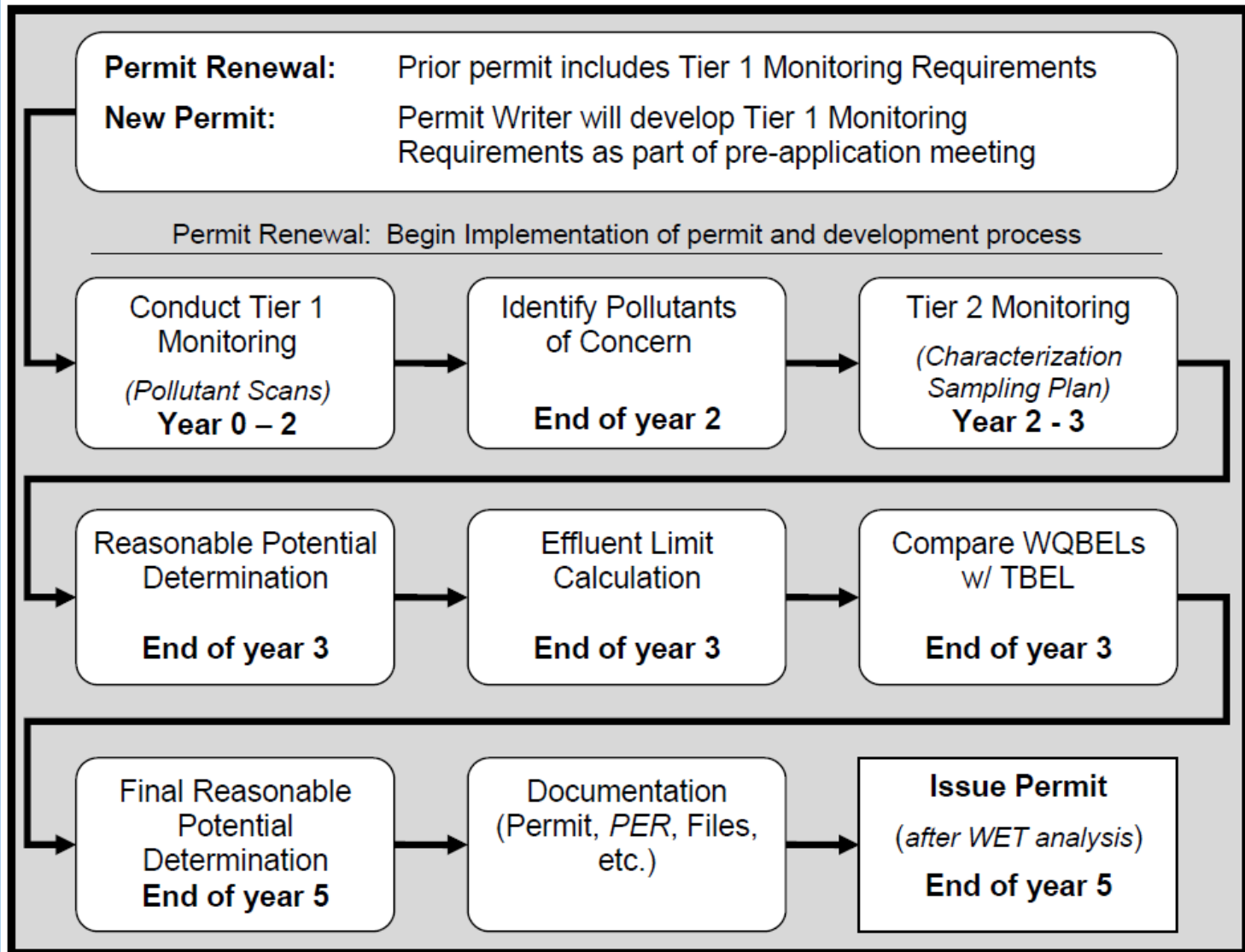


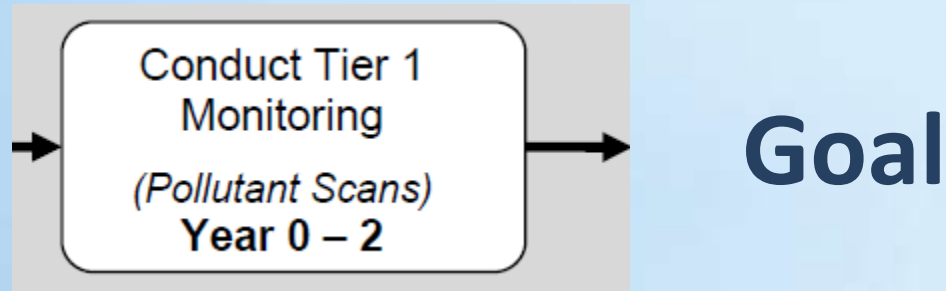
Preparing for the RPA Process

Make sure it doesn't come back to bite you!



General RPA Process and Timeline





Avoid obtaining a “yes” in the Reasonable Potential Analysis for any pollutant.

Be proactive to know early on if there are pollutants of concern.

Your Goal: No "Yes" in the Acute or Chronic column

RPA Run Information		Please complete the following General Facility Information			
Facility Name:	Anytown POTW	1. Do I have dilution values from a mixing zone study? (Y/N)	Y	4. If answered "Y" to Question 1, then fill in dilution values from mixing zone study	
DEQ File Number:	12345	2. Is the receiving waterbody fresh water? (Y/N)	Y	Dilution @ ZID (from study)	10
Permit Writer Name:	Ivana Permit	3. If answered "N" to Question 1, then fill in the following table		Dilution @ MZ (from study)	100
Outfall Number:	1	Eff. Flow Rate	MGD	*	5. Please enter Water Hardness Data below to reflect critical conditions (values from 25 to 400 mg/l)
Date of RPA Run:	6/1/2013	Stream Flow: 7Q10	CFS	*	
RPA Run Notes: Waterbody is 303(d) listed for Silver. The 90th % value for the ambient concentration was 0.5 ug/l. Due to listing status, a value of 1.8 ug/l was used.		Stream Flow: 1Q10	CFS	*	
KEY: * Enter data here -- Calculated results		% dilution at ZID	%	10%	
		% dilution at MZ	%	25%	
		Calculated dilution Factors			
		Dilution @ ZID	na	6. Please enter statistical Confidence and Probability values (note: defaults already entered)	
		Dilution @ MZ	na	Confidence Level	% 99%
				Probability Basis	% 95%

Determine Monitoring Reqs.		Identify Pollutants of Concern				Determine In-Stream Conc.			Determine Reasonable Potential				
PARAMETER	Evaluation Required? (Y/N)	# of Samples	Highest Effluent Conc. (µg/l)	Coefficient of Variance (Default=0.6)	Estimated Max Eff. Conc. (µg/l)	RP at end of pipe? (Y/N)	Ambient Conc. (µg/l)	Max Total Conc. at ZID (µg/l)	Max Total Conc. at RMZ (µg/l)	WQ CRITERIA (µg/l)		Is there Reasonable Potential to Exceed? (Y/N)	
										1 Hour (CMC)	4 Day (CCC)	Acute	Chronic

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

Ammonia (as N)	Yes	Evaluation occurs on Ammonia (NH3) spreadsheet page											
Chlorine (total residual, TRC)	Yes	Evaluation occurs on Chlorine (-Cl) spreadsheet page											
Dissolved oxygen	Yes	Evaluation occurs on Dissolved Oxygen (DO) spreadsheet page											
Oil and Grease	Yes	Compare to Effluent limits in permits or Federal Effluent Limit Guidelines											
Total dissolved solids	Yes	Compare to Effluent limits in permits or Federal Effluent Limit Guidelines											

Table 2 Effluent Parameters for Selected POTWs

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

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

ARSENIC III (State Only)	Yes	4	1.00	0.60	3.20	No	*	--	--	360.0	190.0	--	--
Cadmium	Yes	10	2.00	0.60	4.20	Yes	2.00	2.22	2.02	1.1	0.4	YES	YES
Chromium III + (State Only)	Yes	4	0.50	0.60	1.60	No	*	--	--	691.7	68.1	--	--
Chromium VI (State Only)	Yes	4	0.50	0.60	1.60	No	*	--	--	16.0	11.0	--	--
Copper	Yes	4	1.00	0.60	3.20	No	*	--	--	6.1	3.7	--	--
Iron: dissolved (State Only)	Yes	4	1.00	0.60	3.20	No	*	--	--	na	1000.0	--	--
Lead	Yes	10	0.20	0.60	0.42	No	*	0.94	0.95	5	0.6	NO	NO
Mercury	Yes	4	0.00	0.60	0.00	No	*	--	--	--	0.0	--	--
Nickel	Yes	4	1.00	0.60	3.20	No	*	--	--	370.0	50.0	--	--
Selenium	Yes	4	1.00	0.60	3.20	No	*	--	--	360.0	35.0	--	--
Silver	Yes	10	1.00	0.60	2.10	Yes	1.80	1.83	1.80	0.6	0.1	YES	YES
Zinc	Yes	4	0.50	0.60	1.60	No	*	--	--	45.2	33.6	--	--
Cyanide (Free)	Yes	4	1.00	0.60	3.20	No	*	--	--	22.0	5.2	--	--

Table 2: Volatile organic compounds

Table 2: Acid-extractable compounds

Pentachlorophenol	Yes	4	nd	0.60	--	Non Dect.	*	--	--	20.0	13.0	--	--
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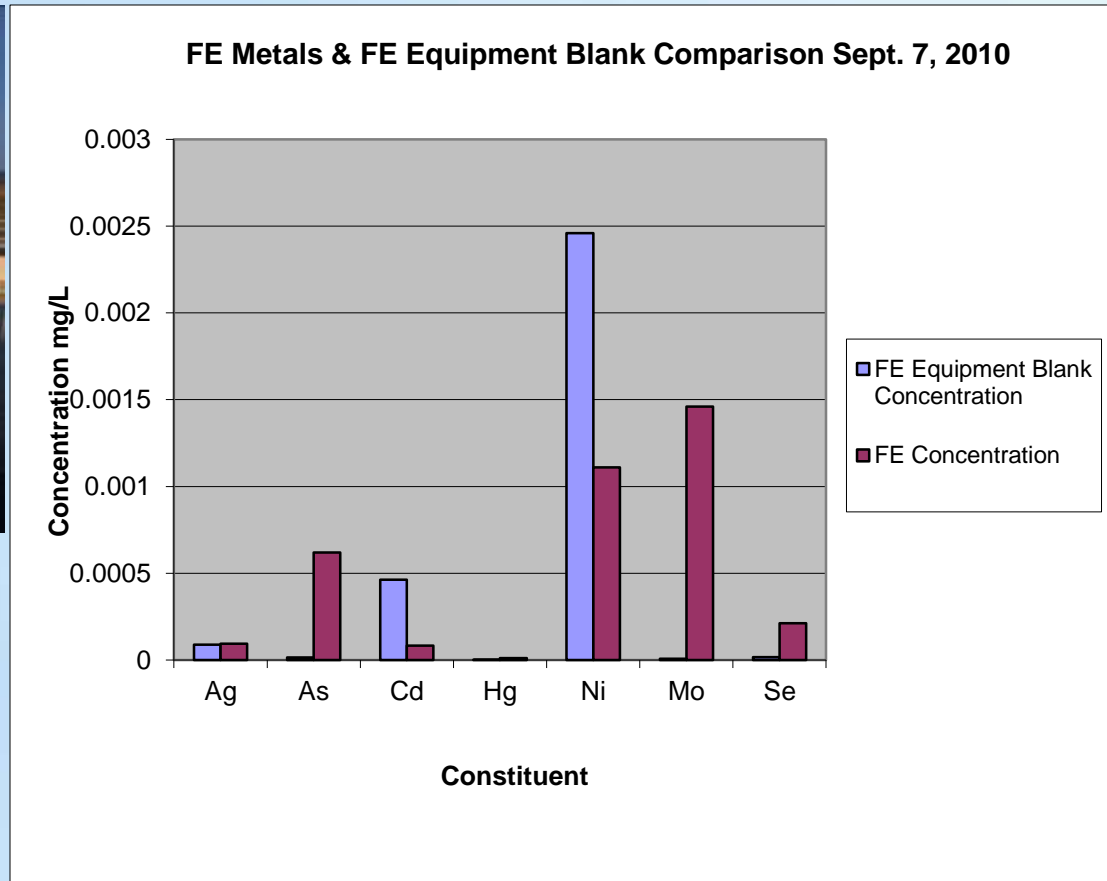
Key Factors that Influence the Results

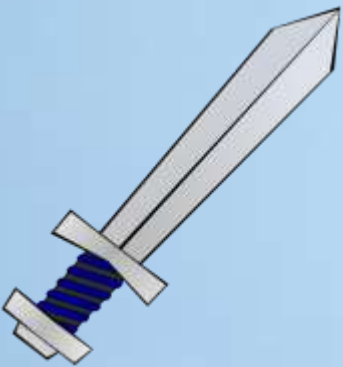
- Concentration of the constituent
- Number of samples
- Data quality and consistency
- Mixing
- Background conditions
- Seasonal variability

Concentration of the Constituent

- The aquatic life RPA is based on the maximum measured concentration of each pollutant
 - One bad data point can trigger a **YES**
 - QA/QC is paramount
 - Study results and identify problems
 - Consider your treatment process prior to sampling
- Human health RPA uses the geometric mean or the maximum concentration

Poor laboratory technique will result in faulty data or false positives





Number of Samples

The double edged sword

More samples can reduce the estimated maximum effluent concentration.

Pollutant Parameter	Evaluation Required?	# of Samples	Highest Effluent Conc.	Coefficient of Variation	Estimated Max Eff. Conc.	RP at end of pipe?	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	(Y/N)	µg/l	µg/l	µg/l	µg/l	µg/l		
Copper	Yes	2	30.00	0.60	153.00	Yes	2.00	29.45	8.04	28.9	19.5	Yes	No
Copper	Yes	3	30.00	0.60	117.00	Yes	2.00	22.91	6.60	28.9	19.5	No	No

More samples can increase the risk of getting a higher concentration of a pollutant and additional sampling and analysis is expensive.

Strategies for Additional Sampling

- If a pollutant is problematic, assess the impact of additional samples
- Consider conditions that could support eliminating a sample
- Communicate with the laboratory on possible issues
- Improve QA/QC

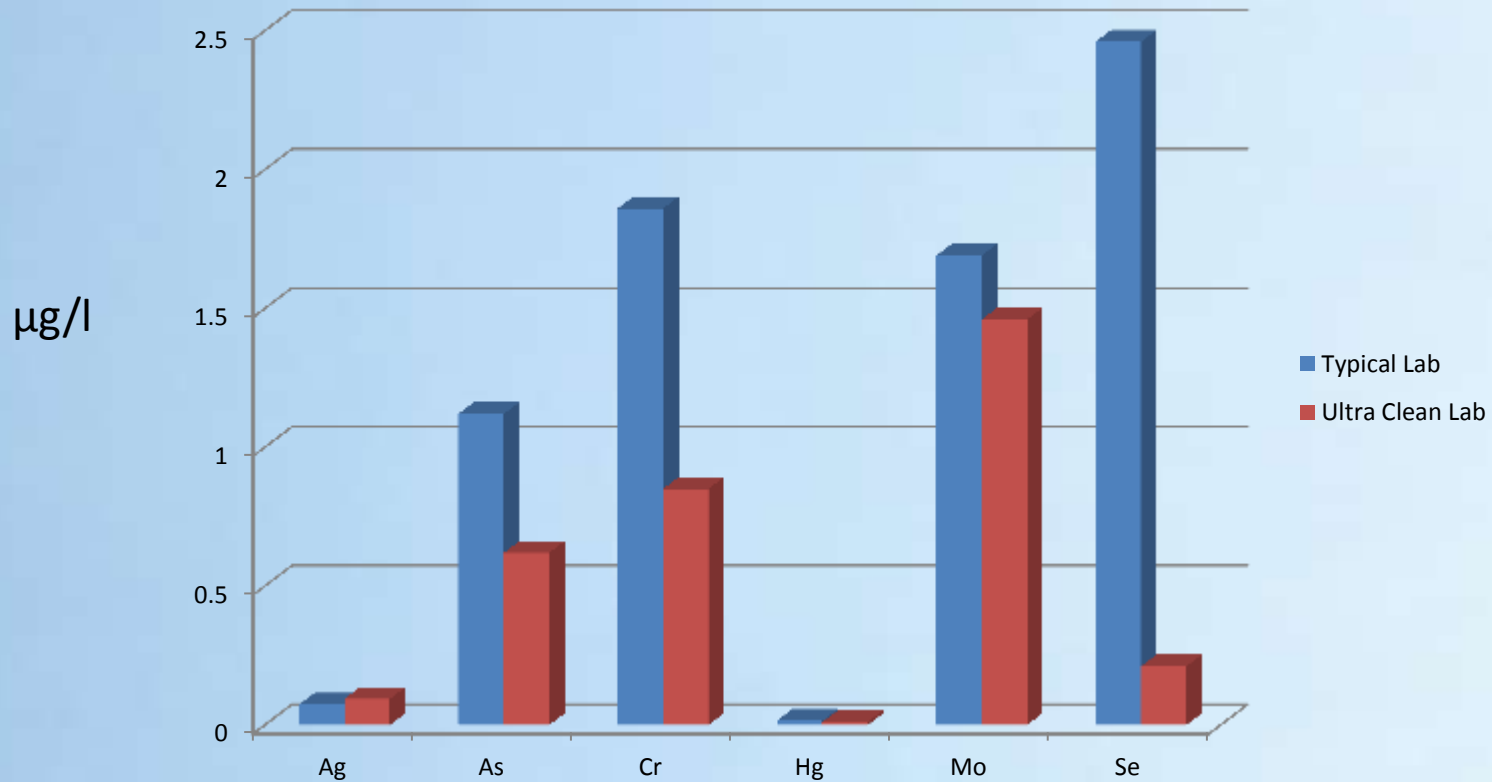
Coefficient of Variation (CV)

$$CV = \frac{\text{Standard Deviation}}{\text{Mean}}$$



Pollutant Parameter	Evaluation Required? (Y/N)	# of Samples	Highest Effluent Conc. µg/l	Coefficient of Variation Default=0.6	Estimated Max Eff. Conc. µg/l	RP at end of pipe? (Y/N)	Ambient Conc. µg/l	Max Total Conc. at ZID µg/l	Max Total Conc. at RMZ µg/l	WQ CRITERIA		Is there Reasonable Potential to Exceed? (Y/N)	
										1 Hour (CMC) µg/l	4 Day (CCC) µg/l	Acute	Chronic
Copper	Yes	2	30.00	0.60	153.00	Yes	2.00	29.45	8.04	28.9	19.5	YES	NO
Copper	Yes	2	30.00	0.35	81.00	Yes	2.00	16.36	5.16	28.9	19.5	NO	NO

Impact of Ultra Clean Analysis



Mixing

- More mixing will help with compliance
- Flow regimes are different for aquatic and human health standards
- Check out the Mixing Zone IMD in anticipation of new permits

Background Conditions

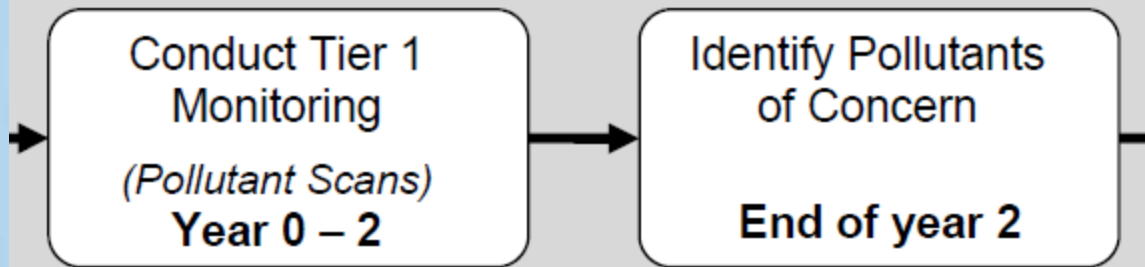
Ambient Data guidelines for use in RPA Calculation

- **Aquatic Toxicity Analysis**
 - For 4 or more data points, the permit writer would enter the **90th percentile** of the data range
 - For less than 4 data points, the permit writer would enter the **most conservative value**
- **Human Health Analysis**
 - The permit writer should calculate and enter the **geometric mean**

- Background conditions establish the assimilative capacity of the water body
- Data QA/QC is equally important

Seasonal Variability

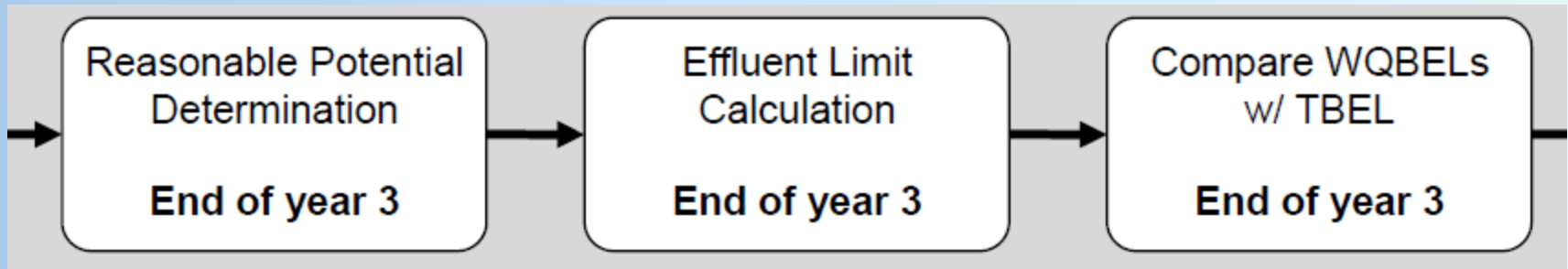
- Evaluate seasonal variations using data that is concurrent
- Ammonia toxicity is based on 90th percentile values for pH, temperature and alkalinity
- Background conditions also vary seasonally



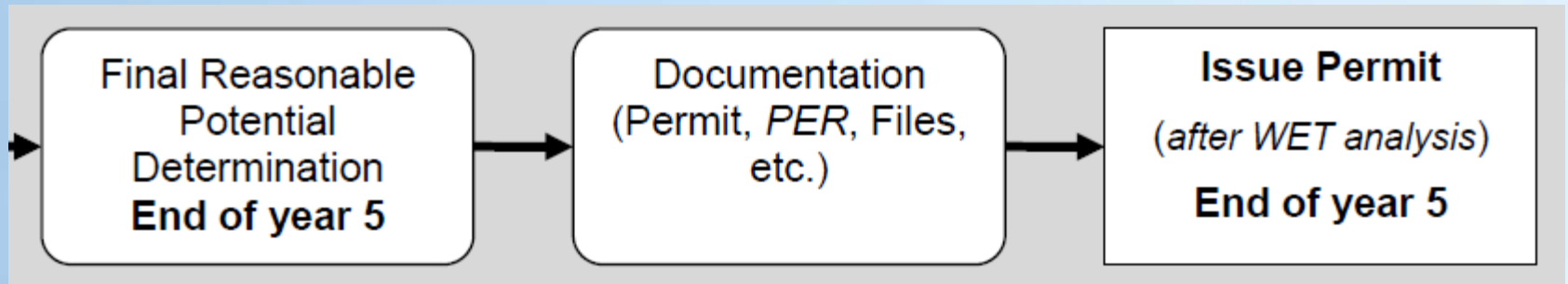
Determine Monitoring Reqs.		Identify Pollutants of Concern				
PARAMETER	Evaluation Required?	# of Samples	Highest Effluent Conc.	Coefficient of Variance	Estimated Max Eff. Conc.	RP at end of pipe?
	(Y/N)		µg/l	Default=0.6	µg/l	(Y/N)
Table 1 Effluent Parameters for all POTWs w/a Flow > 0.1 MGD						
Ammonia (as N)	Yes					Evaluation occurs on Ammonia (NH3) spreadsheet page
Chlorine (total residual, TRC)	Yes					Evaluation occurs on Chlorine (-Cl) spreadsheet page
Dissolved oxygen	Yes					Evaluation occurs on Dissolved Oxygen (DO) spreadsheet page
Oil and Grease	Yes					Compare to Effluent limits in permits or Federal Effluent Limit Guid
Total dissolved solids	Yes					Compare to Effluent limits in permits or Federal Effluent Limit Guid
Table 2 Effluent Parameters for Selected POTWs						
Hardness (Total as CaCO3)	Must be collected for metals criteria calculation. Submit data to the fields at t					
Table 2: Metals (total recoverable), cyanide and total phenols						
ARSENIC III (State Only)	Yes	4	1.00	0.60	3.20	No
Cadmium	Yes	4	2.00	0.60	6.40	Yes
Chromium III + (State Only)	Yes	4	0.50	0.60	1.60	No
Chromium VI (State Only)	Yes	4	0.50	0.60	1.60	No
Copper	Yes	4	1.00	0.60	3.20	No
Iron: dissolved (State Only)	Yes	4	1.00	0.60	3.20	No
Lead	Yes	4	0.20	0.60	0.64	Yes
Mercury	Yes	4	0.00	0.60	0.00	No
Nickel	Yes	4	1.00	0.60	3.20	No
Selenium	Yes	4	1.00	0.60	3.20	No
Silver	Yes	4	1.00	0.60	3.20	Yes
Zinc	Yes	4	0.50	0.60	1.60	No
Cyanide (Free)	Yes	4	1.00	0.60	3.20	No
Table 2: Volatile organic compounds						
Table 2: Acid-extractable compounds						
pentachlorophenol	Yes	4	nd	0.60	--	Non Detect.

Next Steps

- Permit Action Letter will be issued by DEQ
 - Sampling Plan
 - Data Collection
- Additional Sampling and analysis
- RPA



After the initial RPA indicated that there is reasonable potential.....



Possible Actions

- Permit limits
- Variance
- 303 (d) listing of water body
- Use attainability analysis
- Site specific standards
- Retirement ?

In the short term

- DEQ to finalize the RPA IMD
- New permits are being issued
- Sampling will begin
- Stay tuned with ACWA – We're all in this together



Questions, comments or thundering
applause?