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Subject: [EXT] Privileged and Confidential-Attorney/Client Work Product
Attach: LR070813Har.pdf

****EXTERNAL EMAIL****

Tom,

We promised to re-cost the top 5 most economical alternatives.

Based on report attached, the top 4 were:

- a. Alkaline stripping of secondary clarifier effluent (SCE).
- b. Breakpoint chlorination of SCE.
- c. Ion Exchange of SCE.
- d. Ozonation of SCE.
- e. Land application will likely be in top 5 on 88 acres if we do not have to tile field.

We previously said that we would not consider nitrification of effluent due to precarious nature of this process. We may want to consider costing tertiary nitrification. It appears that we have learned that MBT stays with sludge in existing plant and does not show up in final effluent.

To re-cost these options, we need to have a design effluent wasteload.

Average: flow, NH3-N, TKN, BOD (lbs/day) and flow (MGD)

97th Percentile: flow, NH3-N, TKN, BOD (lbs/day) and flow (MGD)

We also need any final effluent analyses that site has on cations (Na, K, Fe, Mg, Ca, and Mn), alkalinity, hardness, and pH.

Regards,
Houston

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EP002526



2017 NACWA Financial Survey

A National Survey of Clean Water Agency
Financing and Management

Final Report, August 2018

Table of Contents

ACKNOWLEDGMENTS	6
PREFACE	7
INTRODUCTION	8
Section A - General Information	9
POPULATION SERVED	10
Service Population Trends	11
Retail versus Wholesale Populations	11
CUSTOMER ACCOUNTS	12
SEWER SERVICE AREA	14
Combined Sewer Service Area	15
Combined Sewer Service Area Trends	15
SEWER SYSTEM LENGTH	16
Collector and Interceptor Systems	17
Sewer System Length Trends	17
TYPES OF SERVICES PROVIDED	18
Reclaimed Water Services	18
Box 1: Definitions for Services Provided	19
PLANT INFLUENT FLOW SOURCES	20
Influent Flow Source Trends	20
Flow Trends Per Person Served	21
PLANT FLOWS AND TREATMENT LEVELS	22
Pump Stations	22
PLANT CAPACITY AND TREATMENT TRENDS	24
Reclaimed Flows	25
DISINFECTION METHODS	26
Disinfection Trends	27
TREATMENT OF CONVENTIONAL POLLUTANTS	28
BIOSOLIDS PRODUCED / DISPOSAL METHODS	30
Biosolids Disposal / Reuse Trends	31
USE OF PERFORMANCE INDICATORS	32
Benchmarks (2016 data)	33
REGULATORY COST DRIVERS	35
Consent Decrees	35
Administrative Orders	35
Total Maximum Daily Loads	36
Watershed and Other Programs	36
Section B - Financing	37
FUNDING SOURCES	38
Federal and State Assistance	40
Funding for Operation and Maintenance	41
Funding for Capital Improvements	41
Funding for Debt Service	42
EXPENDITURES	44
Expenditure Trends	45
Capital expenditure	46
Per Capita Expenditure	46
Payment in Lieu of Taxes (PILOT) or Franchise Fees	47
OPERATION AND MAINTENANCE EXPENSE	48
O&M Expenses by Agency Function	49

O&M Expense by Cost Category	50
O&M Cost Category Trends	51
O&M Cost Per Million Gallons Treated	52
O&M Expense Per Million Gallons Treated – Benchmark Trends	53
Collection System Cost Per Sewer Mile.....	54
Trends in Collection System Costs per Mile	56
Biosolids Management Costs Per Dry Ton.....	56
Trends in Biosolids Management Costs	57
Chemical Costs Per Million Gallons Treated.....	58
Trends in Chemical Costs per Volume Treated	59
Electricity Costs Per Million Gallons Treated	59
Trends in Electricity Costs per Volume Treated	60
LONG-TERM DEBT AND DEBT SERVICE	61
Long-term debt.....	61
Long-Term Debt Trends	62
Debt Service (Principal and Interest Payments).....	63
Debt Service Payment Trends.....	64
Frequency Distribution of Debt	65
Senior versus Subordinate Lien.....	66
Fixed versus Variable Rate Debt.....	66
Per Capita Long-Term Debt.....	67
CREDIT RATINGS	68
Collections / Delinquent customer strategies	69
Shut-off Policies and Procedures.....	71
FIVE-YEAR CAPITAL IMPROVEMENT BUDGETS	72
Per Capita Five-Year CIP Budget.....	73
Breakdown of Capital Improvement Program Budgets.....	74
CapItal Improvement Budget Trends	76
FINANCIAL STATEMENTS.....	77
Fiscal Year End Date	77
Consolidated Balance Sheet.....	77
CONSOLIDATED STATEMENT OF REVENUES AND EXPENDITURES	79
Financial Statement Analysis	80
Current Ratio.....	82
Operating Ratio	83
Debt Ratio	84
POST EMPLOYMENT BENEFITS.....	85
Plan Types	85
Financing Method	85
Financial Reporting.....	85
FINANCIAL POLICIES / TARGETS	87
O&M Reserves	87
Total Debt Service Coverage.....	87
Debt Ratio	87
Working Capital	87
Permissable Investments.....	88
Senior Debt Service Coverage.....	88
Maximum Debt.....	88
Approved Rate Setting Policy	88
Cash-financed Capital.....	88
Unrestricted Cash.....	88
Assets Financed by Debt vs Cash.....	88
Terms of Bonds by Asset Type.....	88

Table of Contents

Section C - Rates and Charges	89
EFFECTIVE DATE OF CURRENT RATES	90
RESIDENTIAL WATER USE AND WASTEWATER VOLUME	91
Estimating Residential Volume	92
RESIDENTIAL RATES AND STRUCTURES	93
Flat Rates	94
Flat Rate Trends	95
Volume Rates	96
Volume Rate Structure	97
Inside versus Outside City Rates	97
Tax Rates	97
RESIDENTIAL CHARGES	98
Maximum Residential Charge	98
Minimum Residential Charge	99
Average Residential Charge	100
Average Residential Charge Trends	101
Average Residential Charge at 90,000 Gallons per Year Usage	102
RESIDENTIAL FEES	103
Residential Connection Fee	103
Residential Facility / Impact Fee	104
New Account Fee	105
Late Fee (Flat Charge)	106
Late Fee (as a Percent of Overdue Amount)	107
RESIDENTIAL BILLING FREQUENCY	108
COMMUNITY ASSISTANCE PROGRAMS	109
Eligibility for Community Assistance	110
INDUSTRIAL FLAT RATES AND VOLUME RATES	111
EXTRA STRENGTH CHARGES	113
Biochemical Oxygen Demand (BOD)	114
Chemical Oxygen Demand (COD)	115
Carbonaceous BOD	116
Suspended Solids (SS)	117
Ammonia Nitrogen	118
Total Kjeldahl Nitrogen	119
Total Phosphorus	120
Fats, Oils, and Greases (FOGs)	121
Industrial Surcharge Levels	122
Industrial Billing Frequency	123
COMMERCIAL AND INDUSTRIAL FEES	124
commercial/industrial fees	124
Connection Fees	125
WHOLESALE CHARGES	126
RESIDENTIAL SEPTIC TANK DISCHARGE	127
Residential Septic Tank Discharge Rate Trends	128
RECLAIMED WATER RATES	129
Flat Rates	129
Volume Rates	129

Section D- Staffing and Salaries 131

AGENCY STAFF SIZE 132

 Staff Breakdown by Function 132

 Trends in Agency Staffing Levels..... 134

 Agency Staffing Benchmarks 135

 Private Contractors 138

STAFF SALARIES 139

 Labor Union vs. Non-Unionized Labor..... 150

 Salary Trends 151

Section E - Energy Use/Costs and Materials Recovery 153

ELECTRICAL ENERGY USE 154

 Overall Electrical Energy Use 154

 Energy Usage - Plant versus Collection System 155

 Plant Energy Use per Volume Treated..... 155

 Trends in Plant Energy Use (kWh/MG treated) 156

 Collection System Energy Use (kWh) per Sewer Mile..... 157

 Annual Biogas Use..... 158

ELECTRICAL ENERGY COST 159

 Trends in Energy Costs..... 160

ELECTRICITY PRODUCTION 161

 Percentage Electricity Generated Onsite 162

 Power Generation Capacity 163

 Electricity Production Costs, Rates, and Revenue 163

ENERGY CONSERVATION AND COST REDUCTION 165

 Energy Conservation and Cost Savings..... 166

 Recent Projects To Optimize Plant Processes and Operations..... 167

MATERIALS RECOVERY 168

 Recent Projects In Materials Recovery 168

ENERGY CREDITS 169

 What is a Renewable Energy Credit (REC) ? 169

Appendix A - General Information Survey Data 171

Appendix B - Financing Survey Data 215

Appendix C - Rates and Charges Survey Data 281

Appendix D - Staffing and Salaries Survey Data 317

Appendix E - Energy Use/Costs Materials Recovery Survey Data 341



ACKNOWLEDGMENTS

The NACWA 2017 Financial Survey... A National Survey of Clean Water Agency Financing and Managments (Financial Survey) was produced and published by the National Association of Clean Water Agencies (NACWA) under the general direction of the NACWA Board of Directors.

The 2017 Financial Survey is the latest edition of NACWA's triennial Financial Survey. The 2017 Survey provides analysis of the most recent clean water financial data and updates and expands upon the content of past surveys, specifically the 2014 Financial Survey.

2017 NACWA Financial Survey: A National Survey of Clean Water Financing and Management Trends (© 2018)

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PREFACE

WHAT IS THE FINANCIAL SURVEY?

Since 1981, the National Association of Clean Water Agencies (NACWA) has performed a triennial financial survey of its membership to provide utilities, government officials, and the public, a comprehensive knowledge base on financing, rates, staffing and key utility management initiatives of U.S. clean water utilities. The 2017 NACWA Financial Survey is the twelfth triennial report to be published since the original development of the survey and covers data for 2016.

WHY IS IT IMPORTANT?

The NACWA Financial Survey is a unique source of information on clean water utilities, their financials, rates and billing, staffing, and energy use and cost. This information can be used by utilities and others to guide national, state and local policy development through comparative analysis and tracking of national trends.

HOW ARE SURVEY RESULTS PROVIDED?

NACWA publishes three different products summarizing the results of the Financial Survey. A published Executive Highlights document provides overarching summary information for utility Board members and other high ranking officials, and/or the public. An electronic version of the full report (see www.nacwa.org) provides more extensive analyses for each survey question and can be used as a reference tool by utility analysts and decision-makers. An electronic spreadsheet is also made available for those utilities and researchers that wish to perform their own custom analyses for internal performance tracking.

HOW IS THE SURVEY CONDUCTED?

The *Financial Survey* is designed as a voluntary survey of NACWA's membership. All NACWA members receive a copy of the five-part survey form and are invited to participate. The five parts to the 2017 NACWA *Financial Survey* include:

- Part A, the General Section of the survey, provides utility information on population served, size of service areas, length of pipe in ground, wholesale and retail customers, type and amount of treatment capacity, volume treated and characterization of its influent. This information provides profiles of the survey group;
- Part B, the Financial Section of the survey, looks at revenue, expenses and long-term debt as listed by all respondents. Capital improvement needs, programs, and revenues (including SRFs) are analyzed for 2017-2021. Post-employment benefits are reported and financial statement data is summarized;
- Part C, the Rate Section of the survey, compares the type and level of rates, rate structures and the frequency of billing for both residential and industrial customers across all agency respondents;
- Part D, the Staffing and Salary Section of the survey, contains information on staff size by function, and salary information for entry-level and senior positions for various occupations in the industry, and;
- Part E, the Energy Use/Costs and Materials Recovery Section of the survey, contains information on the energy use, costs, and production, as well as recent efforts to minimize energy use.

This report presents descriptive tabular summaries for numerous financing and management indicators. Data presented in the table summaries are, in a majority of cases, based on the prior year's operating results (i.e., data provided in the 2017 Survey is derived from 2016 or a respondent's most recently completed fiscal year).

These table summaries also report the number of responding agencies that responded to the particular question, which will not necessarily equal the total number of respondents to the survey since not every respondent answered every question.

There were 126 agencies representing over 81 million people served by centralized sewer service that responded to the 2017 Survey. A list of the 2017 respondents and accompanying data can be found in Appendices A through E.

TREATMENT OF CONVENTIONAL POLLUTANTS

The Survey has tracked trends in the treatment of conventional pollutants since 1987, requesting information on average influent and effluent conventional pollutant concentrations, and treatment plant flow rates. From these data, flow-weighted average influent and effluent loadings can be derived, and average removal efficiencies for treated flows calculated⁴. Table A.9 summarizes the average influent and effluent concentrations and corresponding average removal efficiencies for all 2017 Survey respondents.

During the period from 1995 to 2016, there has been a decreasing trend in average effluent concentrations for conventional pollutants. Notably, average BOD effluent concentrations for survey respondents decreased from 20 to 8 mg/l from 1995 to 2016, and average suspended solids concentrations decreased from 15 to 9 mg/l in the same time period (Figure A.21).

Improvements in operations and increasing advanced treatment and resulting higher removal efficiencies have likely spurred this trend. From 1998 to 2016, average removal for BOD has risen from 89 to 97 percent, for suspended solids from 93 to 97 percent, and for phosphorus from 65 to 78 percent.

Table A.9 - Treatment removal efficiency, 2016 (all respondents)

POLLUTANT	NUMBER OF AGENCIES	FLOW-WEIGHTED AVERAGE INFLUENT CONCENTRATION (MG/L)	FLOW-WEIGHTED AVERAGE EFFLUENT CONCENTRATION (MG/L)	FLOW-WEIGHTED REMOVAL EFFICIENCY (%)
Ammonia Nitrogen	72	21.2	9.2	58.4
BOD	55	266.9	8.3	96.9
CBOD	47	166.5	7.7	95.4
Chlorine	60	NA	0.5	NA
Phosphorous	59	6.9	1.5	78.1
Suspended Solids	93	298.9	9.1	97.0
TKN	45	42.2	12.9	69.5

Nearly 97 percent of BOD and TSS loadings, and 80 percent of phosphorus loadings are removed by NACWA respondents

⁴ Influent concentrations, effluent concentrations, and removals were calculated only for those agencies providing influent, effluent, and flow data for a given pollutant. From these data, an average flow-weighted influent value and flow-weighted average effluent value was determined for each pollutant and used to calculate a flow-weighted removal efficiency.

TOTAL MAXIMUM DAILY LOADS

Total maximum daily loads (TMDLs) are mandated by Section 303(d) of the Clean Water Act and are developed by States to determine the maximum amount of a pollutant that a water body can receive and still meet water quality standards. The implications of TMDLs for clean water utilities include more stringent effluent requirements as a result of wasteload allocations, and the potential need for additional treatment infrastructure.

Twenty (16 percent of respondents) reported that their agency is operating under a Federal or state TMDL. Six agencies reported a total cost of compliance of \$3.5 billion, with a majority devoted to meeting requirements for nitrogen and phosphorus reduction. Other TMDLs impacting costs include bacteria and mercury. These six agencies represent three million people and the estimated compliance cost per capita is nearly \$1,200.

WATERSHED AND OTHER PROGRAMS

Five mid-sized agencies (population 50,000 to 500,000) indicated that their agency is part of a regional or local watershed program, or have other regulatory requirements impacting their capital and/or annual O&M costs. These programs focus on BOD, ammonia-nitrogen, dissolved oxygen, chlorides, nutrients, selenium and sulfate. Four agencies reported a total cost of compliance of \$285 million. These four agencies represent 0.33 million people and the estimated compliance cost per capita over \$800. Regulatory impacts that were reported range from a start date in 2015 and an end date of 2026.

Table A.17- Regulatory cost drivers (all respondents)

REGULATORY COST DRIVER	# OF AGENCIES	TOTAL COST OF COMPLIANCE (US\$ BILLION)	NUMBER OF YEARS (MEDIAN)	ANNUALIZED COST (US\$ BILLION)	COMPLIANCE COST PER CAPITA
- Consent Decrees	22	29.9	21	0.7	\$1,895
- Administrative Orders	14	6.6	4	0.5	\$1,050
- TMDLs	20	3.5	15	1.0	\$1,175
- Watershed and Other	5	0.3	4	0.7	\$802
- Total	48 ^a	39.2	15	2.8	\$1,587

Regulatory cost drivers amount to \$39 billion in capital costs from 48 agencies with a cost per capita of \$1,587.

^a Several agencies reported multiple regulatory cost drivers, thus the sum of individual cost drivers is higher than the total.

EXTRA STRENGTH CHARGES

In order to recover the costs of treatment beyond that needed for domestic strength sewage, it is common for utilities to charge an additional high strength surcharge to commercial or industrial facilities that exceed a certain threshold concentration of a given parameter. These charges are generally expressed as a cost per quantity discharged (\$ per pound). Reported 2016 industrial rates for conventional parameters are shown in Table C.19 and distributions of these charges are shown in Figures C.19 to C.26. Threshold or “surcharge” levels above which these charges are assessed are discussed in the following Section.

Table C.19 - Industrial extra strength charges, 2016

PARAMETER	NUMBER OF AGENCIES	MAXIMUM RATE (\$/LB)	AVERAGE RATE (\$/LB)	MEDIAN RATE (\$/LB)	MINIMUM RATE (\$/LB)
- Biochemical Oxygen Demand (BOD)	72	2,3352	0.3797	0.2950	0.0700
- Chemical Oxygen Demand (COD)	21	0.4940	0.1951	0.1600	0.0310
- Carbonaceous BOD	5	1.0600	0.4485	0.4300	0.1566
- Suspended Solids	88	1.6800	0.3457	0.2620	0.0558
- Ammonia Nitrogen	17	5.0300	1.6014	1.5000	0.2280
- Total Kjeldahl Nitrogen	14	1.6400	0.6901	0.5979	0.1470
- Total Phosphorus	17	36.6200	6.0295	2.8700	0.0250
- Fats, Oils, & Greases	14	3,3400	0.6764	0.2695	0.0700

AMMONIA NITROGEN

Figure C.23 illustrates the distribution of industrial ammonia-nitrogen rates (above surcharge levels) for 2016, 2013, and 2010. These distributions represent 17, 15, and 15 responding agencies, respectively. The median ammonia-nitrogen rate for common respondents decreased 7.3 percent from 2013 to 2016 (Table C.23). For comparison, the inflation rate as measured by the Consumer Price Index (CPI) was 3.0 percent for the same 3-year period.

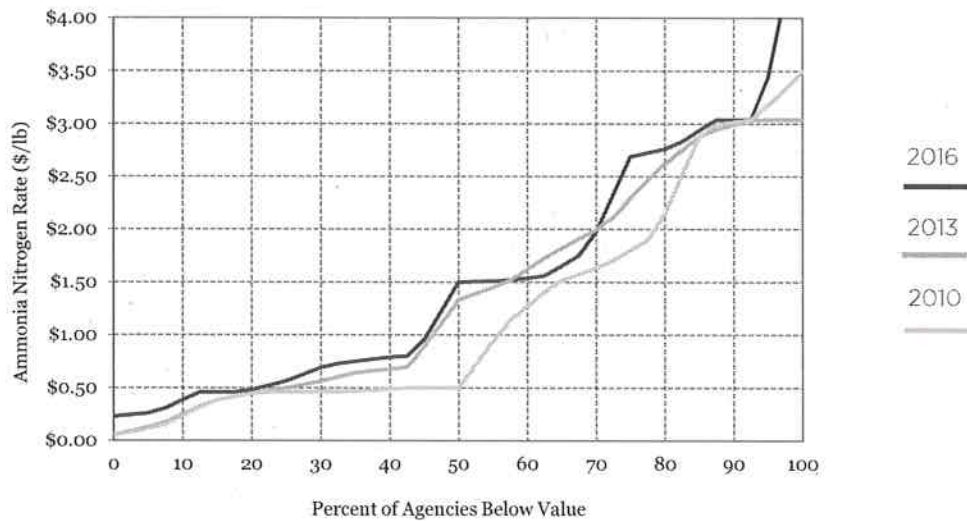


Figure C.23 - Distribution of industrial ammonia-nitrogen rates in \$ per pound, 2010-2016
 Note: Maximum value of \$5.03 for 2016 is not shown on the chart

Table C.23 - Ammonia-nitrogen rate trends, 2004-2016

AMMONIA-NITROGEN RATE	2004 - 2007	2007-2010	2010-2013	2013-2016
- Common Agencies Responding	11	10	12	12
- 3-Year Percentage (%) Change in Median	0.0%	+1.0%	+74.7%	-7.3%
- Change in Consumer Price Index (%)	+9.7%	+5.2%	+6.8%	+3.0%

TOTAL KJELDAHL NITROGEN

Figure C.24 illustrates the distribution of industrial total Kjeldahl nitrogen (TKN) rates (above surcharge levels) for 2016, 2013, and 2010. These distributions represent 14, 12, and 15 responding agencies, respectively. The median TKN rate for common respondents decreased 6.4 percent from 2013 to 2016 (Table C.24). For comparison, the inflation rate as measured by the Consumer Price Index (CPI) was 3.0 percent for the same 3-year period.

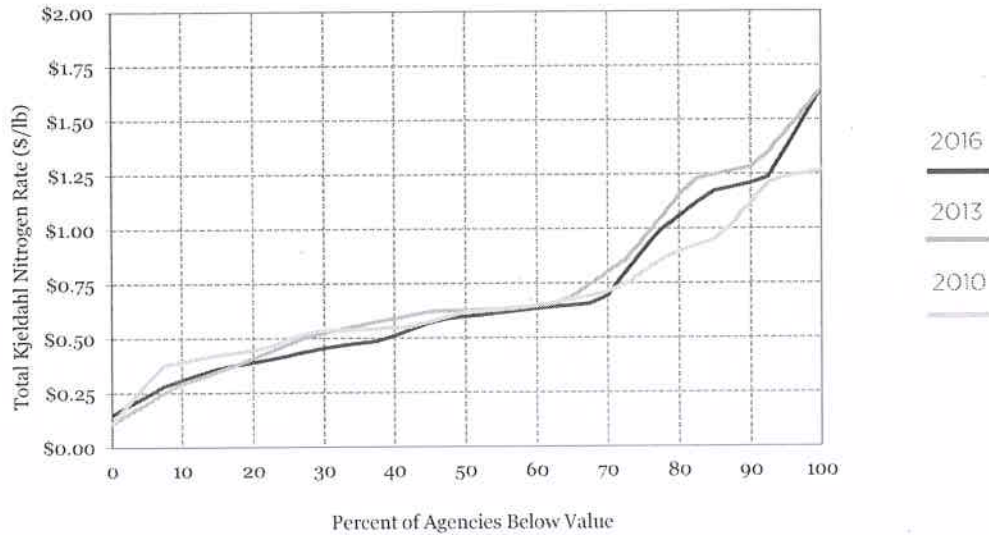


Figure C.24 - Industrial total Kjeldahl nitrogen rates in \$ per pound, 2010-2016

Table C.24 - Total Kjeldahl nitrogen rate trends, 2004-2016

TKN RATE	2004 - 2007	2007-2010	2010-2013	2013-2016
- Common Agencies Responding	6	8	11	11
- 3-Year Percentage (%) Change in Median	+4.2%	+33.7%	-1.6%	-6.4%
- Change in Consumer Price Index (%)	+9.7%	+5.2%	+6.8%	+3.0%

TOTAL PHOSPHORUS

Figure C.25 illustrates the distribution of industrial phosphorus rates (above surcharge levels) for 2016, 2013, and 2010. These distributions represent 17, 13, and 17 responding agencies, respectively. The median phosphorus rate for common respondents has increased 3.0 percent from 2013 to 2016 (Table C.25). For comparison, the inflation rate as measured by the Consumer Price Index (CPI) was 3.0 percent for the same 3-year period.

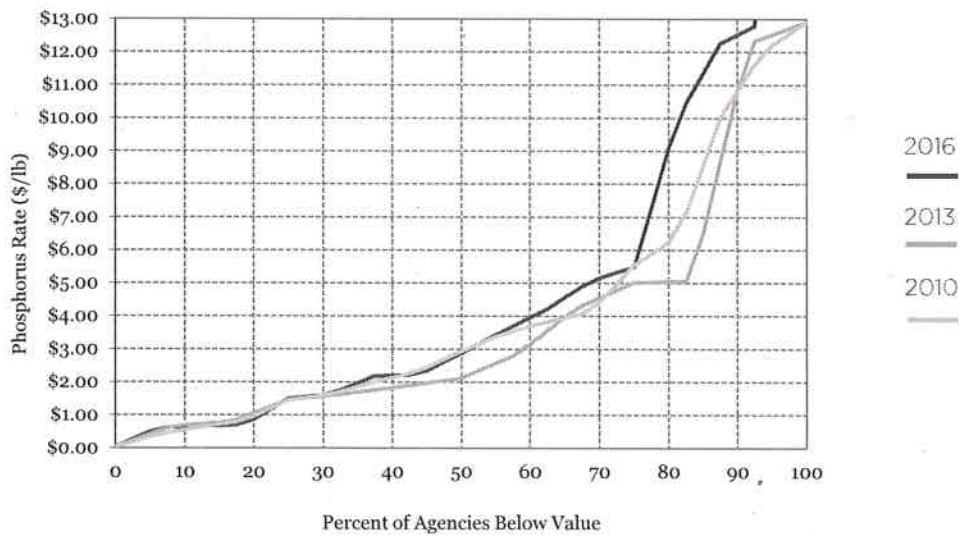


Figure C.25 - Industrial phosphorus rates in \$ per pound, 2010-2016

Table C.25 - Phosphorus rate trends, 2004-2016

PHOSPHORUS RATE	2004 - 2007	2007-2010	2010-2013	2013-2016
- Common Agencies Responding	9	10	12	13
- 3-Year Percentage (%) Change in Median	+5.9%	+21.4%	-7.6%	+3.0%
- Change in Consumer Price Index (%)	+9.7%	+5.2%	+6.8%	+3.0%

The median phosphorus rate increased at the same rate as inflation from 2013 to 2016.

FATS, OILS, AND GREASES (FOGS)

Figure C.26 illustrates the distribution of industrial fats, oils, and grease (FOG) rates (above surcharge levels) for 2016, 2013, and 2010. These distributions represent 14, 10, and 14, responding agencies, respectively. The median FOG rate for common respondents has increased 40% from 2013 to 2016 (Table C.26). For comparison, the inflation rate as measured by the Consumer Price Index (CPI) was 3.0 percent for the same 3-year period.

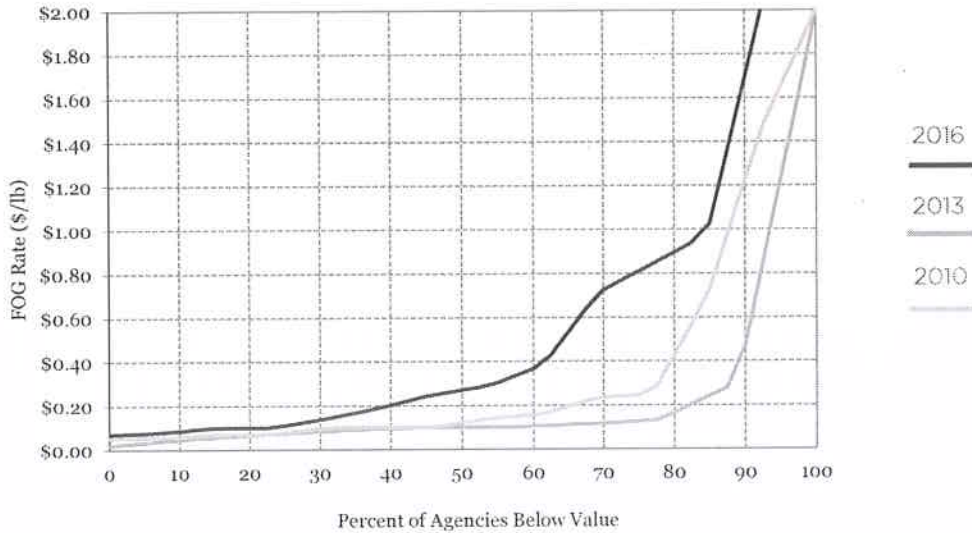


Figure C.26 - Fats, oils and grease rates in \$ per pound, 2010-2016

Note: Maximum value of \$3.34 for 2016 is not shown on the chart

Table C.26 - Fats, oils and grease rate trends, 2004-2016

FATS, OILS AND GREASE RATE	2004 - 2007	2007-2010	2010-2013	2013-2016
- Common Agencies Responding	10	7	7	7
- 3-Year Percentage (%) Change in Median	+21.7%	+16.7%	-12.0%	+40.0%
- Change in Consumer Price Index (%)	+9.7%	+5.2%	-6.8%	+3.0%

The median FOG rate increased 40% from 2013 to 2016.

INDUSTRIAL SURCHARGE LEVELS

A common approach towards setting high strength surcharges is to identify a “floor” or “threshold” concentration (referred to in the Survey as a “surcharge concentration”) above which high strength surcharges are applied. These surcharge levels can vary for different parameters and in some cases can equal zero (i.e., charges apply to any discharge of the given parameter). Rates are usually expressed in dollars per pound (\$/lb). As an example:

Industry X is discharging 100,000 gallons of wastewater a day to the hypothetical Cleanstream Utility. The Biochemical Oxygen Demand (BOD) concentration in the industry’s discharge is 750 milligrams per liter (mg/l). The Cleanstream Utility charges \$0.25 per pound of BOD discharged in excess of 300 mg/l. To calculate Industry X’s BOD surcharges, first determine the pounds discharged in excess of the surcharge level. Second, multiply the pounds in excess of the surcharge level by the BOD rate of \$0.25 per pound.

- Step 1. $(100,000 \text{ gal.} * (750-300) \text{ mg/l}) * (8.34 * 10^{-6} \text{ conversion constant}) = 375.3 \text{ pounds/day}$
- Step 2. $(375.3 \text{ pounds/day} * \$0.25 \text{ per pound}) = \93.80 per day
- Step 3. $(\$93.80 \text{ per day} * 365 \text{ days/year}) = \$34,237 \text{ per year in BOD surcharges}$

The Survey requested information on surcharge levels for Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Carbonaceous Biochemical Oxygen Demand (CBOD), Suspended Solids (SS), Ammonia Nitrogen (NH₃), Total Kjeldahl Nitrogen (TKN), Total Phosphorus (TP), and Fats, Oils, and Greases (FOG). Table C.27 presents a summary of surcharge levels for these parameters. Figure C.27 shows the distribution of surcharge levels for the four most common parameters (BOD, Suspended Solids, Phosphorus and Fats, Oils, and Greases).

Table C.27 - Surcharge levels, 2016

SURCHARGE LIMITS	BOD	COD	CBOD	SS	NH3-N	TKN	TP	FOG
- Agencies Responding	57	16	3	65	12	10	12	14
- Maximum	1,800.0	1,800.0	250.0	1,800.0	30.0	47.0	20.0	300.0
- Average	282.5	603.5	235.0	305.9	24.3	37.2	10.8	93.6
- Median	250.0	516.0	250.0	260.0	25.0	40.0	10.0	100.0
- Minimum	0.0	0.0	205.0	0.0	19.0	20.0	5.5	0.0

In comparing surcharge levels with previous Surveys, there appears to be no significant changes to the average or median surcharge levels, or to the prevalence of one or more surcharge parameters.

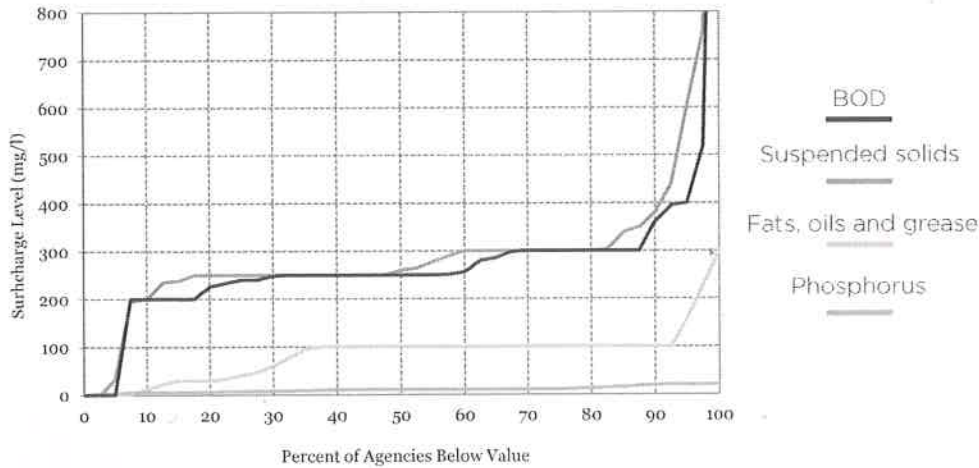


Figure C.27 - Surcharge levels, 2016
 Note: Maximum value of 1,800 mg/l for BOD and suspended solids is not shown on the chart

INDUSTRIAL BILLING FREQUENCY

Figure C.28 shows the distribution of various billing frequencies for commercial and industrial users. Monthly billing continues to be the most common billing time period for commercial and industrial users. The percentage of respondents indicating the use of monthly industrial billing has ranged from 59 to 75 percent during the 1990-2017 Surveys.



Nearly 75% of commercial and industrial users are billed monthly.

Figure C.28 - Industrial billing frequency, 2016 (102 agencies)

AACE International Recommended Practice No. 18R-97

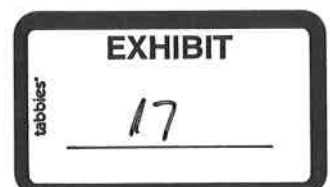
**COST ESTIMATE CLASSIFICATION SYSTEM – AS APPLIED IN
ENGINEERING, PROCUREMENT, AND CONSTRUCTION FOR
THE PROCESS INDUSTRIES**

TCM Framework: 7.3 – Cost Estimating and Budgeting

Acknowledgments:

Peter Christensen, CCE (Author)
Larry R. Dysert, CCC (Author)
Jennifer Bates, CCE
Dorothy J. Burton
Robert C. Creese, PE CCE
John K. Hollmann, PE CCE

Kenneth K. Humphreys, PE CCE
Donald F. McDonald, Jr. PE CCE
C. Arthur Miller
Bernard A. Pietlock, CCC
Wesley R. Querns, CCE
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COST ESTIMATE CLASSIFICATION SYSTEM – AS APPLIED IN ENGINEERING, PROCUREMENT, AND CONSTRUCTION FOR THE PROCESS INDUSTRIES

TCM Framework: 7.3 – Cost Estimating and Budgeting



February 2, 2005

PURPOSE

As a recommended practice of AACE International, the Cost Estimate Classification System provides guidelines for applying the general principles of estimate classification to project cost estimates (i.e., cost estimates that are used to evaluate, approve, and/or fund projects). The Cost Estimate Classification System maps the phases and stages of project cost estimating together with a generic maturity and quality matrix, which can be applied across a wide variety of industries.

This addendum to the generic recommended practice provides guidelines for applying the principles of estimate classification specifically to project estimates for engineering, procurement, and construction (EPC) work for the process industries. This addendum supplements the generic recommended practice (17R-97) by providing:

- a section that further defines classification concepts as they apply to the process industries;
- charts that compare existing estimate classification practices in the process industry; and
- a chart that maps the extent and maturity of estimate input information (project definition deliverables) against the class of estimate.

As with the generic standard, an intent of this addendum is to improve communications among all of the stakeholders involved with preparing, evaluating, and using project cost estimates specifically for the process industries.

It is understood that each enterprise may have its own project and estimating processes and terminology, and may classify estimates in particular ways. This guideline provides a generic and generally acceptable classification system for process industries that can be used as a basis to compare against. It is hoped that this addendum will allow each user to better assess, define, and communicate their own processes and standards in the light of generally-accepted cost engineering practice.

INTRODUCTION

For the purposes of this addendum, the term process industries is assumed to include firms involved with the manufacturing and production of chemicals, petrochemicals, and hydrocarbon processing. The common thread among these industries (for the purpose of estimate classification) is their reliance on process flow diagrams (PFDs) and piping and instrument diagrams (P&IDs) as primary scope defining documents. These documents are key deliverables in determining the level of project definition, and thus the extent and maturity of estimate input information.

Estimates for process facilities center on mechanical and chemical process equipment, and they have significant amounts of piping, instrumentation, and process controls involved. As such, this addendum may apply to portions of other industries, such as pharmaceutical, utility, metallurgical, converting, and similar industries. Specific addendums addressing these industries may be developed over time.

This addendum specifically does not address cost estimate classification in nonprocess industries such as commercial building construction, environmental remediation, transportation infrastructure, "dry" processes such as assembly and manufacturing, "soft asset" production such as software development, and similar industries. It also does not specifically address estimates for the exploration, production, or transportation of mining or hydrocarbon materials, although it may apply to some of the intermediate processing steps in these systems.

The cost estimates covered by this addendum are for engineering, procurement, and construction (EPC) work only. It does not cover estimates for the products manufactured by the process facilities, or for research and development work in support of the process industries. This guideline does not cover the

significant building construction that may be a part of process plants. Building construction will be covered in a separate addendum.

This guideline reflects generally-accepted cost engineering practices. This addendum was based upon the practices of a wide range of companies in the process industries from around the world, as well as published references and standards. Company and public standards were solicited and reviewed by the AACE International Cost Estimating Committee. The practices were found to have significant commonalities that are conveyed in this addendum.

COST ESTIMATE CLASSIFICATION MATRIX FOR THE PROCESS INDUSTRIES

The five estimate classes are presented in figure 1 in relationship to the identified characteristics. Only the level of project definition determines the estimate class. The other four characteristics are secondary characteristics that are generally correlated with the level of project definition, as discussed in the generic standard. The characteristics are typical for the process industries but may vary from application to application.

This matrix and guideline provide an estimate classification system that is specific to the process industries. Refer to the generic standard for a general matrix that is non-industry specific, or to other addendums for guidelines that will provide more detailed information for application in other specific industries. These will typically provide additional information, such as input deliverable checklists to allow meaningful categorization in those particular industries.

ESTIMATE CLASS	Primary Characteristic	Secondary Characteristic			
	LEVEL OF PROJECT DEFINITION Expressed as % of complete definition	END USAGE Typical purpose of estimate	METHODOLOGY Typical estimating method	EXPECTED ACCURACY RANGE Typical variation in low and high ranges [a]	PREPARATION EFFORT Typical degree of effort relative to least cost index of 1 [b]
Class 5	0% to 2%	Concept Screening	Capacity Factored, Parametric Models, Judgment, or Analogy	L: -20% to -50% H: +30% to +100%	1
Class 4	1% to 15%	Study or Feasibility	Equipment Factored or Parametric Models	L: -15% to -30% H: +20% to +50%	2 to 4
Class 3	10% to 40%	Budget, Authorization, or Control	Semi-Detailed Unit Costs with Assembly Level Line Items	L: -10% to -20% H: +10% to +30%	3 to 10
Class 2	30% to 70%	Control or Bid/Tender	Detailed Unit Cost with Forced Detailed Take-Off	L: -5% to -15% H: +5% to +20%	4 to 20
Class 1	50% to 100%	Check Estimate or Bid/Tender	Detailed Unit Cost with Detailed Take-Off	L: -3% to -10% H: +3% to +15%	5 to 100

- Notes: [a] The state of process technology and availability of applicable reference cost data affect the range markedly. The +/- value represents typical percentage variation of actual costs from the cost estimate after application of contingency (typically at a 50% level of confidence) for given scope.
- [b] If the range index value of "1" represents 0.005% of project costs, then an index value of 100 represents 0.5%. Estimate preparation effort is highly dependent upon the size of the project and the quality of estimating data and tools.

Figure 1. – Cost Estimate Classification Matrix for Process Industries
CHARACTERISTICS OF THE ESTIMATE CLASSES

The following charts (figures 2a through 2e) provide detailed descriptions of the five estimate classifications as applied in the process industries. They are presented in the order of least-defined estimates to the most-defined estimates. These descriptions include brief discussions of each of the estimate characteristics that define an estimate class.

For each chart, the following information is provided:

- **Description:** a short description of the class of estimate, including a brief listing of the expected estimate inputs based on the level of project definition.
- **Level of Project Definition Required:** expressed as a percent of full definition. For the process industries, this correlates with the percent of engineering and design complete.
- **End Usage:** a short discussion of the possible end usage of this class of estimate.
- **Estimating Methods Used:** a listing of the possible estimating methods that may be employed to develop an estimate of this class.
- **Expected Accuracy Range:** typical variation in low and high ranges after the application of contingency (determined at a 50% level of confidence). Typically, this results in a 90% confidence that the actual cost will fall within the bounds of the low and high ranges.
- **Effort to Prepare:** this section provides a typical level of effort (in hours) to produce a complete estimate for a US\$20,000,000 plant. Estimate preparation effort is highly dependent on project size, project complexity, estimator skills and knowledge, and on the availability of appropriate estimating cost data and tools.
- **ANSI Standard Reference (1989) Name:** this is a reference to the equivalent estimate class in the existing ANSI standards.
- **Alternate Estimate Names, Terms, Expressions, Synonyms:** this section provides other commonly used names that an estimate of this class might be known by. These alternate names are not endorsed by this Recommended Practice. The user is cautioned that an alternative name may not always be correlated with the class of estimate as identified in the chart.

CLASS 5 ESTIMATE	
<p>Description: Class 5 estimates are generally prepared based on very limited information, and subsequently have wide accuracy ranges. As such, some companies and organizations have elected to determine that due to the inherent inaccuracies, such estimates cannot be classified in a conventional and systemic manner. Class 5 estimates, due to the requirements of end use, may be prepared within a very limited amount of time and with little effort expended—sometimes requiring less than an hour to prepare. Often, little more than proposed plant type, location, and capacity are known at the time of estimate preparation.</p> <p>Level of Project Definition Required: 0% to 2% of full project definition.</p> <p>End Usage: Class 5 estimates are prepared for any number of strategic business planning purposes, such as but not limited to market studies, assessment of initial viability, evaluation of alternate schemes, project screening, project location studies, evaluation of resource needs and budgeting, long-range capital planning, etc.</p>	<p>Estimating Methods Used: Class 5 estimates virtually always use stochastic estimating methods such as cost/capacity curves and factors, scale of operations factors, Lang factors, Hand factors, Chilton factors, Peters-Timmerhaus factors, Guthrie factors, and other parametric and modeling techniques.</p> <p>Expected Accuracy Range: Typical accuracy ranges for Class 5 estimates are - 20% to -50% on the low side, and +30% to +100% on the high side, depending on the technological complexity of the project, appropriate reference information, and the inclusion of an appropriate contingency determination. Ranges could exceed those shown in unusual circumstances.</p> <p>Effort to Prepare (for US\$20MM project): As little as 1 hour or less to perhaps more than 200 hours, depending on the project and the estimating methodology used.</p> <p>ANSI Standard Reference Z94.2-1989 Name: Order of magnitude estimate (typically -30% to +50%).</p> <p>Alternate Estimate Names, Terms, Expressions, Synonyms: Ratio, ballpark, blue sky, seat-of-pants, ROM, idea study, prospect estimate, concession license estimate, guesstimate, rule-of-thumb.</p>

Figure 2a. – Class 5 Estimate

CLASS 4 ESTIMATE	
<p>Description: Class 4 estimates are generally prepared based on limited information and subsequently have fairly wide accuracy ranges. They are typically used for project screening, determination of feasibility, concept evaluation, and preliminary budget approval. Typically, engineering is from 1% to 15% complete, and would comprise at a minimum the following: plant capacity, block schematics, indicated layout, process flow diagrams (PFDs) for main process systems, and preliminary engineered process and utility equipment lists.</p> <p>Level of Project Definition Required: 1% to 15% of full project definition.</p> <p>End Usage: Class 4 estimates are prepared for a number of purposes, such as but not limited to, detailed strategic planning, business development, project screening at more developed stages, alternative scheme analysis, confirmation of economic and/or technical feasibility, and preliminary budget approval or approval to proceed to next stage.</p>	<p>Estimating Methods Used: Class 4 estimates virtually always use stochastic estimating methods such as equipment factors, Lang factors, Hand factors, Chilton factors, Peters-Timmerhaus factors, Guthrie factors, the Miller method, gross unit costs/ratios, and other parametric and modeling techniques.</p> <p>Expected Accuracy Range: Typical accuracy ranges for Class 4 estimates are -15% to -30% on the low side, and +20% to +50% on the high side, depending on the technological complexity of the project, appropriate reference information, and the inclusion of an appropriate contingency determination. Ranges could exceed those shown in unusual circumstances.</p> <p>Effort to Prepare (for US\$20MM project): Typically, as little as 20 hours or less to perhaps more than 300 hours, depending on the project and the estimating methodology used.</p> <p>ANSI Standard Reference Z94.2-1989 Name: Budget estimate (typically -15% to + 30%).</p> <p>Alternate Estimate Names, Terms, Expressions, Synonyms: Screening, top-down, feasibility, authorization, factored, pre-design, pre-study.</p>

Figure 2b. – Class 4 Estimate

CLASS 3 ESTIMATE	
<p>Description: Class 3 estimates are generally prepared to form the basis for budget authorization, appropriation, and/or funding. As such, they typically form the initial control estimate against which all actual costs and resources will be monitored. Typically, engineering is from 10% to 40% complete, and would comprise at a minimum the following: process flow diagrams, utility flow diagrams, preliminary piping and instrument diagrams, plot plan, developed layout drawings, and essentially complete engineered process and utility equipment lists.</p> <p>Level of Project Definition Required: 10% to 40% of full project definition.</p> <p>End Usage: Class 3 estimates are typically prepared to support full project funding requests, and become the first of the project phase "control estimates" against which all actual costs and resources will be monitored for variations to the budget. They are used as the project budget until replaced by more detailed estimates. In many owner organizations, a Class 3 estimate may be the last estimate required and could well form the only basis for cost/schedule control.</p>	<p>Estimating Methods Used: Class 3 estimates usually involve more deterministic estimating methods than stochastic methods. They usually involve a high degree of unit cost line items, although these may be at an assembly level of detail rather than individual components. Factoring and other stochastic methods may be used to estimate less-significant areas of the project.</p> <p>Expected Accuracy Range: Typical accuracy ranges for Class 3 estimates are -10% to -20% on the low side, and +10% to +30% on the high side, depending on the technological complexity of the project, appropriate reference information, and the inclusion of an appropriate contingency determination. Ranges could exceed those shown in unusual circumstances.</p> <p>Effort to Prepare (for US\$20MM project): Typically, as little as 150 hours or less to perhaps more than 1,500 hours, depending on the project and the estimating methodology used.</p> <p>ANSI Standard Reference Z94.2-1989 Name: Budget estimate (typically -15% to + 30%).</p> <p>Alternate Estimate Names, Terms, Expressions, Synonyms: Budget, scope, sanction, semi-detailed, authorization, preliminary control, concept study, development, basic engineering phase estimate, target estimate.</p>

Figure 2c. – Class 3 Estimate

CLASS 2 ESTIMATE	
<p>Description: Class 2 estimates are generally prepared to form a detailed control baseline against which all project work is monitored in terms of cost and progress control. For contractors, this class of estimate is often used as the "bid" estimate to establish contract value. Typically, engineering is from 30% to 70% complete, and would comprise at a minimum the following: process flow diagrams, utility flow diagrams, piping and instrument diagrams, heat and material balances, final plot plan, final layout drawings, complete engineered process and utility equipment lists, single line diagrams for electrical, electrical equipment and motor schedules, vendor quotations, detailed project execution plans, resourcing and work force plans, etc.</p> <p>Level of Project Definition Required: 30% to 70% of full project definition.</p> <p>End Usage: Class 2 estimates are typically prepared as the detailed control baseline against which all actual costs and resources will now be monitored for variations to the budget, and form a part of the change/variation control program.</p>	<p>Estimating Methods Used: Class 2 estimates always involve a high degree of deterministic estimating methods. Class 2 estimates are prepared in great detail, and often involve tens of thousands of unit cost line items. For those areas of the project still undefined, an assumed level of detail takeoff (forced detail) may be developed to use as line items in the estimate instead of relying on factoring methods.</p> <p>Expected Accuracy Range: Typical accuracy ranges for Class 2 estimates are -5% to -15% on the low side, and +5% to +20% on the high side, depending on the technological complexity of the project, appropriate reference information, and the inclusion of an appropriate contingency determination. Ranges could exceed those shown in unusual circumstances.</p> <p>Effort to Prepare (for US\$20MM project): Typically, as little as 300 hours or less to perhaps more than 3,000 hours, depending on the project and the estimating methodology used. Bid estimates typically require more effort than estimates used for funding or control purposes.</p> <p>ANSI Standard Reference Z94.2-1989 Name: Definitive estimate (typically -5% to + 15%).</p> <p>Alternate Estimate Names, Terms, Expressions, Synonyms: Detailed control, forced detail, execution phase, master control, engineering, bid, tender, change order estimate.</p>


Figure 2d. – Class 2 Estimate

CLASS 1 ESTIMATE	
<p>Description: Class 1 estimates are generally prepared for discrete parts or sections of the total project rather than generating this level of detail for the entire project. The parts of the project estimated at this level of detail will typically be used by subcontractors for bids, or by owners for check estimates. The updated estimate is often referred to as the current control estimate and becomes the new baseline for cost/schedule control of the project. Class 1 estimates may be prepared for parts of the project to comprise a fair price estimate or bid check estimate to compare against a contractor's bid estimate, or to evaluate/dispute claims. Typically, engineering is from 50% to 100% complete, and would comprise virtually all engineering and design documentation of the project, and complete project execution and commissioning plans.</p> <p>Level of Project Definition Required: 50% to 100% of full project definition.</p> <p>End Usage: Class 1 estimates are typically prepared to form a current control estimate to be used as the final control baseline against which all actual costs and resources will now be monitored for variations to the budget, and form a part of the change/variation control program. They may be used to evaluate bid checking, to support vendor/contractor negotiations, or for claim evaluations and dispute resolution.</p>	<p>Estimating Methods Used: Class 1 estimates involve the highest degree of deterministic estimating methods, and require a great amount of effort. Class 1 estimates are prepared in great detail, and thus are usually performed on only the most important or critical areas of the project. All items in the estimate are usually unit cost line items based on actual design quantities.</p> <p>Expected Accuracy Range: Typical accuracy ranges for Class 1 estimates are -3% to -10% on the low side, and +3% to +15% on the high side, depending on the technological complexity of the project, appropriate reference information, and the inclusion of an appropriate contingency determination. Ranges could exceed those shown in unusual circumstances.</p> <p>Effort to Prepare (for US\$20MM project): Class 1 estimates require the most effort to create, and as such are generally developed for only selected areas of the project, or for bidding purposes. A complete Class 1 estimate may involve as little as 600 hours or less, to perhaps more than 6,000 hours, depending on the project and the estimating methodology used. Bid estimates typically require more effort than estimates used for funding or control purposes.</p> <p>ANSI Standard Reference Z94.2 Name: Definitive estimate (typically -5% to + 15%).</p> <p>Alternate Estimate Names, Terms, Expressions, Synonyms: Full detail, release, fall-out, tender, firm price, bottoms-up, final, detailed control, forced detail, execution phase, master control, fair price, definitive, change order estimate.</p>

Figure 2e. – Class 1 Estimate

COMPARISON OF CLASSIFICATION PRACTICES

Figures 3a through 3c provide a comparison of the estimate classification practices of various firms, organizations, and published sources against one another and against the guideline classifications. These tables permits users to benchmark their own classification practices.



AACE Classification Standard	ANSI Standard Z94.0	AACE Pre-1972	Association of Cost Engineers (UK) ACostE	Norwegian Project Management Association (NFP)	American Society of Professional Estimators (ASPE)
Class 5	Order of Magnitude Estimate -30/+50	Order of Magnitude Estimate	Order of Magnitude Estimate Class IV -30/+30	Concession Estimate	Level 1
				Exploration Estimate	
				Feasibility Estimate	
Class 4	Budget Estimate -15/+30	Study Estimate	Study Estimate Class III -20/+20	Authorization Estimate	Level 2
Class 3		Preliminary Estimate		Budget Estimate Class II -10/+10	Master Control Estimate
Class 2	Definitive Estimate -5/+15	Definitive Estimate	Definitive Estimate Class I -5/+5	Current Control Estimate	Level 4
Class 1		Detailed Estimate			Level 5
					Level 6

Figure 3a. – Comparison of Classification Practices

	AACE Classification Standard	Major Consumer Products Company (Confidential)	Major Oil Company (Confidential)	Major Oil Company (Confidential)	Major Oil Company (Confidential)
INCREASING PROJECT DEFINITION	Class 5	Class S Strategic Estimate	Class V Order of Magnitude Estimate	Class A Prospect Estimate	Class V
				Class B Evaluation Estimate	
	Class 4	Class 1 Conceptual Estimate	Class IV Screening Estimate	Class C Feasibility Estimate	Class IV
				Class D Development Estimate	
	Class 3	Class 2 Semi-Detailed Estimate	Class III Primary Control Estimate	Class E Preliminary Estimate	Class III
	Class 2	Class 3 Detailed Estimate	Class II Master Control Estimate	Class F Master Control Estimate	Class II
Class 1	Class I Current Control Estimate		Current Control Estimate	Class I	

Figure 3b. – Comparison of Classification Practices

	AACE Classification Standard	J.R. Heizelman, 1988 AACE Transactions [1]	K.T. Yeo, The Cost Engineer, 1989 [2]	Stevens & Davis, 1988 AACE Transactions [3]	P. Behrenbruck, Journal of Petroleum Technology, 1993 [4]
INCREASING PROJECT DEFINITION	Class 5	Class V	Class V Order of Magnitude	Class III*	Order of Magnitude
	Class 4	Class IV	Class IV Factor Estimate	Class II	Study Estimate
	Class 3	Class III	Class III Office Estimate		Budget Estimate
	Class 2	Class II	Class II Definitive Estimate	Class I	Control Estimate
	Class 1	Class I	Class I Final Estimate		

[1] John R. Heizelman, ARCO Oil & Gas Co., 1988 AACE Transactions, Paper V3.7
 [2] K.T. Yeo, The Cost Engineer, Vol. 27, No. 6, 1989
 [3] Stevens & Davis, BP International Ltd., 1988 AACE Transactions, Paper B4.1 (* Class III is inferred)
 [4] Peter Behrenbruck, BHP Petroleum Pty., Ltd., article in Petroleum Technology, August 1993

Figure 3c. – Comparison of Classification Practices

ESTIMATE INPUT CHECKLIST AND MATURITY MATRIX

Figure 4 maps the extent and maturity of estimate input information (deliverables) against the five estimate classification levels. This is a checklist of basic deliverables found in common practice in the process industries. The maturity level is an approximation of the degree of completion of the deliverable. The degree of completion is indicated by the following letters.

- None (blank): development of the deliverable has not begun.
- Started (S): work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- Preliminary (P): work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- Complete (C): the deliverable has been reviewed and approved as appropriate.

General Project Data:	ESTIMATE CLASSIFICATION				
	CLASS 5	CLASS 4	CLASS 3	CLASS 2	CLASS 1
Project Scope Description	General	Preliminary	Defined	Defined	Defined
Plant Production/Facility Capacity	Assumed	Preliminary	Defined	Defined	Defined
Plant Location	General	Approximate	Specific	Specific	Specific
Soils & Hydrology	None	Preliminary	Defined	Defined	Defined
Integrated Project Plan	None	Preliminary	Defined	Defined	Defined
Project Master Schedule	None	Preliminary	Defined	Defined	Defined
Escalation Strategy	None	Preliminary	Defined	Defined	Defined
Work Breakdown Structure	None	Preliminary	Defined	Defined	Defined
Project Code of Accounts	None	Preliminary	Defined	Defined	Defined
Contracting Strategy	Assumed	Assumed	Preliminary	Defined	Defined
Engineering Deliverables:					
Block Flow Diagrams	S/P	P/C	C	C	C
Plot Plans		S	P/C	C	C
Process Flow Diagrams (PFDs)		S/P	P/C	C	C
Utility Flow Diagrams (UFDs)		S/P	P/C	C	C
Piping & Instrument Diagrams (P&IDs)		S	P/C	C	C
Heat & Material Balances		S	P/C	C	C
Process Equipment List		S/P	P/C	C	C
Utility Equipment List		S/P	P/C	C	C
Electrical One-Line Drawings		S/P	P/C	C	C
Specifications & Datasheets		S	P/C	C	C
General Equipment Arrangement Drawings		S	P/C	C	C
Spare Parts Listings			S/P	P	C
Mechanical Discipline Drawings			S	P	P/C
Electrical Discipline Drawings			S	P	P/C
Instrumentation/Control System Discipline Drawings			S	P	P/C
Civil/Structural/Site Discipline Drawings			S	P	P/C

Figure 4. – Estimate Input Checklist and Maturity Matrix

REFERENCES

ANSI Standard Z94.2-1989. **Industrial Engineering Terminology: Cost Engineering.**
AACE International Recommended Practice No.17R-97, **Cost Estimate Classification System.**

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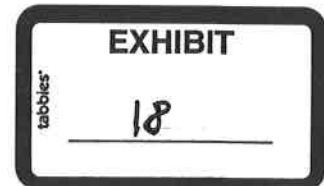
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BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF: Petition)
of Emerald Polymer Additives,)
LC for an Adjusted Standard)
from 35 Ill. Adm. Code)
304.122(b),)
)
)
)
) AS 19-002
)

The deposition of MARK E. WINTERS, called
for examination pursuant to the provisions of the
Illinois Code of Civil Procedure and the Rules of
the Supreme Court as they apply to the taking of
said depositions, taken before Paula A. Morsch,
C.S.R. License No. 84-002965, a Certified Shorthand
Reporter in the State of Illinois, on the 18th day
of December, 2019, at the hour of 9:00 a.m., at 412
SW Washington Street, Ste. D, in the City of Peoria,
County of Peoria, State of Illinois.



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I N D E X

WITNESS	PAGE
MARK E. WINTERS, Engineer	
Direct By Mr. Gradeless	4
Cross By Mr. Dimond	64
Redirect By Mr. Gradeless	69

E X H I B I T S

NUMBER		MARKED FOR ID
Deposition Exhibit		
No. 1	35	

(Attached.)

1

2

MARK E. WINTERS, Engineer

3

called by the IEPA,

4

being first duly sworn,

5

was examined and testified

6

as follows:

7

8

DIRECT EXAMINATION

9

BY MR. GRADELESS:

10

Q This is the deposition of Mark Winters in

11

the matter of the Petition of Emerald Polymer

12

Additives for an Adjusted Standard before the

13

Pollution Control Board, Case Number AS 19-002.

14

Can you please state your full name and

15

spell it for the record?

16

A Mark Edward Winters, M-A-R-K, E-D-W-A-R-D,

17

W-I-N-T-E-R-S.

18

Q Okay. Have you ever had a deposition

19

before, taken a deposition before, Mark?

20

A No.

21

Q Okay. Well, let me go over the ground

22

rules real quick so that there's no surprises and

23

you let me know if you have any questions. The

24

first one is we have to make sure our responses are

1 audible. We have a court reporter here. We should
2 try to talk slowly and clearly to help her out, and
3 also our responses need to be in the form of a yes
4 or a no or if something requires further than a yes
5 or no, you need to elaborate, but we can't say
6 things like uh-huh and huh-uh because when we go to
7 look and read that later, I can't really read your
8 voice inflection. Do you understand that?

9 A Yes.

10 Q You passed the first test. Second, from
11 time to time we attorneys like to yell at each other
12 and argue and object. I don't anticipate that here,
13 but sometimes we may object, and mainly the purpose
14 of that is to get that on the record, so I just ask
15 that during an objection we stop your answer and we
16 get it on the record and then you'll be asked most
17 likely to continue the response, but it shouldn't
18 sway you or affect what you say unless you're
19 specifically told not to respond, but I don't
20 envision that being the case today.

21 Any questions from me? Again if you need
22 to stop at any time -- you're nodding your head. Is
23 there a question?

24 A No, no. I don't have any questions.

1 Q If you need to stop at any time, just
2 interrupt and say it. I just ask that if you do,
3 wait until you've completed an answer and so not in
4 the middle of a question if you need to stop for a
5 break, bathroom break, something like that.

6 All right. So, Mr. Winters, where do you
7 live?

8 A East Peoria.

9 Q What's your address?

10 A 103 Flossmoor Court, Apartment 5.

11 Q Okay. And by whom are you employed?

12 A Emerald Polymer Additives.

13 Q And how long have you been employed by
14 Emerald Polymer Additives?

15 A Just about a year.

16 Q When did you start?

17 A I started during the first week of January
18 in this year.

19 Q What is your job title at Emerald
20 Performance -- or Emerald Polymer Additives?

21 A Utilities foreman.

22 Q Now I want to kind of walk back through
23 your job history before that. So what, if any, jobs
24 did you hold before utilities foreman at any

1 **employer?**

2 A Prior to that I was the shift foreman for
3 Veolia North America in Henry, Illinois.

4 **Q From what dates were you the shift foreman**
5 **there?**

6 A That would have been from December '17 to
7 December '18.

8 **Q December 2017 to December 2018, right?**

9 A That's correct.

10 **Q And what about before that job?**

11 A Before that job I was the shift foreman
12 for a contractor for Caterpillar.

13 **Q Okay. Here in Peoria?**

14 A Yes.

15 **Q All right. And how long did you hold that**
16 **position?**

17 A I was at that position for a year as well.

18 **Q Okay. I've got a pattern going here. So**
19 **from December '18 -- I'm sorry; from December --**

20 A December '16 to December '17.

21 **Q Okay, thank you. And before that?**

22 A Before that I was a contract employee for
23 an engineering testing lab in Michigan; Holland,
24 Michigan.

1 **Q And how long did you hold that position?**

2 A Four months.

3 **Q Okay. What about before that position?**

4 A Before that position I was at a different
5 engineering testing lab for a company called Stryker
6 Medical.

7 **Q Okay. What did you do there?**

8 A They make surgical instruments. I did the
9 quality testing on those.

10 **Q Before we -- let me back up a little bit.**
11 **What is your educational background that led you to**
12 **this current position?**

13 A I have a Bachelor's of Science in chemical
14 engineering from Western Michigan University.

15 **Q Any graduate education?**

16 A No.

17 **Q Or schooling?**

18 A No.

19 **Q Any other certificates or certifications?**
20 **Do you hold any of those?**

21 A Since working for Emerald I have my
22 drinking water license from the Illinois Department
23 of Public Health non-transient, non-- I forgot how
24 the rest of that works, but it's the non-transient,

1 noncommunity. That's what it is.

2 **Q Right, noncom. And do you hold any**
3 **drinking water operator licenses from the Illinois**
4 **EPA?**

5 A No.

6 **Q Any other professional licenses or**
7 **designations that you have?**

8 A No.

9 **Q Okay. And you said you're the utilities**
10 **foreman currently at Emerald Polymer Additives. Is**
11 **that the facility in Henry?**

12 A Yes.

13 **Q Okay. What is a utilities foreman?**

14 A Chiefly it's the wastewater treatment
15 system. That's the biggest utility I'm in charge
16 of, and it's also a couple other utilities around
17 the plant like our compressed nitrogen gas, cooling
18 tower, and process water.

19 **Q And your what? I'm sorry.**

20 A Process water.

21 **Q Process water, okay. Now, when you**
22 **delineate cooling tower and process water and the**
23 **compressed nitrogen, what does that mean? I mean**
24 **are these different buildings?**

1 A They are different buildings.

2 **Q Okay. And you say you oversee those**
3 **functions, is that right?**

4 A Correct.

5 **Q What does that entail?**

6 A Cooling tower, it entails are the pumps on
7 or off, do we have good flow through the processes
8 or cooling. For the process water, all I do there
9 is we just make sure the pumps are on and we have
10 good water pressure.

11 **Q What about the compressed nitrogen?**

12 A The compressed nitrogen is if we -- if
13 there's a leak somewhere, we kind of -- I'm the guy
14 that knows what valves to close to stop the leaks
15 and then track down where the leaks are happening.

16 **Q Any other job responsibilities in that**
17 **Henry plant that you have?**

18 A I also handle the two guys that work in
19 our warehouse.

20 **Q Tell me about the warehouse. What's the**
21 **warehouse?**

22 A It's just our standard shipping and
23 receiving warehouse, so orders out, materials in.

24 **Q Okay. Do you say you supervise two**

1 **employees in the warehouse?**

2 A That's correct.

3 **Q And how many employees do you supervise?**

4 A There's those two and then there's four
5 waste treatment operators that I supervise.

6 **Q So six total?**

7 A Yes.

8 **Q And who do you report to?**

9 A I report to Jim Hastings.

10 **Q And what is his position?**

11 A I do believe he's just head of production
12 is his title.

13 **Q What's head of production, if you know?**

14 A All the shift foremen answer to him. All
15 the maintenance foremen answer to him. I answer to
16 him.

17 **Q Okay.**

18 A He's the number two behind the plant
19 manager, behind Galen Hathcock.

20 **Q Understood. What, if anything, did you do
21 to prepare for today's deposition?**

22 A I read back through the history a little
23 bit, some of the things we've tried to do.

24 **Q Anything else?**

1 A No, I just read through the histories.

2 **Q Okay. Did you talk to anybody about the**
3 **deposition outside of Mr. Dimond or an attorney?**

4 A I talked to Galen Hathcock for a couple
5 minutes just because I've never done one of these
6 before. I was kind of nervous about how this was
7 supposed to work out.

8 **Q And what was discussed with Galen?**

9 A Mostly just what I should, you know, what
10 I should expect, how I should expect it.

11 **Q Did he approach you or did you approach**
12 **him?**

13 A I approached him.

14 **Q And what, if anything, did you ask Galen?**

15 A Well, first what I asked him was if there
16 was a website where I can go to like
17 I'mabouttobedeposed.com where you can practice.

18 **Q I wish there was one on how to be an**
19 **attorney and depose someone. Yes, I wish the same.**
20 **Trust me, nobody is in trouble. So more of a how**
21 **to?**

22 A Yeah, how to.

23 **Q Did he tell you how to?**

24 A He gave me some pointers, keep your calm,

1 answer truthfully, don't guess on anything.

2 **Q Perfect, okay. You guys didn't talk about**
3 **the plans or this case or anything like that?**

4 A Not in -- no, not in those ways.

5 **Q Okay. In any other -- what kind of ways**
6 **did you talk about it?**

7 A We have activities ongoing in waste
8 treatment and that naturally came up in the course
9 of conversation as well.

10 **Q Understood, okay. You also mentioned you**
11 **read over some of the history of this case?**

12 A Yes.

13 **Q Do you recall, what did you read?**

14 A Previous efforts at containing the TBA,
15 MBT, keeping it out of the wastewater.

16 **Q Do you remember what that document looked**
17 **like?**

18 A I do believe they were previous written
19 testimonies.

20 **Q Was it like a transcript form, if you**
21 **recall?**

22 A I don't think it was a transcript. I
23 think it was previous EHS and plant manager's
24 written depositions.

1 Q Do you remember whose depositions you read
2 over?

3 A I think the fellow's name was Dave Giffin.

4 Q And do you remember who Dave Giffin was?

5 A No, I never met him.

6 Q Anybody else's previous depositions that
7 you read over?

8 A Actually I think that was it.

9 Q Aside of the previous efforts, were there
10 any other documents that you looked at to prepare
11 for the deposition?

12 A I looked at our previous DMR's just in
13 case we were asked questions about it.

14 Q And any other documents or items that you
15 read to prepare for your deposition?

16 A One of Houston Flippin's reports on his
17 suggestions.

18 Q Do you recall the date of that report?

19 A I don't recall the actual date. I do
20 recall it was from 2019.

21 Q Any other documents or text that you
22 reviewed to prepare for the deposition?

23 A No. That would be a complete list.

24 Q Okay. I want to make sure that you said

1 **this. Galen was the only one that you talked to**
2 **about the deposition, is that correct?**

3 A That's correct, outside of Mr. Dimond
4 here.

5 **Q Right. How did you -- did somebody give**
6 **you those documents?**

7 A I believe I was given all those documents
8 by Galen.

9 **Q Do you remember when he gave you those?**

10 A Friday. It was last Friday.

11 **Q December 13th?**

12 A Yeah. If that was what this past Friday
13 was, yes.

14 **Q It was this past Friday. We'll go with**
15 **that.**

16 A Yes, it was this past Friday.

17 **Q Okay, understood. Did Galen say anything**
18 **to you when he gave you those documents?**

19 A Nothing besides this is the history, you
20 might want to review this in prep.

21 **Q You said earlier that Mr. Hastings is**
22 **number two under Galen, so would Galen be**
23 **Mr. Hastings' boss?**

24 A I'm not entirely certain on the power

1 structure there. I do know that Jim gets a lot of
2 his marching orders from what Galen thinks we ought
3 to be doing in the plant.

4 Q You had mentioned or you talked a little
5 bit about your job duties at the Henry plant. Have
6 you ever been a part of a continuous process
7 improvement team?

8 A Yes.

9 Q And when did the continuous process
10 improvement team start?

11 A Are you talking about previous experience
12 or currently?

13 Q Currently.

14 A I started being a part of that this
15 spring.

16 Q You couldn't be a part of it before you
17 started I guess.

18 A Right.

19 Q What is the continuous process improvement
20 team?

21 A A lot of what we're looking at are ways to
22 run the waste treatment facility better.

23 Q And what are you looking at to make the
24 waste treatment system run better?

1 A A lot of our focus lately has been on
2 better reaction efficiency upstream to keep less or
3 keep fewer components out of the wastewater when I
4 get it.

5 **Q Any other processes you're looking at?**

6 A We're looking at some testing equipment
7 for the lab to increase our ability to test things
8 on as well as a new piece of software that would
9 handle all of our data.

10 **Q Anything else that comes to mind that you**
11 **guys are looking at with respect to the process**
12 **improvements?**

13 A There's a lot of other process
14 improvements that are internal processes that I'm
15 not a part of that are also being worked on. I
16 couldn't really tell you what they are though.

17 **Q Your focus mostly or your knowledge is**
18 **limited specifically with respect to the waste**
19 **stream; is that fair?**

20 A Yes.

21 **Q Okay. I'm trying to understand how all**
22 **this works. So when you said you were looking at**
23 **software improvements for data, what is that?**

24 A Right now all of our data is stored in a

1 Microsoft access database. We're just looking at --
2 contractors have different, or companies have
3 different data service and lab packages that they
4 want to sell you. We were just comparing those to
5 see if something was better.

6 **Q Are you still comparing those?**

7 A We are. We are still looking.

8 **Q Is this like a data management**
9 **software package, so to speak?**

10 A Yeah. I'm sorry, yes.

11 **Q Yeah works I think. All right. You also**
12 **mentioned testing equipment. What kind of testing**
13 **equipment are you guys looking at?**

14 A Hach makes a device that can do -- it can
15 do all of our hardness testing. It can do ammonia
16 testing. It can do a lot of stuff that we currently
17 outsource, we would have the ability to kind of test
18 in-house.

19 **Q What was the company you said?**

20 A The company is called Hach, H-A-C-H.

21 **Q Okay. Are you comparing that to any other**
22 **companies?**

23 A Right now we're comparing that unit with
24 our current outside lab to see, you know, compare

1 results, make sure that it's a reasonable comparison
2 between one and the other.

3 **Q And that would allow you to conduct the**
4 **testing in-house?**

5 A That's correct.

6 **Q Have you received any of those results?**

7 A I have the results from our in-house
8 testing but I haven't received results from -- PDC
9 is the lab that we use to compare against.

10 **Q You also mentioned looking at upstream**
11 **efficiencies. What does that entail?**

12 A Largely that entails looking at the
13 formulas for the different reactions and seeing if
14 we can improve those so that we -- it's hard to have
15 MBT in the water if you reacted it all, so driving
16 reactions to completion.

17 **Q Oh, boy. Can you explain that?**

18 A I will try to. MBT is a one of the base
19 ingredients that we use and we're looking at
20 different ways to manipulate the chemistry of the
21 rest of the reaction to see if we can drive the
22 reaction of the MBT to completion so that there's no
23 MBT going out because we reacted all of it and we
24 made product with all of it so there's none left.

1 **Q Okay.**

2 A That's the goal.

3 **Q At what point in the process are you**
4 **looking to ensure that there's no MBT left? Is it**
5 **in the pipe or is it somewhere else in the process?**

6 A We are taking samples, as part of this
7 study, we're taking samples at the end of the pipe
8 at each process; so not the end of the wastewater
9 treatment facility but at the end of each individual
10 process.

11 **Q Before I ask that, any other upstream**
12 **efficiency type projects that you guys are looking**
13 **at?**

14 A No, we're just looking at limiting MBT.

15 **Q Can MBT be disposed of in any way?**

16 A I honestly don't have a good answer for
17 that.

18 **Q Okay. Why do you say you don't have a**
19 **good answer for that?**

20 A I could speculate but it would just be
21 speculation as to how to dispose of it.

22 **Q You haven't -- you're not aware of anybody**
23 **disposing MBT?**

24 A No.

1 **Q Have you guys researched ways to possibly**
2 **dispose of it?**

3 MR. DIMOND: Object that it's vague.
4 I'm not sure what you mean by disposing of it.

5 **Q You can answer.**

6 A We -- I've done some research that shows
7 that they use it in the fertilizer industry to help
8 retain nitrogen in the soil, but as far as any kind
9 of actual just dumping it in a landfill or
10 something, no, I don't know anything about it.

11 **Q What did you read about the MBT being used**
12 **to fertilize?**

13 A It was part of a research paper. I
14 googled it and found a research paper that suggested
15 they put MBT in with high nitrogen fertilizers and
16 it helps retain nitrogen in the soil.

17 **Q Did you provide that study to anybody?**

18 A At the time I brought it to Lance
19 Richards' attention.

20 **Q And who is Lance Richards?**

21 A He was our environmental health and safety
22 coordinator.

23 **Q I believe he's in Oklahoma now.**

24 A I have no knowledge of that.

1 **Q** **That's okay. And this was obviously**
2 **sometime after January 2019 --**

3 A Correct.

4 **Q** **-- when you gave the MBT's fertilizing**
5 **study to Lance Richards, is that right?**

6 A Correct.

7 **Q** **Do you remember how you -- did mail it?**
8 **What was the way you gave it to Lance?**

9 A I think it was more of a showed it to him.
10 I don't even recall E-mailing it to him. I think I
11 saw it, dragged him into my office, showed him. We
12 talked about it for a couple minutes.

13 **Q** **Do you remember when this was?**

14 A That part I do not. I couldn't recall a
15 date for you.

16 **Q** **Do you recall whether it was before or**
17 **after you met with the Illinois EPA in June of 2019?**

18 A It may have been before that.

19 **Q** **What, if anything, did Lance say about it?**

20 A That I don't recall either.

21 **Q** **And then has that study been discussed**
22 **since?**

23 A No. No, it has not.

24 **Q** **Why did you give it to Lance?**

1 A I read it and thought it was interesting.
2 We were discussing the issue. I thought he might
3 think it was interesting as well.

4 **Q And then, I'm sorry, you didn't give that**
5 **study to anyone else at the facility; is that**
6 **correct?**

7 A That's correct.

8 **Q Do you remember the author of that study?**

9 A No, I do not.

10 **Q Do you still have a copy?**

11 A No, I don't recall ever saving a copy. I
12 read it. No one seemed terribly interested in
13 discussing it further so I read it, I got some
14 information off of it, and I just exited out.

15 **Q Oh, did you send Lance the link; you**
16 **didn't download it?**

17 A No, I did not download it.

18 **Q But how did you send it to Lance? Oh, you**
19 **just showed him?**

20 A Yeah, I just showed him. We went into my
21 office. I pulled it up on my screen. We talked
22 about it.

23 **Q Gotcha, okay. Do you remember anything**
24 **that was said in that conversation?**

1 A No, not really.

2 **Q You also mentioned upstream efficiency**
3 **projects and looking at those at the end of the pipe**
4 **of each process, is that right?**

5 A Yes.

6 **Q How many processes have MBT showing up at**
7 **the end of the pipe?**

8 A There should be three that I can think of,
9 but I might be missing something.

10 **Q It is my understanding that -- can you**
11 **tell us what MBT is for the record?**

12 A Mercaptobenzothiazole.

13 **Q Okay.**

14 A It's the basic building block of our
15 entire plant basically.

16 **Q And is it a byproduct of your processes?**

17 A It is the basic building block of our
18 processes. Everything we make is based on that
19 molecule.

20 **Q All your products you use MBT?**

21 A There's a few products we don't. There's
22 a few products we don't use MBT, but most of our
23 products, yes, use MBT.

24 **Q Okay. Would it be possible for you to**

1 tell me what products that you use MBT, if you can
2 recall? It's not a test. I'm just trying to see if
3 the list is like 50, tell me. If it's four and you
4 know it, that would be great.

5 A I believe the list is about seven. I may
6 not be able to get all of them for you.

7 Q Okay.

8 A There's BBTS, OBTS, MBDS. We make a
9 50 percent MBT that we put in drums. I think that's
10 all I can think of right now.

11 Q So aside of the reaction formulas and the
12 MBT upstream efficiencies and looking at those at
13 the end of the pipe, are there any other upstream
14 efficiencies that come to mind?

15 A Not off the top of my head.

16 Q Have you ever considered water reductions?

17 A If that's being considered, I'm not a part
18 of that.

19 Q Fair. You have no knowledge of that being
20 considered?

21 A No.

22 Q Do you know when the continuous process
23 improvement team began?

24 A I do not know when the team began meeting.

1 **Q Who do they meet with?**

2 A It's an in-house team. We meet semi
3 regularly on site.

4 **Q What's semi regularly?**

5 A Every other week.

6 **Q How long are the meetings?**

7 A They can vary from couple hours to
8 20 minutes.

9 **Q Do folks from Mexichem attend those**
10 **meetings?**

11 A Not regularly.

12 **Q When do they?**

13 A If we think we need to discuss something
14 with them.

15 **Q How often have the Mexichem employees**
16 **attended the meetings that you know of?**

17 A On the ones that I know of a couple times.
18 I couldn't give you a firm answer. A lot of times
19 things come up in those meetings that we then
20 discuss with Mexichem at our monthly meeting with
21 them.

22 **Q So there's a separate monthly?**

23 A Yeah, there's a separate monthly. I
24 believe that monthly is part of a CCA that we

1 entered into where we agreed to hold meetings with
2 Mexichem once a month to discuss how waste treatment
3 was going.

4 **Q Okay. Do you know if that's the latest**
5 **CCA by any chance?**

6 A I actually don't believe it is the latest
7 one.

8 **Q Do you recall how you became involved in**
9 **the continuous process improvement team?**

10 A Largely that happened over the summer.
11 Our ammonia levels dropped down considerably and we
12 suddenly realized that maybe this was attainable,
13 and they started bringing me into all the other
14 continuous process meetings to discuss, you know,
15 what are we seeing and how can we do things.

16 **Q Right, and that was the summer of 2019?**

17 A That's correct.

18 **Q Was that before or after -- I'm sorry.**
19 **When you saw the ammonia reductions in the summer of**
20 **2019, was that before you met with the Illinois EPA**
21 **or after you met with the Illinois EPA?**

22 A That was after.

23 **Q Okay. So let me talk first about do you**
24 **recall meeting with the Illinois EPA on or about**

1 **June 18th, 2019?**

2 A I do recall.

3 **Q And who invited you? I mean we did, but**
4 **who at your plant?**

5 A I was included into that by Galen
6 Hathcock.

7 **Q And do you remember discussions about that**
8 **meeting before that meeting, having discussions**
9 **before that meeting; I'm sorry, having discussions**
10 **before that meeting with Galen?**

11 A At that time, no, I didn't have a lot of
12 discussions with Galen. I was still learning the
13 processes more than anything.

14 **Q And did you have discussions I guess after**
15 **the meeting with the Illinois EPA about the meeting?**

16 A With the Illinois EPA?

17 **Q Yeah.**

18 A I personally did not. If discussions took
19 place, I was not a part of them.

20 **Q Tell me what happened the summer of 2019.**

21 A We went on shutdown in the middle of
22 August. I do believe it was the second week of
23 August we went on shutdown and when we came back up,
24 things were running exceptionally slow and we

1 happened to get results back as part of our DMR that
2 indicated our ammonia levels in our plant effluent
3 were below the detectable limit of the test.

4 **Q And those effluents did not show any MBT**
5 **in it, did they?**

6 A No, they did not.

7 **Q Were you able to determine what happened?**

8 A That's part of what the testing we're
9 doing now is to determine which processes are the
10 ones that cause the problems and which processes
11 don't seem to be causing the problems and then focus
12 in on which processes seem to be causing the
13 problems.

14 **Q Okay. In the summer of 2019 were you**
15 **accepting waste treatment from Mexichem at the time?**

16 A Yes.

17 **Q So that I guess investigation or research,**
18 **what has been discussed?**

19 A We discussed a new sampling plan for MBT
20 in the facility to more clearly understand which
21 processes are dumping the most MBT and we've been
22 watching Mexichem's ammonia coming into us a little
23 more closely than we had been.

24 **Q What's a sampling plan?**

1 A You're asking what our sampling plan is
2 right now?

3 **Q Just generally what is a sampling plan? I**
4 **guess you said an MBT sampling plan.**

5 A Yes.

6 **Q What is that?**

7 A We have a weekly set of samples that we
8 pull and when we pull them for all our different
9 processes.

10 **Q Is it like a schedule?**

11 A Yeah, it's a scheduled sampling for
12 different areas of the plant.

13 **Q And you say you've changed that now?**

14 A That's correct.

15 **Q When did that change happen?**

16 A That change happened in October.

17 **Q Of 2019?**

18 A That's correct, October of 2019.

19 **Q And this was as a result of what happened**
20 **in the summer of, the reductions you saw in the**
21 **summer of 2019?**

22 A Yes.

23 **Q Tell me how the sampling plan changed.**

24 A We used to sample three times a week at

1 one spot. It was the -- well, let me back up.

2 **Q That's all right.**

3 A We sampled three times a week at the
4 secondary clarifier and at the PC tank and at the
5 primary clarifier. We also sampled at the secondary
6 clarifier every day of the week and when we changed
7 in October, we started sampling at the processes as
8 well because we wanted to see at each process, and
9 that was every day that they were running.

10 **Q Why would sampling at each process, what's**
11 **the benefit in doing that?**

12 A The benefit in doing that is then to know
13 which process is the biggest offender and which
14 process you can look at how to change to get the MBT
15 out of the water supply.

16 **Q Did you stop producing a product in the**
17 **summer of 2019?**

18 A We didn't stop but sales lagged
19 significantly and we effectively stopped.

20 **Q It was shut down, right?**

21 A Yeah.

22 **Q Am I missing something? I mean if you**
23 **shut down and stopped, is that why you -- I guess**
24 **why are you surprised that the ammonia levels**

1 **dropped in the summer of 2019?**

2 A It wasn't an expected result. We were
3 just shocked. We didn't realize that the ammonia
4 would drop like that because everybody had told us
5 that that's not possible.

6 **Q When you say everybody had told you it's**
7 **not possible, who are those?**

8 A That would just be the legacy of previous
9 reports, everybody saying that there's no way to get
10 all the MBT out, there's no way to nitrify.
11 Nitrification does not happen in our process.

12 **Q Do you remember who made those reports?**

13 A That would be Dave Giffin reports. I
14 believe there's a Houston Flippin report that says
15 nitrification is difficult to achieve.

16 **Q You said that it wasn't expected that the**
17 **ammonia levels would drop, is that right?**

18 A That's correct.

19 **Q And I guess why would it not be expected**
20 **if production shut down?**

21 A Well, while production was shut down, the
22 ammonia levels were kind of, you know, we would have
23 expected that.

24 **Q Okay.**

1 A But in the weeks after when we started
2 back up, the ammonia levels stayed down, and that
3 was a surprise to us.

4 **Q And where are we, where are you, I'm**
5 **sorry, your group in evaluating the cause of that**
6 **lowered ammonia level?**

7 A During the course of this month, we've
8 been actually doing some recipe changes and tests
9 with one of our processes that we didn't expect to
10 be a big MBT contributor because of how little it
11 runs, but despite its smaller flow rate compared to
12 others in the waste stream and how little it runs,
13 it turned out to be a much bigger offender than we
14 had thought. So we identified it and we're working
15 on recipe changes right now to see what we can make
16 better.

17 **Q Okay. That is encouraging. You mentioned**
18 **that you reviewed the DMR's prior to today?**

19 A Yes.

20 **Q Do you recall what those DMR's provided,**
21 **what information you read from the DMR's?**

22 A I was particularly interested in if we had
23 ever had an exceedance on our ammonia in terms of
24 concentration or pounds per day.

1 **Q What was the range of the DMR's that you**
2 **looked at?**

3 A It was, I believe it was just this past
4 year's DMR's. It may have been a few more than
5 that.

6 **Q Did you have any exceedances?**

7 A I was not aware of any, no.

8 **Q Do you recall the highest levels that you**
9 **had of ammonia?**

10 A The highest level I saw in the DMR was
11 probably in the 90's, 90 milligrams per liter.

12 **Q Okay. It's my understanding that you've**
13 **made some process improvements in 2015. Are you**
14 **aware of any of those?**

15 A I've heard of them. I couldn't tell you
16 with any degree of certainty what they were or how
17 they worked.

18 **Q Have you been a part of any specific**
19 **process improvements since you started?**

20 A Yes, but not relating to wastewater
21 treatment.

22 **Q Thank you for that clarification.**
23 **Appreciate it.**

24 **I'm going to hand Mr. Winters -- we'll go**

1 **Winters Exhibit 1.**

2

3 (At this point in the proceedings Deposition
4 Exhibit No. 1 was marked for identification.)

5

6 BY MR. GRADELESS:

7 **Q Please just take a second to review this**
8 **document. Do you recognize this document?**

9 A This is the actual petition to have our
10 ammonia standard renewed. I don't believe I have
11 ever seen this particular document.

12 **Q Okay. Did you see a draft or any portions**
13 **of this document?**

14 A No, I don't believe so.

15 **Q How about this? Did you assist in**
16 **preparing or gathering information for the petition?**

17 A Again, no, I don't believe so.

18 **Q Is it a part of your job duties to**
19 **typically look at the DMR data?**

20 A Yes, it is.

21 **Q So you would have seen the DMR's from your**
22 **facility since you've -- you've seen the DMR's from**
23 **your facility, is that correct?**

24 A That's correct.

1 **Q Do you recall providing that information**
2 **at any time to anyone?**

3 A No. No, that information is readily
4 available on our in-company servers.

5 **Q Okay. So anybody could have access to**
6 **that?**

7 A That's correct. Oh, let me clarify that.
8 Obviously the union employees don't have access to
9 that. So not everybody.

10 **Q Okay, appreciate that. So you didn't help**
11 **prepare this document in any way?**

12 A No, not that I'm aware of.

13 **Q Do you recall helping prepare any**
14 **documents with respect to the adjusted standard?**

15 A No.

16 **Q Just a second. Were you ever involved in**
17 **reviewing treatment alternatives?**

18 A Prior to our meeting with the EPA back
19 in -- that was June, correct? I believe I discussed
20 with Lance some of the ideas that had been talked
21 about during that meeting.

22 **Q Okay. And what were those alternatives**
23 **that you talked about?**

24 A We talked about land application. None of

1 us had heard of the algae wheel so we did a little
2 bit of looking into what that was.

3 **Q Okay.**

4 A And we discussed somewhat the river water
5 dilution idea.

6 **Q Do you recall any other alternatives that**
7 **you discussed or provided input?**

8 A No.

9 **Q What about after Mr. Flippin's report?**

10 A After Mr. Flippin's report, I think we did
11 go back and discuss the activated carbon idea.

12 **Q Okay. Any others?**

13 A Not to my knowledge. There may be and
14 I've forgotten.

15 **Q And what was your opinion on the land**
16 **application alternative?**

17 MR. DIMOND: Objection, calls for
18 speculation.

19 A My opinion on it was having studied pulp
20 and paper industry wastewater treatment in college
21 for a fair amount, I was fairly familiar with how to
22 do that. I was curious about it but when I
23 discussed it with Lance, Lance knew a lot about
24 hydrology and was able to show me drawings of how

1 our hydrology would work and it would just go
2 straight back into the river, and we discussed in
3 those terms how the land application was going to
4 work.

5 **Q So did you have any knowledge of land**
6 **application aside of that?**

7 A No, I did not.

8 **Q It's just you and Lance discussing land**
9 **application?**

10 A Yes.

11 **Q And Lance informed you that -- what did**
12 **Lance say about the land application?**

13 A Our soil is highly permeable and it won't
14 retain the water.

15 **Q All right. Did he raise any other**
16 **concerns that you remember about land application?**

17 A I believe we discussed the salts in our
18 wastewater building up in the soil too.

19 **Q What about the algae wheel?**

20 A Outside of a high level discussion of what
21 it was, I don't believe we discussed it too much.

22 **Q What was said about the algae wheel?**

23 A That it was mostly just a tertiary
24 biotreater kind of setup.

1 **Q And what about the river water dilution?**

2 A We talked to some degree about the energy
3 requirements to do that and how much water we would
4 actually have to pump out of the river to be able to
5 do that.

6 **Q Did you have any opinions on the river
7 water dilution?**

8 A I personally felt like it was not a great
9 idea.

10 **Q Okay, that's fair. Why did you think it
11 was not a great idea?**

12 A The amount of effort, the amount of energy
13 it would take to heat the water up to not sterilize
14 our biotreater that we currently use would have been
15 cost prohibitive. It would have dumped all kinds of
16 greenhouse gasses into the air. I thought it was a
17 bad idea.

18 **Q Okay. Did you know about the greenhouse
19 gasses as being a potential side effect of river
20 water dilution?**

21 A Once I knew that the water had to be
22 heated, yes.

23 **Q And what about activated carbon? What was
24 said about that alternative?**

1 A That was mostly a discussion about how it
2 works and the fact that it had several problems as
3 far as waste itself and what we would have to do
4 about those and I believe somebody discussed how
5 expensive it was.

6 **Q Do you remember discussing ozonation?**

7 A No, I don't recall discussing that with
8 anybody.

9 **Q What about alkaline stripping?**

10 A No, I don't recall discussing that one
11 with anybody either.

12 **Q Ion exchange?**

13 A Maybe me and Lance discussed that one but
14 to discuss what we discussed, I couldn't tell you
15 what we talked about.

16 **Q I don't want you to guess if you can't
17 remember.**

18 A Yeah, I couldn't remember that one.

19 **Q That's fine. Do you remember anybody
20 talking about break point chlorination?**

21 A I do recall me and Lance discussing break
22 point chlorination. I don't recall if that was in
23 relationship to this particular issue or a different
24 issue that we also had.

1 **Q Are you familiar with the dechlorination**
2 **methods of treatment facilities?**

3 A I personally am not, no.

4 **Q You don't do dechlorination at the Henry**
5 **facility, do you?**

6 A No. No, we do not.

7 **Q And what about tertiary nitrification?**
8 **What does that mean?**

9 A You're discussing the process of adding a
10 an additional biotreater of some kind that would
11 then treat the nitrification after the biotreaters?

12 **Q That's an example is what you're saying,**
13 **right?**

14 A Yes.

15 **Q Yeah, the general concept?**

16 A Yeah.

17 **Q Did you discuss tertiary nitrification?**

18 A No, we did not, outside of the algae
19 wheel. We did discuss the algae wheel which is a
20 form of that. So we discussed that.

21 **Q Okay. Do any other alternatives come to**
22 **mind that you reviewed or discussed with respect to**
23 **the Henry plant?**

24 A As far as end of pipe treatment, no, I do

1 believe those are what we discussed.

2 **Q Any in process treatments, anything**
3 **additional that you discussed?**

4 A I discussed with a couple of people some
5 alternatives, alternative ways to pull MBT out of
6 the water supply, including hydrogen peroxide.
7 That's what it is. Hydrogen peroxide can actually
8 oxygenate the MBT and pull it out.

9 **Q Oh, really? So if you mix hydrogen**
10 **peroxide with the MBT, what happens?**

11 A I am not familiar with the chemistry. I
12 just know that it oxidizes the MBT and destroys it
13 inside the wastewater. I don't know how it works
14 though.

15 **Q Are you able to isolate the MBT in the**
16 **treatment process?**

17 A Currently, no. That's one of the things
18 we're talking about.

19 **Q Okay. Does the MBT remain in the first**
20 **biotreater at the Henry facility?**

21 A I couldn't give you a for sure answer. I
22 can just tell you what our test results show, that
23 there's no MBT in the secondary clarifier, which is
24 the next step after the biotreater.

1 **Q Okay.**

2 A So in there it's gone. I'm assuming it
3 gets pulled out in the biotreater somehow.

4 **Q Is it in there before the biotreater?**

5 A Yes. We know it's in the primary
6 clarifier, goes to the biotreater, and then it's
7 gone by the time it makes it to the secondary
8 clarifier.

9 **Q So somewhere in there?**

10 A Yeah, somewhere inside that area is where
11 it's going away.

12 **Q Okay. Could -- and I don't know the**
13 **chemistry. You're the chemistry. Could hydrogen**
14 **peroxide be added into the biotreater?**

15 MR. DIMOND: Objection, calls for
16 speculation.

17 A I actually wouldn't recommend that. I
18 think it would damage the bugs, cause BOD problems
19 and whatnot in that location.

20 **Q Solve one problem, create another, right?**

21 A A worse problem too.

22 **Q Have you proposed any alternatives for**
23 **meeting the ammonia limits?**

24 A Can you repeat that question?

1 **Q Sure. I'm just wondering if you've**
2 **proposed any alternatives for solving this problem,**
3 **reducing the ammonia.**

4 MR. DIMOND: Objection, it's vague
5 and calls for speculation.

6 A I think the alternatives that we've been
7 looking at are all based on in process removing MBT,
8 removing any kind of total Kjeldahl nitrogen that we
9 can from the systems before it makes it to the waste
10 treatment. Those are our ideal treatment points up
11 front where it's smaller streams that are
12 concentrated with less water.

13 **Q Have you considered break point**
14 **chlorination at different points in your process?**

15 A We have not. One of the things that is
16 coming out is one of the reactions uses chlorination
17 as part of the reaction and there was a suggestion
18 that there wasn't enough chlorine being added in the
19 reaction.

20 **Q What does that mean?**

21 A I'm not too familiar with how that
22 reaction works, but I can tell you that chlorine is
23 part of what stops the reaction from proceeding any
24 further forward and they were suggesting that by not

1 having enough, there was residuals left that were
2 making it down to the waste streams.

3 **Q I still don't know what that means but**
4 **I'll take your word for it. That's okay. So you're**
5 **saying that break point chlorination could not be**
6 **considered at different points in the process given**
7 **that issue that you just mentioned?**

8 A I don't see why you couldn't still
9 consider break point chlorination but I think part
10 of what they're looking at right now, and this is
11 ongoing even today --

12 **Q Right.**

13 A -- part of that is the application of
14 break point chlorination to stop the reaction and,
15 you know, clear up the product. Like I said, I'm
16 not too certain on the technicalities of the in
17 process reaction, but I think that's kind of how
18 that works.

19 **Q Is there somebody that's tasked at the**
20 **plant with trying to, besides the process**
21 **improvement team, is there somebody that's tasked**
22 **with trying to solve the ammonia problem?**

23 A Not that I'm aware of. There's just the
24 process improvement team.

1 **Q And how many people are on that team?**

2 A We typically have three or four and then
3 we bring in other process engineers from the plant
4 as needed when it's their process we want to look
5 at.

6 **Q It sounds like it's Galen, you?**

7 A Yeah.

8 **Q And --**

9 A Chris Wrobel.

10 **Q Chris, all right. He's on the phone?**

11 A Yep.

12 **Q And then anyone else?**

13 A From time to time we bring in Jim
14 Hastings. He's kind of the plant historian, being
15 the guy that's worked there the longest.

16 **Q Okay. And it's fair to say all of these
17 four have other job responsibilities?**

18 A That's correct.

19 **Q What are your thoughts about the
20 alternatives?**

21 MR. DIMOND: Objection, it's vague
22 and compound and I think it's also asked and
23 answered. You've asked about all the other
24 alternatives already.

1 A My own personal view on all these
2 different alternatives is most of them I don't think
3 are feasible as far as the end of pipe ones are
4 concerned. There's some good evidence of some of --
5 like the hydrogen peroxide, there's some good
6 evidence that that might help. I think there isn't
7 really a good silver bullet option that fixes the
8 problem though.

9 **Q When you said these -- can that answer be**
10 **read back?**

11

12 (Record read as requested.)

13

14 **Q When you say there's not a silver bullet**
15 **option, I want to make sure we know what that means.**
16 **What do you mean by that?**

17 A There isn't one thing that will bring us
18 down to within the limits that we need to be.

19 **Q Do you know whether a combination of**
20 **alternatives and improvement processes, whether that**
21 **could achieve the result?**

22 MR. DIMOND: Objection, calls for
23 speculation.

24 A It's possible. It's possible. It would

1 take a long time to install, study, do a study and
2 figure out what's going on, and with an activated
3 biological system, there could be ramifications
4 beyond -- if I put too much hydrogen peroxide in, I
5 can't sterilize my bugs. So there are risks
6 involved that need to be weighed against.

7 **Q Henry plant has four biotreaters, is that**
8 **correct?**

9 A That is correct.

10 **Q And only one is operational?**

11 A That is correct.

12 **Q What is the capacity of that biotreater,**
13 **the one that's operational?**

14 A 100 percent full is 1.4 million gallons.

15 **Q And what about the other three that are**
16 **not operational? If you can just go down and tell**
17 **me their capacity if you know it.**

18 A I do believe it's 270,000, 270,000, and
19 360,000 are the three that are not operational.

20 **Q What was the last one? I'm sorry.**

21 A 360,000.

22 **Q Thank you. And how much are you utilizing**
23 **the first biotreater? You said when full it's**
24 **1.4 million gallons.**

1 A That's correct.

2 **Q What's your average use per month or**
3 **whatever unit you want to give me?**

4 A We maintain a 90 percent level in that
5 tank.

6 **Q 90 percent level at all times?**

7 A At all times.

8 **Q Even when you shut down?**

9 A Yeah, actually even when we shut down.

10 **Q I'll get my calculator out later. It was**
11 **my understanding that one of the -- or that those**
12 **other three biotreaters were going to be repaired.**
13 **Do you know anything about that?**

14 A I know there is an ongoing project to do
15 refurbishment repair on those. I'm not part of that
16 project. I couldn't tell you where we're at in it.

17 **Q And do you know whether it was to**
18 **refurbish and repair all three?**

19 A I think they had a five-year plan for
20 doing all three, yes.

21 **Q And I think you said you're not involved**
22 **in that process?**

23 A That's correct. That's a project
24 engineer. I'm not involved in that.

1 **Q When you reviewed Mr. Flippin's 2019**
2 **report to prepare for the deposition, do you recall**
3 **what, if anything, you read about that?**

4 MR. DIMOND: Objection, it's vague.

5 A The majority of what I took out of that
6 report was the difficulties he described in
7 achieving nitrification inside the system. I feel
8 current evidence suggests that that is possible.

9 **Q That what's possible?**

10 A That nitrification is possible based on
11 current evidence that I have, again referencing the
12 decreased ammonia levels over the summer.

13 **Q You said you would have evidence of**
14 **nitrification would be possible?**

15 A Yes.

16 **Q Inside the facility?**

17 A Yes.

18 **Q And the basis for that was?**

19 A The basis for that was the reduced ammonia
20 levels that began in late summer.

21 **Q Any other evidence that you can think of**
22 **that serves as the basis for your opinion on that?**

23 A There are reports from PDC that show that
24 evidence of nitrification is the presence of nitrate

1 and nitrite in the wastewater, and at times the low
2 ammonia, that number is a lot higher. So that
3 supports the idea that we are nitrifying in our
4 biotreater now when we didn't used to be able to.

5 **Q What about running a pipe from your first**
6 **bio, at your active biotreater through another**
7 **biotreater, would that achieve nitrification?**

8 A It possibly could. We would probably have
9 to consider other nutrients that would need to be
10 added because that first bio is going to remove all
11 other nutrients. It may be difficult to sustain a
12 bug population in another tank.

13 **Q And how would you add other nutrients in**
14 **that other tank?**

15 MR. DIMOND: Objection, calls for
16 speculation.

17 A We would probably have to pump ethanol or
18 something, some kind of chemical that bugs would eat
19 off of and to grow a colony in there.

20 **Q When you say grow a colony, for the record**
21 **can you describe what that means?**

22 A Oh, to keep a sustainable population of
23 microbiological life inside the biotreater.

24 **Q And what does that do?**

1 A The microbiological life is required to
2 eat up the chemical oxygen demand, the biological
3 oxygen demand. They are the bugs that do the
4 nitrification. It's all a live biological system.

5 **Q To your knowledge have you looked at that**
6 **alternative?**

7 A To my knowledge we discussed the algae
8 wheel which is a very similar technology to that and
9 we have discussed bringing in the others online, the
10 other biotreaters online as additional biotreater
11 capacity, but I don't believe we've looked at
12 cycling a pipe from one to those to do just a
13 nitrification step.

14 **Q And would that sort of be called tertiary**
15 **nitrification?**

16 A That would be fair to call it tertiary
17 nitrification.

18 **Q Do you know of any, this may sound funny,**
19 **any reason why the plant would not want to reduce**
20 **the ammonia levels?**

21 A No, I can't think of a good reason why we
22 would want to --

23 **Q I didn't know if there was a benefit is**
24 **what I was getting at.**

1 A Oh, no.

2 **Q You can't sell the stuff. There's nothing**
3 **I guess holding you back from developing these**
4 **process improvements?**

5 A Right. Outside of reasonableness of cost
6 for any of those processes, I don't think a -- we
7 don't have a reason why we wouldn't want to.

8 **Q Do you know how long Galen has been**
9 **employed?**

10 A It's my understanding he was hired in
11 2017, but as far as actual date and time, no, I do
12 not.

13 **Q Do you know how long Jim Hastings has been**
14 **employed there?**

15 A Vaguely I know it's about 43 years,
16 45 years, somewhere in that vicinity.

17 **Q Okay. And Lance Richards was only there**
18 **six months?**

19 A Yes. Yes, something in that range.

20 **Q Right. Do you know how long Chris Wrobel**
21 **has been employed?**

22 A I do not.

23 **Q Have you met him?**

24 A I have met him a couple times.

1 **Q Have you discussed this case with Chris?**

2 A We have discussed the ammonia with Chris a
3 couple times.

4 **Q And tell me about those discussions.**

5 A Ultimately he likes the direction that
6 we've been going in trying to attack MBT at the
7 processes.

8 **Q Okay.**

9 A And he is also interested in the fact that
10 we have evidence from our outside lab that
11 nitrification can occur in our waste treatment
12 system.

13 **Q If you can achieve nitrification within
14 your waste stream system, what does that mean?**

15 A That potentially gives us the ability to
16 remove ammonia in our waste treatment system as is.

17 **Q So you wouldn't have, if you know, capital
18 improvement costs?**

19 MR. DIMOND: Objection, calls for
20 speculation.

21 A Capital improvement cost wise, I wouldn't
22 have the foggiest idea as to how much it might cost
23 us to make changes to make that a controllable
24 process.

1 Q Right. Let me -- is it the general idea
2 that that will be a cheaper alternative if you can
3 nitrify in-house? That's kind of the general
4 hypothesis that's floating around. Is that fair to
5 say?

6 A Yes, that's fair to say.

7 Q Okay. I just wanted to understand. So
8 you said the algae wheel is sort of a new concept.
9 Was that considered by you guys as a potential way
10 of achieving nitrification or is it kind of put on
11 the back burner?

12 MR. DIMOND: Objection, calls for
13 speculation and lack of foundation.

14 A I think it was mostly put on the back
15 burner but we did discuss it for several hours, what
16 are the potentials, what would be the hangups of a
17 system like that.

18 Q Okay. Have you been asked by anybody to
19 testify in the hearing?

20 A No.

21 Q Do you know anything about the hearing?

22 A I do not.

23 Q Okay. Do you have any expectations of
24 testifying at the hearing?

1 A I do not.

2 MR. GRADELESS: I think I need
3 five minutes to go over some notes and again a
4 bathroom break. I think we'll be in good shape.

5 MR. DIMOND: Okay.

6

7 (Whereupon a five-minute break was taken.)

8

9 BY MR. GRADELESS:

10 **Q Do you know who held your position as**
11 **utilities foreman before you?**

12 A I do not. I've heard a lot of names but I
13 do not.

14 **Q Okay. Do you know who held Lance**
15 **Richards' position before him?**

16 A I do believe that was David Sikes.

17 **Q And how long, if you know, how long had**
18 **David Sikes been employed there?**

19 A I do not know.

20 **Q Do you have an idea of whether it was more**
21 **than ten years?**

22 A Actually I think it was less than
23 ten years.

24 **Q More than five?**

1 A Could have been. I really couldn't tell
2 you.

3 **Q And what about the -- who held the**
4 **position before Galen, do you know?**

5 A The only other name I know is Bill Stone.
6 I think he was the guy before Galen.

7 **Q Do you know how long he had been there?**

8 A From what I've been led to believe, it was
9 awhile.

10 **Q More than ten years?**

11 A Could have been more than ten years. If
12 it was, I don't think it was much more than ten
13 though.

14 **Q More than five?**

15 A Probably.

16 **Q Okay. And you said Jim Hastings has been**
17 **there about 40 years maybe?**

18 A Yes.

19 **Q Have you discussed this case with Jim**
20 **Hastings?**

21 A I have discussed the petition with Jim
22 Hastings a couple times.

23 **Q Has he expressed any positions with**
24 **respect to this case?**

1 A Just his knowledge of the history of
2 things of how we've done in the past.

3 **Q Does he share in the belief that**
4 **nitrification cannot be achieved at the Henry plant**
5 **internally?**

6 A He is of the opinion or at least I believe
7 he is of the opinion that nitrification has never
8 been achieved sustainably at the Henry plant.

9 **Q And you disagree with Mr. Hastings?**

10 MR. DIMOND: Objection, that
11 misstates his testimony.

12 **Q I'm asking, do you disagree?**

13 A I don't necessarily disagree with him on
14 that. I think that something has changed that maybe
15 is making it possible now.

16 **Q Right, okay. And is Jim involved in the**
17 **process improvement team?**

18 A Yes, occasionally.

19 **Q And how so?**

20 A When we come up with ideas, we'll go to
21 Jim. We'll talk to Jim about has this been tried
22 before, do you know of this ever being done, and get
23 his input as far as what he knows.

24 **Q And what kind of input does Jim provide?**

1 A Historical relevance, yes, we've tried
2 something similar to this, it doesn't do this, or
3 you've got to think about how break point
4 chlorination, for instance, may impact the bugs, if
5 it gets here, it gets there; what if we can't
6 dechlorinate effectively and we over chlorinate to
7 the river. Jim has seen it all, so he can give us a
8 pretty good guidance on what he thinks.

9 **Q Does he ever suggest ideas?**

10 A Not really. We're usually past the point
11 of ideation before we get to him.

12 **Q I like that word. So you run the ideas**
13 **through Jim?**

14 A Yes.

15 **Q Has he ever suggested or approved of any**
16 **of your ideas?**

17 A Occasionally he gives me the go ahead to
18 try on a small scale like inside of a jar test or
19 something how to do that.

20 **Q I'm sorry, say that again.**

21 A Occasionally he'll give me, you know, the
22 permission to try in a jar test to see how it will
23 impact things.

24 **Q And what's a jar test? I see you**

1 **signaling what appears to be a jar here.**

2 A Correct, correct. It's a 1,000-milliliter
3 jar. You fill it 1,000 milliliters full of your
4 wastewater sample and you take the chemical,
5 whichever chemical it is you're trying to see how it
6 impacts your wastewater, there's an agitator bar on
7 a motor that spins. It helps if you're testing out
8 different flocculations, coagulations, whatever, and
9 then you can see how this chemical treatment you're
10 suggesting is going to impact your ability to settle
11 out solids or whatever.

12 **Q How did you learn to do the jar test?**

13 A That was something I partially learned in
14 college but also from one of our contractors when
15 they brought me on board, that was one of the first
16 things they trained me on was how to do that.

17 **Q You had mentioned earlier that you don't**
18 **believe there's necessarily one silver bullet type**
19 **solution with respect to ammonia at the Henry**
20 **facility. Are those the kind of ideas that you**
21 **bring to Jim when you're suggesting possible**
22 **alternatives?**

23 MR. DIMOND: Objection, it's vague.

24 A A lot of what I bring to Jim Hastings is I

1 see what seems to be a relationship between like the
2 chlorination that we put into our sanitary water and
3 the residual chlorine coming down to the river and
4 then the nitrification. So I'll go to Jim and I'll
5 say I think I see a relationship here, and he'll
6 either say yeah, no kidding, or no, I don't think
7 you're on to something, I don't think you've got
8 something there.

9 **Q Would you describe him as open-minded?**

10 A I would.

11 **Q And what's the basis for that?**

12 A He's always willing to listen to the ideas
13 that I've got.

14 **Q Any other basis?**

15 A I mean when I have an idea, he lets me
16 talk it out with him. If he believes that I won't
17 completely destroy everything, he'll let me try it.

18 **Q Okay. I guess are there any, anyone that**
19 **you have brought any ideas to that they sort of**
20 **naysay everything?**

21 A No, not really. Everybody is pretty open
22 to helping me solve this problem.

23 **Q Do you view it as your task to be solving**
24 **this problem?**

1 A Yes, actually I do feel like this is kind
2 of my opportunity to shine and show everybody that I
3 actually know my shit. Sorry, I don't know if we're
4 supposed to swear in here.

5 **Q That's okay.**

6 MR. DIMOND: As long as you've told
7 the truth, there's nothing wrong with that.

8 **Q We're all good. I'm rooting for you,**
9 **trust me. We're all rooting for you, that you know**
10 **your things. So is it tied to a job performance**
11 **eval in any way?**

12 A It is actually. Part of my evaluation is
13 working with, working on the ammonia problem. It's
14 specifically listed in my evaluation as how I'm
15 doing in those regards.

16 **Q And what does it say, do you remember?**

17 A I don't remember it word for word. I do
18 remember that it's one of the criterion that I'm
19 getting judged on is how well are we proceeding in
20 finding solutions to the ammonia problem.

21 **Q Do you have certain tasks that you need to**
22 **achieve with respect to your performance evaluation**
23 **and the ammonia problem?**

24 A I wouldn't call them tasks so much as

1 goals, so much as developing understanding.

2 **Q Okay. What are your goals, do you**
3 **remember?**

4 A I think the goal is intentionally written
5 fairly vague. I don't exactly -- like I said, I
6 don't remember what it says word for word. I just
7 know that it's related to how to get the ammonia out
8 of the water.

9 **Q How often are you up for a job performance**
10 **evaluation?**

11 A Annually.

12 **Q So January 2020?**

13 A Yes, that would be correct.

14 **Q And do you expect to receive a favorable**
15 **job performance evaluation?**

16 MR. DIMOND: Objection, it's not
17 relevant or seeking the discovery of relevant
18 information. Also I don't know how he would have
19 knowledge of what somebody else is going to write in
20 his evaluation, so I'm going to object on foundation
21 as well.

22 A I assume I'm doing a good job because
23 they're not mad at me all the time.

24 **Q Good.**

1 A I assume I'm at least not going to get in
2 trouble.

3 Q Perfect. That's what I'm asking, thank
4 you. Are you in -- we mentioned a hearing earlier
5 and you said you hadn't had any expectations of
6 testifying. Are you in the state in January?

7 A Yeah. I live here. I'm not planning
8 on --

9 Q Just making sure you're not leaving the
10 country. It's January 14th and 15th that we may
11 need you, and we may not but we can talk about that
12 later. Tom, I think I'm finished with Mr. Winters.

13 MR. DIMOND: Okay. Let's take a
14 short break.

15

16 (Whereupon a five-minute break was taken.)

17

18 CROSS EXAMINATION

19 BY MR. DIMOND:

20 Q Mr. Winters, my name is Tom Dimond. I
21 represent Emerald Polymer Additives, your employer,
22 and I have just a few follow-up questions for you.

23 In response to some of Mr. Gradeless'
24 questions, you said that after the plant started

1 back up in August, that the plant saw very low
2 levels of ammonia in the wastewater treatment plant
3 effluent. Do you recall that?

4 A Yes.

5 Q Since that time in late August, what has
6 happened to the levels of ammonia that you're seeing
7 in the plant effluent?

8 A Occasionally the ammonia in the plant
9 effluent is at the detection limit, the detection
10 limit capabilities of Peoria Disposal Company's
11 laboratories, but that level fluctuates and we have
12 no understanding as to what causes the fluctuations.

13 Q So since late August, how high have you
14 seen it?

15 A Since late August we've seen it as high as
16 the 40's, 40 milligrams per liter. There may be
17 some data points in the 50's.

18 Q Based on what you currently know about the
19 operations of the plant and the operation of the
20 wastewater treatment system, do you believe that --
21 strike that.

22 Based on what you know about the
23 operations of the plant and the wastewater treatment
24 system, can the plant foresee that it will be able

1 to consistently achieve the levels of ammonia that
2 you have seen since mid August?

3 A At our current run rates, that may be
4 possible, but if production were to pick up, if our
5 volumes were to pick up, we currently don't have a
6 good knowledge of what's causing the ammonia levels
7 to be low so we wouldn't be able to control it if
8 production levels went back up high again. We would
9 simply be at the mercy of the system.

10 Q Now, you talk about the production levels.
11 In broad terms what are the production levels of the
12 plant in 2019 versus 2018?

13 A In broad terms some processes in 2018 set
14 production records running the fastest that they've
15 ever ran. In 2019 they've been idle for more than
16 half the year.

17 Q And have you continued to run at lower
18 production rates since you restarted in mid August?

19 A That's correct. If anything, production
20 rates are lower now than they were prior to the
21 August shutdown.

22 Q And could those lower production levels be
23 contributing to the lower concentrations of ammonia
24 that you've been seeing coming out of the wastewater

1 treatment system?

2 A Absolutely.

3 Q Do you recall Mr. Gradeless also asked you
4 some questions about the second, third, and fourth
5 biotreaters?

6 A Yes.

7 Q If you took the final effluent from the
8 wastewater treatment system and biotreaters two,
9 three, and four were repaired and you simply ran the
10 water into the biotreaters and you did nothing else,
11 would that materially impact the amount of ammonia
12 in the final effluent after the three biotreaters?

13 A It may to a small degree, but it's not
14 extremely likely without additional steps.

15 Q And what would the additional steps be?

16 A I would need to add nitrifying bugs.
17 Without adding any nitrifying bugs to it, it
18 wouldn't work. And then I would need to add
19 additional nutrients to those biotreaters for those
20 nitrifying bugs to eat beyond just the ammonia.

21 Q Because the bugs need the nutrients to
22 stay alive?

23 A That's correct.

24 Q What else would you need to do?

1 A Once I had nitrified, I would be
2 reintroducing solids to the water and I would need
3 to pull those solids back out before I could send
4 that water down to discharge.

5 **Q And why would you need to pull those**
6 **solids out?**

7 A We have a total suspended solids limit on
8 what goes to the river. We would have to make sure
9 we were in compliance with that as well as our
10 ammonia standard before we could put that water in
11 the river.

12 **Q Okay. All those steps you've described,**
13 **is that in essence the tertiary nitrification**
14 **alternative that Mr. Flippin considered in his**
15 **report in 2019?**

16 A It is very similar to. In Flippin's
17 report, I don't recall him mentioning the need to
18 reclean the solids from the water before putting it
19 in the river. I think he oversighted that fact.

20 **Q My math is that 90 -- you also testified**
21 **about the capacity of the various biotreaters. Do**
22 **you remember that?**

23 A Yes.

24 **Q And you said that you maintain the level**

1 of water in the 1.4 million-gallon biotreater at
2 90 percent, correct?

3 A That's correct.

4 Q By my calculation 90 percent of
5 1.4 million is 1.26 million. Does that sound right
6 to you?

7 A Without a calculator, yes, that sounds
8 right.

9 Q And you also told us that the capacity of
10 biotreaters two, three, and four is respectively,
11 270,000, 270,000, and 360,000, right?

12 A That's correct.

13 Q So if I add that up, that's 900,000 total.
14 Does that seem about right?

15 A That seems about right.

16 Q So these three biotreaters, these other
17 three biotreaters, they don't have enough capacity
18 to handle 1.26 million gallons of water, do they?

19 A No, they do not.

20 MR. DIMOND: That's all I've got.

21

22 REDIRECT EXAMINATION

23 BY MR. GRADELESS:

24 Q Mr. Winters, you mentioned lower

1 production levels could also potentially have
2 something to do with the lower ammonia nitrogen
3 levels?

4 A Yes.

5 Q Is it also possible that the lower
6 production levels have nothing to do with the lower
7 ammonia levels?

8 A That's extremely unlikely. The lower
9 numbers, the lower production values are directly
10 related to the amount of total Kjeldahl nitrogen and
11 ammonia that wind up hitting the waste treatment
12 facility.

13 Q I guess I'm just confused. Then why were
14 you surprised in the summer of 2019 that the ammonia
15 was low?

16 A We were surprised because we had been told
17 nitrification wasn't possible. So we expect it to
18 at least match up with what Mexichem was sending us
19 for ammonia and we didn't see that. We saw evidence
20 of nitrification.

21 Q And you just mentioned the Mexichem was
22 sending you something. What were they sending you?

23 A They were sending us their regular
24 wastewater streams.

1 **Q Gotcha. Do you currently remove suspended**
2 **solids at the Henry facility?**

3 A We do.

4 MR. GRADELESS: I have nothing
5 further.

6 MR. DIMOND: We reserve signature.

7

8 WITNESS FURTHER SAYETH NOT;

9 BY AGREEMENT, SIGNATURE NOT WAIVED.

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1 STATE OF ILLINOIS)
)
2 COUNTY OF PEORIA)

3 I, PAULA A. MORSCH, Certified Shorthand
4 Reporter and Officer of the Court authorized to
5 report depositions, do hereby certify that
6 heretofore, to-wit, on the 18th day of December,
7 2019, at the hour of 9:00 a.m., MARK E. WINTERS,
8 Engineer, personally appeared before me at 412 SW
9 Washington Street, Ste. D, in the City of Peoria,
10 County of Peoria, State of Illinois.

11 I further certify that the said witness
12 was by me first duly sworn to testify to the truth,
13 the whole truth and nothing but the truth in the
14 cause aforesaid, that the testimony then given by
15 said witness was reported stenographically by me in
16 the presence of said witness and afterwards reduced
17 to typewriting, and the foregoing is a true and
18 correct transcript of the testimony so given by said
19 witness as aforesaid.

20 I further certify that the signature of
21 the witness to the deposition was not waived by
22 agreement of counsel.

23 I further certify that I am not counsel
24 for nor in any way related to any of the parties to

1 this suit, nor am I in any way interested in the
2 outcome thereof.

3

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_____ C.S.R.

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ALARIS LITIGATION SERVICES

January 6, 2020

ICE MILLER
Thomas W. Dimond, Esq.
200 W. Madison Street, Ste. 3500
Chicago, IL 60606

IN RE: Petition of Emerald Polymer Additives, LC
for an Adjusted Standard from 35 Ill. Adm.
Code 304.122(b)

Dear Mr. Dimond,

Please find enclosed your copies of the deposition of
MARK E. WINTERS taken on December 18, 2019 in the
above-referenced case. Also enclosed is the original
signature page and errata sheets.

Please have the witness read your copy of the
transcript, indicate any changes and/or corrections
desired on the errata sheets, and sign the signature
page before a notary public.

Please return the errata sheets and notarized
signature page to our office at 711 N 11th Street, St.
Louis, MO 63101 for filing prior to trial date.

Sincerely,

Paula A. Morsch

1 ERRATA SHEET
2 Witness Name: MARK E. WINTERS
3 Case Name: Petition of Emerald Polymer Additives, LC
4 for an Adjusted Standard from 35 Ill. Adm.
5 Code 304.122(b)
6 Date Taken: DECEMBER 18, 2019
7
8 Page # _____ Line # _____
9 Should read: _____
10 Reason for change: _____
11
12 Page # _____ Line # _____
13 Should read: _____
14 Reason for change: _____
15
16 Page # _____ Line # _____
17 Should read: _____
18 Reason for change: _____
19
20 Page # _____ Line # _____
21 Should read: _____
22 Reason for change: _____
23
24 Witness Signature: _____

1 STATE OF _____)

2 COUNTY OF _____)

3 I, MARK E. WINTERS, do hereby certify:

4 That I have read the foregoing deposition;

5 That I have made such changes in form

6 and/or substance to the within deposition as might

7 be necessary to render the same true and correct;

8 That having made such changes thereon, I

9 hereby subscribe my name to the deposition.

10 I declare under penalty of perjury that the

11 foregoing is true and correct.

12 Executed this _____ day of _____,

13 20____, at _____.

14

15

16

17

18

MARK E. WINTERS

19

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21

NOTARY PUBLIC

22 My Commission Expires:

23 84958

24

MARK E. WINTERS 12/18/2019

A	Adm 1:4 74:6 75:2 affect 5:18 aforesaid 72:14 72:19 AGENCY 2:7 agitator 60:6 agreed 27:1 agreement 71:9 72:22 ahead 59:17 air 39:16 ALARIS 74:1 algae 37:1 38:19 38:22 41:18,19 52:7 55:8 alive 67:22 alkaline 40:9 allow 19:3 alternative 37:16 39:24 42:5 52:6 55:2 68:14 alternatives 36:17,22 37:6 41:21 42:5 43:22 44:2,6 46:20,24 47:2 47:20 60:22 America 7:3 ammonia 18:15 27:11,19 29:2 29:22 31:24 32:3,17,22 33:2,6,23 34:9 35:10 43:23 44:3 45:22 50:12 50:19 51:2 52:20 54:2,16 60:19 62:13 62:20,23 63:7 65:2,6,8 66:1 66:6,23 67:11 67:20 68:10 70:2,7,11,14,19 amount 37:21	39:12,12 67:11 70:10 and/or 74:12 76:6 Annually 63:11 answer 5:15 6:3 11:14,15,15 13:1 20:16,19 21:5 26:18 42:21 47:9 answered 46:23 anticipate 5:12 anybody 12:2 14:6 20:22 21:17 36:5 40:8,11,19 55:18 Apartment 6:10 appeared 72:8 appears 60:1 application 36:24 37:16 38:3,6,9,12,16 45:13 apply 1:12 appreciate 34:23 36:10 approach 12:11 12:11 approached 12:13 approved 59:15 area 43:10 areas 30:12 argue 5:12 aside 14:9 25:11 38:6 asked 5:16 12:15 14:13 46:22,23 55:18 67:3 asking 30:1 58:12 64:3 assist 35:15 Assistant 2:8 assume 63:22	64:1 assuming 43:2 Attached 3:14 attack 54:6 attainable 27:12 attend 26:9 attended 26:16 attention 21:19 attorney 12:3,19 attorneys 5:11 audible 5:1 August 28:22 28:23 65:1,5 65:13,15 66:2 66:18,21 author 23:8 authorized 72:4 available 36:4 Avenue 2:8 average 49:2 aware 20:22 34:7,14 36:12 45:23 awhile 57:9	50:22 61:11,14 bathroom 6:5 56:4 BBTS 25:8 began 25:23 25:24 50:20 belief 58:3 believe 11:11 13:18 15:7 21:23 25:5 26:24 27:6 28:22 32:14 34:3 35:10,14 35:17 36:19 38:17,21 40:4 42:1 48:18 52:11 56:16 57:8 58:6 60:18 65:20 believes 61:16 benefit 31:11,12 52:23 better 16:22,24 17:2 18:5 33:16 beyond 48:4 67:20 big 33:10 bigger 33:13 biggest 9:15 31:13 Bill 57:5 bio 51:6,10 biological 48:3 52:2,4 biotreater 38:24 39:14 41:10 42:20 42:24 43:3,4 43:6,14 48:12 48:23 51:4,6,7 51:23 52:10 69:1 biotreaters 41:11 48:7 49:12 52:10 67:5,8 67:10,12,19
		B		
		B 3:7 Bachelor's 8:13 back 6:22 8:10 11:22 28:23 29:1 31:1 33:2 36:18 37:11 38:2 47:10 53:3 55:11,14 65:1 66:8 68:3 background 8:11 bad 39:17 bar 60:6 base 19:18 based 24:18 44:7 50:10 65:18,22 basic 24:14,17 basically 24:15 basis 50:18,19		

MARK E. WINTERS 12/18/2019

68:21 69:10,16 69:17 bit 8:10 11:23 16:5 37:2 block 24:14,17 board 1:1 4:13 60:15 BOD 43:18 boss 15:23 boy 19:17 break 6:5,5 40:20,21 44:13 45:5,9 45:14 56:4,7 59:3 64:14,16 bring 46:3,13 47:17 60:21 60:24 bringing 27:13 52:9 broad 66:11,13 brought 21:18 60:15 61:19 bug 51:12 bugs 43:18 48:5 51:18 52:3 59:4 67:16,17 67:20,21 building 24:14 24:17 38:18 buildings 9:24 10:1 bullet 47:7,14 60:18 burner 55:11,15 byproduct 24:16	calls 37:17 43:15 44:5 47:22 51:15 54:19 55:12 calm 12:24 capabilities 65:10 capacity 48:12 48:17 52:11 68:21 69:9,17 capital 54:17,21 carbon 37:11 39:23 case 4:13 5:20 13:3,11 14:13 54:1 57:19,24 74:9 75:2 Caterpillar 7:12 cause 29:10 33:5 43:18 72:14 causes 65:12 causing 29:11,12 66:6 CCA 26:24 27:5 certain 15:24 45:16 62:21 certainty 34:16 certificates 8:19 certifications 8:19 Certified 1:14 72:3 certify 72:5,11 72:20,23 76:3 chance 27:5 change 30:15 30:16 31:14 75:6,10,14,18 75:22 changed 30:13 30:23 31:6 58:14 changes 33:8 33:15 54:23 74:12 76:5,8	charge 9:15 cheaper 55:2 chemical 8:13 51:18 52:2 60:4,5,9 chemistry 19:20 42:11 43:13,13 Chicago 2:3 74:4 Chiefly 9:14 chlorinate 59:6 chlorination 40:20,22 44:14,16 45:5 45:9,14 59:4 61:2 chlorine 44:18 44:22 61:3 Chris 46:9,10 53:20 54:1,2 City 1:17 72:9 Civil 1:11 clarification 34:22 clarifier 31:4,5,6 42:23 43:6,8 clarify 36:7 clear 45:15 clearly 5:2 29:20 close 10:14 closely 29:23 coagulations 60:8 Code 1:4,11 74:6 75:3 college 37:20 60:14 colony 51:19,20 combination 47:19 come 25:14 26:19 41:21 58:20 comes 17:10 coming 29:22 44:16 61:3	66:24 Commission 76:22 companies 18:2 18:22 company 8:5 18:19,20 Company's 65:10 compare 18:24 19:9 compared 33:11 comparing 18:4 18:6,21,23 comparison 19:1 complete 14:23 completed 6:3 completely 61:17 completion 19:16,22 compliance 68:9 components 17:3 compound 46:22 compressed 9:17,23 10:11 10:12 concentrated 44:12 concentration 33:24 concentrations 66:23 concept 41:15 55:8 concerned 47:4 concerns 38:16 conduct 19:3 confused 70:13 consider 45:9 51:9 considerably 27:11 considered	25:16,17,20 44:13 45:6 55:9 68:14 consistently 66:1 containing 13:14 continue 5:17 continued 66:17 continuous 16:6 16:9,19 25:22 27:9,14 contract 7:22 contractor 7:12 contractors 18:2 60:14 contributing 66:23 contributor 33:10 control 1:1 4:13 66:7 controllable 54:23 conversation 13:9 23:24 cooling 9:17,22 10:6,8 coordinator 21:22 copies 74:8 copy 23:10,11 74:11 correct 7:9 10:4 11:2 15:2,3 19:5 22:3,6 23:6,7 27:17 30:14,18 32:18 35:23,24 36:7 36:19 46:18 48:8,9,11 49:1 49:23 60:2,2 63:13 66:19 67:23 69:2,3 69:12 72:18 76:7,11 corrections 74:12
C C.S.R 1:14 73:5 calculation 69:4 calculator 49:10 69:7 call 52:16 62:24 called 1:9 4:3 8:5 18:20 52:14				

<p>cost 39:15 53:5 54:21,22 costs 54:18 counsel 2:8,8 72:22,23 country 64:10 County 1:18 72:2,10 76:2 couple 9:16 12:4 22:12 26:7,17 42:4 53:24 54:3 57:22 course 13:8 33:7 court 1:12 5:1 6:10 72:4 create 43:20 criterion 62:18 Cross 3:4 64:18 curious 37:22 current 8:12 18:24 50:8,11 66:3 currently 9:10 16:12,13 18:16 39:14 42:17 65:18 66:5 71:1 cycling 52:12</p> <hr/> <p style="text-align: center;">D</p> <p>D 1:17 3:1 72:9 damage 43:18 data 17:9,23,24 18:3,8 35:19 65:17 database 18:1 date 14:18,19 22:15 53:11 74:18 75:3 dates 7:4 Dave 14:3,4 32:13 David 56:16,18 day 1:15 31:6,9 33:24 72:6</p>	<p>76:12 Dear 74:7 December 1:16 7:6,7,8,8,19,19 7:20,20 15:11 72:6 74:9 75:3 dechlorinate 59:6 dechlorination 41:1,4 declare 76:10 decreased 50:12 degree 34:16 39:2 67:13 delineate 9:22 demand 52:2,3 Department 8:22 depose 12:19 deposition 1:9 3:9 4:10,18,19 11:21 12:3 14:11 14:15,22 15:2 35:3 50:2 72:21 74:8 76:4,6,9 depositions 1:13 13:24 14:1,6 72:5 describe 51:21 61:9 described 50:6 68:12 designations 9:7 desired 74:13 despite 33:11 destroy 61:17 destroys 42:12 detectable 29:3 detection 65:9 65:9 determine 29:7 29:9 developing</p>	<p>53:3 63:1 device 18:14 different 8:4 9:24 10:1 18:2 18:3 19:13,20 30:8,12 40:23 44:14 45:6 47:2 60:8 difficult 32:15 51:11 difficulties 50:6 dilution 37:5 39:1,7,20 Dimond 2:2 3:4 12:3 15:3 21:3 37:17 43:15 44:4 46:21 47:22 50:4 51:15 54:19 55:12 56:5 58:10 60:23 62:6 63:16 64:13,19,20 69:20 71:6 74:3,7 Direct 3:3 4:8 direction 54:5 directly 70:9 disagree 58:9 58:12,13 discharge 68:4 discovery 63:17 discuss 26:13 26:20 27:2,14 37:11 40:14 41:17,19 55:15 discussed 12:8 22:21 29:18,19 36:19 37:4,7 37:23 38:2,17 38:21 40:4,13 40:14 41:20 41:22 42:1,3,4 52:7,9 54:1,2 57:19,21 discussing 23:2 23:13 38:8</p>	<p>40:6,7,10,21 41:9 discussion 38:20 40:1 discussions 28:7,8,9,12,14 28:18 54:4 Disposal 65:10 dispose 20:21 21:2 disposed 20:15 disposing 20:23 21:4 Div 2:8 DMR 29:1 34:10 35:19 DMR's 14:12 33:18,20,21 34:1,4 35:21 35:22 document 13:16 35:8,8,11,13 36:11 documents 14:10,14,21 15:6,7,18 36:14 doing 16:3 29:9 31:11,12 33:8 49:20 62:15 63:22 download 23:16 23:17 draft 35:12 dragged 22:11 drawings 37:24 drinking 8:22 9:3 drive 19:21 driving 19:15 drop 32:4,17 dropped 27:11 32:1 drums 25:9 duly 4:4 72:12 dumped 39:15 dumping 21:9</p>	<p>29:21 duties 16:5 35:18</p> <hr/> <p style="text-align: center;">E</p> <p>E 1:9 3:1,3,7 4:2 72:7 74:9 75:1 76:3,18 E-D-W-A-R-D 4:16 E-mailing 22:10 earlier 15:21 60:17 64:4 East 2:8 6:8 eat 51:18 52:2 67:20 education 8:15 educational 8:11 Edward 4:16 effect 39:19 effectively 31:19 59:6 efficiencies 19:11 25:12,14 efficiency 17:2 20:12 24:2 effluent 29:2 65:3,7,9 67:7 67:12 effluents 29:4 effort 39:12 efforts 13:14 14:9 EHS 13:23 either 22:20 40:11 61:6 elaborate 5:5 else's 14:6 Emerald 1:3 2:5 4:11 6:12,14,19 6:20 8:21 9:10 64:21 74:5 75:2 employed 6:11 6:13 53:9,14 53:21 56:18 employee 7:22</p>
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<p>employees 11:1 11:3 26:15 36:8 employer 7:1 64:21 enclosed 74:8 74:9 encouraging 33:17 energy 39:2,12 engineer 3:3 4:2 49:24 72:8 engineering 7:23 8:5,14 engineers 46:3 ensure 20:4 entail 10:5 19:11 entails 10:6 19:12 entered 27:1 entire 24:15 entirely 15:24 environmental 2:6 21:21 envision 5:20 EPA 9:4 22:17 27:20,21,24 28:15,16 36:18 equipment 17:6 18:12,13 errata 74:10,13 74:16 75:1 Esq 2:2,7 74:3 essence 68:13 ethanol 51:17 eval 62:11 evaluating 33:5 evaluation 62:12,14,22 63:10,15,20 everybody 32:4 32:6,9 36:9 61:21 62:2 evidence 47:4 47:6 50:8,11 50:13,21,24</p>	<p>54:10 70:19 exactly 63:5 examination 1:10 4:8 64:18 69:22 examined 4:5 example 41:12 exceedance 33:23 exceedances 34:6 exceptionally 28:24 exchange 40:12 Executed 76:12 Exhibit 3:9 35:1 35:4 exited 23:14 expect 12:10,10 33:9 63:14 70:17 expectations 55:23 64:5 expected 32:2 32:16,19,23 expensive 40:5 experience 16:11 Expires 76:22 explain 19:17 expressed 57:23 extremely 67:14 70:8</p> <hr/> <p style="text-align: center;">F</p> <p>facilities 41:2 facility 9:11 16:22 20:9 23:5 29:20 35:22,23 41:5 42:20 50:16 60:20 70:12 71:2 fact 40:2 54:9 68:19 fair 17:19 25:19</p>	<p>37:21 39:10 46:16 52:16 55:4,6 fairly 37:21 63:5 familiar 37:21 41:1 42:11 44:21 far 21:8 40:3 41:24 47:3 53:11 58:23 fastest 66:14 favorable 63:14 feasible 47:3 feel 50:7 62:1 fellow's 14:3 felt 39:8 fertilize 21:12 fertilizer 21:7 fertilizers 21:15 fertilizing 22:4 fewer 17:3 figure 48:2 filing 74:18 fill 60:3 final 67:7,12 find 74:8 finding 62:20 fine 40:19 finished 64:12 firm 26:18 first 4:4,24 5:10 6:17 12:15 27:23 42:19 48:23 51:5,10 60:15 72:12 five 56:3,24 57:14 five-minute 56:7 64:16 five-year 49:19 fixes 47:7 Flippin 32:14 68:14 Flippin's 14:16 37:9,10 50:1 68:16 floating 55:4</p>	<p>flocculations 60:8 Flossmoor 6:10 flow 10:7 33:11 fluctuates 65:11 fluctuations 65:12 focus 17:1,17 29:11 foggiest 54:22 folks 26:9 follow-up 64:22 follows 4:6 foregoing 72:17 76:4,11 foreman 6:21 6:24 7:2,4,11 9:10,13 56:11 foremen 11:14,15 foresee 65:24 forgot 8:23 forgotten 37:14 form 5:3 13:20 41:20 76:5 formulas 19:13 25:11 forward 44:24 found 21:14 foundation 55:13 63:20 four 8:2 11:4 25:3 46:2,17 48:7 67:9 69:10 fourth 67:4 Friday 15:10,10 15:12,14,16 front 44:11 full 4:14 48:14 48:23 60:3 functions 10:3 funny 52:18 further 5:4 23:13 44:24 71:5,8 72:11 72:20,23</p>	<p style="text-align: center;">G</p> <p>Galen 11:19 12:4 12:8,14 15:1,8 15:17,22,22 16:2 28:5,10 28:12 46:6 53:8 57:4,6 gallons 48:14 48:24 69:18 gas 9:17 gasses 39:16,19 gathering 35:16 general 41:15 55:1,3 generally 30:3 getting 52:24 62:19 Giffin 14:3,4 32:13 give 15:5 22:24 23:4 26:18 42:21 49:3 59:7,21 given 15:7 45:6 72:14,18 gives 54:15 59:17 go 4:21 5:6 12:16 15:14 34:24 37:11 38:1 48:16 56:3 58:20 59:17 61:4 goal 20:2 63:4 goals 63:1,2 goes 43:6 68:8 going 7:18 19:23 27:3 34:24 38:3 43:11 48:2 49:12 51:10 54:6 60:10 63:19,20 64:1 good 10:7,10 20:16,19 47:4 47:5,7 52:21</p>
---	--	--	---	---

56:4 59:8 62:8 63:22 63:24 66:6 googled 21:14 Gotcha 23:23 71:1 Gradeless 2:7 3:3,4 4:9 35:6 56:2,9 67:3 69:23 71:4 Gradeless' 64:23 graduate 8:15 Grand 2:8 great 25:4 39:8 39:11 greenhouse 39:16,18 ground 4:21 group 33:5 grow 51:19,20 guess 13:1 16:17 28:14 29:17 30:4 31:23 32:19 40:16 53:3 61:18 70:13 guidance 59:8 guy 10:13 46:15 57:6 guys 10:18 13:2 17:11 18:13 20:12 21:1 55:9	27:10 28:20 29:1,7 30:16 30:19 65:6 happening 10:15 happens 42:10 hard 19:14 hardness 18:15 Hastings 11:9 15:21 46:14 53:13 57:16 57:20,22 58:9 60:24 Hastings' 15:23 Hathcock 11:19 12:4 28:6 he'll 59:21 61:5 61:17 head 5:22 11:11 11:13 25:15 health 8:23 21:21 heard 34:15 37:1 56:12 hearing 55:19 55:21,24 64:4 heat 39:13 heated 39:22 held 56:10,14 57:3 help 5:2 21:7 36:10 47:6 helping 36:13 61:22 helps 21:16 60:7 Henry 7:3 9:11 10:17 16:5 41:4 41:23 42:20 48:7 58:4,8 60:19 71:2 heretofore 72:6 high 21:15 38:20 65:13 65:15 66:8 higher 51:2 highest 34:8,10 highly 38:13	hired 53:10 historian 46:14 Historical 59:1 histories 12:1 history 6:23 11:22 13:11 15:19 58:1 hitting 70:11 hold 6:24 7:15 8:1,20 9:2 27:1 holding 53:3 Holland 7:23 honestly 20:16 hour 1:16 72:7 hours 26:7 55:15 Houston 14:16 32:14 huh-uh 5:6 hydrogen 42:6 42:7,9 43:13 47:5 48:4 hydrology 37:24 38:1 hypothesis 55:4	IEPA 2:10 4:3 IL 2:3,9 74:4 Ill 1:4 74:6 75:2 Illinois 1:1,11,15 1:18 2:6 7:3 8:22 9:3 22:17 27:20,21,24 28:15,16 72:1 72:10 impact 59:4,23 60:10 67:11 impacts 60:6 improve 19:14 improvement 16:7,10,19 25:23 27:9 45:21,24 47:20 54:18 54:21 58:17 improvements 17:12,14,23 34:13,19 53:4 in-company 36:4 in-house 18:18 19:4,7 26:2 55:3 included 28:5 including 42:6 increase 17:7 indicate 74:12 indicated 29:2 individual 20:9 industry 21:7 37:20 inflection 5:8 information 23:14 33:21 35:16 36:1,3 63:18 informed 38:11 ingredients 19:19 input 37:7 58:23,24 inside 42:13 43:10 50:7,16	51:23 59:18 install 48:1 instance 59:4 instruments 8:8 intentionally 63:4 interested 23:12 33:22 54:9 73:1 interesting 23:1 23:3 internal 17:14 internally 58:5 interrupt 6:2 investigation 29:17 invited 28:3 involved 27:8 36:16 48:6 49:21,24 58:16 Ion 40:12 isolate 42:15 issue 23:2 40:23,24 45:7 items 14:14
<hr/> H <hr/>				<hr/> J <hr/>
H 3:7 H-A-C-H 18:20 Hach 18:14,20 half 66:16 hand 34:24 handle 10:18 17:9 69:18 hangups 55:16 happen 30:15 32:11 happened		<hr/> I <hr/>	included 28:5 including 42:6 increase 17:7 indicate 74:12 indicated 29:2 individual 20:9 industry 21:7 37:20 inflection 5:8 information 23:14 33:21 35:16 36:1,3 63:18 informed 38:11 ingredients 19:19 input 37:7 58:23,24 inside 42:13 43:10 50:7,16	January 6:17 22:2 63:12 64:6,10 74:2 jar 59:18,22,24 60:1,3,12 Jim 11:9 16:1 46:13 53:13 57:16,19,21 58:16,21,21,24 59:7,13 60:21 60:24 61:4 job 6:19,23 7:10 7:11 10:16 16:5 35:18 46:17 62:10 63:9,15 63:22 jobs 6:23 judged 62:19 June 22:17 28:1
		I'mabouttobe... 12:17 ICE 2:2 74:3 ID 3:8 idea 37:5,11 39:9,11,17 51:3 54:22 55:1 56:20 61:15 ideal 44:10 ideas 36:20 58:20 59:9,12 59:16 60:20 61:12,19 ideation 59:11 identification 35:4 identified 33:14 idle 66:15		

MARK E. WINTERS 12/18/2019

36:19	knows 10:14 58:23	32:17,22 33:2 34:8 50:12,20 52:20 65:2,6 66:1,6,8,10,11 66:22 70:1,3,6 70:7	19:10,12,19 20:4,12,14 24:3 25:12 37:2 44:7 45:10	materially 67:11 materials 10:23 math 68:20 matter 1:3 4:11 MBDS 25:8 MBT 13:15 19:15 19:18,22,23 20:4,14,15,23 21:11,15 24:6,11 24:20,22,23 25:1,9,12 29:4 29:19,21 30:4 31:14 32:10 33:10 42:5,8 42:10,12,15,19 42:23 44:7 54:6
<hr/> K <hr/>	<hr/> L <hr/>	license 1:14 8:22	lot 16:1,21 17:1,13 18:16 26:18 28:11 37:23 51:2 56:12 60:24	MBT's 22:4 mean 9:23,23 21:4 28:3 31:22 41:8 44:20 47:16 54:14 61:15 means 45:3 47:15 51:21 Medical 8:6 meet 26:1,2 meeting 25:24 26:20 27:24 28:8,8,9,10,15 28:15 36:18,21 43:23 meetings 26:6 26:10,16,19 27:1,14 mentioned 13:10 16:4 18:12 19:10 24:2 33:17 45:7 60:17 64:4 69:24 70:21 mentioning 68:17 Mercaptoben... 24:12 mercy 66:9
keep 12:24 17:2 17:3 51:22	L 2:7	license 9:3,6	Louis 74:18	lowered 33:6
keeping 13:15	lab 7:23 8:5 17:7 18:3,24 19:9 54:10	life 51:23 52:1	low 51:1 65:1 66:7 70:15	lower 66:17,20 66:22,23 69:24 70:2,5 70:6,8,9
kidding 61:6	laboratories 65:11	likes 54:5	lowered 33:6	M
kind 6:22 10:13 12:6 13:5 18:12 18:17 21:8 32:22 38:24 41:10 44:8 45:17 46:14 51:18 55:3,10 58:24 60:20 62:1	lack 55:13	limit 29:3 65:9 65:10 68:7	M-A-R-K 4:16	mad 63:23
kinds 39:15	lagged 31:18	limited 17:18	Madison 2:3 74:4	mail 22:7
Kjeldahl 44:8 70:10	Lance 21:18,20 22:5,8,19,24 23:15,18 36:20 37:23 37:23 38:8,11 38:12 40:13,21 53:17 56:14	limiting 20:14	mail 22:7	maintain 49:4 68:24
knew 37:23 39:21	land 36:24 37:15 38:3,5,8 38:12,16	limits 43:23 47:18	maintain 49:4 68:24	majority 50:5
know 4:23 11:13 12:9 16:1 18:24 21:10 25:4,22 25:24 26:16 26:17 27:4,14 31:12 32:22 39:18 42:12,13 43:5,12 45:3 45:15 47:15,19 48:17 49:13,14 49:17 52:18 52:23 53:8,13 53:15,20 54:17 55:21 56:10,14,17,19 57:4,5,7 58:22 59:21 62:3,3,9 63:7 63:18 65:18 65:22	landfill 21:9	Line 75:4,8,12 75:16,20	manager 11:19	making 45:2 58:15 64:9
land 36:24 37:15 38:3,5,8 38:12,16	Largely 19:12 27:10	link 23:15	manager's 13:23	management 18:8
landfill 21:9	late 50:20 65:5 65:13,15	list 14:23 25:3,5	manipulate 19:20	marching 16:2
Largely 19:12 27:10	lately 17:1	listed 62:14	Mark 1:9 3:3 4:2 4:10,16,19 72:7 74:9 75:1 76:3,18	marked 3:7 35:4
late 50:20 65:5 65:13,15	latest 27:4,6	listen 61:12	match 70:18	
LC 1:4 74:5 75:2	LC 1:4 74:5 75:2	liter 34:11 65:16		
leak 10:13	leak 10:13	LITIGATION 74:1		
leaks 10:14,15	leak 10:13	little 8:10 11:22 16:4 29:22 33:10,12 37:1		
learn 60:12	learn 60:12	live 6:7 52:4 64:7		
learned 60:13	learned 60:13	LLC 2:5		
learning 28:12	learning 28:12	location 43:19		
leaving 64:9	leaving 64:9	long 6:13 7:15 8:1 26:6 48:1 53:8,13,20 56:17,17 57:7 62:6		
led 8:11 57:8	led 8:11 57:8	longest 46:15		
left 19:24 20:4 45:1	left 19:24 20:4 45:1	look 5:7 31:14 35:19 46:4		
legacy 32:8	legacy 32:8	looked 13:16 14:10,12 34:2 52:5,11		
Legal 2:8	Legal 2:8	looking 16:21 16:23 17:5,6,11 17:22 18:1,7,13		
Let's 64:13	Let's 64:13			
level 33:6 34:10 38:20 49:4,6 65:11 68:24	level 33:6 34:10 38:20 49:4,6 65:11 68:24			
levels 27:11 29:2 31:24	levels 27:11 29:2 31:24			

met 14:5 22:17 27:20,21 53:23,24	N	non-transient 8:23,24	8:3,7 9:9,13,21 10:2,24 11:17 12:2 13:2,5,10 14:24 15:17 17:21 18:21 20:1,18 22:1 23:23 24:13 24:24 25:7 27:4,23 29:14 32:24 33:17 34:12 35:12 36:5,10,22 37:3,12 39:10 39:18 41:21 42:19 43:1,12 45:4 46:16 53:17 54:8 55:7,18,23 56:5,14 57:16 58:16 61:18 62:5 63:2 64:13 68:12	orders 10:23 16:2 original 74:9 ought 16:2 outcome 73:2 outside 12:3 15:3 18:24 38:20 41:18 53:5 54:10 outsource 18:17 oversee 10:2 oversighted 68:19 oxidizes 42:12 oxygen 52:2,3 oxygenate 42:8 ozonation 40:6
methods 41:2	N 3:1 74:17	noncom 9:2	O	P
Mexichem 26:9 26:15,20 27:2 29:15 70:18,21	name 4:14 14:3 57:5 64:20 75:1,2 76:9	noncommunity 9:1	object 5:12,13 21:3 63:20	package 18:9 packages 18:3 page 3:2 74:10 74:14,17 75:4 75:8,12,16,20
Mexichem's 29:22	names 56:12	North 2:8 7:3	objection 5:15 37:17 43:15 44:4 46:21 47:22 50:4 51:15 54:19 55:12 58:10 60:23 63:16	paper 21:13,14 37:20 part 16:6,14,16 17:15 20:6 21:13 22:14 25:17 26:24 28:19 29:1,8 34:18 35:18 44:17,23 45:9 45:13 49:15 62:12
Michigan 7:23 7:24 8:14	naturally 13:8	notarized 74:16	OBTS 25:8	partially 60:13 particular 35:11 40:23 particularly 33:22 parties 72:24 passed 5:10 pattern 7:18 Paula 1:13 72:3 74:23 PC 31:4 PDC 19:8 50:23
microbiological 51:23 52:1	naysay 61:20	notary 74:14 76:21	obviously 22:1 36:8	
Microsoft 18:1	necessarily 58:13 60:18	notes 56:3	occasionally 58:18 59:17,21 65:8	
mid 66:2,18	necessary 76:7	number 3:8 4:13 11:18 15:22 51:2	occur 54:11	
middle 6:4 28:21	need 5:3,5,21 6:1,4 26:13 47:18 48:6 51:9 56:2 62:21 64:11 67:16,18,21,24 68:2,5,17	nutrients 51:9,11 51:13 67:19,21	October 30:16 30:18 31:7	
MILLER 2:2 74:3	needed 46:4	O	offender 31:13 33:13	
milligrams 34:11 65:16	nervous 12:6	object 5:12,13 21:3 63:20	office 22:11 23:21 74:17	
milliliters 60:3	never 12:5 14:5 58:7	objection 5:15 37:17 43:15 44:4 46:21 47:22 50:4 51:15 54:19 55:12 58:10 60:23 63:16	Officer 72:4	
million 48:14,24 69:5,5,18	new 17:8 29:19 55:8	obviously 22:1 36:8	Oh 19:17 23:15 23:18 36:7 42:9 51:22 53:1	
million-gallon 69:1	nitrate 50:24	occasionally 58:18 59:17,21 65:8	okay 4:18,21 6:11 7:13,18,21	
mind 17:10 25:14 41:22	nitrification 32:11,15 41:7,11 41:17 50:7,10 50:14,24 51:7 52:4,13,15,17 54:11,13 55:10 58:4,7 61:4 68:13 70:17 70:20	open 61:21		
minutes 12:5 22:12 26:8 56:3	nitrified 68:1	open-minded 61:9		
missing 24:9 31:22	nitrify 32:10 55:3	operation 65:19		
misstates 58:11	nitrifying 51:3 67:16,17,20	operational 48:10,13,16,19		
mix 42:9	nitrite 51:1	operations 65:19,23		
MO 74:18	nitrogen 9:17 9:23 10:11,12 21:8,15,16 44:8 70:2,10	operator 9:3		
molecule 24:19	nodding 5:22	operators 11:5		
month 27:2 33:7 49:2	non-- 8:23	opinion 37:15,19 50:22 58:6,7		
monthly 26:20 26:22,23,24		opinions 39:6		
months 8:2 53:18		opportunity 62:2		
Morsch 1:13 72:3 74:23		option 47:7,15		
motor 60:7				

MARK E. WINTERS 12/18/2019

penalty 76:10	30:12 41:23	36:11,13 50:2	17:5,14 24:6	put 21:15 25:9
people 42:4	45:20 46:3,14	preparing 35:16	24:16,18 28:13	48:4 55:10,14
46:1	48:7 52:19	presence	29:9,10,12,21	61:2 68:10
Peoria 1:17,18	58:4,8 64:24	50:24 72:16	30:9 31:7 33:9	putting 68:18
6:8 7:13 65:10	65:1,2,7,8,19	PRESENT 2:1	47:20 53:6	
72:2,9,10	65:23,24	pressure 10:10	54:7 66:13	<hr/>
percent 25:9	66:12	pretty 59:8	producing 31:16	Q
48:14 49:4,6	please 4:14	61:21	product 19:24	quality 8:9
69:2,4	35:7 74:8,11,16	previous 13:14	31:16 45:15	question 5:23
Perfect 13:2	point 20:3 35:3	13:18,23 14:6	production 11:11	6:4 43:24
64:3	40:20,22	14:9,12 16:11	11:13 32:20,21	questions 4:23
performance	44:13 45:5,9	32:8	66:4,8,10,11,14	5:21,24 14:13
6:20 62:10,22	45:14 59:3,10	primary 31:5	66:18,19,22	64:22,24 67:4
63:9,15	pointers 12:24	43:5	70:1,6,9	quick 4:22
perjury 76:10	points 44:10,14	prior 7:2 33:18	products 24:20	<hr/>
permeable	45:6 65:17	36:18 66:20	24:21,22,23	R
38:13	Pollution 1:1 4:13	74:18	25:1	raise 38:15
permission	Polymer 1:3 2:5	probably 34:11	professional	ramifications
59:22	4:11 6:12,14,20	51:8,17 57:15	9:6	48:3
peroxide 42:6,7	9:10 64:21	problem 43:20	prohibitive	ran 66:15 67:9
42:10 43:14	74:5 75:2	43:21 44:2	39:15	range 34:1
47:5 48:4	population	45:22 47:8	project 49:14,16	53:19
personal 47:1	51:12,22	61:22,24	49:23	rate 33:11
personally	portions 35:12	62:13,20,23	projects 20:12	rates 66:3,18
28:18 39:8	position 7:16,17	problems 29:10	24:3	66:20
41:3 72:8	8:1,3,4,12 11:10	29:11,13 40:2	proposed	reacted 19:15
petition 1:3 4:11	56:10,15 57:4	43:18	43:22 44:2	19:23
35:9,16 57:21	positions 57:23	Procedure 1:11	PROTECTION	reaction 17:2
74:5 75:2	possible 24:24	proceeding	2:6	19:21,22 25:11
Petitioner 2:5	32:5,7 47:24	44:23 62:19	provide 21:17	44:17,19,22,23
phone 46:10	47:24 50:8,9	proceedings	58:24	45:14,17
pick 66:4,5	50:10,14 58:15	35:3	provided 33:20	reactions 19:13
piece 17:8	60:21 66:4	process 9:18,20	37:7	19:16 44:16
pipe 20:5,7	70:5,17	9:21,22 10:8	providing 36:1	read 5:7,7 11:22
24:3,7 25:13	possibly 21:1	16:6,9,19 17:11	provisions 1:10	12:1 13:11,13
41:24 47:3	51:8	17:13 20:3,5,8	public 8:23	14:1,7,15 21:11
51:5 52:12	potential 39:19	20:10 24:4	74:14 76:21	23:1,12,13
place 28:19	55:9	25:22 27:9,14	pull 30:8,8 42:5	33:21 47:10,12
plan 29:19,24	potentially	31:8,10,13,14	42:8 68:3,5	50:3 74:11
30:1,3,4,23	54:15 70:1	32:11 34:13,19	pulled 23:21	75:5,9,13,17,21
49:19	potentials 55:16	41:9 42:2,16	43:3	76:4
planning 64:7	pounds 33:24	44:7,14 45:6	pulp 37:19	readily 36:3
plans 13:3	power 15:24	45:17,20,24	pump 39:4	real 4:22
plant 9:17 10:17	practice 12:17	46:3,4 49:22	51:17	realize 32:3
11:18 13:23	prep 15:20	53:4 54:24	pumps 10:6,9	realized 27:12
16:3,5 24:15	prepare 11:21	58:17	purpose 5:13	really 5:7 17:16
28:4 29:2	14:10,15,22	processes 10:7	pursuant 1:10	24:1 42:9 47:7
				57:1 59:10

<p>61:21 reason 52:19,21 53:7 75:6,10 75:14,18,22 reasonable 19:1 reasonablene... 53:5 recall 13:13,21 14:18,19,20 22:10,14,16,20 23:11 25:2 27:8,24 28:2 33:20 34:8 36:1,13 37:6 40:7,10,21,22 50:2 65:3 67:3 68:17 receive 63:14 received 19:6,8 receiving 10:23 recipe 33:8,15 reclean 68:18 recognize 35:8 recommend 43:17 record 4:15 5:14 5:16 24:11 47:12 51:20 records 66:14 Redirect 3:4 69:22 reduce 52:19 reduced 50:19 72:16 reducing 44:3 reductions 25:16 27:19 30:20 referencing 50:11 refurbish 49:18 refurbishment 49:15 regards 62:15 regular 70:23 regularly 26:3,4 26:11</p>	<p>reintroducing 68:2 related 63:7 70:10 72:24 relating 34:20 relationship 40:23 61:1,5 relevance 59:1 relevant 63:17 63:17 remain 42:19 remember 13:16 14:1,4 15:9 22:7,13 23:8 23:23 28:7 32:12 38:16 40:6,17,18,19 62:16,17,18 63:3,6 68:22 remove 51:10 54:16 71:1 removing 44:7 44:8 render 76:7 renewed 35:10 repair 49:15,18 repaired 49:12 67:9 repeat 43:24 report 11:8,9 14:18 32:14 37:9,10 50:2 50:6 68:15,17 72:5 reported 72:15 reporter 1:15 5:1 72:4 reports 14:16 32:9,12,13 50:23 represent 64:21 requested 47:12 required 52:1 requirements 39:3 requires 5:4</p>	<p>research 21:6 21:13,14 29:17 researched 21:1 reserve 71:6 residual 61:3 residuals 45:1 respect 17:11,18 36:14 41:22 57:24 60:19 62:22 respectively 69:10 respond 5:19 response 5:17 64:23 responses 4:24 5:3 responsibilities 10:16 46:17 rest 8:24 19:21 restarted 66:18 result 30:19 32:2 47:21 results 19:1,6,7 19:8 29:1 42:22 retain 21:8,16 38:14 return 74:16 review 15:20 35:7 reviewed 14:22 33:18 41:22 50:1 reviewing 36:17 Rex 2:7 rex.gradeless... 2:9 Richards 21:20 22:5 53:17 Richards' 21:19 56:15 right 6:6 7:8,15 9:2 10:3 15:5 16:18 17:24 18:11,23 22:5 24:4 25:10</p>	<p>27:16 30:2 31:2,20 32:17 33:15 38:15 41:13 43:20 45:10,12 46:10 53:5,20 55:1 58:16 69:5,8 69:11,14,15 risks 48:5 river 37:4 38:2 39:1,4,6,19 59:7 61:3 68:8 68:11,19 rooting 62:8,9 rules 1:11 4:22 run 16:22,24 59:12 66:3,17 running 28:24 31:9 51:5 66:14 runs 33:11,12</p> <hr/> <p style="text-align: center;">S</p> <hr/> <p>S 3:7 safety 21:21 sales 31:18 salts 38:17 sample 30:24 60:4 sampled 31:3,5 samples 20:6,7 30:7 sampling 29:19 29:24 30:1,3,4 30:11,23 31:7 31:10 sanitary 61:2 saving 23:11 saw 22:11 27:19 30:20 34:10 65:1 70:19 SAYETH 71:8 saying 32:9 41:12 45:5 says 32:14 63:6 scale 59:18 schedule 30:10</p>	<p>scheduled 30:11 schooling 8:17 Science 8:13 screen 23:21 second 5:10 28:22 35:7 36:16 67:4 secondary 31:4 31:5 42:23 43:7 see 18:5,24 19:21 25:2 31:8 33:15 35:12 45:8 59:22,24 60:5,9 61:1,5 70:19 seeing 19:13 27:15 65:6 66:24 seeking 63:17 seen 35:11,21 35:22 59:7 65:14,15 66:2 sell 18:4 53:2 semi 26:2,4 send 23:15,18 68:3 sending 70:18 70:22,22,23 separate 26:22 26:23 servers 36:4 serves 50:22 service 18:3 SERVICES 74:1 set 30:7 66:13 settle 60:10 setup 38:24 seven 25:5 shape 56:4 share 58:3 SHEET 75:1 sheets 74:10,13 74:16 shift 7:2,4,11 11:14</p>
--	--	---	--	--

MARK E. WINTERS 12/18/2019

<p>shine 62:2 shipping 10:22 shit 62:3 shocked 32:3 short 64:14 Shorthand 1:14 72:3 show 29:4 37:24 42:22 50:23 62:2 showed 22:9,11 23:19,20 showing 24:6 shows 21:6 shut 31:20,23 32:20,21 49:8 49:9 shutdown 28:21 28:23 66:21 side 39:19 sign 74:13 signaling 60:1 signature 71:6,9 72:20 74:10 74:13,17 75:24 significantly 31:19 Sikes 56:16,18 silver 47:7,14 60:18 similar 52:8 59:2 68:16 simply 66:9 67:9 Sincerely 74:20 site 26:3 six 11:6 53:18 slow 28:24 slowly 5:2 small 59:18 67:13 smaller 33:11 44:11 software 17:8 17:23 18:9 soil 21:8,16 38:13,18</p>	<p>solids 60:11 68:2,3,6,7,18 71:2 solution 60:19 solutions 62:20 solve 43:20 45:22 61:22 solving 44:2 61:23 somebody 15:5 40:4 45:19,21 63:19 somewhat 37:4 sorry 7:19 9:19 18:10 23:4 27:18 28:9 33:5 48:20 59:20 62:3 sort 52:14 55:8 61:19 sound 52:18 69:5 sounds 46:6 69:7 speak 18:9 specific 34:18 specifically 5:19 17:18 62:14 speculate 20:20 speculation 20:21 37:18 43:16 44:5 47:23 51:16 54:20 55:13 spell 4:15 spins 60:7 spot 31:1 spring 16:15 Springfield 2:9 St 74:17 standard 1:4 4:12 10:22 35:10 36:14 68:10 74:6 75:2 start 6:16 16:10</p>	<p>started 6:17 16:14,17 27:13 31:7 33:1 34:19 64:24 state 1:15,18 4:14 64:6 72:1 72:10 76:1 stay 67:22 stayed 33:2 Ste 1:17 2:3 72:9 74:4 stenographic... 72:15 step 42:24 52:13 steps 67:14,15 68:12 sterilize 39:13 48:5 Stone 57:5 stop 5:15,22 6:1 6:4 10:14 31:16 31:18 45:14 stopped 31:19 31:23 stops 44:23 stored 17:24 straight 38:2 stream 17:19 33:12 54:14 streams 44:11 45:2 70:24 Street 1:17 2:3 72:9 74:4,17 strike 65:21 stripping 40:9 structure 16:1 Stryker 8:5 studied 37:19 study 20:7 21:17 22:5,21 23:5 23:8 48:1,1 stuff 18:16 53:2 subscribe 76:9 substance 76:6 suddenly 27:12 suggest 59:9</p>	<p>suggested 21:14 59:15 suggesting 44:24 60:10 60:21 suggestion 44:17 suggestions 14:17 suggests 50:8 suit 73:1 summer 27:10 27:16,19 28:20 29:14 30:20,21 31:17 32:1 50:12,20 70:14 supervise 10:24 11:3,5 supply 31:15 42:6 supports 51:3 supposed 12:7 62:4 Supreme 1:12 sure 4:24 10:9 14:24 19:1 21:4 42:21 44:1 47:15 64:9 68:8 surgical 8:8 surprise 33:3 surprised 31:24 70:14,16 surprises 4:22 suspended 68:7 71:1 sustain 51:11 sustainable 51:22 sustainably 58:8 SW 1:17 72:8 sway 5:18 swear 62:4 sworn 4:4 72:12 system 9:15</p>	<p>16:24 48:3 50:7 52:4 54:12,14,16 55:17 65:20 65:24 66:9 67:1,8 systems 44:9</p> <hr/> <p style="text-align: center;">T</p> <hr/> <p>T 3:7 take 35:7 39:13 45:4 48:1 60:4 64:13 taken 1:13 4:19 56:7 64:16 74:9 75:3 talk 5:2 12:2 13:2,6 27:23 58:21 61:16 64:11 66:10 talked 12:4 15:1 16:4 22:12 23:21 36:20 36:23,24 39:2 40:15 talking 16:11 40:20 42:18 tank 31:4 49:5 51:12,14 task 61:23 tasked 45:19,21 tasks 62:21,24 TBA 13:14 team 16:7,10,20 25:23,24 26:2 27:9 45:21,24 46:1 58:17 technicalities 45:16 technology 52:8 tell 10:20 12:23 17:16 24:11 25:1,3 28:20 30:23 34:15 40:14 42:22</p>
--	--	---	--	--

<p>44:22 48:16 49:16 54:4 57:1 ten 56:21,23 57:10,11,12 terms 33:23 38:3 66:11,13 terribly 23:12 tertiary 38:23 41:7,17 52:14 52:16 68:13 test 5:10 17:7 18:17 25:2 29:3 42:22 59:18,22,24 60:12 testified 4:5 68:20 testify 55:19 72:12 testifying 55:24 64:6 testimonies 13:19 testimony 58:11 72:14,18 testing 7:23 8:5 8:9 17:6 18:12 18:12,15,16 19:4,8 29:8 60:7 tests 33:8 text 14:21 thank 7:21 34:22 48:22 64:3 thereof 73:2 thereon 76:8 thing 47:17 things 5:6 11:23 17:7 26:19 27:15 28:24 42:17 44:15 58:2 59:23 60:16 62:10 think 13:22,23 14:3,8 18:11</p>	<p>22:9,10 23:3 24:8 25:9,10 26:13 37:10 39:10 43:18 44:6 45:9,17 46:22 47:2,6 49:19,21 50:21 52:21 53:6 55:14 56:2,4 56:22 57:6,12 58:14 59:3 61:5,6,7 63:4 64:12 68:19 thinks 16:2 59:8 third 67:4 Thomas 2:2 74:3 thomas.dimo... 2:4 thought 23:1,2 33:14 39:16 thoughts 46:19 three 24:8 30:24 31:3 46:2 48:15,19 49:12,18,20 67:9,12 69:10 69:16,17 tied 62:10 time 5:11,11,22 6:1 21:18 28:11 29:15 36:2 43:7 46:13,13 48:1 53:11 63:23 65:5 times 26:17,18 30:24 31:3 49:6,7 51:1 53:24 54:3 57:22 title 6:19 11:12 to-wit 72:6 today 5:20 33:18 45:11 today's 11:21 told 5:19 32:4,6 62:6 69:9</p>	<p>70:16 Tom 64:12,20 top 25:15 total 11:6 44:8 68:7 69:13 70:10 tower 9:18,22 10:6 track 10:15 trained 60:16 transcript 13:20 13:22 72:18 74:12 treat 41:11 treatment 9:14 11:5 13:8 16:22 16:24 20:9 27:2 29:15 34:21 36:17 37:20 41:2,24 42:16 44:10,10 54:11,16 60:9 65:2,20,23 67:1,8 70:11 treatments 42:2 trial 74:18 tried 11:23 58:21 59:1 trouble 12:20 64:2 true 72:17 76:7 76:11 trust 12:20 62:9 truth 62:7 72:12 72:13,13 truthfully 13:1 try 5:2 19:18 59:18,22 61:17 trying 17:21 25:2 45:20 45:22 54:6 60:5 turned 33:13 two 10:18,24 11:4,18 15:22 67:8 69:10 type 20:12</p>	<p>60:18 typewriting 72:17 typically 35:19 46:2</p> <hr/> <p style="text-align: center;">U</p> <hr/> <p>uh-huh 5:6 Ultimately 54:5 understand 5:8 17:21 29:20 55:7 understanding 24:10 34:12 49:11 53:10 63:1 65:12 understood 11:20 13:10 15:17 union 36:8 unit 18:23 49:3 University 8:14 upstream 17:2 19:10 20:11 24:2 25:12,13 use 19:9,19 21:7 24:20,22,23 25:1 39:14 49:2 uses 44:16 usually 59:10 utilities 6:21,24 9:9,13,16 56:11 utility 9:15 utilizing 48:22</p> <hr/> <p style="text-align: center;">V</p> <hr/> <p>vague 21:3 44:4 46:21 50:4 60:23 63:5 Vaguely 53:15 values 70:9 valves 10:14 various 68:21 vary 26:7 Veolia 7:3 versus 66:12</p>	<p>vicinity 53:16 view 47:1 61:23 voice 5:8 volumes 66:5</p> <hr/> <p style="text-align: center;">W</p> <hr/> <p>W 2:2,3 74:3,4 W-I-N-T-E-R-S 4:17 wait 6:3 waived 71:9 72:21 walk 6:22 want 6:22 14:24 15:20 18:4 40:16 46:4 47:15 49:3 52:19,22 53:7 wanted 31:8 55:7 warehouse 10:19,20,21,23 11:1 Washington 1:17 72:9 wasn't 32:2,16 44:18 70:17 waste 11:5 13:7 16:22,24 17:18 27:2 29:15 33:12 40:3 44:9 45:2 54:11,14,16 70:11 wastewater 9:14 13:15 17:3 20:8 34:20 37:20 38:18 42:13 51:1 60:4,6 65:2 65:20,23 66:24 67:8 70:24 watching 29:22 water 8:22 9:3 9:18,20,21,22 10:8,10 19:15</p>
--	---	--	--	--

MARK E. WINTERS 12/18/2019

25:16 31:15 37:4 38:14 39:1,3,7,13,20 39:21 42:6 44:12 61:2 63:8 67:10 68:2,4,10,18 69:1,18 way 20:15 22:8 32:9,10 36:11 55:9 62:11 72:24 73:1 ways 13:4,5 16:21 19:20 21:1 42:5 we'll 15:14 34:24 56:4 58:20,21 we're 16:21 17:6 18:1,23 19:19 20:7,14 29:8 33:14 42:18 49:16 59:10 62:3,8,9 we've 11:23 29:21 33:7 44:6 52:11 54:6 58:2 59:1 65:15 website 12:16 week 6:17 26:5 28:22 30:24 31:3,6 weekly 30:7 weeks 33:1 weighed 48:6 went 23:20 28:21,23 66:8 Western 8:14 whatnot 43:19 wheel 37:1 38:19,22 41:19 41:19 52:8 55:8 whichever 60:5 willing 61:12 wind 70:11	Winters 1:9 3:3 4:2,10,16 6:6 34:24 35:1 64:12,20 69:24 72:7 74:9 75:1 76:3 76:18 wise 54:21 wish 12:18,19 witness 3:2 71:8 72:11,15,16,19 72:21 74:11 75:1,24 wondering 44:1 word 45:4 59:12 62:17,17 63:6,6 work 10:18 12:7 38:1,4 67:18 worked 17:15 34:17 46:15 working 8:21 33:14 62:13,13 works 8:24 17:22 18:11 40:2 42:13 44:22 45:18 worse 43:21 wouldn't 43:17 53:7 54:17,21 62:24 66:7 67:18 write 63:19 written 13:18,24 63:4 Wrobel 46:9 53:20 wrong 62:7	31:21 40:18 41:15,16 43:10 46:7 49:9 61:6 64:7 year 6:15,18 7:17 66:16 year's 34:4 years 53:15,16 56:21,23 57:10,11,17 yell 5:11 Yep 46:11	2019 1:16 14:20 22:2,17 27:16 27:20 28:1,20 29:14 30:17,18 30:21 31:17 32:1 50:1 66:12,15 68:15 70:14 72:7 74:9 75:3 2020 63:12 74:2 217-782-5544 2:9 270,000 48:18 48:18 69:11,11	<hr/> 7 <hr/> 711 74:17 <hr/> 8 <hr/> 84-002965 1:14 84958 76:23 <hr/> 9 <hr/> 9:00 1:16 72:7 90 34:11 49:4,6 68:20 69:2,4 90's 34:11 900,000 69:13
	Z			<hr/> 3 <hr/> 304.122(b) 1:5 74:6 75:3 312-72607125 2:4 35 1:4 3:10 74:6 75:2 3500 2:3 74:4 360,000 48:19 48:21 69:11
	0			<hr/> 4 <hr/> 4 3:3 40 57:17 65:16 40's 65:16 412 1:16 72:8 43 53:15 45 53:16
	1	13:10 35:1,4 1,000 60:3 1,000-milliliter 60:2 1.26 69:5,18 1.4 48:14,24 69:1,5 100 48:14 1021 2:8 103 6:10 11th 74:17 13th 15:11 14th 64:10 15th 64:10 16 7:20 17 7:6,20 18 7:7,19 74:9 75:3 18th 1:15 28:1 72:6 19-002 1:7 4:13		<hr/> 5 <hr/> 5 6:10 50 25:3,9 50's 65:17
	X			<hr/> 6 <hr/> 6 74:2 60606 2:3 74:4 62794 2:9 63101 74:18 64 3:4 69 3:4
	Y	2		
	yeah 12:22 15:12 18:10,11 23:20 26:23 28:17 30:11	20 26:8 76:13 200 2:3 74:4 2015 34:13 2017 7:8 53:11 2018 7:8 66:12 66:13		