

**Key Words:** North Baltimore, Ohio, potable, THM reduction, stratification, mixing



**Photos:** Photo on the left is the SN15 running after installation. The middle photo is showing the two SN15 units in Clearwell # 2. Photo on the far right is showing the SN15 running in the Clearwell.

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**System Overview:** This site includes Clearwell # 1 and Clearwell # 2. Both clearwells are partially buried cylindrical concrete tanks, 58 ft. in diameter and 16.75 ft. in height, divided into four sections by baffles. Each tank has a capacity of 300,000 gallons, and an overflow outlet at 15 ft. elevation. Water flows in series through Clearwell # 1 to # 2, then on to distribution. The plant capacity is 1.6 MGD, and peak pump flow rate is 2 MGD. Disinfectant used in this system is chlorine.

**Reported Problem Before SolarBee Installation:** The community of North Baltimore conducted a distribution system evaluation for total trihalomethanes (TTHMs). Concentration at several locations exceeded the maximum contaminant level of 80 ppb as required by EPA Stage 2 DBPR. Evaluations of treatment options were undertaken, considering removal efficacy, capital need, operational and maintenance costs, and vendor service and reputation. The engineering firm of Jones and Henry, represented by Gary Williams, managed the evaluation and system selection. The evaluation showed that a floating spray nozzle and forced air ventilation system was the best option for their water system, producing the strongest results in the comparative evaluation. Medora Corporation was chosen to provide this system based on efficacy, cost and service considerations, and Clearwell # 2 was chosen as the best location for treatment.

**SolarBee Installation:** Date: 3/13/2013 One GridBee GS12 (mixer) unit was installed in Clearwell # 1 to increase TTHM production and reduce formation potential before the water entered Clearwell # 2. Two GridBee SN15 Floating Spray Nozzle THM Removal Systems were installed in Clearwell #2. This system was sized to accommodate the peak pumping rate of 2 MGD.

**Results:** Initial results were less than anticipated. Inspection revealed a ceiling-level opening in a baffle in Clearwell # 2; forced air was short-circuiting to a vent rather than traversing to a treatment zone. The opening was blocked and the THM reduction improved by 57%. The community of North Baltimore has conducted certified lab tests during the peak THM season and these results show consistent THM reduction of 60% or more. The chart below shows the certified lab test results.

### TTHM SUMMARY

SAMPLE DATE	WATER TEMP (degC)	WTP Production (MG)	WTP PRODUCTION RATE (GPM)	UNTREATED WET WELL	TREATED WET WELL	DS202 (Dist. Sample)	% Removal In Clearwell #2	Regrowth in System	"Could've Been" TTHM Value
4/3/2013	7	0.411	600	29.6	18.4	31.8	38%	13.4	43
5/6/2013	15	0.554	600	47.2	20.4	43.4	57%	23	70
5/20/2013	18	0.657	700	56.2	24.8	64.7	56%	39.9	96
6/3/2013	20	0.412	700	49.5	30.1	58.8	39%	28.7	78
6/17/2013	22	0.520	700	62.7	21.2	62.3	66%	41.1	104
7/1/2013	24	0.535	700	63.2	30.7	64.7	51%	34	97
7/16/2013	26	0.531	700	72.9	29.5	72.5	60%	43	116
7/30/2013	24	0.450	700	60.6	21	60.3	65%	39.3	100
8/13/2013	23	0.435	700	53.3	20.3	52.1	62%	31.8	85

**Chart:** Village of North Baltimore certified lab results since installation of GridBee THM removal system. All THM values are shown in ppb.

The community is extremely happy with the ongoing results in THM reduction, and is very happy with Medora Corporation's service and support as well. They are happy to serve as a positive reference for the GridBee SN15 installation.

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