BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL SOUTHERN ZONE BENCH AT CHENNAI

Original Application No. 73 of 2021 (SZ)

IN THE MATTER OF:

Visakha Pawan Praja Karmika Sangham,

Andhra Pradesh ...Applicant

Vs.

Union Of India & Others ...Respondent

REPLY TO THE COMPLIANCE REPORT OF JOINT COMMITTEE DATED 13.02.2024 on BEHALF OF HINDUSTAN PETROLEUM CORPORATION LIMITED – 7th RESPONDENT

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COUNSEL FOR 7TH RESPONDENT

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Dated at Visakhapatnam on this the 18th day of September 2024

For 7th RESPONDENT
M/s. Hindustan Petroleum
Corporation Limited

जी. भगवान
G. BHAGAVAN
महा प्रबंधक - तकनीकी
General Manager - Technical
एच.पी.सी.एल. - विशाख रिफाइनरी
H.P.C.L. - Visakh Refinery

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The following table depicts the point wise reply to the observation of the Joint Committee in Para No. 5 of its Report:-

S.No	Compliance Status of EC Conditions	HPCL Reply
a)	Compliance of standards / norms in terms of fugitive emissions and VOC emissions monitoring at ETP area are not being implemented as per Oil Refinery Industry notified under the Environment (Protection) Rules, 1986 vide G.S.R. 186(E) dated 18th March, 2008	✓ It is submitted that this Respondent (HPCL) is complying with standards / norms in terms of fugitive emissions and VOC emissions monitoring at ETP area are being implemented as per notification for Oil Refinery Industry under the Environment (Protection) Rules, 1986 vide G.S.R. 186(E) dated 18th March, 2008. This Respondent is fully compliant with the same. ✓ APIs and TPIs in ETPs are provided with covers to minimize VOC emissions. VOC emissions are monitored periodically and controlled as part of LDAR survey and observed to meet the prescribed standards. ✓ The LDAR survey report done by MoEF recognized laboratory M/s. Pragathi Labs and Consultants Pvt Ltd conducted during Aug-23 including ETPs is attached. (Annexure-1)
b)	Monitoring of work zone emissions viz., SO2, NOx, HC (Methane & Non-methane), VOCs and Benzene from various units is not being done	Monitoring of VOCs at work zone are monitored through LDAR survey carried at various units of refinery. Monitoring of work zone emissions Viz., SO2, NOx, HC and Benzene are covered through MoEF recognized laboratory M/s GLens Innovation

<table>
<tr><th>S.No</th><th>Compliance Status of EC Conditions</th><th>HPCL Reply</th></tr>
<tr><td></td><td></td><td>Labs Pvt. Ltd, Chennai. Copy of Reports are attached. (Annexure-2).</td></tr>
<tr><td>c)</td><td>The monthly Sulphur balance sheet along with the six-monthly compliance report is not being submitted</td><td>✓It is submitted that monthly Sulphur balance sheet is being submitted along with the six-monthly compliance report. Avg.SO2 Emissions Load in TPD is being reported in six monthly compliance report. However, after advice from MoEF officials, Monthly Sulphur balance reports are also attached along with six monthly EC compliance submitted to MoEF office, Vijayawada.
(Copy of the reports for the period Apr-23 to Sept-23 is attached Annexure-3)

✓As per Table-8 of Joint committee report the SO2 emissions per day (8.44 TPD) during the FY 2022-23 are within the APPCB CTO permitted quantity (11.5 TPD).</td></tr>
<tr><td>d)</td><td>It has been observed that the PM10, PM2.5 and SO2 in the ambient air of the project surroundings are exceeding the prescribed limits of National Ambient Air Quality Standards, 2009.</td><td>❖ PM10 & PM2.5 values most of the time exceed the maximum prescribed limits of 100 µg/m3 and 60 µg/m3, respectively in the entire Visakhapatnam city with an annual average of 112.89 and 45.22 respectively. The following are the Annual average values mentioned in the joint committee report viz GVMC CAAMS located in Visakhapatnam City.

<table>
<tr><td>Parameter</td><td>Annual Limit (ug/m3)</td><td>CAAMS South Gate (ug/m3)</td><td>CAAMS Store Yard (ug/m3)</td><td>CAAMS HLPH (ug/m3)</td></tr>
<tr><td>PM-10</td><td>60</td><td>99.77</td><td>77.06</td><td>91.11</td></tr>
<tr><td>PM-2.5</td><td>40</td><td>31.9</td><td>48.61</td><td>25.2</td></tr>
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❖ As per the above table, PM-10 and PM-2.5 values reported inside the refinery are well below the values recorded in the city.

❖ Visakhapatnam is an industrial town having various other industries. Needless to state that various causes are attributable to increase in PM10 & PM2.5 level, such as vehicular pollution, Port activities, Construction works, industrial activities etc., in Visakhapatnam. Hence, this Respondent (HPCL) is not the cause of increased</td></tr>
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<table>
<tr><th>S.No</th><th>Compliance Status of EC Conditions</th><th>HPCL Reply</th></tr>
<tr><td></td><td></td><td>PM10 and PM 2.5 which is seen in the readings at the CAAMS within the refinery premises. Rather, it is submitted that this Respondent is a recipient of excess PM10 & PM2.5 particles from outside the refinery.
❖ The observation of the Joint Committee in Report dated 13.02.2024 is denied. The annual average of SO2 are within the prescribed limit of National Ambient Air Quality Standards, 2009 as shown below.
<table>
<tr><th>Limit</th><th>CAAMS South Gate</th><th>CAAMS Store Yard</th><th>CAAMS HLPH</th></tr>
<tr><td>50 (ug/m3)</td><td>18.29 (ug/m3)</td><td>14.61 (ug/m3)</td><td>26.3 (ug/m3)</td></tr>
</table>
</td></tr>
<tr><td>e)</td><td>No efforts were made to recycle the treated effluent to achieve zero discharge to achieve zero liquid discharge system and to minimize the fresh water consumption intake</td><td>Stripped sour water from process units is being recycled to the maximum possible extent with the available systems for use as wash water. Subsequent to commissioning of new Integrated Effluent Treatment Plant (IETP) in Feb-24 under refinery expansion project (VRMP), stripped water along with other influent streams are treated and the treated effluent water is being recycled/reused fully.</td></tr>
<tr><td>f)</td><td>The comprehensive water audit reports on annual basis are not being submitted to Ministry's Sub Office, Vijayawada</td><td>Comprehensive water audit study report dated 17-10-2022 was shown to Joint committee during inspection. Henceforth we will ensure water audit reports are submitted to Ministry's Sub Office, Vijayawada on annual basis as advised (Copy of report attached (Annexure-4)</td></tr>
<tr><td>g)</td><td>It has been observed that the PAs are in process of developing green belt in and around the plant premises. However, it has been observed that the plantation around the project area is not satisfactory</td><td>✓Plantation along the South boundary of the refinery has been carried out. Green belt is existing in an area of 45.0 acres. Plantation of trees is not recommended inside the plant area due to safety considerations and development of green belt along the boundary is prohibited considering the associated security risk.

✓HPCL-VR has taken up plantation of saplings in various locations of Visakhapatnam in 4 phases under Green Visakha program and completed the plantation of 6,50,000 saplings covering an area of approx. 700 acres.</td></tr>
</table>

S.No	Compliance Status of EC Conditions	HPCL Reply
		✓In addition to this, HPCL-VR has taken up plantation of saplings under Vanam-Manam program initiated by Andhra Pradesh State Government and completed the target plantation of 10000 saplings in Jan 2019. ✓Further, Green belt of 67 acres is developed near the refinery under VRMP (modernization project). ✓The efforts taken by HPCL-VR with respect to green-belt have already been pointed out as being sufficient and satisfactory by APPCB and accepted as such by the Joint Committee in its Report dated 17.12.2021.
h)	Uploading of Environmental Statement for each financial year ending 31st March in Form-V on company's website is not being done	✓ Being uploaded on company's website. For the financial year ending 31.03.2023, the environmental statement was uploaded on HPCL Corporate site. https://www. hindustanpetroleum.com screenshot of the same is annexed as Annexure- 5. ✓ Statement for the year 2023-24 will be uploaded in September 2024 as per schedule.
i)	It has been observed that the copies of EC letter no. J-11011/22/94-A II(I) dated 30th May,1995, F. No. J-11011188/96- IA II(I) dated10th April, 1997, J-11013/55/2003-IA II (I) dated 3rd February, 2004 and J-11011/66/2007-1A II (I) dated 7th March, 2008 and J-11011/408/2009- IA II (I) dated 2nd September, 2009 along with all environmental monitored data is not uploaded on company's website	Uploaded on website www.hindustanpetroleum.com screenshot of same is annexed as Annexure - 5.

The following table shows the point wise reply to para 9 of the Joint Committee Report:-

<table>
<tr><th>Analysis of results of the effluent samples collected</th><th>HPCL Reply</th></tr>
<tr><td>• The values of BOD - 18 mg/lit., oil & grease - 6.2 mg/lit., sulphide - 5.6 mg/lit. and ammonical nitrogen - 19.78 mg/lit. obtained for the treated effluent of ETP-4 are found exceeding the CTO stipulated standards of BOD - 15 mg/lit., oil & grease -5.0 mg/lit., sulphide - 0.5 mg/lit. and ammonical nitrogen - 15 mg/lit., respectively</td><td>❖ It is submitted that the samples obtained for the treated effluent of ETP-4 are not exceeding the CTO stipulated standards. The treated effluent of ETP-4 meets all the prescribed/stipulated standards.

❖ Samples collected along with Joint Committee samples at the same locations were analyzed at M/s SV Enviro Labs & Consultants which is MoEF-recognized third-party laboratory and the results of all parameters were within the stipulated limits.

❖ Analysis reports are provided in (Annexure-6). The relevant extract is given below:

<table>
<tr><th>Parameter</th><th>Limit (mg/lit)</th><th>Reported in Joint Committee report (mg/lit)</th><th>MoEF recognized Lab (mg/lit)</th></tr>
<tr><td>BOD</td><td>15</td><td>18</td><td>12</td></tr>
<tr><td>O&G</td><td>5</td><td>6.2</td><td>3.2</td></tr>
<tr><td>Sulphides</td><td>0.5</td><td>5.6</td><td>0.36</td></tr>
<tr><td>Ammoniacal Nitrogen</td><td>15</td><td>19.78</td><td>10.3</td></tr>
</table>
</td></tr>
<tr><td>• The values of oil & grease - 7.4 mg/lit., sulphide - 3.6 mg/lit. and ammonical nitrogen - 26.13 mg/lit. obtained for the water sample collected from the stormwater drain originating from ETP-4 and flowing outside the industry premises are found exceeding the CTO stipulated standards of oil & grease — 5.0 mg/lit., sulphide — 0.5 mg/lit. and ammonical nitrogen — 15 mg/lit., respectively.</td><td>✓ It is submitted that the samples obtained for the water sample collected from the stormwater drain originating from ETP-4 and flowing outside the industry premises are not exceeding the CTO stipulated standards. The treated effluent of ETP-4 meets all the prescribed/stipulated standards.

✓ Samples collected along with Joint Committee samples at the same locations were analyzed at M/s SV Enviro Labs & Consultants which is MoEF-recognized third-party laboratory and the results of all parameters were within the stipulated limits.

✓ Analysis reports are provided in (Annexure-7). The relevant extract is given below:</td></tr>
</table>

<table>
<tr><th>Analysis of results of the effluent samples collected</th><th>HPCL Reply</th></tr>
<tr><td></td><td>
<table>
<tr><th>Parameter</th><th>Limit (mg/lit)</th><th>Reported in Joint Committee report (mg/lit)</th><th>MoEF recognized Lab (mg/lit)</th></tr>
<tr><td>O&G</td><td>5</td><td>7.4</td><td>3.8</td></tr>
<tr><td>Sulphides</td><td>0.5</td><td>3.6</td><td>0.24</td></tr>
<tr><td>Ammoniaca l Nitrogen</td><td>15</td><td>26.13</td><td>10.6</td></tr>
</table>
</td></tr>
<tr><td>• The value of sulphide — 3.8 mg/lit. obtained for the sample of combined outlet of treated effluent of ETP - 1 & cooling water blow-down collected at MHF - 1 is found exceeding the CTO stipulated standard of 0.5 mg/lit.</td><td>✓ It is submitted that the samples obtained for the sample of combined outlet of treated effluent of ETP-1 & cooling water blow-down collected at MHF-1 are not exceeding the CTO stipulated standards. The treated effluent of ETP-1 meets all the prescribed/stipulated standards.

✓ Samples collected along with Joint Committee samples at the same locations were analyzed at M/s SV Enviro Labs & Consultants which is MoEF-recognized third-party laboratory and the results of all parameters were within the stipulated limits.

✓ Analysis reports are provided in (Annexure-8). The relevant extract is given below:
<table>
<tr><th>Parameter</th><th>Limit (mg/lit)</th><th>Reported in Joint Committee report (mg/lit)</th><th>MoEF recognized Lab (mg/lit)</th></tr>
<tr><td>Sulphides</td><td>0.5</td><td>3.6</td><td>0.3</td></tr>
</table>
</td></tr>
<tr><td>• The sample collected from the aeration tank of ETP - 4 is having a concentration of 8.2 mg/lit. of oil & grease</td><td>❖ It is submitted that the samples collected from the aeration tank of ETP-4 is not exceeding the permitted standards for Oil & Grease concentration. The treated effluent of ETP-4 meets all the prescribed/stipulated standards.

❖ Samples collected along with Joint Committee samples at the same locations were analyzed at M/s SV Enviro Labs & Consultants which is MoEF-recognized third-party laboratory and the results of all parameters were within the stipulated limits.</td></tr>
</table>

<table>
<tr><th>Analysis of results of the effluent samples collected</th><th>HPCL Reply</th></tr>
<tr><td></td><td>❖ Analysis reports are provided in (Annexure-9). The relevant extract is given below:
<table>
<tr><th>Parameter</th><th>Limit (mg/lit)</th><th>Reported in Joint Committee report (mg/lit)</th><th>MoEF recognized Lab (mg/lit)</th></tr>
<tr><td>O&G</td><td>5</td><td>8.2</td><td><1.0</td></tr>
</table></td></tr>
</table>

The following table shows the point wise reply to para 10 of the Joint Committee Report:-

S.No	Observations of the Committee	HPCL Reply
a)	The Joint Committee has inspected both the ETPs 1 & 4. It was observed that ETP-4 was not operational and all the tanks like clarifiers, aeration tanks, etc. were found floating with black waste mineral oil. The treatment of effluent in the ETP-4 was not observed (Photographs —1 to 10)	The Photographs shown in the report pertains to ETP-2 not ETP-4. As mentioned by Joint Committee, the ETP-2 was not in operation and its influent was being treated in ETP-4 at the time of inspection. Hence, there was no effluent discharge from ETP-2 to outside.-
b)	All the tanks, clarifiers, aeration tanks, etc. of ETP-1 were also found floating with black waste mineral oil.	The stagnated oil in the ETP-1 (non-operational) equipment was manually recovered using gully sucker and processed in ETP-4.
c)	The Online Continuous Effluent Monitoring System (OCEMS) to monitor the treated effluent quality provided for ETP-4 was not functioning for the	✓ As informed during the Joint Committee visit, the analyzers were under maintenance due to non-availability of spares. The spares were procured subsequently and online connectivity was restored on 27-11-2023 after rectification of the analyzers. ✓ However, the quality of effluent is closely monitored by analyzing the effluent samples in our QC Lab and

<table>
<tr><th>S.No</th><th>Observations of the Committee</th><th>HPCL Reply</th></tr>
<tr><td></td><td>parameters, TSS, COD & BOD. Was found working for pH parameter only</td><td>effluent parameters are ensured to be within the stipulated limits. (Lab reports are attached as Annexure-10</td></tr>
<tr><td>d)</td><td>The OCEMS online treated effluent quality monitoring station provided for ETP-1 was found functioning for the parameters, pH, TSS, COD & BOD</td><td>Statement of fact</td></tr>
<tr><td>e)</td><td>These OCEMSs have been installed at the outlet of filtration unit (sand / activated carbon filters), but not at the outlets flowing outside the industry premises</td><td>As per the CPCB Guidelines dated 02.03.2015 para (b) states “to Install online effluent monitoring system at the outlet of the Effluent treatment plant” Copy of the guidelines are attached as Annexure-11 Hence the OCEMSs were installed at the outlet of filtration unit (sand / activated carbon filters) as per the CPCB guidelines and the Respondent (HPCL) is in compliance of the requirements under the guidelines.</td></tr>
<tr><td>f)</td><td>The drain originating from the ETP-4 was observed with black waste mineral oil. The drain is provided with oil catcher tank and the collected waste oil is removed with the gully sucker. However, the black waste mineral oil was found flowing outside the industry beyond the oil catcher tank provided in the drain. This shows that the oil catcher is not working properly (Photograph - 11 to 18).</td><td>❖ The waste oil is being removed using gully sucker as mentioned in the photograph-17 and Hay filter is installed as mentioned in the Photograph 16 to recover any slippage of oil. Hence there was no black waste mineral oil slippage beyond the hay filter to outside the refinery.

❖ The scheme of pumping facility was already planned and material procurement was in progress during the time of inspection. The pumping facility was installed in Feb-24 to bail out the whole content from the oil catcher and route it to the existing influent receiving sump for treatment in ETP.

<table><tr><th>Before</th><th>After</th></tr><tr><td>  </td><td>  </td></tr></table></td></tr>
</table>

<table>
<tr><th>S.No</th><th>Observations of the Committee</th><th>HPCL Reply</th></tr>
<tr><td></td><td></td><td>❖ It is submitted that the Joint Committee report dated 13.02.2024 incorrectly identifies Photograph-18 as being taken outside the industry premises, when in fact the photograph-18 pertains to areas within the refinery premises.</td></tr>
<tr><td>g)</td><td>The storm water drains in ETP areas were flowing with black waste oily effluents, and particularly the storm water drain flowing adjacent to ETP - 4 found with flow of black waste oil marks all along the stretch till discharge point (Photograph — 11 to 18). This shows that ETPs are not operated regularly and untreated oily effluent is being discharged outside the refinery premises</td><td rowspan="2">The photographs show a surface drain which is not connected to refinery outlet. It is also submitted that no oil system is connected with this storm water drain. The storm water was being bailed out using gully suckers and transported to receiving sump of ETP-IV for treatment.
Further, permanent pumping facility has been provided for this in line with the recommendation of NGT joint committee through report dated 17-06-2021.
Samples collected along with Joint Committee samples at the same locations were analyzed at M/s SV Enviro Labs & Consultants which is MoEF-recognized third-party laboratory and the results of all parameters were within the stipulated limits.

Analysis reports are provided in (Annexure-7).

<table><tr><th>Parameter</th><th>Limit (mg/lit)</th><th>Reported in Joint Committee report (mg/lit)</th><th>MoEF recognized Lab (mg/lit)</th></tr><tr><td>O&G</td><td>5</td><td>7.4</td><td>3.8</td></tr></table>
The ETPs were always under operation and untreated effluent never discharged outside the refinery premises.</td></tr>
<tr><td>h)</td><td>The analysis results of the oil & grease in the storm water drain outside the industry premises was 7.4 mg/L, exceeding the discharge standard stipulated by APPCB in CTO. HPCL has not installed OCEMS at the discharge point for verification</td></tr>
<tr><td>i)</td><td>Provision for measurement of quantity of treated effluent being discharged outside at the outlets of guard ponds is not available. Hence, assessment of</td><td>As per the guidelines of CPCB guidelines dated 02.03.2015 para (b) states “to Install online effluent monitoring system at the outlet of the Effluent treatment plant” Copy of the guidelines are attached as (Annexure-11) Hence the OCEMSs were installed at the outlet of ETPs as per the CPCB guidelines</td></tr>
</table>

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<tr><th>S.No</th><th>Observations of the Committee</th><th>HPCL Reply</th></tr>
<tr><td></td><td>quantity of treated effluents being discharged outside the industry cannot be done</td><td></td></tr>
<tr><td>j)</td><td>Deposits of oily scum in huge quantity were observed in the baffled skimming ponds provided for the spent once-through cooling water outlet (Photographs -19 to 22). Which means that considerable amounts of crude and other petroleum products are entering the cooling water system through leakages</td><td>The purpose of skimming pond is to skim oil entered into once through cooling water system in case of any cooler leaks. The scum collected in the skimming pond is removed and bioremediated periodically.

It is submitted that as a part of refinery expansion project once through cooling water has been completely converted to recirculating system in Dec-23 and there is no sea water discharge into the skimming pond.

Before
 
After
  </td></tr>
<tr><td>k)</td><td>Refinery has provided two High oil sludge waste storage tanks with a capacity of 3,000 tons each. These tanks were filled to their brim and almost about to overflow. Spillages were also observed near the loading & unloading point of the tanks (Photographs — 23 to 26). During rainy season, the oily water may flow outside the refinery</td><td>The accumulated oily sludge is processed from time to time and especially before rainy season. There was sufficient ullage to handle inflow till sludge processing agency was mobilized. It was communicated to the Joint Committee during the visit that a purchase order was placed on 19.07.23 and equipment mobilization was underway for sludge processing from Sludge storage Tanks. It may please be noted that there was no occasion of overflow in the past.</td></tr>
<tr><td>l)</td><td>Oily spillages were found near the bitumen melting facility. Black oily effluents were also found in the storm</td><td>Cleaning of Bitumen drums at the melting facility is an ongoing activity. The melted Bitumen is recovered and recycled. The concrete floor and storm water drains are cleaned periodically. It may further be noted that the storm water drain is not connected to refinery outlet</td></tr>
</table>

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<tr><th>S.No</th><th>Observations of the Committee</th><th>HPCL Reply</th></tr>
<tr><td></td><td>water drain near the facility (Photographs — 27 to 30).</td><td></td></tr>
<tr><td>m)</td><td>Construction and installation of new ETP with a capacity of 1,000 KL/hour was found completed. During inspection the Reverse Osmosis and Ultra filtration systems were under trial run</td><td>An Integrated ETP (IETP) with state-of-the-art technology having capacity of treating 1000 KL/Hour effluent was installed and commissioned in Feb-24. Subsequently, influent going to the exiting ETP-1, ETP-2 and ETP-4 was routed to IETP and the old ETPs made non-operational.

The treated effluent from IETP meets the raw water quality specifications. This treated effluent along with raw water is further processed in the Reverse Osmosis DM plant for production of DM water for process requirements.</td></tr>
<tr><td>n)</td><td>The three CAAQM stations installed within the industry premises were found in operation. Committee collected the ambient air quality data of all the three stations from APPCB server and found that the PM10 concentrations are exceeding the annual average standard limit of 60 µg/M3 at all the three locations for the years, 2022 & 2023 (up to 30.11.2023). Ambient air quality data obtained from these three CAAQM stations for the period of two years, 2022 & 2023 (up to 30.11.2023) is enclosed herewith (Annexure - 8).</td><td>PM10 & PM2.5 values most of the time exceed the maximum prescribed limits of 100 µg/m3 and 60 µg/m3, respectively in the entire Visakhapatnam city with an annual average of 112.89 and 45.22 respectively. The following are the Annual average values mentioned in the joint committee report viz GVMC CAAMS located in Visakhapatnam City.

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<tr><th>Parameter</th><th>Annual Limit (ug/m3)</th><th>CAAMS South Gate (ug/m3)</th><th>CAAMS Store Yard (ug/m3)</th><th>CAAMS HLPH (ug/m3)</th><th>CAAMS GVMC (ug/m3)</th></tr>
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<tr><td>PM-2.5</td><td>40</td><td>31.9</td><td>48.61</td><td>25.2</td><td>45.22</td></tr>
</table>

As per the above table, PM-10 and PM-2.5 values reported inside the refinery are well below the values recorded in the city.

Visakhapatnam is an industrial town having various other industries. Needless to state that various causes are attributable to increase in PM10 & PM2.5 level, such as vehicular pollution, Port activities, Construction works, industrial activities etc., in Visakhapatnam. Hence, this Respondent (HPCL) is not the cause of increased PM10 and PM 2.5 which is seen in the readings at the CAAMS within the refinery premises. Rather, it is</td></tr>
</table>

S.No	Observations of the Committee	HPCL Reply
		submitted that this Respondent is a recipient of excess PM10 & PM2.5 particles from outside the refinery.
o)	The refinery is having 42 stacks to emit flue gases generated during refining processes of petroleum crude. Nine (9) of them are not in use. Twenty-seven (27) stacks are in use and have been installed with online continuous emission monitoring systems (CEMS) to monitor the quality of flue gas emissions on real-time basis. Balance six (6) stacks are new ones and will be provided with CEMS once the corresponding refinery units are commissioned, as per the information provided by the representative of the refinery	CEMS data of CDU-IV-unit stack is connected to APPCB/CPCB servers. For balance five stacks, necessary inputs were submitted to CPCB on 05.04.2024 for online connectivity of Stack analysers.
p)	Odour Squad to be constituted by APPCB as per the recommendations of IISc, Bengaluru to initiate action and resolve the odour episodes	This does not apply to this Respondent (HPCL). Reply to be given by APPCB, as may be required.

Reply on Conclusions and Recommendations of the Committee:-

S.No	Conclusions and Recommendations of the Committee	HPCL Reply
a)	The effluent treatment systems is not been operated regularly and the waste mineral oil separation from the process effluents is not properly carried out. All the units including, primary clarifier, aeration tanks, final clarifiers, etc. of ETP -1 & 4 are found with floating black waste oil. Presence of waste mineral oil in aeration tanks / activated sludge process tanks inhibits the bacterial growth thereby the reduction of COD / BOD is affected. It is evident from the analysis results obtained for the treated effluent of ETP - 4, where the BOD, oil & grease, sulphide and ammonical nitrogen are exceeding the CTO standard limits)	❖ It may please be noted that ETPs are in regular operation and influent is treated always before discharging outside. As observed by the Joint committee during the visit the ETP-2 was not in operation as its influent was being treated in ETP-4. ❖ Samples collected along with Joint Committee samples at the same locations were analyzed at the MoEF-recognized third-party laboratory and the results of all parameters were within the stipulated limits.
b)	The Committee felt that the presently operating ETP 1 & 4 performances is not sufficient to handle the oily effluents being generated by the refinery. Hence, the refinery shall adopt suitable treatment techniques to ensure complete oil separation from the process effluents for proper treatment to comply with the standards stipulated	The existing ETPs are adequately designed to treat the maximum influent loads. Further, as witnessed by the joint committee, IETP with capacity of 1000 m3/hr was commissioned and the existing/old ETPs (i.e. ETP-I to ETP-IV) are non-operational from Feb-24.
c)	The new Integrated Effluent Treatment Plant (IETP) of 1,000 M3/hour capacity shall be commissioned & stabilized immediately to ensure proper treatment of refinery process effluents	
d)	HPCL shall install OCEMSs (Online Continuous Effluent Monitoring System) along with the electronic flow measurement equipment at	As per the guidelines of CPCB guidelines dated 02.03.2015 para (b) states “to Install online effluent monitoring system at the outlet of the Effluent treatment plant” Copy of the

S.No	Conclusions and Recommendations of the Committee	HPCL Reply
	the final outlets of ETPs (at the outlets of guard ponds) to ensure exact assessment of quality of the treated effluent and quantity of effluents discharged by the industry	guidelines are attached as (Annexure-11). Hence, the OCEMSs were installed at the outlet of ETPs as per the CPCB guidelines.
e)	The measuring principle of COD / BOD of online effluent water quality monitoring stations installed at the outlets of ETPs is UV light absorption / scanning technique. Suitability of the technique may be reviewed by the refinery and APPCB for measuring COD / BOD in the treated effluents by taking the CPCB Guidelines of Online Continuous Effluent Monitoring Systems (OCEMS), July, 2018 in to consideration.	The measuring principle of COD/BOD of ETP online effluent analysers is as per the CPCB guideline (UV-Visible Absorption Technique)
f)	The storm water drains in the process and as well as in ETP areas are found flowing with black waste mineral oil, which shows that there are leakages of crude oil from the storage tanks. HPCL shall arrest such leakages and clear all the drains to avoid the discharge outside the premises into water bodies	It may please be noted that there are no leakages of crude oil from storage tanks, process and ETPs into the storm water drains. The storm water drains mentioned in the report are periodically cleaned and are not connected to the refinery outlet.
g)	Huge deposits of oil scum was observed in the skimming ponds provided for the once-through cooling sea water, which can be attributed to joining of considerable amounts of crude and other petroleum products into the cooling water system through leakages. Hence, the refinery shall identify and arrest such leakages of crude and other petroleum products into the tanks of once through cooling water system	The purpose of skimming pond is to skim oil entered into once through cooling water system in case of any cooler leaks. The scum collected in the skimming pond is removed and bioremediated periodically. It is submitted that as a part of refinery expansion project once through cooling water has been completely converted to recirculating system in Dec-23 and there is no sea water discharge into the skimming pond.
h)	The refinery shall ensure that all the high oily sludge is disposed off	It was communicated to the Joint Committee during the visit that a purchase order was

S.No	Conclusions and Recommendations of the Committee	HPCL Reply
	as per the APPCB CTO terms & conditions as early as possible to prevent odour nuisance in the surroundings, water / soil pollution through spillages and from possible fire accidents.	placed on 19.07.23 and equipment mobilization was underway for sludge processing from Sludge storage Tanks.
i)	The refinery shall identify the sources of dust pollution within the premises and shall take appropriate steps to comply with the National Ambient Air Quality Standards in respect of PM10 & PM2.5.	Visakhapatnam is an industrial town having various other industries. Needless to state that various causes are attributable to increase in PM10 & PM2.5 level, such as vehicular pollution, Port activities, Construction works, industrial activities etc., in Visakhapatnam. As can be seen from above responses on PM levels, the same is lower within the refinery premises as compared to the levels existing within Visakhapatnam city. Hence, this Respondent (HPCL) is not the cause of increased PM10 and PM 2.5 which is seen in the readings at the CAAMS within the refinery premises. Rather, it is submitted that this Respondent is a recipient of excess PM10 & PM2.5 particles from outside the refinery.
j)	One of the APPCB CFO conditions is that the refinery shall recover sulphur with 99.9% efficiency in order to maintain the overall emission load of SO2 less than 11.5 tons per day even after expansion unit.	Sulphur Recovery Units with 99.9% efficiency are in operation and SO2 emission load is always maintained less than 11.5 tons per day.
k)	The Joint Committee has carried out material balance studies on sulphur recovery & SO2 emission loads during its inspections during March, 2021 and September, 2023. Similarly, APPCB may also verify sulphur recovery efficiency through material balances studies during inspection of the industry on half-yearly basis	This does not apply to this Respondent (HPCL). Reply to be given by APPCB, as may be required.
l)	The refinery and APPCB as well shall ensure regular calibration of the online effluent, emission and ambient air quality monitoring systems as per the laid down	Regular calibration of the online effluent, emission and ambient air quality monitoring systems as per the laid down protocols are being done. Records are maintained and shown to Joint Committee during inspection.

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S.No	Conclusions and Recommendations of the Committee	HPCL Reply
	protocols. Records shall be maintained. APPCB shall ensure that these monitoring systems are not tampered with	
m)	Performance Audit on functioning of CAAQM stations & CEMSs installed to various stacks shall be carried out once in a year by the CPCB empaneled third party independent laboratory other than already engaged for routine calibration & data verification	Noted and shall be complied.
n)	APPCB may be directed to constitute the Odour Squad for Visakhapatnam city to address the odour complaints as recommended by the IISc, Bengaluru	This does not apply to this Respondent (HPCL). Reply to be given by APPCB, as may be required.

Dated at Visakhapatnam on this the 18th day of September, 2024

For 7th RESPONDENT
M/s. Hindustan Petroleum
Corporation Limited

जी. भगवान
G. BHAGAVAN
महा प्रबंधक - तकनीकी
General Manager - Technical
एच.पी.सी.एल. - विशाख रिफाइनरी
H.P.C.L. - Visakh Refinery

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TEST REPORT

Issued to

DGM-Technical
Hindustan Petroleum Corporation Ltd.
Visakh Refinery, Malkapuram,
Visakhapatnam-530 011
Tel: 0891-2894895

Kind attention to: Sri Gudala Bhagavan

Date of Reporting	20th September, 2023	**Nature of Job**	Leak Detection and Repair Survey for Pumps &Valves & Flanges
Our Ref. No	Pra/HPCL-VR/LDAR/23	**No. of Points checked**	65 (Sixty Five Points Only)
P.O. No.	22000586-OP-46002/RD Dated on 27/10/2022	**Instrument used**	Hand held Photo Ionization Detector (PID) (Photo vac 2020 Combo Pro)
Parameters	Volatile Organic Compounds (VOC`s)		

ETP-I– UNIT

(Date: 15/08/2023)

S. No.	Tag No.	Equipment. No.	Leak Type	Description	Unit	VOC (ppm)	Kg/hr	Kg/day
1	.....	28- P- 11A	Valve-1	Clarified effluent transfer pump	ETP-I	12	0.000015	0.000351
2	.....	28- P- 11A	Valve-2	Clarified effluent transfer pump	ETP-I	10	0.000013	0.000306
3	.....	28- P- 11B	Valve-1	Clarified effluent transfer pump	ETP-I	11	0.000014	0.000329
4	.....	28- P- 11B	Valve-2	Clarified effluent transfer pump	ETP-I	15	0.000017	0.000414
5	.....	28- P- 11C	Valve-1	Clarified effluent transfer pump	ETP-I	19	0.000021	0.000494
6	.....	28- P- 11C	Valve-2	Clarified effluent transfer pump	ETP-I	29	0.000028	0.000678
7	.....	28- P- 11D	Valve-1	Clarified effluent transfer pump	ETP-I	18	0.000020	0.000475
8	.....	28- P- 11D	Valve-2	Clarified effluent transfer pump	ETP-I	19	0.000021	0.000494
9	.....	28- P- 12A	Valve-1	Clarified effluent transfer pump	ETP-I	23	0.000024	0.000570
10	.....	28- P- 12A	Valve-2	Clarified effluent transfer pump	ETP-I	25	0.000025	0.000607
11	.....	28- P- 12B	Valve-1	Clarified effluent transfer pump	ETP-I	27	0.000027	0.000642
12	.....	28- P- 12B	Valve-2	Clarified effluent transfer pump	ETP-I	18	0.000020	0.000475
13	.....	28- P- 12C	Valve-1	Clarified effluent transfer pump	ETP-I	16	0.000018	0.000435
14	.....	28- P- 12C	Valve-2	Clarified effluent transfer pump	ETP-I	21	0.000022	0.000533
15	.....	28- P- 11A	Flange-1	Clarified effluent transfer pump	ETP-I	19	0.000037	0.000877
16	.....	28- P- 11A	Flange-2	Clarified effluent transfer pump	ETP-I	16	0.000032	0.000777
17	.....	28- P- 11A	Flange-3	Clarified effluent transfer pump	ETP-I	13	0.000028	0.000671
18	.....	28- P- 11A	Flange-4	Clarified effluent transfer pump	ETP-I	12	0.000026	0.000635
19	.....	28- P- 11B	Flange-1	Clarified effluent transfer pump	ETP-I	14	0.000029	0.000707
20	.....	28- P- 11B	Flange-2	Clarified effluent transfer pump	ETP-I	21	0.000039	0.000941
21	.....	28- P- 11B	Flange-3	Clarified effluent transfer pump	ETP-I	19	0.000037	0.000877
22	.....	28- P- 11B	Flange-4	Clarified effluent transfer pump	ETP-I	26	0.000046	0.001093

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S. No.	Tag No.	Equipment. No.	Leak Type	Description	Unit	VOC (ppm)	Kg/hr	Kg/day
24	.....	28- P- 11C	Flange-2	Clarified effluent transfer pump	ETP-I	18	0.000035	0.000844
25	.....	28- P- 11C	Flange-3	Clarified effluent transfer pump	ETP-I	20	0.000038	0.000909
26	.....	28- P- 11C	Flange-4	Clarified effluent transfer pump	ETP-I	12	0.000026	0.000635
27	.....	28- P- 11D	Flange-1	Clarified effluent transfer pump	ETP-I	13	0.000028	0.000671
28	.....	28- P- 11D	Flange-2	Clarified effluent transfer pump	ETP-I	14	0.000029	0.000707
29	.....	28- P- 11D	Flange-3	Clarified effluent transfer pump	ETP-I	16	0.000032	0.000777
30	.....	28- P- 11D	Flange-4	Clarified effluent transfer pump	ETP-I	22	0.000040	0.000972
31	.....	28- P- 12A	Flange-1	Clarified effluent transfer pump	ETP-I	18	0.000035	0.000844
32	.....	28- P- 12A	Flange-2	Clarified effluent transfer pump	ETP-I	17	0.000034	0.000811
33	.....	28- P- 12A	Flange-3	Clarified effluent transfer pump	ETP-I	25	0.000044	0.001063
34	.....	28- P- 12A	Flange-4	Clarified effluent transfer pump	ETP-I	31	0.000052	0.001237
35	.....	28- P- 12B	Flange-1	Clarified effluent transfer pump	ETP-I	30	0.000050	0.001209
36	.....	28- P- 12B	Flange-2	Clarified effluent transfer pump	ETP-I	10	0.000023	0.000558
37	.....	28- P- 12B	Flange-3	Clarified effluent transfer pump	ETP-I	13	0.000028	0.000671
38	.....	28- P- 12B	Flange-4	Clarified effluent transfer pump	ETP-I	7	0.000018	0.000435
39	.....	28- P- 12C	Flange-1	Clarified effluent transfer pump	ETP-I	13	0.000028	0.000671
40	.....	28- P- 12C	Flange-2	Clarified effluent transfer pump	ETP-I	20	0.000038	0.000909
41	.....	28- P- 12C	Flange-3	Clarified effluent transfer pump	ETP-I	12	0.000026	0.000635
42	.....	28- P- 12C	Flange-4	Clarified effluent transfer pump	ETP-I	11	0.000025	0.000597
43	.....	21-GM-13A	Flange-1	Clarified effluent transfer pump	ETP-I	0	0.000000	0.000000
44	.....	21-GM-13A	Flange-2	Clarified effluent transfer pump	ETP-I	0	0.000000	0.000000
45	.....	21-GM-13A	Flange-3	Clarified effluent transfer pump	ETP-I	0	0.000000	0.000000
46	.....	21-GM-13A	Flange-4	Clarified effluent transfer pump	ETP-I	0	0.000000	0.000000
47	.....	21-GM-13B	Flange-1	Clarified effluent transfer pump	ETP-I	0	0.000000	0.000000
48	.....	21-GM-13B	Flange-2	Clarified effluent transfer pump	ETP-I	0	0.000000	0.000000
49	.....	21-GM-13B	Flange-3	Clarified effluent transfer pump	ETP-I	0	0.000000	0.000000
50	.....	21-GM-13B	Flange-4	Clarified effluent transfer pump	ETP-I	0	0.000000	0.000000
51	.....	28- P- 12A	Pump-1	Clarified effluent transfer pump	ETP-I	80	0.000729	0.017485
52	.....	28- P- 12A	Pump-2	Clarified effluent transfer pump	ETP-I	150	0.001069	0.025656
53	.....	28- P- 12B	Pump-1	Clarified effluent transfer pump	ETP-I	270	0.001530	0.036721
54	.....	28- P- 12B	Pump-2	Clarified effluent transfer pump	ETP-I	240	0.001424	0.034175
55	.....	28- P- 12C	Pump-1	Clarified effluent transfer pump	ETP-I	150	0.001069	0.025656
56	.....	21- GM- 13A	Pump-1	Slop oil pumping in separator	ETP-I	350	0.001792	0.043019

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S. No.	Tag No.	Equipment. No.	Leak Type	Description	Unit	VOC (ppm)	Kg/hr	Kg/day
58	.....	28- P- 11A	Pump-1	Clarified effluent transfer pump	ETP-I	150	0.001069	0.025656
59	.....	28- P- 11A	Pump-2	Clarified effluent transfer pump	ETP-I	525	0.002295	0.055090
60	.....	28- P- 11B	Pump-1	Clarified effluent transfer pump	ETP-I	450	0.002089	0.050146
61	.....	28- P- 11B	Pump-2	Clarified effluent transfer pump	ETP-I	550	0.002362	0.056676
62	.....	28- P- 11C	Pump-1	Clarified effluent transfer pump	ETP-I	300	0.001632	0.039158
63	.....	28- P- 11C	Pump-2	Clarified effluent transfer pump	ETP-I	500	0.002228	0.053475
64	.....	28- P- 11D	Pump-1	Clarified effluent transfer pump	ETP-I	250	0.001460	0.035037
65	.....	28- P- 11D	Pump-2	Clarified effluent transfer pump	ETP-I	150	0.001069	0.025656

Note: 1.VOC emissions for Pumps & Compressors above 5000 ppm are defined as leaks as per revised CPCB norms.
2. VOC emissions for Flanges & Valves above 3000 ppm are defined as leaks as per revised CPCB norms.

MD. Azeem

Analyst Signatory
(Md.Azeem)

Authorized Signatory
(M. Ravi kiran)

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TEST REPORT

issued to

DGM-Technical
Hindustan Petroleum Corporation Ltd.
Visakh Refinery, Malkapuram,
Visakhapatnam-530 011
Tel: 0891-2894895

Kind attention to: Sri Gudala Bhagavan

Date of Reporting	20th September, 2023	***Nature of Job***	Leak Detection and Repair Survey for Pumps &Valves & Flanges
Our Ref. No	Pra/HPCL-VR/LDAR/23	***No. of Points checked***	90 (Ninety Points Only)
P.O. No.	22000586-OP-46002/RD Dated on 27/10/2022	***Instrument used***	Hand held Photo Ionization Detector (PID), (Photo vac 2020 Combo Pro)
Parameters	Volatile Organic Compounds (VOC's)		

ETP- II – UNIT

(Date: 15/08/2023)

S. No.	Tag No.	Equipment. No.	Leak Type	Description	Unit	VOC (ppm)	Kg/hr	Kg/day
1	.....	190 - PM-16A	Valve-1	BIO Sludge Recirculation pump	ETP-II	10	0.000013	0.000306
2	.....	190 - PM- 16A	Valve-2	BIO Sludge Recirculation pump	ETP-II	14	0.000016	0.000394
3	.....	190 - PM-16B	Valve-1	BIO Sludge Recirculation pump	ETP-II	20 *	0.000021	0.000514
4	.....	190 - PM- 16B	Valve-2	BIO Sludge Recirculation pump	ETP-II	10	0.000013	0.000306
5	.....	190 - PM- 11A	Valve-1	BIO Sludge Recirculation pump	ETP-II	31	0.000030	0.000712
6	.....	190 - PM- 11A	Valve-2	BIO Sludge Recirculation pump	ETP-II	7	0.000010	0.000235
7	.....	190 - PM- 11B	Valve-1	BIO Sludge Recirculation pump	ETP-II	13	0.000016	0.000372
8	.....	190 - PM- 11B	Valve-2	BIO Sludge Recirculation pump	ETP-II	20	0.000021	0.000514
9	.....	190 - PM- 11C	Valve-1	BIO Sludge Recirculation pump	ETP-II	9	0.000012	0.000283
10	.....	190 - PM- 11C	Valve-2	BIO Sludge Recirculation pump	ETP-II	11	0.000014	0.000329
11	.....	190 - PM- 11D	Valve-1	BIO Sludge Recirculation pump	ETP-II	22	0.000023	0.000551
12	.....	190 - PM- 11D	Valve-2	BIO Sludge Recirculation pump	ETP-II	18	0.000020	0.000475
13	.....	190 - PM- 11E	Valve-1	BIO Sludge Recirculation pump	ETP-II	3	0.000005	0.000125
14	.....	190 - PM- 11E	Valve-2	BIO Sludge Recirculation pump	ETP-II	14	0.000016	0.000394
15	.....	190 - PM- 12C	Valve-1	BIO Sludge Recirculation pump	ETP-II	18	0.000020	0.000475
16	.....	190 - PM- 12C	Valve-2	BIO Sludge Recirculation pump	ETP-II	19	0.000021	0.000494
17	.....	190 - PM- 12D	Valve-1	BIO Sludge Recirculation pump	ETP-II	13	0.000016	0.000372
18	.....	190 - PM- 12D	Valve-2	BIO Sludge Recirculation pump	ETP-II	21	0.000022	0.000533
19	.....	190 - PM-11A	Flange-1	BIO Sludge Recirculation pump	ETP-II	26	0.000046	0.001093
20	.....	190 - PM-11A	Flange-2	BIO Sludge Recirculation pump	ETP-II	30	0.000050	0.001209
21	.....	190 - PM-11A	Flange-3	BIO Sludge Recirculation pump	ETP-II	35	0.000056	0.001347
22	.....	190 - PM-11A	Flange-4	BIO Sludge Recirculation pump	ETP-II	51	0.000073	0.001755
23	.....	190 - PM-11B	Flange-1	BIO Sludge Recirculation pump	ETP-II	56	0.000078	0.001875

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TEST REPORT

S. No.	Tag No.	Equipment. No.	Leak Type	Description	Unit	VOC (ppm)	Kg/hr	Kg/day
25	.....	190 - PM-11B	Flange-3	BIO Sludge Recirculation pump	ETP-II	23	0.000042	0.001003
26	.....	190 - PM-11B	Flange-4	BIO Sludge Recirculation pump	ETP-II	7	0.000018	0.000435
27	.....	190 - PM-11C	Flange-1	BIO Sludge Recirculation pump	ETP-II	12	0.000026	0.000635
28	.....	190 - PM-11C	Flange-2	BIO Sludge Recirculation pump	ETP-II	13	0.000028	0.000671
29	.....	190 - PM-11C	Flange-3	BIO Sludge Recirculation pump	ETP-II	8	0.000020	0.000477
30	.....	190 - PM-11C	Flange-4	BIO Sludge Recirculation pump	ETP-II	13	0.000028	0.000671
31	.....	190 - PM-11D	Flange-1	BIO Sludge Recirculation pump	ETP-II	27	0.000047	0.001122
32	.....	190 - PM-11D	Flange-2	BIO Sludge Recirculation pump	ETP-II	20	0.000038	0.000909
33	.....	190 - PM-11D	Flange-3	BIO Sludge Recirculation pump	ETP-II	26	0.000046	0.001093
34	.....	190 - PM-11D	Flange-4	BIO Sludge Recirculation pump	ETP-II	19	0.000037	0.000877
35	.....	190 - PM-11E	Flange-1	BIO Sludge Recirculation pump	ETP-II	10	0.000023	0.000558
36	.....	190 - PM-11E	Flange-2	BIO Sludge Recirculation pump	ETP-II	3	0.000010	0.000240
37	.....	190 - PM-11E	Flange-3	BIO Sludge Recirculation pump	ETP-II	9	0.000022	0.000518
38	.....	190 - PM-11E	Flange-4	BIO Sludge Recirculation pump	ETP-II	4	0.000012	0.000293
39	.....	190 -P 100 4A	Flange-1	Ex TPI Transfer pump	ETP-II	7	0.000018	0.000435
40	.....	190 -P 100 4A	Flange-2	Ex TPI Transfer pump	ETP-II	30	0.000050	0.001209
41	.....	190 -P 100 4A	Flange-3	Ex TPI Transfer pump	ETP-II	36	0.000057	0.001374
42	.....	190 -P 100 4B	Flange-1	Ex TPI Transfer pump	ETP-II	20	0.000038	0.000909
43	.....	190 -P 100 4B	Flange-2	Ex TPI Transfer pump	ETP-II	12	0.000026	0.000635
44	.....	190 -P 100 4B	Flange-3	Ex TPI Transfer pump	ETP-II	7	0.000018	0.000435
45	.....	190 -P 100 4C	Flange-1	Ex TPI Transfer pump	ETP-II	13	0.000028	0.000671
46	.....	190 -P 100 4C	Flange-2	Ex TPI Transfer pump	ETP-II	16	0.000032	0.000777
47	.....	190 -P 100 4C	Flange-3	Ex TPI Transfer pump	ETP-II	21	0.000039	0.000941
48	.....	190 - PM-12C	Flange-1	BIO Sludge Recirculation pump	ETP-II	29	0.000049	0.001180
49	.....	190 - PM-12C	Flange-2	BIO Sludge Recirculation pump	ETP-II	20	0.000038	0.000909
50	.....	190 - PM-12C	Flange-3	BIO Sludge Recirculation pump	ETP-II	33	0.000054	0.001292
51	.....	190 - PM-12D	Flange-1	BIO Sludge Recirculation pump	ETP-II	19	0.000037	0.000877
52	.....	190 - PM-12D	Flange-2	BIO Sludge Recirculation pump	ETP-II	21	0.000039	0.000941
53	.....	190 - PM-12D	Flange-3	BIO Sludge Recirculation pump	ETP-II	10	0.000023	0.000558
54	.....	190 - PM-16A	Flange-1	BIO Sludge Recirculation pump	ETP-II	3	0.000010	0.000240
55	.....	190 - PM-16A	Flange-2	BIO Sludge Recirculation pump	ETP-II	12	0.000026	0.000635
56	.....	190 - PM-16A	Flange-3	BIO Sludge Recirculation pump	ETP-II	4	0.000012	0.000293
57	.....	190 - PM-16A	Flange-4	BIO Sludge Recirculation pump	ETP-II	16	0.000032	0.000777
58	.....	190 - PM-16B	Flange-1	BIO Sludge Recirculation pump	ETP-II	27	0.000047	0.001122
59	.....	190 - PM-16B	Flange-2	BIO Sludge Recirculation pump	ETP-II	9	0.000022	0.000518
60	.....	190 - PM-16B	Flange-3	BIO Sludge Recirculation pump	ETP-II	13	0.000028	0.000671

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Opp. Bank of Baroda, Sanath Nagar, Hyderabad - 500 018. Telangana.
Mobile : 98498 72272 Mail : info@pragathilabs.com Web : www.pragathilabs.com

TEST REPORT

S. No.	Tag No.	Equipment. No.	Leak Type	Description	Unit	VOC (ppm)	Kg/hr	Kg/day
62	.....	190 - PM -01A	Pump-2	--	ETP-II	160	0.001112	0.026687
63	.....	190 - PM -01B	Pump-1	--	ETP-II	350	0.001792	0.043019
64	.....	190 - PM -01B	Pump-2	--	ETP-II	210	0.001313	0.031502
65	.....	190 - PM -02A	Pump-1	--	ETP-II	450	0.002089	0.050146
66	.....	190 - PM -02A	Pump-2	--	ETP-II	325	0.001713	0.041118
67	.....	190 - PM -02B	Pump-1	--	ETP-II	190	0.001235	0.029636
68	.....	190 - PM -02B	Pump-2	--	ETP-II	325	0.001713	0.041118
69	.....	190 -P 100 4A	Pump-1	Ex TPI Transfer pump	ETP-II	350	0.001792	0.043019
70	.....	190 -P 100 4A	Pump-2	Ex TPI Transfer pump	ETP-II	250	0.001460	0.035037
71	.....	190 -P 100 4B	Pump-1	Ex TPI Transfer pump	ETP-II	400	0.001945	0.046670
72	.....	190 -P 100 4B	Pump-2	Ex TPI Transfer pump	ETP-II	250	0.001460	0.035037
73	.....	190 -P 100 4C	Pump-1	Ex TPI Transfer pump	ETP-II	410	0.001974	0.047378
74	.....	190 -P 100 4C	Pump-2	Ex TPI Transfer pump	ETP-II	210	0.001313	0.031502
75	.....	190 - PM-11A	Pump-1	BIO Sludge Recirculation pump	ETP-II	190	0.001235	0.029636
76	.....	190 - PM-11A	Pump-2	BIO Sludge Recirculation pump	ETP-II	180	0.001195	0.028674
77	.....	190 - PM-11B	Pump-1	BIO Sludge Recirculation pump	ETP-II	250	0.001460	0.035037
78	.....	190 - PM-11B	Pump-2	BIO Sludge Recirculation pump	ETP-II	180	0.001195	0.028674
79	.....	190 - PM-11C	Pump-1	BIO Sludge Recirculation pump	ETP-II	210	0.001313	0.031502
80	.....	190 - PM-11C	Pump-2	BIO Sludge Recirculation pump	ETP-II	260	0.001495	0.035885
81	.....	190 - PM-11D	Pump-1	BIO Sludge Recirculation pump	ETP-II	175	0.001174	0.028186
82	.....	190 - PM-11D	Pump-2	BIO Sludge Recirculation pump	ETP-II	120	0.000933	0.022391
83	.....	190 - PM-11E	Pump-1	BIO Sludge Recirculation pump	ETP-II	140	0.001025	0.024599
84	.....	190 - PM-11E	Pump-2	BIO Sludge Recirculation pump	ETP-II	180	0.001195	0.028674
85	.....	190 - PM-12C	Pump-1	BIO Sludge Recirculation pump	ETP-II	230	0.001387	0.033299
86	.....	190 - PM-12C	Pump-2	BIO Sludge Recirculation pump	ETP-II	270	0.001530	0.036721
87	.....	190 - PM-12D	Pump-1	BIO Sludge Recirculation pump	ETP-II	180	0.001195	0.028674
88	.....	190 - PM-12D	Pump-2	BIO Sludge Recirculation pump	ETP-II	150	0.001069	0.025656
89	.....	190 - PM-16A	Pump-1	BIO Sludge Recirculation pump	ETP-II	100	0.000835	0.020035
90	.....	190 - PM-16A	Pump-2	BIO Sludge Recirculation pump	ETP-II	140	0.001025	0.024599

Note: 1.VOC emissions for Pumps & Compressors above 5000 ppm are defined as leaks as per revised CPCB norms.
2. VOC emissions for Flanges & Valves above 3000 ppm are defined as leaks as per revised CPCB norms.

MD. Azeem

Analyst Signatory
(Md.Azeem)

Authorized Signatory
(M. Ravi kiran)

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TEST REPORT

Issued to

DGM-Technical
Hindustan Petroleum Corporation Ltd.
Visakh Refinery, Malkapuram
Visakhapatnam-530 011
Tel: 0891-2894895

Kind attention to: Sri Gudala Bhagavan

Date of Reporting	20th September, 2023	***Nature of Job***	Leak Detection and Repair Survey for Pumps &Valves & Flanges
Our Ref. No	Pra/HPCL-VR/LDAR/23	***No. of Points checked***	111 (One Hundred and Eleven Points Only)
P.O. No.	22000586-OP-46002/RD Dated on 27/10/2022	***Instrument used***	Hand held Photo Ionization Detector (PID) ,(Photo vac 2020 Combo Pro)
Parameters	Volatile Organic Compounds (VOC's)		

ETP-IV – UNIT

(Date: 18/08/2023)

S. No.	ID Tag No.	Equipment. No.	Leak Type	Description	Unit	VOC (ppm)	Kg/hr	Kg/day
1	.....	82 -P- 10A	Valve-1	--	ETP-IV	17	0.000019	0.000455
2	.....	82 -P- 10A	Valve-2	--	ETP-IV	21	0.000022	0.000533
3	.....	82 -P- 10B	Valve-1	--	ETP-IV	26	0.000026	0.000625
4	.....	82 -P- 10B	Valve-2	--	ETP-IV	3	0.000005	0.000125
5	.....	82 - P - 07A	Valve-1	--	ETP-IV	16	0.000018	0.000435
6	.....	82 - P - 07A	Valve-2	--	ETP-IV	30	0.000029	0.000695
7	.....	82 - P - 07B	Valve-1	--	ETP-IV	4	0.000006	0.000155
8	.....	82 - P - 07B	Valve-2	--	ETP-IV	10	0.000013	0.000306
9	.....	82 - P - 07C	Valve-1	--	ETP-IV	11	0.000014	0.000329
10	.....	82 - P - 07C	Valve-2	--	ETP-IV	12	0.000015	0.000351
11	.....	82 - P - 07D	Valve-1	--	ETP-IV	10	0.000013	0.000306
12	.....	82 - P - 07D	Valve-2	--	ETP-IV	13	0.000016	0.000372
13	.....	82 - P - 24A	Valve-1	--	ETP-IV	4	0.000006	0.000155
14	.....	82 - P - 24B	Valve-2	--	ETP-IV	30	0.000029	0.000695
15	.....	82 - P - 24C	Valve-1	--	ETP-IV	22	0.000023	0.000551
16	.....	82 - P - 24D	Valve-2	--	ETP-IV	7	0.000010	0.000235
17	.....	82 -P- 004A	Valve-1	--	ETP-IV	10	0.000013	0.000306
18	.....	82 -P- 004B	Valve-2	--	ETP-IV	3	0.000005	0.000125
19	.....	82 -P- 004C	Valve-1	--	ETP-IV	11	0.000014	0.000329
20	.....	82 -P- 004C	Valve-2	--	ETP-IV	20	0.000021	0.000514
21	.....	82 - P - 10A	Flange-1	--	ETP-IV	30	0.000050	0.001209

S. No.	ID Tag No.	Equipment. No.	Leak Type	Description	Unit	VOC (ppm)	Kg/hr	Kg/day
22	.....	82 - P - 10A	Flange-2	--	ETP-IV	9	0.000022	0.000518
23	.....	82 - P - 10A	Flange-3	--	ETP-IV	37	0.000058	0.001401
24	.....	82 - P - 10A	Flange-4	--	ETP-IV	13	0.000028	0.000671
25	.....	82 - P - 10B	Flange-1	--	ETP-IV	3	0.000010	0.000240
26	.....	82 - P - 10B	Flange-2	--	ETP-IV	18	0.000035	0.000844
27	.....	82 - P - 10B	Flange-3	--	ETP-IV	21	0.000039	0.000941
28	.....	82 - P - 10B	Flange-4	--	ETP-IV	22	0.000040	0.000972
29	.....	82 - P - 07A	Flange-1	--	ETP-IV	27	0.000047	0.001122
30	.....	82 - P - 07A	Flange-2	--	ETP-IV	9	0.000022	0.000518
31	.....	82 - P - 07A	Flange-3	--	ETP-IV	23	0.000042	0.001003
32	.....	82 - P - 07A	Flange-4	--	ETP-IV	19	0.000037	0.000877
33	.....	82 - P - 07B	Flange-1	--	ETP-IV	9	0.000022	0.000518
34	.....	82 - P - 07B	Flange-2	--	ETP-IV	21	0.000039	0.000941
35	.....	82 - P - 07B	Flange-3	--	ETP-IV	13	0.000028	0.000671
36	.....	82 - P - 07B	Flange-4	--	ETP-IV	20	0.000038	0.000909
37	.....	82 - P - 07C	Flange-1	--	ETP-IV	12	0.000026	0.000635
38	.....	82 - P - 07C	Flange-2	--	ETP-IV	7	0.000018	0.000435
39	.....	82 - P - 07C	Flange-3	--	ETP-IV	11	0.000025	0.000597
40	.....	82 - P - 07C	Flange-4	--	ETP-IV	23	0.000042	0.001003
41	.....	82 - P - 07D	Flange-1	--	ETP-IV	19	0.000037	0.000877
42	.....	82 - P - 07D	Flange-2	--	ETP-IV	30	0.000050	0.001209
43	.....	82 - P - 07D	Flange-3	--	ETP-IV	20	0.000038	0.000909
44	.....	82 - P - 07D	Flange-4	--	ETP-IV	34	0.000055	0.001320
45	.....	82 -P- 004A	Flange-1	--	ETP-IV	10	0.000023	0.000558
46	.....	82 -P- 004A	Flange-2	--	ETP-IV	13	0.000028	0.000671
47	.....	82 -P- 004A	Flange-3	--	ETP-IV	30	0.000050	0.001209
48	.....	82 -P- 004B	Flange-1	--	ETP-IV	9	0.000022	0.000518
49	.....	82 -P- 004B	Flange-2	--	ETP-IV	30	0.000050	0.001209
50	.....	82 -P- 004B	Flange-3	--	ETP-IV	21	0.000039	0.000941
51	.....	82 -P- 004C	Flange-1	--	ETP-IV	22	0.000040	0.000972
52	.....	82 -P- 004C	Flange-2	--	ETP-IV	20	0.000038	0.000909
53	.....	82 -P- 004C	Flange-3	--	ETP-IV	9	0.000022	0.000518
54	.....	82 - P - 24A	Flange-1	--	ETP-IV	27	0.000047	0.001122
55	.....	82 - P - 24A	Flange-2	--	ETP-IV	40	0.000062	0.001480
56	.....	82 - P - 24A	Flange-3	--	ETP-IV	13	0.000028	0.000671
57	.....	82 - P - 24B	Flange-1	--	ETP-IV	16	0.000032	0.000777
58	.....	82 - P - 24B	Flange-2	--	ETP-IV	3	0.000010	0.000240
59	.....	82 - P - 24B	Flange-3	--	ETP-IV	14	0.000029	0.000707

S. No.	ID Tag No.	Equipment. No.	Leak Type	Description	Unit	VOC (ppm)	Kg/hr	Kg/day
60	.....	82 - P - 24C	Flange-1	--	ETP-IV	27	0.000047	0.001122
61	.....	82 - P - 24C	Flange-2	--	ETP-IV	31	0.000052	0.001237
62	.....	82 - P - 24C	Flange-3	--	ETP-IV	20	0.000038	0.000909
63	.....	82 - P - 24D	Flange-1	--	ETP-IV	23	0.000042	0.001003
64	.....	82 - P - 24D	Flange-2	--	ETP-IV	40	0.000062	0.001480
65	.....	82 - P - 24D	Flange-3	--	ETP-IV	27	0.000047	0.001122
66	.....	82 - P - 07A	Flange-1	--	ETP-IV	10	0.000023	0.000558
67	.....	82 - P - 07A	Flange-2	--	ETP-IV	14	0.000029	0.000707
68	.....	82 - P - 07A	Flange-3	--	ETP-IV	21	0.000039	0.000941
69	.....	82 - P - 07B	Flange-1	--	ETP-IV	22	0.000040	0.000972
70	.....	82 - P - 07B	Flange-2	--	ETP-IV	31	0.000052	0.001237
71	.....	82 - P - 07B	Flange-3	--	ETP-IV	26	0.000046	0.001093
72	.....	82 - P - 07C	Flange-1	--	ETP-IV	19	0.000037	0.000877
73	.....	82 - P - 07C	Flange-2	--	ETP-IV	21	0.000039	0.000941
74	.....	82 - P - 07C	Flange-3	--	ETP-IV	40	0.000062	0.001480
75	.....	82 - P - 07D	Flange-1	--	ETP-IV	3	0.000010	0.000240
76	.....	82 - P - 07D	Flange-2	--	ETP-IV	10	0.000023	0.000558
77	.....	82 - P - 07D	Flange-3	--	ETP-IV	11	0.000025	0.000597
78	.....	82 - P - 31A	Flange-1	--	ETP-IV	27	0.000047	0.001122
79	.....	82 - P - 31A	Flange-2	--	ETP-IV	9	0.000022	0.000518
80	.....	82 - P - 31A	Flange-3	--	ETP-IV	13	0.000028	0.000671
81	.....	82 - P - 31B	Flange-1	--	ETP-IV	27	0.000047	0.001122
82	.....	82 - P - 31B	Flange-2	--	ETP-IV	31	0.000052	0.001237
83	.....	82 - P - 31B	Flange-3	--	ETP-IV	23	0.000042	0.001003
84	.....	82 -P- 004A	Pump-1	--	ETP-IV	140	0.001025	0.024599
85	.....	82 -P- 004A	Pump-2	--	ETP-IV	100	0.000835	0.020035
86	.....	82 -P- 004B	Pump-1	--	ETP-IV	90	0.000783	0.018787
87	.....	82 -P- 004B	Pump-2	--	ETP-IV	150	0.001069	0.025656
88	.....	82 -P- 004C	Pump-1	--	ETP-IV	320	0.001697	0.040731
89	.....	82 -P- 004C	Pump-2	--	ETP-IV	250	0.001460	0.035037
90	.....	82 -P- 10A	Pump-1	--	ETP-IV	190	0.001235	0.029636
91	.....	82 -P- 10A	Pump-2	--	ETP-IV	420	0.002003	0.048080
92	.....	82 -P- 10B	Pump-1	--	ETP-IV	290	0.001598	0.038357
93	.....	82 -P- 10B	Pump-2	--	ETP-IV	240	0.001424	0.034175
94	.....	82 - P - 07A	Pump-1	--	ETP-IV	190	0.001235	0.029636
95	.....	82 - P - 07A	Pump-2	--	ETP-IV	140	0.001025	0.024599
96	.....	82 - P - 07B	Pump-1	--	ETP-IV	130	0.000980	0.023512

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TEST REPORT

S. No.	ID Tag No.	Equipment. No.	Leak Type	Description	Unit	VOC (ppm)	Kg/hr	Kg/day
98	.....	82 - P - 07C	Pump-1	--	ETP-IV	175	0.001174	0.028186
99	.....	82 - P - 07C	Pump-2	--	ETP-IV	325	0.001713	0.041118
100	.....	82 - P - 07D	Pump-1	--	ETP-IV	180	0.001195	0.028674
101	.....	82 - P - 07D	Pump-2	--	ETP-IV	150	0.001069	0.025656
102	.....	82 - P - 24A	Pump-1	--	ETP-IV	210	0.001313	0.031502
103	.....	82 - P - 24A	Pump-2	--	ETP-IV	200	0.001274	0.030578
104	.....	82 - P - 24B	Pump-1	--	ETP-IV	270	0.001530	0.036721
105	.....	82 - P - 24B	Pump-2	--	ETP-IV	220	0.001350	0.032408
106	.....	82 - P - 24C	Pump-1	--	ETP-IV	180	0.001195	0.028674
107	.....	82 - P - 24C	Pump-2	--	ETP-IV	225	0.001369	0.032856
108	.....	82 - P - 24D	Pump-1	--	ETP-IV	140	0.001025	0.024599
109	.....	82 - P - 24D	Pump-2	--	ETP-IV	110	0.000885	0.021234
110	.....	82 - P - 31A	Pump-1	--	ETP-IV	140	0.001025	0.024599
111	.....	82 - P - 31B	Pump-1	--	ETP-IV	90	0.000783	0.018787

Note: 1.VOC emissions for Pumps & Compressors above 5000 ppm are defined as leaks as per revised CPCB norms.
2. VOC emissions for Flanges & Valves above 3000 ppm are defined as leaks as per revised CPCB norms.

Analyst Signatory
(Md.Azeem)

Authorized Signatory
(M. Ravi kiran)

A Report On

Industrial Hygiene Study For Air-borne Contaminants In The Work Environment

For

M/s Hindustan Petroleum Corporation Limited, Visakh Refinery, Visakhapatnam

Conducted By

GLens Innovation Labs Pvt. Ltd.
Chennai

DISCLAIMER

This report has been prepared by GLens Innovation Labs Pvt Ltd., with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating Industrial Hygiene Standard Practices and Conditions of Business and taking account of the manpower and resources devoted to it by agreement with the client.

GLens Innovation Labs disclaims any responsibility to the client and others in respect of any matters outside the scope of the above.

The underlying measurements and preparation of this report have been accomplished using recognized standards and to our best knowledge. No claims shall be raised from this report.

The measurements have been carried out on the day(s) specified. Therefore, these results reflect a single exposure situation and cannot be extrapolated for other prevailing conditions. Errors within acceptable margins cannot be excluded.

ACKNOWLEDGEMENT

M/s Glens Innovation Labs hereby extend our sincere thanks and gratitude to ***Shri. Koneti Gopi****, Assistant Manager- Mesical services, HPCL Visakh Refinery for his continuous support as well as end to end coordination in conceptualization and execution of this scientific study.*

We are also thankful to ***Shri. V. Prabhakar*** *(DGM-HR), for the support in carrying out the project.*

We also appreciate the great support from all the operations and maintenance departments, engineers of HPCL Visakh Refinery for the smooth and successful completion of sampling activities on round the clock basis.

We also extend our thanks to ***Shri. Ponrasu*** *and* ***Shri. Parthiban****, who comprised the monitoring team from Glens Innovation Labs, Chennai. The efforts rendered by all in monitoring and sampling are highly appreciable.* ***Shri. Prithvirajan*** *helped in the timely and accurate analysis of samples. We also would like to thank* ***Ms. Sruthi Rajan*** *for the efforts put in by her. We also extend our gratitude to* ***Shri. S. Dillibabu,*** *Technical Director, GLens Innovation Labs, Chennai for his support and encouragement.*

The Industrial Hygiene Study for airborne contaminants was conducted from 12th February 2024 to 22nd February 2024. Air borne contaminants like Hydrogen Sulfide, Sulphur Dioxide, Ammonia, Carbon Monoxide, SPM, Benzene and Hydrocarbons levels were monitored in all the locations required. The following pages detail the contents of the report.

Thanking you

For GLens Innovation Labs,

Dilli Babu .S
Director

GLENS INNOVATION LABS PVT. LTD. CHENNAI

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Chapter 1

INTRODUCTION

1. Introduction

1.1 Industrial Hygiene

Industrial hygiene is concerned with identifying, evaluating, and controlling real or potential workplace environmental stressors or hazards that can affect the wellbeing of workers and community members. It is sometimes called Occupational Hygiene, Occupational Health or Workplace Health. Ideally, hazards are identified and controlled when a workplace is being planned, when conditions or processes change, or through yearly reviews, before they become an issue for workers.

An industrial hygienist will use scientific methods to evaluate and control hazards in the workplace, including risk assessment tools and information, such as Safety Data Sheets, which are put together by chemical manufacturers and contain detailed information about each chemical. Industrial hygienists can also conduct a worksite analysis to evaluate all jobs, operations, machinery, and work activities at that site, in addition to problem solving on specific activities or work areas.

After a hazard is identified, an industrial hygienist will work with the company to control or eliminate the hazard. This can include substituting a chemical for a less hazardous one, reducing exposure to hazards, utilization of personal protective equipment such as gloves or goggles, or increasing ventilation.

1.2 About Industry

Commissioned with an installed capacity of 0.65 MMTPA by Caltex Oil Refining (India) Ltd. in 1957, Visakh Refinery was one of the first major industries of Visakhapatnam and first oil refinery on the East coast. It was taken over by Govt. of India in 1976 and subsequently merged with HPCL in 1978. After nationalization, HPCL has transformed itself into a mega Public Sector Undertaking. HPCL has progressively augmented its facilities for modernization and for meeting multifarious challenges like increased product demand, energy conservation and stringent safety and pollution control norms. The major refinery capacity augmentation with state-of-the-art facilities was taken up in 1985 by commissioning a separate stream of 3.0 MMTPA Crude Distillation unit (CDU- II), Fluidized Catalytic Cracking unit (FCC-II), Crude Oil receiving facilities at high seas (Offshore Tanker Terminal) and associated tankage and product dispatch facilities. Thus, the installed capacity was increased to 4.5 MMTPA. The LPG import facilities were first developed on the East coast in 1987. Captive Power Plant was commissioned in 1991 to surmount the frequent power disruptions and sustain improved service factors of the Process units. The Refinery, in its efforts to improve the Petrochemical industries had commissioned Propylene Recovery unit (PRU) in 1992 to supply Propylene which is the feedstock to the neighboring industry APCL (for manufacture of Oxo-Alcohols). To meet the stringent environmental norms, the Refinery had set up Sour water stripping units, Effluent Treatment Plants in 1993 and Sulfur Recovery Unit in 1994. To reduce the CO emissions to atmosphere, CO boiler is commissioned along with FCCU-II. In order to match the processing capabilities and economies of world scale refineries, Visakh Refinery has implemented a low-cost expansion project in the year 2000 for augmenting its crude processing capabilities to 7.5 MMTPA; the third Crude Distillation Unit of 3.0 MMTPA capacity was added, along with a new Fluidized Catalytic Cracking Unit to enhance the secondary processing capabilities. In the same year, a 1.8 MMTPA Diesel Hydro Desulphurization Unit and associated facilities were set up for supplying the region with superior quality Diesel meeting BS II specifications. This unit was subsequently

revamped to 2.4 MMTPA in 2005.For meeting the changed auto fuel norms, Visakh Refinery has installed the MS Quality Up gradation facilities (Clean Fuels Project) recently with a massive investment of about Rs. 2200 crores which provided the refinery with the capability to supply superior quality MS (Petrol) meeting Euro III and Euro IV specifications. The facilities were commissioned in the year 2009-10. With the VRCFP facilities in place, the capacity of the refinery was augmented to 8.3 MMTPA. Diesel Hydrotreater (DHT) Unit was subsequently commissioned in 2014 with a capacity of 1.32 MMTPA for production of BS-IV grade diesel. HPCL-VR is currently implementing a major expansion project, viz., Visakh Refinery Modernization Project (VRMP) with the objectives of capacity expansion from 8.33 to 15 MMTPA with bottoms up gradation. As part of VRMP, already, product quality up gradation to facilitate supply of BS-VI grade MS HSD as per Auto Fuel Policy of India has been commissioned. Under VRMP, DHT capacity was increased to 2.86 MMTPA, NHT increased to 1.5 MMTPA and CCR increased to 1.04 MMTPA. A new 9 MMTPA Crude Distillation Unit was commissioned in March'23 and 3 MMTPA Full Conversion Hydrocracker Unit commissioning activities are in progress. Bottom Up gradation unit (RUF) construction activities are in progress.

1.3 Airborne contaminants and their sampling location

The airborne contaminants along with the locations from which the sample is collected is as follows:

1.3.1 Hydrogen Sulphide (H_2S) Gas

- MEROX Unit
- Crude Distillation Unit – 1, 2, & 3
- Visbreaker Unit (VBU)
- Diesel Hydro Desulphurization Unit (DHDS Block)
- Diesel Hydro Treater Unit (DHT Block)
- VRCFP Units
- LPG Mounded Bullet Area

1.3.2 Sulphur Dioxide (SO_2) Gas

- DHDS Sulphur Recovery Unit (SRU)
- DHT Sulphur Recovery Unit (SRU)

1.3.3 Ammonia (NH_4) Gas

- Crude Distillation Unit – 1
- Sour Water Stripping Unit (SWSU)
- DHDS SRU Sour Gas KODs
- DHT SRU Sour Gas KODs

1.3.4 Carbon Monoxide (CO) Gas

- Fluidized Catalytic Cracking Unit (FCCU) – 1
- Fluidized Catalytic Cracking Unit (FCCU) – 2

1.3.5 Airborne Hydrocarbons (including Benzene)

- Crude Distillation Unit (CDU) – 1

- Crude Distillation Unit (CDU) – 2
- Crude Distillation Unit (CDU) – 3 & VBU
- Fluidized Catalytic Cracking Unit (FCCU) – 1
- Fluidized Catalytic Cracking Unit (FCCU) – 2
- Diesel Hydro Desulphurization Unit (DHDS)
- Effluent Treatment Plants (ETP)
- DHT
- MS Block

1.3.6 Suspended Particulate Matter (SPM)

- Crude Distillation Unit (CDU) – 1
- Crude Distillation Unit (CDU) – 2
- Crude Distillation Unit (CDU) – 3
- Fluidized Catalytic Cracking Unit (FCCU) – 1
- Fluidized Catalytic Cracking Unit (FCCU) – 2
- Power Plant – 2
- Sulphur Recovery Units (SRUs, DHDS & PTU)

Chapter 2

AIR BORNE CONTAMINANT – HYDROGEN SULPHIDE (H_2S)

2. Air Borne Contaminant – Hydrogen Sulphide

2.1 Hydrogen Sulphide

Hydrogen Sulphide is a highly toxic gas with a characteristic rotten egg odour. Exposure to low concentrations can cause irritation to mucous membranes, eyes and the respiratory tract. Repeated exposure, even at low levels, can lead to more severe health effects.

Here are some of the potential health effects of exposure to hydrogen sulphide:

- **Irritation:** Low – level exposures can cause irritation of the eyes, nose, throat and respiratory system, leading to symptoms such as coughing, sneezing, sire throat, and eye irritation.
- **Headaces and Dizziness:** Inhalation of higher concentrations can lead to headaches, dizziness, nausea and vomiting.
- **Respiratory Distress:** Exposure to higher concentrations can cause difficulty in breathing, chest tightness, and even respiratory failure in severe cases.
- **Death:** In extreme cases of acute exposure to very high concentrations, H_2S can be fatal.

Given its toxicity, exposure to hydrogen sulphide should be minimised and appropriate safety measures should be in place when working with or around this gas. This includes proper ventilation, the use of personal protective equipment, and adherence to safety protocols and regulations.

2.2 Methodology

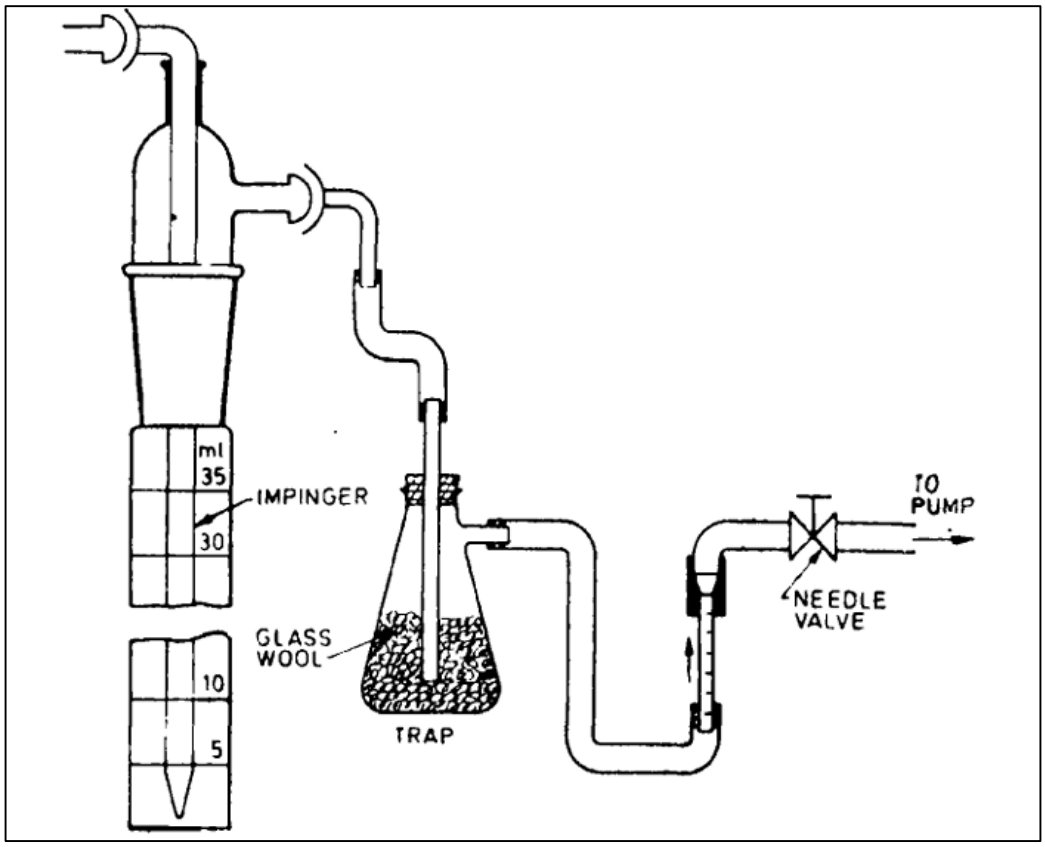
The colorimetric method for determining Hydrogen Sulphide (H_2S) typically involves a reaction between N,N-dimethyl-p-phenylenediamine sulfate (DMPD), ferric sulfate, and sulfide ions present in the sample. This reaction results in the formation of methylene blue, which is a blue-colored compound. Here's a simplified explanation of the reaction:

1. Formation of Methylene Blue:

In the presence of H_2S (sulphide ions), ferric sulphate is reduced to ferrous sulphate.

The reduced form of ferric sulphate then reacts with DMPD, leading to the formation of a blue – coloured compound called methylene blue.

The formation of methylene blue is directly proportional to the concentration of hydrogen sulfide in the sample. Therefore, by measuring the intensity of the blue color produced, one can determine the concentration of H_2S present in the sample.



2.3 Control Measures

Controlling hydrogen sulfide (H_2S) emissions in the petroleum industry is crucial for protecting workers' health, ensuring environmental compliance, and minimizing community exposure. Here are several control measures commonly employed in the petroleum industry to mitigate H2S emissions:

1. Process Modification: Implementing process modifications to minimize the generation of H_2S can be an effective strategy. This may involve altering

operating conditions, such as temperature and pressure, to reduce the formation of H_2S during petroleum refining and production processes.

2. Sulphur Removal Technologies: Utilizing Sulphur removal technologies is essential for reducing H_2S emissions. Processes such as amine scrubbing, Claus process, and hydro-desulphurizstion (HDS) are commonly employed to remove sulphur compounds from various petroleum streams.
3. Gas Treatment: Installing gas treatment systems, such as scrubbers and absorbers, can effectively capture H_2S from has streams before they are released into the atmosphere. These systems use chemical or physical methods to absorb and neutralize H_2S, ensuring compliance with emission regulations.
4. Flare Management: Flaring is a common practice for disposing of excess gases, including those containing H_2S. However, flaring can lead to the release of sulphur dioxide if not properly managed. Efficient flare systems with proper combustion controls and monitoring can help minimize H_2S emissions during flaring operations.
5. Leak Detection and Repair (LDAR): Implementing a robust LDAR program is essential for promptly identifying and repairing leaks in equipment and infrastructure that could lead to H_2S emissions.
6. Personal Protective Equipment (PPE): Providing workers with appropriate personal protective equipment, such as respirators and gas detectors, is crucial for protecting them from exposure to H_2S in the event of leaks or process upsets.
7. Training and Awareness: Conducting comprehensive training programs to educate workers about the hazards of exposure and proper safety procedures. Training should be given on emergency response protocols, safe handling practices and use of PPE to minimize the risk of exposure.

By implementing these control measures, the industry can effectively manage and reduce H_2S emissions, safeguarding the health and safety of workers and the surrounding environment.

2.4 Results – H2S

S. No.	Location of Sampling	H2S(mg/m3)	OSHA Acceptable Ceiling Concentration
1	VRCFP NHT Stripper	0.0112	20 ppm (27.8mg/m3)
2	VRCFP Amine Regeneration Unit	BDL(DL:10)	
3	VRCFP Sour Water Stripping Unit	BDL(DL:10)	
4	VRCFP DMDS Dosing Area in CCR	BDL(DL:10)	
5	MEROX Amine Regeneration Unit	BDL(DL:10)	
6	MEROX Sour Water Stripping Unit	BDL(DL:10)	
7	MEROX VREP-1 &VRCFP Acid flare KOD area	BDL(DL:10)	
8	DHDS-Sour Water Stripping Unit	BDL(DL:10)	
9	DHDS-Acid Flare Knockout Drum Area in SRU	BDL(DL:10)	
10	DHDS-Amine Regeneration Unit	BDL(DL:10)	
11	DHDS-Fuel Gas Amine Absorber Unit	0.0189	
12	DHT-Fuel Gas Amine Treating Unit	BDL(DL:10)	
13	DHT-Acid Flare Knockout Drum Area in SRU	BDL(DL:10)	
14	DHT-Amine Regeneration Unit	BDL(DL:10)	
15	DHT-Sulphur Recovery Unit	BDL(DL:10)	
16	DHT-HGU PDS Stripper	BDL(DL:10)	
17	Crude Distillation Unit-4 Hot Well Amine Absorber Area	BDL(DL:10)	
18	DHT-Diesel Stripper	BDL(DL:10)	
19	DHDS-Diesel Stripper	BDL(DL:10)	
20	DHDS-Sulphur Recovery Unit Train-1	BDL(DL:10)	

21	VBU-VBU Compressor Suction Knockout Drum	0.0165	
22	LPG-Mercaptan Dosing Pump Area	BDL(DL:10)	

2.5 Interpretation

Hydrogen Sulphide (H_2S) is monitored at various location inside the refinery and is found to be within the OSHA permissible limits (8 Hours). Continued observation, adherence to safety protocols, and proactive management are essential to sustaining this compliance and minimizing the risks associated with H_2S exposure in the workplace.

Chapter 3

AIR BORNE CONTAMINANT – SULPHUR DIOXIDE (SO_2)

3. Air Borne Contaminant – Sulphur Dioxide

3.1 Sulphur Dioxide

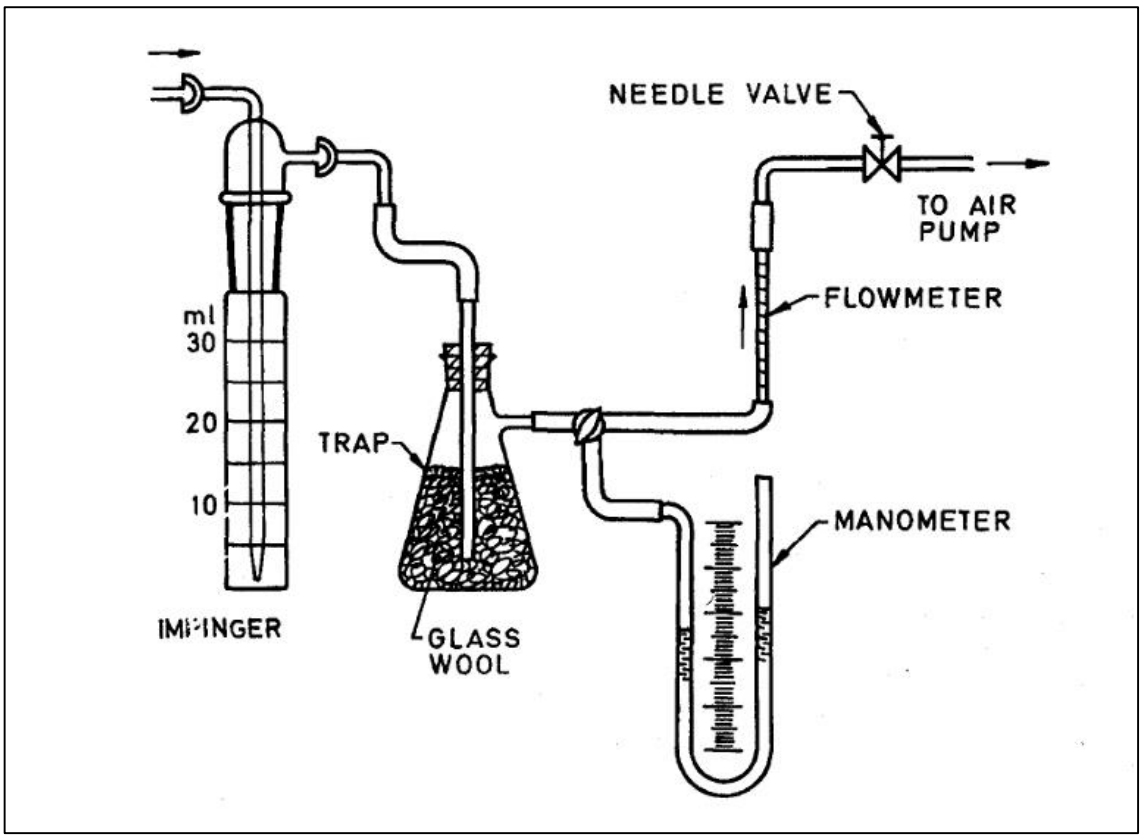
Exposure to sulfur dioxide (SO_2) in the work environment can pose significant health risks to workers, depending on the concentration and duration of exposure. SO_2 is a colorless gas with a pungent odor, primarily produced by the combustion of sulfur-containing fuels. Here are some potential health effects and control measures related to SO_2 exposure in the workplace:

- **Respiratory Irritation:** Short – term exposure to low to moderate levels of SO2 can irritate the nose, throat, and respiratory tract, leading to symptoms such as coughing, wheezing, shortness of breath and chest tightness.
- **Exacerbation of Respiratory Conditions:** Individuals with pre-existing respiratory conditions such as asthma, bronchitis, or chronic obstructive pulmonary disease (COPD) may experience worsened symptoms upon exposure.
- **Long term health effects:** Prolonged or repeated exposure my increase the risk of respiratory infections, decrease lung function and contribute to the development of chronic respiratory diseases over time.
- **Cardiovascular effects:** Some studies suggest that exposure to SO2 may be associated with increased risk of cardiovascular diseases, including heart attacks and strokes, particularly in susceptible individuals.
- **Acute Toxicity:** High concentrations can cause acute toxicity, leading to symptoms such as difficulty in breathing, chest pain and even respiratory failure in severe cases.

3.2 Methodology

Sulphur dioxide is absorbed from air in a solution of potassium tetrachloromercurate dichlorosulphitomercurate (TCM). A complex which resists oxidation by the oxygen in the air, is formed. This complex is stable to

strong oxidants such as ozone and oxides of nitrogen and therefore the absorber solution may be stored for some time prior to analysis. The complex is made to react with para rosaniline and methylsulphonic acid. The absorbance of the solution is measured by means of a suitable spectrophotometer.



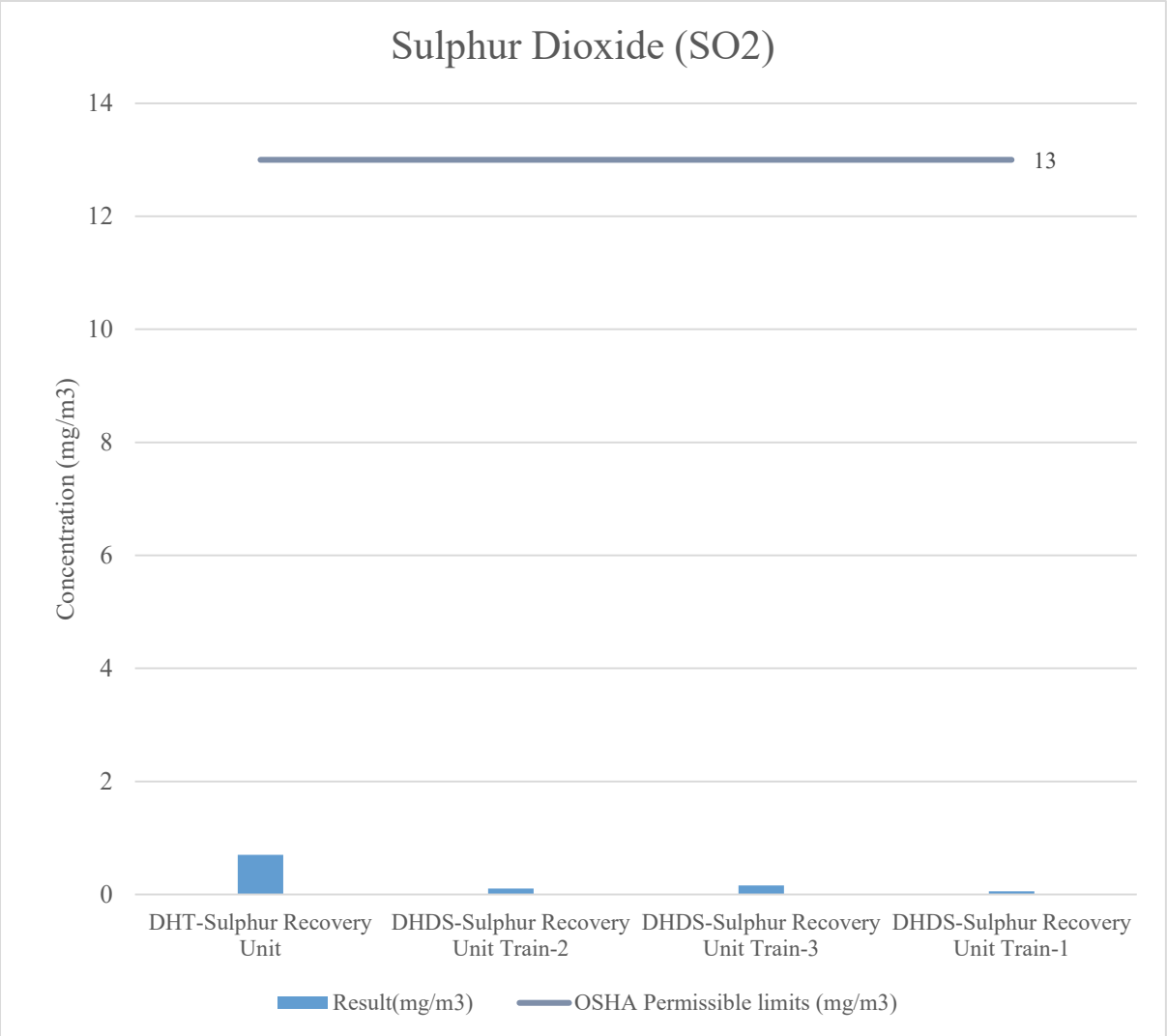
3.3 Control Measures

By implementing these control measures, petroleum refineries can effectively reduce SO2 emissions, minimize environmental impact, and maintain regulatory compliance while ensuring sustainable and responsible operations.

1. Implementing engineering controls to minimize SO2 emissions at the source is the most effective way to reduce exposure in work place.
2. Implementing administrative controls such as work scheduling, job rotation, and limiting access to high exposure areas can help reduce workers overall exposure.
3. PPE & Training and education.

3.4 Results – SO2

S. No.	Location	SO2 (mg/m3)	OSHA Permissible limits (mg/m3)
1	DHT-Sulphur Recovery Unit	0.698	13
2	DHDS-Sulphur Recovery Unit Train-2	0.103	
3	DHDS-Sulphur Recovery Unit Train-3	0.159	
4	DHDS-Sulphur Recovery Unit Train-1	0.054	



3.5 Interpretation

The monitoring of Sulphur Dioxide (SO2) at four locations within the refinery indicates that the levels of SO2 are within the permissible limits set by the Occupational Safety and Health Administration (OSHA). This outcome suggests that the refinery's operations related to SO2 management are in compliance with regulatory standards.

Chapter 4

AIR BORNE CONTAMINANT – AMMONIA

4. Air Borne Contaminant –Ammonia

4.1 Ammonia

Exposure to Ammonia is a significant concern in industries where it is used. Ammonia is toxic, particularly when inhaled or ingested in significant quantities or at high concentrations. Here are several of the possible health effects:

- **Inhalation Toxicity:** Inhalation of Ammonia vapours can cause irritation and damage to the respiratory tract, including lungs. At high concentrations, ammonia inhalation can lead to severe respiratory distress, lung damage and even death.
- **Skin and Eye Irritation:** Ammonia can also cause irritation and burns to the skin and eyes upon contact. Direct contact with concentrated ammonia solutions or vapours can lead to chemical burns, and blistering of the skin. Exposure to ammonia vapour can cause irritation, tearing and permanent damage to eyes.
- **Toxic effects on organs:** Prolonged or repeated exposure to ammonia vapours can have toxic effects on various organs in the body. Chronic exposure to low levels of ammonia may cause damage to the respiratory system, including bronchitis and decreased lung function. Additionally, it has been associated with liver and kidney damage in some cases.

4.2 Methodology

Silica gel glass tube with glass wool plugs are used in sampling process. The tubes are capped with plastic caps as soon as sampling is done and packed securely.

Deionised water is used to extract the ammonia from the sample. Concentration of Ammonia is measured using visible absorption spectrophotometry with the analyte being indophenol blue. The colour development involves several reagents like EDTA antiprecipitant, Phenolate coupling agent, Nitroprusside

intensifier, and hypochlorite (reacts with ammonia to form the indophenol blue complex). Measurements are taken at a wavelength of 630nm.

4.3 Control Measures

Ammonia emissions can occur from various sources within a refinery and control measures to minimize these emissions are:

1. Ensuring proper containment of the process streams to prevent leaks and spills. Installation and maintenance of appropriate seals, gaskets, and containment systems.
2. Provide adequate ventilation to dilute and remove ammonia vapours. Use local exhaust ventilation systems to capture and control emissions at the source.
3. Conduct regular inspection of leaks through a comprehensive LDAR study.
4. Use real-time monitoring systems and data analytics to identify emission hotspots, trends, and opportunities for improvement.

Given its toxicity, it is essential to handle and use ammonia with proper precautions, including adequate ventilation, PPE and training on sage handling practices. Prompt medical attention in the event of ammonia exposure or poisoning is significant.

4.4 Results - Ammonia

S. No.	Location	Ammonia (mg/m3)	OSHA Permissible limits (mg/m3)
1	VRCFP Sour Water Stripping Unit	BDL(DL:20)	35
2	MEROX Sour Water Stripping Unit	BDL(DL:20)	
3	DHDS-Sour Water Stripping Unit	BDL(DL:20)	
4	DHT-SOUR Gas KODs	BDL(DL:20)	
5	DHDS-SOUR Gas KODs	BDL(DL:20)	

4.5 Interpretation

Ammonia levels were monitored in five locations and no detection of ammonia was observed. The absence of detected ammonia in various locations suggests that the emissions are either negligible or effectively controlled in those areas. However, continued monitoring and periodic reassessment are essential to ensure ongoing compliance with environmental regulations and to maintain air quality standards.

Chapter 5

AIR BORNE CONTAMINANT – CARBON MONOXIDE

5. Air Borne Contaminant – Carbon Monoxide

5.1 Carbon Monoxide

Carbon monoxide (CO) emissions are a significant concern in industrial hygiene due to their potential health impacts on workers and the surrounding environment. Exposure to elevated levels of carbon monoxide can lead to serious health effects, including:

- **Carbon Monoxide Poisoning:** Inhalation of high levels of carbon monoxide can lead to poisoning, which can cause symptom such as headache, dizziness, nausea, confusion and even death in severe cases.
- **Cardiovascular effects:** Carbon monoxide interferes with blood's ability to carry oxygen leading to cardiovascular stress.
- **Neurological effect:** Prolonged exposure to low levels of Carbon Monoxide can cause chronic health effects including cognitive impairment, memory loss and neurological disorders.

5.2 Methodology

Portable direct reading CO Monitor is used to analyse real time measurements of CO concentration in air.

5.3 Control Measures

Given the health risks, some key aspects in assessing and mitigating CO emissions are:

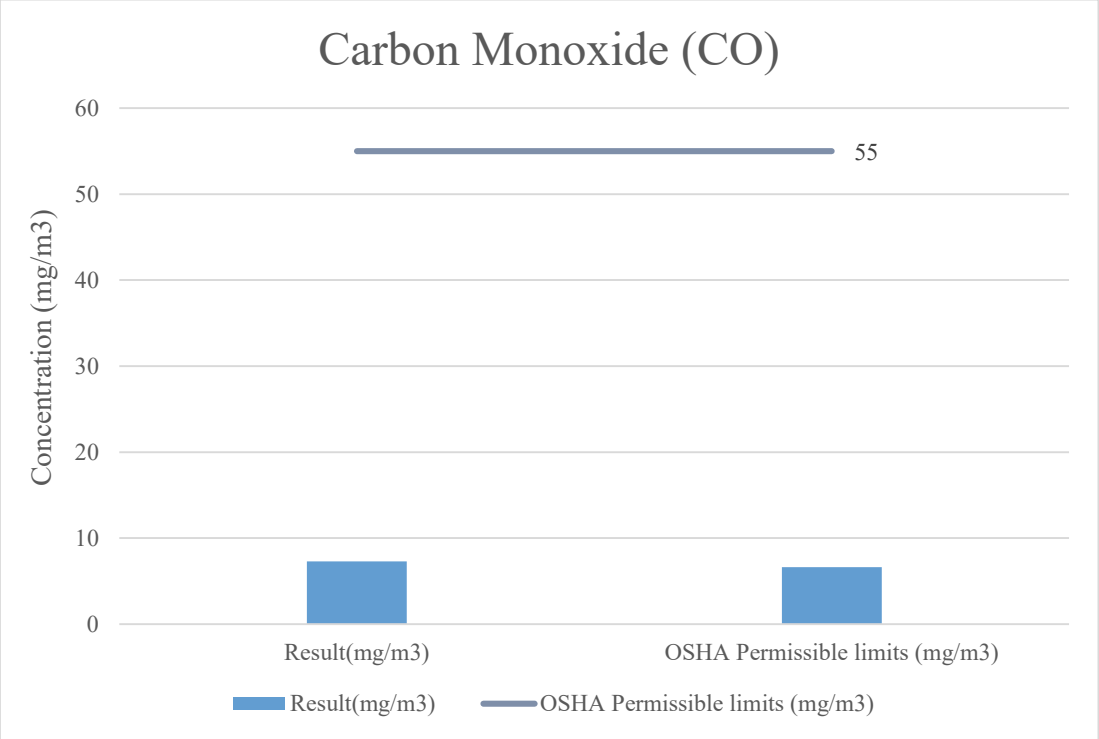
1. Continuous monitoring in areas where CO is generated or periodic sampling to assess overall exposure levels. Place carbon monoxide detectors in areas where CO may accumulate, such as boiler rooms, garages, or confined spaces, to provide early warning of hazardous levels.
2. Modify processes, improve ventilation systems, or implement alternative technologies to minimize emissions.

3. use of personal protective equipment such as respirators to protect workers from inhaling harmful levels of carbon monoxide. Train workers on the proper selection, fitting, and use of respiratory protective equipment, and regularly inspect and maintain respirators to ensure effectiveness.
4. Develop protocols for responding to CO alarms or suspected cases of CO poisoning, including evacuation procedures and medical treatment protocols. Implement programs for monitoring workers' health and conducting medical evaluations to detect and address any cases of CO poisoning or related health effects.

Controlling carbon monoxide (CO) emissions is vital for protecting human health, ensuring regulatory compliance, minimizing environmental impacts, and promoting safe and efficient operations in industries and communities. It helps prevent CO poisoning, protects workers, reduces air pollution, and supports sustainable practices.

5.4 Results – Carbon Monoxide

S. No.	Location	CO (mg/m3)	OSHA Permissible limits (mg/m3)
1	Power Plant-1 Old Boiler	7.3	55
2	Power Plant-2 New Boiler	6.64	



5.5 Interpretation

Carbon monoxide (CO) emissions were monitored in areas suspected of CO emissions. The monitored CO levels are below the Occupational Safety and Health Administration (OSHA) limits. This suggests that the current control measures are effective in mitigating CO exposure risks. This is a positive outcome indicating that workers are not being exposed to hazardous levels of CO, thus reducing the risk of CO poisoning and associated health issues. However, continued monitoring and adherence to safety protocols are essential to maintain a safe work environment and ensure regulatory compliance. Regular inspections, maintenance of equipment, and employee training are also crucial to sustaining these safe conditions over time.

Chapter 6

AIR BORNE CONTAMINANT – SPM

6. Air Borne Contaminant –SPM

6.1 Suspended Particulate Matter (SPM)

Suspended particulate matter, often referred to as particulate matter (PM), consists of tiny particles suspended in the air, including dust, soot, smoke, and other pollutants. These particles can vary in size and composition and may originate from various sources.

Potential health effects associated with exposure to SPM in work zones:

- **Respiratory Irritation:** Inhalation of SPM can irritate the respiratory system, leading to symptoms such as coughing, throat irritation, and shortness of breath. This is particularly problematic for individuals with pre-existing respiratory conditions such as asthma or chronic obstructive pulmonary disease (COPD).
- **Exacerbation of Respiratory conditions:** Exposure to SPM can exacerbate existing respiratory conditions and increase the risk of respiratory infections and complications. Prolonged exposure to high levels of SPM can lead to decreased lung function over time, impairing the ability to breathe and increasing susceptibility to respiratory infections.
- **Cardiovascular effects:** Fine particulate matter (PM2.5), which consists of particles with a diameter of 2.5 micrometers or smaller, can penetrate deep into the lungs and enter the bloodstream. Chronic exposure to PM2.5 has been associated with an increased risk of cardiovascular diseases such as heart attacks, strokes, and high blood pressure.
- **Systemic Inflammation:** Inhalation of SPM can trigger an inflammatory response in the body, leading to systemic inflammation. Chronic inflammation has been linked to various health problems, including cardiovascular disease, diabetes, and certain types of cancer.
- **Neurological effects:** Emerging evidence suggests that that exposure to air pollution, including SPM, may have neurological effects and could be associated with cognitive decline, neurodevelopmental disorders, and

an increased risk of neurodegenerative diseases such as Alzheimer's and Parkinson's disease.

- **Increased risk of mortality:** Long – term exposure to elevated levels of SPM has been associated with an increased risk of premature death, primarily due to cardiovascular and respiratory causes.

6.2 Methodology

To capture particulate matter suspended in the air, 5-µm PVC filter is used. The recommended flow rate for the sampler is between 1 to 2 liters per minute (L/min). The sampling technique employed is gravimetric, wherein particles are collected onto a filter medium. Subsequently, the filter is weighed before and after sampling to quantify the mass of particulate matter collected.

6.3 Control Measures

To address concerns about suspended particulate matter in a work zone, several measures may be implemented:

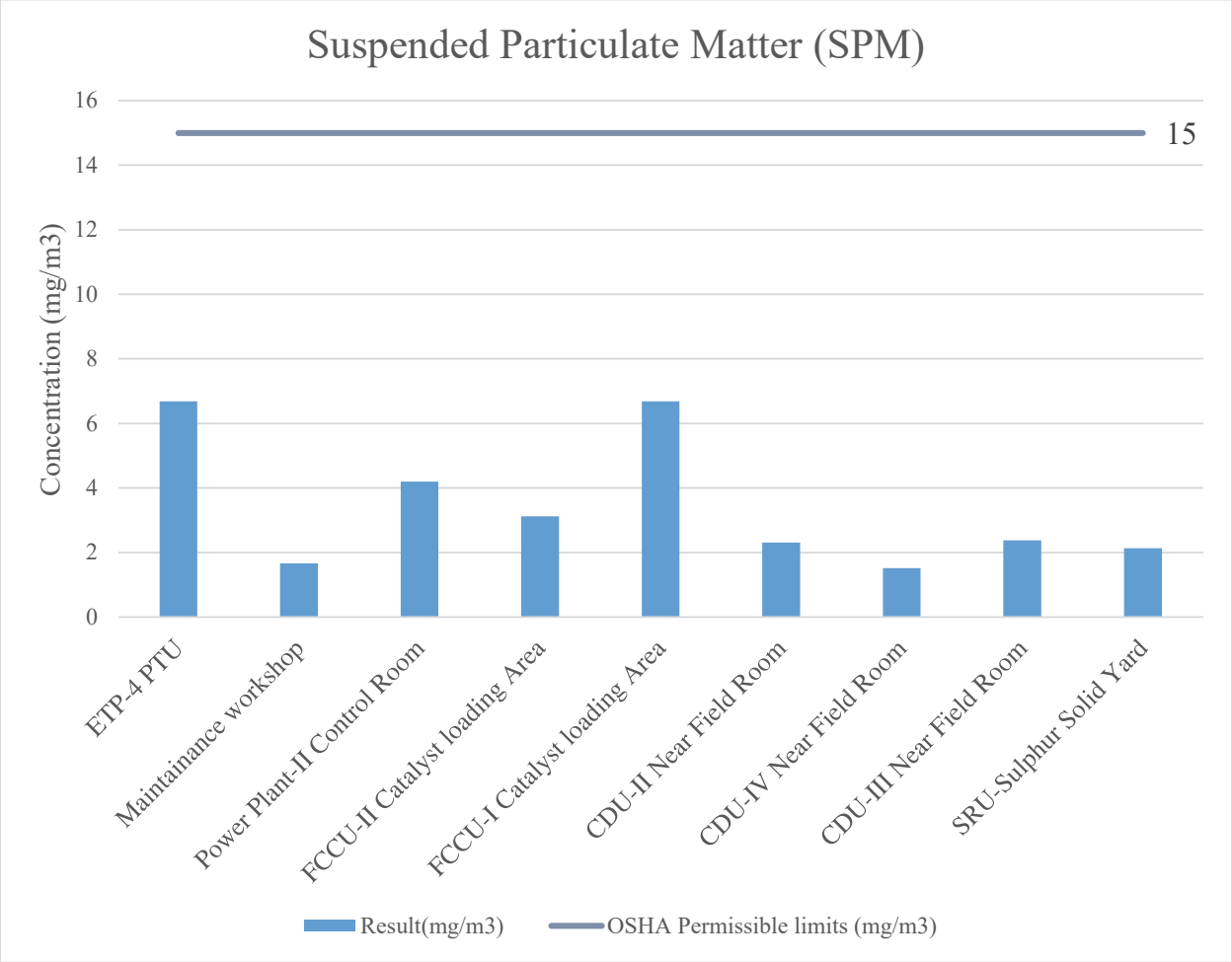
1. Regular monitoring of air quality, including particulate matter levels, using appropriate instrumentation such as air quality monitors or particle counters. This helps to assess the extent of particulate matter pollution in the work environment and identify areas of concern.
2. Implementing measures to minimize the generation of particulate matter at the source, such as using dust control measures (e.g., water sprays, dust suppression systems), enclosing processes that generate dust, and using cleaner technologies.
3. Providing appropriate personal protective equipment, such as respirators or masks rated for particulate matter filtration, to workers who may be exposed to high levels of particulate matter.
4. Implementing work practices to minimize exposure, such as scheduling tasks to minimize dust-generating activities during periods of high occupancy, wet sweeping instead of dry sweeping, and providing training on dust control measures.

5. Ensuring compliance with relevant occupational health and safety regulations and standards governing particulate matter exposure limits and control measures.

To protect workers from the health effects of SPM in work zones, employers should implement measures to minimize exposure, such as controlling dust generation, providing appropriate respiratory protection, ensuring adequate ventilation, and conducting regular air quality monitoring. Additionally, promoting awareness among workers about the potential health risks and encouraging personal hygiene practices can help reduce exposure and mitigate health effects.

6.4 Results - SPM

S. No.	Location	SPM (mg/m3)	OSHA Permissible limits (mg/m3)
1	ETP-4 PTU	6.68	15
2	Maintenance workshop	1.66	
3	Power Plant-II Control Room	4.2	
4	FCCU-II Catalyst loading Area	3.12	
5	FCCU-I Catalyst loading Area	6.68	
6	CDU-II Near Field Room	2.31	
7	CDU-IV Near Field Room	1.52	
8	CDU-III Near Field Room	2.38	
9	SRU-Sulphur Solid Yard	2.13	



6.5 Interpretation

The analysis of suspended particulate matter (SPM) in nine locations indicates that emission levels are below the standards set by the Occupational Safety and Health Administration (OSHA). This finding suggests that the air quality in these areas meets regulatory requirements and provides a safe working environment for employees. Continued monitoring and adherence to established standards are essential to maintain optimal air quality and ensure ongoing compliance with workplace safety regulations

Chapter 7

AIR BORNE CONTAMINANT – BENZENE & HYDROCARBONS

7. Air Borne Contaminant – Benzene & Hydrocarbons

7.1 Benzene

Benzene emissions in the workplace can pose significant health risks to workers due to the toxic nature of benzene. Benzene is a volatile organic compound (VOC) commonly used in various industrial processes and exposure to benzene can occur through inhalation, ingestion, or skin contact, and it has been linked to a range of health effects, including:

- **Carcinogenity:** Benzene is classified as a known human carcinogen by organizations such as the International Agency for Research on Cancer (IARC) and the U.S. Environmental Protection Agency (EPA). Prolonged or repeated exposure to benzene has been associated with the development of leukemia, particularly acute myeloid leukemia (AML).
- **Hematotoxicity:** Benzene exposure can affect the bone marrow, leading to suppression of red blood cell production (aplastic anemia), leukopenia (reduced white blood cell count), and thrombocytopenia (reduced platelet count). These effects can result in anemia, increased susceptibility to infections, and bleeding disorders.
- **Neurotoxicity:** Benzene exposure may cause neurologic symptoms such as dizziness, headaches, drowsiness, and confusion. Chronic exposure can lead to neurological damage and cognitive impairment.
- **Reproductive and Developmental effects:** Benzene exposure has been associated with adverse reproductive outcomes, including infertility, spontaneous abortions, and developmental abnormalities in offspring

7.2 Hydrocarbons

Health and safety considerations related to hydrocarbon emissions in the workplace include:

- **Health Effects:** Hydrocarbon emissions may contain volatile organic compounds (VOCs) and other hazardous substances that can pose health

risks to workers. Chronic exposure to hydrocarbons may lead to respiratory irritation, headaches, dizziness, and in some cases, long-term health effects such as neurological damage or cancer.

- **Fire and explosion hazards:** Hydrocarbons are flammable and can pose fire and explosion hazards if present in sufficient concentrations. Workplaces with high levels of hydrocarbon emissions must implement appropriate fire prevention and control measures, including proper storage, handling, and ventilation systems.

7.3 Methodology

Estimation of VOC: The technique of measuring must consist of three major components namely:

- the means of sampling of air sample
- the means of extraction
- the means of detection of the target analytes

Active sampling is done by pumping air through a bed of sorbent(s) in a tube, at a rate typically at 200 mL/min range for a period of eight hours. Analyte enriched sorbents are typically desorbed by thermal desorption.

Thermal Desorption is a very effective method of extraction from solid sorbent. In this non-destructive method the sampling tube with exposed solid sorbent is subjected to high temperature typically in the range of 200°C to 380°C depending upon the characteristics of the solid sorbent. The target VOCs are desorbed and collected for further analysis.

Adsorbent Tube: Active Thermal Desorption (ATD) combination tube comprises of TenaxTA and Carboxen 1016 as per Compendium method TO-17 as shown in the figure below.

ADSORPTION SECTION:

A Stronger sorbent is one which offers greater safer sampling volumes with greater surface area. For Carboxen 1016 the surface area is 75m2/gm, and the challenging volume or safe sampling volume of most VOCs are 100L. Specifically Benzene, Toluene, Xylene, the challenging volume is 100L. For Tenax TA the surface area is 35m2/gm, and the challenging volume or safe sampling volume is 100L for most of the VOCs. (Enclosed both the adsorbent surface is and challenging or safe volume chart). The adsorbents are selected based on the characteristics for Thermal Desorption as follows.

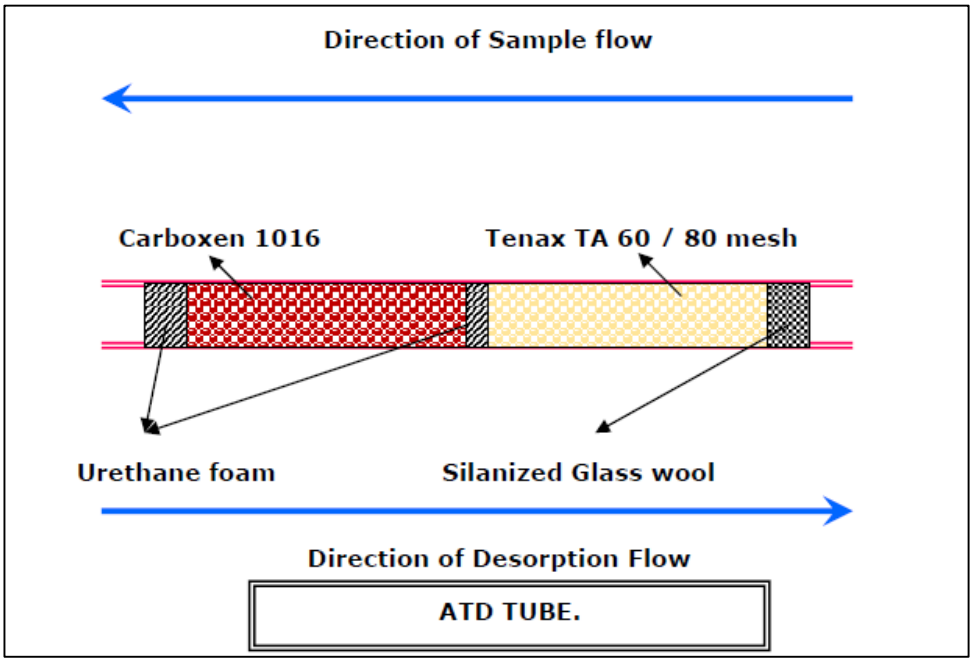
About Adsorbent Tubes: The adsorbent tube (3½" (89 mm) long x ¼" (6.4 mm) O.D. x 4 mm I.D) is filled with 100mg Carboxen 1016 and 50mg Tenax TA and the same will be conditioned at 230°C for 24 hours using nitrogen flushing without having any artefacts. After conditioning a few tubes randomly analysed through GCMS to check if any VOCs are present. After the checking with GCMS the tubes are sealed with brass 1/4-inch Swagelok® - type fittings and wrap the sealed tubes in uncoated aluminum foil and will be placed the tubes in a clean, airtight, opaque container. Each sampling tube will be labelled with a unique ID number for better traceability. The tubes are filled with fresh absorbents every time for this study, and we will not use the used

adsorbents at all.

Before Sampling: Dry purge of the sorbent tube with dry, inert gas before analysis to remove water vapor and air. The sorbent tube can be held at temperatures above ambient for the dry purge.

Some of the desirable traits of adsorbent include:

- Able to retain and release the compounds of interest.
- Able to withstand high temperatures up to 300°C
- Low background levels, low metal content and hydrophobic
- Considerable mesh size, consistent density, low shrinkage, and low number of fines



Analyte Recovery: In the course of instrumental analysis in GCMS-ATD, standard analytes were spiked in virgin sorbent tubes and recovery of benzene was ascertained under analytical environment of the Lab.

7.4 Control Measures

Controlling benzene emissions in the work zone is crucial for protecting the health and safety of workers. Benzene is a known carcinogen and exposure to elevated levels can lead to serious health effects.

1. Enclose processes or equipment that emit benzene and use local exhaust ventilation systems to capture and remove benzene vapors from the air.
2. Substitute benzene-containing products with less hazardous alternatives, if feasible, to reduce the potential for exposure.
3. Modify processes to minimize benzene emissions, such as optimizing operating conditions or using closed-loop systems to prevent benzene releases.
4. Provide training to workers on the hazards of benzene exposure, safe work practices, proper use of personal protective equipment (PPE), and emergency procedures.
5. Provide appropriate respiratory protection, such as respirators with cartridges specifically designed to filter benzene vapors, for workers in areas where benzene exposure cannot be adequately controlled through other means.
6. Conduct regular air monitoring to assess benzene concentrations in the work environment and ensure that exposure levels are within acceptable limits.
7. Develop spill response procedures to quickly contain and clean up benzene spills to prevent further release and exposure.Establish procedures for evacuating the work area in the event of a benzene release or emergency situation.
8. Ensure compliance with regulatory requirements and exposure limits for benzene established by organizations such as OSHA or other relevant regulatory agencies.

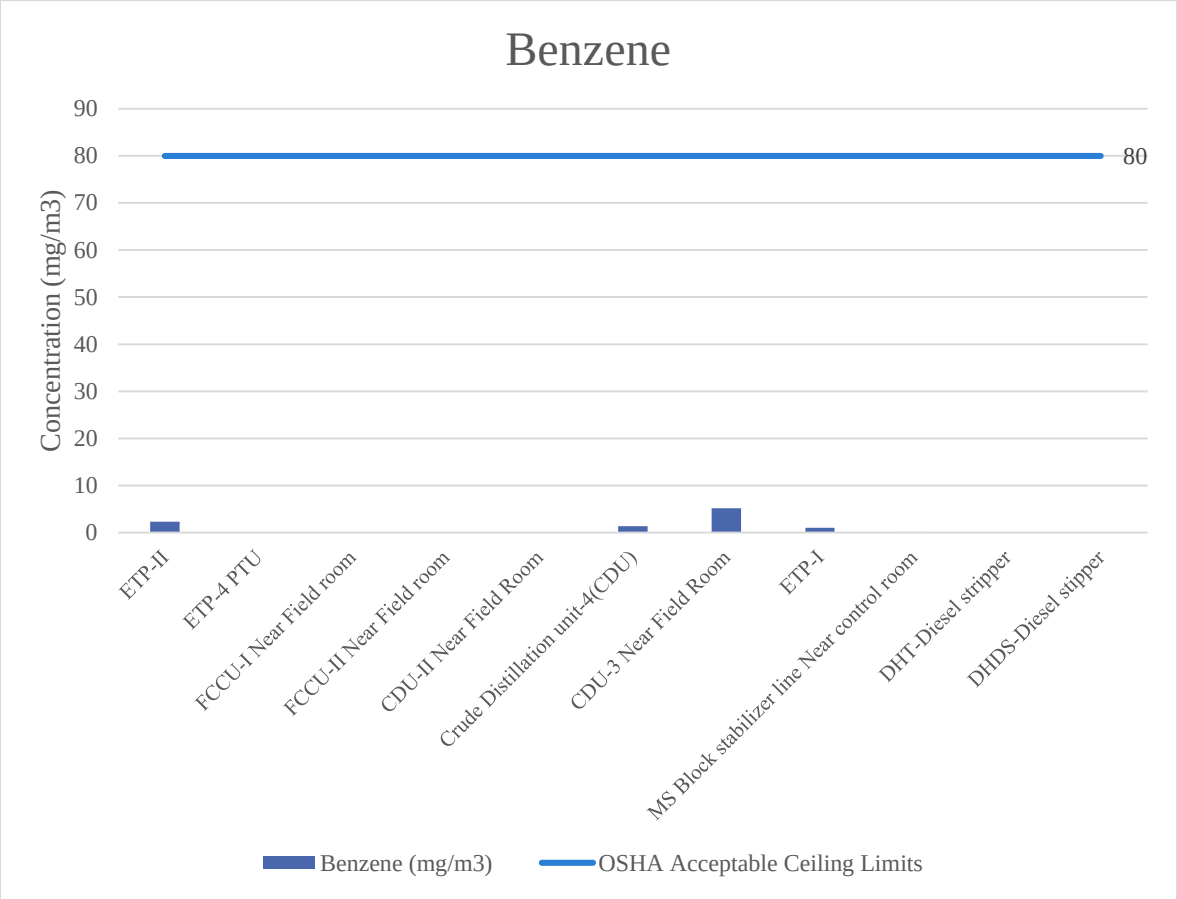
Regular monitoring, training, and evaluation of control measures are essential to maintain a safe work environment and prevent benzene-related health effects.

To mitigate hydrocarbon emissions in the workplace, employers should implement measures such as:

1. Using Low- emission equipment and processes.
2. Implementing effective ventilation systems to capture and control emissions.
3. Conducting regular inspections and maintenance to prevent leaks and ensure equipment integrity.
4. Providing appropriate PPE to workers, such as respirators, gloves, and eye protection.
5. Training employees on safe handling practices, emergency procesure, and the potential hazards associated with hydrocarbon exposure.

7.5 Results – Benzene & Hydrocarbons

S. No.	Location	Benzene (mg/m3)	OSHA Acceptable Ceiling Limits
1	ETP-II	2.33	25 (ppm) 80 (mg/m3)
2	ETP-4 PTU	BLQ(LOQ:0.1)	
3	FCCU-I Near Field room	BLQ(LOQ:0.1)	
4	FCCU-II Near Field room	BLQ(LOQ:0.1)	
5	CDU-II Near Field Room	0.11	
6	Crude Distillation unit-4(CDU)	1.34	
7	CDU-3 Near Field Room	5.14	
8	ETP-I	1.05	
9	MS Block stabilizer line Near control room	0.12	
10	DHT-Diesel stripper	BLQ(LOQ:0.1)	
11	DHDS-Diesel stipper	BLQ(LOQ:0.1)	



S. No.	Location	Hydrocarbons (mg/m3)
1	ETP-II	8.41
2	ETP-4 PTU	0.19
3	FCCU-I Near Field room	BLQ(LOQ:0.1)
4	FCCU-II Near Field room	0.77
5	CDU-II Near Field Room	BLQ(LOQ:0.1)
6	Crude Distillation unit-4(CDU)	BLQ(LOQ:0.1)
7	CDU-3 Near Field Room	2.65
8	ETP-I	10.36
9	MS Block stabilizer line Near control room	BLQ(LOQ:0.1)
10	DHT-Diesel stripper	0.11
11	DHDS-Diesel stipper	BLQ(LOQ:0.1)

7.6 Interpretation

Comprehensive monitoring efforts were conducted to assess benzene levels in different areas of concern and benzene concentrations were found to be within the OSHA (Occupational Safety and Health Administration) ceiling limits signifies that the measured benzene levels did not exceed the regulatory threshold established by OSHA for workplace safety.

This outcome provides reassurance regarding the management of benzene exposure within the workplace, indicating that control measures and preventive measures in place are effective in maintaining benzene levels below the established regulatory limits.

Similarly, achieving lower concentrations of hydrocarbons demonstrates a commitment to environmental stewardship and occupational health and safety within the workplace.

Continual monitoring and regular evaluation of hydrocarbon levels are needed to confirm the efficiency of control measures and uphold a workplace environment that is safe and favourable to health in the long term.

Chapter 8

CONCLUSION

8. Conclusion

Various Air – borne contaminants such as Hydrogen sulphide, Sulphur dioxide, Ammonia, Carbon Monoxide, Suspended Particulate Matter, Benzene and Hydrocarbons were monitored in various locations in the refinery.

After conducting thorough analysis, it has been observed that the concentrations of all airborne contaminants, as measured in the refinery, are found to be within the prescribed limits set by the Occupational Safety and Health Administration (OSHA). Continued vigilance through regular monitoring and adherence to established safety protocols will be essential to sustain these favorable conditions and mitigate potential health risks associated with industrial operations.

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TEST REPORT

Issued to

DGM -Technical
Hindustan Petroleum Corporation Ltd.
Visakha Refinery, Malkapuram
Visakhapatnam-530 011
Tel: 0891-2894895

Kind attention to: Sri Gudala Bhagavan

Date of Reporting	20th December, 2023	*Nature of Job*	Leak Detection and Repair Survey for Pumps &Valves & Flanges
P.O. No.	22000586-OP-46002/RD Dated on 27/10/2022	*Instrument used*	Hand held Photo Ionization Detector (PID) (Photo Vac 2020 Combo Pro)
Parameters	Volatile Organic Compounds (VOC`s)		

Summary August 2023 to October -2023

Unit Name	Equipment Type	No. of Points tested	No. of points leaking >3000 PPM	No. of points leaking >5000 PPM	Emissions Total (Kg/hr.)	Emissions Total (Kg/day)
CDU –II	Total Points	1009	Nil	Nil	0.156868	3.764813
CDU-III	Total Points	1752	Nil	Nil	0.247142	5.931439
FCCU-I	Total Points	581	Nil	Nil	0.084139	2.019330
FCCU-II	Total Points	871	Nil	Nil	0.142727	3.425436
DHDS	Total Points	456	Nil	Nil	0.051406	1.233728
DHDS SRU	Total Points	360	Nil	Nil	0.029700	0.712808
CCR	Total Points	474	Nil	Nil	0.040270	0.966475
FCC	Total Points	432	Nil	Nil	0.041689	1.000546
NIU	Total Points	442	Nil	Nil	0.051040	1.224965
NLU	Total Points	324	Nil	Nil	0.033073	0.793755
DHT	Total Points	534	Nil	Nil	0.041719	1.001242
DHT HGU	Total Points	328	Nil	Nil	0.035580	0.853915
DHT SRU	Total Points	342	Nil	Nil	0.024975	0.599399
TANK FARM	Total Points	1476	Nil	Nil	0.135915	3.261981
TANK FARM(V R)	Total Points	288	Nil	Nil	0.141435	3.394434
CPP	Total Points	196	Nil	Nil	0.024561	0.589476
MEROX	Total Points	348	Nil	Nil	0.036827	0.883827
PRU	Total Points	155	Nil	Nil	0.019113	0.458711
ETP –I,II&IV	Total Points	266	Nil	Nil	0.105330	2.527915
	Total	10634			1.443509	34.644195

Authorized Signature
(M. Ravi Kiran)

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TEST REPORT

Issued to

DGM -Technical
Hindustan Petroleum Corporation Ltd.
Visakha Refinery, Malkapuram
Visakhapatnam-530 011
Tel: 0891-2894895
Kind attention to: Sri Gudala Bhagavan

Date of Reporting	25th October, 2023	*Nature of Job*	Leak Detection and Repair Survey for Pumps &Valves & Flanges
P.O. No.	22000586-OP-46002/RD Dated on 27/10/2022	*Instrument used*	Hand held Photo Ionization Detector (PID) (Photo Vac 2020 Combo Pro)
Parameters	Volatile Organic Compounds (VOC`s)		

SUMMARY – SEPTEMBER 2023

UNIT Name	Equipment Type	No. of Points Tested	No. of points leaking >3000 PPM	No. of points leaking >5000 PPM	Emissions Total (Kg/hr.)	Emissions Total (Kg/day)
FCCU-I	Valves	133	Nil	Nil	0.001719	0.041251
	Flanges	396	Nil	Nil	0.010016	0.240382
	Pumps	52	Nil	Nil	0.072404	1.737697
	Total	**581**	**Nil**	**Nil**	**0.084139**	**2.019330**
FCCU-II	Valves	193	Nil	Nil	0.003651	0.087615
	Flanges	594	Nil	Nil	0.015332	0.367974
	Pumps	84	Nil	Nil	0.123744	2.969847
	Total	**871**	**Nil**	**Nil**	**0.142727**	**3.425436**
DHDS SRU	Valves	82	Nil	Nil	0.001202	0.028860
	Flanges	246	Nil	Nil	0.005777	0.138649
	Pumps	32	Nil	Nil	0.022721	0.545299
	Total	**360**	**Nil**	**Nil**	**0.029700**	**0.712808**
DHT	Valves	96	Nil	Nil	0.001631	0.039141
	Flanges	408	Nil	Nil	0.011278	0.270667
	Pumps	30	Nil	Nil	0.028810	0.691434
	Total	**534**	**Nil**	**Nil**	**0.041719**	**1.001242**
DHT HGU	Valves	73	Nil	Nil	0.001077	0.025850
	Flanges	225	Nil	Nil	0.006121	0.146908
	Pumps	30	Nil	Nil	0.028382	0.681157
	Total	**328**	**Nil**	**Nil**	**0.035580**	**0.853915**
DHT SRU	Valves	75	Nil	Nil	0.001519	0.036454
	Flanges	237	Nil	Nil	0.005226	0.125423
	Pumps	30	Nil	Nil	0.018230	0.437522
	Total	**342**	**Nil**	**Nil**	**0.024975**	**0.599399**
CPP	Valves	42	Nil	Nil	0.000899	0.021565
	Flanges	126	Nil	Nil	0.003867	0.092796
	Pumps	28	Nil	Nil	0.019796	0.475115
	Total	**196**	**Nil**	**Nil**	**0.024561**	**0.589476**

Authorized Signature
(M. Ravi Kiran)

HPCL, Visakha Refinery

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TEST REPORT

Issued to

DGM -Technical
Hindustan Petroleum Corporation Ltd.
Visakha Refinery, Malkapuram
Visakhapatnam-530 011
Tel: 0891-2894895

Kind attention to: Sri Gudala Bhagavan

Date of Reporting	20th September, 2023	***Nature of Job***	Leak Detection and Repair Survey for Pumps &Valves & Flanges
P.O. No.	22000586-OP-46002/RD Dated on 27/10/2022	***Instrument used***	Hand held Photo Ionization Detector (PID) (Photo Vac 2020 Combo Pro)
Parameters	Volatile Organic Compounds (VOC`s)		

SUMMARY – AUGUST 2023

UNIT Name	Equipment Type	No. of Points Tested	No. of points leaking >3000 PPM	No. of points leaking >5000 PPM	Emissions Total (Kg/hr.)	Emissions Total (Kg/day)
CDU-II	Valves	254	Nil	Nil	0.004988	0.119702
	Flanges	699	Nil	Nil	0.020395	0.489472
	Pumps	56	Nil	Nil	0.131485	3.155639
	Total	**1009**	**Nil**	**Nil**	**0.156868**	**3.764813**
CDU-III	Valves	543	Nil	Nil	0.008082	0.193979
	Flanges	1096	Nil	Nil	0.030329	0.727904
	Pumps	113	Nil	Nil	0.208731	5.009556
	Total	**1752**	**Nil**	**Nil**	**0.247142**	**5.931439**
ETPS	Valves	52	Nil	Nil	0.000908	0.021781
	Flanges	141	Nil	Nil	0.004723	0.113353
	Pumps	73	Nil	Nil	0.099699	2.392781
	Total	**266**	**Nil**	**Nil**	**0.105330**	**2.527915**
TANK FARM	Valves	396	Nil	Nil	0.006060	0.145449
	Flanges	882	Nil	Nil	0.019870	0.476888
	Pumps	198	Nil	Nil	0.109985	2.639644
	Total	**1476**	**Nil**	**Nil**	**0.135915**	**3.261981**
TANK FARM(V. R)	Valves	2	Nil	Nil	0.000000	0.000000
	Flanges	0	Nil	Nil	0.000000	0.000000
	Pumps	0	Nil	Nil	0.141435	3.394434
	Total	**288**	**Nil**	**Nil**	**0.141435**	**3.394434**

Authorized Signature
(M. Ravi Kiran)

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TEST REPORT

Issued to

DGM -Technical
Hindustan Petroleum Corporation Ltd.
Visakh Refinery, Malkapuram
Visakhapatnam-530 011
Tel: 0891-2894895
Kind attention to: Sri Gudala Bhagavan

Date of Reporting	20th December, 2023	***Nature of Job***	Leak Detection and Repair Survey for Pumps &Valves & Flanges
P.O. No.	22000586-OP-46002/RD Dated on 27/10/2022	***Instrument used***	Hand held Photo Ionization Detector (PID), (Photo Vac 2020 Combo Pro)
Parameters	Volatile Organic Compounds (VOC`s)		

SUMMARY – OCTOBER 2023

UNIT Name	Equipment Type	No. of Points Tested	No. of points leaking >3000 PPM	No. of points leaking >5000 PPM	Emissions Total (Kg/hr.)	Emissions Total (Kg/day)
DHDS	Valves	107	Nil	Nil	0.001789	0.042926
	Flanges	315	Nil	Nil	0.008591	0.206182
	Pumps	34	Nil	Nil	0.041026	0.984620
	Total	**456**	**Nil**	**Nil**	**0.051406**	**1.233728**
MEROX	Valves	70	Nil	Nil	0.001383	0.033191
	Flanges	246	Nil	Nil	0.007838	0.188101
	Pumps	32	Nil	Nil	0.027606	0.662535
	Total	**348**	**Nil**	**Nil**	**0.036827**	**0.883827**
PRU	Valves	37	Nil	Nil	0.000856	0.020551
	Flanges	102	Nil	Nil	0.003587	0.086091
	Pumps	16	Nil	Nil	0.014670	0.352069
	Total	**155**	**Nil**	**Nil**	**0.019113**	**0.458711**
MS –BLOCK (FCC)	Valves	89	Nil	Nil	0.001810	0.043437
	Flanges	315	Nil	Nil	0.007423	0.178156
	Pumps	28	Nil	Nil	0.032456	0.778953
	Total	**432**	**Nil**	**Nil**	**0.041689**	**1.000546**
MS –BLOCK (CCR)	Valves	108	Nil	Nil	0.002641	0.063385
	Flanges	342	Nil	Nil	0.012843	0.308232
	Pumps	24	Nil	Nil	0.024786	0.594858
	Total	**474**	**Nil**	**Nil**	**0.040270**	**0.966475**

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MS –BLOCK (NIU)	Valves	97	Nil	Nil	0.001858	0.044597
	Flanges	303	Nil	Nil	0.008833	0.211984
	Pumps	42	Nil	Nil	0.040349	0.968384
	Total	**442**	**Nil**	**Nil**	**0.051040**	**1.224965**
MS –BLOCK (NLU)	Valves	71	Nil	Nil	0.001611	0.038658
	Flanges	225	Nil	Nil	0.004496	0.107910
	Pumps	28	Nil	Nil	0.026966	0.647187
	Total	**324**	**Nil**	**Nil**	**0.033073**	**0.793755**

Analyst Signatory
(Ramamurthy Inti)

Authorized Signatory
(M. Ravi kiran)

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Telefax : 040-23717213 Mail : info@pragathilabs.com Web : www.pragathilabs.com

TC-5741

TEST REPORT

Industry Name	Hindustan Petroleum Corporation Limited		
Address	Visakh Refinery, Malkapuram, Visakhapatnam-530 011		
Phone No.	0891-2894825/4818	Kind attention to: Sri Gudala Bhagavan DGM - Technical	
Fax No.	0891-2759861		
Date of sampling	11th August, 2023		
Date of Reporting	04th September, 2023	Nature of the Sample	Ambient Air
Our Ref. No.	Pra/Env/HPCL/08 (AAQ-03)	No. of Samples	3
P.O. No.	20000433-HB/PR200066-HP/LOA/AG	Method of Analysis	IS: 5182 & AWMA
Parameters	PM_{10},$PM_{2.5}$,SO_2, NO_2, O_3,Pb, CO, NH_3,Benzene,Benzo(a)pyrene, Arsenic & Nickel		
ULR No.	ULR-TC5741230000000333F		
Our Report No	PLCPL/23/4314-4316/2951		

Discipline: Chemical Testing:
Group: Atmospheric Pollution

AMBIENT AIR QUALITY

No.	Pollutant	Methods of Measurement & Analysis	NAAQS	HLPH	South Gate	Store Yard
1	PM_{10} ($\mu g/m^3$)	Gravimetric, IS: 5182 (Part 23)	100 - 24 hrs	72	65	60
2	$PM_{2.5}$ ($\mu g/m^3$)	Gravimetric, IS: 5182 (Part 24)	60 - 24 hrs	31	29	26
3	SO_2 ($\mu g/m^3$)	Improved West &Gaeke, IS: 5182 (Part 02)	80 - 24 hrs	23	19	17
4	NO_2 ($\mu g/m^3$)	Modified Jacob &Hochheiser (NaArsenite), IS: 5182 (Part 06)	80 - 24 hrs	28	25	21
5	O_3 ($\mu g/m^3$)	Chemical method, IS: 5182 (Part 09)	100 - 8 hrs	15	14	12
6	Pb ($\mu g/m^3$)	AAS Method after Sampling on EPM 2000 or equipment Filter Pa-, IS: 5182 (Part 22)	1.0–24 hrs	BDL	BDL	BDL
7	CO (mg/m^3)	Gas Chromatography based on Continuous analyzer, IS: 5182 (Part 10)	2.0- 8 hr	0.46	0.42	0.40
8	NH_3 ($\mu g/m^3$)	Indophenol blue Method, Method: 401 AWMA	400 - 24 hrs	14	12	10
9	C_6H_6 ($\mu g/m^3$)	Gas Chromatography based on continuous analyzer, IS: 5182 (Part 11)	5.0-Annum	0.42	0.38	0.35
10	B(a)P (ng/m^3)	GC analysis, CPCB	1.0-Annum	BDL	BDL	BDL
11	As (ng/m^3)	AAS Method after Sampling on EPM 2000 or equipment Filter Pa-, Method: 822, AWMA	6.0-Annum	BDL	BDL	BDL
12	Ni (ng/m^3)	AAS Method after Sampling on EPM 2000 or equipment Filter Pa-, IS: 5182 (Part 26)	20 –Annum	BDL	BDL	BDL

Note: BDL- Below Detectable Limit.

MD. Azeem

Verified by
(MD.Azeem)
Analyst

Authorized Signatory
(M. Ravi Kiran)
Managing Director

PRAGATHI LABS & CONSULTANTS PVT.LTD.

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Telefax : 040-23717213 Mail : info@pragathilabs.com Web : www.pragathilabs.com

TEST REPORT

TC-5741

Industry Name	Hindustan Petroleum Corporation Limited		
Address	Visakh Refinery, Malkapuram, Visakhapatnam-530 011		
Phone No.	0891-2894825/4818	Kind attention to: Sri Gudala Bhagavan DGM - Technical	
Fax No.	0891-2759861		
Date of sampling	15th September, 2023	Nature of the Sample	Ambient Air
Date of Reporting	04th October, 2023	No. of Samples	3
Our Ref. No.	Pra/Env/HPCL/09 (AAQ-03)	Method of Analysis	IS: 5182 & AWMA
P.O. No.	20000433-HB/PR200066-HP/LOA/AG		
Parameters	PM_{10},$PM_{2.5}$,SO_2, NO_2, O_3,Pb, CO, NH_3,Benzene,Benzo(a)pyrene, Arsenic & Nickel		
ULR No.	ULR-TC5741230000000376F		
Our Report No	PLCPL/23/4808-4810/3188		

Discipline: Chemical Testing:
Group: Atmospheric Pollution

AMBIENT AIR QUALITY

No.	Pollutant	Methods of Measurement & Analysis	NAAQS	HLPH	South Gate	Store Yard
1	PM_{10} ($\mu g/m^3$)	Gravimetric, IS: 5182 (Part 23)	100 - 24 hrs	81	74	66
2	$PM_{2.5}$ ($\mu g/m^3$)	Gravimetric, IS: 5182 (Part 24)	60 - 24 hrs	35	32	28
3	SO_2 ($\mu g/m^3$)	Improved West &Gaeke, IS: 5182 (Part 02)	80 - 24 hrs	25	23	20
4	NO_2 ($\mu g/m^3$)	Modified Jacob &Hochheiser (NaArsenite), IS: 5182 (Part 06)	80 - 24 hrs	32	38	25
5	O_3 ($\mu g/m^3$)	Chemical method, IS: 5182 (Part 09)	100 - 8 hrs	16	15	13
6	Pb ($\mu g/m^3$)	AAS Method after Sampling on EPM 2000 or equipment Filter Pa-, IS: 5182 (Part 22)	1.0–24 hrs	BDL	BDL	BDL
7	CO (mg/m^3)	Gas Chromatography based on Continuous analyzer, IS: 5182 (Part 10)	2.0- 8 hr	0.51	0.46	0.43
8	NH_3 ($\mu g/m^3$)	Indophenol blue Method, Method: 401 AWMA	400 - 24 hrs	15	14	12
9	C_6H_6 ($\mu g/m^3$)	Gas Chromatography based on continuous analyzer, IS: 5182 (Part 11)	5.0-Annum	0.48	0.42	0.39
10	B(a)P (ng/m^3)	GC analysis, CPCB	1.0-Annum	BDL	BDL	BDL
11	As (ng/m^3)	AAS Method after Sampling on EPM 2000 or equipment Filter Pa-, Method: 822, AWMA	6.0-Annum	BDL	BDL	BDL
12	Ni (ng/m^3)	AAS Method after Sampling on EPM 2000 or equipment Filter Pa-, IS: 5182 (Part 26)	20 –Annum	BDL	BDL	BDL

Note: BDL- Below Detectable Limit.

Verified by
(MD.Azeem)
Analyst

Authorized Signatory
(M. Ravi Kiran)

PRAGATHI LABS & CONSULTANTS PVT.LTD.

(LAB RECOGNISED BY MINISTRY OF ENVIRONMENT & FORESTS, GOVT. OF INDIA)

(ISO 9001:2015, OHSMS ISO 45001:2018)

Plot No. B15 & 16, Industrial Estate, Behind Pollution Control Board
Opp. Bank of Baroda, Sanath Nagar, Hyderabad - 500 018. Telangana.
Telefax : 040-23717213 Mail : info@pragathilabs.com Web : www.pragathilabs.com

PLCPL/CL7.8/F2

TEST REPORT

Industry Name	Hindustan Petroleum Corporation Limited		
Address	Visakh Refinery, Malkapuram, Visakhapatnam-530 011		
Phone No.	0891-2894825/4818	Kind attention to: Sri Gudala Bhagavan DGM - Technical	
Fax No.	0891-2759861		
Date of sampling	13th October, 2023		
Date of Reporting	06th November, 2023	Nature of the Sample	Ambient Air
Our Ref. No.	Pra/Env/HPCL/10 (AAQ-03)	No. of Samples	3
P.O. No.	20000433-HB/PR200066-HP/LOA/AG	Method of Analysis	IS: 5182 & AWMA
Parameters	PM_{10},$PM_{2.5}$,SO_2, NO_2, O_3,Pb, CO, NH_3,Benzene,Benzo(a)pyrene, Arsenic & Nickel		
ULR No.	ULR-TC5741230000000399F		
Our Report No	PLCPL/23/5167-5169/3443		

Discipline: Chemical Testing:
Group: Atmospheric Pollution

AMBIENT AIR QUALITY

No.	Pollutant	Methods of Measurement & Analysis	NAAQS	HLPH	South Gate	Store Yard
1	PM_{10} ($\mu g/m^3$)	Gravimetric, IS: 5182 (Part 23)	100 - 24 hrs	75	68	60
2	$PM_{2.5}$ ($\mu g/m^3$)	Gravimetric, IS: 5182 (Part 24)	60 - 24 hrs	31	27	25
3	SO_2 ($\mu g/m^3$)	Improved West &Gaeke, IS: 5182 (Part 02)	80 - 24 hrs	28	25	23
4	NO_2 ($\mu g/m^3$)	Modified Jacob &Hochheiser (NaArsenite), IS: 5182 (Part 06)	80 - 24 hrs	34	31	28
5	O_3 ($\mu g/m^3$)	Chemical method, IS: 5182 (Part 09)	100 - 8 hrs	14	13	11
6	Pb ($\mu g/m^3$)	AAS Method after Sampling on EPM 2000 or equipment Filter Pa-, IS: 5182 (Part 22)	1.0–24 hrs	BDL	BDL	BDL
7	CO (mg/m^3)	Gas Chromatography based on Continuous analyzer, IS: 5182 (Part 10)	2.0- 8 hr	0.55	0.49	0.45
8	NH_3 ($\mu g/m^3$)	Indophenol blue Method, Method: 401 AWMA	400 - 24 hrs	13	12	10
9	C_6H_6 ($\mu g/m^3$)	Gas Chromatography based on continuous analyzer, IS: 5182 (Part 11)	5.0-Annum	0.45	0.40	0.36
10	B(a)P (ng/m^3)	GC analysis, CPCB	1.0-Annum	BDL	BDL	BDL
11	As (ng/m^3)	AAS Method after Sampling on EPM 2000 or equipment Filter Pa-, Method: 822, AWMA	6.0-Annum	BDL	BDL	BDL
12	Ni (ng/m^3)	AAS Method after Sampling on EPM 2000 or equipment Filter Pa-, IS: 5182 (Part 26)	20 –Annum	BDL	BDL	BDL

Note: BDL- Below Detectable Limit.

Verified by
(Md.Azeem)
Analyst

Authorized Signatory
(M. Ravi Kiran)

HPCL-VISAKH REFINERY (PS&E DIVISION)

Overall Refinery Sulphur Balance:April 2023

						Apr-23	30	Days
	Crude run (TMT)	Sulphur content (wt%)	Sulphur in (MT)		Production (TMT)	Sulphur Standard (wt%)	Sulphur Actual (wt%)	Sulphur out (MT)
CRUDE				**PRODUCTS**				
Low Sulphur :								
AZERI Lt.	164.3	0.17	272.75	**Propylene**	3.4	0.005	0.004	0.12
RAVVA	0.2	0.05	0.11	**LPG**	36.0	0.02	0.01	4.42
NOVY PORT	195.4	0.13	248.12	**Naphtha**	2.6	0.28	0.02	0.56
SLEB	25.4	0.10	25.91	**MS EVI**	158.3	0.001	0.001	1.03
CHAMP	19.5	0.13	25.00	**ATF**				
				MS 89 RON	1.51	0.001	0.001	0.01
				HPCK (LS SKO)	9.8	0.10	0.012	1.14
High Sulphur :				**PDS SKO**	-31.6	0.10	0.023	-7.33
ARAB EXTRA LIGHT	75.4	1.16	874.83	**BS-6 HSD**	450.4	0.001	0.001	4.50
URALS (REBCO)	126.6	1.57	1982.35	**HFHSD**				
URALS RCO	30.0	1.74	520.50	**LDO**	10.6	-	1.00	105.47
BASRAH LIGHT (ISPRL)	73.1	1.71	1249.63	**JBO**				
BASRAH MEDIUM	134.9	3.12	4209.88	**MTO**	1.0	0.11	0.02	0.19
				FO	125.7	4.00	2.21	2777.97
				VLS FO	6.4	0.50	0.48	30.94
				LSHS	1.0	-	0.80	7.68
				BIT 80/100 & 60/70	51.9	-	5.72	2970.86
				Sulphur	3.9		100.00	3867.31
				ISD	**-48.6**	-	0.94	-456.64
				VGO	0.00	-	1.62	
				Fuel	57.89	-	0.17	98.41
				Loss	4.78	-	0.05	2.39
TOTAL	**844.8**		**9409.07**	**TOTAL**	**844.8**			**9409.05**

SUMMARY

Sulphur in: **9409.07** MT

Sulphur out: **9409.05** MT

Unaccounted sulphur quantity **0.03** MT

This unaccounted quantity plus the sulphur present in "Fuel" will be released in the form of SO2=	**6.7**	**MT Per day**

HPCL-VISAKH REFINERY (PS&E DIVISION)

Overall Refinery Sulphur Balance:May 2023

						May-23	31	Days
	Crude run (TMT)	Sulphur content (wt%)	Sulphur in (MT)		Production (TMT)	Sulphur Standard (wt%)	Sulphur Actual (wt%)	Sulphur out (MT)
CRUDE				**PRODUCTS**				
Low Sulphur :								
AZERI LIGHT	119.2	0.18	214.56	**Propylene**	4.4	0.005	0.004	0.16
NOVY PORT	200.6	0.13	252.76	**LPG**	43.8	0.02	0.10	42.49
AGBAMI	87.7	0.10	91.21	**Naphtha**	24.8	0.28	0.02	5.48
QUAIBOE	126.6	0.17	208.89	**MS EVI**	164.5	0.001	0.001	1.32
				ATF	7.9	0.30	0.21	16.20
				MS 89 RON	5.80	0.001	0.001	0.05
				HPCK (LS SKO)	11.6	0.10	0.008	0.87
High Sulphur :				**PDS SKO**	-0.8	0.10	0.008	-0.06
ARAB EXTRA LIGHT	87.1	1.29	1123.59	**BS-6 HSD**	491.9	0.001	0.006	29.02
URALS (REBCO)	158.6	1.76	2791.36	**HFHSD**	0.0	0.20		
MURBAN	46.1	0.80	368.80	**LDO**	11.1	-	1.26	139.86
BASRAH LIGHT (ISPRL)	43.2	3.00	1296.00	**JBO**	0.0	-		
BASRAH MEDIUM	197.0	2.80	5506.15	**MTO**	1.4	0.11	0.04	0.60
				FO	115.8	4.00	2.93	3392.94
				VLS FO	7.3	0.50	0.45	33.14
				LSHS	11.3	-	0.68	76.84
				BIT 80/100 & 60/70	62.3	-	6.31	3931.13
				Sulphur	3.8		100.00	3800.00
				ISD	**-0.8**	-	0.47	-3.73
				VGO	28.10	-	1.01	283.81
				Fuel	66.42	-	0.15	99.63
				Loss	5.48	-	0.05	2.74
TOTAL	**1066.1**		**11853.31**	**TOTAL**	**1066.1**			**11852.48**

SUMMARY

Sulphur in: **11853.31** MT

Sulphur out: **11852.48** MT

Unaccounted sulphur quantity **0.83** MT

This unaccounted quantity plus the sulphur present in "Fuel" will be released in the form of SO2=	**6.7**	**MT Per day**

HPCL-VISAKH REFINERY (PS&E DIVISION)

Overall Refinery Sulphur Balance: June 2023

						Jun-23	30	Days
	Crude run (TMT)	Sulphur content (wt%)	Sulphur in (MT)		Production (TMT)	Sulphur Standard (wt%)	Sulphur Actual (wt%)	Sulphur out (MT)
CRUDE				**PRODUCTS**				
Low Sulphur :								
Ravva	53.5	0.05	26.73	**Propylene**	4.9	0.005	0.004	0.18
MH	55.4	0.17	94.21	**LPG**	38.5	0.02	0.01	3.74
WTI	154.0	0.14	215.53	**Naphtha**	70.0	0.28	0.02	15.47
Quaiboe	0.4	0.16	0.57	**89 RON MS**	14.6	0.001	0.001	0.12
Agbami	43.2	0.10	43.19	**BS-6 MS**	139.4	0.001	0.001	1.12
				HP Super Solvent	-0.53	0.001	0.001	0.00
				ATF	7.78	0.10	0.247	19.22
High Sulphur :				**PDS SKO**	2.9	0.10	0.008	0.22
Sokol	96.4	0.32	308.44	**BS-6 HSD**	474.5	0.001	0.001	2.80
Sib Lt	99.4	0.60	596.44	**HFHSD**				
Arab Ex Lt	86.7	1.18	1023.18	**LDO**	13.6	-	1.27	172.83
Murban	77.5	0.80	620.18	**JBO**	1.4	-	2.50	35.25
Basrah Medium	192.2	2.90	5573.22	**MTO**	1.4	0.11	0.04	0.61
URAL	191.2	1.77	3384.80	**FO**	128.4	4.00	3.21	4115.22
				LSFO	3.0		1.00	30.00
				VLS FO	11.1	0.50	0.45	50.26
				LSHS	2.8	-	0.69	18.97
				BIT 80/100 & 60/70	50.5	-	6.58	3321.59
				Sulphur	3.8		100.00	3844.36
				ISD	**16.0**	-	0.85	135.82
				VGO	0.00	-	1.06	0.00
				Fuel	61.58	-	0.19	117.01
				Loss	4.11	-	0.05	2.06
TOTAL	**1049.8**		**11886.48**	**TOTAL**	**1049.8**			**11886.83**

SUMMARY

Sulphur in: **11886.48** MT

Sulphur out: **11886.83** MT

Unaccounted sulphur quantity **-0.36** MT

This unaccounted quantity plus the sulphur present in "Fuel" will be released in the form of SO2=	**7.9**	**MT Per day**

HPCL-VISAKH REFINERY (PS&E DIVISION)

Overall Refinery Sulphur Balance: July 2023

						Jul-23	31	Days
	Crude run (TMT)	Sulphur content (wt%)	Sulphur in (MT)		Production (TMT)	Sulphur Standard (wt%)	Sulphur Actual (wt%)	Sulphur out (MT)
CRUDE				**PRODUCTS**				
Low Sulphur :								
Okwuibome	120.1	0.11	132.10	**Propylene**	4.7	0.005	0.004	0.17
Okono	108.9	0.09	98.02	**LPG**	38.8	0.02	0.01	3.80
WTI	365.5	0.14	511.74	**Naphtha**	77.8	0.28	0.03	19.91
				89 RON MS	-11.2		0.001	-0.09
				BS-6 MS	177.7	0.001	0.001	1.08
				ATF	4.71	0.30	0.220	10.37
High Sulphur :				**SKO**	12.6	0.10	0.009	1.15
				BS-6 HSD	463.8	0.001	0.001	2.74
Sib Lt	106.1	0.60	636.42	**HFHSD**	2.9	0.20	0.09	0.00
Arab Ex Lt	48.9	1.19	582.66	**LDO**	8.9	-	1.13	100.65
Basrah Medium	153.9	3.18	4898.28	**JBO**	0.0	-	2.30	0.00
URAL	205.2	1.76	3618.21	**MTO**	1.4	0.11	0.03	0.45
				FO	130.7	4.00	2.30	3006.62
				LSFO	11.6		1.00	116.00
				VLS FO	12.4	0.50	0.44	54.93
				LSHS	0.7	-	0.70	4.91
				BIT 80/100 & 60/70	38.5	-	5.35	2057.13
				Sulphur	4.6		100.00	4598.00
				ISD	**55.6**	-	0.69	382.01
				VGO	0.00	-	1.02	0.00
				Fuel	67.68	-	0.17	115.06
				Loss	4.73	-	0.05	2.36
TOTAL	**1108.7**		**10477.43**	**TOTAL**	**1108.7**			**10477.24**

SUMMARY

Sulphur in:	**10477.43**	MT
Sulphur out:	**10477.24**	MT
Unaccounted sulphur quantity	**0.19**	MT

This unaccounted quantity plus the sulphur present in "Fuel" will be released in the form of SO2=	**7.6**	**MT Per day**

HPCL-VISAKH REFINERY (PS&E DIVISION)

Overall Refinery Sulphur Balance:August 2023

						Aug-23	31	Days
	Crude run (TMT)	Sulphur content (wt%)	Sulphur in (MT)		Production (TMT)	Sulphur Standard (wt%)	Sulphur Actual (wt%)	Sulphur out (MT)
CRUDE				**PRODUCTS**				
Low Sulphur :								
MH	2.1	0.15	3.13	**Propylene**	4.8	0.005	0.004	0.18
BONNY LIGHT	130.5	0.20	258.42	**LPG**	41.0	0.02	0.01	3.98
WTI	266.2	0.13	332.78	**Naphtha**	121.2	0.28	0.01	12.36
ERHA	96.6	0.20	188.44	**MS EVI**	102.9	0.001	0.001	0.68
OKWUIBOME	3.7	0.11	4.09	**ATF**	9.5	0.30	0.18	17.55
OKONO	8.7	0.09	7.42					
AGBAMI	33.0	0.08	24.74					
AKPO	132.2	0.10	134.84	**HPCK (LS SKO)**	7.2	0.10	0.003	0.22
High Sulphur :				**PDS SKO**				
ARAB EXTRA LIGHT	99.6	0.99	986.36	**BS-6 HSD**	446.6	0.001	0.001	2.77
SIB LT	69.0	0.59	407.13	**HFHSD**	2.8	0.20	0.11	3.02
URAL	139.3	1.80	2509.82	**LDO**	20.5	-	0.97	199.23
BASRAH MEDIUM	124.0	3.26	4042.61	**JBO**	1.6	-	2.50	40.14
				MTO	2.1	0.11	0.03	0.58
				FO	121.3	4.00	2.34	2839.36
				VLS FO	3.4	0.50	0.43	14.36
				LSFO	7.9	-	0.90	71.10
				LSHS	19.1	-	0.71	136.15
				BIT 80/100 & 60/70	30.5	-	5.48	1670.67
				Sulphur	3.2		100.00	3231.98
				ISD	82.6	-	0.65	538.00
				VGO	0.00	-	1.01	
				Fuel	71.41	-	0.16	114.25
				Loss	5.33	-	0.05	2.66
TOTAL	**1105.0**		**8899.76**	**TOTAL**	**1105.0**			**8899.23**

SUMMARY

Sulphur in: **8899.76** MT

Sulphur out: **8899.23** MT

Unaccounted sulphur quantity **0.53** MT

This unaccounted quantity plus the sulphur present in "Fuel" will be released in the form of SO2=	**7.6**	**MT Per day**

HPCL-VISAKH REFINERY (PS&E DIVISION)

Overall Refinery Sulphur Balance:September 2023

						Sep-23	30	Days
	Crude run (TMT)	Sulphur content (wt%)	Sulphur in (MT)		Production (TMT)	Sulphur Standard (wt%)	Sulphur Actual (wt%)	Sulphur out (MT)
CRUDE				**PRODUCTS**				
Low Sulphur :								
Ravva	6.6	0.06	4.25	**Propylene**	4.5	0.005	0.004	0.17
MH	99.0	0.15	149.53	**LPG**	39.4	0.02	0.01	3.82
WTI	275.4	0.16	440.63	**Naphtha**	82.0	0.28	0.01	8.36
ERHA	28.3	0.20	55.09	**MS EVI**	144.8	0.001	0.001	0.91
Agbami	90.0	0.08	67.51	**ATF**	11.3	0.30	0.18	20.81
				HPCK (LS SKO)	9.4	0.10	0.0001	0.01
High Sulphur :				**PDS SKO**				
Sib Lt	10.6	0.59	62.78	**BS-6 HSD**	407.3	0.001	0.001	2.65
Arab Ex Lt	92.9	1.07	994.52	**HFHSD**	2.3	0.20	0.12	2.82
Basrah Medium	137.6	2.60	3577.97	**LDO**	13.1	-	0.99	129.51
URAL	272.6	1.53	4171.34	**JBO**	0.7	-	2.50	18.47
				MTO	2.5	0.11	0.03	0.71
				FO	133.9	4.00	2.58	3454.62
				VLS FO	8.7	0.50	0.45	39.39
				LSFO	4.1	-	0.90	36.90
				LSHS	2.3	-	0.75	17.40
				BIT 80/100 & 60/70	33.5	-	5.84	1954.52
				Sulphur	3.5		100.00	3490.64
				ISD	37.2	-	0.62	231.54
				VGO	0.00	-	1.01	
				Fuel	67.47	-	0.16	107.94
				Loss	5.21	-	0.05	2.61
TOTAL	**1013.2**		**9523.63**	**TOTAL**	**1013.2**			**9523.79**

SUMMARY

Sulphur in:	**9523.63**	MT
Sulphur out:	**9523.79**	MT
Unaccounted sulphur quantity	**-0.16**	MT

This unaccounted quantity plus the sulphur present in "Fuel" will be released in the form of SO2=	**7.4**	**MT Per day**

इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)
एक नवरत्न कम्पनी
ENGINEERS INDIA LIMITED
(A Govt. of India Undertaking)
A Navratna Company

इंजीनियर्स इंडिया लिमिटेड, ईआईएल कार्यालय परिसर, सैक्टर-16, गुरुग्राम - 122 001 (हरियाणा) भारत
Engineers India Limited, EIL Office Complex, Sector-16, Gurugram - 122 001 (Haryana) INDIA

Ref. ELC / HPCL / B016 / L- 836 **October 17, 2022**

M/s. Hindustan Petroleum Corporation Ltd.
Projects department,
Visakh refinery,
Post Box No-15, Malkapuram,
Visakhapatnam - 530011

Kind Attn : Mr. G U Narasimhulu, CGM (Projects)

Sub : Water Audit Study Report / जल लेखा परीक्षा अध्ययन रिपोर्ट

Ref : PMC services for HPCL VRMP, EIL Job No.B016

Dear Sir/ महोदय,

Please find enclosed Following document with this letter for your kind perusal
कृपया इस पत्र के साथ निम्नलिखित दस्तावेज़ आपके अवलोकन हेतु संलग्न पाएँ

S No / क्रमांक	Document / दस्तावेज़	Document No / संख्या
1	Water Audit Study Report – Post Implementation of VRMP जल लेखा परीक्षा अध्ययन रिपोर्ट - वीआरएमपी परियोजना के कार्यान्वयन उपरांत	B016-000-17-42-RP-1001, Rev. 0

Thanking you and assuring you of our best services at all times.
धन्यवाद एवं सदैव सर्वोत्तम सेवाओं के आश्वासन सहित ।

Very truly yours,

अनुभव

Anubhav Tiwari / अनुभव तिवारी
Sr Manager (P) / वरिष्ठ प्रबन्धक (परि.)

WATER AUDIT STUDY POST VRMP IMPLEMENTATION FOR HPCL VISAKH REFINERY

HINDUSTAN PETROLEUM CORPORATION LIMITED

VISAKHAPATNAM

REPORT No. B016-000-17-42-RP-1001
VOLUME 1 OF 1
Revision 0 : August 2022

Prepared by

इंजीनियर्स इंडिया लिमिटेड
(भारत सरकार का उपक्रम)
ENGINEERS INDIA LIMITED
(A Govt. of India Undertaking)

Delivering Excellence through People

WATER AUDIT STUDY

POST VRMP IMPLEMENTATION

FOR

HPCL VISAKH REFINERY

PROJECT : VISAKH REFINFERY MODERNIZATION PROJECT (VRMP)

OWNER : HPCL-VISAKH REFINERY

PMC : ENGINEERS INDIA LIMITED

JOB No. : B016

Rev. No	Date	Purpose	Prepared By	Checked by	Approved by
0	05.08.2022	SUBMITTED AS STUDY REPORT	SC	AD	VS

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1.0 INTRODUCTION

Hindustan Petroleum Corporation Ltd. (HPCL) operates an 8.33 MMTPA refinery at Vishakhapatnam in the state of Andhra Pradesh. The Visakh Refinery of HPCL is one of the most integrated refineries with three crude distillation units, MS Block (NHT / ISOM / CCR), Diesel Hydro Desulphurization unit, two Fluid Catalytic Cracking units, Visbreaker Unit, Bitumen Blowing unit, Propylene Recovery unit and Diesel Hydrotreater Unit.

HPCL intends to further enhance its refining capacity up to 15 MMTPA under VRMP (Visakh Refinery Modernization Project). The basic process unit configuration finalized under the VRMP is considering (a) A new Crude Distillation Unit (b) Full Conversion Hydrocracker as Secondary Processing unit and Residue Upgradation facility as bottoms upgrade unit.

The refinery presently has fresh raw water made available by Greater Visakh Municipal Corporation (GVMC) as the main source of raw water. Visakh Refinery has also installed a Sea Water Desalination Plant to generate treated raw water to meet its raw water demand.

Raw water received is stored in a raw water reservoir within complex and pumped to consumers like DM plant for DM water generation, Make--up to Bearing Cooling Water systems, service water to Process units and Offsite facilities and as Drinking Water to Canteen and sanitary requirements

Apart from the fresh raw water being used in the Bearing cooling towers, the major cooling water requirements in the Refinery are met by sea water as the Refinery has two sea water based Cooling Tower systems and utilizes sea water in the cooling towers as make up water along with a small part of the sea water also employed in the once through cooling network present in the complex.

In addition to the Capacity Expansion under the Visakh Refinery Modernization Project, The refinery is also installing a Sea Water Desalination Plant and an Effluent water recycle plant to treat and recycle the Effluents generated in the complex and also to supplement the fresh raw water demand of the new facilities planned under the Modernization Project. The new water treatment facilities shall enable the refinery to meet the requirement of treated raw water and DM Water of VRMP, combine the entire effluent of existing refinery and VRMP in one single Integrated Effluent Treatment Plant and the treated effluent shall be processed to produce DM quality water for use in the refinery. This shall further reduce requirement of fresh raw water from GVMC for DM water generation post the VRMP project.

As part of EIL's scope of work, a comprehensive water audit has been carried out for the supply and consumption of water in the refinery post Implementation of VRMP. The audit was carried out on the following water systems

- Raw Water System
- Demineralized Water System

- Recirculating Bearing Cooling Water System
- Recirculating Sea Cooling Water System
- Effluent Treatment & Recycle
- Condensate Polishing and Recycle

2.0 WATER SOURCES & UTILIZATION

The Visakh refinery uses fresh water and sea water to meet its total requirements of water for the existing refinery.

A. RAW WATER

The sources of raw water for the existing refinery are:

i. Fresh water from GVMC

ii. Treated water produced from Sea Water Desalination Plant (SWRO-I)

The raw water received from Greater Visakh Municipal Corporation (GVMC) is stored in the existing raw water reservoir of operating capacity 72000 m3 (total capacity 136500 m3) to ensure uninterrupted supply of raw water for existing refinery with a storage of ~3.1 days at normal consumption rate of raw water. The raw water from the reservoir shall be pumped to various consumers in the existing refinery to meet its process and other requirements post VRMP.

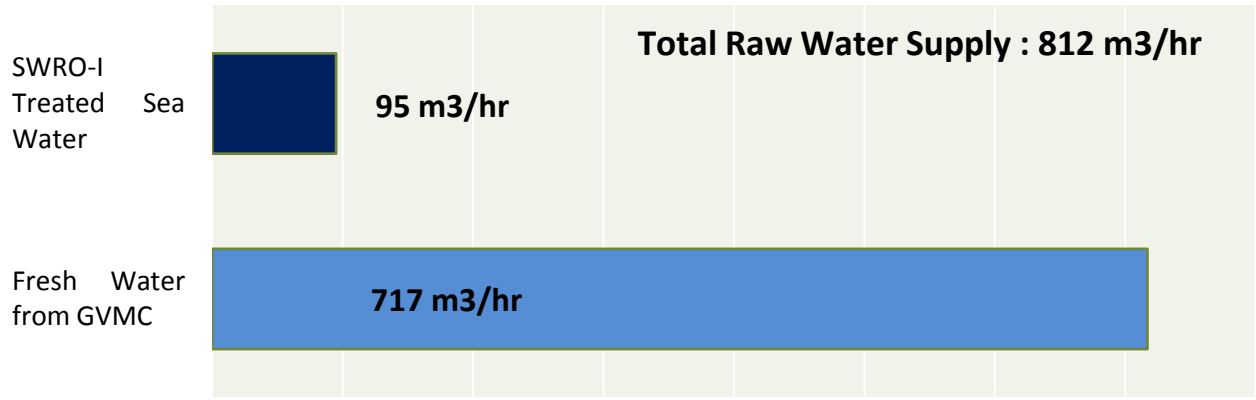
Visakh Refinery had also installed a Sea Water Desalination Plant to generate treated raw water to meet its raw water demand. The design treated water production from SWRO-I is 100 m3/h which is being utilized as raw water in the refinery.

Raw water is required in the refinery for the following purposes:

- As feed to DM water system
- As makeup to the bearing cooling water system.
- As service water for process units and operating hose stations for various miscellaneous uses in the plant, flare system makeup, flushing of pipelines, preparation of chemical solution, floor washing, etc
- Drinking water system (Canteen and sanitary requirements, etc.)

The Total Water demand for the existing Refinery is 812 m3/hr. Presently, raw water supplied by GVMC caters to ~ 90% of the water requirement and about ~ 10% is being met by the existing Sea Water Desalination Plant.

Figure 1: Raw Water Supply in Existing Refinery



The present consumption of raw water in existing refinery is indicated in the following Table -1

Table 1: Raw Water Consumption in Existing Refinery

S. No.	Unit	Consumption (m3/h)
1.	Bearing Cooling Water Make-up	142
2.	DM Plant Feed (DMP-II/III/IV)	565
3.	Service Water to Units	10
4.	Drinking Water	95
Total Raw Water Consumption in Existing Refinery		**812**

Figure 2: Raw Water Network in Existing Refinery

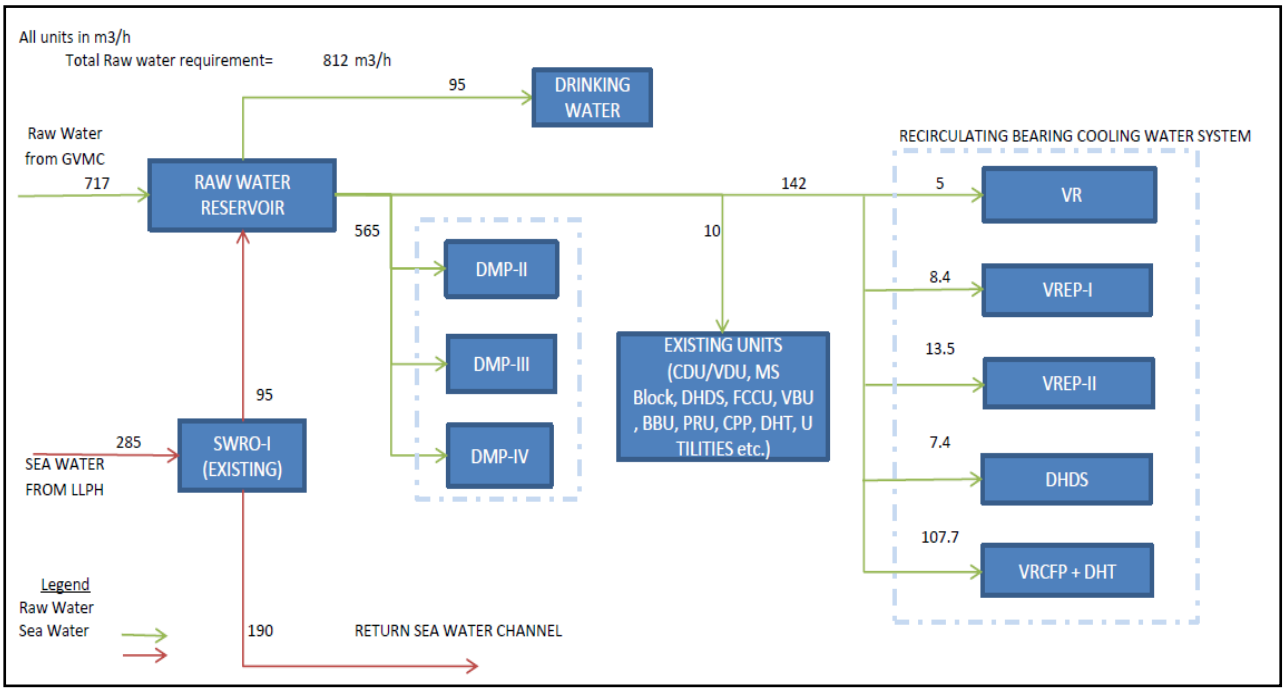
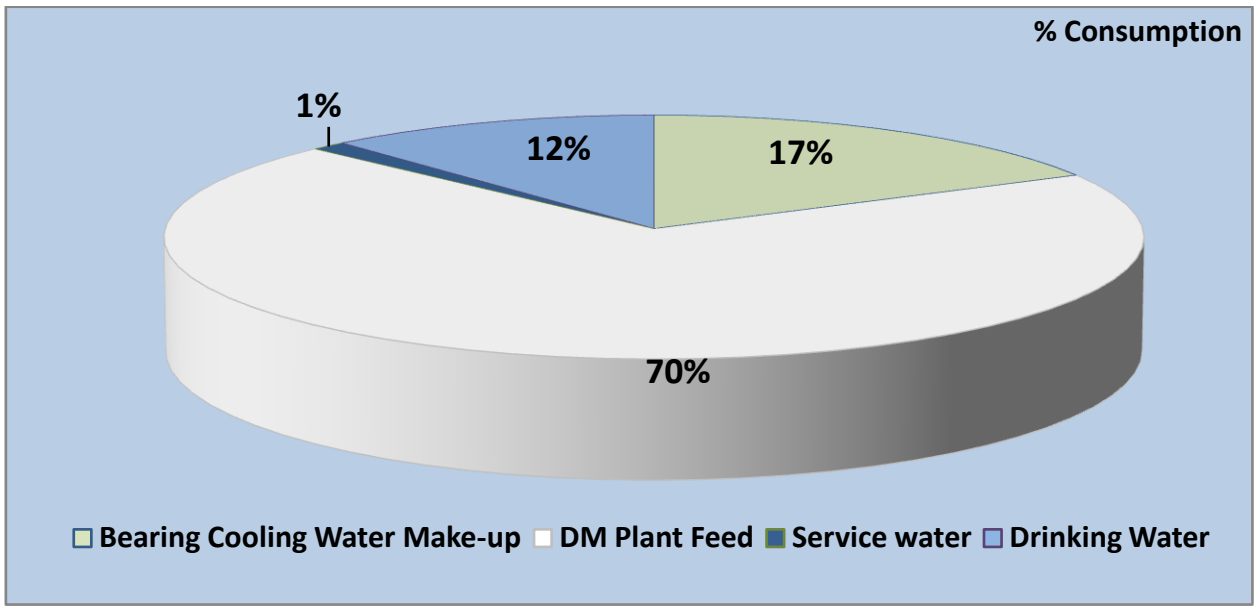


Figure 3: Raw Water Consumption in Existing Refinery



Post VRMP Implementation Scenario

The Raw Water consumption of existing Refinery will undergo changes due to the modifications proposed as part of VRMP and other projects under progress:

1. Installation of one new Sea Water Desalination Plant (SWRO-II) of capacity 584 m3/h treated water providing for treated desalinated water for use in the Refinery supplementing the Raw Water from GVMC.
2. Installation of Integrated Effluent Treatment Plant (IETP) for treatment and recycling of effluents generated in the existing refinery and VRMP
3. Installation of DMP-V which utilizes IETP treated effluent to generate DM Water for refinery and VRMP uses.
4. DMP-II shall be dismantled post VRMP and the DM water requirement of its units shall be met from VRMP DMP-V.
5. DMP-III shall be considered as spare chain and the DM water requirement of its units shall be met from VRMP DMP-V
6. Bearing Cooling Water Towers of existing refinery (VR, VREP-1, VREP-2, DHDS) shall be dismantled and an Integrated Bearing Cooling Water Tower (IBCW) shall be installed to cater to bearing cooling water requirement of Existing Refinery along with Bearing Cooling Tower of VRCFP+ DHT.

Due to the proposed changes, the raw water requirement for the Existing Refinery post VRMP implementation shall be as indicated in Table -2

Table 2: Raw Water Consumption in Existing Refinery Post VRMP

S. No.	Unit	Consumption (m3/h)
1.	Bearing Cooling Water Make-up (IBCW & VRCFP+DHT)	143.1
2.	DM Plant Feed (DMP-IV)	420
3.	Service water to Units	10
4.	Drinking Water	95
Total Raw Water Consumption in Existing Refinery Post VRMP		**668.1**

The reduction in Raw water demand in the existing Refinery is mainly due to the discontinuation of the DM Plant - II operation as the DM water required shall be met from the New DM Plant in VRMP which shall process the treated effluent for DM water generation.

The raw water consumption of VRMP Units has been estimated as follows:

Table 3: Raw Water Consumption in VRMP Units

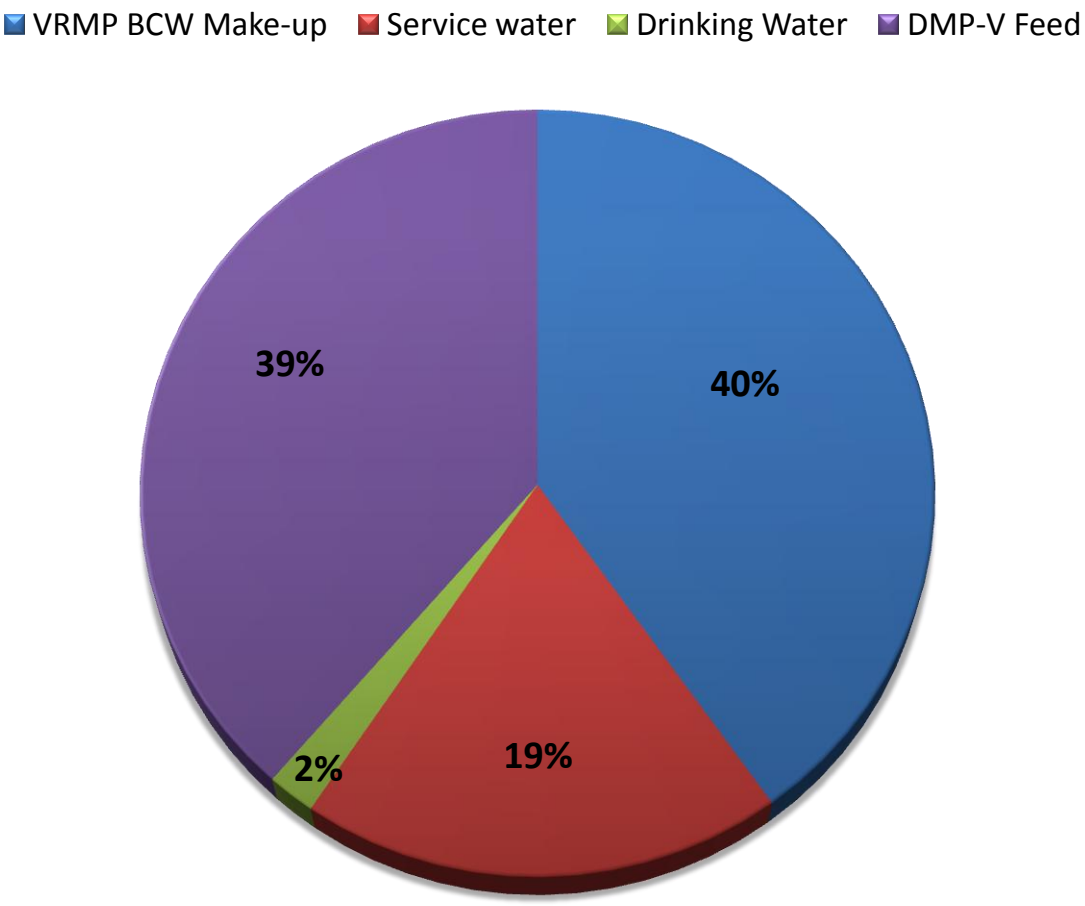
S. No.	Unit	Design Consumption (m3/h)
1.	VRMP Bearing Cooling Water Make-up	208
2.	Service Water to VRMP Units	100
3.	Drinking Water	10
4.	DMP-V Feed	200 (Note-1)
Total Raw Water requirement for VRMP		**518**

Notes:

1. During dry weather flow of IETP treated effluent, a part of RO-I Permeate from SWRO-II (~200 m3/h) shall be routed to DMP-V for further processing and total 700 m3/h DM Water generation. The dry weather flow to IETP has been considered since this will be the prevalent flow during normal operation.

2. In case IETP Treated Effluent is not available, GVMC raw water of 178 m3/hr is required as backup feed in DMP-V in addition to complete treated water from SWRO-II for DM water generation of 700 m3/hr. However, complete raw water backup from GVMC of 945 m3/h to DMP-V is considered for a scenario where IETP effluent recycling and SWRO-II treated water both are not available.

Figure 4: Raw Water Consumption in VRMP Units



A raw water tank converted from refinery crude tank (120-T-01C) having nominal capacity of 65000 m3 equivalent to ~3.2 days storage at peak raw water consumption shall be used to store the raw water required for VRMP.

The final balance of Raw Water post VRMP implementation shall be as follows:

Table 4: Raw Water balance Post VRMP

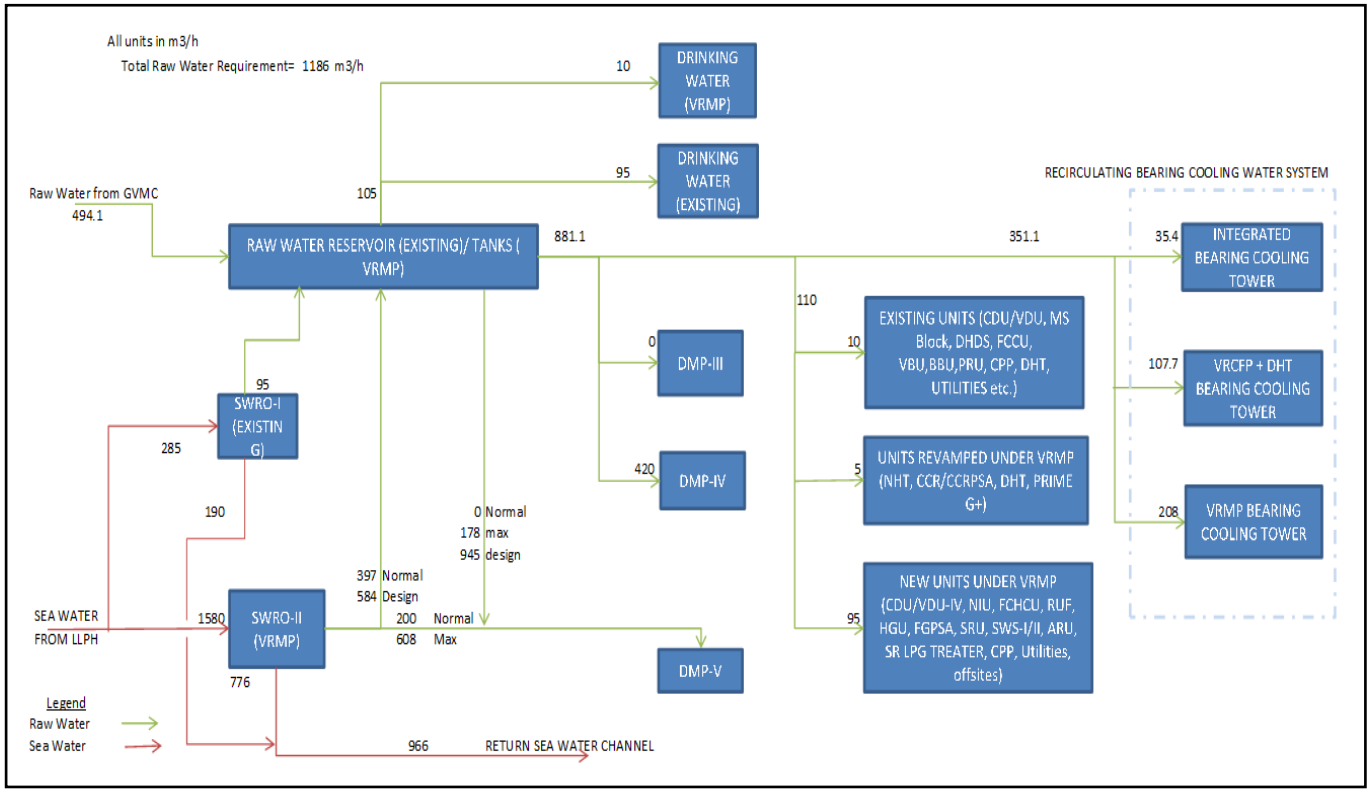
Unit	Value (m3/h)
Raw Water Demand post VRMP	
Existing Refinery requirement	668.1
VRMP Units requirement	518
Total Raw Water Demand post VRMP	**1186.1**
Raw Water (Desalinated) generation in the Refinery post VRMP	
SWRO-I treated water supply	95
SWRO-II treated water supply	397 + 200 (Note-1)
Total Raw Water Generation post VRMP	**692**
Raw Water Supply required from GVMC	
Total Supply from GVMC (1+2)-(3+4)	494.1

Notes:

1. During dry weather flow of IETP treated effluent, a part of RO-I Permeate from SWRO-II (~200 m3/h) shall be routed to DMP-V for further processing and total 700 m3/h DM Water generation. Balance permeate shall be further processed in SWRO-II units to produce 397 m3/h as treated raw water.
2. Complete backup of raw water of 945 m3/h is considered for a scenario where IETP effluent recycling and SWRO-II treated water both are not available for processing in DMP-V.

Hence, the total requirement of fresh water from GVMC post VRMP Implementation shall be ~494.1 m3/h with a peak requirement of 1836.1 m3/h in case IETP Treated Effluent and SWRO-II desalinated water is not available for processing in DMP-V.

Figure 5: Raw Water System Post VRMP



Changes in raw water consumption pattern post VRMP:

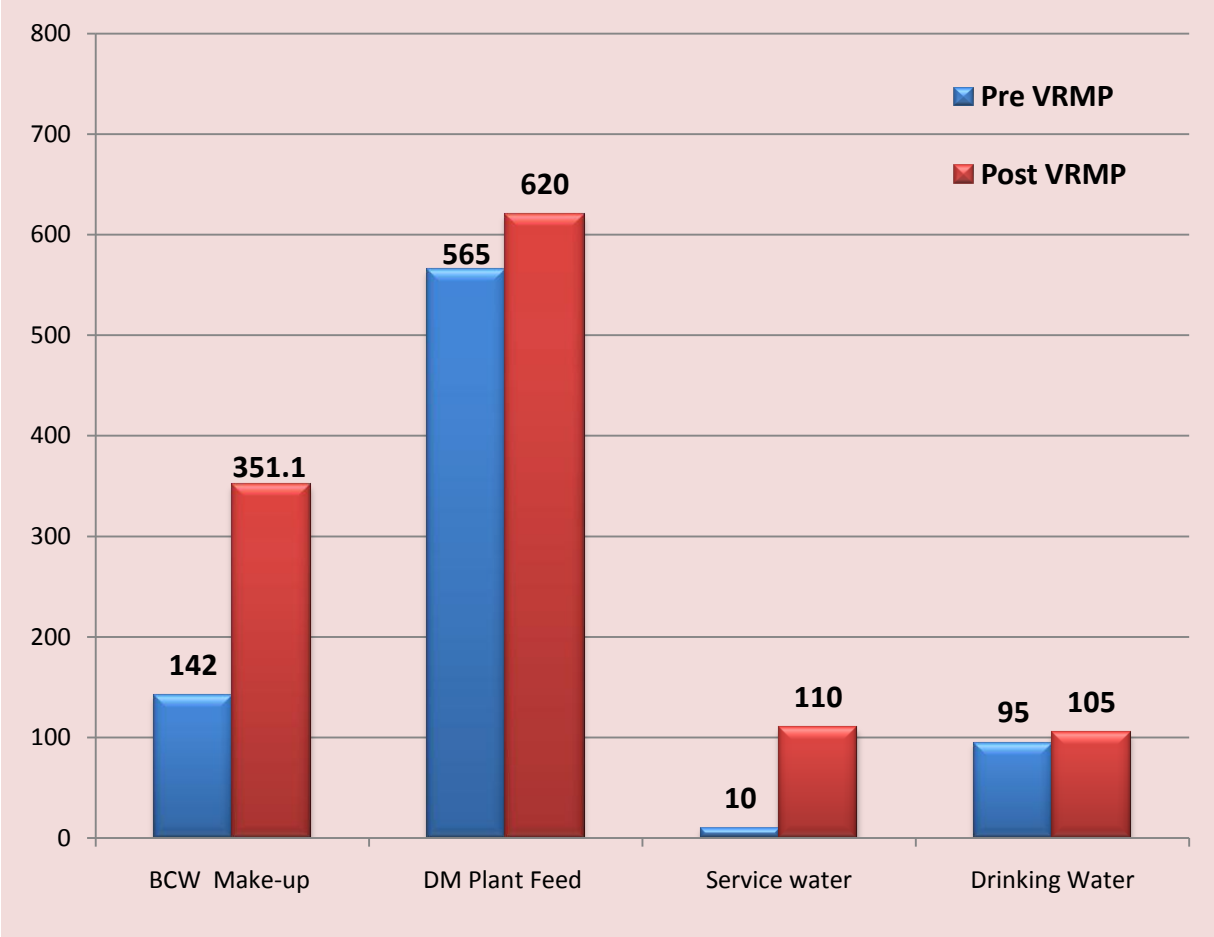
Table 5: Raw Water Consumption Pattern Post VRMP

S. No.	Unit	Consumption (m3/h)	
		pre VRMP	post VRMP
1.	Bearing Cooling Water Make-up	142	351.1
2.	DM Plant Feed	565	620
3.	Service water to Units	10	110
4.	Drinking Water	95	105
Total		**812**	**1186.1**

Note:

1. Complete backup of raw water of 945 m3/h is considered for a scenario where IETP effluent recycling and SWRO-II treated water both are not available.

Figure 6: Raw Water Consumption Pattern

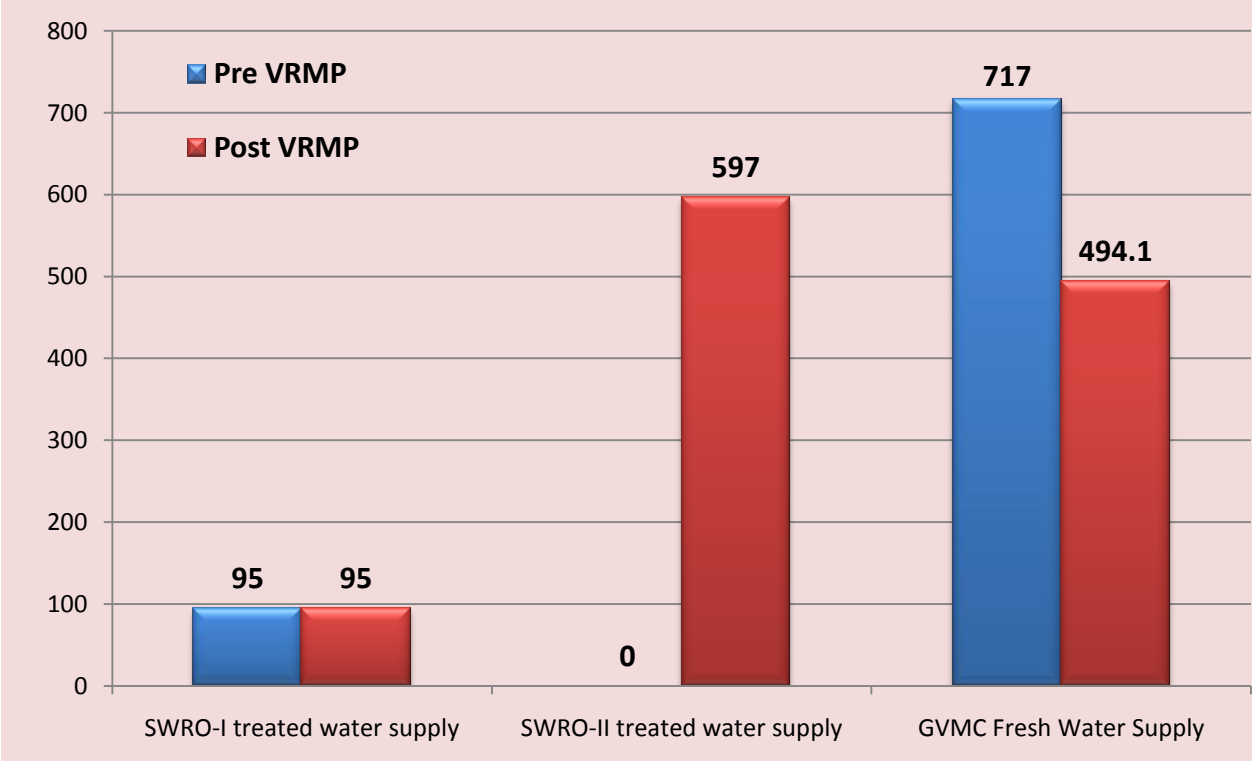


Changes in Raw Water Supply post VRMP is tabulated below:

Table 6: Raw Water Supply Post VRMP

S. No.	Unit	Supply (m3/h)	
		pre VRMP	post VRMP
1.	SWRO-I treated water supply	95	95
2.	SWRO-II treated water supply	-	597
3.	GVMC Fresh Water Supply	717	494.1
Total		**812**	**1186.1**

Figure 7: Raw Water Supply Post VRMP



B. SEA WATER

The sea water is utilized in the refinery for recirculating and once-through cooling towers, feed to SWRO Plant and fire water network.
The present configuration of sea water consumption in the Refinery is as follows:

Table 7: Sea Water Requirement in Existing Refinery

S. No.	Unit	Design Capacity	Actual Flow (m3/h)	COC	Sea water Requirement (m3/h)
1.	VREP-II SCW	14000 m3/hr (4+1 cells)	11529	1.1	2430
2.	VRCFP+ DHT SCW	14000 m3/hr (4+1 cells)	11796	1.1	2487
3.	HLPH SCW	Once through system	8075	1	8075
4.	SWRO-I	100 m3/h	95	-	285

Post VRMP implementation, the configuration of cooling towers shall be updated to include VRMP Re-circulating cooling towers and sea water for SWRO-II shall also be added to be sea water consumption:

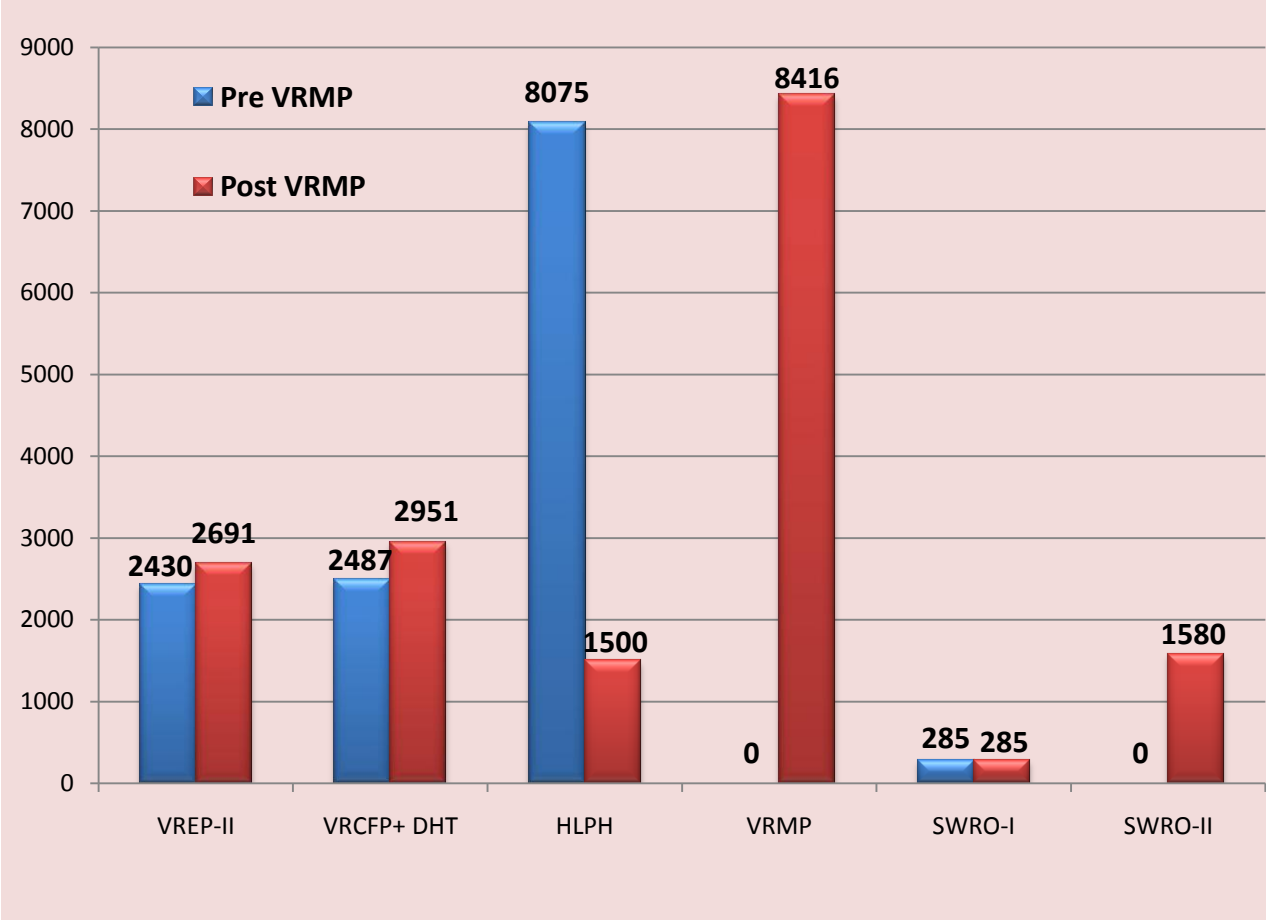
Table 8: Sea Water Requirement Post VRMP

S. No.	Unit	Design Capacity	Actual Flow (m3/h)	COC	Sea Water Requirement (m3/h)
1.	VREP-II SCW	14000 m3/hr (4+1 cells)	12766	1.1	2691
2.	VRCFP+ DHT SCW	14000 m3/hr (4+1 cells)	14000	1.1	2951
3.	VRMP SCW	44000 m3/hr (11+1 cells)	39924	1.1	8416
4.	HLPH SCW	Once through system	1500	1	1500
5.	SWRO-I	100 m3/h	95	-	285
6.	SWRO-II	584	584	-	1580

The make-up requirement post VRMP implementation shall be met through the existing pumps at HLPH for Sea Cooling water make-up and with new pumps at LLPH for SWRO-II.

The changes in sea water requirement post VRMP is summarized below:

Figure 8: Sea Water Consumption Pattern



3.0 WATER AUDIT

3.1 DM WATER SYSTEM

DM water for the complex is mainly required for the following purposes:

- ✓ As boiler feed water for the generation of steam
- ✓ As process water for dilution, reaction and washing
- ✓ During start-up of the Sour Water Stripping units
- ✓ For jacket cooling of some compressor, if required.

3.1.1 EXISTING DM WATER NETWORK

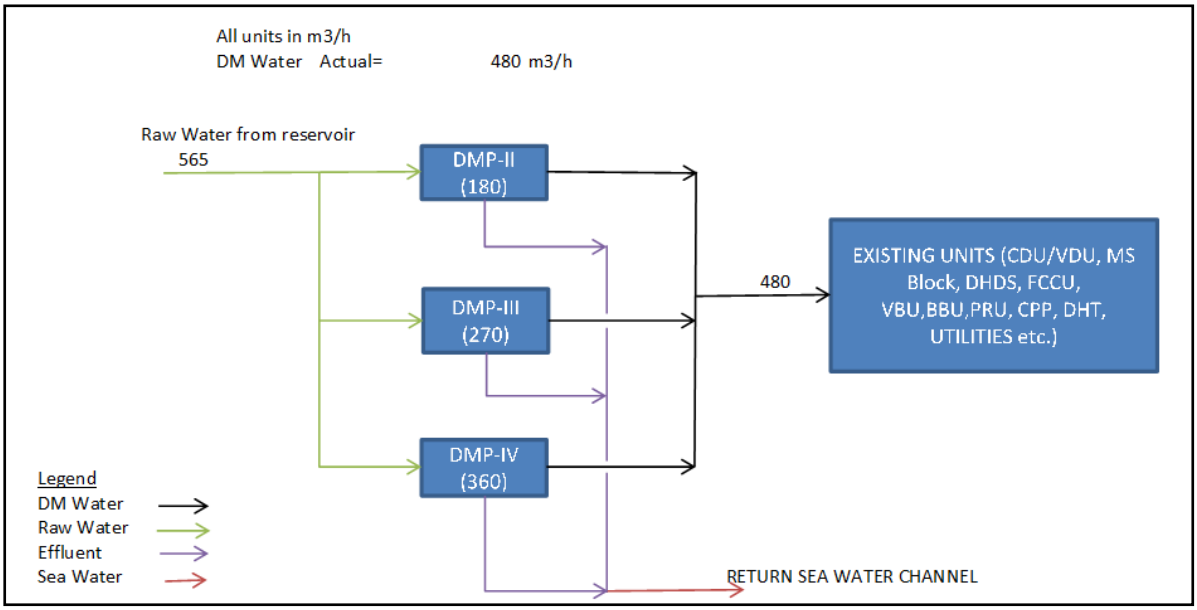
The DM Water Plants in Refinery are using Raw Water as feed to produce DM Water for refinery usage. The current DM Water requirement of the refinery is 480 m3/h.

The detail of the DM Plants is as follows:

Table 9: DM Plants in Existing Refinery

S. No.	Plant	Process	Design Feed Capacity (m3/h)	Design DM Water Production (m3/h)
1.	DMP-II	Ion Exchange	210	180
2.	DMP-III	Ion Exchange	300	270
3.	DMP-IV	UF-RO-MB	420	360

Figure 9: DM Water Network in Existing Refinery



3.1.2 VRMP DM WATER NETWORK

To increase effluent recycle and reuse in the system, DMP-V is installed under VRMP. This plant shall utilize the IETP treated effluent and raw water to generate DM Water.

The details of DMP-V are as follows:

Table 10: DM Plant in VRMP

S. No.	Plant	Process	Design Feed Capacity (m3/h)	DM Water Production (m3/h)
1.	DMP-V	UF-RO-MB	1042 (Design IETP treated effluent)	700

The design feed flow to DMP-V is 1042 m3/h of treated effluent from IETP. The dry weather flow to IETP has been considered since this will be the prevalent flow during normal operation. Hence, the feed flow to DMP-V shall be 745 m3/h treated effluent from IETP (dry weather flow) and 200 m3/h treated water from SWRO-II. The reject water from DMP-V, approx 572 m3/h, is proposed to be routed to VRMP Sea Cooling Tower as make-up water.

The following provisions are also considered to ensure continuous production of 700 m3/h DM Water:

1. Complete SWRO-II treated water, i.e. 608 m3/h, and 178 m3/h GVMC supplied raw water as combined feed to DMP-V in case IETP treated effluent is not available.
2. Complete GVMC supplied raw water backup, i.e. 945 m3/h, as feed to DMP-V in case both IETP treated effluent and SWRO-II treated water is not available.

Post VRMP Implementation, the requirement of DM Water in the Refinery shall be met from existing DMP-IV and VRMP DMP-V. Hence, DMP-II shall be dismantled and DMP-III shall be considered as spare chain and the DM water requirement of their units shall be met from DMP-IV and VRMP DMP-V.

The DM Water requirement and supply post VRMP Implementation shall be as follows:

Table 11: DM Water Generation post VRMP

Unit	Value (m3/h)
DM Water requirement in Refinery post VRMP	
DM Water for Refinery	480

DM Water for VRMP	580
Total DM Water requirement post VRMP	**1060**
DM Water Generation in Refinery post VRMP	
DMP-IV	360
DMP-V	700
Total DM Water generated post VRMP	**1060**

Figure 10: DM Water Network post VRMP

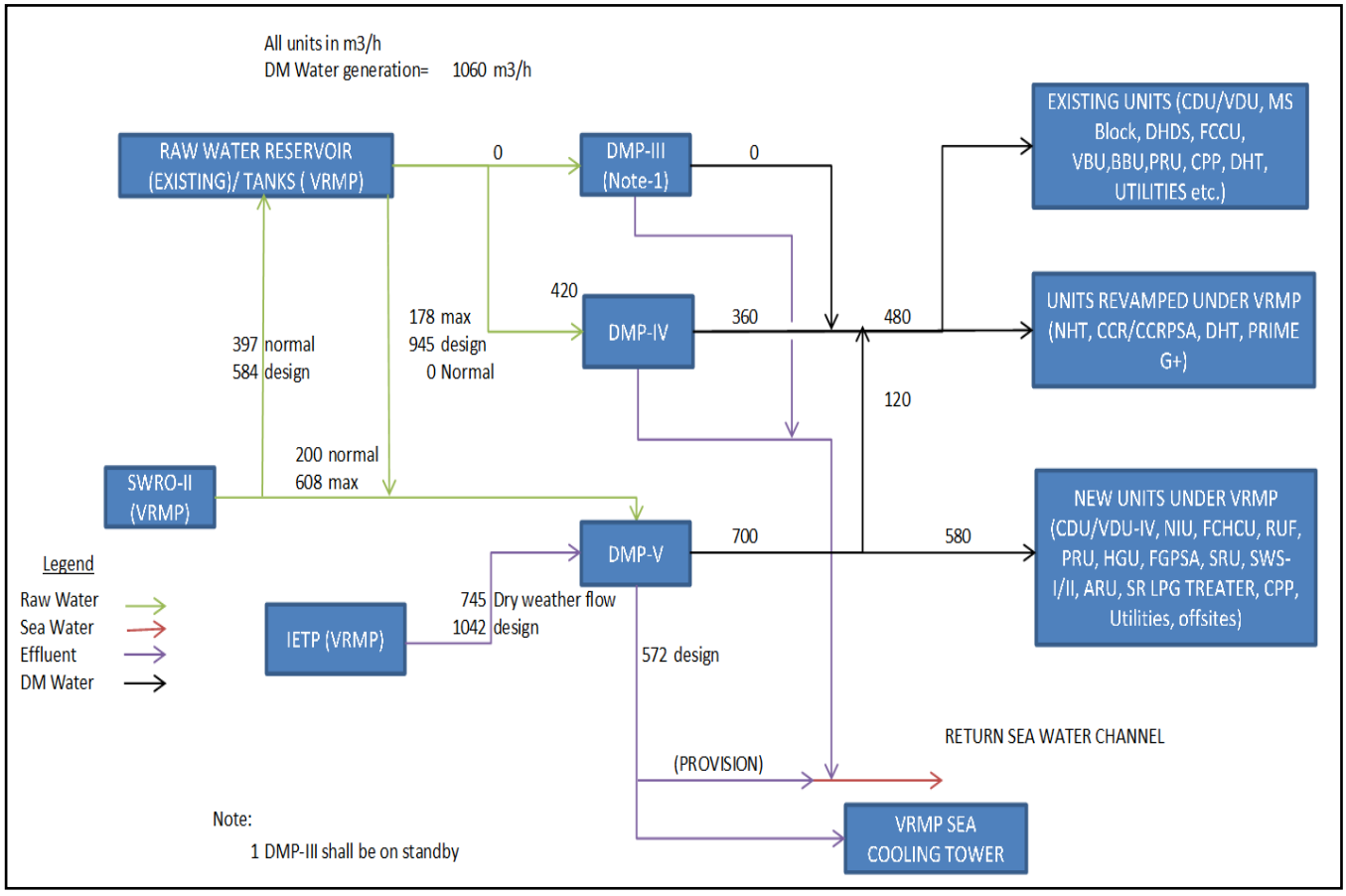
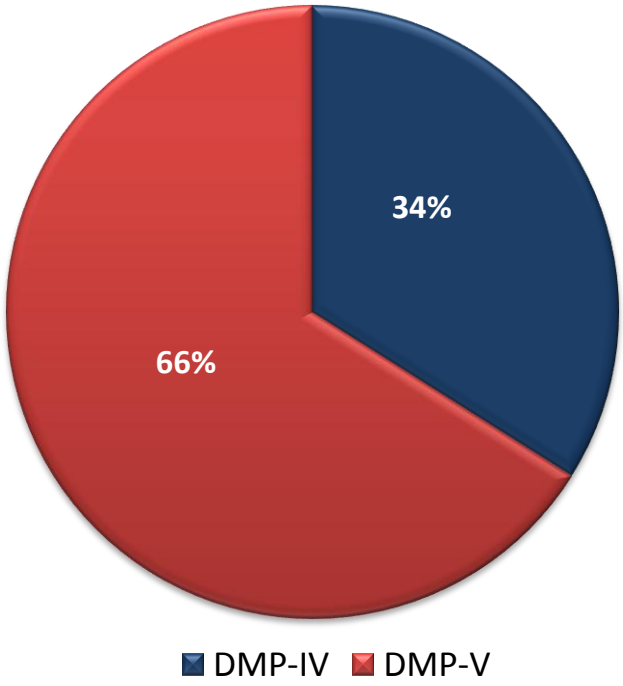


Figure 11: DM Water Generation post VRMP



3.2 RECIRCULATING COOLING WATER SYSTEM:

3.2.1 RECIRCULATING BEARING COOLING WATER SYSTEM

The re-circulating bearing cooling water system caters to the following main requirements:

- As cooling medium for pumps/rotary equipment requiring bearing/ seal pot cooling.
- As cooling medium for Air Compressor package. (i.e. Compressor intercooler and after cooler etc.)

Make-up water for the BCT is provided from raw water after basic filtration.

3.2.1.1 EXISTING BCW NETWORK

Following are the details of existing Recirculating Bearing Cooling Water Towers:

Table 12: Bearing Cooling Towers in Existing Refinery

Project	Circulating capacity (m3/h)	Number & Capacity of Recirculating Pumps	COC	Make-up Requirement(m3/h)
VR	150	2W - 75 m3/hr	2-3	5

Project	Circulating capacity (m3/h)	Number & Capacity of Recirculating Pumps	COC	Make-up Requirement(m3/h)
VREP-I	250	2W - 125 m3/hr	2-3	8.4
VREP-II	400	2W - 200 m3/hr	2-3	13.5
DHDS	200	2W - 100 m3/hr	2-3	7.4
VRCFP +DHT	3200	4W - 800 m3/hr	2-3	107.7
Total Make-up water				142

Figure 12: Bearing Cooling Water Network in Existing Refinery

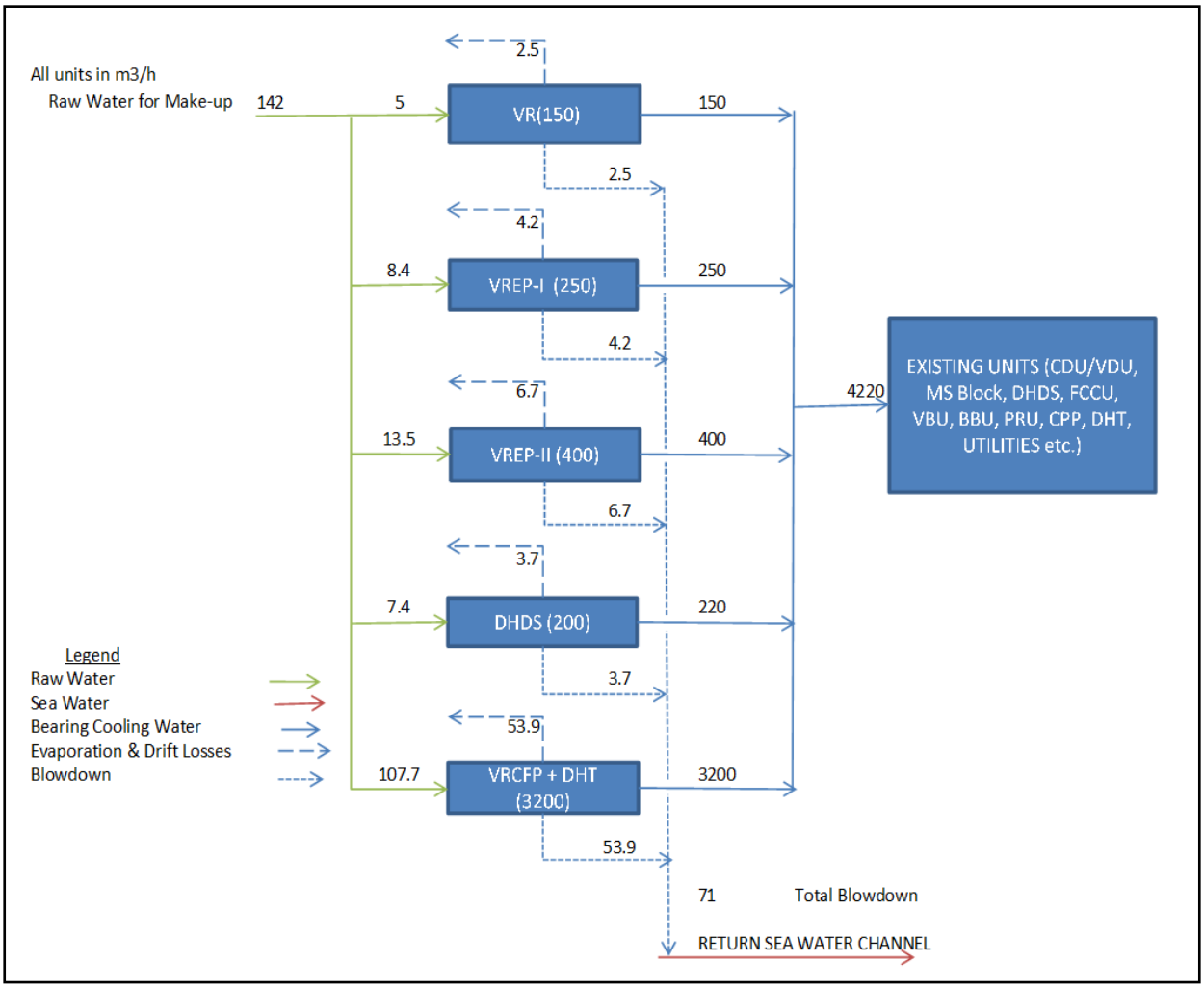
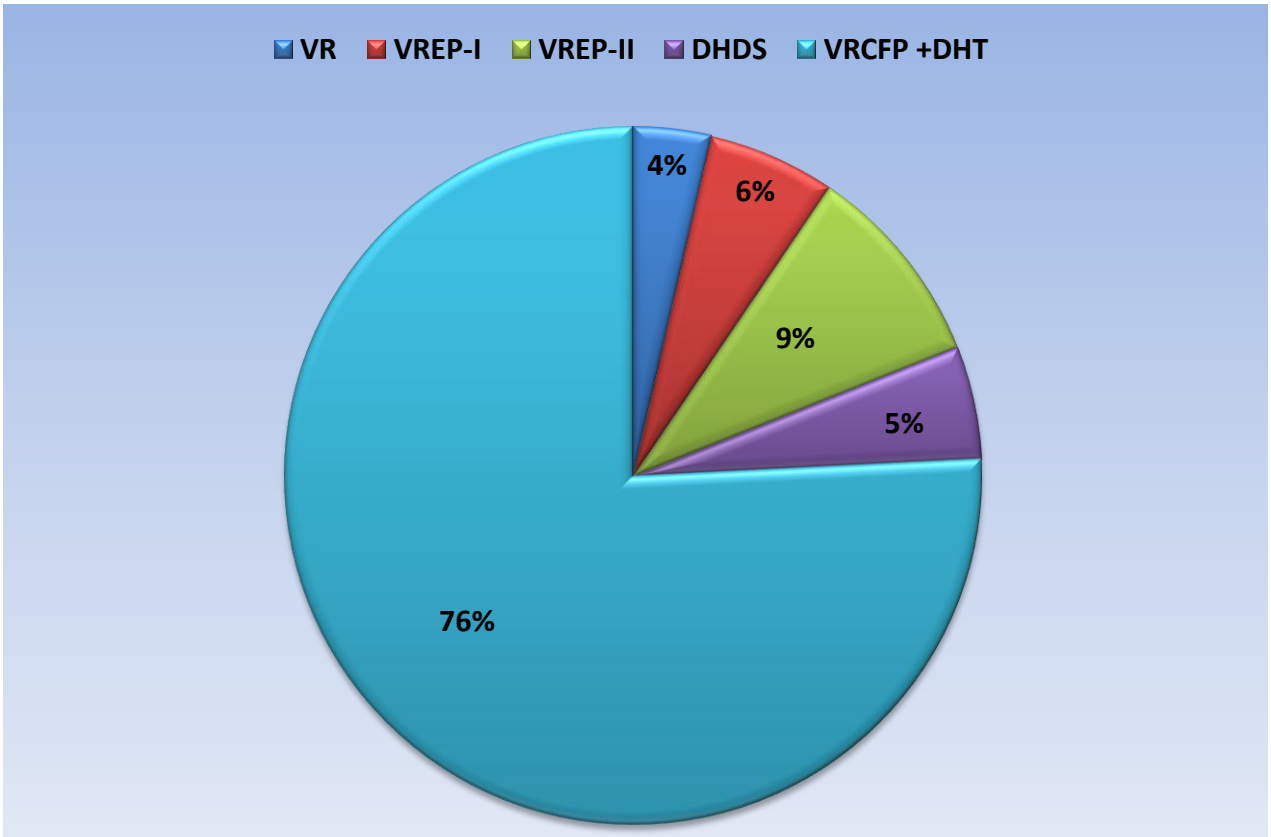


Figure 13: Bearing Cooling Water Make-up requirement in Existing Refinery



The VR, VREP-I, VREP-II and DHDS BCW systems are relatively old and smaller systems located at different locations within the refinery. As informed by HPCL, post VRMP, the old facilities will be dismantled and in place of existing BCW systems a new Integrated Bearing Cooling Water system in DMP-I area shall be considered to cater existing refinery requirement of VR, VREP-I, VREP-II, DHDS BCW systems. The same is not part of VRMP project and same shall be taken care by HPCL.

The new Integrated Bearing Cooling Water Tower shall have the following configuration:

Table 13: New Bearing Cooling Tower in Existing Refinery

Project	Circulation capacity (m3/h)	Number & Capacity of Recirculating Pumps	COC	Make-up Requirement (m3/h)
IBCW	1200	3W+2S - 400 m3/hr	2-3	35.4

3.2.1.2 VRMP BCW NETWORK

To meet the requirements of bearing cooling water for VRMP units and offsites, one Bearing Cooling tower of following configuration is envisaged.

Table 14: Bearing Cooling Tower in VRMP

Project	Recirculation capacity (m3/h)	Number & Capacity of Recirculating Pumps	COC	Make-up Requirement (m3/h)
VRMP	7200	6W+1S - 1200 m3/hr	3	208

Hence, post VRMP implementation, there will be only three BCW systems as follows:

- **Integrated BCW System (172-CT-01):** Recirculation capacity: 1200 m3/h. This bearing cooling water system will meet the total bearing cooling water demand of units connected with VR, VREP-I, VREP-II, DHDS BCW system.

- **VRCFP+DHT BCW System (171-CT-101):** Recirculation capacity: 3200 m3/h. This bearing cooling water system will meet the total bearing cooling water demand of units connected with VRCFP+DHT BCW system and revamp facilities under VRMP i.e. (NHT/CCR/DHT/PRU and Prime G).

- **VRMP BCW System (604-CT-101):** Recirculation capacity: 7200 m3/h. This bearing cooling water system will meet the total bearing cooling water demand of new units under VRMP including Compressed air system, Steam/power generation system, SRR/substation/control room and utility and offsite systems.

The following make-up requirement of BCW shall be met through treated and filtered raw water:

Table 15: Bearing Cooling Tower Network Post VRMP

S. No.	Project	Recirculation Capacity (m3/h)	Make-up water requirement (m3/h)
1.	VRCFP +DHT	3200	107.7
2.	IBCW	1200	35.4
3.	VRMP	7200	208
Total Raw Water Requirement			**351.1**

Figure 14: Bearing Cooling Water Network post VRMP

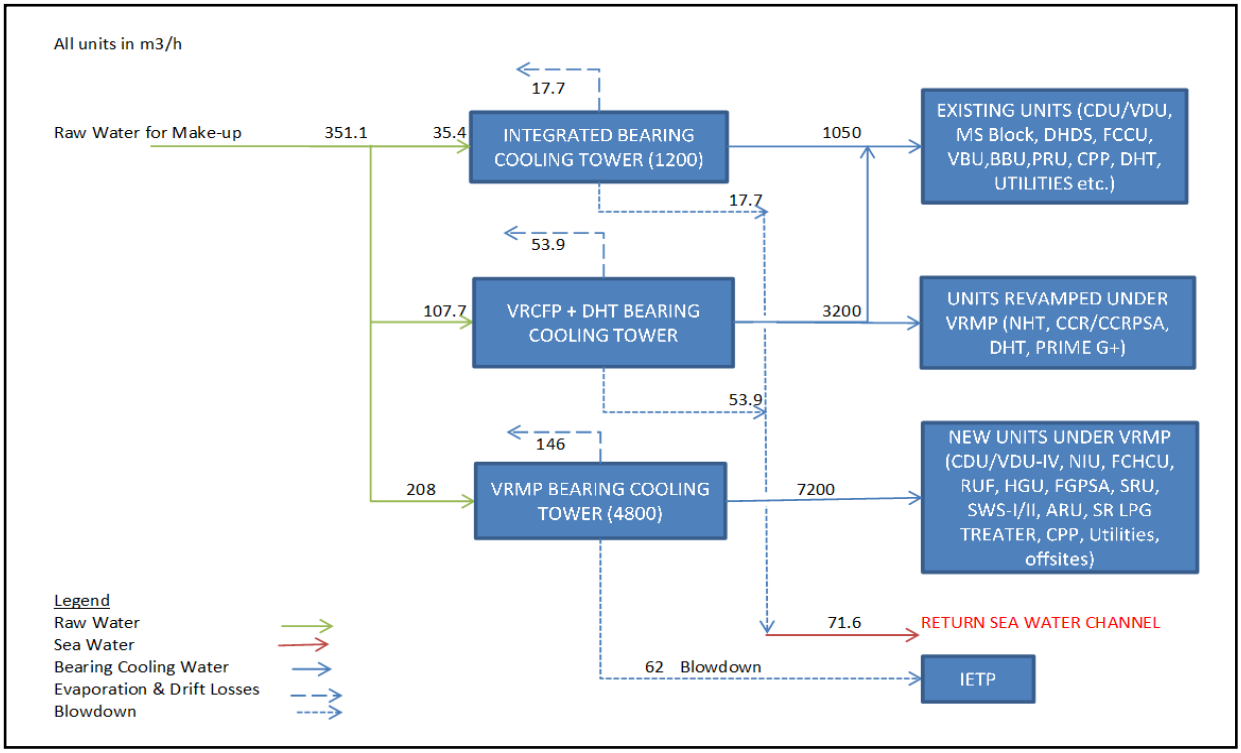
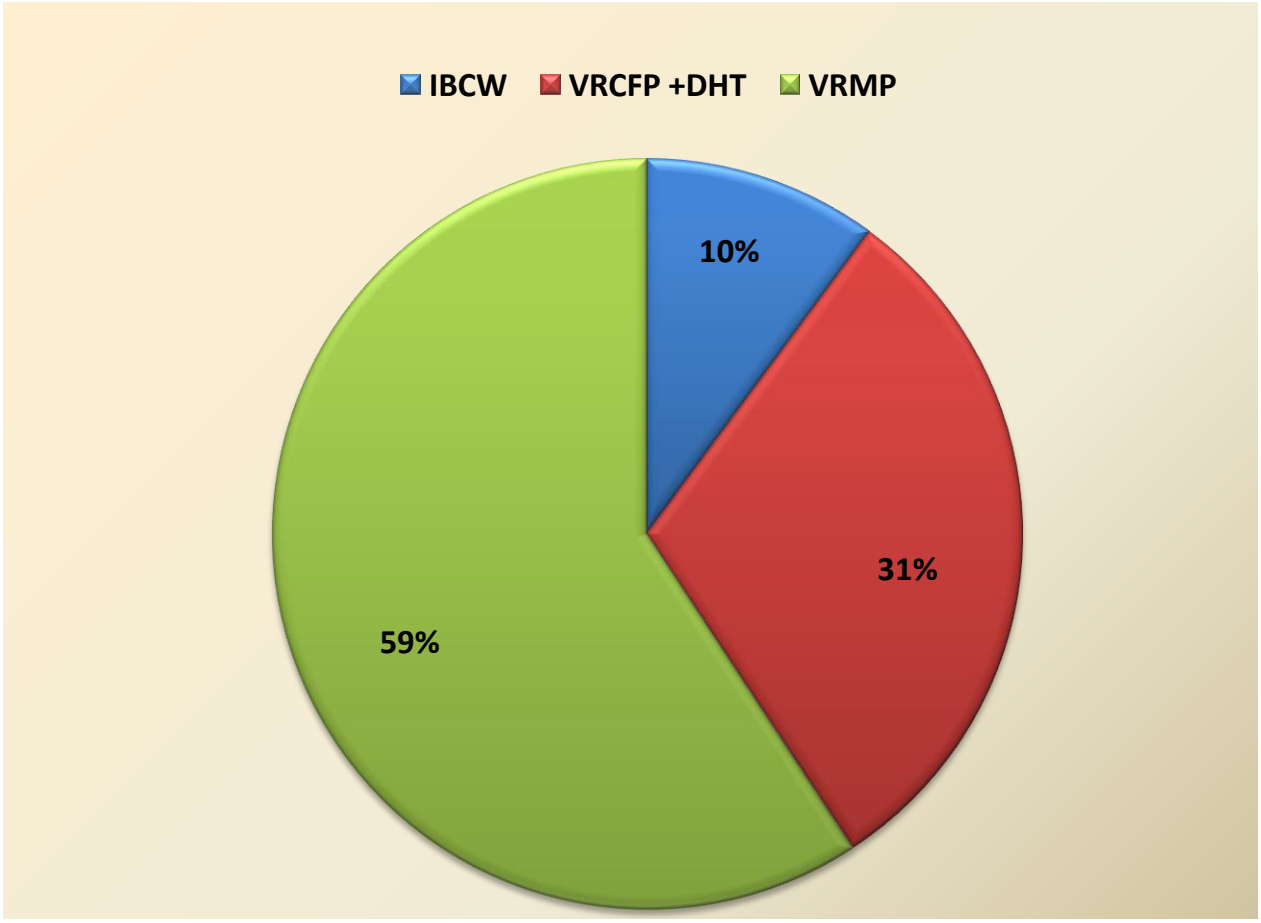


Figure 15: Bearing Cooling Water Make-up requirement post VRMP



3.2.2 RECIRCULATING SEA COOLING WATER SYSTEM:

3.2.2.1 EXISTING REFINERY SCW NETWORK

The Sea cooling towers in the refinery at present have the following configuration are as given below:

Table 16: Sea Cooling Tower Network in Existing Refinery

S. No.	SCW	Design Capacity	Actual Recirculation (m3/h)	COC	Make-up Requirement (m3/h)
1.	VREP-II	14000 m3/hr (4+1 cells)	11529	1.1	2430
2.	VRCFP + DHT	14000 m3/hr (4+1 cells)	11796	1.1	2487
3.	HLPH	Once through system	8075	1	8075

Figure 16: Sea Cooling Tower Network in Existing Refinery

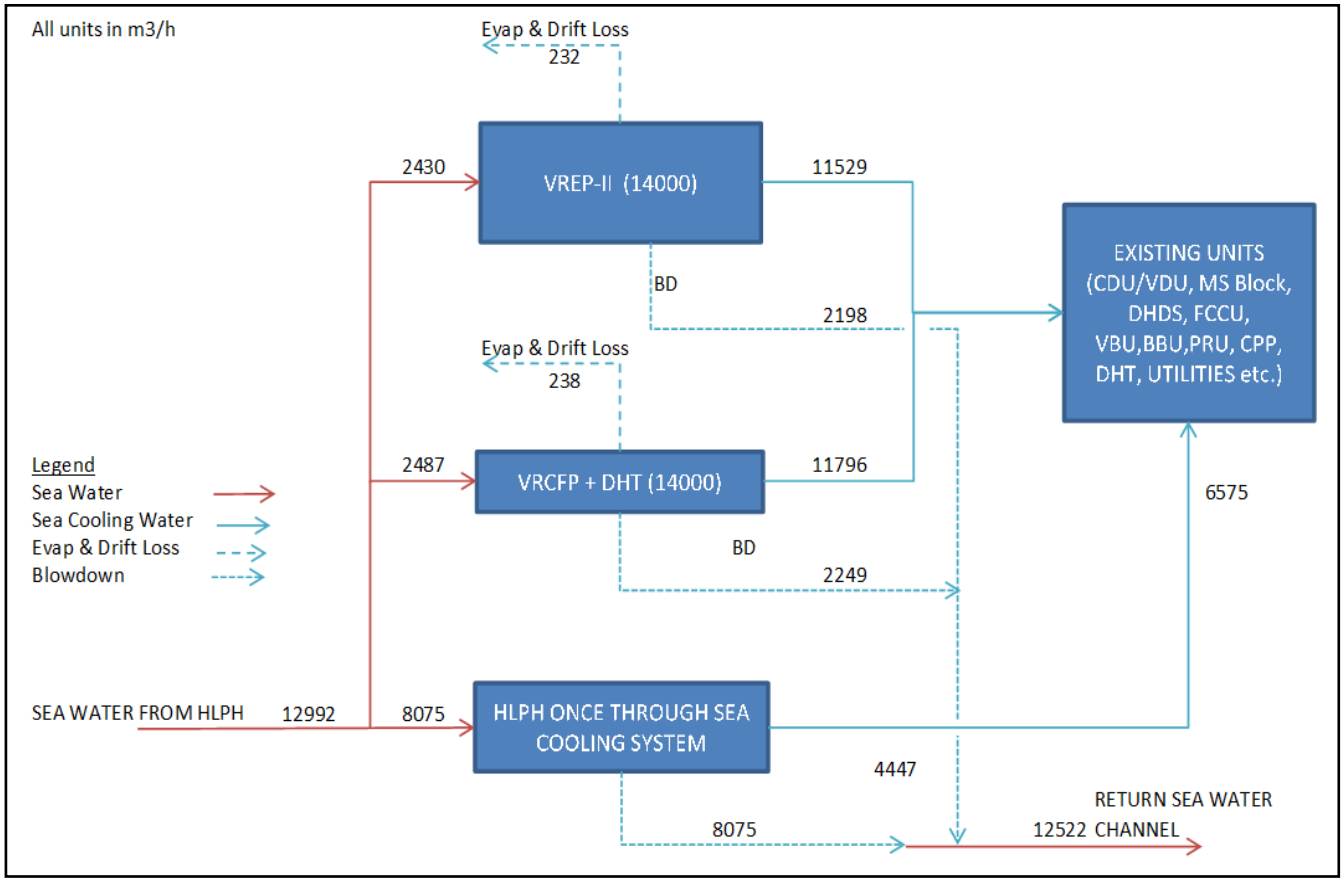
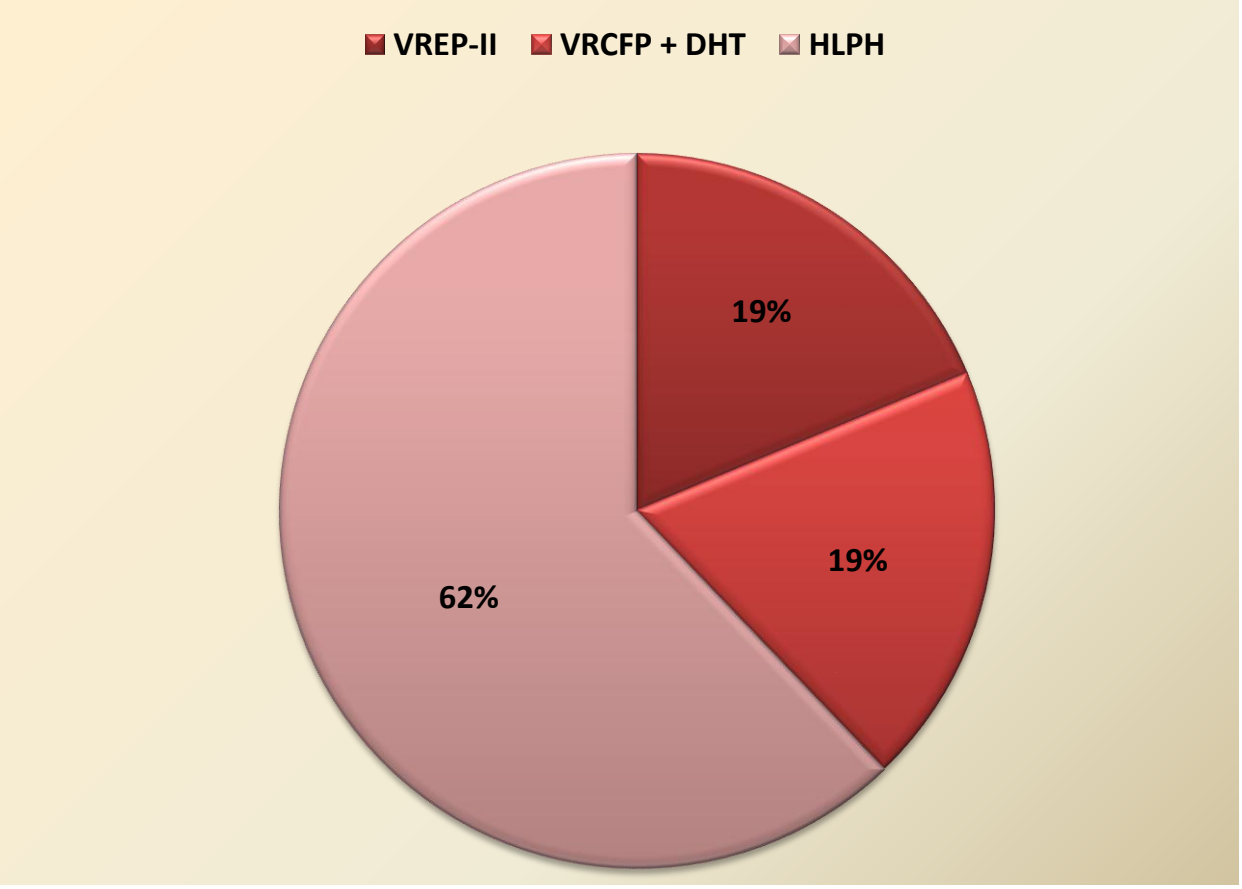


Figure 17: Sea Cooling Water Make-up requirement in Existing Refinery



In existing refinery make up sea water is supplied by 5 number HLPH pumps with one of capacity 4000 m3/hr and four of 4800 m3/hr each.

3.2.2.2 VRMP SCW NETWORK

The Cooling Water requirement for VRMP shall be met from Recirculating Sea Cooling Tower of following configuration:

Table 17: Sea Cooling Tower Network in VRMP

S. No.	SCW	Design Capacity	COC	Design Make-up Requirement (m3/h)
1.	VRMP	44000 m3/hr (11+1 cells)	1.1	9277

Post VRMP implementation the requirement of cooling water from VREP-II & VRCFP + DHT SCW shall change due to revamp of some existing units (NHT, CCR, DHDT, Prime G+) under VRMP.

The post VRMP operation of Cooling Towers shall be as below:

Table 18: Sea Cooling Tower Network post VRMP

S. No.	SCW	Actual Recirculation (m3/h)	Make-up Requirement (m3/h)
1.	VREP-II	12766	2691
2.	VRCFP + DHT	14000	2951
3.	VRMP	39924	8416
4.	HLPH- Once through System	1500	1500
Total			15558

Figure 18: Sea Cooling Tower Network post VRMP

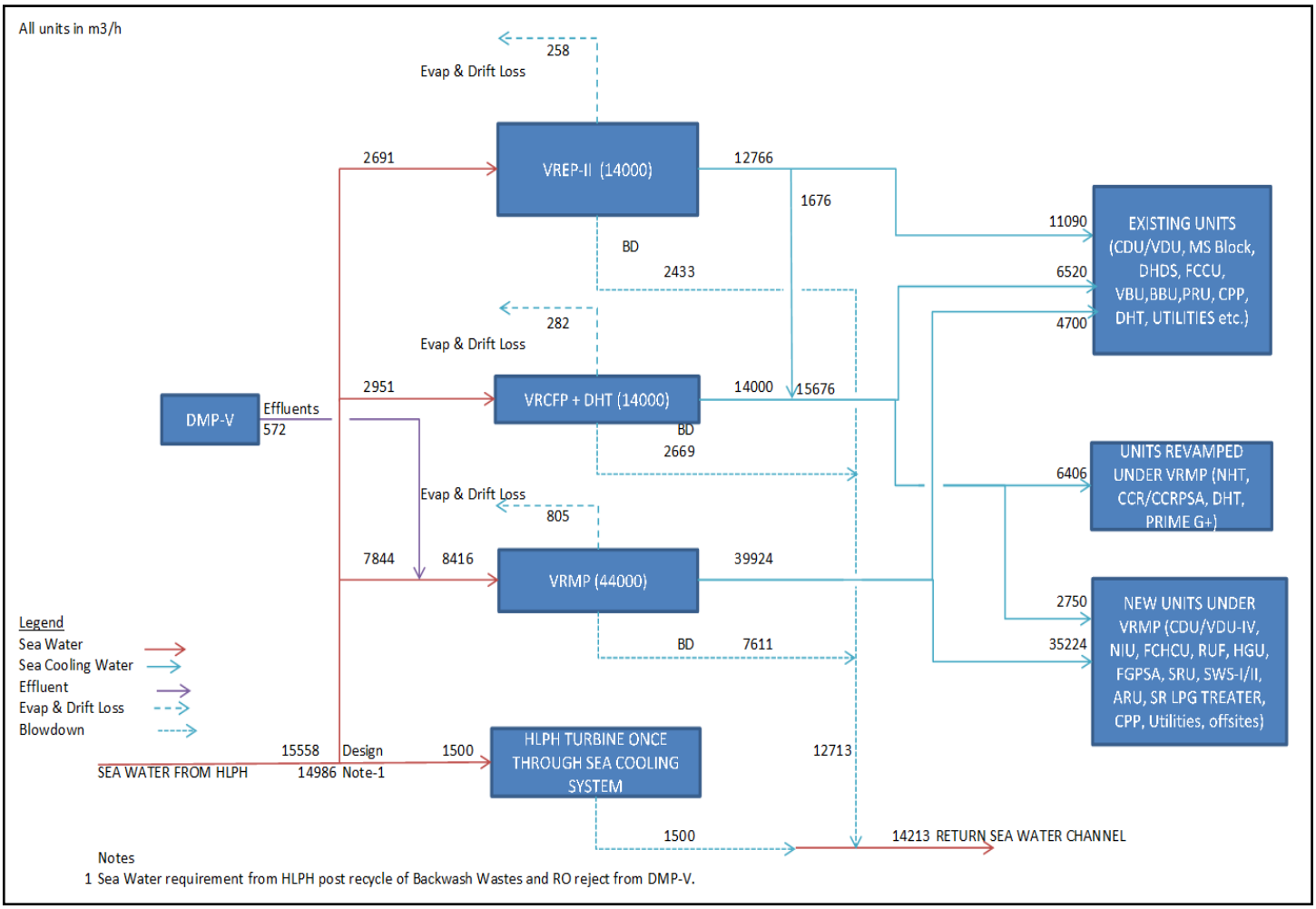
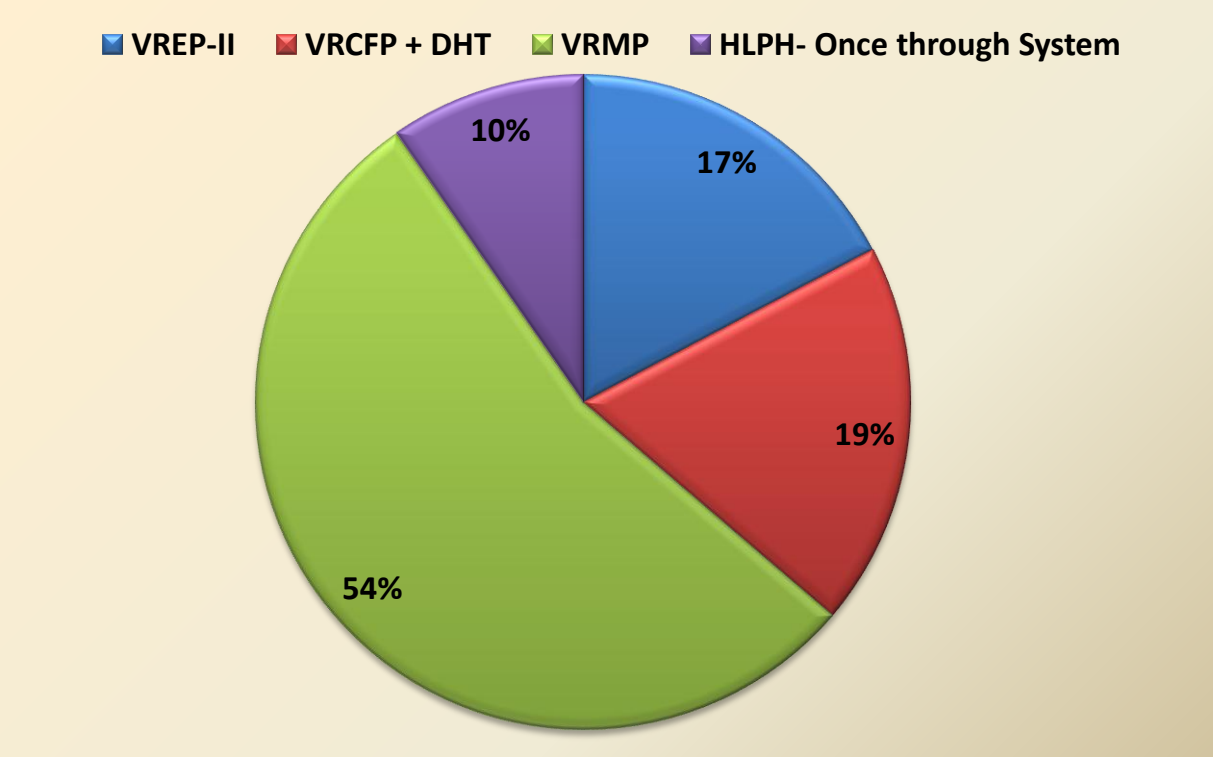


Figure 19: Sea Cooling Water Make-up requirement post VRMP



Make-up sea water for the Sea Cooling Towers is supplied though the following pump system at HLPH:

Total No. of Pumps: 5 nos.

Pump Capacity: 4 nos: 4800 m3/h; 1 no.: 4000 m3/h

Total Pump capacity: 18400 m3/h (1 no. Pump 4800 m3/h as standby)

The Sea Water requirement for make-up before VRMP was ~ 12992 m3/h which was met through the Pumps at HLPH.

The Sea Water requirement for make-up post VRMP implementation shall be ~ 15558 m3/h which shall be supplied by the existing pumps at HLPH. The reject water from DMP-V, approx 572 m3/h shall also be utilized as make-up water for VRMP Sea Cooling Towers. In that case the make-up water requirement from HLPH shall be ~14986 m3/h.

3.3 EFFLUENT TREATMENT & RECYCLE:

At present the following Effluent Treatment Plants are operating in the refinery:

Table 19: Effluent Treatment Plant in Existing Refinery

S. No.	Plant	Capacity
1.	ETP-I	90 m3/h Dry Weather / 135 m3/h Wet weather
2.	ETP-II	275 m3/h Dry Weather / 325 m3/h Wet Weather
3.	ETP-III (ATP-ETP)	30 m3/h
4.	ETP-IV	180 m3/h
5.	CRW-ETP	100 m3/h

The treated effluent from these plants is disposed in the existing Sea Water return channel.

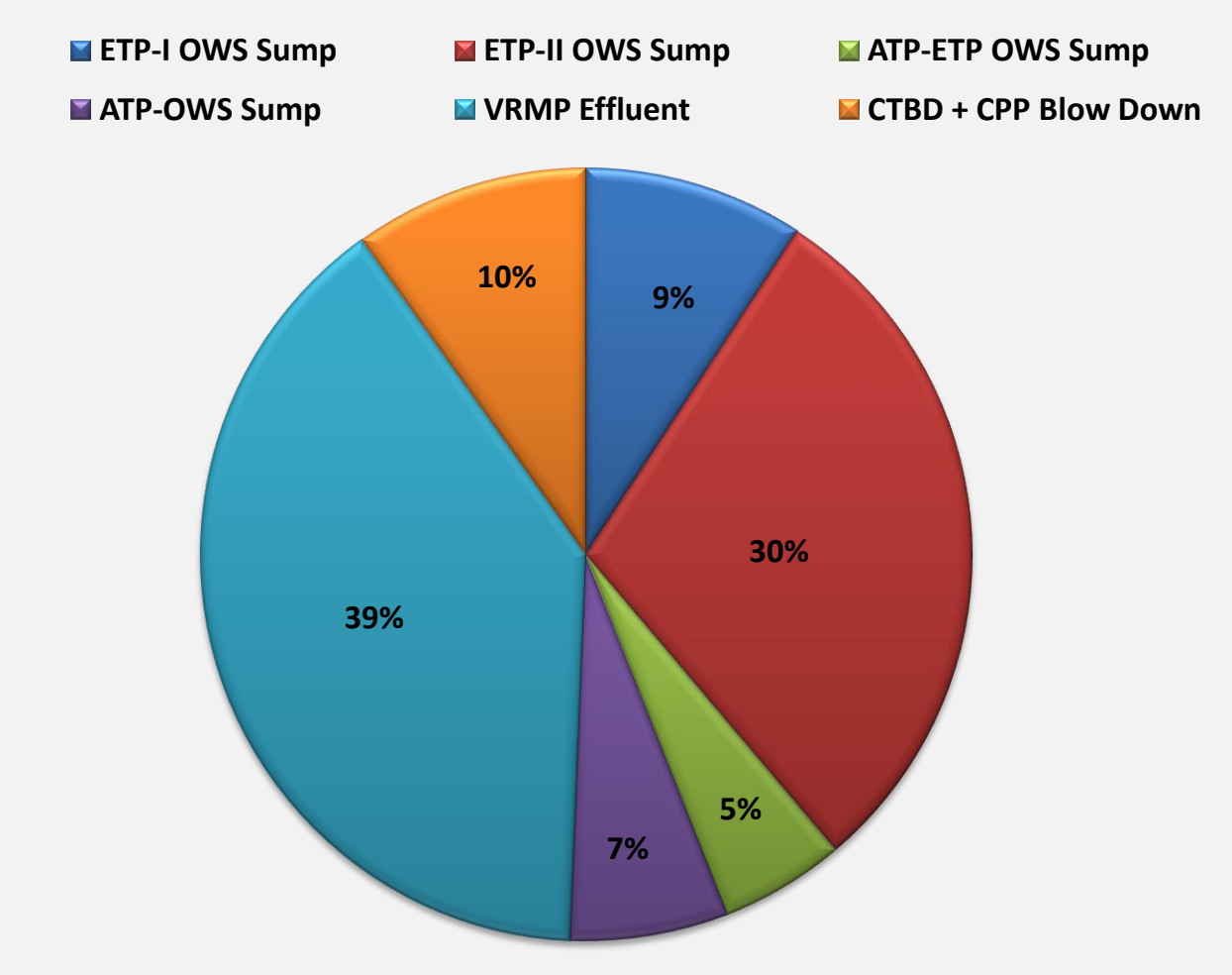
Due to operational issues within the existing ETPs and zero recycle from these ETPs, an Integrated Effluent Treatment Plant of design capacity 1000 m3/h is being installed under VRMP to treat the effluents generated in the entire complex and VRMP. The treated effluent shall be recycled as feed to DMP-V for generation of DM Water and reduction of dependence on GVMC raw water supply for DM production.

The existing ETPs shall be decommissioned post VRMP implementation except OWS & CRWS Sump and Pump system for transferring of Refinery effluent to IETP. The dry weather flows to IETP shall be as follows:

Table 20: Effluent routing to IETP

S. No.	Plant	Dry Weather Flow (m3/h)
1.	ETP-I OWS Sump	70
2.	ETP-II OWS Sump	225
3.	ATP-ETP OWS Sump	40
4.	ATP-OWS Sump	50
5.	VRMP Effluents	300
6.	CTBD + CPP Blow Down	75
Total		760

Figure 20: Effluent Routing to IETP post VRMP



The CTBD and CPP Blow Down require basic filtration and polishing before routing to DMP-V Plant as feed. Hence, this effluent is routed to Polishing section of IETP (DMF, ACF) instead of Inlet of IETP. Considering 2-3% losses in the plant, a minimum of 745 m3/h continuous treated effluent shall be supplied to DMV-V for recycling and generation of DM Water.

Apart from the dry weather flow, a CRWS chain of capacity 305 m3/h (consisting of TPI, DMF & ACF) is envisaged as part of IETP. The treated CRW flow shall be routed to storm water drain or to DMP-V as feed if required.

3.4 CONDENSATE SYSTEM:

Maximum condensate generated in the refinery is recycled. One Condensate polishing Unit of capacity 2 x 59 m3/h (118 TPH) is installed for polishing of suspect condensate generated in the Refinery.

At present the suspect condensate sent for polishing in CPU is ~70 TPH. Hence, the spare capacity in CPU is ~48TPH. The polished condensate is routed to existing deaerator.

The Condensate collection and recycle philosophy followed for VRMP includes maximum recycle of condensate. A small amount of condensate ~12.5 TPH is routed to the existing CPU.

Post VRMP implementation, the CPU shall be operating at ~82.5 TPH and the total polished condensate shall be routed to existing deaerator with a provision for routing to new deaerator.

4. POST VRMP CONSUMPTION

The raw water and sea water consumption shall change Post VRMP implementation. The changes in consumption and generation of other utilities are summarized below:

Table 21: Comparative Consumption of Utilities in Refinery

S. No.	Utility	Pre-VRMP (m3/h)	Post VRMP (m3/h)
1.	Raw Water	812	1186.1
2.	Sea Water for treated water production	285	1865
3.	Sea water for SCW make-up	12992	15558
4.	DM Water	480	1060
5.	Effluent	385	760
6.	Condensate	70	82.5

Figure 21.a: Comparative Consumption pattern of Utilities in Refinery

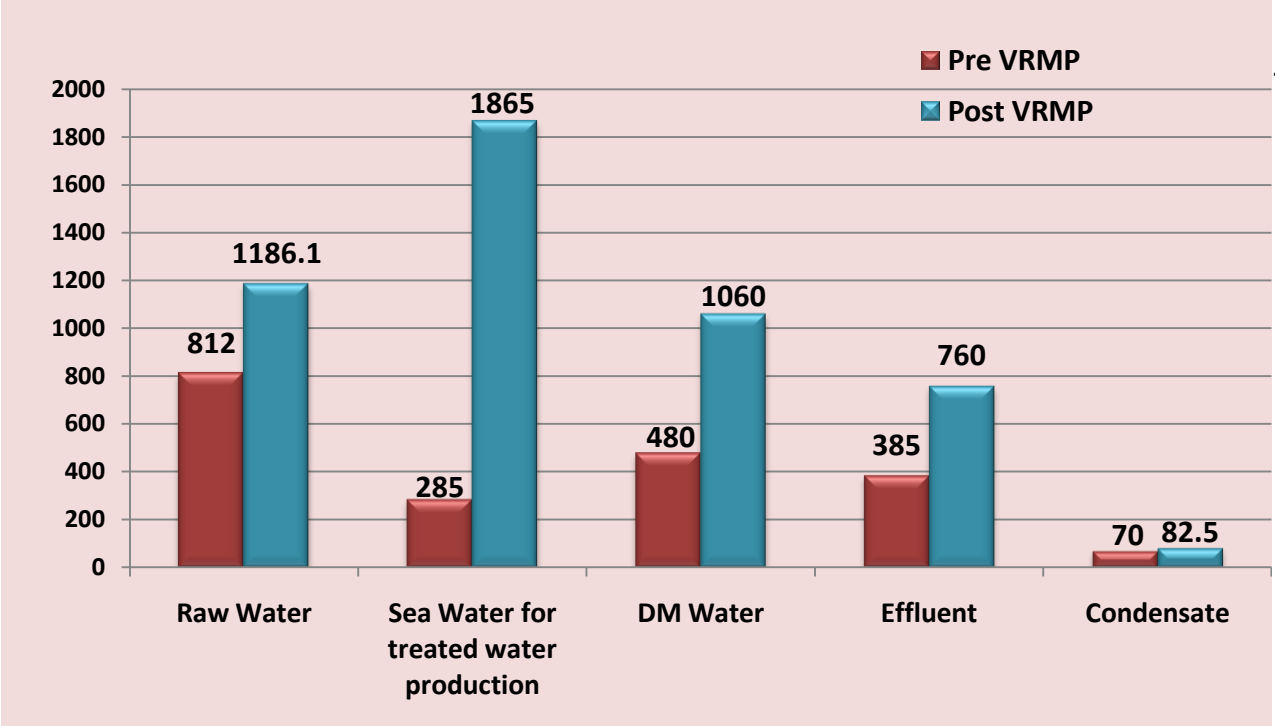
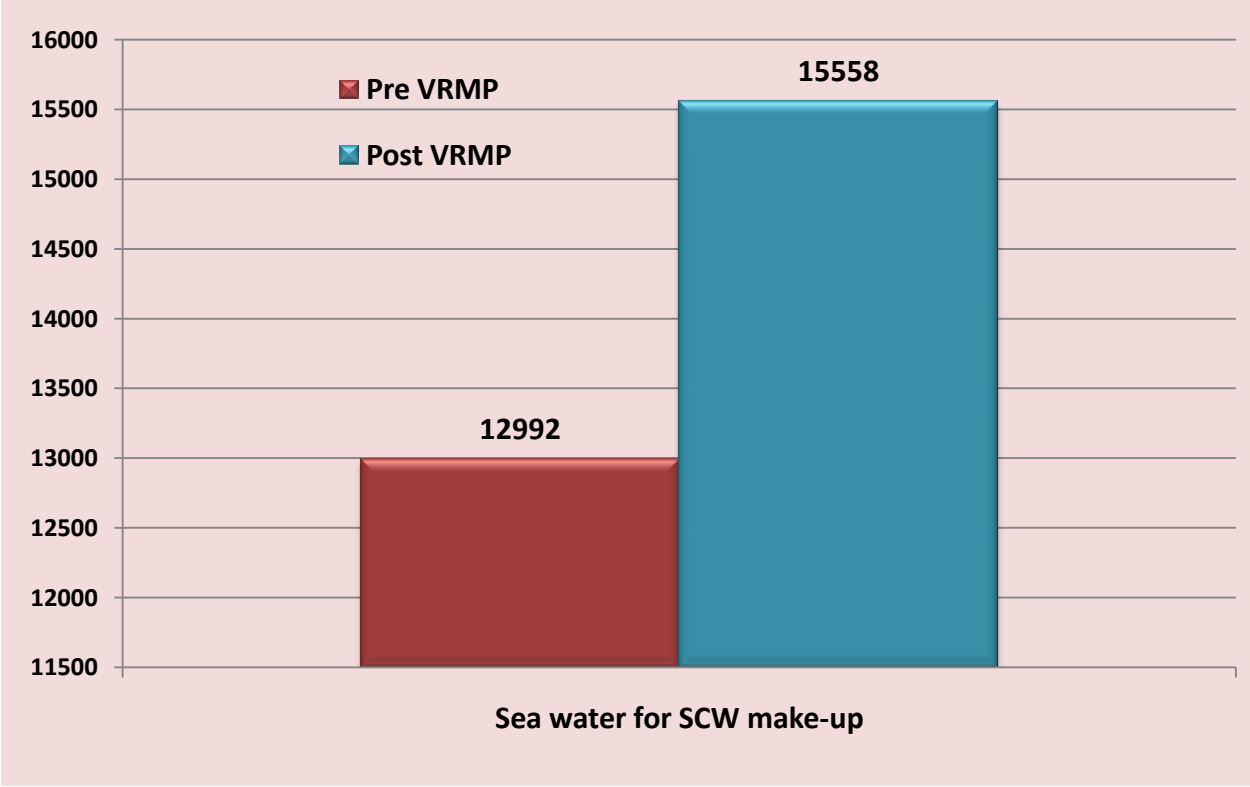


Figure 21.b: Comparative Consumption pattern of Utilities in Refinery



5. SUMMARY OF WATER AUDIT

The Visakh Refinery Modernization Project (VRMP) is being executed to increase the capacity of the refinery to 15 MMTPA. Apart from new process units, revamp of existing units is also carried out under VRMP.

The main source of water supply in the existing refinery is GVMC and a small capacity Sea Water Desalination Plant.

The effluents generated from the Process and Offsite facilities of the existing Refinery are treated in the different Effluent Treatment Plants namely, ETP-I, ETP-II, ETP-III (ATP-ETP), ETP-IV and CRW-ETP installed as part of the expansion projects in the Refinery and the Treated effluent from these ETPs along with the waste water generated from DM Plant, blowdown from Bearing Cooling Towers are routed to the Sea Disposal Channel. A need was felt to increase the recycling of effluent in the refinery to reduce fresh water consumption in the refinery and reduce dependency on supply of raw water from GVMC.

As part of the Visakh Refinery Modernization Project (VRMP), the following additional facilities for Fresh water generation and recycling have been envisaged

1. Installation of one new Sea Water Desalination Plant (SWRO-II) of capacity 584 m3/h treated water providing for treated desalinated water for use in the Refinery supplementing the Raw Water from GVMC.
2. The existing Effluent Treatment Plants were facing various operational issues hence, it was decided to route the complete effluent of the refinery and VRMP units to a new Integrated Effluent Treatment Plant (IETP). The new IETP is installed with a dry weather flow of 760 m3/h and design capacity of 1042 m3/h for treatment and recycling of effluents generated in the existing refinery and VRMP.
3. A New DM Plant, DMP-V is also being installed as Part of the VRMP facilities that shall process the treated Effluent from the IETP and Boiler blowdown from CPP to produce treated Water of DM Water Quality.
4. The Demineralization Plant in existing refinery utilizes raw water from GVMC to generate DM Water. As part of VRMP, it was envisaged that the treated effluent from IETP shall be recycled to generate DM Water and reduce raw water consumption in refinery. Hence, the following changes in DM Water network are carried out as part of VRMP:
    a. DMP-V of capacity 700 m3/h DM Water generation is installed which utilizes IETP treated effluent to generate DM Water for refinery and VRMP uses.
    b. DMP-II shall be dismantled post VRMP and the DM water requirement of its units shall be met from VRMP DMP-V.

c. DMP-III shall be considered as spare chain and the DM water requirement of its units shall be met from VRMP DMP-V

5. Bearing Cooling Water Towers of existing refinery (VR, VREP-1, VREP-2, DHDS) shall be dismantled and an Integrated Bearing Cooling Water Tower (IBCW) shall be installed to cater to bearing cooling water requirement of the units linked to previous BCTs along with Bearing Cooling Tower of VRCFP+ DHT. Also a new Bearing Cooling Tower is envisaged as part of VRMP. The Blowdown from this BCT is recycled in the IETP.
6. A new Sea Cooling Tower is envisaged as part of VRMP with a COC of 1.1. The cooling water requirement of all the process units of existing refinery and VRMP are managed such that load on Once-Through Cooling Water system is reduced from 8075 m3/h for process units and HLPH Pump cooling to only 1500 m3/h for HLPH pump cooling.

This Water Audit has been carried out to assess the changes in consumption pattern of utilities and check the adequacy of these utilities for the Refinery Complex post VRMP Implementation Under VRMP, the above plants and recycling practices are executed and the change in consumption pattern of utilities due to these schemes is summarized in Section 4.

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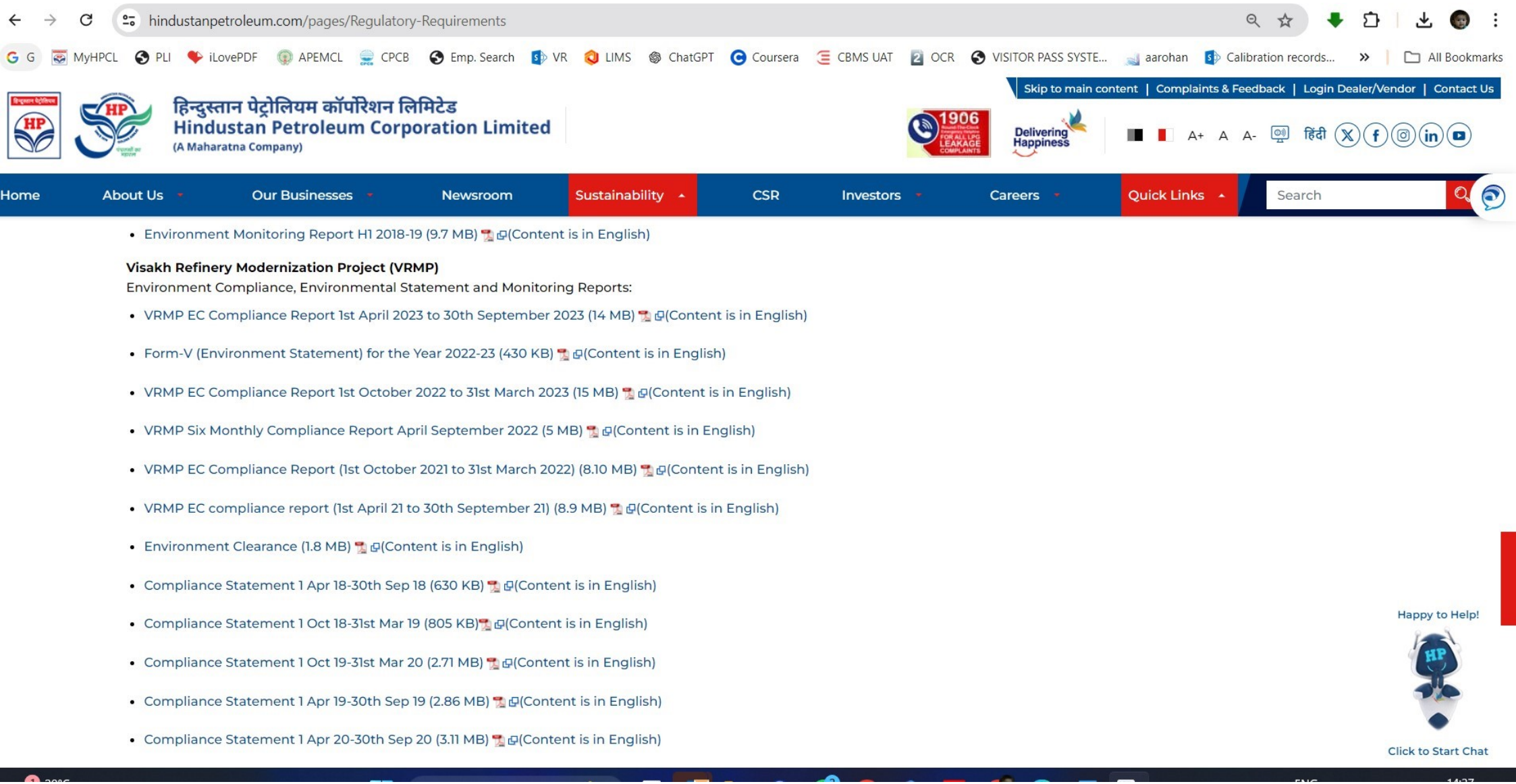
ANNEXURE-5



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- Environment Monitoring Report H1 2018-19 (9.7 MB) (Content is in English)

Visakh Refinery Modernization Project (VRMP)

Environment Compliance, Environmental Statement and Monitoring Reports:

- VRMP EC Compliance Report 1st April 2023 to 30th September 2023 (14 MB) (Content is in English)
- Form-V (Environment Statement) for the Year 2022-23 (430 KB) (Content is in English)
- VRMP EC Compliance Report 1st October 2022 to 31st March 2023 (15 MB) (Content is in English)
- VRMP Six Monthly Compliance Report April September 2022 (5 MB) (Content is in English)
- VRMP EC Compliance Report (1st October 2021 to 31st March 2022) (8.10 MB) (Content is in English)
- VRMP EC compliance report (1st April 21 to 30th September 21) (8.9 MB) (Content is in English)
- Environment Clearance (1.8 MB) (Content is in English)
- Compliance Statement 1 Apr 18-30th Sep 18 (630 KB) (Content is in English)
- Compliance Statement 1 Oct 18-31st Mar 19 (805 KB) (Content is in English)
- Compliance Statement 1 Oct 19-31st Mar 20 (2.71 MB) (Content is in English)
- Compliance Statement 1 Apr 19-30th Sep 19 (2.86 MB) (Content is in English)
- Compliance Statement 1 Apr 20-30th Sep 20 (3.11 MB) (Content is in English)

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(ENVIRONMENTAL ENGINEERS & CONSULTANTS IN POLLUTION CONTROL)

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Hyderabad: Flat No. 302, H.No. 7-1-396/B/12, Sai Ram Residency, Balkampet Road, S.R.Nagar, Hyderabad-500038.

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Ref: SVELC/HPCL-VR/23-09/003 Date: 06-10-2023

NAME AND ADDRESS : **Mr. G.Bhagavan, DGM – Technical,**
M/s. Hindustan Petroleum Corporation Ltd.,
Visakha Refinery, Post Box No.15,
Visakhapatnam – 530 011.

SAMPLE PARTICULARS : **EFFLUENT**

SOURCE OF COLLECTION : Treated Effluent Collected at the Outlet of Guard Pond of ETP-4

SAMPLE COLLECTED BY : SVELC

QUANTITY OF SAMPLE : 3 lts

TYPE OF CONTAINER : 2 PVC Containers and 1 Glass Container each 1ltr

DATE OF COLLECTION : 27-09-2023

TEST REPORT

S. No.	Parameter	Unit	Result	Method followed
1.	pH	--	7.1	APHA, 4500-H+B
2.	Total Suspended Solids – TSS	mg/l	18.0	APHA, 2540-D
3.	Chemical Oxygen Demand – COD	mg/l	48.0	APHA, 5220-B
4.	Bio-Chemical Oxygen Demand – BOD (3 days incubation at 27^0C)	mg/l	12.0	IS 3025, Part 44
5.	Oil & Grease	mg/l	3.2	APHA, 5520-D, 5-38
6.	Phenols as C_6H_5OH	mg/l	0.10	APHA, 5530-C
7.	Sulphides as S	mg/l	0.36	APHA, 4500S^2D
8.	Cyanide as CN	mg/l	0.01	APHA, 4500-CN^- E
9.	Ammonia as N	mg/l	10.3	IS 3025, Part 34
10.	Total Kjeldahl Nitrogen	mg/l	12.7	IS 3025, Part 34
11.	Phosphorus as P	mg/l	0.50	APHA, 4500 P- C
12.	Hexavalent Chromium as Cr^{+6}	mg/l	BDL	APHA, 3500 Cr - B
13.	Total Chromium as Cr	mg/l	<0.01	APHA, 3120-B
14.	Lead as Pb	mg/l	<0.01	APHA, 3120-B
15.	Mercury as Hg	mg/l	<0.01	APHA, 3120-B
16.	Zinc as Zn	mg/l	<0.01	APHA, 3120-B
17.	Nickel as N	mg/l	<0.01	APHA, 3120-B
18.	Copper as Cu	mg/l	<0.01	APHA, 3120-B
19.	Vanadium as V	mg/l	<0.01	APHA, 3120-B
20.	Benzene	mg/l	<0.01	APHA, 6410-B
21.	Benzo pyrene	mg/l	<0.01	APHA, 6440-B

*BDL – Below Detectable Limit

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Ref: SVELC/HPCL-VR/23-09/001

Date: 06-10-2023

NAME AND ADDRESS : **Mr. G.Bhagavan, DGM – Technical,**
M/s. Hindustan Petroleum Corporation Ltd.,
Visakha Refinery, Post Box No.15,
Visakhapatnam – 530 011.

SAMPLE PARTICULARS : **EFFLUENT**

SOURCE OF COLLECTION : Water Sample Collected from the Storm Water Drain Originating from ETP-4 before Joining the Combined Outlet of Treated Effluent of ETP-4 & Once through Cooling Water after MHF-2

SAMPLE COLLECTED BY : SVELC

QUANTITY OF SAMPLE : 3 lts

TYPE OF CONTAINER : 2 PVC Containers and 1 Glass Container each 1ltr

DATE OF COLLECTION : 27-09-2023

TEST REPORT

S. No.	Parameter	Unit	Result	Method followed
1.	pH	--	7.5	APHA, 4500-H+B
2.	Total Suspended Solids – TSS	mg/l	18.0	APHA, 2540-D
3.	Chemical Oxygen Demand – COD	mg/l	36.0	APHA, 5220-B
4.	Bio-Chemical Oxygen Demand – BOD (3 days incubation at 27^0C)	mg/l	6.0	IS 3025, Part 44
5.	Oil & Grease	mg/l	3.8	APHA, 5520-D, 5-38
6.	Phenols as C_6H_5OH	mg/l	0.05	APHA, 5530-C
7.	Sulphides as S	mg/l	0.24	APHA, 4500S^2D
8.	Cyanide as CN	mg/l	BDL	APHA, 4500-CN^- E
9.	Ammonia as N	mg/l	10.6	IS 3025, Part 34
10.	Total Kjeldahl Nitrogen	mg/l	13.2	IS 3025, Part 34
11.	Phosphorus as P	mg/l	<0.01	APHA, 4500 P- C
12.	Hexavalent Chromium as Cr^{+6}	mg/l	BDL	APHA, 3500 Cr - B
13.	Total Chromium as Cr	mg/l	<0.01	APHA, 3120-B
14.	Lead as Pb	mg/l	<0.01	APHA, 3120-B
15.	Mercury as Hg	mg/l	<0.01	APHA, 3120-B
16.	Zinc as Zn	mg/l	<0.01	APHA, 3120-B
17.	Nickel as N	mg/l	<0.01	APHA, 3120-B
18.	Copper as Cu	mg/l	<0.01	APHA, 3120-B
19.	Vanadium as V	mg/l	<0.01	APHA, 3120-B
20.	Benzene	mg/l	<0.01	APHA, 6410-B
21.	Benzo pyrene	mg/l	<0.01	APHA, 6440-B

*BDL – Below Detectable Limit

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Ref: SVELC/HPCL-VR/23-09/002 Date: 06-10-2023

NAME AND ADDRESS : **Mr. G.Bhagavan, DGM – Technical,**
M/s. Hindustan Petroleum Corporation Ltd.,
Vaisakha Refinery, Post Box No.15,
Visakhapatnam – 530 011.

SAMPLE PARTICULARS : **EFFLUENT**

SOURCE OF COLLECTION : Sample of Combined Outlet of Treated Effluent of ETP-1 & Cooling Water Blowdown Collected at MHF-1

SAMPLE COLLECTED BY : SVELC

QUANTITY OF SAMPLE : 3 lts

TYPE OF CONTAINER : 2 PVC Containers and 1 Glass Container each 1ltr

DATE OF COLLECTION : 27-09-2023

TEST REPORT

S. No.	Parameter	Unit	Result	Method followed
1.	pH	--	7.2	APHA, 4500-H+B
2.	Total Suspended Solids – TSS	mg/l	12.0	APHA, 2540-D
3.	Chemical Oxygen Demand – COD	mg/l	30.0	APHA, 5220-B
4.	Bio-Chemical Oxygen Demand – BOD (3 days incubation at 27^0C)	mg/l	5.0	IS 3025, Part 44
5.	Oil & Grease	mg/l	1.0	APHA, 5520-D, 5-38
6.	Phenols as C_6H_5OH	mg/l	0.03	APHA, 5530-C
7.	Sulphides as S	mg/l	0.30	APHA, 4500S^2D
8.	Cyanide as CN	mg/l	BDL	APHA, 4500-CN^- E
9.	Ammonia as N	mg/l	2.35	IS 3025, Part 34
10.	Total Kjeldahl Nitrogen	mg/l	3.87	IS 3025, Part 34
11.	Phosphorus as P	mg/l	0.22	APHA, 4500 P- C
12.	Hexavalent Chromium as Cr^{+6}	mg/l	BDL	APHA, 3500 Cr - B
13.	Total Chromium as Cr	mg/l	<0.01	APHA, 3120-B
14.	Lead as Pb	mg/l	<0.01	APHA, 3120-B
15.	Mercury as Hg	mg/l	<0.01	APHA, 3120-B
16.	Zinc as Zn	mg/l	<0.01	APHA, 3120-B
17.	Nickel as N	mg/l	<0.01	APHA, 3120-B
18.	Copper as Cu	mg/l	<0.01	APHA, 3120-B
19.	Vanadium as V	mg/l	<0.01	APHA, 3120-B
20.	Benzene	mg/l	<0.01	APHA, 6410-B
21.	Benzo pyrene	mg/l	<0.01	APHA, 6440-B

*BDL – Below Detectable Limit

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Ref: SVELC/HPCL-VR/23-09/006

Date: 06-10-2023

NAME AND ADDRESS	:	**Mr. G.Bhagavan, DGM – Technical,** **M/s. Hindustan Petroleum Corporation Ltd.,** Visakha Refinery, Post Box No.15, Visakhapatnam – 530 011.
SAMPLE PARTICULARS	:	**EFFLUENT**
SOURCE OF COLLECTION	:	Effluent Sample Collected from the Aeration Tank of ETP-4
SAMPLE COLLECTED BY	:	SVELC
QUANTITY OF SAMPLE	:	1 lts
TYPE OF CONTAINER	:	1ltr Glass Container
DATE OF COLLECTION	:	27-09-2023

TEST REPORT

S. No.	Parameter	Unit	Result	Method followed
1.	Oil & Grease	mg/l	<1.0	APHA, 5520-D, 5-38

*BDL – Below Detectable Limit

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LIMS ID	UNIT	SAMPLE	DATE	TIME	ANALYSIS	RESULTS
AY59234	ETP-IV	ACF O/L	07-03-2023	01:00	Oil & Grease	3
AY59365	ETP-IV	ACF O/L	07-03-2023	15:00	pH	7.0
AY59365	ETP-IV	ACF O/L	07-03-2023	15:00	Oil & Grease	4
AY59365	ETP-IV	ACF O/L	07-03-2023	15:00	Sulphides	0.24
AY59365	ETP-IV	ACF O/L	07-03-2023	15:00	BOD	6.6
AY59365	ETP-IV	ACF O/L	07-03-2023	15:00	COD	42
AY59365	ETP-IV	ACF O/L	07-03-2023	15:00	Phenol	0.12
AY59365	ETP-IV	ACF O/L	07-03-2023	15:00	TSS	8
AY59930	ETP-IV	ACF O/L	08-03-2023	15:00	pH	7.4
AY59930	ETP-IV	ACF O/L	08-03-2023	15:00	Oil & Grease	4
AY59930	ETP-IV	ACF O/L	08-03-2023	15:00	Sulphides	0.24
AY59930	ETP-IV	ACF O/L	08-03-2023	15:00	BOD	6.3
AY59930	ETP-IV	ACF O/L	08-03-2023	15:00	COD	40
AY59930	ETP-IV	ACF O/L	08-03-2023	15:00	Phenol	0.18
AY59930	ETP-IV	ACF O/L	08-03-2023	15:00	TSS	4
AY60457	ETP-IV	ACF O/L	09-03-2023	15:00	pH	8.0
AY60457	ETP-IV	ACF O/L	09-03-2023	15:00	Oil & Grease	3
AY60457	ETP-IV	ACF O/L	09-03-2023	15:00	Sulphides	0.32
AY60457	ETP-IV	ACF O/L	09-03-2023	15:00	BOD	9.1
AY60457	ETP-IV	ACF O/L	09-03-2023	15:00	COD	42
AY60457	ETP-IV	ACF O/L	09-03-2023	15:00	Phenol	0.17
AY60457	ETP-IV	ACF O/L	09-03-2023	15:00	TSS	8
AY60987	ETP-IV	ACF O/L	10-03-2023	15:00	pH	7.2
AY60987	ETP-IV	ACF O/L	10-03-2023	15:00	Oil & Grease	3
AY60987	ETP-IV	ACF O/L	10-03-2023	15:00	Sulphides	0.24
AY60987	ETP-IV	ACF O/L	10-03-2023	15:00	BOD	7.7
AY60987	ETP-IV	ACF O/L	10-03-2023	15:00	COD	48
AY60987	ETP-IV	ACF O/L	10-03-2023	15:00	Phenol	0.12
AY60987	ETP-IV	ACF O/L	10-03-2023	15:00	TSS	6
AY61464	ETP-IV	ACF O/L	11-03-2023	15:00	pH	7.2
AY61464	ETP-IV	ACF O/L	11-03-2023	15:00	Oil & Grease	4
AY61464	ETP-IV	ACF O/L	11-03-2023	15:00	Sulphides	0.32
AY61464	ETP-IV	ACF O/L	11-03-2023	15:00	BOD	5.9
AY61464	ETP-IV	ACF O/L	11-03-2023	15:00	COD	36
AY61464	ETP-IV	ACF O/L	11-03-2023	15:00	Phenol	0.11
AY61464	ETP-IV	ACF O/L	11-03-2023	15:00	TSS	6
AY61961	ETP-IV	ACF O/L	12-03-2023	15:00	pH	7.6
AY61961	ETP-IV	ACF O/L	12-03-2023	15:00	Oil & Grease	3
AY61961	ETP-IV	ACF O/L	12-03-2023	15:00	Sulphides	0.24
AY61961	ETP-IV	ACF O/L	12-03-2023	15:00	BOD	6.6
AY61961	ETP-IV	ACF O/L	12-03-2023	15:00	COD	34
AY61961	ETP-IV	ACF O/L	12-03-2023	15:00	Phenol	0.10
AY61961	ETP-IV	ACF O/L	12-03-2023	15:00	TSS	15
AY62471	ETP-IV	ACF O/L	13-03-2023	15:00	pH	7.4
AY62471	ETP-IV	ACF O/L	13-03-2023	15:00	Oil & Grease	4
AY62471	ETP-IV	ACF O/L	13-03-2023	15:00	Sulphides	0.32

AY62471	ETP-IV	ACF O/L	13-03-2023	15:00	BOD	6.9
AY62471	ETP-IV	ACF O/L	13-03-2023	15:00	COD	42
AY62471	ETP-IV	ACF O/L	13-03-2023	15:00	Phenol	0.12
AY62471	ETP-IV	ACF O/L	13-03-2023	15:00	TSS	8
AY63050	ETP-IV	ACF O/L	14-03-2023	15:00	pH	7.2
AY63050	ETP-IV	ACF O/L	14-03-2023	15:00	Oil & Grease	4
AY63050	ETP-IV	ACF O/L	14-03-2023	15:00	Sulphides	0.32
AY63050	ETP-IV	ACF O/L	14-03-2023	15:00	BOD	6.5
AY63050	ETP-IV	ACF O/L	14-03-2023	15:00	COD	32
AY63050	ETP-IV	ACF O/L	14-03-2023	15:00	Phenol	0.14
AY63050	ETP-IV	ACF O/L	14-03-2023	15:00	TSS	12
AY63546	ETP-IV	ACF O/L	15-03-2023	15:00	pH	7.6
AY63546	ETP-IV	ACF O/L	15-03-2023	15:00	Oil & Grease	3
AY63546	ETP-IV	ACF O/L	15-03-2023	15:00	Sulphides	0.16
AY63546	ETP-IV	ACF O/L	15-03-2023	15:00	BOD	8.0
AY63546	ETP-IV	ACF O/L	15-03-2023	15:00	COD	40
AY63546	ETP-IV	ACF O/L	15-03-2023	15:00	Phenol	0.12
AY63546	ETP-IV	ACF O/L	15-03-2023	15:00	TSS	4
AY64012	ETP-IV	ACF O/L	16-03-2023	15:00	pH	7.7
AY64012	ETP-IV	ACF O/L	16-03-2023	15:00	Oil & Grease	4
AY64012	ETP-IV	ACF O/L	16-03-2023	15:00	Sulphides	0.32
AY64012	ETP-IV	ACF O/L	16-03-2023	15:00	BOD	8.3
AY64012	ETP-IV	ACF O/L	16-03-2023	15:00	COD	42
AY64012	ETP-IV	ACF O/L	16-03-2023	15:00	Phenol	0.20
AY64012	ETP-IV	ACF O/L	16-03-2023	15:00	TSS	19
AY64534	ETP-IV	ACF O/L	17-03-2023	15:00	pH	7.4
AY64534	ETP-IV	ACF O/L	17-03-2023	15:00	Oil & Grease	3
AY64534	ETP-IV	ACF O/L	17-03-2023	15:00	Sulphides	0.40.
AY64534	ETP-IV	ACF O/L	17-03-2023	15:00	BOD	6.3
AY64534	ETP-IV	ACF O/L	17-03-2023	15:00	COD	38
AY64534	ETP-IV	ACF O/L	17-03-2023	15:00	Phenol	0.12
AY64534	ETP-IV	ACF O/L	17-03-2023	15:00	TSS	4
AY65011	ETP-IV	ACF O/L	18-03-2023	15:00	pH	7.2
AY65011	ETP-IV	ACF O/L	18-03-2023	15:00	Oil & Grease	4
AY65011	ETP-IV	ACF O/L	18-03-2023	15:00	Sulphides	0.32
AY65011	ETP-IV	ACF O/L	18-03-2023	15:00	BOD	8.9
AY65011	ETP-IV	ACF O/L	18-03-2023	15:00	COD	53
AY65011	ETP-IV	ACF O/L	18-03-2023	15:00	Phenol	0.16
AY65011	ETP-IV	ACF O/L	18-03-2023	15:00	TSS	11
AY65509	ETP-IV	ACF O/L	19-03-2023	15:00	pH	7.0
AY65509	ETP-IV	ACF O/L	19-03-2023	15:00	Oil & Grease	2
AY65509	ETP-IV	ACF O/L	19-03-2023	15:00	Sulphides	0.32
AY65509	ETP-IV	ACF O/L	19-03-2023	15:00	BOD	7.0
AY65509	ETP-IV	ACF O/L	19-03-2023	15:00	COD	44
AY65509	ETP-IV	ACF O/L	19-03-2023	15:00	Phenol	0.12
AY65509	ETP-IV	ACF O/L	19-03-2023	15:00	TSS	10
AY65973	ETP-IV	ACF O/L	20-03-2023	15:00	pH	6.8

AY65973	ETP-IV	ACF O/L	20-03-2023	15:00	Oil & Grease	3
AY65973	ETP-IV	ACF O/L	20-03-2023	15:00	Sulphides	0.4
AY65973	ETP-IV	ACF O/L	20-03-2023	15:00	BOD	8.0
AY65973	ETP-IV	ACF O/L	20-03-2023	15:00	COD	48
AY65973	ETP-IV	ACF O/L	20-03-2023	15:00	Phenol	0.18
AY65973	ETP-IV	ACF O/L	20-03-2023	15:00	TSS	8
AY66540	ETP-IV	ACF O/L	21-03-2023	15:00	pH	7.2
AY66540	ETP-IV	ACF O/L	21-03-2023	15:00	Oil & Grease	4.0
AY66540	ETP-IV	ACF O/L	21-03-2023	15:00	Sulphides	0.32
AY66540	ETP-IV	ACF O/L	21-03-2023	15:00	BOD	7.2
AY66540	ETP-IV	ACF O/L	21-03-2023	15:00	COD	44
AY66540	ETP-IV	ACF O/L	21-03-2023	15:00	Phenol	0.15
AY66540	ETP-IV	ACF O/L	21-03-2023	15:00	TSS	6.0
AY67303	ETP-IV	ACF O/L	22-03-2023	15:00	pH	7.6
AY67303	ETP-IV	ACF O/L	22-03-2023	15:00	Oil & Grease	4
AY67303	ETP-IV	ACF O/L	22-03-2023	15:00	TSS	5
AY67303	ETP-IV	ACF O/L	22-03-2023	15:00	Sulphides	0.32
AY67303	ETP-IV	ACF O/L	22-03-2023	15:00	BOD	6.5
AY67303	ETP-IV	ACF O/L	22-03-2023	15:00	COD	38
AY67303	ETP-IV	ACF O/L	22-03-2023	15:00	Phenol	0.12
AY67594	ETP-IV	ACF O/L	23-03-2023	15:00	pH	7.0
AY67594	ETP-IV	ACF O/L	23-03-2023	15:00	Oil & Grease	3
AY67594	ETP-IV	ACF O/L	23-03-2023	15:00	Sulphides	0.16
AY67594	ETP-IV	ACF O/L	23-03-2023	15:00	BOD	6.7
AY67594	ETP-IV	ACF O/L	23-03-2023	15:00	COD	28
AY67594	ETP-IV	ACF O/L	23-03-2023	15:00	Phenol	0.14
AY67594	ETP-IV	ACF O/L	23-03-2023	15:00	TSS	10
AY68146	ETP-IV	ACF O/L	24-03-2023	15:00	pH	7.2
AY68146	ETP-IV	ACF O/L	24-03-2023	15:00	Oil & Grease	4
AY68146	ETP-IV	ACF O/L	24-03-2023	15:00	Sulphides	0.16
AY68146	ETP-IV	ACF O/L	24-03-2023	15:00	BOD	8.5
AY68146	ETP-IV	ACF O/L	24-03-2023	15:00	COD	40
AY68146	ETP-IV	ACF O/L	24-03-2023	15:00	Phenol	0.14
AY68146	ETP-IV	ACF O/L	24-03-2023	15:00	TSS	4
AY68643	ETP-IV	ACF O/L	25-03-2023	15:00	pH	7.4
AY68643	ETP-IV	ACF O/L	25-03-2023	15:00	Oil & Grease	3
AY68643	ETP-IV	ACF O/L	25-03-2023	15:00	Sulphides	0.32
AY68643	ETP-IV	ACF O/L	25-03-2023	15:00	BOD	6.8
AY68643	ETP-IV	ACF O/L	25-03-2023	15:00	COD	40
AY68643	ETP-IV	ACF O/L	25-03-2023	15:00	Phenol	0.14
AY68643	ETP-IV	ACF O/L	25-03-2023	15:00	TSS	4
AY69147	ETP-IV	ACF O/L	26-03-2023	15:00	pH	7.2
AY69147	ETP-IV	ACF O/L	26-03-2023	15:00	Oil & Grease	3
AY69147	ETP-IV	ACF O/L	26-03-2023	15:00	Sulphides	0.24
AY69147	ETP-IV	ACF O/L	26-03-2023	15:00	BOD	6.1
AY69147	ETP-IV	ACF O/L	26-03-2023	15:00	COD	36
AY69147	ETP-IV	ACF O/L	26-03-2023	15:00	Phenol	0.12

AY69147	ETP-IV	ACF O/L	26-03-2023	15:00	TSS	5
AY69664	ETP-IV	ACF O/L	27-03-2023	15:00	pH	7.4
AY69664	ETP-IV	ACF O/L	27-03-2023	15:00	Oil & Grease	3
AY69664	ETP-IV	ACF O/L	27-03-2023	15:00	Sulphides	0.24
AY69664	ETP-IV	ACF O/L	27-03-2023	15:00	BOD	6.3
AY69664	ETP-IV	ACF O/L	27-03-2023	15:00	COD	38
AY69664	ETP-IV	ACF O/L	27-03-2023	15:00	Phenol	0.10
AY69664	ETP-IV	ACF O/L	27-03-2023	15:00	TSS	3
AY70239	ETP-IV	ACF O/L	28-03-2023	15:00	pH	8.2
AY70239	ETP-IV	ACF O/L	28-03-2023	15:00	Oil & Grease	4
AY70239	ETP-IV	ACF O/L	28-03-2023	15:00	Sulphides	0.32
AY70239	ETP-IV	ACF O/L	28-03-2023	15:00	BOD	10.1
AY70239	ETP-IV	ACF O/L	28-03-2023	15:00	COD	60
AY70239	ETP-IV	ACF O/L	28-03-2023	15:00	Phenol	0.30
AY70239	ETP-IV	ACF O/L	28-03-2023	15:00	TSS	8
AY70764	ETP-IV	ACF O/L	29-03-2023	15:00	pH	7.6
AY70764	ETP-IV	ACF O/L	29-03-2023	15:00	Oil & Grease	4
AY70764	ETP-IV	ACF O/L	29-03-2023	15:00	Sulphides	0.32
AY70764	ETP-IV	ACF O/L	29-03-2023	15:00	BOD	6.1
AY70764	ETP-IV	ACF O/L	29-03-2023	15:00	COD	42
AY70764	ETP-IV	ACF O/L	29-03-2023	15:00	Phenol	0.14
AY70764	ETP-IV	ACF O/L	29-03-2023	15:00	TSS	6
AY71261	ETP-IV	ACF O/L	30-03-2023	15:00	pH	7.0
AY71261	ETP-IV	ACF O/L	30-03-2023	15:00	Oil & Grease	3
AY71261	ETP-IV	ACF O/L	30-03-2023	15:00	Sulphides	0.24
AY71261	ETP-IV	ACF O/L	30-03-2023	15:00	BOD	7.4
AY71261	ETP-IV	ACF O/L	30-03-2023	15:00	COD	45
AY71261	ETP-IV	ACF O/L	30-03-2023	15:00	Phenol	0.12
AY71261	ETP-IV	ACF O/L	30-03-2023	15:00	TSS	8
AY71801	ETP-IV	ACF O/L	31-03-2023	15:00	pH	6.8
AY71801	ETP-IV	ACF O/L	31-03-2023	15:00	Oil & Grease	3
AY71801	ETP-IV	ACF O/L	31-03-2023	15:00	Sulphides	0.16
AY71801	ETP-IV	ACF O/L	31-03-2023	15:00	BOD	8.5
AY71801	ETP-IV	ACF O/L	31-03-2023	15:00	COD	38
AY71801	ETP-IV	ACF O/L	31-03-2023	15:00	Phenol	0.16
AY71801	ETP-IV	ACF O/L	31-03-2023	15:00	TSS	8
AY72336	ETP-IV	ACF O/L	01-04-2023	15:00	pH	7.2
AY72336	ETP-IV	ACF O/L	01-04-2023	15:00	Oil & Grease	2
AY72336	ETP-IV	ACF O/L	01-04-2023	15:00	Sulphides	0.32
AY72336	ETP-IV	ACF O/L	01-04-2023	15:00	BOD	8.0
AY72336	ETP-IV	ACF O/L	01-04-2023	15:00	COD	36
AY72336	ETP-IV	ACF O/L	01-04-2023	15:00	Phenol	0.11
AY72336	ETP-IV	ACF O/L	01-04-2023	15:00	TSS	4
AY72894	ETP-IV	ACF O/L	02-04-2023	15:00	pH	7.2
AY72894	ETP-IV	ACF O/L	02-04-2023	15:00	Oil & Grease	3
AY72894	ETP-IV	ACF O/L	02-04-2023	15:00	Sulphides	0.32
AY72894	ETP-IV	ACF O/L	02-04-2023	15:00	BOD	12.5

AY72894	ETP-IV	ACF O/L	02-04-2023	15:00	COD	77
AY72894	ETP-IV	ACF O/L	02-04-2023	15:00	Phenol	0.12
AY72894	ETP-IV	ACF O/L	02-04-2023	15:00	TSS	5
AY73390	ETP-IV	ACF O/L	03-04-2023	15:00	pH	7.2
AY73390	ETP-IV	ACF O/L	03-04-2023	15:00	Oil & Grease	2
AY73390	ETP-IV	ACF O/L	03-04-2023	15:00	Sulphides	0.32
AY73390	ETP-IV	ACF O/L	03-04-2023	15:00	BOD	8.5
AY73390	ETP-IV	ACF O/L	03-04-2023	15:00	COD	46
AY73390	ETP-IV	ACF O/L	03-04-2023	15:00	Phenol	0.12
AY73390	ETP-IV	ACF O/L	03-04-2023	15:00	TSS	8
AY73987	ETP-IV	ACF O/L	04-04-2023	15:00	pH	7.0
AY73987	ETP-IV	ACF O/L	04-04-2023	15:00	Oil & Grease	3
AY73987	ETP-IV	ACF O/L	04-04-2023	15:00	Sulphides	0.32
AY73987	ETP-IV	ACF O/L	04-04-2023	15:00	BOD	6.6
AY73987	ETP-IV	ACF O/L	04-04-2023	15:00	COD	45
AY73987	ETP-IV	ACF O/L	04-04-2023	15:00	Phenol	0.12
AY73987	ETP-IV	ACF O/L	04-04-2023	15:00	TSS	4
AY74536	ETP-IV	ACF O/L	05-04-2023	15:00	pH	7.2
AY74536	ETP-IV	ACF O/L	05-04-2023	15:00	Oil & Grease	4
AY74536	ETP-IV	ACF O/L	05-04-2023	15:00	Sulphides	0.4
AY74536	ETP-IV	ACF O/L	05-04-2023	15:00	BOD	7.1
AY74536	ETP-IV	ACF O/L	05-04-2023	15:00	COD	42
AY74536	ETP-IV	ACF O/L	05-04-2023	15:00	Phenol	0.12
AY74536	ETP-IV	ACF O/L	05-04-2023	15:00	TSS	4
AY75021	ETP-IV	ACF O/L	06-04-2023	15:00	pH	7.2
AY75021	ETP-IV	ACF O/L	06-04-2023	15:00	Oil & Grease	4
AY75021	ETP-IV	ACF O/L	06-04-2023	15:00	Sulphides	0.32
AY75021	ETP-IV	ACF O/L	06-04-2023	15:00	BOD	6.4
AY75021	ETP-IV	ACF O/L	06-04-2023	15:00	COD	42
AY75021	ETP-IV	ACF O/L	06-04-2023	15:00	Phenol	0.12
AY75021	ETP-IV	ACF O/L	06-04-2023	15:00	TSS	4
AY75595	ETP-IV	ACF O/L	07-04-2023	15:00	pH	7.2
AY75595	ETP-IV	ACF O/L	07-04-2023	15:00	Oil & Grease	3
AY75595	ETP-IV	ACF O/L	07-04-2023	15:00	Sulphides	0.24
AY75595	ETP-IV	ACF O/L	07-04-2023	15:00	BOD	8.2
AY75595	ETP-IV	ACF O/L	07-04-2023	15:00	COD	45
AY75595	ETP-IV	ACF O/L	07-04-2023	15:00	Phenol	0.11
AY75595	ETP-IV	ACF O/L	07-04-2023	15:00	TSS	8
AY76110	ETP-IV	ACF O/L	08-04-2023	15:00	pH	7.8
AY76110	ETP-IV	ACF O/L	08-04-2023	15:00	Oil & Grease	3
AY76110	ETP-IV	ACF O/L	08-04-2023	15:00	Sulphides	0.32
AY76110	ETP-IV	ACF O/L	08-04-2023	15:00	BOD	8.3
AY76110	ETP-IV	ACF O/L	08-04-2023	15:00	COD	42
AY76110	ETP-IV	ACF O/L	08-04-2023	15:00	Phenol	0.12
AY76110	ETP-IV	ACF O/L	08-04-2023	15:00	TSS	5
AY76628	ETP-IV	ACF O/L	09-04-2023	15:00	pH	7.8
AY76628	ETP-IV	ACF O/L	09-04-2023	15:00	Oil & Grease	2

AY76628	ETP-IV	ACF O/L	09-04-2023	15:00	Sulphides	0.16
AY76628	ETP-IV	ACF O/L	09-04-2023	15:00	BOD	11.0
AY76628	ETP-IV	ACF O/L	09-04-2023	15:00	COD	65
AY76628	ETP-IV	ACF O/L	09-04-2023	15:00	Phenol	0.16
AY76628	ETP-IV	ACF O/L	09-04-2023	15:00	TSS	8
AY77139	ETP-IV	ACF O/L	10-04-2023	07:00	pH	7.4
AY77139	ETP-IV	ACF O/L	10-04-2023	07:00	Oil & Grease	2
AY77139	ETP-IV	ACF O/L	10-04-2023	07:00	Sulphides	0.24
AY77139	ETP-IV	ACF O/L	10-04-2023	07:00	BOD	8.5
AY77139	ETP-IV	ACF O/L	10-04-2023	07:00	COD	51
AY77139	ETP-IV	ACF O/L	10-04-2023	07:00	Phenol	0.14
AY77139	ETP-IV	ACF O/L	10-04-2023	07:00	TSS	3
AY77514	ETP-IV	ACF O/L	07-04-2023	15:00	BOD	8.2
AY77690	ETP-IV	ACF O/L	11-04-2023	15:00	pH	7.0
AY77690	ETP-IV	ACF O/L	11-04-2023	15:00	Oil & Grease	3
AY77690	ETP-IV	ACF O/L	11-04-2023	15:00	Sulphides	0.24
AY77690	ETP-IV	ACF O/L	11-04-2023	15:00	BOD	5.9
AY77690	ETP-IV	ACF O/L	11-04-2023	15:00	COD	36
AY77690	ETP-IV	ACF O/L	11-04-2023	15:00	Phenol	0.10
AY77690	ETP-IV	ACF O/L	11-04-2023	15:00	TSS	4
AY78231	ETP-IV	ACF O/L	12-04-2023	15:00	pH	6.8
AY78231	ETP-IV	ACF O/L	12-04-2023	15:00	Oil & Grease	6
AY78231	ETP-IV	ACF O/L	12-04-2023	15:00	Sulphides	0.24
AY78231	ETP-IV	ACF O/L	12-04-2023	15:00	BOD	7.0
AY78231	ETP-IV	ACF O/L	12-04-2023	15:00	COD	42
AY78231	ETP-IV	ACF O/L	12-04-2023	15:00	Phenol	0.12
AY78231	ETP-IV	ACF O/L	12-04-2023	15:00	TSS	4
AY78571	ETP-IV	ACF O/L	13-04-2023	01:30	Oil & Grease	5
AY78692	ETP-IV	ACF O/L	13-04-2023	15:00	pH	7.2
AY78692	ETP-IV	ACF O/L	13-04-2023	15:00	Oil & Grease	4
AY78692	ETP-IV	ACF O/L	13-04-2023	15:00	Sulphides	0.32
AY78692	ETP-IV	ACF O/L	13-04-2023	15:00	BOD	8.8
AY78692	ETP-IV	ACF O/L	13-04-2023	15:00	COD	44
AY78692	ETP-IV	ACF O/L	13-04-2023	15:00	Phenol	0.10
AY78692	ETP-IV	ACF O/L	13-04-2023	15:00	TSS	4
AY79231	ETP-IV	ACF O/L	14-04-2023	15:00	pH	7.2
AY79231	ETP-IV	ACF O/L	14-04-2023	15:00	Oil & Grease	3
AY79231	ETP-IV	ACF O/L	14-04-2023	15:00	Sulphides	0.16
AY79231	ETP-IV	ACF O/L	14-04-2023	15:00	BOD	6.1
AY79231	ETP-IV	ACF O/L	14-04-2023	15:00	COD	42
AY79231	ETP-IV	ACF O/L	14-04-2023	15:00	Phenol	0.12
AY79231	ETP-IV	ACF O/L	14-04-2023	15:00	TSS	7
AY79724	ETP-IV	ACF O/L	15-04-2023	15:00	pH	7.2
AY79724	ETP-IV	ACF O/L	15-04-2023	15:00	Oil & Grease	4
AY79724	ETP-IV	ACF O/L	15-04-2023	15:00	Sulphides	0.24
AY79724	ETP-IV	ACF O/L	15-04-2023	15:00	BOD	7.4
AY79724	ETP-IV	ACF O/L	15-04-2023	15:00	COD	42

AY79724	ETP-IV	ACF O/L	15-04-2023	15:00	Phenol	0.12
AY79724	ETP-IV	ACF O/L	15-04-2023	15:00	TSS	3
AY80239	ETP-IV	ACF O/L	16-04-2023	15:00	pH	8.0
AY80239	ETP-IV	ACF O/L	16-04-2023	15:00	Oil & Grease	4
AY80239	ETP-IV	ACF O/L	16-04-2023	15:00	Sulphides	0.24
AY80239	ETP-IV	ACF O/L	16-04-2023	15:00	BOD	8.2
AY80239	ETP-IV	ACF O/L	16-04-2023	15:00	COD	36
AY80239	ETP-IV	ACF O/L	16-04-2023	15:00	Phenol	0.12
AY80239	ETP-IV	ACF O/L	16-04-2023	15:00	TSS	4
AY80726	ETP-IV	ACF O/L	17-04-2023	07:00	pH	7.0
AY80726	ETP-IV	ACF O/L	17-04-2023	07:00	Oil & Grease	3
AY80726	ETP-IV	ACF O/L	17-04-2023	07:00	Sulphides	0.24
AY80726	ETP-IV	ACF O/L	17-04-2023	07:00	BOD	6.2
AY80726	ETP-IV	ACF O/L	17-04-2023	07:00	COD	32
AY80726	ETP-IV	ACF O/L	17-04-2023	07:00	Phenol	0.12
AY80726	ETP-IV	ACF O/L	17-04-2023	07:00	TSS	4
AY81528	ETP-IV	ACF O/L	18-04-2023	15:00	pH	7.6
AY81528	ETP-IV	ACF O/L	18-04-2023	15:00	Oil & Grease	3
AY81528	ETP-IV	ACF O/L	18-04-2023	15:00	TSS	3
AY81528	ETP-IV	ACF O/L	18-04-2023	15:00	Sulphides	0.24
AY81528	ETP-IV	ACF O/L	18-04-2023	15:00	BOD	6.6
AY81528	ETP-IV	ACF O/L	18-04-2023	15:00	COD	36
AY81528	ETP-IV	ACF O/L	18-04-2023	15:00	Phenol	0.10
AY81817	ETP-IV	ACF O/L	19-04-2023	15:00	pH	6.8
AY81817	ETP-IV	ACF O/L	19-04-2023	15:00	Oil & Grease	3
AY81817	ETP-IV	ACF O/L	19-04-2023	15:00	Sulphides	0.24
AY81817	ETP-IV	ACF O/L	19-04-2023	15:00	BOD	6.0
AY81817	ETP-IV	ACF O/L	19-04-2023	15:00	COD	36
AY81817	ETP-IV	ACF O/L	19-04-2023	15:00	Phenol	0.12
AY81817	ETP-IV	ACF O/L	19-04-2023	15:00	TSS	8
AY82290	ETP-IV	ACF O/L	20-04-2023	15:00	pH	8.0
AY82290	ETP-IV	ACF O/L	20-04-2023	15:00	Oil & Grease	4
AY82290	ETP-IV	ACF O/L	20-04-2023	15:00	Sulphides	0.16
AY82290	ETP-IV	ACF O/L	20-04-2023	15:00	BOD	7.1
AY82290	ETP-IV	ACF O/L	20-04-2023	15:00	COD	42
AY82290	ETP-IV	ACF O/L	20-04-2023	15:00	Phenol	0.12
AY82290	ETP-IV	ACF O/L	20-04-2023	15:00	TSS	2
AY82813	ETP-IV	ACF O/L	21-04-2023	15:00	pH	7.8
AY82813	ETP-IV	ACF O/L	21-04-2023	15:00	Oil & Grease	4
AY82813	ETP-IV	ACF O/L	21-04-2023	15:00	Sulphides	0.08
AY82813	ETP-IV	ACF O/L	21-04-2023	15:00	BOD	10.4
AY82813	ETP-IV	ACF O/L	21-04-2023	15:00	COD	65
AY82813	ETP-IV	ACF O/L	21-04-2023	15:00	Phenol	0.12
AY82813	ETP-IV	ACF O/L	21-04-2023	15:00	TSS	8
AY83336	ETP-IV	ACF O/L	22-04-2023	15:00	pH	8.0
AY83336	ETP-IV	ACF O/L	22-04-2023	15:00	Oil & Grease	3
AY83336	ETP-IV	ACF O/L	22-04-2023	15:00	Sulphides	0.24

AY83336	ETP-IV	ACF O/L	22-04-2023	15:00	BOD	11.6
AY83336	ETP-IV	ACF O/L	22-04-2023	15:00	COD	70
AY83336	ETP-IV	ACF O/L	22-04-2023	15:00	Phenol	0.16
AY83336	ETP-IV	ACF O/L	22-04-2023	15:00	TSS	9
AY83822	ETP-IV	ACF O/L	23-04-2023	15:00	pH	8.2
AY83822	ETP-IV	ACF O/L	23-04-2023	15:00	Oil & Grease	4
AY83822	ETP-IV	ACF O/L	23-04-2023	15:00	Sulphides	0.24
AY83822	ETP-IV	ACF O/L	23-04-2023	15:00	BOD	8.3
AY83822	ETP-IV	ACF O/L	23-04-2023	15:00	COD	40
AY83822	ETP-IV	ACF O/L	23-04-2023	15:00	Phenol	0.12
AY83822	ETP-IV	ACF O/L	23-04-2023	15:00	TSS	8
AY84236	ETP-IV	ACF O/L	24-04-2023	07:00	pH	7.2
AY84236	ETP-IV	ACF O/L	24-04-2023	07:00	Oil & Grease	7
AY84236	ETP-IV	ACF O/L	24-04-2023	07:00	Sulphides	0.024
AY84236	ETP-IV	ACF O/L	24-04-2023	07:00	BOD	8.5
AY84236	ETP-IV	ACF O/L	24-04-2023	07:00	COD	33
AY84236	ETP-IV	ACF O/L	24-04-2023	07:00	Phenol	0.13
AY84236	ETP-IV	ACF O/L	24-04-2023	07:00	TSS	4
AY84709	ETP-IV	ACF O/L	24-04-2023	23:00	Oil & Grease	4
AY85111	ETP-IV	ACF O/L	25-04-2023	15:00	pH	7.4
AY85111	ETP-IV	ACF O/L	25-04-2023	15:00	Oil & Grease	3
AY85111	ETP-IV	ACF O/L	25-04-2023	15:00	TSS	3
AY85111	ETP-IV	ACF O/L	25-04-2023	15:00	Sulphides	0.24
AY85111	ETP-IV	ACF O/L	25-04-2023	15:00	BOD	9.0
AY85111	ETP-IV	ACF O/L	25-04-2023	15:00	COD	36
AY85111	ETP-IV	ACF O/L	25-04-2023	15:00	Phenol	0.10
AY85340	ETP-IV	ACF O/L	26-04-2023	15:00	pH	7.8
AY85340	ETP-IV	ACF O/L	26-04-2023	15:00	Oil & Grease	3
AY85340	ETP-IV	ACF O/L	26-04-2023	15:00	Sulphides	0.24
AY85340	ETP-IV	ACF O/L	26-04-2023	15:00	BOD	5.6
AY85340	ETP-IV	ACF O/L	26-04-2023	15:00	COD	34
AY85340	ETP-IV	ACF O/L	26-04-2023	15:00	Phenol	0.10
AY85340	ETP-IV	ACF O/L	26-04-2023	15:00	TSS	4
AY85829	ETP-IV	ACF O/L	27-04-2023	15:00	pH	8.6
AY85829	ETP-IV	ACF O/L	27-04-2023	15:00	Oil & Grease	4
AY85829	ETP-IV	ACF O/L	27-04-2023	15:00	Sulphides	0.32
AY85829	ETP-IV	ACF O/L	27-04-2023	15:00	BOD	7.0
AY85829	ETP-IV	ACF O/L	27-04-2023	15:00	COD	42
AY85829	ETP-IV	ACF O/L	27-04-2023	15:00	Phenol	0.10
AY85829	ETP-IV	ACF O/L	27-04-2023	15:00	TSS	4
AY86178	ETP-IV	ACF O/L	27-04-2023	22:00	pH	7.4
AY86693	ETP-IV	ACF O/L	28-04-2023	15:00	pH	7.6
AY86693	ETP-IV	ACF O/L	28-04-2023	15:00	Oil & Grease	3
AY86693	ETP-IV	ACF O/L	28-04-2023	15:00	TSS	***
AY86693	ETP-IV	ACF O/L	28-04-2023	15:00	Sulphides	0.08
AY86693	ETP-IV	ACF O/L	28-04-2023	15:00	BOD	6.7
AY86693	ETP-IV	ACF O/L	28-04-2023	15:00	COD	40

AY86693	ETP-IV	ACF O/L	28-04-2023	15:00	Phenol	0.12
AY86693	ETP-IV	ACF O/L	28-04-2023	15:00	TSS	4
AY86866	ETP-IV	ACF O/L	29-04-2023	15:00	pH	8.2
AY86866	ETP-IV	ACF O/L	29-04-2023	15:00	Oil & Grease	3
AY86866	ETP-IV	ACF O/L	29-04-2023	15:00	Sulphides	0.16
AY86866	ETP-IV	ACF O/L	29-04-2023	15:00	BOD	7.1
AY86866	ETP-IV	ACF O/L	29-04-2023	15:00	COD	42
AY86866	ETP-IV	ACF O/L	29-04-2023	15:00	Phenol	0.14
AY86866	ETP-IV	ACF O/L	29-04-2023	15:00	TSS	5
AY87354	ETP-IV	ACF O/L	30-04-2023	15:00	pH	8.2
AY87354	ETP-IV	ACF O/L	30-04-2023	15:00	Oil & Grease	3
AY87354	ETP-IV	ACF O/L	30-04-2023	15:00	Sulphides	0.32
AY87354	ETP-IV	ACF O/L	30-04-2023	15:00	BOD	6.9
AY87354	ETP-IV	ACF O/L	30-04-2023	15:00	COD	38
AY87354	ETP-IV	ACF O/L	30-04-2023	15:00	Phenol	0.10
AY87354	ETP-IV	ACF O/L	30-04-2023	15:00	TSS	7
AY87863	ETP-IV	ACF O/L	01-05-2023	15:00	pH	7.0
AY87863	ETP-IV	ACF O/L	01-05-2023	15:00	Oil & Grease	3
AY87863	ETP-IV	ACF O/L	01-05-2023	15:00	Sulphides	0.32
AY87863	ETP-IV	ACF O/L	01-05-2023	15:00	BOD	7.0
AY87863	ETP-IV	ACF O/L	01-05-2023	15:00	COD	40
AY87863	ETP-IV	ACF O/L	01-05-2023	15:00	Phenol	0.12
AY87863	ETP-IV	ACF O/L	01-05-2023	15:00	TSS	4
AY88473	ETP-IV	ACF O/L	02-05-2023	15:00	pH	8.0
AY88473	ETP-IV	ACF O/L	02-05-2023	15:00	Oil & Grease	4
AY88473	ETP-IV	ACF O/L	02-05-2023	15:00	Sulphides	0.32
AY88473	ETP-IV	ACF O/L	02-05-2023	15:00	BOD	8.2
AY88473	ETP-IV	ACF O/L	02-05-2023	15:00	COD	42
AY88473	ETP-IV	ACF O/L	02-05-2023	15:00	Phenol	0.12
AY88473	ETP-IV	ACF O/L	02-05-2023	15:00	TSS	4
AY89003	ETP-IV	ACF O/L	03-05-2023	15:00	pH	7.5
AY89003	ETP-IV	ACF O/L	03-05-2023	15:00	Oil & Grease	3
AY89003	ETP-IV	ACF O/L	03-05-2023	15:00	Sulphides	0.32
AY89003	ETP-IV	ACF O/L	03-05-2023	15:00	BOD	6.6
AY89003	ETP-IV	ACF O/L	03-05-2023	15:00	COD	40
AY89003	ETP-IV	ACF O/L	03-05-2023	15:00	Phenol	0.12
AY89003	ETP-IV	ACF O/L	03-05-2023	15:00	TSS	5
AY89870	ETP-IV	ACF O/L	04-05-2023	15:00	pH	7.6
AY89870	ETP-IV	ACF O/L	04-05-2023	15:00	Oil & Grease	3
AY89870	ETP-IV	ACF O/L	04-05-2023	15:00	TSS	5
AY89870	ETP-IV	ACF O/L	04-05-2023	15:00	Sulphides	0.32
AY89870	ETP-IV	ACF O/L	04-05-2023	15:00	BOD	7.1
AY89870	ETP-IV	ACF O/L	04-05-2023	15:00	COD	42
AY89870	ETP-IV	ACF O/L	04-05-2023	15:00	Phenol	0.12
AY90015	ETP-IV	ACF O/L	05-05-2023	15:00	pH	8.0
AY90015	ETP-IV	ACF O/L	05-05-2023	15:00	Oil & Grease	3
AY90015	ETP-IV	ACF O/L	05-05-2023	15:00	Sulphides	0.32

AY90015	ETP-IV	ACF O/L	05-05-2023	15:00	BOD	7.1
AY90015	ETP-IV	ACF O/L	05-05-2023	15:00	COD	44
AY90015	ETP-IV	ACF O/L	05-05-2023	15:00	Phenol	0.14
AY90015	ETP-IV	ACF O/L	05-05-2023	15:00	TSS	3
AY90518	ETP-IV	ACF O/L	06-05-2023	15:00	pH	7.8
AY90518	ETP-IV	ACF O/L	06-05-2023	15:00	Oil & Grease	3
AY90518	ETP-IV	ACF O/L	06-05-2023	15:00	Sulphides	0.24
AY90518	ETP-IV	ACF O/L	06-05-2023	15:00	BOD	7.0
AY90518	ETP-IV	ACF O/L	06-05-2023	15:00	COD	42
AY90518	ETP-IV	ACF O/L	06-05-2023	15:00	Phenol	0.10
AY90518	ETP-IV	ACF O/L	06-05-2023	15:00	TSS	5
AY91024	ETP-IV	ACF O/L	07-05-2023	15:00	pH	7.8
AY91024	ETP-IV	ACF O/L	07-05-2023	15:00	Oil & Grease	4
AY91024	ETP-IV	ACF O/L	07-05-2023	15:00	Sulphides	0.32
AY91024	ETP-IV	ACF O/L	07-05-2023	15:00	BOD	7.2
AY91024	ETP-IV	ACF O/L	07-05-2023	15:00	COD	40
AY91024	ETP-IV	ACF O/L	07-05-2023	15:00	Phenol	0.12
AY91024	ETP-IV	ACF O/L	07-05-2023	15:00	TSS	4
AY91540	ETP-IV	ACF O/L	08-05-2023	15:00	pH	7.6
AY91540	ETP-IV	ACF O/L	08-05-2023	15:00	Oil & Grease	3
AY91540	ETP-IV	ACF O/L	08-05-2023	15:00	Sulphides	0.16
AY91540	ETP-IV	ACF O/L	08-05-2023	15:00	BOD	6.5
AY91540	ETP-IV	ACF O/L	08-05-2023	15:00	COD	40
AY91540	ETP-IV	ACF O/L	08-05-2023	15:00	Phenol	0.12
AY91540	ETP-IV	ACF O/L	08-05-2023	15:00	TSS	4.0
AY92092	ETP-IV	ACF O/L	09-05-2023	15:00	pH	7.8
AY92092	ETP-IV	ACF O/L	09-05-2023	15:00	Oil & Grease	3
AY92092	ETP-IV	ACF O/L	09-05-2023	15:00	Sulphides	0.32
AY92092	ETP-IV	ACF O/L	09-05-2023	15:00	BOD	6.7
AY92092	ETP-IV	ACF O/L	09-05-2023	15:00	COD	40
AY92092	ETP-IV	ACF O/L	09-05-2023	15:00	Phenol	0.12
AY92092	ETP-IV	ACF O/L	09-05-2023	15:00	TSS	6
AY92613	ETP-IV	ACF O/L	10-05-2023	15:00	pH	7.6
AY92613	ETP-IV	ACF O/L	10-05-2023	15:00	Oil & Grease	3
AY92613	ETP-IV	ACF O/L	10-05-2023	15:00	Sulphides	0.32
AY92613	ETP-IV	ACF O/L	10-05-2023	15:00	BOD	7.2
AY92613	ETP-IV	ACF O/L	10-05-2023	15:00	COD	41
AY92613	ETP-IV	ACF O/L	10-05-2023	15:00	Phenol	0.10
AY92613	ETP-IV	ACF O/L	10-05-2023	15:00	TSS	6
AY93112	ETP-IV	ACF O/L	11-05-2023	15:00	pH	7.0
AY93112	ETP-IV	ACF O/L	11-05-2023	15:00	Oil & Grease	2
AY93112	ETP-IV	ACF O/L	11-05-2023	15:00	Sulphides	0.24
AY93112	ETP-IV	ACF O/L	11-05-2023	15:00	BOD	5.6
AY93112	ETP-IV	ACF O/L	11-05-2023	15:00	COD	34
AY93112	ETP-IV	ACF O/L	11-05-2023	15:00	Phenol	0.11
AY93112	ETP-IV	ACF O/L	11-05-2023	15:00	TSS	5
AY93642	ETP-IV	ACF O/L	12-05-2023	15:00	pH	7.0

AY93642	ETP-IV	ACF O/L	12-05-2023	15:00	Oil & Grease	2
AY93642	ETP-IV	ACF O/L	12-05-2023	15:00	Sulphides	0.24
AY93642	ETP-IV	ACF O/L	12-05-2023	15:00	BOD	5.9
AY93642	ETP-IV	ACF O/L	12-05-2023	15:00	COD	36
AY93642	ETP-IV	ACF O/L	12-05-2023	15:00	Phenol	0.12
AY93642	ETP-IV	ACF O/L	12-05-2023	15:00	TSS	4
AY94141	ETP-IV	ACF O/L	13-05-2023	15:00	pH	7.4
AY94141	ETP-IV	ACF O/L	13-05-2023	15:00	Oil & Grease	3
AY94141	ETP-IV	ACF O/L	13-05-2023	15:00	Sulphides	0.24
AY94141	ETP-IV	ACF O/L	13-05-2023	15:00	BOD	5.9
AY94141	ETP-IV	ACF O/L	13-05-2023	15:00	COD	36
AY94141	ETP-IV	ACF O/L	13-05-2023	15:00	Phenol	0.12
AY94141	ETP-IV	ACF O/L	13-05-2023	15:00	TSS	4
AY94663	ETP-IV	ACF O/L	14-05-2023	15:00	pH	7.4
AY94663	ETP-IV	ACF O/L	14-05-2023	15:00	Oil & Grease	3
AY94663	ETP-IV	ACF O/L	14-05-2023	15:00	Sulphides	0.24
AY94663	ETP-IV	ACF O/L	14-05-2023	15:00	BOD	6.3
AY94663	ETP-IV	ACF O/L	14-05-2023	15:00	COD	38
AY94663	ETP-IV	ACF O/L	14-05-2023	15:00	Phenol	0.11
AY94663	ETP-IV	ACF O/L	14-05-2023	15:00	TSS	8
AY95187	ETP-IV	ACF O/L	15-05-2023	15:00	pH	7.4
AY95187	ETP-IV	ACF O/L	15-05-2023	15:00	Oil & Grease	3
AY95187	ETP-IV	ACF O/L	15-05-2023	15:00	Sulphides	0.24
AY95187	ETP-IV	ACF O/L	15-05-2023	15:00	BOD	6.6
AY95187	ETP-IV	ACF O/L	15-05-2023	15:00	COD	36
AY95187	ETP-IV	ACF O/L	15-05-2023	15:00	Phenol	0.10
AY95187	ETP-IV	ACF O/L	15-05-2023	15:00	TSS	4
AY95773	ETP-IV	ACF O/L	16-05-2023	15:00	pH	7.2
AY95773	ETP-IV	ACF O/L	16-05-2023	15:00	Oil & Grease	3
AY95773	ETP-IV	ACF O/L	16-05-2023	15:00	Sulphides	0.24
AY95773	ETP-IV	ACF O/L	16-05-2023	15:00	BOD	8.3
AY95773	ETP-IV	ACF O/L	16-05-2023	15:00	COD	42
AY95773	ETP-IV	ACF O/L	16-05-2023	15:00	Phenol	0.10
AY95773	ETP-IV	ACF O/L	16-05-2023	15:00	TSS	8
AY96274	ETP-IV	ACF O/L	17-05-2023	07:00	pH	7.6
AY96274	ETP-IV	ACF O/L	17-05-2023	07:00	Oil & Grease	3
AY96274	ETP-IV	ACF O/L	17-05-2023	07:00	Sulphides	0.24
AY96274	ETP-IV	ACF O/L	17-05-2023	07:00	BOD	8.3
AY96274	ETP-IV	ACF O/L	17-05-2023	07:00	COD	38
AY96274	ETP-IV	ACF O/L	17-05-2023	07:00	Phenol	0.12
AY96274	ETP-IV	ACF O/L	17-05-2023	07:00	TSS	6
AY96786	ETP-IV	ACF O/L	18-05-2023	15:00	pH	8.0
AY96786	ETP-IV	ACF O/L	18-05-2023	15:00	Oil & Grease	3
AY96786	ETP-IV	ACF O/L	18-05-2023	15:00	Sulphides	0.24
AY96786	ETP-IV	ACF O/L	18-05-2023	15:00	BOD	6.0
AY96786	ETP-IV	ACF O/L	18-05-2023	15:00	COD	36
AY96786	ETP-IV	ACF O/L	18-05-2023	15:00	Phenol	0.10

AY96786	ETP-IV	ACF O/L	18-05-2023	15:00	TSS	4
AY97597	ETP-IV	ACF O/L	19-05-2023	15:00	pH	8.0
AY97597	ETP-IV	ACF O/L	19-05-2023	15:00	Oil & Grease	3
AY97597	ETP-IV	ACF O/L	19-05-2023	15:00	TSS	3
AY97597	ETP-IV	ACF O/L	19-05-2023	15:00	Sulphides	0.24
AY97597	ETP-IV	ACF O/L	19-05-2023	15:00	BOD	6.3
AY97597	ETP-IV	ACF O/L	19-05-2023	15:00	COD	38
AY97597	ETP-IV	ACF O/L	19-05-2023	15:00	Phenol	0.10
AY97825	ETP-IV	ACF O/L	20-05-2023	15:00	pH	7.4
AY97825	ETP-IV	ACF O/L	20-05-2023	15:00	Oil & Grease	3
AY97825	ETP-IV	ACF O/L	20-05-2023	15:00	Sulphides	0.32
AY97825	ETP-IV	ACF O/L	20-05-2023	15:00	BOD	7.0
AY97825	ETP-IV	ACF O/L	20-05-2023	15:00	COD	42
AY97825	ETP-IV	ACF O/L	20-05-2023	15:00	Phenol	0.12
AY97825	ETP-IV	ACF O/L	20-05-2023	15:00	TSS	10
AY98352	ETP-IV	ACF O/L	21-05-2023	07:00	pH	7.2
AY98352	ETP-IV	ACF O/L	21-05-2023	07:00	Oil & Grease	4
AY98352	ETP-IV	ACF O/L	21-05-2023	07:00	Sulphides	0.24
AY98352	ETP-IV	ACF O/L	21-05-2023	07:00	BOD	6.9
AY98352	ETP-IV	ACF O/L	21-05-2023	07:00	COD	32
AY98352	ETP-IV	ACF O/L	21-05-2023	07:00	Phenol	0.11
AY98352	ETP-IV	ACF O/L	21-05-2023	07:00	TSS	3
AY98869	ETP-IV	ACF O/L	22-05-2023	15:00	pH	7.4
AY98869	ETP-IV	ACF O/L	22-05-2023	15:00	Oil & Grease	3
AY98869	ETP-IV	ACF O/L	22-05-2023	15:00	Sulphides	0.32
AY98869	ETP-IV	ACF O/L	22-05-2023	15:00	BOD	7.1
AY98869	ETP-IV	ACF O/L	22-05-2023	15:00	COD	38
AY98869	ETP-IV	ACF O/L	22-05-2023	15:00	Phenol	0.10
AY98869	ETP-IV	ACF O/L	22-05-2023	15:00	TSS	8
AY99442	ETP-IV	ACF O/L	23-05-2023	07:00	pH	7.8
AY99442	ETP-IV	ACF O/L	23-05-2023	07:00	Oil & Grease	2
AY99442	ETP-IV	ACF O/L	23-05-2023	07:00	Sulphides	0.16
AY99442	ETP-IV	ACF O/L	23-05-2023	07:00	BOD	8.3
AY99442	ETP-IV	ACF O/L	23-05-2023	07:00	COD	36
AY99442	ETP-IV	ACF O/L	23-05-2023	07:00	Phenol	0.08
AY99442	ETP-IV	ACF O/L	23-05-2023	07:00	TSS	3
AY99965	ETP-IV	ACF O/L	24-05-2023	15:00	pH	7.8
AY99965	ETP-IV	ACF O/L	24-05-2023	15:00	Oil & Grease	4
AY99965	ETP-IV	ACF O/L	24-05-2023	15:00	Sulphides	0.16
AY99965	ETP-IV	ACF O/L	24-05-2023	15:00	BOD	10.5
AY99965	ETP-IV	ACF O/L	24-05-2023	15:00	COD	56
AY99965	ETP-IV	ACF O/L	24-05-2023	15:00	Phenol	0.12
AY99965	ETP-IV	ACF O/L	24-05-2023	15:00	TSS	3
AZ00472	ETP-IV	ACF O/L	25-05-2023	15:00	pH	8.0
AZ00472	ETP-IV	ACF O/L	25-05-2023	15:00	Oil & Grease	3
AZ00472	ETP-IV	ACF O/L	25-05-2023	15:00	Sulphides	0.32
AZ00472	ETP-IV	ACF O/L	25-05-2023	15:00	BOD	6.1

AZ00472	ETP-IV	ACF O/L	25-05-2023	15:00	COD	32
AZ00472	ETP-IV	ACF O/L	25-05-2023	15:00	Phenol	0.10
AZ00472	ETP-IV	ACF O/L	25-05-2023	15:00	TSS	8
AZ00996	ETP-IV	ACF O/L	26-05-2023	07:00	pH	8.0
AZ00996	ETP-IV	ACF O/L	26-05-2023	07:00	Oil & Grease	2
AZ00996	ETP-IV	ACF O/L	26-05-2023	07:00	Sulphides	0.24
AZ00996	ETP-IV	ACF O/L	26-05-2023	07:00	BOD	8.0
AZ00996	ETP-IV	ACF O/L	26-05-2023	07:00	COD	36
AZ00996	ETP-IV	ACF O/L	26-05-2023	07:00	Phenol	0.10
AZ00996	ETP-IV	ACF O/L	26-05-2023	07:00	TSS	4
AZ01764	ETP-IV	ACF O/L	27-05-2023	07:00	pH	7.8
AZ01764	ETP-IV	ACF O/L	27-05-2023	07:00	Oil & Grease	2
AZ01764	ETP-IV	ACF O/L	27-05-2023	07:00	TSS	3
AZ01764	ETP-IV	ACF O/L	27-05-2023	07:00	Sulphides	0.24
AZ01764	ETP-IV	ACF O/L	27-05-2023	07:00	BOD	6.3
AZ01764	ETP-IV	ACF O/L	27-05-2023	07:00	COD	35
AZ01764	ETP-IV	ACF O/L	27-05-2023	07:00	Phenol	0.10
AZ01929	ETP-IV	ACF O/L	28-05-2023	07:00	pH	7.6
AZ01929	ETP-IV	ACF O/L	28-05-2023	07:00	Oil & Grease	3
AZ01929	ETP-IV	ACF O/L	28-05-2023	07:00	TSS	4
AZ01929	ETP-IV	ACF O/L	28-05-2023	07:00	Sulphides	0.16
AZ01929	ETP-IV	ACF O/L	28-05-2023	07:00	BOD	7.0
AZ01929	ETP-IV	ACF O/L	28-05-2023	07:00	COD	38
AZ01929	ETP-IV	ACF O/L	28-05-2023	07:00	Phenol	0.105
AZ02375	ETP-IV	ACF O/L	29-05-2023	07:00	pH	7.6
AZ02375	ETP-IV	ACF O/L	29-05-2023	07:00	Oil & Grease	4
AZ02375	ETP-IV	ACF O/L	29-05-2023	07:00	Sulphides	0.24
AZ02375	ETP-IV	ACF O/L	29-05-2023	07:00	BOD	8.0
AZ02375	ETP-IV	ACF O/L	29-05-2023	07:00	COD	42
AZ02375	ETP-IV	ACF O/L	29-05-2023	07:00	Phenol	0.12
AZ02375	ETP-IV	ACF O/L	29-05-2023	07:00	TSS	3
AZ03289	ETP-IV	ACF O/L	30-05-2023	07:00	pH	7.5
AZ03289	ETP-IV	ACF O/L	30-05-2023	07:00	Oil & Grease	4
AZ03289	ETP-IV	ACF O/L	30-05-2023	07:00	Sulphides	0.24
AZ03289	ETP-IV	ACF O/L	30-05-2023	07:00	BOD	6.6
AZ03289	ETP-IV	ACF O/L	30-05-2023	07:00	COD	40
AZ03289	ETP-IV	ACF O/L	30-05-2023	07:00	Phenol	0.12
AZ03289	ETP-IV	ACF O/L	30-05-2023	07:00	TSS	8
AZ03798	ETP-IV	ACF O/L	31-05-2023	07:00	pH	7.6
AZ03798	ETP-IV	ACF O/L	31-05-2023	07:00	Oil & Grease	3
AZ03798	ETP-IV	ACF O/L	31-05-2023	07:00	Sulphides	0.24
AZ03798	ETP-IV	ACF O/L	31-05-2023	07:00	BOD	7.0
AZ03798	ETP-IV	ACF O/L	31-05-2023	07:00	COD	38
AZ03798	ETP-IV	ACF O/L	31-05-2023	07:00	Phenol	0.12
AZ03798	ETP-IV	ACF O/L	31-05-2023	07:00	TSS	6
AZ04301	ETP-IV	ACF O/L	01-06-2023	07:00	pH	7.4
AZ04301	ETP-IV	ACF O/L	01-06-2023	07:00	Oil & Grease	3

AZ04301	ETP-IV	ACF O/L	01-06-2023	07:00	Sulphides	0.32
AZ04301	ETP-IV	ACF O/L	01-06-2023	07:00	BOD	8.3
AZ04301	ETP-IV	ACF O/L	01-06-2023	07:00	COD	40
AZ04301	ETP-IV	ACF O/L	01-06-2023	07:00	Phenol	0.12
AZ04301	ETP-IV	ACF O/L	01-06-2023	07:00	TSS	6
AZ05086	ETP-IV	ACF O/L	02-06-2023	07:00	pH	8.0
AZ05086	ETP-IV	ACF O/L	02-06-2023	07:00	Oil & Grease	2
AZ05086	ETP-IV	ACF O/L	02-06-2023	07:00	TSS	3
AZ05086	ETP-IV	ACF O/L	02-06-2023	07:00	Sulphides	0.24
AZ05086	ETP-IV	ACF O/L	02-06-2023	07:00	BOD	6.1
AZ05086	ETP-IV	ACF O/L	02-06-2023	07:00	COD	35
AZ05086	ETP-IV	ACF O/L	02-06-2023	07:00	Phenol	0.10
AZ05701	ETP-IV	ACF O/L	03-06-2023	07:00	pH	7.8
AZ05701	ETP-IV	ACF O/L	03-06-2023	07:00	Oil & Grease	2
AZ05701	ETP-IV	ACF O/L	03-06-2023	07:00	TSS	5
AZ05701	ETP-IV	ACF O/L	03-06-2023	07:00	Sulphides	0.32
AZ05701	ETP-IV	ACF O/L	03-06-2023	07:00	BOD	6.5
AZ05701	ETP-IV	ACF O/L	03-06-2023	07:00	COD	38
AZ05701	ETP-IV	ACF O/L	03-06-2023	07:00	Phenol	0.10
AZ05856	ETP-IV	ACF O/L	04-06-2023	07:00	pH	7.6
AZ05856	ETP-IV	ACF O/L	04-06-2023	07:00	Oil & Grease	5
AZ05856	ETP-IV	ACF O/L	04-06-2023	07:00	Sulphides	0.40
AZ05856	ETP-IV	ACF O/L	04-06-2023	07:00	BOD	6.4
AZ05856	ETP-IV	ACF O/L	04-06-2023	07:00	COD	40
AZ05856	ETP-IV	ACF O/L	04-06-2023	07:00	Phenol	0.12
AZ05856	ETP-IV	ACF O/L	04-06-2023	07:00	TSS	5
AZ06346	ETP-IV	ACF O/L	05-06-2023	07:00	pH	7.2
AZ06346	ETP-IV	ACF O/L	05-06-2023	07:00	Oil & Grease	3
AZ06346	ETP-IV	ACF O/L	05-06-2023	07:00	Sulphides	0.32
AZ06346	ETP-IV	ACF O/L	05-06-2023	07:00	BOD	5.3
AZ06346	ETP-IV	ACF O/L	05-06-2023	07:00	COD	32
AZ06346	ETP-IV	ACF O/L	05-06-2023	07:00	Phenol	0.11
AZ06346	ETP-IV	ACF O/L	05-06-2023	07:00	TSS	4
AZ06922	ETP-IV	ACF O/L	06-06-2023	07:00	pH	7.4
AZ06922	ETP-IV	ACF O/L	06-06-2023	07:00	Oil & Grease	4
AZ06922	ETP-IV	ACF O/L	06-06-2023	07:00	Sulphides	0.4
AZ06922	ETP-IV	ACF O/L	06-06-2023	07:00	BOD	7.1
AZ06922	ETP-IV	ACF O/L	06-06-2023	07:00	COD	42
AZ06922	ETP-IV	ACF O/L	06-06-2023	07:00	Phenol	0.12
AZ06922	ETP-IV	ACF O/L	06-06-2023	07:00	TSS	6
AZ07453	ETP-IV	ACF O/L	07-06-2023	07:00	pH	7.4
AZ07453	ETP-IV	ACF O/L	07-06-2023	07:00	Oil & Grease	2
AZ07453	ETP-IV	ACF O/L	07-06-2023	07:00	Sulphides	0.16
AZ07453	ETP-IV	ACF O/L	07-06-2023	07:00	BOD	6.6
AZ07453	ETP-IV	ACF O/L	07-06-2023	07:00	COD	46
AZ07453	ETP-IV	ACF O/L	07-06-2023	07:00	Phenol	0.08
AZ07453	ETP-IV	ACF O/L	07-06-2023	07:00	TSS	5

AZ07951	ETP-IV	ACF O/L	08-06-2023	07:00	pH	7.6
AZ07951	ETP-IV	ACF O/L	08-06-2023	07:00	Oil & Grease	2
AZ07951	ETP-IV	ACF O/L	08-06-2023	07:00	Sulphides	0.40
AZ07951	ETP-IV	ACF O/L	08-06-2023	07:00	BOD	7.2
AZ07951	ETP-IV	ACF O/L	08-06-2023	07:00	COD	42
AZ07951	ETP-IV	ACF O/L	08-06-2023	07:00	Phenol	0.12
AZ07951	ETP-IV	ACF O/L	08-06-2023	07:00	TSS	4
AZ08487	ETP-IV	ACF O/L	09-06-2023	07:00	pH	7.6
AZ08487	ETP-IV	ACF O/L	09-06-2023	07:00	Oil & Grease	2
AZ08487	ETP-IV	ACF O/L	09-06-2023	07:00	Sulphides	0.24
AZ08487	ETP-IV	ACF O/L	09-06-2023	07:00	BOD	6.3
AZ08487	ETP-IV	ACF O/L	09-06-2023	07:00	COD	38
AZ08487	ETP-IV	ACF O/L	09-06-2023	07:00	Phenol	0.10
AZ08487	ETP-IV	ACF O/L	09-06-2023	07:00	TSS	5
AZ08976	ETP-IV	ACF O/L	10-06-2023	07:00	pH	8.0
AZ08976	ETP-IV	ACF O/L	10-06-2023	07:00	Oil & Grease	2
AZ08976	ETP-IV	ACF O/L	10-06-2023	07:00	Sulphides	0.24
AZ08976	ETP-IV	ACF O/L	10-06-2023	07:00	BOD	9.5
AZ08976	ETP-IV	ACF O/L	10-06-2023	07:00	COD	55
AZ08976	ETP-IV	ACF O/L	10-06-2023	07:00	Phenol	0.16
AZ08976	ETP-IV	ACF O/L	10-06-2023	07:00	TSS	4
AZ09497	ETP-IV	ACF O/L	11-06-2023	07:00	pH	8.1
AZ09497	ETP-IV	ACF O/L	11-06-2023	07:00	Oil & Grease	3
AZ09497	ETP-IV	ACF O/L	11-06-2023	07:00	Sulphides	0.24
AZ09497	ETP-IV	ACF O/L	11-06-2023	07:00	BOD	7.0
AZ09497	ETP-IV	ACF O/L	11-06-2023	07:00	COD	26
AZ09497	ETP-IV	ACF O/L	11-06-2023	07:00	Phenol	0.12
AZ09497	ETP-IV	ACF O/L	11-06-2023	07:00	TSS	6
AZ09979	ETP-IV	ACF O/L	12-06-2023	07:00	pH	7.8
AZ09979	ETP-IV	ACF O/L	12-06-2023	07:00	Oil & Grease	4
AZ09979	ETP-IV	ACF O/L	12-06-2023	07:00	Sulphides	0.48
AZ09979	ETP-IV	ACF O/L	12-06-2023	07:00	BOD	7.9
AZ09979	ETP-IV	ACF O/L	12-06-2023	07:00	COD	48
AZ09979	ETP-IV	ACF O/L	12-06-2023	07:00	Phenol	0.11
AZ09979	ETP-IV	ACF O/L	12-06-2023	07:00	TSS	5
AZ10539	ETP-IV	ACF O/L	13-06-2023	07:00	pH	7.0
AZ10539	ETP-IV	ACF O/L	13-06-2023	07:00	Oil & Grease	3
AZ10539	ETP-IV	ACF O/L	13-06-2023	07:00	Sulphides	0.40
AZ10539	ETP-IV	ACF O/L	13-06-2023	07:00	BOD	6.1
AZ10539	ETP-IV	ACF O/L	13-06-2023	07:00	COD	42
AZ10539	ETP-IV	ACF O/L	13-06-2023	07:00	Phenol	0.12
AZ10539	ETP-IV	ACF O/L	13-06-2023	07:00	TSS	2
AZ11058	ETP-IV	ACF O/L	14-06-2023	07:00	pH	7.6
AZ11058	ETP-IV	ACF O/L	14-06-2023	07:00	Oil & Grease	4
AZ11058	ETP-IV	ACF O/L	14-06-2023	07:00	Sulphides	0.60
AZ11058	ETP-IV	ACF O/L	14-06-2023	07:00	BOD	7.4
AZ11058	ETP-IV	ACF O/L	14-06-2023	07:00	COD	32

AZ11058	ETP-IV	ACF O/L	14-06-2023	07:00	Phenol	0.11
AZ11058	ETP-IV	ACF O/L	14-06-2023	07:00	TSS	2
AZ12291	ETP-IV	ACF O/L	14-06-2023	23:00	Sulphides	0.36
AZ12408	ETP-IV	ACF O/L	15-06-2023	07:00	pH	8.0
AZ12408	ETP-IV	ACF O/L	15-06-2023	07:00	Oil & Grease	3
AZ12408	ETP-IV	ACF O/L	15-06-2023	07:00	Sulphides	0.24
AZ12408	ETP-IV	ACF O/L	15-06-2023	07:00	BOD	7.1
AZ12408	ETP-IV	ACF O/L	15-06-2023	07:00	COD	40
AZ12408	ETP-IV	ACF O/L	15-06-2023	07:00	Phenol	0.10
AZ12408	ETP-IV	ACF O/L	15-06-2023	07:00	TSS	8
AZ12757	ETP-IV	ACF O/L	12-06-2023	15:00	BOD	8.0
AZ12934	ETP-IV	ACF O/L	16-06-2023	07:00	pH	8.4
AZ12934	ETP-IV	ACF O/L	16-06-2023	07:00	Oil & Grease	4
AZ12934	ETP-IV	ACF O/L	16-06-2023	07:00	Sulphides	0.20
AZ12934	ETP-IV	ACF O/L	16-06-2023	07:00	BOD	6.1
AZ12934	ETP-IV	ACF O/L	16-06-2023	07:00	COD	35
AZ12934	ETP-IV	ACF O/L	16-06-2023	07:00	Phenol	0.12
AZ12934	ETP-IV	ACF O/L	16-06-2023	07:00	TSS	7
AZ13405	ETP-IV	ACF O/L	17-06-2023	07:00	pH	8.0
AZ13405	ETP-IV	ACF O/L	17-06-2023	07:00	Oil & Grease	2
AZ13405	ETP-IV	ACF O/L	17-06-2023	07:00	Sulphides	0.24
AZ13405	ETP-IV	ACF O/L	17-06-2023	07:00	BOD	6.5
AZ13405	ETP-IV	ACF O/L	17-06-2023	07:00	COD	40
AZ13405	ETP-IV	ACF O/L	17-06-2023	07:00	Phenol	0.10
AZ13405	ETP-IV	ACF O/L	17-06-2023	07:00	TSS	3
AZ13921	ETP-IV	ACF O/L	18-06-2023	07:00	pH	8.2
AZ13921	ETP-IV	ACF O/L	18-06-2023	07:00	Oil & Grease	3
AZ13921	ETP-IV	ACF O/L	18-06-2023	07:00	Sulphides	0.24
AZ13921	ETP-IV	ACF O/L	18-06-2023	07:00	BOD	6.3
AZ13921	ETP-IV	ACF O/L	18-06-2023	07:00	COD	38
AZ13921	ETP-IV	ACF O/L	18-06-2023	07:00	Phenol	0.10
AZ13921	ETP-IV	ACF O/L	18-06-2023	07:00	TSS	8
AZ14411	ETP-IV	ACF O/L	19-06-2023	07:00	pH	7.4
AZ14411	ETP-IV	ACF O/L	19-06-2023	07:00	Oil & Grease	4
AZ14411	ETP-IV	ACF O/L	19-06-2023	07:00	Sulphides	0.32
AZ14411	ETP-IV	ACF O/L	19-06-2023	07:00	BOD	7.5
AZ14411	ETP-IV	ACF O/L	19-06-2023	07:00	COD	42
AZ14411	ETP-IV	ACF O/L	19-06-2023	07:00	Phenol	0.12
AZ14411	ETP-IV	ACF O/L	19-06-2023	07:00	TSS	9
AZ14981	ETP-IV	ACF O/L	20-06-2023	07:00	pH	7.8
AZ14981	ETP-IV	ACF O/L	20-06-2023	07:00	Oil & Grease	3
AZ14981	ETP-IV	ACF O/L	20-06-2023	07:00	Sulphides	0.4
AZ14981	ETP-IV	ACF O/L	20-06-2023	07:00	BOD	6.0
AZ14981	ETP-IV	ACF O/L	20-06-2023	07:00	COD	32
AZ14981	ETP-IV	ACF O/L	20-06-2023	07:00	Phenol	0.13
AZ14981	ETP-IV	ACF O/L	20-06-2023	07:00	TSS	7
AZ15541	ETP-IV	ACF O/L	21-06-2023	07:00	pH	8.6

AZ15541	ETP-IV	ACF O/L	21-06-2023	07:00	Oil & Grease	2
AZ15541	ETP-IV	ACF O/L	21-06-2023	07:00	Sulphides	0.4
AZ15541	ETP-IV	ACF O/L	21-06-2023	07:00	BOD	6.5
AZ15541	ETP-IV	ACF O/L	21-06-2023	07:00	COD	30
AZ15541	ETP-IV	ACF O/L	21-06-2023	07:00	Phenol	0.12
AZ15541	ETP-IV	ACF O/L	21-06-2023	07:00	TSS	2
AZ15914	ETP-IV	ACF O/L	21-06-2023	22:00	pH	7.6
AZ16041	ETP-IV	ACF O/L	22-06-2023	07:00	pH	7.6
AZ16041	ETP-IV	ACF O/L	22-06-2023	07:00	Oil & Grease	4
AZ16041	ETP-IV	ACF O/L	22-06-2023	07:00	Sulphides	0.6
AZ16041	ETP-IV	ACF O/L	22-06-2023	07:00	BOD	6.2
AZ16041	ETP-IV	ACF O/L	22-06-2023	07:00	COD	34
AZ16041	ETP-IV	ACF O/L	22-06-2023	07:00	Phenol	0.12
AZ16041	ETP-IV	ACF O/L	22-06-2023	07:00	TSS	2
AZ16429	ETP-IV	ACF O/L	22-06-2023	21:00	Sulphides	0.24
AZ16573	ETP-IV	ACF O/L	23-06-2023	07:00	pH	8.0
AZ16573	ETP-IV	ACF O/L	23-06-2023	07:00	Oil & Grease	3
AZ16573	ETP-IV	ACF O/L	23-06-2023	07:00	Sulphides	0.24
AZ16573	ETP-IV	ACF O/L	23-06-2023	07:00	BOD	6.5
AZ16573	ETP-IV	ACF O/L	23-06-2023	07:00	COD	38
AZ16573	ETP-IV	ACF O/L	23-06-2023	07:00	Phenol	0.14
AZ16573	ETP-IV	ACF O/L	23-06-2023	07:00	TSS	3
AZ17087	ETP-IV	ACF O/L	24-06-2023	07:00	pH	7.8
AZ17087	ETP-IV	ACF O/L	24-06-2023	07:00	Oil & Grease	5
AZ17087	ETP-IV	ACF O/L	24-06-2023	07:00	Sulphides	0.6
AZ17087	ETP-IV	ACF O/L	24-06-2023	07:00	BOD	5.0
AZ17087	ETP-IV	ACF O/L	24-06-2023	07:00	COD	30
AZ17087	ETP-IV	ACF O/L	24-06-2023	07:00	Phenol	0.12
AZ17087	ETP-IV	ACF O/L	24-06-2023	07:00	TSS	2
AZ17599	ETP-IV	ACF O/L	25-06-2023	07:00	pH	7.8
AZ17599	ETP-IV	ACF O/L	25-06-2023	07:00	Oil & Grease	2
AZ17599	ETP-IV	ACF O/L	25-06-2023	07:00	Sulphides	0.4
AZ17599	ETP-IV	ACF O/L	25-06-2023	07:00	BOD	7.5
AZ17599	ETP-IV	ACF O/L	25-06-2023	07:00	COD	45
AZ17599	ETP-IV	ACF O/L	25-06-2023	07:00	Phenol	0.14
AZ17599	ETP-IV	ACF O/L	25-06-2023	07:00	TSS	5
AZ17924	ETP-IV	ACF O/L	24-06-2023	22:00	Sulphides	0.24
AZ18074	ETP-IV	ACF O/L	26-06-2023	07:00	pH	7.6
AZ18074	ETP-IV	ACF O/L	26-06-2023	07:00	Oil & Grease	2
AZ18074	ETP-IV	ACF O/L	26-06-2023	07:00	Sulphides	0.24
AZ18074	ETP-IV	ACF O/L	26-06-2023	07:00	BOD	7.4
AZ18074	ETP-IV	ACF O/L	26-06-2023	07:00	COD	40
AZ18074	ETP-IV	ACF O/L	26-06-2023	07:00	Phenol	0.10
AZ18074	ETP-IV	ACF O/L	26-06-2023	07:00	TSS	5
AZ18635	ETP-IV	ACF O/L	27-06-2023	07:00	pH	8.0
AZ18635	ETP-IV	ACF O/L	27-06-2023	07:00	Oil & Grease	4
AZ18635	ETP-IV	ACF O/L	27-06-2023	07:00	Sulphides	0.24

AZ18635	ETP-IV	ACF O/L	27-06-2023	07:00	BOD	8.7
AZ18635	ETP-IV	ACF O/L	27-06-2023	07:00	COD	48
AZ18635	ETP-IV	ACF O/L	27-06-2023	07:00	Phenol	0.11
AZ18635	ETP-IV	ACF O/L	27-06-2023	07:00	TSS	5
AZ19138	ETP-IV	ACF O/L	28-06-2023	07:00	pH	8.5
AZ19138	ETP-IV	ACF O/L	28-06-2023	07:00	Oil & Grease	2
AZ19138	ETP-IV	ACF O/L	28-06-2023	07:00	Sulphides	0.16
AZ19138	ETP-IV	ACF O/L	28-06-2023	07:00	BOD	5.1
AZ19138	ETP-IV	ACF O/L	28-06-2023	07:00	COD	31
AZ19138	ETP-IV	ACF O/L	28-06-2023	07:00	Phenol	0.13
AZ19138	ETP-IV	ACF O/L	28-06-2023	07:00	TSS	5
AZ19617	ETP-IV	ACF O/L	29-06-2023	07:00	pH	7.6
AZ19617	ETP-IV	ACF O/L	29-06-2023	07:00	Oil & Grease	4
AZ19617	ETP-IV	ACF O/L	29-06-2023	07:00	Sulphides	0.32
AZ19617	ETP-IV	ACF O/L	29-06-2023	07:00	BOD	7.2
AZ19617	ETP-IV	ACF O/L	29-06-2023	07:00	COD	42
AZ19617	ETP-IV	ACF O/L	29-06-2023	07:00	Phenol	0.12
AZ19617	ETP-IV	ACF O/L	29-06-2023	07:00	TSS	5
AZ20176	ETP-IV	ACF O/L	30-06-2023	07:00	pH	8.0
AZ20176	ETP-IV	ACF O/L	30-06-2023	07:00	Oil & Grease	3
AZ20176	ETP-IV	ACF O/L	30-06-2023	07:00	Sulphides	0.24
AZ20176	ETP-IV	ACF O/L	30-06-2023	07:00	BOD	7.4
AZ20176	ETP-IV	ACF O/L	30-06-2023	07:00	COD	36
AZ20176	ETP-IV	ACF O/L	30-06-2023	07:00	Phenol	0.12
AZ20176	ETP-IV	ACF O/L	30-06-2023	07:00	TSS	8
AZ20655	ETP-IV	ACF O/L	01-07-2023	07:00	pH	8.2
AZ20655	ETP-IV	ACF O/L	01-07-2023	07:00	Oil & Grease	4
AZ20655	ETP-IV	ACF O/L	01-07-2023	07:00	Sulphides	0.32
AZ20655	ETP-IV	ACF O/L	01-07-2023	07:00	BOD	8.3
AZ20655	ETP-IV	ACF O/L	01-07-2023	07:00	COD	38
AZ20655	ETP-IV	ACF O/L	01-07-2023	07:00	Phenol	0.10
AZ20655	ETP-IV	ACF O/L	01-07-2023	07:00	TSS	10
AZ21219	ETP-IV	ACF O/L	02-07-2023	07:00	pH	7.4
AZ21219	ETP-IV	ACF O/L	02-07-2023	07:00	Oil & Grease	2
AZ21219	ETP-IV	ACF O/L	02-07-2023	07:00	Sulphides	0.24
AZ21219	ETP-IV	ACF O/L	02-07-2023	07:00	BOD	8.3
AZ21219	ETP-IV	ACF O/L	02-07-2023	07:00	COD	34
AZ21219	ETP-IV	ACF O/L	02-07-2023	07:00	Phenol	0.12
AZ21219	ETP-IV	ACF O/L	02-07-2023	07:00	TSS	8
AZ21742	ETP-IV	ACF O/L	03-07-2023	07:00	pH	8.0
AZ21742	ETP-IV	ACF O/L	03-07-2023	07:00	Oil & Grease	3
AZ21742	ETP-IV	ACF O/L	03-07-2023	07:00	Sulphides	0.24
AZ21742	ETP-IV	ACF O/L	03-07-2023	07:00	BOD	8.5
AZ21742	ETP-IV	ACF O/L	03-07-2023	07:00	COD	45
AZ21742	ETP-IV	ACF O/L	03-07-2023	07:00	Phenol	0.11
AZ21742	ETP-IV	ACF O/L	03-07-2023	07:00	TSS	9
AZ22339	ETP-IV	ACF O/L	04-07-2023	07:00	pH	8.0

AZ22339	ETP-IV	ACF O/L	04-07-2023	07:00	Oil & Grease	4
AZ22339	ETP-IV	ACF O/L	04-07-2023	07:00	Sulphides	0.32
AZ22339	ETP-IV	ACF O/L	04-07-2023	07:00	BOD	9.1
AZ22339	ETP-IV	ACF O/L	04-07-2023	07:00	COD	46
AZ22339	ETP-IV	ACF O/L	04-07-2023	07:00	Phenol	0.13
AZ22339	ETP-IV	ACF O/L	04-07-2023	07:00	TSS	6
AZ22900	ETP-IV	ACF O/L	05-07-2023	07:00	pH	8.2
AZ22900	ETP-IV	ACF O/L	05-07-2023	07:00	Oil & Grease	4
AZ22900	ETP-IV	ACF O/L	05-07-2023	07:00	Sulphides	0.32
AZ22900	ETP-IV	ACF O/L	05-07-2023	07:00	BOD	5.6
AZ22900	ETP-IV	ACF O/L	05-07-2023	07:00	COD	34
AZ22900	ETP-IV	ACF O/L	05-07-2023	07:00	Phenol	0.12
AZ22900	ETP-IV	ACF O/L	05-07-2023	07:00	TSS	7
AZ23391	ETP-IV	ACF O/L	06-07-2023	07:00	pH	8.4
AZ23391	ETP-IV	ACF O/L	06-07-2023	07:00	Oil & Grease	4
AZ23391	ETP-IV	ACF O/L	06-07-2023	07:00	Sulphides	0.32
AZ23391	ETP-IV	ACF O/L	06-07-2023	07:00	COD	40
AZ23391	ETP-IV	ACF O/L	06-07-2023	07:00	Phenol	0.14
AZ23391	ETP-IV	ACF O/L	06-07-2023	07:00	TSS	4
AZ23391	ETP-IV	ACF O/L	06-07-2023	07:00	BOD	6.5
AZ23928	ETP-IV	ACF O/L	07-07-2023	07:00	pH	8.8
AZ23928	ETP-IV	ACF O/L	07-07-2023	07:00	Oil & Grease	4
AZ23928	ETP-IV	ACF O/L	07-07-2023	07:00	Sulphides	0.32
AZ23928	ETP-IV	ACF O/L	07-07-2023	07:00	BOD	8.4
AZ23928	ETP-IV	ACF O/L	07-07-2023	07:00	COD	42
AZ23928	ETP-IV	ACF O/L	07-07-2023	07:00	Phenol	0.12
AZ23928	ETP-IV	ACF O/L	07-07-2023	07:00	TSS	5
AZ24325	ETP-IV	ACF O/L	07-07-2023	22:30	pH	7.4
AZ24446	ETP-IV	ACF O/L	08-07-2023	07:00	pH	8.0
AZ24446	ETP-IV	ACF O/L	08-07-2023	07:00	Oil & Grease	3
AZ24446	ETP-IV	ACF O/L	08-07-2023	07:00	Sulphides	0.32
AZ24446	ETP-IV	ACF O/L	08-07-2023	07:00	BOD	7.4
AZ24446	ETP-IV	ACF O/L	08-07-2023	07:00	COD	36.0
AZ24446	ETP-IV	ACF O/L	08-07-2023	07:00	Phenol	0.16
AZ24446	ETP-IV	ACF O/L	08-07-2023	07:00	TSS	6
AZ24956	ETP-IV	ACF O/L	09-07-2023	07:00	pH	7.6
AZ24956	ETP-IV	ACF O/L	09-07-2023	07:00	Oil & Grease	4
AZ24956	ETP-IV	ACF O/L	09-07-2023	07:00	Sulphides	0.48
AZ24956	ETP-IV	ACF O/L	09-07-2023	07:00	BOD	6.6
AZ24956	ETP-IV	ACF O/L	09-07-2023	07:00	COD	32
AZ24956	ETP-IV	ACF O/L	09-07-2023	07:00	Phenol	0.12
AZ24956	ETP-IV	ACF O/L	09-07-2023	07:00	TSS	5
AZ25449	ETP-IV	ACF O/L	10-07-2023	07:00	pH	7.6
AZ25449	ETP-IV	ACF O/L	10-07-2023	07:00	Oil & Grease	5
AZ25449	ETP-IV	ACF O/L	10-07-2023	07:00	Sulphides	0.8
AZ25449	ETP-IV	ACF O/L	10-07-2023	07:00	BOD	6.1
AZ25449	ETP-IV	ACF O/L	10-07-2023	07:00	COD	30

AZ25449	ETP-IV	ACF O/L	10-07-2023	07:00	Phenol	0.14
AZ25449	ETP-IV	ACF O/L	10-07-2023	07:00	TSS	3
AZ25918	ETP-IV	ACF O/L	10-07-2023	23:00	Sulphides	0.32
AZ26063	ETP-IV	ACF O/L	11-07-2023	07:00	pH	7.4
AZ26063	ETP-IV	ACF O/L	11-07-2023	07:00	Oil & Grease	4
AZ26063	ETP-IV	ACF O/L	11-07-2023	07:00	Sulphides	0.32
AZ26063	ETP-IV	ACF O/L	11-07-2023	07:00	BOD	5.1
AZ26063	ETP-IV	ACF O/L	11-07-2023	07:00	COD	28
AZ26063	ETP-IV	ACF O/L	11-07-2023	07:00	Phenol	0.13
AZ26063	ETP-IV	ACF O/L	11-07-2023	07:00	TSS	42
AZ26415	ETP-IV	ACF O/L	12-07-2023	18:30	TSS	12 ppm
AZ26570	ETP-IV	ACF O/L	12-07-2023	07:00	pH	7.6
AZ26570	ETP-IV	ACF O/L	12-07-2023	07:00	Oil & Grease	3
AZ26570	ETP-IV	ACF O/L	12-07-2023	07:00	Sulphides	0.4
AZ26570	ETP-IV	ACF O/L	12-07-2023	07:00	BOD	5.6
AZ26570	ETP-IV	ACF O/L	12-07-2023	07:00	COD	34
AZ26570	ETP-IV	ACF O/L	12-07-2023	07:00	Phenol	0.12
AZ26570	ETP-IV	ACF O/L	12-07-2023	07:00	TSS	4
AZ27066	ETP-IV	ACF O/L	13-07-2023	07:00	pH	8.2
AZ27066	ETP-IV	ACF O/L	13-07-2023	07:00	Oil & Grease	4
AZ27066	ETP-IV	ACF O/L	13-07-2023	07:00	Sulphides	1.2
AZ27066	ETP-IV	ACF O/L	13-07-2023	07:00	BOD	5.0
AZ27066	ETP-IV	ACF O/L	13-07-2023	07:00	COD	25
AZ27066	ETP-IV	ACF O/L	13-07-2023	07:00	Phenol	0.10
AZ27066	ETP-IV	ACF O/L	13-07-2023	07:00	TSS	3
AZ27421	ETP-IV	ACF O/L	13-07-2023	21:00	Sulphides	0.32
AZ27591	ETP-IV	ACF O/L	14-07-2023	07:00	pH	8.8
AZ27591	ETP-IV	ACF O/L	14-07-2023	07:00	Oil & Grease	3
AZ27591	ETP-IV	ACF O/L	14-07-2023	07:00	Sulphides	1.2
AZ27591	ETP-IV	ACF O/L	14-07-2023	07:00	BOD	5.3
AZ27591	ETP-IV	ACF O/L	14-07-2023	07:00	COD	31
AZ27591	ETP-IV	ACF O/L	14-07-2023	07:00	Phenol	0.11
AZ27591	ETP-IV	ACF O/L	14-07-2023	07:00	TSS	5
AZ27946	ETP-IV	ACF O/L	14-07-2023	23:00	pH	7.8
AZ27946	ETP-IV	ACF O/L	14-07-2023	23:00	Sulphides	0.48
AZ28070	ETP-IV	ACF O/L	15-07-2023	07:00	pH	7.6
AZ28070	ETP-IV	ACF O/L	15-07-2023	07:00	Oil & Grease	3
AZ28070	ETP-IV	ACF O/L	15-07-2023	07:00	Sulphides	0.8
AZ28070	ETP-IV	ACF O/L	15-07-2023	07:00	BOD	6.6
AZ28070	ETP-IV	ACF O/L	15-07-2023	07:00	COD	40
AZ28070	ETP-IV	ACF O/L	15-07-2023	07:00	Phenol	0.13
AZ28070	ETP-IV	ACF O/L	15-07-2023	07:00	TSS	4
AZ28422	ETP-IV	ACF O/L	15-07-2023	21:00	Sulphides	0.24
AZ28564	ETP-IV	ACF O/L	16-07-2023	07:00	pH	7.8
AZ28564	ETP-IV	ACF O/L	16-07-2023	07:00	Oil & Grease	3
AZ28564	ETP-IV	ACF O/L	16-07-2023	07:00	Sulphides	0.40
AZ28564	ETP-IV	ACF O/L	16-07-2023	07:00	BOD	6.7

AZ28564	ETP-IV	ACF O/L	16-07-2023	07:00	COD	36
AZ28564	ETP-IV	ACF O/L	16-07-2023	07:00	Phenol	0.12
AZ28564	ETP-IV	ACF O/L	16-07-2023	07:00	TSS	5
AZ29059	ETP-IV	ACF O/L	17-07-2023	07:00	pH	7.6
AZ29059	ETP-IV	ACF O/L	17-07-2023	07:00	Oil & Grease	2
AZ29059	ETP-IV	ACF O/L	17-07-2023	07:00	Sulphides	0.24
AZ29059	ETP-IV	ACF O/L	17-07-2023	07:00	BOD	8.6
AZ29059	ETP-IV	ACF O/L	17-07-2023	07:00	COD	44
AZ29059	ETP-IV	ACF O/L	17-07-2023	07:00	Phenol	0.11
AZ29059	ETP-IV	ACF O/L	17-07-2023	07:00	TSS	4
AZ29637	ETP-IV	ACF O/L	18-07-2023	07:00	pH	7.0
AZ29637	ETP-IV	ACF O/L	18-07-2023	07:00	Oil & Grease	3
AZ29637	ETP-IV	ACF O/L	18-07-2023	07:00	Sulphides	0.24
AZ29637	ETP-IV	ACF O/L	18-07-2023	07:00	BOD	6.2
AZ29637	ETP-IV	ACF O/L	18-07-2023	07:00	COD	32
AZ29637	ETP-IV	ACF O/L	18-07-2023	07:00	Phenol	0.11
AZ29637	ETP-IV	ACF O/L	18-07-2023	07:00	TSS	6
AZ30147	ETP-IV	ACF O/L	19-07-2023	07:00	pH	7.6
AZ30147	ETP-IV	ACF O/L	19-07-2023	07:00	Oil & Grease	2
AZ30147	ETP-IV	ACF O/L	19-07-2023	07:00	Sulphides	0.32
AZ30147	ETP-IV	ACF O/L	19-07-2023	07:00	BOD	5.0
AZ30147	ETP-IV	ACF O/L	19-07-2023	07:00	COD	30
AZ30147	ETP-IV	ACF O/L	19-07-2023	07:00	Phenol	0.10
AZ30147	ETP-IV	ACF O/L	19-07-2023	07:00	TSS	6
AZ30645	ETP-IV	ACF O/L	20-07-2023	07:00	pH	7.2
AZ30645	ETP-IV	ACF O/L	20-07-2023	07:00	Oil & Grease	3
AZ30645	ETP-IV	ACF O/L	20-07-2023	07:00	Sulphides	0.32
AZ30645	ETP-IV	ACF O/L	20-07-2023	07:00	BOD	7.5
AZ30645	ETP-IV	ACF O/L	20-07-2023	07:00	COD	44
AZ30645	ETP-IV	ACF O/L	20-07-2023	07:00	Phenol	0.12
AZ30645	ETP-IV	ACF O/L	20-07-2023	07:00	TSS	7
AZ31184	ETP-IV	ACF O/L	21-07-2023	07:00	pH	7.4
AZ31184	ETP-IV	ACF O/L	21-07-2023	07:00	Oil & Grease	4
AZ31184	ETP-IV	ACF O/L	21-07-2023	07:00	Sulphides	0.24
AZ31184	ETP-IV	ACF O/L	21-07-2023	07:00	BOD	6.3
AZ31184	ETP-IV	ACF O/L	21-07-2023	07:00	COD	38
AZ31184	ETP-IV	ACF O/L	21-07-2023	07:00	Phenol	0.10
AZ31184	ETP-IV	ACF O/L	21-07-2023	07:00	TSS	5
AZ31678	ETP-IV	ACF O/L	22-07-2023	07:00	pH	7.6
AZ31678	ETP-IV	ACF O/L	22-07-2023	07:00	Oil & Grease	4
AZ31678	ETP-IV	ACF O/L	22-07-2023	07:00	Sulphides	1.6
AZ31678	ETP-IV	ACF O/L	22-07-2023	07:00	BOD	6.6
AZ31678	ETP-IV	ACF O/L	22-07-2023	07:00	COD	42
AZ31678	ETP-IV	ACF O/L	22-07-2023	07:00	Phenol	0.11
AZ31678	ETP-IV	ACF O/L	22-07-2023	07:00	TSS	5
AZ32086	ETP-IV	ACF O/L	22-07-2023	22:00	Sulphides	0.24
AZ32206	ETP-IV	ACF O/L	23-07-2023	07:00	pH	8.4

AZ32206	ETP-IV	ACF O/L	23-07-2023	07:00	Oil & Grease	3
AZ32206	ETP-IV	ACF O/L	23-07-2023	07:00	Sulphides	0.24
AZ32206	ETP-IV	ACF O/L	23-07-2023	07:00	BOD	7.4
AZ32206	ETP-IV	ACF O/L	23-07-2023	07:00	COD	40
AZ32206	ETP-IV	ACF O/L	23-07-2023	07:00	Phenol	0.12
AZ32206	ETP-IV	ACF O/L	23-07-2023	07:00	TSS	3
AZ32695	ETP-IV	ACF O/L	24-07-2023	07:00	pH	8.2
AZ32695	ETP-IV	ACF O/L	24-07-2023	07:00	Oil & Grease	4
AZ32695	ETP-IV	ACF O/L	24-07-2023	07:00	Sulphides	0.24
AZ32695	ETP-IV	ACF O/L	24-07-2023	07:00	BOD	10.7
AZ32695	ETP-IV	ACF O/L	24-07-2023	07:00	COD	55
AZ32695	ETP-IV	ACF O/L	24-07-2023	07:00	Phenol	0.12
AZ32695	ETP-IV	ACF O/L	24-07-2023	07:00	TSS	5
AZ33249	ETP-IV	ACF O/L	25-07-2023	07:00	pH	7.8
AZ33249	ETP-IV	ACF O/L	25-07-2023	07:00	Oil & Grease	4
AZ33249	ETP-IV	ACF O/L	25-07-2023	07:00	Sulphides	0.24
AZ33249	ETP-IV	ACF O/L	25-07-2023	07:00	BOD	6.2
AZ33249	ETP-IV	ACF O/L	25-07-2023	07:00	COD	36
AZ33249	ETP-IV	ACF O/L	25-07-2023	07:00	Phenol	0.30
AZ33249	ETP-IV	ACF O/L	25-07-2023	07:00	TSS	5
AZ33760	ETP-IV	ACF O/L	26-07-2023	07:00	pH	7.2
AZ33760	ETP-IV	ACF O/L	26-07-2023	07:00	Oil & Grease	4
AZ33760	ETP-IV	ACF O/L	26-07-2023	07:00	Sulphides	0.24
AZ33760	ETP-IV	ACF O/L	26-07-2023	07:00	BOD	7.6
AZ33760	ETP-IV	ACF O/L	26-07-2023	07:00	COD	38
AZ33760	ETP-IV	ACF O/L	26-07-2023	07:00	Phenol	0.24
AZ33760	ETP-IV	ACF O/L	26-07-2023	07:00	TSS	8
AZ34246	ETP-IV	ACF O/L	27-07-2023	07:00	pH	7.8
AZ34246	ETP-IV	ACF O/L	27-07-2023	07:00	Oil & Grease	3
AZ34246	ETP-IV	ACF O/L	27-07-2023	07:00	Sulphides	0.16
AZ34246	ETP-IV	ACF O/L	27-07-2023	07:00	BOD	7.7
AZ34246	ETP-IV	ACF O/L	27-07-2023	07:00	COD	42
AZ34246	ETP-IV	ACF O/L	27-07-2023	07:00	Phenol	0.26
AZ34246	ETP-IV	ACF O/L	27-07-2023	07:00	TSS	3
AZ34780	ETP-IV	ACF O/L	28-07-2023	07:00	pH	8.8
AZ34780	ETP-IV	ACF O/L	28-07-2023	07:00	Oil & Grease	3
AZ34780	ETP-IV	ACF O/L	28-07-2023	07:00	Sulphides	0.24
AZ34780	ETP-IV	ACF O/L	28-07-2023	07:00	BOD	6.3
AZ34780	ETP-IV	ACF O/L	28-07-2023	07:00	COD	38
AZ34780	ETP-IV	ACF O/L	28-07-2023	07:00	Phenol	0.23
AZ34780	ETP-IV	ACF O/L	28-07-2023	07:00	TSS	4
AZ35260	ETP-IV	ACF O/L	29-07-2023	07:00	pH	7.4
AZ35260	ETP-IV	ACF O/L	29-07-2023	07:00	Oil & Grease	4
AZ35260	ETP-IV	ACF O/L	29-07-2023	07:00	Sulphides	0.72
AZ35260	ETP-IV	ACF O/L	29-07-2023	07:00	BOD	6.7
AZ35260	ETP-IV	ACF O/L	29-07-2023	07:00	COD	42
AZ35260	ETP-IV	ACF O/L	29-07-2023	07:00	Phenol	0.32

AZ35260	ETP-IV	ACF O/L	29-07-2023	07:00	TSS	4
AZ35284	ETP-IV	ACF O/L	28-07-2023	22:30	pH	7.8
AZ35595	ETP-IV	ACF O/L	29-07-2023	20:00	Sulphides	0.24
AZ35760	ETP-IV	ACF O/L	30-07-2023	07:00	pH	7.6
AZ35760	ETP-IV	ACF O/L	30-07-2023	07:00	Oil & Grease	3
AZ35760	ETP-IV	ACF O/L	30-07-2023	07:00	Sulphides	0.2
AZ35760	ETP-IV	ACF O/L	30-07-2023	07:00	BOD	5.2
AZ35760	ETP-IV	ACF O/L	30-07-2023	07:00	COD	32
AZ35760	ETP-IV	ACF O/L	30-07-2023	07:00	Phenol	0.11
AZ35760	ETP-IV	ACF O/L	30-07-2023	07:00	TSS	4
AZ36227	ETP-IV	ACF O/L	31-07-2023	07:00	pH	8.8
AZ36227	ETP-IV	ACF O/L	31-07-2023	07:00	Oil & Grease	3
AZ36227	ETP-IV	ACF O/L	31-07-2023	07:00	Sulphides	0.24
AZ36227	ETP-IV	ACF O/L	31-07-2023	07:00	BOD	6.5
AZ36227	ETP-IV	ACF O/L	31-07-2023	07:00	COD	46
AZ36227	ETP-IV	ACF O/L	31-07-2023	07:00	Phenol	0.12
AZ36227	ETP-IV	ACF O/L	31-07-2023	07:00	TSS	5
AZ36688	ETP-IV	ACF O/L	31-07-2023	21:30	pH	8.2
AZ36841	ETP-IV	ACF O/L	01-08-2023	07:00	pH	7.6
AZ36841	ETP-IV	ACF O/L	01-08-2023	07:00	Oil & Grease	3
AZ36841	ETP-IV	ACF O/L	01-08-2023	07:00	Sulphides	0.24
AZ36841	ETP-IV	ACF O/L	01-08-2023	07:00	BOD	10.6
AZ36841	ETP-IV	ACF O/L	01-08-2023	07:00	COD	56
AZ36841	ETP-IV	ACF O/L	01-08-2023	07:00	Phenol	0.12
AZ36841	ETP-IV	ACF O/L	01-08-2023	07:00	TSS	4
AZ37413	ETP-IV	ACF O/L	02-08-2023	07:00	pH	7.8
AZ37413	ETP-IV	ACF O/L	02-08-2023	07:00	Oil & Grease	4
AZ37413	ETP-IV	ACF O/L	02-08-2023	07:00	Sulphides	0.4
AZ37413	ETP-IV	ACF O/L	02-08-2023	07:00	BOD	7.6
AZ37413	ETP-IV	ACF O/L	02-08-2023	07:00	COD	46
AZ37413	ETP-IV	ACF O/L	02-08-2023	07:00	Phenol	0.13
AZ37413	ETP-IV	ACF O/L	02-08-2023	07:00	TSS	5
AZ37912	ETP-IV	ACF O/L	03-08-2023	07:00	pH	8.6
AZ37912	ETP-IV	ACF O/L	03-08-2023	07:00	Oil & Grease	3
AZ37912	ETP-IV	ACF O/L	03-08-2023	07:00	Sulphides	0.4
AZ37912	ETP-IV	ACF O/L	03-08-2023	07:00	BOD	8.1
AZ37912	ETP-IV	ACF O/L	03-08-2023	07:00	COD	48
AZ37912	ETP-IV	ACF O/L	03-08-2023	07:00	Phenol	0.12
AZ37912	ETP-IV	ACF O/L	03-08-2023	07:00	TSS	4
AZ38326	ETP-IV	ACF O/L	03-08-2023	19:40	pH	7.4
AZ38461	ETP-IV	ACF O/L	04-08-2023	07:00	pH	7.8
AZ38461	ETP-IV	ACF O/L	04-08-2023	07:00	Oil & Grease	3
AZ38461	ETP-IV	ACF O/L	04-08-2023	07:00	Sulphides	0.80
AZ38461	ETP-IV	ACF O/L	04-08-2023	07:00	BOD	7.5
AZ38461	ETP-IV	ACF O/L	04-08-2023	07:00	COD	45
AZ38461	ETP-IV	ACF O/L	04-08-2023	07:00	Phenol	0.13
AZ38461	ETP-IV	ACF O/L	04-08-2023	07:00	TSS	2

AZ38963	ETP-IV	ACF O/L	05-08-2023	07:00	pH	7.8
AZ38963	ETP-IV	ACF O/L	05-08-2023	07:00	Oil & Grease	4
AZ38963	ETP-IV	ACF O/L	05-08-2023	07:00	Sulphides	0.4
AZ38963	ETP-IV	ACF O/L	05-08-2023	07:00	BOD	5.9
AZ38963	ETP-IV	ACF O/L	05-08-2023	07:00	COD	48
AZ38963	ETP-IV	ACF O/L	05-08-2023	07:00	Phenol	0.11
AZ38963	ETP-IV	ACF O/L	05-08-2023	07:00	TSS	3
AZ39114	ETP-IV	ACF O/L	04-08-2023	19:00	Sulphides	0.24
AZ39493	ETP-IV	ACF O/L	06-08-2023	07:00	pH	7.4
AZ39493	ETP-IV	ACF O/L	06-08-2023	07:00	Oil & Grease	3
AZ39493	ETP-IV	ACF O/L	06-08-2023	07:00	Sulphides	0.24
AZ39493	ETP-IV	ACF O/L	06-08-2023	07:00	BOD	7.9
AZ39493	ETP-IV	ACF O/L	06-08-2023	07:00	COD	48
AZ39493	ETP-IV	ACF O/L	06-08-2023	07:00	Phenol	0.11
AZ39493	ETP-IV	ACF O/L	06-08-2023	07:00	TSS	8
AZ40027	ETP-IV	ACF O/L	07-08-2023	07:00	pH	7.8
AZ40027	ETP-IV	ACF O/L	07-08-2023	07:00	Oil & Grease	3
AZ40027	ETP-IV	ACF O/L	07-08-2023	07:00	Sulphides	0.8
AZ40027	ETP-IV	ACF O/L	07-08-2023	07:00	BOD	9.2
AZ40027	ETP-IV	ACF O/L	07-08-2023	07:00	COD	54
AZ40027	ETP-IV	ACF O/L	07-08-2023	07:00	Phenol	0.11
AZ40027	ETP-IV	ACF O/L	07-08-2023	07:00	TSS	4
AZ40459	ETP-IV	ACF O/L	07-08-2023	19:00	Sulphides	0.96
AZ40494	ETP-IV	ACF O/L	08-08-2023	05:00	Sulphides	0.36
AZ40626	ETP-IV	ACF O/L	08-08-2023	07:00	pH	7.8
AZ40626	ETP-IV	ACF O/L	08-08-2023	07:00	Oil & Grease	3
AZ40626	ETP-IV	ACF O/L	08-08-2023	07:00	Sulphides	0.4
AZ40626	ETP-IV	ACF O/L	08-08-2023	07:00	BOD	7.0
AZ40626	ETP-IV	ACF O/L	08-08-2023	07:00	COD	40
AZ40626	ETP-IV	ACF O/L	08-08-2023	07:00	Phenol	0.12
AZ40626	ETP-IV	ACF O/L	08-08-2023	07:00	TSS	2
AZ41174	ETP-IV	ACF O/L	09-08-2023	07:00	pH	7.6
AZ41174	ETP-IV	ACF O/L	09-08-2023	07:00	Oil & Grease	3
AZ41174	ETP-IV	ACF O/L	09-08-2023	07:00	Sulphides	0.32
AZ41174	ETP-IV	ACF O/L	09-08-2023	07:00	BOD	8.4
AZ41174	ETP-IV	ACF O/L	09-08-2023	07:00	COD	40
AZ41174	ETP-IV	ACF O/L	09-08-2023	07:00	Phenol	0.12
AZ41174	ETP-IV	ACF O/L	09-08-2023	07:00	TSS	8
AZ41929	ETP-IV	ACF O/L	10-08-2023	07:00	pH	7.8
AZ41929	ETP-IV	ACF O/L	10-08-2023	07:00	Oil & Grease	3
AZ41929	ETP-IV	ACF O/L	10-08-2023	07:00	TSS	5
AZ41929	ETP-IV	ACF O/L	10-08-2023	07:00	Sulphides	0.32
AZ41929	ETP-IV	ACF O/L	10-08-2023	07:00	BOD	5.7
AZ41929	ETP-IV	ACF O/L	10-08-2023	07:00	COD	38
AZ41929	ETP-IV	ACF O/L	10-08-2023	07:00	Phenol	0.12
AZ42223	ETP-IV	ACF O/L	11-08-2023	07:00	pH	8.0
AZ42223	ETP-IV	ACF O/L	11-08-2023	07:00	Oil & Grease	3

AZ42223	ETP-IV	ACF O/L	11-08-2023	07:00	Sulphides	0.40
AZ42223	ETP-IV	ACF O/L	11-08-2023	07:00	BOD	8.2
AZ42223	ETP-IV	ACF O/L	11-08-2023	07:00	COD	48
AZ42223	ETP-IV	ACF O/L	11-08-2023	07:00	Phenol	0.11
AZ42223	ETP-IV	ACF O/L	11-08-2023	07:00	TSS	4
AZ42703	ETP-IV	ACF O/L	12-08-2023	07:00	pH	7.8
AZ42703	ETP-IV	ACF O/L	12-08-2023	07:00	Oil & Grease	5
AZ42703	ETP-IV	ACF O/L	12-08-2023	07:00	Sulphides	0.40
AZ42703	ETP-IV	ACF O/L	12-08-2023	07:00	BOD	9.3
AZ42703	ETP-IV	ACF O/L	12-08-2023	07:00	COD	46
AZ42703	ETP-IV	ACF O/L	12-08-2023	07:00	Phenol	0.12
AZ42703	ETP-IV	ACF O/L	12-08-2023	07:00	TSS	4
AZ43179	ETP-IV	ACF O/L	13-08-2023	07:00	pH	7.8
AZ43179	ETP-IV	ACF O/L	13-08-2023	07:00	Oil & Grease	4
AZ43179	ETP-IV	ACF O/L	13-08-2023	07:00	Sulphides	0.8
AZ43179	ETP-IV	ACF O/L	13-08-2023	07:00	BOD	10
AZ43179	ETP-IV	ACF O/L	13-08-2023	07:00	COD	72
AZ43179	ETP-IV	ACF O/L	13-08-2023	07:00	Phenol	0.16
AZ43179	ETP-IV	ACF O/L	13-08-2023	07:00	TSS	6
AZ43536	ETP-IV	ACF O/L	13-08-2023	17:30	Sulphides	0.32
AZ43673	ETP-IV	ACF O/L	14-08-2023	07:00	pH	8.4
AZ43673	ETP-IV	ACF O/L	14-08-2023	07:00	Oil & Grease	4
AZ43673	ETP-IV	ACF O/L	14-08-2023	07:00	Sulphides	0.36
AZ43673	ETP-IV	ACF O/L	14-08-2023	07:00	BOD	9.6
AZ43673	ETP-IV	ACF O/L	14-08-2023	07:00	COD	58
AZ43673	ETP-IV	ACF O/L	14-08-2023	07:00	Phenol	0.11
AZ43673	ETP-IV	ACF O/L	14-08-2023	07:00	TSS	4
AZ44267	ETP-IV	ACF O/L	15-08-2023	07:00	pH	7.4
AZ44267	ETP-IV	ACF O/L	15-08-2023	07:00	Oil & Grease	3
AZ44267	ETP-IV	ACF O/L	15-08-2023	07:00	Sulphides	0.24
AZ44267	ETP-IV	ACF O/L	15-08-2023	07:00	BOD	7.9
AZ44267	ETP-IV	ACF O/L	15-08-2023	07:00	COD	48
AZ44267	ETP-IV	ACF O/L	15-08-2023	07:00	Phenol	0.10
AZ44267	ETP-IV	ACF O/L	15-08-2023	07:00	TSS	10
AZ45110	ETP-IV	ACF O/L	16-08-2023	07:00	pH	7.6
AZ45110	ETP-IV	ACF O/L	16-08-2023	07:00	Oil & Grease	4
AZ45110	ETP-IV	ACF O/L	16-08-2023	07:00	Sulphides	0.32
AZ45110	ETP-IV	ACF O/L	16-08-2023	07:00	BOD	8.2
AZ45110	ETP-IV	ACF O/L	16-08-2023	07:00	COD	36
AZ45110	ETP-IV	ACF O/L	16-08-2023	07:00	Phenol	0.12
AZ45110	ETP-IV	ACF O/L	16-08-2023	07:00	TSS	10
AZ45352	ETP-IV	ACF O/L	17-08-2023	07:00	pH	8.0
AZ45352	ETP-IV	ACF O/L	17-08-2023	07:00	Oil & Grease	3
AZ45352	ETP-IV	ACF O/L	17-08-2023	07:00	Sulphides	0.40
AZ45352	ETP-IV	ACF O/L	17-08-2023	07:00	BOD	7.0
AZ45352	ETP-IV	ACF O/L	17-08-2023	07:00	COD	38
AZ45352	ETP-IV	ACF O/L	17-08-2023	07:00	Phenol	0.14

AZ45352	ETP-IV	ACF O/L	17-08-2023	07:00	TSS	9
AZ45893	ETP-IV	ACF O/L	18-08-2023	07:00	pH	7.6
AZ45893	ETP-IV	ACF O/L	18-08-2023	07:00	Oil & Grease	3
AZ45893	ETP-IV	ACF O/L	18-08-2023	07:00	Sulphides	0.24
AZ45893	ETP-IV	ACF O/L	18-08-2023	07:00	BOD	PENDING
AZ45893	ETP-IV	ACF O/L	18-08-2023	07:00	COD	40
AZ45893	ETP-IV	ACF O/L	18-08-2023	07:00	Phenol	0.11
AZ45893	ETP-IV	ACF O/L	18-08-2023	07:00	TSS	8
AZ46409	ETP-IV	ACF O/L	19-08-2023	07:00	pH	7.8
AZ46409	ETP-IV	ACF O/L	19-08-2023	07:00	Oil & Grease	3
AZ46409	ETP-IV	ACF O/L	19-08-2023	07:00	Sulphides	0.24
AZ46409	ETP-IV	ACF O/L	19-08-2023	07:00	BOD	6.5
AZ46409	ETP-IV	ACF O/L	19-08-2023	07:00	COD	36
AZ46409	ETP-IV	ACF O/L	19-08-2023	07:00	Phenol	0.10
AZ46409	ETP-IV	ACF O/L	19-08-2023	07:00	TSS	5
AZ46953	ETP-IV	ACF O/L	20-08-2023	07:00	pH	7.6
AZ46953	ETP-IV	ACF O/L	20-08-2023	07:00	Oil & Grease	3
AZ46953	ETP-IV	ACF O/L	20-08-2023	07:00	Sulphides	0.24
AZ46953	ETP-IV	ACF O/L	20-08-2023	07:00	BOD	6.7
AZ46953	ETP-IV	ACF O/L	20-08-2023	07:00	COD	40
AZ46953	ETP-IV	ACF O/L	20-08-2023	07:00	Phenol	0.11
AZ46953	ETP-IV	ACF O/L	20-08-2023	07:00	TSS	4
AZ47462	ETP-IV	ACF O/L	21-08-2023	07:00	pH	7.6
AZ47462	ETP-IV	ACF O/L	21-08-2023	07:00	Oil & Grease	5
AZ47462	ETP-IV	ACF O/L	21-08-2023	07:00	Sulphides	0.48
AZ47462	ETP-IV	ACF O/L	21-08-2023	07:00	BOD	6.9
AZ47462	ETP-IV	ACF O/L	21-08-2023	07:00	COD	42
AZ47462	ETP-IV	ACF O/L	21-08-2023	07:00	Phenol	0.12
AZ47462	ETP-IV	ACF O/L	21-08-2023	07:00	TSS	8
AZ48024	ETP-IV	ACF O/L	22-08-2023	07:00	pH	7.6
AZ48024	ETP-IV	ACF O/L	22-08-2023	07:00	Oil & Grease	4
AZ48024	ETP-IV	ACF O/L	22-08-2023	07:00	Sulphides	0.32
AZ48024	ETP-IV	ACF O/L	22-08-2023	07:00	BOD	6.6
AZ48024	ETP-IV	ACF O/L	22-08-2023	07:00	COD	40
AZ48024	ETP-IV	ACF O/L	22-08-2023	07:00	Phenol	0.11
AZ48024	ETP-IV	ACF O/L	22-08-2023	07:00	TSS	12
AZ48569	ETP-IV	ACF O/L	23-08-2023	07:00	pH	8.2
AZ48569	ETP-IV	ACF O/L	23-08-2023	07:00	Oil & Grease	3
AZ48569	ETP-IV	ACF O/L	23-08-2023	07:00	Sulphides	0.24
AZ48569	ETP-IV	ACF O/L	23-08-2023	07:00	BOD	7.9
AZ48569	ETP-IV	ACF O/L	23-08-2023	07:00	COD	40
AZ48569	ETP-IV	ACF O/L	23-08-2023	07:00	Phenol	0.12
AZ48569	ETP-IV	ACF O/L	23-08-2023	07:00	TSS	4
AZ49094	ETP-IV	ACF O/L	24-08-2023	07:00	pH	7.4
AZ49094	ETP-IV	ACF O/L	24-08-2023	07:00	Oil & Grease	4
AZ49094	ETP-IV	ACF O/L	24-08-2023	07:00	Sulphides	0.24
AZ49094	ETP-IV	ACF O/L	24-08-2023	07:00	BOD	7.1

AZ49094	ETP-IV	ACF O/L	24-08-2023	07:00	COD	38
AZ49094	ETP-IV	ACF O/L	24-08-2023	07:00	Phenol	0.11
AZ49094	ETP-IV	ACF O/L	24-08-2023	07:00	TSS	6
AZ49655	ETP-IV	ACF O/L	25-08-2023	07:00	pH	7.6
AZ49655	ETP-IV	ACF O/L	25-08-2023	07:00	Oil & Grease	3
AZ49655	ETP-IV	ACF O/L	25-08-2023	07:00	Sulphides	0.24
AZ49655	ETP-IV	ACF O/L	25-08-2023	07:00	BOD	6.7
AZ49655	ETP-IV	ACF O/L	25-08-2023	07:00	COD	36
AZ49655	ETP-IV	ACF O/L	25-08-2023	07:00	Phenol	0.10
AZ49655	ETP-IV	ACF O/L	25-08-2023	07:00	TSS	4
AZ50161	ETP-IV	ACF O/L	26-08-2023	07:00	pH	7.6
AZ50161	ETP-IV	ACF O/L	26-08-2023	07:00	Oil & Grease	4
AZ50161	ETP-IV	ACF O/L	26-08-2023	07:00	Sulphides	0.32
AZ50161	ETP-IV	ACF O/L	26-08-2023	07:00	BOD	6.6
AZ50161	ETP-IV	ACF O/L	26-08-2023	07:00	COD	40
AZ50161	ETP-IV	ACF O/L	26-08-2023	07:00	Phenol	0.13
AZ50161	ETP-IV	ACF O/L	26-08-2023	07:00	TSS	5
AZ50723	ETP-IV	ACF O/L	27-08-2023	07:00	pH	7.8
AZ50723	ETP-IV	ACF O/L	27-08-2023	07:00	Oil & Grease	5
AZ50723	ETP-IV	ACF O/L	27-08-2023	07:00	Sulphides	0.24
AZ50723	ETP-IV	ACF O/L	27-08-2023	07:00	BOD	6.9
AZ50723	ETP-IV	ACF O/L	27-08-2023	07:00	COD	40
AZ50723	ETP-IV	ACF O/L	27-08-2023	07:00	Phenol	0.12
AZ50723	ETP-IV	ACF O/L	27-08-2023	07:00	TSS	4
AZ51256	ETP-IV	ACF O/L	28-08-2023	07:00	pH	7.4
AZ51256	ETP-IV	ACF O/L	28-08-2023	07:00	Oil & Grease	3
AZ51256	ETP-IV	ACF O/L	28-08-2023	07:00	Sulphides	0.24
AZ51256	ETP-IV	ACF O/L	28-08-2023	07:00	BOD	6.3
AZ51256	ETP-IV	ACF O/L	28-08-2023	07:00	COD	35
AZ51256	ETP-IV	ACF O/L	28-08-2023	07:00	Phenol	0.10
AZ51256	ETP-IV	ACF O/L	28-08-2023	07:00	TSS	8
AZ51859	ETP-IV	ACF O/L	29-08-2023	07:00	pH	8.4
AZ51859	ETP-IV	ACF O/L	29-08-2023	07:00	Oil & Grease	3
AZ51859	ETP-IV	ACF O/L	29-08-2023	07:00	Sulphides	0.24
AZ51859	ETP-IV	ACF O/L	29-08-2023	07:00	BOD	7.1
AZ51859	ETP-IV	ACF O/L	29-08-2023	07:00	COD	42
AZ51859	ETP-IV	ACF O/L	29-08-2023	07:00	Phenol	0.13
AZ51859	ETP-IV	ACF O/L	29-08-2023	07:00	TSS	4
AZ52435	ETP-IV	ACF O/L	30-08-2023	07:00	pH	7.8
AZ52435	ETP-IV	ACF O/L	30-08-2023	07:00	Oil & Grease	3
AZ52435	ETP-IV	ACF O/L	30-08-2023	07:00	Sulphides	0.24
AZ52435	ETP-IV	ACF O/L	30-08-2023	07:00	BOD	7.1
AZ52435	ETP-IV	ACF O/L	30-08-2023	07:00	COD	38
AZ52435	ETP-IV	ACF O/L	30-08-2023	07:00	Phenol	0.11
AZ52435	ETP-IV	ACF O/L	30-08-2023	07:00	TSS	5
AZ52962	ETP-IV	ACF O/L	31-08-2023	07:00	pH	8.2
AZ52962	ETP-IV	ACF O/L	31-08-2023	07:00	Oil & Grease	3

AZ52962	ETP-IV	ACF O/L	31-08-2023	07:00	Sulphides	0.24
AZ52962	ETP-IV	ACF O/L	31-08-2023	07:00	BOD	8.2
AZ52962	ETP-IV	ACF O/L	31-08-2023	07:00	COD	42
AZ52962	ETP-IV	ACF O/L	31-08-2023	07:00	Phenol	0.12
AZ52962	ETP-IV	ACF O/L	31-08-2023	07:00	TSS	4
AZ53558	ETP-IV	ACF O/L	01-09-2023	07:00	pH	7.2
AZ53558	ETP-IV	ACF O/L	01-09-2023	07:00	Oil & Grease	4
AZ53558	ETP-IV	ACF O/L	01-09-2023	07:00	Sulphides	0.32
AZ53558	ETP-IV	ACF O/L	01-09-2023	07:00	BOD	6.4
AZ53558	ETP-IV	ACF O/L	01-09-2023	07:00	COD	32
AZ53558	ETP-IV	ACF O/L	01-09-2023	07:00	Phenol	0.12
AZ53558	ETP-IV	ACF O/L	01-09-2023	07:00	TSS	8
AZ54193	ETP-IV	ACF O/L	02-09-2023	07:00	pH	7.6
AZ54193	ETP-IV	ACF O/L	02-09-2023	07:00	Oil & Grease	3
AZ54193	ETP-IV	ACF O/L	02-09-2023	07:00	Sulphides	0.24
AZ54193	ETP-IV	ACF O/L	02-09-2023	07:00	BOD	10.0
AZ54193	ETP-IV	ACF O/L	02-09-2023	07:00	COD	58
AZ54193	ETP-IV	ACF O/L	02-09-2023	07:00	Phenol	0.10
AZ54193	ETP-IV	ACF O/L	02-09-2023	07:00	TSS	5
AZ54763	ETP-IV	ACF O/L	03-09-2023	07:00	pH	7.4
AZ54763	ETP-IV	ACF O/L	03-09-2023	07:00	Oil & Grease	5
AZ54763	ETP-IV	ACF O/L	03-09-2023	07:00	Sulphides	0.40
AZ54763	ETP-IV	ACF O/L	03-09-2023	07:00	BOD	8.3
AZ54763	ETP-IV	ACF O/L	03-09-2023	07:00	COD	51
AZ54763	ETP-IV	ACF O/L	03-09-2023	07:00	Phenol	0.12
AZ54763	ETP-IV	ACF O/L	03-09-2023	07:00	TSS	10
AZ55275	ETP-IV	ACF O/L	04-09-2023	07:00	pH	8.6
AZ55275	ETP-IV	ACF O/L	04-09-2023	07:00	Oil & Grease	4
AZ55275	ETP-IV	ACF O/L	04-09-2023	07:00	Sulphides	0.4
AZ55275	ETP-IV	ACF O/L	04-09-2023	07:00	BOD	8.7
AZ55275	ETP-IV	ACF O/L	04-09-2023	07:00	COD	48
AZ55275	ETP-IV	ACF O/L	04-09-2023	07:00	Phenol	0.11
AZ55275	ETP-IV	ACF O/L	04-09-2023	07:00	TSS	5
AZ55771	ETP-IV	ACF O/L	04-09-2023	21:30	pH	7.6
AZ55921	ETP-IV	ACF O/L	05-09-2023	07:00	pH	8.0
AZ55921	ETP-IV	ACF O/L	05-09-2023	07:00	Oil & Grease	4
AZ55921	ETP-IV	ACF O/L	05-09-2023	07:00	Sulphides	0.24
AZ55921	ETP-IV	ACF O/L	05-09-2023	07:00	BOD	7.5
AZ55921	ETP-IV	ACF O/L	05-09-2023	07:00	COD	42
AZ55921	ETP-IV	ACF O/L	05-09-2023	07:00	Phenol	0.12
AZ55921	ETP-IV	ACF O/L	05-09-2023	07:00	TSS	3
AZ56488	ETP-IV	ACF O/L	06-09-2023	07:00	pH	7.6
AZ56488	ETP-IV	ACF O/L	06-09-2023	07:00	Oil & Grease	3
AZ56488	ETP-IV	ACF O/L	06-09-2023	07:00	Sulphides	0.24
AZ56488	ETP-IV	ACF O/L	06-09-2023	07:00	BOD	6.6
AZ56488	ETP-IV	ACF O/L	06-09-2023	07:00	COD	40
AZ56488	ETP-IV	ACF O/L	06-09-2023	07:00	Phenol	0.10

AZ56488	ETP-IV	ACF O/L	06-09-2023	07:00	TSS	10
AZ57032	ETP-IV	ACF O/L	07-09-2023	07:00	pH	8.0
AZ57032	ETP-IV	ACF O/L	07-09-2023	07:00	Oil & Grease	4
AZ57032	ETP-IV	ACF O/L	07-09-2023	07:00	Sulphides	0.24
AZ57032	ETP-IV	ACF O/L	07-09-2023	07:00	BOD	6.8
AZ57032	ETP-IV	ACF O/L	07-09-2023	07:00	COD	42
AZ57032	ETP-IV	ACF O/L	07-09-2023	07:00	Phenol	0.13
AZ57032	ETP-IV	ACF O/L	07-09-2023	07:00	TSS	2
AZ57594	ETP-IV	ACF O/L	08-09-2023	07:00	pH	7.8
AZ57594	ETP-IV	ACF O/L	08-09-2023	07:00	Oil & Grease	3
AZ57594	ETP-IV	ACF O/L	08-09-2023	07:00	Sulphides	0.24
AZ57594	ETP-IV	ACF O/L	08-09-2023	07:00	BOD	8.2
AZ57594	ETP-IV	ACF O/L	08-09-2023	07:00	COD	40
AZ57594	ETP-IV	ACF O/L	08-09-2023	07:00	Phenol	0.12
AZ57594	ETP-IV	ACF O/L	08-09-2023	07:00	TSS	3
AZ58115	ETP-IV	ACF O/L	09-09-2023	07:00	pH	7.6
AZ58115	ETP-IV	ACF O/L	09-09-2023	07:00	Oil & Grease	3
AZ58115	ETP-IV	ACF O/L	09-09-2023	07:00	Sulphides	0.24
AZ58115	ETP-IV	ACF O/L	09-09-2023	07:00	BOD	6.9
AZ58115	ETP-IV	ACF O/L	09-09-2023	07:00	COD	36
AZ58115	ETP-IV	ACF O/L	09-09-2023	07:00	Phenol	0.10
AZ58115	ETP-IV	ACF O/L	09-09-2023	07:00	TSS	5
AZ58890	ETP-IV	ACF O/L	10-09-2023	07:00	pH	7.6
AZ58890	ETP-IV	ACF O/L	10-09-2023	07:00	Oil & Grease	3
AZ58890	ETP-IV	ACF O/L	10-09-2023	07:00	TSS	4
AZ58890	ETP-IV	ACF O/L	10-09-2023	07:00	Sulphides	0.24
AZ58890	ETP-IV	ACF O/L	10-09-2023	07:00	BOD	6.0
AZ58890	ETP-IV	ACF O/L	10-09-2023	07:00	COD	36
AZ58890	ETP-IV	ACF O/L	10-09-2023	07:00	Phenol	0.12
AZ59242	ETP-IV	ACF O/L	11-09-2023	07:00	pH	7.8
AZ59242	ETP-IV	ACF O/L	11-09-2023	07:00	Oil & Grease	4
AZ59242	ETP-IV	ACF O/L	11-09-2023	07:00	Sulphides	0.56
AZ59242	ETP-IV	ACF O/L	11-09-2023	07:00	BOD	6.67
AZ59242	ETP-IV	ACF O/L	11-09-2023	07:00	COD	48
AZ59242	ETP-IV	ACF O/L	11-09-2023	07:00	Phenol	0.12
AZ59242	ETP-IV	ACF O/L	11-09-2023	07:00	TSS	4
AZ59681	ETP-IV	ACF O/L	11-09-2023	20:30	Sulphides	0.48
AZ59873	ETP-IV	ACF O/L	12-09-2023	07:00	pH	7.6
AZ59873	ETP-IV	ACF O/L	12-09-2023	07:00	Oil & Grease	4
AZ59873	ETP-IV	ACF O/L	12-09-2023	07:00	Sulphides	0.64
AZ59873	ETP-IV	ACF O/L	12-09-2023	07:00	BOD	6.4
AZ59873	ETP-IV	ACF O/L	12-09-2023	07:00	COD	40
AZ59873	ETP-IV	ACF O/L	12-09-2023	07:00	Phenol	0.11
AZ59873	ETP-IV	ACF O/L	12-09-2023	07:00	TSS	10
AZ60251	ETP-IV	ACF O/L	12-09-2023	19:00	Sulphides	0.40
AZ60414	ETP-IV	ACF O/L	13-09-2023	07:00	pH	7.6
AZ60414	ETP-IV	ACF O/L	13-09-2023	07:00	Oil & Grease	4

AZ60414	ETP-IV	ACF O/L	13-09-2023	07:00	Sulphides	0.16
AZ60414	ETP-IV	ACF O/L	13-09-2023	07:00	BOD	6.4
AZ60414	ETP-IV	ACF O/L	13-09-2023	07:00	COD	42
AZ60414	ETP-IV	ACF O/L	13-09-2023	07:00	Phenol	0.10
AZ60414	ETP-IV	ACF O/L	13-09-2023	07:00	TSS	8
AZ60932	ETP-IV	ACF O/L	14-09-2023	07:00	pH	7.6
AZ60932	ETP-IV	ACF O/L	14-09-2023	07:00	Oil & Grease	4
AZ60932	ETP-IV	ACF O/L	14-09-2023	07:00	Sulphides	0.32
AZ60932	ETP-IV	ACF O/L	14-09-2023	07:00	BOD	8.2
AZ60932	ETP-IV	ACF O/L	14-09-2023	07:00	COD	48
AZ60932	ETP-IV	ACF O/L	14-09-2023	07:00	Phenol	0.11
AZ60932	ETP-IV	ACF O/L	14-09-2023	07:00	TSS	4
AZ61485	ETP-IV	ACF O/L	15-09-2023	07:00	pH	7.6
AZ61485	ETP-IV	ACF O/L	15-09-2023	07:00	Oil & Grease	3
AZ61485	ETP-IV	ACF O/L	15-09-2023	07:00	Sulphides	0.24
AZ61485	ETP-IV	ACF O/L	15-09-2023	07:00	BOD	7.3
AZ61485	ETP-IV	ACF O/L	15-09-2023	07:00	COD	40
AZ61485	ETP-IV	ACF O/L	15-09-2023	07:00	Phenol	0.12
AZ61485	ETP-IV	ACF O/L	15-09-2023	07:00	TSS	4
AZ62041	ETP-IV	ACF O/L	16-09-2023	07:00	pH	7.6
AZ62041	ETP-IV	ACF O/L	16-09-2023	07:00	Oil & Grease	3
AZ62041	ETP-IV	ACF O/L	16-09-2023	07:00	Sulphides	0.24
AZ62041	ETP-IV	ACF O/L	16-09-2023	07:00	BOD	7.0
AZ62041	ETP-IV	ACF O/L	16-09-2023	07:00	COD	38
AZ62041	ETP-IV	ACF O/L	16-09-2023	07:00	Phenol	0.12
AZ62041	ETP-IV	ACF O/L	16-09-2023	07:00	TSS	6
AZ62644	ETP-IV	ACF O/L	17-09-2023	07:00	pH	8.2
AZ62644	ETP-IV	ACF O/L	17-09-2023	07:00	Oil & Grease	4
AZ62644	ETP-IV	ACF O/L	17-09-2023	07:00	Sulphides	0.24
AZ62644	ETP-IV	ACF O/L	17-09-2023	07:00	BOD	6.1
AZ62644	ETP-IV	ACF O/L	17-09-2023	07:00	COD	36
AZ62644	ETP-IV	ACF O/L	17-09-2023	07:00	Phenol	0.11
AZ62644	ETP-IV	ACF O/L	17-09-2023	07:00	TSS	5
AZ63176	ETP-IV	ACF O/L	18-09-2023	07:00	pH	7.8
AZ63176	ETP-IV	ACF O/L	18-09-2023	07:00	Oil & Grease	5
AZ63176	ETP-IV	ACF O/L	18-09-2023	07:00	Sulphides	1.2
AZ63176	ETP-IV	ACF O/L	18-09-2023	07:00	BOD	6.7
AZ63176	ETP-IV	ACF O/L	18-09-2023	07:00	COD	40
AZ63176	ETP-IV	ACF O/L	18-09-2023	07:00	Phenol	0.12
AZ63176	ETP-IV	ACF O/L	18-09-2023	07:00	TSS	8
AZ63783	ETP-IV	ACF O/L	19-09-2023	07:00	pH	8.0
AZ63783	ETP-IV	ACF O/L	19-09-2023	07:00	Oil & Grease	4
AZ63783	ETP-IV	ACF O/L	19-09-2023	07:00	Sulphides	0.24
AZ63783	ETP-IV	ACF O/L	19-09-2023	07:00	BOD	8.4
AZ63783	ETP-IV	ACF O/L	19-09-2023	07:00	COD	50
AZ63783	ETP-IV	ACF O/L	19-09-2023	07:00	Phenol	0.13
AZ63783	ETP-IV	ACF O/L	19-09-2023	07:00	TSS	7

AZ63807	ETP-IV	ACF O/L	18-09-2023	23:00	Sulphides	0.24
AZ64343	ETP-IV	ACF O/L	20-09-2023	07:00	pH	7.2
AZ64343	ETP-IV	ACF O/L	20-09-2023	07:00	Oil & Grease	4
AZ64343	ETP-IV	ACF O/L	20-09-2023	07:00	Sulphides	0.40
AZ64343	ETP-IV	ACF O/L	20-09-2023	07:00	BOD	6.6
AZ64343	ETP-IV	ACF O/L	20-09-2023	07:00	COD	40
AZ64343	ETP-IV	ACF O/L	20-09-2023	07:00	Phenol	0.12
AZ64343	ETP-IV	ACF O/L	20-09-2023	07:00	TSS	4
AZ64855	ETP-IV	ACF O/L	21-09-2023	07:00	pH	7.8
AZ64855	ETP-IV	ACF O/L	21-09-2023	07:00	Oil & Grease	3
AZ64855	ETP-IV	ACF O/L	21-09-2023	07:00	Sulphides	0.48
AZ64855	ETP-IV	ACF O/L	21-09-2023	07:00	BOD	6.9
AZ64855	ETP-IV	ACF O/L	21-09-2023	07:00	COD	42
AZ64855	ETP-IV	ACF O/L	21-09-2023	07:00	Phenol	0.12
AZ64855	ETP-IV	ACF O/L	21-09-2023	07:00	TSS	9
AZ65445	ETP-IV	ACF O/L	22-09-2023	07:00	pH	7.8
AZ65445	ETP-IV	ACF O/L	22-09-2023	07:00	Oil & Grease	5
AZ65445	ETP-IV	ACF O/L	22-09-2023	07:00	Sulphides	0.16
AZ65445	ETP-IV	ACF O/L	22-09-2023	07:00	BOD	7.9
AZ65445	ETP-IV	ACF O/L	22-09-2023	07:00	COD	48
AZ65445	ETP-IV	ACF O/L	22-09-2023	07:00	Phenol	0.18
AZ65445	ETP-IV	ACF O/L	22-09-2023	07:00	TSS	6
AZ66029	ETP-IV	ACF O/L	23-09-2023	07:00	pH	7.6
AZ66029	ETP-IV	ACF O/L	23-09-2023	07:00	Oil & Grease	5
AZ66029	ETP-IV	ACF O/L	23-09-2023	07:00	Sulphides	0.24
AZ66029	ETP-IV	ACF O/L	23-09-2023	07:00	BOD	8.7
AZ66029	ETP-IV	ACF O/L	23-09-2023	07:00	COD	52
AZ66029	ETP-IV	ACF O/L	23-09-2023	07:00	Phenol	0.14
AZ66029	ETP-IV	ACF O/L	23-09-2023	07:00	TSS	6
AZ66565	ETP-IV	ACF O/L	24-09-2023	07:00	pH	8.0
AZ66565	ETP-IV	ACF O/L	24-09-2023	07:00	Oil & Grease	3
AZ66565	ETP-IV	ACF O/L	24-09-2023	07:00	Sulphides	0.24
AZ66565	ETP-IV	ACF O/L	24-09-2023	07:00	BOD	6.3
AZ66565	ETP-IV	ACF O/L	24-09-2023	07:00	COD	38
AZ66565	ETP-IV	ACF O/L	24-09-2023	07:00	Phenol	0.10
AZ66565	ETP-IV	ACF O/L	24-09-2023	07:00	TSS	4
AZ67085	ETP-IV	ACF O/L	25-09-2023	07:00	pH	7.8
AZ67085	ETP-IV	ACF O/L	25-09-2023	07:00	Oil & Grease	4
AZ67085	ETP-IV	ACF O/L	25-09-2023	07:00	Sulphides	0.24
AZ67085	ETP-IV	ACF O/L	25-09-2023	07:00	BOD	6.5
AZ67085	ETP-IV	ACF O/L	25-09-2023	07:00	COD	48
AZ67085	ETP-IV	ACF O/L	25-09-2023	07:00	Phenol	0.12
AZ67085	ETP-IV	ACF O/L	25-09-2023	07:00	TSS	10
AZ67691	ETP-IV	ACF O/L	26-09-2023	07:00	pH	8.0
AZ67691	ETP-IV	ACF O/L	26-09-2023	07:00	Oil & Grease	8
AZ67691	ETP-IV	ACF O/L	26-09-2023	07:00	Sulphides	0.32
AZ67691	ETP-IV	ACF O/L	26-09-2023	07:00	BOD	10.4

AZ67691	ETP-IV	ACF O/L	26-09-2023	07:00	COD	60
AZ67691	ETP-IV	ACF O/L	26-09-2023	07:00	Phenol	0.14
AZ67691	ETP-IV	ACF O/L	26-09-2023	07:00	TSS	14
AZ68096	ETP-IV	ACF O/L	26-09-2023	22:00	Oil & Grease	3
AZ68271	ETP-IV	ACF O/L	27-09-2023	07:00	pH	7.8
AZ68271	ETP-IV	ACF O/L	27-09-2023	07:00	Oil & Grease	5
AZ68271	ETP-IV	ACF O/L	27-09-2023	07:00	Sulphides	0.24
AZ68271	ETP-IV	ACF O/L	27-09-2023	07:00	BOD	6.7
AZ68271	ETP-IV	ACF O/L	27-09-2023	07:00	COD	40
AZ68271	ETP-IV	ACF O/L	27-09-2023	07:00	Phenol	0.12
AZ68271	ETP-IV	ACF O/L	27-09-2023	07:00	TSS	4
AZ68796	ETP-IV	ACF O/L	28-09-2023	07:00	pH	7.0
AZ68796	ETP-IV	ACF O/L	28-09-2023	07:00	Oil & Grease	4
AZ68796	ETP-IV	ACF O/L	28-09-2023	07:00	Sulphides	0.32
AZ68796	ETP-IV	ACF O/L	28-09-2023	07:00	BOD	6.6
AZ68796	ETP-IV	ACF O/L	28-09-2023	07:00	COD	40
AZ68796	ETP-IV	ACF O/L	28-09-2023	07:00	Phenol	0.13
AZ68796	ETP-IV	ACF O/L	28-09-2023	07:00	TSS	4
AZ69566	ETP-IV	ACF O/L	29-09-2023	07:00	pH	7.8
AZ69566	ETP-IV	ACF O/L	29-09-2023	07:00	Oil & Grease	4
AZ69566	ETP-IV	ACF O/L	29-09-2023	07:00	TSS	8
AZ69566	ETP-IV	ACF O/L	29-09-2023	07:00	Sulphides	0.24
AZ69566	ETP-IV	ACF O/L	29-09-2023	07:00	BOD	9.6
AZ69566	ETP-IV	ACF O/L	29-09-2023	07:00	COD	58
AZ69566	ETP-IV	ACF O/L	29-09-2023	07:00	Phenol	0.16
AZ69943	ETP-IV	ACF O/L	30-09-2023	07:00	pH	7.6
AZ69943	ETP-IV	ACF O/L	30-09-2023	07:00	Oil & Grease	4
AZ69943	ETP-IV	ACF O/L	30-09-2023	07:00	Sulphides	0.32
AZ69943	ETP-IV	ACF O/L	30-09-2023	07:00	BOD	8.3
AZ69943	ETP-IV	ACF O/L	30-09-2023	07:00	COD	40
AZ69943	ETP-IV	ACF O/L	30-09-2023	07:00	Phenol	0.12
AZ69943	ETP-IV	ACF O/L	30-09-2023	07:00	TSS	8
AZ70475	ETP-IV	ACF O/L	01-10-2023	07:00	pH	8.4
AZ70475	ETP-IV	ACF O/L	01-10-2023	07:00	Oil & Grease	4
AZ70475	ETP-IV	ACF O/L	01-10-2023	07:00	Sulphides	0.24
AZ70475	ETP-IV	ACF O/L	01-10-2023	07:00	BOD	10.1
AZ70475	ETP-IV	ACF O/L	01-10-2023	07:00	COD	58
AZ70475	ETP-IV	ACF O/L	01-10-2023	07:00	Phenol	0.12
AZ70475	ETP-IV	ACF O/L	01-10-2023	07:00	TSS	8
AZ71109	ETP-IV	ACF O/L	02-10-2023	07:00	pH	7.4
AZ71109	ETP-IV	ACF O/L	02-10-2023	07:00	Oil & Grease	2
AZ71109	ETP-IV	ACF O/L	02-10-2023	07:00	Sulphides	0.16
AZ71109	ETP-IV	ACF O/L	02-10-2023	07:00	BOD	8.4
AZ71109	ETP-IV	ACF O/L	02-10-2023	07:00	COD	46
AZ71109	ETP-IV	ACF O/L	02-10-2023	07:00	Phenol	0.10
AZ71109	ETP-IV	ACF O/L	02-10-2023	07:00	TSS	6
AZ71756	ETP-IV	ACF O/L	03-10-2023	07:00	pH	7.4

AZ71756	ETP-IV	ACF O/L	03-10-2023	07:00	Oil & Grease	2
AZ71756	ETP-IV	ACF O/L	03-10-2023	07:00	Sulphides	0.16
AZ71756	ETP-IV	ACF O/L	03-10-2023	07:00	BOD	7.3
AZ71756	ETP-IV	ACF O/L	03-10-2023	07:00	COD	44
AZ71756	ETP-IV	ACF O/L	03-10-2023	07:00	Phenol	0.12
AZ71756	ETP-IV	ACF O/L	03-10-2023	07:00	TSS	8
AZ72336	ETP-IV	ACF O/L	04-10-2023	07:00	pH	7.6
AZ72336	ETP-IV	ACF O/L	04-10-2023	07:00	Oil & Grease	4
AZ72336	ETP-IV	ACF O/L	04-10-2023	07:00	Sulphides	0.32
AZ72336	ETP-IV	ACF O/L	04-10-2023	07:00	BOD	7.8
AZ72336	ETP-IV	ACF O/L	04-10-2023	07:00	COD	40
AZ72336	ETP-IV	ACF O/L	04-10-2023	07:00	Phenol	0.11
AZ72336	ETP-IV	ACF O/L	04-10-2023	07:00	TSS	10
AZ72902	ETP-IV	ACF O/L	05-10-2023	07:00	pH	8.0
AZ72902	ETP-IV	ACF O/L	05-10-2023	07:00	Oil & Grease	4
AZ72902	ETP-IV	ACF O/L	05-10-2023	07:00	Sulphides	0.24
AZ72902	ETP-IV	ACF O/L	05-10-2023	07:00	BOD	8.0
AZ72902	ETP-IV	ACF O/L	05-10-2023	07:00	COD	48
AZ72902	ETP-IV	ACF O/L	05-10-2023	07:00	Phenol	0.14
AZ72902	ETP-IV	ACF O/L	05-10-2023	07:00	TSS	10
AZ73544	ETP-IV	ACF O/L	06-10-2023	07:00	pH	7.8
AZ73544	ETP-IV	ACF O/L	06-10-2023	07:00	Oil & Grease	4
AZ73544	ETP-IV	ACF O/L	06-10-2023	07:00	Sulphides	0.32
AZ73544	ETP-IV	ACF O/L	06-10-2023	07:00	BOD	6.7
AZ73544	ETP-IV	ACF O/L	06-10-2023	07:00	COD	40
AZ73544	ETP-IV	ACF O/L	06-10-2023	07:00	Phenol	0.14
AZ73544	ETP-IV	ACF O/L	06-10-2023	07:00	TSS	8
AZ74187	ETP-IV	ACF O/L	07-10-2023	07:00	pH	8.0
AZ74187	ETP-IV	ACF O/L	07-10-2023	07:00	Oil & Grease	5
AZ74187	ETP-IV	ACF O/L	07-10-2023	07:00	Sulphides	0.16
AZ74187	ETP-IV	ACF O/L	07-10-2023	07:00	BOD	8.2
AZ74187	ETP-IV	ACF O/L	07-10-2023	07:00	COD	48
AZ74187	ETP-IV	ACF O/L	07-10-2023	07:00	Phenol	0.12
AZ74187	ETP-IV	ACF O/L	07-10-2023	07:00	TSS	4
AZ74786	ETP-IV	ACF O/L	08-10-2023	07:00	pH	7.8
AZ74786	ETP-IV	ACF O/L	08-10-2023	07:00	Oil & Grease	4
AZ74786	ETP-IV	ACF O/L	08-10-2023	07:00	Sulphides	0.16
AZ74786	ETP-IV	ACF O/L	08-10-2023	07:00	BOD	7.9
AZ74786	ETP-IV	ACF O/L	08-10-2023	07:00	COD	46
AZ74786	ETP-IV	ACF O/L	08-10-2023	07:00	Phenol	0.14
AZ74786	ETP-IV	ACF O/L	08-10-2023	07:00	TSS	3
AZ75349	ETP-IV	ACF O/L	09-10-2023	07:00	pH	7.4
AZ75349	ETP-IV	ACF O/L	09-10-2023	07:00	Oil & Grease	5
AZ75349	ETP-IV	ACF O/L	09-10-2023	07:00	Sulphides	0.48
AZ75349	ETP-IV	ACF O/L	09-10-2023	07:00	BOD	5.8
AZ75349	ETP-IV	ACF O/L	09-10-2023	07:00	COD	32
AZ75349	ETP-IV	ACF O/L	09-10-2023	07:00	Phenol	0.12

AZ75349	ETP-IV	ACF O/L	09-10-2023	07:00	TSS	12
AZ75962	ETP-IV	ACF O/L	10-10-2023	07:00	pH	8.0
AZ75962	ETP-IV	ACF O/L	10-10-2023	07:00	Oil & Grease	4
AZ75962	ETP-IV	ACF O/L	10-10-2023	07:00	Sulphides	0.24
AZ75962	ETP-IV	ACF O/L	10-10-2023	07:00	BOD	6.9
AZ75962	ETP-IV	ACF O/L	10-10-2023	07:00	COD	42
AZ75962	ETP-IV	ACF O/L	10-10-2023	07:00	Phenol	0.10
AZ75962	ETP-IV	ACF O/L	10-10-2023	07:00	TSS	8
AZ76515	ETP-IV	ACF O/L	11-10-2023	07:00	pH	7.8
AZ76515	ETP-IV	ACF O/L	11-10-2023	07:00	Oil & Grease	5
AZ76515	ETP-IV	ACF O/L	11-10-2023	07:00	Sulphides	0.48
AZ76515	ETP-IV	ACF O/L	11-10-2023	07:00	BOD	8.3
AZ76515	ETP-IV	ACF O/L	11-10-2023	07:00	COD	48
AZ76515	ETP-IV	ACF O/L	11-10-2023	07:00	Phenol	0.11
AZ76515	ETP-IV	ACF O/L	11-10-2023	07:00	TSS	4
AZ77033	ETP-IV	ACF O/L	12-10-2023	07:00	pH	8.0
AZ77033	ETP-IV	ACF O/L	12-10-2023	07:00	Oil & Grease	5
AZ77033	ETP-IV	ACF O/L	12-10-2023	07:00	Sulphides	0.32
AZ77033	ETP-IV	ACF O/L	12-10-2023	07:00	BOD	9.2
AZ77033	ETP-IV	ACF O/L	12-10-2023	07:00	COD	52
AZ77033	ETP-IV	ACF O/L	12-10-2023	07:00	Phenol	0.17
AZ77033	ETP-IV	ACF O/L	12-10-2023	07:00	TSS	6
AZ77597	ETP-IV	ACF O/L	13-10-2023	07:00	pH	8.2
AZ77597	ETP-IV	ACF O/L	13-10-2023	07:00	Oil & Grease	4
AZ77597	ETP-IV	ACF O/L	13-10-2023	07:00	Sulphides	0.32
AZ77597	ETP-IV	ACF O/L	13-10-2023	07:00	BOD	8.5
AZ77597	ETP-IV	ACF O/L	13-10-2023	07:00	COD	52
AZ77597	ETP-IV	ACF O/L	13-10-2023	07:00	Phenol	0.14
AZ77597	ETP-IV	ACF O/L	13-10-2023	07:00	TSS	10
AZ78128	ETP-IV	ACF O/L	14-10-2023	07:00	pH	8.0
AZ78128	ETP-IV	ACF O/L	14-10-2023	07:00	Oil & Grease	4
AZ78128	ETP-IV	ACF O/L	14-10-2023	07:00	Sulphides	0.40
AZ78128	ETP-IV	ACF O/L	14-10-2023	07:00	BOD	6.6
AZ78128	ETP-IV	ACF O/L	14-10-2023	07:00	COD	40
AZ78128	ETP-IV	ACF O/L	14-10-2023	07:00	Phenol	0.13
AZ78128	ETP-IV	ACF O/L	14-10-2023	07:00	TSS	6
AZ78668	ETP-IV	ACF O/L	15-10-2023	07:00	pH	7.4
AZ78668	ETP-IV	ACF O/L	15-10-2023	07:00	Oil & Grease	3
AZ78668	ETP-IV	ACF O/L	15-10-2023	07:00	Sulphides	0.32
AZ78668	ETP-IV	ACF O/L	15-10-2023	07:00	BOD	6.9
AZ78668	ETP-IV	ACF O/L	15-10-2023	07:00	COD	40
AZ78668	ETP-IV	ACF O/L	15-10-2023	07:00	Phenol	0.12
AZ78668	ETP-IV	ACF O/L	15-10-2023	07:00	TSS	6
AZ79178	ETP-IV	ACF O/L	16-10-2023	07:00	pH	8.0
AZ79178	ETP-IV	ACF O/L	16-10-2023	07:00	Oil & Grease	4
AZ79178	ETP-IV	ACF O/L	16-10-2023	07:00	Sulphides	0.32
AZ79178	ETP-IV	ACF O/L	16-10-2023	07:00	BOD	8.1

AZ79178	ETP-IV	ACF O/L	16-10-2023	07:00	COD	44
AZ79178	ETP-IV	ACF O/L	16-10-2023	07:00	Phenol	0.10
AZ79178	ETP-IV	ACF O/L	16-10-2023	07:00	TSS	6
AZ79957	ETP-IV	ACF O/L	17-10-2023	07:00	pH	8.0
AZ79957	ETP-IV	ACF O/L	17-10-2023	07:00	Oil & Grease	3
AZ79957	ETP-IV	ACF O/L	17-10-2023	07:00	TSS	4
AZ79957	ETP-IV	ACF O/L	17-10-2023	07:00	Sulphides	0.24
AZ79957	ETP-IV	ACF O/L	17-10-2023	07:00	BOD	9.3
AZ79957	ETP-IV	ACF O/L	17-10-2023	07:00	COD	48
AZ79957	ETP-IV	ACF O/L	17-10-2023	07:00	Phenol	0.10
AZ80303	ETP-IV	ACF O/L	18-10-2023	07:00	pH	7.6
AZ80303	ETP-IV	ACF O/L	18-10-2023	07:00	Oil & Grease	2
AZ80303	ETP-IV	ACF O/L	18-10-2023	07:00	Sulphides	0.24
AZ80303	ETP-IV	ACF O/L	18-10-2023	07:00	BOD	7.9
AZ80303	ETP-IV	ACF O/L	18-10-2023	07:00	COD	40
AZ80303	ETP-IV	ACF O/L	18-10-2023	07:00	Phenol	0.10
AZ80303	ETP-IV	ACF O/L	18-10-2023	07:00	TSS	20
AZ80768	ETP-IV	ACF O/L	19-10-2023	07:00	pH	8.4
AZ80768	ETP-IV	ACF O/L	19-10-2023	07:00	Oil & Grease	3
AZ80768	ETP-IV	ACF O/L	19-10-2023	07:00	Sulphides	0.32
AZ80768	ETP-IV	ACF O/L	19-10-2023	07:00	BOD	8.7
AZ80768	ETP-IV	ACF O/L	19-10-2023	07:00	COD	52
AZ80768	ETP-IV	ACF O/L	19-10-2023	07:00	Phenol	0.11
AZ80768	ETP-IV	ACF O/L	19-10-2023	07:00	TSS	16
AZ80768	ETP-IV	ACF O/L	19-10-2023	07:00	TSS	16
AZ81254	ETP-IV	ACF O/L	20-10-2023	07:00	pH	8.0
AZ81254	ETP-IV	ACF O/L	20-10-2023	07:00	Oil & Grease	2
AZ81254	ETP-IV	ACF O/L	20-10-2023	07:00	Sulphides	0.48
AZ81254	ETP-IV	ACF O/L	20-10-2023	07:00	BOD	8.0
AZ81254	ETP-IV	ACF O/L	20-10-2023	07:00	COD	40
AZ81254	ETP-IV	ACF O/L	20-10-2023	07:00	Phenol	0.10
AZ81254	ETP-IV	ACF O/L	20-10-2023	07:00	TSS	15
AZ81715	ETP-IV	ACF O/L	21-10-2023	07:00	pH	7.8
AZ81715	ETP-IV	ACF O/L	21-10-2023	07:00	Oil & Grease	2
AZ81715	ETP-IV	ACF O/L	21-10-2023	07:00	Sulphides	0.32
AZ81715	ETP-IV	ACF O/L	21-10-2023	07:00	BOD	8.1
AZ81715	ETP-IV	ACF O/L	21-10-2023	07:00	COD	42
AZ81715	ETP-IV	ACF O/L	21-10-2023	07:00	Phenol	0.10
AZ81715	ETP-IV	ACF O/L	21-10-2023	07:00	TSS	3
AZ82188	ETP-IV	ACF O/L	22-10-2023	07:00	pH	7.8
AZ82188	ETP-IV	ACF O/L	22-10-2023	07:00	Oil & Grease	3
AZ82188	ETP-IV	ACF O/L	22-10-2023	07:00	Sulphides	0.40
AZ82188	ETP-IV	ACF O/L	22-10-2023	07:00	BOD	7.0
AZ82188	ETP-IV	ACF O/L	22-10-2023	07:00	COD	48
AZ82188	ETP-IV	ACF O/L	22-10-2023	07:00	Phenol	0.11
AZ82188	ETP-IV	ACF O/L	22-10-2023	07:00	TSS	6
AZ82678	ETP-IV	ACF O/L	23-10-2023	07:00	pH	7.2

AZ82678	ETP-IV	ACF O/L	23-10-2023	07:00	Oil & Grease	3
AZ82678	ETP-IV	ACF O/L	23-10-2023	07:00	Sulphides	0.60
AZ82678	ETP-IV	ACF O/L	23-10-2023	07:00	BOD	7.5
AZ82678	ETP-IV	ACF O/L	23-10-2023	07:00	COD	45
AZ82678	ETP-IV	ACF O/L	23-10-2023	07:00	Phenol	0.14
AZ82678	ETP-IV	ACF O/L	23-10-2023	07:00	TSS	12
AZ83231	ETP-IV	ACF O/L	24-10-2023	07:00	pH	7.6
AZ83231	ETP-IV	ACF O/L	24-10-2023	07:00	Oil & Grease	3
AZ83231	ETP-IV	ACF O/L	24-10-2023	07:00	Sulphides	0.16
AZ83231	ETP-IV	ACF O/L	24-10-2023	07:00	BOD	8.4
AZ83231	ETP-IV	ACF O/L	24-10-2023	07:00	COD	40
AZ83231	ETP-IV	ACF O/L	24-10-2023	07:00	Phenol	0.12
AZ83231	ETP-IV	ACF O/L	24-10-2023	07:00	TSS	8
AZ83693	ETP-IV	ACF O/L	25-10-2023	07:00	pH	7.8
AZ83693	ETP-IV	ACF O/L	25-10-2023	07:00	Oil & Grease	2
AZ83693	ETP-IV	ACF O/L	25-10-2023	07:00	Sulphides	0.32
AZ83693	ETP-IV	ACF O/L	25-10-2023	07:00	BOD	6.8
AZ83693	ETP-IV	ACF O/L	25-10-2023	07:00	COD	32
AZ83693	ETP-IV	ACF O/L	25-10-2023	07:00	Phenol	0.12
AZ83693	ETP-IV	ACF O/L	25-10-2023	07:00	TSS	6
AZ84131	ETP-IV	ACF O/L	26-10-2023	07:00	pH	8.4
AZ84131	ETP-IV	ACF O/L	26-10-2023	07:00	Oil & Grease	4
AZ84131	ETP-IV	ACF O/L	26-10-2023	07:00	Sulphides	0.32
AZ84131	ETP-IV	ACF O/L	26-10-2023	07:00	BOD	7.2
AZ84131	ETP-IV	ACF O/L	26-10-2023	07:00	COD	44
AZ84131	ETP-IV	ACF O/L	26-10-2023	07:00	Phenol	0.16
AZ84131	ETP-IV	ACF O/L	26-10-2023	07:00	TSS	15
AZ84605	ETP-IV	ACF O/L	27-10-2023	07:00	pH	7.8
AZ84605	ETP-IV	ACF O/L	27-10-2023	07:00	Oil & Grease	4
AZ84605	ETP-IV	ACF O/L	27-10-2023	07:00	Sulphides	0.32
AZ84605	ETP-IV	ACF O/L	27-10-2023	07:00	BOD	6.7
AZ84605	ETP-IV	ACF O/L	27-10-2023	07:00	COD	40
AZ84605	ETP-IV	ACF O/L	27-10-2023	07:00	Phenol	0.16
AZ84605	ETP-IV	ACF O/L	27-10-2023	07:00	TSS	10
AZ85066	ETP-IV	ACF O/L	28-10-2023	07:00	pH	7.8
AZ85066	ETP-IV	ACF O/L	28-10-2023	07:00	Oil & Grease	4
AZ85066	ETP-IV	ACF O/L	28-10-2023	07:00	Sulphides	0.32
AZ85066	ETP-IV	ACF O/L	28-10-2023	07:00	BOD	7.1
AZ85066	ETP-IV	ACF O/L	28-10-2023	07:00	COD	42
AZ85066	ETP-IV	ACF O/L	28-10-2023	07:00	Phenol	0.16
AZ85066	ETP-IV	ACF O/L	28-10-2023	07:00	TSS	12
AZ85557	ETP-IV	ACF O/L	29-10-2023	07:00	pH	8.4
AZ85557	ETP-IV	ACF O/L	29-10-2023	07:00	Oil & Grease	3
AZ85557	ETP-IV	ACF O/L	29-10-2023	07:00	Sulphides	0.24
AZ85557	ETP-IV	ACF O/L	29-10-2023	07:00	BOD	7.4
AZ85557	ETP-IV	ACF O/L	29-10-2023	07:00	COD	45
AZ85557	ETP-IV	ACF O/L	29-10-2023	07:00	Phenol	0.10

AZ85557	ETP-IV	ACF O/L	29-10-2023	07:00	TSS	10
AZ86035	ETP-IV	ACF O/L	30-10-2023	07:00	pH	7.8
AZ86035	ETP-IV	ACF O/L	30-10-2023	07:00	Oil & Grease	3
AZ86035	ETP-IV	ACF O/L	30-10-2023	07:00	Sulphides	0.32
AZ86035	ETP-IV	ACF O/L	30-10-2023	07:00	BOD	7.1
AZ86035	ETP-IV	ACF O/L	30-10-2023	07:00	COD	40
AZ86035	ETP-IV	ACF O/L	30-10-2023	07:00	Phenol	0.12
AZ86035	ETP-IV	ACF O/L	30-10-2023	07:00	TSS	8
AZ86590	ETP-IV	ACF O/L	31-10-2023	07:00	pH	7.6
AZ86590	ETP-IV	ACF O/L	31-10-2023	07:00	Oil & Grease	3
AZ86590	ETP-IV	ACF O/L	31-10-2023	07:00	Sulphides	0.24
AZ86590	ETP-IV	ACF O/L	31-10-2023	07:00	BOD	7.2
AZ86590	ETP-IV	ACF O/L	31-10-2023	07:00	COD	41
AZ86590	ETP-IV	ACF O/L	31-10-2023	07:00	Phenol	0.14
AZ86590	ETP-IV	ACF O/L	31-10-2023	07:00	TSS	6
AZ87089	ETP-IV	ACF O/L	01-11-2023	07:00	pH	7.8
AZ87089	ETP-IV	ACF O/L	01-11-2023	07:00	Oil & Grease	3
AZ87089	ETP-IV	ACF O/L	01-11-2023	07:00	Sulphides	0.40
AZ87089	ETP-IV	ACF O/L	01-11-2023	07:00	BOD	6.4
AZ87089	ETP-IV	ACF O/L	01-11-2023	07:00	COD	40
AZ87089	ETP-IV	ACF O/L	01-11-2023	07:00	Phenol	0.14
AZ87089	ETP-IV	ACF O/L	01-11-2023	07:00	TSS	4
AZ87542	ETP-IV	ACF O/L	02-11-2023	07:00	pH	7.8
AZ87542	ETP-IV	ACF O/L	02-11-2023	07:00	Oil & Grease	3
AZ87542	ETP-IV	ACF O/L	02-11-2023	07:00	Sulphides	0.32
AZ87542	ETP-IV	ACF O/L	02-11-2023	07:00	BOD	6.9
AZ87542	ETP-IV	ACF O/L	02-11-2023	07:00	COD	40
AZ87542	ETP-IV	ACF O/L	02-11-2023	07:00	Phenol	0.12
AZ87542	ETP-IV	ACF O/L	02-11-2023	07:00	TSS	3
AZ87990	ETP-IV	ACF O/L	03-11-2023	07:00	pH	8.0
AZ87990	ETP-IV	ACF O/L	03-11-2023	07:00	Oil & Grease	4
AZ87990	ETP-IV	ACF O/L	03-11-2023	07:00	Sulphides	0.32
AZ87990	ETP-IV	ACF O/L	03-11-2023	07:00	BOD	6.8
AZ87990	ETP-IV	ACF O/L	03-11-2023	07:00	COD	36
AZ87990	ETP-IV	ACF O/L	03-11-2023	07:00	Phenol	0.12
AZ87990	ETP-IV	ACF O/L	03-11-2023	07:00	TSS	6
AZ88429	ETP-IV	ACF O/L	04-11-2023	07:00	pH	7.4
AZ88429	ETP-IV	ACF O/L	04-11-2023	07:00	Oil & Grease	4
AZ88429	ETP-IV	ACF O/L	04-11-2023	07:00	Sulphides	0.32
AZ88429	ETP-IV	ACF O/L	04-11-2023	07:00	BOD	8.0
AZ88429	ETP-IV	ACF O/L	04-11-2023	07:00	COD	40
AZ88429	ETP-IV	ACF O/L	04-11-2023	07:00	Phenol	0.14
AZ88429	ETP-IV	ACF O/L	04-11-2023	07:00	TSS	8
AZ88885	ETP-IV	ACF O/L	05-11-2023	07:00	pH	7.2
AZ88885	ETP-IV	ACF O/L	05-11-2023	07:00	Oil & Grease	4
AZ88885	ETP-IV	ACF O/L	05-11-2023	07:00	Sulphides	0.24
AZ88885	ETP-IV	ACF O/L	05-11-2023	07:00	BOD	9.5

AZ88885	ETP-IV	ACF O/L	05-11-2023	07:00	COD	52
AZ88885	ETP-IV	ACF O/L	05-11-2023	07:00	Phenol	0.11
AZ88885	ETP-IV	ACF O/L	05-11-2023	07:00	TSS	12
AZ89356	ETP-IV	ACF O/L	06-11-2023	07:00	pH	7.6
AZ89356	ETP-IV	ACF O/L	06-11-2023	07:00	Oil & Grease	4
AZ89356	ETP-IV	ACF O/L	06-11-2023	07:00	Sulphides	0.32
AZ89356	ETP-IV	ACF O/L	06-11-2023	07:00	BOD	9.5
AZ89356	ETP-IV	ACF O/L	06-11-2023	07:00	COD	58
AZ89356	ETP-IV	ACF O/L	06-11-2023	07:00	Phenol	0.14
AZ89356	ETP-IV	ACF O/L	06-11-2023	07:00	TSS	10
AZ89843	ETP-IV	ACF O/L	07-11-2023	07:00	pH	8.0
AZ89843	ETP-IV	ACF O/L	07-11-2023	07:00	Oil & Grease	5
AZ89843	ETP-IV	ACF O/L	07-11-2023	07:00	Sulphides	0.24
AZ89843	ETP-IV	ACF O/L	07-11-2023	07:00	BOD	6.4
AZ89843	ETP-IV	ACF O/L	07-11-2023	07:00	COD	38
AZ89843	ETP-IV	ACF O/L	07-11-2023	07:00	Phenol	0.10
AZ89843	ETP-IV	ACF O/L	07-11-2023	07:00	TSS	6
AZ90320	ETP-IV	ACF O/L	08-11-2023	07:00	pH	8.2
AZ90320	ETP-IV	ACF O/L	08-11-2023	07:00	Oil & Grease	5
AZ90320	ETP-IV	ACF O/L	08-11-2023	07:00	Sulphides	0.32
AZ90320	ETP-IV	ACF O/L	08-11-2023	07:00	BOD	8.2
AZ90320	ETP-IV	ACF O/L	08-11-2023	07:00	COD	40
AZ90320	ETP-IV	ACF O/L	08-11-2023	07:00	Phenol	0.12
AZ90320	ETP-IV	ACF O/L	08-11-2023	07:00	TSS	8
AZ90742	ETP-IV	ACF O/L	09-11-2023	07:00	pH	7.6
AZ90742	ETP-IV	ACF O/L	09-11-2023	07:00	Oil & Grease	3
AZ90742	ETP-IV	ACF O/L	09-11-2023	07:00	Sulphides	0.24
AZ90742	ETP-IV	ACF O/L	09-11-2023	07:00	BOD	6.5
AZ90742	ETP-IV	ACF O/L	09-11-2023	07:00	COD	38
AZ90742	ETP-IV	ACF O/L	09-11-2023	07:00	Phenol	0.10
AZ90742	ETP-IV	ACF O/L	09-11-2023	07:00	TSS	8
AZ91191	ETP-IV	ACF O/L	10-11-2023	07:00	pH	8.0
AZ91191	ETP-IV	ACF O/L	10-11-2023	07:00	Oil & Grease	4
AZ91191	ETP-IV	ACF O/L	10-11-2023	07:00	Sulphides	0.24
AZ91191	ETP-IV	ACF O/L	10-11-2023	07:00	BOD	6.2
AZ91191	ETP-IV	ACF O/L	10-11-2023	07:00	COD	40
AZ91191	ETP-IV	ACF O/L	10-11-2023	07:00	Phenol	0.10
AZ91191	ETP-IV	ACF O/L	10-11-2023	07:00	TSS	14
AZ91584	ETP-IV	ACF O/L	11-11-2023	07:00	pH	7.8
AZ91584	ETP-IV	ACF O/L	11-11-2023	07:00	Oil & Grease	5
AZ91584	ETP-IV	ACF O/L	11-11-2023	07:00	Sulphides	0.4
AZ91584	ETP-IV	ACF O/L	11-11-2023	07:00	BOD	8.1
AZ91584	ETP-IV	ACF O/L	11-11-2023	07:00	COD	48
AZ91584	ETP-IV	ACF O/L	11-11-2023	07:00	Phenol	0.11
AZ91584	ETP-IV	ACF O/L	11-11-2023	07:00	TSS	4
AZ91993	ETP-IV	ACF O/L	12-11-2023	07:00	pH	8.0
AZ91993	ETP-IV	ACF O/L	12-11-2023	07:00	Oil & Grease	3

AZ91993	ETP-IV	ACF O/L	12-11-2023	07:00	Sulphides	0.32
AZ91993	ETP-IV	ACF O/L	12-11-2023	07:00	BOD	8.3
AZ91993	ETP-IV	ACF O/L	12-11-2023	07:00	COD	50
AZ91993	ETP-IV	ACF O/L	12-11-2023	07:00	Phenol	0.14
AZ91993	ETP-IV	ACF O/L	12-11-2023	07:00	TSS	4
AZ92424	ETP-IV	ACF O/L	13-11-2023	07:00	pH	7.4
AZ92424	ETP-IV	ACF O/L	13-11-2023	07:00	Oil & Grease	3
AZ92424	ETP-IV	ACF O/L	13-11-2023	07:00	Sulphides	0.24
AZ92424	ETP-IV	ACF O/L	13-11-2023	07:00	BOD	8.0
AZ92424	ETP-IV	ACF O/L	13-11-2023	07:00	COD	44
AZ92424	ETP-IV	ACF O/L	13-11-2023	07:00	Phenol	0.13
AZ92424	ETP-IV	ACF O/L	13-11-2023	07:00	TSS	10
AZ92911	ETP-IV	ACF O/L	14-11-2023	07:00	pH	7.4
AZ92911	ETP-IV	ACF O/L	14-11-2023	07:00	Oil & Grease	4
AZ92911	ETP-IV	ACF O/L	14-11-2023	07:00	Sulphides	0.24
AZ92911	ETP-IV	ACF O/L	14-11-2023	07:00	BOD	7.8
AZ92911	ETP-IV	ACF O/L	14-11-2023	07:00	COD	48
AZ92911	ETP-IV	ACF O/L	14-11-2023	07:00	Phenol	0.10
AZ92911	ETP-IV	ACF O/L	14-11-2023	07:00	TSS	8
AZ93344	ETP-IV	ACF O/L	15-11-2023	07:00	pH	8.0
AZ93344	ETP-IV	ACF O/L	15-11-2023	07:00	Oil & Grease	3
AZ93344	ETP-IV	ACF O/L	15-11-2023	07:00	Sulphides	0.24
AZ93344	ETP-IV	ACF O/L	15-11-2023	07:00	BOD	6.3
AZ93344	ETP-IV	ACF O/L	15-11-2023	07:00	COD	40
AZ93344	ETP-IV	ACF O/L	15-11-2023	07:00	Phenol	0.14
AZ93344	ETP-IV	ACF O/L	15-11-2023	07:00	TSS	4
AZ93769	ETP-IV	ACF O/L	16-11-2023	07:00	pH	7.6
AZ93769	ETP-IV	ACF O/L	16-11-2023	07:00	Oil & Grease	4
AZ93769	ETP-IV	ACF O/L	16-11-2023	07:00	Sulphides	0.40
AZ93769	ETP-IV	ACF O/L	16-11-2023	07:00	BOD	8.0
AZ93769	ETP-IV	ACF O/L	16-11-2023	07:00	COD	42
AZ93769	ETP-IV	ACF O/L	16-11-2023	07:00	Phenol	0.16
AZ93769	ETP-IV	ACF O/L	16-11-2023	07:00	TSS	18
AZ94236	ETP-IV	ACF O/L	17-11-2023	07:00	pH	8.4
AZ94236	ETP-IV	ACF O/L	17-11-2023	07:00	Oil & Grease	4
AZ94236	ETP-IV	ACF O/L	17-11-2023	07:00	Sulphides	0.32
AZ94236	ETP-IV	ACF O/L	17-11-2023	07:00	BOD	7.2
AZ94236	ETP-IV	ACF O/L	17-11-2023	07:00	COD	44
AZ94236	ETP-IV	ACF O/L	17-11-2023	07:00	Phenol	0.19
AZ94236	ETP-IV	ACF O/L	17-11-2023	07:00	TSS	8
AZ94631	ETP-IV	ACF O/L	18-11-2023	07:00	pH	8.2
AZ94631	ETP-IV	ACF O/L	18-11-2023	07:00	Oil & Grease	3
AZ94631	ETP-IV	ACF O/L	18-11-2023	07:00	Sulphides	0.32
AZ94631	ETP-IV	ACF O/L	18-11-2023	07:00	BOD	8.3
AZ94631	ETP-IV	ACF O/L	18-11-2023	07:00	COD	42
AZ94631	ETP-IV	ACF O/L	18-11-2023	07:00	Phenol	0.16
AZ94631	ETP-IV	ACF O/L	18-11-2023	07:00	TSS	8

AZ95042	ETP-IV	ACF O/L	19-11-2023	07:00	pH	8.0
AZ95042	ETP-IV	ACF O/L	19-11-2023	07:00	Oil & Grease	8
AZ95042	ETP-IV	ACF O/L	19-11-2023	07:00	Sulphides	0.24
AZ95042	ETP-IV	ACF O/L	19-11-2023	07:00	BOD	10.6
AZ95042	ETP-IV	ACF O/L	19-11-2023	07:00	COD	60
AZ95042	ETP-IV	ACF O/L	19-11-2023	07:00	Phenol	0.14
AZ95042	ETP-IV	ACF O/L	19-11-2023	07:00	TSS	11
AZ95310	ETP-IV	ACF O/L	19-11-2023	15:30	Oil & Grease	4
AZ95473	ETP-IV	ACF O/L	20-11-2023	07:00	pH	7.7
AZ95473	ETP-IV	ACF O/L	20-11-2023	07:00	Oil & Grease	4
AZ95473	ETP-IV	ACF O/L	20-11-2023	07:00	Sulphides	0.24
AZ95473	ETP-IV	ACF O/L	20-11-2023	07:00	BOD	7.0
AZ95473	ETP-IV	ACF O/L	20-11-2023	07:00	COD	40
AZ95473	ETP-IV	ACF O/L	20-11-2023	07:00	Phenol	0.14
AZ95473	ETP-IV	ACF O/L	20-11-2023	07:00	TSS	10
AZ95944	ETP-IV	ACF O/L	21-11-2023	07:00	pH	7.6
AZ95944	ETP-IV	ACF O/L	21-11-2023	07:00	Oil & Grease	4
AZ95944	ETP-IV	ACF O/L	21-11-2023	07:00	Sulphides	0.32
AZ95944	ETP-IV	ACF O/L	21-11-2023	07:00	BOD	7.4
AZ95944	ETP-IV	ACF O/L	21-11-2023	07:00	COD	40
AZ95944	ETP-IV	ACF O/L	21-11-2023	07:00	Phenol	0.14
AZ95944	ETP-IV	ACF O/L	21-11-2023	07:00	TSS	10
AZ96370	ETP-IV	ACF O/L	22-11-2023	07:00	pH	7.8
AZ96370	ETP-IV	ACF O/L	22-11-2023	07:00	Oil & Grease	7
AZ96370	ETP-IV	ACF O/L	22-11-2023	07:00	Sulphides	0.24
AZ96370	ETP-IV	ACF O/L	22-11-2023	07:00	BOD	8.4
AZ96370	ETP-IV	ACF O/L	22-11-2023	07:00	COD	46
AZ96370	ETP-IV	ACF O/L	22-11-2023	07:00	Phenol	0.18
AZ96370	ETP-IV	ACF O/L	22-11-2023	07:00	TSS	9
AZ96707	ETP-IV	ACF O/L	22-11-2023	21:00	Oil & Grease	3
AZ96799	ETP-IV	ACF O/L	23-11-2023	07:00	pH	8.2
AZ96799	ETP-IV	ACF O/L	23-11-2023	07:00	Oil & Grease	3
AZ96799	ETP-IV	ACF O/L	23-11-2023	07:00	Sulphides	0.32
AZ96799	ETP-IV	ACF O/L	23-11-2023	07:00	BOD	7.4
AZ96799	ETP-IV	ACF O/L	23-11-2023	07:00	COD	45
AZ96799	ETP-IV	ACF O/L	23-11-2023	07:00	Phenol	0.14
AZ96799	ETP-IV	ACF O/L	23-11-2023	07:00	TSS	4
AZ97234	ETP-IV	ACF O/L	24-11-2023	07:00	pH	7.8
AZ97234	ETP-IV	ACF O/L	24-11-2023	07:00	Oil & Grease	4
AZ97234	ETP-IV	ACF O/L	24-11-2023	07:00	Sulphides	0.48
AZ97234	ETP-IV	ACF O/L	24-11-2023	07:00	BOD	7.4
AZ97234	ETP-IV	ACF O/L	24-11-2023	07:00	COD	48
AZ97234	ETP-IV	ACF O/L	24-11-2023	07:00	Phenol	0.18
AZ97234	ETP-IV	ACF O/L	24-11-2023	07:00	TSS	28
AZ97550	ETP-IV	ACF O/L (check)	24-11-2023	15:30	TSS	18
AZ97636	ETP-IV	ACF O/L	25-11-2023	07:00	pH	7.8
AZ97636	ETP-IV	ACF O/L	25-11-2023	07:00	Oil & Grease	4

AZ97636	ETP-IV	ACF O/L	25-11-2023	07:00	Sulphides	0.24
AZ97636	ETP-IV	ACF O/L	25-11-2023	07:00	BOD	8.0
AZ97636	ETP-IV	ACF O/L	25-11-2023	07:00	COD	46
AZ97636	ETP-IV	ACF O/L	25-11-2023	07:00	Phenol	0.12
AZ97636	ETP-IV	ACF O/L	25-11-2023	07:00	TSS	5
AZ98054	ETP-IV	ACF O/L	26-11-2023	07:00	pH	7.6
AZ98054	ETP-IV	ACF O/L	26-11-2023	07:00	Oil & Grease	5
AZ98054	ETP-IV	ACF O/L	26-11-2023	07:00	Sulphides	0.24
AZ98054	ETP-IV	ACF O/L	26-11-2023	07:00	BOD	9.9
AZ98054	ETP-IV	ACF O/L	26-11-2023	07:00	COD	48
AZ98054	ETP-IV	ACF O/L	26-11-2023	07:00	Phenol	0.14
AZ98054	ETP-IV	ACF O/L	26-11-2023	07:00	TSS	3
AZ98506	ETP-IV	ACF O/L	27-11-2023	07:00	pH	7.6
AZ98506	ETP-IV	ACF O/L	27-11-2023	07:00	Oil & Grease	3
AZ98506	ETP-IV	ACF O/L	27-11-2023	07:00	Sulphides	0.24
AZ98506	ETP-IV	ACF O/L	27-11-2023	07:00	BOD	8.0
AZ98506	ETP-IV	ACF O/L	27-11-2023	07:00	COD	38
AZ98506	ETP-IV	ACF O/L	27-11-2023	07:00	Phenol	0.14
AZ98506	ETP-IV	ACF O/L	27-11-2023	07:00	TSS	4

SPEED POST

March 02, 2015

B-29016/04/06/PCI-I/ 7216.
To
The Chairman 7176
(All SPCBs/PCCs)

SUB: DIRECTIONS UNDER SECTION 18(1)(b) OF THE WATER (PREVENTION & CONTROL OF POLLUTION) ACT, 1974 and THE AIR (PREVENTION & CONTROL OF POLLUTION) ACT, 1981 IN THE MATTER OF POLLUTION CONTROL IN 17 CATEGORY OF HIGHLY POLLUTING INDUSTRIES , CETPs AND COMMON HAZRDOUS WASTE & BIOMEDICAL WASTE INCINERATORS-REGARDING SELF MONITORING OF COMPLIANCE

WHEREAS, under Section 17 of the Water (Prevention & Control of Pollution) Act, 1974, and under Section 17 of the Air (Prevention & Control of Pollution) Act, 1981, one of the function of the State Pollution Control Boards(SPCBs)/Pollution Control Committees(PCCs) is to plan a comprehensive programme for the prevention, control or abatement of pollution of streams, wells and air pollution in the State/Union territory and to secure the execution thereof; and

WHEREAS, under section 16 of the Water (Prevention and Control of Pollution) Act, 1974 and under Section 16 of the Air (Prevention & Control of Pollution) Act, 1981, one of the functions of the Central Pollution Control Board (CPCB), constituted under Water (Prevention and Control of Pollution) Act, 1974 is to coordinate activities of the State Pollution Control Boards and Pollution Control Committees and to provide technical assistance and guidance to SPCBs / PCCs; and

WHEREAS, the SPCBs and PCCs are empowered to stipulate standards for discharge of environmental pollutants for various categories of industries and common effluent treatment plants (CETPs) , Common Hazardous waste and Biomedical waste incinerators even more stringent than those notified by the Central Government, under the Environmental (Protection) Act, 1986 and rules framed there under; and

WHEREAS, Pharmaceuticals, Chlor Alkali, Fertilizers, Oil Refinery, Dye and dye intermediate, Pesticides, Petrochemical, Large Power plants, Cement, Aluminium, Zinc, Copper, Iron & steel, Large Pulp & paper, Distillery, Sugar and Tannery industries located in States/UTs have been discharging environmental

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pollutants directly or indirectly into the ambient air and water, which pose constant threat to cause adverse effect on the water and air quality ; and

WHEREAS, Common Hazardous waste and Biomedical waste incinerators and Common Effluent Treatment Plants(CETPs) located in States/UTs have been discharging environmental pollutants directly or indirectly into the ambient air and water; and

WHEREAS, the SPCBs and PCCs are also required to ensure installation and regular operation of the requisite pollution control facilities in the polluting industries; and

WHEREAS, there is need to inculcate habit of self monitoring mechanism within the industries for complying the prescribed standards and this can be achieved by the methods like installing online effluent and emission monitoring devices; and

WHEREAS, number of industries under 17 category which are operating in the state/UT have been identified can be suitably directed for installation and commissioning of online monitoring systems (emission and or effluent); and

WHEREAS, number of Common Hazardous waste and Biomedical waste incinerators and CETPs operating in the state/UT can also be considered for installation and commissioning of online monitoring systems (emission and or effluent);and

WHEREAS, for strengthening the monitoring and compliance through self regulatory mechanism ,online source and effluent monitoring systems need to be installed and operated by the developers and the industries on 'polluter pays principle' ;and

WHEREAS, some of the SPCBs have already given specific conditions in consent to operate of 17 categories of highly polluting industries/ and Common

Hazardous waste and Biomedical waste incinerators to install continuous emission and effluent monitoring systems; and

WHEREAS, it is envisaged in "National Environment Policy- 2006" that to strengthen the testing infrastructure and network for monitoring ambient environmental quality and progressively ensure real-time, and online availability of the monitoring data; and

WHEREAS, CPCB had earlier issued letter dated January 12,2011 to SPCBs /PCCs to direct all the 17 categories of highly polluting industries to install automatic air and water quality stations to monitor the ambient quality; and

WHEREAS ,it is becoming a need and necessity to regulate and minimize inspection of industries on routine basis and instead efforts need to be made to bring self discipline in the industries to exercise self monitoring & compliance and transmit data of effluent and emission compliance to SPCBs/PCCs and to CPCB on continuous basis; and

WHEREAS, there could be some time needed for getting such devices standardised and requiring confidence on data generated but needless to emphasize that efforts towards setting up to continuous monitoring devices is essential; and

WHEREAS, the ground truthing of the values indicated by the online devices need to be done before bringing them in public domain for proper interpretation and such measures need to be taken at the level of SPCBs/PCCs .And whereas for regulatory purposes and for purposes of actions to be taken against non complying industries /facilities, the existing methods of sampling, analysis and related procedures under the existing statutes need to be continued; and

WHEREAS, SPCBs and PCCS have prescribed standards for various parameters as per the notified standards under Environment(Protection) Act,1986

and the State Boards may refer to the parameters which should be monitored by installing continuous effluent and emission monitoring devices(Annexure -4);and

WHEREAS, continuous effluent and emission monitoring devices can be installed in those industries which are continuously letting out effluents and emissions out of their premises: and

WHEREAS following direction under Section 18(1)(b) of the Water (Prevention & Control of Pollution) Act, 1974, and 18(1)(b) of the Air (Prevention & Control of Pollution) Act, 1981 have been issued to all SPCBs/PCCs on 05.2014;

a) To Install online continuous Stack Emission Monitoring Systems (CSEMS) in 17 categories of highly polluting industries and in Common Hazardous waste and Biomedical waste incinerators for the parameters(industry/sector specific parameter) mentioned in the consent to operate/authorisation not later than by March 31,2015;
b) To install online effluent quality monitoring system at the outlet of effluent treatment plants of the 17 category industries and in CETPs for the measurement of the parameters(industry/sector specific parameter) like flow, pH, COD, BOD, TSS and for other consented parameters as per the guidelines provided; not later than by March 31, 2015;
c) To connect and upload the online emission and effluent monitoring data at SPCBs/PCCs and CPCB server in a time bound manner but not later than by March 31,2015;
d) To ensure regular maintenance and operation of the online system with temper proof mechanism having facilities for online calibration;
e) To submit bank guarantee of 25 % of the cost of online monitoring systems (emission and effluent whichever applicable) for ensuring timely installation of online monitoring systems within 90 days from the date of receipt of directions issued by SPCBs/PCCs to the industries;

WHEREAS In order to sensitize the issues among SPCBs/PCCs ,CPCB also highlighted the status of compliance of setting up online monitoring system in the conference of Chairman and Member Secretaries(February 21-22,2014 at

Bangalore and January 09,2015 at Chandigarh) at the National as well as Regional level on online monitoring system; and

WHEREAS CPCB has organized five interaction meets on 06/8/2014,19/09/2014,29/09/2014,8/10/2014 and 16/10/2014 respectively to have an interaction with SPCBs, representative of industries, industrial associations and instrument suppliers on online monitoring system; and

WHEREAS CPCB has already published a guidelines for online continuous monitoring system for effluents on 07.11.2014; and

WHEREAS a letter has been issued to all SPCBs/PCCs on October 31, 2014 and subsequent reminder sent on December 24,2014 to provide action taken report to CPCB in the format before January 10, 2015; and

Now, therefore, in exercise of the powers conferred under Section 18 (1) (b) of the Water (Prevention & Control of Pollution) Act, 1974, and 18 (1) (b) of the Air (Prevention & Control of Pollution) Act, 1981 and keeping in view strengthening of the monitoring mechanism for effective compliance through self regulatory mechanism, you are directed to

(i) All the industries will submit bank guarantee of 100 % of the cost of online monitoring systems (emission and effluent whichever applicable) for ensuring timely installation of online monitoring systems by 30.06.2015 and such bank guarantee will be discharged if they install the system before June 30,2015.

(ii) If the industries will not install the online monitoring system by June 30, 2015 their consent to operate of the industry shall be withdrawn and bank guarantee shall be forfeited.

(Shashi Shekhar)
Chairman

O/C

Copy to:

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2. I/C PCI-I,II,III and HWMD
3. All Zonal Officer ,CPCB
4. I/c IT Division, CPCB
5. I/c. ESS, CPCB

(A.B. Akolkar)
Member Secretary

O/C