



Factory Survey and Data Collection

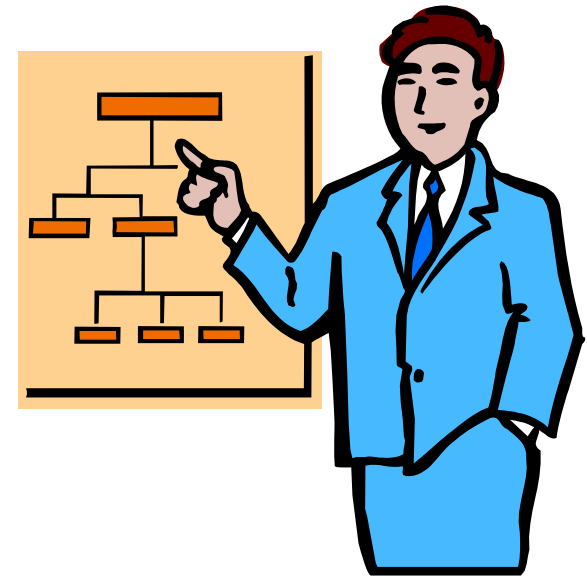
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**Industrial Wastewater Treatment:
Technologies and Solutions**

**ANEAS Annual Convention
10 November 2014**

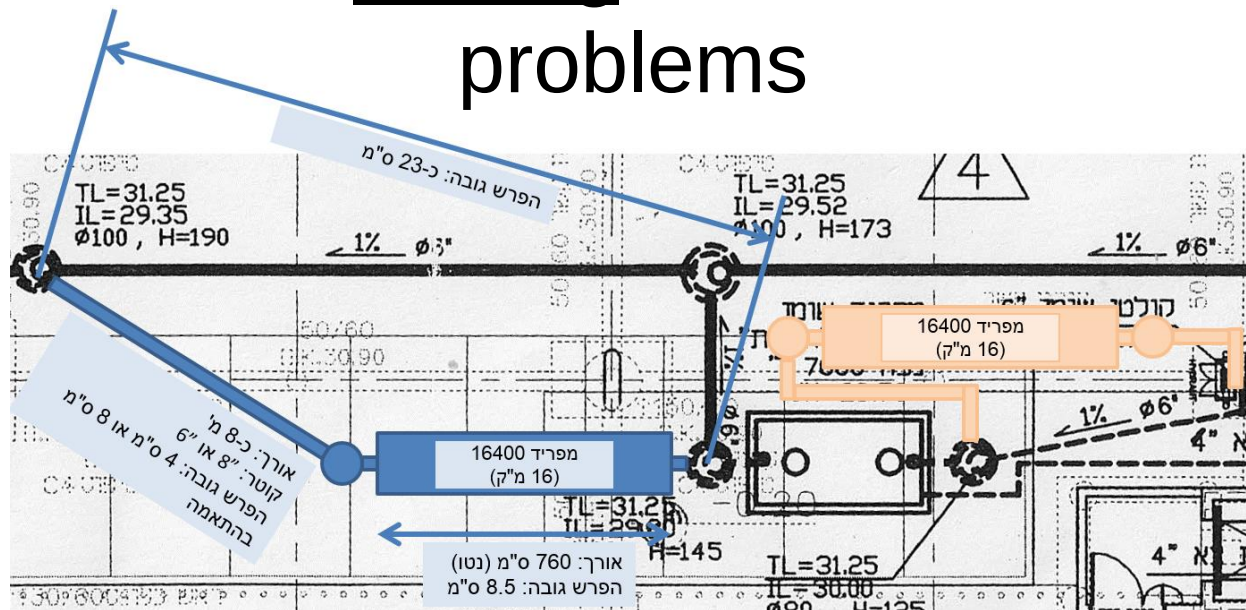
Outline

1. Purpose
2. Survey Methodology
3. Examples
4. Summary



Purpose

A survey is intended to provide information needed for planning industrial wastewater solutions and solving industrial wastewater problems



Survey Methodology

PHASE 1: EVALUATION OF EXISTING DATA

PHASE 2: SITE SURVEY

PHASE 3 DATA COMPLETION

PHASE 4: EVALUATION OF DATA

PHASE 5: REPORT

BEFORE STARTING

1. Define the main challenges. Ex.:
 - a. Reduce operational cost
 - b. Compliance with standards
 - c. Failures of existing system
2. Clarify the methodology
3. Allocate internal and external resources/personnel needed for performing the survey
4. Define the responsibilities for sampling and analysis in external laboratories, if needed, and other external resources



PHASE 1:

EVALUATION OF EXISTING DATA

1. Site overview:

a. Production site:

- 1) Process flow sheet
- 2) Raw material usage: Composition and quantities of all materials used in the process; MSDS
- 3) Production data: Present and future
- 4) Production changes and fluctuations

b. Non-production site (Ex.: resort, shopping complex, hospital):

- 1) List of water consumers
- 2) Characteristics of activity
- 3) Seasonal and other changes in activity

PHASE 1: EVALUATION OF EXISTING DATA

2. Water supply and drainage system
3. Water meter readings
 - When meters are not available: Timing of pumping cycles, etc.
4. Lab Analysis of water and wastewater
5. Cost data:
 - a. Water supply
 - b. Wastewater discharge
 - c. Existing treatment plant operation

PHASE 1: EVALUATION OF EXISTING DATA

6. Land availability
7. Location and characteristics of wastewater recipient
8. Standards and regulations:
Current and expected
9. Any additional data relevant to
the specific issue



PHASE 2: SITE SURVEY

1. Prepare a questionnaire and detailed instructions - many people in the factory could be involved
2. Site tour:
 - a. Visit all parts of the production area
 - b. Inspect water, sewerage and drainage systems
 - c. Open access doors and manholes - view and smell; drop a stone to “sense” the scum
3. Visit the site at night, looking for small unnoticeable discharges that might be strong during the day.
EVERY DISCHARGE SHOULD BE SURVEYED.



PHASE 3: DATA COMPLETION

1. Measure flows within the factory:
 - a. Use weirs if needed, or bucket and stop watch, or flux of salts etc.
 - b. Take frequent periodic samples to measure fluctuations
 - c. Instantaneous discharges: Sand filters backwash; Ion exchange regeneration; Production systems wash cycles



PHASE 3: DATA COMPLETION

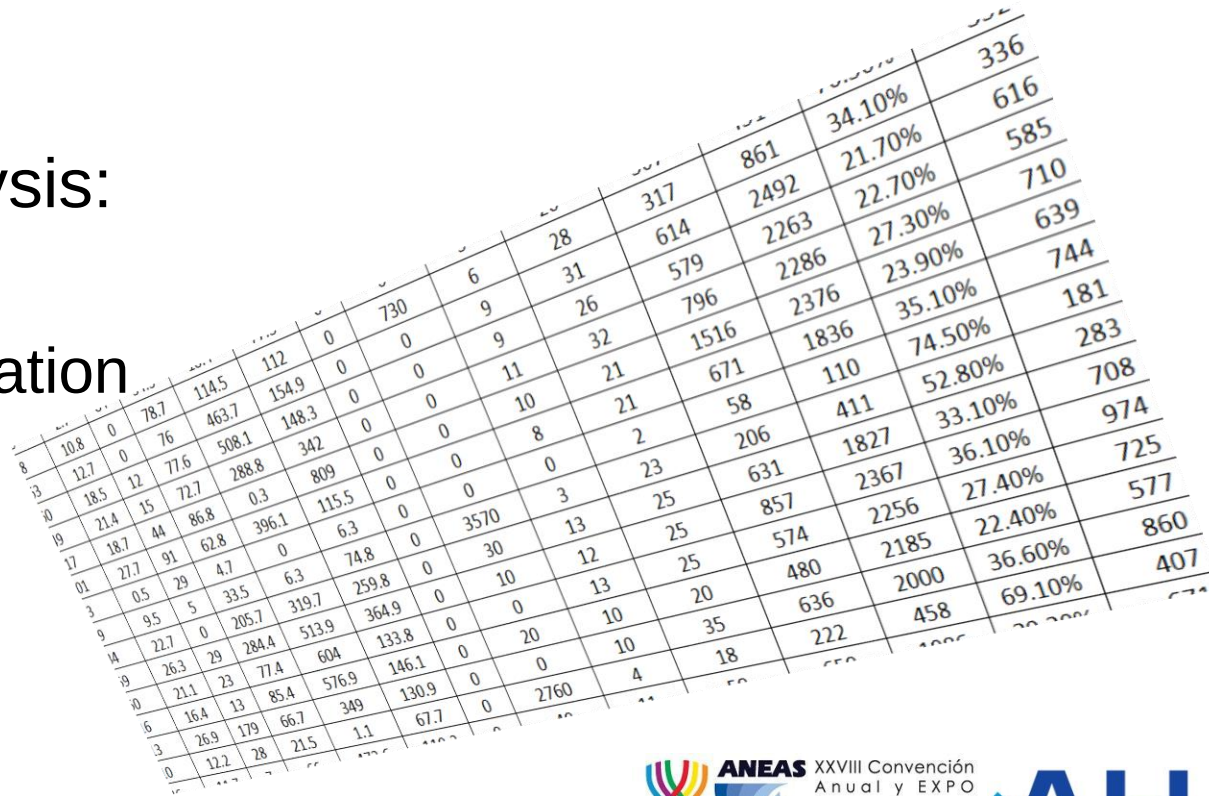
2. Analysis of water and wastewater throughout the water system
 - a. Sampling times need to match production characteristics:
 - day and night
 - Weekday and weekend
 - Summer and winter
 - Dry day and rainy day
 - Batch vs. continuous flow
3. Simple treatability studies: settling, flocculation, pH, sludge, biological treatability, simple titration test



PHASE 4:

EVALUATION OF DATA

1. Flow diagrams
2. Tables
3. Graphs
4. Statistical analysis:
 - a. Averages
 - b. Standard deviation
 - c. Peaks



8	10.8	0	78.7	114.5	154.9	0	730	6	28	317	861	34.10%	336
13	12.7	0	76	463.7	148.3	0	0	9	31	614	2492	21.70%	616
20	18.5	12	77.6	508.1	342	0	0	9	26	579	2263	22.70%	585
19	21.4	15	72.7	288.8	809	0	0	11	32	796	2286	27.30%	710
17	18.7	44	86.8	0.3	115.5	0	0	10	21	1516	2376	23.90%	639
01	27.7	91	62.8	396.1	6.3	0	0	8	21	671	1836	35.10%	744
3	0.5	29	4.7	0	74.8	0	0	0	23	58	411	52.80%	181
9	9.5	5	33.5	319.7	259.8	0	0	3	25	631	1827	33.10%	283
14	22.7	0	205.7	513.9	364.9	0	3570	13	25	857	2367	36.10%	974
9	26.3	29	284.4	604	133.8	0	0	12	25	574	2256	27.40%	725
10	21.1	23	77.4	85.4	576.9	146.1	0	13	25	480	2185	22.40%	577
6	16.4	13	85.4	349	130.9	0	0	10	20	636	2000	36.60%	860
3	26.9	179	66.7	1.1	67.7	0	0	20	10	222	458	69.10%	407
0	12.2	28	21.5	0	0	0	0	0	4	18	0	0	0

PHASE 5: REPORT

1. Collected data and analysis
2. Violations of standards
3. Alternative solutions
4. Rough costs estimates
5. Potential sludge disposal sites
6. Effluent disposal charges

EXAMPLE: SHOPPING COMPLEX

1. Multifunction complex, including:
 - a. Shopping center
 - b. Residential building
 - c. Office building
 - d. Fitness center with pool
2. Goals:
 - a. Assure compliance with standards
 - b. Reduce water consumption

EXAMPLE:

SHOPPING COMPLEX

1. Few violations of standards were found and reported
2. Chemical free water treatment for cooling towers was suggested
3. Usage of wasted groundwater was identified:
 - a. Cooling towers
 - b. Toilet flushing
4. Future plans got expansion of the complex were discussed - Consideration of an effective water cycle will be an integral part of the planning

Work continues . . .

SUMMARY

- Methodology of industrial wastewater survey has been presented
- A good survey requires careful planning of many details
- The result is useful information for planning solutions and problem solving

WATER IS LIFE



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