

# ENERGY CONSERVATION IN WASTEWATER COLLECTION

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Lumberton Municipal Utility District

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**The Energy Star Program of the EPA estimates that about \$4 billion are spent annually for energy costs to run drinking water and wastewater utilities. If the sector could reduce energy use by just 10% through investment in energy efficiency collectively it would save about \$ 400 million annually.**

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## WHAT ARE SOME CAUSES FOR HIGH ENERGY CONSUMPTION

- WORN OUT PUMPS OR IMPELLERS
- INEFFICIENT MOTORS
- FAULTY CHECK VALVES
- PUMPS OR IMPELLERS IMPROPERLY SIZED
- SEALING FLANGE LEAKS
- INOPERABLE OR FAULTY CONTROLS
- INFLOW AND INFILTRATION INTO SYSTEM
- FAULTY OR IMPROPER AIR RELEASE VALVES

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**WHAT ARE SOME CAUSES FOR HIGH ENERGY CONSUMPTION**

- IMPROPER ROTATION ON PUMPS
- WORN OR DAMAGED WEAR RINGS
- DEBRIS IN PIPING OR FITTINGS
- UNRELIABLE CONTROLS
- UNFORSEEN PRESSURES ON A FORCEMAIN
- FAULTY RAIL OR MOUNTING FLANGE
- ECT.....

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**THERE ARE PLENTY OF REASONS FOR HIGH ENERGY CONSUMPTION  
WHAT CAN YOU DO TO REDUCE YOURS?**

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**MONITOR, MONITOR, MONITOR,**

**DATA COLLECTION IS THE KEY TO PROPERLY OPERATING YOUR SYSTEM**

HISTORICAL DATA IS A GOOD WAY TO MONITOR THE HEALTH OF YOUR PUMPING SYSTEM AND CAN PROVIDE YOU WITH WEALTH OF INFORMATION

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**DO I HAVE TO HAVE  
A SCADA SYSTEM TO  
DO IT??**

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**NO**

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**ALTHOUGH A SCADA SYSTEM  
IS A VERY EFFECTIVE TOOL  
AND SHOULD BE YOUR  
ULTIMATE GOAL**

**YOU CAN DO IT  
EFFECTIVELY WITHOUT AN  
ELECTRONIC SCADA  
SYSTEM.....**

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**HOW DO YOU KNOW WHEN YOUR PUMPS ARE PUMPING CORRECTLY**

**JUST BECAUSE THE PUMP IS SPINNING DOESN'T MEAN THAT THEY ARE PUMPING CORRECTLY**

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**HISTORICAL DATA FOR EACH STATION CAN HELP YOU TREMENDOUSLY**

**IT IS VERY EASY AND INEXPENSIVE WITH A SIMPLE SPREADSHEET, AND HISTORICAL DATA STRAIGHT FROM YOUR ENERGY PROVIDER, BELIEVE IT OR NOT YOU CAN TRACK STATION PROBLEMS WITH HOW MUCH ELECTRICITY THAT THEY CONSUME EACH MONTH**

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E. S. #	NAME	Jan 18	Feb 18	Mar 18	Apr 18	May 18	Jun 18	Jul 18	Aug 18	Sep 18	Oct 18	Nov 18	Dec 18	Jan 19	TOTAL	AVERAGE	MINIMUM	MAXIMUM	
15	Oakdale	78	127	69	97	115	179	712	912	117	692	111	111	72	3812	326.0	105	1279	
16	Pool Rd.	716	691	662	627	596	481	491	618	618	816	180	170	462	649	716	498.5	166	691
17	Dana	811	1292	819	711	578	721	979	1019	799	991	650	774	1091	1091	1091	732.8	379	1292
20	Indian Ln. (East)	491	771	805	491	491	491	491	491	491	491	491	491	491	491	491	491.0	491	491
24	Tiptonwood	574	474	301	298	172	245	156	205	219	189	211	199	242	1989	165.8	172	574	
23	Gayle	99	89	91	47	99	99	99	99	99	99	99	99	99	999	83.3	99	99	
19	Moore	296	361	219	207	181	227	191	217	191	151	490	261	329	2149	179.1	111	490	
18	South Nod	177	451	254	205	199	274	349	419	211	181	267	715	269	4191	349.3	111	715	
14	Walden	2217	1271	2016	702	706	916	819	1187	719	771	691	817	821	11881	1074.0	816	2116	
11	Weth Rd.	1486	1991	1511	705	701	711	750	746	599	576	459	519	519	11449	954.1	459	1751	
10	2154 Park	197	151	149	78	106	76	81	81	82	79	71	81	77	1267	105.6	79	197	
	Publ Comm Fees	474	251	432	214	96	84	156	179	111	189	97	117	141	2461	205.1	96	474	
	Placidin Oaks	187	129	191	129	194	119	149	149	149	117	119	119	142	1811	150.9	119	191	
9	Norman	198	159	139	91	112	61	107	118	87	85	86	81	112	1111	92.6	86	111	
	Cascade	79	91	77	61	91	91	91	107	102	91	112	128	179	1491	124.3	91	179	
22	North Nod	31	31	29	31	27	28	31	31	31	31	31	31	31	311	25.9	31	31	
16	Tipton Oaks	549	371	381	254	269	219	171	149	111	171	201	241	291	4191	349.3	171	549	
10	Madison	4519	5191	5291	5391	5491	5591	5691	5791	5891	5991	6091	6191	6291	6391	6491	5291.0	5191	6291
41	Dave	419	474	471	269	269	269	174	114	111	111	111	111	111	4191	349.3	111	471	
19	Walden	117	129	129	119	144	117	189	119	119	119	119	119	119	1791	149.3	119	179	
14	Pinewood Manor	171	241	241	144	144	117	144	111	171	144	111	144	144	1791	149.3	144	241	
6	Weth Rd.	1491	1111	1197	2791	2711	2467	2466	2796	1087	2112	2674	2129	1491	17911	1493.0	2129	2791	
10	Shoemaker	1111	1197	1111	1197	889	811	919	811	919	762	1111	762	889	11911	992.6	762	1111	

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THE COLLECTION OF  
HISTORICAL DATA CAN  
HELP YOU REDUCE THE  
AMOUNT OF ELECTRICITY  
THAT YOU CONSUME BUT  
ALSO HELP YOU PREDICT A  
SERIOUS PROBLEM BEFORE  
IT OCCURS

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ELECTRICAL

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DID YOU KNOW THAT  
THERE IS GREEN  
MONEY OUT THERE

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CHECK WITH YOUR LOCAL  
POWER PROVIDER THERE  
ARE MANY OPTIONS THAT  
THEY WILL INCENTIVIES  
SOME NEW EQUIPMENT IF  
IT MEETS THE RIGHT  
CRITERIA

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### ELECTRICAL DESIGN

HOW WELL DO YOU KNOW YOUR  
CITY/DISTRICT ENGINEER

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THERE ARE SO MANY WAYS TO  
HELP YOUR PUMP EFFECIENCY  
AND REDUCE ENERGY  
CONSUMPTION WHILE THE  
STATION IS BEING DESIGNED.  
OVER THE LAST FEW YEARS WE  
ARE SEEING MORE AND MORE  
VARIBLE FREQUENCY DRIVES  
(VFD'S)

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VFD'S CAN SAVE YOUR CITY A LOT OF MONEY BUT NOT JUST IN POWER SAVINGS ALONE  
A VFD IS ONE OF THE VERY BEST MOTOR PROTECTOR ON THE MARKET  
IT WILL NOT APPLY ANY INCORRECT INCOMING VOLTAGE TO THE MOTOR

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THE SAVINGS IN REPAIR COST ALONE WILL PAY FOR ITSELF OVER AND OVER  
TRUST ME IT IS NICE TO WEAR OUT THE ACTUAL PUMP COMPONENTS TWO TIMES FOR THE SAME MOTOR

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THERE IS A LOT TO TAKE INTO CONSIDERATION WHEN SIZING ONE. ONE OF THE BIGGEST MISTAKES MADE WHEN SIZING ONE IS THE TEMPERATURE RATING, NEARLY ALL VFD'S ARE RATED @ 30 DEGREES CELCIUS USUALLY THIS IS NOT THE CASE MOST CONTROL PANELS CAN GET UPWARD OF 50 C

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WHEN YOU HAVE SOMEONE SIZE ONE FOR YOU PLEASE REMEMBER TO BRING THIS TO THEIR ATTENTION IT IS A COMMON MISTAKE MADE ALL OVER THE NATION. THERE IS ALSO NOTHING STOPPING YOU FROM PUTTING A LARGER VFD IN, IT WILL JUST REDUCE HEAT IN TURN MAKING THE VFD LAST LONGER

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## **CONTROLS**

YOU CAN ACTUALLY HELP YOUR ENERGY CONSUMPTION AND TROUBLESHOOTING TECHNIQUES BY HOW YOU CONTROL YOUR PUMPS

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**PUMP ALTERNATION HAS BEEN THE INDUSTRY STANDARD FOR YEARS**

**HAVE YOU THOUGHT ABOUT HOUR SHARING**

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**HOUR SHARING CAN BE VERY BENEFICIAL TO IDENTIFICATION OF COMMON PROBLEM IN A LIFT STATION**

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**DID YOU KNOW THAT BY HOUR SHARING PUMPS YOU CAN GET A GOOD IDEA OF PUMP EFFICIENCY**

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**IF I HAVE TWO OR THREE PUMPS IN HOUR SHARE THEN THE HOURS ARE RELATIVELY EVEN NOW YOU CAN LOOK AT YOUR PUMP STARTS IF YOU HAVE A PUMP WITH HALF AS MANY STARTS AS THE OTHERS THEN IT MEANS IT IS TAKING TWICE AS LONG TO MOVE THE SAME AMOUNT OF SEWER**

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	HOURS	STARTS	CYCLE TIME IN MINUTES
PUMP 1	256.8	3207	4.80
PUMP 2	256.7	3203	4.81
PUMP 3	256.5	2756	5.58

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**WHAT OTHER DATA DO YOU MONITOR?**

**STARTS, ALARMS, FAULTS, CYCLE TIMES.....**

**DO YOU COMPARE THEM AGAINST THE OTHER PUMPS.**

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**FORCEMAINS**

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**HOW DO YOU THINK AIR  
TRAPPED IN A FORCEMAIN CAN  
CHANGE HOW MUCH  
ELECTRICITY THE STATION  
CONSUMES?  
CAN IT BE HARMFUL TO  
EQUIPMENT?**

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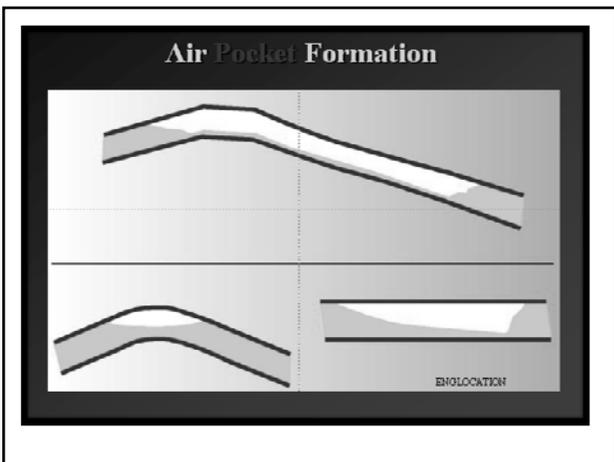
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CAN FAULTY AIR RELEASE  
VALVES DAMAGE  
FORCEMAINS AND  
TRANSMISSION LINES

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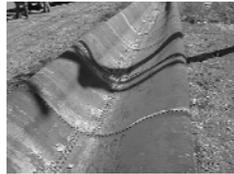
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A.R.I. FLOW CONTROL ACCESSORIES

Inward collapse of pipelines



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A.R.I. FLOW CONTROL ACCESSORIES

Inward collapse of pipelines

- Extreme low pressure conditions
- Large thin-walled pressure mains



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**WHERE DO YOU NEED THEM**

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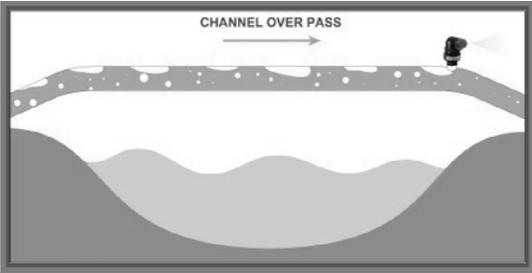
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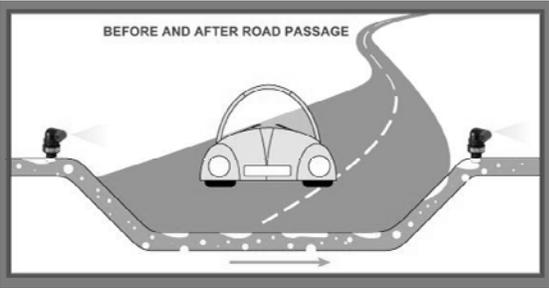
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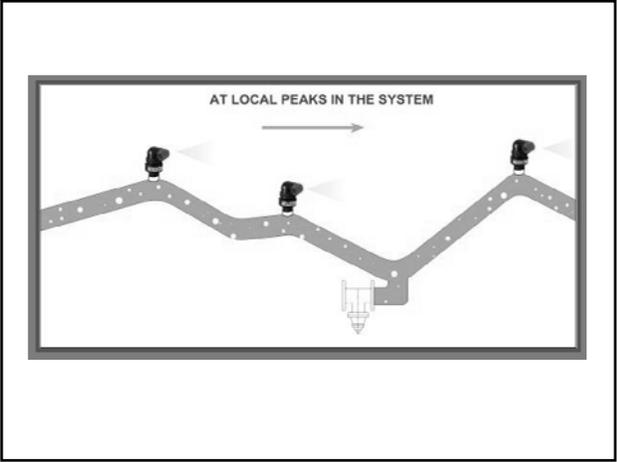
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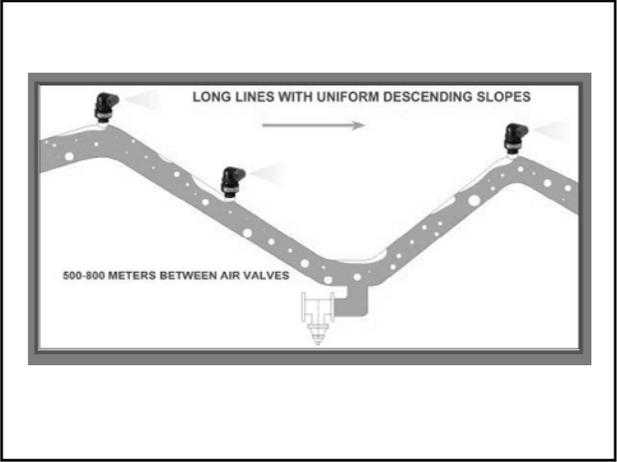
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**DOES SIZING A  
FORCEMAIN PLAY A  
MAJOR ROLE IN IN  
ELECTRICAL  
EFFICIENCY**

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**SOME TIMES IT IS  
MORE FEASABLE TO  
JUST PUT LARGER  
PUMPS IN JUST TO  
ADD MORE FLOW**

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**YOU MUST ALWAYS  
CONSIDER A SIZE  
CHANGE IN THE FORCE  
MAIN AS WELL**

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**YOU HAVE TO CONSIDER  
LIFE CYCLE COST WHEN**

**UPGRADING PUMPS**

**vs.**

**ENLARGING A FORCE MAIN**

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# PUMPS

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**WORN OR BROKEN  
IMPELLERS CAN CAUSE  
A LOT OF EXCESSIVE  
CONSUMPTION IN  
ENERGY**

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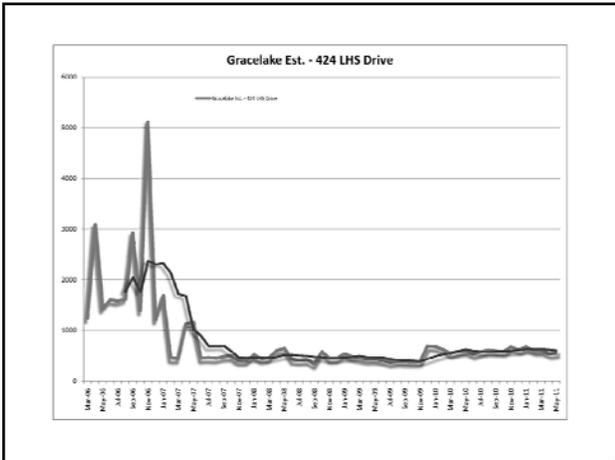
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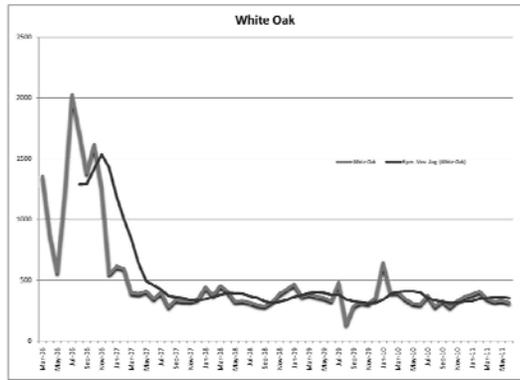
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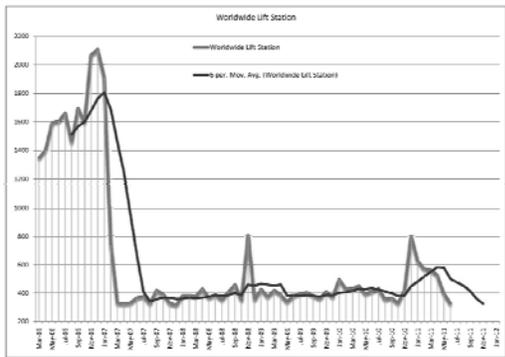
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**I & I WILL CAUSE A LOT  
OF ENERGY  
CONSUMPTION AND CAN  
LEAD TO OTHER  
OPERATIONAL  
PROBLEMS**

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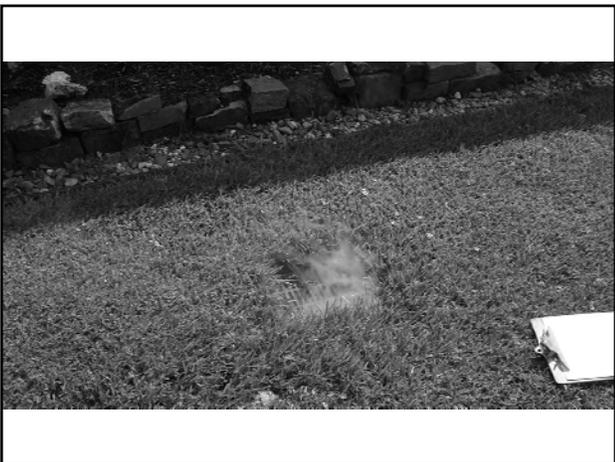
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**CHECK VALVES**

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**CHECK VALVES**  
THERE ARE A LOT OF PROBLEMS  
COMMONLY ASSOCIATED  
WITH CHECK VALVES THEY DO  
A VERY IMPORTANT JOB THEY  
KEEP YOU FROM PUMPING  
SEWER THAT YOU HAVE  
ALREADY PUMPED

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# CHECK VALVES

UNFORTUNATELY THIS ITEM SEEMS TO FAIL MORE THAN ANY OTHER EQUIPMENT IN THE STATION.... MOST OF THE FAILURES GO UN NOTICED BECAUSE MOST OF THE TIME YOU CANT SEE IT OR HEAR IT.

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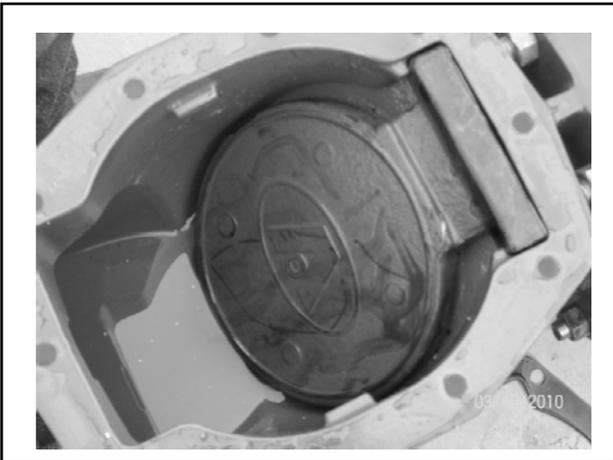
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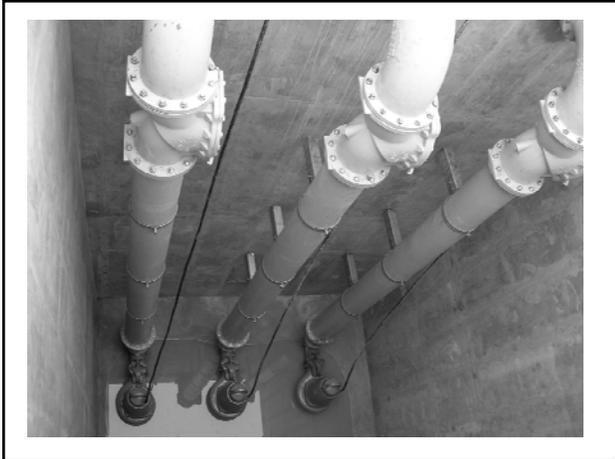
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# QUESTIONS

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Feel free to contact me  
@  
[robbs@lumbertonmud.com](mailto:robbs@lumbertonmud.com)

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