

Process Name	Operating Control System Monitor Method / Location	Frequency Recording data and abnormal conditions	Reference Procedure	Potential upset state Potential Abnormal condition(s)	Potential problem source	Reaction if Abnormal Conditions are Encountered
Lime Silo Chemical Level	Local display Level %	1 time per turn  Operator: Record level % on Form <div></div>	NSCS-M-P-7094-03	Volume <div>%</div>	1) Level sensor may have failed  2) More product may be dosed than normal	1) Contact Chemical Vendor for an emergency delivery if needed. Contact Instrument Repair to correct/replace the level sensor.  2) See the lime section below for proper lime addition rates. If incoming pH is consistently low, contact Final Treat Operator and ask them to investigate.
Lime Slurry Pumps Pump Operation	Visual inspection of pumps	1 time per turn  Operator: Record abnormal conditions on Form <div></div>	NSCS-M-P-7094-02	Lime not being dosed	Low oil level in pump	Check the sump pump for the proper oil level. Add oil if needed. If pump is not working, utilize the backup pump and contact Maintenance.
Thickener Sludge pH	Handheld pH meter Hach 3700 sc-series, or similar	1 time per turn  Operator: Record abnormal conditions on Form <div></div>	NSCS-M-P-7094-01 NSCS-M-P-7094-02 NSCS-M-P-7094-06	1) pH S.U. < <div></div>  2) pH S.U. > <div></div>	1) Lime feed rate may be too low, or influent sludge pH from Final Treat may be low  2) Lime feed rate was too high, or influent sludge pH from Final Treat may be high	1) If pH is low, increase lime feed to splitter box by mixing up a second lime slurry tank per shift. Improper pH can fail TCLP, but the system can run temporarily without lime addition. Perform multiple pH tests during a turn if the pH is out of range to ensure the proper lime slurry amount is added, or to determine when lime slurry should be added again. Contact Maintenance if repairs are required.  2) If pH is too high, decrease lime feed to splitter box. Note on Log Sheet 7094-02 that lime slurry should not be fed until the pH is back within range. Improper pH can fail TCLP, but the system can run temporarily without lime addition. Perform multiple pH tests during a turn if the pH is out of range to ensure the proper lime slurry amount is added, or to determine when lime slurry should be added again. Contact Maintenance if repairs are required. If lime addition is turned off and the pH continues to be high, contact Final Treat operator to check pH in the Final Treat system.
Thickener Sludge ORP	ORP Meter at Final Treat Aquametrix R60R8, or similar	1 time per turn  Operator: Record ORP on Form <div></div>	NSCS-M-P-7094-03	ORP < <div></div>	Lack of metals reduction chemistry	If ORP is low, oxidation may occur and change the state of the metal complexes. If low, the sludge may fail the TCLP at the Greenbelt II Landfill. Contact Final Treat Operator and ask them to check the ORP.

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Last Review Date: 12/03/2018

Utilities Midwest  
Plant Maintenance Midwest  
Gary Works

Process Name	Monitor Method / Location	Recording data and abnormal conditions	Reference Procedure	Potential upset state	Potential problem source	Reaction if Abnormal Conditions are Encountered
Thickener Sludge Bed Rake Torque	Local torque meter display  Westech torque control unit, or similar	1 time per turn  Operator: Record torque % on Form [REDACTED]	NSCS-M-P-7094-01	Torque > [REDACTED] %	1) More frequent press cycles are needed  2) Excessive formation of solids at Final Treat	1) Increase the press cycle frequency. Check the sludge level as noted below.  2) If greater than [REDACTED]%, notify the Utilities Manager. Valve all incoming sludge flow to the other gravity thickener unless its sludge load is greater than [REDACTED] ft. The sludge rake will "AUTO" stop at torque loads higher than [REDACTED] % to avoid mechanical damage.
Thickener Sludge Bed Sludge Level	Manual sludge sounder  Raven SID-10200, or similar	1 time per turn  Operator: Record level ft. on Form [REDACTED]	NSCS-M-P-7094-01  UT05-10-SJP	[REDACTED] ft depth	More frequent press cycles are needed	If the alarm is triggered, the sludge bed is too high. Begin to initiate more frequent sludge press cycles. If increased press cycles cannot keep up with the solids accumulation, contact Final Treat to reduce sludge pump rate and determine the increased solids cause.
Sludge Feed to Press pH	Handheld pH meter  Hach 3700 sc-series, or similar	1 time per turn  Operator: Record pH on Form [REDACTED]	NSCS-M-P-7094-01 NSCS-M-P-7094-02 NSCS-M-P-7094-06	1) pH S.U. < [REDACTED]  2) pH S.U. > [REDACTED]	1) Lime feed rate in thickener may be too low  2) Lime feed rate in thickener may be too high	1) See Thickener pH above.  2) See Thickener pH above.
Sludge Feed to Press ORP	Local Display ORP Meter in Press Building  Aquametrix R60R8, or similar	1 time per turn  Operator: Record ORP on Form [REDACTED]	NSCS-M-P-7094-03	ORP < [REDACTED]	Lack of metals reduction chemistry	See Thickener Sludge ORP above.
Sludge Cake % Solids	Manual % Solids Test	Perform Each Press Cycle  Operator: Record % solids on Form [REDACTED]	NSCS-M-P-7094-07 NSCS-M-P-7094-02	Solids [REDACTED]	Poor press system operation	This test is used for process control to monitor press performance. If the solids content is too low, it may be due to a pump problem and a longer press cycle may be needed. It could also indicate maintenance is needed on the filter press. Check if the filter cloths need cleaning.
Sludge Cake Thickness	Metric ruler measurement	Perform Each Press Cycle  Operator: Record thickness on Form [REDACTED]	NSCS-M-P-7094-11 NSCS-M-P-7094-02 UT05-05-SJP	Cake [REDACTED]	Poor press system operation	This test is used as process control information to monitor press performance. If cake thickness is low, check if filter cloths need cleaned or replaced, that sludge pumps are working properly, the membrane air system is working properly, and if a membrane or plate may be broken.

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