

**ADDENDUM NUMBER 2  
TO  
PLANS AND SPECIFICATIONS FOR  
WWTP/SLUDGE REMOVAL AND DISPOSAL  
MANCHESTER, IOWA  
Project No. 07601.MS**

A. EXCAVATED MATERIALS

Materials expected to be encountered during excavation include topsoil, clayey sand, and sandy clay soils typical of the area and the sludge materials intended for removal. Information from soil bores completed for the WWTP project is included in the contract documents. No other information is provided indicating the presence of other materials such as rubble or trash.

If the Contractor encounters subsurface conditions differing from those indicated above the Contractor shall notify the Engineer. See Section 1040, 1.09 Changed Site Conditions.

B. COMPLETION DATE / SITE CONDITIONS

The Contractor may begin working following receipt of the signed contract and issuance of the Notice to Proceed. The land owner of the property where sludge is to be land applied will provide the Jurisdiction with the suitability of access to the field(s) for application. When conditions are suitable for application, work shall proceed.

If weather and site conditions do not provide a minimum of five days for land application of the sludge materials prior to the completion date of April 25, 2008, and extension for completion will be provided based on conditions at such time.

C. PERMIT INFORMATION

The City of Manchester STP, Permit Number 2839001, is an existing sludge generating facility and is authorized to land apply sewer sludge under its NPDES permit. Iowa DNR Field Office No. 1 has been notified of the proposed land application of the buried sludge material as required under the permit.

The Contractor shall complete the necessary information on the attached Class II Sludge Disposal Plan and provide copy to the Jurisdiction. This information shall be kept on file by both the Jurisdiction and Contractor for five years.

D. SLUDGE FECAL COLIFORM TESTING

Testing of sludge samples collected by the Contractor and provided to the Jurisdiction is anticipated to require five business days for results to be received.

E. SLUDGE INFORMATION


Pollutant concentration of the sludge is listed in the attached Class II Sludge Disposal Plan. The average percent solids of the sludge from the soil testing completed is 76.7%. A rate of 35 CY / Acre is estimated to maintain a rate below the expected agronomic uptake rate. The land area required based on 1000 CY of sludge is 30 acres.

F. WORKING HOURS

Contractor shall restrict work within the City Corporate Limits between the hours of 6:00AM and 5:00PM unless written authorization is obtained from the Jurisdiction for an extension of these hours.

G. ADDENDUM ACKNOWLEDGEMENT

Bidders are reminded to acknowledge this addendum in Part B on the first page of the Form of Proposal.

	<p>I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.</p> <hr/> <p>Ryan M. Wicks, P.E. <span style="float: right;">Date</span> License Number 16341 My license renewal date is December 31, 2009. Pages covered by this seal: Addendum No. 2, Pages 1 - 2</p>
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# CITY OF MANCHESTER, IOWA

## CLASS II SLUDGE DISPOSAL PLAN \_\_\_\_\_

(DATE)

### SLUDGE SAMPLING FREQUENCY

AMOUNT OF SEWAGE SLUDGE IN METRIC TONS PER 365-DAY PERIOD DRY WEIGHT BASIS	MONITORING FREQUENCY	CHECK THE CORRECT BOX FOR YOUR FACILITY
GREATER THAN ZERO BUT LESS THAN 290 (or 325 English Tons)	ONCE PER YEAR	<input type="checkbox"/>
EQUAL TO OR GREATER THAN 290 BUT LESS THAN 1,500 (325 To 1,680 English Tons)	ONCE PER QUARTER (4 Times Per Year)	<input checked="" type="checkbox"/> (one time application)
EQUAL TO OR GREATER THAN 1,500 BUT LESS THAN 15,000 (1,680 To 16,800 English Tons)	ONCE PER 60 DAYS (6 Times Per Year)	<input type="checkbox"/>
EQUAL TO OR GREATER THAN 15,000 (or 16,800 English Tons)	ONCE PER MONTH (12 Times Per Year)	<input type="checkbox"/>

### POLLUTANT CEILING CONCENTRATIONS

POLLUTANT	COLUMN A mg/Kg	Ceiling Concentration Milligrams / Kilogram*	SAMPLING DATES / RESULTS					
			SB1-6' 5/15/2007	SB1-8' 5/15/2007	SB10-6' 5/15/2007	SB10-9' 5/15/2007	SB10-10' 5/15/2007	
Arsenic	41	75	2.6	<2.9	<1.5	<1.6	2.0	
Cadmium	39	85	<0.8	<1.5	<0.8	<0.8	<0.8	
Chromium	1200	3000	11.8	9.7	9.3	9.3	10.7	
Copper	1500	4300	11.2	14.2	7.3	10.3	8.9	
Lead	300	840	8.9	11.1	7.0	9.4	7.9	
Mercury	17	57	<0.07	<0.15	<0.04	<0.07	<0.09	
Molybdenum	75	75	1.7	3.3	1.2	<0.8	<0.8	
Nickel	420	420	8.6	<7.4	5.6	6.4	7.5	
Selenium	36	100	<1.5	<2.9	<1.5	<1.6	<1.5	
Zinc	2800	7500	49.9	84.1	38.4	31.5	36.6	

\*Dry Weight Basis

IS THIS SLUDGE SUBJECT TO CUMULATIVE LOADING RATES:  YES  NO

(Sludge less than concentration in Column A is not subject to cumulative loading rates.)

(If sludge exceeds ceiling concentrations, the sludge can not be land applied - contact Field Office #6.)

THE LOADING RATE IN POUNDS PER ACRE IS DETERMINED BY THE FOLLOWING CALCULATIONS:

(1) METAL CONCENTRATION (mg/Kg) X .000001\* =     lbs METAL      
\*(conversion factor) lb DRY SLUDGE

(2) GALLONS OF SLUDGE X % SOLIDS (in decimals) X 8.34 lb/gal = lbs DRY SLUDGE

(3) MULTIPLY ANSWER (1) BY ANSWER (2) TO GET lbs OF METAL.

(4) TAKE ANSWER FROM (3) AND DIVIDE BY # OF ACRES = lbs / ACRE

**EXAMPLE:** THE SEWAGE SLUDGE SAMPLE RESULT FOR CHROMIUM IS 40 mg/Kg. DETERMINE THE lbs/Acre OF CHROMIUM THAT WILL BE LAND APPLIED ON 30 ACRES - ASSUME 10,000 GALLONS OF SLUDGE AT 10% SOLIDS.

(1) 40 mg / Kg X .000001 = .00004 lbs CHROMIUM PER lb OF DRY SLUDGE

(2) 10,000 GALLONS OF SLUDGE X .10 (% Solids in Decimals) X 8.34 lb / gal = 8340 lbs DRY SLUDGE

(3) .00004 lbs CHROMIUM / lb DRY SLUDGE X 8340 lbs DRY SLUDGE = .3336 lbs CHROMIUM

(4)  $\frac{.3336 \text{ lbs CHROMIUM}}{30 \text{ ACRES}}$  = .0111 lbs OF CHROMIUM / ACRE

### CUMULATIVE POLLUTANT LOADING RATES

POLLUTANT	LOADING RATE Pounds Per Acre	Previous Loading Rate Pounds Per Acre	Current Loading Rate Pounds Per Acre	Cumulative Loading Rate Pounds Per Acre
Arsenic	36			
Cadmium	34			
Chromium	2670			
Copper	1335			
Lead	267			
Mercury	15			
Molybdenum	66			
Nickel	373			
Selenium	89			
Zinc	2490			

### MANAGEMENT PRACTICES

BRIEFLY DESCRIBE HOW YOUR FACILITY COMPLIES WITH THE MANAGEMENT PRACTICES FOR CLASS II SEWAGE SLUDGE LISTED IN IOWA ADMINISTRATIVE CODE 567--67.8(2) [see attached copy].

- Sludge will be applied to an agricultural field and not a lawn or garden.
- Pollutant concentrations of this sludge are well below those listed in Table 1 of 567-subrule 67.7(1), so cumulative loading rates do not apply.
- Sludge is not being applied to land that is likely to adversely affect a threatened or endangered species.
- The sludge will be applied at a rate below the agronomic nitrogen uptake rate. Assuming a conservatively low typical corn yield of 180 bushel per acre, the total nitrogen required is 133 pounds per acre. The total nitrogen in the sludge is estimated at 3,700 pounds, so 28 acres are required at a minimum. The total area being applied to is **30 acres**, so the rate will be below the agronomic uptake rate.
- A small portion of one of the fields is classified as "Chelsea loamy fine sand". Application in this area will not be allowed.
- Due to the low application rate proposed (approximately ¼") and single time application, we do not expect any impacts on soil pH.
- The sludge will be incorporated within 6 hours of application.
- The sludge will not be applied on frozen or snow covered ground.
- There are no open streams within 30 feet of the land application areas and the sludge will be incorporated.
- The sludge will be incorporated, so the flooding issue is not a concern.
- The sludge will not be applied within 200 feet of a residence or well.

## PROCESS TO SIGNIFICANTLY REDUCE PATHOGENS (PSRP)

CHECK THE BOX(ES) NEXT TO THE METHOD(S) WHICH YOUR FACILITY USES TO COMPLY WITH **PSRP** REQUIREMENTS:

1. GEOMETRIC MEAN OF SEVEN FECAL COLIFORM SAMPLES SHALL BE LESS THAN 2,000,000 MPN.  
RESULTS OF TEST \_\_\_\_\_ MPN.

USE THE FOLLOWING CALCULATION TO DETERMINE GEOMETRIC MEAN OF SEVEN SAMPLES:  
 $X = \text{SAMPLE RESULT} \quad (X_1) (X_2) (X_3) (X_4) (X_5) (X_6) (X_7) = (X_{1...7})^{.143}$

EXAMPLE: DETERMINE THE GEOMETRIC MEAN FOR THE FOLLOWING 7 RESULTS:  
FECAL COLIFORM RESULTS (In Millions): 1.5, 2, 1, 3, 1, 2, .5

$$(1.5) (2) (1) (3) (1) (2) (5) = 9 \Rightarrow 9^{.143} = 1.37 \text{ MILLION ORGANISMS}$$

2. AEROBIC DIGESTION. VALUES FOR THE MEAN CELL RESIDENCE TIME AND TEMPERATURE SHALL BE BETWEEN 40 DAYS AT 20° C AND 60 DAYS AT 15° C.

DETENTION TIME \_\_\_\_\_ TEMPERATURE \_\_\_\_\_

3. ANAEROBIC DIGESTION. VALUES FOR THE MEAN CELL RESIDENCE TIME AND TEMPERATURE OF 15 DAYS AT 35° TO 55° C AND 60 DAYS AT 20° C.

DETENTION TIME \_\_\_\_\_ TEMPERATURE \_\_\_\_\_

4. COMPOSTING. USING ONE OF THREE COMPOSTING METHODS, THE TEMPERATURE OF THE SLUDGE IS RAISED TO 40° C OR HIGHER AND REMAINS AT 40° C OR HIGHER FOR FIVE DAYS. FOR FOUR HOURS DURING THE FIVE DAYS, THE TEMPERATURE IN THE COMPOST PILE EXCEEDS 55° C.

DURATION \_\_\_\_\_ TEMPERATURE \_\_\_\_\_

5. LIME STABILIZATION. LIME ADDITION TO RAISE THE pH OF THE SEWAGE SLUDGE TO 12 AFTER TWO HOURS OF CONTACT

HOURS OF CONTACT \_\_\_\_\_ pH \_\_\_\_\_

6. AIR DRYING. SEWAGE SLUDGE IS DRIED ON SAND BEDS OR ON PAVED OR UNPAVED BASINS FOR A MINIMUM OF THREE MONTHS. DURING TWO OF THE THREE MONTHS, THE AMBIENT AVERAGE DAILY TEMPERATURE IS ABOVE ZERO° CELSIUS.

LENGTH OF DRYING TIME \_\_\_\_\_ AVERAGE TEMPERATURE \_\_\_\_\_

VECTOR ATTRACTION REDUCTION (VAR)

CHECK THE BOX(ES) NEXT TO THE METHOD(S) WHICH YOUR FACILITY USES TO COMPLY WITH **VAR** REQUIREMENTS:

- 1. REDUCE MASS OF VOLATILE SOLIDS BY A MINIMUM OF 38%.  
RESULT \_\_\_\_\_
  
- 2. THE SPECIFIC OXYGEN UPTAKE RATE (SOUR) SHALL BE  $\leq 1.5$  mg O<sub>2</sub> PER HOUR PER GRAM TOTAL SOLIDS AT 20° C. (Aerobic Digestion)  
RESULT \_\_\_\_\_
  
- 3. 40 DAY BENCH-SCALE TEST. (Anaerobic Digestion)
  
- 4. 30 DAY BENCH-SCALE TEST. (Aerobic Digestion)
  
- 5. AEROBIC DIGESTION 14 DAYS OR LONGER WITH AVERAGE TEMPERATURE OF 45° C.  
TEMPERATURE \_\_\_\_\_
  
- 6. pH ADJUSTMENT TO 12.  
DURATION \_\_\_\_\_ pH \_\_\_\_\_
  
- 7. INJECTION OF SEWAGE SLUDGE.  
METHOD \_\_\_\_\_
  
- 8. INCORPORATE SEWAGE SLUDGE WITHIN 6 HOURS.  
METHOD \_\_\_\_\_

CERTIFICATION STATEMENT

"I CERTIFY, UNDER PENALTY OF LAW, THAT THE CLASS II SEWAGE SLUDGE REQUIREMENTS HAVE BEEN MET. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR FALSE CERTIFICATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT."

Signature \_\_\_\_\_

TREATMENT FACILITIES WITH A DESIGN FLOW RATE OF 1 MILLION GALLONS PER DAY OR GREATER AND TREATMENT WORKS THAT SERVE 10,000 OR MORE PEOPLE SHALL SUBMIT THIS SLUDGE PLAN (OR A SIMILAR VERSION) TO THE IDNR WASTEWATER SECTION IN DES MOINES BY FEBRUARY 19<sup>TH</sup> OF EACH YEAR FOR THE PREVIOUS CALENDAR YEAR.

ALL OTHER TREATMENT FACILITIES WITH CLASS II SLUDGE SHALL DEVELOP AND MAINTAIN A WRITTEN SLUDGE PLAN AND RETAIN THE INFORMATION ON FILE FOR FIVE YEARS.



**67.8(4) Record keeping for Class II sewage sludge.**

a. Both the generator and applicator of Class II sewage sludge shall develop the following information and shall retain the information for five years:

- (1) The concentration of each pollutant listed in Table 3 in the sewage sludge.
- (2) The following certification statement: "I certify, under penalty of law, that the Class II sewage sludge requirements have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."
- (3) A description of how the Processes to Significantly Reduce Pathogens (PSRP) requirements are met.
- (4) A description of how the vector attraction reduction requirements are met.
- (5) A description of how the management practices for Class II sewage sludge are met for each site.
- (6) The location and area of each site.
- (7) The date and time and amount of sewage sludge applied to each site.
- (8) If subjected to cumulative loading limits, the amount and cumulative amount of each pollutant listed in Table 4 of paragraph 67.8(2) "b" in the sewage sludge applied to each site.
- (9) The amount of sewage sludge (i.e., metric tons) applied to each site.

**67.8(2) Management practices for Class II sewage sludge.**

a. Class II sewage sludge shall not be applied to a lawn or a home garden.

b. Land application sites accepting Class II sewage sludges not meeting pollutant concentrations listed in Table 1 of 567—subrule 67.7(1) are subjected to the cumulative pollutant loading rates listed in Table 4.

c. Sewage sludge shall not be applied to the land if it is likely to adversely affect a threatened or endangered species listed under section 4 of the Endangered Species Act or its designated critical habitat.

d. Sewage sludge shall be applied to the land at an annual whole sludge application rate that is equal to or less than the agronomic nitrogen uptake rate, unless otherwise specified by the department.

e. The sewage sludge shall be applied only to soils classified as acceptable throughout the top 5 feet of soil profile. The sewage sludge shall not be applied to soils classified as sand, loamy sand and silt. The acceptability of a soil shall be determined using the USDA soil classifications.

f. Land application sites shall have soil pH maintained above 6.0, unless (1) crops prefer soils with lower pH conditions, (2) the sludge meets the pollution concentrations contained in Table 1, or (3) the site does not exceed calcium carbonate equivalent levels according to sound farm management practices. If the soil pH is below 6.0, it is acceptable to use agricultural lime to increase the pH to an acceptable level.

g. If the sewage sludge is applied to land on which the soil loss exceeds the soil loss limits established by the county soil conservation district, the sewage sludge shall be injected on the contour or shall be applied to the surface and mechanically incorporated into soil within 48 hours of application. The sewage sludge shall not be applied to ground having greater than 9 percent slope unless approved by the department.

h. Sewage sludge application on frozen or snow-covered ground should be avoided, unless special precautions are taken such as proven farm management practices to avoid runoff. If application on frozen or snow-covered ground is necessary, it shall be limited to land areas of less than 5 percent slope unless approved by the department.

i. Sewage sludge shall not be applied to the land that is 35 feet or less from an open waterway. If sewage sludge is applied within 200 feet, but no closer than 35 feet, of a stream, lake, sinkhole or tile line surface intake located downgradient of the land application site, it shall be injected or applied to

the surface and mechanically incorporated into the soil within 48 hours of application unless approved by the department. Ch 67, p.8 Environmental Protection[567]

**j.** If the sewage sludge is applied to land subject to flooding more frequently than once in ten years, the sludge shall be injected or shall be applied to the surface and mechanically incorporated into the soil within 48 hours. Information on which land is subject to flooding more frequently than once in ten years is available from the department.

**k.** Sewage sludge shall not be applied within 200 feet of an occupied residence or any well. Distances may be reduced to a minimum of 35 feet with the written agreement of both the owner and occupant and an approved farm management plan which addresses soil erodibility, harvest residuals, buffer strips, and other sound farm management practices. The farm management plan shall be approved by the local soil conservation district commission in accordance with rules implementing Iowa Code sections 161A.42 to 161A.51.

**l.** Food crops with harvested parts that touch the sewage sludge/soil mixture shall not be harvested for 38 months after application of sewage sludge.

**m.** Food crops, feed crops and fiber crops shall not be harvested for 30 days after application of sewage sludge.

**n.** Animals shall not be allowed to graze on the land for 30 days after application of sewage sludge.

**o.** Turf grown on land where sewage sludge is applied shall not be harvested for one year after application of the sewage sludge when the harvested turf is placed on either land with a high potential for public exposure or a lawn, unless otherwise specified by the department.

**p.** Public access to land with a high potential for public exposure shall be restricted for one year after application of sewage sludge.

**q.** Public access to land with a low potential for public exposure shall be restricted for 30 days after application of sewage sludge.

**r.** When required by the director, groundwater monitoring wells and surface monitoring points shall be installed and a monitoring program implemented. Samples must be analyzed by a laboratory which is equipped and competent to perform the tests required by the director. The results shall be forwarded to the department on a stipulated schedule.

**s.** The sewage sludge generator shall provide the notice and necessary information to comply with the requirements to the sewage sludge applicator and landowner.

**t.** The sewage sludge applicator shall provide written notice, prior to the initial application of sewage sludge, to the department. The notice shall include:

(1) The location, by legal description, of the land application site and the landowner.

(2) The name, address, telephone number, and National Pollutant Discharge Elimination System permit number (if appropriate) of the sewage sludge generator and the applicator.