

# RPA Spreadsheet

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# RPA Spreadsheet

- RPA spreadsheet is used to answer two basic questions:
  - Is there reasonable potential for a discharge to cause or contribute to an exceedance of a water quality criterion?
  - For pollutants that have reasonable potential, what effluent limits should be established such that water quality criterion are met?

# RPA Spreadsheet

- RPA spreadsheet divided into three categories
  - First tab is new (effluent data)
  - Determine if there is reasonable potential (RPA tabs)
  - Calculate effluent limits for pollutants for which there is reasonable potential (limits tabs)

# RPA Evaluation – 5 Steps

- Step 1: Conduct effluent monitoring for required pollutants
- Step 2: Conduct screening evaluation
- Step 3: Conduct effluent/receiving stream characterization (*if necessary*)
- Step 4: Conduct RPA evaluation (*if necessary*)
- Step 5: Refine inputs and redo RPA evaluation (*if necessary*)

# RPA Spreadsheet Inputs

- RPA spreadsheet utilizes the following information:
  - WWTF effluent data (metals, organics, chlorine and ammonia)
  - Receiving stream characterization (if necessary)
  - Mixing zone dilution information (if necessary)
  - Water quality criteria (already included)

# Water Quality Standards

- Aquatic life standards/Human health standards
- Statistics for effluent concentrations/stream background levels
- Statistics for effluent flows/stream flows to define dilution factors

# Aquatic Life RPA Spreadsheet

Wherever there's water, there's Clean Water.



RPA Run Information	
Facility Name:	Anytown STP
DEQ File Number:	enter file # here
Permit Writer Name:	Ima Permit
Outfall Number:	1
Date of RPA Run:	enter date here
RPA Run Notes:	
KEY:	-- Intermediate calc.s
*	Enter data here -- Calculated results

Please complete the following General Facility Information			
1. Do I have dilution values from a mixing zone study? (Y/N)	Y		
2. Is the receiving waterbody fresh water? (Y/N)	Y		
3. If answered "N" to Question 1, then fill in the following table			
Eff. Flow Rate	MGD	*	
Stream Flow: 7Q10	CFS	*	
Stream Flow: 1Q10	CFS	*	
% dilution at ZID	%	10%	
% dilution at MZ	%	25%	
Calculated dilution Factors			
Dilution @ ZID	na		
Dilution @ MZ	na		
4. If answered "Y" to Question 1, then fill in dilution values from mixing zone study			
Dilution @ ZID (from study)	5.5		
Dilution @ MZ (from study)	25		
5. Please enter Water Hardness Data below to reflect critical conditions (values from 25 to 400 mg/l)			
Effluent	mg/L CaCO <sub>3</sub>	100	
Up-stream	mg/L CaCO <sub>3</sub>	183	
ZID boundary	mg/L CaCO <sub>3</sub>	168	
MZ boundary	mg/L CaCO <sub>3</sub>	180	
6. Please enter statistical Confidence and Probability values (note: defaults already entered)			
Confidence Level	%	99%	
Probability Basis	%	95%	

Determine Monitoring Reqs.		Identify Pollutants of Concern				Determine In-Stream Conc.			Determine Reasonable Potential				
Pollutant Parameter	Evaluation Required?	# of Samples	Highest Effluent Conc.	Coefficient of Variation	Estimated Max Eff. Conc.	RP at end of ppe?	Ambient Conc.	Max Total Conc. at ZID	Max Total Conc. at RMZ	WQ CRITERIA	1 Hour (CMC)	4 Day (CCC)	Is there Reasonable Potential to Exceed? (Y/N)
	(Y/N)		µg/l	Default=0.6	µg/l	(Y/N)	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	Acute Chronic
<b>Table 1: Effluent Parameters for all POTWs w/a Flow &gt; 0.1 MGD</b>													
Ammonia (as N)	Yes												
Chlorine (total residual, TRC)	Yes												
Dissolved oxygen	Yes												
Oil and Grease	Yes												
Total dissolved solids	Yes												
<b>Table 2: Effluent Parameters for Selected POTWs</b>													
Hardness (Total as CaCO <sub>3</sub> ) Must be collected for metals criteria calculation. Submit data to the fields at the top of the spreadsheet													
<b>Table 2: Metals (total recoverable), cyanide and total phenols</b>													
ARSENIC III	Yes	2	nd	0.60	--	Non-Det.	*	--	--	360.0	190.0	--	--
Cadmium	Yes	2	nd	0.60	--	Non-Det.	*	--	--	7.0	1.8	--	--
Chromium III	Yes	2	nd	0.60	--	Non-Det.	*	--	--	2654.7	334.5	--	--
Chromium VI	Yes	2	nd	0.60	--	Non-Det.	*	--	--	16.0	11.0	--	--
Copper	Yes	2	1.90	0.60	9.69	No	*	--	--	28.9	19.5	--	--
Iron	Yes	2	nd	0.60	--	Non-Det.	*	--	--	na	####	--	--
Lead	Yes	2	0.34	0.60	1.73	No	*	--	--	157.9	6.7	--	--
Mercury	Yes	2	nd	0.60	--	Non-Det.	*	--	--	2.4	0.0	--	--
Nickel	Yes	2	2.10	0.60	10.71	No	*	--	--	2198.7	258.8	--	--
Selenium	Yes	2	nd	0.60	--	Non-Det.	*	--	--	260.0	35.0	--	--
Silver	Yes	2	nd	0.60	--	Non-Det.	*	--	--	9.9	0.1	--	--
Zinc	Yes	2	30.00	0.60	153.00	No	*	--	--	181.5	174.1	--	--
Cyanide (Free)	Yes	2	nd	0.60	--	Non-Det.	*	--	--	22.0	5.2	--	--
<b>Table 2: Volatile organic compounds</b>													
<b>Table 2: Acid-extractable compounds</b>													
pentachlorophenol	Yes	2	nd	0.60	--	Non-Det.	*	--	--	20.0	13.0	--	--
<b>Table 2: Base-neutral compounds</b>													
<b>Table 3: Organochlorine Pesticides</b>													
Aldrin	No	*	*	0.60	--	--	*	--	--	3.0	na	--	--
gamma-BHC (Lindane)	No	*	*	0.60	--	--	*	--	--	1.0	0.1	--	--
Chlordane	No	*	*	0.60	--	--	*	--	--	2.4	0.0	--	--
Chloropyrifos	No	*	*	0.60	--	--	*	--	--	0.1	0.0	--	--
Demeton	No	*	*	0.60	--	--	*	--	--	na	0.1	--	--
DDT 4,4'	No	*	*	0.60	--	--	*	--	--	1.1	0.0	--	--
Dieldrin	No	*	*	0.60	--	--	*	--	--	0.2	0.0	--	--
Endosulfan alpha-	No	*	*	0.60	--	--	*	--	--	0.2	0.1	--	--
Endosulfan beta-	No	*	*	0.60	--	--	*	--	--	0.2	0.1	--	--
endosulfan	No	*	*	0.60	--	--	*	--	--	0.2	0.1	--	--
Endrin	No	*	*	0.60	--	--	*	--	--	0.1	0.0	--	--
Heptachlor	No	*	*	0.60	--	--	*	--	--	0.5	0.0	--	--
Heptachlor Epoxide	No	*	*	0.60	--	--	*	--	--	0.5	0.0	--	--
Malathion	No	*	*	0.60	--	--	*	--	--	na	0.1	--	--
Methoxychlor	No	*	*	0.60	--	--	*	--	--	na	0.0	--	--
Mirex	No	*	*	0.60	--	--	*	--	--	na	0.0	--	--
Parathion	No	*	*	0.60	--	--	*	--	--	0.1	0.0	--	--
Toxaphene	No	*	*	0.60	--	--	*	--	--	0.7	0.0	--	--
Total PCBs	Yes	2	nd	0.60	--	Non-Det.	*	--	--	2.0	0.0	--	--
<b>Other parameters with state water quality criteria</b>													
Sulfide-Hydrogen Sulfide	No	*	*	0.60	--	--	*	--	--	na	2.0	--	--
Guthion	No	*	*	0.60	--	--	*	--	--	na	0.0	--	--
Phosphorus, Elemental	No	*	*	0.60	--	--	*	--	--	na	na	--	--

Intake Credit Analysis						Additional Information			
Intake Concentration	Adjusted Max Effluent Concentration	Max Total Conc. at ZID	Max Total Conc. at RMZ	Is there Reasonable Potential to Exceed? (Y/N)	Acute	Chronic	CAS Number	Quantitation Limit	Is a mixing zone or ZID needed?
Check	ug/l	ug/l	ug/l	(Y/N)			(CAS)	(ug/l)	ZID   MZ
--	*	--	--	--	--	--	22541544	50	
--	*	--	--	--	--	--	7440439	0.10	
--	*	--	--	--	--	--	16065831	10	
--	*	--	--	--	--	--	18540299	10	
--	*	--	--	--	--	--	7440508	10	
--	*	--	--	--	--	--	7439896	100	
--	*	--	--	--	--	--	7439921	5.0	
--	*	--	--	--	--	--	7439976	0.010	
--	*	--	--	--	--	--	7440020	10	
--	*	--	--	--	--	--	7782492	2.0	
--	*	--	--	--	--	--	7440224	1.0	
--	*	--	--	--	--	--	7440666	5.0	
--	*	--	--	--	--	--	57-12-5	TBD	
--	*	--	--	--	--	--	87865	2.0	
--	*	--	--	--	--	--	309002	0.010	
--	*	--	--	--	--	--	58899	0.010	
--	*	--	--	--	--	--	57749	0.10	
--	*	--	--	--	--	--	2921882	0.010	
--	*	--	--	--	--	--	8065483	1.0	
--	*	--	--	--	--	--	50293	0.010	
--	*	--	--	--	--	--	60571	0.010	
--	*	--	--	--	--	--	959988	0.010	
--	*	--	--	--	--	--	33213659	0.010	
--	*	--	--	--	--	--	115297	0.010	
--	*	--	--	--	--	--	72208	0.010	
--	*	--	--	--	--	--	76448	0.010	
--	*	--	--	--	--	--	1024573	0.010	
--	*	--	--	--	--	--	121755	0.20	
--	*	--	--	--	--	--	72435	0.010	
--	*	--	--	--	--	--	2385855	0.010	
--	*	--	--	--	--	--	56382	10	
--	*	--	--	--	--	--	8001352	0.50	
--	*	--	--	--	--	--	1336-36-3	0.50	
--	*	--	--	--	--	--	7783064	200	
--	*	--	--	--	--	--	86500	1.0	
--	*	--	--	--	--	--	7723140	10	

Color Key: State Water Quality, Autofill or Fixed Values, Fill in the Blank, Results

Notes: 1. Parameters marked as "(State Only)" reflect state water quality criteria that do not have federal monitoring requirements. Permit Writer must ensure these are scanned for and assessed.  
2. In most cases where state criteria is for total concentration of a pollutant parameter, federally required  
3. For PCBs, Dinitrotoluenes and Dichlorobenzenes use highest single cumulative sample event.

# Dilution/Mixing Inputs

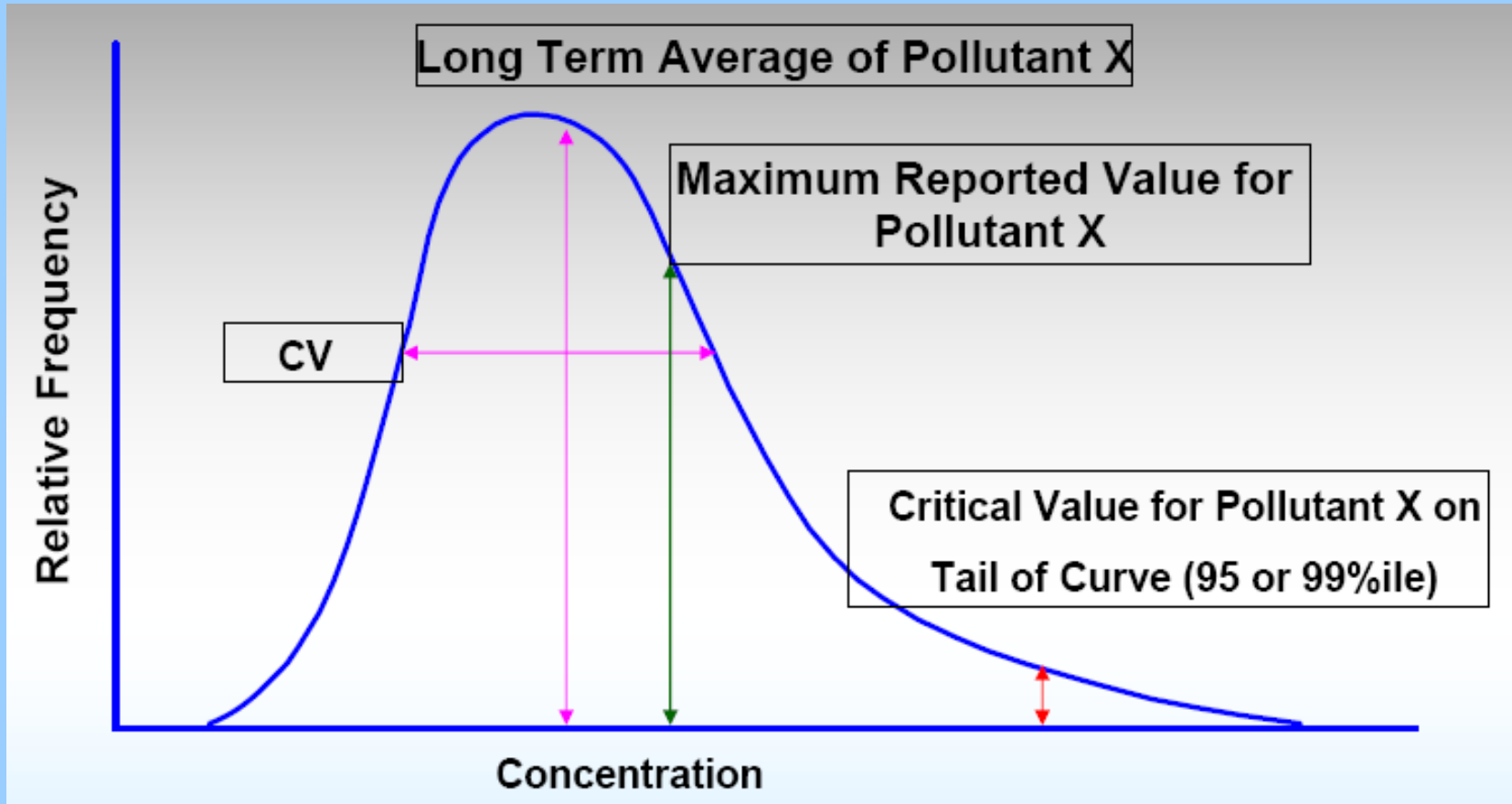
## Please complete the following General Facility Information

1. Do I have dilution values from a mixing zone study? (Y/N)			y		
2. Is the receiving waterbody fresh water? (Y/N)			y		
3. If answered "N" to <i>Question 1</i> , then fill in the following table					
Eff. Flow Rate	MGD	*			
Stream Flow: 7Q10	CFS	*			
Stream Flow: 1Q10	CFS	*			
% dilution at ZID	%	10%			
% dilution at MZ	%	25%			
Calculated dilution Factors					
Dilution @ ZID		na			
Dilution @ MZ		na			
4. If answered "Y" to <i>Question 1</i> , then fill in dilution values from mixing zone study					
Dilution @ ZID (from study)			2		
Dilution @ MZ (from study)			10		
5. Please enter <i>Water Hardness Data</i> below to reflect critical conditions (values from 25 to 400 mg/l)					
Effluent	mg/L CaCO <sub>3</sub>		150		
Up-stream	mg/L CaCO <sub>3</sub>		50		
ZID boundary	mg/L CaCO <sub>3</sub>		100		
MZ boundary	mg/L CaCO <sub>3</sub>		60		
6. Please enter statistical <i>Confidence</i> and <i>Probability</i> values (note: defaults already entered)					
Confidence Level	%		99%		
Probability Basis	%		95%		

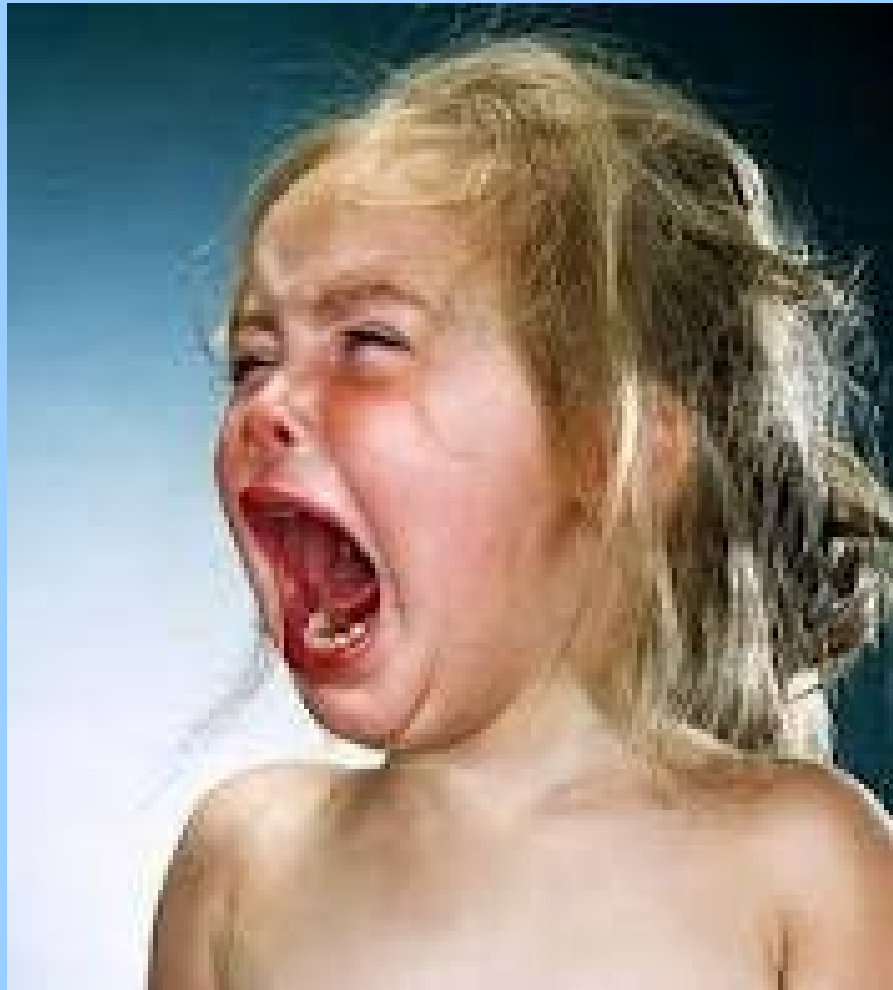
# Effluent Variability

Pollutant Parameter	Evaluation Required?	# of Samples	Highest Effluent Conc.	Coefficient of Variation	Estimated Max Eff. Conc.
	(Y/N)		µg/l	Default=0.6	µg/l
ARSENIC III	Yes	2	nd	0.60	--
Cadmium	Yes	2	nd	0.60	--
Chromium III	Yes	2	nd	0.60	--
Chromium VI	Yes	2	nd	0.60	--
Copper	Yes	2	1.90	0.60	9.69
Iron	Yes	2	nd	0.60	--
Lead	Yes	2	0.34	0.60	1.73
Mercury	Yes	2	nd	0.60	--
Nickel	Yes	2	2.10	0.60	10.71
Selenium	Yes	2	nd	0.60	--
Silver	Yes	2	nd	0.60	--
Zinc	Yes	2	30.00	0.60	153.00
Cyanide (Free)	Yes	2	nd	0.60	--

# Effluent Variability



# Screening Level Evaluation



Wherever there's water, there's Clean Water.

Clean Water  Services

# Screening Level Evaluation

Pollutant Parameter	Estimated Max Eff. Conc.	RP at end of pipe?	WQ CRITERIA	
			1 Hour (CMC)	4 Day (CCC)
	µg/l	(Y/N)	µg/l	µg/l
ARSENIC III	--	<b>Non-Det.</b>	360.0	190.0
Cadmium	--	<b>Non-Det.</b>	3.9	0.8
Chromium III	--	<b>Non-Det.</b>	1736.5	136.2
Chromium VI	--	<b>Non-Det.</b>	16.0	11.0
Copper	9.69	<b>Yes</b>	17.7	7.6
Iron	--	<b>Non-Det.</b>	na	1000.0
Lead	1.73	<b>Yes</b>	81.6	1.7
Mercury	--	<b>Non-Det.</b>	2.4	0.0
Nickel	10.71	<b>No</b>	1418.2	102.3
Selenium	--	<b>Non-Det.</b>	260.0	35.0
Silver	--	<b>Non-Det.</b>	4.1	0.1
Zinc	153.00	<b>Yes</b>	117.0	68.8
Cyanide (Free)	--	<b>Non-Det.</b>	22.0	5.2

# Reasonable Potential Analysis (Aquatic Life)

Pollutant Parameter	Evaluation Required?	# of Samples	Highest Effluent Conc.	Coefficient of Variation	Estimated Max Eff. Conc.	Ambient Conc.	Max Total Conc. at ZID	Max Total Conc. at RMZ	WQ CRITERIA		Is there Reasonable Potential to Exceed? (Y/N)	
									1 Hour (CMC)	4 Day (CCC)	Acute	Chronic
	(Y/N)		µg/l	Default=0.6	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l		
Copper	Yes	10	3.50	0.35	5.60	2.50	4.05	2.81	17.7	7.6	NO	NO
Lead	Yes	10	0.55	0.40	0.94	0.50	0.72	0.54	81.6	1.7	NO	NO
Zinc	Yes	10	44.00	0.50	83.60	10.00	46.80	17.36	117.0	68.8	NO	NO

# Human Health RPA Spreadsheet

Wherever there's water, there's Clean Water.



**RPA Run Information**

Facility Name:	Anytown STP
DEQ File Number:	enter file # here
Permit Writer Name:	Ima Permit
Outfall Number:	1
Date of RPA Run:	enter date here
RPA Run Notes:	

**Please complete the following General Facility Information**

1. Do I have dilution value from a mixing zone study? (Y/N)	y	4. If answered "Y" to Question 1, then fill in dilution values from mixing zone study
2. Is the receiving waterbody fresh water? (Y/N)	y	Dilution @ RMZ under harmonic mean flow
3. If answered "N" to Question 1, then fill in the following table		25
Eff. Flow Rate	MGD	*
Stream Flow: Harmonic Mean	CFS	*
Stream Flow: 30Q5	CFS	*
% dilution at MZ	%	25%
Calculated dilution factors		
Dilution @ Harmonic Mean Flow		na
Dilution @ 30Q5		na
		Dilution @ RMZ under 30Q5 flow
		25
5. Please enter statistical Confidence and Probability values (note: defaults already entered)		
Confidence Level	%	95%
Probability Basis	%	95%

Determine Monitoring Reqs.			Identify Pollutants of Concern					In-stream Conc.		Determine Reasonable Potential			
Pollutant Parameter	Carcinogen Status	Evaluation required?	# of Samples	Effluent Conc.	Coefficient of Variation	Estimated Max Eff. Conc.	RP at end of pipe?	Ambient Conc.	Max Total Conc. at RMZ	WQ Criteria		Is there Reasonable Potential to Exceed? (Y/N)	
Pollutant Type	(Y/N)	(Y/N)		µg/l	default=0.6	µg/l	(Y/N)	µg/l	µg/l	Water + Fish	Fish	Water + Fish	Fish

**Table 1 Effluent Parameters for all POTWs w/a Flow > 0.1 MGD**

Ammonia (as N)	Evaluation occurs on Ammonia (NH3) spreadsheet page												
Chlorine (total residual, TRC)	Evaluation occurs on Chlorine (-Cl) spreadsheet page												
Dissolved oxygen	Evaluation occurs on Dissolved Oxygen (DO) spreadsheet page												
Nitrates-Nitrite	N	Yes	2	nd	0.60	--	Non-Det.	*	--	10000	na	--	--
Kjeldahl nitrogen													
Oil and Grease	Compare to Effluent limits in permits or Federal Effluent Limit Guidelines												
Total dissolved solids	Compare to Effluent limits in permits or Federal Effluent Limit Guidelines												

**Table 2 Effluent Parameters for Selected POTWs**

Hardness (Total as CaCO3) Must be collect for metals criteria calculation. Submit data to the fields at the top of the spreadsheet

**Table 2: Metals (total recoverable), cyanide and total phenols**

Antimony	N	Yes	2	0.39	0.60	1.48	No	*	--	5.1	64	--	--
Arsenic (Inorganic)	Y	Yes	2	6.75	0.60	25.61	Yes	4.50	5.3445	2.1	2.1	YES	YES
Copper	N	Yes	2	1.90	0.60	7.21	No	*	--	1300	na	--	--
Methyl Mercury	N	*	If evaluation is required, contact HQ for technical assistance and follow guidance										
Nickel	N	Yes	2	2.10	0.60	7.97	No	*	--	140	170	--	--
Selenium	N	Yes	2	nd	0.60	--	Non-Det.	*	--	120	420	--	--
Thallium	N	Yes	2	nd	0.60	--	Non-Det.	*	--	0.043	0.047	--	--
Zinc	N	Yes	2	30.00	0.60	113.84	No	*	--	2100	2600	--	--
Cyanide (Total)	N	Yes	2	nd	0.60	--	Non-Det.	*	--	130	130	--	--

**Table 2: Volatile organic compounds**

acrolein	N	Yes	2	nd	0.60	--	Non-Det.	*	--	0.88	0.93	--	--
acrylonitrile	Y	Yes	2	nd	0.60	--	Non-Det.	*	--	0.018	0.025	--	--
benzene	Y	Yes	2	nd	0.60	--	Non-Det.	*	--	0.44	1.4	--	--
bromoform	Y	Yes	2	nd	0.60	--	Non-Det.	*	--	3.3	14	--	--
carbon tetrachloride	Y	Yes	2	nd	0.60	--	Non-Det.	*	--	0.10	0.16	--	--
chlorobenzene	N	Yes	2	nd	0.60	--	Non-Det.	*	--	74	160	--	--
chlorodibromomethane	Y	Yes	2	nd	0.60	--	Non-Det.	*	--	0.31	1.3	--	--
chloroform	N	Yes	2	nd	0.60	--	Non-Det.	*	--	260	1100	--	--
dichlorobromomethane	Y	Yes	2	nd	0.60	--	Non-Det.	*	--	0.42	1.7	--	--
1,2-dichloroethane	Y	Yes	2	nd	0.60	--	Non-Det.	*	--	0.35	3.7	--	--
1,2-trans-dichloroethylene	N	Yes	2	nd	0.60	--	Non-Det.	*	--	120	1000	--	--
1,1-dichloroethylene	N	Yes	2	nd	0.60	--	Non-Det.	*	--	230	710	--	--
1,2-dichloropropane	Y	Yes	2	nd	0.60	--	Non-Det.	*	--	0.38	1.5	--	--
1,3-dichloropropylene	Y	Yes	2	nd	0.60	--	Non-Det.	*	--	0.30	2.1	--	--
ethylbenzene	N	Yes	2	nd	0.60	--	Non-Det.	*	--	160	210	--	--
methyl bromide	N	Yes	2	nd	0.60	--	Non-Det.	*	--	37	150	--	--
methylene chloride	Y	Yes	2	nd	0.60	--	Non-Det.	*	--	4.3	59	--	--
1,1,2,2-tetrachloroethane	Y	Yes	2	nd	0.60	--	Non-Det.	*	--	0.12	0.4	--	--
tetrachloroethylene	Y	Yes	2	nd	0.60	--	Non-Det.	*	--	0.24	0.33	--	--
toluene	N	Yes	2	nd	0.60	--	Non-Det.	*	--	720	1500	--	--
1,1,2-trichloroethane	Y	Yes	2	nd	0.60	--	Non-Det.	*	--	0.44	1.6	--	--
trichloroethylene	Y	Yes	2	nd	0.60	--	Non-Det.	*	--	1.4	3	--	--
vinyl chloride	Y	Yes	2	nd	0.60	--	Non-Det.	*	--	0.023	0.24	--	--

# Dilution/Mixing Inputs

Please complete the following General Facility Information			
1. Do I have dilution value from a mixing zone study? (Y/N)		y	
2. Is the receiving waterbody fresh water? (Y/N)		y	
3. If answered "N" to <i>Question 1</i> , then fill in the following table			
Eff. Flow Rate	MGD	*	
Stream Flow: Harmonic Mean	CFS	*	
Stream Flow: 30Q5	CFS	*	
% dilution at MZ	%	25%	
Calculated dilution factors			
Dilution @ Harmonic Mean Flow		na	
Dilution @ 30Q5		na	
4. If answered "Y" to <i>Question 1</i> , then fill in dilution values from mixing zone study			
Dilution @ RMZ under harmonic mean flow		25	
Dilution @ RMZ under 30Q5 flow		10	
5. Please enter statistical <i>Confidence</i> and <i>Probability</i> values (note: defaults already entered)			
Confidence Level	%	95%	
Probability Basis	%	95%	

# Effluent Variability

Pollutant Parameter	Carcinogen Status	Evaluation required?	# of Samples	Effluent Conc.	Coefficient of Variation	Estimated Max Eff. Conc.
Pollutant Type	(Y/N)	(Y/N)		µg/l	default=0.6	µg/l
<b>Table 2: Volatile organic compounds</b>						
acrolein	N	Yes	2	nd	0.60	--
acrylonitrile	Y	Yes	2	nd	0.60	--
benzene	Y	Yes	2	nd	0.60	--
bromoform	Y	Yes	2	nd	0.60	--
carbon tetrachloride	Y	Yes	2	nd	0.60	--
chlorobenzene	N	Yes	2	nd	0.60	--
chlorodibromomethane	Y	Yes	2	7.00	0.60	26.56
chloroform	N	Yes	2	10.00	0.60	37.95
dichlorobromomethane	Y	Yes	2	8.50	0.60	32.25
1,2-dichloroethane	Y	Yes	2	nd	0.60	--
1,2-trans-dichloroethylene	N	Yes	2	nd	0.60	--
1,1-dichloroethylene	N	Yes	2	nd	0.60	--
1,2-dichloropropane	Y	Yes	2	nd	0.60	--
1,3-dichloropropylene	Y	Yes	2	nd	0.60	--
ethylbenzene	N	Yes	2	nd	0.60	--
methyl bromide	N	Yes	2	nd	0.60	--
methylene chloride	Y	Yes	2	nd	0.60	--
1,1,2,2-tetrachloroethane	Y	Yes	2	nd	0.60	--
tetrachloroethylene	Y	Yes	2	nd	0.60	--
toluene	N	Yes	2	nd	0.60	--
1,1,2-trichloroethane	Y	Yes	2	nd	0.60	--
trichloroethylene	Y	Yes	2	nd	0.60	--
vinyl chloride	Y	Yes	2	nd	0.60	--

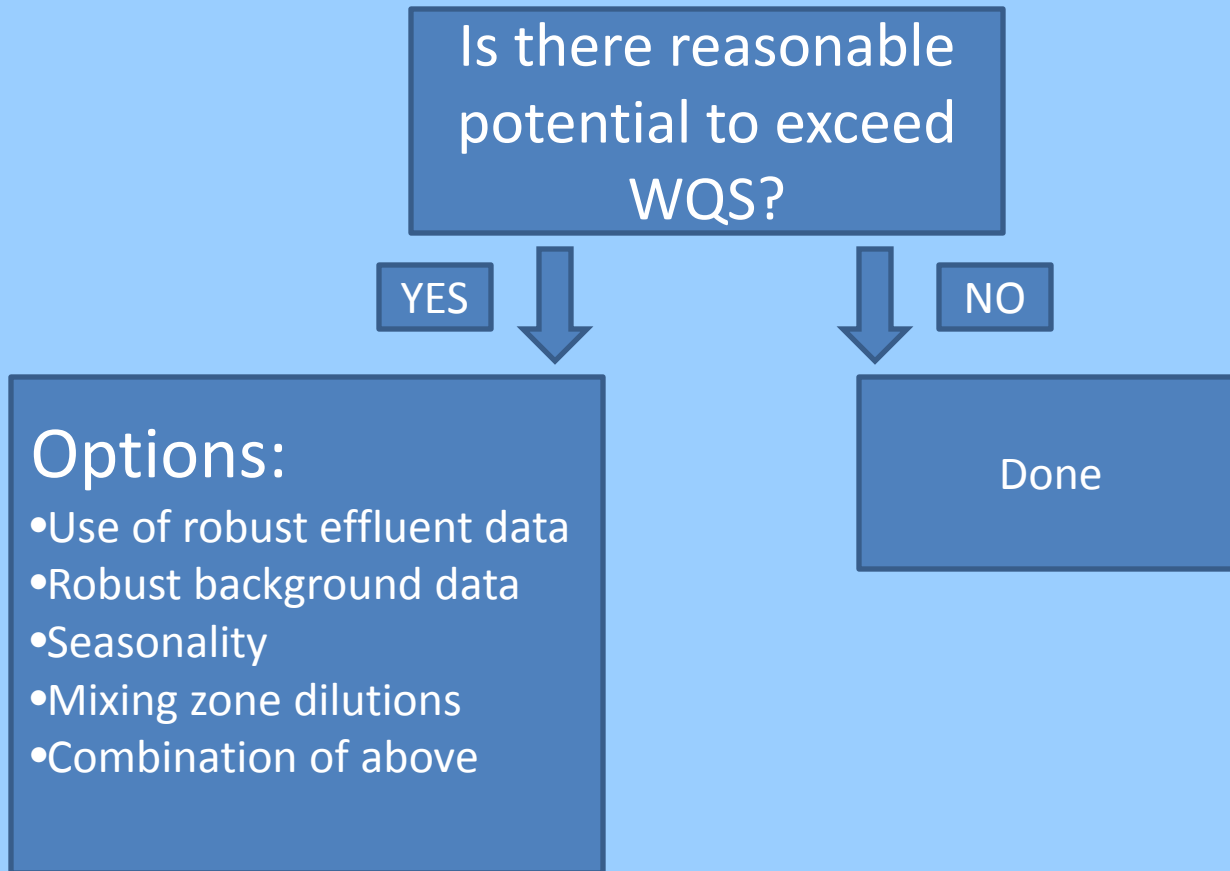
# Screening Level Evaluation

Pollutant Parameter	Estimated Max Eff. Conc.	RP at end of pipe?	WQ Criteria	
			Water + Fish	Fish
Pollutant Type	µg/l	(Y/N)	µg/l	µg/l
<b>Table 2: Volatile organic compounds</b>				
acrolein	--	<b>Non-Det.</b>	0.88	0.93
acrylonitrile	--	<b>Non-Det.</b>	0.018	0.025
benzene	--	<b>Non-Det.</b>	0.44	1.4
bromoform	--	<b>Non-Det.</b>	3.3	14
carbon tetrachloride	--	<b>Non-Det.</b>	0.10	0.16
chlorobenzene	--	<b>Non-Det.</b>	74	160
chlorodibromomethane	26.56	<b>Yes</b>	0.31	1.3
chloroform	37.95	<b>No</b>	260	1100
dichlorobromomethane	32.25	<b>Yes</b>	0.42	1.7
1,2-dichloroethane	--	<b>Non-Det.</b>	0.35	3.7
1,2-trans-dichloroethylene	--	<b>Non-Det.</b>	120	1000
1,1-dichloroethylene	--	<b>Non-Det.</b>	230	710
1,2-dichloropropane	--	<b>Non-Det.</b>	0.38	1.5
1,3-dichloropropylene	--	<b>Non-Det.</b>	0.30	2.1
ethylbenzene	--	<b>Non-Det.</b>	160	210
methyl bromide	--	<b>Non-Det.</b>	37	150
methylene chloride	--	<b>Non-Det.</b>	4.3	59
1,1,2,2-tetrachloroethane	--	<b>Non-Det.</b>	0.12	0.4
tetrachloroethylene	--	<b>Non-Det.</b>	0.24	0.33
toluene	--	<b>Non-Det.</b>	720	1500
1,1,2-trichloroethane	--	<b>Non-Det.</b>	0.44	1.6
trichloroethylene	--	<b>Non-Det.</b>	1.4	3
vinyl chloride	--	<b>Non-Det.</b>	0.023	0.24

# Reasonable Potential Analysis (Human Health)

Pollutant Parameter	# of Samples	Effluent Conc.	Coefficient of Variation	Estimated Max Eff. Conc.	Ambient Conc.	Max Total Conc. at RMZ	WQ Criteria		Is there Reasonable Potential to Exceed? (Y/N)	
							Water + Fish	Fish	Water + Fish	Fish
Pollutant Type		µg/l	default=0.6	µg/l	µg/l	µg/l	µg/l	µg/l	Water + Fish	Fish
<b>Table 2: Volatile organic compounds</b>										
chlorodibromomethane	10	5.00	0.40	7.34	0.00	0.2938	0.31	1.3	NO	NO
dichlorobromomethane	10	6.00	0.60	10.44	0.00	0.4174	0.42	1.7	NO	NO

# RPA Evaluation – Next Steps



# RPA Process – Take Away Messages

- Be proactive/stay engaged
- Permittee should conduct screening analysis and full scale RPA evaluation
  - Determine need for additional data
  - Determine need for additional evaluations (i.e. mixing zone)
- Ensure that the best available information is used in conducting the analysis

# Next Training in February

- I have my results, now what?
- **Implementation Options**

Determine Monitoring Reqs.			Identify Pollutants of Concern					In-stream Conc		Determine Reasonable Potential			
Pollutant Parameter	Carcinogen Status	Evaluation required?	# of Samples	Effluent Conc. $\mu\text{g/l}$	Coefficient of Variation	Estimated Max Eff. Conc. $\mu\text{g/l}$	RP at end of pipe?	Ambient Conc. $\mu\text{g/l}$	Max Total Conc. at RMZ $\mu\text{g/l}$	WQ Criteria		Is there Reasonable Potential to Exceed? (Y/N)	
Pollutant Type	(Y/N)	(Y/N)		$\mu\text{g/l}$	default=0.6	$\mu\text{g/l}$	(Y/N)	$\mu\text{g/l}$	$\mu\text{g/l}$	Water + Fish	Fish	Water + Fish	Fish
<b>Table 1 Effluent Parameters for all POTWs w/a Flow &gt; 0.1 MGD</b>													
Ammonia (as N)													
Chlorine (total residual, TRC)													
Dissolved oxygen													
Nitrates-Nitrite	N	Yes	2	nd	0.60	--	Non-Det.	*	--	10000	na	--	--
Kjeldahl nitrogen													
Oil and Grease													
Total dissolved solids													
<b>Table 2 Effluent Parameters for Selected POTWs</b>													
Hardness (Total as $\text{CaCO}_3$ ) Must be collect for metals criteria calculation. Submit data to the fields at the top of the spreadsheet													
<b>Table 2: Metals (total recoverable), cyanide and total phenols</b>													
Antimony	N	Yes	2	0.39	0.60	1.48	No	*	--	5.1	64	--	--
Arsenic (Inorganic)	Y	Yes	2	6.75	0.60	25.61	Yes	4.50	5.3445	2.1	2.1	YES	YES
Copper	N	Yes	2	1.90	0.60	7.21	No	*	--	1300	na	--	--
Methyl Mercury	N									na	0.040 mg/kg	na	--
Nickel	N	Yes	2	2.10	0.60	7.97	No	*	--	140	170	--	--
Selenium	N	Yes	2	nd	0.60	--	Non-Det.	*	--	120	420	--	--
Thallium	N	Yes	2	nd	0.60	--	Non-Det.	*	--	0.043	0.047	--	--
Zinc	N	Yes	2	30.00	0.60	113.84	No	*	--	2100	2600	--	--

Intake Credit Analysis						
Intake Concentration	Adjusted Max. Effluent Concentration	Max. Total Conc at	Is there Reasonable Potential to			
Check	$\mu\text{g/l}$	$\mu\text{g/l}$	Water + Fish	Fish	Water + Fish	Fish
--	*	--	--	--	--	--
X	4.00	No IC	--	--	--	--
--	*	--	--	--	--	--
--	*	--	--	--	--	--
--	*	--	--	--	--	--
--	*	--	--	--	--	--

# Extra slides

Wherever there's water, there's Clean Water.

Clean Water  Services

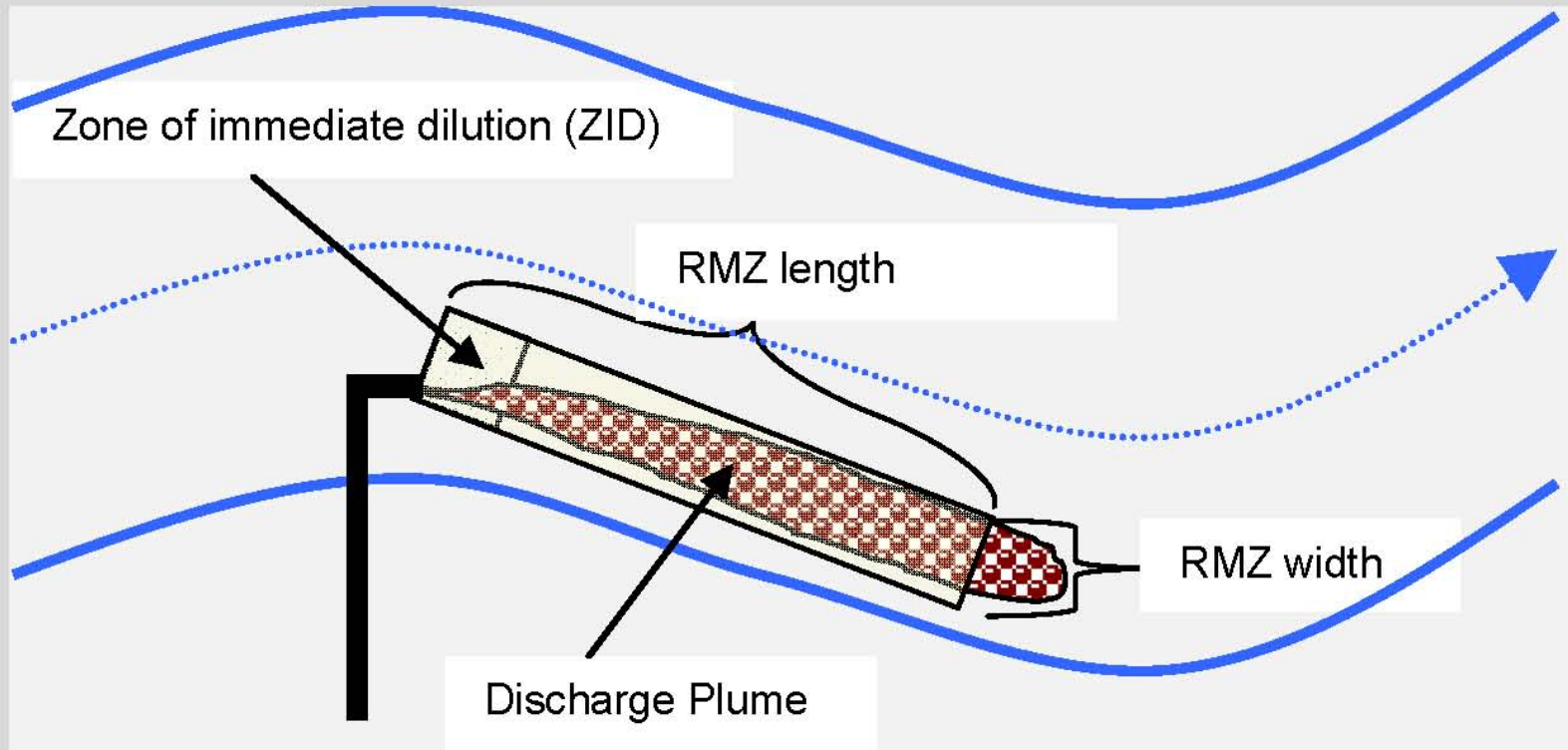
# Water Quality based Effluent Limits

- If technology limits are not protective of water quality, then WQBELs are developed.
- For parameters of concern that do not have technology based limits, determine whether effluent levels are protective of water quality



# Mixing Zones

## Example of Regulatory Mixing Zone (RMZ) for a River



# Reasonable Potential Analysis (RPA)

- CFR 122.44(d)(1)(ii) states that if a pollutant has *reasonable potential* to cause or contribute to an exceedance of a water quality criterion, the permit must contain effluent limits for that pollutant.
- Statistically based approach
- Methodology/statistics in EPA's Technical Support Document for Water Quality Based Toxics Control