



Iowa Department of Natural Resources

IAC 567- Chapter 69 “Private Sewage Disposal Systems” & NPDES General Permit #4

Code and Permit Revisions

January 2009

Overview of Changes

- Title changed to “Private Sewage Disposal Systems” to match Iowa Code
- Changes and additions to definitions
- Addition of a time of transfer inspection section
- Addition of final inspection requirement and database tracking
- Changes to septic tank sizing and configuration
- Addition of soil loading rates to absorption system sizing
- Addition of requirements for grease traps, tank abandonment, pump vaults, at-grade soil systems, EPS aggregate, peat filters and textile filters
- Removal of some applications of free access sand filters and waste stabilization ponds
- Additional requirements for aerobic treatment units
- General permit 4 will change to include only those discharging onsite systems that pose a substantial risk to water quality

New Definitions

“Domestic sewage” or “domestic wastewater” – from Iowa Code

“Expanded Polystyrene (EPS) Aggregate Systems” – from industry

“Grease interceptor” – from Consortium

“Packed Bed Media Filter” – from Consortium and Committee

“Pre-treated effluent” – DNR and other states

“Sewage sludge” - from Iowa Code

Changed Definitions

“Administrative authority” – includes the Department

“Aerobic treatment unit (ATU)” – formerly mechanical aerobic....

“Gravel” – includes washed free of clay and clay coatings

“Gravelless pipe system” – removed 8” pipe

“Mound system” - defined as soil absorption system

“Qualified sampler” - removed DNR staff person

Changed Definitions

Private sewage disposal system” means a system which provides for the treatment or disposal of domestic sewage from four or fewer dwelling units or the equivalent of less than sixteen individuals on a continuing basis. This includes domestic waste whether residential or nonresidential but does not include industrial waste of any flow rate.

“Septage” means the liquid and solid material pumped from a septic tank, cesspool, or similar domestic sewage treatment system, or from a holding tank, when the system is cleaned or maintained.

Source – Iowa Code 455B.171

Rescinded definitions

Rescind the definitions of “Carbonaceous biochemical oxygen demand”, “Class A1 water”, “Class A2 water”, “Class A3 water”, “Sewage wastewater”, “Sludge” and “Wastewater management district”

Replaced or not used in Ch 69

General Requirements

Abandonment. Private sewage disposal systems that are abandoned shall have the septic tank pumped, the tank lid shall be crushed into the tank and the tank shall be filled with sand or soil.

Construction Permit required

Permit by rule. This chapter is intended to act as a permit by rule for private sewage disposal systems. Activities in compliance with this chapter are permitted by the director for purposes of compliance with sections 455B.183 and 455B.186 of the Code of Iowa.



More General Requirements

Final inspections - Required before backfilling or at a time prescribed by the administrative authority

Onsite wastewater tracking system - Required entry of; private sewage disposal system location address, owner, type of system, date of installation and a drawing of the system

Separation distances – same distances but,

- closed portion of system includes fully contained media filters
- Open portion includes open bottom filters

Time of Transfer Inspections



Largest addition to rules

Covered in detail in the next presentation

NPDES GP4 Requirements

Permit required for systems that discharge to a designated water of the state (perennial stream).



All other discharging systems require varying degrees of O&M



NPDES GP4 Requirements



Operation/maintenance

- packaged treatment systems
- Buried sand filters
- Others



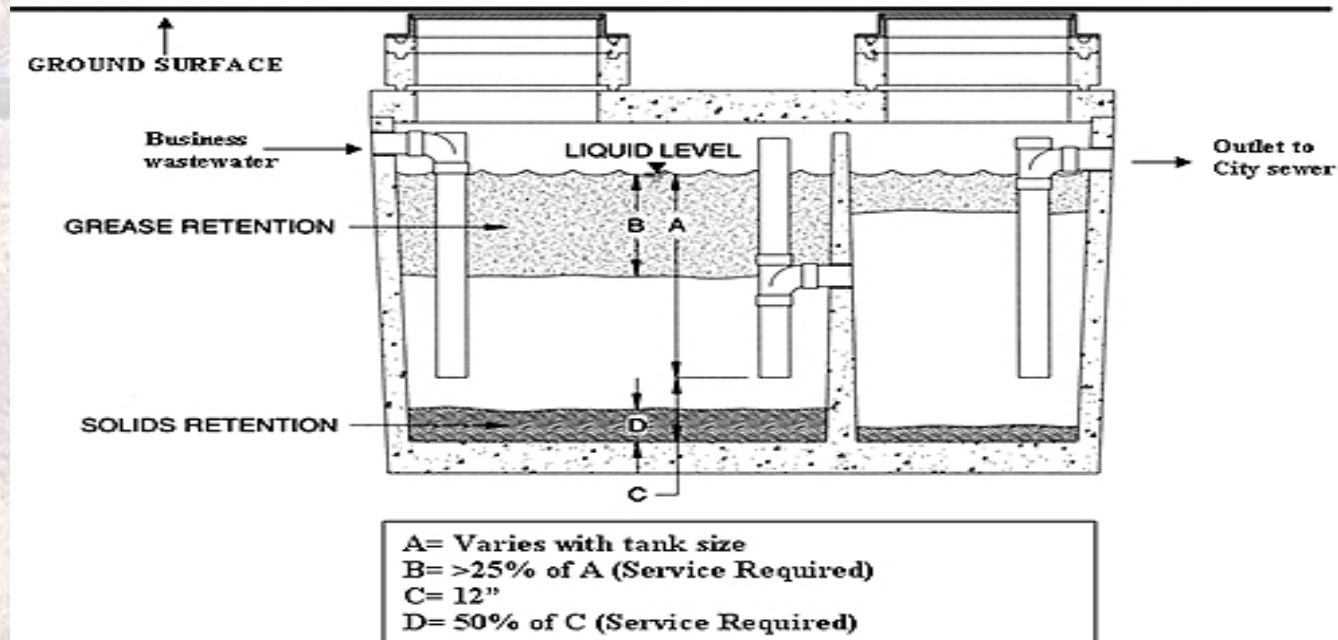
Guidance document for determining permit requirements

Grease interceptors

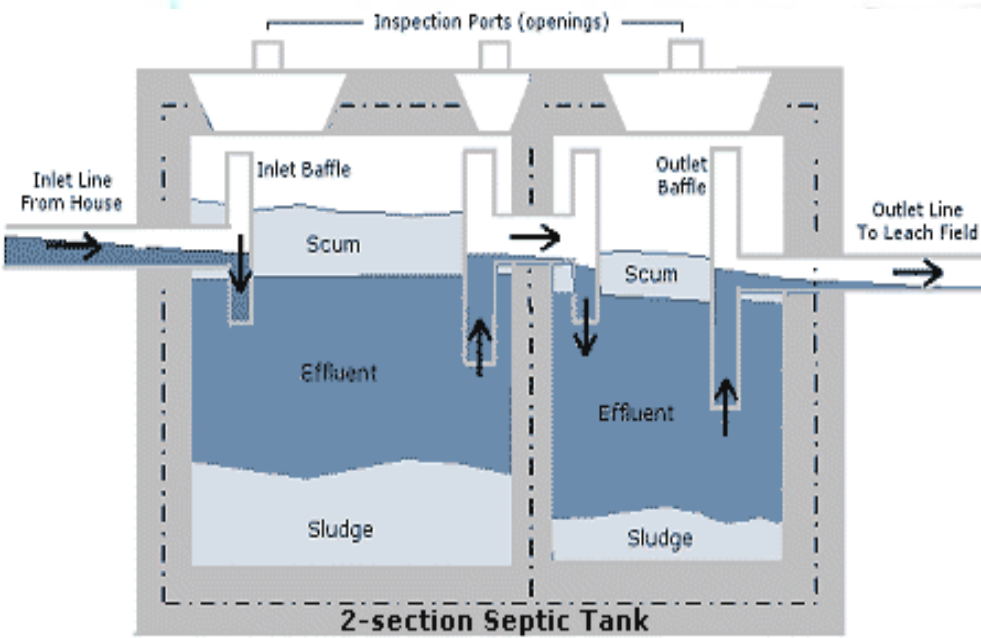
Required for commercial kitchens on septic systems

Installed prior to the septic tank

Encourage outside traps or tanks



Septic Tanks



Sizes increased by 250 gallons

- 250 gal. addition for high volume water use device(s) removed

Watertight tanks

- Allows for administrative authority to ask for proof

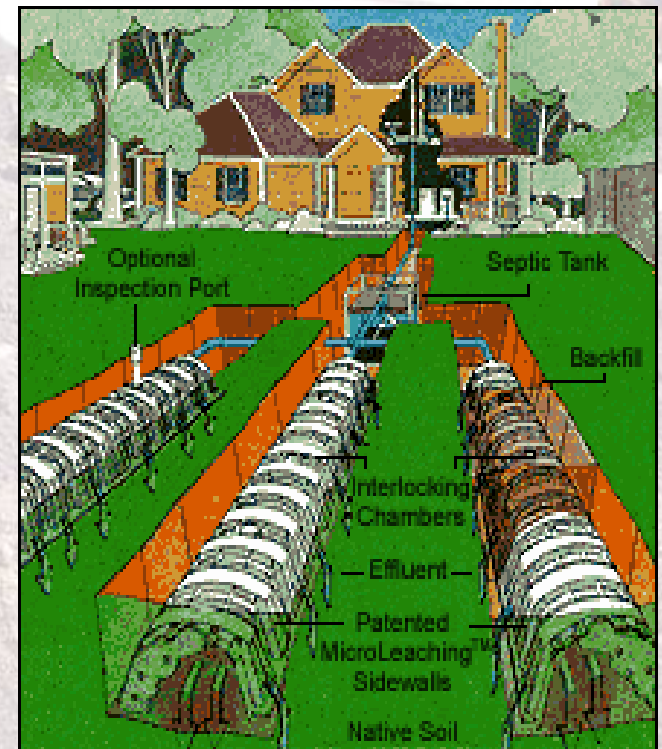
Septic Tanks



- Effluent screens required
- Lids finished to grade with watertight risers
- Lid configuration
- “Secured” lids
 - Weight
 - Fasteners

Soil absorption systems

- Sized by trench bottom square footage using soil loading rates
- Sizing chart will have perc rates and corresponding soil loading rate
- Allows 3ft wide trenches (wider is a bed!)



Trench sizing

Table III a
Maximum Soil Application Rates Based Upon Percolation Rates
Monthly Averages

<u>Percolation Rate</u> <u>(minutes per inch)</u>	<u>Septic tank effluent¹</u>		<u>Pre-treated effluent</u>
	<u>BOD5</u>	<u>30 mg/L -220 mg/L</u>	<u>BOD5 <30 mg/L</u>
	<u>TSS</u>	<u>30 mg/L -150 mg/L</u>	<u>TSS <30 mg/L</u>
	<u>(gals/sq ft/day)²</u>		<u>(gals/sq ft/day)</u>
0 to 5		1.2	1.6
Fine sands		0.5	0.9
6 to 10		0.8 – 0.6	1.2
11 to 29		0.6 – 0.5	0.9
30 to 45		0.5 – 0.4	0.7
46 to 60		0.4 – 0.2	0.5
61 to 120		0.0	0.3
greater than 120		0.0	0.0

Note: BOD means biochemical oxygen demand

TSS means total suspended solids

< means less than or equal to

(1) Typical waste strengths for domestic waste. Higher strength waste should consider pre-treatment.

(2) Percolation rates and soil loading rates do not precisely correlate therefore a range is provided.

Trench sizing

Table III c
Length of absorption trenches in feet

	<u>2 bedroom</u> <u>300 gal.</u>		<u>3 bedroom</u> <u>450 gal.</u>		<u>4 bedroom</u> <u>600 gal.</u>		<u>5 bedroom</u> <u>750 gal.</u>		<u>6 bedroom</u> <u>900 gal.</u>	
<u>Width of</u> <u>trench in feet</u>	<u>2'</u>	<u>3'</u>	<u>2'</u>	<u>3'</u>	<u>2'</u>	<u>3'</u>	<u>2'</u>	<u>3'</u>	<u>2'</u>	<u>3'</u>
<u>Soil loading</u> <u>rate gal/ft²</u>										
<u>0.1</u>	<u>Not suitable for soil absorption trenches</u>									
<u>0.2</u>	<u>750</u>	<u>500</u>	<u>1125*</u>	<u>750</u>	<u>1500*</u>	<u>1000*</u>	<u>1875*</u>	<u>1250*</u>	<u>2250*</u>	<u>1500*</u>
<u>0.3</u>	<u>500</u>	<u>333</u>	<u>750</u>	<u>500</u>	<u>1000*</u>	<u>666</u>	<u>1250*</u>	<u>833*</u>	<u>1500*</u>	<u>1000*</u>
<u>0.4</u>	<u>375</u>	<u>250</u>	<u>562</u>	<u>375</u>	<u>750</u>	<u>500</u>	<u>938*</u>	<u>625</u>	<u>1125*</u>	<u>750</u>
<u>0.5</u>	<u>300</u>	<u>200</u>	<u>450</u>	<u>300</u>	<u>600</u>	<u>400</u>	<u>750</u>	<u>500</u>	<u>900*</u>	<u>600</u>
<u>0.6</u>	<u>250</u>	<u>167</u>	<u>375</u>	<u>250</u>	<u>500</u>	<u>333</u>	<u>625</u>	<u>417</u>	<u>750</u>	<u>500</u>
<u>0.7</u>	<u>214</u>	<u>143</u>	<u>321</u>	<u>214</u>	<u>428</u>	<u>286</u>	<u>536</u>	<u>357</u>	<u>643</u>	<u>429</u>
<u>0.8</u>	<u>188</u>	<u>125</u>	<u>281</u>	<u>188</u>	<u>375</u>	<u>250</u>	<u>469</u>	<u>312</u>	<u>562</u>	<u>375</u>
<u>0.9</u>	<u>167</u>	<u>111</u>	<u>250</u>	<u>167</u>	<u>333</u>	<u>222</u>	<u>417</u>	<u>278</u>	<u>500</u>	<u>333</u>
<u>1.0</u>	<u>150</u>	<u>100</u>	<u>250</u>	<u>150</u>	<u>300</u>	<u>200</u>	<u>375</u>	<u>250</u>	<u>450</u>	<u>300</u>
<u>1.1</u>	<u>136</u>	<u>91</u>	<u>205</u>	<u>136</u>	<u>273</u>	<u>182</u>	<u>341</u>	<u>227</u>	<u>409</u>	<u>273</u>
<u>1.2</u>	<u>125</u>	<u>84</u>	<u>188</u>	<u>125</u>	<u>250</u>	<u>167</u>	<u>313</u>	<u>208</u>	<u>375</u>	<u>250</u>

NS - Not suitable for laterals

* Requires pressure distribution (pump)

Trench sizing

Table III b

Maximum soil loading rates based upon soil evaluations in gallons per square foot(gal/ft²/day) for septic tank effluent. Values in () are for secondary treated effluent.

<u>Soil Texture</u>	<u>Single Grain</u>	<u>Massive</u>	<u>Structure</u>			<u>Platy</u>	
			<u>Granular, Blocky, or Prismatic</u>			<u>weak</u>	<u>moderate strong</u>
			<u>weak</u>	<u>moderate</u>	<u>strong</u>		
<u>Coarse Sand and Gravel</u>	<u>1.2</u> <u>(1.6)</u>	<u>x</u>	<u>1.2</u> <u>(1.6)</u>	<u>x</u>	<u>x</u>	<u>1.2</u> <u>(1.6)</u>	<u>x</u>
<u>Medium sands</u>	<u>0.7</u> <u>(1.4)</u>	<u>x</u>	<u>0.7</u> <u>(1.4)</u>	<u>x</u>	<u>x</u>	<u>0.7</u> <u>(1.4)</u>	<u>x</u>
<u>Fine sands</u>	<u>0.5</u> <u>(0.9)</u>	<u>x</u>	<u>0.5</u> <u>(0.9)</u>	<u>x</u>	<u>x</u>	<u>0.5</u> <u>(0.9)</u>	<u>x</u>
<u>Very fine sands*</u>	<u>0.3</u> <u>(0.5)</u>	<u>x</u>	<u>0.3</u> <u>(0.5)</u>	<u>x</u>	<u>x</u>	<u>0.3</u> <u>(0.5)</u>	<u>x</u>
<u>Sandy Loam</u>	<u>X</u>	<u>0.3</u> <u>(0.5)</u>	<u>0.45</u> <u>(0.7)</u>	<u>0.6</u> <u>(1.1)</u>	<u>0.65</u> <u>(1.2)</u>	<u>0.4</u> <u>(0.6)</u>	<u>0.3</u> <u>(0.5)</u>
<u>Loam</u>	<u>X</u>	<u>0.4</u> <u>(0.6)</u>	<u>0.45</u> <u>(0.7)</u>	<u>0.5</u> <u>(0.8)</u>	<u>0.55</u> <u>(0.8)</u>	<u>0.4</u> <u>(0.6)</u>	<u>0.3</u> <u>(0.5)</u>
<u>Silty loam</u>	<u>X</u>	<u>NS</u>	<u>0.4</u> <u>(0.6)</u>	<u>0.5</u> <u>(0.8)</u>	<u>0.5</u> <u>(0.8)</u>	<u>0.3</u> <u>(0.5)</u>	<u>0.2</u> <u>(0.3)</u>
<u>Clay loam</u>	<u>X</u>	<u>NS</u>	<u>0.2</u> <u>(0.3)</u>	<u>0.45</u> <u>(0.7)</u>	<u>0.45</u> <u>(0.7)</u>	<u>0.1</u> <u>(0.2)</u>	<u>0.1</u> <u>(0.2)</u>
<u>Silty clay loam</u>	<u>X</u>	<u>NS</u>	<u>0.2</u> <u>(0.3)</u>	<u>0.45</u> <u>(0.7)</u>	<u>0.45</u> <u>(0.7)</u>	<u>NS</u>	<u>NS</u>

“X” - not found in nature

NS - not suitable for soil absorption

* some very fines sands are difficult to determine flow rates and experience may provide better information and flow rates.

Trench sizing

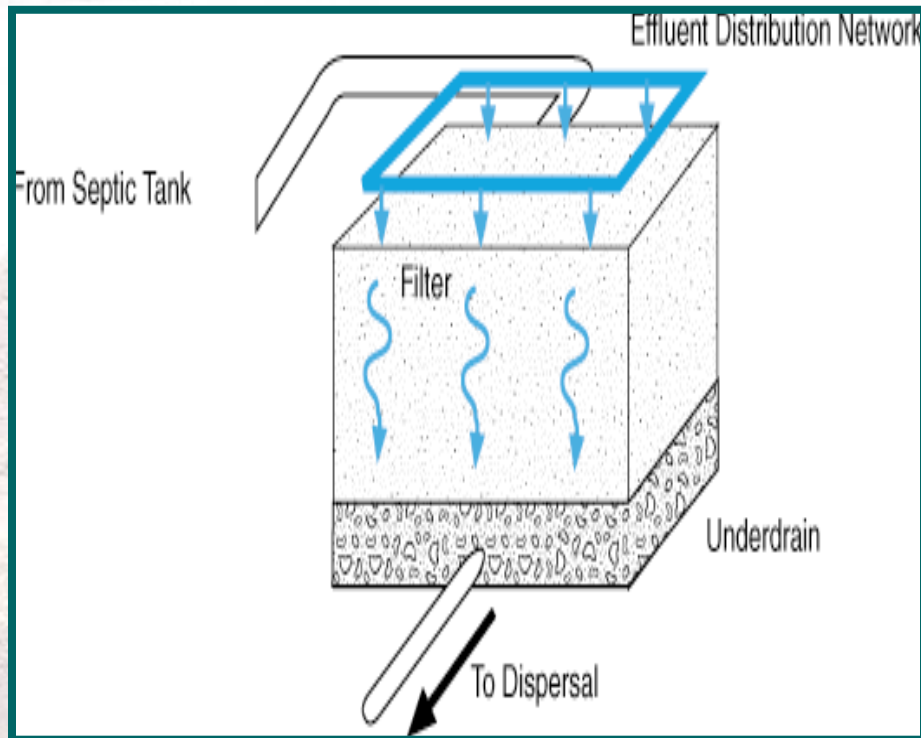


- Beds (any trench wider than 3 feet) still 50% larger
- Trench length reduction for additional rock removed
- Pre-treated effluent will refer to new sizing chart

Soil absorption systems

- Adds expanded polystyrene aggregate (EPS)
- Narrow chambers and 12" EPS bundles sized as 2 ft wide trench
- At-grade systems included
- Mounds – minor changes
- Soil absorption systems shall be considered BEFORE discharging systems

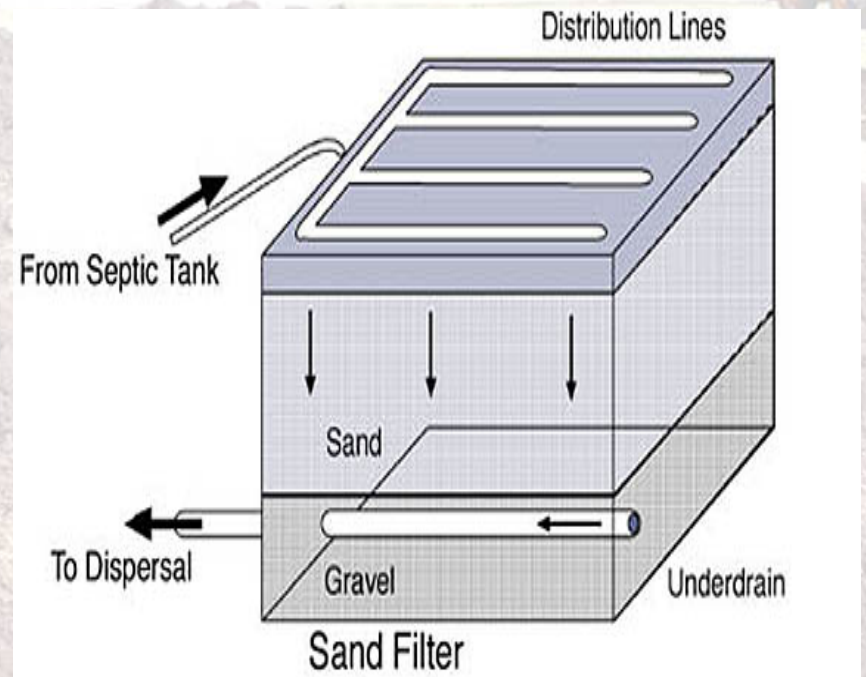
Packed bed media filters



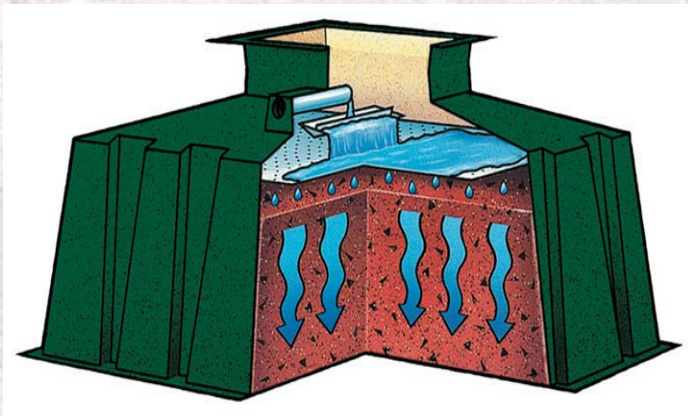
- Sand filters
- Sizing
 - Gravity, 240sqft/bdrm
 - Siphon, 180sqft/bdrm
 - Pumped, 150sqft/bdrm
- EPS, chambers added for distribution
- Discharge pipe must be SDR35 or better

Sand Filters

- Free access sand filters removed (except after ATU's)
- NPDES requirements only found in General Permit
- Dual sand filters removed



Other Packed Bed Media Filters



- Textile, peat filters added
- NSF certified
- Installed according to manufacturers recommendations
- All require perpetual maintenance contracts

Aerobic Treatment Units

- 500 gal. minimum trash tank required (for units that don't include one)
- Follow up treatment
 - 2^o treatment sizing
 - 5gpd/sqft free access sand filter
- Perpetual maintenance, no contract = no ATU
- Manufacturers must provide adequate service providers



ATU's continued



- Maintenance contracts required
 - Must be recorded in abstract
 - Maintenance provider must report discontinuance of contract
- Preference given to packed bed media filters

Other secondary treatment



- Waste stabilization ponds (lagoons) removed for household use
- Wetlands section does not change, note preference for packed bed media filters

Miscellaneous Items

- Experimental systems
 - Terminology changed from alternative/innovative
 - Must be engineered
 - Written agreement to replace system if it fails
 - Recorded in abstract
- Chemical toilets removed
- Appendix A simplified (commercial flows)

Questions?

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A 3D graphic of the words "THANK YOU" in a bold, blue, sans-serif font. The letters are rendered with a metallic, reflective texture and are set against a black rectangular background. The text is slightly tilted and has a shadow effect, giving it a three-dimensional appearance.

**THANK
YOU**