APPENDIX A

Howard R. Green Company

March 13, 2009

Brad Thompson
U.S. Army Corps of Engineers, Omaha District
Planning Division
Attn: CENWO-PM-AE
1616 Capitol Avenue, Suite 9000
Omaha, NE 68102

Re: Lift Station to Pump Wastewater from Harrisburg to Sioux Falls for Treatment
City of Harrisburg, South Dakota

Dear Mr. Thompson:

The City of Harrisburg, South Dakota is applying to the South Dakota Department of Environment and Natural Resources (DENR) for grants and loans through the State Revolving Fund Program. The funding will be used to construct the above-referenced project. In conjunction with the program requirements from this funding agency, comments from appropriate agencies regarding flood plain, wildlife, environmental, and historical concerns are requested.

The City of Harrisburg proposes to use the DENR funding to construct a lift station on the existing site of the evaporation ponds. The evaporation ponds are near capacity and must be upgraded to provide wastewater treatment for the growing community of Harrisburg. A can-type wet well/dry well lift station will pump wastewater effluent from cell #3 to the City of Sioux Falls Lift Station #240 located on 57th Street near the Big Sioux River. The existing ponds will continue to be used as an equalization basin. The project will include:

- Upsizing of the influent gravity sewer from a point in the collection system to cell #1 of the ponds.
- Screening equipment ahead of the ponds or the lift station.
- Effluent piping from cell #3 of the evaporation pond to the lift station.
- Lift station.
- Installation of approximately 11 miles of force main.
- Connection to LS #240.

The exact route of the force main has not been determined at this time. It is planned to be located within the right-of-way of township, county, and city streets. The potential routes have been identified on the enclosed map B.

This project will occur within the county, township, or street right-of-way; in existing easements; on existing City owned land where the current wastewater ponds are located; and within railroad right-of-way. The work will be completed in the following areas:

- Township 99N, Range 50W, Sections 1 and 12
- Township 99N, Range 49W, Sections 4 thru 9
- Township 100N, Range 49W, Sections 7 thru 10, 15 thru 22, 27 thru 34
- Township 101N, Range 48W, Sections 31, 32, and 32
- Township 101N, Range 49W, Section 36

Howard R. Green Company

Because time is of the essence, we would greatly appreciate your comments within 30 days. If we do not hear back from you within 30 days, we will assume that you have no comments on the project, and that the project will have no significant impact.

If you have any questions, please feel free to contact me at 605-334-4499. Thank you for your consideration.

Sincerely,
Howard R. Green Company

Ryan W. Johnson, P.E.
Project Engineer

Enclosures

cc: SD Department of Game, Fish and Parks, Division of Wildlife
United States Department of Interior, Fish and Wildlife Service
United States Department of Agriculture, Natural Resources Conservation Service
Mary McClung, City of Harrisburg

Howard R. Green Company

March 13, 2009

Daniel R. Shurtliff
Acting State Soil Scientist
United States Department of Agriculture
Natural Resources Conservation Service
Federal Building
Huron, SD 57350-2475

Re: Lift Station to Pump Wastewater from Harrisburg to Sioux Falls for Treatment
City of Harrisburg, South Dakota

Dear Mr. Shurtliff:

The City of Harrisburg, South Dakota is applying to the South Dakota Department of Environment and Natural Resources (DENR) for grants and loans through the State Revolving Fund Program. The funding will be used to construct the above-referenced project. In conjunction with the program requirements from this funding agency, comments from appropriate agencies regarding flood plain, wildlife, environmental, and historical concerns are requested.

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Howard R. Green Company

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Sincerely,
Howard R. Green Company

Ryan W. Johnson, P.E.
Project Engineer

Enclosures

cc: South Dakota Department of Game, Fish and Parks, Division of Wildlife
United States Department of Interior, Fish and Wildlife Service
U.S. Army Corps of Engineers, Omaha District
Mary McClung, City of Harrisburg

Howard R. Green Company

March 13, 2009

John Kirk
Interagency Coordinator
South Dakota Department of Game, Fish and Parks
Division of Wildlife
523 East Capitol Avenue
Pierre, SD 57501-3181

Re: Lift Station to Pump Wastewater from Harrisburg to Sioux Falls for Treatment
City of Harrisburg, South Dakota

Dear Mr. Kirk:

The City of Harrisburg, South Dakota is applying to the South Dakota Department of Environment and Natural Resources (DENR) for grants and loans through the State Revolving Fund Program. The funding will be used to construct the above-referenced project. In conjunction with the program requirements from this funding agency, comments from appropriate agencies regarding flood plain, wildlife, environmental, and historical concerns are requested.

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Howard R. Green Company

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Sincerely,
Howard R. Green Company

Ryan W. Johnson, P.E.
Project Engineer

Enclosures

cc: United States Department of Interior, Fish and Wildlife Service
United States Department of Agriculture, Natural Resources Conservation Service
U.S. Army Corps of Engineers, Omaha District
Mary McClung, City of Harrisburg

Howard R. Green Company

March 13, 2009

Donald Gober
Field Supervisor
United States Department of Interior
Fish and Wildlife Service
420 South Garfield Avenue
Pierre, SD 57501-5408

Re: Lift Station to Pump Wastewater from Harrisburg to Sioux Falls for Treatment
City of Harrisburg, South Dakota

Dear Mr. Gober:

The City of Harrisburg, South Dakota is applying to the South Dakota Department of Environment and Natural Resources (DENR) for grants and loans through the State Revolving Fund Program. The funding will be used to construct the above-referenced project. In conjunction with the program requirements from this funding agency, comments from appropriate agencies regarding flood plain, wildlife, environmental, and historical concerns are requested.

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Howard R. Green Company

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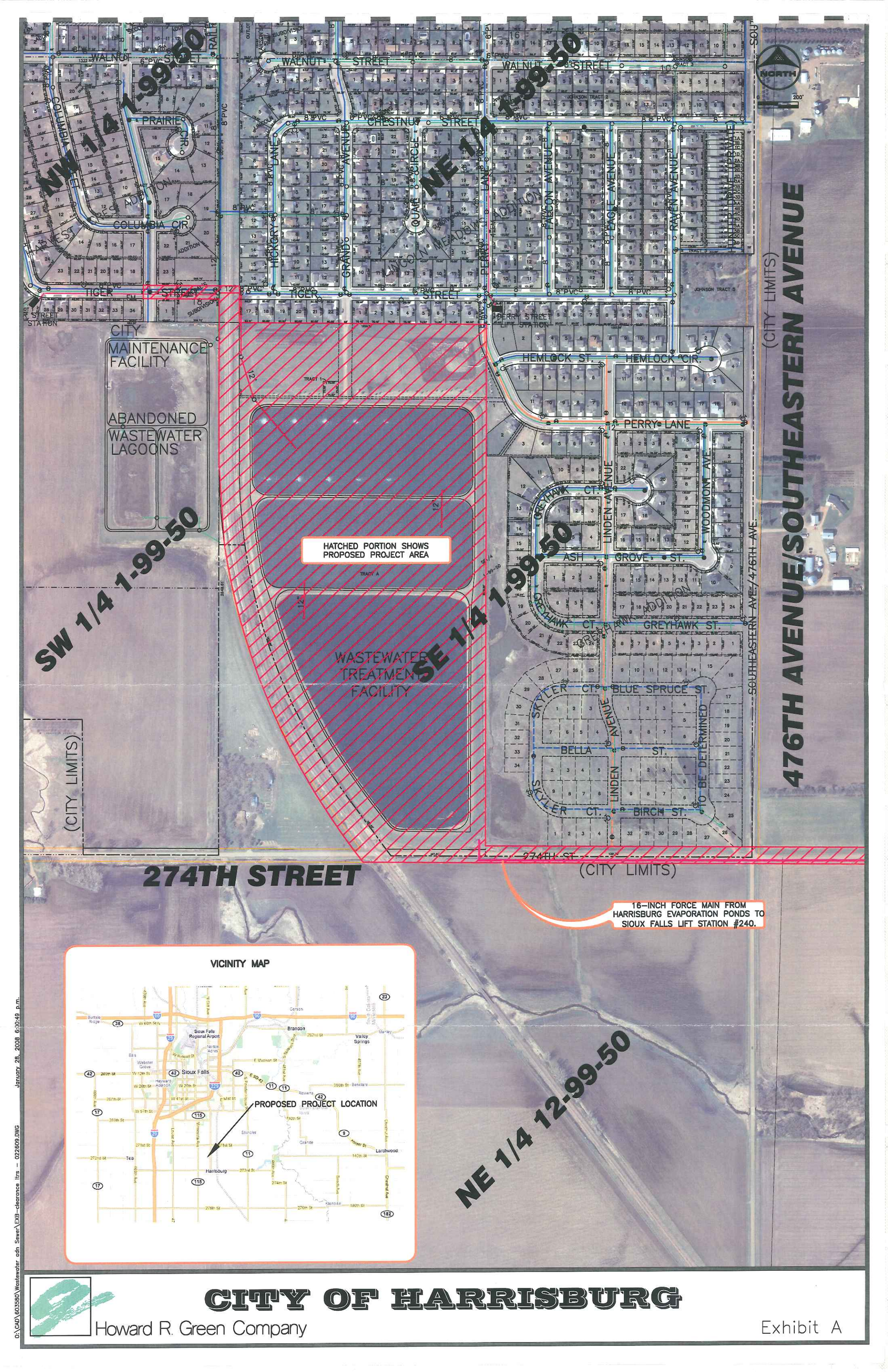
Sincerely,
Howard R. Green Company

Ryan W. Johnson, P.E.
Project Engineer

Enclosures

cc: SD Department of Game, Fish and Parks, Division of Wildlife
United States Department of Agriculture, Natural Resources Conservation Service
U.S. Army Corps of Engineers, Omaha District
Mary McClung, City of Harrisburg



CITY OF HARRISBURG

Howard R. Green Company

Exhibit A

January 28, 2008 6:30:49 p.m.

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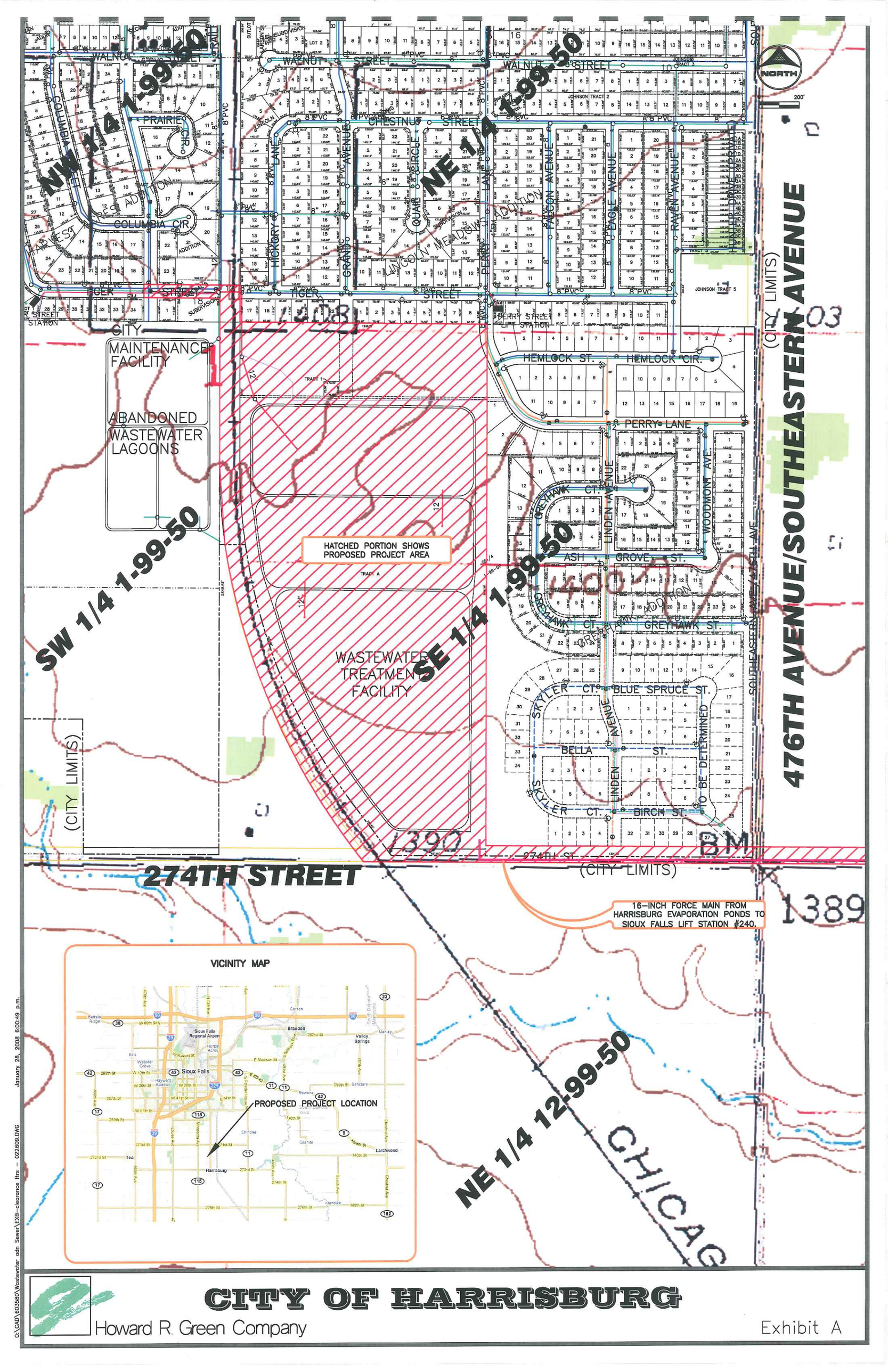

CITY OF HARRISBURG

Howard R. Green Company

Exhibit A

January 28, 2008 6:00:49 p.m.

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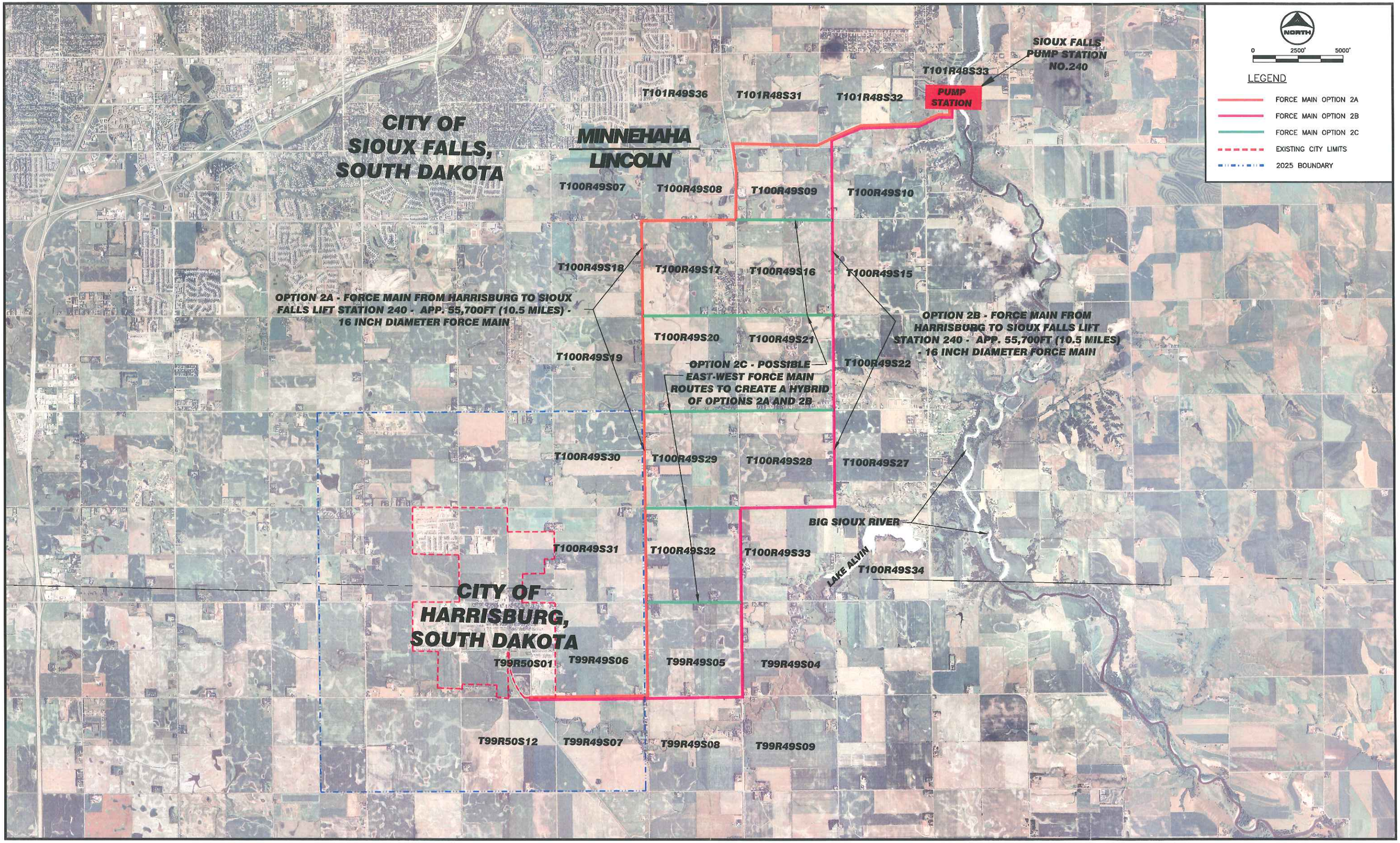
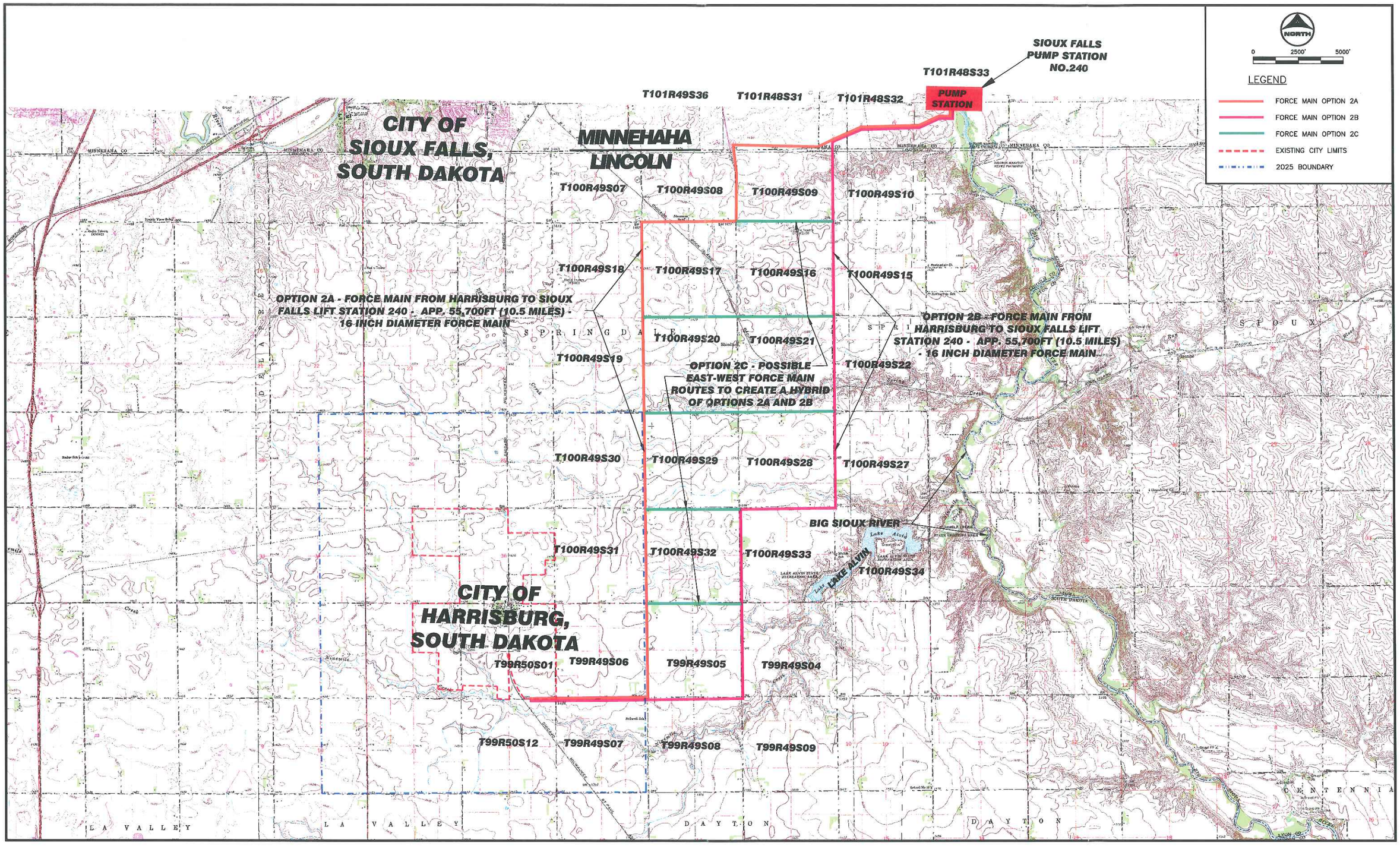


DRAWN BY: RWJ JOB DATE: 2009 APPROVED: JOB NUMBER: 604980 CAD DATE: CAD FILE: O:\CAD\604980J\PRELIM\exhibit-031109-FM Alignment options	Howard R. Green Company	WW TREATMENT SYSTEM FACILITY PLAN CITY OF HARRISBURG HARRISBURG, SOUTH DAKOTA	FORCE MAIN OPTIONS	SHEET NO. B



DRAWN BY: RWJ	JOB DATE: 2009	WW TREATMENT SYSTEM FACILITY PLAN CITY OF HARRISBURG HARRISBURG, SOUTH DAKOTA	SHEET NO. B
APPROVED:	JOB NUMBER: 604980		
CAD DATE:			
CAD FILE: O:\CAD\604980J\PRELIM\exhibit-031109-FM Alignment options		Howard R. Green Company	FORCE MAIN OPTIONS

Howard R. Green Company

February 27, 2009

Jane Watts
SD State Historical Society Archaeological Research Center
2425 East Saint Charles Street
Rapid City, SD 57703

Re: Record Search for Archeology and Historical Sites

Dear Jane:

Howard R. Green Company is currently working with the City of Harrisburg on a Facility Plan for wastewater treatment system improvements, and requests record searches for archeological and historical sites for the following project:

The Facility Plan proposes modifications to the existing evaporation ponds to convert them to aerated lagoons with a new interceptor to discharge treated wastewater to Ninemile Creek. This work will also require construction of the following:

- New earthen berms to divide cells in the existing lagoons.
- Replacement of the influent piping to the lagoons.
- New buildings with footing excavations of 3 to 12 feet for buried equipment.
- New underground piping with excavations to a depth of 6 feet to 12 feet.

This project will occur within the street right-of-way, in existing easements, on existing City owned land where the current wastewater ponds are located, and within railroad right-of-way. The work will be completed in the Section 1 and 12, Township 99N, Range 50W.

Maps of the project listed above are attached for your use.

You may send the findings and invoice for your time to the following address:

Ryan Johnson
Howard R. Green Company
6010 South Minnesota Avenue, Suite 102
Sioux Falls, SD 57108-2715

Please contact me with any questions. Thank you for your assistance.

Sincerely,
Howard R. Green Company

Ryan Johnson, P.E.
Project Engineer

Enclosures

cc: Mary McClung, City of Harrisburg

6010 S. Minnesota Avenue, Suite 102 • Sioux Falls, South Dakota 57108-2715
605.334.4499 fax 605.338.6124 toll free 800.765.3008 www.hrgreen.com

Howard R. Green Company

March 19, 2009

Jane Watts
SD State Historical Society Archaeological Research Center
2425 East Saint Charles Street
Rapid City, SD 57703

Re: Record Search for Archeology and Historical Sites

Dear Jane:

Howard R. Green Company is currently working with the City of Harrisburg on a Facility Plan for Wastewater Treatment System improvements, and requests record searches for archeological and historical sites for the following project:

Modifications are proposed to Harrisburg's existing evaporation ponds by installing a can-type wet well/dry well lift station, which will pump wastewater effluent from the City of Harrisburg to the City of Sioux Falls Pump Station #240. The wastewater would be pumped from Pump Station #240, which is located on 57th Street near the Big Sioux River, to the City of Sioux Falls Water Reclamation Facility. The existing ponds will continue to be used as equalization basins. The project will include:

- Upsizing of the influent gravity sewer from a point in the collection system to Cell #1 of the evaporation ponds.
- Screening equipment ahead of the ponds or the lift station.
- Effluent piping from Cell #3 of the evaporation pond to the lift station.
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Maps of the project listed above are attached for your use.

6010 S. Minnesota Avenue, Suite 102 • Sioux Falls, South Dakota 57108-2715
605.334.4499 fax 605.338.6124 toll free 800.765.3008 www.hrgreen.com

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Howard R. Green Company
6010 South Minnesota Avenue, Suite 102
Sioux Falls, SD 57108-2715

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Sincerely,
Howard R. Green Company

Ryan Johnson, P.E.
Project Engineer

Enclosures

cc: Mary McClung, City of Harrisburg
Angie Hilton, SECOG

O:\PROJ\604980J\Permitting and Funding\Clearance Letters\ltr-031909-archeology and historical search.doc

Miller, Tanya

From: Miller, Tanya
Sent: Wednesday, April 15, 2009 11:31 AM
To: 'Jane.Watts@state.sd.us'
Cc: Horner, Dawn; Johnson, Ryan; 'Angie Hilton'
Subject: Record Search for Archeology and Historical Sites
Attachments: USGS for LS site.pdf; aerial for LS site.pdf; Force Main Option-Aerial.pdf; Force Main Option-USGS.pdf

Howard R. Green Company is currently working with the City of Harrisburg on a Facility Plan for Wastewater Treatment System improvements, and requests record searches for archeological and historical sites for the following project:

Modifications are proposed to Harrisburg's existing evaporation ponds by installing a can-type wet well/dry well lift station, which will pump wastewater effluent from the City of Harrisburg to the City of Sioux Falls Pump Station #240, which is located on 57th Street near the Big Sioux River. The existing ponds will continue to be used as equalization basins. The project will include:

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The enclosed maps show the location of the proposed force main piping and lift station modifications. The exact route of the force main has not been determined at this time. It is planned to be located within the right-of-way of township, county, state and city streets. The attached map shows the potential routes.

This project will occur within the county, township, state or city street right-of-way; in existing easements; on existing City owned land where the current wastewater ponds are located; and within railroad right-of-way. The work will be completed in the following areas:

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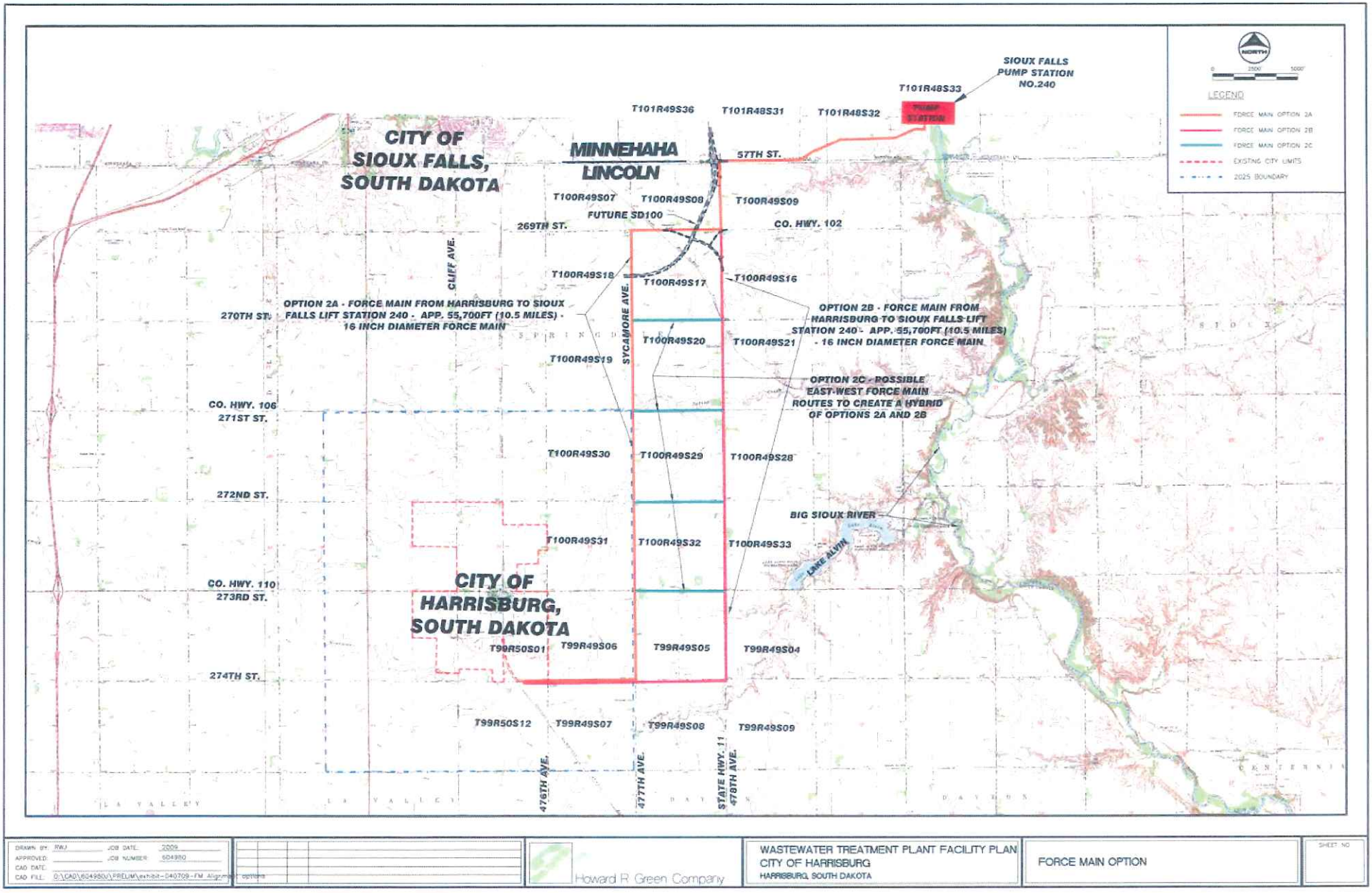
We are not sure why previous letters mailed to the State Historical Society Archeological Research Center on February 27, 2009 and March 19, 2009 were not received. We ask you to complete these searches as quickly as possible, as the City of Harrisburg is working closely with the SD DENR on funding. Let us know if there is any other information or files we can provide to expedite the process.

You may email the findings and invoice for your time to rjohnson@hrgreen.com, or mail it to the following address:

Ryan Johnson
Howard R. Green Company
6010 South Minnesota Avenue, Suite 102
Sioux Falls, SD 57108-2715

Please contact Ryan or myself with any questions. Thank you for your assistance.

Tanya Miller, P.E.
Howard R. Green Company
6010 S. Minnesota Avenue, Suite 102
Sioux Falls, SD 57108
800.765.3008 or 605.334.4499
Direct: 605.331.1051 Ext. 303
Fax: 605.338.6124
tmiller@hrgreen.com
www.hrgreen.com



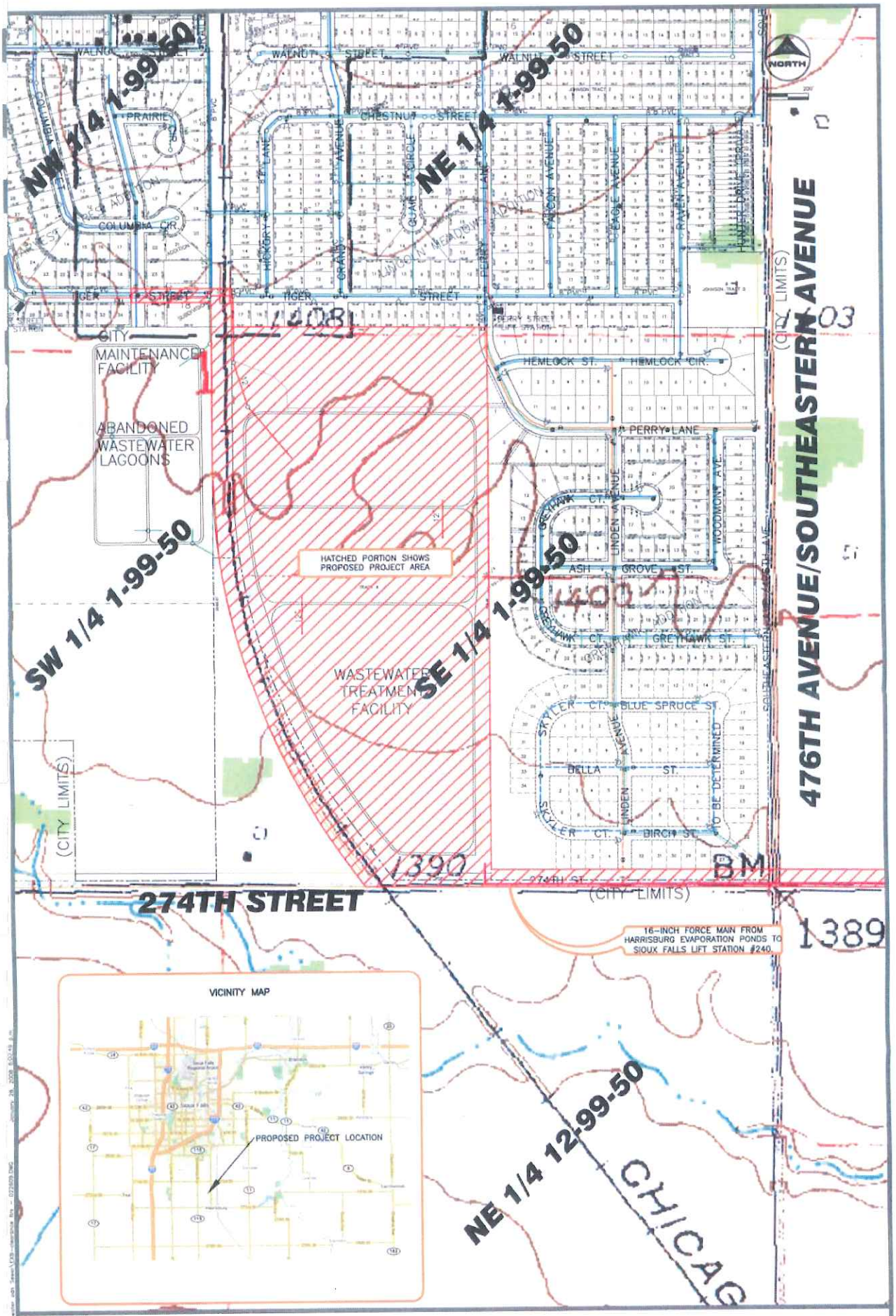
DRAWN BY: RWJ JOB DATE: 2009
APPROVED: JOB NUMBER: 604980
CAD DATE:
CAD FILE: O:\CAD\604980\PRELIM\exhibit-040709-FM Alignment options

Howard R Green Company

WASTEWATER TREATMENT PLANT FACILITY PLAN
CITY OF HARRISBURG
HARRISBURG, SOUTH DAKOTA

FORCE MAIN OPTION

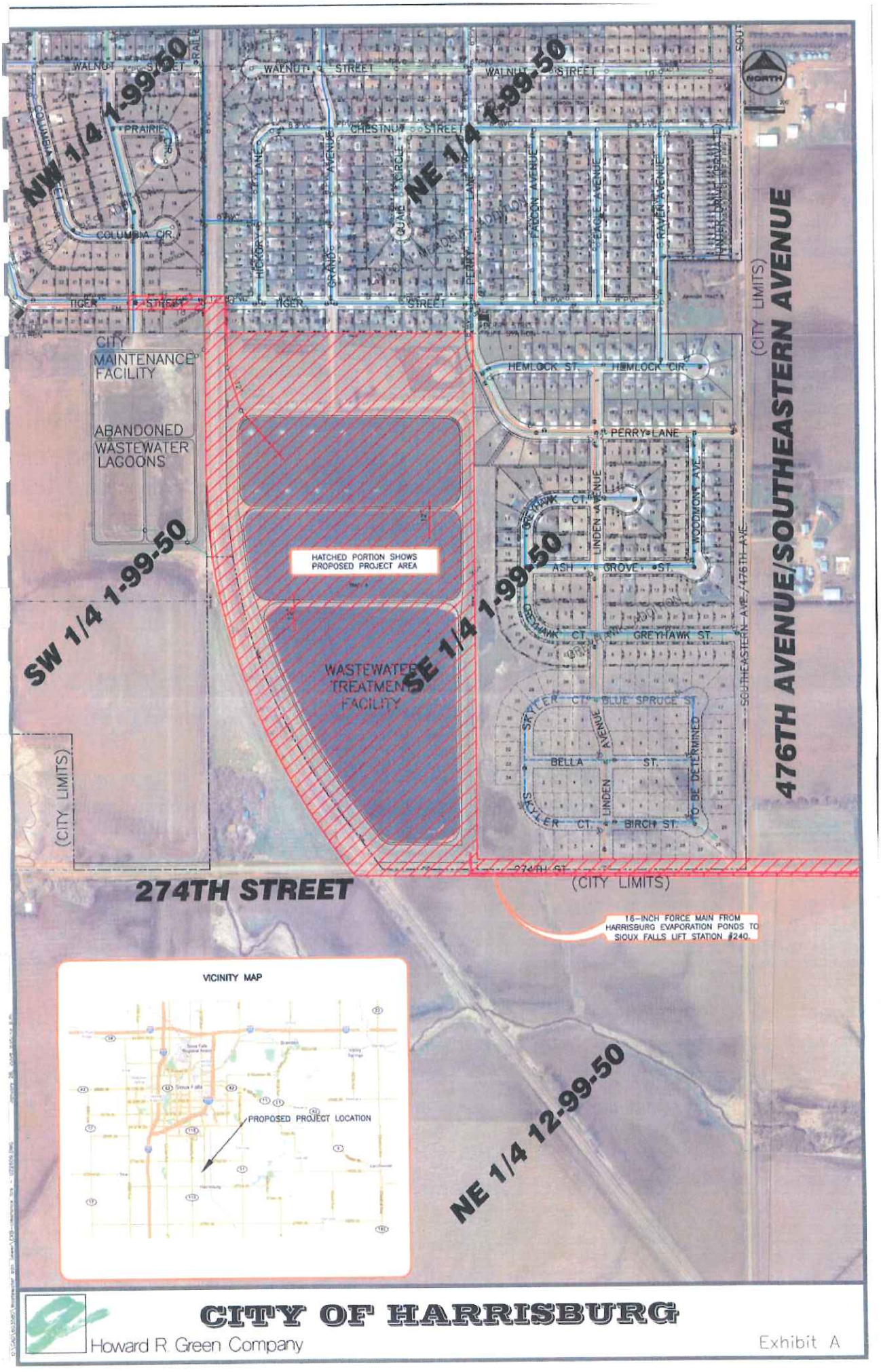
SHEET NO



CITY OF HARRISBURG

Howard R Green Company

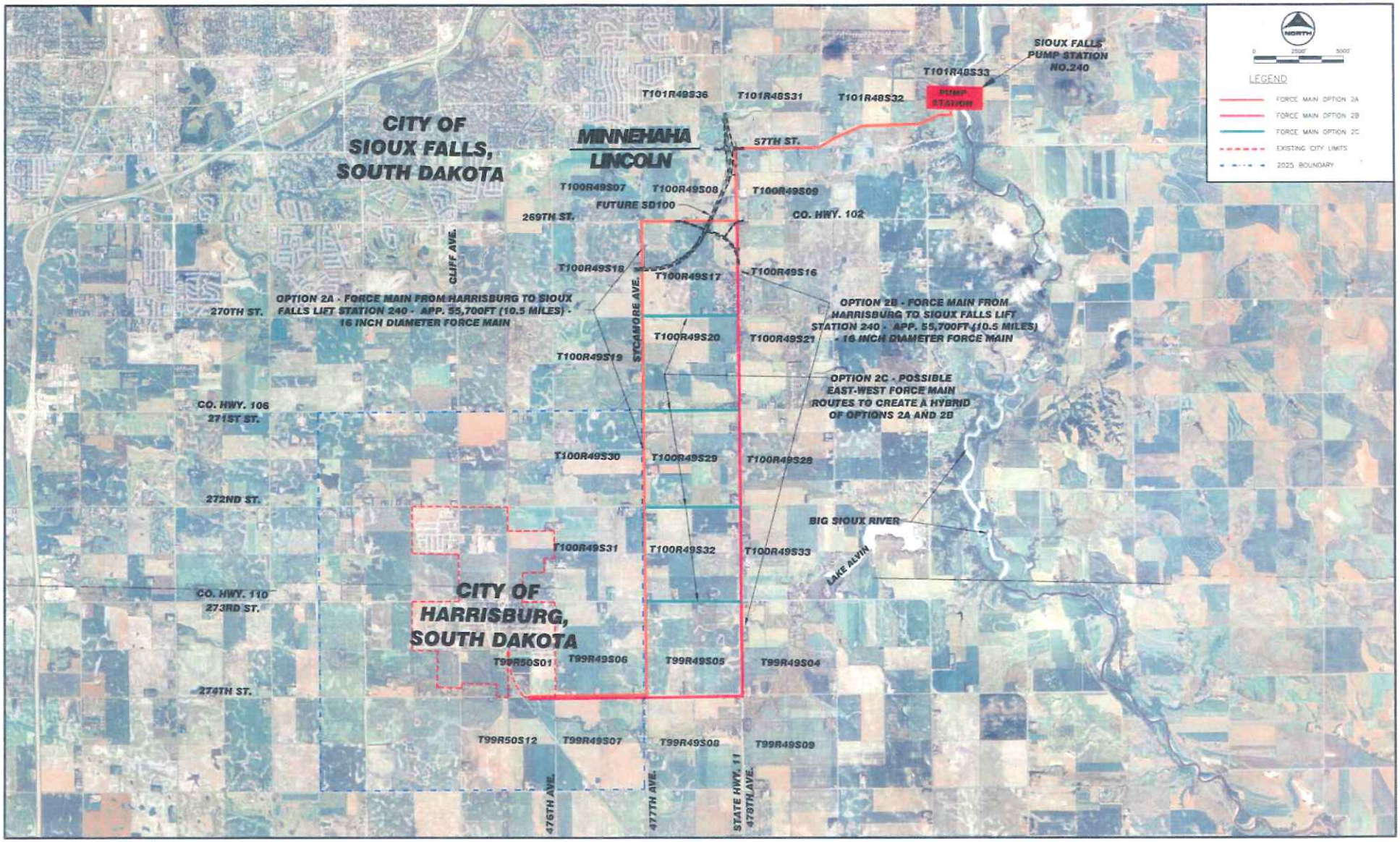
Exhibit A



CITY OF HARRISBURG

Howard R. Green Company

Exhibit A



DRAWN BY: RWJ JOB DATE: 2009 APPROVED: JOB NUMBER: 604980 CAD DATE: CAD FILE: D:\CAD\604980\PRELIM\exhibit-040709-FM Alignment options		Howard R. Green Company	WASTEWATER TREATMENT PLANT FACILITY PLAN CITY OF HARRISBURG HARRISBURG, SOUTH DAKOTA	FORCE MAIN OPTION SHEET NO.

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
1616 CAPITOL AVENUE
OMAHA NE 68102-4901

APRIL 10, 2009

Planning, Programs, and Project Management Division

Mr. Ryan Johnson
Howard R. Green Company
6010 S. Minnesota Avenue, Suite 102
Sioux Falls, South Dakota 57108-2715

Dear Mr. Johnson:

The U.S. Army Corps of Engineers, Omaha District (Corps) has reviewed your letter dated March 13, 2009 regarding the lift station to pump wastewater from Harrisburg to Sioux Falls for treatment. The Corps offers the following comments:

Your plans should be coordinated with the U.S. Environmental Protection Agency, which is currently involved in a program to protect groundwater resources. In addition, the South Dakota State Historic Preservation Office should be contacted for information and recommendations on potential cultural resources in the project area.

We are not able to provide flood plain impact comments at this time. This project does not appear to be within Corps owned or operated land. To determine if the proposed project may impact areas designated as floodway please consult the following flood plain management offices.

NFIP Coordinator:
South Dakota, Division of Emergency Management
Nicole Prince
118 W. Capitol Ave.
Pierre. SD 57501-5070
Nicole.prince@state.sd.us
T-605-773-3238
F-605-773-3580

FEMA:
Ryan Pietramali
Federal Emergency Management Agency
Region VIII, Denver Federal Center
Building 710, P.O. 25267
Denver, CO 80225-0267
ryan.pietramali@dhs.gov
T-303-235-4836
F-303-235-4849

Any proposed placement of dredged or fill material into waters of the United States (including jurisdictional wetlands) requires Department of the Army authorization under Section 404 of the Clean Water Act. You can visit the Omaha District's Regulatory website for permit applications and related information. Please review the information on the provided web site (https://www.nwo.usace.army.mil/html/od-r/district.htm) to determine if this project requires a 404 permit. For a detailed review of permit requirements, preliminary and final project plans should be sent to:

U.S. Army Corps of Engineers
Pierre Regulatory Office
Attention: CENWO-OD-R-SD/Naylor
28563 Powerhouse Road, Room 120
Pierre, South Dakota 57501

If you have any questions, please contact Mr. Dave Crane of my staff at (402) 995-2676.

Sincerely,

Julie Price

FOR

Brad Thompson, Chief
Environmental, Economics, and
Cultural Resources Section
Planning Branch

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
200 Fourth Street SW
Huron, South Dakota 57350

Phone: (605) 352-1200
Fax: (605) 352-1270

March 30, 2009

Mr. Ryan W. Johnson, P.E.
Howard R. Green Company
6010 S. Minnesota Ave., Suite 102
Sioux Falls, South Dakota 57108

RE: Lift Station to Pump Wastewater from Harrisburg to Sioux Falls for Treatment – City of Harrisburg, South Dakota

Dear Mr. Johnson:

Thank you for the opportunity to provide comments on the above project. This project will have no effect on prime or important farmland.

The Natural Resources Conservation Service (NRCS) would advise the applicant to consult with the local NRCS and Farm Service Agency (FSA) offices regarding any USDA easements or contracts in the project area that may be affected.

If you have any questions, please contact Dan Shurtliff, Assistant State Soil Scientist, at (605) 352-1254.

Sincerely

FOR

DEANNA PETERSON
State Soil Scientist

cc: Brian Top, DC, NRCS, Sioux Falls FO

DEPARTMENT OF GAME, FISH AND PARKS
Foss Building
523 East Capitol
Pierre, South Dakota 57501-3182

March 18, 2009

Mr. Ryan W. Johnston, P.E.
Howard R. Green Company
6010 S. Minnesota Avenue
Suite 102
Sioux Falls, SD 57108-2715

RE: Lift Station to Pump Wastwater from Harrisburg to Sioux Falls
City of Harrisburg, South Dakota

Dear Mr. Johnston:

The South Dakota Department of Game, Fish and Parks, Wildlife Division, has reviewed the proposed project involving the construction of a lift station near the City of Harrisburg, South Dakota.

Information included in your letter dated March 13, 2009, indicated that the force main was to be installed entirely within existing road right-of-ways. Due to the previously disturbed nature of these areas, the project described will have no significant impacts on fish and wildlife resources. However, if the project design changes or if new information becomes available, please submit the changes for review.

Thank you for the opportunity to provide comments on this project. If you have any other questions, or if I can be of further assistance, please feel free to contact me at (605) 773-6208.

Sincerely,

Leslie Petersen
Aquatic Resource Coordinator

Howard R. Green Company

RECEIVED

MAR 16 2009

U.S. FISH & WILDLIFE SERVICE

March 13, 2009

Donald Gober
Field Supervisor
United States Department of Interior
Fish and Wildlife Service
420 South Garfield Avenue
Pierre, SD 57501-5408

This constitutes a report of the Department of the Interior prepared in accordance with the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.). We have reviewed and have NO OBJECTION to this proposed project.

3/17/09 Scott Larson
Date Acting Supervisor

Re: Lift Station to Pump Wastewater from Harrisburg to Sioux Falls for Treatment
City of Harrisburg, South Dakota

Dear Mr. Gober:

The City of Harrisburg, South Dakota is applying to the South Dakota Department of Environment and Natural Resources (DENR) for grants and loans through the State Revolving Fund Program. The funding will be used to construct the above-referenced project. In conjunction with the program requirements from this funding agency, comments from appropriate agencies regarding flood plain, wildlife, environmental, and historical concerns are requested.

The City of Harrisburg proposes to use the DENR funding to construct a lift station on the existing site of the evaporation ponds. The evaporation ponds are near capacity and must be upgraded to provide wastewater treatment for the growing community of Harrisburg. A can-type wet well/dry well lift station will pump wastewater effluent from cell #3 to the City of Sioux Falls Lift Station #240 located on 57th Street near the Big Sioux River. The existing ponds will continue to be used as an equalization basin. The project will include:

- Upsizing of the influent gravity sewer from a point in the collection system to cell #1 of the ponds.
- Screening equipment ahead of the ponds or the lift station.
- Effluent piping from cell #3 of the evaporation pond to the lift station.
- Lift station.
- Installation of approximately 11 miles of force main.
- Connection to LS #240.

The exact route of the force main has not been determined at this time. It is planned to be located within the right-of-way of township, county, and city streets. The potential routes have been identified on the enclosed map B.

This project will occur within the county, township, or street right-of-way; in existing easements; on existing City owned land where the current wastewater ponds are located; and within railroad right-of-way. The work will be completed in the following areas:

- Township 99N, Range 50W, Sections 1 and 12
- Township 99N, Range 49W, Sections 4 thru 9
- Township 100N, Range 49W, Sections 7 thru 10, 15 thru 22, 27 thru 34
- Township 101N, Range 48W, Sections 31, 32, and 32
- Township 101N, Range 49W, Section 36

Howard R. Green Company

Because time is of the essence, we would greatly appreciate your comments within 30 days. If we do not hear back from you within 30 days, we will assume that you have no comments on the project, and that the project will have no significant impact.

If you have any questions, please feel free to contact me at 605-334-4499. Thank you for your consideration.

Sincerely,
Howard R. Green Company

Ryan W. Johnson, P.E.
Project Engineer

Enclosures

cc: SD Department of Game, Fish and Parks, Division of Wildlife
United States Department of Agriculture, Natural Resources Conservation Service
U.S. Army Corps of Engineers, Omaha District
Mary McClung, City of Harrisburg

APPENDIX B

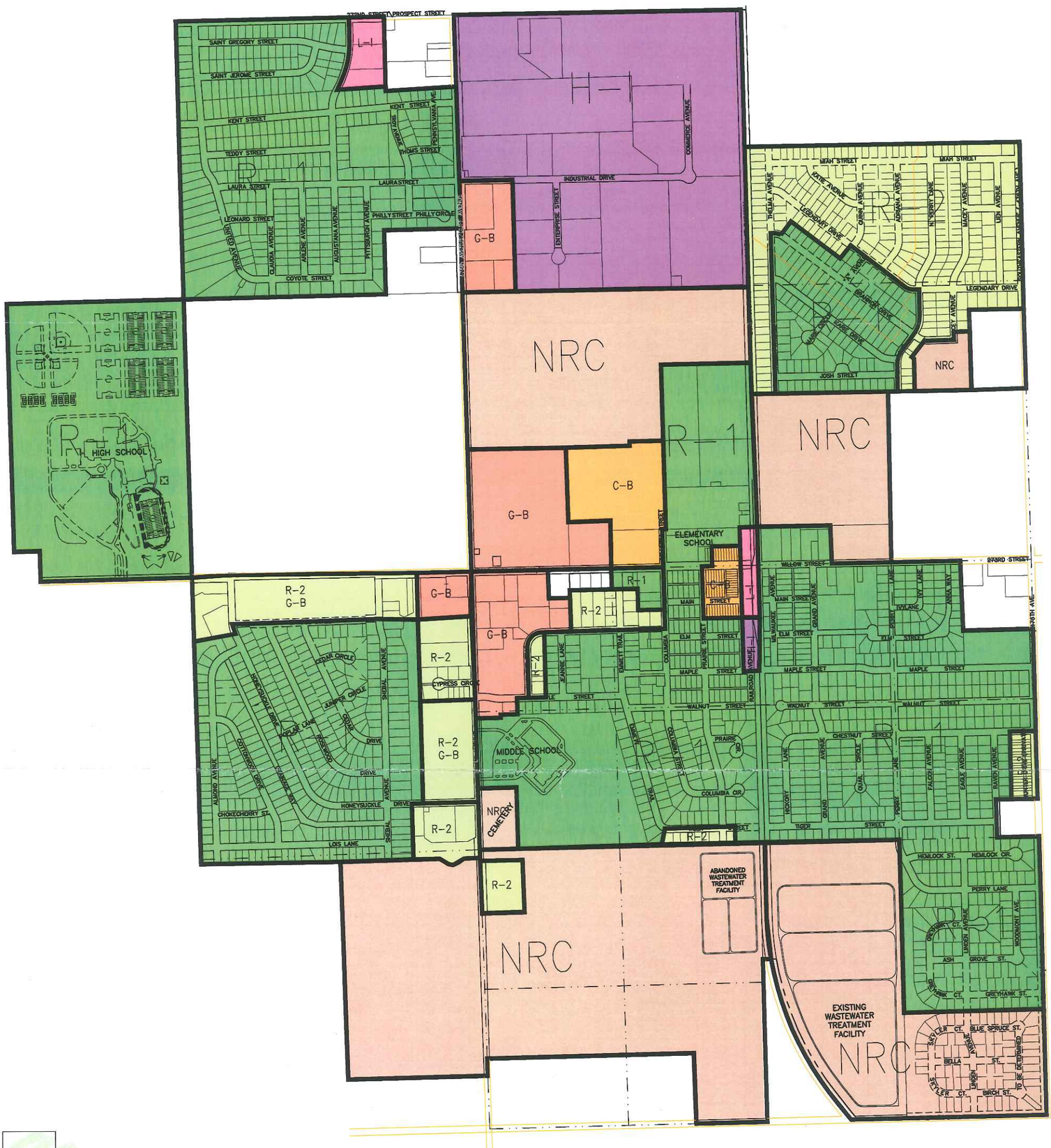
City of Harrisburg, South Dakota
Zoning Map

EXHIBIT B-1

LEGEND

R-1	SINGLE FAMILY RESIDENTIAL
R-2	MULTIPLE FAMILY RESIDENTIAL
C-B	CENTRAL BUSINESS DISTRICT
G-B	GENERAL BUSINESS DISTRICT
L-I	LIGHT INDUSTRY
H-I	HEAVY INDUSTRY
NRC	NATURAL RESOURCE CONSERVATION DISTRICT

NORTH
0 500
1"=500'



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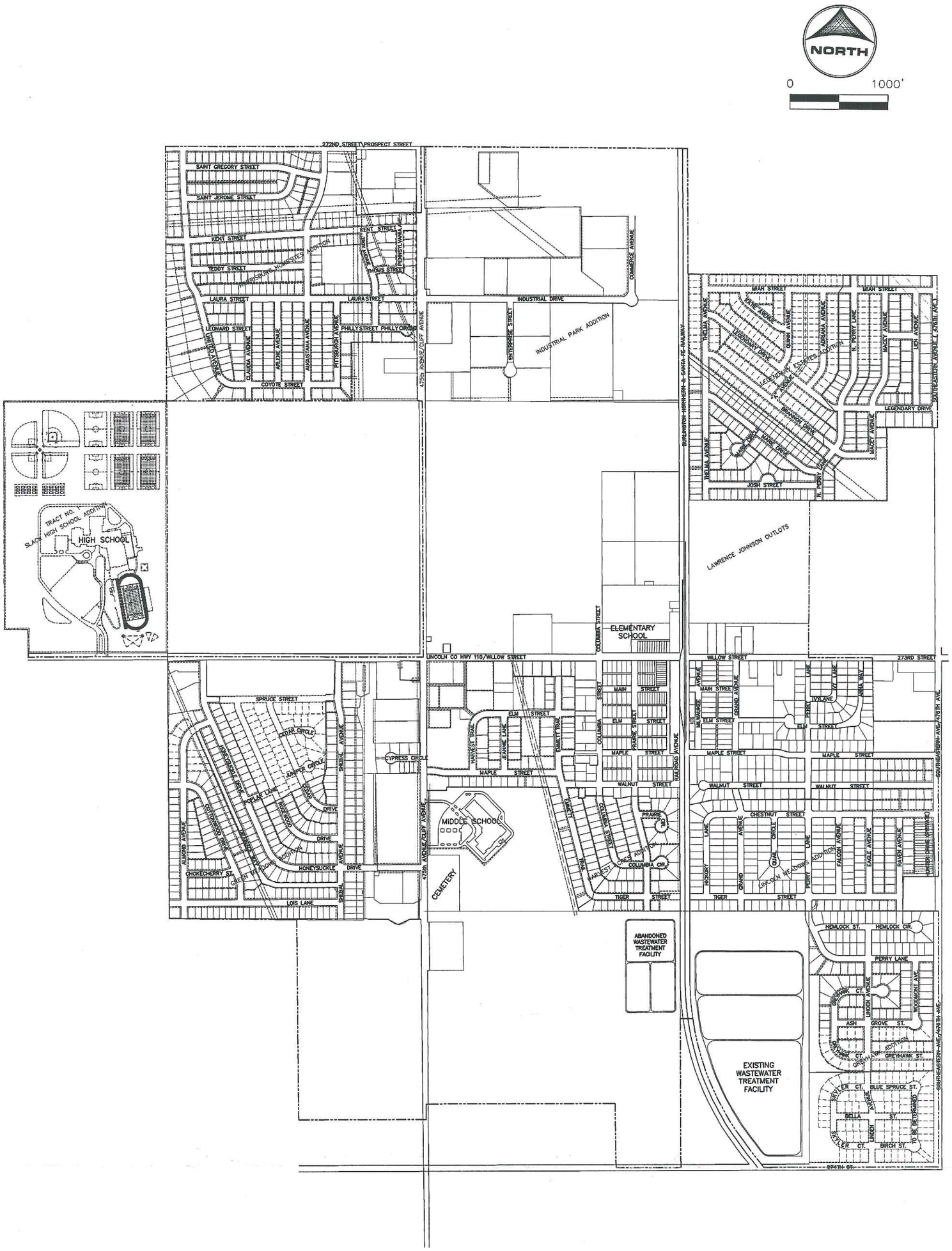


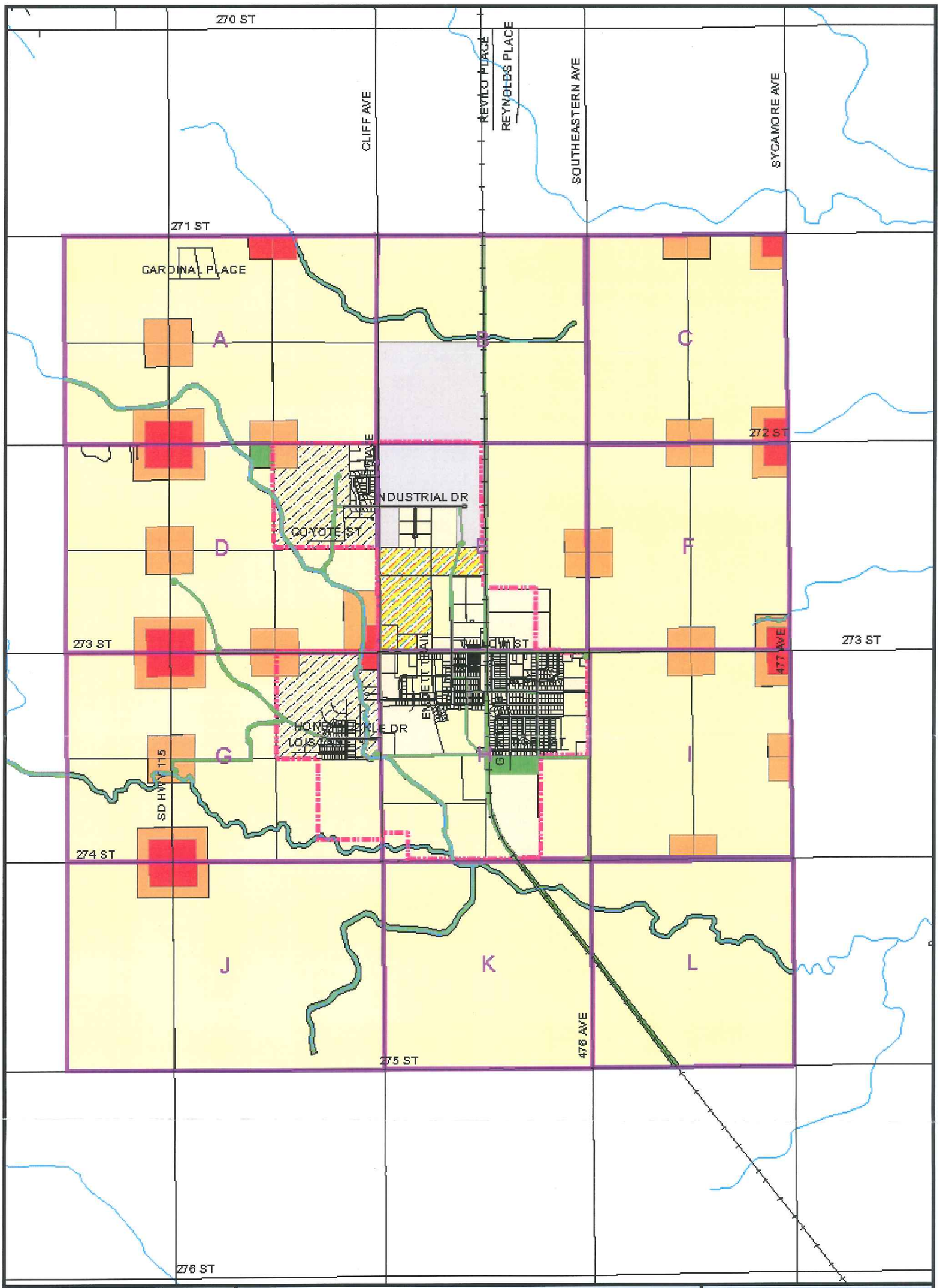
City of Harrisburg, South Dakota

Howard R. Green Company

Exhibit B-2

Xrefs: HARRISBURG-BASE-UTM14.DWG

June 05, 2007 3:10:48 p.m.
603580J\Exhibits\11X17 BASE MAP.DWG



Legend

- Recreational Greenspace/Parks
- Commercial
- Current Use Ag
- Combined Residential
- Industrial
- Multi-Family Residential
- Mixed Use Development
- Single-Family Residential
- CITY LIMITS
- Rivers
- RAIL
- Creeks
- GROWTH SITE BOUNDARIES

FUTURE LAND USE

Miles

0 0.3 0.6 0.9 1.2

HARRISBURG
SOUTH DAKOTA

This information has been secured from sources we believe to be reliable, however, we do not guarantee the accuracy of the information contained herein. This map does not eliminate the need for on site investigation.

This map was compiled by the South Eastern Council of Governments.

APPENDIX C

CITY OF HARRISBURG

EXISTING EVAPORATION PONDS

NORTH

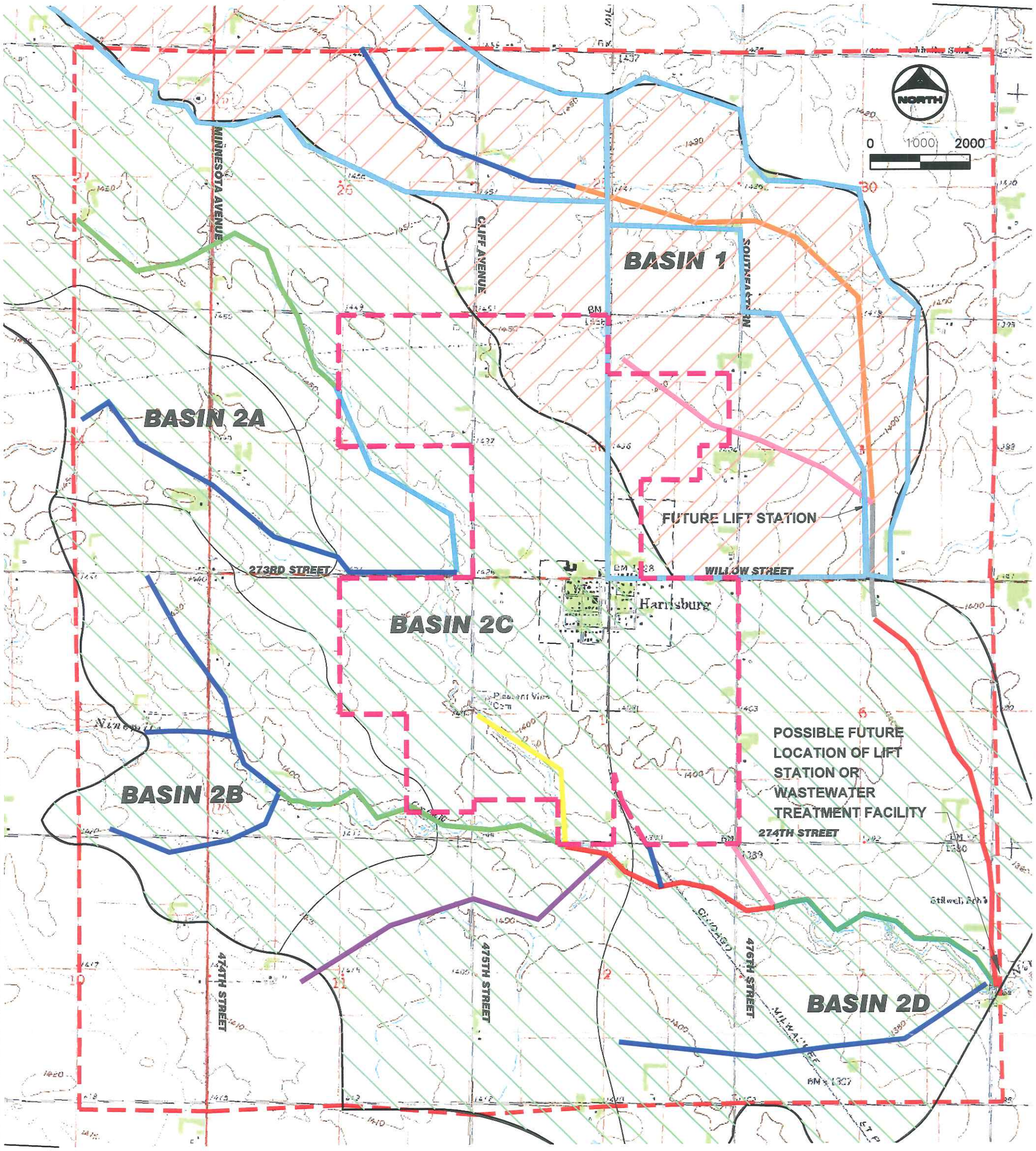
0 600

Howard R. Green Company

EXHIBIT C-1

CITY OF HARRISBURG

SANITARY SEWER COLLECTION SYSTEM MASTER PLAN
2025 FUTURE LAND USE



MAP LEGEND

- EXISTING CITY LIMITS
- 2025 FUTURE LAND USE BOUNDARY
- SANITARY SEWER BASIN BOUNDARY
- SANITARY SEWER SUB-BASIN BOUNDARY
- BASIN 1 AREA
- BASIN 2 AREA

PROPOSED SANITARY SEWER LEGEND

- 12" SANITARY SEWER
- 15" SANITARY SEWER
- 18" SANITARY SEWER
- 21" SANITARY SEWER
- 30" SANITARY SEWER
- 33" SANITARY SEWER
- 36" SANITARY SEWER
- 42" SANITARY SEWER
- 48" SANITARY SEWER
- FORCE MAIN

Howard R. Green Company

EXHIBIT C-2

TABLE C-1: 2000 Wastewater Lagoon Reports

Year 2000					Depth of Cell (ft-in)				
Date	Time	Flow (gpd)	Temp. (F)	Wind	1	2	3	Condition	Weather
January 18, 2000	3:12 PM	46,500	N/A	N/A	N/A	N/A	N/A	N/A	N/A
January 25, 2000	3:11 PM	40,600	N/A	N/A	N/A	N/A	N/A	N/A	N/A
February 1, 2000	2:30 PM	39,800	N/A	N/A	N/A	N/A	N/A	N/A	N/A
February 8, 2000	1:15 PM	77,500	40	N/A	2'	0	0	N/A	N/A
February 11, 2000	4:35 PM	46,500	20	calm	2'	0	0	OK	no precip in last 3 days
February 15, 2000	1:37 PM	36,500	35	NW 20	2'-2"	0	0	OK	normal temps
February 22, 2000	2:00 PM	44,000	50	S 10	2'-2"	0	0	OK-little odor	above normal temps-little snow left
February 29, 2000	2:00 PM	40,500	50	N 18	2'-6"	0	0	OK-ice almost gone	0.75" rain, above normal temps
March 7, 2000	1:25 PM	51,800	73	S 12	2'-8"	0	0	OK-open water	warm, no precipitation
March 14, 2000	1:55 PM	48,000	52	SW 10	2'-8"	0	0	OK	2" snow, above avg. temps
March 21, 2000	1:35 PM	46,900	46	W 5	2'-8"	0	0	OK a little green	cloudy & foggy, no precip
March 28, 2000	4:25 PM	40,600	52	E 8	2'-9"	0	0	OK	Above normal temps, no precip
April 4, 2000	4:10 PM	50,600	53	W 13	2'-9"	0	0	good	Above normal temps, no precip
April 11, 2000	1:15 PM	49,400	40	N 15	2'-9"	0	0	OK	4" snow, cool & windy
April 18, 2000	2:30 PM	47,000	64	N 17	2'-9"	0	0	good	1/2" rain, cool & windy
April 25, 2000	3:35 PM	46,500	66	S 23	2'-3"	6"	0	OK	no precipitation
May 2, 2000	1:17 PM	48,000	77	S 25	2'	1'	0	a little smell	no precipitation
May 11, 2000	3:15 PM	54,730	65	NW 18	2'-1"	1'	0	OK	1 1/2" rain
May 16, 2000	3:00 PM	48,000	65	E 13	2'-1"	9"	0	good	0.6" rain & hail
May 24, 2000	1:50 PM	47,600	70	W 10	2'-4"	11"	0	good	2.6" rain
May 31, 2000	3:00 PM	44,000	66	E 20	2'-6"	8"	0	add water to cell #2	3/4" rain
June 7, 2000	2:20 PM	46,700	81	S 9	2'	1'	0	good	windy & warmer
June 13, 2000	3:30 PM	50,630	68	SE 10	1'-8"	8"	0	little red	stormy
June 20, 2000	10:40 AM	56,160	65	W 18	1'-8"	6"	0	mowed top of berm	no precipitation
June 27, 2000	4:38 PM	32,000	68	calm	1'-9"	6"	0	good	2" rain, mild
July 3, 2000	4:00 PM	72,600	78	E 17	1'-8"	6"	0	rock getting weedy	warm & humid
July 11, 2000	10:40 AM	48,500	70	E 20	1'-8"	3"	0	OK	no precip, warm & humid
July 18, 2000	3:30 PM	67,000	62	E 14	1'-9"	0	0	sprayed rock	1.2", 7", 0.2", 7/8" rain, cool
July 25, 2000	2:18 PM	57,250	78	SW 6	1'-6"	0	0	OK	0.3 rain, cool & seasonal
August 1, 2000	2:15 PM	48,840	86	NW 11	1'-6"	0	0	very low	no precipitation
August 8, 2000	2:50 PM	52,330	81	N 8	1'-10"	0	0	added water	3" rain
August 22, 2000	1:40 PM	56,500	69	N 11	1'-10"	0	0	OK	0.3" in last week
September 5, 2000	2:22 PM	55,600	74	SE 20	1'-10"	0	0	OK	2" rain
September 12, 2000	11:30 AM	53,500	66	SSW 12	1'-10"	0	0	OK	no precipitation
September 19, 2000	2:15 PM	46,900	63	NW 13	1'-7"	0	0	low	no precipitation
September 25, 2000	1:30 PM	54,200	67	SW 8	1'-6"	0	0	OK	1/2" rain, cool & windy
October 3, 2000	1:45 PM	80,500	50	E 8	1'-8"	0	0	OK	1/2" rain
October 10, 2000	5:08 PM	93,760	63	S 15	1'-8"	0	0	OK	cold
October 17, 2000	3:40 PM	42,840	67	SW 8	1'-4"	0	0	OK	0.25 rain
October 24, 2000	3:52 PM	48,300	64	SE 9	1'-8"	0	0	OK	0.25 rain
October 31, 2000	1:50 PM	64,770	65	S 15	1'-10"	0	0	OK	0.75 rain
November 8, 2000	1:50 PM	42,000	24	W 20	1'-11"	0	0	50% freeze over	
November 14, 2000	1:45 PM	48,600	16	W 10	1'-11"	0	0	Froze over	
November 22, 2000	1:30 PM	35,000	18	E 8	1'-11"	0	0	froze over	cold, below normal
November 28, 2000	2:30 PM	43,600	36	W 26	1'11"	0	0	mostly ice now	
December 5, 2000	3:00 PM	41,000	7	SE 8	1'-11"	0	0	iced over	cold & windy
December 13, 2000	4:10 PM	41,540	5	S 5	2'	0	0	OK	record cold, 2'-9" snow
December 19, 2000	1:08 PM	53,000	0	NW 10	2'	0	0	OK	cold & windy
December 26, 2000	1:49 PM	70,750	15	NW 10	2'	0	0	OK	cold & windy, 1" snow

Average Daily Flow: **51,008** **gal/day**

2003 Population **991**

Average Daily Flow: **51.47** **gal/person/day**

TABLE C-2: 2001 Wastewater Lagoon Reports

Year 2001					Depth of Cell (ft-in)				
Date	Time	Flow (gpd)	Temp. (F)	Wind	1	2	3	Condition	Weather
January 2, 2001	4:40 PM	55,400	12	W 10	2'	0	0	OK, iced over	cold & windy
January 12, 2001	10:05 AM	55,600	15	S 5	2'-2"	0	0	OK, iced over	foggy, some snow melt
January 16, 2001	4:30 PM	43,700	21	W 8	2'-2"	0	0	OK, iced over	6" snow
January 23, 2001	2:30 PM	44,600	25	W 8	2'-4"	0	0	OK	normal temps
February 15, 2001	3:14 PM	44,380	18	S 10	2'-4"	0	0	OK	lots of snow, wind & cold
February 20, 2001	3:40 PM	79,160	14	NW 21	2'-6"	0	0	OK	windy & cold
February 28, 2001	4:00 PM	39,500	21	SW 10	2'-6"	0	0	OK	5" snow, below normal cold
March 6, 2001	1:10 PM	123,500	24	SSW 6	2'-10"	0	0	OK	melting weather
March 13, 2001	3:45 PM	53,000	36	W 13	2'-10"	0	0	OK	4" snow
March 20, 2001	2:30 PM	80,180	47	Var 3	3'-2"	0	0	open at outflow	melting snow
March 27, 2001	4:00 PM	54,060	32	S 10	3'-6"	0	0	OK	cold, no precipitation
April 3, 2001	4:20 PM	90,600	44	E 15	3'-10"	0	0	little odor	no precipitation
April 10, 2001	2:50 PM	70,200	57	NE 12	4'	0	0	all ice turned over	little rain
April 18, 2001	4:11 PM	59,500	66	S 22	4'-2"	0	0	some smell	1 1/2" rain, variable temps
April 24, 2001	10:15 AM	165,100	45	SW 10	4'-6"	0	0	discharge to #2 cell	3 1/2" rain, 2" snow
May 1, 2001	1:45 PM	90,200	79	W 25	4'-6"	6"	0	discharge to #2 cell	0.1" rain, windy
May 8, 2001	2:10 PM	82,000	70	W 10	2'6"	2'-8"	O	stop discharge to #2	1 1/4" rain, cool
May 15, 2001	4:50 PM	62,570	90	SW 20	2'-4"	2'-6"	0	smell good	windy & warmer
May 22, 2001	3:00 PM	39,503	56	NW 20	2'-4"	2'-6"	0	no smell	0.1" rain
May 30, 2001	2:24 PM	78,100	66	E 14	2'-2"	2'	0	#2 little milky	no precipitation
June 6, 2001	3:15 PM	44,030			2'-2"	2'	0	good	0.5" rain
June 12, 2001	4:05 PM	53,000	67	SE 10	2'-2"	2'	0	a little smell	1/2" rain
June 19, 2001	3:35 PM	57,900	71	NW 6	2'-8"	1'-8"	0	Cell #1 up a little	1 1/2" rain
June 26, 2001	4:07 PM	39,800	81	E 12	2'-6"	1'-6"	0	OK	0.2" rain
July 3, 2001	3:20 PM	31,500	86	N 6	2'-6"	1'-6"	0	OK	0.85" rain
July 10, 2001	1:51 PM	41,050	85	N 4	2'-7"	1'-4"	0	a little green	0.25" rain, hot & muggy
July 17, 2001	3:55 PM	48,700	87	SE 9	2'-6"	1'	0	OK	hot & muggy
July 24, 2001	1:32 PM	38,900	69	NE 16	3'	1'-6"	0	OK	2' rain
July 31, 2001	2:15 PM	81,000	92	S 26	2'-6"	2'	0	very green	0.2" rain, hot & humid
August 7, 2001	2:00 PM	39,900	92	SE 10	2'-4"	1'-8"	0	green	hot & muggy
August 14, 2001	3:32 PM	33,000	69	SE 12	2'-4"	1'-6"	0	green	no precipitation
August 21, 2001	4:35 PM	48,500	77	S 9	2'	1'	0	green	no precipitation
September 4, 2001	5:00 PM	31,200	86	S 17	2'	10"	0	green	0.5" rain, hot & dry
September 11, 2001	5:00 PM	58,490	85	S 15	2'	10"	0	OK	0.6" rain, warm & dry
September 12, 2001	10:00 AM	76,210	53	calm	2'-6"	10"	0	green	2" rain
September 25, 2001	2:45 PM	46,910	62	SE 12	2'-6"	8"	0	OK	first frost
October 2, 2001	10:44 AM	49,330	60	E 14	2'-8"	6"	0	OK	no precipitation
October 9, 2001	4:25 PM	54,440	61	SE 14	2'	1'	0	OK	no precipitation
October 16, 2001	2:45 PM	59,690	48	N 9	1'-8"	1"	0	OK	below normal temps
October 23, 2001	4:50 PM	45,500	63	S 10	1'-8"	8"	0	OK	no precipitation
October 30, 2001	2:45 PM	58,200	58	SE 13	1'-10"	8"	0	OK	no precipitation
November 6, 2001	1:34 PM	50,600	67	NE 12	1'-10"	7"	0	OK	no precipitation
November 13, 2001	1:55 PM	47,100	64	S 13	1'-10"	7"	0	OK	no precipitation
December 4, 2001	1:46 PM	77,000	fog, 34	NE 6	2'	1'	0	almost froze over	3" rain, 1" snow
December 11, 2001	10:15 AM	119,100	25	SE 15	2'-8"	8"	0	opened up a little	no precipitation
December 18, 2001	1:44 PM	127,300	33	N 5	2'-6"	8"	0	a little open	most snow gone
December 26, 2001	1:40 PM	110,100	17	N 7	2'-6"	8"	0	iced over	no snow, below normal temp

Average Daily Flow: **63,389** **gal/day**
2003 Population **1,034**
Average Daily Flow: **61.31** **gal/person/day**

TABLE C-3: 2003 Wastewater Lagoon Reports

Year 2003					Depth of Cell (ft-in)				
Date	Time	Flow (gpd)	Temp. (F)	Wind	1	2	3	Condition	Weather
January 7, 2003	2:50 PM	80,160	53	NW 20	2'-4"	0	0	breaking up	no snow on ground
January 14, 2003	4:20 PM	140,000	17	WNW 16	2'-4"	0	0	iced up	no precipitation
January 21, 2003	3:31 PM	29,600	9	W 8	2'-4"	0	0	iced up	1/2" snow, cold
January 28, 2003	4:33 PM	65,200	33	calm	2'-4"	0	0	iced up	1/2" snow, rain
February 4, 2003	2:20 PM	54,400	17	NW 10	2'-8	0	0	iced up	little precipitation
February 11, 2003	3:45 PM	39,100	25	NW 40+	2'-8"	2"	0	open in middle	cold, no precipitation
February 18, 2003	3:45 PM	47,300	35	NW 20	2'-8"	2"	0	OK	6" snow
February 25, 2003	3:36 PM	24,200	20	S 15	2'-8"	2"	0	OK	1" snow, cold
March 4, 2003	4:15 PM	58,400	10	N 5	2'8"	1"	0	OK	5" snow, variable temps
March 12, 2003	3:05 PM	63,300	31	N 15	2'-8"	1'	0	OK	cold, 4" snow
March 18, 2003	3:17 PM	70,200	56	ENE 18	2'-10"	6"	0	stinks, ice turning over	all snow gone
March 25, 2003	2:20 PM	74,500	60	SW 20	2'-10"	6"	0	smelly & turning over	no precipitation
April 3, 2003	4:25 PM	73,700	38	N 10	2'-10"	6"	0	milky, no wind action	no precipitation
April 9, 2003	3:30 PM	68,500	48	S 23	2'-10"	6"	0	some wind action	9" snow
April 22, 2003	3:50 PM	87,300	62	E 10	3'-2"	6"	0	start overflowing to #2	2.0" rain, normal temps
April 30, 2003	1:00 PM	86,600	52	NE 16	1'-8"	1'-4"	0	continue to dump to #2	0.8" rain, cold, damp & windy
May 14, 2003	4:19 PM	70,430	59	NW 18	1'-10"	1'-8"	0	stopped dumping into #2	1.8" rain, cold, damp & windy
May 29, 2003	1:50 PM	41,490	78	S 9	1'-10"	1'-8"	0	little floating red things	dry, normal temps
June 10, 2003	3:36 PM	34,240	64	N 15	2'	1'-8"	0	OK	1" rain, below normal temps
June 17, 2003	5:10 PM	41,300	84	N 6	1'-10"	1'-4"	0	OK	hot & dry
June 24, 2003	3:05 PM	47,900	88	W 18	1'-10"	1"	0	lots of ducks	1.2" rain, warm & muggy
July 1, 2003	3:17 PM	72,600	85	S 20	2'	1'	0	OK	1.5" rain
July 8, 2003	5:32 PM	69,000	75	SE 10	2'-2"	1'	0	OK	1 1/2" rain, stormy
July 15, 2003	3:00 PM	29,900	84	NW 16	2'-3"	1'	0	OK, mowed dikes	no rain, humid
July 29, 2003	3:20 PM	68,600	84	S 18	2'	1'	0	green	hot & dry
August 12, 2003	3:50 PM	37,400	82	S 10	2'	1'	0	green	hot & dry
August 19, 2003	4:11 PM	73,900	84	S 20	2'	1'	0	green	hot & dry
August 26, 2003	3:15 PM	94,000	91	NE 12	2'	6"	0	green, stinky	hot & dry
September 2, 2003	5:15 PM	77,700	88	SW 10	2'	0	0	green	no precipitation
September 9, 2003	10:40 PM	98,000	62	S 15	2'	0	0	green, good waves	some rain
September 16, 2003	4:10 PM	129,000	83	S 25	2'-2"	6"	0	good	3 1/2" rain, cool
September 23, 2003	3:30 PM	114,000	73	S 10	2'-3"	0	0	good	0.75" rain, cool
October 7, 2003	2:25 PM	no elec.	80	S 18	2'-3"	0	0	good	dry, above normal temps
October 14, 2003	3:18 PM	190,000	-	NW 9	2'-4"	0	0	OK	4" rain, normal temps
November 11, 2003	1:36 PM	143,100	56	calm	2'-4"	0	0	OK	little precipitation, cold
November 18, 2003	3:20 PM	122,000	52	NW 25	2'-5"	0	0	OK, lots of geese	no precipitation
December 2, 2003	4:40 PM	51,500	37	SE 17	2'-8"	0	0	almost froze over	6" snow
December 23, 2003	1:55 PM	103,700	28	WNW 10	3'	0	0	froze over	12" snow but thawing temps
December 30, 2003	2:42 PM	49,030	35	S 12	3'	0	0	froze over, one open spot	above normal temps

Average Daily Flow: **72,340** **gal/day**

2003 Population **1,487**

Average Daily Flow: **48.65** **gal/person/day**

TABLE C-4: Capacity of Existing Wastewater Lagoons

Design Basis for Existing Harrisburg Wastewater Lagoons

Design Population	pop.	1,670
Design Year		2,017
Average Daily Flow	gpd	125,250
Average Daily	gpcd	75
Average Daily	gpm	87
Peak Design	gpm	225

Size of Existing Harrisburg Wastewater Lagoons

		Primary	Secondary	Tertiary
Water Surface Area	ac	10.2	10.2	19.6
Water Surface Area	sq ft	444,748	443,441	853,776
Water Volume	gal	6,598,000	9,594,000	36,831,000
Water Surface Elev	ft	1,398	1,398	1,398
Bottom Elev	ft	1,393	1,392	1,390
Depth	ft	5	6	8

Other Assumptions:

Annual Rainfall (in)	24.62
Annual Evaporation (in)	39
Seepage (in per day)	0.06
Seepage (in per year)	22.81
Net Loss (in)	-37.19
Net Loss (ft)	-3.10

TABLE C-4: Capacity of Existing Wastewater Lagoons

WASTEWATER LAGOON CAPACITY CALCULATIONS

Flow =	0.12525	MGD
Influent BOD =	200	mg/l
Bottom Storage =	0	ft
Seepage =	1/16	in/day
Desired Detention Time =	270	days
Actual Tot. Vol. Corrected for Seepage=	13,529,658	ft^3
Actual Detention Time =	808.0	days
Total BOD Loading =	5.2	lb BOD/acre-day

	Units	Primary Pond	Secondary Pond	Tertiary Pond	TOTAL
Actual Depth	ft	5	6	8	
Usable Depth	ft	5	6	8	
Slope	ft/ft	3	3	3	
L to W Ratio	ft/ft				
Top Length	ft	1,072	1,068	1,200	
Top Width	ft	415	415	711	
Top Area	ft^2	444,880	443,220	853,200	
Middle Length	ft	1,057	1,050	1,176	
Middle Width	ft	400	397	687	
Middle Area	ft^2	422,800	416,850	807,912	
Bottom Length	ft	1,042	1,032	1,152	
Bottom Width	ft	385	379	663	
Bottom Area	ft^2	401,170	391,128	763,776	
Volume	acre-ft^2	49	57	148	
Volume	ft^3	2,114,375	2,501,748	6,464,832	11,080,955
Vol. Corr. For Seepage	ft^3	2,739,988	3,125,026	7,664,645	13,529,658
BOD Loading	lb BOD/acre-day	20.5			
% of Tot. Pond Area	%	25.5	25.5	49.0	

TABLE C-4: Capacity of Existing Wastewater Lagoons

Time to Fill Ponds Based on 75 gpcd

Flow to Pond (cu. ft. per year)	Year	Population	Evaporation (Based on Middle Area) (cu. ft. per year)	Volume Used (cu. ft. per year)	Volume Remaining (cu. ft. per year)
	2004			1,618,844	11,910,814
7,601,320	2005	2,077	-5,106,412	2,494,908	9,415,906
8,361,452	2006	2,285	-5,106,412	3,255,040	6,160,867
9,197,597	2007	2,513	-5,106,412	4,091,185	2,069,682
10,117,357	2008	2,764	-5,106,412	5,010,945	-2,941,263
11,129,093	2009	3,041	-5,106,412	6,022,680	-8,963,943
12,242,002	2010	3,345	-5,106,412	7,135,590	-16,099,533
13,466,202	2011	3,680	-5,106,412	8,359,790	-24,459,323
14,812,823	2012	4,047	-5,106,412	9,706,410	-34,165,733
16,294,105	2013	4,452	-5,106,412	11,187,692	-45,353,426
17,923,515	2014	4,897	-5,106,412	12,817,103	-58,170,528
19,715,867	2015	5,387	-5,106,412	14,609,454	-72,779,983
21,687,454	2016	5,926	-5,106,412	16,581,041	-89,361,024
23,856,199	2017	6,519	-5,106,412	18,749,787	-108,110,811
26,241,819	2018	7,170	-5,106,412	21,135,406	-129,246,217
28,866,001	2019	7,887	-5,106,412	23,759,588	-153,005,805
31,752,601	2020	8,676	-5,106,412	26,646,188	-179,651,994
34,927,861	2021	9,544	-5,106,412	29,821,448	-209,473,442
38,420,647	2022	10,498	-5,106,412	33,314,235	-242,787,677
42,262,712	2023	11,548	-5,106,412	37,156,299	-279,943,976
46,488,983	2024	12,703	-5,106,412	41,382,570	-321,326,546

TABLE C-4: Capacity of Existing Wastewater Lagoons

Time to Fill Ponds Based on 54 gpcd

Flow to Pond (cu. ft. per year)	**Year**	**Population**	**Evaporation (Based on Middle Area)** (cu. ft. per year)	**Volume Used** (cu. ft. per year)	**Volume Remaining** (cu. ft. per year)
	2004			1,618,844	11,910,814
5,472,951	2005	2,077	-5,106,412	366,538	11,910,814
6,020,246	2006	2,285	-5,106,412	913,833	10,996,981
6,622,270	2007	2,513	-5,106,412	1,515,858	9,481,123
7,284,497	2008	2,764	-5,106,412	2,178,085	7,303,039
8,012,947	2009	3,041	-5,106,412	2,906,534	4,396,504
8,814,242	2010	3,345	-5,106,412	3,707,829	688,675
9,695,666	2011	3,680	-5,106,412	4,589,253	-3,900,578
10,665,232	2012	4,047	-5,106,412	5,558,820	-9,459,398
11,731,756	2013	4,452	-5,106,412	6,625,343	-16,084,741
12,904,931	2014	4,897	-5,106,412	7,798,519	-23,883,260
14,195,424	2015	5,387	-5,106,412	9,089,012	-32,972,271
15,614,967	2016	5,926	-5,106,412	10,508,554	-43,480,825
17,176,463	2017	6,519	-5,106,412	12,070,051	-55,550,876
18,894,110	2018	7,170	-5,106,412	13,787,697	-69,338,573
20,783,521	2019	7,887	-5,106,412	15,677,108	-85,015,681
22,861,873	2020	8,676	-5,106,412	17,755,460	-102,771,142
25,148,060	2021	9,544	-5,106,412	20,041,647	-122,812,789
27,662,866	2022	10,498	-5,106,412	22,556,453	-145,369,242
30,429,152	2023	11,548	-5,106,412	25,322,740	-170,691,982
33,472,068	2024	12,703	-5,106,412	28,365,655	-199,057,637

APPENDIX D

Table D-1: City of Harrisburg Projected Sanitary Sewer Flows

		Based on 2007 Population Projection					Based on 2009 Population Projection					
Year	Peaking Factor*	Average Day Dry Weather Flow** (gpd)	Peak Hour Dry Weather Flow (gpd)	Average Day Wet Weather Flow*** (gpd)	Maximum Day Wet Weather Flow**** (gpd)	Peak Hour Wet Weather Flow (gpd)	Average Day Dry Weather Flow** (gpd)	Peak Hour Dry Weather Flow (gpd)	Average Day Wet Weather Flow*** (gpd)	Maximum Day Wet Weather Flow**** (gpd)	Peak Hour Wet Weather Flow (gpd)	Expected Population
2007	3.4	281,854	946,315	375,805	751,610	1,261,754						
2008	3.3	315,676	1,045,974	420,901	841,803	1,394,632						
2009	3.3	353,557	1,155,638	471,410	942,819	1,540,851	341,933	1,122,193	455,910	911,821	1,496,258	4,559
2010	3.2	395,984	1,276,259	527,979	1,055,957	1,701,678	376,126	1,220,077	501,501	1,003,003	1,626,769	5,015
2011	3.2	435,582	1,386,943	580,777	1,161,553	1,849,257	413,739	1,326,101	551,652	1,103,303	1,768,135	5,517
2012	3.1	479,141	1,506,779	638,854	1,277,708	2,009,039	455,113	1,440,911	606,817	1,213,633	1,921,215	6,068
2013	3.1	527,055	1,636,490	702,740	1,405,479	2,181,986	500,624	1,565,199	667,498	1,334,997	2,086,931	6,675
2014	3.1	579,760	1,776,850	773,014	1,546,027	2,369,133	550,686	1,699,710	734,248	1,468,497	2,266,280	7,342
2015	3.0	637,736	1,928,697	850,315	1,700,630	2,571,596	605,755	1,845,249	807,673	1,615,346	2,460,332	8,077
2016	3.0	701,510	2,092,932	935,346	1,870,693	2,790,576	666,330	2,002,681	888,440	1,776,881	2,670,241	8,884
2017	3.0	757,631	2,235,250	1,010,174	2,020,348	2,980,333	719,637	2,139,118	959,516	1,919,031	2,852,157	9,595
2018	2.9	818,241	2,386,824	1,090,988	2,181,976	3,182,431	777,208	2,284,441	1,036,277	2,072,554	3,045,921	10,363
2019	2.9	883,700	2,548,235	1,178,267	2,356,534	3,397,647	839,384	2,439,210	1,119,179	2,238,358	3,252,280	11,192
2020	2.9	954,396	2,720,103	1,272,529	2,545,057	3,626,805	906,535	2,604,017	1,208,713	2,417,427	3,472,023	12,087
2021	2.8	1,030,748	2,903,086	1,374,331	2,748,662	3,870,781	979,058	2,779,495	1,305,410	2,610,821	3,705,993	13,054
2022	2.8	1,092,593	3,049,444	1,456,791	2,913,581	4,065,926	1,037,801	2,919,859	1,383,735	2,767,470	3,893,145	13,837
2023	2.8	1,158,149	3,202,895	1,544,198	3,088,396	4,270,527	1,100,069	3,067,031	1,466,759	2,933,518	4,089,374	14,668
2024	2.7	1,227,637	3,363,774	1,636,850	3,273,700	4,485,031	1,166,074	3,221,333	1,554,765	3,109,529	4,295,111	15,548
2025	2.7	1,301,296	3,532,433	1,735,061	3,470,122	4,709,910	1,236,038	3,383,104	1,648,051	3,296,101	4,510,805	16,481
2026	2.7	1,379,373	3,709,242	1,839,165	3,678,329	4,945,656	1,310,200	3,552,697	1,746,934	3,493,867	4,736,929	17,469
2027	2.7	1,462,136	3,894,590	1,949,515	3,899,029	5,192,786	1,375,710	3,700,990	1,834,280	3,668,561	4,934,653	18,343
2028	2.6	1,549,864	4,088,882	2,066,485	4,132,971	5,451,843	1,444,496	3,855,256	1,925,994	3,851,989	5,140,341	19,260
2029	2.6	1,642,856	4,292,547	2,190,474	4,380,949	5,723,396	1,516,721	4,015,733	2,022,294	4,044,588	5,354,310	20,223
2030	2.6	1,741,427	4,506,032	2,321,903	4,643,806	6,008,043						
2031	2.6	1,845,913	4,729,809	2,461,217	4,922,434	6,306,412						

*Peaking factor based on Ten States Standards (18+SQRT(P))/(4+SQRT(P)), where P is population in thousands.

**Assumes 75 gal/person/day

***Assumes 100 gal/person/day

****Assumes a peaking factor of 2.0 times Average Day Wet Weather Flows

TABLE D-2: Harrisburg Wastewater Flow Data

	Year	
	2008	2009
Date	Flow (Gallons)	Flow (Gallons)
12/31	680,000	
12/30	671,000	
12/29	668,000	
12/28	610,000	
12/27	595,000	
12/26	576,000	
12/25	589,000	
12/24	571,000	
12/23	555,000	
12/22	563,000	
12/21	549,000	
12/20	498,000	
12/19	475,000	
12/18	450,000	
12/17	440,000	
12/16	454,000	
12/15	477,000	
12/14	433,000	
12/13	384,000	
12/12	366,000	
12/11	346,000	
12/10	332,000	
12/9	321,000	
12/8	353,000	
12/7	307,000	
12/6	288,000	
12/5	277,000	
12/4	201,000	
12/3	378,000	
12/2	288,000	
12/1	318,000	
11/30	276,000	
11/29	243,000	
11/28	285,000	
11/27	298,000	
11/26	282,000	
11/25	297,000	
11/24	321,000	
11/23	275,000	
11/22	229,000	
11/21	264,000	
11/20	285,000	
11/19	290,000	
11/18	278,000	
11/17	299,000	
11/16	267,000	

TABLE D-2: Harrisburg Wastewater Flow Data

	Year	
	2008	2009
Date	Flow (Gallons)	Flow (Gallons)
11/15	248,000	
11/14	249,000	
11/13	257,000	
11/12	258,000	
11/11	247,000	
11/10	286,000	
11/9	286,000	
11/8	248,000	
11/7	250,000	
11/6	264,000	
11/5	270,000	
11/4	269,000	
11/3	301,000	
11/2	280,000	
11/1	249,000	
10/31	265,000	
10/30	269,000	
10/29	277,000	
10/28	293,000	
10/27	345,000	
10/26	312,000	
10/25	300,000	
10/24	353,000	
10/23	396,000	
10/22	242,000	
10/21	232,000	
10/20	256,500	
10/19	256,500	
10/18	233,000	
10/17	244,000	
10/16	252,000	
10/15	296,000	
10/14	306,000	
10/13	340,000	
10/12	294,000	
10/11	274,000	
10/10	290,000	
10/9	278,000	
10/8	286,000	
10/7	287,000	
10/6	275,000	
10/5	233,000	
10/4	215,000	
10/3	235,000	
10/2	227,000	
10/1	191,000	

TABLE D-2: Harrisburg Wastewater Flow Data

	Year	
	2008	2009
Date	Flow (Gallons)	Flow (Gallons)
9/30	256,000	
9/29	256,000	
9/28	247,000	
9/27	225,000	
9/26	215,000	
9/25		
9/24	226,000	
9/23	234,000	
9/22	274,000	
9/21	241,000	
9/20	235,000	
9/19	236,000	
9/18	234,000	
9/17	231,000	
9/16	222,000	
9/15	290,000	
9/14	259,000	
9/13	250,000	
9/12	248,000	
9/11	247,000	
9/10	413,000	
9/9	507,000	
9/8	510,000	
9/7	447,000	
9/6	402,000	
9/5	378,000	
9/4	345,000	
9/3	356,000	
9/2	345,000	
9/1	291,000	
8/31	279,000	
8/30	266,000	
8/29	259,000	
8/28	250,000	
8/27	252,000	
8/26	238,000	
8/25	268,000	
8/24	223,000	
8/23	220,000	
8/22	223,000	
8/21	225,000	
8/20	221,000	
8/19	227,000	
8/18	256,000	
8/17	229,000	
8/16	239,000	

TABLE D-2: Harrisburg Wastewater Flow Data

	Year	
	2008	2009
Date	Flow (Gallons)	Flow (Gallons)
8/15	240,000	
8/14	230,000	
8/13	235,000	
8/12	237,000	
8/11	258,000	
8/10	249,000	
8/9	288,000	
8/8	382,000	
8/7	400,000	
8/6	358,000	
8/5	405,000	
8/4	406,000	
8/3	362,000	
8/2	396,000	
8/1	382,000	
7/31	380,000	
7/30	354,000	
7/29	345,000	
7/28	371,000	
7/27	335,000	
7/26	327,000	
7/25	333,000	
7/24	316,000	
7/23	313,000	
7/22	337,000	
7/21	466,000	
7/20	635,000	
7/19	359,000	
7/18	334,000	
7/17	290,000	
7/16	283,000	
7/15	273,000	
7/14	288,000	
7/13	261,000	
7/12	255,000	
7/11	253,000	
7/10	225,000	
7/9	243,000	
7/8	255,000	
7/7	248,000	
7/6	220,000	
7/5	210,000	
7/4	230,000	
7/3	240,000	
7/2	243,000	
7/1	249,000	

TABLE D-2: Harrisburg Wastewater Flow Data

	Year	
	2008	2009
Date	Flow (Gallons)	Flow (Gallons)
6/30	288,000	
6/29	335,000	
6/28	510,000	
6/27	429,000	
6/26	559,000	
6/25	431,000	
6/24	411,000	
6/23	400,000	
6/22	353,000	
6/21	339,500	
6/20	339,500	
6/19	339,500	
6/18	339,500	
6/17	388,000	
6/16	394,000	
6/15	383,000	
6/14	378,000	
6/13	428,000	
6/12	427,000	
6/11	401,000	
6/10	417,000	
6/9	489,000	
6/8	463,000	
6/7	510,000	
6/6	542,000	
6/5	295,000	
6/4		
6/3		
6/2		
6/1		
5/31		
5/30		
5/29		
5/28		
5/27		
5/26		
5/25		
5/24		
5/23		
5/22		
5/21		
5/20		
5/19		
5/18		
5/17		
5/16		

TABLE D-2: Harrisburg Wastewater Flow Data

	Year	
	2008	2009
Date	Flow (Gallons)	Flow (Gallons)
5/15		
5/14		
5/13		
5/12		
5/11		
5/10		
5/9		
5/8		
5/7		
5/6		
5/5		
5/4		
5/3		
5/2		
5/1		
4/30		
4/29		
4/28		
4/27		
4/26		
4/25		
4/24		
4/23		
4/22	246,000	
4/21	252,000	
4/20	293,000	
4/19	288,000	
4/18	269,000	
4/17	297,000	
4/16	422,000	
4/15	628,000	
4/14	610,000	
4/13	588,000	
4/12	525,000	
4/11	458,000	
4/10	394,000	
4/9	300,000	
4/8	273,000	
4/7	267,000	
4/6	295,000	
4/5	768,000	
4/4		
4/3		
4/2	486,000	
4/1		
3/31	252,000	

TABLE D-2: Harrisburg Wastewater Flow Data

	Year	
	2008	2009
Date	Flow (Gallons)	Flow (Gallons)
3/30	287,000	
3/29	895,000	
3/28		
3/27	791,000	
3/26		
3/25	1,227,000	
3/24	1,285,000	
3/23	1,227,000	
3/22	1,188,000	
3/21	1,108,000	
3/20	1,053,000	
3/19	978,000	
3/18	926,000	
3/17	832,000	
3/16	727,000	
3/15	692,000	
3/14	692,000	
3/13	642,000	
3/12	604,000	
3/11	461,000	
3/10	389,000	
3/9	377,000	
3/8	306,000	
3/7	113,000	
3/6		
3/5		
3/4		
3/3		
3/2		263,000
3/1		300,000
2/29		278,000
2/28		238,000
2/27		251,000
2/26		259,000
2/25		260,000
2/24		247,000
2/23		277,000
2/22		253,000
2/21		225,000
2/20		239,000
2/19		237,000
2/18		260,000
2/17		273,000
2/16		284,000
2/15		256,000
2/14		233,000

TABLE D-2: Harrisburg Wastewater Flow Data

	Year	
	2008	2009
Date	Flow (Gallons)	Flow (Gallons)
2/13		255,000
2/12		274,000
2/11		340,000
2/10		361,000
2/9		293,000
2/8		288,000
2/7		253,000
2/6		254,000
2/5		238,000
2/4		239,000
2/3		244,000
2/2		312,000
2/1		316,000
1/31		123,000
1/30		266,750
1/29		266,750
1/28		266,750
1/27		266,750
1/26		266,750
1/25		266,750
1/24		266,750
1/23		266,750
1/22		266,750
1/21		266,750
1/20		266,750
1/19		266,750
1/18		266,750
1/17		266,750
1/16		266,750
1/15		266,750
1/14		360,000
1/13		429,000
1/12		466,000
1/11		493,000
1/10		520,000
1/9		574,000
1/8		651,000
1/7		730,000
1/6		815,000
1/5		806,000
1/4		773,000
1/3		725,000
1/2		734,000
1/1		687,000

TABLE D-2: Harrisburg Wastewater Flow Data

	Year	
	2008	2009
Date	Flow (Gallons)	Flow (Gallons)
Total Annual Flow (gal)	92,811,000	32,144,000
Average Day Flow (gpd)	369,765	349,391
Max Day Flow (gpd)	1,285,000	815,000
Ratio of Ave Day Flow to Max Day	3.48	2.33
Average Day Dry Weather Flow (gpd)	315,563	
Max Day Dry Weather Flow (gpd)	680,000	
Ratio of Ave Day Dry to Max Day Dry Flow	2.2	
Average Day Wet Weather Flow (gpd)*	711,077	
Maximum Day Wet Weather Flow (gpd)	1,285,000	
Ratio of Ave Day Wet to Max Day Wet Weather Flow (gpd)	1.8	

** Based on 30-day wetest flows. For 2008, this was from March 8, 2008 to April 6, 2008.*

APPENDIX E

TABLE E-1: Capacity of Future Wastewater Lagoons

Design Basis for Existing Harrisburg Wastewater Lagoons

Design Population	pop.	20,223
Design Year		2,029
Average Daily Flow	gpd	1,516,721
Average Daily	gpcd	75
Average Daily	gpm	1,053
Peak Design	gpm	2,809

Other Assumptions:

Annual Rainfall (in)	24.62
Annual Evaporation (in)	39
Seepage (in per day)	0.06
Seepage (in per year)	22.81
Net Loss (in)	-37.19
Net Loss (ft)	-3.10

WASTEWATER LAGOON CAPACITY CALCULATIONS

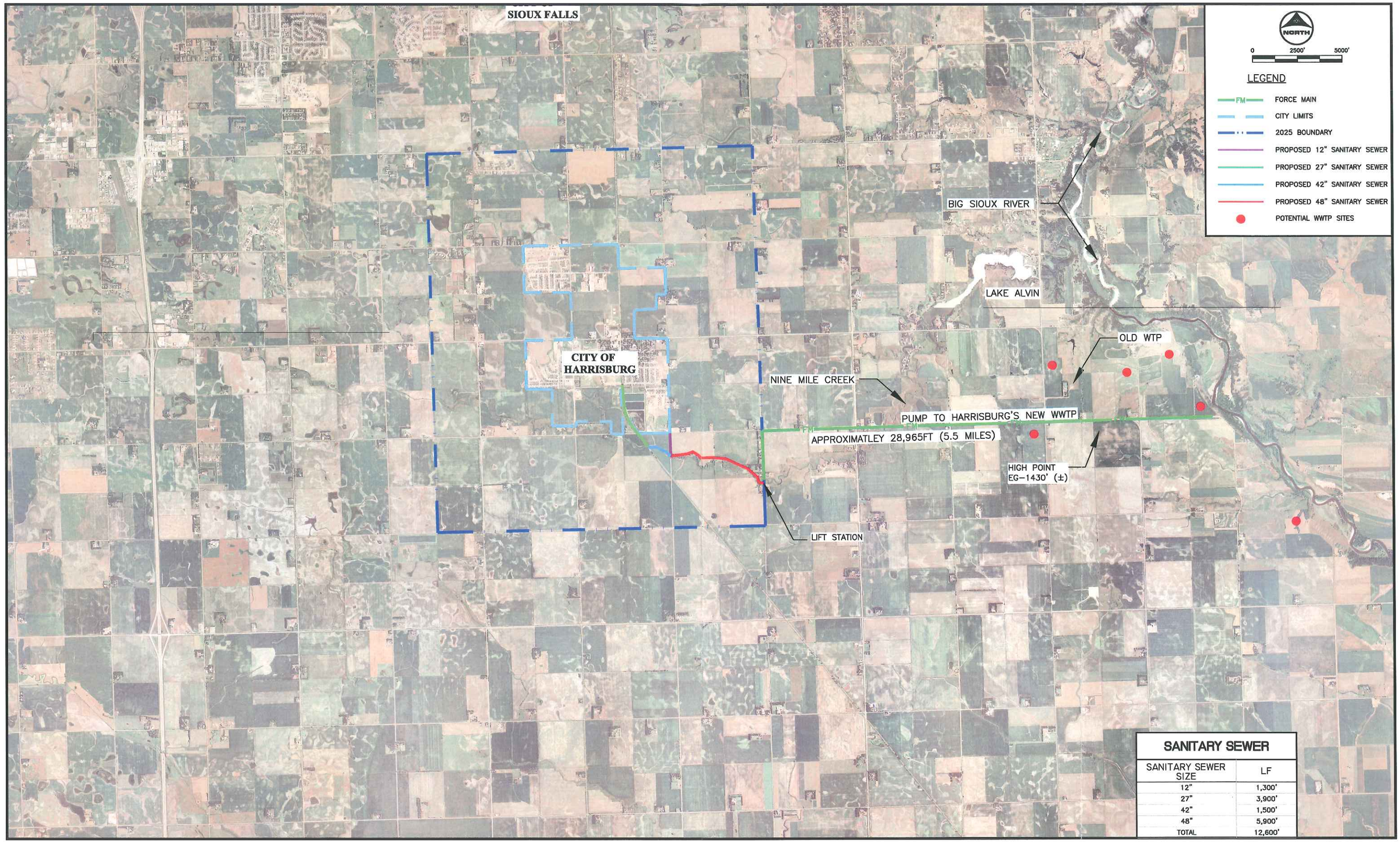
Flow =	1.52	MGD
Influent BOD =	210	mg/l
Bottom Storage =	0	ft
Seepage =	1/16	in/day
Desired Detention Time =	365	days
Actual Tot. Vol. =	91,606,611	ft^3
Actual Detention Time =	365	days
Total BOD Loading =	7.2	lb BOD/acre-day

	Units	Primary Pond	Secondary Pond	Tertiary Pond	TOTAL
Actual Depth	ft	5	6	8	
Usable Depth	ft	5	6	8	
Slope	ft/ft	3	3	3	
L to W Ratio	ft/ft				
Top Length	ft	3,750	2,250	2,250	
Top Width	ft	2,475	1,485	1,485	
Top Area	ft^2	9,281,250	3,341,250	3,341,250	
Middle Length	ft	3,735	2,232	2,226	
Middle Width	ft	2,460	1,467	1,461	
Middle Area	ft^2	9,188,100	3,274,344	3,252,186	
Bottom Length	ft	3,720	2,214	2,202	
Bottom Width	ft	2,445	1,449	1,437	
Bottom Area	ft^2	9,095,400	3,208,086	3,164,274	
Volume	acre-ft^2	1,055	451	597	
Volume	ft^3	45,940,875	19,646,712	26,019,024	91,606,611
BOD Loading	lb BOD/acre-day	12			
% of Tot. Pond Area	%	58	21	21	
Free Board	ft	3	3	3	
Top of Berm Length	ft	3,768	2,268	2,268	
Top of Berm Width	ft	2,493	1,503	1,503	
Top of Berm Area	ft^2	9,393,624	3,408,804	3,408,804	16,211,232
Top of Berm Area	acres				372.16

TABLE E-1: Capacity of Future Wastewater Lagoons

Time to Fill Ponds Based on 75 gpcd

Flow to Pond (ft^3/year)	Year	Population	Evaporation (Based on Middle Area) (ft^3/year)	Volume Used (ft^3/year)	Totalized Volume Used (ft^3/year)
18,353,746	2010	5,015	-48,705,531	-30,351,785	
20,189,120	2011	5,517	-48,705,531	-28,516,411	
22,208,033	2012	6,068	-48,705,531	-26,497,499	
24,428,836	2013	6,675	-48,705,531	-24,276,696	
26,871,719	2014	7,342	-48,705,531	-21,833,812	
29,558,891	2015	8,077	-48,705,531	-19,146,640	
32,514,780	2016	8,884	-48,705,531	-16,190,751	
35,115,963	2017	9,595	-48,705,531	-13,589,569	
37,925,240	2018	10,363	-48,705,531	-10,780,291	
40,959,259	2019	11,192	-48,705,531	-7,746,272	
44,236,000	2020	12,087	-48,705,531	-4,469,532	
47,774,880	2021	13,054	-48,705,531	-930,652	
50,641,373	2022	13,837	-48,705,531	1,935,841	1,935,841
53,679,855	2023	14,668	-48,705,531	4,974,324	4,974,324
56,900,646	2024	15,548	-48,705,531	8,195,115	8,195,115
60,314,685	2025	16,481	-48,705,531	11,609,154	11,609,154
63,933,566	2026	17,469	-48,705,531	15,228,035	26,837,188
67,130,244	2027	18,343	-48,705,531	18,424,713	45,261,901
70,486,757	2028	19,260	-48,705,531	21,781,225	67,043,127
74,011,094	2029	20,223	-48,705,531	25,305,563	92,348,690



SANITARY SEWER

SANITARY SEWER SIZE	LF
12"	1,300'
27"	3,900'
42"	1,500'
48"	5,900'
TOTAL	12,600'

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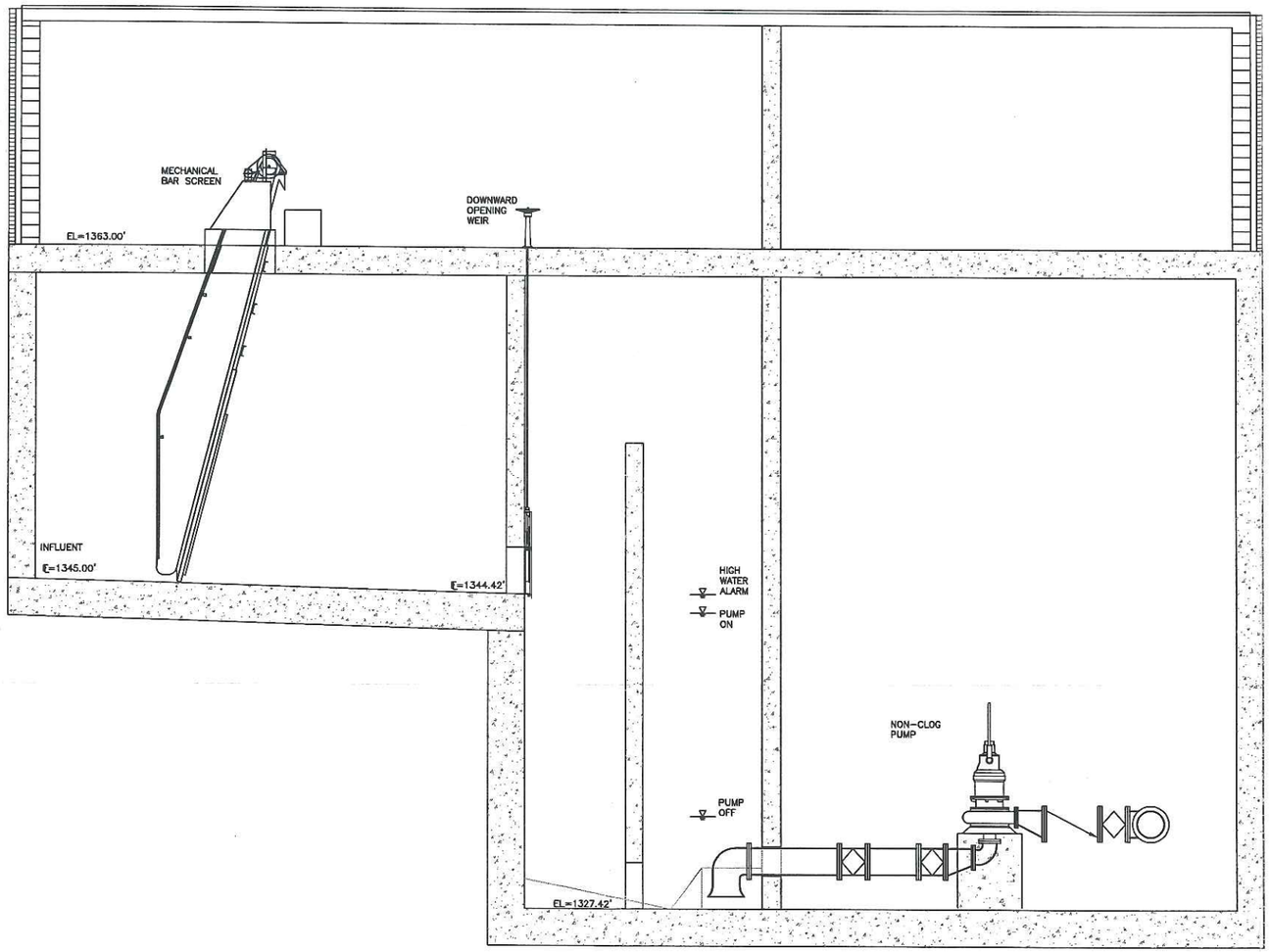
Howard R. Green Company

WASTEWATER TREATMENT PLAN FACILITY PLAN
CITY OF HARRISBURG
HARRISBURG, SOUTH DAKOTA

EXHIBIT
PUMP WW TO HARRISBURG WWTP

SHEET NO.
E-1

Xrefs: LINCOLN COUNTY 2006 AERIAL.DWG WINNEHAHA COUNTY 2006 AERIAL.DWG



1 SECTION

SCALE: NTS

PRELIMINARY
NOT FOR CONSTRUCTION

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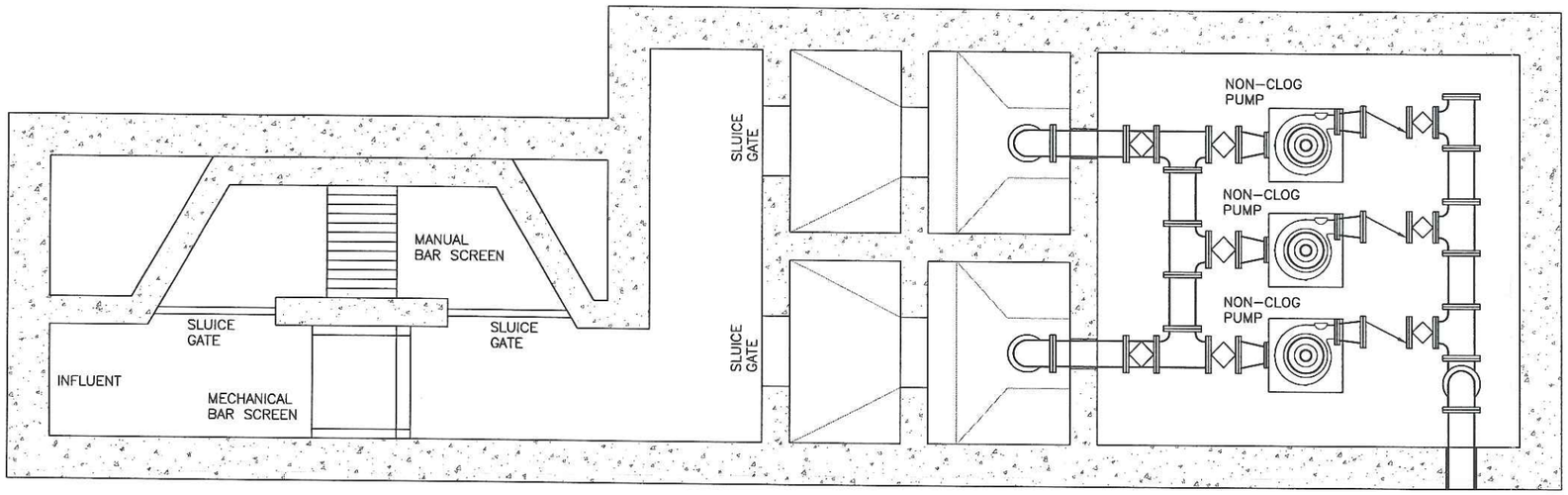
Howard R. Green Company

WASTEWATER TREATMENT PLANT FACILITY PLAN
CITY OF HARRISBURG
HARRISBURG, SOUTH DAKOTA

PROCESS
LIFT STATION EXHIBIT
SECTION VIEW WETWLL/DRYWELL

SHEET NO.
E-2



1 PLAN

SCALE: NTS

PRELIMINARY
NOT FOR CONSTRUCTION

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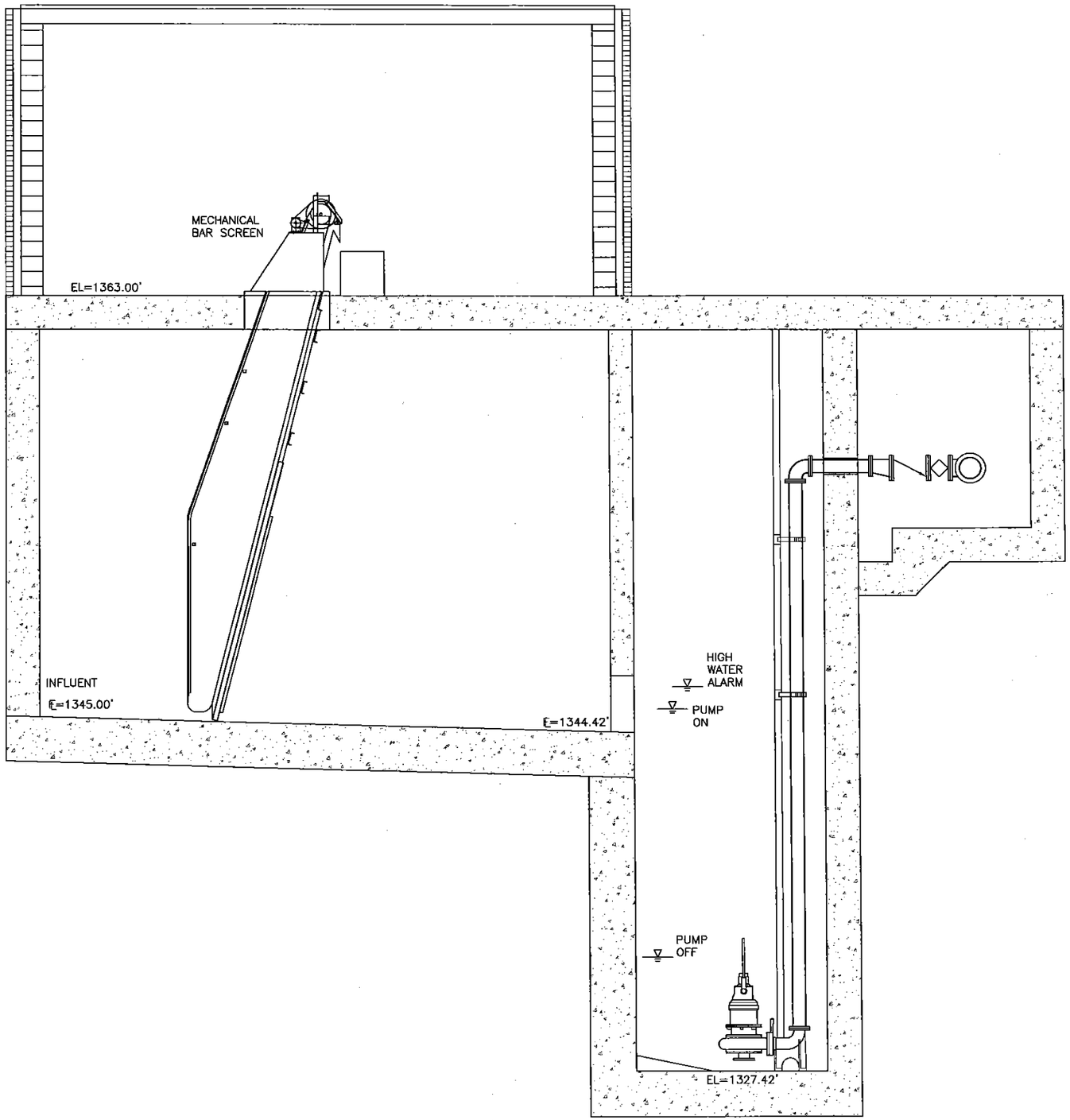
NO.	DATE	BY	REVISION DESCRIPTION

Howard R. Green Company

WASTEWATER TREATMENT PLANT FACILITY PLAN
CITY OF HARRISBURG
HARRISBURG, SOUTH DAKOTA



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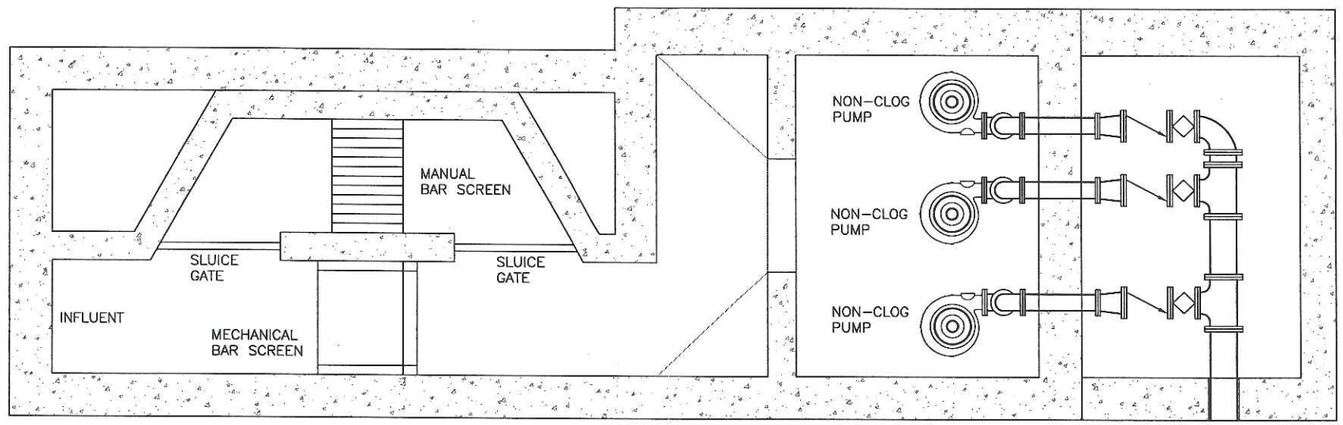
NO.	DATE	BY	REVISION DESCRIPTION

Howard R. Green Company

WASTEWATER TREATMENT PLANT FACILITY PLAN
CITY OF HARRISBURG
HARRISBURG, SOUTH DAKOTA

PROCESS
LIFT STATION EXHIBIT
SECTION VIEW SUBMERSIBLE DESIGN

SHEET NO.
E-4



1 PLAN

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PRELIMINARY
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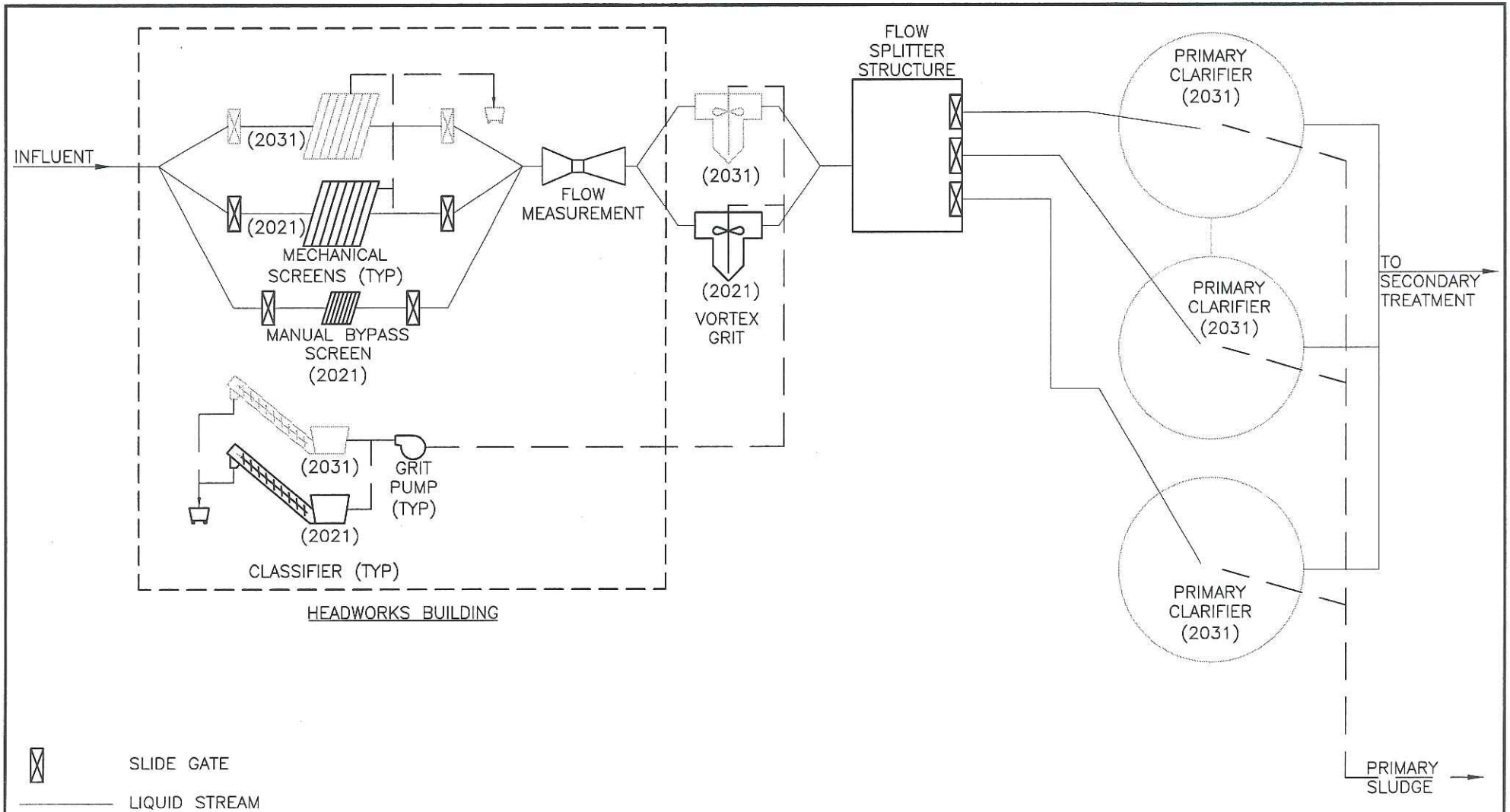
NO.	DATE	BY	REVISION DESCRIPTION

Howard R. Green Company

WASTEWATER TREATMENT PLANT FACILITY PLAN
CITY OF HARRISBURG
HARRISBURG, SOUTH DAKOTA

PROCESS
LIFT STATION EXHIBIT
PLAN VIEW SUBMERSIBLE DESIGN

SHEET NO.
E-5



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JOB NUMBER:	604280J
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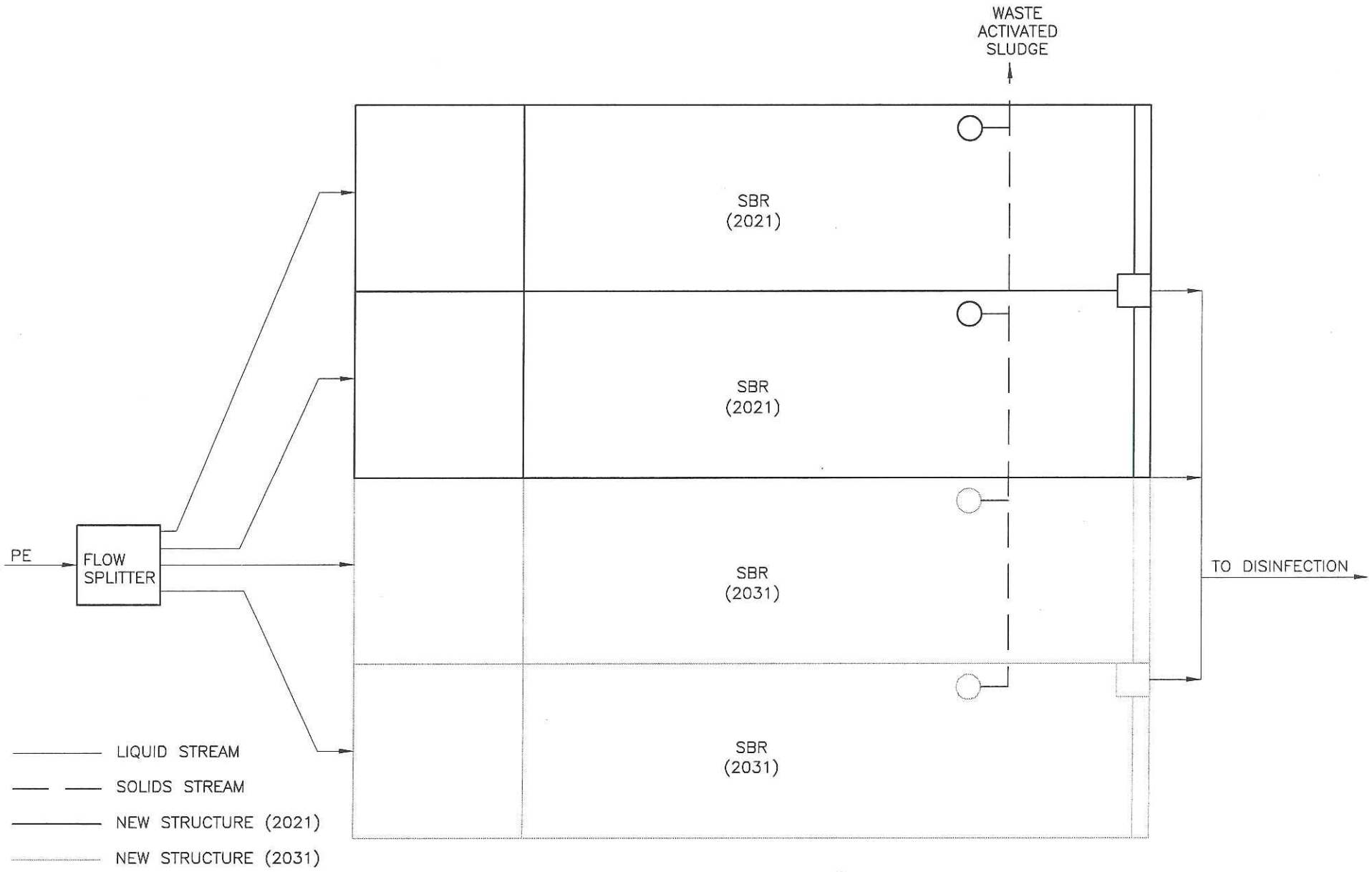
Howard R. Green Company

SCHEMATIC

PRIMARY TREATMENT

EXHIBIT E-6



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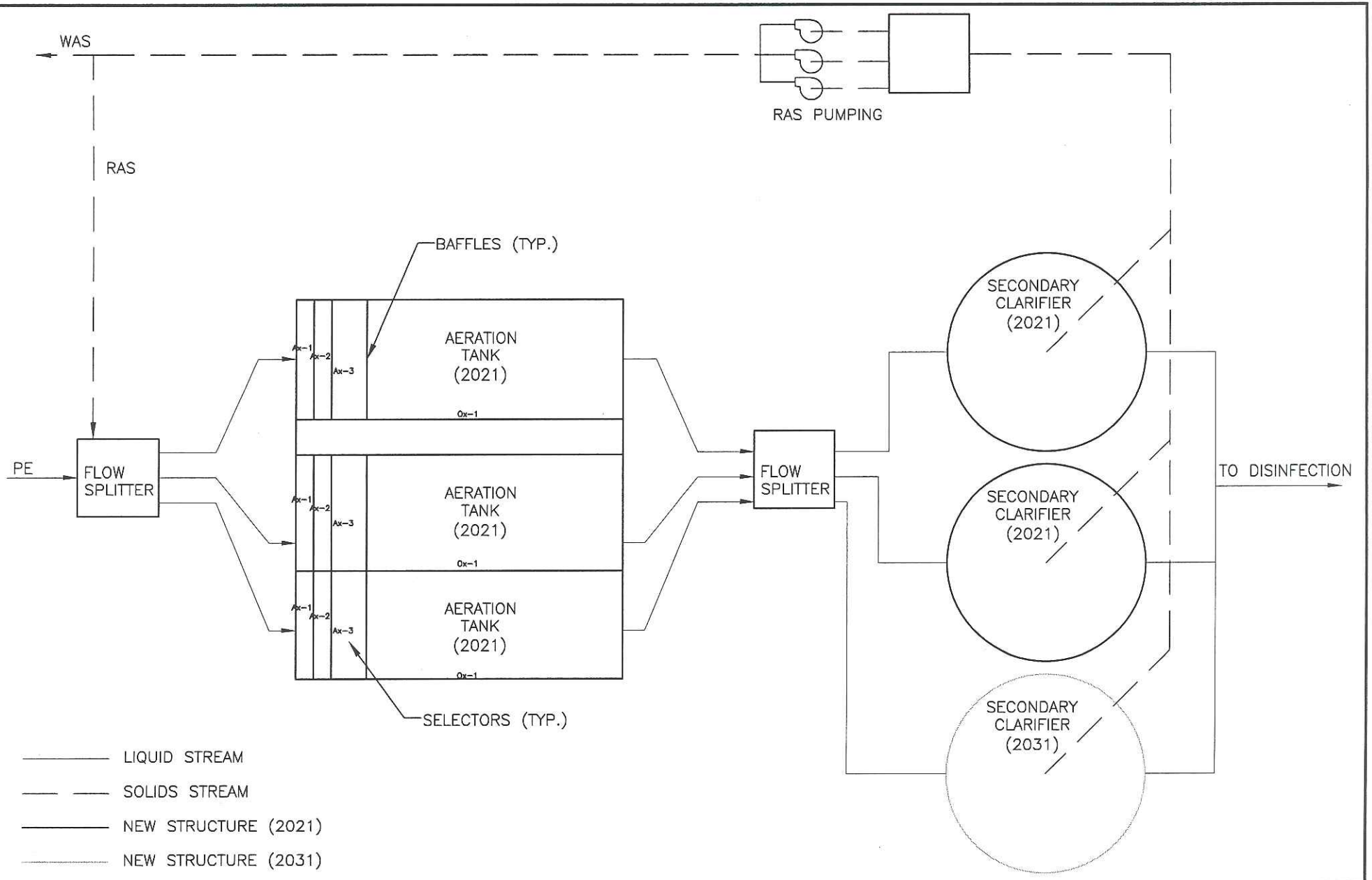
Howard R. Green Company

SCHEMATIC

SECONDARY TREATMENT

SBR ALTERNATIVE

FIGURE E-7



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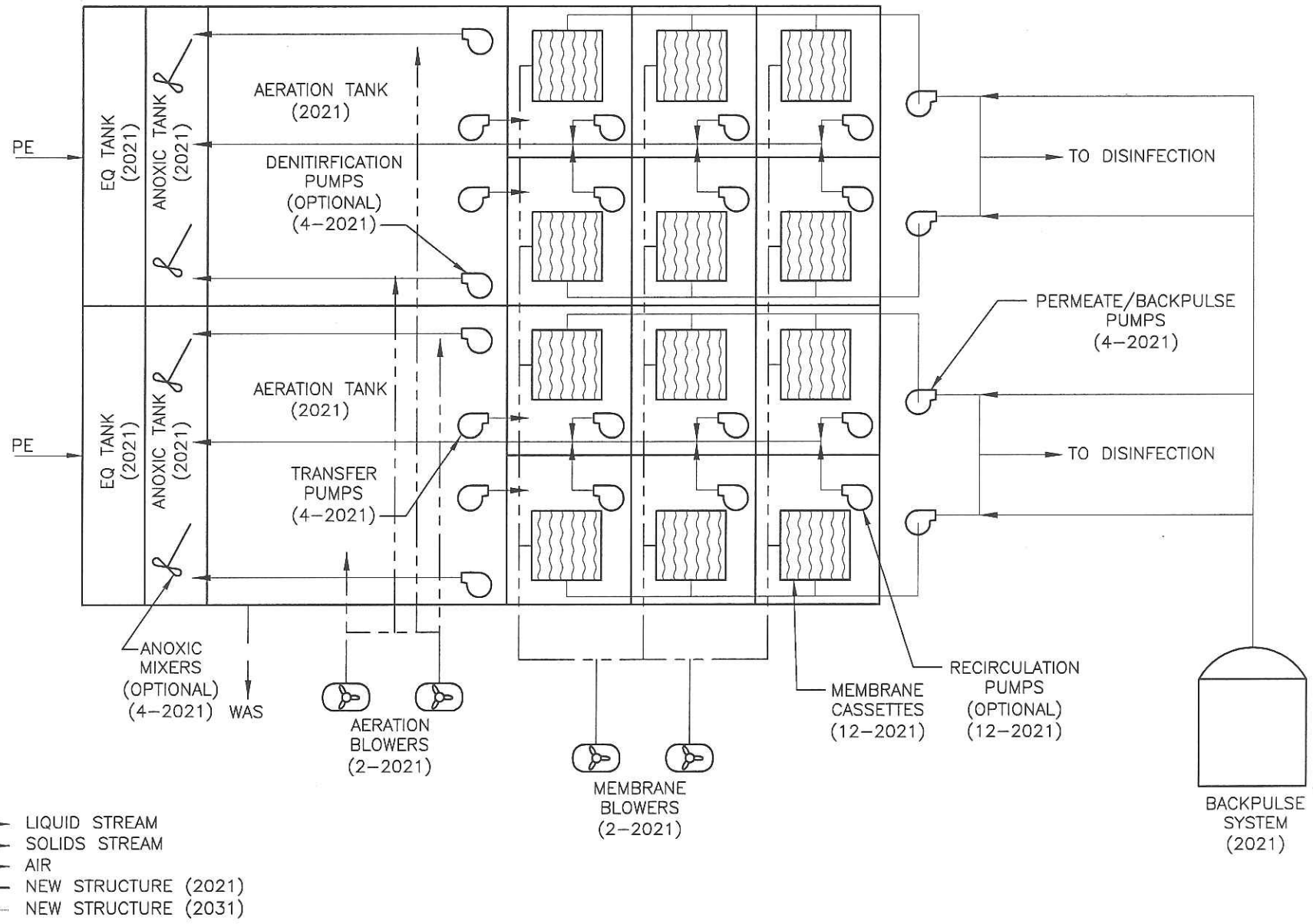
Howard R. Green Company

SCHEMATIC

SECONDARY TREATMENT

CONVENTIONAL ACTIVATED SLUDGE ALTERNATIVE

FIGURE E-8



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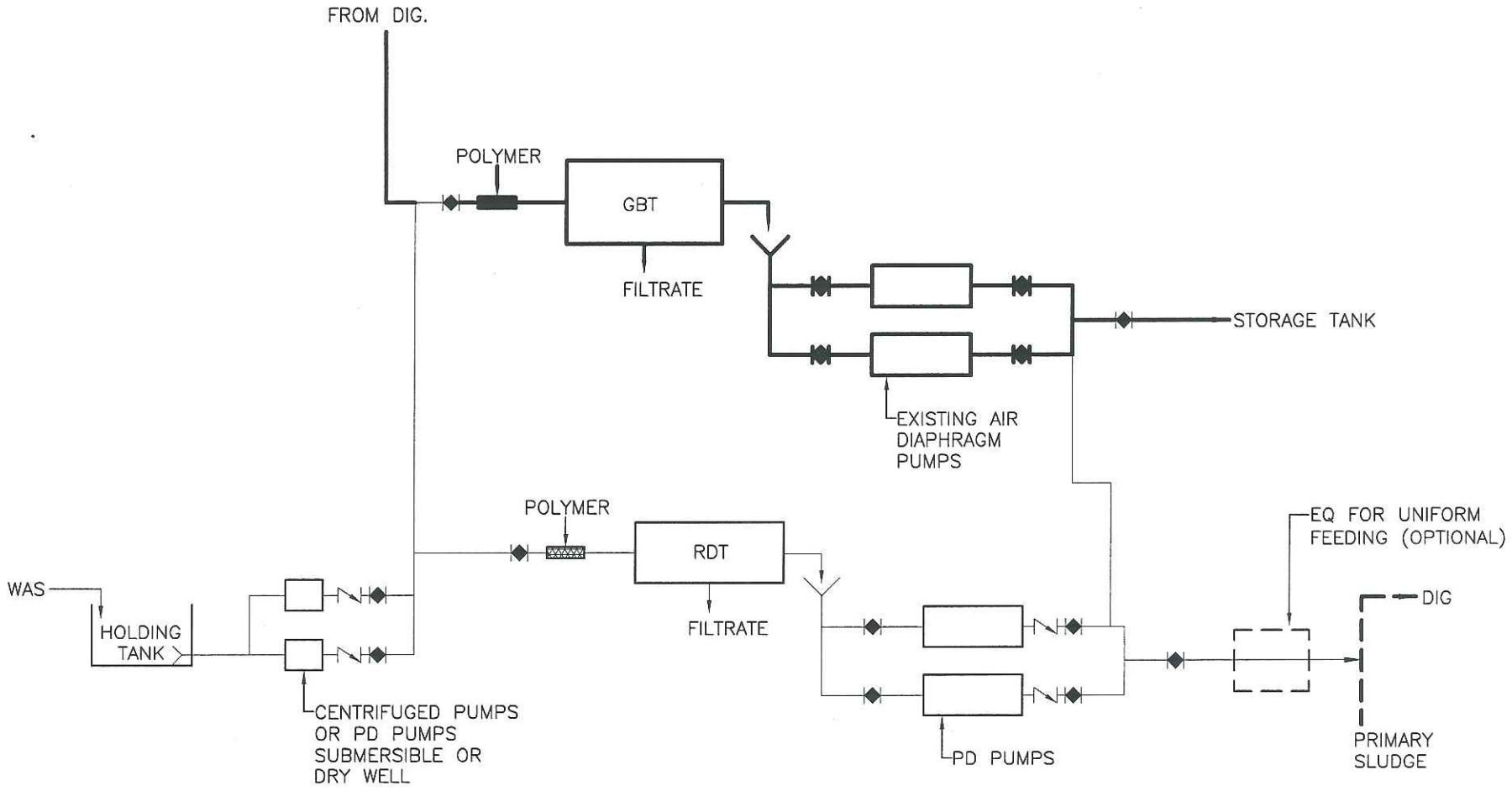
Howard R. Green Company

SCHEMATIC

SECONDARY TREATMENT

MBR ALTERNATIVE

FIGURE E-9



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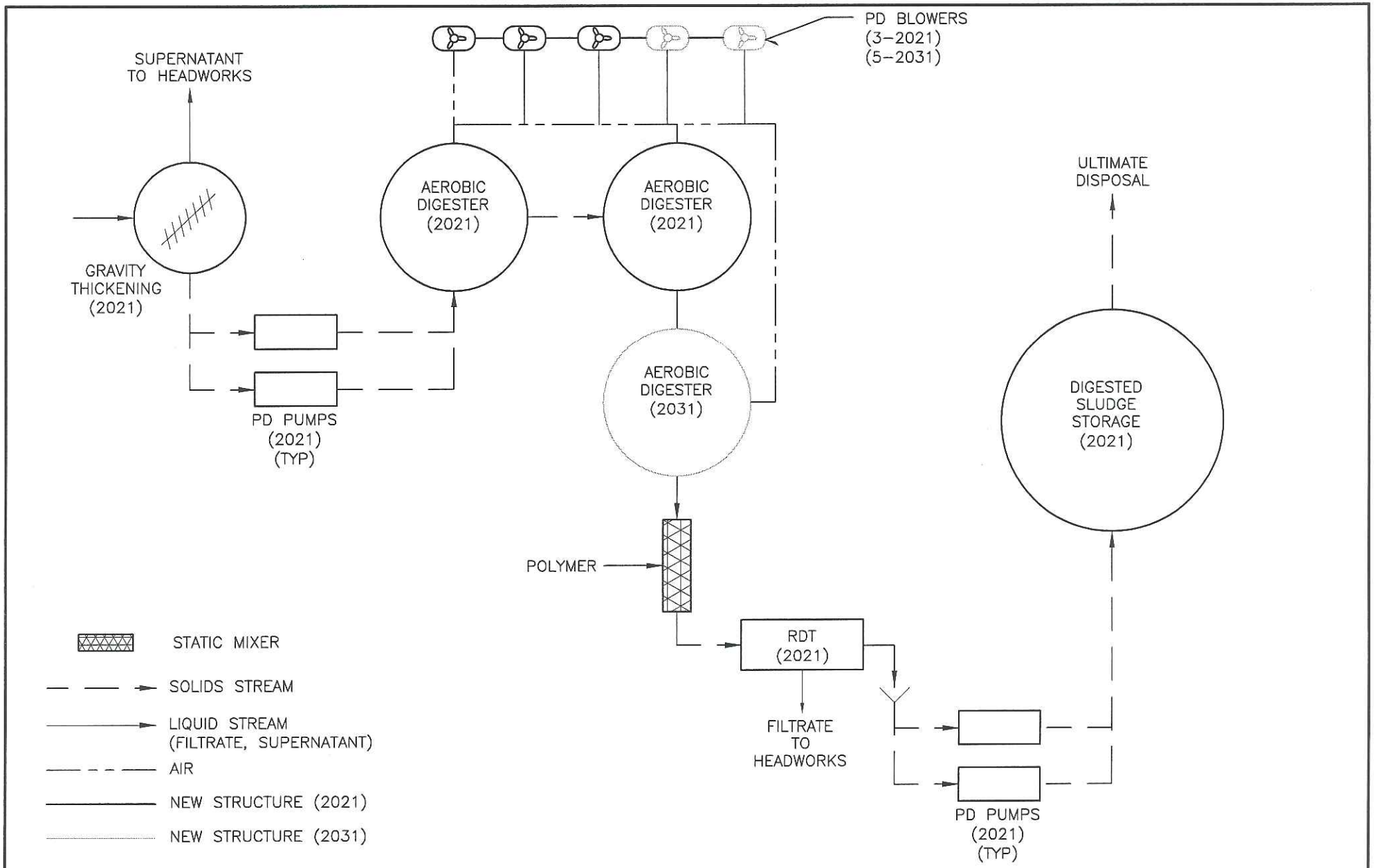
Howard R. Green Company

SCHEMATIC

WAS THICKENING/DEWATERING

FIGURE E-10



DRAWN BY: CMB	JOB DATE: 2006	Howard R. Green Company	SCHEMATIC SOLIDS TREATMENT AEROBIC DIGESTION
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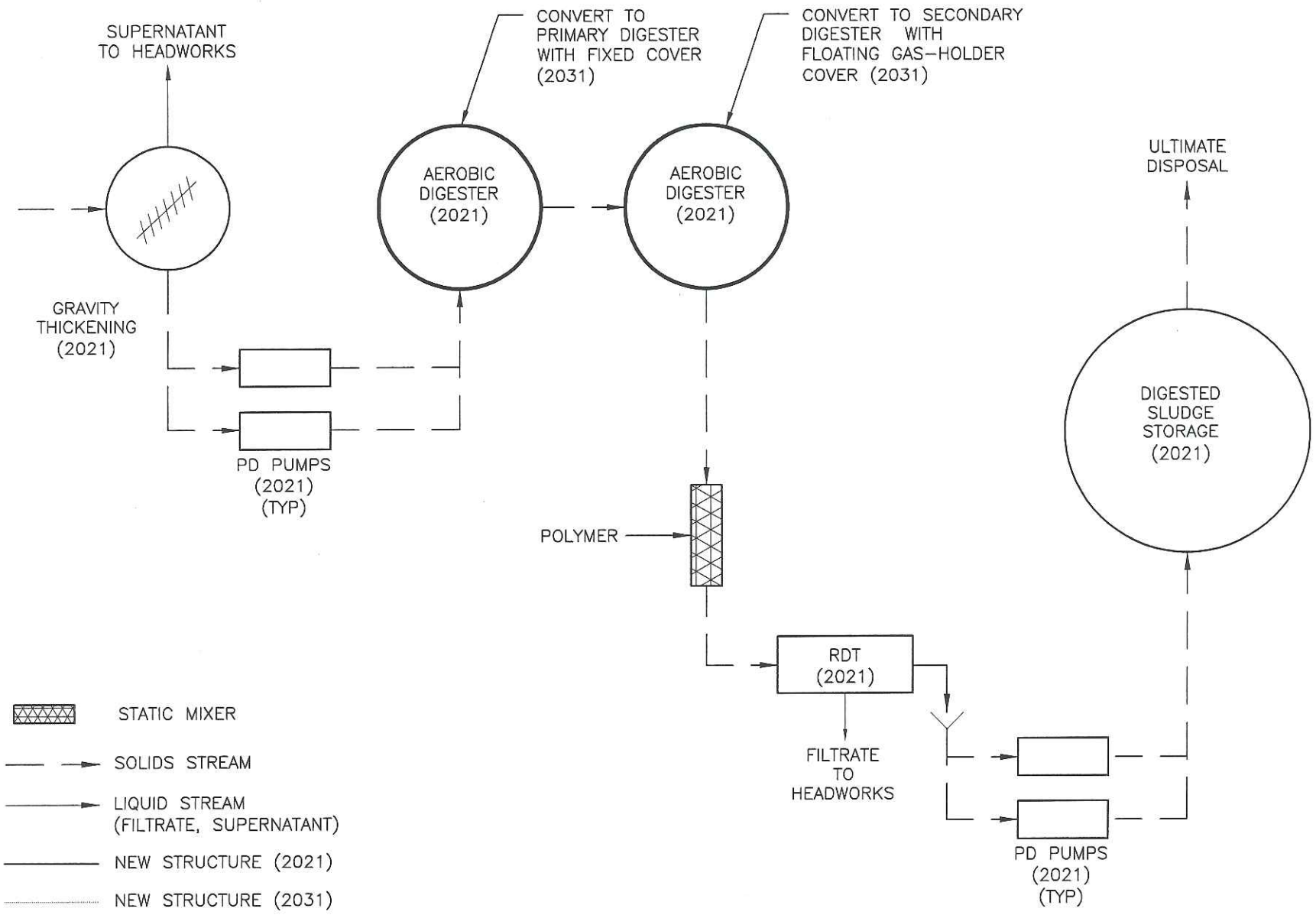

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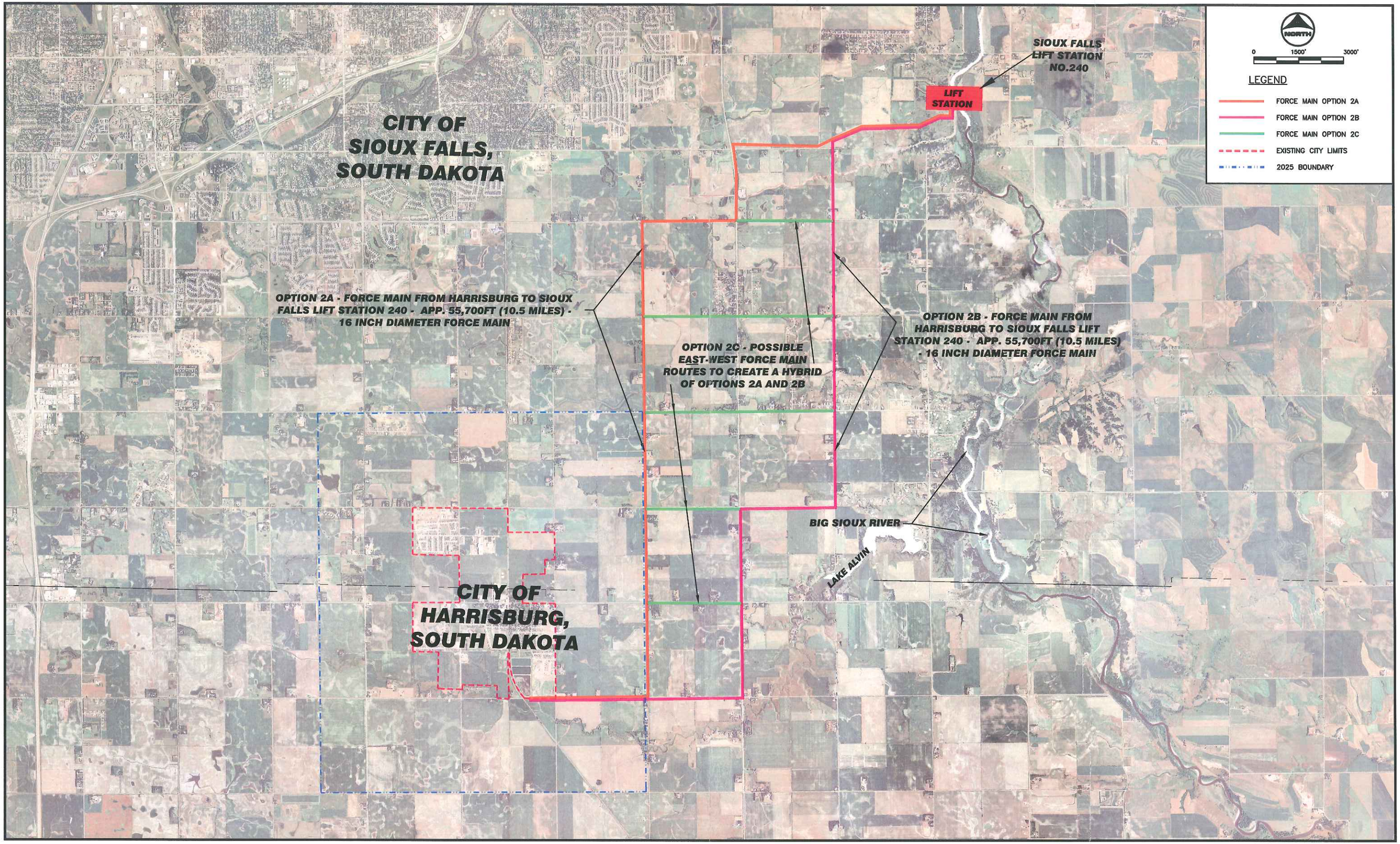
Howard R. Green Company

SCHEMATIC

SOLIDS TREATMENT

ANAEROBIC DIGESTION

FIGURE E-12



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Howard R. Green Company

WASTEWATER TREATMENT PLANT FACILITY PLAN
CITY OF HARRISBURG
HARRISBURG, SOUTH DAKOTA

FORCE MAIN OPTION 2

SHEET NO.
E-13

APPENDIX F

TABLE F-1: PRELIMINARY ENGINEERS OPINION OF PROBABLE COST
GRAVITY SEWER
AUGUST 2007

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
	SITE WORK				
1	CLEARING & GRUBBING	LS	1.0	$ 10,000.00	$ 10,000
2	SALVAGE TOPSOIL	CY	8,800	$ 2.00	$ 17,600
3	PLACING TOPSOIL	CY	8,800	$ 4.00	$ 35,200
4	LOCATING UTILITIES	EA	10	$ 500.00	$ 5,000
	SITE WORK SUBTOTAL				**$ 67,800**
	EROSION CONTROL				
5	TEMPORARY SILT FENCE	LF	15,800	$ 5.00	$ 79,000
6	PERMANENT SEEDING	LB	1,925	$ 12.00	$ 23,100
7	FERTILIZING	LB	7,255	$ 1.00	$ 7,300
8	MULCHING	TON	75	$ 150.00	$ 11,300
	EROSION CONTROL SUBTOTAL				**$ 120,700**
	SURFACING				
9	GRAVEL SURFACING	TON	30	$ 20.00	$ 600
	SURFACING SUBTOTAL				**$ 600**
	TRAFFIC CONTROL				
10	TRAFFIC CONTROL, IN PLACE, COMPLETE	LS	1.0	$ 5,000.00	$ 5,000
	TRAFFIC CONTROL SUBTOTAL				**$ 5,000**
	SANITARY SEWER				
11	TRENCH DEWATERING	LS	1	$ 200,000.00	$ 200,000
12	TRENCH STABILIZATION MATERIAL	TON	1,460	$ 21.00	$ 30,660
13	GRANULAR INITIAL BACKFILL FOR SANITARY SEWER	TON	5,500	$ 11.00	$ 60,500
14	MH FRAME AND COVER	EA	33	$ 350.00	$ 11,550
15	MH CONSTRUCTION PLATE MARKER	EA	33	$ 200.00	$ 6,600
16	MH EXTERNAL FRAME SEAL	EA	33	$ 400.00	$ 13,200
17	48"ø HDPE LINED MH, IN PLACE, COMPLETE	EA	4	$ 4,500.00	$ 18,000
18	72"ø HDPE LINED MH, IN PLACE, COMPLETE	EA	10	$ 13,000.00	$ 130,000
19	84"ø HDPE LINED MH, IN PLACE, COMPLETE	EA	4	$ 17,500.00	$ 70,000
20	96"ø HDPE LINED MH, IN PLACE, COMPLETE	EA	15	$ 22,000.00	$ 330,000
21	12" SAN SWR PVC PIPE SDR 35	LF	1,300	$ 50.00	$ 65,000
22	27" SAN SWR PVC PIPE SDR 35	LF	3,900	$ 245.00	$ 955,500
23	42" SAN SWR HOBAS PIPE	LF	1,500	$ 340.00	$ 510,000
24	48" SAN SWR HOBAS PIPE	LF	5,900	$ 415.00	$ 2,448,500
25	MH EXFILTRATION\VACUUM TEST	EA	33	$ 300.00	$ 9,900
26	SAN SWR EXFILTRATION TESTING	LF	12,600	$ 1.25	$ 15,750
27	SWR PIPE DEFLECTION TEST	LF	12,600	$ 1.00	$ 12,600
	SANITARY SEWER SUBTOTAL				**$ 4,890,000**
	SUBTOTAL CONSTRUCTION COSTS				$ 5,084,100
	CONTINGENCY (20%)				$ 1,017,000
	PRELIMINARY OPINION OF CONSTRUCTION COSTS				**$ 6,101,100**
	ENGINEERING, LEGAL, CONSTRUCTION ADMINISTRATION (20%)				$ 1,220,220
	TOTAL ENGINEER'S OPINION OF PROBABLE PROJECT COST				**$ 7,321,000**

TABLE F-1A: PRELIMINARY ENGINEERS OPINION OF PROBABLE COST

INFLUENT PIPING FROM TIGER ST. AND PRARIE AVE. TO RECEIVING MH

FEBRUARY 2009

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
	SITE WORK				
1	CLEARING & GRUBBING	LS	1.0	$ 5,000.00	$ 5,000
2	SALVAGE TOPSOIL	CY	300	$ 2.00	$ 600
3	PLACING TOPSOIL	CY	300	$ 4.00	$ 1,200
4	LOCATING UTILITIES	EA	10	$ 300.00	$ 3,000
5	REMOVE ASPHALT CONCRETE	SY	2,280	$ 10.00	$ 22,800
6	REMOVE EXISTING SANITARY SEWER PIPING	LF	1,000	$ 10.00	$ 10,000
7	REMOVE EXISTING MANHOLE	EA	6	$ 1,000.00	$ 6,000
	SITE WORK SUBTOTAL				**$ 48,600**
	EROSION CONTROL				
8	TEMPORARY SILT FENCE	LF	540	$ 5.00	$ 2,700
9	INLET PROTCTION	EA	2	$ 500.00	$ 1,000
10	PERMANENT SEEDING	LB	70	$ 12.00	$ 900
11	FERTILIZING	LB	130	$ 1.00	$ 200
12	MULCHING	TON	2	$ 150.00	$ 300
	EROSION CONTROL SUBTOTAL				**$ 5,100**
	SANITARY SEWER				
13	TRENCH DEWATERING	LS	1	$ 25,000.00	$ 25,000
14	TRENCH STABILIZATION MATERIAL	TON	140	$ 21.00	$ 2,940
15	GRANULAR INITIAL BACKFILL FOR SANITARY SEWER	TON	470	$ 13.00	$ 6,110
16	MH FRAME AND COVER	EA	4	$ 350.00	$ 1,400
17	MH CONSTRUCTION PLATE MARKER	EA	4	$ 200.00	$ 800
18	MH EXTERNAL FRAME SEAL	EA	4	$ 400.00	$ 1,600
19	48"ø MH, IN PLACE, COMPLETE	EA	4	$ 1,500.00	$ 6,000
20	FLOW SPLITTER STRUCTURES	EA	2	$ 3,000.00	$ 6,000
21	12" SAN SWR PVC PIPE SDR 35	EA	400	$ 50.00	$ 20,000
22	24" SAN SWR PVC PIPE SDR 35	LF	340	$ 150.00	$ 51,000
23	27" SAN SWR PVC PIPE SDR 35	LF	335	$ 160.00	$ 53,600
24	30" SAN SWR PVC PIPE SDR 35	LF	225	$ 175.00	$ 39,375
25	20" SAN SWR CASING PIPE (F&I)	LF	400	$ 200.00	$ 80,000
26	MH EXFILTRATION\VACUUM TEST	EA	4	$ 300.00	$ 1,200
27	SAN SWR EXFILTRATION TESTING	LF	1,700	$ 1.25	$ 2,125
28	SWR PIPE DEFLECTION TEST	LF	1,700	$ 1.00	$ 1,700
	SANITARY SEWER SUBTOTAL				**$ 300,000**
	SURFACING				
29	ASPHALT CONCRETE COMPOSITE	TON	700.0	75.00	$ 52,500
30	GRANULAR SUBBASE	TON	700.0	13.00	$ 9,100
31	SCARIFY AND RECOMPACT	SF	1400.0	1.00	$ 1,400
	SANITARY SEWER SUBTOTAL				**$ 63,000**
	SUBTOTAL CONSTRUCTION COSTS				$ 416,700
	CONTINGENCY (20%)				$ 83,340
	PRELIMINARY OPINION OF CONSTRUCTION COSTS				**$ 500,040**
	ENGINEERING, LEGAL, CONSTRUCTION ADMINISTRATION (20%)				$ 100,008
	TOTAL ENGINEER'S OPINION OF PROBABLE PROJECT COST				**$ 600,000**

TABLE F-2: PRELIMINARY ENGINEERS OPINION OF PROBABLE COST
FORCE MAIN TO NEW WWTP
AUGUST 2007

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
	SITE WORK				
1	CLEARING & GRUBBING	LS	1.0	$ 10,000.00	$ 10,000
2	SALVAGE TOPSOIL	CY	8,046	$ 2.00	$ 16,100
3	PLACING TOPSOIL	CY	8,046	$ 4.00	$ 32,200
4	LOCATING UTILITIES	EA	10	$ 500.00	$ 5,000
	SITEWORK SUBTOTAL				**$ 63,300**
	EROSION CONTROL				
5	TEMPORARY SILT FENCE	LF	28,965	$ 5.00	$ 144,900
6	PERMANENT SEEDING	LB	1,765	$ 12.00	$ 21,200
7	FERTILIZING	LB	6,650	$ 1.00	$ 6,700
8	MULCHING	TON	100	$ 150.00	$ 15,000
	EROSION CONTROL SUBTOTAL				**$ 187,800**
	SURFACING				
9	GRAVEL SURFACING	TON	37	$ 20.00	$ 800
	SURFACING SUBTOTAL				**$ 800**
	TRAFFIC CONTROL				
10	TRAFFIC CONTROL, IN PLACE, COMPLETE	LS	1.0	$ 5,000.00	$ 5,000
	TRAFFIC CONTROL SUBTOTAL				**$ 5,000**
	SANITARY SEWER				
11	TRENCH STABILIZATION MATERIAL	TON	652	$ 12.50	$ 8,200
12	FORCE MAIN BEDDING MATERIAL	TON	13,034	$ 6.50	$ 84,800
13	TRENCH DEWATERING	LS	1.0	$ 100,000.00	$ 100,000
14	CONNECT TO EXISTING SEWER	EA	1.0	$ 5,000.00	$ 5,000
15	16" CL. 235 PVC AWWA C905 FORCE MAIN, F&I	LF	28,965	$ 55.00	$ 1,593,100
16	FORCE MAIN FITTINGS, F&I (@ 15% OF FORCE MAIN COST)	LS	1.0	$ 239,000.00	$ 239,000
17	26" STEEL CASING PIPE, FURNISH & INSTALL	LF	150	$ 175.00	$ 26,300
18	BORE & JACK 26" STEEL CASING PIPE	LF	150	$ 275.00	$ 41,300
19	16" CL. 235 PVC AWWA C905 CARRIER PIPE	LF	150	$ 100.00	$ 15,000
	SANITARY SEWER SUBTOTAL				**$ 2,112,700**
	SUBTOTAL CONSTRUCTION COSTS				$ 2,369,600
	CONTINGENCY (20%)				$ 474,000
	PRELIMINARY OPINION OF CONSTRUCTION COSTS				**$ 2,843,600**
	ENGINEERING, LEGAL, CONSTRUCTION ADMINISTRATION (20%)				$ 569,000
	TOTAL ENGINEER'S OPINION OF PROBABLE PROJECT COST				**$ 3,413,000**

TRENCH STABILZATION MATERIAL WAS CALCULATED FOR 1/5 PIPE LENGTH, 6" DEEP
FORCE MAIN PIPE COST WAS DOUBLED BASED ON WHAT HD SUPPLY PROVIDED
FORCE MAIN BEDDING WAS ASSUMED TO BE SAME BEDDING REQUIREMENTS AS SIOUX FALLS WATERMAIN

TABLE F-3: PRELIMINARY ENGINEERS OPINION OF PROBABLE COST
FORCE MAIN TO L.S. NO. 240
MARCH 2009

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
	SITE WORK				
1	CLEARING & GRUBBING	LS	1.0	$ 10,000.00	$ 10,000
2	SALVAGE TOPSOIL	CY	15,556	$ 2.00	$ 31,200
3	PLACING TOPSOIL	CY	15,556	$ 4.00	$ 62,300
4	LOCATING UTILITIES	EA	10	$ 500.00	$ 5,000
	SITEWORK SUBTOTAL				**$ 108,500**
	EROSION CONTROL				
5	TEMPORARY SILT FENCE	LF	56,000	$ 5.00	$ 280,000
6	PERMANENT SEEDING	LB	3,500	$ 12.00	$ 42,000
7	FERTILIZING	LB	13,000	$ 1.00	$ 13,000
8	MULCHING	TON	200	$ 150.00	$ 30,000
	EROSION CONTROL SUBTOTAL				**$ 365,000**
	SURFACING				
9	GRAVEL SURFACING	TON	80	$ 20.00	$ 1,600
	SURFACING SUBTOTAL				**$ 1,600**
	TRAFFIC CONTROL				
10	TRAFFIC CONTROL, IN PLACE, COMPLETE	LS	1.0	$ 5,000.00	$ 5,000
	TRAFFIC CONTROL SUBTOTAL				**$ 5,000**
	SANITARY SEWER				
11	TRENCH STABILIZATION MATERIAL	TON	1,260	$ 12.50	$ 15,800
12	FORCE MAIN BEDDING MATERIAL	TON	25,200	$ 6.50	$ 163,800
13	TRENCH DEWATERING	LS	1.0	$ 100,000.00	$ 100,000
14	CONNECT TO EXISTING SEWER	EA	1.0	$ 5,000.00	$ 5,000
15	16" CL. 235 PVC AWWA C905 FORCE MAIN, F&I	LF	56,000	$ 50.00	$ 2,800,000
16	FORCE MAIN FITTINGS, F&I (@ 15% OF FORCE MAIN COST)	LS	1.0	$ 420,000.00	$ 420,000
17	26" STEEL CASING PIPE, FURNISH & INSTALL	LF	225	$ 150.00	$ 33,800
18	BORE & JACK 26" STEEL CASING PIPE	LF	225	$ 200.00	$ 45,000
19	16" CL. 235 PVC AWWA C905 CARRIER PIPE	LF	225	$ 50.00	$ 11,300
	SANITARY SEWER SUBTOTAL				**$ 3,594,700**
	SUBTOTAL CONSTRUCTION COSTS				$ 4,074,800
	CONTINGENCY (20%)				$ 815,000
	PRELIMINARY OPINION OF CONSTRUCTION COSTS				**$ 4,889,800**
	ENGINEERING, LEGAL, CONSTRUCTION ADMINISTRATION (20%)				$ 978,000
	TOTAL ENGINEER'S OPINION OF PROBABLE PROJECT COST				**$ 5,868,000**

TRENCH STABILZATION MATERIAL WAS CALCULATED FOR 1/5 PIPE LENGTH, 6" DEEP
FORCE MAIN PIPE COST WAS DOUBLED BASED ON WHAT HD SUPPLY PROVIDED
FORCE MAIN BEDDING WAS ASSUMED TO BE SAME BEDDING REQUIREMENTS AS SIOUX FALLS WATERMAIN

TABLE F-4: PRELIMINARY ENGINEERS OPINION OF PROBABLE COST

FORCE MAIN FROM L.S. NO. 240 TO FUTURE SF WWTP

SEPTEMBER 2007

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
	SITE WORK				
1	CLEARING & GRUBBING	LS	1.0	$ 10,000.00	$ 10,000
2	SALVAGE TOPSOIL	CY	556	$ 2.00	$ 1,200
3	PLACING TOPSOIL	CY	556	$ 4.00	$ 2,300
4	ROCK EXCAVATION	CY	290	$ 180.00	$ 52,200
	SITEWORK SUBTOTAL				**$ 65,700**
	EROSION CONTROL				
5	TEMPORARY SILT FENCE	LF	4,000	$ 5.00	$ 20,000
6	PERMANENT SEEDING	LB	125	$ 12.00	$ 1,500
7	FERTILIZING	LB	475	$ 1.00	$ 500
8	MULCHING	TON	7	$ 150.00	$ 1,100
	EROSION CONTROL SUBTOTAL				**$ 23,100**
	SANITARY SEWER				
9	COFFER DAM, FLOW BYPASS, IMPERVIOUS MATERIAL	LS	1	$80,000.00	$ 80,000
10	TRENCH STABILIZATION MATERIAL	TON	75	$ 12.50	$ 1,000
11	FORCE MAIN BEDDING MATERIAL	TON	240	$ 6.50	$ 1,600
12	TRENCH DEWATERING	LS	1.0	$ 175,000.00	$ 175,000
13	CONNECT TO EXISTING SEWER	EA	2.0	$ 1,000.00	$ 2,000
14	16" CL. 235 PVC AWWA C905 FORCE MAIN, F&I	LF	2,000	$ 55.00	$ 110,000
15	FORCE MAIN FITTINGS, F&I (@ 15% OF FORCE MAIN COST)	LS	1.0	$ 17,000.00	$ 17,000
16	26" STEEL CASING PIPE, FURNISH & INSTALL	LF	225	$ 175.00	$ 39,400
17	16" CL. 235 PVC AWWA C905 CARRIER PIPE	LF	225	$ 100.00	$ 22,500
	SANITARY SEWER SUBTOTAL				**$ 448,500**
	SUBTOTAL CONSTRUCTION COSTS				$ 537,300
	CONTINGENCY (20%)				$ 108,000
	PRELIMINARY OPINION OF CONSTRUCTION COSTS				**$ 645,300**
	ENGINEERING, LEGAL, CONSTRUCTION ADMINISTRATION (20%)				$ 130,000
	TOTAL ENGINEER'S OPINION OF PROBABLE PROJECT COST				**$ 775,000**

TABLE F-5: PRELIMINARY ENGINEERS OPINION OF PROBABLE COST
SMALL EQUALIZATION BASIN
SEPTEMBER 2007

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
	EARTHWORK				
1	EXCAVATION	CY	13,993	$ 5.00	$ 70,000
2	FILL AND COMPACT	CY	4,789	$ 5.00	$ 24,000
	EARTHWORK SUBTOTAL				**$ 94,000**
	CONCRETE				
3	CONCRETE SCOUR PAD	SY	1276	$ 28.00	$ 36,000
	CONCRETE SUBTOTAL				**$ 36,000**
	SITEWORK				
4	SITE PIPING	LS	1	$ 25,000.00	$ 25,000
5	MISCELLANEOUS SITEWORK	LS	1	$ 10,000.00	$ 10,000
6	FENCE (CHAIN LINK W/ 3 STRANDS BARB WIRE)	LF	1,960	$ 20.00	$ 40,000
	SITEWORK SUBTOTAL				**$ 75,000**
	TOTAL ITEMS 1 THROUGH 5				
	SUBTOTAL CONSTRUCTION COSTS				$ 205,000
	CONTINGENCY (20%)				$ 41,000
	PRELIMINARY OPINION OF CONSTRUCTION COSTS				**$ 246,000**
	ENGINEERING, LEGAL, CONSTRUCTION ADMINISTRATION (20%)				$ 50,000
	TOTAL ENGINEER'S OPINION OF PROBABLE PROJECT COST				**$ 296,000**

TABLE F-6: PRELIMINARY ENGINEERS OPINION OF PROBABLE COST
2 LARGE EQUALIZATION BASINS
SEPTEMBER 2007

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
	EARTHWORK				
1	EXCAVATION	CY	170,754	$ 5.00	$ 853,800
2	FILL AND COMPACT	CY	170,754	$ 5.00	$ 853,800
3	HAUL, FILL AND COMPACT	CY	16,944	$ 10.00	$ 169,500
	EARTHWORK SUBTOTAL				**$ 1,707,600**
	ODOR CONTROL				
4	AERATORS	EA	30	$ 10,000.00	$ 300,000
	ODOR CONTROL SUBTOTAL				**$ 300,000**
	CONCRETE				
5	CONCRETE SCOUR PAD	SY	5,107	$ 28.00	$ 143,000
	CONCRETE SUBTOTAL				**$ 150,000**
	SITEWORK				
6	SITE PIPING	LS	1	$ 100,000.00	$ 100,000
7	MISCELLANEOUS SITEWORK	LS	1	$ 50,000.00	$ 50,000
8	FENCE	LF	4,575	$ 20.00	$ 92,000
	SITEWORK SUBTOTAL				**$ 150,000**
	SUBTOTAL CONSTRUCTION COSTS				$ 2,307,600
	CONTINGENCY (20%)				$ 462,000
	PRELIMINARY OPINION OF CONSTRUCTION COSTS				**$ 2,769,600**
	ENGINEERING, LEGAL, CONSTRUCTION ADMINISTRATION (20%)				$ 554,000
	TOTAL ENGINEER'S OPINION OF PROBABLE PROJECT COST				**$ 3,324,000**

TABLE F-7: PRELIMINARY ENGINEERS OPINION OF PROBABLE COST
CAN LIFT STATION TO PUMP TO SIOUX FALLS OR NEW WWTP
MARCH 2009

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
	SITE WORK				
1	CLEARING & GRUBBING	LS	1.0	$ 10,000.00	$ 10,000
2	DEWATERING	LS	1.0	$ 30,000.00	$ 30,000
3	WETWELL EXCAVATION	CY	2,280	$ 5.00	$ 11,400
4	STRUCTURAL FILL	CY	3,400	$ 5.00	$ 17,000
5	CRUSHED ROCK UNDER WETWELL & LIFT STATION	TON	60	$ 25.00	$ 1,500
6	ASPHALT SURFACING	LS	1.0	$ 60,000.00	$ 60,000
7	LANDSCAPING	LS	1.0	$ 10,000.00	$ 10,000
8	FENCING	LS	1.0	$ 10,000.00	$ 10,000
9	GATE	EA	1.0	$ 5,000.00	$ 5,000
10	ELECTRICAL	LS	1.0	$ 40,000.00	$ 40,000
11	WATER SERVICE	LF	2,640	$ 25.00	$ 66,000
	SITE WORK SUBTOTAL				**$ 260,900**
	LIFT STATION AND WETWELL				
12	PACKAGED LIFT STATION	LS	1.0	$ 420,000.00	$ 420,000
13	180" x 180" x 12" INT BASE SLAB	EA	1.0	$ 9,120.00	$ 9,200
14	168" x 168" x 12" TOP SLAB W/EMBEDS	EA	1.0	$ 7,020.00	$ 7,100
15	12' x 12' PRECAST BOX MH RISER (UNLINED)	LF	25.0	$ 1,500.00	$ 37,500
16	FILLABLE CONCRETE	CY	15.0	$ 200.00	$ 3,000
17	ENTRANCE & EQUIPMENT HATCH	LS	1.0	$ 10,000.00	$ 10,000
18	ROLL 1" x 14.5' WATERSTOP JOINT MATERIAL	EA	36.0	$ 28.00	$ 1,100
	LIFT STATION & WETWELL SUBTOTAL				**$ 487,900**
	PUMPS AND PIPING				
19	16" D.I. FLANGED PIPE (PROCESS)	LS	1.0	$ 5,000.00	$ 5,000
20	PIPE FITTINGS (PROCESS)	LS	1.0	$ 5,000.00	$ 5,000
	PUMPS AND PIPING SUBTOTAL				**$ 10,000**
	MISCELLANEOUS				
21	GENERATOR	LS	1.0	$ 450,000.00	$ 450,000
22	VFD's	LS	1.0	$ 40,000.00	$ 40,000
22	INSTRUMENTATION AND CONTROL SYSTEM	LS	1.0	$ 50,000.00	$ 50,000
23	MAG METER	LS	1.0	$ 15,000.00	$ 15,000
24	ODOR CONTROL UNIT	LS	1.0	$ 100,000.00	$ 100,000
25	SURGE TANK	LS	1.0	$ 75,000.00	$ 75,000
	MISCELLANEOUS SUBTOTAL				**$ 730,000**
	TOTAL ITEMS 1 THROUGH 23				
	SUBTOTAL CONSTRUCTION COSTS				$ 1,488,800
	CONTINGENCY (20%)				$ 298,000
	PRELIMINARY OPINION OF CONSTRUCTION COSTS				**$ 1,786,800**
	ENGINEERING, LEGAL, CONSTRUCTION ADMINISTRATION (20%)				$ 358,000
	TOTAL ENGINEER'S OPINION OF PROBABLE PROJECT COST				**$ 2,145,000**

TABLE F-8A: PRELIMINARY ENGINEERS OPINION OF PROBABLE COST

LIFT STATION TO PUMP TO SIOUX FALLS (2011-2021)

JANUARY 2008

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
	SITE WORK				
1	CLEARING & GRUBBING	LS	1.0	$ 10,000.00	$ 10,000
2	DEWATERING	LS	1.0	$ 30,000.00	$ 30,000
3	WETWELL & SCREENING EXCAVATION	CY	5,640	$ 5.00	$ 28,200
4	STRUCTURAL FILL	CY	8,600	$ 5.00	$ 43,000
5	CRUSHED ROCK UNDER WETWELL & LIFT STATION	TON	75	$ 25.00	$ 1,900
6	ASPHALT SURFACING	LS	1.0	$ 60,000.00	$ 60,000
7	LANDSCAPING	LS	1.0	$ 10,000.00	$ 10,000
8	FENCING	LS	1.0	$ 10,000.00	$ 10,000
9	GATE	EA	1.0	$ 5,000.00	$ 5,000
10	ELECTRICAL	LS	1.0	$ 75,000.00	$ 75,000
11	WATER SERVICE	LF	2,640	$ 25.00	$ 66,000
	SITE WORK SUBTOTAL				**$ 339,100**
	LIFT STATION AND WETWELL				
12	PACKAGED LIFT STATION	LS	1.0	$ 560,000.00	$ 560,000
13	204" x 204" x 12" INT BASE SLAB	EA	1.0	$ 11,700.00	$ 11,700
14	192" x 192" x 12" TOP SLAB W/EMBEDS	EA	1.0	$ 8,870.00	$ 8,900
15	14' x 14' PRECAST BOX MH RISER (UNLINED)	LF	27.0	$ 1,810.00	$ 48,900
16	FILLABLE CONCRETE	CY	25.0	$ 200.00	$ 5,000
17	ENTRANCE & EQUIPMENT HATCH	LS	1.0	$ 10,000.00	$ 10,000
18	ROLL 1" x 14.5' WATERSTOP JOINT MATERIAL	EA	36.0	$ 28.00	$ 1,100
	LIFT STATION & WETWELL SUBTOTAL				**$ 645,600**
	PUMPS AND PIPING				
19	16" D.I. FLANGED PIPE (PROCESS)	LS	1.0	$ 5,000.00	$ 5,000
20	PIPE FITTINGS (PROCESS)	LS	1.0	$ 5,000.00	$ 5,000
	PUMPS AND PIPING SUBTOTAL				**$ 10,000**
	MISCELLANEOUS				
21	MECHANICAL BAR SCREEN	EA	1.0	$ 200,000.00	$ 200,000
22	BAR SCREEN BUILDING FOUNDATION & CHANNEL	LS	1.0	$ 70,000.00	$ 70,000
23	BAR SCREEN ABOVE GRADE BUILDING	LS	1.0	$ 25,000.00	$ 25,000
24	GENERATOR	LS	1.0	$ 150,000.00	$ 150,000
25	INSTRUMENTATION AND CONTROL SYSTEM	LS	1.0	$ 75,000.00	$ 75,000
26	MAG METER	LS	1.0	$ 7,000.00	$ 7,000
	MISCELLANEOUS SUBTOTAL				**$ 530,000**
	TOTAL ITEMS 1 THROUGH 26				
	SUBTOTAL CONSTRUCTION COSTS				$ 1,524,700
	CONTINGENCY (20%)				$ 305,000
	PRELIMINARY OPINION OF CONSTRUCTION COSTS				**$ 1,829,700**
	ENGINEERING, LEGAL, CONSTRUCTION ADMINISTRATION (20%)				$ 366,000
	TOTAL ENGINEER'S OPINION OF PROBABLE PROJECT COST				**$ 2,196,000**

TABLE F-8B: PRELIMINARY ENGINEERS OPINION OF PROBABLE COST
LIFT STATION TO PUMP TO SIOUX FALLS (2011-2021)
JANUARY 2008

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
	SITE WORK				
1	CLEARING & GRUBBING	LS	1.0	$ 10,000.00	$ 10,000
2	DEWATERING	LS	1.0	$ 30,000.00	$ 30,000
3	WETWELL EXCAVATION	CY	2,280	$ 5.00	$ 11,400
4	STRUCTURAL FILL	CY	3,400	$ 5.00	$ 17,000
5	CRUSHED ROCK UNDER WETWELL & LIFT STATION	TON	60	$ 25.00	$ 1,500
6	ASPHALT SURFACING	LS	1.0	$ 60,000.00	$ 60,000
7	LANDSCAPING	LS	1.0	$ 10,000.00	$ 10,000
8	FENCING	LS	1.0	$ 10,000.00	$ 10,000
9	GATE	EA	1.0	$ 5,000.00	$ 5,000
10	ELECTRICAL	LS	1.0	$ 20,000.00	$ 20,000
11	WATER SERVICE	LF	2,640	$ 25.00	$ 66,000
	SITE WORK SUBTOTAL				**$ 240,900**
	LIFT STATION AND WETWELL				
12	PACKAGED LIFT STATION	LS	1.0	$ 406,000.00	$ 406,000
13	180" x 180" x 12" INT BASE SLAB	EA	1.0	$ 9,120.00	$ 9,200
14	168" x 168" x 12" TOP SLAB W/EMBEDS	EA	1.0	$ 7,020.00	$ 7,100
15	12' x 12' PRECAST BOX MH RISER (UNLINED)	LF	25.0	$ 1,500.00	$ 37,500
16	FILLABLE CONCRETE	CY	15.0	$ 200.00	$ 3,000
17	ENTRANCE & EQUIPMENT HATCH	LS	1.0	$ 10,000.00	$ 10,000
18	ROLL 1" x 14.5' WATERSTOP JOINT MATERIAL	EA	36.0	$ 28.00	$ 1,100
	LIFT STATION & WETWELL SUBTOTAL				**$ 473,900**
	PUMPS AND PIPING				
19	16" D.I. FLANGED PIPE (PROCESS)	LS	1.0	$ 5,000.00	$ 5,000
20	PIPE FITTINGS (PROCESS)	LS	1.0	$ 5,000.00	$ 5,000
	PUMPS AND PIPING SUBTOTAL				**$ 10,000**
	MISCELLANEOUS				
21	GENERATOR	LS	1.0	$ 75,000.00	$ 75,000
22	INSTRUMENTATION AND CONTROL SYSTEM	LS	1.0	$ 50,000.00	$ 50,000
23	MAG METER	LS	1.0	$ 7,000.00	$ 7,000
	MISCELLANEOUS SUBTOTAL				**$ 140,000**
	TOTAL ITEMS 1 THROUGH 23				
	SUBTOTAL CONSTRUCTION COSTS				$ 864,800
	CONTINGENCY (20%)				$ 173,000
	PRELIMINARY OPINION OF CONSTRUCTION COSTS				**$ 1,037,800**
	ENGINEERING, LEGAL, CONSTRUCTION ADMINISTRATION (20%)				$ 208,000
	TOTAL ENGINEER'S OPINION OF PROBABLE PROJECT COST				**$ 1,246,000**

TABLE F-9: PRELIMINARY ENGINEERS OPINION OF PROBABLE COST
LIFT STATION TO PUMP TO HARRISBURG WWTP (2021-2031)
AUGUST 2007

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
	PUMPS AND PIPING				
1	PUMP REPLACEMENT	EA	2.0	$ 232,000.00	$ 464,000
2	WATER AND PUMPING TESTS	LS	1.0	$ 2,500.00	$ 2,500
	PUMPS AND PIPING SUBTOTAL				**$ 466,500**
	BUILDING				
3	ELECTRICAL & CONTROLS UPGRADE	LS	1.0	$ 70,000.00	$ 70,000
	BUILDING SUBTOTAL				**$ 70,000**
	TOTAL ITEMS 1 THROUGH 3				
	SUBTOTAL CONSTRUCTION COSTS				$ 536,500
	CONTINGENCY (20%)				$ 108,000
	PRELIMINARY OPINION OF CONSTRUCTION COSTS				**$ 644,500**
	ENGINEERING, LEGAL, CONSTRUCTION ADMINISTRATION (20%)				$ 129,000
	TOTAL ENGINEER'S OPINION OF PROBABLE PROJECT COST				**$ 774,000**

TABLE F-10: PRELIMINARY ENGINEERS OPINION OF PROBABLE COST
LIFT STATION TO PUMP TO SIOUX FALLS (2021-2031)
AUGUST 2007

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
	PUMPS AND PIPING				
1	PUMP REPLACEMENT	EA	4.0	$ 178,000.00	$ 712,000
2	WATER AND PUMPING TESTS	LS	1.0	$ 2,500.00	$ 2,500
	PUMPS AND PIPING SUBTOTAL				**$ 714,500**
	BUILDING				
3	ELECTRICAL & CONTROLS UPGRADE	LS	1.0	$ 110,000.00	$ 110,000
	BUILDING SUBTOTAL				**$ 110,000**
	TOTAL ITEMS 1 THROUGH 3				
	SUBTOTAL CONSTRUCTION COSTS				$ 824,500
	CONTINGENCY (20%)				$ 165,000
	PRELIMINARY OPINION OF CONSTRUCTION COSTS				**$ 989,500**
	ENGINEERING, LEGAL, CONSTRUCTION ADMINISTRATION (20%)				$ 198,000
	TOTAL ENGINEER'S OPINION OF PROBABLE PROJECT COST				**$ 1,188,000**

CITY OF HARRISBURG, SOUTH DAKOTA
WASTEWATER TREATMENT IMPROVEMENTS
OPINION OF PROBABLE PROJECT COST
October 24, 2007

Table F-11: Sequencing Batch Reactor Alternative 2021 Construction Costs

Item Description			Total Cost
PRELIMINARY TREATMENT			
Fine Screens (including washer/compactor)	1 ea	$ 50,000.00	$50,000
Sampler	1 ea	$ 6,500.00	$6,500
Grit Removal Equipment			
Structure			
Slabs	28 cu yds	$ 400.00	$11,200
Channel/Foundation Walls	21 cu yds	$ 700.00	$14,700
Vortex Chamber Walls	6 cu yds	$ 1,000.00	$6,000
Excavation	500 cu yds	$ 8.00	$4,000
Structural Backfill	20 cu yds	$ 26.00	$520
Backfill	175 cu yds	$ 12.00	$2,100
Grit Equipment (Vortex/Classifier)	1 ea	$150,000.00	$150,000
Grit Pumps	1 ea	$ 15,000.00	$15,000
Process Piping	1 Lump Sum	$ 15,000.00	$15,000
Misc. Metals	1 ea	$ 5,000.00	$5,000
Slide Gates	1 ea	$ 8,000.00	$8,000
Stop Plates	3 ea	$ 2,500.00	$7,500
Painting	1 Lump Sum	$ 15,000.00	$15,000
Flowmeter-Parshall Flume	1 ea	$ 7,000.00	$7,000
Headworks Structure			
Slabs	128 cu yds	$ 400.00	$51,200
Walls	58 cu yds	$ 700.00	$40,600
Excavation	930 cu yds	$ 8.00	$7,440
Structural Backfill	350 cu yds	$ 26.00	$9,100
Backfill	350 cu yds	$ 12.00	$4,200
Misc. Metals	1 Lump Sum	$ 15,000.00	$15,000
Superstructure	1500 sq ft	$ 70.00	$105,000
HVAC	Lump Sum	15%	$35,000
Plumbing	Lump Sum	15%	$35,000
Equipment Installation	Lump Sum	20%	$45,700
Electrical	Lump Sum	15%	$83,000
Instrumentation & Controls	Lump Sum	5%	$28,000
		Subtotal =	$776,800
BIOLOGICAL TREATMENT SPLITTER STRUCTURE			
Structure	Lump Sum		$38,350
Process			
Pipe	Lump Sum		$13,700
Stop Plates	3 ea	$ 800.00	$2,400
Excavation	500 cu yds	$ 8.00	$4,000
Structural Backfill	70 cu yds	$ 26.00	$1,820
Backfill	1000 cu yds	$ 12.00	$12,000
		Subtotal=	$72,270

CITY OF HARRISBURG, SOUTH DAKOTA
WASTEWATER TREATMENT IMPROVEMENTS
OPINION OF PROBABLE PROJECT COST
October 24, 2007

Table F-11: Sequencing Batch Reactor Alternative 2021 Construction Costs

SBR - BIOLOGICAL TREATMENT			
Structure			
Slab/footing	941 cu yd	$ 400.00	$376,400
Walls	780 cu yd	$ 700.00	$546,000
Excavation	6750 cu yd	$ 8.00	$54,000
Backfill	2378 cu yd	$ 12.00	$28,536
Structural Backfill	941 cu yd	$ 26.00	$24,466
Miscellaneous Structure	Lump Sum	4%	$41,176
Process			
Equipment Package	1 Lump Sum	$747,500.00	$747,500
Process/Aeration Piping	1 Lump Sum	$100,000.00	$100,000
Painting	1 Lump Sum	$ 20,000.00	$20,000
Electrical	Lump Sum	10%	$194,000
Instrumentation & Controls	Lump Sum	0%	$0
		Subtotal =	$2,132,078
EFFLUENT/DISINFECTION STRUCTURE			
Flowmeter-Parshall Flume	1 ea	$ 7,000.00	$7,000
Sampler	1 ea	$ 8,000.00	$8,000
UV Equipment	1 Lump Sum	$180,000.00	$180,000
Sluice Gate	1 ea	$ 8,000.00	$8,000
Structure			
Slab/footing	4.5 cu yd	$ 400.00	$1,800
Walls	10 cu yd	$ 700.00	$7,000
Excavation	51 cu yd	$ 8.00	$408
Backfill	25.5 cu yd	$ 12.00	$306
Metals (handrail, grating, stairs)	1 Lump Sum	$ 20,000.00	$20,000
Electrical		8%	$19,000
Instrumentation & Controls		4%	$9,000
		Subtotal =	$260,514
AEROBIC DIGESTION			
Existing Digestion Facilities			
Primary Digester Concrete			
Walls	795 cu yds	$ 700.00	$556,500
Slab	435 cu yds	$ 400.00	$174,000
Excavation	4620 cu yds	$ 8.00	$36,960
Backfill	1960 cu yds	$ 12.00	$23,520
Structural Backfill	190 cu yds	$ 26.00	$4,940
125 hp Blowers	2 ea	$ 75,000.00	$150,000
Diffusers and Piping	1 Lump Sum	$ 40,000.00	$40,000
Process Pipe and Fittings	1 Lump Sum	$ 50,000.00	$50,000
Electrical		14%	$145,000
Instrumentation & Controls		5%	$52,000
		Subtotal =	$1,232,920

CITY OF HARRISBURG, SOUTH DAKOTA
WASTEWATER TREATMENT IMPROVEMENTS
OPINION OF PROBABLE PROJECT COST
October 24, 2007

Table F-11: Sequencing Batch Reactor Alternative 2021 Construction Costs

THICKENING/DEWATERING BUILDING			
RDT	0 EA	$182,000.00	$0
RDT Feed Pumps	0 EA	$ 20,000.00	$0
RDT-to-Digester Feed Pumps	0 EA	$ 25,000.00	$0
Polymer Feed Unit	1 EA	$ 15,000.00	$15,000
BFP	1 EA	$300,000.00	$300,000
BFP Feed Pumps	2 EA	$ 20,000.00	$40,000
Conveyor	1 EA	$ 60,000.00	$60,000
Process			
Piping	1 Lump Sum	$ 20,000.00	$20,000
Valves	1 Lump Sum	$ 15,000.00	$15,000
Structure	1800 sq ft	$ 150.00	$270,000
Footing	30 cu yds	$ 400.00	$12,000
Slab	35 cu yds	$ 400.00	$14,000
Misc Concrete	10 cu yds	$ 700.00	$7,000
Excavation	100 cu yds	$ 8.00	$800
Structural Backfill	35 cu yds	$ 26.00	$900
Backfill	100 cu yds	$ 12.00	$1,200
WAS Holding Tank	1 Lump Sum	$ 15,000.00	$15,000
Excavation	1400 cu yds	$ 8.00	$11,200
Backfill	500 cu yds	$ 12.00	$6,000
Structural Backfill	250 cu yds	$ 26.00	$6,500
Walls	130 cu yds	$ 700.00	$91,000
Slab	200 cu yds	$ 400.00	$80,000
Roofing	1800 sq ft	$ 100.00	$180,000
HVAC		6%	$63,000
Plumbing		7%	$74,500
Electrical		12%	$137,500
Instrumentation & Controls		6%	$68,700
		Subtotal =	$1,489,300

CITY OF HARRISBURG, SOUTH DAKOTA
WASTEWATER TREATMENT IMPROVEMENTS
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Table F-11: Sequencing Batch Reactor Alternative 2021 Construction Costs

NEW CONTROL BUILDING			
Structure	1000 Sq Ft	$ 100.00	$100,000
Laboratory Equip	1 Lump Sum	$ 25,000.00	$25,000
Plumbing	1000 Sq Ft	$ 20.00	$20,000
HVAC	1000 Sq Ft	$ 15.00	$15,000
Roofing	1000 Sq Ft	$ 50.00	$50,000
Finishes	1 Lump Sum	$ 10,000.00	$10,000
Electrical Modifications		10%	$22,000
Instrumentation & Controls		8%	$18,000
		Subtotal =	$260,000
Subtotal			$6,223,882
SITEWORK	10%		$622,388
Subtotal			$6,846,270
GENERAL REQUIREMENTS	10%		$685,000
Subtotal			$7,531,270
CONTINGENCY	20%		$1,506,000
Opinion of Probable Construction Cost			**$9,037,270**

*** Based on 2007 costs**

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CITY OF HARRISBURG, SOUTH DAKOTA
WASTEWATER TREATMENT IMPROVEMENTS
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Table F-12: Sequencing Batch Reactor Alternative 2031 Construction Costs

Item Description				Total Cost*
PRELIMINARY TREATMENT				
Fine Screens (including washer/compactor)	1 ea	$	50,000.00	$50,000
Sampler	0 ea	$	6,500.00	$0
Grit Removal Equipment				$0
Structure				$0
Slabs	0 cu yds	$	400.00	$0
Channel/Foundation Walls	0 cu yds	$	700.00	$0
Vortex Chamber Walls	0 cu yds	$	1,000.00	$0
Excavation	0 cu yds	$	8.00	$0
Structural Backfill	0 cu yds	$	26.00	$0
Backfill	0 cu yds	$	12.00	$0
Grit Equipment (Vortex/Classifier)	1 ea	$	150,000.00	$150,000
Grit Pumps	1 ea	$	15,000.00	$15,000
Process Piping	1 Lump Sum	$	15,000.00	$15,000
Misc. Metals	1 ea	$	5,000.00	$5,000
Slide Gates	1 ea	$	8,000.00	$8,000
Stop Plates	3 ea	$	2,500.00	$7,500
Painting	1 Lump Sum	$	15,000.00	$15,000
Flowmeter-Parshall Flume	0 ea	$	7,000.00	$0
Headworks Structure				$0
Slabs	0 cu yds	$	400.00	$0
Walls	0 cu yds	$	700.00	$0
Excavation	0 cu yds	$	8.00	$0
Structural Backfill	0 cu yds	$	26.00	$0
Backfill	0 cu yds	$	12.00	$0
Misc. Metals	1 Lump Sum	$	15,000.00	$15,000
Superstructure	0 sq ft	$	70.00	$0
HVAC	Lump Sum		0%	$0
Plumbing	Lump Sum		15%	$2,000
Equipment Installation	Lump Sum		20%	$43,000
Electrical	Lump Sum		15%	$42,000
Instrumentation & Controls	Lump Sum		5%	$14,000
		Subtotal =		$381,500

CITY OF HARRISBURG, SOUTH DAKOTA
WASTEWATER TREATMENT IMPROVEMENTS
OPINION OF PROBABLE PROJECT COST
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Table F-12: Sequencing Batch Reactor Alternative 2031 Construction Costs

PRIMARY CLARIFIER				
Structure				
Walls	376	cu yds	$ 700.00	$263,200
Slab	528	cu yds	$ 400.00	$211,200
Misc concrete	55	cu yds	$ 700.00	$38,500
Excavation	4647	cu yds	$ 8.00	$37,176
Structural Backfill	715	cu yds	$ 26.00	$18,590
Backfill	2033	cu yds	$ 12.00	$24,396
Pump Structure				$0
Walls	80	cu yds	$ 700.00	$56,000
Slab	50	cu yds	$ 400.00	$20,000
Suspended Slab	50	cu yds	$ 700.00	$35,000
Misc Metals	3	ea	$ 5,000.00	$15,000
Primary Sludge Pumps	3	ea	$ 15,000.00	$45,000
Piping & Valves	1	Lump	$ 20,000.00	$20,000
Misc Metals	3	ea	$ 5,000.00	$15,000
Process				$0
4" Pipe	30	lin ft	$ 24.00	$720
6" Pipe	135	lin ft	$ 36.00	$4,860
18" Pipe	135	lin ft	$ 108.00	$14,580
Concrete Encasement	270	lin ft	$ 20.00	$5,400
Mechanisms	3	ea	$ 100,000.00	$300,000
Weirs & Baffles	3	ea	$ 8,000.00	$24,000
Scum Pumping Structures	3	ea	$ 5,000.00	$15,000
Painting	1	Lump Sum	$ 20,000.00	$20,000
Equipment Installation		Lump Sum	20%	$73,800
Electrical		Lump Sum	15%	$178,000
Instrumentation & Controls		Lump Sum	5%	$59,000
			Subtotal=	$1,494,422
PRIMARY CLARIFIER SPLITTER STRUCTURE				
Structure	1	Lump Sum	$ 38,350.00	$38,350
Process				$0
Pipe		Lump Sum		$0
Slide Gates	3	ea	$ 6,000.00	$18,000
Excavation	500	cu yds	$ 8.00	$4,000
Structural Backfill	70	cu yds	$ 26.00	$1,820
Backfill	1000	cu yds	$ 12.00	$12,000
			Subtotal=	$74,170

CITY OF HARRISBURG, SOUTH DAKOTA
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Table F-12: Sequencing Batch Reactor Alternative 2031 Construction Costs

BIOLOGICAL TREATMENT SPLITTER STRUCTURE			
Structure	1 Lump Sum	$38,350	$38,350
Process			
Pipe	1 Lump Sum	$ 13,700.00	$13,700
Stop Plates	3 ea	$ 800.00	$2,400
Excavation	500 cu yds	$ 8.00	$4,000
Structural Backfill	70 cu yds	$ 12.00	$840
Backfill	1000 cu yds	$ 26.00	$26,000
		Subtotal =	$85,290
SBR - BIOLOGICAL TREATMENT			
Structure			
Slab/footing	882 cu yd	$ 400.00	$352,800
Walls	595 cu yd	$ 700.00	$416,500
Excavation	5688 cu yd	$ 8.00	$45,504
Backfill	1412 cu yd	$ 12.00	$16,944
Structural Backfill	882 cu yd	$ 26.00	$22,932
Miscellaneous Structure	Lump Sum	4%	$34,200
Process			
Equipment Package	1 Lump Sum	$ 644,000.00	$644,000
Process/Aeration Piping	1 Lump Sum	$ 100,000.00	$100,000
Painting	1 Lump Sum	$ 20,000.00	$20,000
Electrical	Lump Sum	10%	$165,000
Instrumentation & Controls	Lump Sum	0%	$0
		Subtotal =	$1,817,880
EFFLUENT/DISINFECTION STRUCTURE			
Flowmeter-Parshall Flume	0 ea	$ 7,000.00	$0
Sampler	0 ea	$ 8,000.00	$0
UV Equipment	0 Lump Sum	$ 115,000.00	$0
Sluice Gate	0 ea	$ 8,000.00	$0
Structure	0 Lump Sum	$ 30,000.00	$0
Electrical		8%	$0
Instrumentation & Controls		4%	$0
		Subtotal =	$0

CITY OF HARRISBURG, SOUTH DAKOTA
WASTEWATER TREATMENT IMPROVEMENTS
OPINION OF PROBABLE PROJECT COST
October 24, 2007

Table F-12: Sequencing Batch Reactor Alternative 2031 Construction Costs

ANAEROBIC DIGESTION CONVERSION			
Existing Digestion Facilities			
Selective Demolition			
Aeration System	1 Lump Sum	$ 20,000.00	$20,000
Digester Cleaning	2 ea	$ 5,000.00	$10,000
New Digestion Facilities			$0
Dual-fuel Boiler	2 ea	$ 100,000.00	$200,000
Heat Exchanger	2	$ 20,000.00	$40,000
Recirculation Pumps	1	$ 30,000.00	$30,000
Equipment Building	1	$ 62,500.00	$62,500
Waste Gas Burner, Piping, & Controls	1 Lump Sum	$ 100,000.00	$100,000
Primary Digester Mixing System	1 ea	$ 75,000.00	$75,000
Primary Digester Covers-fixed	1 ea	$ 125,000.00	$125,000
Secondary Digester Cover-floating	1 ea	$ 200,000.00	$200,000
Process Pipe and Fittings	1 Lump Sum	$ 25,000.00	$25,000
Electrical		14%	$120,000
Instrumentation & Controls		5%	$43,000
		Subtotal =	$1,050,500
THICKENING/DEWATERING BUILDING			
RDT	1 EA	$ 182,000.00	$182,000
RDT Feed Pumps	2 EA	$ 20,000.00	$40,000
RDT-to-Digester Feed Pumps	2 EA	$ 25,000.00	$50,000
Polymer Feed Unit	1 EA	$ 15,000.00	$15,000
BFP	0 EA	$ 300,000.00	$0
BFP Feed Pumps	0 EA	$ 20,000.00	$0
Conveyor	0 EA	$ 60,000.00	$0
Process			
Piping	0 Lump Sum	$ 20,000.00	$0
Valves	0 Lump Sum	$ 15,000.00	$0
Structure	0 sq ft	$ 150.00	$0
Footing	0 cu yds	$ 400.00	$0
Slab	0 cu yds	$ 400.00	$0
Misc Concrete	0 cu yds	$ 700.00	$0
Excavation	0 cu yds	$ 8.00	$0
Structural Backfill	0 cu yds	$ 26.00	$0
Backfill	0 cu yds	$ 12.00	$0
WAS Holding Tank	0 Lump Sum	$ 15,000.00	$0
Excavation	0 cu yds	$ 8.00	$0
Backfill	0 cu yds	$ 12.00	$0
Structural Backfill	0 cu yds	$ 26.00	$0
Walls	0 cu yds	$ 700.00	$0
Slab	0 cu yds	$ 400.00	$0
Roofing	0 sq ft	$ 100.00	$0
HVAC		6%	$15,800
Plumbing		7%	$18,700

Table F-12: Sequencing Batch Reactor Alternative 2031 Construction Costs

Electrical			12%	$34,400
Instrumentation & Controls			6%	$17,200
		Subtotal =		$373,100
NEW CONTROL BUILDING				
Structure	0 Sq Ft	$	100.00	$0
Laboratory Equip	0 Lump Sum	$	25,000.00	$0
Plumbing	0 Sq Ft	$	20.00	$0
HVAC	0 Sq Ft	$	15.00	$0
Roofing	0 Sq Ft	$	50.00	$0
Finishes	0 Lump Sum	$	10,000.00	$0
Electrical Modifications		10%		$0
Instrumentation & Controls		8%		$0
		Subtotal =		$0
Subtotal				$5,276,862
SITEWORK	10%			$527,686
Subtotal				$5,804,548
GENERAL REQUIREMENTS	10%			$580,000
Subtotal				$6,384,548
CONTINGENCY	20%			$1,277,000
Opinion of Probable Construction Cost				**$7,661,548**

*** Based on 2007 costs**

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CITY OF HARRISBURG, SOUTH DAKOTA
WASTEWATER TREATMENT IMPROVEMENTS
OPINION OF PROBABLE PROJECT COST
October 24, 2007

TABLE F-13: Conventional Activated-Sludge Alternative 2021 Construction Costs

Item Description				Total Cost
PRELIMINARY TREATMENT				
Fine Screens (including washer/compactor)	1 ea	$	50,000.00	$50,000
Sampler	1 ea	$	6,500.00	$6,500
Grit Removal Equipment				
Structure				
Slabs	28 cu yds	$	400.00	$11,200
Channel/Foundation Walls	21 cu yds	$	700.00	$14,700
Vortex Chamber Walls	6 cu yds	$	1,000.00	$6,000
Excavation	500 cu yds	$	8.00	$4,000
Structural Backfill	20 cu yds	$	26.00	$520
Backfill	175 cu yds	$	12.00	$2,100
Grit Equipment (Vortex/Classifier)	1 ea	$	150,000.00	$150,000
Grit Pumps	1 ea	$	15,000.00	$15,000
Process Piping	1 Lump Sum	$	15,000.00	$15,000
Misc. Metals	1 ea	$	5,000.00	$5,000
Slide Gates	1 ea	$	8,000.00	$8,000
Stop Plates	3 ea	$	2,500.00	$7,500
Painting	1 Lump Sum	$	15,000.00	$15,000
Flowmeter-Parshall Flume	1 ea	$	7,000.00	$7,000
Headworks Structure				
Slabs	128 cu yds	$	400.00	$51,200
Walls	58 cu yds	$	700.00	$40,600
Excavation	930 cu yds	$	8.00	$7,440
Structural Backfill	350 cu yds	$	26.00	$9,100
Backfill	350 cu yds	$	12.00	$4,200
Misc. Metals	1 Lump Sum	$	15,000.00	$15,000
Superstructure	1500 sq ft	$	70.00	$105,000
HVAC	Lump Sum		15%	$35,000
Plumbing	Lump Sum		15%	$35,000
Equipment Installation	Lump Sum		20%	$45,700
Electrical	Lump Sum		15%	$83,000
Instrumentation & Controls	Lump Sum		5%	$28,000
		Subtotal =		$776,800
BIOLOGICAL TREATMENT SPLITTER STRUCTURE				
Structure	Lump Sum			$38,350
Process				
Pipe	Lump Sum			$13,700
Stop Plates	3 ea	$	800.00	$2,400
Excavation	500 cu yds	$	8.00	$4,000
Structural Backfill	70 cu yds	$	26.00	$1,820
Backfill	1000 cu yds	$	12.00	$12,000
		Subtotal=		$72,270

CITY OF HARRISBURG, SOUTH DAKOTA
WASTEWATER TREATMENT IMPROVEMENTS
OPINION OF PROBABLE PROJECT COST
October 24, 2007

TABLE F-13: Conventional Activated-Sludge Alternative 2021 Construction Costs

CONVENTIONAL AS - BIOLOGICAL TREATMENT				
Structure				
Slab/footing	905.2	cu yd	$ 400.00	$362,080
Walls	566.6	cu yd	$ 700.00	$396,620
Excavation	5237	cu yd	$ 8.00	$41,896
Backfill	1877	cu yd	$ 12.00	$22,524
Structural Backfill	905.2	cu yd	$ 26.00	$23,535
Miscellaneous Structure		Lump Sum	4%	$33,866
Process				
75 Hp Blowers	3	ea	$ 45,000.00	$135,000
Air Piping	1	Lump Sum	$ 70,000.00	$70,000
Diffusers	1	Lump Sum	$ 150,000.00	$150,000
Baffles	1	Lump Sum	$ 50,000.00	$50,000
Painting	1	Lump Sum	$ 10,000.00	$10,000
Electrical		Lump Sum	10%	$130,000
Instrumentation & Controls		Lump Sum	4%	$52,000
			Subtotal =	$1,477,521
SECONDARY CLARIFIER SPLITTER STRUCTURE				
Structure		Lump Sum		$38,350
Process				
Pipe		Lump Sum		$13,700
Stop Plates	3	ea	$ 800.00	$2,400
Excavation	500	cu yds	$ 8.00	$4,000
Structural Backfill	70	cu yds	$ 26.00	$1,820
Backfill	1000	cu yds	$ 12.00	$12,000
			Subtotal=	$72,270
SECONDARY CLARIFIER				
Clarifier Structure				
Concrete Structures	1	Lump Sum	$ 375,000.00	$375,000
Miscellaneous Structures	1	Lump Sum	$ 40,000.00	$40,000
Secondary Solids Handling				
Incl. WAS, RAS, scum, structures	1	Lump Sum	$ 1,000,000.00	$1,000,000
Process				
Equipment (incl. installation)	1	Lump Sum	$ 260,000.00	$260,000
Piping	1	Lump Sum	$ 25,000.00	$25,000
Electrical		Lump Sum	10%	$170,000
Instrumentation & Controls		Lump Sum	4%	$68,000
			Subtotal=	$1,938,000
EFFLUENT/DISINFECTION STRUCTURE				
Flowmeter-Parshall Flume	1	ea	$ 7,000.00	$7,000
Sampler	1	ea	$ 8,000.00	$8,000
UV Equipment	1	Lump Sum	$ 120,000.00	$120,000
Sluice Gate	1	ea	$ 8,000.00	$8,000
Structure				
Slab/footing	4.5	cu yd	$ 400.00	$1,800
Walls	10	cu yd	$ 700.00	$7,000
Excavation	51	cu yd	$ 8.00	$408
Backfill	25.5	cu yd	$ 12.00	$306
Metals (handrail, grating, stairs)	1	Lump Sum	$ 20,000.00	$20,000
Electrical			8%	$14,000
Instrumentation & Controls			4%	$7,000
			Subtotal =	$193,514

CITY OF HARRISBURG, SOUTH DAKOTA
WASTEWATER TREATMENT IMPROVEMENTS
OPINION OF PROBABLE PROJECT COST
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TABLE F-13: Conventional Activated-Sludge Alternative 2021 Construction Costs

AEROBIC DIGESTION				
Existing Digestion Facilities				
Primary Digester Concrete				
Walls	795	cu yds	$ 700.00	$556,500
Slab	435	cu yds	$ 400.00	$174,000
Excavation	4620	cu yds	$ 8.00	$36,960
Backfill	1960	cu yds	$ 12.00	$23,520
Structural Backfill	190	cu yds	$ 26.00	$4,940
125 hp Blowers	2	ea	$ 75,000.00	$150,000
Diffusers and Piping	1	Lump Sum	$ 40,000.00	$40,000
Process Pipe and Fittings	1	Lump Sum	$ 50,000.00	$50,000
Electrical			14%	$145,000
Instrumentation & Controls			5%	$52,000
			Subtotal =	$1,232,920
THICKENING/DEWATERING BUILDING				
RDT	0	EA	$ 182,000.00	$0
RDT Feed Pumps	0	EA	$ 20,000.00	$0
RDT-to-Digester Feed Pumps	0	EA	$ 25,000.00	$0
Polymer Feed Unit	1	EA	$ 15,000.00	$15,000
BFP	1	EA	$ 300,000.00	$300,000
BFP Feed Pumps	2	EA	$ 20,000.00	$40,000
Conveyor	1	EA	$ 60,000.00	$60,000
Process				
Piping	1	Lump Sum	$ 20,000.00	$20,000
Valves	1	Lump Sum	$ 15,000.00	$15,000
Structure	1800	sq ft	$ 150.00	$270,000
Footing	30	cu yds	$ 400.00	$12,000
Slab	35	cu yds	$ 400.00	$14,000
Misc Concrete	10	cu yds	$ 700.00	$7,000
Excavation	100	cu yds	$ 8.00	$800
Structural Backfill	35	cu yds	$ 26.00	$900
Backfill	100	cu yds	$ 12.00	$1,200
WAS Holding Tank	1	Lump Sum	$ 15,000.00	$15,000
Excavation	1400	cu yds	$ 8.00	$11,200
Backfill	500	cu yds	$ 12.00	$6,000
Structural Backfill	250	cu yds	$ 26.00	$6,500
Walls	130	cu yds	$ 700.00	$91,000
Slab	200	cu yds	$ 400.00	$80,000
Roofing	1800	sq ft	$ 100.00	$180,000
HVAC			6%	$63,000
Plumbing			7%	$74,500
Electrical			12%	$137,500
Instrumentation & Controls			6%	$68,700
			Subtotal =	$1,489,300

CITY OF HARRISBURG, SOUTH DAKOTA
WASTEWATER TREATMENT IMPROVEMENTS
OPINION OF PROBABLE PROJECT COST
October 24, 2007

TABLE F-13: Conventional Activated-Sludge Alternative 2021 Construction Costs

NEW CONTROL BUILDING				
Structure	1000 Sq Ft	$	100.00	$100,000
Laboratory Equip	1 Lump Sum	$	25,000.00	$25,000
Plumbing	1000 Sq Ft	$	20.00	$20,000
HVAC	1000 Sq Ft	$	15.00	$15,000
Roofing	1000 Sq Ft	$	50.00	$50,000
Finishes	1 Lump Sum	$	10,000.00	$10,000
Electrical Modifications		10%		$22,000
Instrumentation & Controls		8%		$18,000
		Subtotal =		$260,000
Subtotal				$7,512,595
SITEWORK	10%			$751,260
Subtotal				$8,263,855
GENERAL REQUIREMENTS	10%			$826,000
Subtotal				$9,089,855
CONTINGENCY	20%			$1,818,000
Opinion of Probable Construction Cost				**$10,907,855**

*** Based on 2007 costs**

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CITY OF HARRISBURG, SOUTH DAKOTA
WASTEWATER TREATMENT IMPROVEMENTS
OPINION OF PROBABLE PROJECT COST
October 24, 2007

Table F-14: Conventional Activated-Sludge Alternative 2031 Construction Costs

Item Description			Total Cost*
PRELIMINARY TREATMENT			
Fine Screens (including washer/compactor)	1 ea	$ 50,000.00	$50,000
Sampler	0 ea	$ 6,500.00	$0
Grit Removal Equipment			$0
Structure			$0
Slabs	0 cu yds	$ 400.00	$0
Channel/Foundation Walls	0 cu yds	$ 700.00	$0
Vortex Chamber Walls	0 cu yds	$ 1,000.00	$0
Excavation	0 cu yds	$ 8.00	$0
Structural Backfill	0 cu yds	$ 26.00	$0
Backfill	0 cu yds	$ 12.00	$0
Grit Equipment (Vortex/Classifier)	1 ea	$150,000.00	$150,000
Grit Pumps	1 ea	$ 15,000.00	$15,000
Process Piping	1 Lump Sum	$ 15,000.00	$15,000
Misc. Metals	1 ea	$ 5,000.00	$5,000
Slide Gates	1 ea	$ 8,000.00	$8,000
Stop Plates	3 ea	$ 2,500.00	$7,500
Painting	1 Lump Sum	$ 15,000.00	$15,000
Flowmeter-Parshall Flume	0 ea	$ 7,000.00	$0
Headworks Structure			$0
Slabs	0 cu yds	$ 400.00	$0
Walls	0 cu yds	$ 700.00	$0
Excavation	0 cu yds	$ 8.00	$0
Structural Backfill	0 cu yds	$ 26.00	$0
Backfill	0 cu yds	$ 12.00	$0
Misc. Metals	1 Lump Sum	$ 15,000.00	$15,000
Superstructure	0 sq ft	$ 70.00	$0
HVAC	Lump Sum	0%	$0
Plumbing	Lump Sum	15%	$2,000
Equipment Installation	Lump Sum	20%	$43,000
Electrical	Lump Sum	15%	$42,000
Instrumentation & Controls	Lump Sum	5%	$14,000
		Subtotal =	$381,500

CITY OF HARRISBURG, SOUTH DAKOTA
WASTEWATER TREATMENT IMPROVEMENTS
OPINION OF PROBABLE PROJECT COST
October 24, 2007

Table F-14: Conventional Activated-Sludge Alternative 2031 Construction Costs

PRIMARY CLARIFIER			
Structure			
Walls	376 cu yds	$ 700.00	$263,200
Slab	528 cu yds	$ 400.00	$211,200
Misc concrete	55 cu yds	$ 700.00	$38,500
Excavation	4647 cu yds	$ 8.00	$37,176
Structural Backfill	715 cu yds	$ 26.00	$18,590
Backfill	2033 cu yds	$ 12.00	$24,396
Pump Structure			$0
Walls	80 cu yds	$ 700.00	$56,000
Slab	50 cu yds	$ 400.00	$20,000
Suspended Slab	50 cu yds	$ 700.00	$35,000
Misc Metals	3 ea	$ 5,000.00	$15,000
Primary Sludge Pumps	3 ea	$ 15,000.00	$45,000
Piping & Valves	1 Lump	$ 20,000.00	$20,000
Misc Metals	3 ea	$ 5,000.00	$15,000
Process			$0
4" Pipe	30 lin ft	$ 24.00	$720
6" Pipe	135 lin ft	$ 36.00	$4,860
18" Pipe	135 lin ft	$ 108.00	$14,580
Concrete Encasement	270 lin ft	$ 20.00	$5,400
Mechanisms	3 ea	$100,000.00	$300,000
Weirs & Baffles	3 ea	$ 8,000.00	$24,000
Scum Pumping Structures	3 ea	$ 5,000.00	$15,000
Painting	1 Lump Sum	$ 20,000.00	$20,000
Equipment Installation	Lump Sum	20%	$73,800
Electrical	Lump Sum	15%	$178,000
Instrumentation & Controls	Lump Sum	5%	$59,000
		Subtotal=	$1,494,422
PRIMARY CLARIFIER SPLITTER STRUCTURE			
Structure	1 Lump Sum	$ 38,350.00	$38,350
Process			$0
Pipe	Lump Sum		$0
Slide Gates	3 ea	$ 6,000.00	$18,000
Excavation	500 cu yds	$ 8.00	$4,000
Structural Backfill	70 cu yds	$ 26.00	$1,820
Backfill	1000 cu yds	$ 12.00	$12,000
		Subtotal=	$74,170

CITY OF HARRISBURG, SOUTH DAKOTA
WASTEWATER TREATMENT IMPROVEMENTS
OPINION OF PROBABLE PROJECT COST
October 24, 2007

Table F-14: Conventional Activated-Sludge Alternative 2031 Construction Costs

BIOLOGICAL TREATMENT SPLITTER STRUCTURE				
Structure	Lump Sum			$0
Process				
Pipe	Lump Sum			$0
Stop Plates	0 ea	$	800.00	$0
Excavation	0 cu yds	$	8.00	$0
Structural Backfill	0 cu yds	$	26.00	$0
Backfill	0 cu yds	$	12.00	$0
		Subtotal=		$0
CONVENTIONAL AS - BIOLOGICAL TREATMENT				
Structure				
Slab/footing	0 cu yd	$	400.00	$0
Walls	0 cu yd	$	700.00	$0
Excavation	0 cu yd	$	8.00	$0
Backfill	0 cu yd	$	12.00	$0
Structural Backfill	0 cu yd	$	26.00	$0
Miscellaneous Structure	Lump Sum		4%	$0
Process				
75 Hp Blowers	2 ea	$	45,000.00	$90,000
Air Piping	1 Lump Sum	$	25,000.00	$25,000
Diffusers	0 Lump Sum	$	150,000.00	$0
Baffles	0 Lump Sum	$	50,000.00	$0
Painting	0 Lump Sum	$	10,000.00	$0
Electrical	Lump Sum		10%	$12,000
Instrumentation & Controls	Lump Sum		4%	$5,000
		Subtotal =		$132,000
SECONDARY CLARIFIER SPLITTER STRUCTURE				
Structure	Lump Sum			$0
Process				
Pipe	Lump Sum			$0
Stop Plates	0 ea	$	800.00	$0
Excavation	0 cu yds	$	8.00	$0
Structural Backfill	0 cu yds	$	26.00	$0
Backfill	0 cu yds	$	12.00	$0
		Subtotal=		$0

CITY OF HARRISBURG, SOUTH DAKOTA
WASTEWATER TREATMENT IMPROVEMENTS
OPINION OF PROBABLE PROJECT COST
October 24, 2007

Table F-14: Conventional Activated-Sludge Alternative 2031 Construction Costs

SECONDARY CLARIFIER			
Clarifier Structure			
Concrete Structures	1 Lump Sum	$200,000.00	$200,000
Miscellaneous Structures	1 Lump Sum	$ 10,000.00	$10,000
Secondary Solids Handling			
Incl. WAS, RAS, scum, structures	1 Lump Sum	$ -	$0
Process			
Equipment (incl. installation)	1 Lump Sum	$130,000.00	$130,000
Piping	1 Lump Sum	$ 10,000.00	$10,000
Electrical	Lump Sum	10%	$35,000
Instrumentation & Controls	Lump Sum	4%	$14,000
		Subtotal=	$399,000
EFFLUENT/DISINFECTION STRUCTURE			
Flowmeter-Parshall Flume	0 ea	$ 7,000.00	$0
Sampler	0 ea	$ 8,000.00	$0
UV Equipment	1 Lump Sum	$ 60,000.00	$60,000
Sluice Gate	0 ea	$ 8,000.00	$0
Structure	0 Lump Sum	$ 30,000.00	$0
Electrical		8%	$5,000
Instrumentation & Controls		4%	$2,000
		Subtotal =	$67,000
ANAEROBIC DIGESTION CONVERSION			
Existing Digestion Facilities			
Selective Demolition			
Aeration System	1 Lump Sum	$ 20,000.00	$20,000
Digester Cleaning	2 ea	$ 5,000.00	$10,000
New Digestion Facilities			$0
Dual-fuel Boiler	2 ea	$100,000.00	$200,000
Heat Exchanger	2 ea	$ 20,000.00	$40,000
Recirculation Pumps	1 ea	$ 30,000.00	$30,000
Equipment Building	1 ea	$ 62,500.00	$62,500
Waste Gas Burner, Piping, & Controls	1 Lump Sum	$100,000.00	$100,000
Primary Digester Mixing System	1 ea	$ 75,000.00	$75,000
Primary Digester Covers-fixed	1 ea	$125,000.00	$125,000
Secondary Digester Cover-floating	1 ea	$200,000.00	$200,000
Process Pipe and Fittings	1 Lump Sum	$ 25,000.00	$25,000
Electrical		14%	$120,000
Instrumentation & Controls		5%	$43,000
		Subtotal =	$1,050,500

CITY OF HARRISBURG, SOUTH DAKOTA
WASTEWATER TREATMENT IMPROVEMENTS
OPINION OF PROBABLE PROJECT COST
October 24, 2007

Table F-14: Conventional Activated-Sludge Alternative 2031 Construction Costs

THICKENING/DEWATERING BUILDING			
RDT	1 EA	$182,000.00	$182,000
RDT Feed Pumps	2 EA	$ 20,000.00	$40,000
RDT-to-Digester Feed Pumps	2 EA	$ 25,000.00	$50,000
Polymer Feed Unit	1 EA	$ 15,000.00	$15,000
BFP	0 EA	$300,000.00	$0
BFP Feed Pumps	0 EA	$ 20,000.00	$0
Conveyor	0 EA	$ 60,000.00	$0
Process	0		
Piping	0 Lump Sum	$ 20,000.00	$0
Valves	0 Lump Sum	$ 15,000.00	$0
Structure	0 sq ft	$ 150.00	$0
Footing	0 cu yds	$ 400.00	$0
Slab	0 cu yds	$ 400.00	$0
Misc Concrete	0 cu yds	$ 700.00	$0
Excavation	0 cu yds	$ 8.00	$0
Structural Backfill	0 cu yds	$ 26.00	$0
Backfill	0 cu yds	$ 12.00	$0
WAS Holding Tank	0 Lump Sum	$ 15,000.00	$0
Excavation	0 cu yds	$ 8.00	$0
Backfill	0 cu yds	$ 12.00	$0
Structural Backfill	0 cu yds	$ 26.00	$0
Walls	0 cu yds	$ 700.00	$0
Slab	0 cu yds	$ 400.00	$0
Roofing	0 sq ft	$ 100.00	$0
HVAC		6%	$15,800
Plumbing		7%	$18,700
Electrical		12%	$34,400
Instrumentation & Controls		6%	$17,200
		Subtotal =	$373,100
NEW CONTROL BUILDING			
Structure	0 Sq Ft	$ 100.00	$0
Laboratory Equip	0 Lump Sum	$ 25,000.00	$0
Plumbing	0 Sq Ft	$ 20.00	$0
HVAC	0 Sq Ft	$ 15.00	$0
Roofing	0 Sq Ft	$ 50.00	$0
Finishes	0 Lump Sum	$ 10,000.00	$0
Electrical Modifications		10%	$0
Instrumentation & Controls		8%	$0
		Subtotal =	$0
Subtotal			$3,971,692
SITEWORK		10%	$397,169
Subtotal			$4,368,861
GENERAL REQUIREMENTS		10%	$437,000
Subtotal			$4,805,861
CONTINGENCY		20%	$961,000
Opinion of Probable Construction Cost			**$5,766,861**

*** Based on 2007 costs**

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CITY OF HARRISBURG, SOUTH DAKOTA
WASTEWATER TREATMENT IMPROVEMENTS
OPINION OF PROBABLE PROJECT COST
October 24, 2007

Table F-15: Membrane Biological Reactor Alternative 2021 Construction Costs

Item Description				Total Cost
PRELIMINARY TREATMENT				
Fine Screens (including washer/compactor)	1	ea	$ 200,000.00	$200,000
Sampler	1	ea	$ 6,500.00	$6,500
Grit Removal Equipment				
Structure				
Slabs	28	cu yds	$ 400.00	$11,200
Channel/Foundation Walls	21	cu yds	$ 700.00	$14,700
Vortex Chamber Walls	6	cu yds	$ 1,000.00	$6,000
Excavation	500	cu yds	$ 8.00	$4,000
Structural Backfill	20	cu yds	$ 26.00	$520
Backfill	175	cu yds	$ 12.00	$2,100
Grit Equipment (Vortex/Classifier)	1	ea	$ 150,000.00	$150,000
Grit Pumps	1	ea	$ 15,000.00	$15,000
Process Piping	1	Lump Sum	$ 15,000.00	$15,000
Misc. Metals	1	ea	$ 5,000.00	$5,000
Slide Gates	1	ea	$ 8,000.00	$8,000
Stop Plates	3	ea	$ 2,500.00	$7,500
Painting	1	Lump Sum	$ 15,000.00	$15,000
Flowmeter-Parshall Flume	1	ea	$ 7,000.00	$7,000
Headworks Structure				
Slabs	128	cu yds	$ 400.00	$51,200
Walls	58	cu yds	$ 700.00	$40,600
Excavation	930	cu yds	$ 8.00	$7,440
Structural Backfill	350	cu yds	$ 26.00	$9,100
Backfill	350	cu yds	$ 12.00	$4,200
Misc. Metals	1	Lump Sum	$ 15,000.00	$15,000
Superstructure	1500	sq ft	$ 70.00	$105,000
HVAC		Lump Sum	15%	$35,000
Plumbing		Lump Sum	15%	$35,000
Equipment Installation		Lump Sum	20%	$75,700
Electrical		Lump Sum	15%	$105,000
Instrumentation & Controls		Lump Sum	5%	$35,000
			Subtotal =	$985,800
BIOLOGICAL TREATMENT SPLITTER STRUCTURE				
Structure		Lump Sum		$38,350
Process				
Pipe		Lump Sum		$13,700
Stop Plates	3	ea	$ 800.00	$2,400
Excavation	500	cu yds	$ 8.00	$4,000
Structural Backfill	70	cu yds	$ 26.00	$1,820
Backfill	1000	cu yds	$ 12.00	$12,000
			Subtotal=	$72,270

MEMBRANE - BIOLOGICAL TREATMENT				
Structure				
Slab/footing	441	cu yd	$ 400.00	$176,400
Walls	350	cu yd	$ 700.00	$245,000
Excavation	2700	cu yd	$ 8.00	$21,600
Backfill	1130	cu yd	$ 12.00	$13,560
Structural Backfill	441	cu yd	$ 26.00	$11,466
Miscellaneous Structure		Lump Sum	5%	$23,401
Process				
75 Hp Blowers	3	ea	$ 45,000.00	$135,000
Air Piping	1	Lump Sum	$ 65,000.00	$65,000
Diffusers	1	Lump Sum	$ 80,000.00	$80,000
Baffles	1	Lump Sum	$ 30,000.00	$30,000
Painting	1	Lump Sum	$ 10,000.00	$10,000
Electrical		Lump Sum	10%	$34,000
Instrumentation & Controls		Lump Sum	4%	$14,000
			Subtotal =	$859,427
MEMBRANE CLARIFICATION				
Membrane Module Tank Structure				
Slab/footing	45	cu yd	$ 400.00	$18,000
Walls	142	cu yd	$ 700.00	$99,400
Excavation	350	cu yd	$ 8.00	$2,800
Membrane Module Equipment Bldg	1	Lump Sum	$ 665,300.00	$665,300
Membrane Process Equipment Package	1	Lump Sum	$2,152,600.00	$2,152,600
Electrical		Lump Sum	10%	$282,000
Instrumentation & Controls		Lump Sum	0%	$0
			Subtotal=	$3,220,100
EFFLUENT/DISINFECTION STRUCTURE				
Flowmeter-Parshall Flume	1	ea	$ 7,000.00	$7,000
Sampler	1	ea	$ 8,000.00	$8,000
UV Equipment	1	Lump Sum	$ 120,000.00	$120,000
Sluice Gate	1	ea	$ 8,000.00	$8,000
Structure				
Slab/footing	4.5	cu yd	$ 400.00	$1,800
Walls	10	cu yd	$ 700.00	$7,000
Excavation	51	cu yd	$ 8.00	$408
Backfill	25.5	cu yd	$ 12.00	$306
Metals (handrail, grating, stairs)	1	Lump Sum	$ 20,000.00	$20,000
Electrical			8%	$14,000
Instrumentation & Controls			4%	$7,000
			Subtotal =	$193,514
AEROBIC DIGESTION				
Existing Digestion Facilities				
Primary Digester Concrete				
Walls	795	cu yds	$ 700.00	$556,500
Slab	435	cu yds	$ 400.00	$174,000
Excavation	4620	cu yds	$ 8.00	$36,960
Backfill	1960	cu yds	$ 12.00	$23,520
Structural Backfill	190	cu yds	$ 26.00	$4,940
125 hp Blowers	2	ea	$ 75,000.00	$150,000
Diffusers and Piping	1	Lump Sum	$ 40,000.00	$40,000
Process Pipe and Fittings	1	Lump Sum	$ 50,000.00	$50,000
Electrical			14%	$145,000
Instrumentation & Controls			5%	$52,000
			Subtotal =	$1,232,920

THICKENING/DEWATERING BUILDING				
RDT	0	EA	$ 182,000.00	$0
RDT Feed Pumps	0	EA	$ 20,000.00	$0
RDT-to-Digester Feed Pumps	0	EA	$ 25,000.00	$0
Polymer Feed Unit	1	EA	$ 15,000.00	$15,000
BFP	1	EA	$ 300,000.00	$300,000
BFP Feed Pumps	2	EA	$ 20,000.00	$40,000
Conveyor	1	EA	$ 60,000.00	$60,000
Process				
Piping	1	Lump Sum	$ 20,000.00	$20,000
Valves	1	Lump Sum	$ 15,000.00	$15,000
Structure	1800	sq ft	$ 150.00	$270,000
Footing	30	cu yds	$ 400.00	$12,000
Slab	35	cu yds	$ 400.00	$14,000
Misc Concrete	10	cu yds	$ 700.00	$7,000
Excavation	100	cu yds	$ 8.00	$800
Structural Backfill	35	cu yds	$ 26.00	$900
Backfill	100	cu yds	$ 12.00	$1,200
WAS Holding Tank	1	Lump Sum	$ 15,000.00	$15,000
Excavation	1400	cu yds	$ 8.00	$11,200
Backfill	500	cu yds	$ 12.00	$6,000
Structural Backfill	250	cu yds	$ 26.00	$6,500
Walls	130	cu yds	$ 700.00	$91,000
Slab	200	cu yds	$ 400.00	$80,000
Roofing	1800	sq ft	$ 100.00	$180,000
HVAC			6%	$63,000
Plumbing			7%	$74,500
Electrical			12%	$137,500
Instrumentation & Controls			6%	$68,700
			Subtotal =	$1,489,300
NEW CONTROL BUILDING				
Structure	1000	Sq Ft	$ 100.00	$100,000
Laboratory Equip	1	Lump Sum	$ 25,000.00	$25,000
Plumbing	1000	Sq Ft	$ 20.00	$20,000
HVAC	1000	Sq Ft	$ 15.00	$15,000
Roofing	1000	Sq Ft	$ 50.00	$50,000
Finishes	1	Lump Sum	$ 10,000.00	$10,000
Electrical Modifications			10%	$22,000
Instrumentation & Controls			8%	$18,000
			Subtotal =	$260,000
Subtotal				$8,313,331
SITEWORK			10%	$831,333
Subtotal				$9,144,664
GENERAL REQUIREMENTS			10%	$914,000
Subtotal				$10,058,664
CONTINGENCY			20%	$2,012,000
Opinion of Probable Construction Cost				**$12,070,664**

*** Based on 2007 costs**

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CITY OF HARRISBURG, SOUTH DAKOTA
WASTEWATER TREATMENT IMPROVEMENTS
OPINION OF PROBABLE PROJECT COST
October 24, 2007

Table F-16: Membrane Biological Reactor Alternative 2031 Construction Costs

Item Description				Total Cost*
PRELIMINARY TREATMENT				
Fine Screens (including washer/compactor)	1 ea	$	200,000.00	$200,000
Sampler	0 ea	$	6,500.00	$0
Grit Removal Equipment				$0
Structure				$0
Slabs	0 cu yds	$	400.00	$0
Channel/Foundation Walls	0 cu yds	$	700.00	$0
Vortex Chamber Walls	0 cu yds	$	1,000.00	$0
Excavation	0 cu yds	$	8.00	$0
Structural Backfill	0 cu yds	$	26.00	$0
Backfill	0 cu yds	$	12.00	$0
Grit Equipment (Vortex/Classifier)	1 ea	$	150,000.00	$150,000
Grit Pumps	1 ea	$	15,000.00	$15,000
Process Piping	1 Lump Sum	$	15,000.00	$15,000
Misc. Metals	1 ea	$	5,000.00	$5,000
Slide Gates	1 ea	$	8,000.00	$8,000
Stop Plates	3 ea	$	2,500.00	$7,500
Painting	1 Lump Sum	$	15,000.00	$15,000
Flowmeter-Parshall Flume	0 ea	$	7,000.00	$0
Headworks Structure				$0
Slabs	0 cu yds	$	400.00	$0
Walls	0 cu yds	$	700.00	$0
Excavation	0 cu yds	$	8.00	$0
Structural Backfill	0 cu yds	$	26.00	$0
Backfill	0 cu yds	$	12.00	$0
Misc. Metals	1 Lump Sum	$	15,000.00	$15,000
Superstructure	0 sq ft	$	70.00	$0
HVAC	Lump Sum		0%	$0
Plumbing	Lump Sum		15%	$2,000
Equipment Installation	Lump Sum		20%	$73,000
Electrical	Lump Sum		15%	$65,000
Instrumentation & Controls	Lump Sum		5%	$22,000
		Subtotal =		$592,500

CITY OF HARRISBURG, SOUTH DAKOTA
WASTEWATER TREATMENT IMPROVEMENTS
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October 24, 2007

Table F-16: Membrane Biological Reactor Alternative 2031 Construction Costs

PRIMARY CLARIFIER				
Structure				
Walls	376 cu yds	$	700.00	$263,200
Slab	528 cu yds	$	400.00	$211,200
Misc concrete	55 cu yds	$	700.00	$38,500
Excavation	4647 cu yds	$	8.00	$37,176
Structural Backfill	715 cu yds	$	26.00	$18,590
Backfill	2033 cu yds	$	12.00	$24,396
Pump Structure				$0
Walls	80 cu yds	$	700.00	$56,000
Slab	50 cu yds	$	400.00	$20,000
Suspended Slab	50 cu yds	$	700.00	$35,000
Misc Metals	3 ea	$	5,000.00	$15,000
Primary Sludge Pumps	3 ea	$	15,000.00	$45,000
Piping & Valves	1 Lump	$	20,000.00	$20,000
Misc Metals	3 ea	$	5,000.00	$15,000
Process				$0
4" Pipe	30 lin ft	$	24.00	$720
6" Pipe	135 lin ft	$	36.00	$4,860
18" Pipe	135 lin ft	$	108.00	$14,580
Concrete Encasement	270 lin ft	$	20.00	$5,400
Mechanisms	3 ea	$	100,000.00	$300,000
Weirs & Baffles	3 ea	$	8,000.00	$24,000
Scum Pumping Structures	3 ea	$	5,000.00	$15,000
Painting	1 Lump Sum	$	20,000.00	$20,000
Equipment Installation	Lump Sum		20%	$73,800
Electrical	Lump Sum		15%	$178,000
Instrumentation & Controls	Lump Sum		5%	$59,000
		Subtotal=		$1,494,422
PRIMARY CLARIFIER SPLITTER STRUCTURE				
Structure	1 Lump Sum	$	38,350.00	$38,350
Process				$0
Pipe	Lump Sum			$0
Slide Gates	3 ea	$	6,000.00	$18,000
Excavation	500 cu yds	$	8.00	$4,000
Structural Backfill	70 cu yds	$	26.00	$1,820
Backfill	1000 cu yds	$	12.00	$12,000
		Subtotal=		$74,170

CITY OF HARRISBURG, SOUTH DAKOTA
WASTEWATER TREATMENT IMPROVEMENTS
OPINION OF PROBABLE PROJECT COST
October 24, 2007

Table F-16: Membrane Biological Reactor Alternative 2031 Construction Costs

BIOLOGICAL TREATMENT SPLITTER STRUCTURE				
Structure	1	Lump Sum	$38,350	$38,350
Process				
Pipe	1	Lump Sum	$ 13,700.00	$13,700
Stop Plates	3	ea	$ 800.00	$2,400
Excavation	500	cu yds	$ 8.00	$4,000
Structural Backfill	70	cu yds	$ 26.00	$1,820
Backfill	1000	cu yds	$ 12.00	$12,000
			Subtotal=	$72,270
MEMBRANE - BIOLOGICAL TREATMENT				
Structure				
Slab/footing	645	cu yd	$ 400.00	$258,000
Walls	484	cu yd	$ 700.00	$338,800
Excavation	3800	cu yd	$ 8.00	$30,400
Backfill	1460	cu yd	$ 12.00	$17,520
Structural Backfill	644	cu yd	$ 26.00	$16,744
Miscellaneous Structure		Lump Sum	5%	$33,073
Process				
75 Hp Blowers	2	ea	$ 45,000.00	$90,000
Air Piping	1	Lump Sum	$ 15,000.00	$15,000
Diffusers	1	Lump Sum	$ 35,000.00	$35,000
Baffles	1	Lump Sum	$ 15,000.00	$15,000
Painting	1	Lump Sum	$ 10,000.00	$10,000
Electrical		Lump Sum	10%	$20,000
Instrumentation & Controls		Lump Sum	4%	$8,000
			Subtotal =	$887,537
MEMBRANE CLARIFICATION				
Membrane Module Tank Structure				
Slab/footing	45	cu yd	$ 400.00	$18,000
Walls	142	cu yd	$ 700.00	$99,400
Excavation	350	cu yd	$ 8.00	$2,800
Membrane Module Equipment Bldg	1	Lump Sum	$ 670,320.00	$670,320
Membrane Process Equipment Package	1	Lump Sum	$ 2,152,600.00	$2,152,600
Electrical		Lump Sum	10%	$282,000
Instrumentation & Controls		Lump Sum	0%	$0
			Subtotal=	$3,225,120
EFFLUENT/DISINFECTION STRUCTURE				
Flowmeter-Parshall Flume	0	ea	$ 7,000.00	$0
Sampler	0	ea	$ 8,000.00	$0
UV Equipment	1	Lump Sum	$ 60,000.00	$60,000
Sluice Gate	0	ea	$ 8,000.00	$0
Structure	0	Lump Sum	$ 30,000.00	$0
Electrical			8%	$5,000
Instrumentation & Controls			4%	$2,000
			Subtotal =	$67,000

CITY OF HARRISBURG, SOUTH DAKOTA
WASTEWATER TREATMENT IMPROVEMENTS
OPINION OF PROBABLE PROJECT COST
October 24, 2007

Table F-16: Membrane Biological Reactor Alternative 2031 Construction Costs

ANAEROBIC DIGESTION CONVERSION				
Existing Digestion Facilities				
Selective Demolition				
Aeration System	1 Lump Sum	$	20,000.00	$20,000
Digester Cleaning	2 ea	$	5,000.00	$10,000
New Digestion Facilities				$0
Dual-fuel Boiler	2 ea	$	100,000.00	$200,000
Heat Exchanger	2	$	20,000.00	$40,000
Recirculation Pumps	1	$	30,000.00	$30,000
Equipment Building	1	$	62,500.00	$62,500
Waste Gas Burner, Piping, & Controls	1 Lump Sum	$	100,000.00	$100,000
Primary Digester Mixing System	1 ea	$	75,000.00	$75,000
Primary Digester Covers-fixed	1 ea	$	125,000.00	$125,000
Secondary Digester Cover-floating	1 ea	$	200,000.00	$200,000
Process Pipe and Fittings	1 Lump Sum	$	25,000.00	$25,000
Electrical			14%	$120,000
Instrumentation & Controls			5%	$43,000
		Subtotal =		$1,050,500
THICKENING/DEWATERING BUILDING				
RDT	1 EA	$	182,000.00	$182,000
RDT Feed Pumps	2 EA	$	20,000.00	$40,000
RDT-to-Digester Feed Pumps	2 EA	$	25,000.00	$50,000
Polymer Feed Unit	1 EA	$	15,000.00	$15,000
BFP	0 EA	$	300,000.00	$0
BFP Feed Pumps	0 EA	$	20,000.00	$0
Conveyor	0 EA	$	60,000.00	$0
Process				
Piping	0 Lump Sum	$	20,000.00	$0
Valves	0 Lump Sum	$	15,000.00	$0
Structure	0 sq ft	$	150.00	$0
Footing	0 cu yds	$	400.00	$0
Slab	0 cu yds	$	400.00	$0
Misc Concrete	0 cu yds	$	700.00	$0
Excavation	0 cu yds	$	8.00	$0
Structural Backfill	0 cu yds	$	26.00	$0
Backfill	0 cu yds	$	12.00	$0
WAS Holding Tank	0 Lump Sum	$	15,000.00	$0
Excavation	0 cu yds	$	8.00	$0
Backfill	0 cu yds	$	12.00	$0
Structural Backfill	0 cu yds	$	26.00	$0
Walls	0 cu yds	$	700.00	$0
Slab	0 cu yds	$	400.00	$0
Roofing	0 sq ft	$	100.00	$0
HVAC			6%	$15,800
Plumbing			7%	$18,700

Table F-16: Membrane Biological Reactor Alternative 2031 Construction Costs

Electrical			12%	$34,400
Instrumentation & Controls			6%	$17,200
		Subtotal =		$373,100
NEW CONTROL BUILDING				
Structure	0 Sq Ft	$	100.00	$0
Laboratory Equip	0 Lump Sum	$	25,000.00	$0
Plumbing	0 Sq Ft	$	20.00	$0
HVAC	0 Sq Ft	$	15.00	$0
Roofing	0 Sq Ft	$	50.00	$0
Finishes	0 Lump Sum	$	10,000.00	$0
Electrical Modifications		10%		$0
Instrumentation & Controls		8%		$0
		Subtotal =		$0
Subtotal				$7,836,619
SITEWORK	10%			$783,662
Subtotal				$8,620,281
GENERAL REQUIREMENTS	10%			$862,000
Subtotal				$9,482,281
CONTINGENCY	20%			$1,896,000
Opinion of Probable Construction Cost				**$11,378,281**

*** Based on 2007 costs**

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TABLE F-17: PRELIMINARY ENGINEERS OPINION OF PROBABLE COST
CONVERSION TO AERATED LAGOONS-OPTER WITH SAGR
MARCH 2009

Items	Existing Lagoon Modifications
Mobilization (8%)	$ 765,000
Screening Building	$ 200,000
Supply and installation supervision of the OPTAER MAT Lagoon Aeration System	$ 1,950,000
Supply and installation supervision of the OPTAER SAGR Treatment System	$ 1,560,000
Dual Stage Vertical Flow Gravity Sand Filters w/Alum Feed System	$ 1,550,000
Blower/Chemical Feed Building	$ 150,000
UV Disinfection	$ 300,000
Sitework/Piping	$ 2,919,000
Electrical/I&C	$ 450,000
Subtotal Construction Costs	**$ 9,844,000**
Contingency (15%)	$ 1,477,000
Preliminary Opinion of Construction Costs	**$ 11,321,000**
Engineering, Legal, Construction Administration (20%)	$ 2,264,000
Total Engineer's Opinion of Probable Project Construction Cost	**$ 13,585,000**

TABLE F-18A: PRELIMINARY ENGINEERS OPINION OF PROBABLE COST
CONVERSION TO AERATED LAGOONS-LEMNA PHASE ONE
MARCH 2009

Items	Existing Lagoon Modifications
Mobilization	$ 654,000
Screening/Grit Removal Building	$ 300,000
Supply and install Lemna LBTP and LPR for 1.03 mgd	$ 3,315,000
Supply and install Lemna LBTP and LPR for 1.84 mgd total	future
Dual Stage Vertical Flow Gravity Sand Filters w/Alum Feed System	$ 1,550,000
Blower/Chemical Feed Building	$ 150,000
UV Disinfection	$ 300,000
Sitework/Piping	$ 1,740,000
Electrical/I&C	$ 450,000
Subtotal Construction Costs	**$ 8,459,000**
Contingency (15%)	$ 1,269,000
Preliminary Opinion of Construction Costs	**$ 9,728,000**
Engineering, Legal, Construction Administration (20%)	$ 1,946,000
Total Engineer's Opinion of Probable Project Construction Cost	**$ 11,674,000**

TABLE F-18B: PRELIMINARY ENGINEERS OPINION OF PROBABLE COST
CONVERSION TO AERATED LAGOONS-LEMNA PHASE TWO
MARCH 2009

Items	Existing Lagoon Modifications
Mobilization (8%)	$ 320,000
Supply and install Lemna LBTP and LPR for 1.84 mgd total	$ 3,009,500
Sitework/Piping	$ 100,000
Electrical/I&C	$ 40,000
Subtotal Construction Costs	**$ 3,469,500**
Contingency (15%)	$ 520,000
Preliminary Opinion of Construction Costs	**$ 3,989,500**
Engineering, Legal, Construction Administration (20%)	$ 798,000
Total Engineer's Opinion of Probable Project Construction Cost	**$ 4,787,500**

TABLE F-19: PRELIMINARY ENGINEERS OPINION OF PROBABLE COST
GRAVITY OUTFALL TO NINEMILE CREEK
FEBRUARY 2009

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
	SITE WORK				
1	CLEARING & GRUBBING	LS	1.0	$ 5,000.00	$ 5,000
2	SALVAGE TOPSOIL	CY	1,300	$ 2.00	$ 2,600
3	PLACING TOPSOIL	CY	1,300	$ 4.00	$ 5,200
4	LOCATING UTILITIES	EA	2	$ 300.00	$ 600
5	RIPRAP	TON	50	$ 30.00	$ 1,500
	SITE WORK SUBTOTAL				**$ 14,900**
	EROSION CONTROL				
6	TEMPORARY SILT FENCE	LF	2,300	$ 5.00	$ 11,500
7	PERMANENT SEEDING	LB	270	$ 12.00	$ 3,300
8	FERTILIZING	LB	530	$ 1.00	$ 600
9	MULCHING	TON	10	$ 150.00	$ 1,500
	EROSION CONTROL SUBTOTAL				**$ 16,900**
	SANITARY SEWER				
10	TRENCH DEWATERING	LS	1	$ 50,000.00	$ 50,000
11	TRENCH STABILIZATION MATERIAL	TON	350	$ 21.00	$ 7,350
12	GRANULAR INITIAL BACKFILL FOR SANITARY SEWER	TON	1,200	$ 13.00	$ 15,600
13	MH FRAME AND COVER	EA	5	$ 350.00	$ 1,750
14	MH CONSTRUCTION PLATE MARKER	EA	5	$ 200.00	$ 1,000
15	MH EXTERNAL FRAME SEAL	EA	5	$ 400.00	$ 2,000
16	48"ø MH, IN PLACE, COMPLETE	EA	5	$ 1,500.00	$ 7,500
17	30" SAN SWR PVC PIPE SDR 35	LF	2,300	$ 175.00	$ 402,500
18	MH EXFILTRATION\VACUUM TEST	EA	5	$ 300.00	$ 1,500
19	SAN SWR EXFILTRATION TESTING	LF	2,300	$ 1.25	$ 2,875
20	SWR PIPE DEFLECTION TEST	LF	2,300	$ 1.00	$ 2,300
	SANITARY SEWER SUBTOTAL				**$ 500,000**
	SURFACING				
21	GRAVEL SURFACING	TON	40.0	13.00	$ 520
22	SCARIFY AND RECOMPACT	SF	1400.0	1.00	$ 1,400
	SANITARY SEWER SUBTOTAL				**$ 1,920**
	TOTAL ITEMS 1 THROUGH 20				
	SUBTOTAL CONSTRUCTION COSTS				$ 533,720
	CONTINGENCY (20%)				$ 106,744
	PRELIMINARY OPINION OF CONSTRUCTION COSTS				**$ 640,464**
	ENGINEERING, LEGAL, CONSTRUCTION ADMINISTRATION (20%)				$ 128,093
	TOTAL ENGINEER'S OPINION OF PROBABLE PROJECT COST				**$ 769,000**

TABLE F-20: PRELIMINARY ENGINEERS OPINION OF PROBABLE COST
GRAVITY OUTFALL
SEPTEMBER 2007

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
	SITE WORK				
1	CLEARING & GRUBBING	LS	1.0	$ 10,000.00	$ 10,000
2	SALVAGE TOPSOIL	CY	1,125	$ 2.00	$ 2,300
3	PLACING TOPSOIL	CY	1,125	$ 4.00	$ 4,500
4	LOCATING UTILITIES	EA	2	$ 500.00	$ 1,000
5	RIPRAP	TON	50	$ 30.00	$ 1,500
	SITE WORK SUBTOTAL				**$ 19,300**
	EROSION CONTROL				
6	TEMPORARY SILT FENCE	LF	2,000	$ 5.00	$ 10,000
7	PERMANENT SEEDING	LB	250	$ 12.00	$ 3,000
8	FERTILIZING	LB	925	$ 1.00	$ 1,000
9	MULCHING	TON	15	$ 150.00	$ 2,300
	EROSION CONTROL SUBTOTAL				**$ 16,300**
	SANITARY SEWER				
10	TRENCH DEWATERING	LS	1	$ 50,000.00	$ 50,000
11	TRENCH STABILIZATION MATERIAL	TON	160	$ 21.00	$ 3,360
12	GRANULAR INITIAL BACKFILL FOR SANITARY SEWER	TON	525	$ 11.00	$ 5,775
13	MH FRAME AND COVER	EA	4	$ 350.00	$ 1,400
14	MH CONSTRUCTION PLATE MARKER	EA	4	$ 200.00	$ 800
15	MH EXTERNAL FRAME SEAL	EA	4	$ 400.00	$ 1,600
16	48"ø MH, IN PLACE, COMPLETE	EA	4	$ 2,500.00	$ 10,000
17	30" SAN SWR PVC PIPE SDR 35	LF	2,000	$ 300.00	$ 600,000
18	MH EXFILTRATION\VACUUM TEST	EA	4	$ 300.00	$ 1,200
19	SAN SWR EXFILTRATION TESTING	LF	2,000	$ 1.25	$ 2,500
20	SWR PIPE DEFLECTION TEST	LF	2,000	$ 1.00	$ 2,000
	SANITARY SEWER SUBTOTAL				**$ 680,000**
	TOTAL ITEMS 1 THROUGH 20				
	SUBTOTAL CONSTRUCTION COSTS				$ 715,600
	CONTINGENCY (20%)				$ 143,120
	PRELIMINARY OPINION OF CONSTRUCTION COSTS				**$ 858,720**
	ENGINEERING, LEGAL, CONSTRUCTION ADMINISTRATION (20%)				$ 171,744
	TOTAL ENGINEER'S OPINION OF PROBABLE PROJECT COST				**$ 1,030,000**

TABLE F-21: PRELIMINARY ENGINEERS OPINION OF PROBABLE COST
GRAVITY OUTFALL TO LIFT STATION TO PUMP TO BIG SIOUX RIVER
FEBRUARY 2009

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
	SITE WORK				
1	CLEARING & GRUBBING	LS	1.0	$ 1,000.00	$ 1,000
2	SALVAGE TOPSOIL	CY	115	$ 2.00	$ 300
3	PLACING TOPSOIL	CY	115	$ 4.00	$ 500
4	LOCATING UTILITIES	EA	1	$ 500.00	$ 500
5	REMOVE AND RESET RIPRAP	TON	50	$ 50.00	$ 2,500
6	EARTHEN COFFER DAM AND DEWATERING	LS	1	$ 16,000.00	$ 16,000
	SITE WORK SUBTOTAL				**$ 20,800**
	EROSION CONTROL				
7	TEMPORARY SILT FENCE	LF	200	$ 5.00	$ 1,000
8	PERMANENT SEEDING	LB	25	$ 12.00	$ 300
9	FERTILIZING	LB	100	$ 1.00	$ 100
10	MULCHING	TON	2	$ 150.00	$ 300
	EROSION CONTROL SUBTOTAL				**$ 1,700**
	SANITARY SEWER				
11	TRENCH DEWATERING	LS	1	$ 1,000.00	$ 1,000
12	TRENCH STABILIZATION MATERIAL	TON	35	$ 21.00	$ 735
13	GRANULAR INITIAL BACKFILL FOR SANITARY SEWER	TON	105	$ 13.00	$ 1,365
14	MH FRAME AND COVER	EA	1	$ 350.00	$ 350
15	MH CONSTRUCTION PLATE MARKER	EA	1	$ 200.00	$ 200
16	MH EXTERNAL FRAME SEAL	EA	1	$ 400.00	$ 400
17	48"ø MH, IN PLACE, COMPLETE	EA	1	$ 1,500.00	$ 1,500
18	30" SAN SWR PVC PIPE SDR 35	LF	200	$ 175.00	$ 35,000
19	MH EXFILTRATION\VACUUM TEST	EA	1	$ 300.00	$ 300
20	SAN SWR EXFILTRATION TESTING	LF	200	$ 1.25	$ 250
21	SWR PIPE DEFLECTION TEST	LF	200	$ 1.00	$ 200
	SANITARY SEWER SUBTOTAL				**$ 50,000**
	TOTAL ITEMS 1 THROUGH 20				
	SUBTOTAL CONSTRUCTION COSTS				$ 72,500
	CONTINGENCY (20%)				$ 14,500
	PRELIMINARY OPINION OF CONSTRUCTION COSTS				**$ 87,000**
	ENGINEERING, LEGAL, CONSTRUCTION ADMINISTRATION (20%)				$ 17,400
	TOTAL ENGINEER'S OPINION OF PROBABLE PROJECT COST				**$ 104,000**

APPENDIX G

TABLE G-1
CITY OF HARRISBURG, SOUTH DAKOTA
OPINION OF PROBABLE COST FOR ANNUAL O&M COST

NEW WASTEWATER LIFT STATION TO A NEW WWTP
1900 GPM 2021 Peak Day Demand

AVE DAY WATER TO SYSTEM *(GAL)*	606,637
NET ANNUAL WATER TO SYSTEM *(GAL)*	221,422,540
ELECTRICAL COST *($/KW-HR)*	$0.060

DESCRIPTION	FACTORS	CURRENT ANNUAL $	COST PER 1000 GAL PUMPED
O&M FIXED COSTS			
AIR COMPRESSOR		$3,921	$0.0177
HORSEPOWER DRAW	15.0		
HOURS OF OPERATION PER DAY	16		
KW-HR PER YEAR	65,350		
GAS HEATING			
TREATMENT BUILDING AREA *(SF)*	1,940	$4,850	$0.0219
$ PER YEAR PER SQ FT	$2.50		
LIGHTING/GENERAL POWER		$3,399	$0.0154
TREATMENT BUILDING AREA *(SF)*	1,940		
WATTS PER SQ FT	10.00		
HOURS OF OPERATION PER DAY	8.0		
KW-HR PER YEAR	56,648		
ODOR CONTROL UNIT			
FAN		$1,960	$0.0089
HORSEPOWER DRAW	5.0		
HOURS OF OPERATION PER DAY	24		
KW-HR PER YEAR	32,675		
RECIRCULATION PUMP		$784	$0.0035
HORSEPOWER DRAW	2.0		
HOURS OF OPERATION PER DAY	24		
KW-HR PER YEAR	13,070		
HEATERS		$7,884	$0.0356
NUMBER OF HEATERS	2.0		
HOURS OF OPERATION PER DAY	12		
RATED CAPACITY (PEAK) - KW	20		
KW-HR USED FOR CALCS	15		
KW-HR PER YEAR	131,400		
OPERATION SALARIES & BENEFITS		$10,400	$0.0470
NUMBER OF OPERATORS	1		
OPERATOR STAFF *(HOURS PER DAY)*	1		
ANNUAL OPERATOR HOURS	260		
HOURLY RATE	$40.00		
ANNUAL COST	$10,400		
VEHICLE		$1,500	$0.0068
ANNUAL COST	$1,500		

TABLE G-1
CITY OF HARRISBURG, SOUTH DAKOTA
OPINION OF PROBABLE COST FOR ANNUAL O&M COST

NEW WASTEWATER LIFT STATION TO A NEW WWTP
1900 GPM 2021 Peak Day Demand

AVE DAY WATER TO SYSTEM *(GAL)*	606,637
NET ANNUAL WATER TO SYSTEM *(GAL)*	221,422,540
ELECTRICAL COST *($/KW-HR)*	$0.060

DESCRIPTION	FACTORS	CURRENT ANNUAL $	COST PER 1000 GAL PUMPED
PUMP CLEANING		$4,000	$0.0181
NUMBER OF PUMPS	2.0		
CLEANING COSTS PER PUMP	$1,000		
ESTIMATED CLEANING INTERVAL *(YEARS)*	0.5		
TOTAL O&M FIXED COSTS		**$38,699**	**$0.1748**
O&M VARIABLE COSTS			
PUMP POWER		$5,381	$0.0243
PUMPING HEAD *(FT)*	90		
OVERALL PUMPING EFFICIENCY	70%		
KW-HR PER YEAR	89,676		
WATER		$3,500	$0.0158
COST PER 1000 GALLONS	$3.50		
GAL PER YEAR	1,000,000		
REPAIRS & MAINTENANCE		$5,000	$0.0226
ANNUAL COST	$5,000		
TOTAL VARIABLE O&M COSTS		**$13,881**	**$0.0627**
TOTAL ANNUAL O&M COSTS		**$52,579**	**$0.2375**
INFLATION RATE	3.00%		
INTEREST RATE	4.75%		
PRESENT WORTH O&M COSTS		**$463,923**	

TABLE G-2
CITY OF HARRISBURG, SOUTH DAKOTA
OPINION OF PROBABLE COST FOR ANNUAL O&M COST

NEW WASTEWATER LIFT STATION TO A NEW WWTP
3410 GPM 2031 Peak Day Demand

AVE DAY WATER TO SYSTEM *(GAL)*	1,240,346
NET ANNUAL WATER TO SYSTEM *(GAL)*	452,726,308
ELECTRICAL COST *($/KW-HR)*	$0.060

DESCRIPTION	FACTORS	CURRENT ANNUAL $	COST PER 1000 GAL PUMPED
O&M FIXED COSTS			
AIR COMPRESSOR		$3,921	$0.0087
HORSEPOWER DRAW	15.0		
HOURS OF OPERATION PER DAY	16		
KW-HR PER YEAR	65,350		
GAS HEATING			
TREATMENT BUILDING AREA *(SF)*	1,940	$4,850	$0.0107
$ PER YEAR PER SQ FT	$2.50		
LIGHTING/GENERAL POWER		$3,399	$0.0075
TREATMENT BUILDING AREA *(SF)*	1,940		
WATTS PER SQ FT	10.00		
HOURS OF OPERATION PER DAY	8.0		
KW-HR PER YEAR	56,648		
ODOR CONTROL UNIT			
FAN		$1,960	$0.0043
HORSEPOWER DRAW	5.0		
HOURS OF OPERATION PER DAY	24		
KW-HR PER YEAR	32,675		
RECIRCULATION PUMP		$784	$0.0017
HORSEPOWER DRAW	2.0		
HOURS OF OPERATION PER DAY	24		
KW-HR PER YEAR	13,070		
HEATERS		$7,884	$0.0174
NUMBER OF HEATERS	2.0		
HOURS OF OPERATION PER DAY	12		
RATED CAPACITY (PEAK) - KW	20		
KW-HR USED FOR CALCS	15		
KW-HR PER YEAR	131,400		
OPERATION SALARIES & BENEFITS		$10,400	$0.0230
NUMBER OF OPERATORS	1		
OPERATOR STAFF *(HOURS PER DAY)*	1		
ANNUAL OPERATOR HOURS	260		
HOURLY RATE	$40.00		
ANNUAL COST	$10,400		
VEHICLE		$1,500	$0.0033
ANNUAL COST	$1,500		

TABLE G-2
CITY OF HARRISBURG, SOUTH DAKOTA
OPINION OF PROBABLE COST FOR ANNUAL O&M COST

NEW WASTEWATER LIFT STATION TO A NEW WWTP
3410 GPM 2031 Peak Day Demand

AVE DAY WATER TO SYSTEM *(GAL)*	1,240,346
NET ANNUAL WATER TO SYSTEM *(GAL)*	452,726,308
ELECTRICAL COST *($/KW-HR)*	$0.060

DESCRIPTION	FACTORS	CURRENT ANNUAL $	COST PER 1000 GAL PUMPED
PUMP CLEANING		$4,000	$0.0088
NUMBER OF PUMPS	2.0		
CLEANING COSTS	$1,000		
ESTIMATED CLEANING INTERVAL *(YEARS)*	0.5		
TOTAL O&M FIXED COSTS		**$38,699**	**$0.0855**
O&M VARIABLE COSTS			
PUMP POWER		$14,668	$0.0324
PUMPING HEAD *(FT)*	120		
OVERALL PUMPING EFFICIENCY	70%		
KW-HR PER YEAR	244,472		
WATER		$3,500	$0.0077
COST PER 1000 GALLONS	$3.50		
GAL PER YEAR	1,000,000		
REPAIRS & MAINTENANCE		$5,000	$0.0110
ANNUAL COST	$5,000		
TOTAL VARIABLE O&M COSTS		**$23,168**	**$0.0512**
TOTAL ANNUAL O&M COSTS		**$61,867**	**$0.1367**
INFLATION RATE	3.00%		
INTEREST RATE	4.75%		
PRESENT WORTH O&M COSTS		**$461,235**	

TABLE G-3
CITY OF HARRISBURG, SOUTH DAKOTA
OPINION OF PROBABLE COST FOR ANNUAL O&M COST

NEW WASTEWATER LIFT STATION TO SIOUX FALLS
2019 Demand

AVE DAY WATER TO SYSTEM *(GAL)*	540,715
NET ANNUAL WATER TO SYSTEM *(GAL)*	197,360,975
ELECTRICAL COST *($/KW-HR)*	$0.060

DESCRIPTION	FACTORS	CURRENT ANNUAL $	COST PER 1000 GAL PUMPED
O&M FIXED COSTS			
AIR COMPRESSOR		$3,921	$0.0199
HORSEPOWER DRAW	15.0		
HOURS OF OPERATION PER DAY	16		
KW-HR PER YEAR	65,350		
GAS HEATING			
TREATMENT BUILDING AREA *(SF)*	2,540	$6,350	$0.0322
$ PER YEAR PER SQ FT	$2.50		
FLOATING AERATION UNITS			
HORESEPOWER PER UNIT	5	$7,842	$0.0397
NUMBER OF UNITS	4		
HOURS OF OPERATION PER DAY	24		
TOTAL MAX ELECTRICAL DRAW	14.92		
LIGHTING/GENERAL POWER		$4,450	$0.0225
TREATMENT BUILDING AREA *(SF)*	2,540		
WATTS PER SQ FT	10.00		
HOURS OF OPERATION PER DAY	8.0		
KW-HR PER YEAR	74,168		
ODOR CONTROL UNIT			
FAN		$1,960	$0.0099
HORSEPOWER DRAW	5.0		
HOURS OF OPERATION PER DAY	24		
KW-HR PER YEAR	32,675		
RECIRCULATION PUMP		$784	$0.0040
HORSEPOWER DRAW	2.0		
HOURS OF OPERATION PER DAY	24		
KW-HR PER YEAR	13,070		
HEATERS		$7,884	$0.0399
NUMBER OF HEATERS	2.0		
HOURS OF OPERATION PER DAY	12		
RATED CAPACITY (PEAK) - KW	20		
KW-HR USED FOR CALCS	15		
KW-HR PER YEAR	131,400		
OPERATION SALARIES & BENEFITS		$10,400	$0.0527
NUMBER OF OPERATORS	1		
OPERATOR STAFF *(HOURS PER DAY)*	1		
ANNUAL OPERATOR HOURS	260		
HOURLY RATE	$40.00		
ANNUAL COST	$10,400		
VEHICLE		$1,500	$0.0076
ANNUAL COST	$1,500		

CITY OF HARRISBURG, SOUTH DAKOTA
OPINION OF PROBABLE COST FOR ANNUAL O&M COST

NEW WASTEWATER LIFT STATION TO SIOUX FALLS
2019 Demand

AVE DAY WATER TO SYSTEM *(GAL)*	540,715
NET ANNUAL WATER TO SYSTEM *(GAL)*	197,360,975
ELECTRICAL COST *($/KW-HR)*	$0.060

DESCRIPTION	FACTORS	CURRENT ANNUAL $	COST PER 1000 GAL PUMPED
PUMP CLEANING		$4,000	$0.0203
NUMBER OF PUMPS	2.0		
CLEANING COSTS	$1,000		
ESTIMATED CLEANING INTERVAL *(YEARS)*	0.5		
TOTAL O&M FIXED COSTS		**$49,092**	**$0.2487**
O&M VARIABLE COSTS			
PUMP POWER		$6,661	$0.0338
PUMPING HEAD *(FT)*	125		
OVERALL PUMPING EFFICIENCY	70%		
KW-HR PER YEAR	111,016		
WATER		$3,500	$0.0177
COST PER 1000 GALLONS	$3.50		
GAL PER YEAR	1,000,000		
REPAIRS & MAINTENANCE		$5,000	$0.0253
ANNUAL COST	$5,000		
TOTAL VARIABLE O&M COSTS		**$15,161**	**$0.0768**
TOTAL ANNUAL O&M COSTS		**$64,253**	**$0.3256**
INFLATION RATE	3.00%		
INTEREST RATE	4.75%		
PRESENT WORTH O&M COSTS		**$505,836**	

TABLE G-4
CITY OF HARRISBURG, SOUTH DAKOTA
OPINION OF PROBABLE COST FOR ANNUAL O&M COST

NEW WASTEWATER LIFT STATION TO SIOUX FALLS
2029 Demand

AVE DAY WATER TO SYSTEM *(GAL)*	1,173,826
NET ANNUAL WATER TO SYSTEM *(GAL)*	428,446,490
ELECTRICAL COST *($/KW-HR)*	$0.060

DESCRIPTION	FACTORS	CURRENT ANNUAL $	COST PER 1000 GAL PUMPED
O&M FIXED COSTS			
AIR COMPRESSOR		$3,921	$0.0092
HORSEPOWER DRAW	15.0		
HOURS OF OPERATION PER DAY	16		
KW-HR PER YEAR	65,350		
GAS HEATING			
TREATMENT BUILDING AREA *(SF)*	2,540	$6,350	$0.0148
$ PER YEAR PER SQ FT	$2.50		
FLOATING AERATION UNITS			
HORESEPOWER PER UNIT	5	$27,447	$0.0641
NUMBER OF UNITS	14		
HOURS OF OPERATION PER DAY	24		
TOTAL MAX ELECTRICAL DRAW	52.22		
LIGHTING/GENERAL POWER		$4,450	$0.0104
TREATMENT BUILDING AREA *(SF)*	2,540		
WATTS PER SQ FT	10.00		
HOURS OF OPERATION PER DAY	8.0		
KW-HR PER YEAR	74,168		
ODOR CONTROL UNIT			
FAN		$1,960	$0.0046
HORSEPOWER DRAW	5.0		
HOURS OF OPERATION PER DAY	24		
KW-HR PER YEAR	32,675		
RECIRCULATION PUMP		$784	$0.0018
HORSEPOWER DRAW	2.0		
HOURS OF OPERATION PER DAY	24		
KW-HR PER YEAR	13,070		
HEATERS		$7,884	$0.0184
NUMBER OF HEATERS	2.0		
HOURS OF OPERATION PER DAY	12		
RATED CAPACITY (PEAK) - KW	20		
KW-HR USED FOR CALCS	15		
KW-HR PER YEAR	131,400		
OPERATION SALARIES & BENEFITS		$10,400	$0.0243
NUMBER OF OPERATORS	1		
OPERATOR STAFF *(HOURS PER DAY)*	1		
ANNUAL OPERATOR HOURS	260		
HOURLY RATE	$40.00		
ANNUAL COST	$10,400		
VEHICLE		$1,500	$0.0035
ANNUAL COST	$1,500		

TABLE G-4
CITY OF HARRISBURG, SOUTH DAKOTA
OPINION OF PROBABLE COST FOR ANNUAL O&M COST

NEW WASTEWATER LIFT STATION TO SIOUX FALLS
2029 Demand

AVE DAY WATER TO SYSTEM *(GAL)*	1,173,826
NET ANNUAL WATER TO SYSTEM *(GAL)*	428,446,490
ELECTRICAL COST *($/KW-HR)*	$0.060

DESCRIPTION	FACTORS	CURRENT ANNUAL $	COST PER 1000 GAL PUMPED
PUMP CLEANING		$4,000	$0.0093
NUMBER OF PUMPS	2.0		
CLEANING COSTS	$1,000		
ESTIMATED CLEANING INTERVAL *(YEARS)*	0.5		
TOTAL O&M FIXED COSTS		**$68,697**	**$0.1603**
O&M VARIABLE COSTS			
PUMP POWER		$24,756	$0.0578
PUMPING HEAD *(FT)*	214		
OVERALL PUMPING EFFICIENCY	70%		
KW-HR PER YEAR	412,594		
WATER		$3,500	$0.0082
COST PER 1000 GALLONS	$3.50		
GAL PER YEAR	1,000,000		
REPAIRS & MAINTENANCE		$5,000	$0.0117
ANNUAL COST	$5,000		
TOTAL VARIABLE O&M COSTS		**$33,256**	**$0.0776**
TOTAL ANNUAL O&M COSTS		**$101,952**	**$0.2380**
INFLATION RATE	3.00%		
INTEREST RATE	4.75%		
PRESENT WORTH O&M COSTS		**$760,083**	

PROJECT 604980J, WASTEWATER FACILITY PLAN
CITY OF HARRISBURG, SD - 2009
TREATMENT COSTS TO PUMP TO SIOUX FALLS

ENGINEER'S OPINION OF PROBABLE COST -MARCH 2009

TABLE G-5: TREATMENT COSTS TO PUMP TO SIOUX FALLS

YEAR	RATE	YEARLY FLOW*	YEARLY COST	TERM	INTEREST RATE	PRESENT WORTH
	($ / 1000 gal)	*(gal)*	*($)*	*(years)*	*(%)*	*($)*
2007						
2008						
2009						
2010	$ 1.80	141,047,280	$ 253,885	1	4.75%	$ 242,372
2011	$ 1.85	155,152,008	$ 287,652	2	4.75%	$ 262,156
2012	$ 1.91	170,667,209	$ 325,910	3	4.75%	$ 283,553
2013	$ 1.97	187,733,930	$ 369,255	4	4.75%	$ 306,698
2014	$ 2.03	206,507,323	$ 418,366	5	4.75%	$ 331,731
2015	$ 2.09	227,158,055	$ 474,009	6	4.75%	$ 358,808
2016	$ 2.15	249,873,860	$ 537,052	7	4.75%	$ 388,095
2017	$ 2.21	269,863,769	$ 597,417	8	4.75%	$ 412,141
2018	$ 2.28	291,452,871	$ 664,567	9	4.75%	$ 437,676
2019	$ 2.35	314,769,100	$ 739,264	10	4.75%	$ 464,793
2020	$ 2.42	339,950,628	$ 822,357	11	4.75%	$ 493,590
2021	$ 2.49	367,146,679	$ 914,790	12	4.75%	$ 524,171
2022	$ 2.57	389,175,479	$ 998,768	13	4.75%	$ 546,339
2023	$ 2.64	412,526,008	$ 1,090,455	14	4.75%	$ 569,444
2024	$ 2.72	437,277,569	$ 1,190,559	15	4.75%	$ 593,527
2025	$ 2.80	463,514,223	$ 1,299,852	16	4.75%	$ 618,628
2026	$ 2.89	491,325,076	$ 1,419,179	17	4.75%	$ 644,790
2027	$ 2.98	515,891,330	$ 1,534,842	18	4.75%	$ 665,719
2028	$ 3.06	541,685,897	$ 1,659,931	19	4.75%	$ 687,327
2029	$ 3.16	568,770,191	$ 1,795,216	20	4.75%	$ 709,637

FUTURE WORTH = $ 17,393,327 **PRESENT WORTH = $ 9,541,196**

TABLE G-6

Headworks Building Treatment — PRELIMINARY

Harrisburg WWTP

7/12/2007

Design Condition: 2021 (from 2011-2021)

Design life:	10 years
Interest Rate:	5%
Inflation Rate:	3%

Fine Screen		
Nameplate Horsepower:		1
Electricity Cost:	$	0.06
1hp=		0.746 kwh
Number of units:		1
Hours of operation per day:		12
Total Max Electricity Draw:		0.75 KW H
Annual Electricity Cost:	$	196.049
Design life:		10 years
Interest Rate:		5%
Inflation Rate:		3%
Electricity Present Worth (2011):	$	1,736.97

Grit Vortex		
Nameplate Horsepower:		1
Electricity Cost:	$	0.06
1hp=		0.746 kwh
Number of units:		1
Hours of operation per day:		24
Total Max Electricity Draw:		0.75 KW H
Annual Electricity Cost:	$	392.098
Design life:		10 years
Interest Rate:		5%
Inflation Rate:		3%
Electricity Present Worth (2011):	$	3,473.94

Grit Classifier		
Nameplate Horsepower:		1
Electricity Cost:	$	0.06
1hp=		0.746 kwh
Number of units:		1
Hours of operation per day:		12
Total Max Electricity Draw:		0.75 KW H
Annual Electricity Cost:	$	196.049
Design life:		10 years
Interest Rate:		5%
Inflation Rate:		3%
Electricity Present Worth (2011):	$	1,736.97

Grit Pump		
Nameplate Horsepower:		5
Electricity Cost:	$	0.06
1hp=		0.746 kwh
Number of units:		1
Hours of operation per day:		12
Total Max Electricity Draw:		3.73 KW H
Annual Electricity Cost:	$	980.244
Design life:		10 years
Interest Rate:		5%
Inflation Rate:		3%
Electricity Present Worth (2011):	$	8,684.86

TABLE G-7

Headworks TREATMENT OMR COSTS

Design Condition:	**2021 (from 2011-2021)**	
Design Life	**14**	**years**
All costs shown in 2007 dollars		
Interest Rate	**4.75%**	
Inflation Rate	**3%**	

Preliminary Treatment		
Capital Cost[3]:		
Item	Annual Cost	Present Worth (2007)
Operation		
Electricity[1]		
Fine Screen	$ 196.05	$ 2,353.86
Grit Vortex	$ 392.10	$ 4,707.71
Grit Classifier	$ 196.05	$ 2,353.86
Grit Pump	$ 980.24	$ 11,769.28
Subtotal	$ 1,764.44	$ 21,184.71
Maintenance		
Labor[2]	$ -	$ -
Subtotal	$ -	$ -
Replacement		
Parts	$ 1,098.88	$ 8,589.22
Subtotal	$ 1,098.88	$ 8,589.22
TOTAL	**$ 2,863.32**	**$ 29,773.93**

Notes:
1) Headworks building only
2) Included with secondary treatment
3) Capital costs are for preliminary treatment system only.

Replacement - Preliminary Treatment Only																		
	Part																	
	Screen Cleaning Brush Every year		Screen Mechanical Rebuild Every 15 years		Grit Pump Seals Once every 5 years		Grit Pump Wear Plate Once every 2 years											
Year	Present Cost 1 @ $500 ea.	Inflated Yearly Cost	1 @ $40000 ea.	Inflated Yearly Cost	Present Cost 1 @ $1000 ea.	Inflated Yearly Cost	Present Cost 1 @ $500 ea.	Inflated Yearly Cost	3 @ $1000 ea.	Inflated Yearly Cost	Present Cost 2 @ $300 ea.	Inflated Yearly Cost	Present Cost 3 @ $1000 ea	Inflated Yearly Cost	Present Cost 1 @ $1000 ea.	Inflated Yearly Cost	Total Inflated Yearly Cost	Present Worth
0	$ 500.00	$ -	$ 40,000.00	$ -	$ 1,000.00	$ -	$ 500.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1		$ 515.00		$ -		$ -		$ -		$ -		$ -		$ -		$ -	$ 515.00	$ 491.65
2		$ 530.45		$ -		$ -		$ 530.45		$ -		$ -		$ -		$ -	$ 1,060.90	$ 966.87
3		$ 546.36		$ -		$ -		$ -		$ -		$ -		$ -		$ -	$ 546.36	$ 475.36
4		$ 562.75		$ -		$ -		$ 562.75		$ -		$ -		$ -		$ -	$ 1,125.51	$ 934.83
5		$ 579.64		$ -		$ 1,159.27		$ -		$ -		$ -		$ -		$ -	$ 1,738.91	$ 1,378.82
6		$ 597.03		$ -		$ -		$ 597.03		$ -		$ -		$ -		$ -	$ 1,194.05	$ 903.86
7		$ 614.94		$ -		$ -		$ -		$ -		$ -		$ -		$ -	$ 614.94	$ 444.38
8		$ 633.39		$ -		$ -		$ 633.39		$ -		$ -		$ -		$ -	$ 1,266.77	$ 873.91
9		$ 652.39		$ -		$ -		$ -		$ -		$ -		$ -		$ -	$ 652.39	$ 429.65
10		$ 671.96		$ -		$ 1,343.92		$ 671.96		$ -		$ -		$ -		$ -	$ 2,687.83	$ 1,689.90
										$ -		$ -		$ -		$ -	$ -	$ -
										$ -		$ -		$ -		$ -	$ -	$ -
										$ -		$ -		$ -		$ -	$ -	$ -
										$ -		$ -		$ -		$ -	$ -	$ -
										$ -		$ -		$ -		$ -	$ -	$ -
										$ -		$ -		$ -		$ -	$ -	$ -
										$ -		$ -		$ -		$ -	$ -	$ -
										$ -		$ -		$ -		$ -	$ -	$ -
										$ -		$ -		$ -		$ -	$ -	$ -
										$ -		$ -		$ -		$ -	$ -	$ -
															TOTAL PRESENT WORTH		**=**	**$ 8,589.22**

Notes:
1) Present costs for replacement parts are based on estimates provided by the equipment manufacturer.

TABLE G-8

Headworks Building Treatment
Harrisburg WWTP
7/12/2007
Design Condition: 2031 (from 2021-2031)

PRELIMINARY

Design life:	10	years
Interest Rate:	5%	
Inflation Rate:	3%	

Fine Screen		
Nameplate Horsepower:	1	
Electricity Cost:	$ 0.06	
1hp=	0.746	kwh
Number of units:	2	
Hours of operation per day:	12	
Total Max Electricity Draw:	1.49	KW H
Annual Electricity Cost:	$ 392.098	
Design life:	10	years
Interest Rate:	5%	
Inflation Rate:	3%	
Electricity Present Worth (2011):	$ 2,184.15	

Grit Vortex		
Nameplate Horsepower:	1	
Electricity Cost:	$ 0.06	
1hp=	0.746	kwh
Number of units:	2	
Hours of operation per day:	24	
Total Max Electricity Draw:	1.49	KW H
Annual Electricity Cost:	$ 784.195	
Design life:	10	years
Interest Rate:	5%	
Inflation Rate:	3%	
Electricity Present Worth (2011):	$ 4,368.30	

Grit Classifier		
Nameplate Horsepower:	1	
Electricity Cost:	$ 0.06	
1hp=	0.746	kwh
Number of units:	2	
Hours of operation per day:	12	
Total Max Electricity Draw:	1.49	KW H
Annual Electricity Cost:	$ 392.098	
Design life:	10	years
Interest Rate:	5%	
Inflation Rate:	3%	
Electricity Present Worth (2011):	$ 2,184.15	

Grit Pump		
Nameplate Horsepower:	5	
Electricity Cost:	$ 0.06	
1hp=	0.746	kwh
Number of units:	2	
Hours of operation per day:	12	
Total Max Electricity Draw:	7.46	KW H
Annual Electricity Cost:	$ 1,960.488	
Design life:	10	years
Interest Rate:	5%	
Inflation Rate:	3%	
Electricity Present Worth (2011):	$ 10,920.75	

TABLE G-9

PRELIMINARY TREATMENT OMR COSTS

Design Condition:	**2031 (from 2021-2031)**	
Design Life	**14**	**years**
All costs shown in 2007 dollars		
Interest Rate	**4.75%**	
Inflation Rate	**3%**	
Net Rate	**1.75%**	

Preliminary Treatment		
Capital Cost[3]:		
Item	Annual Cost	Present Worth (2007)
Operation		
Electricity[1]		
Fine Screen	$ 392.10	$ 3,241.05
Grit Vortex	$ 784.20	$ 6,482.09
Grit Classifier	$ 392.10	$ 3,241.05
Grit Pump	$ 1,960.49	$ 16,205.23
Subtotal	$ 3,528.88	$ 29,169.42
Maintenance		
Labor[2]	$ -	$ -
Subtotal	$ -	$ -
Replacement		
Parts	$ 5,363.17	$ 42,314.09
Subtotal	$ 5,363.17	$ 42,314.09
TOTAL	**$ 8,892.05**	**$ 71,483.50**

Notes:

1) Headworks building only

2) Included with secondary treatment

3) Capital costs are for preliminary treatment system only.

Replacement - Preliminary Treatment Only																		
	Part																	
	Screen Cleaning Brush Every year		Screen Mechanical Rebuild Every 15 years		Grit Pump Seals Once every 5 years		Grit Pump Wear Plate Once every 2 years											
Year	Present Cost 2 @ $500 ea.	Inflated Yearly Cost	1 @ $40000 ea.	Inflated Yearly Cost	Present Cost 2@ $1000 ea.	Inflated Yearly Cost	Present Cost 2@ $500 ea.	Inflated Yearly Cost	3 @ $1000 ea.	Inflated Yearly Cost	Present Cost 2 @ $300 ea.	Inflated Yearly Cost	Present Cost 3 @ $1000 ea	Inflated Yearly Cost	Present Cost 1 @ $1000 ea.	Inflated Yearly Cost	Total Inflated Yearly Cost	Present Worth
0	$ 1,000.00	$ -	$ 40,000.00	$ -	$ 2,000.00	$ -	$ 1,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1		$ 1,030.00		$ -		$ -		$ -		$ -		$ -		$ -		$ -	$ 1,030.00	$ 983.29
2		$ 1,060.90		$ -		$ -		$ 1,060.90		$ -		$ -		$ -		$ -	$ 2,121.80	$ 1,933.73
3		$ 1,092.73		$ -		$ -		$ -		$ -		$ -		$ -		$ -	$ 1,092.73	$ 950.71
4		$ 1,125.51		$ -		$ -		$ 1,125.51		$ -		$ -		$ -		$ -	$ 2,251.02	$ 1,869.66
5		$ 1,159.27		$ 46,370.96		$ 2,318.55		$ -		$ -		$ -		$ -		$ -	$ 49,848.79	$ 39,526.14
6		$ 1,194.05		$ -		$ -		$ 1,194.05		$ -		$ -		$ -		$ -	$ 2,388.10	$ 1,807.71
7		$ 1,229.87		$ -		$ -		$ -		$ -		$ -		$ -		$ -	$ 1,229.87	$ 888.76
8		$ 1,266.77		$ -		$ -		$ 1,266.77		$ -		$ -		$ -		$ -	$ 2,533.54	$ 1,747.82
9		$ 1,304.77		$ -		$ -		$ -		$ -		$ -		$ -		$ -	$ 1,304.77	$ 859.31
10		$ 1,343.92		$ -		$ 2,687.83		$ 1,343.92		$ -		$ -		$ -		$ -	$ 5,375.67	$ 3,379.81
										$ -		$ -		$ -		$ -	$ -	$ -
										$ -		$ -		$ -		$ -	$ -	$ -
										$ -		$ -		$ -		$ -	$ -	$ -
										$ -		$ -		$ -		$ -	$ -	$ -
										$ -		$ -		$ -		$ -	$ -	$ -
										$ -		$ -		$ -		$ -	$ -	$ -
										$ -		$ -		$ -		$ -	$ -	$ -
										$ -		$ -		$ -		$ -	$ -	$ -
										$ -		$ -		$ -		$ -	$ -	$ -
										$ -		$ -		$ -		$ -	$ -	$ -
															TOTAL PRESENT WORTH		**=**	**$ 53,946.94**

Notes:

1) Present costs for replacement parts are based on estimates provided by the equipment manufacturer.

TABLE G-10: Primary Treatment Process

	Primary Clarifier	PS Pumps											
Nameplate Horsepower	1	5											
Hours of Operation	24	12											
Electricity Cost, $					0.06								
					1 hp = 0.746 KWH								
Max Electricity Draw, KWH	0.746	3.73		0		0		0		0		0	
Electricity Cost	$ 392.10	$ 980.24	$	-	$	-	$	-	$	-	$	-	
Number of Units	3	3		2		2		2		2		2	
		(see Note 1)	(see Note 1)		(see Note 1)		(see Note 1)		(see Note 1)		(see Note 2)		
Total Electricity Cost	$ 1,176.29	$ 2,940.73	$	-	$	-	$	-	$	-	$	-	
TOTAL		**$**											**4,117.02**

Notes:

1) 3 units operating at PHWW flow

2) Assumed HP from flow.

TABLE G-11
PRIMARY TREATMENT OMR COSTS

Design Life	**14**	**years**
All costs based on 2007 dollars		
Interest Rate	**4.75%**	
Inflation Rate	**3%**	
Net Rate	**1.75%**	

Primary Treatment - Existing Site

Capital Cost[3]:

Item	Annual Cost	2007 Present Worth
Operation		
Electricity[1]		
Primary Clarifier	$ 1,176.29	$ 9,723.14
PS Pumps	$ 2,940.73	$ 24,307.85
	$ -	$ -
	$ -	$ -
	$ -	$ -
Subtotal	$ 4,117.02	$ 34,030.98
Maintenance		
Labor[2]	$ -	$ -
Subtotal	$ -	$ -
Replacement		
Parts	$ 3,247.87	$ 25,624.87
Subtotal	$ 3,247.87	$ 25,624.87
TOTAL	$ 7,364.89	$ 59,655.85

Notes:
1) See electricy costs appendix for per unit annual electrical cost calculations.
2) No additional labor costs for primary treatment
3) Capital costs are for preliminary treatment system only.

Replacement - Existing Site - Primary Treatment Only

Year	Part: Primary Clarifier Drives Oil Change — Present Cost 3@ $1,000 ea	Part: Primary Clarifier Drives Oil Change — Inflated Yearly Cost	Part: PS Pump Seals Every 5 years — Present Cost 3@ $1,000 ea	Part: PS Pump Seals Every 5 years — Inflated Yearly Cost	Inflated Yearly Cost	Inflated Yearly Cost	Inflated Yearly Cost	Inflated Yearly Cost	Inflated Yearly Cost	Inflated Yearly Cost	Inflated Yearly Cost	Total Inflated Yearly Cost	Present Worth
0	$ 3,000.00	$ -	$ 3,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1		$ 3,090.00			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,090.00	$ 2,949.86
2		$ 3,182.70			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,182.70	$ 2,900.60
3		$ 3,278.18			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,278.18	$ 2,852.14
4		$ 3,376.53			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,376.53	$ 2,804.49
5		$ 3,477.82		$ 3,477.82	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 6,955.64	$ 5,515.28
6		$ 3,582.16			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,582.16	$ 2,711.57
7		$ 3,689.62			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,689.62	$ 2,666.27
8		$ 3,800.31			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,800.31	$ 2,621.72
9		$ 3,914.32			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,914.32	$ 2,577.92
10		$ 4,031.75		$ 4,031.75	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 8,063.50	$ 5,069.71
11					$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
12					$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
13					$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
14					$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
15					$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
16					$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
17					$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
18					$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
19					$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
20					$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
											TOTAL PRESENT WORTH =		$ 32,669.58

Notes:
1) Present costs for replacement parts are based on estimates provided by the equipment manufacturer.

TABLE G-12
Conventional AS
Harrisburg WWTP
8/16/2007
Design Condition 2021

PRELIMINARY

Aeration Blowers		
Nameplate Horsepower:		75
Electricity Cost:	$	0.06
1hp=		0.746 kwh
Number of units:		2
Hours of operation per day:		24
Total Max Electricity Draw:		111.90 KW H
Annual Electricity Cost:	$	58,814.640
Design life:		10 years
Interest Rate:		5%
Inflation Rate:		3%
Electricity Present Worth:	$	521,091.69

RAS Pumps		
Nameplate Horsepower:		0.75
Electricity Cost:	$	0.06
1hp=		0.746 kwh
Number of units:		3
Hours of operation per day:		6
Total Max Electricity Draw:		1.68 KW H
Annual Electricity Cost:	$	220.555
Design life:		10 years
Interest Rate:		5%
Inflation Rate:		3%
Electricity Present Worth:	$	1,954.09

WAS Pumps		
Nameplate Horsepower:		3
Electricity Cost:	$	0.06
1hp=		0.746 kwh
Number of units:		3
Hours of operation per day:		6
Total Max Electricity Draw:		6.71 KW H
Annual Electricity Cost:	$	882.220
Design life:		10 years
Interest Rate:		5%
Inflation Rate:		3%
Electricity Present Worth:	$	7,816.38

Secondary Clarifiers		
Nameplate Horsepower:		2
Electricity Cost:	$	0.06
1hp=		0.746 kwh
Number of units:		2
Hours of operation per day:		24
Total Max Electricity Draw:		2.98 KW H
Annual Electricity Cost:	$	1,568.390
Design life:		10 years
Interest Rate:		5%
Inflation Rate:		3%
Electricity Present Worth:	$	13,895.78

TABLE G-13
SECONDARY TREATMENT OMR COSTS

Design Condition **2021** (from 2011 thru 2021)
Design Life **10** **years**

Interest Rate **4.75%**
Inflation Rate **3%**

Conv AS		
Capital Cost[3]:		
Item	Annual Cost	2007 Present Worth
Operation		
Electricity[1]		
Blowers	$ 58,814.64	$ 432,810.73
RAS Pumps	$ 220.55	$ 1,623.04
Seconary Clarifiers	$ 1,568.39	$ 11,541.62
WAS pumps	$ 882.22	$ 6,492.16
Subtotal	$ 61,485.80	$ 452,467.55
Maintenance		
Labor[2]	$ 90,000.00	$ 662,300.51
Subtotal	$ 90,000.00	$ 662,300.51
Replacement		
Parts	$ 9,142.44	$ 67,278.29
Subtotal	$ 9,142.44	$ 67,278.29
TOTAL	**$ 160,628.25**	**$ 1,182,046.35**

Notes:
1) See electricy costs appendix for per unit annual electrical cost calculations.
2) Annual maintenance labor costs are based on 1 1/2 persons, $90,000/yr (salary + benefits)
3) Capital costs are for secondary treatment system only.

Replacement - Secondary Treatment Only

	Part																	
	Membrane Diffusers Every 7 years		Blower Belt Every 2 years		Blower Lubrication Every year		Blower Filters 6 times per year		WAS Pump Seals Every 5 years		RAS Pump Seals Every 5 years		Clarifier Drives Oil Change Once every year					
Year	Present Cost 440@$10 ea.	Inflated Yearly Cost	Present Cost 6 @ $75 ea	Inflated Yearly Cost	Present Cost 2 @ $1000 ea	Inflated Yearly Cost	Present Cost 12 @ $150 ea	Inflated Yearly Cost	Present Cost 3 @ $1000 ea.	Inflated Yearly Cost	Present Cost 3 @ $1000 ea	Inflated Yearly Cost	Present Cost 2@ $1,000 ea	Inflated Yearly Cost	Total Inflated Yearly Cost	Present Worth
0	$ 4,400.00	$ -	$ 450.00	$ -	$ 2,000.00	$ -	$ 1,800.00	$ -	$ 3,000.00	$ -	$ 3,000.00	$ -	$ 2,000.00	$ 2,000.00	$ 2,000.00	$ 2,000.00		
1		$ -		$ -		$ 2,060.00		$ 1,854.00		$ -		$ -		$ 2,060.00	$ 5,974.00	$ 5,703.10		
2		$ -		$ 477.41		$ 2,121.80		$ 1,909.62		$ -		$ -		$ 2,121.80	$ 6,630.63	$ 6,042.91		
3		$ -		$ -		$ 2,185.45		$ 1,966.91		$ -		$ -		$ 2,185.45	$ 6,337.82	$ 5,514.14		
4		$ -		$ 506.48		$ 2,251.02		$ 2,025.92		$ -		$ -		$ 2,251.02	$ 7,034.43	$ 5,842.69		
5		$ -		$ -		$ 2,318.55		$ 2,086.69		$ 3,477.82		$ -		$ 2,318.55	$ 13,679.43	$ 10,846.71		
6		$ -		$ 537.32		$ 2,388.10		$ 2,149.29		$ -		$ -		$ 2,388.10	$ 7,462.83	$ 5,649.10		
7		$ 5,411.45		$ -		$ 2,459.75		$ 2,213.77		$ -		$ -		$ 2,459.75	$ 12,544.71	$ 9,065.31		
8		$ -		$ 570.05		$ 2,533.54		$ 2,280.19		$ -		$ -		$ 2,533.54	$ 7,917.31	$ 5,461.92		
9		$ -		$ -		$ 2,609.55		$ 2,348.59		$ -		$ -		$ 2,609.55	$ 7,567.68	$ 4,983.99		
10		$ -		$ 604.76		$ 2,687.83		$ 2,419.05		$ 4,031.75		$ 4,031.75		$ 2,687.83	$ 16,462.98	$ 10,350.66		
11															$ -	$ -		
12															$ -	$ -		
13															$ -	$ -		
14															$ -	$ -		
15															$ -	$ -		
16															$ -	$ -		
17															$ -	$ -		
18															$ -	$ -		
19															$ -	$ -		
20															$ -	$ -		
											TOTAL PRESENT WORTH	=	$ 71,460.52					

TABLE G-14
Conventional AS
Harrisburg WWTP
8/16/2007
Design Condition 2031

PRELIMINARY

Aeration Blowers		
Nameplate Horsepower:		75
Electricity Cost:	$	0.06
1hp=		0.746 kwh
Number of units:		4
Hours of operation per day:		24
Total Max Electricity Draw:		223.80 KW H
Annual Electricity Cost:	$	117,629.280
Design life:		10 years
Interest Rate:		5%
Inflation Rate:		3%
Electricity 2011 Present Worth:	$	1,042,183.38

RAS Pumps		
Nameplate Horsepower:		0.75
Electricity Cost:	$	0.06
1hp=		0.746 kwh
Number of units:		3
Hours of operation per day:		6
Total Max Electricity Draw:		1.68 KW H
Annual Electricity Cost:	$	220.555
Design life:		10 years
Interest Rate:		5%
Inflation Rate:		3%
Electricity Present Worth:	$	1,954.09

WAS Pumps		
Nameplate Horsepower:		3
Electricity Cost:	$	0.06
1hp=		0.746 kwh
Number of units:		3
Hours of operation per day:		6
Total Max Electricity Draw:		6.71 KW H
Annual Electricity Cost:	$	882.220
Design life:		10 years
Interest Rate:		5%
Inflation Rate:		3%
Electricity Present Worth:	$	7,816.38

Secondary Clarifiers		
Nameplate Horsepower:		2
Electricity Cost:	$	0.06
1hp=		0.746 kwh
Number of units:		3
Hours of operation per day:		24
Total Max Electricity Draw:		4.48 KW H
Annual Electricity Cost:	$	2,352.586
Design life:		10 years
Interest Rate:		5%
Inflation Rate:		3%
Electricity Present Worth:	$	20,843.67

TABLE G-15
SECONDARY TREATMENT OMR COSTS

Design Condition	**2031**	(from 2021 thru 2031)
Design Life	**14**	**years**
all costs based on 2007 dollars		
Interest Rate	**4.75%**	
Inflation Rate	**3%**	
Net Rate	**1.75%**	

Conv AS		
Capital Cost[3].		
Item	Annual Cost	2007 Present Worth
Operation		
Electricity[1]		
Blowers	$ 117,629.28	$ 972,313.85
RAS pumps	$ 220.55	$ 1,823.09
Seconary Clarifiers	$ 2,352.59	$ 19,446.28
WAS pumps	$ 882.22	$ 7,292.35
Subtotal	$ 121,084.64	$ 1,000,875.57
Maintenance		
Labor[2]	$ 161,000.00	$ 1,330,812.62
Subtotal	$ 161,000.00	$ 1,330,812.62
Replacement		
Parts	$ 11,625.23	$ 91,720.17
Subtotal	$ 11,625.23	$ 91,720.17
TOTAL	**$ 293,709.87**	**$ 2,423,408.36**

Notes:
1) See electricy costs appendix for per unit annual electrical cost calculations.
2) Annual maintenance labor costs are based on 2 FTE $161,000/yr (salary + benefits)
3) Capital costs are for secondary treatment system only.

Replacement - Secondary Treatment Only

	Membrane Diffusers Every 7 years		Blower Belt Every 2 years		Blower Lubrication Every year		Blower Filters 6 times per year		WAS Pump Seals Every 5 years		RAS Pump Seals Every 5 years		Clarifier Drives Oil Change Once every year			
Year	Present Cost 880@$10 ea.	Inflated Yearly Cost	Present Cost 12 @ $75 ea	Inflated Yearly Cost	Present Cost 4 @ $1000 ea	Inflated Yearly Cost	Present Cost 24 @ $150 ea	Inflated Yearly Cost	Present Cost 4 @ $1000 ea.	Inflated Yearly Cost	Present Cost 3 @ $1000 ea.	Inflated Yearly Cost	Present Cost 3 @ $1000 ea.	Inflated Yearly Cost	Total Inflated Yearly Cost	Present Worth
0	$ 880.00	$ -	$ 900.00	$ -	$ 4,000.00	$ -	$ 3,600.00	$ -	$ 4,000.00	$ -	$ 3,000.00	$ -	$ 3,000.00	$ 3,000.00	$ 3,000.00	$ 3,000.00
1		$ -		$ -		$ 4,120.00		$ 3,708.00		$ -		$ -		$ 3,090.00	$ 10,918.00	$ 10,422.91
2		$ -		$ 954.81		$ 4,243.60		$ 3,819.24		$ -		$ -		$ 3,182.70	$ 12,200.35	$ 11,118.96
3		$ -		$ -		$ 4,370.91		$ 3,933.82		$ -		$ -		$ 3,278.18	$ 11,582.91	$ 10,077.56
4		$ -		$ 1,012.96		$ 4,502.04		$ 4,051.83		$ -		$ -		$ 3,376.53	$ 12,943.35	$ 10,750.55
5		$ -		$ -		$ 4,637.10		$ 4,173.39		$ 4,637.10		$ 3,477.82		$ 3,477.82	$ 16,178.14
6		$ -		$ 1,074.65		$ 4,776.21		$ 4,298.59		$ -		$ -		$ 3,582.16	$ 13,731.60	$ 10,394.34
7		$ 1,082.29		$ -		$ 4,919.50		$ 4,427.55		$ -		$ -		$ 3,689.62	$ 14,118.95	$ 10,202.91
8		$ -		$ 1,140.09		$ 5,067.08		$ 4,560.37		$ -		$ -		$ 3,800.31	$ 14,567.86	$ 10,049.94
9		$ -		$ -		$ 5,219.09		$ 4,697.18		$ -		$ -		$ 3,914.32	$ 13,830.60	$ 9,108.66
10		$ -		$ 1,209.52		$ 5,375.67		$ 4,838.10		$ 5,375.67		$ 4,031.75		$ 4,031.75	$ 24,862.45	$ 15,631.61
11															$ -	$ -
12															$ -	$ -
13															$ -	$ -
14															$ -	$ -
15															$ -	$ -
16															$ -	$ -
17															$ -	$ -
18															$ -	$ -
19															$ -	$ -
20															$ -	$ -
													TOTAL PRESENT WORTH =	$ 116,935.59		

TABLE G-16
ICEAS - SBR
Harrisburg WWTP
8/16/2007
Design Condition 2021

PRELIMINARY

Aeration Blowers			
Nameplate Horsepower:		50	
Electricity Cost:	$	0.06	
1hp=		0.746	kwh
Number of units:		2	
Hours of operation per day:		12	
Total Max Electricity Draw:		74.60	KW H
Annual Electricity Cost:	$	19,604.880	
Design life:		10	years
Interest Rate:		5%	
Inflation Rate:		3%	
Electricity Present Worth:	$	173,697.23	

Decanter			
Nameplate Horsepower:		0.75	
Electricity Cost:	$	0.06	
1hp=		0.746	kwh
Number of units:		2	
Hours of operation per day:		6	
Total Max Electricity Draw:		1.12	KW H
Annual Electricity Cost:	$	147.037	
Design life:		10	years
Interest Rate:		5%	
Inflation Rate:		3%	
Electricity Present Worth:	$	1,302.73	

WAS Pumps			
Nameplate Horsepower:		3	
Electricity Cost:	$	0.06	
1hp=		0.746	kwh
Number of units:		2	
Hours of operation per day:		6	
Total Max Electricity Draw:		4.48	KW H
Annual Electricity Cost:	$	588.146	
Design life:		10	years
Interest Rate:		5%	
Inflation Rate:		3%	
Electricity Present Worth:	$	5,210.92	

TABLE G-17
SECONDARY TREATMENT OMR COSTS

Design Condition	2021	(from 2011 thru 2021)
Design Life	10	years
Interest Rate	4.75%	
Inflation Rate	3%	

ICEAS-SBR

Capital Cost[3]:

Item	Annual Cost	2007 Present Worth
Operation		
Electricity[1]		
Blowers	$ 19,604.88	$ 144,270.24
Decanter	$ 147.04	$ 1,082.03
WAS pumps	$ 588.15	$ 4,328.11
Subtotal	$ 20,340.06	$ 149,680.38
Maintenance		
Labor[2]	$ 90,000.00	$ 662,300.51
Subtotal	$ 90,000.00	$ 662,300.51
Replacement		
Parts	$ 5,648.74	$ 41,568.45
Subtotal	$ 5,648.74	$ 41,568.45
TOTAL	$ 115,988.80	$ 853,549.33

Notes:
1) See electricy costs appendix for per unit annual electrical cost calculations.
2) Annual maintenance labor costs are based on 1 1/2 persons, $90,000/yr (salary + benefits)
3) Capital costs are for secondary treatment system only.

Replacement - Secondary Treatment Only

	Part: Membrane Diffusers Every 7 years		Blower Belt Every 2 years		Blower Lubrication Every year		Blower Filters 6 times per year		WAS Pump Seals Every 5 years					
Year	Present Cost 440@$10 ea.	Inflated Yearly Cost	Present Cost 6 @ $75 ea	Inflated Yearly Cost	Present Cost 2 @ $1000 ea	Inflated Yearly Cost	Present Cost 12 @ $150 ea	Inflated Yearly Cost	Present Cost 2 @ $1000 ea.	Inflated Yearly Cost	Present Cost	Inflated Yearly Cost	Total Inflated Yearly Cost	Present Worth
0	$ 4,400.00	$ -	$ 450.00	$ -	$ 2,000.00	$ -	$ 1,800.00	$ -	$ 2,000.00	$ -	$ -	$ -	$ -	$ -
1		$ -		$ -		$ 2,060.00		$ 1,854.00		$ -		$ -	$ 3,914.00	$ 3,736.52
2		$ -		$ 477.41		$ 2,121.80		$ 1,909.62		$ -		$ -	$ 4,508.83	$ 4,109.18
3		$ -		$ -		$ 2,185.45		$ 1,966.91		$ -		$ -	$ 4,152.36	$ 3,612.71
4		$ -		$ 506.48		$ 2,251.02		$ 2,025.92		$ -		$ -	$ 4,783.41	$ 3,973.03
5		$ -		$ -		$ 2,318.55		$ 2,086.69		$ 2,318.55		$ -	$ 6,723.79	$ 5,331.43
6		$ -		$ 537.32		$ 2,388.10		$ 2,149.29		$ -		$ -	$ 5,074.72	$ 3,841.39
7		$ 5,411.45		$ -		$ 2,459.75		$ 2,213.77		$ -		$ -	$ 10,084.97	$ 7,287.80
8		$ -		$ 570.05		$ 2,533.54		$ 2,280.19		$ -		$ -	$ 5,383.77	$ 3,714.11
9		$ -		$ -		$ 2,609.55		$ 2,348.59		$ -		$ -	$ 4,958.14	$ 3,265.37
10		$ -		$ 604.76		$ 2,687.83		$ 2,419.05		$ 2,687.83		$ -	$ 8,399.48	$ 5,280.95
11												$ -	$ -	$ -
12												$ -	$ -	$ -
13												$ -	$ -	$ -
14												$ -	$ -	$ -
15												$ -	$ -	$ -
16												$ -	$ -	$ -
17												$ -	$ -	$ -
18												$ -	$ -	$ -
19												$ -	$ -	$ -
20												$ -	$ -	$ -
											TOTAL PRESENT WORTH	=		$ 44,152.48

TABLE G-18
ICEAS - SBR
Harrisburg WWTP
8/16/2007
Design Condition 2031

PRELIMINARY

Aeration Blowers			
Nameplate Horsepower:		50	
Electricity Cost:	$	0.06	
1hp=		0.746	kwh
Number of units:		4	
Hours of operation per day:		12	
Total Max Electricity Draw:		149.20	KW H
Annual Electricity Cost:	$	39,209.760	
Design life:		10	years
Interest Rate:		5%	
Inflation Rate:		3%	
Electricity 2011 Present Worth:	$	347,394.46	

Decanter			
Nameplate Horsepower:		0.75	
Electricity Cost:	$	0.06	
1hp=		0.746	kwh
Number of units:		4	
Hours of operation per day:		6	
Total Max Electricity Draw:		2.24	KW H
Annual Electricity Cost:	$	294.073	
Design life:		10	years
Interest Rate:		5%	
Inflation Rate:		3%	
Electricity Present Worth:	$	2,605.46	

WAS Pumps			
Nameplate Horsepower:		3	
Electricity Cost:	$	0.06	
1hp=		0.746	kwh
Number of units:		4	
Hours of operation per day:		6	
Total Max Electricity Draw:		8.95	KW H
Annual Electricity Cost:	$	1,176.293	
Design life:		10	years
Interest Rate:		5%	
Inflation Rate:		3%	
Electricity Present Worth:	$	10,421.83	

TABLE G-19
SECONDARY TREATMENT OMR COSTS

Design Condition		**2031** (from 2021 thru 2031)
Design Life	**14**	**years**
All costs based on 2007 dollars		
Interest Rate	**4.75%**	
Inflation Rate	**3%**	
Net Rate	**1.75%**	

ICEAS-SBR

Capital Cost[3]:

Item	Annual Cost	2007 Present Worth
Operation		
Electricity[1]		
Blowers	$ 39,209.76	$ 272,484.02
Decanter	$ 294.07	$ 2,043.63
WAS pumps	$ 1,176.29	$ 8,174.52
Subtotal	$ 40,680.13	$ 282,702.17
Maintenance		
Labor[2]	$ 161,000.00	$ 1,118,852.23
Subtotal	$ 161,000.00	$ 1,118,852.23
Replacement		
Parts	$ 11,297.47	$ 78,510.56
Subtotal	$ 11,297.47	$ 78,510.56
TOTAL	**$ 212,977.60**	**$ 1,480,064.96**

Notes:
1) See electricy costs appendix for per unit annual electrical cost calculations.
2) Annual maintenance labor costs are based on 2 FTE $161,000/yr (salary + benefits)
3) Capital costs are for secondary treatment system only.

Replacement - Secondary Treatment Only

	Part															
	Membrane Diffusers Every 7 years		Blower Belt Every 2 years		Blower Lubrication Every year		Blower Filters 6 times per year		WAS Pump Seals Every 5 years							
Year	Present Cost 880@$10 ea.	Inflated Yearly Cost	Present Cost 12 @ $75 ea	Inflated Yearly Cost	Present Cost 4 @ $1000 ea	Inflated Yearly Cost	Present Cost 24 @ $150 ea	Inflated Yearly Cost	Present Cost 4 @ $1000 ea.	Inflated Yearly Cost	Present Cost	Inflated Yearly Cost	Total Inflated Yearly Cost	Present Worth
0	$ 8,800.00	$ -	$ 900.00	$ -	$ 4,000.00	$ -	$ 3,600.00	$ -	$ 4,000.00	$ -	$ -	$ -	$ -	$ -
1		$ -		$ -		$ 4,120.00		$ 3,708.00		$ -		$ -	$ 7,828.00	$ 7,473.03
2		$ -		$ 954.81		$ 4,243.60		$ 3,819.24		$ -		$ -	$ 9,017.65	$ 8,218.36
3		$ -		$ -		$ 4,370.91		$ 3,933.82		$ -		$ -	$ 8,304.73	$ 7,225.42
4		$ -		$ 1,012.96		$ 4,502.04		$ 4,051.83		$ -		$ -	$ 9,566.82	$ 7,946.06
5		$ -		$ -		$ 4,637.10		$ 4,173.39		$ 4,637.10		$ -	$ 13,447.58	$ 10,662.87
6		$ -		$ 1,074.65		$ 4,776.21		$ 4,298.59		$ -		$ -	$ 10,149.44	$ 7,682.77
7		$ 10,822.89		$ -		$ 4,919.50		$ 4,427.55		$ -		$ -	$ 20,169.93	$ 14,575.59
8		$ -		$ 1,140.09		$ 5,067.08		$ 4,560.37		$ -		$ -	$ 10,767.55	$ 7,428.22
9		$ -		$ -		$ 5,219.09		$ 4,697.18		$ -		$ -	$ 9,916.28	$ 6,530.74
10		$ -		$ 1,209.52		$ 5,375.67		$ 4,838.10		$ 5,375.67		$ -	$ 16,798.95	$ 10,561.90
11												$ -	$ -	$ -
12												$ -	$ -	$ -
13												$ -	$ -	$ -
14												$ -	$ -	$ -
15												$ -	$ -	$ -
16												$ -	$ -	$ -
17												$ -	$ -	$ -
18												$ -	$ -	$ -
19												$ -	$ -	$ -
20												$ -	$ -	$ -
											TOTAL PRESENT WORTH		=	$ 88,304.96

TABLE G-20
MBR
Harrisburg WWTP
8/16/2007
Design Condition 2021

PRELIMINARY

Aeration Blowers		
Nameplate Horsepower:		75
Electricity Cost:	$	0.06
1hp=		0.746 kwh
Number of units:		2
Hours of operation per day:		24
Total Max Electricity Draw:		111.90 KW H
Annual Electricity Cost:	$	58,814.640
Design life.		10 years
Interest Rate:		5%
Inflation Rate.		3%
Electricity Present Worth.	$	521,091.69

RAS Pumps		
Nameplate Horsepower:		0.75
Electricity Cost:	$	0.06
1hp=		0.746 kwh
Number of units:		6
Hours of operation per day:		6
Total Max Electricity Draw:		3.36 KW H
Annual Electricity Cost:	$	441.110
Design life:		10 years
Interest Rate:		5%
Inflation Rate:		3%
Electricity Present Worth:	$	3,908.19

WAS Pumps		
Nameplate Horsepower:		3
Electricity Cost:	$	0.06
1hp=		0.746 kwh
Number of units:		3
Hours of operation per day:		6
Total Max Electricity Draw:		6.71 KW H
Annual Electricity Cost	$	882.220
Design life:		10 years
Interest Rate:		5%
Inflation Rate:		3%
Electricity Present Worth:	$	7,816.38

Membrane Air Scour Blowers		
Nameplate Horsepower:		15
Electricity Cost:	$	0.06
1hp=		0.746 kwh
Number of units:		1
Hours of operation per day:		2
Total Max Electricity Draw:		11.19 KW H
Annual Electricity Cost:	$	490.122
Design life:		10 years
Interest Rate:		5%
Inflation Rate:		3%
Electricity Present Worth:	$	4,342.43

Permeate/Backpulse Pumps		
Nameplate Horsepower:		5
Electricity Cost:	$	0.06
1hp=		0.746 kwh
Number of units:		2
Hours of operation per day:		1
Total Max Electricity Draw:		7.46 KW H
Annual Electricity Cost.	$	163.374
Design life:		10 years
Interest Rate:		5%
Inflation Rate:		3%
Electricity Present Worth:	$	1,447.48

TABLE G-21
SECONDARY TREATMENT OMR COSTS

Design Condition	**2021**	(from 2011 thru 2021)
Design Life	**10**	**years**
Interest Rate	**4.75%**	
Inflation Rate	**3%**	

MBR		
Capital Cost[3]:		
Item	Annual Cost	2007 Present Worth
Operation		
Electricity[1]		
Blowers	$ 58,814.64	$ 432,810.73
RAS Pumps	$ 441.11	$ 3,246.06
Membrane Blowers	$ 490.12	$ 3,606.76
Permeate/Backpulse pumps	$ 163.37	$ 1,202.25
WAS pumps	$ 882.22	$ 6,492.16
Subtotal	$ 60,791.47	$ 447,357.98
Maintenance		
Labor[2]	$ 90,000.00	$ 662,300.51
Subtotal	$ 90,000.00	$ 662,300.51
Replacement		
Cleaning Chemicals	$ 8,000.00	$ 58,871.16
Parts	$ 13,352.61	$ 98,260.43
Subtotal	$ 13,352.61	$ 157,131.58
TOTAL	**$ 164,144.07**	**$ 1,266,790.07**

Notes:
1) See electricy costs appendix for per unit annual electrical cost calculations.
2) Annual maintenance labor costs are based on 1 1/2 persons, $60,000/yr (salary + benefits)
3) Capital costs are for secondary treatment system only.

Replacement - Secondary Treatment Only

	Part																	
	Membrane Diffusers Every 7 years		Blower Belt Every 2 years		Blower Lubrication Every year		Blower Filters 6 times per year		WAS Pump Seals Every 5 years		RAS Pump Seals Every 5 years		UF Membrane Replacement Every 10 years		Permeate/Backpulse Pump Seals Every 5 years			
Year	Present Cost 440@$10 ea.	Inflated Yearly Cost	Present Cost 12 @ $75 ea	Inflated Yearly Cost	Present Cost 4 @ $1000 ea	Inflated Yearly Cost	Present Cost 24 @ $150 ea	Inflated Yearly Cost	Present Cost 3 @ $1000 ea.	Inflated Yearly Cost	Present Cost 6 @ $1000 ea.	Inflated Yearly Cost	Present Cost 12@ $1100 ea	Inflated Yearly Cost	Present Cost 2 @ $1000 ea.	Inflated Yearly Cost	Total Inflated Yearly Cost	Present Worth
0	$ 4,400.00	$ -	$ 900.00	$ -	$ 4,000.00	$ -	$ 3,600.00	$ -	$ 3,000.00	$ -	$ 6,000.00	$ -	$ 13,200.00	$ -	$ 2,000.00	$ -	$ -	$ -
1		$ -		$ -		$ 4,120.00		$ 3,708.00		$ -		$ -		$ -		$ -	$ 7,828.00	$ 7,473.03
2		$ -		$ 954.81		$ 4,243.60		$ 3,819.24		$ -		$ -		$ -		$ -	$ 9,017.65	$ 8,218.36
3		$ -		$ -		$ 4,370.91		$ 3,933.82		$ -		$ -		$ -		$ -	$ 8,304.73	$ 7,225.42
4		$ -		$ 1,012.96		$ 4,502.04		$ 4,051.83		$ -		$ -		$ -		$ -	$ 9,566.82	$ 7,946.06
5		$ -		$ -		$ 4,637.10		$ 4,173.39		$ 3,477.82		$ 6,955.64		$ -		$ 2,318.55	$ 19,243.95	$ 15,258.93
6		$ -		$ 1,074.65		$ 4,776.21		$ 4,298.59		$ -		$ -		$ -		$ -	$ 10,149.44	$ 7,682.77
7		$ 5,411.45		$ -		$ 4,919.50		$ 4,427.55		$ -		$ -		$ -		$ -	$ 14,758.49	$ 10,665.07
8		$ -		$ 1,140.09		$ 5,067.08		$ 4,560.37		$ -		$ -		$ -		$ -	$ 10,767.55	$ 7,428.22
9		$ -		$ -		$ 5,219.09		$ 4,697.18		$ -		$ -		$ -		$ -	$ 9,916.28	$ 6,530.74
10		$ -		$ 1,209.52		$ 5,375.67		$ 4,838.10		$ 4,031.75		$ 8,063.50		$ 17,739.70		$ 2,687.83	$ 41,258.23	$ 25,940.02
11																	$ -	$ -
12																	$ -	$ -
13																	$ -	$ -
14																	$ -	$ -
15																	$ -	$ -
16																	$ -	$ -
17																	$ -	$ -
18																	$ -	$ -
19																	$ -	$ -
20																	$ -	$ -
											TOTAL PRESENT WORTH	=	$ 104,368.62					

TABLE G-22

MBR

Harrisburg WWTP

8/16/2007

Design Condition 2031

PRELIMINARY

Aeration Blowers		
Nameplate Horsepower:		75
Electricity Cost:	$	0.06
1hp=		0.746 kwh
Number of units:		4
Hours of operation per day:		24
Total Max Electricity Draw:		223.80 KW H
Annual Electricity Cost:	$	117,629.280
Design life:		10 years
Interest Rate:		5%
Inflation Rate:		3%
Electricity 2011 Present Worth:	$	1,042,183.38

RAS Pumps		
Nameplate Horsepower:		0.75
Electricity Cost:	$	0.06
1hp=		0.746 kwh
Number of units:		12
Hours of operation per day:		6
Total Max Electricity Draw:		6.71 KW H
Annual Electricity Cost:	$	882.220
Design life:		10 years
Interest Rate:		5%
Inflation Rate:		3%
Electricity Present Worth:	$	7,816.38

WAS Pumps		
Nameplate Horsepower:		3
Electricity Cost:	$	0.06
1hp=		0.746 kwh
Number of units:		3
Hours of operation per day:		6
Total Max Electricity Draw:		6.71 KW H
Annual Electricity Cost:	$	882.220
Design life:		10 years
Interest Rate:		5%
Inflation Rate:		3%
Electricity Present Worth:	$	7,816.38

Membrane Air Scour Blowers		
Nameplate Horsepower:		15
Electricity Cost:	$	0.06
1hp=		0.746 kwh
Number of units:		2
Hours of operation per day:		2
Total Max Electricity Draw:		22.38 KW H
Annual Electricity Cost:	$	980.244
Design life:		10 years
Interest Rate:		5%
Inflation Rate:		3%
Electricity Present Worth:	$	8,684.86

Permeate/Backpulse Pumps		
Nameplate Horsepower:		5
Electricity Cost:	$	0.06
1hp=		0.746 kwh
Number of units:		4
Hours of operation per day:		1
Total Max Electricity Draw:		14.92 KW H
Annual Electricity Cost:	$	326.748
Design life:		10 years
Interest Rate:		5%
Inflation Rate:		3%
Electricity Present Worth:	$	2,894.95

TABLE G-23
SECONDARY TREATMENT OMR COSTS

Design Condition		**2031** (from 2021 thru 2031)
Design Life	**14**	**years**
all costs based on 2007 dollars		
Interest Rate	**4.75%**	
Inflation Rate	**3%**	
Net Rate	**1.75%**	

MBR			
Capital Cost[2]:			
Item	Annual Cost		2011 Present Worth
Operation			
Electricity[1]			
Blowers	$ 117,629.28	$	817,452.06
RAS pumps	$ 882.22	$	6,130.89
Membrane Blowers	$ 980.24	$	6,812.10
Permeate/backpulse pumps	$ 326.75	$	2,270.70
WAS pumps	$ 882.22	$	6,130.89
Subtotal	$ 120,700.71	$	838,796.65
Maintenance			
Labor[2]	$ 161,000.00	$	1,118,852.23
Subtotal	$ 161,000.00	$	1,118,852.23
Replacement			
Cleaning Chemicals	$ 8,000.00	$	55,595.14
Parts	$ 20,839.36	$	144,820.92
Subtotal	$ 20,839.36	$	200,416.06
TOTAL	**$ 302,540.07**	**$**	**2,158,064.93**

Notes:
1) See electricy costs appendix for per unit annual electrical cost calculations.
2) Annual maintenance labor costs are based on 2 FTE $161,000/yr (salary + benefits)
3) Capital costs are for secondary treatment system only.

Replacement - Secondary Treatment Only

Year	Membrane Diffusers Every 7 years: Present Cost 880@$10 ea.	Membrane Diffusers Every 7 years: Inflated Yearly Cost	Blower Belt Every 2 years: Present Cost 12 @ $75 ea	Blower Belt Every 2 years: Inflated Yearly Cost	Blower Lubrication Every year: Present Cost 4 @ $1000 ea	Blower Lubrication Every year: Inflated Yearly Cost	Blower Filters 6 times per year: Present Cost 48 @ $150 ea	Blower Filters 6 times per year: Inflated Yearly Cost	WAS Pump Seals Every 5 years: Present Cost 3 @ $1000 ea.	WAS Pump Seals Every 5 years: Inflated Yearly Cost	RAS Pump Seals Every 5 years: Present Cost 12 @ $1000 ea.	RAS Pump Seals Every 5 years: Inflated Yearly Cost	Permeate/Backpulse Pump Seals Every 5 years: Present Cost 4 @ $1000 ea.	Permeate/Backpulse Pump Seals Every 5 years: Inflated Yearly Cost	UF Membrane Replacement Every 10 years: Present Cost 24@ $1100 ea	UF Membrane Replacement Every 10 years: Inflated Yearly Cost	Total Inflated Yearly Cost	Present Worth
0	$ 880.00	$ -	$ 900.00	$ -	$ 4,000.00	$ -	$ 7,200.00	$ -	$ 3,000.00	$ -	$ 12,000.00	$ -	$ 4,000.00	$ -	$ 26,400.00	$ -	$ -	$ -
1		$ -		$ -		$ 4,120.00		$ 7,416.00		$ -		$ -		$ -		$ -	$ 11,536.00	$ 11,012.89
2		$ -		$ 954.81		$ 4,243.60		$ 7,638.48		$ -		$ -		$ -		$ -	$ 12,836.89	$ 11,699.08
3		$ -		$ -		$ 4,370.91		$ 7,867.63		$ -		$ -		$ -		$ -	$ 12,238.54	$ 10,647.99
4		$ -		$ 1,012.96		$ 4,502.04		$ 8,103.66		$ -		$ -		$ -		$ -	$ 13,618.66	$ 11,311.45
5		$ -		$ -		$ 4,637.10		$ 8,346.77		$ 3,477.82		$13,911.29		$ 4,637.10		$ -	$ 35,010.08	$ 27,760.22
6		$ -		$ 1,074.65		$ 4,776.21		$ 8,597.18		$ -		$ -		$ -		$ -	$ 14,448.03	$ 10,936.66
7		$ 1,082.29		$ -		$ 4,919.50		$ 8,855.09		$ -		$ -		$ -		$ -	$ 14,856.88	$ 10,736.17
8		$ -		$ 1,140.09		$ 5,067.08		$ 9,120.74		$ -		$ -		$ -		$ -	$ 15,327.92	$ 10,574.28
9		$ -		$ -		$ 5,219.09		$ 9,394.37		$ -		$ -		$ -		$ -	$ 14,613.46	$ 9,624.25
10		$ -		$ 1,209.52		$ 5,375.67		$ 9,676.20		$ 4,031.75		$16,127.00		$ 5,375.67		$ 35,479.39	$ 77,275.19	$ 48,584.73
11																	$ -	$ -
12																	$ -	$ -
13																	$ -	$ -
14																	$ -	$ -
15																	$ -	$ -
16																	$ -	$ -
17																	$ -	$ -
18																	$ -	$ -
19																	$ -	$ -
20																	$ -	$ -
											TOTAL PRESENT WORTH		**=**	**$ 162,887.71**				

TABLE G-24
UV Disinfection - SBR
Harrisburg WWTP
8/16/2007

PRELIMINARY

UV Modules - 2021		
Nameplate Horsepower:		
Electricity Cost:	$ 0.06	
Power draw per unit	12.6	kW
Number of units:	2	
Hours of operation per day:	18	
Total Max Electricity Draw:	25.20	KW H
Annual Electricity Cost:	$ 9,933.840	
Design life:	10	years
Interest Rate:	5%	
Inflation Rate:	3%	
Electricity Present Worth:	$ 88,012.81	

UV Modules - 2031		
Nameplate Horsepower:		
Electricity Cost:	$ 0.06	
Power draw per unit	12.6	kW
Number of units:	2	
Hours of operation per day:	18	
Total Max Electricity Draw:	25.20	KW H
Annual Electricity Cost:	$ 9,933.840	
Design life:	10	years
Interest Rate:	5%	
Inflation Rate:	3%	
Electricity Present Worth:	$ 88,012.81	

TABLE G-25
UV Disinfection - AS
Harrisburg WWTP
8/16/2007

PRELIMINARY

UV Modules - 2021		
Nameplate Horsepower:		
Electricity Cost:	$ 0.06	
Power draw per unit	12.6	kW
Number of units:	1	
Hours of operation per day:	24	
Total Max Electricity Draw:	12.60	KW H
Annual Electricity Cost:	$ 6,622.560	
Design life:	10	years
Interest Rate:	5%	
Inflation Rate:	3%	
Electricity Present Worth:	$ 58,675.20	

UV Modules - 2031		
Nameplate Horsepower:		
Electricity Cost:	$ 0.06	
Power draw per unit	12.6	kW
Number of units:	2	
Hours of operation per day:	24	
Total Max Electricity Draw:	25.20	KW H
Annual Electricity Cost:	$ 13,245.120	
Design life:	10	years
Interest Rate:	5%	
Inflation Rate:	3%	
Electricity Present Worth:	$ 117,350.41	

TABLE G-26
UV Disinfection - MBR
Harrisburg WWTP
8/16/2007

PRELIMINARY

UV Modules - 2021			
Nameplate Horsepower:			
Electricity Cost:	$	0.06	
Power draw per unit		12.6	kW
Number of units:		1	
Hours of operation per day:		24	
Total Max Electricity Draw:		12.60	KW H
Annual Electricity Cost:	$	6,622.560	
Design life:		10	years
Interest Rate:		5%	
Inflation Rate:		3%	
Electricity Present Worth:	$	58,675.20	

UV Modules - 2031			
Nameplate Horsepower:			
Electricity Cost:	$	0.06	
Power draw per unit		12.6	kW
Number of units:		2	
Hours of operation per day:		24	
Total Max Electricity Draw:		25.20	KW H
Annual Electricity Cost:	$	13,245.120	
Design life:		10	years
Interest Rate:		5%	
Inflation Rate:		3%	
Electricity Present Worth:	$	117,350.41	

TABLE G-27
UV DISINFECTION OMR COSTS

Design Life	**10**	**years**
Design Year	**2021**	
Interest Rate	**4.75%**	
Inflation Rate	**3%**	
Net Rate	**1.75%**	

UV-SBR

Capital Cost[3]:

Item	Annual Cost	2007 Present Worth
Operation		
Electricity[1]		
UV Modules	$ 9,933.84	$ 73,102.08
Subtotal	$ 9,933.84	$ 73,102.08
Maintenance		
Labor[2]	$ -	$ -
Subtotal	$ -	$ -
Replacement		
Parts	$ 11,576.79	$ 85,192.40
Subtotal	$ 11,576.79	$ 85,192.40
TOTAL	**$ 21,510.63**	**$ 158,294.48**

Notes:
1) UV disinfection only
2) Included with secondary treatment cost
3) Capital costs are for solids treatment and disposal systems only.

UV-AS

Capital Cost[3]:

Item	Annual Cost	2007 Present Worth
Operation		
Electricity[1]		
UV Modules	$ 6,622.56	$ 48,734.72
Subtotal	$ 6,622.56	$ 48,734.72
Maintenance		
Labor[2]	$ -	$ -
Subtotal	$ -	$ -
Replacement		
Parts	$ 5,788.40	$ 42,596.20
Subtotal	$ 5,788.40	$ 42,596.20
TOTAL	**$ 12,410.96**	**$ 91,330.92**

Notes:
1) UV disinfection only
2) Included with secondary treatment cost
3) Capital costs are for solids treatment and disposal systems only.

UV-MBR

Capital Cost[3]:

Item	Annual Cost	2007 Present Worth
Operation		
Electricity[1]		
UV Modules	$ 6,622.56	$ 48,734.72
Subtotal	$ 6,622.56	$ 48,734.72
Maintenance		
Labor[2]	$ -	$ -
Subtotal	$ -	$ -
Replacement		
Parts	$ 5,788.40	$ 42,596.20
Subtotal	$ 5,788.40	$ 42,596.20
TOTAL	**$ 12,410.96**	**$ 91,330.92**

Notes:
1) UV disinfection only
2) Included with secondary treatment cost
3) Capital costs are for solids treatment and disposal systems only.

Replacement - UV Disinfection - SBR

	Part: Lamp Replacement Every 2 years													
Year	Present Cost 80 @ $250 ea	Inflated Yearly Cost	Present Cost 3 @ $1000 ea	Inflated Yearly Cost	Present Cost 18 @ $150 ea	Inflated Yearly Cost	Present Cost 80 @ $10 ea	Inflated Yearly Cost	Present Cost 2 @ $1000 ea	Inflated Yearly Cost	Present Cost 1 @ $350 ea	Inflated Yearly Cost	Total Inflated Yearly Cost	Present Worth
0	$ 20,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
2		$ 21,218.00		$ -		$ -		$ -		$ -		$ -	$ 21,218.00	$ 19,337.32
3		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
4		$ 22,510.18		$ -		$ -		$ -		$ -		$ -	$ 22,510.18	$ 18,696.61
5		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
6		$ 23,881.05		$ -		$ -		$ -		$ -		$ -	$ 23,881.05	$ 18,077.12
7		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
8		$ 25,335.40		$ -		$ -		$ -		$ -		$ -	$ 25,335.40	$ 17,478.15
9		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
10		$ 26,878.33		$ -		$ -		$ -		$ -		$ -	$ 26,878.33	$ 16,899.04
11				$ -		$ -		$ -		$ -		$ -	$ -	$ -
12				$ -		$ -		$ -		$ -		$ -	$ -	$ -
13				$ -		$ -		$ -		$ -		$ -	$ -	$ -
14				$ -		$ -		$ -		$ -		$ -	$ -	$ -
15				$ -		$ -		$ -		$ -		$ -	$ -	$ -
16				$ -		$ -		$ -		$ -		$ -	$ -	$ -
17				$ -		$ -		$ -		$ -		$ -	$ -	$ -
18				$ -		$ -		$ -		$ -		$ -	$ -	$ -
19				$ -		$ -		$ -		$ -		$ -	$ -	$ -
20				$ -		$ -		$ -		$ -		$ -	$ -	$ -
												TOTAL PRESENT WORTH	=	$ 90,488.24

Replacement - UV Disinfection - Conv. AS

	Part: Lamp Replacement Every 2 years													
Year	Present Cost 40 @ $250 ea	Inflated Yearly Cost	Present Cost 3 @ $1000 ea	Inflated Yearly Cost	Present Cost 18 @ $150 ea	Inflated Yearly Cost	Present Cost 80 @ $10 ea	Inflated Yearly Cost	Present Cost 2 @ $1000 ea	Inflated Yearly Cost	Present Cost 1 @ $350 ea	Inflated Yearly Cost	Total Inflated Yearly Cost	Present Worth
0	$ 10,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
2		$ 10,609.00		$ -		$ -		$ -		$ -		$ -	$ 10,609.00	$ 9,668.66
3		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
4		$ 11,255.09		$ -		$ -		$ -		$ -		$ -	$ 11,255.09	$ 9,348.30
5		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
6		$ 11,940.52		$ -		$ -		$ -		$ -		$ -	$ 11,940.52	$ 9,038.56
7		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
8		$ 12,667.70		$ -		$ -		$ -		$ -		$ -	$ 12,667.70	$ 8,739.08
9		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
10		$ 13,439.16		$ -		$ -		$ -		$ -		$ -	$ 13,439.16	$ 8,449.52
11				$ -		$ -		$ -		$ -		$ -	$ -	$ -
12				$ -		$ -		$ -		$ -		$ -	$ -	$ -
13				$ -		$ -		$ -		$ -		$ -	$ -	$ -
14				$ -		$ -		$ -		$ -		$ -	$ -	$ -
15				$ -		$ -		$ -		$ -		$ -	$ -	$ -
16				$ -		$ -		$ -		$ -		$ -	$ -	$ -
17				$ -		$ -		$ -		$ -		$ -	$ -	$ -
18				$ -		$ -		$ -		$ -		$ -	$ -	$ -
19				$ -		$ -		$ -		$ -		$ -	$ -	$ -
20				$ -		$ -		$ -		$ -		$ -	$ -	$ -
												TOTAL PRESENT WORTH	=	$ 45,244.12

Replacement - UV Disinfection - Conv. AS

	Part: Lamp Replacement Every 2 years													
Year	Present Cost 40 @ $250 ea	Inflated Yearly Cost	Present Cost 3 @ $1000 ea	Inflated Yearly Cost	Present Cost 18 @ $150 ea	Inflated Yearly Cost	Present Cost 80 @ $10 ea	Inflated Yearly Cost	Present Cost 2 @ $1000 ea	Inflated Yearly Cost	Present Cost 1 @ $350 ea	Inflated Yearly Cost	Total Inflated Yearly Cost	Present Worth
0	$ 10,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
2		$ 10,609.00		$ -		$ -		$ -		$ -		$ -	$ 10,609.00	$ 9,668.66
3		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
4		$ 11,255.09		$ -		$ -		$ -		$ -		$ -	$ 11,255.09	$ 9,348.30
5		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
6		$ 11,940.52		$ -		$ -		$ -		$ -		$ -	$ 11,940.52	$ 9,038.56
7		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
8		$ 12,667.70		$ -		$ -		$ -		$ -		$ -	$ 12,667.70	$ 8,739.08
9		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
10		$ 13,439.16		$ -		$ -		$ -		$ -		$ -	$ 13,439.16	$ 8,449.52
11				$ -		$ -		$ -		$ -		$ -	$ -	$ -
12				$ -		$ -		$ -		$ -		$ -	$ -	$ -
13				$ -		$ -		$ -		$ -		$ -	$ -	$ -
14				$ -		$ -		$ -		$ -		$ -	$ -	$ -
15				$ -		$ -		$ -		$ -		$ -	$ -	$ -
16				$ -		$ -		$ -		$ -		$ -	$ -	$ -
17				$ -		$ -		$ -		$ -		$ -	$ -	$ -
18				$ -		$ -		$ -		$ -		$ -	$ -	$ -
19				$ -		$ -		$ -		$ -		$ -	$ -	$ -
20				$ -		$ -		$ -		$ -		$ -	$ -	$ -
												TOTAL PRESENT WORTH	=	$ 45,244.12

TABLE G-28
UV DISINFECTION OMR COSTS
all costs based on 2007 dollars

Design Life	**14**	**years**
Design Year	**2031**	
Interest Rate	**4.75%**	
Inflation Rate	**3%**	
Net Rate	**1.75%**	

UV-SBR

Capital Cost[3]:

Item	Annual Cost	2007 Present Worth
Operation		
Electricity[1]		
UV Modules	$ 9,933.84	$ 69,034.16
Subtotal	$ 9,933.84	$ 69,034.16
Maintenance		
Labor[2]	$ -	$ -
Subtotal	$ -	$ -
Replacement		
Parts	$ 8,995.95	$ 62,516.37
Subtotal	$ 8,995.95	$ 62,516.37
TOTAL	**$ 18,929.79**	**$ 131,550.53**

Notes:
1) UV disinfection only
2) Included with secondary treatment cost
3) Capital costs are for solids treatment and disposal systems only.

Replacement - UV Disinfection - SBR

	Part													
	Lamp Replacement Every 2 years													
Year	Present Cost 80 @ $250 ea	Inflated Yearly Cost	Present Cost 3 @ $1000 ea	Inflated Yearly Cost	Present Cost 18 @ $150 ea	Inflated Yearly Cost	Present Cost 80 @ $10 ea	Inflated Yearly Cost	Present Cost 2 @ $1000 ea	Inflated Yearly Cost	Present Cost 1 @ $350 ea	Inflated Yearly Cost	Total Inflated Yearly Cost	Present Worth
0	$ 20,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
2		$ 21,218.00		$ -		$ -		$ -		$ -		$ -	$ 21,218.00	$ 19,337.32
3		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
4		$ 22,510.18		$ -		$ -		$ -		$ -		$ -	$ 22,510.18	$ 18,696.61
5		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
6		$ 23,881.05		$ -		$ -		$ -		$ -		$ -	$ 23,881.05	$ 18,077.12
7		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
8		$ 25,335.40		$ -		$ -		$ -		$ -		$ -	$ 25,335.40	$ 17,478.15
9		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
10		$ 26,878.33		$ -		$ -		$ -		$ -		$ -	$ 26,878.33	$ 16,899.04
11				$ -		$ -		$ -		$ -		$ -	$ -	$ -
12				$ -		$ -		$ -		$ -		$ -	$ -	$ -
13				$ -		$ -		$ -		$ -		$ -	$ -	$ -
14				$ -		$ -		$ -		$ -		$ -	$ -	$ -
15				$ -		$ -		$ -		$ -		$ -	$ -	$ -
16				$ -		$ -		$ -		$ -		$ -	$ -	$ -
17				$ -		$ -		$ -		$ -		$ -	$ -	$ -
18				$ -		$ -		$ -		$ -		$ -	$ -	$ -
19				$ -		$ -		$ -		$ -		$ -	$ -	$ -
20				$ -		$ -		$ -		$ -		$ -	$ -	$ -
												TOTAL PRESENT WORTH	=	$ 90,488.24

UV-AS

Capital Cost[3]:

Item	Annual Cost	2007 Present Worth
Operation		
Electricity[1]		
UV Modules	$ 13,245.12	$ 92,045.54
Subtotal	$ 13,245.12	$ 92,045.54
Maintenance		
Labor[2]	$ -	$ -
Subtotal	$ -	$ -
Replacement		
Parts	$ 8,995.95	$ 62,516.37
Subtotal	$ 8,995.95	$ 62,516.37
TOTAL	**$ 22,241.07**	**$ 154,561.91**

Notes:
1) UV disinfection only
2) Included with secondary treatment cost
3) Capital costs are for solids treatment and disposal systems only.

Replacement - UV Disinfection - Conv. AS

	Part													
	Lamp Replacement Every 2 years													
Year	Present Cost 80 @ $250 ea	Inflated Yearly Cost	Present Cost 3 @ $1000 ea	Inflated Yearly Cost	Present Cost 18 @ $150 ea	Inflated Yearly Cost	Present Cost 80 @ $10 ea	Inflated Yearly Cost	Present Cost 2 @ $1000 ea	Inflated Yearly Cost	Present Cost 1 @ $350 ea	Inflated Yearly Cost	Total Inflated Yearly Cost	Present Worth
0	$ 20,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
2		$ 21,218.00		$ -		$ -		$ -		$ -		$ -	$ 21,218.00	$ 19,337.32
3		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
4		$ 22,510.18		$ -		$ -		$ -		$ -		$ -	$ 22,510.18	$ 18,696.61
5		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
6		$ 23,881.05		$ -		$ -		$ -		$ -		$ -	$ 23,881.05	$ 18,077.12
7		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
8		$ 25,335.40		$ -		$ -		$ -		$ -		$ -	$ 25,335.40	$ 17,478.15
9		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
10		$ 26,878.33		$ -		$ -		$ -		$ -		$ -	$ 26,878.33	$ 16,899.04
11				$ -		$ -		$ -		$ -		$ -	$ -	$ -
12				$ -		$ -		$ -		$ -		$ -	$ -	$ -
13				$ -		$ -		$ -		$ -		$ -	$ -	$ -
14				$ -		$ -		$ -		$ -		$ -	$ -	$ -
15				$ -		$ -		$ -		$ -		$ -	$ -	$ -
16				$ -		$ -		$ -		$ -		$ -	$ -	$ -
17				$ -		$ -		$ -		$ -		$ -	$ -	$ -
18				$ -		$ -		$ -		$ -		$ -	$ -	$ -
19				$ -		$ -		$ -		$ -		$ -	$ -	$ -
20				$ -		$ -		$ -		$ -		$ -	$ -	$ -
												TOTAL PRESENT WORTH	=	$ 90,488.24

UV-MBR

Capital Cost[3]:

Item	Annual Cost	2007 Present Worth
Operation		
Electricity[1]		
UV Modules	$ 13,245.12	$ 92,045.54
Subtotal	$ 13,245.12	$ 92,045.54
Maintenance		
Labor[2]	$ -	$ -
Subtotal	$ -	$ -
Replacement		
Parts	$ 8,995.95	$ 62,516.37
Subtotal	$ 8,995.95	$ 62,516.37
TOTAL	**$ 22,241.07**	**$ 154,561.91**

Notes:
1) UV disinfection only
2) Included with secondary treatment cost
3) Capital costs are for solids treatment and disposal systems only.

Replacement - UV Disinfection - Conv. AS

	Part													
	Lamp Replacement Every 2 years													
Year	Present Cost 80 @ $250 ea	Inflated Yearly Cost	Present Cost 3 @ $1000 ea	Inflated Yearly Cost	Present Cost 18 @ $150 ea	Inflated Yearly Cost	Present Cost 80 @ $10 ea	Inflated Yearly Cost	Present Cost 2 @ $1000 ea	Inflated Yearly Cost	Present Cost 1 @ $350 ea	Inflated Yearly Cost	Total Inflated Yearly Cost	Present Worth
0	$ 20,000.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
2		$ 21,218.00		$ -		$ -		$ -		$ -		$ -	$ 21,218.00	$ 19,337.32
3		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
4		$ 22,510.18		$ -		$ -		$ -		$ -		$ -	$ 22,510.18	$ 18,696.61
5		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
6		$ 23,881.05		$ -		$ -		$ -		$ -		$ -	$ 23,881.05	$ 18,077.12
7		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
8		$ 25,335.40		$ -		$ -		$ -		$ -		$ -	$ 25,335.40	$ 17,478.15
9		$ -		$ -		$ -		$ -		$ -		$ -	$ -	$ -
10		$ 26,878.33		$ -		$ -		$ -		$ -		$ -	$ 26,878.33	$ 16,899.04
11				$ -		$ -		$ -		$ -		$ -	$ -	$ -
12				$ -		$ -		$ -		$ -		$ -	$ -	$ -
13				$ -		$ -		$ -		$ -		$ -	$ -	$ -
14				$ -		$ -		$ -		$ -		$ -	$ -	$ -
15				$ -		$ -		$ -		$ -		$ -	$ -	$ -
16				$ -		$ -		$ -		$ -		$ -	$ -	$ -
17				$ -		$ -		$ -		$ -		$ -	$ -	$ -
18				$ -		$ -		$ -		$ -		$ -	$ -	$ -
19				$ -		$ -		$ -		$ -		$ -	$ -	$ -
20				$ -		$ -		$ -		$ -		$ -	$ -	$ -
												TOTAL PRESENT WORTH	=	$ 90,488.24

TABLE G-29
Harrisburg WWTP Improvements
Design Life **10** **years**
Design Condition **2021** **(from 2011-2021)**
7/13/2007

PRELIMINARY

	Solids Treatment & Disposal									
	Unit									
	RDT	Polymer Feed Pump	Polymer Mixer	Aeration Blowers	RDT Feed Pumps	RDT-to-Digester Feed Pumps	Belt Filter Press Feed Pump	Belt Filter Press	BFP-to-Sludge Storage Tank Feed Pumps	Sludge Storage Tank Mixer
Nameplate Horsepower	0	0.5	0.5	125	0	0	5	10	5	15
Daily Hours of Operation	4	4	4	24	4	4	4	4	4	1
Electricity Cost, $				0.06						
				1 hp = 0.746 KWH						
Max Electricity Draw, KWH	0	0.373	0.373	93.25	0	0	3.73	7.46	3.73	11.19
Annual Electricity Cost	$ -	$ 32.67	$ 32.67	$ 49,012.20	$ -	$ -	$ 46.55	$ 93.10	$ 326.75	$ 34.91
Number of Units	1	1	1	2	1	1	1	1	1	1
Total Annual Electricity Cost	$ -	$ 32.67	$ 32.67	$ 98,024.40	$ -	$ -	$ 46.55	$ 93.10	$ 326.75	$ 34.91
TOTAL	**$**									**98,591.06**

TABLE G-30
SOLIDS TREATMENT OMR COSTS
Harrisburg WWTP Improvements

Design Life	10	years
Design Condition	2021	(from 2011-2021)
Interest Rate	4.75%	
Inflation Rate	3%	

PRELIMINARY

Alternative 1 - Aerobic Digester

Item	Annual Cost	2007 Present Worth
Capital Cost[3]:	????	
Operation		
Electricity[1]		
RDT	$ -	$ -
Polymer Feed Pump	$ 32.87	$ 240.45
Polymer Mixer	$ 32.87	$ 240.45
Aeration Blowers	$ 98,024.40	$ 721,351.22
RDT Feed Pumps	$ -	$ -
RDT-to-Digester Feed Pumps	$ -	$ -
Belt Filter Press Feed Pump	$ 46.55	$ 342.56
Belt Filter Press	$ 93.10	$ 685.12
BFP-to-Sludge Storage Tank Feed Pumps	$ 326.75	$ 2,404.50
Sludge Storage Tank Mixer	$ 34.91	$ 256.92
Subtotal	$ 98,591.06	$ 725,521.23
Maintenance		
Labor[2]	$ -	$ -
Subtotal	$ -	$ -
Replacement		
Parts	$ 8,111.40	$ 59,690.91
Subtotal	$ 8,111.40	$ 59,690.91
TOTAL	$ 106,702.46	$ 785,212.13

Notes:
1) Solids treatment and storage only
2) Included in secondary treatment
3) Capital costs are for solids treatment and disposal systems only.

Replacement - Solids Treatment & Disposal Only

Year	Part: Blower Belt, Every 2 years, 6 @ $75 ea		Blower Lubrication, Every year, 2 @ $1000 ea		Blower Filters, 6 times per year, 12 @ $150 ea		RDT Turbine Wheels, Every 5 years, 6 @ $300 ea		RDT Drive Chain, Every 5 years, 2 @ $40 ea		Polymer Pump Rebuild Kit, Every year, 1 @ $350 ea	
	Present Cost	Inflated Yearly Cost	Present Cost	Inflated Yearly Cost	Present Cost	Inflated Yearly Cost	Present Cost	Inflated Yearly Cost	Present Cost	Inflated Yearly Cost	Present Cost	Inflated Yearly Cost
0	$ 450.00	$ -	$ 2,000.00	$ -	$ 1,800.00	$ -	$ -	$ -	$ -	$ -	$ 350.00	$ -
1		$ -		$ 2,060.00		$ 1,854.00		$ -		$ -		$ 360.50
2		$ 477.41		$ 2,121.80		$ 1,909.62		$ -		$ -		$ 371.32
3		$ -		$ 2,185.45		$ 1,966.91		$ -		$ -		$ 382.45
4		$ 506.48		$ 2,251.02		$ 2,025.92		$ -		$ -		$ 393.93
5		$ -		$ 2,318.55		$ 2,086.69		$ -		$ -		$ 405.75
6		$ 537.32		$ 2,388.10		$ 2,149.29		$ -		$ -		$ 417.92
7		$ -		$ 2,459.75		$ 2,213.77		$ -		$ -		$ 430.46
8		$ 570.06		$ 2,533.54		$ 2,280.19		$ -		$ -		$ 443.37
9		$ -		$ 2,609.55		$ 2,348.59		$ -		$ -		$ 456.67
10		$ 604.76		$ 2,687.83		$ 2,419.05		$ -		$ -		$ 470.37

Year	Part: RDT Feed Pump Seals, Every 5 years, 0 @ $2000 ea		RDT-to-Digester Feed Pumps, Every 5 years, 0 @ $2000 ea		BFP Bearings, Every 5 years, 2 @ $250 ea		BFP Hydraulic Drive Oil, Every year, 1 @ $100 ea		BFP Belts, Every 5 years, 2 @ $4000 ea		BFP Doctor Blades, Every 5 years, 1 @ $300 ea		BFP Feed Pump Seals, Every 5 years, 1 @ $2000 ea		BFP-to-Sludge Storage Tank/Feed Pumps, Every 5 years, 1 @ $2000 ea		Total Inflated Yearly Cost	Present Worth
	Present Cost	Inflated Yearly Cost	Present Cost	Inflated Yearly Cost	Present Cost	Inflated Yearly Cost	Present Cost	Inflated Yearly Cost	Present Cost	Inflated Yearly Cost	Present Cost	Inflated Yearly Cost	Present Cost	Inflated Yearly Cost	Present Cost	Inflated Yearly Cost		
0	$ -	$ -	$ -	$ -	$ 500.00	$ -	$ 100.00	$ -	$ 8,000.00	$ -	$ 300.00	$ -	$ 2,000.00	$ -	$ 2,000.00	$ -	$ -	$ -
1		$ -		$ -		$ -		$ 103.00		$ -		$ -		$ -		$ -	$ 4,377.50	$ 4,178.00
2		$ -		$ -		$ -		$ 106.09		$ -		$ -		$ -		$ -	$ 4,986.23	$ 4,844.27
3		$ -		$ -		$ -		$ 109.27		$ -		$ -		$ -		$ -	$ 4,644.09	$ 4,040.53
4		$ -		$ -		$ -		$ 112.55		$ -		$ -		$ -		$ -	$ 5,288.89	$ 4,392.70
5		$ -		$ -		$ 579.64		$ 115.93		$ 9,274.19		$ 347.78		$ 2,316.55		$ 2,316.55	$ 15,765.62	$ 15,672.57
6		$ -		$ -		$ -		$ 119.41		$ -		$ -		$ -		$ -	$ 5,612.05	$ 4,248.12
7		$ -		$ -		$ -		$ 122.99		$ -		$ -		$ -		$ -	$ 5,228.96	$ 3,777.21
8		$ -		$ -		$ -		$ 126.68		$ -		$ -		$ -		$ -	$ 5,953.82	$ 4,107.37
9		$ -		$ -		$ -		$ 130.48		$ -		$ -		$ -		$ -	$ 5,546.29	$ 3,852.06
10		$ -		$ -		$ 671.96		$ 134.39		$ 10,751.33		$ 403.17		$ 2,687.83		$ 2,687.83	$ 23,518.54	$ 14,766.66
																	$ -	$ -
																	$ -	$ -
																	$ -	$ -
																	$ -	$ -
																	$ -	$ -
																	$ -	$ -
																	$ -	$ -
																	$ -	$ -
																TOTAL PRESENT WORTH	=	$ 63,401.48

TABLE G-31
Harrisburg WWTP Improvements
Design Life 10 years
Design Condition 2031 (from 2021-2031)
7/13/2007

PRELIMINARY

	Solids Treatment & Disposal Unit									
	RDT	Polymer Feed Pump	Polymer Mixer	Internal Draft Tube Mixers	RDT Feed Pumps	RDT-to-Digester Feed Pumps	Belt Filter Press Feed Pump	Belt Filter Press	BFP-to-Sludge Storage Tank Feed Pumps	Sludge Storage Tank Mixer
Nameplate Horsepower	5	0.5	0.5	10	5	5	5	10	5	15
Daily Hours of Operation	4	4	4	24	4	4	4	4	4	1
Electricity Cost, $				0.06						
				1 hp = 0.746 KWH						
Max Electricity Draw, KWH	3.73	0.373	0.373	7.46	3.73	3.73	3.73	7.46	3.73	11.19
Annual Electricity Cost	$ 326.75	$ 32.67	$ 32.67	$ 3,920.98	$ 326.75	$ 326.75	$ 46.55	$ 93.10	$ 326.75	$ 34.91
Number of Units	1	1	1	2	1	1	1	1	1	1
Total Annual Electricity Cost	$ 326.75	$ 32.67	$ 32.67	$ 7,841.95	$ 326.75	$ 326.75	$ 46.55	$ 93.10	$ 326.75	$ 34.91
TOTAL	**$**									**9,388.86**

TABLE G-32

SOLIDS TREATMENT OMR COSTS

PRELIMINARY

Harrisburg WWTP Improvements
all costs based on 2007 dollars

Design Life	14	years
Design Condition	2031	(from 2021-2031)
Interest Rate	4.75%	
Inflation Rate	3%	
Net Rate	1.75%	

Alternative 1 - Anaerobic Digester		
Capital Cost[3]:	????	
Item	Annual Cost	2007 Present Worth
Operation		
Electricity[1]		
RDT	$ 326.75	$ 2,270.70
Polymer Feed Pump	$ 32.67	$ 227.07
Polymer Mixer	$ 32.67	$ 227.07
Internal Draft Tube Mixers	$ 7,841.95	$ 54,496.80
RDT Feed Pumps	$ 326.75	$ 2,270.70
RDT-to-Digester Feed Pumps	$ 326.75	$ 2,270.70
Belt Filter Press Feed Pump	$ 46.55	$ 323.50
Belt Filter Press	$ 93.10	$ 646.99
BFP-to-Sludge Storage Tank Feed Pumps	$ 326.75	$ 2,270.70
Sludge Storage Tank Mixer	$ 34.91	$ 242.62
Subtotal	$ 9,388.86	$ 65,246.86
Maintenance		
Labor[2]	$ -	$ -
Subtotal	$ -	$ -
Replacement		
Parts	$ 8,161.01	$ 56,714.08
Subtotal	$ 8,161.01	$ 56,714.08
TOTAL	$ 17,549.67	$ 121,960.94

Notes:
1) Solids treatment and storage only
2) Included in secondary treatment
3) Capital costs are for solids treatment and disposal systems only.

Replacement - Solids Treatment & Disposal Only

Part

Year	Present Cost 6 @ $75 ea	Inflated Yearly Cost	Yearly Internal Draft Tube Mixer Maintenance: Present Cost 2 @ $2500 ea	Inflated Yearly Cost	Present Cost 12 @ $150 ea	Inflated Yearly Cost
0	$ -	$ -	$ 5,000.00	$ -	$ -	$ -
1		$ -		$ 5,150.00		$ -
2		$ -		$ 5,304.50		$ -
3		$ -		$ 5,463.64		$ -
4		$ -		$ 5,627.54		$ -
5		$ -		$ 5,796.37		$ -
6		$ -		$ 5,970.26		$ -
7		$ -		$ 6,149.37		$ -
8		$ -		$ 6,333.65		$ -
9		$ -		$ 6,523.87		$ -
10		$ -		$ 6,719.58		$ -

Year	RDT Turirion Wheels Every 5 years: Present Cost 5 @ $300 ea	Inflated Yearly Cost	RDT Drive Chain Every 5 years: Present Cost 1 @ $40 ea	Inflated Yearly Cost	Polymer Pump Rebuild Kit Every year: Present Cost 1 @ $350 ea	Inflated Yearly Cost	RDT Feed Pump Seals Every 5 years: Present Cost 1@ $2000 ea	Inflated Yearly Cost
0	$ 1,500.00	$ -	$ 40.00	$ -	$ 350.00	$ -	$ 2,000.00	$ -
1		$ -		$ -		$ 360.50		$ -
2		$ -		$ -		$ 371.32		$ -
3		$ -		$ -		$ 382.45		$ -
4		$ -		$ -		$ 393.93		$ -
5		$ 1,736.91		$ 46.37		$ 405.75		$ 2,318.55
6		$ -		$ -		$ 417.92		$ -
7		$ -		$ -		$ 430.46		$ -
8		$ -		$ -		$ 443.37		$ -
9		$ -		$ -		$ 456.67		$ -
10		$ 2,015.87		$ 53.76		$ 470.37		$ 2,687.63

Year	RDT-to-Digester Feed Pumps Every 5 years: Present Cost 1 @ $2000 ea	Inflated Yearly Cost	BFP Bearings Every 5 years: Present Cost 2 @ $250 ea	Inflated Yearly Cost	BFP Hydraulic Drive Oil Every year: Present Cost 1 @ $100 ea	Inflated Yearly Cost	BFP Belts Every 5 years: Present Cost 2 @ $4000 ea	Inflated Yearly Cost
0	$ 2,000.00	$ -	$ 500.00	$ -	$ 100.00	$ -	$ 8,000.00	$ -
1		$ -		$ -		$ 103.00		$ -
2		$ -		$ -		$ 106.09		$ -
3		$ -		$ -		$ 109.27		$ -
4		$ -		$ -		$ 112.55		$ -
5		$ 2,318.55		$ 579.64		$ 115.93		$ 9,274.19
6		$ -		$ -		$ 119.41		$ -
7		$ -		$ -		$ 122.99		$ -
8		$ -		$ -		$ 126.68		$ -
9		$ -		$ -		$ 130.48		$ -
10		$ 2,687.63		$ 671.96		$ 134.39		$ 10,751.33

Year	BFP Doctor Blades Every 5 years: Present Cost 1 @ $300 ea	Inflated Yearly Cost	BFP Feed Pump Seals Every 5 years: Present Cost 1@ $2000 ea	Inflated Yearly Cost	BFP-to-Sludge Storage TankFeed Pumps Every 5 years: Present Cost 1 @ $2000 ea	Inflated Yearly Cost	Total Inflated Yearly Cost	Present Worth
0	$ 300.00	$ -	$ 2,000.00	$ -	$ 2,000.00	$ -	$ -	$ -
1		$ -		$ -		$ -	$ 5,613.50	$ 5,358.95
2		$ -		$ -		$ -	$ 5,761.91	$ 5,269.42
3		$ -		$ -		$ -	$ 5,955.36	$ 5,181.39
4		$ -		$ -		$ -	$ 6,134.02	$ 5,094.83
5		$ 347.78		$ 2,318.55		$ 2,318.55	$ 27,579.13	$ 21,868.07
6		$ -		$ -		$ -	$ 6,507.59	$ 4,926.01
7		$ -		$ -		$ -	$ 6,702.81	$ 4,843.72
8		$ -		$ -		$ -	$ 6,903.90	$ 4,762.60
9		$ -		$ -		$ -	$ 7,111.01	$ 4,683.23
10		$ 403.17		$ 2,687.63		$ 2,687.63	$ 31,971.77	$ 20,101.40
TOTAL PRESENT WORTH							=	$ 82,069.81

TABLE G-33
Harrisburg WWTP Improvements

	ESTIMATE	
Design Life	**10**	**years**
Design Condition	**2021**	**(from 2011-2021)**
7/20/2007		

all costs are based on 2007 dollars

Biosolids Land Application & Management

	Spread Biosolids	Haul Biosolids up to 20 miles	Mobilization Fee	Biosolids Management Program
Number of gallons	713,337	713,337		
Unit Cost	2 ¢/gal	2.5 ¢/gal	1,000 $/trip	5,000 $/year
Trips per year	2	2	2	
Total Cost	$28,533	$35,667	$2,000	$5,000
TOTAL COST PER YEAR		**$71,200**		

TABLE G-34
SOLIDS DISPOSAL OMR COSTS

ESTIMATE

Harrisburg WWTP Improvements
all costs based on 2007 dollars

Design Life	10	years
Design Condition	2021	(from 2011-2021)
Interest Rate	4.75%	
Inflation Rate	3%	
Real Interest Rate (adjusted for inflation)	1.75%	

Aerobic Digester

Item	Annual Cost	Present Worth
Biosolids Hauling		
Land Application	$ 28,533.48	$ 215,694.15
Biosolids Transport 20 mi	$ 35,666.85	$ 269,617.69
Subtotal	$ 64,200.33	$ 485,311.84
Overhead Fees		
Transport Mobilization Fee	$ 2,000.00	$ 15,118.67
Subtotal	$ 2,000.00	$ 15,118.67
Management Program		
Lump Sum: Yearly	$ 5,000.00	$ 37,796.68
Subtotal	$ 5,000.00	$ 37,796.68
TOTAL	**$ 71,200.33**	**$ 538,227.19**

Notes:
1) Assumed solids concentration for aerobic digestion is 10%

Inflated Costs

Year	Land Application		Biosolids Transport 20 mi		Transportation Mobilization Fee		Biosolids Management Program		Total Inflated Yearly Cost	Present Worth
	Present Cost Per Year	Inflated Yearly Cost	Present Cost Per Year	Inflated Yearly Cost	Present Cost Per Year	Inflated Yearly Cost	Present Cost Per Year	Inflated Yearly Cost		
0	$ 28,533.48	$ -	$ 35,666.85	$ -	$ 2,000.00	$ -	$ 5,000.00	$ -	$ -	$ -
1		$ 29,389.48		$ 36,736.86		$ 2,060.00		$ 5,150.00	$ 73,336.34	$ 70,010.83
2		$ 30,271.17		$ 37,838.96		$ 2,121.80		$ 5,304.50	$ 75,536.43	$ 68,841.19
3		$ 31,179.30		$ 38,974.13		$ 2,185.45		$ 5,463.64	$ 77,802.52	$ 67,691.10
4		$ 32,114.68		$ 40,143.35		$ 2,251.02		$ 5,627.54	$ 80,136.60	$ 66,560.22
5		$ 33,078.12		$ 41,347.65		$ 2,318.55		$ 5,796.37	$ 82,540.70	$ 65,448.24
6		$ 34,070.47		$ 42,588.08		$ 2,388.10		$ 5,970.26	$ 85,016.92	$ 64,354.83
7		$ 35,092.58		$ 43,865.73		$ 2,459.75		$ 6,149.37	$ 87,567.43	$ 63,279.69
8		$ 36,145.36		$ 45,181.70		$ 2,533.54		$ 6,333.85	$ 90,194.45	$ 62,222.51
9		$ 37,229.72		$ 46,537.15		$ 2,609.55		$ 6,523.87	$ 92,900.28	$ 61,183.00
10		$ 38,346.61		$ 47,933.26		$ 2,687.83		$ 6,719.58	$ 95,687.29	$ 60,160.85
									$ -	**$ 649,752.47**

TABLE G-35
Harrisburg WWTP Improvements

ESTIMATE		
Design Life	**10**	**years**
Design Condition	**2031**	**(from 2021-2031)**

7/20/2007
all costs are based on 2007 dollars

Biosolids Land Application & Management

	Spread Biosolids	Haul Biosolids up to 20 miles	Mobilization Fee	Biosolids Management Program
Number of gallons	595,252	595,252		
Unit Cost	2 ¢/gal	2.5 ¢/gal	1,000 $/trip	5,000 $/year
Trips per year	2	2	2	
Total Cost	$23,810	$29,763	$2,000	$5,000
TOTAL COST PER YEAR		**$60,573**		

TABLE G-36

SOLIDS DISPOSAL OMR COSTS

ESTIMATE

Harrisburg WWTP Improvements
all costs based on 2007 dollars

Design Life	**10**	**years**
Design Condition	**2031**	**(from 2021-2031)**
Interest Rate	**4.75%**	
Inflation Rate	**3%**	
Real Interest Rate (adjusted for inflation)	**1.75%**	

Anaerobic Digester

Item	Annual Cost	2007 Present Worth
Biosolids Hauling		
Land Application	$ 23,810.08	$ 196,714.55
Biosolids Transport 20 mi	$ 29,762.60	$ 245,893.18
Subtotal	$ 53,572.68	$ 442,607.73
Overhead Fees		
Transport Mobilization Fee	$ 2,000.00	$ 16,523.64
Subtotal	$ 2,000.00	$ 16,523.64
Management Program		
Lump Sum: Yearly	$ 5,000.00	$ 41,309.09
Subtotal	$ 5,000.00	$ 41,309.09
TOTAL	**$ 60,572.68**	**$ 500,440.46**

Notes:

1) Assumed solids concentration for anaerobic digestion is 15%

Inflated Costs

Year	Land Application		Biosolids Transport 20 mi		Transportation Mobilization Fee		Biosolids Management Program		Total Inflated Yearly Cost	Present Worth
	Present Cost Per Year	Inflated Yearly Cost	Present Cost Per Year	Inflated Yearly Cost	Present Cost Per Year	Inflated Yearly Cost	Present Cost Per Year	Inflated Yearly Cost		
0	$ 23,810.08	$ -	$ 29,762.60	$ -	$ 2,000.00	$ -	$ 5,000.00	$ -	$ -	$ -
1		$ 32,958.72		$ 41,198.40		$ 2,768.47		$ 6,921.17	$ 83,846.76	$ 50,325.94
2		$ 33,947.48		$ 42,434.35		$ 2,851.52		$ 7,128.80	$ 86,362.16	$ 49,485.17
3		$ 34,965.91		$ 43,707.38		$ 2,937.07		$ 7,342.67	$ 88,953.02	$ 48,658.45
4		$ 36,014.88		$ 45,018.60		$ 3,025.18		$ 7,562.95	$ 91,621.61	$ 47,845.54
5		$ 37,095.33		$ 46,369.16		$ 3,115.93		$ 7,789.84	$ 94,370.26	$ 47,046.21
6		$ 38,208.19		$ 47,760.24		$ 3,209.41		$ 8,023.53	$ 97,201.37	$ 46,260.24
7		$ 39,354.43		$ 49,193.04		$ 3,305.70		$ 8,264.24	$ 100,117.41	$ 45,487.40
8		$ 40,535.07		$ 50,668.83		$ 3,404.87		$ 8,512.17	$ 103,120.93	$ 44,727.46
9		$ 41,751.12		$ 52,188.90		$ 3,507.01		$ 8,767.53	$ 106,214.56	$ 43,980.23
10		$ 43,003.65		$ 53,754.57		$ 3,612.22		$ 9,030.56	$ 109,401.00	$ 43,245.47
									$ -	**$ 467,062.12**

TABLE G-37

Aerated Lagoon - OPTER/SAGR

PRELIMINARY

Harrisburg WWTP

3/10/2009

Design Condition 2019

Pond Aeration Blowers			
Airflow to Lagoons (SCFM)		5100	
Electricity Cost:	$	0.06	
1hp=		0.746	kwh
SCFM/bhp=		26	
Hours of operation per day:		24	
Total bhp=		196.2	
Total Max Electricity Draw:		146.33	KW H
Annual Electricity Cost:	$	76,911.452	
Design life:		10	years
Interest Rate:		4.75%	
Inflation Rate:		3%	
Electricity Present Worth:	$	681,427.60	

SAGR Blowers			
Airflow to SAGR (SCFM)		1215	
Electricity Cost:	$	0.06	
1hp=		0.746	kwh
SCFM/bhp=		26	
Hours of operation per day:		24	
Total bhp=		46.7	
Total Max Electricity Draw:		34.86	KW H
Annual Electricity Cost:	$	18,323.022	
Design life:		10	years
Interest Rate:		4.75%	
Inflation Rate:		3%	
Electricity Present Worth:	$	162,340.10	

TABLE G-38

Aerated Lagoon - OPTER/SAGR - OMR Costs

Design Condition	**2019**	(from 2009 thru 2019)
Design Life	**10**	**years**
Interest Rate	**4.75%**	
Inflation Rate	**3%**	

Aerated Lagoon - OPTER/SAGR

Capital Cost[3]:

Item	Annual Cost	2009 Present Worth
Operation		
Electricity[1]		
Pond Aeration Blowers	$ 76,911.45	$ 681,427.60
SAGR Blowers	$ 18,323.02	$ 162,340.10
	$ -	$ -
	$ -	$ -
Subtotal	$ 95,234.47	$ 843,767.70
Maintenance		
Chemical Phosphorus		
Testing Costs	$ 64,662.50	$ 572,903.13
Labor[2]	$ 60,375.00	$ 534,916.32
Subtotal	$ 125,037.50	$ 1,107,819.46
Replacement		
Parts	$ 46,684.14	$ 413,616.72
Subtotal	$ 46,684.14	$ 413,616.72
TOTAL	**$ 266,956.12**	**$ 2,365,203.88**

Notes:

1) See electricy costs appendix for per unit annual electrical cost calculations.
2) Annual maintenance labor costs are based on 3/4 FTE. FTE pay assumed at $80,500/yr (salary + benefits)
3) Capital costs are for secondary treatment system only.

Replacement - Aerated Lagoon OPTER/SAGR

	Part											
	Membrane Diffusers Every 10 years		Blower Belt Every 2 years		Blower Lubrication Twice Every year		Blower Filters 3 times per year		Sludge Removal			
Year	Present Cost 1065@$220 ea.	Inflated Yearly Cost	Present Cost 6 @ $400 and 2 @$200 ea	Inflated Yearly Cost	Present Cost 6 @ $180 and 2 @80 ea	Inflated Yearly Cost	Present Cost 6 @ $125 and 2 @ $100 ea	Inflated Yearly Cost	Present Cost	Inflated Yearly Cost	Total Inflated Yearly Cost	Present Worth
0	$ 234,300.00	$ -	$ 2,800.00	$ -	$ 2,480.00	$ -	$ 2,850.00	$ -	$ 125,000.00	$ -	$ -	$ -
1		$ -		$ -		$ 2,554.40		$ 2,935.50		$ -	$ 5,489.90	$ 5,240.95
2		$ -		$ 2,970.52		$ 2,631.03		$ 3,023.57		$ -	$ 8,625.12	$ 7,860.62
3		$ -		$ -		$ 2,709.96		$ 3,114.27		$ -	$ 5,824.23	$ 5,067.30
4		$ -		$ 3,151.42		$ 2,791.26		$ 3,207.70		$ -	$ 9,150.39	$ 7,600.17
5		$ -		$ -		$ 2,875.00		$ 3,303.93		$ -	$ 6,178.93	$ 4,899.40
6		$ -		$ 3,343.35		$ 2,961.25		$ 3,403.05		$ -	$ 9,707.65	$ 7,348.35
7		$ -		$ -		$ 3,050.09		$ 3,505.14		$ -	$ 6,555.23	$ 4,737.07
8		$ -		$ 3,546.96		$ 3,141.59		$ 3,610.29		$ -	$ 10,298.84	$ 7,104.87
9		$ -		$ -		$ 3,235.84		$ 3,718.60		$ -	$ 6,954.44	$ 4,580.11
10		$ 314,879.61		$ 3,762.97		$ 3,332.91		$ 3,830.16		$ 167,989.55	$ 493,795.20	$ 310,460.64
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
										TOTAL PRESENT WORTH	=	**$ 364,899.48**

TABLE G-39
OPTER/SAGR
Harrisburg WWTP
8/16/2007
Design Condition 2029

PRELIMINARY

Pond Aeration Blowers			
Airflow to Lagoons (SCFM)		10100	
Electricity Cost:	$	0.06	
SCFM/bhp=		26	
1hp=		0.746	kwh
Total bhp=		388.5	total of 3 blowers
Hours of operation per day:		24	
Total Max Electricity Draw:		289.79	KW H
Annual Electricity Cost:	$	152,314.837	
Design life:		10	years
Interest Rate:		4.75%	
Inflation Rate:		3%	
Electricity 2011 Present Worth:	$	1,349,493.87	

SAGR Blowers			
Airflow to SAGR (SCFM)		2050	
Electricity Cost:	$	0.06	
SCFM/bhp=		26	
1hp=		0.746	kwh
Total bhp=		78.8	
Hours of operation per day:		24	
Total Max Electricity Draw:		58.82	KW H
Annual Electricity Cost:	$	30,915.388	
Design life:		10	years
Interest Rate:		4.75%	
Inflation Rate:		3%	
Electricity 2011 Present Worth:	$	273,907.17	

TABLE G-40

Aerated Lagoon - OPTER/SAGR - OMR Costs

Design Condition	**2029**	(from 2019 thru 2029)
Design Life	**10**	**years**
all costs based on 2007 dollars		
Interest Rate	**4.75%**	
Inflation Rate	**3%**	
Net Rate	**1.75%**	

OPTER/SAGR

Capital Cost[3]:

Item	Annual Cost	2019 Present Worth
Operation		
Electricity[1]		
Pond Aeration Blowers	$ 152,314.84	$ 1,349,493.87
SAGR Blowers	$ 30,915.39	$ 273,907.17
	$ -	$ -
	$ -	$ -
Subtotal	$ 183,230.22	$ 1,623,401.04
Maintenance		
Chemical Phosphorus	$ 27,270.00	$ 241,609.41
Testing Costs	$ 64,662.50	$ 572,903.13
Labor[2]	$ 60,375.00	$ 534,916.32
Subtotal	$ 152,307.50	$ 1,349,428.87
Replacement		
Parts	$ 46,684.14	$ 413,616.72
Subtotal	$ 46,684.14	$ 413,616.72
TOTAL	**$ 382,221.87**	**$ 3,386,446.63**

Convert to 2009 Present Worth

Notes:

1) See electricy costs appendix for per unit annual electrical cost calculations.
2) Annual maintenance labor costs are based on 3/4 FTE. FTE pay assumed at $80,500/yr (salary + benefits)
3) Capital costs are for secondary treatment system only.

Replacement - Aerated Lagoon OPTER/SAGR

	Part: Membrane Diffusers Every 10 years		Blower Belt Every 2 years		Blower Lubrication Twice Every year		Blower Filters 3 times per year		Sludge Removal			
Year	Present Cost 1065@$220 ea.	Inflated Yearly Cost	Present Cost 6 @ $400 and 2 @$200 ea	Inflated Yearly Cost	Present Cost 6 @ $180 and 2 @80 ea	Inflated Yearly Cost	Present Cost 6 @ $125 and 2 @ $100 ea	Inflated Yearly Cost	Present Cost	Inflated Yearly Cost	Total Inflated Yearly Cost	Present Worth
0	$ 234,300.00	$ -	$ 2,800.00	$ -	$ 2,480.00	$ -	$ 2,850.00	$ -	$ 125,000.00	$ -	$ -	$ -
1		$ -		$ -		$ 2,554.40		$ 2,935.50		$ -	$ 5,489.90	$ 5,240.95
2		$ -		$ 2,970.52		$ 2,631.03		$ 3,023.57		$ -	$ 8,625.12	$ 7,860.62
3		$ -		$ -		$ 2,709.96		$ 3,114.27		$ -	$ 5,824.23	$ 5,067.30
4		$ -		$ 3,151.42		$ 2,791.26		$ 3,207.70		$ -	$ 9,150.39	$ 7,600.17
5		$ -		$ -		$ 2,875.00		$ 3,303.93		$ -	$ 6,178.93	$ 4,899.40
6		$ -		$ 3,343.35		$ 2,961.25		$ 3,403.05		$ -	$ 9,707.65	$ 7,348.35
7				$ -		$ 3,050.09		$ 3,505.14		$ -	$ 6,555.23	$ 4,737.07
8		$ -		$ 3,546.96		$ 3,141.59		$ 3,610.29		$ -	$ 10,298.84	$ 7,104.87
9		$ -		$ -		$ 3,235.84		$ 3,718.60		$ -	$ 6,954.44	$ 4,580.11
10		$ 314,879.61		$ 3,762.97		$ 3,332.91		$ 3,830.16		$ 167,989.55	$493,795.20	$ 310,460.64
11											$ -	$ -
12											$ -	$ -
13											$ -	$ -
14											$ -	$ -
15											$ -	$ -
16											$ -	$ -
17											$ -	$ -
18											$ -	$ -
19											$ -	$ -
20											$ -	$ -
								TOTAL PRESENT WORTH =				$ 364,899.48

TABLE G-41
Aerated Lagoon - Lemna
Harrisburg WWTP
3/10/2009
Design Condition 2019

PRELIMINARY

Aeration Blowers		
Nameplate Horsepower:	25	
Electricity Cost:	$ 0.06	
1hp=	0.746	kwh
Number of units:	2	
Hours of operation per day:	24	
Total Max Electricity Draw:	37.30	KW H
Annual Electricity Cost:	$ 19,604.880	
Design life:	10	years
Interest Rate:	4.75%	
Inflation Rate:	3%	
Electricity Present Worth:	$ 173,697.23	

Aspirators		
Nameplate Horsepower:	5	
Electricity Cost:	$ 0.06	
1hp=	0.746	kwh
Number of units:	57	
Hours of operation per day:	24	
Total Max Electricity Draw:	212.61	KW H
Annual Electricity Cost:	$ 111,747.816	
Design life:	10	years
Interest Rate:	4.75%	
Inflation Rate:	3%	
Electricity Present Worth:	$ 990,074.22	

TABLE G-42
Aerated Lagoon - Lemna - OMR Costs

Design Condition	**2019**	(from 2009 thru 2019)
Design Life	**10**	**years**
Interest Rate	**4.75%**	
Inflation Rate	**3%**	

Aerated Lagoon - Lemna

Capital Cost[3]:

Item	Annual Cost	2009 Present Worth
Operation		
Electricity[1]		
Blowers	$ 19,604.88	$ 173,697.23
Aspirators	$ 111,747.82	$ 990,074.22
	$ -	$ -
	$ -	$ -
Subtotal	$ 131,352.70	$ 1,163,771.45
Maintenance		
Testing	$ 64,662.50	$ 572,903.13
Labor[2]	$ 60,375.00	$ 534,916.32
Subtotal	$ 125,037.50	$ 1,107,819.46
Replacement		
Parts	$ 15,122.52	$ 111,285.03
Subtotal	$ 15,122.52	$ 111,285.03
TOTAL	**$ 271,512.72**	**$ 2,382,875.93**

Notes:
1) See electricy costs appendix for per unit annual electrical cost calculations.
2) Annual maintenance labor costs are based on 3/4 persons, $60,000/yr (salary + benefits)
3) Capital costs are for secondary treatment system only.

Replacement - Aerated Lagoon Lemna

Year	Membrane Diffusers Every 10 years: Present Cost 4@$220 ea.	Membrane Diffusers: Inflated Yearly Cost	Blower Belt Every 2 years: Present Cost 2 @ $300 ea	Blower Belt: Inflated Yearly Cost	Blower Lubrication Twice Every year: Present Cost 2 @ $100 ea	Blower Lubrication: Inflated Yearly Cost	Blower Filters 3 times per year: Present Cost 2 @ $100 ea	Blower Filters: Inflated Yearly Cost	Aspirators Every 15 years: Present Cost 57 @ $11000 ea.	Aspirators: Inflated Yearly Cost	Settling Cell Cleaning: Present Cost	Settling Cell Cleaning: Inflated Yearly Cost	Total Inflated Yearly Cost	Present Worth
0	$ 880.00	$ -	$ 600.00	$ -	$ 400.00	$ -	$ 600.00	$ -		$ -	$ 125,000.00	$ -	$ -	$ -
1		$ -		$ -		$ 412.00		$ 618.00		$ -		$ -	$ 1,030.00	$ 983.29
2		$ -		$ 636.54		$ 424.36		$ 636.54		$ -		$ -	$ 1,697.44	$ 1,546.99
3		$ -		$ -		$ 437.09		$ 655.64		$ -		$ -	$ 1,092.73	$ 950.71
4		$ -		$ 675.31		$ 450.20		$ 675.31		$ -		$ -	$ 1,800.81	$ 1,495.73
5		$ -		$ -		$ 463.71		$ 695.56					$ 1,159.27	$ 919.21
6		$ -		$ 716.43		$ 477.62		$ 716.43		$ -		$ -	$ 1,910.48	$ 1,446.17
7				$ -		$ 491.95		$ 737.92		$ -		$ -	$ 1,229.87	$ 888.76
8		$ -		$ 760.06		$ 506.71		$ 760.06		$ -		$ -	$ 2,026.83	$ 1,398.25
9		$ -		$ -		$ 521.91		$ 782.86		$ -		$ -	$ 1,304.77	$ 859.31
10		$ 1,182.65		$ 806.35		$ 537.57		$ 806.35		$ -		$ 167,989.55	$ 171,322.46	$ 107,714.45
11													$ -	$ -
12													$ -	$ -
13													$ -	$ -
14													$ -	$ -
15													$ -	$ -
16													$ -	$ -
17													$ -	$ -
18													$ -	$ -
19													$ -	$ -
20										$ -			$ -	$ -
												TOTAL PRESENT WORTH =		$ 118,202.87

TABLE G-43
Aerated Lagoon - Lemna
Harrisburg WWTP
3/10/2009
Design Condition 2029

PRELIMINARY

Aeration Blowers			
Nameplate Horsepower:		25	
Electricity Cost:	$	0.06	
1hp=		0.746	kwh
Number of units:		3	
Hours of operation per day:		24	
Total Max Electricity Draw:		55.95	KW H
Annual Electricity Cost:	$	29,407.320	
Design life:		10	years
Interest Rate:		4.75%	
Inflation Rate:		3%	
Electricity 2011 Present Worth:	$	260,545.85	

total of 3 blowers

Aspirators			
Nameplate Horsepower:		5	
Electricity Cost:	$	0.06	
1hp=		0.746	kwh
Number of units:		103	
Hours of operation per day:		24	
Total Max Electricity Draw:		384.19	KW H
Annual Electricity Cost:	$	201,930.264	
Design life:		10	years
Interest Rate:		4.75%	
Inflation Rate:		3%	
Electricity 2011 Present Worth:	$	1,789,081.48	

TABLE G-44

Aerated Lagoon - Lemna - OMR Costs

Design Condition	**2029**	(from 2019 thru 2029)
Design Life	**10**	**years**
all costs based on 2007 dollars		
Interest Rate	**4.75%**	
Inflation Rate	**3%**	
Net Rate	**1.75%**	

LEMNA

Capital Cost[3]:

Item	Annual Cost	2007 Present Worth
Operation		
Electricity[1]		
Blowers	$ 29,407.32	$ 260,545.85
Aspirators	$ 201,930.26	$ 1,789,081.48
	$ -	$ -
	$ -	$ -
Subtotal	$ 231,337.58	$ 2,049,627.32
Maintenance		
Chemical Phosphorus	$ 37,400.00	$ 331,360.17
Testing	$ 64,662.50	$ 572,903.13
Labor[2]	$ 60,000.00	$ 531,593.86
Subtotal	$ 162,062.50	$ 1,435,857.17
Replacement		
Parts	$ 76,198.49	$ 500,732.84
Subtotal	$ 76,198.49	$ 500,732.84
TOTAL	**$ 469,598.58**	**$ 3,986,217.33**

Notes:

1) See electricy costs appendix for per unit annual electrical cost calculations.
2) Annual maintenance labor costs are based on 0.75 FTE $60,000/yr (salary + benefits)
3) Capital costs are for secondary treatment system only.

Replacement - Aerated Lagoon Lemna

	Part											
	Membrane Diffusers Every 10 years		Blower Belt Every 2 years		Blower Lubrication Twice Every year		Blower Filters 3 times per year		Aspirators Every 10 years			
Year	Present Cost 8@$220 ea.	Inflated Yearly Cost	Present Cost 3 @ $300 ea	Inflated Yearly Cost	Present Cost 3 @ $100 ea	Inflated Yearly Cost	Present Cost 3 @ $100 ea	Inflated Yearly Cost	Present Cost 114 @ $11000 ea.	Inflated Yearly Cost	Total Inflated Yearly Cost	Present Worth
0	$ 1,760.00	$ -	$ 900.00	$ -	$ 600.00	$ -	$ 900.00	$ -	$627,000.00	$ -	$ -	$ -
1		$ -		$ -		$ 618.00		$ 927.00		$ -	$ 1,545.00	$ 1,474.94
2		$ -		$ 954.81		$ 636.54		$ 954.81		$ -	$ 2,546.16	$ 2,320.48
3		$ -		$ -		$ 655.64		$ 983.45		$ -	$ 1,639.09	$ 1,426.07
4		$ -		$ 1,012.96		$ 675.31		$ 1,012.96		$ -	$ 2,701.22	$ 2,243.59
5		$ -		$ -		$ 695.56		$ 1,043.35		$726,864.84	$ 728,603.76	$ 577,725.11
6		$ -		$ 1,074.65		$ 716.43		$ 1,074.65		$ -	$ 2,865.73	$ 2,169.25
7				$ -		$ 737.92		$ 1,106.89		$ -	$ 1,844.81	$ 1,333.13
8		$ -		$ 1,140.09		$ 760.06		$ 1,140.09		$ -	$ 3,040.25	$ 2,097.38
9		$ -		$ -		$ 782.86		$ 1,174.30		$ -	$ 1,957.16	$ 1,288.96
10		$ 2,365.29		$ 1,209.52		$ 806.35		$ 1,209.52		$ -	$ 5,590.69	$ 3,515.00
11											$ -	$ -
12											$ -	$ -
13											$ -	$ -
14											$ -	$ -
15											$ -	$ -
16											$ -	$ -
17											$ -	$ -
18											$ -	$ -
19											$ -	$ -
20											$ -	$ -
										TOTAL PRESENT WORTH =		$ 595,593.92

File

Project
Harrisburg WWT

Calc's for
P removal system Annual Electric Costs

Howard R. Green Company

Sheet No. ____ of ____

Job No. ____

By MJR Date 3/10/2009

Checked ____ Date ____

KEY: → nn input values; nn calculated values

Microsoft Excel 2003

	Phosphorus Removal System Unit				
	Polymer Feed Pump	Polymer Mixer	Sand Filter Feed Pumps	Sand Filter Air Compressor	
Nameplate Horsepower	0.5	0.5	5	25	
Hours of Operation	24	24	24	24	
Electricity Cost, $			0.076		
		1 hp = 0.746 KWH			
Max Electricity Draw, KWH	0.373	0.373	3.73	18.65	0
Electricity Cost	$ 248.33	$ 248.33	$ 2,483.28	$ 12,416.42	$ -
Number of Units	1	1	2	1	
Total Electricity Cost	$ 248.33	$ 248.33	$ 4,966.57	$ 12,416.42	$ -
TOTAL	**$**				**17,879.65**
					$ 17,900.00

Present Worth

Phosphorus Removal System Annual Electrical Costs

all costs based on 2009 dollars

Design Life	**20**	**years**
Design Year	**2029**	
Interest Rate	**4.75%**	
Inflation Rate	**3%**	
Net Rate	**1.75%**	

Phosphorus Removal System Annual Electrical Costs

Capital Cost[3]:

Item		Annual Cost	2009 Present Worth
Operation			
	Phosphorus Removal Electrical	$ 17,900.00	$ 206,813.27
	Subtotal	$ 17,900.00	$ 206,813.27
TOTAL		**$ 17,900.00**	**$ 206,813.27**

Howard R. Green Company

Sheet No. 1 of

Project: Harrisburg WWTP

Job No.

By MJR Date 3/6/2009

Checked Date

Calc's for: Chemical P-removal O&M costs

KEY: → nn input values; nn calculated values

Microsoft Excel 2003

Assumptions:

Chemical Name:	Ferric Chloride	
Percent Solution:	38.0%	
Usual FeCl3 dosage:	18	mg/l per 1 mg/L removed of Phosphorus
Ferric Chloride Density:	11.676	lb/gal
SAGR Effl P concentration:	2.0	mg/L

Given:

Permit Effl P limit:	0.1	mg/L
Design flow:	900000	gal/day
	625	gpm
FeCl3 Dosage req'd:	34.2	mg/L

Feed Points:

Amount Req'd:	256.7	lbs/day
	57.9	gal/day
30-day Storage:	1736	gallons
Unit Cost:	$ 0.10	per lbs assumed
	$ 0.44	per gallon
Daily cost:	$ 25.67	per day
Annual cost:	$ 9,369.74	(assumes equal daily usage)

APPENDIX H

Table H-1: Harrisburg Sanitary Sewer Department Historical and Projected Financials

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Revenue from User Fees	$ 95,569.80	$ 123,276.82	$ 155,049.83	$ 200,712.42									
Revenue from Other Sources	$ 24,844.55	$ 33,804.37	$ 52,606.17	$ 59,785.87									
TOTAL REVENUE	**$ 120,414.35**	**$ 157,081.19**	**$ 207,656.00**	**$ 260,498.29**	**$ 310,525.53**	**$ 369,295.91**	***$ 418,827.36***	***$ 674,610.35***	***$ 1,077,030.37***	***$ 1,719,352.38***	***$ 1,949,559.87***	***$ 2,188,970.46***	***$ 2,457,620.43***
Percent Increase		30%	32%	25%	19%	19%	13%	61%	60%	60%	13%	12%	12%
O&M Costs	$ 34,256.03	$ 55,639.12	$ 59,364.64	$ 78,787.36	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Capital Purchases	$ 9,133.31	$ 5,671.43	$ 3,193.92	$ 59,660.42	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Retirement of Current Debt	$ 41,382.62	$ 39,818.24	$ 45,725.70	$ 39,818.24	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
New Debt Payment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	*$ 662,276.37*	*$ 662,276.37*	*$ 662,276.37*	*$ 662,276.37*	*$ 662,276.37*
New O&M Costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	*$ 57,250.00*	*$ 57,250.00*	*$ 57,250.00*	*$ 57,250.00*	*$ 57,250.00*	*$ 57,250.00*
Payment to Sioux Falls for Treatment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	*$ 253,885.10*	*$ 287,651.82*	*$ 325,909.52*	*$ 369,255.48*	*$ 418,366.46*	*$ 474,009.20*
TOTAL EXPENSES	**$ 84,771.96**	**$ 101,128.79**	**$ 108,284.26**	**$ 178,266.02**	**$ 316,132.06**	**$ 200,585.09**	***$ 220,643.60***	***$ 553,843.06***	***$ 1,559,169.56***	***$ 1,715,585.99***	***$ 1,825,946.96***	***$ 1,948,774.46***	***$ 2,085,505.36***
Percent Increase		19%	7%	65%	77%	-37%							
SURPLUS (added to reserves)	**$ 35,642.39**	**$ 55,952.40**	**$ 99,371.74**	**$ 82,232.27**	**$ (5,606.53)**	**$ 168,710.82**	***$ 198,183.76***	***$ 120,767.29***	***$ (482,139.19)***	***$ 3,766.40***	***$ 123,612.90***	***$ 240,196.01***	***$ 372,115.07***
Cash Reserves for Sanitary Sewer Department				**$ 377,159.32**	**$ 346,951.00**	**$ 489,631.00**	*$ 687,814.76*	*$ 808,582.04*	*$ 326,442.85*	*$ 330,209.25*	*$ 453,822.15*	*$ 694,018.16*	*$ 1,066,133.23*

TABLE H-2: AMORTIZATION FOR PROPOSED SRF LOAN

Fiscal Year	Principal	Interest Rate	Interest	Balance	Total Payment	Principal Payment	Interest Payment	Balance
2010	$ 9,853,000	3.00%	$295,590	$10,148,590	$ 662,276	$ 366,686	$ 295,590	$ 9,486,314
2011	$ 9,486,314	3.00%	$284,589	$ 9,770,903	$ 662,276	$ 377,687	$ 284,589	$ 9,108,627
2012	$ 9,108,627	3.00%	$273,259	$ 9,381,885	$ 662,276	$ 389,018	$ 273,259	$ 8,719,609
2013	$ 8,719,609	3.00%	$261,588	$ 8,981,197	$ 662,276	$ 400,688	$ 261,588	$ 8,318,921
2014	$ 8,318,921	3.00%	$249,568	$ 8,568,489	$ 662,276	$ 412,709	$ 249,568	$ 7,906,212
2015	$ 7,906,212	3.00%	$237,186	$ 8,143,399	$ 662,276	$ 425,090	$ 237,186	$ 7,481,122
2016	$ 7,481,122	3.00%	$224,434	$ 7,705,556	$ 662,276	$ 437,843	$ 224,434	$ 7,043,280
2017	$ 7,043,280	3.00%	$211,298	$ 7,254,578	$ 662,276	$ 450,978	$ 211,298	$ 6,592,302
2018	$ 6,592,302	3.00%	$197,769	$ 6,790,071	$ 662,276	$ 464,507	$ 197,769	$ 6,127,794
2019	$ 6,127,794	3.00%	$183,834	$ 6,311,628	$ 662,276	$ 478,443	$ 183,834	$ 5,649,352
2020	$ 5,649,352	3.00%	$169,481	$ 5,818,832	$ 662,276	$ 492,796	$ 169,481	$ 5,156,556
2021	$ 5,156,556	3.00%	$154,697	$ 5,311,253	$ 662,276	$ 507,580	$ 154,697	$ 4,648,976
2022	$ 4,648,976	3.00%	$139,469	$ 4,788,446	$ 662,276	$ 522,807	$ 139,469	$ 4,126,169
2023	$ 4,126,169	3.00%	$123,785	$ 4,249,954	$ 662,276	$ 538,491	$ 123,785	$ 3,587,678
2024	$ 3,587,678	3.00%	$107,630	$ 3,695,308	$ 662,276	$ 554,646	$ 107,630	$ 3,033,032
2025	$ 3,033,032	3.00%	$ 90,991	$ 3,124,023	$ 662,276	$ 571,285	$ 90,991	$ 2,461,746
2026	$ 2,461,746	3.00%	$ 73,852	$ 2,535,599	$ 662,276	$ 588,424	$ 73,852	$ 1,873,322
2027	$ 1,873,322	3.00%	$ 56,200	$ 1,929,522	$ 662,276	$ 606,077	$ 56,200	$ 1,267,246
2028	$ 1,267,246	3.00%	$ 38,017	$ 1,305,263	$ 662,276	$ 624,259	$ 38,017	$ 642,987
2029	$ 642,987	3.00%	$ 19,290	$ 662,276	$ 662,276	$ 642,987	$ 19,290	$ (0)
TOTAL					$13,245,527	$ 9,853,000	$ 3,392,527	

Table H-3: Revenue Projections

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Number of Accounts as of December[1]	548	727	891	1030	1190	1374	1516	1671	1842	2029	2236	2463
Billed Water Usage (gallons)	42,165,800	51,313,400	64,318,100	75,877,265	87,258,855	95,984,740	105,583,214	116,141,536	127,755,689	140,531,258	154,584,384	170,042,822
Rates until August 2006												
0-2000 gallons	$16.00	$16.00	$16.00									
Over 2,000 gallons	$19.00	$19.00	$19.00									
Rates After August 2006												
Customer Charge Revenue (No water included)			$10.00	$10.00	$10.00	$11.00	$15.95	$23.13	$33.53	$34.54	$35.23	$35.94
Volume Charge Revenue (per 100 gallons)			$0.20	$0.20	$0.24	$0.26	$0.38	$0.55	$0.79	$0.82	$0.83	$0.85
Projected Revenue[2]		**$ 145,350**	**$ 200,878**	**$ 267,027**	**$ 342,650**	**$ 418,827**	**$ 674,610**	**$ 1,077,030**	**$ 1,719,352**	**$ 1,949,560**	**$ 2,188,970**	**$ 2,457,620**
Actual Revenue	**$ 123,277**	**$ 155,050**	**$ 200,712**									
Proposed Rate Increase							45%	45%	45%	3%	2.0%	2.0%
Percent Increase in Water Usage		21.7%	25.3%	18.0%	15.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Coverage Ratio		32.7%	22.6%									

1. Accounts for 2007 and beyond are projected. These number account for the 37 customers that do not receive sewer bills.

2. Projected revenue based on the average number of customers from current year and past year to reflect growth in customers throughout the year.

APPENDIX I

Harrisburg - INCOME SURVEY June 27, 2006

Table Frequencies

Total Number of households	301
Total Number of Individuals in Households	962

Q2A - H Income

High Income		70.4%
Total Households	212	
Total Individuals	672	
Low to Moderate Income		29.6%
Total Households	89	
Total Individuals	290	

Percent of Individuals in Household

Percent Individuals in High Income Household	69.9%
Percent Individuals in Low to Moderate Income Households	30.1%

Gender

Male	34.2%
Female	65.8%

Head of Household

Male	86.7%
Female	13.3%

Q4A-F	**Race/Ethnicity**	Percent of Households
Number considered physically/mentally challenged		3.30%
One or more White in household		99.30%
One or more Native American in household		3.00%
One or more Black in household		2.70%
One or more Hispanic in household		3.70%
One or more Asian in household		2.00%
One or more Other in household		1.70%

Income Survey

Hello, this is _____ calling from Robinson Muenster Associates. We are calling on behalf of the city of _____ conducting an income survey to determine eligibility for state grant assistance. We are not selling anything and will not ask for any charitable contributions. I will not be asking the actual dollar amount of your household income. All responses will be confidential and no names will be attached to the survey responses. We will also be asking some questions regarding ethnicity that may or may not apply to your family, but are required grant assistance. May I speak with an adult in the household who is 18 or over?

Q1: How many people currently live in your household?

1. One (skip to Q2A)
2. Two (skip to Q2B)
3. Three (skip to Q2C)
4. Four (skip to Q2D)
5. Five (skip to Q2E)
6. Six (skip to Q2F)
7. Seven (skip to Q2G)
8. Eight (skip to Q2H)

Instructions: Income is based on the total income of all household members from your last Federal Income Tax Form. If you own a farm or a business, those deductions may be taken off of your gross income, but NO PERSONAL DEDUCTIONS. DO NOT USE the TAXABLE INCOME FIGURES from your income tax form.

Q2A: Does your current income fall above or below $27,600?

1. Above
2. Below

Q2B: Does your current income fall above or below $31,550?

1. Above
2. Below

Q2C: Does your current income fall above or below $35,500?

1. Above
2. Below

Q2D: Does your current income fall above or below $39,450?

1. Above
2. Below

Q2E: Does your current income fall above or below $42,600?

1. Above
2. Below

Q2F: Does your current income fall above or below $45,750?

1. Above
2. Below

Q2G: Does your income fall above or below $48,900?

1. Above
2. Below

Q2H: Does your income fall above or below $52,050?

1. Above
2. Below

Q3: Is the head of household male or female?

1. Male
2. Female

Q4A: How many persons in your household are considered white?

1. One
2. Two
3. Three
4. Four
5. Five
6. Six
7. Seven
8. Eight or more
9. None

Q4AA: How many in the household are also considered Hispanic or Latino?

1. One
2. Two
3. Three
4. Four
5. Five
6. Six
7. Seven
8. Eight or more
9. None

Q4B: How many persons in your household are considered American Indian or Alaska Native?

1. One
2. Two
3. Three
4. Four
5. Five
6. Six
7. Seven
8. Eight or more
9. None

Q4BB: How many persons in the household are considered American Indian or Alaskan Native and White?

1. One
2. Two
3. Three
4. Four
5. Five
6. Six
7. Seven
8. Eight or more
9. None

Q4BBB: How many persons in the household are considered American Indian or Alaskan Native and Black or African American?

1. One
2. Two
3. Three
4. Four
5. Five
6. Six
7. Seven
8. Eight or more
9. None

Q4BBBB: How many persons are also considered Hispanic or Latino?

1. One
2. Two
3. Three
4. Four
5. Five
6. Six
7. Seven
8. Eight or more
9. None

Q4C: How many persons in your household are considered Black or African American?

1. One
2. Two
3. Three
4. Four
5. Five
6. Six
7. Seven
8. Eight or more
9. None

Q4CC: How many persons in your household are considered Black or African American and White?

1. One
2. Two
3. Three
4. Four
5. Five
6. Six
7. Seven
8. Eight or more
9. None

Q4CCC: How many persons in the household are also considered Hispanic?

1. One
2. Two
3. Three
4. Four
5. Five
6. Six
7. Seven
8. Eight or more
9. None

Q4D: How many persons in your household are considered Asian?

1. One
2. Two
3. Three
4. Four
5. Five
6. Six
7. Seven
8. Eight or more
9. None

Q4DD: How many persons in your household are considered Asian and White?

1. One
2. Two
3. Three
4. Four
5. Five
6. Six
7. Seven
8. Eight or more
9. None

Q4DDD: How many persons in your household are also considered Hispanic or Latino?

1. One
2. Two
3. Three
4. Four
5. Five
6. Six
7. Seven
8. Eight or more
9. None

Q4E: How many persons in the household are considered Native Hawaiian or Other Pacific Islander?

1. One
2. Two
3. Three
4. Four
5. Five
6. Six
7. Seven
8. Eight or more
9. None

Q4EE: How many persons in your household are also considered Hispanic?

1. One
2. Two
3. Three
4. Four
5. Five
6. Six
7. Seven
8. Eight or more
9. None

Q4F: How many persons in your household are multi-racial other than specified earlier?

1. One
2. Two
3. Three
4. Four
5. Five
6. Six
7. Seven
8. Eight or more
9. None

Q5: How many persons in your household are considered physically/mentally challenged?

1. One
2. Two
3. Three
4. Four
5. Five
6. Six
7. Seven
8. Eight or more

9. None

END

That completes our income survey. I thank you for your time and patience in answering my questions. Thanks again.

APPENDIX J

AFFIDAVIT OF PUBLICATION-
Customer Number: 127064
Invoice Number: 1199515

CITY OF HARRISBURG

Argus Leader Media
AFFIDAVIT OF PUBLICATION

STATE OF SOUTH DAKOTA

COUNTY OF MINNEHAHA } ss

Linda Schulte being duly sworn, says: That the **Tea Champion and Harrisburg Champion** is, and during all the times hereinafter mentioned was, a weekly legal newspaper as defined by SDCL 17-2-2.1 through 17-2-2.4, as amended published at Tea, Lincoln County, South Dakota; that affiant is and during all of said times, was an employee of the publisher of such newspaper and has personal knowledge of the facts stated in this affidavit; that the notice, order or advertisement, a printed copy of which is hereto attached, was published in said newspaper upon

Wednesday ,the 1 day of April 2009

_____ ,the _____ day of _____ 2009

_____ ,the _____ day of _____ 2009

_____ ,the _____ day of _____ 2009

_____ ,the _____ day of _____ 2009 ,

and that $25.89 was charged for publishing the same

Linda Schulte

Subscribed and sworn to before me 4/1/2009 .

J. Zimmerman

Notary Public, South Dakota

My Commission expires December 22, 2009

JACQUELINE ZIMMERMAN
SEAL NOTARY PUBLIC SOUTH DAKOTA SEAL

CITY OF HARRISBURG
Notice of Public Hearing

The City of Harrisburg will hold a public hearing to receive comments regarding a proposed application to the S.D. Dept. of Environment and Natural Resources Clean Water State Revolving Fund (CW-SRF) Loan Program to finance the Wastewater Treatment Plant Improvements project. A public hearing is a requirement of the facilities planning process for the CW-SRF program. A Facilities Plan is an engineering and environmental study of project alternatives. It documents the need for improvements and proposes a solution. The City of Harrisburg proposes to apply for up to $9,856,000 in CW-SRF loan funds. The total project cost is estimated at $9,856,000. The purpose of the public hearing is to discuss the proposed project, the proposed financing, and the source of repayment for the loans. The public is invited to attend and comment on the project.

The hearing will be held Monday, April 13, 2009, at 6:30 p.m. at the American Legion Building. Project information may be reviewed at City Hall during City Finance Office hours.

The hearing is open to all interested parties. Information regarding accessibility for the disabled may be obtained by calling the City Finance Officer at 743-5872. Anyone unable to attend may submit written comments prior to the hearing.

Mary McClung
Finance Officer
City of Harrisburg
PO Box 28
Harrisburg, SD 57032-0026

1199515 Apr. 1, 2009

PUBLIC HEARING
CITY OF HARRISBURG
WASTEWATER TREATMENT IMPROVEMENTS

April 13, 2009
Harrisburg American Legion Hall

NAME	ADDRESS
Angie Hilton	500 N. Western, Ste 100
Clinton Larson	Harrisburg Champion
Lynne Keller Forbes	500 N. Western, Ste 100 SF
Doug Hajek	Davenport Law Firm - Sioux Falls
Chad Hanisch	WR Green
Dan Fink	City of Harrisburg
Toby Morris	Northland Securities

Harrisburg City Council
Regular Meeting Minutes

City Council met in regular session April 13th, 2009, at 6:00 p.m. at the Legion Hall. The Pledge of Allegiance was said and roll call was taken. Members present were Julie Bowen, Troy Lubbers, Steve Becker and Mayor Reed Ramstad. Absent was James Seeley. Also present were Mary McClung, Alysia Simunek, Dan Fink and Albert Schmidt. A listing of all others in attendance is on file at city hall.

Motion Lubbers to approve the minutes of the March 16th, 2009, special meeting; seconded Bowen. All in favor, motion carried.

Motion Lubbers to approve all claims (bills) as presented; seconded Becker. All in favor, motion carried.

Motion Bowen to approve building permits as presented; seconded Lubbers. All in favor, motion carried.

Council reviewed the March 2009 finance report.

Motion Lubbers, to take Resolution 2008-30 Hunters Glen Addition Replat off of the table, seconded Becker.

Motion Becker to approve Resolution 2008-30 Hunters Glen Addition Replat, seconded Lubbers. All in favor; motion carried.

RESOLUTION 2008-30

BE IT RESOLVED BY THE CITY COUNCIL OF HARRISBURG, SOUTH DAKOTA, that the plat known and described as Lot 11A in Hunter's Glen Addition to the City of Harrisburg, Lincoln County, South Dakota, is hereby approved and the Municipal Finance Officer of the City of Harrisburg, South Dakota, is hereby directed to endorse on such plat, a copy of this resolution and certify the same hereon.

Adopted this 13th day of April 2009.
Reed Ramstad
Mayor, City of Harrisburg, SD

ATTEST:
Mary McClung
Municipal Finance Officer

I, Mary McClung the Duly Appointed, Qualified and Acting Municipal Finance Officer of the City of Harrisburg, South Dakota, Hereby certify that the foregoing resolution was passed by the City Council of Harrisburg, South Dakota, at its regular meeting held on the 13th day of April 2009.
Witness my Hand as Municipal Finance Officer and Official Seal of the City of Harrisburg, South Dakota.

Mary McClung
Municipal Finance Officer, Harrisburg, SD

Published April 22, 2009
Effective May 12, 2009

Motion Becker, to take Resolution 2009-05 Noise Ordinance off of the table, seconded Bowen.

Motion Becker to approve Ordinance 2009-05 Noise Ordinance, seconded Bowen. All in favor; motion carried.

Motion Lubbers to approve the second reading of Ordinance 2009-04 Supplemental Appropriation Ordinance (Library) seconded Bowen. All in favor; motion carried.

Motion Lubbers to approve second reading of Ordinance 2009-01 Annual Street Assessment, seconded Becker. All in favor; motion carried.

Chad Meyer was present to request a credit for the late charges incurred on his water bill due to a miscalculation of water readings. The automated system caught the miscalculation and Meyer contacted the city to set up payment arrangements on the large balance until it is paid off. Due to the previous approval for a 20% charge on all outstanding balances in February, Meyer was charged a $75.00 late fee. When the decision was made to keep the charge at 20% of the water charge the following month, the late charge returned to $5.20. Meyer would accept the $5.20 each month, however is requesting a break in the $75.00 late fee. Motion Lubbers to issue a credit to Meyer's account in the amount of $64.60, which would reflect a $5.20 late charge for the past three months, seconded Becker. All in favor; motion carried.

Deputy Steve Erickson and Deputy Travis Johns from the Lincoln County Sheriffs Department were present to discuss the implementation of a crime free housing project for the multi-family complexes in town. Each apartment owner has been responsible for the purchase of the signs in Sioux Falls however the deputies are requesting assistance for the purchase of the signs for each building to show the apartment owners that the city is backing this program. There are currently 10 buildings and each sign costs $29.00. Motion Lubbers to approve the city contribute $150.00 towards the purchase of half the signs, seconded Bowen. All in favor; motion carried.

Council approved the spring newsletter. They will be printed and distributed this week.

Motion Lubbers, to approve Mayor Ramstad to sign the contract approving the 2010 Fire Department Dues for the City of Harrisburg in the amount of $49,377.92, seconded Becker. All in favor; motion carried.

Council reviewed the West Nile Prevention and Control Program Grant options received from the state and approved of the request that was submitted.

Mary was contacted by Schoenfish & Co. with an engagement letter to complete the 2007-2008 audits. Motion Becker to approve Mayor Ramstad to sign the 2007-2008 Audits Engagement Letter with Schoenfish & Co., seconded Bowen. All in favor; motion carried.

A Public Hearing was held at 6:30 pm for the Wastewater Treatment Plant Improvements. Howard R. Green Company (HR Green) presented the Wastewater Treatment Facility Plan and expressed the need for a new wastewater treatment system as the current city's evaporation ponds have reached capacity. With the city's projected population at over 20,000 in the next 20 years, the city needs to look into accommodating the projected growth. HR Green presented multiple options for the city. The first is to do nothing. The second would be to expand the city's existing evaporation ponds, which is typically used for smaller communities and would require 332 acres of additional land space, also increasing the odor situation. The third would be to convert the lagoons to aerated ponds with discharge to the Big Sioux River, or discharge to Ninemile Creek with additional treatment for ammonia and phosphorus removal. The fourth option would require infrastructure for a new mechanical wastewater treatment plant. The final option would be regionalization. A regional approach, with pumping wastewater to the City of Sioux Falls for treatment would require using the existing ponds for an equalization basin, new influent and effluent piping from the ponds, a lift station, and over 10 miles of force main. Tanya presented the engineer's probable cost of each option, dividing each option into phases. The Phase I opinion of probable cost ranged from options ranged from $9,853,000.00 to $34,697,200.00. Howard R Green's recommendation was to go with Option 5 and pump wastewater to Sioux Fall for treatment with an opinion of probable cost of $9,853,000.00. The facility plan will now be submitted to SD DENR along with funding information to apply for economic stimulus and CW-SRF funding. Becker asked what the maximum amount the city can pump to Sioux Falls each day. Tanya stated it would be 75% of the maximum wet weather daily supply. Becker asked how long this capacity would hold. Tanya explained that the project is

designed for a 20-year period to allow the City to grow to a population just over 20,000 people. After 10-years, or when the population reaches just over 11,000 the City will need to upsize the pumps in the lift station and install additional aeration units in the ponds. The force main is sized for 20-years, and could likely continue to be used beyond that.

Motion Lubbers to approve the wastewater facility plan as presented by HR Green, seconded Bowen. All in favor; motion carried

Motion Lubbers to approve Resolution 2009-11 CW-SRF Funding Application Sponsorship, seconded Becker. All in favor; motion carried.

CITY OF HARRISBURG
RESOLUTION # 2009-11
CW-SRF FUNDING APPLICATION SPONSORSHIP

WHEREAS, the City Council has determined the need for a Wastewater Treatment Improvements Project; and

WHEREAS, loan assistance is necessary to enable the City of Harrisburg to construct these improvements; and

WHEREAS, the City Council is desirous of applying for up to a $3,941,200 20 year loan, to be repaid with project surcharge revenues, at 3.00% and a $5,911,800 30 year loan to be repaid with sales tax revenues at 3.25% from the Clean Water State Revolving Fund Program of the South Dakota Department of Environment & Natural Resources for these improvements;

BE IT RESOLVED the City Council hereby authorizes the filing of an application, including all understandings and assurances contained therein, for the Clean Water State Revolving Fund Loan Program, and hereby designates the Mayor to act as signatory in connection with the application, loan agreement, payment requests, and other required forms, and to provide such additional information as may be required by the State of South Dakota.

Adopted this 13th day of April, 2009.

ATTEST:

Reed Ramstad, Mayor — Mary McClung, Finance Officer

Bill Reiners was present to discuss the sanitary sewer backup into his basement at 501 E. Walnut Street. There has been a problem with a couple of houses in that area before because when the contractor put in the sewer lines the pipe slopes back towards the houses. The city could go in and rebuild two of the man holes in that area but the residences would still have to rebuild their lines. A grinder pump was also mentioned as a possible to the residences problem. City maintenance will flush the man hole monthly and Bill should call if he has any problems. The council will discuss this at later time when Dan and Tanya have had time to access the problems and the remedy.

Tanya Miller went through the City Engineer's report. A copy is on file at the city office. Construction on the water tower is anticipated to begin in May. The survey for the Maple Street and Prairie Street Water main replacement and overlay has been completed. The facility plan for the water main loop for the 750,000 gallon tower will be submitted to the SD DENR this week. The water main loop includes 2,550 feet of 12-inch water main from the tower site to Harrisburg Homesites. Work on the water and wastewater rate study has been delayed until the funding for the Wastewater Treatment Improvements has been determined.

Motion Lubbers to approve the proposal for Design and Construction Administration of the Water Main Loop for the 750,000 Gallon Water Tower, seconded Bowen. All in favor; motion carried.

Tanya requested approval from council to obtain costs for soil borings for the Maple Street and Prairie Street water main replacement and overlay. Council gave Tanya approval to obtain costs and continue with soil borings up to $1,000.00. If costs are higher than $1,000.00, approval will again be needed from council.

Chad Hanisch informed council that they are unable to obtain the turning lane equipment from Brandon without having to take all of their surplused items. Dan will talk with Brandon about this equipment. Chad went through the high school turning lane and stop light projects and will continue to work with Dan on these items. Seeding will also begin this week at the Heartland Park.

The 2008 Annual Drinking Water Report is now available on the city website and will be published in the April 15th, 2009, edition of the Harrisburg Champion. There is also a copy on file at the city office.

First reading was held for Ordinance 2009-03 2006 IRC, IBC, IMC, IFGC and IPMC. This will implement building codes, mechanical codes, gas codes and maintenance codes. Motion Lubbers to set the second reading for May 4th, 2009, seconded Becker. All in favor; motion carried.

Motion Becker, to authorize Mayor Ramstad to sign the Redwood Wireless Option to Lease and Contract Approval seconded Bowen. All in favor; motion carried.

Albert went through the Planning & Zoning Administrator report. A copy is on file at the city office.

Mary informed council that Toby from SECOG sat down with Mary, Alysia and Dan to go over the city's water and sewer ordinances and Toby will be drafting the revisions to present to council in May.

The network card in the color printer at the city office went out and Mary requested approval to purchase a new printer. Mary obtained quotes from Best Business products but would also like to look at the printers available at Office Max. Approval given to purchase a new color printer for the office.

Dan Fink gave the city maintenance report. Dan informed council that they continue to add gravel to Southeastern to keep it maintained. The Heartland Park playground equipment is in and will be installed after seeding. Thompson Electric has been out to install conduit and wire for the lights on ball diamond B. The city is waiting for Xcel Energy to install the poles.

Council received a letter of resignation from Alderman James Seeley. Seeley will continue to serve until the first meeting in June 2009. At this time council has received one letter of interest for the seat on the council. The city will post the vacancy for this position.

The next meeting of the City Council will be held on Monday, May 4th, 2009, at the American Legion at 6:00 p.m. The City P & Z regular meeting will be held May 13th, 2009, at 7:00 p.m. at the American Legion.

With no further business, a motion was made by Lubbers to adjourn the meeting at 8:14 p.m., seconded by Becker. All in favor, motion carried.

Alysia Simunek, Deputy Finance Officer

Harrisburg City Council
Special Meeting Minutes

City Council met in special session March 16th, 2009, at 6:00 p.m. at the Legion Hall. The Pledge of Allegiance was said and roll call was taken. Members present were Steve Becker, Troy Lubbers, Julie Bowen, James Seeley and Mayor Reed Ramstad. Also present were Mary McClung, Alysia Simunek, Tanya Miller, Dan Fink, and Albert Schmidt. A listing of all others in attendance is on file at city hall.

Motion Seeley to approve the minutes of the March 2nd, 2009, meeting, seconded Lubbers. All in favor; motion carried.

Motion Bowen to approve claims (bills) as presented; seconded Becker. All in favor; motion carried.

Motion Bowen to approve building permits as presented; seconded Seeley. All in favor; motion carried.

Council reviewed the finance report for February 2009.

Under old business Resolution 2008-30 Hunters Glen Addition Replat will remain tabled.

The second reading for Ordinance 2009-05 Noise Ordinance was held. Current ordinance allows for Federal holidays. Council would like to add a clause to include special events or other holidays by approval of the council. Motion Lubbers, to table Ordinance 2009-05 Noise Ordinance until the Aprils 6th, 2009, meeting, seconded Becker. All in favor; motion carried.

Discussion was held regarding the 2009 water restriction levels. Council agreed to begin the spring/summer season with a 2-day a week restriction and to monitor the usage. If there is a large increase in usage, Dan and the Mayor Ramstad can enact an emergency change back to once per week. Discussion was halted for the public hearing.

Tanya Miller of Howard R. Green Company presented the draft Facility Plan for Wastewater System Improvements at 6:10pm. Tanya went through the Facility Plan with the council, and the options that have been evaluated. Draft copies are available for review at City Hall. Pumping wastewater to Sioux Falls is the current recommended alterative. Several questions were received from the public. Bob Sproul asked if the city had researched discharging the pond effluent water through wetlands or for irrigation like the City of Mitchell has done. This option was researched but if done near Ninemile Creek, the phosphorus would still likely need to be removed therefore a discharge location would likely need to be found outside a protected waterway. Doug Allen questioned what the difference is between the two least expensive options and why pumping to Sioux Falls was chosen over the other. The next least expensive option was for the OPTAER process with SAGR and the initial cost up front was over $14,000,000.00 and the city can not afford to finance it. The option to pump to Sioux Falls has less up front construction costs but the overall cost to construct the pumping system and pay Sioux Falls to treat the wastewater will be higher over the longevity. Doug also asked about the route of the proposed pipeline to Sioux Falls and Tanya said that she would like to work with the county and townships to determine that and would propose going to the east and north within the ROW. Doug asked if the city were to remove the ponds from the city what would that likely run and the cost is estimated between $16,000,000 to $20,000,000 and at this time is not an option the city can afford. Tanya asked if it would be all right if she were to see if the city could get on the township, county and City of Sioux Falls agendas for discussion. A future public hearing will discuss the project cost and financing.

Motion Becker, to approve Resolution 2009-09 CWFCP Funding Application Sponsorship – Wastewater Treatment Improvements Project, seconded Lubbers. All in favor; motion carried.

RESOLUTION # 2009-09
CWFCP FUNDING APPLICATION SPONSORSHIP

WHEREAS, the City Council of the City of Harrisburg has determined the need for the Wastewater Treatment Improvements project; and
WHEREAS, financial assistance will be necessary to enable the City of Harrisburg to construct these improvements; and
WHEREAS, the City Council desires funding assistance from the Consolidated Water Facilities Construction Program (CWFCP) of the South Dakota Department of Environment and Natural Resources for this improvement;
THEREFORE BE IT RESOLVED, the City Council of the City of Harrisburg hereby authorizes the filing of a CWFCP grant application, including all assurances contained therein, and hereby designates the Mayor to act as Project Certifying Officer in connection with the application, grant agreement, and other required forms, and to provide such additional information as may be required by the State of South Dakota.

Adopted this 16th day of March 2009, by the City Council of the City of Harrisburg, South Dakota.

Reed Ramstad, Mayor Official Seal:

ATTEST: Mary McClung, Finance Officer

A Public Hearing was held at 6:45pm for the Water Main Loop for the 750,000 Gallon Water Tower project. Tanya Miller with Howard R. Green Company went through the facilities plan report for the water main loop, and draft copies are available for review at City Hall. The water main loop is needed to improve water quality in a future dead-end water main and improve water flow into and out of the new water tower. It will also provide a redundant connection to the Harrisburg Homesites area, which is currently served through a single water main connection to the rest of the distribution system. Two options were considered; Option 1: Do Nothing and Option 2: New Water Main Loop. The new water main loop was the recommended option. This project will be an amendment to the 750,000 Gallon Water Tower project loan since the cost for that project came in under the estimated funding amount. The Engineer's Opinion of Probable Cost for the water main loop is $285,660; however the total cost of both projects cannot exceed $2,715,000. The Environmental Review is being amended for the project. Financing would be from the city's water department funds and the increased water rates planned for the tower project would repay the water main loop project debt. The $2,090,000 DW-SRF loan has a 20-year term with an interest rate of 3.25%. Annual debt service will be approximately $142,526. Work on the project is anticipated to begin this summer and be completed by this fall.

Lubbers made motion to adjourn the special meeting to sit as the local review board at 7:00 pm, seconded Becker. All in favor; motion carried.

Lubbers made motion at 7:02 to reconvene special meeting of the city council, seconded Becker. All in favor; motion carried.

Tanya presented the council with the engineering proposal for the Maple Street overlay and replacement of the 4-inch water main in Maple and Prairie Streets. Council will review.

Dan went through the maintenance department report and updated council on Cliff Reuer's visit regarding traffic lights on Willow Street. Toby will be attending the Harrisburg Days planning meetings for representation from the city maintenance.

Dan requested approval to attend the upcoming SDWWA Wastewater Seminar in Mitchell and the SDML Street Maintenance Seminar in Oacoma. Approval given.

Discussion reconvened on water restrictions. Motion Lubbers, seconded Bowen, to approve Resolution 2009-10 2009 Water Restrictions. All in favor; motion carried. Bowen added that the city will contact the news media and send a notice to the residents if the restrictions level changes.

RESOLUTION 2009-10

A RESOLUTION TO RESTRICT WATER USE IN THE CITY OF HARRISBURG, SOUTH DAKOTA.

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF HARRISBURG, SOUTH DAKOTA.

Whereas, due to the increased daily water demand on the Harrisburg water system, the following water use restriction shall apply to all Harrisburg water system users.

* Reference - Ordinance 2006-11

Level 1 – Normal – Water use restricted to 2 days per week watering schedule using the last digit of the physical address number to determine status. Water use shall occur before 10:00 a.m. or after 7:00 p.m. No watering is permitted other than pursuant to the following chart:

House number ending in:	Day watering may occur:
0,3,6	Monday
1,4,7	Tuesday
2,5,8,9	Wednesday
0,3,6	Thursday
1,4,7	Friday
2,5,8,9	Saturday
No Watering Allowed	Sunday

Water restrictions apply to the sprinkling, watering or irrigating of lawns. Trees, shrubs, vegetable and flower gardens may be watered as necessary.

Reference to Ordinance 2006-12 - The City of Harrisburg may issue 2 week lawn watering permits for newly seeded or sodded lawns for a permit fee of $50.00 payable by the applicant. Only the sod or seeded area may be watered (this does not permit you to water an established lawn which has been seeded or spot sodded to fill in scattered bare spots). A watering permit allows residents to water their lawns Monday through Saturday for the first week of the permit and three days for the second week of the permit. No watering is allowed between the hours of 10:00 a.m. and 7:00 p.m. After the expiration date of the watering permit, the water level alert that is in effect for the city applies to all subsequent watering.

Reference to No. 2 of Section 8.0128 Enforcement of Ordinance 1996-3. - Any person, firm, or corporation violating any of the provisions of this resolution shall be deemed guilty of a misdemeanor. Each time such violation is committed or permitted to continue, shall constitute a separate offense and shall be punishable as such.

Pursuant to SDCL 9-19-3, the City of Harrisburg resolves that any person, firm, or corporation violating any provision of this resolution shall be subject to a fine in the amount of $150.00

Water alert levels are subject to change by order of the mayor. Section 8.0123 of City Ordinance Authority to Control Use of Water: Pursuant to SDCL 9-47-1, the city council shall have the authority to regulate the distribution and use of water supplied by and for the City, including those instances where a diminution in the supply of water for the City may exist due to a prolonged drought, where other unanticipated emergencies affecting the distribution and supply of water may arise from time to time, and due to adverse weather conditions.

Adopted this 16th day of March, 2009.

REED RAMSTAD
Mayor, City of Harrisburg

ATTEST:

MARY MCCLUNG
Finance Officer, City of Harrisburg

Seal

Publication:	March 25, 2009
Effective Date:	April, 15, 2009

The 1st reading of Ordinance 2009-04 Supplemental Appropriation to the budget (Library) was held. The city received $5,000.00 from Lincoln County for the Harrisburg Library in 2009 and the ordinance will account for budgeting the $5,000.00. Motion Becker to set the second reading of Ordinance 2009-04 Supplemental Appropriation to the budget (Library) for Monday, April 6th, 2009; seconded Seeley. All in favor, motion carried.

The 1st reading of Ordinance 2009-01 Annual Street Assessment was held. Motion Lubbers to set the second reading of Ordinance 2009-01 Annual Street Assessment for Monday, April 6th, 2009; seconded Bowen. All in favor, motion carried.

Albert went through the Planning & Zoning Administrator Report.

Mary requested council to review the items for the spring newsletter. Julie will get a write-up for Harrisburg Days and Tour de Kota.

Mary received a response from the city attorney in regards to the water late fee charges. Council agreed to review the existing late fee charges for the water bill and not make any changes until the ordinance has been updated. Mary will present a draft at a future meeting.

Council reviewed the engineering proposal for the Maple Street overlay. Motion Becker, seconded Seeley, to sign the contract from Howard R Green for the Maple Street Overlay and Replacement of 4-inch Water Main in Maple and Prairie Streets. All in favor; motion carried.

Motion Becker to enter into executive session at 7:48 p.m. for personnel matters.

Motion Becker, seconded Seeley, to return to special meeting at 8:34pm. All in favor; motion carried.

The next regular meeting of the City Council will be held on April 6th, 2009, at the American Legion at 6:00 p.m. The City Planning & Zoning regular meeting will be held on April 8th, 2009, at 7:00 p.m. at the American Legion.

With no further business, a motion was made by Lubbers to adjourn the meeting at 8:35pm, seconded by Becker. All in favor, motion carried.

Alysia Simunek, Deputy Finance Officer