

**Invoice**

1676

Brian Harding, General Manager  
Eastman Sewer Company  
P. O. Box 470  
Grantham, NH 03753

Invoice No. 8248  
Invoice Date: May 26, 2013

**Current Invoice Amount: \$5,734.25**

Services through 5/26/2013

Services: Professional engineering services for the evaluation of alternatives to allow the WWTF to meet the new effluent discharge permit limits, the first task will be to review a sampling and analysis program by others.

Reference: Report Phase Contract dated June 17, 2011. Amendment No. 1 dated February 17, 2012. Amendment No. 2. Amendment No, 3 dated February 26, 2013. Amendment No. 4 dated May 8, 2013.

**Task 01 Wastewater Evaluations**

Contract Value:	\$50,000.00
Previously Billed:	\$32,843.83
Current Billing:	\$5,734.25
Remaining Balance:	\$11,421.92

Professional Services

	<u>Hours</u>	<u>Charge</u>
Senior Project Manager	6.00	794.88
Project Manager	23.00	2,530.37
Technician	10.25	852.80
Clerical	3.50	227.60
Professional Services Total		<u>\$4,405.65</u>

Reimbursables

	<u>Charge</u>
Mileage	50.85
Prints & Copies	3.30
Telephone	3.70
Reimbursables Total	<u>\$57.85</u>

Subcontractors

	<u>Charge</u>
Todd Land Use Consultants, LLC	1,270.75
Subcontractors Total	<u>\$1,270.75</u>

**Task 01 Total \$5,734.25**

**Total Balance This Invoice \$5,734.25**

Project Manager per Dgm  
Principal Cam

**Invoice**

1676

Brian Harding, General Manager  
Eastman Sewer Company  
P. O. Box 470  
Grantham, NH 03753

Invoice No. 8349  
Invoice Date: July 21, 2013

**Current Invoice Amount: \$10,398.03**

Services through 7/21/2013

Services: Professional engineering services for the evaluation of alternatives to allow the WWTF to meet the new effluent discharge permit limits, the first task will be to review a sampling and analysis program by others.

Reference: Report Phase Contract dated June 17, 2011. Amendment No. 1 dated February 17, 2012. Amendment No. 2. Amendment No, 3 dated February 26, 2013. Amendment No. 4 dated May 8, 2013.

**Task 01 Wastewater Evaluations**

Contract Value:	\$50,000.00
Previously Billed:	\$38,578.08
Current Billing:	\$10,398.03
Remaining Balance:	\$1,023.89

Professional Services

	<u>Hours</u>	<u>Charge</u>
Principal	.50	87.50
Senior Project Manager	8.00	1,059.84
Project Manager	68.00	7,481.09
Project Engineer	8.00	595.71
Technician	12.25	1,019.20
Professional Services Total		<u>\$10,243.34</u>

Reimbursables

	<u>Charge</u>
Mileage	113.00
Postage & Freight	2.24
Prints & Copies	14.10
Telephone	21.85
Tolls	3.50
Reimbursables Total	<u>\$154.69</u>

**Task 01 Total \$10,398.03**

**Total Balance This Invoice \$10,398.03**

Project Manager per DJM  
Principal cam

1676-01

July 15, 2013

Mr. Brian Harding, Manager  
Eastman Sewer Company  
Post Office Box 470  
Grantham, NH 03753

**Re: Wastewater Evaluation - Site Investigations  
Eastman Sewer Company - Grantham, NH**

Dear Mr. Harding:

In accordance with Amendment 4 of our Contract, the following is a summary of preliminary site investigations for a new subsurface disposal system. This letter report is based on site reviews conducted in May and June 2013 and test auger data collected at each of two potential sites.

### **Background**

Underwood Engineers (UE) completed a Wastewater Evaluation study (final report dated January 4, 2013) which recommended pursuing subsurface disposal using drip dispersal to replace the existing spray irrigation. Preliminary soil investigations were recommended on two potential sites, the Heath and Brookridge (formerly Heidenblad) lots, to confirm feasibility. Eastman Sewer Company (ESC) prefers to use the Brookridge site due to concerns with the Heath site, including:

- Existing recreational uses at the Heath site.
- Brook and wetlands crossing required
- Town Conservation Commission does not favor the Heath site for wastewater disposal

Therefore, investigations were prioritized on the Brookridge site.

### **Design Capacity**

Design flows identified in the January 2013 Report were:

- To replace current spray irrigation (worst case year 5.6 Mgal): 16,000 gpd
- To handle current average daily flow (if holding ponds discontinued): 55,000 gpd
- To handle future design flow with 30% additional allowance (if holding ponds discontinued): 72,000 gpd

The current upgrade is to replace the spray irrigation only, with continued use of the holding ponds. Identification of areas for future expansion of the drip dispersal is recommended should the holding ponds need to be discontinued. Future expansion with additional zones would only be constructed if necessary and is not included in the current recommended project.

For planning purposes (including setting aside enough useful land area), a future design flow of up to 72,000 gpd was identified based on the current average daily flow of 55,000 gpd, a 10% growth allowance, and a 20% reserve per State recommendations and standard practice. The State recommends that once a community has met or exceeded 80% of their facility's design capacity they perform a Facilities Plan to upgrade/enlarge their treatment systems to handle future flow increases. The reserve may be reduced if a community chooses to not plan for expansion and places a moratorium on future connections.

### **Work Completed**

To refine the suitable area(s) for locating drip dispersal systems, UE performed the following:

- Review of available soil mapping.
- Site reconnaissance with a handheld GPS receiver to approximately locate features such as ledge or wetlands. (Note: a topographic survey is needed for final design.)
- Test cores with a hand auger to preliminary assess soil conditions and depth to seasonal high water table.
- Review and site visit with drip dispersal vendor.

### **Brookridge Site Findings**

The Brookridge site is a 79 acre parcel recently acquired by ECA near Brookridge Drive (Figure 1, Appendix A). This wooded parcel has no current uses other than a ski trail across the lower portion.

#### Brookridge Site Findings

- Forested with small to medium size trees on slopes of 8 to 15%.
- Lower area (north and east part of lot) is too steep, rocky, and/or wet to be suitable for subsurface disposal. Much of this area appears to be wetlands.
- Upper portion contains Monadnock stony fine sandy loam soils suitable for subsurface disposal.
- Hand auger cores show depth to seasonal high water table (SHWT) of 24" to 32" (Appendix B).
- Small boulders to large rocks distributed over much of area, along with possible outcrops.
- Pockets of wetlands or vernal pools.

#### Brookridge Site Capacity

The potential area for subsurface disposal is indicated on Figure 1, based on the approximate locations of interferences and assuming setbacks from the property line and apparent wetlands. The capacity for effluent disposal was estimated based on the following:

- Viable area to site drip dispersal zones is approximately 350,000 SF (8 acres).
- Assumed 0.6 gpd/sf based drip dispersal guidelines for this soil type.
- Drip lines 4' on center average to allow routing around trees and minor obstacles (2' minimum).
- Assumed 50% to 75% of area is occupied with zones, to allow for major interferences.
- **Net estimated capacity: 52,000 gpd to 78,000 gpd (further study required to confirm assumptions)**



The site conditions are more challenging than typical drip dispersal installations but are anticipated to be overcome with additional efforts, which may include:

- Multiple smaller zones, instead of one or two larger zones
- Determination of final layout in field as work progresses
- Removal of smaller stones
- Routing of tubing around larger stones and tree
- Impervious tubing sections in the vicinity of obstacles
- Addition of fill with wood chips or imported granular material.

A preliminary layout is shown in Figure 1 (Appendix A), pending additional subsurface investigations and topographical survey. A preliminary basis of design is in Appendix C.

Potential routes are shown for supply/return lines from the pumping station to the drip zones. Installation on the steep slopes and rock outcrops below Brookridge Drive will require blasting and/or additional fill for cover and frost protection. Crossing a private lot may also be required. Access to the site may be accomplished by building a gravel road from Brookridge Drive across one of the ECA common lots.

### **Heath Site**

The Heath site is a 160 acre parcel acquired by ECA in 2011, with current uses including hiking trails, outdoor recreation, and conservation. UE performed limited site investigations in case sufficient disposal capacity could not be determined elsewhere (Figure 2, Appendix A).

#### Heath Site Findings

- Upper portion contains wetlands/bogs adjacent to Greensward Drive
- Middle portion contains Monadnock-Hermon stony sandy loam soils suitable for subsurface disposal.
- Segmented by streams
- Lower portion near Eastman Brook has sandy soils with stands of pine.
- Former gravel pit reportedly in southwest corner.
- Forested with small to medium size trees on slopes of 8 to 15%.
- Hand auger cores show depth to seasonal high water table (SHWT) of 20" to 32".
- Suitable areas are more limited than previously thought, due to shallow ledge and wetlands.

#### Heath Site Challenges

- Significant stream crossing required by directional drill
- Potential prime wetlands identified by Town
- Town Conservation Commission does not favor due to concerns for protecting potential future groundwater sources downstream.
- Site capacity was not further evaluated as there is no clear advantage over using Brookridge.



### Conclusions

- The Brookridge site has enough capacity to handle the proposed 16,000 gpd system (based on the highest volume in a season for spray irrigation).
- The Brookridge site may have enough capacity to handle future design flows if the holding ponds must be discontinued. Further study is needed to confirm assumptions.
- The Heath site does not appear to have significantly greater capacity or more favorable site conditions than the Brookridge site.

### Recommendations

- Pursue a drip dispersal system at the Brookridge site sized for 16,000 gpd
- Maintain the budget identified previously for the new disposal system and existing system improvements at \$845,000.
- Perform subsurface investigations: deep hole test pits, borings - confirm depth to ledge and groundwater.
- Perform geotechnical evaluation: mounding analysis and nitrate modeling - confirm loading rate.
- Perform a topographic survey.
- Determine site access and pipeline routes, and obtain easements if necessary.
- Complete Final Design.
- Submit a Groundwater discharge permit application based on the proposed drip system.
- Refine ultimate capacity during final design.
- Consider as Reserve Sites for drip dispersal (if Holding Ponds discontinued or insufficient capacity at Brookridge) the following:
  - Areas around Holding Ponds
  - Heath Lot
  - Golf Course Fairways

### Schedule

- |  |                         |
|--|-------------------------|
| • SRF Pre-application submitted        | June 2013               |
| • Site Investigations Report           | July 2013               |
| • Transfer to VDE or new district      | Fall 2013               |
| • Survey and Subsurface Investigations | Fall 2013               |
| • Final Design                         | Winter/Spring 2013/2014 |
| • VDE approval of funding              | March 2014              |
| • Construction                         | 2014                    |

Note: If funding for Preliminary and Final Design cannot be provided until after the VDE 2014 annual meeting, construction may be delayed until 2015.



Page 5  
Mr. Brian Harding  
July 15, 2013

**Appendices**

- A. Workplans
- B. Test Auger Core Data
- C. Preliminary Basis of Design

Please feel free to contact us if you have any questions.

Very truly yours,

UNDERWOOD ENGINEERS, INC.



David J. Mercier, P.E.  
Senior Project Manager

DJM/tgp

Encl.

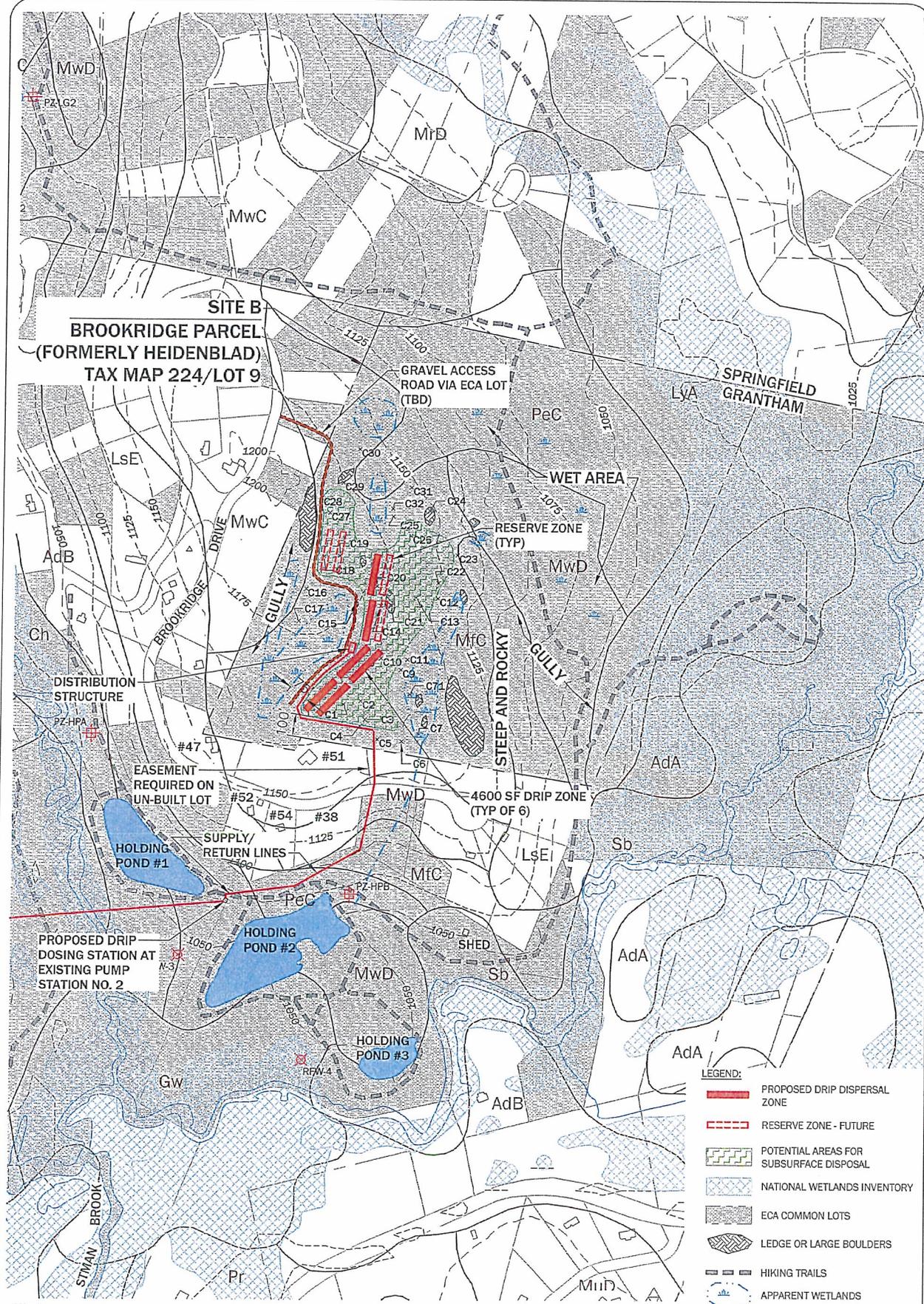
C.c. Bill Webber, Village District of Eastman



Thomas G. Page, P.E.  
Project Manager



**Appendix A.**  
**Workplans**



**SITE B**  
**BROOKRIDGE PARCEL**  
**(FORMERLY HEIDENBLAD)**  
**TAX MAP 224/LOT 9**

DISTRIBUTION STRUCTURE

EASEMENT REQUIRED ON UN-BUILT LOT

PROPOSED DRIP DOSING STATION AT EXISTING PUMP STATION NO. 2

GRAVEL ACCESS ROAD VIA ECA LOT (TBD)

WET AREA

RESERVE ZONE (TYP)

4600 SF DRIP ZONE (TYP OF 6)

SPRINGFIELD GRANTHAM

**LEGEND:**

- PROPOSED DRIP DISPERSAL ZONE
- - - RESERVE ZONE - FUTURE
- POTENTIAL AREAS FOR SUBSURFACE DISPOSAL
- NATIONAL WETLANDS INVENTORY
- ECA COMMON LOTS
- LEDGE OR LARGE BOULDERS
- HIKING TRAILS
- APPARENT WETLANDS
- x C2 AUGER CORE LOCATION
- HmC USDA NRCS SOIL GROUP

**NOTE:**  
 INFORMATION IS APPROXIMATE ONLY, BASED ON ON FIELD OBSERVATIONS AND AVAILABLE MAPPING, AND IS NOT BASED ON TOPOGRAPHIC SURVEY OR SUBSURFACE INVESTIGATIONS.  
 DRIP ZONE LOCATIONS AND CONFIGURATIONS PRELIMINARY ONLY PENDING SURVEY AND SUBSURFACE INVESTIGATIONS.



SCALE: 1"=400'

DATE  
7/2013  
PROJECT  
1676



**PROPOSED GROUNDWATER DISPOSAL SYSTEM**  
**BROOKRIDGE SITE**  
 EASTMAN COMMUNITY ASSOCIATION  
 GRANTHAM, N.H.

FIGURE  
**1**



**Appendix B.**  
**Test Auger Core Data**

# TODD LAND USE CONSULTANTS, LLC



TODD LAND USE CONSULTANTS, LLC  
336 FRANCESTOWN ROAD – P.O. BOX 190  
NEW BOSTON, NH 03070  
Telephone 603-487-2996  
Fax 603-487-2997

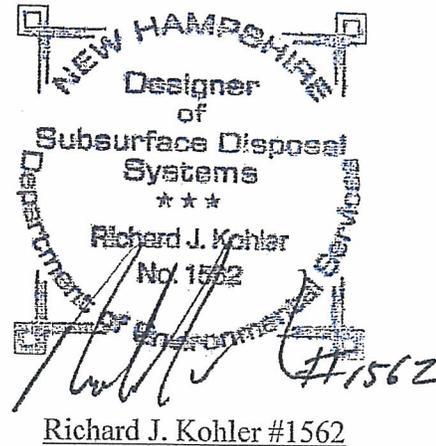
May 23, 2013

## SOILS REPORT

### Report Submitted To:

Thomas Page P.E.  
Underwood Engineers  
25 Vaughn Mall  
Portsmouth, N.H. 03801

Telephone: 436-6192



The following is my brief report relative to soil sampling performed for the Eastman Community Association proposed groundwater disposal system project Grantham, N.H. on May 22<sup>nd</sup>, 2013.

### Soils Information:

The soils in the subject areas were determined to be Monadnock stony fine sandy loam 8-15% slopes (MfC), Monadnock-Lyman-Rock outcrop complex 8-15% & 15-25% slopes (MwC/D) and potential inclusions of Peru stony loam 8-15% slopes (PeC) per Granit Soils Map Data.

### Objective:

The objective was to determine the estimated seasonal high water table (ESHWT) in the most reasonable locations for potential dispersal field placement in the subject areas A & B as determined by Underwood Engineers.

Considerations taken in the selected areas included slope, contour, percent cover by stone, boulders or ledge and evidence of drainage patterns and poorly drained soils.

### Methodology:

Using an incremented manual "T" bar soil auger I performed test bores at each selected site to determine either the (ESHWT) or a depth at which I encountered refusal above the (ESHWT). The depth of the Water Table was determined by the presence of redoximorphic features within the soil matrix and/or the presence of a restrictive feature indicative of a "perched" water table. The predominant result in my 58 samples were the existence of iron depletions (color 2.5Y 6/1) (Munsell Color Chart) and iron concentrations (color 7.5YR 5/8) massive spots >2% in the soil matrix (color 2.5Y5/4) having a weak blocky structure and a silty fine sandy loam texture. As illustrated in the following log, each test bore represents the depth of the (ESHWT) as either absolute or greater than in inches, shown as "X" or ">X".

**Conclusion:**

The density of the borings is sufficient to support the existence of the soil types as mapped and to conclude that within the designated areas A&B there are sufficient receiving areas to facilitate the proposed Drip Type system dependant on the size of the system relative to restrictive features on site.

**TEST BORE LOG:**

**Area (B)**

Bore 1. ESHWT 13"  
Bore 2. ESHWT >28"  
Bore 3. ESHWT 25"  
Bore 4. ESHWT 35"  
Bore 5. ESHWT 21"  
Bore 6. ESHWT 24"  
Bore 7. ESHWT >24"  
Bore 8. ESHWT 24"  
Bore 9. ESHWT >24"  
Bore 10. ESHWT 18"  
Bore 11. ESHWT 28"  
Bore 12. ESHWT 30"  
Bore 13. ESHWT 32"  
Bore 14. ESHWT >40"  
Bore 15. ESHWT 28"  
Bore 16. ESHWT 26"  
Bore 17. ESHWT >30"  
Bore 18. ESHWT 32"  
Bore 19. ESHWT 28"  
Bore 20. ESHWT >24"  
Bore 21. ESHWT >24"

Bore 22. ESHWT >20"  
Bore 23. ESHWT 18"  
Bore 24. ESHWT 32"  
Bore 25. ESHWT 25"  
Bore 26. ESHWT >32"  
Bore 27. ESHWT 26"  
Bore 28. ESHWT >30"  
Bore 29. ESHWT >20"  
Bore 30. ESHWT 30"  
Bore 31. ESHWT >30"  
Bore 32. ESHWT 29"

**TEST BORE LOG:**

**Area (A)**

Bore 33. ESHWT >30"  
Bore 34. ESHWT >32"  
Bore 35. ESHWT 18"  
Bore 36. ESHWT >30"  
Bore 37. ESHWT 32"

Bore 38. ESHWT 28"  
Bore 39. ESHWT 14"  
Bore 40. ESHWT >30"  
Bore 41. ESHWT 12"  
Bore 42. ESHWT At Surface  
Bore 43. ESHWT 21"  
Bore 44. ESHWT >30"  
Bore 45. ESHWT 18"  
Bore 46. ESHWT 24"  
Bore 47. ESHWT 24"  
Bore 48. ESHWT 16"  
Bore 49. ESHWT 21"  
Bore 50. ESHWT >24"  
Bore 51. ESHWT 21"  
Bore 52. ESHWT >60" Sand Dep.  
Bore 53. ESHWT At Surface  
Bore 54. ESHWT 28"  
Bore 55. ESHWT 21"  
Bore 56. ESHWT 22"  
Bore 57. ESHWT 16"  
Bore 58. ESHWT 21"

**Appendix C.**  
**Preliminary Basis of Design**

Eastman Sewer Company  
 Brookridge Site  
 (Formerly Heidenblad Site)

6/14/2013

Underwood Engineers

**Available Capacity for Drip Dispersal**

	<i>Lower Range</i>	<i>Higher Range</i>	<i>Remarks</i>
Total lot size, Ac		79	79
Suitable Area, Total, SF	<b>350000</b>		<b>350000</b>
Suitable area, total, ac	<b>8.0</b>		<b>8.0</b>
ledge, and distribution piping	0.5		0.75 Allow for major interferences between zones
Net area for zones, SF	175000		262500
Loading rate, gpd/sf	0.6		0.6 max loading 0.6 gpd/sf at 2' spacing minimum
Average drip line spacing, ft	4		4 Allow routing around local interferences: trees, rocks, etc
Net capacity, gpd	<b>52500</b>		<b>78750</b> Assuming average spacing is greater than 2' minimum
<b>Design Capacity Required</b>			
Design flow to replace irrigation, gpd	16,000		
Existing average daily flow, gpd	55,000		
Future design average daily flow, gpd	71,500		Includes 30% allowance for future growth and NHDES 20% spare capacity

Eastman Sewer Company  
 Conceptual Drip Dispersal Design

9-Jul-13

Parameter	Current Design	Future	Remarks
<b>General Drip Zone Design</b>			
Lateral length, ft	190	190	300' max lateral length
Lateral spacing, ft	4	4	4' average, 2' minimum, to allow routing around 4 trees, interferences
Number of laterals	12	12	Use even number for equal subzones
Zone width, ft	48	48	
Total drip line length, ft	2280	2280	
Zone area, sf	9,120	9,120	
Number of sub zones per zone	1	1	
Subzone width, ft	48	48	50' max lines from top manifold to lateral
Drip line area, SF per LF	2.0	2.0	
Drip line loading rate, gpd/sf	0.6	0.6	Average loading over entire zone area
Zone capacity, gpd/zone	2736	2736	
Emitter flowrate, gph	0.61	0.61	based on Perc-Rite emitters
Emitter spacing, ft	2	2	
Number of emitters per zone	1140	1140	
Total emitter flowrate per zone, gpm	11.6	11.6	
<b>Brookridge Site</b>			
Number of Zones	6	20	Initial/future number of zones
Capacity per zone, gpd	2736	2736	
Total capacity, gpd	16,416	54,720	
Total capacity, Mgal/yr	6.0	20.0	
Number of zones dosed at a time per station	2	4	Connect some zones together in future and increase pump rate
Flowrate per zone, gpm	11.6	11.6	
Total dosing pump rate, gpm	23.18	46.36	largest std Perc-rite unit is 250 gpm
Dosing pump run time per day, hours	11.8	19.7	total run time all doses (keep less than 50% of day initially)
Number of doses per day per zone	6	6	
Number of doses per day total	18	30	
Time per dose, min	39.3	39.3	15 minutes minimum for even distribution, but limited to avoid instantaneous overloading.

**Notes**

Consider higher flow emitters or more dripline per zone if need to reduce pump runtime.

1676 Contract

May 14, 2013

Mr. Brian Harding, General Manager  
Eastman Sewer Company  
Post Office Box 470  
Grantham, NH 03753

Re: ***Report Phase Engineering Contract – Amendment No. 4  
WWTF Evaluation  
Eastman Sewer Company, Grantham, NH***

Dear Mr. Harding:

Enclosed is a **fully executed copy** of the Report Phase Engineering Contract Amendment No. 4 for the above-referenced project for your files.

Please contact me at 230-9898 if you have any questions.

Very truly yours,

UNDERWOOD ENGINEERS, INC.



David J. Mercier, P.E.  
Senior Project Manager

Encl.

cc: Keith Pratt – UE (w/ORIGINAL)

Amendment No. 4

**Engineering Report Phase  
Contract for Professional Services  
for  
Treatment Works**

Wastewater Treatment Evaluations  
Eastman Sewer Company  
Grantham, New Hampshire  
UEI Project #1676-01; DES Project No. R-700-01

WHEREAS, an AGREEMENT made and entered into at Sullivan County, New Hampshire, on the 14<sup>th</sup> day of June 2011, by and between the Eastman Sewer Company, hereinafter called the OWNER, and Underwood Engineers, Inc. hereinafter called the ENGINEER for engineering work required to evaluate upgrades to the existing wastewater treatment facilities to allow the new effluent discharge permit to be met, the first task of which was to develop and implement a sampling and analysis program, and

WHEREAS, engineering assistance for a temporary (one-year) groundwater discharge permit which expires in 2013 was provided under Amendment No. 1, and

WHEREAS, a Wastewater Evaluation report was prepared under Amendment No. 2, and

WHEREAS, engineering assistance for a 5-year discharge permit renewal was provided under Amendment No. 3, and

WHEREAS, site investigations are needed to evaluate the potential subsurface disposal sites identified in the Wastewater Evaluation report before proceeding with design.

NOW, THEREFORE, in consideration of the agreement an amendment is hereby agreed to by the OWNER and the ENGINEER as follows:

A. That the time of report completion for in Section III, Paragraph A., on Page 2 be amended to read:

**“The site investigations report within 90 consecutive calendar days following acceptance of contract Amendment No. 4 by the Owner,”**

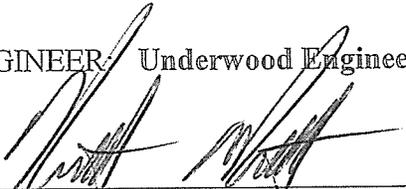
B. That the dollar amount in Section IV, Paragraph A.2, on Page 2 be amended to read:

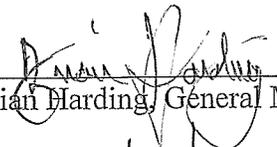
**“, a fee not to exceed Fifty Thousand Dollars (\$50,000.00). (Previous fee = \$34,500.00, Increase = \$15,500.00)”**

The OWNER and the ENGINEER hereby agree to this Amendment.

ENGINEER: Underwood Engineers, Inc.

OWNER: Eastman Sewer Company

  
\_\_\_\_\_  
By: Keith A. Pratt, P.E., President

  
\_\_\_\_\_  
By: Brian Harding, General Manager

Date: 5-2-13

Date: 4/30/2013

\_\_\_\_\_  
By: W. Steven Clifton, P.E., Vice President  
Date: \_\_\_\_\_

APPROVED: Department of Environmental Services  
Water Division

  
\_\_\_\_\_  
By: Paul L. Heitzler, P.E., Administrator  
Date: 5/8/13

*\*\*It is understood that as an act in furtherance of its statutory authority to approve engineering agreements for sewerage facilities, the DIVISION's approval does not impose any contractual obligation or liability on the State of New Hampshire, the Department of Environmental Services or the DIVISION.*

*\*Signatures should be supported by appropriate document.*

**ATTACHMENT A - COMPREHENSIVE STUDY SCOPE OF SERVICES****EASTMAN SEWER COMPANY  
GRANTHAM, NEW HAMPSHIRE****WASTEWATER TREATMENT EVALUATIONS**

Underwood Engineers (UE) will provide professional engineering services relating to long-term wastewater improvements for the Eastman Sewer Company (ESC). The project will be based on implementing an onsite subsurface disposal system with modified permit limits.

The Wastewater Evaluation Report prepared by Underwood Engineers (January 4, 2013) identified two potential sites for subsurface disposal: the Heath Property and the Heidenblad Property. The latter site may be preferred by ESC if confirmed feasible. The purpose of this Scope is to evaluate the feasibility of each property and refine the location of proposed subsurface disposal systems for final design. Note: This is still considered preliminary investigative work and additional detailed investigations will be required for final design purposes.

**TASK 5: PRELIMINARY SITE INVESTIGATIONS - HEIDENBLAD PROPERTY**

The evaluation and preliminary layout will be based on drip dispersal zones with a total maximum daily flow of 16,000 gpd in accordance with the Wastewater Evaluation report. The layout will include provisions for phased future expansion. Preliminary site investigations at the Heidenblad Property will include:

- Kickoff meeting with ESC.
- Site reconnaissance to establish test pit locations. Existing work plans and a handheld GPS unit will be used to approximately locate certain features of interest.
- Evaluate piping route(s) from Effluent Storage Pond pumping station to disposal sites.
- One day of test pits, with logs. Additional test pits carried in Task 6 may be performed instead at the Heidenblad property if directed by ESC.
- If the test pits indicate potential suitability for drip dispersal, develop preliminary location and layout of drip zones and distribution piping, based on site investigations.
- Layout will be basis for future hydrogeological evaluations.
- Refine basis of design including design loading rates for hydrogeological evaluations.
- Meet with ESC to review findings and recommendations.
- Brief letter report or technical memo summarizing findings and recommendations.

## TASK 6: PRELIMINARY SITE INVESTIGATIONS - HEATH PROPERTY

Pending the results of site investigations under Task 5 and if authorized by ESC, UE will perform site investigations at the Heath Property, including:

- Site reconnaissance to establish test pit locations. Existing work plans and a handheld GPS unit will be used to approximately locate certain features of interest.
- Evaluate piping route(s) from Effluent Storage Pond pumping station to disposal sites.
- One day of test pits, with logs.
- If the test pits indicate potential suitability for drip dispersal, develop preliminary location and layout of drip zones and distribution piping, based on site investigations.
- Layout will be basis for future hydrogeological evaluations.
- Refine basis of design including design loading rates for hydrogeological evaluations.
- Meetings and technical memo are assumed included under Task 5.

**NOTE:** Access to site(s) to be provided by ESC. Minor clearing of limbs and brush will be necessary for access by machinery.

**NOTE:** Backhoe and operator to be provided by ESC.

**NOTE:** Future Design tasks are anticipated to includes design of improvements, subsurface investigations (including borings, hydrogeological evaluation, and nitrate attenuation study), and topographical survey. Design, Bidding, and Construction Phase Engineering Services are not included in this Scope of Work.

### BUDGET COST:

Budget estimates for the tasks outlined in the Scope of Work are:

TASK 5 – Preliminary Site Investigations - Heidenblad Property	\$10,700
TASK 6 – Preliminary Site Investigations - Heath Property	<u>\$4,800</u>
TOTAL	\$15,500