Ohio Environmental Protection Agency
Division of Drinking and Ground Waters

Monthly Operating Report (MOR) Addendum for UV: Intensity Setpoint Approach

PWS Name: _____

STU Name: _____

PWSID: _____

STUID: _____

Reporting Period: _____

Reactor Number	Total Flow Through (MG)	Off-Specification Data	
		Number of Off-Specification Events	Total Off-Specification Volume (MG)
Total Volume for Plant [B]		**Total Off-Specification Volume for Plant [A]**	

Compliance Certification

Total Volume of Off-Specification Water Produced (MG) [A] _____
Total Volume of Water Produced (MG) [B] _____
Total Off-Specification Water Produced (% of Volume of Water Produced) [A]/[B]*100 _____
Facility Meets Off-Specification Requirement (< 5% of Volume on a Monthly Basis) (Y/N) _____

Of the _____ sensors, _____ have been checked for calibration and _____ were within the acceptable range of tolerance.

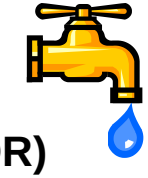
The following Reactors had a Sensor Correction Factor

Reactor Number	Sensor Correction Factor

I certify under penalty of law that I have personally examined and am familiar with the data submitted in this MOR; that the data in this report is true, accurate and complete; and I am aware that falsification thereof could result in the imposition of fines and penalties including revocation of my certification as a public water system operator.

Name of Certified Operator and Certification Number	Signature of Responsible Official	Date

Ohio Environmental Protection Agency
Division of Drinking and Ground Waters



Monthly Operating Report (MOR) Addendum for UV: Daily Operating Log for UV Intensity Setpoint Approach

PWS Name: _____

STU Name: _____

PWSID: _____

STUID: _____

Reporting Period: _____

UV Reactor: _____

Process Train: _____

Maximum Validated Flow Rate: _____

Minimum Validated UVT: _____

Target Log Inactivation: _____

Target Pathogen: _____

Intensity Setpoint: _____

Operational Data						Intensity Requirements			Daily Minimum Intensity		Total Off-Specification
			Flow Rate								
Day	Run Time (hrs)	Total Production (MG)	Min (mgd)	Ave (mgd)	Max (mgd)	Intensity Setpoint (W/m^2) [A]	Sensor Correction Factor[1] [B]	Adjusted Intensity Setpoint (W/m^2) ([A] * [B]) [C]	Daily Minimum Intensity (W/m^2) [D]	Minimum Daily Intensity > Adjusted Intensity Setpoint ([D] > [C]) (Y/N)	Total Flow Off-Specification[3] (MG)
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											

Operational Data						Intensity Requirements			Daily Minimum Intensity		Total Off-Specification
			Flow Rate								
Day	Run Time (hrs)	Total Production (MG)	Min (mgd)	Ave (mgd)	Max (mgd)	Intensity Setpoint (W/m^2) [A]	Sensor Correction Factor[1] [B]	Adjusted Intensity Setpoint (W/m^2) ([A] * [B]) [C]	Daily Minimum Intensity (W/m^2) [D]	Minimum Daily Intensity > Adjusted Intensity Setpoint ([D] > [C]) (Y/N)	Total Flow Off-Specification[3] (MG)
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
31											
Min											
Max											
Total											

[1] Sensor CF will be 1 is no CF is used.

[2] UVT measurements are not required but could be useful in addressing operational issues.

[3] Off-specification worksheet (Figure 6.5) should be used to calculate daily off-specification volume. If UV intensity or flowrate off-specification occur simultaneously, the off-specification time should only be counted once.

I certify under penalty of law that I have personally examined and am familiar with the data submitted in this MOR; that the data in this report is true, accurate and complete; and I am aware that falsification thereof could result in the imposition of fines and penalties including revocation of my certification as a public water system operator.

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PWS Name: _____

STU Name: _____

PWSID: _____

STUID: _____

Reporting Period: _____

Monthly Operating Report (MOR) Addendum for UV: Off-Specification Calculation Worksheet

(Note – This sheet should only be used when an off-specification event occurs)

Date[1]	Reactor Number	Process Train Number	Off-Specification Event Description[2]	Flow Rate[3] (MGD) [A]	Time (days) [B]	Off-Specification Volume (MG) ([A]*[B])
				Total Off-Specification Flow for the Day[3]		

[1] This worksheet should only be used for one date and one reactor.

[2] This worksheet assumes that the flowrate is constant during the off-specification event. Off-specification volume can also be obtained from a flow totalizer.

[3] Off-specification event can be caused by UVT, flowrate, intensity, or validated dose being out of the validated range.

[4] The total off-specification flow should be transferred to Figure 6.3 or 6.4 if any off-specification events occurred.

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Name of Certified Operator and Certification Number	Signature of Responsible Official	Date

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Monthly Operating Report (MOR) Addendum for UV: UV Sensor CF Calibration Worksheet

Calibration Ratio:

$$\left(\frac{S_{Duty}}{S_{Ref}} \right)$$

Sensor Correction Factor:

$$\left(\frac{S_{Duty}}{S_{Ref}} - 0.2 \right)$$

where S is the measured intensity

PWS Name: _____ Reporting Period: _____

STU Name: _____

PWSID: _____ CF used (if applicable): _____

STUID: _____

Date	Reactor Number	Duty Sensor Number	UV Sensor Operating Time (hrs)	Reference Sensor Serial Number	Duty UV Sensor Reading[1] [A]	Reference UV Sensor Reading[1] [B]	Calibration Ratio ([A]/[B])	Calibration Ratio ≤ 1.2 (Y/N)	Sensor Correction Factor Used	If CF is used, Calibration Ratio – 0.2 ≤ CF (Y/N)

Certification:

Number of UV sensor calibrated _____

Number of UV sensors out of calibration _____

Number of UV sensor(s) sent to manufacturer to be recalibrated as documented below _____

UV intensity sensors sent to manufacturer for calibration (Add additional rows as necessary):

Sensor Serial Number	Unit No.	Date Sent	Date Received

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Monthly Operating Report (MOR) Addendum for UV: UV Sensor CF Calibration Worksheet

Correction Factor = $\left(\frac{S_{Duty}}{S_{Ref}} - 0.2 \right)$

Where: S_{Duty} is the duty UV sensor reading
S_{Ref} is the duty UV sensor reading

PWS Name: _____ Reporting Period: _____

STU Name: _____

PWSID: _____ CF used (if applicable): _____

STUID: _____

Optional Sensor Correction Factor Worksheet:

Date	Reactor Number	Duty Sensor Number[1]	UV Sensor Operating Time (hrs)	Reference Sensor Serial Number	Duty UV Sensor Reading[3] [A]	Refernce UV Sensor Reading[3] [B]	Sensor Correction Factor (([A]/[B])-0.2)
						Selected UV Sensor CF[2]	

[1] Only failed sensors need to be input.

[2] UV Sensor CF should be based on the calibration ratios for the failed sensors and should use the maximum ratio. The CF is reactor specific.

[3] If three duty UV sensor and reference UV sensor readings are taken, the mean of the reading can be used.

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Monthly Operating Report (MOR) Addendum for UV: Monthly UVT Analyzer Calibration Check Log

PWS Name: _____

STU Name: _____

PWSID: _____

STUID: _____

Reporting Period: _____

UVT Analyzer Number: _____

$|UVT_{on\text{-}line}(\%) - UVT_{bench}(\%)| \leq 2\%$ UVT

UVT Analyzer Calibration Report (Make Additional Copies of Form as Necessary)

UVT Analyzer Number	Week Number	Dates	On-line Reading (%) [A]	Grab Sample Result (%) [B]	Difference (%) (|[A]-[B]|)	Difference ≤ 2% UVT? (Y/N)
	1					
	2					
	3					
	4					
	5					

Certification:

All Calibration checks were within the acceptable tolerance during this month. ☐

Recalibration was required and is documented below. ☐

On-Site Calibration. ☐ Manufacturer Calibration. ☐

UVT Analyzer Calibration:

UVT Analyzer Number	On-site or manufacturer recalibration?	Date Recalibration Performed	Recalibration Successful? (Y/N)	Initials (On-site Calibration Only)

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