

Case Study: Observations, Thoughts and Suggestions from a Seasoned Inspector

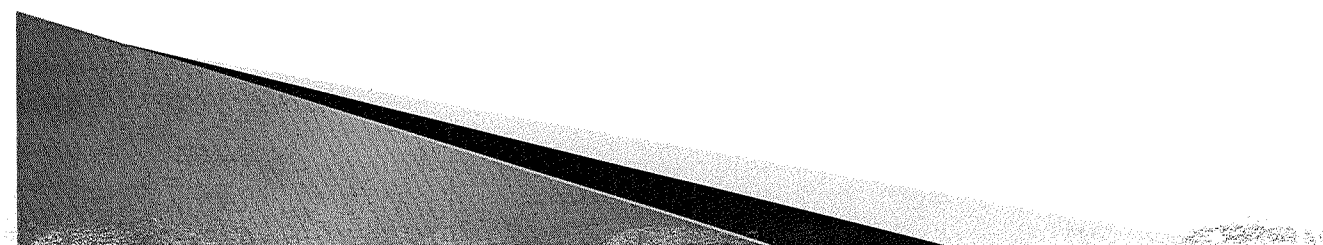
AWW & WEA Annual Conference
Brent Walker – ADEQ
May 3, 2016

The logo for the Arkansas Department of Environmental Quality (ADEQ). It features the letters "ADEQ" in a large, bold, serif font. Below the letters are two horizontal lines, and then the word "ARKANSAS" in a smaller, bold, sans-serif font. At the bottom, the words "Department of Environmental Quality" are written in a small, sans-serif font.

ARKANSAS
Department of Environmental Quality

Read Your Permit!!!

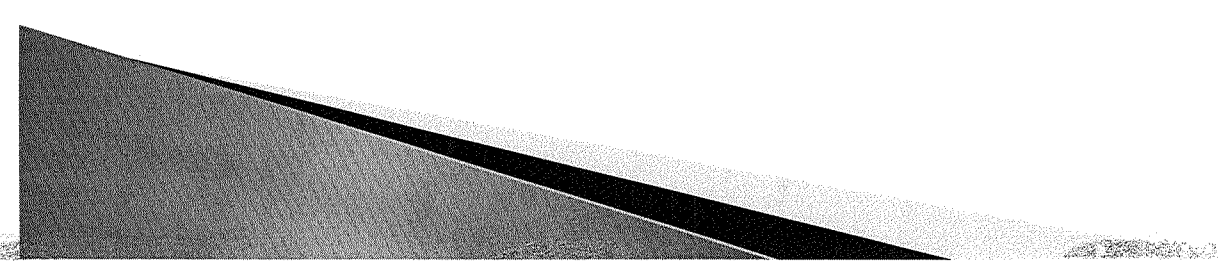
- ▶ Cover Page
- ▶ Part I – Limits
- ▶ Part II – Other Conditions
- ▶ Part III – Standard Conditions
- ▶ Part IV – Definitions
- ▶ Statement of Basis



Reading Your Permit

► Cover Page

- Facility Name and Location
- Receiving Stream and Outfall Location
- Effective and Expiration Dates
- Must Reapply 180 Days Prior to the Expiration Date



Reading Your Permit

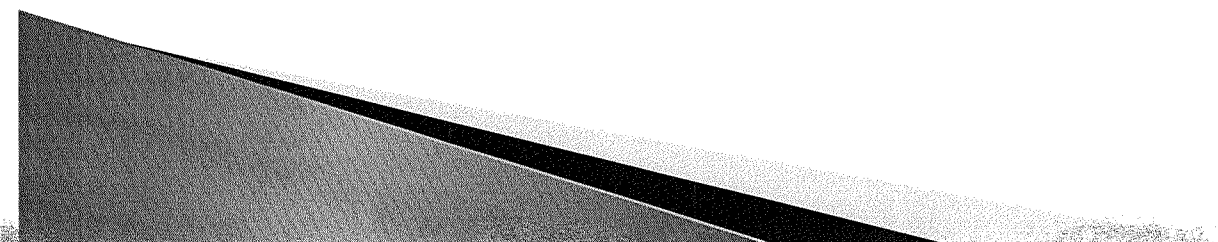
- ▶ Part I – Monitoring Requirements and Limits
 - Required Parameters
 - (Flow, pH, TSS, BOD, NH₃-N, FCB, etc.)
 - Required Frequency
 - Concentration Limits
 - Loading Limits
 - Compliance Schedule (if applicable)



Reading Your Permit

► Part II – Other Conditions

- Operator Licensing Requirements (Class I, II, III, IV)
- Minimum Percent Removal (BOD and/or TSS)
- SSO Reporting Information
- Pretreatment Requirements
- WET Testing/Biomonitoring



Reading Your Permit

- ▶ Part III – Standard Conditions
 - Section A: General Conditions
 - Section B: Operation and Maintenance
 - Section C: Monitoring and Records
 - Section D: Reporting Requirements



Reading Your Permit

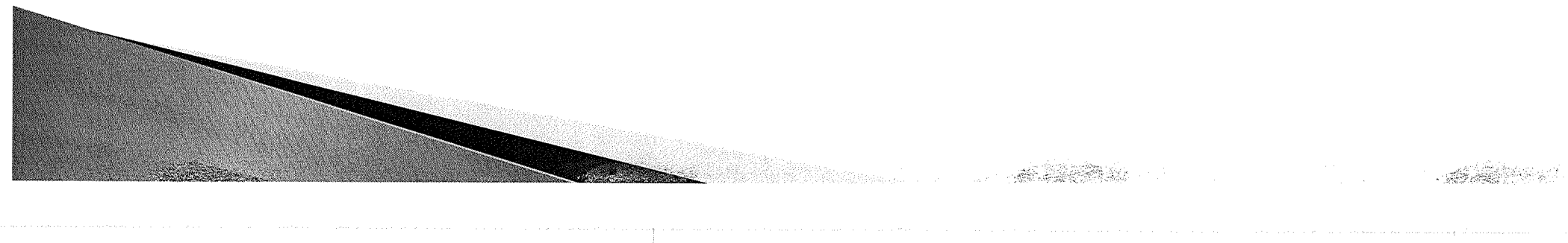
► Part IV – Definitions

- What is a ...?
 - Grab Sample
 - Composite Sample
 - Weekday
 - Upset
 - Bypass



Reading Your Permit

- ▶ Statement of Basis
 - Name and Contact Information of Permit Writer
 - Summary of Significant Changes
 - Receiving Stream Details
 - Facility Design Flow
 - Limits Calculations

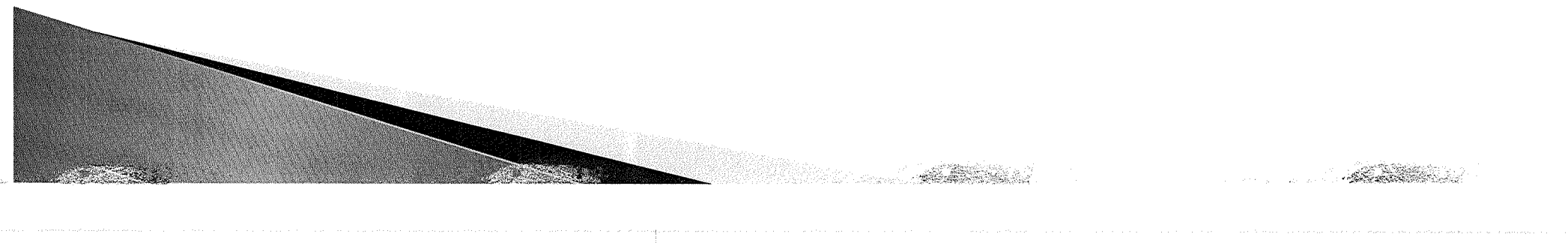


Percent Removal (Part II of your Permit)

- ▶ For publicly owned treatment works, the 30-day average percent removal for Biochemical Oxygen Demand (BOD5) and Total Suspended Solids (TSS) shall not be less than 85%.

(May vary by permit)

- ▶ The permittee must monitor the influent BOD5 and TSS at least once per year during a standard sampling event as required in Part I.A. of the permit.



Percent Removal Formula

(Part IV Definitions)

$$\frac{(\text{Influent Concentration} - \text{Effluent Concentration})}{\text{Influent Concentration}} \times 100$$



Percent Removal Example

▶ Influent BOD = 250 mg/l & Effluent BOD = 8 mg/l

▶ % Removal = $\frac{(\text{Influent} - \text{Effluent})}{\text{Influent}} \times 100$

▶ % Removal = $\frac{(250 - 8)}{250} \times 100 = \frac{242}{250} \times 100$

▶ % Removal = $0.968 \times 100 = \mathbf{96.8\%}$

Influent Sampling

- ▶ Location, Location, Location
- ▶ Preferred sampling points include:
 - Main pump station wet well (if turbulent)
 - Influent force main
 - Influent flume
 - Aerated grit chamber



Influent Sampling (cont.)

- ▶ Collect samples at points of highly turbulent flow to ensure good mixing.
- ▶ Ensure sampling location is upstream of any return/recirculation lines.
- ▶ If it is not possible to sample at a preferred point, choose an alternative location and document the basis for choosing that location.



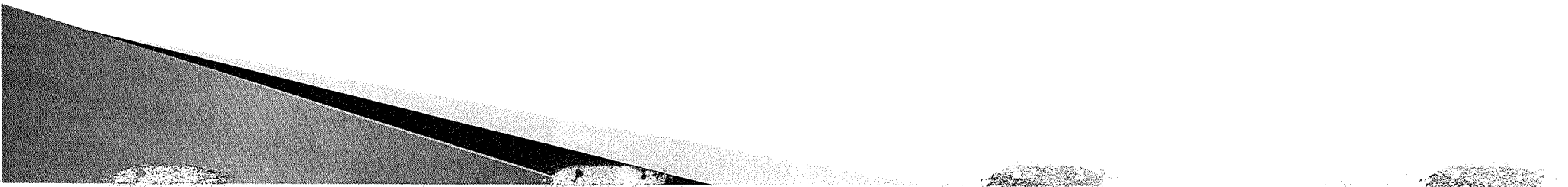
Influent Sampling (cont.)

- ▶ Collect samples at multiple points if necessary for representative sampling.
- ▶ Sample at representative times.
 - Avoid periods of high I&I flows.
 - Take intermittent dischargers into consideration.
- ▶ *Multiple (quarterly) samples per year are suggested.*



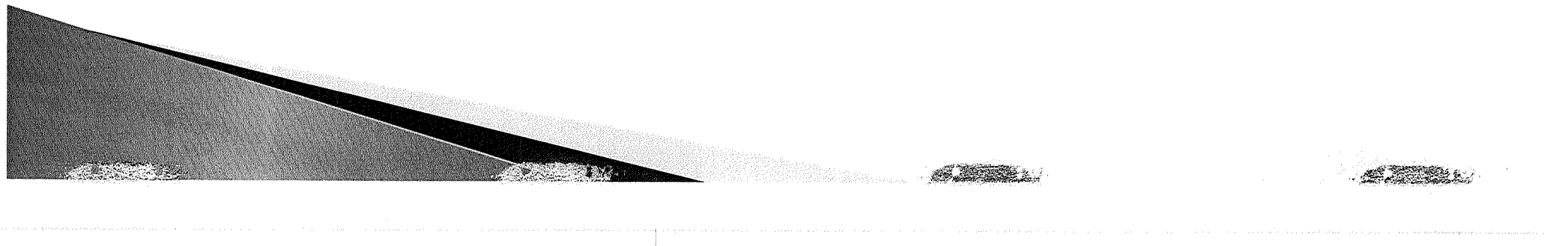
Representative Sampling

- ▶ Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge during the entire monitoring period.
- ▶ All samples shall be taken at the monitoring points specified in this permit and, unless otherwise specified, before the effluent joins or is diluted by any other waste stream, body of water, or substance.



Representative Sampling (cont.)

- ▶ Monitoring points shall not be changed without notification to and the approval of the Director.
- ▶ Intermittent discharges shall be monitored.

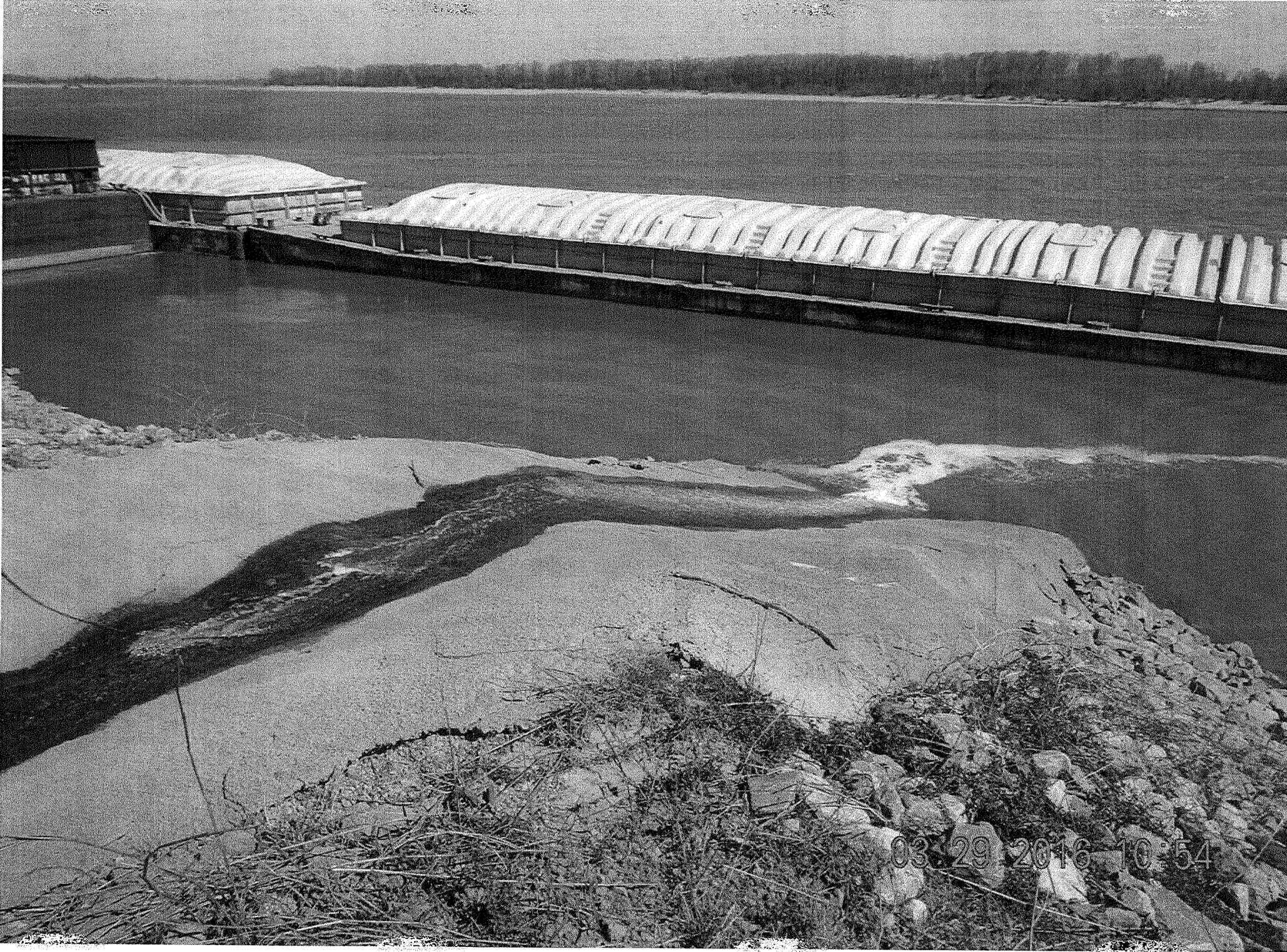


Representative Samples





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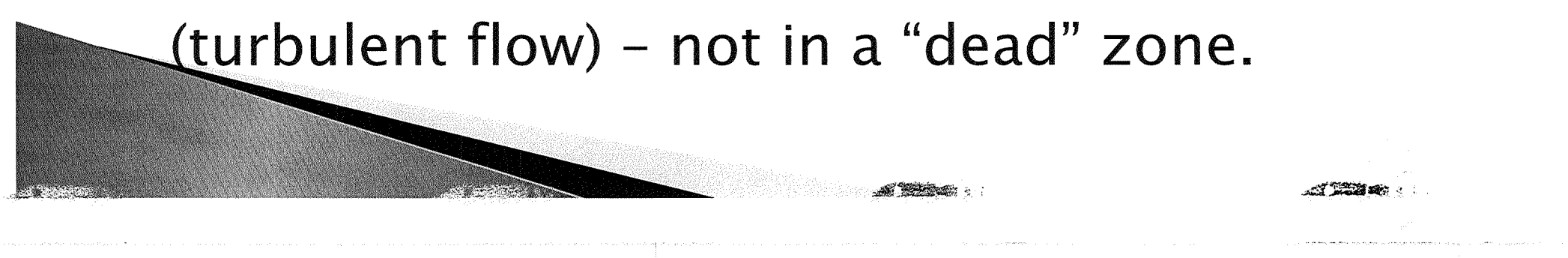





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Effluent Sampling

- ▶ Take samples at the location specified in the NPDES permit.
- ▶ Should be the most representative site after final treatment.
- ▶ Must be downstream from all entering waste streams before entering the receiving waters.
- ▶ Collect effluent from well mixed area (turbulent flow) – not in a “dead” zone.



Effluent Sampling (cont.)

- ▶ Use the sampling method (grab, composite, continuous) as required in the permit and as appropriate for the parameter.
 - ▶ Use clean sampling equipment and containers.
 - ▶ Avoid collecting large nonhomogeneous particles and objects.
 - ▶ Do not rinse sample container with sample when collecting oil and grease and microbiological samples.
- 

Intermittent Discharges

- ▶ Intermittent discharges shall be monitored.
- ▶ Plan ahead – look at your lagoons and the calendar.
- ▶ Communicate – talk to your lab.
- ▶ Do not “force” a discharge.
- ▶ Sampling twice in one day does not meet the requirements of sampling twice per month.



February 2016

Calendarpedia
Your source for calendars

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
31	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	1	2	3	4	5

When to stop discharging?

When to start discharging?

Sample

Sample



~~Vote Early and Vote Often~~

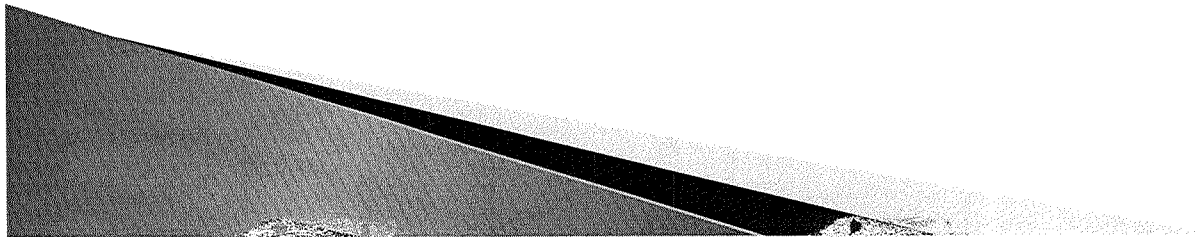
- ▶ If the permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR Part 136 or as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR.
- ▶ Such increased frequency shall also be indicated on the DMR.

February 2016

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
31	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	1	2	3	4	5

Record Contents (Part III, C:8)

- ▶ The date, exact place, time and methods of sampling or measurements, and preservatives used, if any.
- ▶ The individuals(s) who performed the sampling or measurements.
- ▶ The date(s) and time analyses were performed.
- ▶ The individual(s) who performed the analyses.
- ▶ The analytical techniques or methods used.
- ▶ The measurements and results of such analyses.



Example Flow Records

Smelly Creek WWTP AR0099999
Outfall 001 - 90°V-Notch Weir

Date: April 2016

Day	Time	Head (ft)	Flow (MGD)	Initials	Notes
1	07:45	0.21	0.0327	BLW	
2					
3					
4	08:20	0.25	0.0505	BLW	
5	07:10	0.28	0.0670	BLW	1/4" Rain
6	12:30	0.29	0.0732	BLW	1/2" Rain
7	15:50	0.25	0.0505	BLW	
8	16:10	0.22	0.0367	BLW	
9					
10					
11	12:10	0.20	0.0289	BLW	Closed Valve
12	12:05	0	No Discharge	BLW	
13	13:40	0	No Discharge	BLW	
14	07:50	0	No Discharge	BLW	
15	07:35	0	No Discharge	BLW	

Flow Measurement (Part III, C, 1)

- ▶ Devices shall be capable of measuring flows with a maximum deviation of less than $\pm 10\%$ from true discharge rates throughout the range of expected discharge volumes.

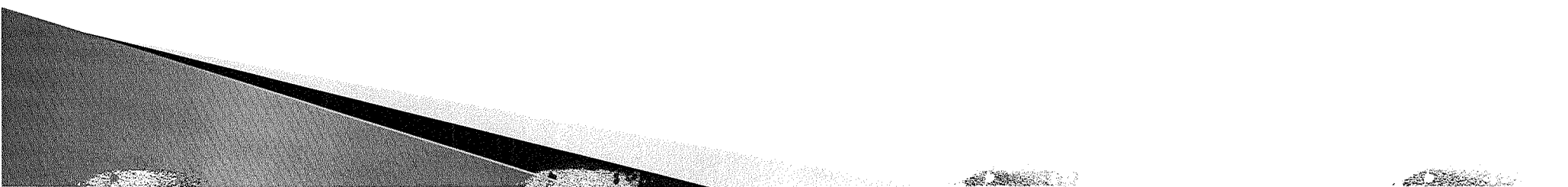


Flow Calibration Checks

$$\text{Percent Error} = \frac{(\text{Calculated Flow} - \text{Recorded Flow})}{\text{Calculated Flow}} \times 100$$

Calculated Flow = Measured using Staff Gauge and Flow Table

Recorded Flow = Electronic Display from Flow Meter



Flow Calibration Checks

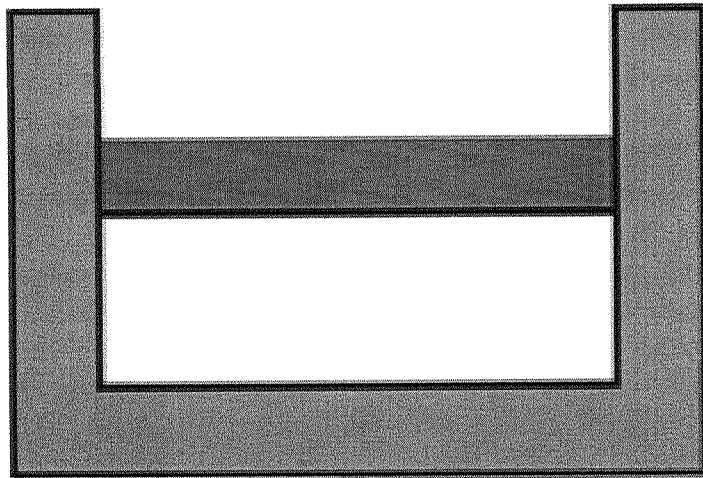
▶ Calculated 426 GPM & Recorded = 468 GPM

▶ % Error = $\frac{(\text{Calculated} - \text{Recorded})}{\text{Calculated}} \times 100$

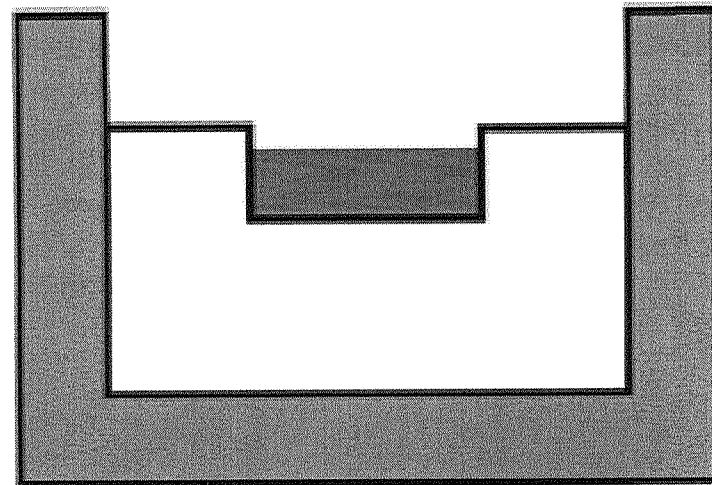
▶ % Error = $\frac{(426 - 468)}{426} \times 100 = \frac{-42}{426} \times 100$

▶ % Error = $-0.099 \times 100 = -9.9\%$

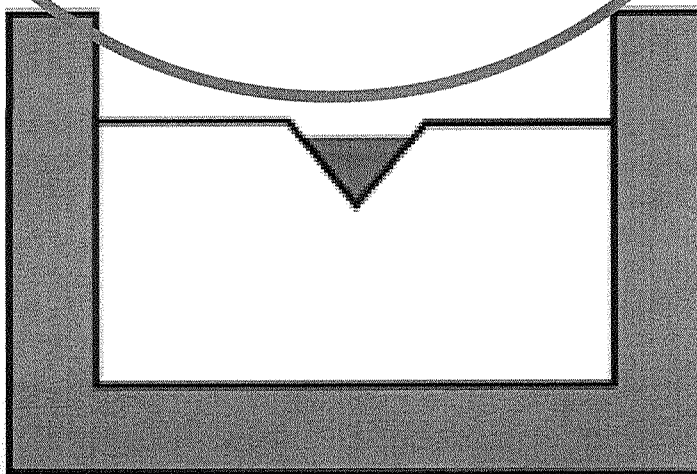
Flow Measurement – Weirs



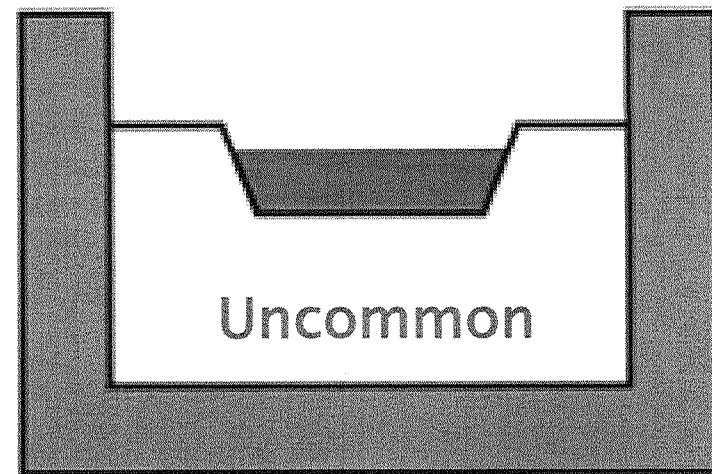
A. Rectangular weir without end contractions



B. Rectangular weir with end contractions



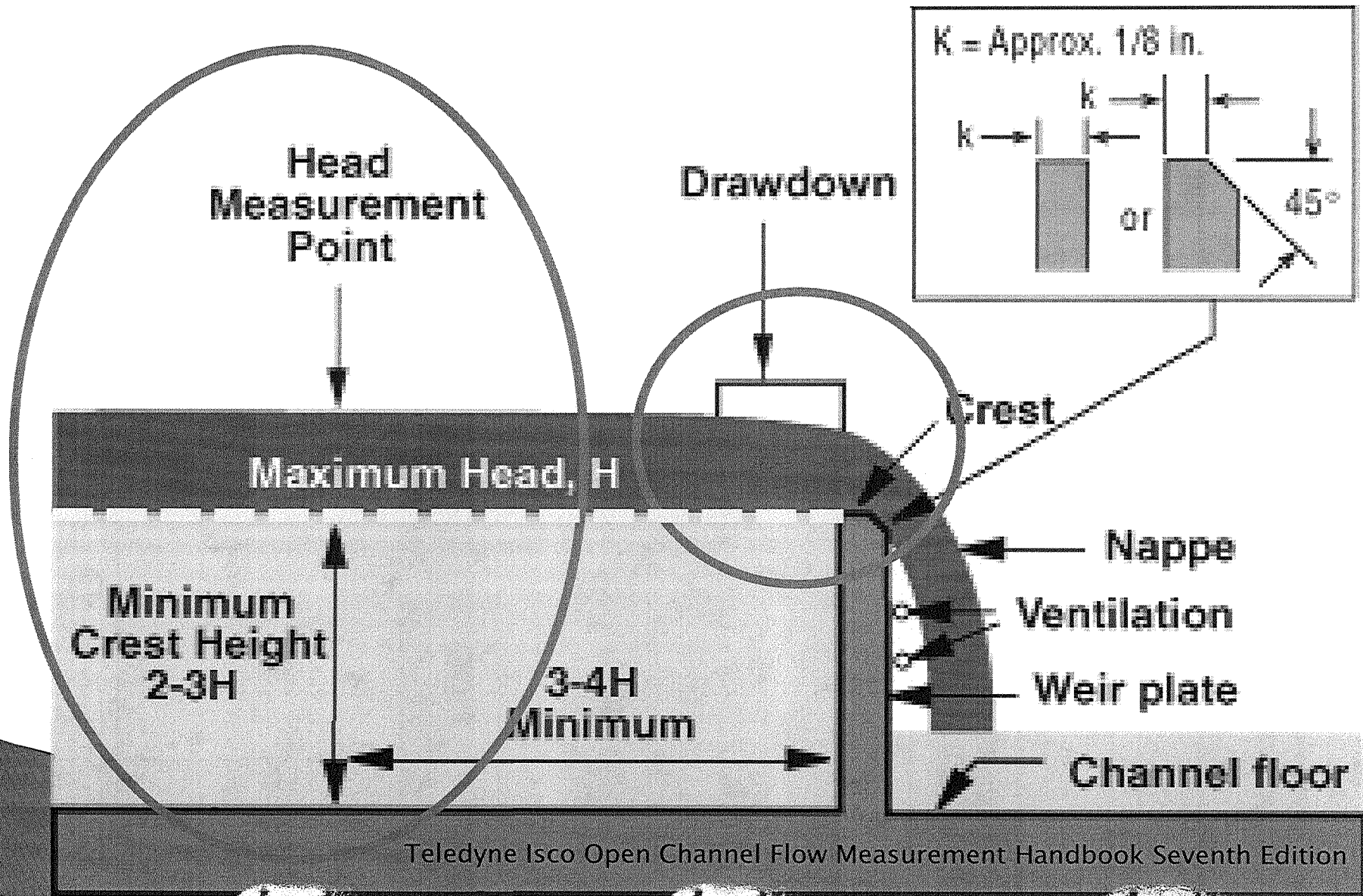
C. V-notch (or triangular) weir

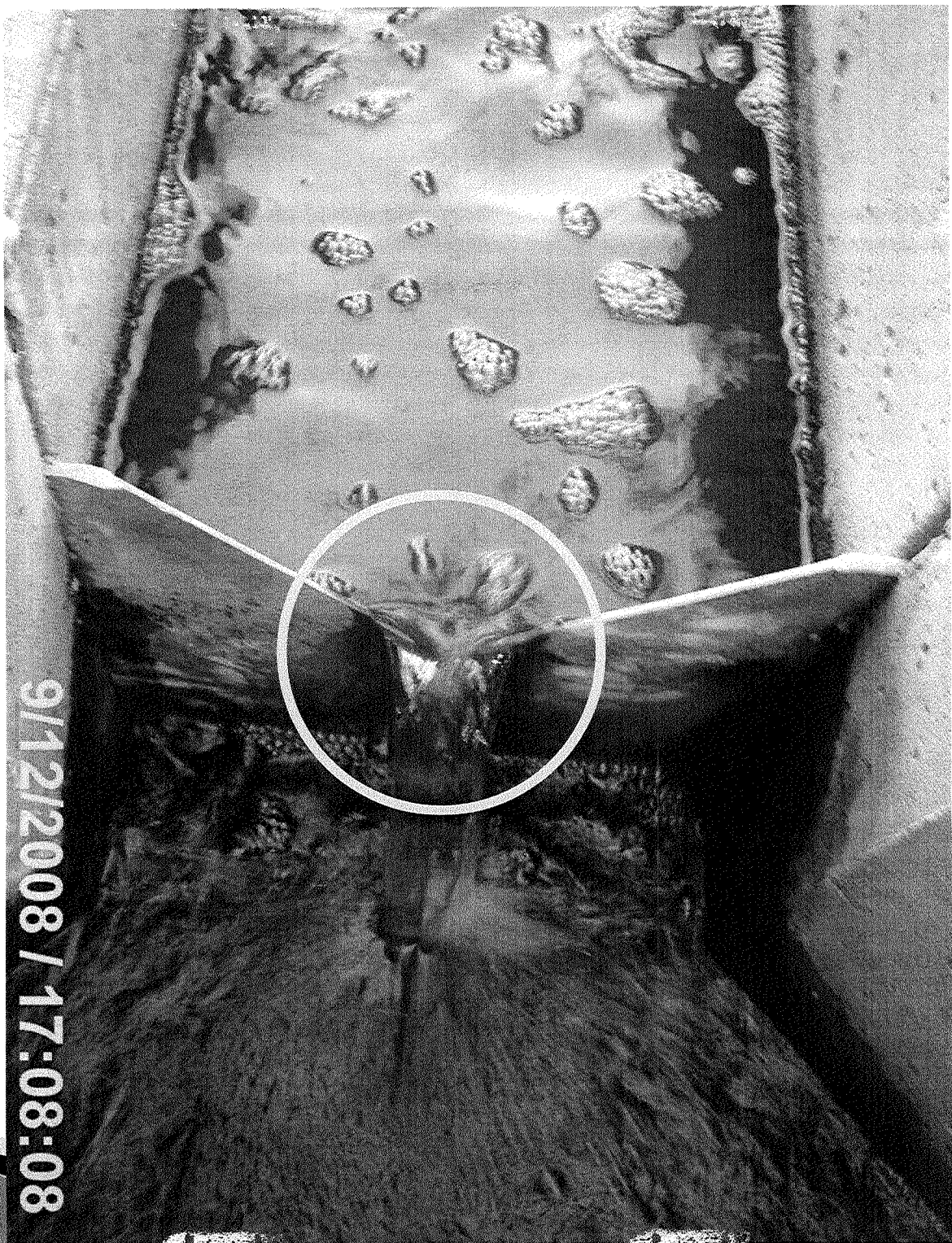


D. Trapezoidal (or Cipolletti) weir

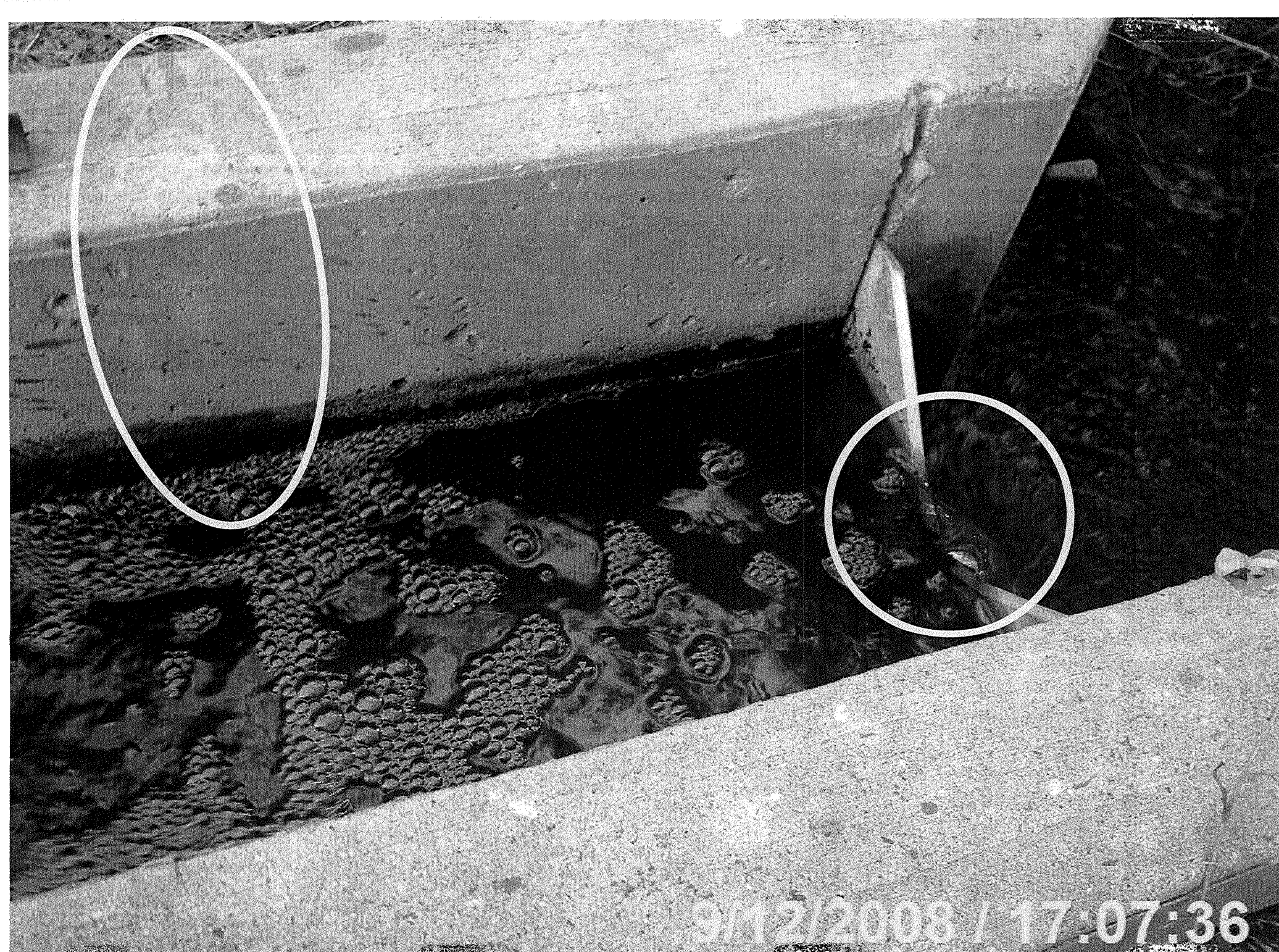
Uncommon

Flow Measurement – Weirs



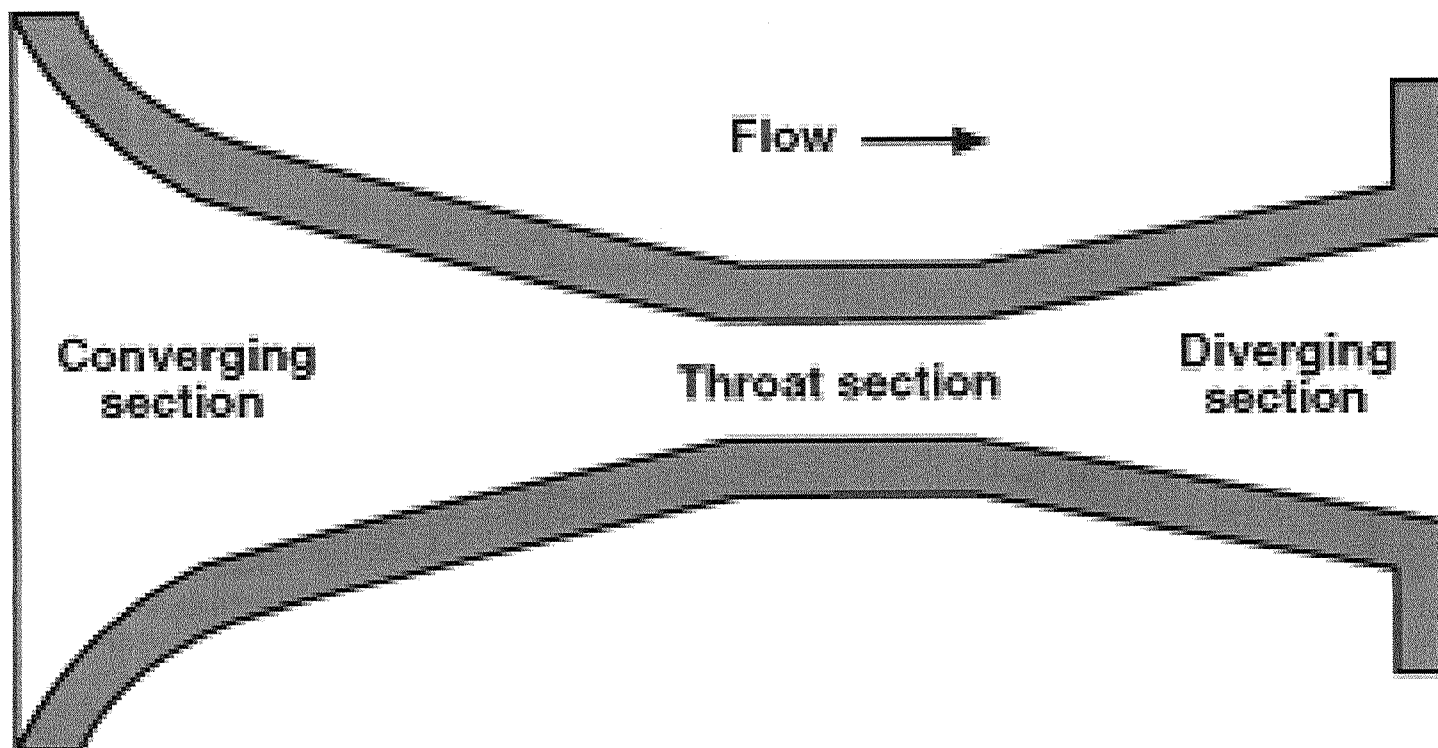


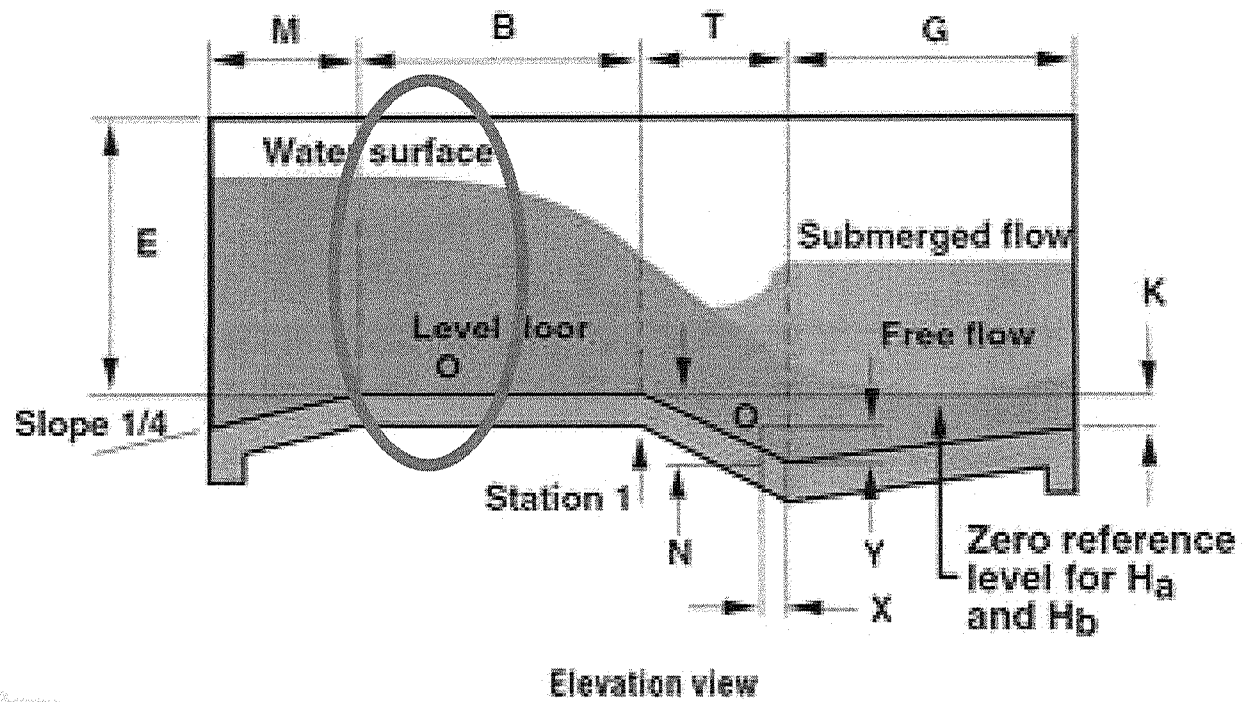
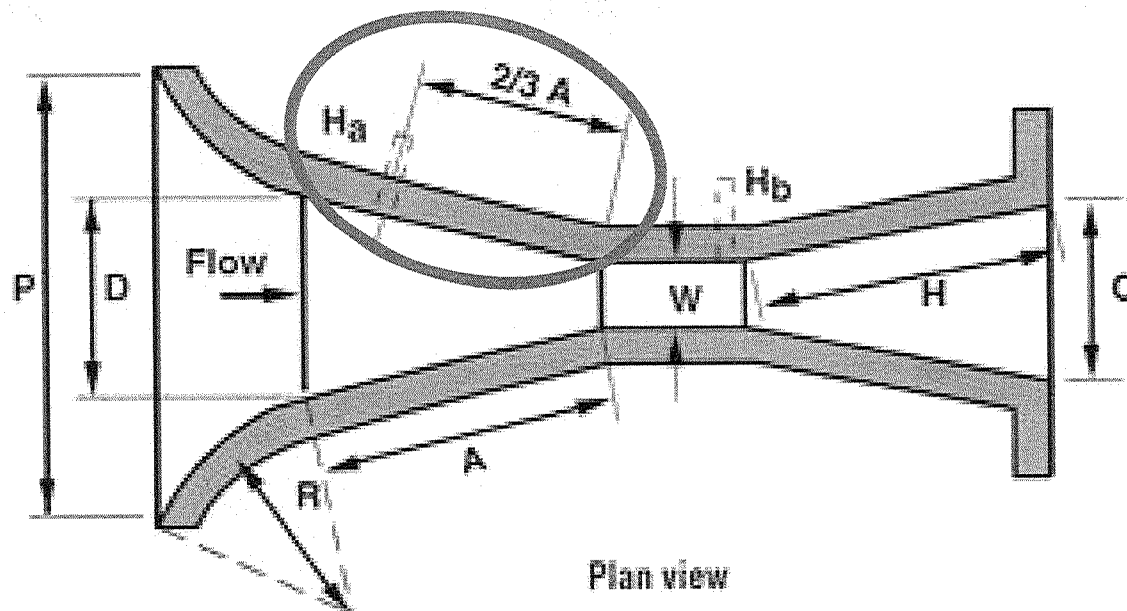
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Parshall Flumes

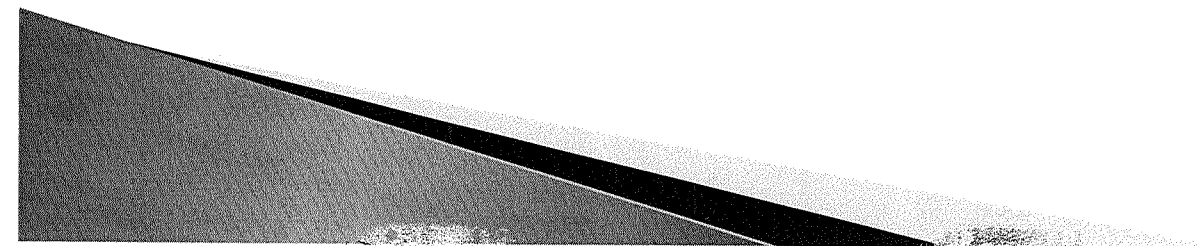






Review your DMR

- ▶ Match it to your permit (Part I.A.).
- ▶ Do you understand the information?
- ▶ Are the reported results reasonable?



Exceeding Permit Limits

- ▶ Review the sampling and analysis data.
- ▶ Are the reported results plausible?
- ▶ Compare to past results.
- ▶ Make your lab defend their results.
 - Ask for their QA/QC data.



Questions?



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