

Appendix B
System Reports *(Example)*

DRAFT

Delaware Wastewater Study System Report													
Kent County Department of Public Works Kent County Levy Court 555 Bay Road Dover, DE 19901	ID: 61 City ID: KENT												
Kent County Department of Public Works	reatment Plant - State Permit No. WPCC 3082F/74												
General													
1) Contact(s):													
<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid black;"><i>Name</i></th> <th style="text-align: left; border-bottom: 1px solid black;"><i>Title</i></th> <th style="text-align: left; border-bottom: 1px solid black;"><i>Email</i></th> <th style="text-align: left; border-bottom: 1px solid black;"><i>Telephone</i></th> <th style="text-align: left; border-bottom: 1px solid black;"><i>Ext</i></th> <th style="text-align: left; border-bottom: 1px solid black;"><i>Fax</i></th> </tr> </thead> <tbody> <tr> <td>Hans Medlarz</td> <td>Director of Public Works</td> <td>hans.medlarz@co.kent.de.us</td> <td>(302)744-2430</td> <td></td> <td></td> </tr> </tbody> </table>	<i>Name</i>	<i>Title</i>	<i>Email</i>	<i>Telephone</i>	<i>Ext</i>	<i>Fax</i>	Hans Medlarz	Director of Public Works	hans.medlarz@co.kent.de.us	(302)744-2430			
<i>Name</i>	<i>Title</i>	<i>Email</i>	<i>Telephone</i>	<i>Ext</i>	<i>Fax</i>								
Hans Medlarz	Director of Public Works	hans.medlarz@co.kent.de.us	(302)744-2430										
2) Interviewer Name: <input style="width: 80%;" type="text" value="CSG, HKM, JH"/>													
3) Interview Date: <input style="width: 80%;" type="text" value="12/10/2010"/>													
4) Entity responsibilities (check all that apply):													
<input checked="" type="checkbox"/> Collection <input checked="" type="checkbox"/> Transmission <input checked="" type="checkbox"/> Treatment (including solids) <input type="checkbox"/> Other (Describe): <input style="width: 60%;" type="text"/>													
5) Entity is responsible for multiple treatment plants? (If "yes", the survey must be filled out for each treatment plant / service area)													
<input type="text" value="No"/>													
6) Ownership													
<input checked="" type="radio"/> Municipal <input type="radio"/> Municipal Authority <input type="radio"/> Private Investor Owned <input type="radio"/> Private Non-Investor Owned <input type="radio"/> Other (Describe): <input style="width: 60%;" type="text"/>													
7) General Comments													
<div style="border: 1px solid black; height: 40px; width: 100%;"></div>													
Treatment Plant													
1) Wastewater Treatment Plant Name: <input style="width: 90%;" type="text" value="Kent County Regional Wastewater Treatment Plant - State Permit N"/>													
2) Physical Address <input style="width: 90%;" type="text" value="139 Milford Neck Road
Milford, Delaware 19963"/>													
3) General level of treatment													
<input checked="" type="checkbox"/> Primary Treatment <input checked="" type="checkbox"/> Secondary Treatment <input checked="" type="checkbox"/> Nitrogen removal <input checked="" type="checkbox"/> Phosphorus removal 													
<hr/>													
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treatment Plant - State Permit No. WPCC 3082F/74

Tertiary Treatment

Other (Describe):

Downflow filtration, Ferric Injection before filtration and adding carbon sources to remove phosphate, sludge handling

4) What is source of treatment plant back-up power (check all that apply):

On-site Generator (diesel/gasoline)

Portable Generator

Other (Describe):

On-site Generator (natural gas from main)

Battery

1.2 MW Solar

On-site Generator (propane / natural gas from tank)

None

5) Permit Information: General

Permit ID	Permit Type	Dischg. Type	Discharge Location	Watershed	Lat (dec. degree)	Long (dec. degree)	Permit Capacity (MGD)	Permit Issuance Date	Permit Expiration Date
DE0020338	NPDES	Stream Out	MURDERKILL	19. Delaware Bay	38.997030	75.43876	16.3	11/1/2006	10/31/2011

6) Treatment Plant Capacity:

Current Design Flow (MGD)	16.30	Average Daily Flow (MGD)	12.19
Peak Flow (MGD)	18.60	% of Average Daily Flow from Domestic Source	74.00
Anticipated Flow in 2020 (MGD)	15.00	Future Design Flow in 2030 (MGD)	18.00

7) Has the plant exceeded its current design flow capacity for 2 or more consecutive months in the past 2 years?

Yes

8) Are the flows above the permitted limit due to excessive infiltration and inflow? (See Service Area Question #11 to describe I/I problem)

Yes

9) Permit Limits

Outfall	Parameter	Load Daily Averag	Load Daily Maximu	Load Units	Conc Daily Minimu	Conc Daily Average	Conc Daily Maximu	Conc Units	Measurement Frequency	Sample Type
001	DO				5			MG/L	DAILY	GRAB
001	Flow	16.3		MGD					CONTINUOUS	RECORD
001	pH				6		9	SU	DAILY	GRAB
001	Chlorine, Tot Res (MDL)						0	MG/L	DAILY	GRAB
001	Enterococci					33		#/ 10	DAILY	GRAB
001	TSS	2720	4080	LBS/D		20	30	MG/L	WEEKLY	COMP-8
001	5-Day CBOD	1001		LBS/D				MG/L	DAILY	COMP-8
001	Nitrogen, Total (annual average)		274115	LB/YR					WEEKLY	COMP-8
001	Nitrogen, Total (may-sept)	751	1126	LBS/D				MG/L	WEEKLY	COMP-8
001	Phosphorus, Total (annual average)		22812	LB/YR					WEEKLY	COMP-8
001	Phosphorus, Total (may-sept)	62.5	93.7	LBS/D				MG/L	WEEKLY	COMP-8

Influent Wastewater Strength

10) Over the last 12 months, what was the typical average strength of the influent wastewater BOD and TSS?

Kent County Department of Public Works	reatment Plant - State Permit No. WPCC 3082F/74
<input type="radio"/> About Normal (150-250 mg/l BOD and TSS) <input checked="" type="radio"/> Above Normal (>250 mg/l BOD and TSS) Reason: <input style="width: 150px;" type="text" value="Food processing"/> <input type="radio"/> Below Normal (<150 mg/l BOD and TSS) Reason: <input style="width: 150px;" type="text"/>	
<u>Nitrification</u>	
11) What is the typical average strength of the influent wastewater NH3-N?	<input style="width: 100px;" type="text" value="21 to 30 mg/l"/>
12) Is the facility required to remove ammonia nitrogen (NH3-N, nitrification)?	<input style="width: 100px;" type="text" value="No"/>
13) Has the facility been in non-compliance for ammonia nitrogen for 2 or more consecutive months within the last 2 years?	<input style="width: 100px;" type="text"/>
14) What was the cause of the non-compliance with the ammonia nitrogen limits?	
<input type="checkbox"/> Wash out of biomass due to inflow and infiltration <input type="checkbox"/> Equipment failure <input type="checkbox"/> Design issues <input type="checkbox"/> Operational issues	<input type="checkbox"/> Low dissolved oxygen <input type="checkbox"/> Low alkalinity <input type="checkbox"/> Low temperature <input type="checkbox"/> Toxic shock
	<input type="checkbox"/> Unknown <input type="checkbox"/> Other (explain): <input style="width: 100px; height: 30px;" type="text"/>
<u>Total Nitrogen</u>	
15) Does the facility have or anticipate having (within 5 years) total nitrogen limits in the permit based on TMDL or other control strategies?	
<input checked="" type="radio"/> Yes, actual limits in place now. <input type="radio"/> No limits currently. ANTICIPATE limits within 5 years. <input type="radio"/> No limits currently. DO NOT ANTICIPATE any limits in the future.	
16) Has the facility experienced problems in meeting actual total nitrogen limits within the last 2 years?	<input style="width: 100px;" type="text" value="No"/>
17) Do you anticipate any problems in complying with the ANTICIPATED total nitrogen limits?	<input style="width: 100px;" type="text"/>
18) What problems do you anticipate?	<input style="width: 100px;" type="text"/>
<u>Total Phosphorus</u>	
19) Does the facility have or anticipate having (within 5 years) total phosphorus limits in the permit based on TMDL or other control strategies?	
<input checked="" type="radio"/> Yes, actual limits in place now. <input type="radio"/> No limits currently. ANTICIPATE limits within 5 years. <input type="radio"/> No limits currently. DO NOT ANTICIPATE any limits in the future.	
20) Has the facility experienced problems in meeting actual total phosphorus limits within the last 2 years?	<input style="width: 100px;" type="text" value="No"/>
21) Do you anticipate any problems in complying with the ANTICIPATED total phosphorus limits?	<input style="width: 100px;" type="text"/>
22) What problems do you anticipate?	<input style="width: 100px;" type="text"/>
<u>Effluent Problems</u>	
23) Has the facility experienced non-compliance with any other parameters for 2 or more consecutive months within the last 2 years (excluding ammonia nitrogen, total nitrogen, and phosphorus)?	
<input type="checkbox"/> pH <input type="checkbox"/> cBOD <input type="checkbox"/> TSS <input type="checkbox"/> DO <input type="checkbox"/> Total Residual Chlorine <input type="checkbox"/> Enterococcus / Fecal Coliform <input type="checkbox"/> Metals (any) <input type="checkbox"/> PCBs <input checked="" type="checkbox"/> Other (explain): <input style="width: 150px;" type="text" value="Nothing for 2 consecutive months (see belo)"/>	
24) What was the cause of the above non-compliance?	
<input checked="" type="checkbox"/> Wash out of biomass due to inflow and infiltration <input checked="" type="checkbox"/> Toxic shock <input type="checkbox"/> Equipment failure	<input type="checkbox"/> Low temperature <input type="checkbox"/> Operational issues <input type="checkbox"/> Design issues
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Unknown

Other (explain) _____

25) General Treatment Plant Comments.

BOD/TSS strength top end of normal (250 to 300 influent strength in November 2010). Ammonia/N/P limits start in May 2011. Temp above TN limits due to plant modifications/construction. Exceeded flow capacity in March 2010 b/c I/I. Also exceeded TSS capacity due to I/I biomass washout. Lat/Lon doesn't match PCS.

Service Area

1) Service area, square miles:

2) Number of pump stations:

3) What is source of back-up power at pump stations?

- On-site Generator (diesel/gasoline) Portable Generator
- On-site Generator (natural gas from main) Battery
- On-site Generator (propane/natural from tank) None
- Other (Describe): _____

4) Number of holding tanks:

5) Total holding tank capacity (gallons):

6) Sewer Districts included in service area (in whole or in part):

<i>City/Town</i>	<i>Contract User</i>	<i>Percent Service Area</i>	<i>Number of Households</i>	<i>Average Sewer Rate (\$/yr)</i>	<i>Total Annual Residential Revenue (\$)</i>
Bowers Beach	<input type="checkbox"/>		347	\$410.48	\$142,436.56
Camden	<input checked="" type="checkbox"/>				
KCSSD - Capital Park	<input type="checkbox"/>		243	\$304.80	\$74,066.40
Cheswold	<input type="checkbox"/>		1259	\$313.56	\$394,772.04
Clayton	<input checked="" type="checkbox"/>				
KCSSD - Colony West	<input type="checkbox"/>		195	\$282.20	\$55,029.00
Dover	<input checked="" type="checkbox"/>				
KCSSD - Dykes Branch	<input type="checkbox"/>		1155	\$323.76	\$373,942.80
Felton	<input type="checkbox"/>		1047	\$333.56	\$349,237.32
Frederica	<input type="checkbox"/>		404	\$333.56	\$134,758.24
KCSSD - Garrison Lake I	<input type="checkbox"/>		316	\$304.80	\$96,316.80
KCSSD - Garrison Lake II	<input type="checkbox"/>		95	\$304.80	\$28,956.00
KCSSD - Garrison Lake V	<input type="checkbox"/>		972	\$304.80	\$296,265.60
KCSSD - Garrison Lake IV	<input type="checkbox"/>		121	\$304.80	\$36,880.80
KCSSD - Generals Green	<input type="checkbox"/>		327	\$304.80	\$99,669.60
KCSSD - Isaacs Branch	<input type="checkbox"/>		2263	\$304.80	\$689,762.40
Kenton	<input type="checkbox"/>		133	\$476.60	\$63,387.80
Little Creek	<input type="checkbox"/>		132	\$358.32	\$47,298.24

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KCSSD - Little Heaven	<input type="checkbox"/>	27	\$282.20	\$7,619.40
Magnolia	<input type="checkbox"/>	757	\$282.20	\$213,625.40
Milford	<input checked="" type="checkbox"/>			
KCSSD - Northeast	<input type="checkbox"/>	220	\$517.20	\$113,784.00
KCSSD - Pickering Beach	<input type="checkbox"/>			
KCSSD - Royal Grant	<input type="checkbox"/>	207	\$304.80	\$63,093.60
Smyrna	<input checked="" type="checkbox"/>			
KCSSD - Tidbury Branch	<input type="checkbox"/>	1755	\$304.80	\$534,924.00
Wyoming	<input checked="" type="checkbox"/>			
KCSSD - Bakers Choice	<input type="checkbox"/>	86	\$499.08	\$42,920.88
KCSSD - Burtonwood Village	<input type="checkbox"/>	122	\$304.80	\$37,185.60
KCSSD - Carlisle Village	<input type="checkbox"/>	240	\$304.80	\$73,152.00
KCSSD - DAFB	<input type="checkbox"/>	2829	\$282.20	\$798,343.80
KCSSD - North Magnolia	<input type="checkbox"/>	69	\$282.20	\$19,471.80
KCSSD - South Central	<input type="checkbox"/>	870	\$439.20	\$382,104.00

7) Population served:

	Current	Future, 2030
Resident	37,130	39,130
Non-resident	62,870	65,870
Total	100,000	105,000

8) Is service area digitized?

9) Map obtained?

10) Provide a narrative description and status of the service area (include information about your combined sewer system, if applicable).

220 miles Gravity sewers (<=18"), 139 Low pressure sewers / Force main (49 miles of 24"-48" pipes); Nascar 2 weekends a year. Original quote of 100,000 pop. served. Subtracted out contract user populations to separate res/non-res.

11) Describe your system's I / I problem. Include details on flow or percent flow to help quantify the issue.

No Combined Sewer. Experience I/I problems from towns contributing to system. Much of the I/I is from the City of Dover (Pump Station #3): 1.5 MGD (Sept. 2010, dry) vs. 3.25 MGD (March 2010, wet).

12) Service Area Comments:

DAFB is now a district. "Other" examples include MHPs (High Point - 500 units) or industry (PPG). Adding 1600 EDUs/yr, x200, should be 400,000 GPY but not seeing it...

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Finance

1) Is sufficient revenue being generated to meet the cost of the wastewater enterprise without transfers from other enterprises?

2) If the revenue is not sufficient, please explain why:

N/A.

3) Do you have a reserve account?

4) Is your reserve account, or a portion of the reserve account, restricted to the wastewater enterprise?

5) What is the percent value (%) in the wastewater reserve account when compared to the overall operating revenue of the wastewater enterprise?

6) Reserve account restrictions / comments (example: "emergency repairs only"):

Funds are shared/overlapped. "Working capital reserve fund", "capital emergency reserve fund", (not "accounts"), are restricted. Operating revenue and % reserve do not include debt service.

7) How are residential customer rates/bills computed (check all that apply)?

- EDU
- Metered
- Front-footage assessment
- Other (Describe):

8) How are commercial, industrial, and contract user rates/bills computed?

All comm./ind./MHP/contracts pay \$2.34 per 1000 gal.

9) Median Household Income (MHI) (\$/year)

10) How much additional revenue could be generated per year if residential sewer charges were increased to:

1.5 percent of MHI	<input type="text" value="\$6,506,245"/>
2.0 percent of MHI	<input type="text" value="\$10,397,994"/>
2.5 percent of MHI	<input type="text" value="\$14,289,744"/>

11) Rates, Billing, and MHI Comments:

Flow-weighted MHI spreadsheet provided by Hans (\$37,002, Census 2000). Converted to CPI 2010. Note: KC Avg. Adj to 2010 is \$53,203. Also compare to ACS. Operations fee is uniform (\$282/yr – Colony West). Rest is debt-based.

12) What is the debt borrowing limit (\$)?

13) How much of this limit (\$) is allocated to the wastewater enterprise?

14) How much of this limit (\$) available to the wastewater enterprise is used overall?

15) Borrowing Limit and Debt Comments:

Debt borrowing limit is about 12% of assessed value.

Future Capital

1) Do you have a long - term capital improvement plan for your waste water enterprise?

2) When was CIP last updated (year)?

3) Anticipated Future Capital Needs (include projects with or without costs, including I / I and CSO strategies)

Title	Description	Duration	Reason	Cost	
				Total (\$)	Reason (%)
Treatment Plant Upgrades	<input checked="" type="checkbox"/> PD See original for breakdown <input checked="" type="checkbox"/> Cons. <input type="checkbox"/> Doc.	2011 - 2015	Treatment	\$46,802,000	100
Conveyance System Upgrades	<input checked="" type="checkbox"/> PD See original for breakdown <input checked="" type="checkbox"/> Cons. <input type="checkbox"/> Doc.	2011 - 2015	Conveyance	\$9,552,000	100
Sanitary Sewer Districts	<input checked="" type="checkbox"/> PD See original for breakdown <input checked="" type="checkbox"/> Cons. <input type="checkbox"/> Doc.	2011 - 2015	New Districts	\$17,651,328	100
Pump Station Upgrades	<input checked="" type="checkbox"/> PD See original for breakdown <input checked="" type="checkbox"/> Cons. <input type="checkbox"/> Doc.	2011 - 2015	Pump Stations	\$1,800,000	100
Equipment	<input checked="" type="checkbox"/> PD See original for breakdown <input checked="" type="checkbox"/> Cons. <input type="checkbox"/> Doc.	2011 - 2015	Equip	\$450,000	100

Notes: PD: Planning and Design Project (Yes/No)
Cons.: Construction Project (Yes/No)
Doc.: Documentation Acquired for Files (Yes/No)

3) continued

Title	Expected Funding Options: Percent of Total Cost				
Treatment Plant Upgrades	Capital Contributions:	Assessments:	Reserves:	SRF:	
	Connection/Impact Fees:	State Grant:	USDA:	Other:	
	Local Borrowing:	Bond Issue:	CDBG:		
Conveyance System Upgrades	Capital Contributions:	Assessments:	Reserves:	SRF:	
	Connection/Impact Fees:	State Grant:	USDA:	Other:	
	Local Borrowing:	Bond Issue:	CDBG:		
Sanitary Sewer Districts	Capital Contributions:	Assessments:	Reserves:	SRF:	
	Connection/Impact Fees:	State Grant:	USDA:	Other:	
	Local Borrowing:	Bond Issue:	CDBG:		
Pump Station Upgrades	Capital Contributions:	Assessments:	Reserves:	SRF:	
	Connection/Impact Fees:	State Grant:	USDA:	Other:	
	Local Borrowing:	Bond Issue:	CDBG:		
Equipment	Capital Contributions:	Assessments:	Reserves:	SRF:	
	Connection/Impact Fees:	State Grant:	USDA:	Other:	
	Local Borrowing:	Bond Issue:	CDBG:		

4) Future Capital Comments:

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See consolidated spreadsheet and original w/ projects. \$76.25M listed above incl 2010 and prior budget years. 2011 2015 future cap needs is \$52.5M.

Reuse

1) Has this reporting entity evaluated opportunities for reuse via:

	No	No, but interested	Yes, but not viable	Yes, some planning performed	Yes, currently implementing some reuse now
Land Application for Agriculture Use	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Commercial/Industrial Use	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Residential Use	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Municipal Wastewater Sludge Reuse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Water Reclaimed at plant 100,000 gpd	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
N/A-Additional reuse method not specified	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
N/A-Additional reuse method not specified	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2) Comments (options considered, opportunities, barriers):

100% sludge reuse. Been purchasing land around plant for spray, about 700 acres to date. 10 years down road per estimated EDU's.

3) If interested in beneficial reuse via irrigation, can the domestic wastewater effluent consistently meet the effluent limitations for Unlimited Public Access Sites as required in Part II, B, Section 303, (2) c of the Guidance and Regulations Governing the Land Treatment of Wastes?

- Yes
- No

4) Comments (to further explain your response to #3):

Meets unlimited upon completion of tertiary project (funding in place, next 24 months).

5) What is the availability and potential interest of owners of agricultural lands nearby for irrigation?

Interest is great if farmers have control of valve. Questions at about cost (free?) and ability to keep pressure.

6) What are the current permit requirements that may be satisfied with a wastewater reuse alternative(s) to the current situation?

Don't need it now, possibly in future.

7) What are the necessary wastewater facilities upgrades needed and associated costs for wastewater reuse options?

Description	Cost Estimates (\$)
N/A, funding is in place.	

8) If reuse is not an option, what other methods are available to manage effluent?

N/A.

9) List any other reuse, green technologies, or energy efficiency upgrades that the wastewater enterprise has, or plans to have, and the funding strategy used to implement or convert to new technologies (examples: methane capture, solar panels, N/P pelletizing):

1.2 MW solar panels for 100% elec on sunny days, HVAC with effluent (heat exchangers / heat pumps), 3 passive solar greenhouses for drying (1/4 acre each w/ heated floors), not interested in methane capture (expertise issue, and only 20%).