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CENTRALIZED WASTEWATER TREATMENT
USING AN INTEGRATED TREATMENT PLANT AT
KERTEH INDUSTRIAL ZONE

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Abstract

An assessment was conducted during the pre-commissioning and commissioning period of an integrated wastewater treatment plant (WWTP). The WWTP has been designed to receive multiple effluents from central utility facilities (CUF) and other neighboring plants with varying wastewater characteristics. Commissioning of the plant was necessary as part of the quality assurance for the plant design specification. Operating units of the WWTP during commissioning are the intake collection, effluent monitoring, primary treatment operation, waste homogenizing and biological unit of processes. The assessment includes the monitoring of average flow rate, total suspended solids (TSS), oil & grease (O&G), pH, temperature, biochemical oxygen demand (BOD), chemical oxygen demand (COD), dissolved oxygen (DO), mixed liquor suspended solid (MLSS), and solid settling test. A complete Standard B analysis was conducted on the treated effluent at the first day and final day of the commissioning period. The total COD loading in this plant is 1488 mg/l and at the final discharge point the COD reading was 63 mg/L. It shows that the WWTP has the COD removal rate of 96%. The total TSS loading is 331mg/L and at the final discharge point the TSS reading was 27 mg/L. The average BOD from the untreated effluent streams was 109 mg/L and at the final discharge point the BOD reading was 10 mg/L. The WWTP has almost 91% of BOD treatment efficiency. The DO reading was very satisfactory throughout the 2 months pre-commissioning period with an average reading between 3.0 to 4.0 mg/l and during the commissioning period of 8 days, an average DO reading of 4.2 mg/L was observed. The average MLSS reading was 1690 mg/L. The integrated WWTP is considered operating within the DOE Standard B discharge limit.

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LIST OF SYMBOLS AND ABBREVIATIONS

A/B	Absorption-Bio-Oxidation
AOL	Acrosteolysis
APHA	American Public Health Association
ASGP	Ammonia Syngas Plant
ASM	Activated Sludge Model
ASP	Activated Sludge Process
ASL	Angiosarcoma
BOD	Biological Oxygen Demand
BPPA	BP PETRONAS Acetyls Sdn Bhd @ Acetic Acid Plant
COD	Chemical Oxygen Demand
CUF	Central Utility Plant
CPI	Coagulation Plate Interception
Demin.	Dematerialized
DO	Dissolved oxygen
DOE	Department Of Environment
EDC	Ethylene dichloride
ED & RC	Environmental Protection And Resource Conservation
HRT	Hydraulic Retention Time
IAWQ	International Association On Water Quality
IWK	Indah Water Konsortium
L	Liter
m ³ /d	meter cube per day
m ³ /hr	meter cube ^s per hour
mg/L	milligram per liter
MLSS	Mixed Liquor Suspended Solids

LIST OF SYMBOLS AND ABBREVIATIONS (Continued)

N	Nitrogen
NH ₃	Ammonia
NIOSH	National Institute Of Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
OUR	Oxygen Uptake Rate
P	Phosphorus
PCDD/F	Polychlorinated Dibenzodioxin/furan
PVC	Poly Vinyl Chloride
RAS	Return Activated Sludge
RBC	Rotating Biological Contactor
SBR	Sequencing Batch Reactors
SBC	Solid Bowl Centrifuge
SCE	Sister Chromatid Exchange
SDT	Sludge Digestion Tank
TCDD	2,3,7,8-tetrachlorodibenzodioxin
T1	Tank 1
TDS	Total Dissolve Solids
TOD	Total Oxygen Demand Meters
TSS	Total Suspended Solids
VC	Vinyl Chloride
VCM	Vinyl Chloride Monomer
VSS	Volatile Suspended Solid
WAS	Waste Activated Sludge
WWTP	Wastewater Treatment Plant

LIST OF APPENDIX

- Appendix I: Standard B for Inland Water Other Than Those Within
Specified Drinking Water Catchments Areas.
- Appendix II: Overall Process Flow