Doc# NSCS-M-P-7091-09
Title: Equalization Basins
Issue Dt: 05/22/2003
Revision Dt:07/20/2018 Review Interval:12
Cat: Quality Doc Type: SOP
Auth:
Desc: Equalization Basins
Loc: Midwest - Utilities-Midwest - Plant Maintenance-Midwest-Gary Works

STEPS	PROCEDURES
Process Overview	The equalization basins are at the south end of the Final Treatment Plant. They are made up of the influent distribution box, the north and south basins, the effluent distribution box, oil skimmers, and sub-drain and sludge buildings and pumps. The raw wastewater enters the influent distribution where two large gate valves control the flow to the inlet of the two basins. The wastewater enters the basins and rises up the two chimneys or out of the sidewall of the pipeline. In the basin the wastewater is slightly aerated to oxidize the iron. Also, large rocks, debris and heavy oils sink in the basin. The wastewater leaves the basin via the effluent distribution box and flows north to the mix tank inlet channel. Oils can be skimmed via the manual skimmer system. The oil flows down a pipeline to the scum and oil pit where is it pumped up into the light oil tank. From here the water is decanted to the north equalization basin and the oil is removed from the tank for further processing and recycle.
Process Control	Operator controls the equalization basins level in the basins. Level control is accomplished by manually adjusting the effluent gate valves. It takes several hours for adjustments to balance out. Normal control range is one to four feet of freeboard below the maximum level the basin can hold. Best control is attained when the concrete chimneys are not visible.
Equalization Basin and North End Sedimentation Basin Inspection and Skimming	The north and south equalization basins and the north end of the east and west sedimentation basins must be inspected a minimum of four times per shift, seven days a week. This inspection is part of a State of Indiana IDEM agreement for improved operational control of the treatment plant. Inspect the: ▪ North end scum and oil skimmer on both the east and west sedimentation tanks for material that needs skimmed. ▪ North equalization basin for material that needs skimmed. ▪ South equalization basin for material that needs skimmed. ▪ Skimming decant storage tank level. ▪ Flow of wastewater down the skimming sewer from the north end of the sedimentation basins. ▪ Flow of the wastewater down the skimming sewer from the north and south equalization basin skimmer tube openings. 1. Document the findings from the inspection on form 7091.10. Use square feet of material as a sizing. If no material is present, indicate “NONE, NA – or zero (0). 2. Skim all areas on the equalization basins and north end as needed. This may be more frequently than the four times per shift mandatory inspections.

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3. Decant the skimming decant storage tank as needed. Note changes in level caused by decanting and filling of storage tank. The storage tank level should be checked a minimum of four times per shift.
4. The wastewater skimming storage tank should be checked for the need to decant after skimming.
5. Document the date, time and beginning and end level in the wastewater skimming tank level. All documentation should be recorded on log sheet 7091-01 and 7091-10 as required.
   When tank is 60% full, notify the Manager so the tank can be called to get emptied.
6. All inspections should be initialed by either/ both the FT Operator and UT Helper.
7. The completed forms should be turned in daily with the regular mail.

Relating Skimming Standards

The following SOP's contain additional information related to skimming the equalization basins and sedimentation basins.

NSCS-M-P-7091-02 Routine Inspections

This SOP contains information on the need to conduct a routine check of the areas and what to look for.

NSCS-M-P-7091-12 Sedimentation Basin

This SOP contains information on the east and west sedimentation basin on skimming, the skimmings pipeline and related information.

Excessive Oil on Basin Surfaces

If during a shift excessive amounts of oil are found on either the equalization basins or sedimentation basins:

1. Notify the Manager.
2. Contact the Pretreat Operator and have the API oil interceptor chemical feeds checked, and north end skimmed.
3. Skim the areas until clear of oil.
4. Review the dump sheets for both Pretreat and Final Treat.
5. Document the findings in the final Treatment Plant log sheet 7091-10 and Pretreat log sheet 7093-10.
6. If the excessive oil problem occurs a second time within 12 hours the operator should contact all of the production units by phone and in person inspect the 52" Five Stand, 80" Five Stand and the DCR Mill for leaks or operating problems that cause them to loss oil. Also, attempt to locate the production unit losing oil and ask them to make repairs or stop the loss of oil.

Skimming Oil

To skim oil off the surface of equalization basins, use the following procedures:

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1. Adjust water hoses to direct floating oil toward the skimmer tube.
2. Slowly lower the skimmer tube until it is just below the surface of the water.
3. The floating oil will flow into the skimmer tube and then into the scum and oil sump.
4. The scum and oil (S + O) sump is controlled by H.O.A. (hand-operated-actuator) control and discharges into the oil separation tank.
5. A strainer is mounted on the S + O pump inlet line. When the S + O pump begins to labor, the strainer needs to be cleaned using the following procedure.:
   A. Shut off pump.
   B. Close suction and discharge valves.
   C. Open drain and vent valves.
   D. Open strainer cover and remove dirty strainer.
   E. Reinstall the spare clean strainer
   F. Close vent valves and close drain.
   G. Open suction and discharge valves.
   H. Start Pump.
   I. Bleed air out of the vent and then close vent valve.
   J. Dump the contents of the dirty strainer into the sludge dumpster.
   K. If dirty strainer is plugged, use solvent to open up wire mesh.
   L. Record time strainer was cleaned in the Final Treat log sheet.

Eq Basin Out of Service

The Supervisor will advise when a basin is taken out of service for de-sludging.

Use the following procedures:

1. Put selector switch for integrator in Control Building to what sub drain pump is being used.
2. Record the sub drain flow integrator/totalizer reading in the Final Treat log sheet and on the Daily Operating Report - Final Treat.
3. Inspect sub drain pumps for proper lubrication and operation.
4. Open sub-drain sump inlet valve for the equalization basin to be taken out of service.
5. Start the sub drain pump.
6. As necessary, check the pump for proper operation.
7. At the end of each turn, record the sub drain flow integrator/totalizer reading in the Final Treat log sheet and Daily Operating Report - Final Treat.

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8. After the sub drain pump starts cycling on/off, the equalization basin can be de-watered.
9. Notify Supervisor that basin is ready for maintenance.
10. Maintenance will install an air bag in the wastewater inlet and outlet valves to the equalization Basin.

NOTE: The equalization basin inlet and outlet valves can be closed. However, each valve has a two (2) inch diameter hole in the gate valve to prevent the valve from freezing and breaking. Therefore, the air bags are <u>required</u>.

11. Maintenance will set up portable pumps to de-water the basin.
12. Leave the air diffusers "On" while maintenance removes them. After they are removed from the water, turn them "Off."
13. Adjust the oil skimmer to its highest position.
14. Monitor and adjust pressure on the air bags to maintain between ten (10) psi and 15 psi.
15. Adjust hoses and operate the portable pumps as required.

NOTE: The pumps should only be pumping water. If they are pumping sludge, raise the hose.

16. Notify the Supervisor when the basin is empty.

When desludging is completed, the equalization basin can be placed back into service using the following procedure:

Putting Equalization Basin in Service

The Supervisor will advise that the equalization basin can be placed into service.

1. Maintenance will re-install the air diffusers.
2. Lower oil skimmer to its normal position.
3. Make sure discharge gate is closed on basin that is out of service.
4. Let air out of discharge side air bag. (maintenance). Pull bag slowly. Open discharge gate to allow basin to backfill. Keep eye on total plant flow as to not stop all flow going out the weirs.
5. Close the sub drain sump inlet valve when the basin is ½ full.
6. Stop the sub drain pump.
7. Record the sub drain flow integrator/totalizer reading in the Final Treat log sheet.
8. When basin is full, let air out of inlet side of basin. Pull the bag. (maintenance).
9. The equalization basin is now "in service."