

Technical Details of the Proposed Produced Water Treatment Plant at Gumry
FPF: DPOC

Parameter	Unit	Option 1	Option 2
Produced Water Flow Rate	BWPD / m ³ /hr	34,000 / 225	12,000 / 80
Produced Water Temperature (Normal / Max.)	°C	65 / 75	65 / 75
Produced Water Receiving Pressure (Normal / Max.)	Barg	1 / 3.5	1 / 3.5
Inlet Raw Produced Water Analysis;			
• Appearance		Clear Transparent	Clear Transparent
• Oil in Water	ppm	29.88	29.88
• pH Value	pH	7.67	7.67
• Conductivity	Micro Siemen	2760	2760
• Total Dissolve Solids	mg/L	4310	4310
• Turbidity	NTU	0.13	0.13
• Total Suspended Solids (TSS)	mg/L	33	33
• Heavy sediment (sand)%	%	Nil	Nil
Treated Injection Water Quality;			
• Oil Content Maximum	ppm	10 (Note 1)	10 (Note 1)
• Median diameter of suspended solid particles	micron	≤3.0 (Note 1)	≤3.0 (Note 1)
• TSS (Total suspended solids)	mg/L	≤5.0	≤5.0
• Dissolved oxygen	mg/L	<0.05	<0.05
• SRB (Sulfate reducing bacterium)	bacterium/ml	0 - <10	0 - <10
• Iron bacteria (Note 2)	1bacterium/ml	n×10 ⁴	n×10 ⁴
• (Saprophytic bacteria) TGB (Note 2)	1bacterium/ml)	n×10 ⁴	n×10 ⁴
• Total iron content	mg/L	<0.5	<0.5

<ul style="list-style-type: none"> Free carbon dioxide content 	mg/L	< 10	< 10
<ul style="list-style-type: none"> Sulphide content (diatomic sulphide) 	mg/L	<10	<10

Notes

1. Oil content and maximum particle size shall not exceed 10 ppm and 10 micron respectively. The provided values are based on the requirements specified based on the lab test results.
2. Value of "n" shall be between $1 < n < 10$.

Additionally the following shall be considered for the design of the new Produced Water Treatment Plant;

- 2 x 100% units shall be considered for each system to allow operation on 1 working + 1 stand by basis.
- Maximum allowable oil content in the inlet Produced Water specified will vary depends on the upstream CPI Separators performance. Vendor to confirm the acceptable maximum oil content at the facility inlet.
- Filter Units shall be selected such as to maintain a reduced minimum or zero consumption of Chemical including Biocides, Oxygen Scavenger etc for the new PWT unit to maintain the Injection Water quality.
- Requirement for the disposal of any hazardous chemicals shall be avoided.