Date: 21/11/2016

adani

AHPPL/MOEF&CC/2016-17/014

То

Additional Principal Chief Conservator of Forests (C), Ministry of Environment, Forest and Climate Change, Regional Office (WZ), E-5, Kendriya Paryavaran Bhawan, E-5 Arera Colony, Link Road-3, Ravishankar Nagar, Bhopal - 462016 (Madhya Pradesh) Tel. No.: 0755- 2465054, 2465496, 2466525 Email: rowz.bpl-mef@nic.in

Kind Attn.: Sh. Tejinder Singh (IFS)

Dear Sir,

- Sub.: Half yearly compliance report of conditions stipulated in Environment and CRZ clearance for the development of Multi Cargo Port with supporting utilities and infrastructure facilities at Hazira, Surat, Gujarat for the period April, 2016 to September, 2016.
- Ref.: 1) Environmental and CRZ clearance issued by MoEF & CC, New Delhi vide letter No.: 11-150/2010-IA.III dated 03rd May, 2013.
 - CRZ Recommendation issued by Forest & Environment Department, Govt. of Gujarat to MoEF & CC, New Delhi vide letter No.: ENV-10-2012-30-E dated 11th May, 2012.
 - Amendment in CRZ/Environment Clearance issued by MoEF & CC, New Delhi vide letter No.: J-16011/11/2003-IA-III, dated 19th February, 2007.
 - CRZ Recommendation issued by Forest & Environment Department, Govt. of Gujarat to MoEF & CC, New Delhi vide letter No.: ENV-10-2006-128-P dated 05th Feb., 2007.
 - Amendment in CRZ Clearance issued by MoEF & CC, New Delhi vide letter No.: J-16011/11/2003-IA-III, dated 12th November, 2003.
 - CRZ Clearance issued by MoEF & CC, New Delhi vide letter No.: 160-11/11/2003-IA.III dated 26th June, 2003.

Please find enclosed herewith point wise Compliance Reports (Hard copy as well as in a CD) of conditions stipulated in the above referred letters.

Thank you,

For, M/s. Adani Hazira Port Private Limited,

-pl' il &

(Capt. A. K. Singh) Chief Executive Officer

Encl.: As above

Copy to:

- 1. The Director (Monitoring IA Division), Ministry of Environment, Forests & Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi-110 003.
- 2. The Director, Forests & Environment Department, Block 14, 8th Floor, Sachivalaya, Gandhinagar, Gujarat 382 010.
- 3. The Zonal Officer, Central Pollution Control Board, Zonal Office Vadodara, Parivesh Bhawan, Opp. VMC Ward Office No.:10, Subhanpura, Vadodra-390 023.
- 4. The Chairman, Gujarat Pollution Control Board, Parvayaran Bhawan, Sector 10A, Gandhinagar-382 010 (Gujarat).
- 5. The Regional Officer, Gujarat Pollution Control Board, Belgium Square, Ring Road, Surat-395003, (Gujarat).

Adani Hazira Port Pvt Ltd At & PO Hazira Choryashi Surat 394 270 Gujarat, India CIN: U45209GJ2009PTC058789 Tel +91 79 2656 5555 Fax +91 79 2555 5500 info@adani.com www.adani.com

Registered Office: Adani House, Nr Mithakhali Circle, Navrangpura, Ahmedabad 380 009, Gujarat, India



HALF YEARLY COMPLIANCE REPORT OF ENVIRONMENT AND CRZ CLEARANCE ISSUED BY MOEF & CC, NEW DELHI VIDE LETTER NO.: <u>11-150/2010-IA.III DATED</u> <u>03RD MAY, 2013</u> FOR THE DEVELOPMENT OF MULTI CARGO PORT WITH SUPPORTING UTILITIES AND INFRASTRUCTURE FACILITIES AT HAZIRA, SURAT, GUJARAT BY M/S. ADANI HAZIRA PORT PVT. LTD.



A. Half Yearly Compliance Report for Environmental and CRZ Clearance issued by MoEF & CC, New Delhi vide letter No.: 11-150/2010-IA.III dated 03rd May, 2013 for the development of Multi Cargo Port with supporting utilities and infrastructure facilities at Hazira, Surat, Gujarat by M/s. Adani Hazira Port Pvt. Ltd.: -

| S. No. | Stipulated Conditions | Compliance Status | | |
|--------|---|--|--|--|
| 6. | Specific Conditions | | | |
| i | "Consent for Establishment" shall be obtained from State Pollution Control Board under Air & Water Act and a copy | AHPPL has o (NOC) from Board: | btained Cons Gujarat Po | ent to Establish ollution Control |
| | shall be submitted to the Ministry before start of any construction work at site. | Consent No. | Issued On | Submitted To MoEF & CC On |
| | | CTE 49766 | 05/10/2012 | 19/11/2014 |
| | | CTE-64900 | 26/09/2014 | 12/05/2015 |
| | | CTE-74330 | 13/01/2016 | 23/05/2016 |
| | | CTE-77767 | 16/04/2016 | Copy enclosed |
| | | | | as Annexure-1 |
| | The action plan on the issues raised during public hearing shall be submitted to the Pollution Control Board. The action plan shall be implemented without fail. Report on compliance shall be submitted to the Regional Office, MOEF along with the six monthly reports. | Key points of Preference people for other cont M/s. AHPF locals for candidates suitable re Villagers displaceme M/s. AHP approx. & uninhabite of private p The action pl the issues rai is enclosed as | the PH were: to be give employment racts. PL is giving pl contracts a for emplo quirements. were anxiou ent due to pol PL is devel 373.27 hect and there property. an and comp sed during the Annexure-2. | en to the local and transport & reference to the nd skilled local byment as per us about their rt development. loping port on ares which is is no acquisition pliance status on he public hearing |
| iii | All the recommendations of SCZMA shall be complied with. | Compliance stipulated in Appendix -1 . | status of n GCZMA i | the conditions s enclosed as |
| iv | Periodical study on shore line changes shall be conducted and mitigation carried out if necessary. The details shall be submitted along with six monthly monitoring reports. | Shoreline cha NIO, Vizag November, 2 Please find Shoreline Ch kind referenc | ange study w during the 2014 to D attached ange Study e as Annexur | as conducted by e period from ecember, 2015. herewith the Report for your e-3. |
| V | Oil spills if any shall be properly collected and disposed as per Rules. Proper Oil contingency Management plan shall be put in the place. | Oil Spill Co prepared approved/vet (Letter No.: 7 | ontingency f and the ted by India 563, dated OS | Plan has been same was an Coast Guard 9.01.2014). |
| Vi | The detailed plan with budgetary provisions for the CSR shall be submitted to the ministry. | CSR activiti Foundation in Community h and Rural infr Details of th 2016-17 (up budget is enc | es carried n four vertica nealth, Sustai astructure de e CSR activi to Septem losed as Anne | out by Adani Is i.e. Education, inable livelihood evelopment. ties for the FY: ber, 2016) and exure-4. |
| VII | DMP shall be complied within letter and | DMP are bein | g taken care. | |



| S. No. | Stipulated Conditions | Compliance Status |
|--------|--|--|
| | spirit. | |
| viii | Periodical monitoring of the sea water | AHPPL is monitoring the Sea Water Quality |
| | quality at the outlet shall be carried out | at three locations on monthly basis. Copy |
| | to check the discharge is meeting the | of the Environmental Monitoring / Analysis |
| | standard and not causing any impact to | Reports for the period April, 2016 to Sept., |
| | marine life. | 2016 is enclosed as Annexure-5. |
| ix | Transport of cargo shall in closed system | Transportation of cargo from port to |
| | and dust control viz. water sprinkler, | hinterland is being done through dumpers/ |
| | along conveyor and transfer points shall | trucks covered with tarpaulin. Following |
| | be providea. | dust control measures are in place at port |
| | | to control rugitive dust: |
| | | 2. Wator Sprinklors System |
| | | 2. Water Sprinklers System, 3. Soray Nozzles in Conveyor System |
| | | 4 Water Browsers |
| | | 5. Water Mist/Fog System and |
| | | 6. Wind Brake Shield. |
| x | Construction activity shall be carried out | Development of port is as per master plan |
| | strictly as per the provisions of CRZ | submitted to MoEF & CC for which the |
| | notification 2011. No construction work | Environment and CRZ Clearance has been |
| | other than those permitted in Coastal | granted. |
| | Regulation Zone Notification shall be | |
| | carried out in Coastal Regulation Zone. | |
| xi | The project shall be executed in such a | No fishermen are displaced due to project |
| | manner that there shall not be any | activity of AHPPL. The surrounding areas |
| | disturbance to the fishing activity. | are open for fishing and there is no |
| | | addition AHPPI is cogularly providing |
| | | support to fisherman by giving tools nets |
| | | etc. |
| xii | It shall be ensured that there is no | There is no acquisition of private land and |
| | displacement of people, houses or fishing | thus there is no displacement of people, |
| | activity as a result of the project. | houses or fishing activity due to port |
| | | development. |
| xiii | The project proponent shall set up | Environment Management Cell has been |
| | separate Environment Management Cell | set up with qualified staff to ensure the |
| | for effective implementation of the | effective implementation of environmental |
| | stipulated environmental sate guards | sate guards. |
| | under the supervision of a Senior | |
| xiv | The funds earmarked for environment | Details of budget for Environment |
| | management plan shall be included in the | Management for the Financial Year: 2016- |
| | budget and this shall not be diverted for | 17 is enclosed as Annexure-6. No funds are |
| | any other purposes. | diverted for any other purposes. |
| 7. | General Conditions | |
| i. | Appropriate measures must be taken | Digging is limited to the channel turning |
| | while undertaking digging activities to | circle & berth pocket is carried out. Marine |
| | avoid any degradation of water quality. | water quality monitoring through a MoEF |
| | | shows that those is no impact on the sec |
| | | water quality Copy of the Environmental |
| | | Monitoring / Analysis Reports for the |
| | | period April. 2016 to September. 2016 is |
| | | enclosed as Annexure-5. |
| ii. | Full support shall be extended to the | Complied With. Last visit by Addl. PCCF. |
| | officers of this Ministry /Regional Office | MoEF & CC - RO, Bhopal was held on |



| at Bhopal by the project propone inspection of the project for m purposes, by furnishing full de action plans including the actio | during 10/02/2016 and full co-operation was hitoring extended. Is and taken easures tection |
|---|---|
| reports in respect of mitigation r and other environmental p activities. | |
| iii. A six-monthly monitoring repo need to be submitted by the proponents to the Regional Offic Ministry at Bhopal regardi implementation of the s conditions. | t shall Complying with, six-monthly monitoring project report is regularly submitted to the RO - of this MoEF & CC, Bhopal and other authorities along with half yearly Environment & CRZ clearance stipulated conditions compliance report. Please refer the Annexure-5. |
| iv. Ministry of Environment & Fores other competent authority may any additional conditions or ma existing ones, if necessary subs if deemed necessary for enviro protection, which shall be compli | or any Noted and agreed to comply with an additional conditions stipulate or modify the the existing ones by MoEF & CC, if any. International distribution of the existing ones by MoEF & CC, if any. |
| v. The Ministry reserves the right t this clearance, if any of the constipulated are not complied wit satisfaction of this Ministry. | revoke Noted and agreed to comply the directions nditions of the MoEF & CC, if any. to the |
| vi. In the event of a change in proje or change in the implementation a fresh reference shall be i Ministry of Environment and Fore | profile Noted, there is no change in project profile agency, project profile or implementation agency. ade to ts. |
| vii. The project proponents shall in Regional Office as well as the Mir date of financial closure as approval of the project by the cr authorities and the date of start Development Work. | arm the Closed. Stry the Required information is already submitted d final to the MoEF & CC, New Delhi and other authorities along with the half yearly of Land compliance report dated 23 rd May, 2016. |
| viii. A copy of the clearance letter marked to concerned Panchaya NGO, if any from whom any sugg representations has been receiv processing the proposal. | hall be Closed. / Local Copy of the clearance letter was sent to stions / the concerned Panchayat and local NGO. d while Copy of the RPAD receipt is already submitted to MoEF & CC along with half yearly compliance report dated 27 th November, 2013. |
| ix. State Pollution Control Board sha a copy of the clearance lette Regional Office, District Industrie and Collector's Office/Tehsildar for 30 days. | display Closed. at the This condition does not belong to M/s. Center AHPPL. Office |
| These stipulations would be among others under the provi Water (Prevention and Corr Pollution) Act 1974, the Air (Pr and Control of Pollution) Act 1 Environment (Protection) Act 1 Public Liability (Insurance) Act 7 EIA notification 1994, include amendments and rules thereafter | AHPPL has obtained Public Liability ons of Insurance vide Policy No.: rol of 3133201064763101000 valid up to 31 st wention March, 2017. 81, the Copy of the PLI policy is already submitted 36, the to MoEF & CC along with half yearly ompliance report dated 23 th May, 2016. |



| S. No. | Stipulated Conditions | Compliance Status |
|--------|---|--|
| | approvals for storage of diesel from Chief Controller of Explosive, Fire Department, Civil Aviation Department, Forest Conservation Act, 1980 and Wildlife (Protection) Act, 1972 etc. shall be obtained, as applicable by project proponent from the respective competent authorities. | authorities have been obtained i.e.: - 1. PESO License from Chief Controller of Explosive, Nagpur vides Order No.: P/HQ/GJ/15/5294 (P270337), Renewed on 31.12.2015 valid till 31.12.2018. Copy of the PESO License is already submitted to MoEF & CC along with half yearly compliance report dated 23th May, 2016. 2. License to work a Factory (Liquid Terminal) from Director of Industrial Safety and Health, Govt. of Gujarat their vide Registration No.: 3502 / 51410 / 2013 and License No.: 18757, Renewed on 09-02-2015, valid till 31.12.2016. PESO Approval obtained on 18th December, 2015, valid up to 31st December, 2018. Copy of the License to work a Factory is already submitted to MoEF & CC along with half yearly compliance report dated 23th May, 2016. 3. Civil Aviation: Not Applicable, 4. Forest Clearance: Not Applicable, and 5. Wildlife Conservation: Not Applicable. |
| 10. | The project proponent shall advertise in at least two local newspapers widely circulated in the region, one of which shall be in the vernacular language informing that the project has been accorded Environment and CRZ clearance and copies of clearance letters are available with the State Pollution Control Board and may also be seen at Website of the Ministry of Environment & Forests at http://www.envfor.nic.in . The advertisement should be made within 10 days from the date of issue of the clearance letter and a copy of the same should be forwarded to the Regional Office of this Ministry at Bhonal | Closed. Advertisement were published in Gujarat News Paper "Gujarat Mitra" and English News Paper "The Times Of India" on 13/05/2013 and copy of the same is already submitted to MoEF & CC, New Delhi and other authorities along with the half yearly compliance report dated 27 th November, 2013. |
| 11. | This clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation Vs. Union of India in Writ Petition (Civil) No.: 460 of 2004 as may be applicable to this project | Noted and same will be complied, if applicable. |
| 12. | Status of Compliance to the various stipulated environmental conditions and environmental safeguards will be uploaded by the project proponent in its website. | Compliance report of conditions stipulated in Environment and CRZ Clearance is available on the company website i.e.: <u>http://www.adaniports.com/ports-</u> <u>downloads</u> |
| 13. | Any appeal against this clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010. | Noted. |



From : Apr., 2016 To : Sept., 2016

| S. No. | Stipulated Conditions | Compliance Status |
|--------|--|--|
| 14. | A copy of the clearance letter shall be sent to concerned Panchayat, Zila Parishad/ Municipal Corporation, Urban Local Body and the Local NGO, if any from whom suggestions/ representations if any, were received while processing the proposal. The Clearance letter shall also be put on the website of the company by the proponent. | Closed, Copy of the clearance letter was sent to the concerned Panchayat and local NGO. Copy of the RPAD receipt is already submitted to MoEF & CC along with Half Yearly Compliance Report dated 27 th November, 2013. |
| 15. | The Proponent shall upload the status of compliance of the stipulated EC conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of MOEF, the respective Zonal Office of CPCB and the SPCB. | The Half Yearly Compliance Report is being uploaded on the company website at <u>http://www.adaniports.com/ports-</u> <u>downloads</u> and submitted to: 1. RO - MoEF & CC, Bhopal, 2. MoEF & CC, New Delhi, 3. DoEF, Gandhinagar 4. Zonal Office - CPCB, Vadodara, 5. HO - GPCB, Gandhinagar, and 6. RO - GPCB, Surat. |
| 16. | The Environmental Statement for each financial year ending 31 st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules 1986, as amended subsequently, shall also be put on the website of the company along with status of compliance of EC Conditions and shall also be sent to the respective Regional Offices of MoEF by e-mail. | The Environment Statement in Form-V for the Financial Year: 2015-16 is submitted to GPCB vide letter No.: AHPPL/GPCB/2016- 17/003 dated 16-05-2016 & also uploaded on company website at http://www.adaniports.com/ports- downloads. Form-V for FY: 2015-16 has also been sent to Regional Office of MoEF & CC by email to <u>rowz.bpl-mef@nic.in</u> on 01 st June, 2016. |



HALF YEARLY COMPLIANCE REPORT OF CRZ CLEARANCE ISSUED BY MOEF & CC, NEW DELHI VIDE LETTER NO.: <u>160-11/11/2003-IA.III DATED 26TH JUNE, 2003</u> FOR THE DEVELOPMENT OF MULTI CARGO PORT WITH SUPPORTING UTILITIES AND INFRASTRUCTURE FACILITIES AT HAZIRA, SURAT, GUJARAT



B. Half Yearly Compliance Report for CRZ Clearance issued by MoEF & CC, New Delhi vide letter No.: 160-11/11/2003-IA.III dated 26th June, 2003 for the development of Multi Cargo Port with supporting utilities and infrastructure facilities at Hazira, Surat, Gujarat: -

| S. No. | Stipulated Conditions | Compliance Status |
|--------|--|---|
| Α. | SPECIFIC CONDITIONS | |
| i | All the conditions stipulated by the Gujarat Pollution Control Board vide their letter No.: PC NOC-SRT/1241/8995, dated 24 th March, 2003 shall be effectively implemented. | All the conditions stipulated by GPCB in consent to establish issued time to time are being complied. |
| ii | All conditions stipulated by the Forest and Environment Department, Government of Gujarat vide their letter No.: ENV.10.2003-29- P1, dated 10 th April, 2003 and letter No.: ENV- 10-2003-29-P1, dated 29 th May, 2003 shall be effectively implemented. | Complying with all the stipulated conditions of the aforesaid letters issued by the Forest and Environment Department, Government of Gujarat. |
| 111 | All the conditions stipulated by Gujarat Maritime Board vide their No.: GMB/ N/Pvt/190(10)/9041, dated 31.12.2002 shall be effectively implemented. | Complying with all the stipulated conditions of the aforesaid letter issued by Gujarat Maritime Board. |
| iv | The proposals for infrastructure corridor (37 Km of rail line, 10 Km. of road, 3 Km of underground conveyor system and 22 MW CCGT for connectivity) are deferred for lack of adequate details. The proponents are requested to submit a separate, fresh proposal embodying various components of the infrastructure corridor with requisite details. However, the desalination facilities can be taken up. Brine concentrates produced as a result of desalination works should not be disposed of in the sea. Instead, their techo- commercial viability should be explored for optimal utilization. | Noted and will be complied with as and when applicable. |
| V | No groundwater should be tapped. | No groundwater is being tapped for port operation purpose. |
| vi | The area of 22 ha. of the mangrove patch and 8 ha. of buffer area along the mangrove patch should be protected during construction and operation phase of the project. As an additional measure, the 50 ha. of land identified at Kadia Bet located in the vicinity of the project site should be taken up for afforestation and no developmental activity should be taken up in the above mangrove areas. A detailed plan for the afforestation of mangroves at Kadia Bet should be prepared within 3 months and submitted to this Ministry. | This condition is amended by MoEF & CC vide letter dated 19 th February, 2007 bearing No.: J-16011/11/2003-IA- III. Compliance of the amended condition is enclosed as Appendix - 2 . |
| vii | Dumping of dredged spoils should be done in the locations approved earlier. | Modified as per communication from MoEF & CC dated 12 th November, 2003 bearing letter No.: J-16011/11/ 2003-IA-III revised conditions states "dumping of dredged spoils should be dumped at the sites A & C as per the following coordinates: |



| S. No. | Stipulated Conditions | Compliance Status |
|--------|--|--|
| | | (A) 21" 03' to 21" 05' N & |
| | | (C) 21" 03' to 21" 05' N & |
| | | 72" 30' to 72" 32' E |
| | | Noted & will be complied during |
| viii | Environmental Management Plan (EMP) with | dredging. Details of budget for Environment |
| VIII | detailed break-up of item-wise budget as | Management for the Financial Year: |
| | contained in your letter dated 18 th June, 2003 | 2016-17 is enclosed as Annexure-6. |
| | earmarked for EMP should be kept separate | no funds are diverted for any other purposes. |
| | and should not be diverted for any other | |
| | extraneous purpose. | |
| ix | Method of disposal of solid wastes and the | Hazardous waste generated is being |
| | Ministry of Environment & Forests. | CHWIF sites i.e.: M/s. SEPPL, Bhachau, |
| | | Kutch (Gujarat) and M/s. BEIL, |
| | | Ankleshwar, Bharuch (Gujarat). |
| | | as Annexure-7. |
| x | The project proponents should find ways to | Treated sewage water is being |
| | reuse the treated sewage for greenery or any | utilized for horticulture purpose. |
| | into the coastal waters. | |
| xi | Proper navigational aids and leading lights | Proper navigational aids and leading |
| vii | should be provided. | lights have been provided. |
| | should be monitored and kept within | being carried out through a MoEF & |
| | permissible limits. | CC and NABL accredited laboratory |
| | | within port premises and during current monitoring period all the |
| | | pollutants are found under the limit. |
| | | Copy of the Environmental Monitoring |
| | | / Analysis Reports for the period April, 2016 to September 2016 is enclosed |
| | | as Annexure-5. |
| xiii | Forest clearances, as applicable, be obtained. | Noted and will be complied with. |
| xiv | Construction labour camps should be located | Complied, labour camps are outside |
| | should be provided with adequate cooking and | the Coastal Regulation Zone aleas. |
| | sanitation facilities, | |
| xv | The developer shall provide pollution control | Transportation of cargo from port to |
| | bulk coal, iron ore and sulphur. Spill boards | trucks covered with tarpaulin. |
| | shall be provided in the berth to prevent cargo | Following dust control measures are |
| | spillage into the sea. | in place at port to control fugitive |
| | | 1. Belt Conveyor With Hood. |
| | | 2. Water Sprinklers, |
| | | 3. Spray Nozzles In Conveyor System, |
| | | 5. Water Mist/Fog System and |
| | | 6. Wind Brake Shield. |
| xvi | The project proponent should ensure that the | Run off from stockyard is being |
| 1 | surrace run-orr from the stockyard is not let | conected into dump ponds. Quality |



| S. No. | Stipulated Conditions | Compliance Status |
|--------|---|---|
| | out into the sea/open area causing seawater/ groundwater pollution. | monitoring of the Sea Water, Ground Water and Dump Pond Water is being done through MoEF & CC and NABL accredited laboratory. Copy of the Environmental Monitoring / Analysis Reports for the period April, 2016 to Sept., 2016 is enclosed as Annex5. |
| xvii | All pollution control facilities for handling ballast water and bilge as required under MARPOL convention for servicing ships shall be provided. | AHPPL is not taking any ballast water and bilge. However, ballast water and bilge generated from our own tugs is being collected into barrels / drums in secure manner and disposed of through GPCB registered vendors. |
| xviii | A specific oil spill response plan shall be prepared and submitted to the State Authority with a copy to Ministry of Environment & Forests, before commissioning the project. | Oil Spill Contingency Plan has been prepared and the same was approved/vetted by Indian Coast Guard (Letter No.: 7563, dated 09.01.2014). |
| xix | The stacking height of sulphur shall not in any case exceed 5 m. | Comply with, Sulphur stacking height is being maintained less than 5 m. |
| XX | Adequate fire-fighting facilities as per National Fire Protection Code shall be provided in the port area and in the buildings. | All the fire-fighting facilities are at place according to the National Fire Protection Code. |
| xxi | All dredging operations should be restricted to bare minimum extent, the dredge material should be used for reclamation instead of dumping off-shore. | Modified as per communication from MoEF & CC dated 12 th November, 2003 bearing letter No.: J-16011/11/ 2003-IA-III revised conditions states "all dredging operations should be restricted to bare minimum extent, the maximum dredged material suitable for reclamation should be used for the said purpose and the remaining material may be used for dumping at the recommended sites mentioned in Para (vii), complying with. |
| xxii | The dredging operations shall be carried out in a controlled manner such that there is no increase in turbidity levels outside the port area. | Complied, capital dredging is carried out within port limit and as per approved plan only. |
| xxiii | A comprehensive water supply and management plan for the multi cargo port without tapping groundwater shall be prepared, in consultation with State Government/ Irrigation Department with a view to make water available for ships calling at the Hazira Port. | Comprehensive water supply and management plan is in place. No ground water used for Multi-Cargo Port Operations. Agreement has been made with KRIBHCO for procurement of treated industrial water. |
| xxiv | During reclamation, setting ponds shall be provided to control silt discharge into the sea. | During project development phase bunds/setting ponds were provided to control the dumped soil materials which ensure no discharge of silt into the Sea. |
| XXV | A Regional Disaster Management Plan for the Hazira Peninsula, covering all major industries and the port shall be prepared in consultation | Regional DMP for the Hazira Peninsula, covering all major industries and the port has been |



| S. No. | Stipulated Conditions | Compliance Status |
|------------|---|--|
| | with District Authorities and implemented. | prepared in consultation with District |
| | | Authorities and same is being |
| xxvi | The tugs shall be equipped with fire-fighting | All tugs have been well equipped with |
| , | facilities and booms to control oil spill in the | fire-fighting facilities and booms to |
| | port area. | control oil spill in the port area. |
| xxvii | A comprehensive Environmental Impact | Complied with. Comprehensive EIA |
| | Assessment report for the entire gamut of | study report prepared by NEERI has |
| | shall be prepared and submitted within one | Environment and Enrests Gol on 19 th |
| | year from date of receipt of this clearance | July, 2004. |
| | letter. Any additional environmental | |
| | safeguards brought out by this comprehensive | |
| | Environmental Impact Assessment report shall | |
| | The project economic shall engage National | Boing complied with in line with the |
| ~~~ | Institute of Oceanography. Goa for monitoring | substituted conditions 6(a) & 6(b) |
| | the biological parameters of the mangrove | from MoEF & CC, dated 19 th February, |
| | areas located within the project site and the | 2007. |
| | additional area 50 ha identified at Kadia Bet | |
| | monitoring the water quality and to study the | |
| | siltation pattern, National Environmental | |
| | Engineering Research, Nagpur shall be | |
| | engaged. | |
| XXIX | and NEERL undertake monitoring as above | Being complied with in line with the substituted conditions 6(a) & 6(b) |
| | once in thirty days during construction period. | from MoEF & CC, dated 19 th February, |
| | The monitoring schedule should be once is | 2007. |
| | three months during the operational phase of | |
| | the project. The monitoring reports furnished by NIO and NEERI shall be submitted to the | |
| | Regional Office of Ministry of Environment & | |
| | Forests, Bhopal and to Ministry of | |
| | Environment & Forests, New Delhi. | |
| B . | GENERAL CONDITIONS | Noted and being complied with All |
| I | be undertaken meticulously conforming to the | the construction designs/drawings |
| | existing Central/local rules and regulations | relating to the proposed construction |
| | including Coastal Regulation Zone | activities has been approved by the |
| | Notification, 1991 and its amendments. All the | concerned State Government |
| | construction designs/drawings relating to the | Department / Agencies. |
| | approvals of the concerned State Government | |
| | Department / Agencies. | |
| ii | The proponent shall ensure that as a result of | Proper care is being taken during |
| | the proposed constructions, ingress of the | construction activity to avoid any |
| | take place. Piezometers shall be installed for | However M/s AHPPI is monitoring |
| | regular monitoring for this purpose at | the Ground Water Quality at one |
| | appropriate locations on the project site. | location on monthly basis. |
| | | Copy of the Environmental Monitoring |
| | | 7 Analysis Reports for the period April, 2016 to Sentember 2016 is appload |
| | | as Annexure-5. |



| S. No. | Stipulated Conditions | Compliance Status |
|--------|--|--|
| II | Handling, manufacturing, storage and transportation of all hazardous chemicals should be carried out in accordance with MSIHC rules, 1989 and subsequent amendments. All approvals from State and Central nodal agencies including OISD, Chief Controller of Explosives, Chief Inspectorate of Factories must be obtained. A comprehensive contingency plan in collaboration with the concerned authorities must be formulated before commissioning of the project to meet any eventuality in case of an accident. | Complying with and all required statutory approvals has been obtained from the concerned authorities i.e.: 1. PESO License from Chief Controller of Explosive, Nagpur vides Order No.: P/HQ/GJ/15/5294 (P270337). Renewed on 31.12.2015 valid till 31.12.2018. 2. License to work a Factory (Liquid Terminal) from Director of Industrial Safety and Health, Govt. of Gujarat their vide Registration No.: 3502/51410/2013 and License No.: 18757, Renewed on 09-02-2015, valid till 31.12.2016. |
| iv | A well-equipped laboratory with suitable instruments to monitor the quality of air and water shall be set up as to ensure that the quality of ambient air and water conforms to the prescribed standards. The laboratory will also be equipped with qualified manpower including a marine biologist so that the marine water quality is regularly monitored in order to ensure that the marine life is not adversely affected as a result of implementation of the said project. The quality of ambient air and water shall be monitored periodically in all the seasons and the results should be properly maintained for inspection of the concerned pollution control agencies. The periodic monitoring reports at least once in 6 months must be send to this Ministry (Regional Office at Bhopal) and State Pollution Control Board. | Complying with, the environmental quality monitoring is being done by MoEF & CC & NABL accredited laboratory. Please refer the Annexure-5 for the Environmental Monitoring / Analysis Reports for the period April, 2016 to September, 2016 . |
| V | Adequate provisions for infrastructure facilities such as water supply, fuel for cooking, sanitation etc. must be provided for the laborers during the construction period in order to avoid damage to the environment. Colonies for the laborers should not be located in Coastal Regulation Zone area. It should also be ensured that the construction workers do not cut trees including mangroves for fuel wood purpose. | All the labour colonies are located outside the CRZ area. |
| vi | To prevent discharge of sewage and other liquid wastes into the water bodies, adequate system for collection and treatment of the wastes must be provided. No sewage and other liquid wastes without treatment should be allowed to enter into the water bodies. | Adequate system for collection and treatment of sewage and liquid wastes are in place. Treated sewage water is being utilized for horticulture purpose. |
| vii | Appropriate facility should be created for the collection of solid and liquid wastes generated by the barges/vessels and their safe treatment and disposal should be ensured to avoid possible contamination of the water bodies. | We are providing the facility to collect the solid and liquid waste from the vessel on call basis. Garbage collected from the vessels is disposed of in environment friendly manner by converting bio-compost |



| S. No. | Stipulated Conditions | Compliance Status |
|--------|---|--|
| | | and used the same in horticulture / gardening purpose. We are also arranged the GPCB approved third party to collect the liquid waste from vessels on call basis and the agency collect the liquid waste from vessels and transport at their facility for further treatment and disposal purpose. Solid and liquid wastes generated from our own tugs is being collected in secure manner and disposed of through GPCB registered / approved vendors. |
| VIII | Necessary navigational aids such as channel markers should be provided to prevent accidents. Internationally recognized safety standards shall be applied in case of barge/vessel movements. | Proper navigational aids and leading lights have been provided. Internationally recognized safety standards are being followed during vessel movement. |
| ix | The project authorities should take appropriate community development and welfare measures for villagers in the vicinity of the project site, including drinking water facilities. A separate fund should be allocated for this purpose. | CSR activities are carried out by Adani Foundation in four verticals i.e. Education, Community Health, Sustainable Livelihood and Rural Infrastructure Development. Details of the CSR activities for the Financial Year: 2016-17 (Up to September, 2016) and budget is enclosed as Annexure-4 . |
| x | The quarrying material required for the construction purpose shall be obtained only from the approved quarries/borrow areas. Adequate safeguard measures shall be taken to ensure that the overburden and rocks at the quarry site do not find their way into water bodies. | All quarrying material is being obtained from approved quarries. |
| xi | The dredging operations to be undertaken with the prior approval of this Ministry, shall be executed with appropriate safeguard measures to prevent turbidity conditions in consultation with the expert agencies such CWPRS/NIO. | Deleted as per communication from MoEF & CC dated 12 th November, 2003 bearing letter No.: J- 16011/11/2003-IA-III. |
| xii | For employing unskilled, semi-skilled and skilled workers for the project, preference shall be given to local people. | M/s. AHPPL is giving preference to the locals for contracts and skilled local candidates for employment as per suitable requirements. |
| xiii | The recommendations made in the Environmental Management Plan and Disaster Management Plan, as contained in the Environmental Impact Assessment and Risk Analysis Reports of the project shall be effectively implemented. | Complying with the recommendations made in the EMP and DMP in the EIA and RA reports. |
| xiv | A separate Environmental Management Cell with suitable qualified staff to carry out various environment related functions should be set up under the charge of a Senior | Environment Management Cell has been set up with qualified staff to ensure the effective implementation of environmental safe guards. |



| S. No. | Stipulated Conditions | Compliance Status |
|--------|---|---|
| | Executive who will report directly to the Chief | |
| xv | Executive of the Company. The project-affected people, of any should be properly compensated and rehabilitated. | There is no acquisition of private land and thus there is no displacement of people, houses or fishing activity due to port development. |
| xvi | The funds earmarked for environment protection measures should be maintained in a separate account and there should be no diversion of these funds for any other purpose. A year-wise expenditure on environmental safeguards should be reported to this Ministry. | Details of budget for Environment Management for the Financial Year: 2016-17 is enclosed as Annexure-6 . No funds are diverted for any other purposes. |
| xvii | Full support should be extended to the officers of this Ministry's Regional Office at Bhopal and the officers of the Central and State Pollution Control Boards by the project proponent during this inspection for monitoring purposes, by furnishing full details and action plans including the action plans including the action taken reports in respect if mitigative measures and other environmental protection activities. | Noted and being complied with. Last visit by Addl. PCCF, MoEF & CC - RO, Bhopal was on 10/02/2016 and full cooperation was extended. |
| xviii | In case of deviation or alternation in the project including the implementing agency, a fresh reference should be made to this Ministry for modification in the clearance conditions or imposition of new ones for ensuring environmental protection. The project proponents should be responsible for implementing the suggested safeguard measures. | Noted and same will be complied in the case of change in project profile / implementation agency, if any. |
| xix | This Ministry reserves the right to revoke this clearance, if any of the conditions stipulated are not complied with to the satisfaction of this Ministry. | Noted and comply with the MoEF & CC directions, if any. |
| xx | This Ministry or any other competent authority may stipulate any additional conditions subsequently, if deemed necessary for environmental protection, which shall be complied with. | Noted and comply with the additional conditions stipulated by the MoEF & CC, if any. |
| xxi | The project proponent should advertise at least in two local newspapers widely circulated in the region around the project, one of which shall be in the vernacular language of the locality concerned informing that the project has been accorded environmental clearance and copies of clearance letters are available with the State Pollution Control Board and may also be seen at Website of the Ministry of Environment & Forests at <u>http://www.envfornic.in</u> . The advertisement should be made within 7 days from the date of issue of the clearance letter and a copy of the same should be forwarded to the Regional Office of this Ministry at | Closed, Advertisements were published in Gujarati News Paper "Gujarat Samachar" on 12/07/2003 and English News Paper "The Times Of India" on 10/07/2003. |



| S. No. | Stipulated Conditions | Compliance Status |
|--------|---|------------------------------------|
| | Bangalore. | |
| xxii | The project proponents should inform the | Closed, |
| | Regional Office as well as the Ministry the | Required details were submitted |
| | date of financial closure and final approval of | along with the half yearly |
| | the project by the concerned authorities and | Environment & CRZ Clearance report |
| | the date of start of Land Development Work. | dated 23 rd May, 2016. |



APPENDIX - 1:

COMPLIANCE TO THE CONDITIONS STIPULATED IN CRZ RECOMMENDATION ISSUED BY FOREST & ENVIRONMENT DEPARTMENT, GOVERNMENT OF GUJARAT TO MOEF & CC, NEW DELHI VIDE LETTER NO.: ENV-10-2012-30-E DATED 11TH MAY, 2012



Appendix -1: Compliance to the conditions stipulated in CRZ recommendation issued by Forest & Environment Department, Government of Gujarat to MoEF & CC, New Delhi vide letter No.: ENV-10-2012-30-E dated 11th May, 2012:

| S. No. | Conditions | Compliance Status | |
|--------|--|--|--|
| Α. | Specific Condition | | |
| 1 | The provision of CRZ Notification 2011 shall be strictly adhered by M/s. AHPPL. No activity in contradiction to the provision of CRZ Notification shall be carried out by M/s. AHPPL. | All the activities is being carried is in line with the approval received under CRZ Notification, 2011. | |
| 2.1 | M/s. AHPPL shall not construct any storage facilities for material / chemicals in the CRZ area except for those permissible as per Annexure - II of CRZ Notification 2011. | Noted. Only permissible activities being carried out in CRZ area. | |
| 2.2 | Also for other hazardous chemicals, outside CRZ Areas, the AHPPL shall consult SDMA for Disaster Management Plan. | Complied, Disaster Management Plan has been submitted to GSDMA vide letter dated 20.10.2012. Comments vide GSDMA letter No.: GSDMA / SM / Ind. Safety / 770560 dated 03.12.2012. The Revised Plan was submitted to GSDMA on 23.05.2014. | |
| 3 | All necessary permissions from different Government Departments / agencies shall be obtained by M/s. AHPPL before commencing the activities. | All the statutory permissions from the concerned statutory authorities are obtained i.e.: 1. Environment and CRZ Clearance from MoEF & CC, GOI vide order No.: F.No.:11-150/2010-IA-III dated 03.05.2013. 2. PESO License from Chief Controller of Explosive, Nagpur vides order No.: P/HQ/GJ/15/5294 (P270337), Renewed on 31.12.2015 valid till 31.12.2018. 3. License to work a Factory (Liquid Terminal) from Director of Industrial Safety and Health, Govt. of Gujarat their vide Registration No.: 3502/51410/2013 and License No.: 18757, Renewed on 09-02-2015, valid till 31.12.2016. | |
| 4 | The AHPPL shall ensure that there shall be no damage to the existing mangrove patches near the site and also ensure the free flow of water to avoid damage to the mangrove. | Noted and complied with. There are no adverse impacts on mangrove as well as flow of water with respect to development activities. | |
| 5 | No dredging, reclamation or any other project related activities shall be carried out in CRZ area categorized as CRZ-I (A) and it shall have to be ensured that the mangrove habitats and other ecologically important and significant areas, if any in the region are not affected due to any of the project activities. | All activities will be carried out as per CRZ clearance. No mangrove habitats and other ecologically important and significant areas are present within port limit. | |
| 6 | The dredging material shall be disposed of at the location already approved by the Ministry of Environment and Forests, Government of | Dredging material is being utilized for level raising, reclamation and apart from the above activity, if any excess material | |



| S. No. | Conditions | Compliance Status | |
|--------|--|---|--|
| | India. | generated will be disposed of at the location already approved by the MoEF & CC. | |
| 7 | All the recommendations and suggestions given by M/s. NIO and Cholamandalam MS Risk Services Ltd, Chennai in their EIA reports for conservation / protection and betterment of environment shall be implemented strictly by M/s. AHPPL. | All the recommendations and suggestions for conservation / protection and betterment of environment are being implemented strictly. | |
| 8 | The construction and operational activities shall be carried out in such a way that there is no negative impact on mangroves, if any and other important coastal / marine / habitats. The construction activities shall be carried out only under the guidance / supervision of reputed institute / organization. | There are no other important coastal / marine / habitats presents within the port limit. The Port development work is supervised by Gujarat Maritime Board (GMB) and the progress report of Port development activities are regularly submitted to GMB. | |
| 9 | M/s. AHPPL shall strictly ensure that no creeks or rivers are blocked due to any activity at Shipyard. | All the activities are carried out as per EC & CRZ clearance and no creeks are blocked due to development activities. Shipyard is not envisaged in our proposal. | |
| 10 | The construction debris and / or any other type of waste shall not be disposed of into the sea, creek or in CRZ areas. The debris shall be removed from construction site immediately after the construction is over. | Complied with, construction debris removed from construction site immediately after completion of the construction work. | |
| 11 | The construction camps shall be located outside the CRZ area and the construction labour shall be provided with the necessary amenities, including sanitation, water supply and fuel and it shall be ensured that the environmental conditions are not deteriorated by construction labours. | Labour camps are located outside the Coastal Regulation Zone areas. | |
| 12 | M/s. AHPPL shall prepare and regularly update their Local Oil Spill Contingency and Disaster Management Plan in consonance with National Oil Spill and Disaster Contingency Plan and shall submit the same to this department after having it vetted through Indian Coast Guard. | Oil Spill Contingency Plan has been prepared and the same was approved/vetted by Indian Coast Guard (Letter No.: 7563, dated 09.01.2014). Disaster Management Plan has been submitted to GSDMA vide letter dated 20.10.2012. Comments vide GSDMA letter No.: GSDMA / SM / Ind. Safety / 770560 dated 03.12.2012. The Revised Plan was submitted to GSDMA on 23.05.2014. | |
| 13 | M/s. AHPPL shall bear the cost of external agency that may be appointed by this department for supervision / monitoring of proposed activities and the environment impact of the proposed activities. | Noted and agreeing to bear the cost of external agency, if any that may be appointed by this department. | |
| 14 | The jetty and most of the approach would be supported on piles allowing adequate flow of water without significant obstruction. | Jetty approach is supported by piles allowing adequate flow of water. | |
| 15 | The ground water shall not be tapped within the CRZ areas by the AHPPL to meet with | No ground water is tapped with in CRZ area. | |



| S. No. | Conditions | Compliance Status | |
|--------|---|--|--|
| | the water requirements in any case. | | |
| 16 | M/s. AHPPL shall take up massive greenbelt development activities in consultation with Forest Dept. / GEER Foundation / Gujarat Ecology Commission. A comprehensive plan for this purpose has to be submitted to the Forests and Environment Department. | Company has set up dedicated greenbelt area for plantation at periphery / avenue plantation / landscaping etc. | |
| 17 | Mangrove plantation in 200 Ha. shall be carried out in consultation with Gujarat Ecology Commission / Forest Dept. by M/s. AHPPL with in a period of two years from the issuance of CRZ clearance by MoEF, Gol and an action plan in this regard shall be submitted to this Department along with satellite images and GPS readings with Latitudes and Longitudes. | Company has carried out mangrove afforestation in an area of 200 hectares i.e.: 50 hectares in Kantiyajal and 150 hectares in Village Nada-Devla of District - Bharuch and same is completed. | |
| 18 | The AHPPL shall have to take up bio- shielding development programme as part of CSR in consultation with Forest Department / PCCF and action plan in this regard shall have to be submitted to the MoEF - Gol and this Department. | Communication has been initiated with PCCF, Forest Dept., GoG vide our letter 29 th May, 2012 and District Forest Officer, Surat Forest Range vide our letter dated 05 th May, 2014. AHPPL has already been initiated the development of Bio-Shield Pilot Project at Village - Tankari Bandar, Taluka - Jambusar, District - Bharuch (Gujarat) on an area of 18 hectare with the help of local NGO. | |
| 19 | M/s. AHPPL shall have to contribute financially for taking up the socio-economic upliftment activities in this region in consultation with Forest and Environment Dept. and the District Collector / District Development Officer. | CSR activities are carried out by Adani Foundation in four verticals i.e.: Education, community health, sustainable livelihood and rural infrastructure development. Appropriate financial contribution is being made. Schemes promoted by District Authorities and Forest & Environment Department, GoG are also included. | |
| 20 | A separate budget shall be earmarked for environment management and socio- economic activities including green belt development / mangrove plantation and details thereof shall be furnished to this Department as well as the MoEF, Gol. The details with respect to the expenditure from this budget head shall also be furnished along with the compliance report. | Environmental Management Plan is in place and the funds earmarked are being utilized for effective implementation of environmental safeguards and environment monitoring. Key components are Environment monitoring, Mangrove plantation, environmental studies etc. Details of budget for Environment Management for the Financial Year: 2016-17 is enclosed as Annexure-6. CSR activities are carried out by Adani Foundation in four verticals i.e.: Education, community health, sustainable livelihood and rural infrastructure development. Details of the CSR activities for the Financial Year: 2016-2017 (Up to September, 2016) and budget is | |



| S. No. | Conditions | Compliance Status | |
|--------|---|--|--|
| | | enclosed herewith as Annexure-4. | |
| 21 | A separate Environment Management Cell with qualified personnel shall be created for environmental monitoring and management during construction and operational phases of the project. | Environment Management Cell has been set up with qualified staff to ensure the effective implementation of environmental safe guards. | |
| 22 | Environment Audit Report including the changes, if any, with respect to baseline environmental quality in the coastal and marine environment shall be submitted every year by M/s. AHPPL to this Department as well as MoEF, Gol. | Regular environment monitoring is being done by MoEF & CC and NABL accredited laboratory and reports are submitted to MoEF & CC, Gol along with half yearly compliance report. No significant changes observed with respect to baseline. | |
| 23 | A six monthly report on compliance of the conditions mentioned in this letter shall have to be furnished by M/s. AHPPL on a regular basis to this Department as well as MoEF, Gol. | Noted and complied with, half yearly compliance report is being submitted to all the concerned authorities on regular basis. | |
| 24 | Any other condition that may be stipulated by this Department / MoEF, Gol from time to time for environment protection / management purpose shall have to be complied with by M/s. AHPPL. | Noted and comply with the additional conditions stipulated by the MoEF & CC, if any. | |



APPENDIX - 2:

COMPLIANCE TO THE CONDITIONS STIPULATED IN LETTER DATED 19TH FEBRUARY, 2007 FOR AMENDMENT IN CERTAIN CONDITIONS OF CRZ/ENVIRONMENTAL CLEARANCE ISSUED ON 03RD MAY, 2003



<u>Appendix - 2</u>: Compliance to the conditions stipulated in letter dated 19th February, 2007 for amendment in certain conditions of CRZ/Environmental Clearance issued on 03rd May, 2003: -

| S. No. | Stipulated Conditions | Compliance Status | |
|-----------|--|---|--|
| Α. | SPECIFIC CONDITIONS | | |
| 6(a) | M/s. HPPL should undertake compensatory mangrove plantation in 200 ha. While 250 ha fresh mangrove plantation should be done by M/s Niko Resources Limited. The mangrove afforestation programme of 450 ha by the HPPL and Niko resources will be monitored by the sub-Committee constituted by the NCZMA and report to the Chairman periodically. | Complied, Mangrove plantation on area approximately 1371 ha. has been done by Hazira LNG Pvt. Ltd. in phase manner. Same has been inspected by local forest department. | |
| 6(b) | The yearly monitoring of the afforestation programme of mangrove will be also be carried out through time series satellite imagery in 1:25,000 scale by the respective units and submit a monitoring report to the NCZMA. | Latest report on mangrove afforestation monitoring by using remote sensing techniques from November to December, 2015 satellite data images was submitted to Principal Secretary, Forest and Environment Department, Gandhinagar vide letter No.: HLPL/HSE/ECR/Port/ 2016/1 dated 11 th March, 2016. | |



ANNEXURE-1:

COPY OF LATEST CONSENT TO ESTABLISH ISSUED BY GPCB



Annexure - 1: Copy of Consent to Establish issued by GPCB dated 16/04/2016

| APPENDING AND ADDRESS AND ADDR | GUJARAT POLLUTION CONTROL BOARD |
|--|---|
| | PARYAVARAN BHAVAN |
| | Sector 10-A, Gandhinagar 382 010 |
| | Phone : (079) 23226295 |
| | Fax : (079) 23232156 |
| GPCB | "Consent to Establish" Website : www.gpcb.gov.in |
| | (CTE-77767) |
| | BY R.P.A.D. |
| | NO: GPCB/CCA-SRT-1314(6)/ID_35352(352537 Date: 16/4/2016 |
| \sim | To M/s. Adani hazira Port Pvt. Ltd., Near Hazira LNG Pvt. Ltd., Hazira:- 394270, Tal:- Chorasi, Dist:- Surat. |
| | Sub: Consent to Establish (NOC) Amendment under Section 25 of Water Act 1974 and Section 21 of Air Act 1981 |
| | Ref: Your application No. 103781Dated: 5/2/2016 |
| | Without prejudice to the powers of this Devel |

of Pollution) Act-1974, the Air Act-1981 and the Environment (Protection) Act-1986 and without reducing your responsibilities under the said Acts in any way, this is to inform you that this Board grants Consent to Establish for setting up of <u>D.G. Set (Stand by) of Capacity 750 KVA</u> located at Near Hazira LNG Pvt. Ltd., Hazira:- 394270, Tal:- Chorasi, Dist:- Surat.

SPECIFIC CONDITIONS:

- The Validity period of the order will be Five years i.e. <u>30/03/2021</u>
- Unit shall provide arrangement for acoustic enclosure to keep Noise levels within Norms.
- Unit shall obtain CCA-amendment for D.G. Sets.

The Conditions under Air Act 1981 shall be read as:

The following shall be used as fuel only in D.G. Set (Stand By).

| Sr.No. | Fuel | Total Quantity | |
|--------|--------|----------------|--|
| 1 | Diesel | 160 Lit/Hr | |

- The applicant shall install & operate a comprehensive adequate air pollution control system in order to achieve prescribed norms.
- 3. The flue gas emission through Proposed D.G. Sets stack shall conform to the following standards:

| No. | Stack attached to | Stack height in Meter | Air Pollution Control System | Parameters | Permissible Limit |
|-----|-------------------------------------|--------------------------|------------------------------------|--|---|
| 1. | D.G. Set - (Stand By) 750 KVA | 11 | | PM SO ₂ NO _x | 150 mg/NM ³ 100 ppm 50 ppm |



Clean Gujarat Green Gujarat ISO-9001-2008 & ISO-14001 - 2004 Certified Organisation

1

- 1. Stack monitoring facilities like port hole, platform/ladder etc., shall be provided with stacks/vents chimney in order to facilitate sampling of gases being emitted into the atmosphere.
- Ambient air quality within and outside the premises of the unit shall conform National Ambient Air Quality standards notified by MOEF vide notification dated 16/11/2009 and maintly to the following standards:-

| Sr. | Pollutant | Time Weighted | Concentration in |
|-----|--|---------------|------------------|
| No. | | Average | Ambient air |
| 1. | Sulphur Dioxide (SO2), µg/M3 | Annual | 50 |
| | | 24 Hours | 80 |
| 2. | Nitrogen Dioxide (NO2), µg/M3 | Annual | 40 |
| | | 24 Hours | 80 |
| 3. | Particulate Matter | Annual | 60 |
| _ | (Size less than 10 µm) OR PM10 µg/M3 | 24 Hours | 100 |
| 4. | Particulate Matter (Size less than 2.5 mm) OR PM | Annual | 40 |
| | 2.5 μg/M3 | 24 Hours | 60 |

- 6. The industry shall take adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standards in respect of noise to less than 75dB(a) during day time and70 dB (A) during night time. Daytime is reckoned in between 6a.m. and10 p.m. and nighttime is reckoned between 10 p.m. and 6 a.m.
- The applicant shall provide proper ventilation and exhaust facilities so as to maintain healthy working atmosphere within the factory premises.
- The other conditions of the Consent order No: WH-47069 Dated: 21/05/2015 Valid up to Dated – 04/04/2017 shall remain unchanged.

For and on behalf of GUJARAT POLLUTION CONTROL BOARD

> (K.C.Mistry) Senior Environmental Scientist

ID_35352



ANNEXURE-2:

ACTION PLAN AND COMPLIANCE STATUS ON THE ISSUES RAISED DURING THE PUBLIC HEARING



<u>Annexure-2</u>: Action plan and compliance status on the issues raised during the public hearing:

| S. No. | Details of Representation | Response from M/s. AHPPL | Compliance Status |
|-----------|---|--|--|
| 1 | On behalf of Hazira village, I welcome the expansion project of M/s. Adani Hazira Port Pvt. Ltd. at Hazira. Priority will be given to thousands of people of Hazira and surrounding villages for transport, business and employment opportunities. Company has provided training to the people of Hazira and surrounding villages for crane operation at Mundra and given employment as crane operator at Hazira Port. | Rohitbhai, we are happy to note that on behalf of Hazira gram panchayat you have given warm welcome for this project. We whole heartedly thank you for this gesture. We assure you that our conduct and approach in managing activities would be in reciprocation to your welcome. | Closed. |
| | I believe that company will install latest technology for pollution control. Proposed project will surely care for human life. Due to proposed port Hazira people will surely get water, health and education facilities. I request that company would take required precautions for accident prevention and safety. Adani Foundation has provided required support as and when needed by Hazira village. I request that fishermen's concerns be taken care. | Port Business consists of handling of cargo and port business is a service industry not any process industry as there is no processing involved in port activities. We will ensure the pollution levels are within limit. As part of Adani Foundation CSR Activities are already in place and to provide support to fisher folks. Adani foundation intents to improve their livelihood and propose the following steps: 1). Fishermen Equipment Aid Scheme, 2). Equipment's worth Rs. 15 lacks for support programme, 3). Education and awareness through Video shows, 4). Exposure Visit Safety measures for workman ship is also already in place and implementation of the same is being driven by Health & Safety Department. | There is no adverse effect on Environment observed and the pollution levels are within limit. The results of Environmental Monitoring conducted by MoEF recognized agency are regularly submitted to concerned authorities. Adani foundation is taking care of CSR activities in and around surrounding area. Details are submitted along with compliance report. Please refer the Annexure - 4. |
| | I welcome this port as we are getting transport related business opportunities and we hope that same would be continued in future. | Adani will continue to give priority to locals for transportation business. | Preference is given to local transporters. |
| | Please clarify how much priority will be given to people from Hazira and surrounding areas for employment. | First preference will be given to Hazira and surrounding areas villagers for employment provided candidates satisfy qualification and medium of | AHPPL has always given employment priority to local qualified persons and in future the same will be |



| S. No. | Details of Representation | Response from M/s. AHPPL | Compliance Status |
|-----------|--|--|---|
| | | experience requirements. | continued. |
| | Forest land is also requested for development of port at Hazira. So kindly clarify for compensation/afforestation. | As part of State CRZ recommendation competent authority has advised us to do mangrove plantation to the tune of 200 ha. on obtaining Environment Clearance (EC). We will comply the same on obtaining EC. | M/s. AHPPL has developed mangrove plantation on 200 ha. area i.e.: 50 ha. in Kantiyajal and 150 ha. in Village Nada-Devla of District - Bharuch. |
| | Please clarify what arrangements have been made by company if calamities like Tsunami, Earthquake or Flood arise after implementation of the proposed project. | In the context of natural calamities, we have done modeling studies to understand the risk of oil spillage. We have also prepared Disaster Management Plan. This plan is being presented to the District Collector. After his approval it will go to State Disaster Management Authority at Gandhinagar for necessary approval and guidance. During natural calamities all local industrial units and government organizations work together to mitigate impacts of natural calamities. In that situation we would work under the guidance of District Collector and police authorities to do the needful. Disaster Management Plan is structured in such a way. | Disaster Management Plan has been submitted to District & State Authorities vide letter dated 20.10.2012. Suggestions / comments received from authority vide letter No.: GSDMA/ SM/ Ind. Safety/ 770560 dated 03.12.2012. Suggestions are incorporated and revised plan has been submitted to GSDMA on 23.05.2014. GSDMA has also prepared a comprehensive Disaster Management Plan for entire Hazira Posion |
| 2 | We welcome this public hearing. It is good that you are giving preference to local affected people and hearing them during public hearing. We don't have any objection against the development of Adani Group along with other industrial development in Hazira leading to development of Gujarat and the Nation. Adani company is complying with the environmental laws promulgated by the State and Union Government. In fact, it is duty of Adani Port to do so. Under their CSR activities Adani Group should provide | Thanks for welcoming our project. CSR Activities are already in place by Adani Foundation. We also ensure that priority will be given for employment to local's people and provide business opportunities to small & big local transporters. For affected Fisherman Youth Adequate training will be given and based on performance during training, employment preference will be given. National Highway - 6 is being widened. On completion of widening the | AHPPL has always given employment priority to local qualified persons and in future the same will be continued. No fishing activity has been affected by the port. However, we are always ready to give required training to fishermen or any other persons as per their needs. Adani Foundation is taking care of |



| S. No. | Details of Representation | Response from M/s. AHPPL | Compliance Status |
|-----------|--|---|---|
| | support for development of Hazira village and employment to unemployed people. All transport businesses should be given to small & big local transporters of Hazira only. Youth from families of affected fishermen should be provided required training and employment. New transport route should be proposed as the present route to take containers is very narrow. | constriction and congestion that we see today will be behind us. As mentioned in the EIA in the first 5 years of the multi cargo port maximum number of 1200 trucks is expected to ply in the national highway connecting the port. After the railway line is developed and the trains start plying 60% of the transportation load will be conveyed through rail transport only 40% will come on the national highway. That is a moderate load. | training programs under our CSR activities. The Hazira bypass Road is now taken over by NHAI and upgraded to four lanes. Additionally, AHPPL is planning to transport cargo through dedicated Rail Route. The development work of Rail corridor is under process in consultation with Govt. Agencies. |
| | We thank Adani Group for giving support for the construction of classrooms for standard 11 & 12 in Navchetan school. | | Closed. |
| | I thank you for making me successful in providing compensation to the affected fishermen. | | Closed. |
| | I request for employment to locals people and transport contract to local transporters only. We support the development of Adani Port in our area. We don't have any objection to the project in this public hearing. | | AHPPL has always given employment priority to local qualified persons and in future the same will be continued. |
| 3 | As this is biggest port in the South Gujarat and as there is no government land left, we wish that there will not be resettlement of the Junagam village due to this proposed expansion project of Adani Port. There is a fear in the people of the village that they will have to vacate the village in future. So we request collector to give us guarantee in writing that we will be able to live with peace where we are today. | We want to assure you that we do not intend to take any private land of farmers or any house site land. If you carefully see the development plan we have just presented, the map will alleviate your uncalled fears. There would not be any question of rehabilitation of any village. Moreover, we will take care that your property, your assets and convenience are not jeopardized by our action. | There is no R&R factors involve for development of Port. The entire port is being developed on reclaimed land allotted by Government. |
| | Berths will be developed through dredging up to -15 meters. We are getting ground water from the depth of 20 to | Dredging activity is carried out in marine area i.e. sub tidal area and not in terrestrial part. Dredging is | Ground water quality in vicinity of the project is being monitored by MoEF |



| S. No. | Details of Representation | Response from M/s. AHPPL | Compliance Status |
|-----------|---|--|---|
| | 65 ft in some of the areas, which we are using for drinking purpose. What will be the impact on the ground water due to dredging up to -15 meters? | limited to turning circle and basin area. Due to this ground water is not going to be polluted in any way. | & CC and NABL accredited laboratory. There is no adverse impact observed on ground water quality. |
| | After construction of liquid berth No.: 3 which will handle & store 1.95 Million Tones by 2017-18, what emergency steps would be required to save the human life incase just like Bhopal if there will be gas leakage due to Tsunami, Earthquake or terrorist activities. | In the context of natural calamities, we have done modeling studies to understand the risk of oil spillage. We have also prepared Disaster Management Plan. This plan is being presented to the District Collector. After his approval it will go to State Disaster Management Authority at Gandhinagar for necessary approval and guidance. During natural calamities all local industrial units and government organizations work together to mitigate impacts of natural calamities. In that situation we would work under the guidance of District Collector and police authorities to do the needful. Disaster Management Plan is structured in such a way. | Disaster Management Plan has been submitted to District & State Authorities vide letter dated 20.10.2012. Suggestions / comments received from authority vide letter No.: GSDMA/ SM/ Ind. Safety/ 770560 dated 03.12.2012. Suggestions are incorporated and revised plan has been submitted to GSDMA on 23.05.2014. GSDMA has also prepared a comprehensive Disaster Management Plan for entire Hazira Region |
| | We welcome Adani Port & they require land for the container and coal storage. However, all industries located in the Hazira area have acquired government land and another 2000 acre land is allotted to tourism department. Sir therefore, I request you to declare remaining land of Junagam, Suvali. Damka & Batlai as residential area or agricultural zone. This is to ensure that in future we will not be displaced. As the port is to be constructed at the coast line, there are chances of spillage of liquid into sea and impact of solid hazardous waste. In this condition explain plan to mitigate impact on fisher man community. | Thanks for welcoming our project and as we mentioned above we are not going to acquire any land apart from our port layout area mentioned in EIA report. So far as declaring rest of Govt. land as residential and agricultural zone is concerned authorities may take a call on it, which is not in our control. Our Oil Spill Response Plan and Disaster Management plan is addressed to above questions and fisherman community our CSR activities are addressed in response to Rohitbhai Jayantibhai Patel, Sarpanch, Hazira. | Closed. |



| S. No. | Details of Representation | Response from M/s. AHPPL | Compliance Status |
|-----------|--|--|--|
| | Secondly there is a question of unemployment of the youth of the Hazira area. As told by the company 700 people will be employed, youth from local families presently engaged in farming, animal husbandry and fisheries should be trained. Due to development of the port people from different states of India will come and therefore, there are chances of crime such as gang rape, hooliganism and terrorist attack. Is there any plan to control these potential evils? Training to unemployed women and employment is being planned. In future we and Adani Port would like to work together with full cooperation. On behalf of Junagam village and villagers, I welcome the expansion of the terminal. | The port has opportunities for both technical and non- technical employment. Moreover indirect employment in transport and other services will also be there. All these opportunities may be taken by local residents. To facilitate them to take this opportunity we will provide necessary training to enhance their competence, so that they may not only get employment in Adani port but else were also. Some of you have expressed concern about terrorist activity creating great risk to our chemical terminals with attendant adverse consequences in our neighborhood. We are going to be ISPS compliant; as a result of this discipline only authorized persons and material can enter into the port. More over district administration and police also take precautionary measures to intercept terrorist activities. Coast guards contribute to this effort. In a sense the entire nation is collectively fishting against torrorism | Port has obtained ISPS, NSPC and other clearances from concerned authorities. Port authority is closely coordinating with Marine Police Station to maintain law and order. No serious increase in law and order issues so far. |
| 4 | Plantation of the mangroves has been carried out between well numbers 4 to 7. This plantation has been destroyed by dredging and area is filled up. | As per Environment Clearance 2003 there were mangroves of 22 ha. and it was informed to protect the same vide specific condition (vi). But an amendment was issued on 19 th Feb., 2007 for deleting the specific condition and instruction was given to HPPL to do compensatory mangrove plantation to the tune of 200 ha. AHPPL has not destroyed any mangrove directly or indirectly. | M/s. AHPPL has developed mangrove plantation on 200 hectares area i.e.: 50 hectares in Kantiyajal and 150 hectares in Village Nada-Devla of District - Bharuch. |
| | In this area fisherman used to catch prawns, crabs and | As above | Closed |
| | Through dredging company has | | |



| S. No. | Details of Representation | Response from M/s. AHPPL | Compliance Status |
|-----------|--|---|---|
| | destroyed Mangroves. | | |
| | There are approximately 2500 fishermen, belonging to, Halpathi and Koli Patel communities living in the village. These people will be unemployed as fishing activity will be stopped due to dredging up to 20 meter by the company. Is it development or destruction? | M/s. AHPPL had provided compensation to affected fisherman by identifying effected fisher man with the help of the Sarpanch, Hazira. | M/s. AHPPL had provided monetary help to needy fishermen who were affected by reduced catch in this area well before arrival of AHPPL by identifying effected fishermen and women with the help of the Sarpanch, Hazira. No fishing activities have been affected by dredging which is strictly as per EC. |
| | If fishermen get sand from the river by the boat in the Magdalla area, they have to pay royalty for the same. But why companies are given permission for dredging without royalty? What about approximately 2500 fishermen? | In regard to impact on fisherman, I want to point out the real situation that we are not in the river mouth, but just outside of it. The port development is only in a stretch of 4 km of coast line. We have not displaced any fisherman. The surrounding areas are open for fishing, Nevertheless we have compensated fisherman who were identified by the Grampanchayat to be active in the areas where we are now operating. As Sushmaben mentioned we will support fisherman by giving them tools, nets etc. and be help full to them. A charge on sand procured from riverbanks is a subject of Govt. Policy. Dredging may be treated differently because without dredging no port can be created. Moreover, reclaimed land remains under ownership of Government. | No further action required by AHPPL. |
| 5 | As our friends have already given suggestion for safety and employment, it is not required to repeat the same. Foundation should provide employment opportunity to the land looser, fisherman, individual engaged in animal husbandry who are | The port has opportunities for both technical and non- technical employment. Moreover indirect employment in transport and other services will also be there. All these opportunities may be taken | AHPPL has always given employment priority to local qualified persons and in future the same will be continued. |



| S. No. | Details of Representation | Response from M/s. AHPPL | Compliance Status |
|-----------|---|--|---|
| | above 50 years and uneducated. | by local residents. To facilitate them to take this opportunity we will provide necessary training to enhance their competence, so that they may not only get employment in Adani port but else were also. | |
| | should be provided training and given opportunity for the employment. Company should control the pollution arising due to transportation of chemical or coal. Earlier Shell company used to avoid overloading. So Adani Port should also not do the overloading to prevent the accidents. There is no medical facility available for treatment in case of emergency. As there is drought this year, company should consider providing drinking water in surrounding area. | This port will have focus on container cargo. Container cargo comes in boxes and is clean by nature. So the question of fugitive dust emission on the road is not expected to be severe for this port. The coal handling will be done taking care that all the trucks are properly covered so that there is no dust emitted on the road. As you know practically all our transporters are from this area. It is their responsibility to take care of overloading. If transporters do not overload there would not be any spillage on the roads. It is not only responsibility of GPCB or the company but we all have to collectively work together for spillage free coal transportation. We have taken note of your needs. In CSR activities we would include public health related measures. | AHPPL is following best practices of port operation to reduce pollution and prevent accidents. Port is maintaining an Occupational Health Centre with qualified officers, ambulance and proper antidotes for all types of chemicals being handled in port. Tie- up with reputed hospitals in the city exists to cater to more serious cases. |
| 6 | (During the representation of the Shri. Divyeshbhai there was an aggressive representation of Shri Jayesh Patel resident of village Dihen that he wants to present his questions. Honourable Collector replied that resident or stakeholders from affected villages should represent first. During this time Shri Jayesh Patel and his henchmen created disturbance which was controlled by Panel and then representation from Mr. Divyeshbhai continued.) Why this public hearing is kept | Public Hearing is conducted | No further action required by AHPPL Closed. |
| | at Junagam even it is of Hazira Village? Now we will talk about | at Junagam as this location is central for all the | 0.0300. |



| S. No. | Details of Representation | Response from M/s. AHPPL | Compliance Status |
|-----------|--|--|-------------------|
| | the pollution. Lots of dust is observed in the houses of the hazira village during the night hours. As per information particles of dust have been found in the lungs of the woman. If this information proves to be true we will file a petition in the High Court. During the widening of the National Highway No. 6 land in the surroundings villages will be taken. As National Highway is not passing through Hazira, the villagers need to travel 8 Kilometers extra. Why it is not extended straight? Fishermen are being told that there is no fish in the sea but slabs are cast in the corners of the sea due to which some fish die. Dolphin is also found at present in the Hazira area. We welcome the project if the port company is ready to give written assurance regarding employment. | stakeholders and keeping in view of the convenience of all the stakeholders this site was decided duly taking an opinion of GPCB. You have informed that lots of dust is observed in the houses of Hazira. As you are aware there is a very big processing industry behind the residential area of Hazira village. Ours is a service industry which will not contribute significantly to pollution levels and our project is exactly on the sea front not very near village settlements. National Highway exists as it used to be before we started our project. We have not created any disturbance in the road network. Marine EIA does not reveal that there are Dolphins in the area. Method of our jetty construction keeps the fish out of harm's way and we have not observed any fish fatality in the jetty | |
| 7 | I raise my objections against proposed expansion project of AHPPL for which public hearing is organized and I request that my objections should be included. <i>M/s.</i> Shell India has got environment clearance in 2003 in which clearance was given for development of three berths. These berths are constructed at places other than shown earlier. So I request collector to remove these three berths. Out of proposed 7 berths for container and 4 for bulk terminal 3 have been already constructed and port is functional. In this situation I request to include in this public hearing what actions have been taken by collector against Adani for functioning of port & | M/s. Shell got approval for construction of 11 berths and the berths have been constructed at approved location only. As on date totally 5 berths are developed and this public hearing is only for one additional berth i.e. liquid terminal. Further, coal is stored in dedicated area with proper windshield arrangement to avoid blowing of coal. To avoid fine dust emission fire hydrants were arranged for regular sprinkling and to avoid fire accident two fire tenders have been arranged on permanent basis. | Closed |



| S. No. | Details of Representation | Response from M/s. AHPPL | Compliance Status |
|-----------|--|---|---|
| | disposal of coal in Hazira and what actions have been taken by GPCB against company for disposal of coal in open. | | |
| | This project is being developed on the mouth of river Tapi therefore it is my feeling and request that it should not be given Environment Clearance. | I want to point out the real situation that we are not in the river mouth, but just outside of it. | No further action required by AHPPL. |
| | EIA study does not include the objections of the report of Sugnaben Commission which was set up by Gujarat Government in 2006 in the aftermath of Surat flood. | The report objects only to construction that may potentially obstruct seaward flow in Tapi River. Our port is so located that it cannot have any such effect. | No further action required by AHPPL. |
| | Hazira is located on the mouth of Vindhola & Tapi river. As per ICMAM report of Tapi river, erosion effect had spread up to Dumas because of filling of Tapi river due to Industrialization in this area. Erosion of shore is up to 2500 m towards Dumas. ICMAM report is not studied. There is no clarity on what steps are required to control the erosion of shore near Dumas, so it is my request that it should not be given Environment Clearance. | We have done modeling of all activities in marine area. There is not even any remote chance of this port construction leading to erosion in Dumas. These are disjoint or unconnected matters. | No further action required by AHPPL. |
| | This area is declared reserved for vultures. As per survey there are about 150 vultures in the forest area. This report does not include what would happen to vultures, where they would go and what would be impact on Environment. So it is my request that it should not be given Environment Clearance. | The figures are exaggerated beyond proportion. Forest department survey vulture population periodically. This area is not identified by forest department to be eco-sensitive from that prospective. | No further action required by AHPPL. |
| | There are approximately 2500- 3000 fishermen families. There will be crisis for their livelihood. There is no clarity for rehabilitation and resettlement from Adani. So it is my feeling and request that it should not be given Environment Clearance. | In regard to impact on fisherman, I want to point out the real situation that we are not in the river mouth, but just outside of it. The port development is only in a stretch of 4 km of coast line. We have not displaced any fisherman. The surrounding areas are open for fishing, Nevertheless we have compensated fisherman who were identified by the | AHPPL has supported fishermen by providing them tools and net. |


Adani Hazira Port Private Limited

| S. No. | Details of Representation | Response from M/s. AHPPL | Compliance Status |
|-----------|--|---|---|
| | Routes to sea are almost closed | Gram Panchayat to be active in the areas where we are now operating. As Sushmaben mentioned we will support fisherman by giving them tools, nets etc. and be help full to them The compensation is | No further action |
| | fishermen who do fishing on foot. There is a big problem of their livelihood. Due to loss of fishing activities now they will not get thousands of crores of rupees which they were supposed to get due to fishing activities. Rs. 15 lacs are not sufficient compensation for that. | deprived of livelihood & fishing can be continued. Fish catch in the area used to be scanty. Mudskippers do not fetch good market price. Your claims are factually incorrect. | |
| | This area comes under CRZ-IA. Specific fish called "Levta" grows in the mudflat and fishermen catch that fish in this mud and earn their livelihood. Due to excavation and reclamation there will be damage to biological mud and destruction of marine ecology. EIA report does not have clarity on what actions are required. So it is my feeling and request that it should be clarified in EIA report or not be given Environment Clearance. | | No further action required by AHPPL. |
| | Before Adani came there was mangrove forest in the area of 40 ha. As per survey today mangroves survive in the area of 15 ha only. Due to destruction of mangrove there will be damage to environment and coastal erosion. This study in not covered in EIA so it is my feeling and request that it should not be given Environment Clearance. | It is clearly shows that whatever allegation made against project is with half knowledge or due to vested interest. There are no mangroves within the port limit. There used to be a mangrove patch of 22ha and the same was reclaimed by M/s. HPPL with due permission of MoEF dated 19 th Feb.' 2007. When Adani took position of the site there was not even single mangrove tree available within port limit. | No further action required by AHPPL. |
| | Five ports from 15 different companies and two big ports within 5 Km is coming in this area. The cumulative impact on road & rail transport due to | There are no five ports in the area, though there are isolated captive jetties in the Tapi River. We are outside river mouth. In fact | No further action required by AHPPL |



From : Apr., 2016 To : Sept., 2016

| S. No. | Details of Representation | Response from M/s. AHPPL | Compliance Status |
|-----------|--|---|-------------------|
| | operation of both ports i.e. Adani & Essar is not studied while preparing the impacts on land environment. Six-lane-road is also not going to be sufficient for this. So I request that Environment clearance should be given only after doing cumulative study. | there are only two ports Magdalla & Hazira. | |
| | As reported levels of SS & PHC is high as compared to desired levels in water. Levels of pollution in the areas of water, air and land is already high as compared to other locations in the country. EIA report does not have clarity on what steps will be taken to bring down the pollution. So it is my feeling and request that it should not be given Environment Clearance. (It is to be noted that Mr. Jayshbhai Patel belongs to Dihen village which is approx. 18 Km away from the port) | In Marine EIA & Terrestrial EIA reports, it is clearly mentioned the baseline date, Pollution levels are within the limit, except AAQ recorded high in Hazira village that is due to other industrial activities. | Closed. |
| 8 | Employment is given to 30-35 people in the form of contract but we insist that it should be permanent in nature. | Though employment was given on contract basis, his/her performance will be rated based on the performance decision would be taken. | Closed. |
| | For this liquid cargo transport, it will be storage of chemicals or processing of chemicals? If it is processing then hazards will increase so I request to provide information on what measures Adani will take for health and safety? | There is no processing envisaged in the project. It's a commercial port and we are entitled to only handle the commodities. However Oil spill response plan and Disaster Management Plan is in place. Please refer to earlier responses given to other stakeholders. | Closed. |
| | Please provide information if this project has got any clearance from Central Government like what they have got from State Government. | M/s. HPPL received Environment Clearance in 2003 and further amendment in 2007. The same is transferred to AHPPL. Further our project received Consent to Operate for based on 2003 EC from GPCB. Also received GCZMA recommendations. | Closed. |
| | Adani has declared only 4-5 villages as affected. Will there | EIA shows and we believe there would be no | Closed. |



| S. No. | Details of Representation | Response from M/s. AHPPL | Compliance Status |
|-----------|--|---|---|
| | not be any impact on Mora, Kawas or Interior of Ichhapur while trucks pass through them? | significant impact in Mora, Kawas and Ichhapur. | |
| | There are 10-12 big companies in this area and they have developed residential township with all facilities for their employees. Is it not possible that each company will take one village from 10-12 villages and also provide them same facilities? | This suggestion you might like to address to Hazira Area Development Authority. | No further action required by AHPPL. |
| | For this MOU is necessary and matters related to self- employment & development of village should be mentioned. We will be benefited in future only if there will be MOU. (It is to be noted that Mr. Dhansukhbhai Patel belongs to Kawas Village which does not fall within 10 Km. radius of the study area) | This matter should be addressed by Hazira Industrial Development Authority. Who alone can bring all the developers & Industrial units into a common platform | No further action required by AHPPL. |
| 9 | I welcome the expansion project of Adani company. Due to proposed port priority would be given to Hazira and surrounding area for employment and business. I request that fishermen's concerned would be taken care by this project. Adani Foundation of Adani Company has given commitment for the various activities for the development of village. So I welcome the project and declare my support for the Port of Adani Company at Hazira. | Thanks for your support all the concerns raised by you are responded by us in above raised queries. Hope no need to repeat the same. | Closed. |
| 10 | (Collector informed Mohanbhai to raise those issues only which were not raised earlier) Adani Company has told that 700 people will be employed. Please clarify whether it will be permanent or contractual basis? Thousands of people are working on contractual basis in the surrounding companies but nobody gets permanent | This number includes both permanent and contractual employees. Part of staff workers requirement is of temporary nature. Our recruitment would be need based. | |
| | employment. Then Regional Officer, GPCB again informed the concerned persons to raise other issues if | Our port is a commercial port and it is not envisaged or allowed it for captive | Status unchanged no agriculture land or private land is |



Adani Hazira Port Private Limited

From : Apr., 2016 To : Sept., 2016

| S. No. | Details of Representation | Response from M/s. AHPPL | Compliance Status | | |
|-----------|--|---|--|--|--|
| | any. The employment issue will be addressed by the company. As per survey carried out by NIO out of 1600 km. of Gujarat coast nearly 25% is already filled due to construction of ports at other places. As a consequence of this, there will be huge damage to agriculture in the surrounding area and there would also be ingress of sea water in the area. | operations. This port water front area covers hardly 4 Km. stretch. | required for port development nor affected by same. | | |
| | Adani Company has decided to pay compensation of Rs. 15 Lacs to 40 fishermen but what arrangement company will make for the 4000 fishermen in the surrounding villages? | Company is talking about the fisherman's who were active in our port premises area and AHPPL is not responsible for entire fisher folks in 10 Km radius. AHPPL is not stopping them do fishing in other areas. | There are no R&R activities required on account Port Project. Adani Foundation is working at reskilling of marginal fishermen as CSR activities. Fishing is not affected due to port project. | | |
| | Adani Company is developing their project on 31428 ha of land. Is this land private or government? If it is on private land then whole Junagam village would be vacated. Survey numbers are also not shown for this land. (It is to be noted that Mr. Mohanbhai Patel belongs to Vaswa village which does not fall within 10 Km radius of the study area) | Please see our port layout in EIA report which clearly indicates total area required for development is 873.27 Hectors and not even single private property is falling within the port development area. | Closed. | | |
| 11 | You all will go away after this public hearing but whom should we contact regarding pollution in our area? Then Collector informed him that regarding pollution he may contact GPCB. Regional Officer, GPCB also informed him that regarding pollution he can submit in writing. | Assurances that we give today would be lasting and not fickle. | Closed. | | |



ANNEXURE-3:

SHORELINE CHANGE STUDY REPORT



STUDIES OF SHORELINE CHANGES FOR PROPOSED DEVELOPMENT AT ADANI HAZIRA PORT PVT. LTD., HAZIRA, GUJARAT.

Sponsored by

adani

M/s. Adani Hazira Port Pvt. Ltd., Hazira.



| Scientist - In - Charge | | : Dr.V.S.N. Murty | | |
|-------------------------|--------------|-------------------|-------------------|--|
| Principal | Investigator | : | Ch. Jawahar Kumar | |



CSIR-NATIONAL INSTITUTE OF OCEANOGRAPHY (Council of Scientific & Industrial Research) Regional Centre, Visakhapatnam – 530 017 Andhra Pradesh, INDIA.

September, 2016





CONTENTS

| Description | Page No: |
|--|----------|
| > Preamble | Ι |
| Summary | II |
| List of Tables | III |
| List of Graphs | IV |
| List of Figures | V |
| List of Abbreviation | VI |
| > Project Team | VII |
| CHAPTER 1: | 1-9 |
| *Introduction | 1 |
| Shoreline Change, Data Source & Geo-reference | 2 |
| ◆Coastal Environment of Gujarat | 3 |
| ✤Geomorphology and Physical Environment of the Gulf of Khambat | 4 |
| *Geology | 5 |
| *Description of Gulf of Khambat | 6 |
| *Physiography | 7 |
| Scope of Work | 8 |
| *Methodology | 8 |
| *Instruments | 9 |
| *Objectives | 9 |
| CHAPTER 2: | 10-20 |
| ◆Data & Methods | 10 |
| ◆Data Used | 10 |
| ♦Software Used | 10 |
| *Methodology | 11 |
| ✤Image Processing | 12 |
| *Shoreline Extraction | 12 |
| *DSAS | 12 |
| Preprocessing before DSAS Statistics calculation | 17 |
| ✤ Field visits & GCP Collections | 20 |





| CHAPTER 3: | 21-42 |
|--|-------|
| ✤ Results | 21 |
| ✤ Morphological Assessment for the years 2004-2006 | 28 |
| ✤ Morphological Assessment for the years 2006-2008 | 30 |
| ✤ Morphological Assessment for the years 2008-2010 | 32 |
| ✤ Morphological Assessment for the years 2010-2012 | 34 |
| ✤ Morphological Assessment for the years 2012-2014 | 36 |
| Morphological Assessment for the years 2014-2015 | 38 |
| Morphological Assessment for the years 2004-2014 | 40 |
| * Conclusion | 42 |
| CHAPTER 4: | 43-54 |
| ✤ Beach Profile | 43 |
| Executive Summary | 43 |
| ✤ Methodology | 43 |
| ✤ Beach Profiles Graphs | 45 |
| ✤ Beach Profile Stations | 53 |
| ✤ Conclusion | 54 |
| | |
| | |
| | |
| | |
| | / |
| | |



PREAMBLE

Adani Hazira Port Pvt. Ltd, Hazira, Gujarat (AHPPL), being located (21° 06' N and 72° 37' E) close to the Delhi-Mumbai Industrial Corridor (DMIC), plays a vital role in handling all types of cargo and acts as a convenient international trade gateway to Europe, Africa, America and the Middle East.

AHPPL proposed to extend and develop port activities in and around its Port Boundary. As a part of proposed Marine Environmental study, AHPPL sought consultancy services from CSIR-National Institute of Oceanography (CSIR-NIO), Goa, to carry out mapping the shoreline changes. Coastal/shoreline areas are dynamic and vulnerable for changing physical and environmental environments and ultimately control the coastal beach deposition and erosion. Shoreline Changes studies are mandatory to obtain necessary clearances for the implementation of the Port developments and should be as per the approved TOR of the Ministry of Environment & Forests (MoEF), Govt. of India.

Based on AHPPL Service Order (5700126069) dated 02.06.2014, Regional Center, CSIR-NIO, Visakhapatnam, carried out collection field data during two periods i.e., Nov, 2014 and Dec 2015, along the shore line between north of port (21 08 22 N, 72 37 19 E) to southern tip of the port (21 02 59 N, 72 38 58 E) to delineate the shoreline changes.

In this report, results of shoreline studies and maps are included.

(**Ch. Jawahar Kumar**) Principal Investigator CSIR-NIO, Visakhapatnam



SUMMARY

The present study indented to elaborate the shoreline change behavior during last Eight years at Hazira coast but restricted within 2004,2006, 2008, 2010, 2012 and 2014 because of the same tidal water level in these years. Different parts of shoreline showed a dynamic behavior of erosion and accretion at different time intervals. Shoreline mapping for the year 2004-2014 clearly showed the erosion and accretion at various locations within the study region. It can be attributed to the developmental activities in addition to the natural. Mudflats have eroded and accreted randomly based on the physical processes in that region. Infrastructural activities have added the erosion/accretion process. Most of the development at study area took place after 2010 and it has altered the coastline. Mudflats (of the bar part) in South side of the study area reported deposition as well as reclamation in a cyclic manner from 2008-2014 due to intense infrastructural/Industrial developments and needs to be explored in detail to understand the processes. The coastline of this region has undergone severe changes during the study time. The Maximum deposition of coast line due to reclamation. Northern of the shell Petronet breakwater area has not experienced any developmental activity till now, but the random changes in the area is reclamation work is noticed.



LIST OF TABLES

| Table No. | Description | |
|-----------|---|-----|
| | | No. |
| 2.1 | Satellite data information used for the Study | 10 |
| 2.2 | Shoreline attribute fields requirement | 13 |
| 2.3 | Attribute field details for baseline | 15 |
| 2.4 | Transect and Tide details for study area | 17 |





LIST OF GRAPHS

| Graph.No | Description | | |
|----------|-----------------------------|-----|--|
| | | No. | |
| 4.3.1 | Beach Profile Station – AD1 | 45 | |
| 4.3.2 | Beach Profile Station –AD2 | 46 | |
| 4.3.3 | Beach Profile Station – AD3 | 47 | |
| 4.3.4 | Beach Profile Station – AD4 | 48 | |
| 4.3.5 | Beach Profile Station – AD5 | 49 | |
| 4.3.6 | Beach Profile Station – AD6 | 50 | |
| 4.3.7 | Beach Profile Station – AD7 | 51 | |
| 4.3.8 | Beach Profile Station – AD8 | 52 | |





LIST OF FIGURES

| Fig. No. | Description | Page |
|----------|--|------|
| 2.0 | Charaling Changes Many Adami Haring Dant Dat Ltd. Haring Cuinnat | No. |
| 2.0 | Shorenne Changes Map. Adam Hazira Port Pvt. Ltd., Hazira, Gujarat | - |
| 2.1 | Methodology | 11 |
| 2.2 | Baseline and transects cast | 14 |
| 2.3 | DSAS workflow processing | 16 |
| 2.4 | User-specified parameters including transect spacing and transect length | 18 |
| 2.5 | Example of Net Shoreline Movement | 19 |
| 2.6 | Example of End Point Rate | 20 |
| 3.0 | Geomorphology of Gulf of Khambat | 4 |
| 3.1 | Hazira coast shoreline for the years 2004-2006 | 22 |
| 3.2 | Hazira coast shoreline for the years 2006-2008 | 23 |
| 3.3 | Hazira coast shoreline for the years 2008-2010 | 24 |
| 3.4 | Hazira coast shoreline for the years 2010-2012 | 25 |
| 3.5 | Hazira coast shoreline for the years 2012-2014 | 26 |
| 3.6 | Hazira coast shoreline for the years 2004-2014 | 27 |
| 3.7 | Erosion and accretion details for each transect for year 2004 and 2006 | 28 |
| 3.8 | Shoreline Changes for the years 2004-2006 | 29 |
| 3.9 | Erosion and accretion details for each transect for year 2006 and 2008 | 30 |
| 3.10 | Shoreline Changes for the years 2006-2008 | 31 |
| 3.11 | Erosion and accretion details for each transect for year 2008 and 2010 | 32 |
| 3.12 | Shoreline changes for the years 2008 to 2010 | 33 |
| 3.13 | Erosion and accretion details for each transect for year 2010 and 2012 | 34 |
| 3.14 | Shoreline changes for the years 2010 to 2012 | 35 |
| 3.15 | Erosion and accretion details for each transect for year 2012 and 2014 | 36 |
| 3.16 | Shoreline changes for the years 2012 to 2014 | 37 |
| 3.17 | Erosion and accretion details for each transect for year 2014 and 2015 | 38 |
| 3.18 | Shoreline changes for the years 2014 to 2015 | 39 |
| 3.19 | Erosion and accretion details for each transect for year 2004 and 2014 | 40 |
| 3.20 | Shoreline changes for the years 2004 to 2014 | 41 |
| 4.0 | Geology Map of the Gulf | 5 |
| 5.0 | Beach Profile Locations along the Adani Hazira Port Coastal Front | 53 |



LIST OF ABREVIATIONS

| AHPPL | Adani Hazira Port Private Limited |
|--------|---|
| ArcGIS | Arc Geographical Information System |
| BP | Beach Profile |
| BM | Bench Mark |
| CSIR | Council of Scientific & Industrial Research |
| CRZ | Coastal Regulation Zone |
| CWC | Central Water Commission |
| DSAS | Digital Shoreline Assessment System |
| EIA | Environmental Impact Assessment |
| EOS | Earth Observing System |
| EPR | End Point Rate |
| ERDAS | Earth Resource Data Analysis Systems |
| FCC | False Colour Composite |
| GIS | Geographical Information System |
| GLCF | Global Land Cover Facility |
| GPS | Global Positioning System |
| IRS | Indian Remote Sensing |
| ISRO | Indian Space Research Organization |
| LISS | Linear Imaging and Self Scanning |
| LULC | Land use/Land cover |
| MOEF | Ministry of Environment and Forests |
| MoWR | Ministry of Water Resources |
| MSL | Mean Sea Level |
| NIO | National Institute of Oceanography |
| NOAA | National Oceanic and Atmospheric Administration |
| NRSC | National Remote Sensing Centre |
| NSM | Net Shoreline Movement |
| RL | Reduced Level |
| RS | Remote Sensing |
| SCE | Shoreline Change Envelope |
| SOI | Survey of India |
| TBM | Temporary Bench Mark |
| TID | Transect Identity Number |
| UTM | Universal Transverse Mercator |
| WGS-84 | World Geodetic System 84 |



PROJECT TEAM

Dr. V.S.N. Murty Shri. Ch.Jawahar Kumar Shri. Mani Murali Shri. Y.S.N. Raju Shri. D. Rama Rao Shri. G. Jagadeesh Miss. D. Sravani Devi Miss. N.Durga Bhavani

Scientist-in-Charge Principal Investigator Associate Project Leader Principal Technical Officer Field Assistant Project Assistant Project Assistant



CHAPTER – 1 INTRODUCTION

Adani Ports and Special Economic Zone Ltd authorities requested National Institute of Oceanography (NIO),Dona Paula, Goa to undertake a shoreline changes study along the Hazira coastal area in connection with Adani Hazira Port Pvt. Ltd., Hazira,Gujarat. The studies were based on remote sensing techniques for the past ten years (2004-2014) and beach profile data collection in recent times and comprising the following scope of work.

As this work consists of shoreline mapping, the following paragraph regarding the definition of shoreline and the changes in the shorelineconcerning, various parameters are given (Elizabeth H. Boak and Ian L. Turner, 2005). The evolution of shoreline change is of elemental importance to coastal scientists, engineers, and managers. Coastal management requires information about the position of coastline, where it was and where it would be. The location of the shore can provide information to quantify rates of change. An idealized definition of shoreline is that it coincides with the physical interface of land and water (DOLAN et al., 1980). Though it sounds simple, this definition is in practice a challenge to apply. The shoreline position changes continually through time, because of waves, tides, groundwater, storm surge, setup, runup, etc.

The coastlines of Indian Ocean region is highly dynamic in nature, shifting over time due to natural processes and man-made interferences. Therefore, the study of shoreline changes and its trends in spatial and temporal dimensions is required to establish a scientific understanding among the professionals across the disciplines to take necessary steps to maintain its stability.





Shoreline Change:

- Shoreline changes caused by the forces such as wind, waves, and currents that move the sand. Short and long-term relative sea-level changes also control shoreline movement.
- Shoreline change analysis and prediction are important for Integrated Coastal Zone Management and are conventionally performed by field and aerial surveys.
- The study has been carried out along 15km of Hazira Coast adjoining Gulf of Khambhat of Arabian Sea in Western India over the time interval 2004-2014. The present study demonstrates that combined use of satellite imagery and statistical methods can be a reliable method for shoreline related studies.
- The study of shoreline changes is critical for a broad range of coastal research, such as the development of setback planning, coastal hazard zoning, erosion-accretion studies or predictive modeling of coastal morphodynamics.
- Understanding the rate of change of shoreline position includes field measurement of the Present High water level, shoreline tracing using satellite images and beach profiling.

Data Source & Geo-Referencing:

- Multi-resolution Satellite data over the study area. The area is covered by a survey of IndiaTopo Sheets at 1:50,000 scale.
- The satellite images have been geo-referenced with the SOI Topo Sheets of 1973 which have been considered as reference base maps.
- The selection of Best Grid Resolution of the study area will get the usage of smallscale Topo Sheets into Geo-referenced.
- Tapi river has affected on the shoreline either sides of the estuarine, the factors such as sea level rise increase in storm frequencies as well as anthropogenic interferences had caused theenhanced release of sediments from Beaches, which interm had contributed towards the formation of Off-shore shoals and near shore bars.





Short-Term Change:

Shoreline change that occurs over about ten years or less and that may be in the opposite direction of the long-term trend is difficult to understand and predict. These Short-term shoreline changes can also be quite variable alongshore.

Long-Term Change:

Changing of sea level about the land and to increase and decrease in the sand towards Hazira Coast causes the shoreline to retreat or advance over a period of 50 years or more. The Long-term Sea level rise along the Hazira Coast has moved the shoreline by simply inundating it and by shifting the wave action and currents towards landward.

1.1. Coastal environment of Gujarat

Gujarat has the longest coastline of 1,650 km amongst all coastal states of India. It extends from the Valsad to Kori creek on the coast of Kutch in the north. Gujarat state falls in sub-tropical climate zone and can be divided into five climatic regions. The Gujarat coast is having two gulfs, namely, Gulf of Kutch and Gulf of Khambhat. Total seven estuaries exist in the Gulf of Khambhat and delivering a large amount of water and sediments, whereas in the Gulf of Kutch riverine inputs are very little. Gujarat coast provides a wide variety of coastal features due to its physiography, geomorphology, and coastal processes. Large industrial investments all along the coast are altering the coastal land use and land cover. The average rainfall in the region is 50 cm/y, and evaporation rate is estimated to be _1.5 m/y (Kankara et. al. 2007).Tidal amplitude exceeds 10 m in the Gulf of Khambhat and varies between 3 m (mouth) to 8 m (head) in the Gulf of Kutch (Coastal Zones of India, MoEF, SAC, 2012).



1.2 Geomorphology and Physical Environment of the Gulf of Khambat

The eastern coast of Saurashtra extends upto Bhavnagar, beyond which it becomes a part of the Gulf of Khambhat. The coastline of the Gulf is diverse in geomorphic condition with some estuaries, creeks, islands, mudflats and salt marshes. A vast track of low salineland from Bhavnagar to Khambhat is a paleo-mudflat known as 'Bhal' region (Patel, 1996). The coastline from Gopnath to Ghogha is rocky with small narrow non-calcareous sandy beaches and from Ghogha right up to the mouth of Sabarmati river, it is highly muddy and shows the extensive development of mudflats and mudbanks (Fig.3) The shetrunji river which meets the Gulf near Gopnath forms a prominent estuarine delta at Sultanpur. The segment from Khambhat to Bharuch is alluvial, characterized by steep and cliffy river mouths abruptly rising to as much as 30 m above the tidal flats.



Fig.3 Geomorphology of Gulf of Khambat



Studies on Landsat data indicated significant geomorphological changes in land forms such as shoreline, estuaries, mudflats, islands, mangroves, cliffs, sandybars, floodplains, etc., in the past two decades (Naik and Baldev, 1985; Shaikh et al., 1989). These changes were due to erosional and depositional processes not only by natural agents like strong tidal forces but also through developmental activities such as the construction of dams, destruction of mangroves due to human interference and rapid industrialization. Shoreline changes in Mahi estuary, while depositional activities are dominant in Narmada estuary. It is observed that the deposition at the mouth of Narmada estuary is at its maximum. As a result, the Aliya Bet Island got connected to the main land by gradual expansion in the mudflat area (Fig.3).

Geology

Thick coastal sediments occupied the entire northern Gulf and eastern coast of southern Gulf (Fig.4). Bhavnagar district bears Deccan traps, while Alluvium covered most parts of Ahmedabad, Kheda, Bharuch and Surat districts. Pleistocene sediments are confined only to Mahuva region.



Fig.4 Geology Map of the Gulf





Description of Gulf of Khambat

The Gulf of Khambhat is south to north penetration of the Arabian Sea on the western shelf of India between the Saurashtra peninsula and mainland Gujarat. It is located approximately between latitude 20° 30' and 22° 20' N and longitude 71° 45' and 72° 53' E (Fig.1). At its northern end between the Sabarmati and Mahi mouths, the Gulf is barely 5 km wide, and it opens out southwards like a funnel, reaching its maximum width south of Gopnath point. Its north-south length is approximately 115km. It covers and extent of about 3,120 km² mainly of mudflats with some rocky (sandstone) intertidal area and a volume of 62,400 million m³. The rocky beaches are common from Mahuva to Gopnath, reducing towards Ghogha and Bhavnagar. A few sandy patches are also observed intermittently. The Gulf is intercepted by several inlets of sea and creeks formed by the confluence of major rivers such as Narmada, Tapi, Mahi, Sabarmati, Shetrunji and many minor rivers. All the major rivers form estuaries and their inflow carryheavy load of suspended sediments into the Gulf. A medium sized delta is present near Shetrunji between Gopnath and Ghogha. The ecosystems of the Gulf comprising mangroves, estuaries, creeks and vast intertidal mud flats are known to have rich biodiversity and some endemic flora and fauna.

In the interior of the Gulf, off Ghogha, there is a small island viz. Piram Bet and further north there are large shoals which get exposed during low tide. A series of shallow banks run linear at the Gulf mouth, making navigation hazardous even for country crafts. The shoreline of the coast between Bhavnagar and Gopnath provides an assemblage of erosional and depositional features related to tectonic and eustatic factors resulting in the gaining of land in between Bhavnagar and Mahuva. Rapid development and heavy industrialization on the coast line of the Gulf has resulted in the degradation of the environment and a decline in biodiversity.





PHYSIOGRAPHY:

The Gulf receives rains during the southwest monsoon (from June to September), the average annual rainfall varies from 600mm on the western side to 800mm on the eastern side (source: www.imd.gov.in) The Gulf has a positive water balance, mainly due to the high volume of river runoff. The relative humidity ranges between 65 and 86% thus offering semi-arid to sub-humid climatic conditions. The temperature in the Gulf is extreme, the lowest being 8.4°C during January and highest of 43.7°C during May.

The depth of the Gulf ranges from 18 to 27 m and is less than 20 m over most of its length. However, the depth at the head is as low as 5m and in the channel on the eastern side of the Piram Bet it is about 50 m. The tides are of amixed semi-diurnal type, with large diurnal inequality and varying amplitude, which decrease from north to south. Because of its unique position (nearness to the Tropic of Cancer), Gujarat coast experiences very high tides; the highest anywhere along the Indian coast. Because of the funnel shape and the semi-enclosed nature at the head, the tidal height increases tremendously in the upstream. The mean tidal elevation during spring is 4.7 m at Mahuva Bandar which rises to 6.5 m at Gopnath Point and 10.2 m at Bhavnagar. The maximum spring tide recorded at Bhavnagar is 12.5 m, which is second only to that of the highest tide recorded anywhere in the world (around 17 m at the Bay of Fundy of Newfoundland coast of Canada). Because of the high tidal amplitude, especially in the upper Gulf, it has huge inter-tidal expanses of 1.5 to 5 km, perhaps the widest along the Indian coast.

Long-Shore currents with low wave dominate the open coasts along the Arabian Sea. However, due to exceptionally strong flood and ebb tides, powerful tidal currents with a speed of 3 to 4 knots dominate the flow. Maximum velocities of 6 knots associated with high wave energy occur during mid-tide. Currents in the Gulf, though tidal, are monsoonal in origin and dominated by barotropic tides (Unnikrishnan et al.,1999). The flow adjusts its directional orientation with the changing direction of wind effected by changing seasons of the year. The turnover residence times are quite short because of its shallow depth, large tidal amplitude, and strong tidal current.





Following the request from Adani Ports and Special Economic Zone Ltd, The CSIR- NIO carried out the study about the below scope.

I. Scope of work:

- A primary scope of this work is to map and analyze shoreline movement following standard methods.
- Delineation of shoreline between North to the South tip of Adani Hazira
 Port Pvt. Ltd.
- Proposed period of data collection is initially at one time.
- Mapping the shoreline changes
 - Report and Analysis

II. Methodology:

- a. A set of pre-determined transects along the study area was identified, and permanently set up for periodical data acquisition.
- b. Data collection along the land and marking the line contact between land and sea using DGPS data periodically over the selected transects.
- c. Digitization of shoreline from the archived satellite imageries to estimate the physical and anthropogenic factors that influence land loss or deposition along the coast.
- d. Beach profiling is a technique which will be applied to study and document the dynamics of beach changes over time. Mapping shoreline using the physical data collected data will be used for both extracting shoreline positions and quantifying shoreline change periodically.
- e. Comparison of physically collected field data and extracted shoreline with satellite imageries.

All rights reserved. This report, or parts thereof may not be reproduced in any form without the prior written permission of the Director, NIO.





- f. Shore Line Change analysis Graphs/Maps/Tables.
- g. Project Report is prepared and submitted to sponsors with conclusions based on above field data results.

These data sets in this periodical inventory are expected to provide shoreline change database of the study area.

- III. Instruments:
 - 1. DGPS
 - 2. AUTO LEVEL

Objectives

- a) To assess the shoreline changes along the Hazira Coast area using remote sensing techniques for the past ten years (2004-2014).
- b) Biennial shoreline changes analysis of Hazira coast area from 2004 onwards.



CHAPTER – 2 DATA AND METHODS

2.1. Data Used

LANDSAT 7 ETM and LANDSAT 8 satellite imagery from USGS was used for the study area for all the years from Jan 2004 to Apr 2014. The following Table displays the details of data product used in the study.

| Date of Pass | Path/Row | Resolution | Satellite | Sensor | Cloud Cover |
|--------------|----------|------------|-----------|----------|----------------|
| 19 JAN 2004 | 148/45 | 30 m | LANDSAT 7 | ETM | Nil |
| 24 JAN 2006 | 148/45 | 30 m | LANDSAT 7 | ETM | Nil |
| 14 JAN 2008 | 148/45 | 30 m | LANDSAT 7 | ETM | Nil |
| 12 FEB 2010 | 148/45 | 30 m | LANDSAT 7 | ETM | Nil |
| 10 FEB 2012 | 148/45 | 30 m | LANDSAT 7 | ETM | Nil |
| 23 FEB 2014 | 148/45 | 30 m | LANDSAT 8 | OLI_TIRS | Nil |
| 28 APR 2014 | 148/45 | 30m | LANDSAT 8 | OLI_TIRS | Nil |
| 21 OCT 2014 | 148/45 | 30m | LANDSAT 8 | OLI_TIRS | Nil |
| 25 NOV2015 | 148/45 | 30m | LANDSAT8 | OLI_TIRS | Nil |

Table 2.1Satellite data information used for the study

- 2.2 Software Used
 - ERDAS Imagine 2013
 - ESRI ArcGIS 10.1
 - USGS DSAS 4.3





2.2. Methodology



Fig 2.1 Methodology



2.2.1. Image Processing

Satellite imagery of the study region was downloaded accordingly and used for this study. The important factors which were considered for finalizing the satellite images are cloud cover, similar tide conditions, similar season data, uniform projection factors, etc. In this study, the above factors were considered forfinal selection of imagery. The satellite data undergoes radiometric correction and data scaling to enable maximum visual interpretation. All images were geo-coded with UTM projection WGS 84 datum parameters. The study was conducted for all years of 2004-2014 within the months of Jan to Feb.

2.2.2. Shoreline Extraction

Satellite imagery is used to digitize shorelines for the entire duration of the study. False color composite imagery for LANDSAT sensors is used for accurate demarcation of land and water interface. A fine textured bright blue pixel is targeted for shoreline digitization for the years 2004-2014. These shorelines were overlaid at biennial scale to quantify the changes. ArcGIS 10.1 was used, and final shoreline maps were composed for the years 2004-2014.

2.2.3. DSAS

The Digital Shoreline Analysis System (DSAS) from USGS is a software application that works within the Environmental Systems Research Institute (ESRI) Geographic Information System (ArcGIS) software. DSAS computes rate-of-change statistics for a time series of vector shoreline data(Thieler*et al.* 2009).

Cartering Required Inputs:

Geodatabase: All DSAS input data must be managed within a personal geodatabase, which also serves as the storage location for the program-generated transect feature class and related statistical output Tables. Preexisting data, such as shapefiles, can be imported as feature classes within a geodatabase in ArcCatalog. So, as per required input personal geo-databases are created for all different study areas in ArcGIS. DSAS requires that data be in meter units in a projected coordinate system.



Shorelines: All shoreline data must reside in a single feature class within a personal geo-database. If the shoreline data are collected as shapefiles, they must be appended to a single file and then imported into a geodatabase within ArcCatalog. Shoreline positions can refer to several features such as the vegetation line, the high water line, the low water lineandthe wet/dry line. They can be digitized from a variety of sources (for example, satellite imagery, digital orthophotos, and historical coastal-survey maps), collected by global-positioning-system field surveys, or extracted from lidar surveys. It is strongly recommended that initial data-preparation steps be taken to reference all shoreline vectors to the same feature (for example, mean high water) before using DSAS to compute change statistics. Each shoreline vector represents a specific position in time and must be assigned a date in the shoreline feature-class attribute table. The measurement transects that are cast by DSAS from the baseline will intersect the shoreline vectors. The points of intersection provide location and time information used to calculate rates of change.

| | Field name | Data type | Method | | |
|---|--------------|-------------------|----------------|--|--|
| | OBJECTID | Object ID | Auto-generated | | |
| - | SHAPE | Geometry | Auto-generated | | |
| | SHAPE_Length | Double | Auto-generated | | |
| | DATE_ | Text | User-created | | |
| | UNCERTAINTY | Any numeric field | User- created | | |

Baseline: DSAS uses a baseline measurementmethod (Leatherman and Clow, 1983) to calculate rate-of-change statistics for a time series of shorelines. The baseline is constructed by the user and serves as the starting point for all transects cast by the DSAS application. These transects intersect each shoreline at the measurement points used to calculate shoreline-change rates.



Checklist of baseline requirements

- 1. Must be a feature class within a personal geodatabase.
- 2. Must be in a projected coordinate system in meter units.
- 3. May consist of a single line or be a collection of segments.
- 4. Each baseline segment must be placed entirely onshore or offshore on the shorelines.

The baseline should be established adjacent to the series of shoreline positions. Transects will be cast perpendicular to this baseline (at a user-defined spacing) and intersect the shorelines to establish measurement points. The orientation oftransect through the shorelines is highly dependent on the position of the baseline (Fig. 2.4).Users must consider the appropriate scale at which the baseline should conform to changes in the combined orientation of the shoreline positions. The recommended position for transects is perpendicular to the general trend of the shorelines so that shoreline change



rates describe the area immediately seaward of the current shoreline.

Fig 2.2Transect cast from the baseline by DSAS establishes a measurement point at each shoreline intersection. The trend of the baseline on the shorelines influences the locations of the measurement points established bytransects and used to calculate shoreline-change rates.





Baseline attributesfield requirements

The attribute field requirements for the baseline provide necessary information to DSAS about the alongshore order of transects as well as the location of the baselineonthe shorelines (onshore or offshore). This information is incorporated into the calculations so that rate-of-change statistics properly denote erosion as negative and accretion as positive.

| Field name | Data type | Method | Importance |
|--------------|---------------|----------------|------------|
| OBJECTID | Object ID | Auto-generated | Required |
| SHAPE | Geometry | Auto-generated | Required |
| SHAPE_Length | Double | Auto-generated | Required |
| D P | Long Integer | User-created | Required |
| Group | Long Integer | User-created | Optional |
| OFFshore | Short Integer | User-created | Optional |
| CastDir | Short Integer | User-created | Optional |

Table 2.3Attribute field details for baseline

DSAS Workflow

Once the required geodatabase and input-feature classes have been created or imported from shape files and all necessary feature classes have been added and properly attributed, the DSAS Application can be used within ArcMap to establish transect locations and calculate change statistics. Figure 2.3. shows a typical DSAS workflow.





Fig 2.3Diagram illustrating the steps necessary to establish transect locations and compute change-rate statistics by using the DSAS application.



2.1.1. Preprocessing before DSAS statistics calculation

Shorelines for all years were digitized, and final maps were prepared for shoreline mapping. These shorelineswere used as input to DSAS for erosion and accretion quantification for the study area. Calculation of statistics for erosion and accretion mapping is done for different years at different intervals. Finally, six possible combinations of different year shorelines were used to calculate DSAS statistics.

Cast Transects: Transects were created on all baselines along shorelines for all years. Transect starting point was taken from the western most side and ending point was taken at the eastern most side of the study area, and a unique transect ID is given to all transect in numerical order (details in Annexure 1) for better result interpretation.

| Duration | Tide(m) | Tide (m) | Transect | Transect |
|--------------------------|----------------|--------------|----------|-------------|
| | (Initial Year) | (Final Year) | length | spacing (m) |
| 19 Jan 2004 – 24 Jan | 3.84m | 2.48m | 3000 | 100 - 200 |
| 2006 | | | | |
| 24 Jan 2006 – 14 Jan2008 | 2.48m | 1.28m | 3000 | 100 - 200 |
| 14 Jan 2008 – 12 Feb | 1.28m | 3.21m | 3000 | 100 - 200 |
| 2010 | | | | |
| 12 Feb 2010 – 10 Feb | 3.21m | 1.59m | 3000 | 100 - 200 |
| 2012 | | | | |
| 10 Feb 2012 – 23 Feb | 1.59m | 1.86m | 3000 | 100 - 200 |
| 2014 | | | | |
| 19 Jan 2004 – 28 Apr | 3.84m | 3.70m | 3000 | 100 - 200 |
| 2014 | | | | |

Table 2.4 Transect details for study area





Fig 2.4User-specified parameters including transect spacing and transect length.

Calculation of Statistics: Rate calculations are performed by MATLAB executables bundled within the DSAS installation. DSAS generates all required information from the input baseline, shoreline, and transect files (examples include, distance to each shoreline from the baseline, the date for each shoreline, the position of the baseline, and group information). The information is written to an XML formatted file and is sent to each module selected by the user in the Calculate Change Statistics window.

Output Results

DSAS generated a database file by input parameters and calculation. Following output results are used for further analysis.

All rights reserved. This report, or parts thereof may not be reproduced in any form without the prior written permission of the Director, NIO.



Net Shoreline Movement (NSM): The net shoreline movement reports a distance, not a rate. The NSM is associated with the dates of only two shorelines. It reports the distance between the oldest andthe youngest shorelines for each transect (Fig 2.5). This represents the total distance between the oldest and youngest shorelines. (If this distance is divided by the number of years elapsed between the two shoreline positions, the result is the End Point Rate).



Fig 2.5In the example above, the net shoreline movement is the distance of 76.03 meters between the most recent shoreline from 2005 and the oldest shoreline from 1936.

End Point Rate (EPR): The end point rate is calculated by dividing the distance of shoreline movement by the time elapsed between the oldest and the most recent shoreline (Fig 3.9). The major advantages of the EPR are the ease of computation and minimal requirement of only two shoreline dates. The major disadvantage is that in cases where more data are available, the additional information is ignored. Changes in sign (for example, accretion to erosion), magnitude, or cyclical trends may be missed (Crowell*et al.*, 1997; Dolan*et al.*, 1991).





Fig 2.6In the example above, the end point rate of 1.09 m per year is the distance between the 2005 and 1936 shorelines (76.03 m) divided by the span of time elapsed between the two shoreline positions (69.82 years).

2.3 Field Visits and GCP Collections

Ground control points were collected by conducting the field visits in the study region. Important geomorphologic features were noticed and recorded for better accuracy of results. Important features and landmarks related to the studyare enlisted in the report.



CHAPTER – 3 RESULTS

Accurate shoreline demarcation was done for the years 2004-2014 at biennial scale. The area under investigation shows dynamic behavior in nature because of tides, mudflats, changing sediment transport processes and other anthropogenic activities. A detailed map of shoreline positions wasdesigned, and assessment was done for the years 2004-2006 (fig 3.8), 2006-2008 (fig 3.10), 2008-2010 (3.12), 2010-2012 (3.14), 2012-2014 (3.16), 2004-2014 (3.18). The final comparison is carried out between 2004 and 2014 under their similar tidal condition. These shorelines were used for erosion and accretion quantification. It was done using DSAS by creating transects at a distance spacing of 100-200 meters depending upon the geomorphology of the area. High distance spacing of transects increases the uncertainty in results and very low distance spacing increase the huge amount of data values.








Fig 3.1 Hazira coast shorelines for the years 2004 and 2006







Fig 3.2 Hazira coast shorelines for the years 2006 and 2008







Fig 3.3 Hazira coast shorelines for the years 2008 and 2010







Fig 3.4 Hazira coast shorelines for the years 2010 and 2012





Fig 3.5 Hazira coast shorelines for the years 2012 and 2014







Fig 3.6 Hazira coast shorelines for the years 2004 and 2014



3.1.1. Morphological assessment for 2004 and 2006

A movement of 133 m at transect id 73 was observed which was far from the development area of project area that time and maximum accretion of 425 m at transect id 46is observedbetween 2004and 2006. The study area is observed under high-intensity reclamation and developmental activities with approval from MoEF during this period.









Fig 3.8 Shoreline changes for the years 2004 and 2006



3.1.1. Morphological Assessment for the years 2006 and 2008

A movement of 185 m at transect id 61 was observed due to the natural process and maximum accretion of 1303 m at transect id 82is observed in between the years 2006 and 2008.Human inducedaccretiondue to the reclamation is noticed in the central part of the study area. Project proponent informed that this is as per the approvals received from MoEF.



Fig3.9 Erosion and accretion details for each transect for the year 2006 and 2008







Fig 3.10 Shoreline changes for the years 2006 and 2008



3.1.1. Morphological Assessment for the years 2008 and 2010

A movement of 29 m at transect id 01 and maximum accretion of 2068 m at transect id 95 is observed in 2008 and 2010. Accretion is investigated all along the shoreline, and little erosion is noticed in the southern part of the study area. Project proponent informed that accreditation near transact id 95 is due to the reclamation activities by other institutions in the region and far from the project area of AHPPL.









Fig 3.12 Shoreline changes for the years 2008 and 2010



3.1.1. Morphological Assessment for the years 2010 and 2012

A maximum erosion of 286 m at transect id 87 and maximum accretion of 857 m at transect id 77 is observed in 2010 and 2012 both the area are far from the project area of AHPPL. This may be due to the project activities of other institutions in the region.



Fig 3.13 Erosion and accretion details for each transect for years 2010 and 2012







Fig 3.14 Shoreline changes for the years 2010 and 2012



3.1.1. Morphological Assessment for the years 2012 and 2014

A maximum erosion of 1078 m at transect id 71was observed which may be due to the project activities of other institutions in the region and maximum accretion of 15 m at transect id 27 is observed in 2012 and 2014.



Fig 3.15 Erosion and accretion details for each transect for years 2012 and 2014







Fig 3.16 Shoreline changes for the years 2012 and 2014



3.1.1. Morphological Assessment for the years 2014 and 2015

A maximum erosion of 87 m at transect id 98 and maximum accretion of 357 m at transect id 72 is observed in 2014 and 2015. Both the places are far from the project site of AHPPL. This change in the shoreline at transect id 98 and 72 are due to the project activity of other institution in the region.



Fig 3.17 Erosion and accretion details for each transect for years 2014 and 2015







Fig 3.18 Shoreline changes for the years 2014 and 2015



3.1.1. Morphological Assessment for the years 2004 and 2014

A movement of 232 m at transect id 35 was observed between 2004 and 2014. It is as per the approvals received from MoEF for the development of mutli cargo portand maximum accretion of 1780 m at transect id 92 is observed in 2004 and 2014. This is due to the reclamation activity by other institution in the region. This area is far from the project site of AHPPL.



Fig 3.19 Erosion and accretion details for each transect for years 2004 and 2014







Fig 3.20 Shoreline changes for the years 2004 and 2014





Conclusion

The study area was analyzed for the morphological changes for the past ten years. This region has experienced very high activity regarding reclamation. Shoreline and mudflats region have been modified by the natural as well as the anthropogenic influences. In the last ten years, northern side of Tapi river bank has experienced an accretion of 1780 m. This accretion has been attributed to the reclamation for the developmental activities by other institutions. The area within the Hazira LNG and Port and Adani port area has shown erosion of 232 m which is as per the approval by MoEF for development of multi cargo port. Fig 3.18 exhibits the regions of erosion and accretion at various intensities.





CHAPTER – 4 BEACH PROFILES

4.1 Executive Summary:

The overall purpose of this study is to develop a quantitative understanding of the coastal processes governing theHazira Shoreline and to utilize this information as the basis for shoreline management recommendations for this stretch of coastline. Due to environmental regulatory constraints use of offshore and near shore sediment sources for beach nourishment is often discouraged.

Oceanographic factors influencing shoreline stability and sediment transport consist of waves and tides, as well as the currents associated with these forcing mechanism.

To obtain a true representation of the beach form, it is necessary to be able to measure the minor changes in slope present along a sandy beach profile. The spacing of observation points will often be irregular to define the beach shape.

This kind of Beach profiling method historically employed by many surveying institutes. This technique provides accurate and repeatable surveys using simple and robust equipment (DGPS & Auto level)

4.2 Methodology:

A set of pre-determined transects along the study area will be identified and set up permanently for periodical data acquisition.

- a. Data collection along land line marking contact between land and sea using DGPS- geographical data periodically over the selected transects.
- b. Acquire satellite imageries from space research agencies. Digitization of shoreline from satellite imageries is done to estimate the physical and anthropogenic factors that influence land loss or deposition along the coast.





- d. Comparison of physically collected data and extracted shoreline from satellite imageries will be cross checked for the results and reports.
- e. Shore Line Change analysis Graphs/Maps/Tables
- f. Project Report is prepared and submitted to sponsors with conclusions based on above field data results.

These data sets in this periodical inventory are expected to provide shoreline change database of the study area.



4.3 BEACH PROFIELS



4.3.1 Beach Profile Station – AD1



4.3.2 Beach Profile Station – AD2

All rights reserved. This report, or parts thereof may not be reproduced in any form without the prior written permission of the Director, NIO.



4.3.3 Beach Profile Station – AD3

All rights reserved. This report, or parts thereof may not be reproduced in any form without the prior written permission of the Director, NIO.



4.3.4 Beach Profile Station - AD4

All rights reserved. This report, or parts thereof may not be reproduced in any form without the prior written permission of the Director, NIO.



4.3.5 Beach Profile Station – AD5

All rights reserved. This report, or parts thereof may not be reproduced in any form without the prior written permission of the Director, NIO.



4.3.6 Beach Profile Station – AD6

All rights reserved. This report, or parts thereof may not be reproduced in any form without the prior written permission of the Director, NIO.



4.3.7 Beach Profile Station – AD7

All rights reserved. This report, or parts thereof may not be reproduced in any form without the prior written permission of the Director, NIO.



4.3.8 Beach Profile Station – AD8

All rights reserved. This report, or parts thereof may not be reproduced in any form without the prior written permission of the Director, NIO.

4.4 Beach Profile Stations



Fig: 5.0 Beach Profile Locations along the Adani Hazira Port Coastal Front





4.5 Conclusion

Suitably accurate GPS surveying equipment has allowed large-scaletopographic and hydrographic surveys to be carried out which has presented more options for capturing data. Having considered the beach profiles under takento date it has been concluded that better data can be produced, particularly for future design work by carrying out comprehensive topographic surveys along defended front ages. The elevation of the beach will change due to rise and fall of the wave action and this beach profiling will give accurate results of the beach topography and these results impacted on the shoreline changes.











ANNEXURE-4:

DETAILS OF CSR ACTIVITIES AND BUDGET FOR THE FINANCIAL YEAR: 2016-17


Annexure - 4: Details of CSR Activities, and Budget For the FY 2016-17: -

Adani Foundation - the CSR Wing of Adani Groups is functions in four core areas i.e.: (1). Education, (2). Community Health, (3). Sustainable Livelihood Development and (4). Rural Infrastructure Development. Following activities have been carried out during first half of the Financial Year: 2016-17.

| S. No. | Activities | Domain | Beneficiaries |
|-----------|---|--|---|
| 1 | Strengthening Pragyna Project | Education | Under Pragna project, which is a SSA initiative of activity based learning, Adani Foundation has supported 26 schools of Surat district benefitting 3000 children. |
| 2 | Support to Navchetan Vidhyalay, Junagam | Education | Navchetan Vidyalaya at Junagam was adopted by Adani Foundation in 2014, the Foundation has constructed a new building for the school and is now supporting 304 students and 21 staff members. |
| 3 | General Medical Camp for Truck Drivers / Defensive Driving | Community Health | General And Eye Check-Up camps were organized for 158 truckers in Hazira |
| 4 | Strengthening existing SHGs | Sustainable Livelihood Development | With an aim to empower the women, Adani Foundation is Strengthening existing Self Help Groups (SHGs) in Hazira benefitting 50 women of the region. |
| 5 | Rural Infrastructure Development | Rural Infrastructure Development | The rural infrastructure development projects under Adani Foundation has majorly focused more on enhancing housing facilities in Rajgiri and Vasava. Under the project 20 houses are in the process of been reconstructed. |

Details of the Budget and Expenditure for the FY: 2016-17 (Up to September, 2016) is given in the table below: -

| S. No. | Activity | Budget FY: 2016-17 (INR in Lakh) | Expenditure (Up to Sept., 2016) (INR in Lakh) |
|-----------|------------------------------------|-------------------------------------|---|
| 1 | Education | 62.44 | 19.38 |
| 2 | Community Health | 16.50 | 0.99 |
| 3 | Sustainable Livelihood Development | 18.00 | 5.35 |
| 4 | Rural Infrastructure Development | 218.90 | 53.92 |
| 5 | Admin and other Expenses | 31.30 | 5.10 |
| | Total Amount (INR in Lakh) | 347.14 | 84.74 |



ANNEXURE-5:

ENVIRONMENTAL MONITORING / ANALYSIS RESULTS FOR THE PERIOD FROM APRIL, 2016 TO SEPTEMBER, 2016:



<u>Annexure - 5</u>: Environmental Monitoring Reports For The Period From April, 2016 To September, 2016:

A. AMBIENT AIR QUALITY MONITORING: -

Table No.: 1.1 - Ambient Air Quality Monitoring Results For PM_{10} (µg/m³):

| Date Of | Near Port | Near STP | Central Water | Container | Hazira Village |
|------------|---------------|---------------|---------------|---------------|----------------|
| Sampling | N 21° 05.426' | N 21° 05.211′ | N 21° 04.697' | N 21° 05.187' | N 21° 05.44' |
| 01/04/2016 | E 72° 37.739' | E 72° 38.605' | E 72° 38.420' | E 72° 37.774' | E 72° 38.44′ |
| 01/04/2010 | 00.22 | 00.49 | 00.59 | 60.51 | 95.05 |
| 0//04/2016 | 81.30 | 93./1 | 87.61 | 65.62 | 88.31 |
| 08/04/2016 | 58.32 | 80.28 | 66.72 | 50.18 | 73.60 |
| 14/04/2016 | 96.49 | 73.41 | 78.21 | 67.61 | 91.33 |
| 15/04/2016 | 69.68 | 92.60 | 62.41 | 78.60 | 85.30 |
| 21/04/2016 | 87.28 | 78.28 | 93.21 | 64.21 | 70.43 |
| 22/04/2016 | 75.30 | 90.38 | 70.32 | 56.77 | 87.51 |
| 28/04/2016 | 66.31 | 87.50 | 57.58 | 74.47 | 92.42 |
| 29/04/2016 | 85.92 | 61.28 | 74.30 | 66.29 | 79.60 |
| 05/05/2016 | 82.53 | 71.51 | 65.54 | 57.74 | 95.52 |
| 06/05/2016 | 58.89 | 80.10 | 51.35 | 67.72 | 87.21 |
| 12/05/2016 | 64.49 | 95.31 | 82.58 | 76.18 | 91.51 |
| 13/05/2016 | 79.79 | 89.20 | 70.61 | 62.42 | 84.48 |
| 19/05/2016 | 88.29 | 77.63 | 64.09 | 55.39 | 94.58 |
| 20/05/2016 | 63.70 | 86.28 | 55.85 | 73.61 | 80.28 |
| 26/05/2016 | 83.61 | 92.61 | 79.83 | 51.60 | 77.28 |
| 27/05/2016 | 94.57 | 66.43 | 86.18 | 60.15 | 81.67 |
| 02/06/2016 | 76.31 | 83.21 | 89.58 | 58.68 | 65.42 |
| 06/06/2016 | 68.58 | 92.42 | 76.50 | 80.50 | 71.17 |
| 09/06/2016 | 87.62 | 78.38 | 62.59 | 55.63 | 94.48 |
| 13/06/2016 | 63.29 | 88.22 | 54.15 | 72.62 | 80.57 |
| 16/06/2016 | 82.59 | 70.32 | 65.50 | 90.61 | 76.59 |
| 20/06/2016 | 73.51 | 90.57 | 80.40 | 76.51 | 86.31 |
| 23/06/2016 | 61.21 | 76.37 | 52.39 | 82.41 | 69.80 |
| 27/06/2016 | 85.78 | 95.57 | 75.90 | 66.12 | 90.41 |

| Date Of | Near Port Gate No 2 | Near STP | Central Water Pump House | Container Terminal | Hazira Village |
|------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|------------------------------|
| Sampling | N 21° 05.426' E 72° 37.739' | N 21° 05.211' E 72° 38.605' | N 21° 04.697' E 72° 38.420' | N 21° 05.187' E 72° 37.774' | N 21° 05.44' E 72° 38.44' |
| 30/06/2016 | 74.18 | 79.27 | 68.38 | 52.58 | 85.38 |
| 04/07/2016 | 59.61 | 80.31 | 51.41 | 67.17 | 75.92 |
| 07/07/2016 | 81.57 | 77.63 | 60.28 | 51.54 | 69.62 |
| 11/07/2016 | 68.58 | 90.42 | 76.39 | 71.63 | 84.49 |
| 14/07/2016 | 74.63 | 86.62 | 64.53 | 80.18 | 92.41 |
| 18/07/2016 | 52.61 | 79.18 | 59.42 | 68.20 | 87.77 |
| 21/07/2016 | 80.81 | 88.22 | 72.12 | 57.58 | 94.18 |
| 25/07/2016 | 72.39 | 91.19 | 56.31 | 64.21 | 82.10 |
| 28/07/2016 | 58.22 | 70.38 | 47.18 | 52.70 | 62.61 |
| 01/08/2016 | 61.32 | 53.80 | 75.27 | 44.39 | 66.32 |
| 04/08/2016 | 73.28 | 62.48 | 68.31 | 57.58 | 78.62 |
| 08/08/2016 | 58.38 | 47.60 | 38.56 | 43.54 | 53.40 |
| 11/08/2016 | 64.99 | 55.07 | 45.36 | 39.81 | 59.33 |
| 15/08/2016 | 77.48 | 66.40 | 52.25 | 61.43 | 72.61 |
| 19/08/2016 | 42.51 | 78.22 | 64.40 | 73.22 | 68.49 |
| 22/08/2016 | 81.29 | 61.11 | 73.57 | 50.95 | 56.58 |
| 25/08/2016 | 53.10 | 41.18 | 36.72 | 30.23 | 47.12 |
| 29/08/2016 | 62.48 | 73.31 | 66.54 | 48.43 | 80.70 |
| 01/09/2016 | 68.58 | 62.59 | 84.28 | 56.29 | 74.59 |
| 05/09/2016 | 56.70 | 72.60 | 78.52 | 64.33 | 86.59 |
| 08/09/2016 | 70.50 | 65.69 | 86.28 | 53.42 | 92.38 |
| 12/09/2016 | 67.51 | 74.27 | 57.36 | 61.29 | 79.41 |
| 15/09/2016 | 53.53 | 48.62 | 38.40 | 43.48 | 59.30 |
| 19/09/2016 | 60.29 | 52.60 | 49.52 | 58.59 | 66.30 |
| 22/09/2016 | 79.32 | 70.58 | 65.38 | 60.39 | 85.58 |
| 26/09/2016 | 86.72 | 67.58 | 81.62 | 76.40 | 93.39 |
| 29/09/2016 | 71.49 | 59.39 | 68.31 | 52.39 | 77.33 |



| Date Of | Near Port Gate No 2 | Near STP | Central Water Pump House | Container Terminal | Hazira Village |
|------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|------------------------------|
| Sampling | N 21° 05.426' E 72° 37.739' | N 21° 05.211′ E 72° 38.605′ | N 21° 04.697' E 72° 38.420' | N 21° 05.187' E 72° 37.774' | N 21° 05.44' E 72° 38.44' |
| 01/04/2016 | 36.73 | 45.47 | 28.36 | 40.74 | 56.41 |
| 07/04/2016 | 46.75 | 54.65 | 40.64 | 29.52 | 51.71 |
| 08/04/2016 | 26.71 | 48.39 | 37.55 | 18.48 | 33.76 |
| 14/04/2016 | 52.59 | 36.29 | 39.60 | 31.50 | 44.44 |
| 15/04/2016 | 39.40 | 50.48 | 20.44 | 35.70 | 54.70 |
| 21/04/2016 | 48.42 | 31.70 | 43.63 | 26.46 | 38.46 |
| 22/04/2016 | 32.56 | 55.48 | 24.74 | 19.40 | 50.43 |
| 28/04/2016 | 22.54 | 46.72 | 21.65 | 36.54 | 55.56 |
| 29/04/2016 | 40.49 | 35.46 | 30.54 | 22.68 | 47.44 |
| 05/05/2016 | 48.62 | 42.38 | 37.74 | 24.57 | 56.35 |
| 06/05/2016 | 25.54 | 34.56 | 21.71 | 32.62 | 39.53 |
| 12/05/2016 | 34.61 | 55.54 | 45.60 | 41.64 | 49.62 |
| 13/05/2016 | 31.72 | 50.61 | 28.46 | 36.64 | 46.67 |
| 19/05/2016 | 47.58 | 38.68 | 32.65 | 26.65 | 51.72 |
| 20/05/2016 | 29.66 | 45.67 | 18.44 | 39.56 | 42.47 |
| 26/05/2016 | 49.44 | 54.72 | 29.53 | 22.58 | 45.41 |
| 27/05/2016 | 55.62 | 29.62 | 42.56 | 25.40 | 38.69 |
| 02/06/2016 | 35.43 | 40.73 | 48.46 | 20.40 | 30.70 |
| 06/06/2016 | 26.37 | 48.55 | 43.42 | 35.54 | 22.71 |
| 09/06/2016 | 38.73 | 33.74 | 29.53 | 25.40 | 43.73 |
| 13/06/2016 | 24.72 | 45.67 | 18.42 | 38.73 | 48.36 |
| 16/06/2016 | 37.65 | 31.68 | 27.62 | 46.64 | 41.63 |
| 20/06/2016 | 32.55 | 50.61 | 42.46 | 36.64 | 47.52 |
| 23/06/2016 | 25.54 | 38.68 | 21.71 | 40.56 | 33.64 |
| 27/06/2016 | 34.61 | 54.72 | 30.40 | 26.65 | 46.67 |
| 30/06/2016 | 39.55 | 32.50 | 28.74 | 18.74 | 40.37 |
| 04/07/2016 | 30.49 | 43.61 | 27.45 | 34.56 | 37.42 |
| 07/07/2016 | 43.67 | 39.50 | 32.57 | 22.58 | 27.75 |
| 11/07/2016 | 29.66 | 54.72 | 36.48 | 44.56 | 47.52 |

Table No.: 1.2 - Ambient Air Quality Monitoring Results For $PM_{2.5}$ (µg/m³):

| Date Of | Near Port Gate No 2 | Near STP | Central Water Pump House | Container Terminal | Hazira Village |
|------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|------------------------------|
| Sampling | N 21° 05.426' E 72° 37.739' | N 21° 05.211' E 72° 38.605' | N 21° 04.697' E 72° 38.420' | N 21° 05.187' E 72° 37.774' | N 21° 05.44' E 72° 38.44' |
| 14/07/2016 | 35.43 | 48.55 | 39.34 | 42.47 | 52.56 |
| 18/07/2016 | 23.58 | 40.73 | 26.37 | 35.40 | 45.41 |
| 21/07/2016 | 41.61 | 46.49 | 35.60 | 30.40 | 54.66 |
| 25/07/2016 | 32.55 | 51.43 | 25.62 | 29.69 | 38.69 |
| 28/07/2016 | 22.66 | 30.45 | 15.63 | 19.57 | 26.49 |
| 01/08/2016 | 28.43 | 26.74 | 35.60 | 20.40 | 31.54 |
| 04/08/2016 | 43.67 | 31.68 | 40.38 | 26.34 | 47.52 |
| 08/08/2016 | 29.66 | 19.34 | 17.37 | 15.41 | 23.55 |
| 11/08/2016 | 32.55 | 24.27 | 21.76 | 18.74 | 27.75 |
| 15/08/2016 | 42.62 | 33.74 | 28.46 | 25.40 | 37.42 |
| 19/08/2016 | 18.54 | 39.50 | 25.73 | 34.56 | 30.70 |
| 22/08/2016 | 44.50 | 27.57 | 33.44 | 30.53 | 24.39 |
| 25/08/2016 | 24.72 | 17.69 | 15.63 | 19.57 | 21.45 |
| 29/08/2016 | 30.49 | 42.38 | 39.46 | 33.31 | 48.36 |
| 01/09/2016 | 32.55 | 28.39 | 40.74 | 25.40 | 35.74 |
| 05/09/2016 | 26.37 | 37.44 | 44.73 | 33.45 | 40.37 |
| 08/09/2016 | 37.49 | 31.68 | 47.77 | 28.73 | 51.72 |
| 12/09/2016 | 28.43 | 35.38 | 23.44 | 30.40 | 38.69 |
| 15/09/2016 | 25.65 | 20.57 | 15.49 | 18.74 | 28.59 |
| 19/09/2016 | 29.66 | 23.45 | 20.59 | 26.65 | 32.38 |
| 22/09/2016 | 46.56 | 43.61 | 36.48 | 32.62 | 48.36 |
| 26/09/2016 | 49.44 | 27.57 | 45.60 | 36.64 | 52.56 |
| 29/09/2016 | 33.78 | 30.45 | 38.60 | 27.48 | 22.71 |



30/06/2016

04/07/2016

07/07/2016

11/07/2016

BDL*

BDL*

BDL*

BDL*

| Date Of | Near Port Gate No 2 | Near STP | Central Water Pump House | Container Terminal | Hazira Village |
|------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|------------------------------|
| Sampling | N 21° 05.426' E 72° 37.739' | N 21° 05.211' E 72° 38.605' | N 21° 04.697' E 72° 38.420' | N 21° 05.187' E 72° 37.774' | N 21° 05.44' E 72° 38.44' |
| 01/04/2016 | BDL* | 0.54 | BDL* | BDL* | 0.62 |
| 07/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 08/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 14/04/2016 | 0.72 | BDL* | BDL* | BDL* | 0.58 |
| 15/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 21/04/2016 | 0.64 | 0.52 | 0.59 | BDL* | 0.69 |
| 22/04/2016 | BDL* | 0.68 | BDL* | BDL* | BDL* |
| 28/04/2016 | BDL* | BDL* | BDL* | BDL* | 0.53 |
| 29/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 05/05/2016 | BDL* | BDL* | BDL* | BDL* | 0.72 |
| 06/05/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 12/05/2016 | BDL* | 0.74 | BDL* | BDL* | 0.62 |
| 13/05/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 19/05/2016 | BDL* | BDL* | BDL* | BDL* | 0.68 |
| 20/05/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 26/05/2016 | BDL* | 0.65 | BDL* | BDL* | BDL* |
| 27/05/2016 | 0.82 | BDL* | 0.64 | BDL* | 0.74 |
| 02/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 06/06/2016 | BDL* | 0.58 | BDL* | BDL* | BDL* |
| 09/06/2016 | BDL* | BDL* | BDL* | BDL* | 0.68 |
| 13/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 16/06/2016 | BDL* | BDL* | BDL* | 0.56 | BDL* |
| 20/06/2016 | BDL* | 0.61 | BDL* | BDL* | BDL* |
| 23/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 27/06/2016 | BDL* | 0.54 | BDL* | BDL* | 0.64 |
| | | | | | |

BDL*

BDL*

BDL*

0.62

BDL*

BDL*

BDL*

BDL*

BDL*

BDL*

BDL*

BDL*

Table No.: 1.3 - Ambient Air Quality Monitoring Results for Lead as Pb (μ g/m³):

BDL*

BDL*

BDL*

BDL*

| adani | Adani Hazira Port Private Limited | From : Apr., 2016 To : Sept., 2016 |
|-------|-----------------------------------|---------------------------------------|
|-------|-----------------------------------|---------------------------------------|

| Date Of | Near Port Gate No 2 | Near STP | Central Water Pump House | Container Terminal | Hazira Village |
|------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|------------------------------|
| Sampling | N 21° 05.426' E 72° 37.739' | N 21° 05.211' E 72° 38.605' | N 21° 04.697' E 72° 38.420' | N 21° 05.187' E 72° 37.774' | N 21° 05.44' E 72° 38.44' |
| 14/07/2016 | BDL* | 0.58 | BDL* | 0.64 | 0.52 |
| 18/07/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 21/07/2016 | BDL* | BDL* | BDL* | BDL* | 0.66 |
| 25/07/2016 | BDL* | 0.67 | BDL* | BDL* | BDL* |
| 28/07/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 01/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 04/08/2016 | BDL* | 0.56 | BDL* | BDL* | 0.59 |
| 08/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 11/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 15/08/2016 | BDL* | BDL* | BDL* | BDL* | 0.52 |
| 19/08/2016 | BDL* | 0.58 | BDL* | BDL* | BDL* |
| 22/08/2016 | 0.62 | BDL* | 0.54 | BDL* | BDL* |
| 25/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 29/08/2016 | BDL* | BDL* | BDL* | BDL* | 0.68 |
| 01/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 05/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 08/09/2016 | 0.52 | BDL* | 0.57 | BDL* | 0.78 |
| 12/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 15/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 19/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 22/09/2016 | 0.64 | BDL* | BDL* | BDL* | 0.56 |
| 26/09/2016 | 0.69 | BDL* | 0.58 | BDL* | 0.73 |
| 29/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |

BDL*: Below Detection Limit - Lead as Pb $(\mu g/m^3)$: 0.5



Table No.: 1.4 - Ambient Air Quality Monitoring Results For Benzo (A) Pyrene (BAP) - Particulate Phase Only ($\mu g/m^3$):

| Date Of Sampling | Near Port Gate No 2 N 21° 05.426' | Near STP N 21° 05.211' | Central Water Pump House N 21° 04.697' | Container Terminal N 21° 05.187' | Hazira Village N 21° 05.44' |
|---------------------|---|---------------------------|--|--|--------------------------------|
| 01/04/2016 | E 72° 37.739' | E 72° 38.605' | E 72° 38.420' | E 72° 37.774' | E 72° 38.44' |
| 07/04/2016 | | | | | |
| 07/04/2010 | | | | | |
| 08/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 14/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 15/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 21/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 22/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 28/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 29/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 05/05/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 06/05/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 12/05/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 13/05/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 19/05/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 20/05/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 26/05/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 27/05/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 02/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 06/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 09/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 13/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 16/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 20/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 23/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 27/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 30/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 04/07/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 07/07/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 11/07/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |

| Date Of | Near Port Gate No 2 | Near STP | Central Water Pump House | Container Terminal | Hazira Village |
|------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|------------------------------|
| Sampling | N 21° 05.426' E 72° 37.739' | N 21° 05.211' E 72° 38.605' | N 21° 04.697' E 72° 38.420' | N 21° 05.187' E 72° 37.774' | N 21° 05.44' E 72° 38.44' |
| 14/07/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 18/07/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 21/07/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 25/07/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 28/07/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 01/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 04/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 08/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 11/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 15/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 19/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 22/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 25/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 29/08/2016 | BDL* | BDL* | BDL* | BDL* | 0.54 |
| 01/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 05/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 08/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 12/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 15/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 19/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 22/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 26/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 29/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |

BDL*: Below Detection Limit - Benzo (a) Pyrene (BaP) - Particulate Phase only (ng/m³): 0.5



| Table No.: 1.5 - Ambient Ai | [•] Quality Monitoring | Results For Ar | senic as As (ng/m³): |
|-----------------------------|---------------------------------|----------------|----------------------|
|-----------------------------|---------------------------------|----------------|----------------------|

| Date Of Sampling | Near Port Gate No 2 N 21° 05.426' | Near STP N 21° 05.211' | Central Water Pump House N 21° 04.697' | Container Terminal N 21° 05.187' | Hazira Village N 21° 05.44' |
|---------------------|---|---------------------------|--|--|--------------------------------|
| compiling | E 72° 37.739' | E 72° 38.605' | E 72° 38.420' | E 72° 37.774' | E 72° 38.44' |
| 01/04/2016 | BDL* | BDL* | BDL* | BDL* | 2.32 |
| 07/04/2016 | BDL* | 2.08 | BDL* | BDL* | BDL* |
| 08/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 14/04/2016 | 2.12 | BDL* | BDL* | BDL* | BDL* |
| 15/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 21/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 22/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 28/04/2016 | BDL* | BDL* | BDL* | BDL* | 2.08 |
| 29/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 05/05/2016 | 2.08 | 2.18 | BDL* | BDL* | 2.26 |
| 06/05/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 12/05/2016 | BDL* | 2.36 | BDL* | BDL* | 2.68 |
| 13/05/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 19/05/2016 | BDL* | BDL* | BDL* | BDL* | 2.46 |
| 20/05/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 26/05/2016 | BDL* | 2.46 | BDL* | BDL* | BDL* |
| 27/05/2016 | 2.42 | BDL* | BDL* | BDL* | 2.06 |
| 02/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 06/06/2016 | BDL* | 2.24 | BDL* | BDL* | BDL* |
| 09/06/2016 | BDL* | BDL* | BDL* | BDL* | 2.38 |
| 13/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 16/06/2016 | BDL* | BDL* | BDL* | 2.24 | BDL* |
| 20/06/2016 | BDL* | 2.36 | BDL* | BDL* | BDL* |
| 23/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 27/06/2016 | BDL* | 2.56 | BDL* | BDL* | 2.22 |
| 30/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 04/07/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 07/07/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 11/07/2016 | BDL* | 2.18 | BDL* | BDL* | BDL* |

| Date Of | Near Port Gate No 2 | Near STP | Central Water Pump House | Container Terminal | Hazira Village |
|------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|------------------------------|
| Sampling | N 21° 05.426' E 72° 37.739' | N 21° 05.211' E 72° 38.605' | N 21° 04.697' E 72° 38.420' | N 21° 05.187' E 72° 37.774' | N 21° 05.44' E 72° 38.44' |
| 14/07/2016 | BDL* | BDL* | BDL* | BDL* | 2.22 |
| 18/07/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 21/07/2016 | BDL* | BDL* | BDL* | BDL* | 2.06 |
| 25/07/2016 | BDL* | 2.42 | BDL* | BDL* | BDL* |
| 28/07/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 01/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 04/08/2016 | 2.18 | BDL* | BDL* | BDL* | 2.36 |
| 08/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 11/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 15/08/2016 | BDL* | BDL* | BDL* | BDL* | 2.18 |
| 19/08/2016 | BDL* | 2.16 | BDL* | BDL* | BDL* |
| 22/08/2016 | 2.52 | BDL* | 2.32 | BDL* | BDL* |
| 25/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 29/08/2016 | BDL* | 2.26 | BDL* | BDL* | 2.42 |
| 01/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 05/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 08/09/2016 | BDL* | BDL* | 2.18 | BDL* | 2.36 |
| 12/09/2016 | BDL* | BDL* | BDL* | BDL* | 2.42 |
| 15/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 19/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 22/09/2016 | 2.16 | BDL* | BDL* | BDL* | 2.26 |
| 26/09/2016 | 2.36 | BDL* | 2.18 | BDL* | 2.48 |
| 29/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |

BDL*: Below Detection Limit - Arsenic as As (ng/m³): 2



| Data Of | Near Port | Near STP | Central Water | Container | Hazira Village |
|------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|------------------------------|
| Sampling | N 21° 05.426' E 72° 37.739' | N 21° 05.211' E 72° 38.605' | N 21° 04.697' E 72° 38.420' | N 21° 05.187' E 72° 37.774' | N 21° 05.44' E 72° 38.44' |
| 01/04/2016 | BDL* | 10.57 | BDL* | BDL* | 11.39 |
| 07/04/2016 | BDL* | 10.77 | BDL* | BDL* | BDL* |
| 08/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 14/04/2016 | 10.57 | BDL* | BDL* | BDL* | 10.30 |
| 15/04/2016 | BDL* | 10.72 | BDL* | BDL* | BDL* |
| 21/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 22/04/2016 | BDL* | 10.65 | BDL* | BDL* | 10.17 |
| 28/04/2016 | BDL* | BDL* | BDL* | BDL* | 10.90 |
| 29/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 05/05/2016 | BDL* | BDL* | BDL* | BDL* | 10.71 |
| 06/05/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 12/05/2016 | BDL* | 10.45 | BDL* | BDL* | 10.92 |
| 13/05/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 19/05/2016 | 10.58 | BDL* | BDL* | BDL* | 10.30 |
| 20/05/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 26/05/2016 | BDL* | 10.20 | BDL* | BDL* | BDL* |
| 27/05/2016 | 10.35 | 10.13 | BDL* | BDL* | 10.62 |
| 02/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 06/06/2016 | BDL* | 10.25 | BDL* | BDL* | BDL* |
| 09/06/2016 | BDL* | BDL* | BDL* | BDL* | 10.50 |
| 13/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 16/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 20/06/2016 | BDL* | 10.37 | BDL* | BDL* | 10.13 |
| 23/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 27/06/2016 | BDL* | 10.13 | BDL* | BDL* | 10.22 |
| 30/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 04/07/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 07/07/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 11/07/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |

Table No.: 1.6 - Ambient Air Quality Monitoring Results for Nickel as Ni (ng/m³):

|--|

| 14/07/2016 | BDL* | 10.25 | BDL* | BDL* | 10.38 |
|------------|-------|-------|-------|------|-------|
| 18/07/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 21/07/2016 | BDL* | BDL* | BDL* | BDL* | 10.25 |
| 25/07/2016 | BDL* | 10.31 | BDL* | BDL* | BDL* |
| 28/07/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 01/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 04/08/2016 | 10.20 | BDL* | BDL* | BDL* | 10.19 |
| 08/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 11/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 15/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 19/08/2016 | BDL* | 10.50 | BDL* | BDL* | BDL* |
| 22/08/2016 | 10.31 | BDL* | BDL* | BDL* | BDL* |
| 25/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 29/08/2016 | BDL* | 10.20 | BDL* | BDL* | 10.40 |
| 01/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 05/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 08/09/2016 | 10.38 | BDL* | 10.19 | BDL* | 10.56 |
| 12/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 15/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 19/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 22/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 26/09/2016 | 10.60 | BDL* | 10.35 | BDL* | 10.62 |
| 29/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |

BDL*: Below Detection Limit - Nickel as Ni (ng/m³): 10

| Table No.: 1. 7 - | Ambient | Air Quality | Monitoring | Results for | Carbon | Monoxide | (CO) | (mg/m ³) |): |
|-------------------|---------|-------------|------------|--------------------|--------|----------|------|----------------------|----|
|-------------------|---------|-------------|------------|--------------------|--------|----------|------|----------------------|----|

| Date Of Samoling | Near Port Gate No 2 N 21° 05.426' | Near STP N 21° 05.211' | Central Water Pump House N 21° 04.697' | Container Terminal N 21° 05.187' | Hazira Village N 21° 05.44' |
|---------------------|---|---------------------------|--|--|--------------------------------|
| g | E 72° 37.739' | E 72° 38.605' | E 72° 38.420' | E 72° 37.774' | E 72° 38.44' |
| 01/04/2016 | 0.87 | 0.79 | 0.64 | 0.47 | 0.55 |
| 07/04/2016 | 0.63 | 0.53 | 0.14 | 0.23 | 0.94 |
| 08/04/2016 | 0.78 | 0.89 | 0.41 | 0.26 | 0.61 |
| 14/04/2016 | 0.29 | 0.42 | 0.16 | 0.22 | 0.82 |
| 15/04/2016 | 0.48 | 0.80 | 0.72 | 0.36 | 0.62 |
| 21/04/2016 | 0.54 | 0.71 | 0.18 | 0.33 | 0.85 |
| 22/04/2016 | 0.57 | 0.21 | 0.32 | 0.25 | 0.37 |
| 28/04/2016 | 0.69 | 0.66 | 0.58 | 0.17 | 0.76 |
| 29/04/2016 | 0.31 | 0.52 | 0.15 | 0.19 | 0.44 |
| 05/05/2016 | 0.53 | 0.69 | 0.17 | 0.31 | 0.89 |
| 06/05/2016 | 0.29 | 0.46 | 0.55 | 0.16 | 0.71 |
| 12/05/2016 | 0.45 | 0.82 | 0.66 | 0.32 | 0.47 |
| 13/05/2016 | 0.64 | 0.48 | 0.14 | 0.19 | 0.42 |
| 19/05/2016 | 0.58 | 0.18 | 0.30 | 0.24 | 0.34 |
| 20/05/2016 | 0.81 | 0.73 | 0.61 | 0.44 | 0.52 |
| 26/05/2016 | 0.73 | 0.50 | 0.25 | 0.33 | 0.88 |
| 27/05/2016 | 0.26 | 0.40 | 0.15 | 0.21 | 0.78 |
| 02/06/2016 | 0.64 | 0.71 | 0.27 | 0.22 | 0.30 |
| 06/06/2016 | 0.46 | 0.66 | 0.34 | 0.39 | 0.52 |
| 09/06/2016 | 0.48 | 0.62 | 0.16 | 0.32 | 0.82 |
| 13/06/2016 | 0.26 | 0.42 | 0.50 | 0.15 | 0.64 |
| 16/06/2016 | 0.40 | 0.72 | 0.57 | 0.29 | 0.45 |
| 20/06/2016 | 0.33 | 0.63 | 0.44 | 0.53 | 0.77 |
| 23/06/2016 | 0.24 | 0.37 | 0.13 | 0.18 | 0.47 |
| 27/06/2016 | 0.60 | 0.45 | 0.65 | 0.11 | 0.38 |
| 30/06/2016 | 0.55 | 0.69 | 0.36 | 0.49 | 0.73 |
| 04/07/2016 | 0.25 | 0.42 | 0.36 | 0.14 | 0.65 |
| 07/07/2016 | 0.48 | 0.60 | 0.16 | 0.31 | 0.81 |
| 11/07/2016 | 0.40 | 0.71 | 0.55 | 0.29 | 0.46 |

| adani Hazira Port Private Limited | From : Apr., 2016 To : Sept., 2016 |
|-----------------------------------|---------------------------------------|
|-----------------------------------|---------------------------------------|

| Date Of | Near Port Gate No 2 | Near STP | Central Water Pump House | Container Terminal | Hazira Village |
|------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|------------------------------|
| Sampling | N 21° 05.426' E 72° 37.739' | N 21° 05.211' E 72° 38.605' | N 21° 04.697' E 72° 38.420' | N 21° 05.187' E 72° 37.774' | N 21° 05.44' E 72° 38.44' |
| 14/07/2016 | 0.61 | 0.68 | 0.27 | 0.21 | 0.53 |
| 18/07/2016 | 0.56 | 0.66 | 0.34 | 0.38 | 0.30 |
| 21/07/2016 | 0.58 | 0.77 | 0.64 | 0.24 | 0.39 |
| 25/07/2016 | 0.32 | 0.87 | 0.44 | 0.50 | 0.78 |
| 28/07/2016 | 0.23 | 0.37 | 0.13 | 0.18 | 0.26 |
| 01/08/2016 | 0.54 | 0.58 | 0.44 | 0.30 | 0.69 |
| 04/08/2016 | 0.79 | 0.81 | 0.56 | 0.42 | 0.74 |
| 08/08/2016 | 0.36 | 0.49 | 0.29 | 0.19 | 0.63 |
| 11/08/2016 | 0.48 | 0.55 | 0.37 | 0.45 | 0.71 |
| 15/08/2016 | 0.84 | 0.27 | 0.30 | 0.57 | 0.65 |
| 19/08/2016 | 0.40 | 0.50 | 0.60 | 0.33 | 0.76 |
| 22/08/2016 | 0.64 | 0.77 | 0.72 | 0.41 | 0.82 |
| 25/08/2016 | 0.26 | 0.48 | 0.23 | 0.31 | 0.46 |
| 29/08/2016 | 0.47 | 0.60 | 0.77 | 0.38 | 0.78 |
| 01/09/2016 | 0.70 | 0.44 | 0.54 | 0.38 | 0.76 |
| 05/09/2016 | 0.52 | 0.36 | 0.74 | 0.45 | 0.86 |
| 08/09/2016 | 0.63 | 0.23 | 0.87 | 0.49 | 0.93 |
| 12/09/2016 | 0.90 | 0.34 | 0.58 | 0.77 | 0.84 |
| 15/09/2016 | 0.46 | 0.22 | 0.37 | 0.24 | 0.56 |
| 19/09/2016 | 0.33 | 0.18 | 0.26 | 0.40 | 0.50 |
| 22/09/2016 | 0.69 | 0.39 | 0.32 | 0.25 | 0.88 |
| 26/09/2016 | 0.85 | 0.57 | 0.41 | 0.53 | 0.62 |
| 29/09/2016 | 0.61 | 0.52 | 0.45 | 0.56 | 0.94 |

BDL*: Below Detection Limit - Carbon Monoxide as CO (mg/m³): 0.01



| Table No.: 1.8 - Ambient Ai | r Quality Monitoring I | Results for Benzene as | $C_6H_6(\mu g/m^3)$: |
|-----------------------------|------------------------|------------------------|-----------------------|
|-----------------------------|------------------------|------------------------|-----------------------|

| Date Of | Near Port Gate No 2 | Near STP | Central Water Pump House | Container Terminal | Hazira Village |
|------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|------------------------------|
| Sampling | N 21° 05.426' E 72° 37.739' | N 21° 05.211' E 72° 38.605' | N 21° 04.697' E 72° 38.420' | N 21° 05.187' E 72° 37.774' | N 21° 05.44' E 72° 38.44' |
| 01/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 07/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 08/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 14/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 15/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 21/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 22/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 28/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 29/04/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 05/05/2016 | BDL* | BDL* | BDL* | BDL* | 2.56 |
| 06/05/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 12/05/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 13/05/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 19/05/2016 | BDL* | BDL* | BDL* | BDL* | 2.46 |
| 20/05/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 26/05/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 27/05/2016 | BDL* | BDL* | BDL* | BDL* | 2.16 |
| 02/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 06/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 09/06/2016 | BDL* | BDL* | BDL* | BDL* | 2.24 |
| 13/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 16/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 20/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 23/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 27/06/2016 | BDL* | BDL* | BDL* | BDL* | 2.08 |
| 30/06/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 04/07/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 07/07/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 11/07/2016 | BDL* | 2.26 | BDL* | BDL* | 2.11 |

| Date Of | Near Port Gate No 2 | Near STP | Central Water Pump House | Container Terminal | Hazira Village |
|------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|------------------------------|
| Sampling | N 21° 05.426' E 72° 37.739' | N 21° 05.211' E 72° 38.605' | N 21° 04.697' E 72° 38.420' | N 21° 05.187' E 72° 37.774' | N 21° 05.44' E 72° 38.44' |
| 14/07/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 18/07/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 21/07/2016 | BDL* | BDL* | BDL* | BDL* | 2.56 |
| 25/07/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 28/07/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 01/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 04/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 08/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 11/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 15/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 19/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 22/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 25/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 29/08/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 01/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 05/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 08/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 12/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 15/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 19/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 22/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 26/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |
| 29/09/2016 | BDL* | BDL* | BDL* | BDL* | BDL* |

BDL*: Below Detection Limit - Benzene as $C_6H_6 (\mu g/m^3)$: 2



| Table No.: 1.9: Ambient Air (| Quality Monitoring | Results For Ammonia (N | IH₃): |
|-------------------------------|--------------------|------------------------|-------|
|-------------------------------|--------------------|------------------------|-------|

| Date Of | Near Port Gate No 2 | Near STP | Central Water Pump House | Container Terminal | Hazira Village |
|------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|------------------------------|
| Sampling | N 21° 05.426' E 72° 37.739' | N 21° 05.211' E 72° 38.605' | N 21° 04.697' E 72° 38.420' | N 21° 05.187' E 72° 37.774' | N 21° 05.44' E 72° 38.44' |
| 01/04/2016 | 33.75 | 42.29 | 26.61 | 10.53 | 50.54 |
| 07/04/2016 | 17.50 | 62.49 | 33.81 | 38.10 | 54.29 |
| 08/04/2016 | 44.38 | 52.70 | 29.43 | 34.39 | 60.53 |
| 14/04/2016 | 50.63 | 31.24 | 12.52 | 28.81 | 36.50 |
| 15/04/2016 | 41.57 | 36.29 | 22.54 | 18.59 | 48.36 |
| 21/04/2016 | 55.01 | 40.40 | 28.80 | 25.40 | 32.45 |
| 22/04/2016 | 30.32 | 38.50 | 18.16 | 22.61 | 52.42 |
| 28/04/2016 | 38.44 | 54.60 | 45.08 | 32.53 | 40.25 |
| 29/04/2016 | 21.25 | 27.14 | 11.27 | 14.56 | 18.41 |
| 05/05/2016 | 44.79 | 33.52 | 21.47 | 16.07 | 27.63 |
| 06/05/2016 | 31.72 | 48.25 | 38.28 | 27.51 | 33.84 |
| 12/05/2016 | 40.43 | 58.59 | 26.76 | 20.40 | 39.73 |
| 13/05/2016 | 17.42 | 22.56 | 10.27 | 11.74 | 15.52 |
| 19/05/2016 | 24.26 | 42.61 | 15.56 | 19.47 | 52.15 |
| 20/05/2016 | 29.24 | 36.34 | 20.54 | 15.45 | 42.84 |
| 26/05/2016 | 48.52 | 54.52 | 27.39 | 31.21 | 61.15 |
| 27/05/2016 | 41.36 | 26.94 | 32.68 | 18.85 | 36.63 |
| 02/06/2016 | 41.61 | 56.54 | 38.73 | 32.37 | 48.61 |
| 06/06/2016 | 28.71 | 34.12 | 17.43 | 13.14 | 36.70 |
| 09/06/2016 | 36.45 | 29.24 | 13.55 | 41.34 | 42.49 |
| 13/06/2016 | 45.48 | 40.29 | 31.63 | 23.08 | 28.65 |
| 16/06/2016 | 39.35 | 23.39 | 27.43 | 16.67 | 35.41 |
| 20/06/2016 | 40.32 | 46.79 | 23.56 | 26.60 | 53.44 |
| 23/06/2016 | 16.45 | 21.44 | 10.65 | 14.10 | 26.40 |
| 27/06/2016 | 42.57 | 51.01 | 22.27 | 17.31 | 34.45 |
| 30/06/2016 | 22.58 | 38.34 | 14.52 | 25.32 | 29.62 |
| 04/07/2016 | 36.73 | 31.58 | 24.71 | 19.51 | 23.39 |
| 07/07/2016 | 29.45 | 45.62 | 19.33 | 33.04 | 38.56 |
| 11/07/2016 | 32.30 | 54.23 | 22.50 | 28.32 | 44.25 |

| Adani Hazira Port Private Limited | From : Apr., 2016 To : Sept., 2016 |
|-----------------------------------|---------------------------------------|
|-----------------------------------|---------------------------------------|

| Date Of | Near Port Gate No 2 | Near STP | Central Water Pump House | Container Terminal | Hazira Village |
|------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|------------------------------|
| Sampling | N 21° 05.426' E 72° 37.739' | N 21° 05.211' E 72° 38.605' | N 21° 04.697' E 72° 38.420' | N 21° 05.187' E 72° 37.774' | N 21° 05.44' E 72° 38.44' |
| 14/07/2016 | 42.75 | 47.53 | 29.47 | 24.23 | 34.14 |
| 18/07/2016 | 21.22 | 27.75 | 18.06 | 14.16 | 29.39 |
| 21/07/2016 | 35.47 | 41.15 | 31.37 | 27.69 | 47.73 |
| 25/07/2016 | 31.35 | 62.53 | 40.56 | 21.71 | 48.36 |
| 28/07/2016 | 13.62 | 29.35 | 10.46 | 16.68 | 21.49 |
| 01/08/2016 | 50.38 | 57.96 | 30.50 | 37.09 | 46.56 |
| 04/08/2016 | 34.21 | 48.56 | 24.27 | 30.60 | 39.11 |
| 08/08/2016 | 23.33 | 31.64 | 15.56 | 19.16 | 27.63 |
| 11/08/2016 | 29.24 | 37.60 | 19.29 | 26.27 | 33.53 |
| 15/08/2016 | 36.70 | 53.58 | 25.21 | 31.52 | 41.29 |
| 19/08/2016 | 21.46 | 44.18 | 34.54 | 28.74 | 37.56 |
| 22/08/2016 | 40.12 | 50.13 | 23.34 | 35.54 | 45.63 |
| 25/08/2016 | 17.11 | 22.87 | 14.32 | 10.51 | 20.49 |
| 29/08/2016 | 26.44 | 45.43 | 33.61 | 20.40 | 38.80 |
| 01/09/2016 | 63.45 | 29.45 | 33.05 | 40.49 | 48.74 |
| 05/09/2016 | 23.33 | 24.44 | 38.35 | 31.52 | 56.19 |
| 08/09/2016 | 29.86 | 42.61 | 28.69 | 22.56 | 62.71 |
| 12/09/2016 | 40.43 | 31.33 | 35.79 | 27.51 | 45.63 |
| 15/09/2016 | 28.30 | 21.31 | 12.45 | 15.45 | 25.45 |
| 19/09/2016 | 22.39 | 18.49 | 15.25 | 11.43 | 29.49 |
| 22/09/2016 | 38.57 | 26.32 | 22.72 | 33.38 | 43.46 |
| 26/09/2016 | 44.16 | 20.37 | 27.39 | 39.25 | 50.60 |
| 29/09/2016 | 33.59 | 41.36 | 26.45 | 30.29 | 35.39 |

BDL*: Below Detection Limit - Ammonia NH_3 (µg/m³): 10

| able No.: 1.10 - Ambient A | r Quality Monitoring | Results For Sulphur | Dioxide (SO_2) (µg/m ³): |
|----------------------------|----------------------|---------------------|--|
|----------------------------|----------------------|---------------------|--|

| Date Of Sampling | Near Port Gate No 2 N 21° 05.426' | Near STP N 21° 05.211' | Central Water Pump House N 21° 04.697' | Container Terminal N 21° 05.187' | Hazira Village N 21° 05.44' |
|---------------------|---|---------------------------|--|--|--------------------------------|
| | E 72° 37.739' | E 72° 38.605' | E 72° 38.420' | E 72° 37.774' | E 72° 38.44' |
| 01/04/2016 | 20.31 | 11.55 | 17.71 | 7.44 | 14.60 |
| 07/04/2016 | 17.62 | 13.50 | 7.50 | 15.41 | 19.56 |
| 08/04/2016 | 15.50 | 9.45 | 6.73 | 12.43 | 17.69 |
| 14/04/2016 | 18.77 | 22.38 | 8.43 | 6.55 | 24.71 |
| 15/04/2016 | 22.76 | 16.60 | 5.51 | 14.62 | 18.62 |
| 21/04/2016 | 6.69 | 14.38 | 12.61 | 10.43 | 15.50 |
| 22/04/2016 | 14.59 | 10.80 | 16.54 | 22.49 | 21.74 |
| 28/04/2016 | 21.36 | 26.56 | 10.58 | 5.70 | 29.70 |
| 29/04/2016 | 12.34 | 23.33 | 14.68 | 18.41 | 20.62 |
| 05/05/2016 | 5.74 | 12.59 | 16.37 | 9.66 | 15.41 |
| 06/05/2016 | 19.75 | 23.75 | 9.71 | 5.72 | 27.46 |
| 12/05/2016 | 20.36 | 14.37 | 5.77 | 18.69 | 16.38 |
| 13/05/2016 | 11.43 | 20.46 | 16.42 | 13.71 | 18.37 |
| 19/05/2016 | 13.47 | 25.51 | 14.74 | 20.55 | 19.69 |
| 20/05/2016 | 18.63 | 16.59 | 10.65 | 6.64 | 12.40 |
| 26/05/2016 | 15.50 | 22.49 | 6.35 | 14.56 | 17.34 |
| 27/05/2016 | 23.46 | 19.56 | 11.41 | 7.50 | 20.58 |
| 02/06/2016 | 16.47 | 27.75 | 14.77 | 22.77 | 25.59 |
| 06/06/2016 | 20.67 | 18.63 | 11.35 | 7.44 | 13.66 |
| 09/06/2016 | 13.41 | 16.38 | 19.31 | 9.66 | 11.67 |
| 13/06/2016 | 18.75 | 26.60 | 10.51 | 16.65 | 20.63 |
| 16/06/2016 | 15.57 | 21.63 | 12.62 | 8.35 | 23.64 |
| 20/06/2016 | 17.58 | 23.49 | 7.51 | 19.45 | 10.46 |
| 23/06/2016 | 19.45 | 9.74 | 5.47 | 11.39 | 15.37 |
| 27/06/2016 | 12.65 | 22.45 | 9.35 | 15.46 | 19.64 |
| 30/06/2016 | 8.80 | 13.38 | 15.60 | 10.51 | 21.36 |
| 04/07/2016 | 17.37 | 23.98 | 9.58 | 15.50 | 20.55 |
| 07/07/2016 | 12.57 | 14.53 | 17.72 | 6.63 | 10.54 |
| 11/07/2016 | 15.61 | 18.35 | 11.77 | 13.35 | 22.36 |

| Date Of | Near Port Gate No 2 | Near STP | Central Water Pump House | Container Terminal | Hazira Village |
|------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|------------------------------|
| Sampling | N 21° 05.426' E 72° 37.739' | N 21° 05.211' E 72° 38.605' | N 21° 04.697' E 72° 38.420' | N 21° 05.187' E 72° 37.774' | N 21° 05.44' E 72° 38.44' |
| 14/07/2016 | 13.57 | 22.71 | 15.76 | 11.58 | 17.75 |
| 18/07/2016 | 19.47 | 16.57 | 10.41 | 9.57 | 13.45 |
| 21/07/2016 | 11.39 | 19.60 | 14.77 | 16.36 | 21.49 |
| 25/07/2016 | 16.69 | 24.70 | 12.71 | 10.48 | 19.36 |
| 28/07/2016 | 10.34 | 15.51 | 5.70 | 8.62 | 12.71 |
| 01/08/2016 | 12.41 | 22.44 | 19.48 | 14.48 | 24.51 |
| 04/08/2016 | 22.70 | 25.46 | 16.66 | 8.77 | 18.61 |
| 08/08/2016 | 14.56 | 19.36 | 9.71 | 11.53 | 16.34 |
| 11/08/2016 | 16.63 | 21.64 | 13.65 | 19.64 | 22.52 |
| 15/08/2016 | 21.66 | 15.70 | 7.55 | 12.74 | 17.58 |
| 19/08/2016 | 19.47 | 18.57 | 15.57 | 9.59 | 12.36 |
| 22/08/2016 | 15.38 | 13.35 | 10.52 | 17.44 | 21.57 |
| 25/08/2016 | 8.36 | 16.52 | 12.64 | 10.51 | 13.59 |
| 29/08/2016 | 11.66 | 20.87 | 8.35 | 18.83 | 15.45 |
| 01/09/2016 | 15.38 | 6.70 | 20.65 | 13.37 | 22.59 |
| 05/09/2016 | 24.33 | 10.59 | 15.44 | 18.33 | 12.61 |
| 08/09/2016 | 19.47 | 13.36 | 10.65 | 21.48 | 25.45 |
| 12/09/2016 | 22.60 | 15.50 | 6.63 | 9.64 | 18.62 |
| 15/09/2016 | 13.60 | 7.58 | 9.72 | 5.72 | 11.76 |
| 19/09/2016 | 17.58 | 9.63 | 12.50 | 7.49 | 15.38 |
| 22/09/2016 | 20.33 | 16.47 | 18.50 | 12.48 | 23.65 |
| 26/09/2016 | 16.68 | 14.59 | 11.57 | 19.42 | 21.78 |
| 29/09/2016 | 18.44 | 12.40 | 16.61 | 22.56 | 24.50 |



Table No.: 1.11 - Ambient Air Quality Monitoring Results for Oxides of Nitrogen as NO_2 $(\mu g/m^3):$

| Date Of | Near Port Gate No 2 | Near STP | Central Water Pump House | Container Terminal | Hazira Village |
|------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|------------------------------|
| Sampling | N 21° 05.426' E 72° 37.739' | N 21° 05.211' E 72° 38.605' | N 21° 04.697' E 72° 38.420' | N 21° 05.187' E 72° 37.774' | N 21° 05.44' E 72° 38.44' |
| 01/04/2016 | 26.53 | 40.62 | 22.53 | 31.57 | 43.41 |
| 07/04/2016 | 40.51 | 33.37 | 17.36 | 23.38 | 37.58 |
| 08/04/2016 | 32.13 | 29.32 | 25.63 | 19.56 | 34.62 |
| 14/04/2016 | 22.50 | 27.77 | 34.52 | 25.71 | 39.52 |
| 15/04/2016 | 34.54 | 41.17 | 19.31 | 29.42 | 30.59 |
| 21/04/2016 | 28.27 | 21.52 | 36.20 | 24.34 | 36.14 |
| 22/04/2016 | 38.10 | 24.22 | 20.58 | 27.59 | 33.79 |
| 28/04/2016 | 36.31 | 32.44 | 26.32 | 17.18 | 41.58 |
| 29/04/2016 | 27.08 | 28.43 | 33.22 | 28.55 | 38.64 |
| 05/05/2016 | 28.58 | 39.55 | 31.56 | 18.56 | 35.57 |
| 06/05/2016 | 35.18 | 28.45 | 22.33 | 15.61 | 39.30 |
| 12/05/2016 | 30.20 | 36.59 | 17.66 | 26.36 | 27.56 |
| 13/05/2016 | 24.25 | 32.58 | 29.68 | 23.37 | 34.24 |
| 19/05/2016 | 33.76 | 20.88 | 19.32 | 35.75 | 29.55 |
| 20/05/2016 | 22.44 | 35.53 | 26.66 | 31.19 | 38.54 |
| 26/05/2016 | 39.59 | 30.64 | 15.54 | 21.65 | 26.48 |
| 27/05/2016 | 20.60 | 38.20 | 18.46 | 25.62 | 33.53 |
| 02/06/2016 | 36.56 | 24.52 | 20.24 | 29.52 | 33.49 |
| 06/06/2016 | 24.79 | 40.17 | 29.27 | 33.83 | 21.55 |
| 09/06/2016 | 31.82 | 34.79 | 26.64 | 23.16 | 39.23 |
| 13/06/2016 | 27.65 | 29.47 | 23.32 | 20.55 | 35.22 |
| 16/06/2016 | 22.84 | 38.56 | 33.61 | 27.43 | 31.22 |
| 20/06/2016 | 39.40 | 30.21 | 25.61 | 22.25 | 34.78 |
| 23/06/2016 | 18.62 | 21.18 | 16.46 | 24.64 | 27.26 |
| 27/06/2016 | 26.84 | 35.34 | 30.65 | 21.62 | 38.79 |
| 30/06/2016 | 20.45 | 23.71 | 27.32 | 19.25 | 30.47 |
| 04/07/2016 | 23.52 | 26.63 | 21.20 | 19.47 | 31.72 |
| 07/07/2016 | 30.64 | 34.24 | 27.64 | 22.64 | 37.63 |
| 11/07/2016 | 19.59 | 37.18 | 30.43 | 28.31 | 24.21 |

| Date Of | Near Port Gate No 2 | Near STP | Central Water Pump House | Container Terminal | Hazira Village |
|------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|------------------------------|
| Sampling | N 21° 05.426' E 72° 37.739' | N 21° 05.211' E 72° 38.605' | N 21° 04.697' E 72° 38.420' | N 21° 05.187' E 72° 37.774' | N 21° 05.44' E 72° 38.44' |
| 14/07/2016 | 26.65 | 30.33 | 17.55 | 33.77 | 38.20 |
| 18/07/2016 | 38.50 | 41.65 | 26.34 | 30.67 | 28.65 |
| 21/07/2016 | 25.57 | 33.37 | 29.26 | 20.15 | 35.58 |
| 25/07/2016 | 36.33 | 28.23 | 22.34 | 25.69 | 32.29 |
| 28/07/2016 | 27.62 | 23.29 | 15.39 | 18.56 | 25.35 |
| 01/08/2016 | 31.46 | 38.61 | 34.61 | 28.56 | 23.47 |
| 04/08/2016 | 37.23 | 27.75 | 31.16 | 25.64 | 35.44 |
| 08/08/2016 | 33.31 | 30.45 | 37.26 | 21.47 | 25.69 |
| 11/08/2016 | 23.63 | 33.34 | 21.57 | 27.18 | 30.63 |
| 15/08/2016 | 32.75 | 36.82 | 28.75 | 24.56 | 34.64 |
| 19/08/2016 | 22.41 | 42.37 | 35.19 | 29.35 | 38.69 |
| 22/08/2016 | 27.65 | 37.39 | 30.24 | 22.50 | 33.49 |
| 25/08/2016 | 17.75 | 24.24 | 19.39 | 15.42 | 21.22 |
| 29/08/2016 | 25.69 | 35.31 | 29.21 | 32.43 | 37.62 |
| 01/09/2016 | 25.18 | 18.61 | 29.62 | 21.65 | 36.66 |
| 05/09/2016 | 35.55 | 24.47 | 38.35 | 31.46 | 27.72 |
| 08/09/2016 | 31.59 | 29.28 | 34.53 | 25.45 | 42.35 |
| 12/09/2016 | 37.64 | 25.28 | 41.19 | 22.55 | 29.37 |
| 15/09/2016 | 23.61 | 28.72 | 19.29 | 15.07 | 21.52 |
| 19/09/2016 | 27.55 | 21.37 | 24.65 | 19.49 | 31.65 |
| 22/09/2016 | 42.25 | 31.60 | 35.68 | 28.45 | 38.48 |
| 26/09/2016 | 30.45 | 27.57 | 37.55 | 24.26 | 33.47 |
| 29/09/2016 | 38.32 | 26.67 | 32.54 | 29.69 | 41.63 |

| Table No.: 1.12 - Ambient Ai | [•] Quality Monitoring F | Results for Ozone as O_3 (µg/m ³): |
|------------------------------|-----------------------------------|--|
|------------------------------|-----------------------------------|--|

| Data Of | Near Port Gate No 2 | Near STP | Central Water Pump House | Container Terminal | Hazira Village |
|------------|--------------------------------|-----------------------------------|-----------------------------------|--------------------------------|------------------------------|
| Sampling | N 21° 05.426' E 72° 37.739' | N 21° 05.211′ E 72° 38.605′ | N 21° 04.697' E 72° 38.420' | N 21° 05.187' E 72° 37.774' | N 21° 05.44' E 72° 38.44' |
| 01/04/2016 | 22.98 | 27.49 | 25.25 | 20.60 | 30.24 |
| 07/04/2016 | 29.68 | 21.18 | 30.06 | 23.89 | 26.27 |
| 08/04/2016 | 26.44 | 29.41 | 20.66 | 27.12 | 20.32 |
| 14/04/2016 | 30.44 | 25.43 | 18.18 | 24.18 | 28.59 |
| 15/04/2016 | 18.23 | 30.60 | 27.27 | 22.22 | 25.29 |
| 21/04/2016 | 23.45 | 26.37 | 21.62 | 18.54 | 31.34 |
| 22/04/2016 | 25.70 | 22.68 | 19.56 | 21.66 | 29.72 |
| 28/04/2016 | 20.32 | 24.64 | 22.75 | 29.15 | 18.17 |
| 29/04/2016 | 24.40 | 20.62 | 26.35 | 17.12 | 22.63 |
| 05/05/2016 | 19.46 | 21.31 | 17.57 | 28.32 | 26.69 |
| 06/05/2016 | 17.84 | 24.42 | 22.62 | 26.19 | 28.32 |
| 12/05/2016 | 15.61 | 26.73 | 28.37 | 18.12 | 21.49 |
| 13/05/2016 | 20.69 | 18.38 | 21.30 | 29.47 | 27.20 |
| 19/05/2016 | 22.77 | 23.50 | 19.20 | 20.74 | 29.23 |
| 20/05/2016 | 29.31 | 27.91 | 25.43 | 17.81 | 25.61 |
| 26/05/2016 | 26.80 | 17.59 | 29.54 | 27.48 | 22.05 |
| 27/05/2016 | 25.61 | 20.82 | 27.53 | 19.63 | 23.94 |
| 02/06/2016 | 23.86 | 22.48 | 18.44 | 18.36 | 29.70 |
| 06/06/2016 | 30.46 | 26.39 | 23.51 | 20.53 | 18.48 |
| 09/06/2016 | 18.31 | 20.52 | 21.27 | 28.39 | 26.47 |
| 13/06/2016 | 25.37 | 23.48 | 29.38 | 26.59 | 21.82 |
| 16/06/2016 | 29.18 | 19.27 | 22.54 | 30.54 | 24.58 |
| 20/06/2016 | 26.19 | 30.33 | 28.76 | 27.32 | 22.17 |
| 23/06/2016 | 19.46 | 21.50 | 24.75 | 17.16 | 20.36 |
| 27/06/2016 | 24.81 | 29.60 | 26.30 | 24.33 | 27.51 |
| 30/06/2016 | 28.56 | 25.60 | 20.39 | 22.48 | 30.74 |
| 04/07/2016 | 18.73 | 30.72 | 25.68 | 27.52 | 24.17 |
| 07/07/2016 | 16.34 | 23.70 | 19.48 | 24.39 | 27.10 |
| 11/07/2016 | 26.52 | 17.89 | 20.24 | 23.75 | 22.68 |

| adani | Adani Hazira Port Private Limited | From : Apr., 2016 To : Sept., 2016 |
|-------|-----------------------------------|---------------------------------------|
|-------|-----------------------------------|---------------------------------------|

| Data Of | Near Port Gate No 2 | Near STP | Central Water Pump House | Container Terminal | Hazira Village |
|------------|--------------------------------|-----------------------------------|-----------------------------------|--------------------------------|------------------------------|
| Sampling | N 21° 05.426' E 72° 37.739' | N 21° 05.211′ E 72° 38.605′ | N 21° 04.697' E 72° 38.420' | N 21° 05.187' E 72° 37.774' | N 21° 05.44' E 72° 38.44' |
| 14/07/2016 | 21.27 | 24.29 | 28.22 | 19.31 | 26.41 |
| 18/07/2016 | 27.42 | 20.24 | 21.80 | 25.41 | 18.49 |
| 21/07/2016 | 22.72 | 25.49 | 27.52 | 21.40 | 23.71 |
| 25/07/2016 | 24.54 | 27.71 | 23.21 | 29.57 | 21.61 |
| 28/07/2016 | 20.50 | 22.48 | 18.19 | 16.24 | 19.63 |
| 01/08/2016 | 24.84 | 21.31 | 19.76 | 28.66 | 25.53 |
| 04/08/2016 | 27.28 | 25.35 | 22.49 | 16.32 | 30.40 |
| 08/08/2016 | 22.56 | 19.10 | 16.57 | 24.59 | 20.67 |
| 11/08/2016 | 18.38 | 29.25 | 21.33 | 27.61 | 24.68 |
| 15/08/2016 | 20.57 | 26.36 | 17.83 | 23.44 | 28.69 |
| 19/08/2016 | 28.32 | 22.30 | 29.49 | 17.49 | 21.62 |
| 22/08/2016 | 21.49 | 28.33 | 25.13 | 20.51 | 23.35 |
| 25/08/2016 | 23.28 | 16.28 | 20.09 | 22.17 | 17.42 |
| 29/08/2016 | 26.56 | 24.65 | 18.70 | 30.77 | 27.86 |
| 01/09/2016 | 28.61 | 24.46 | 22.18 | 20.78 | 29.51 |
| 05/09/2016 | 26.66 | 22.48 | 30.65 | 18.55 | 24.31 |
| 08/09/2016 | 29.34 | 27.52 | 21.15 | 25.70 | 30.64 |
| 12/09/2016 | 23.31 | 25.43 | 20.58 | 29.33 | 22.58 |
| 15/09/2016 | 25.72 | 21.50 | 18.16 | 16.87 | 23.80 |
| 19/09/2016 | 21.54 | 18.16 | 16.62 | 19.48 | 25.49 |
| 22/09/2016 | 30.23 | 23.69 | 26.31 | 22.60 | 27.60 |
| 26/09/2016 | 24.28 | 30.62 | 28.76 | 21.51 | 26.54 |
| 29/09/2016 | 20.36 | 26.45 | 24.66 | 30.30 | 28.52 |

BDL*: Below Detection Limit: Ozone as O_3 (µg/m³): 10

B. GROUND WATER QUALITY MONITORING: -

Table No.: 2.1 - Ground Water Quality Analysis Results:

| S. | | | GROUND WATER OPEN WELL (HAZIRA VILLAGE) | | | | | | | | | |
|------|--|-------|---|---------------|---------------|---------------|---------------|-----------|--|--|--|--|
| NO. | TEST PARAMETERS | ONIT | April-16 | May-16 | June-16 | July-16 | Aug-16 | Sep-16 | | | | |
| | | | 27/04/16 | 20/05/16 | 20/06/16 | 08/07/16 | 05/08/16 | 30/09/16 | | | | |
| 1 | Colour | Hazen | 2 | 2 | 2 | 2 | < 1.0 | 2 | | | | |
| 2 | Odour | | Agreeable | Agreeabl e | Agreeabl e | Agreeabl e | Agreeabl e | Agreeable | | | | |
| 3 | Taste | | Agreeable | Agreeabl e | Agreeabl e | Agreeabl e | Agreeabl e | Agreeable | | | | |
| 4 | Turbidity | NTU | 3.86 | 4.02 | 4.18 | 4.4 | 0.91 | 0.54 | | | | |
| 5 | pH Value | | 7.61 | 7.59 | 7.63 | 8.43 | 7.53 | 7.89 | | | | |
| 6 | Total Hardness as CaCO₃ | mg/l | 258 | 242 | 268 | 136 | 390 | 296 | | | | |
| 7 | Iron as Fe | mg/l | 0.014 | 0.015 | 0.014 | 0.013 | 0.014 | 0.014 | | | | |
| 8 | Chloride as Cl | mg/l | 61.59 | 56.99 | 62.86 | 30.99 | 69.98 | 64.89 | | | | |
| 9 | Residual Free Chlorine | mg/l | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | | | | |
| 10 | Fluoride as F | mg/l | 0.335 | 0.42 | 0.37 | 0.3 | 0.4 | 0.5 | | | | |
| 11 | Total Dissolved Solids | mg/l | 512 | 516 | 526 | 249 | 620 | 526 | | | | |
| 12 | Calcium as Ca | mg/l | 62.99 | 60.99 | 65.12 | 36 | 87.2 | 63.72 | | | | |
| 13 | Magnesium as Mg | mg/l | 24.08 | 26.06 | 25.2 | 11.04 | 41.28 | 25.24 | | | | |
| 14 | Copper as Cu | mg/l | 0.023 | 0.022 | 0.024 | 0.019 | 0.019 | 0.043 | | | | |
| 15 | Manganese as Mn | mg/l | BDL* | BDL* | BDL* | BDL* | BDL* | 0.22 | | | | |
| 16 | Sulphate as SO_4 | mg/l | 25.78 | 22.88 | 23.25 | 9.46 | 26.8 | 32.66 | | | | |
| 17 | Nitrate Nitrogen as NO ₃ | mg/l | BDL* | BDL* | BDL* | BDL* | BDL* | 0.21 | | | | |
| 18 | Phenolic compounds as C ₆ H₅OH | mg/l | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | | | | |
| 19 | Mercury as Hg | mg/l | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | | | | |
| 20 | Cadmium as Cd | mg/l | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | | | | |
| 21 | Selenium as Se | mg/l | BDL* | BDL* BDL* | | BDL* | BDL* | BDL* | | | | |
| 22 | Arsenic as As | mg/l | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | | | | |
| 23 | Cyanide as CN | mg/l | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | | | | |
| 24 | Lead as Pb | mg/l | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | | | | |
| 25 | Zinc as Zn | mg/l | 0.028 | 0.016 | 0.028 | 0.018 | 0.033 | 0.017 | | | | |
| 26 | Anionic Detergents as MBAS | mg/l | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | | | | |
| 27 | Chromium as Cr ⁺⁶ | mg/l | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | | | | |
| 28 | Mineral Oil | mg/l | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | | | | |
| 29 | Alkalinity | mg/l | 270 | 306 | 282 | 94 | 340 | 260 | | | | |
| 30 | Aluminum as Al | mg/l | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | | | | |
| 31 | Boron as B | mg/l | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | | | | |
| 32 | Pesticides | | | | | | | | | | | |
| 32.1 | Alachor | µg/I | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | | | |
| 32.2 | Atrazine | µg/I | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | | | |
| 32.3 | Aldrin/Dieldrine | µg/I | < 0.015 | < 0.015 | < 0.015 | < 0.015 | < 0.015 | < 0.015 | | | | |
| 32.4 | Alpha HCH | µg/I | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | | | | |
| 32.5 | Beta HCH | µg/I | < 0.02 | < 0.02 | < 0.02 | < 0.02 | < 0.02 | < 0.02 | | | | |
| 32.6 | Butachlor | µg/I | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | | | |
| 32.7 | Chlorpyriphos | µg/I | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | | | |



| S. NO. | | UNIT | GROUND WATER OPEN WELL (HAZIRA VILLAGE) | | | | | | | | | |
|-----------|---|------------|---|----------|----------|----------|----------|----------|--|--|--|--|
| NO. | TEST PARAMETERS | 0 | April-16 | May-16 | June-16 | July-16 | Aug-16 | Sep-16 | | | | |
| | | | 27/04/16 | 20/05/16 | 20/06/16 | 08/07/16 | 05/08/16 | 30/09/16 | | | | |
| 32.8 | Delta HCH | µg/l | < 0.02 | < 0.02 | < 0.02 | < 0.02 | < 0.02 | < 0.02 | | | | |
| 32.9 | 2,4- Dichlorophrnoxy acetic acid | µg/I | < 15 | < 15 | < 15 | < 15 | < 15 | < 15 | | | | |
| 32.10 | DDT (0,p & p,p-Isomers of DDT, DDE & DDD | µg/I | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.5 | | | | |
| 32.11 | Endosulfan (alpha, beta, and sulphate) | µg/I | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 | | | | |
| 32.12 | Ethion | µg/l | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | | | |
| 32.13 | Gamma – HCH (Lindane) | µg/I | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | | | |
| 32.14 | lsoproturon | µg/I | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | | | |
| 32.15 | Malathion | µg/l | < 95 | < 95 | < 95 | < 95 | < 95 | < 95 | | | | |
| 32.16 | Methyl Parathion | µg/l | < 0.15 | < 0.15 | < 0.15 | < 0.15 | < 0.15 | < 0.15 | | | | |
| 32.17 | Monocrotophos | µg/l | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.5 | | | | |
| 32.18 | Phorate | µg/l | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | | | | |
| 33 | Coliform | /100 ml | Present | Absent | Absent | Absent | Absent | Absent | | | | |
| 34 | 34 E-Coli | | Absent | Absent | Absent | Absent | Absent | Absent | | | | |

*Below detection limit



C. SOIL QUALITY MONITROING: -

Table No.: 3.1 - Soil Quality Testing Results:

| S. | PARAMETERS | UNIT | NEAR LT PAR | CANTEEN KING | NEAR PORT GATE NO.: 2 | | | |
|-------|--------------------------------|---------------|------------------------|------------------------|------------------------|------------------------|--|--|
| NO. | PARAMETERS | | 18/06/2016 | 29/09/2016 | 18/06/2016 | 29/09/2016 | | |
| 1 | Туре | | Clay | Clay | Clay | Clay | | |
| Grain | n Size Analysis | | | | | | | |
| 2 | Gravel | % | 4 | 3.8 | 5 | 5.2 | | |
| 3 | Coarse Sand | % | 5 | 5.2 | 5 | 4.8 | | |
| 4 | Medium Sand | % | 12 | 14 | 10 | 12 | | |
| 5 | Fine Sand | % | 58 | 56 | 64 | 62 | | |
| 6 | Total Sand | % | 20 | 18 | 16 | 18 | | |
| 7 | Silt + Clay | % | 84 | 82 | 82 | 80 | | |
| 8 | рН (1:5) | | 9.52 | 9.46 | 9.47 | 9.33 | | |
| 9 | Electricity Conductivity | µmho/cm | 1616 | 1820 | 1590 | 1480 | | |
| 10 | Alkali matter | mg/kg | 706 | 698 | 674 | 652 | | |
| 11 | Cation Exchange Capacity | meq/100 gm | 58 | 54 | 50 | 48 | | |
| 12 | Sodium Absorption Ratio | | 10.76 | 11.66 | 16.86 | 14.72 | | |
| 13 | Organic Matter | mg/kg | 0.7 | 0.64 | 0.5 | 0.48 | | |
| 14 | Available Nitrogen | meq/100 gm | 0.038 | 0.034 | 0.048 | 0.046 | | |
| 15 | Available Potassium | mg/kg | 1980 | 2010 | 2310 | 2290 | | |
| 16 | Available Phosphorus | mg/kg | 0.42 | 0.4 | 0.43 | 0.4 | | |
| 17 | Available Sodium | mg/kg | 0.96 | 0.93 | 0.88 | 0.86 | | |
| 18 | Permeability | cm/sec | 3.6 X 10 ⁻⁵ | 3.4 X 10 ⁻⁵ | 3.3 X 10 ⁻⁵ | 3.4 X 10 ⁻⁵ | | |

D. SEA WATER QUALITY MONITORING: -

| Table No.: 4.1 - Sea Water Quality Analysis Results Of CB2 South End Towards Landside From The Sea B |
|--|
|--|

| | | | RESULT OF SEA WATER | | | | | | | | | | | |
|--------|---|------------------------------|---------------------|---------------|-------------------|---------------|---------------|---------------|------------------------|---------------|---------------|---------------|---------------------|---------------------|
| S. NO. | TEST PARAMETERS | UNIT | Apr | il-16 | May | y-16 | Jun | e-16 | July | y-16 | Augu | ist-16 | Septen | nber-16 |
| | | | SURFACE | BOTTOM | SURFACE | BOTTOM | SURFACE | BOTTOM | SURFACE | BOTTOM | SURFACE | BOTTOM | SURFACE | BOTTOM |
| 1 | рН | | 7.77 | 8.01 | 8.02 | 8.18 | 7.75 | 7.89 | 7.93 | 8.17 | 7.86 | 7.9 | 7.72 | 7.88 |
| 2 | Temperature | °C | 29 | 30 | 30 | 29 | 31 | 30 | 29 | 28 | 30 | 29 | 28 | 29 |
| 3 | Total Suspended Solids | mg/L | 200 | 270 | 340 | 410 | 310 | 322 | 194 | 238 | 310 | 210 | 246 | 330 |
| 4 | BOD (3 Days @ 27 °C) | mg/L | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | 5 | 6 | BDL* | BDL* | 6 | 2 |
| 5 | Dissolved Oxygen | mg/L | 5.2 | 6.8 | 5.2 | 4.6 | 5.4 | 4.6 | 5.6 | 4.8 | 5.6 | 1.8 | 5.6 | 4.4 |
| 6 | Salinity | ppt | 36.04 | 36.98 | 34.84 | 35.24 | 37.10 | 37.96 | 35.58 | 36.66 | 36.40 | 35.80 | 36.80 | 37.20 |
| 7 | Oil & Grease | mg/L | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* |
| 8 | Nitrate as NO3 | mg/L | 0.038 | 0.073 | 0.045 | 0.060 | 0.062 | 0.071 | 0.048 | 0.078 | 0.061 | 0.031 | 0.044 | 0.062 |
| 9 | Nitrite as NO ₂ | mg/L | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* |
| 10 | Ammonical Nitrogen as NH₃ | mg/L | 1.88 | 2.76 | 2.61 | 3.86 | 0.99 | 0.75 | 2.22 | 3.67 | 1.76 | 2.14 | 1.98 | 2.82 |
| 11 | Phosphates as PO ₄ | mg/L | 0.67 | 0.77 | 3.46 | 3.74 | 0.18 | 0.76 | 0.70 | 0.80 | 0.66 | 0.72 | 0.74 | 0.83 |
| 12 | Total Nitrogen | mg/L | 1.91 | 2.83 | 2.65 | 3.92 | 1.04 | 0.82 | 2.26 | 3.75 | 1.82 | 2.17 | 2.02 | 2.88 |
| 13 | Petroleum Hydrocarbon | µg/L | BDL* | BDL* | BDL* | BDL* | 10.2 | BDL* | BDL* | BDL* | BDL* | BDL* | 12 | BDL* |
| 14 | Total Dissolved Solids | mg/L | 40460 | 40920 | 43240 | 42680 | 43280 | 44520 | 39720 | 40740 | 39260 | 40480 | 43110 | 43560 |
| 15 | COD | mg/L | 20 | 14 | 19 | 28 | 25 | 15 | 20 | 22 | 22 | 18 | 24 | 14 |
| 16 | Oxidisable Particular Organic Carbon | % | 1.46 | 0.98 | 1.34 | 0.62 | 0.90 | 0.51 | 0.50 | 0.57 | 1.40 | 0.80 | 0.88 | 0.42 |
| 17 | Turbidity | NTU | 16.50 | 44 | 18 | 40 | 15.20 | 15 | 14.80 | 14.40 | 12.80 | 14.20 | 14.20 | 16.80 |
| Α | Flora and Fauna | | | • | | • | • | • | | • | • | • | • | |
| 17.1 | Primary Productivity | mgC/L/d ay | 3.26 | 0.67 | 1.46 | 0.45 | 1.75 | 0.22 | 1.98 | 0.67 | 2.54 | 0.23 | 2.29 | 0.79 |
| В | Phytoplankton | | | | | | | | | | | | | |
| 18.1 | Chlorophyll | mg/m² | 3.57 | 0.40 | 2.93 | 0.93 | 2.85 | 0.37 | 2.96 | 0.40 | 3.25 | 0.19 | 2.51 | 0.56 |
| 18.2 | Phaeophytin | mg/m³ | BDL* | 1.74 | BDL* | 0.84 | BDL* | 1.88 | BDL* | 1.84 | BDL* | 2.06 | BDL* | 1.57 |
| 18.3 | Cell Count | Unit x 10 ³ /L | 216 | 69 | 288 | 22 | 202 | 24 | 101 | 12 | 202 | 24 | 236 | 74 |
| | | | Bacillariophy | Bacillariophy | Bacillariophy | Bacillariophy | Bacillariophy | Bacillariophy | Bacillariophy | Bacillariophy | Bacillariophy | Bacillariophy | Bacillariophy | Bacillariophy |
| | | | ceae | ceae | ceae | ceae | ceae | ceae | ceae | ceae | ceae | ceae | ceae | ceae |
| | | | Biddulphia | Rhizosolenia | Coscinodisc | Biddulphia | Nitzschia sp. | Navicula sp. | Achnanthes | Fragillaria | Melosira sp. | Biddulphia | Navicula sp. | Navicula sp. |
| | | | sp. | sp. | us sp. | sp. | Synedra sp. | Fragillaria | sp. | sp. | Nitzschia sp. | sp. | Nitzschia sp. | Nitzschia sp. |
| | | | Coscinodisc | Fragillaria | Asterionella | Navicula sp. | Coscinodisc | sp. | Navicula sp. | Nitzschia sp. | Synedra sp. | Gyrosigma | Synedra sp. | Fragillaria |
| | Name of Group | | US SP. | sp. | sp. | Fragillaria | US SP. | Pinnularia | Nitzschia sp. | Gyrosigma | Biddulphia | sp. | Rhizosolenia | sp. |
| 10.4 | Number | | Rhizosolenia | Coscinodisc | Gomphonem | sp. | Asterionella | sp. | Syneora sp. | sp. | sp. | Asterionella | sp. | Pinnularia |
| 18.4 | and name of group | | sp. | US Sp. | a sp. | Cymbella sp. | Sp. | Nitzschia sp. | Coscinodisc | Inaliasione | Cyanophyce | sp. | Skeleconema | sp. Overballa an |
| | species of each group | | Cymbolla sp. | Thallaciocica | RIIIZUSUIEIIIa | | | Gyrusiyina | US SP. Phizocologia | Mavioula co | | cyanophyce | Sp. Actoriopolla | Cynibena sp. |
| | | | Tabellaria | sn | sp. Cvanonhyce | | Rhizosolenia | sp. | sn | | Anahaena | Oscillatoria | So | |
| | | | SD. | Surirella so | ae | | SD. | | Thallasione | | sp. | SD. | Cymbella so. | |
| | | | Fragillaria | Cvanophyce | Oscillatoria | | Skeletonema | | ma sp. | | Oscillatoria | Microcystis | Desmids | |
| | | | SD. | ae | SD. | | SD. | | Gomphonem | | SD. | SD. | Closterium | |
| | | | Skeletonema | Oscillatoria | Spirulina sp. | | Pinnularia | | a sp. | | Green Algae | | SD. | |



| | | | sp. Cyanophyce ae Anabaena sp. Microcystis sp. Oscillatoria sp. Oscillatoria sp. Green Algae Chlorella sp. Ankistrodes mus sp. | sp. Spirulina sp. Green Algae Spirogyra sp. Pediastrum sp. | Green Algae Spirogyra sp. Volvox sp. Scenedesmu s sp. | | sp. Green Algae Scenedesmu s sp. Pediastrum sp. Oedogonium sp. Desmids Cosmarium sp. | | Cyanophyce ae Anabaena sp. Oscillatoria sp. Green Algae Ankistrodes mus sp. Chlorella sp. | | Pandorina sp. Scenedesmu s | | Cosmarium sp. Green Algae Ankistrodes mus sp. Scenedesmu s sp. Ulothrix sp. Spirogyra sp. | |
|------|---|--------------------------|--|---|---|------------------------------|--|--|--|----------------------------------|--|---|---|--|
| С | Zooplanktons | | | | | | | | | | | | | |
| 19.1 | Abundance (Population) | no/m² | 263 | 50 | 210 | 30 | 263 | 38 | 210 | 30 | 350 | 50 | 330 | 90 |
| 19.2 | Name of Group Number and name of group species of each group | | Copepods Decapods Crustaceans Molluscans Bivalves | Molluscans Echinoderms Crustaceans | Copepods Echinoderms Bivalves Crabs | Snails Gastropods | Copepods Nematodes Gastropods Echinoderms | Polychaetes Worms Gastropods | Copepods Polychaete worms Mysids Echinoderms | Nematodes Crustaceans | Echinoderms Krill Ostracods Crustaceans Decapods Bivalves | Gastropods Copepods Ostracods | Polychaete worms Crustaceans Echinoderms Snail Bivalves Mysids Isopods | Polychaete worms Nematodes Gastropods Foraminifera ns |
| 19.3 | Total Biomass | ml/100 m ³ | 123 | 14.10 | 110 | 1.10 | 99.60 | 1.54 | 102 | 12.54 | 125 | 26.70 | 152 | 98.95 |
| D | Microbiological Parame | eters | | | | | | | | | | | | |
| 20.1 | Total Bacterial Count | CFU/mI | 2010 | 1580 | 1980 | 1720 | 1760 | 1510 | 1730 | 1520 | 1520 | 1380 | 1510 | 1360 |
| 20.2 | Total Coliform | /ml | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 20.3 | E.coli | /ml | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 20.4 | Enterococcus species | /ml | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 20.5 | Salmonella species | /ml | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 20.6 | Shigella species | /ml | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 20.7 | Vibrio species | /ml | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |

BDL* - Below Detection Limit



| | | | RESULT OF SEA WATER | | | | | | | | | | | |
|--------|---------------------------------------|------------------------------|---------------------|-------------------|--------------|------------------|--------------------|-------------------|-----------------------|--------------------|------------------|-------------------|-----------------|--------------------|
| S. NO. | TEST PARAMETERS | UNIT | Apri | il-16 | May | y-16 | Jun | e-16 | July | y-16 | Augu | ist-16 | Septen | nber-16 |
| | | | SURFACE | BOTTOM | SURFACE | BOTTOM | SURFACE | BOTTOM | SURFACE | BOTTOM | SURFACE | BOTTOM | SURFACE | BOTTOM |
| 1 | pН | | 7.88 | 8.13 | 8.17 | 8.30 | 7.96 | 7.97 | 7.97 | 8.03 | 7.90 | 8.08 | 7.91 | 8.01 |
| 2 | Temperature | °C | 29 | 30 | 30 | 30 | 30 | 29 | 30 | 29 | 30 | 29 | 29 | 30 |
| 3 | Total Suspended Solids | mg/L | 180 | 250 | 260 | 300 | 266 | 294 | 290 | 330 | 290 | 310 | 238 | 326 |
| 4 | BOD (3 Days @ 27 °C) | mg/L | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | 4 | 5 | BDL* | BDL* | 8 | 5 |
| 5 | Dissolved Oxygen | mg/L | 5.0 | 4.4 | 5.6 | 4.8 | 5.4 | 5.0 | 5.0 | 4.6 | 5.4 | 4.8 | 5.0 | 4.8 |
| 6 | Salinity | ppt | 37.72 | 38.06 | 35.30 | 36.21 | 35.54 | 36.32 | 34.90 | 35.50 | 35.80 | 36.20 | 36.60 | 37.20 |
| 7 | Oil & Grease | mg/L | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* |
| 8 | Nitrate as NO3 | mg/L | 0.015 | 0.060 | 0.075 | 0.075 | 0.048 | 0.056 | 0.044 | 0.056 | 0.045 | 0.061 | 0.045 | 0.076 |
| 9 | Nitrite as NO ₂ | mg/L | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* |
| 10 | Ammonical Nitrogen as NH ₃ | mg/L | 2.04 | 2.80 | 2.14 | 4.10 | 2.17 | 3.06 | 2.10 | 3.06 | 4.22 | 4.70 | 2.40 | 3.60 |
| 11 | Phosphates as PO ₄ | mg/L | 0.55 | 0.68 | 2.41 | 3.41 | BDL* | 0.62 | 0.41 | 0.30 | 0.56 | 0.45 | 0.44 | 0.32 |
| 12 | Total Nitrogen | mg/L | 2.05 | 2.86 | 2.21 | 4.17 | 2.21 | 3.11 | 2.14 | 3.12 | 4.26 | 4.76 | 2.44 | 3.67 |
| 13 | Petroleum Hydrocarbon | µg/L | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* |
| 14 | Total Dissolved Solids | mg/L | 41330 | 41840 | 42790 | 43310 | 42480 | 43930 | 35810 | 36760 | 45320 | 46110 | 44120 | 45060 |
| 15 | COD | mg/L | 28 | 24 | 24 | 28 | 18 | 20 | 16 | 18 | 20 | 22 | 28 | 19 |
| 16 | Oxidisable Particular | % | 1.06 | 0.82 | 0.83 | 0.47 | 0.62 | 0.94 | 0.46 | 0.53 | 0.58 | 0.80 | 0.56 | 0.72 |
| 17 | Tuchidity | NTU | 12 50 | 38 30 | 14 0 | 36.0 | 22.50 | 20.40 | 20.20 | 18.60 | 18.20 | 16.40 | 20.40 | 14.60 |
| A | Flora and Fauna | NIO | 12.50 | 50.50 | 14.0 | 50.0 | 22.50 | 20.40 | 20.20 | 10.00 | 10.20 | 10.40 | 20.40 | 14.00 |
| | | maC/L/d | | | | | | | | | | | | |
| 17.1 | Primary Productivity | ay | 2.13 | 0.45 | 1.575 | 0.315 | 1.30 | 0.56 | 1.75 | 0.45 | 2.74 | 0.387 | 1.84 | 0.90 |
| В | Phytoplankton | | | | | | | | | | | | | |
| 18.1 | Chlorophyll | mg/m² | 2.21 | 0.37 | 2.59 | 0.51 | 2.32 | 0.61 | 2.67 | 0.56 | 3.23 | 0.35 | 2.24 | 0.45 |
| 18.2 | Phaeophytin | mg/m ⁻ | BDL* | 1.96 | BDL* | 1.36 | BDL* | 1.47 | BDL* | 1.57 | BDL* | 1.78 | BDL* | 1.67 |
| 18.3 | Cell Count | Unit x 10 ³ /L | 278 | 73 | 208 | 16 | 232 | 22 | 121 | 11 | 242 | 22 | 248 | 70 |
| | | | Bacillarioph | Bacillarioph | Bacillarioph | | Bacillarioph | Bacillarioph | Bacillarioph | Bacillarioph | Bacillarioph | Bacillarioph | Coscinodisc | Bacillarioph |
| | | | усеае | усеае | усеае | Bacillarioph | усеае | усеае | усеае | усеае | усеае | усеае | us sp. | усеае |
| | | | Asterionella | Fragillaria | Synedra sp. | yceae | Melosira sp. | Navicula sp. | Navicula sp. | Biddulphia | Gomphone | Cymbella sp. | Pinnularia | Nitzschia |
| | | | sp. | sp. | Cocconeis | Pinnularia | Coscinodisc | Nitzschia | Synedra sp. | sp. | ma sp. | Rhizosoleni | sp. | sp. |
| | | | Biddulphia | Biddulphia | sp. | sp. | US SP. | sp. | Biddulphia | Navicula sp. | Achnanthes | a sp. | Synedra sp. | Thallasione |
| | | | sp. | sp. | Gomphone | Cymbella sp. | NIEZSCHIA | Tabellaria | sp. | Nitzschia | sp. | Fragiliaria | Asterionella | ma sp. |
| | | | Flagiliaria | Pieurosigina | Dhizocologi | Fragiliaria | sp. Navioula co | sp. Biddulahia | Cheatocero | sp. Econillacia | Asterionella | sp. Nitzcobio | sp. Comphone | Navicula sp. |
| | Name of Group Number | | sµ. Coccipadica | sp. Biopulacia | | sp. Nitzcobia | | Бійдлірі і іа | US SP. Phizocologi | FlayIllaria | sµ. Cocconois | INILZSCIIId | Gomphone | COCCOTTERS |
| 18.4 | and name of group | | | sn | Biddulohia | 50 | maiso | Sp. Cvanonhyce | a sn | Sp. Gyrosioma | sn | Sp. Cvanonhyce | Rhizosoleni | sp. Franillaria |
| 10.4 | species of each group | | Thallasiosira | Navicula so | sn | | Cymbella so | ae | Cyclotella | sn | Cvanonhvce | ae | a sn | sn |
| | species of each group | | SD. | Cvanonhvce | Cvanonhvce | | Rhizosoleni | Oscillatoria | SD. | Synedra sn. | ae | Microcystis | Biddulohia | Cymbella sn. |
| | | | Melosira sp. | ae | ae | | a sp. | SD. | Melosira sp. | | Oscillatoria | SD. | SD. | |
| | | | Cyclotella | Oscillatoria | Oscillatoria | | Pinnularia | Lyngbya sp. | Cyanophyce | | SD. | Anabaena | Spirulina sp. | |
| | | | sp. | sp. | SD. | | SD. | | ae | | Microcystis | SD. | Cyanophyce | |
| | | | Cyanophyce | Green Algae | Anabaena | | Cyanophyce | | Spirulina sp. | | sp. | | ae | |
| | | | ае | Chlorella sp. | sp. | | ae | | Microcystis | | Spirulina sp. | | Spirulina sp. | |
| | | | Oscillatoria | ' | Microcystis | | Oscillatoria | | sp. | | Green Algae | | Nostoc sp. | |
| | | 1 | sp. | | sp. | | sp. | | Green Algae | | Spirogyra | | Green Algae | |



| | | | Nostoc sp. Green Algae Hydrodictyo n sp. Chlorella sp. | | Green Algae Volvox sp. Chlorella sp. | | Spirulina sp. Green Algae Pediastrum sp. | | Chlorella sp. Pediastrum sp. Scenedesm | | sp. Pandorina sp. | | Chlorella sp. Scenedesm us sp | |
|------|--|--------------------------|---|--|---|------------------------|---|-------------------------|---|----------------------------|-------------------------------------|--|---|--|
| С | Zooplanktons | | oniorena sp. | | | | | | 03 SP. | | | | | |
| 19.1 | Abundance (Population) | no/m² | 213 | 63 | 170 | 10 | 213 | 13 | 170 | 10 | 283 | 67 | 230 | 30 |
| 19.2 | Name of Group Number and name of group species of each group | | Ostracods Gastropods Foraminifer ans Molluscans Snails | Copepods Decapods Molluscans | Polychaete worms Decapods Molluscans Gastropods | Gastropods | Molluscans Gastropods Crustaceans Polychaetes Worms | Echinoderm s | Copepods Gastropods Fish egg Nematodes Polychaetes Worms | Gastropods | Gastropods Bivalves Ostracods | Polychaetes Worms Copepods Molluscans | Gastropods Ostracods Crustaceans Snail Isopods Polychaete worms | Molluscans Copepods Foraminifer ans |
| 19.3 | Total Biomass | ml/100 m ³ | 96.20 | 8.80 | 80.65 | 1.01 | 99.58 | 1.41 | 112 | 15.47 | 136 | 27.60 | 135 | 92.54 |
| D | Microbiological Paramete | rs | | | | | | | | | | | | |
| 20.1 | Total Bacterial Count | CFU/mI | 1730 | 1260 | 1840 | 1560 | 1710 | 1420 | 1660 | 1490 | 1680 | 1460 | 1700 | 1490 |
| 20.2 | Total Coliform | /ml | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 20.3 | E.coli | /ml | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 20.4 | Enterococcus species | /ml | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 20.5 | Salmonella species | /ml | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 20.6 | Shigella species | /ml | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 20.7 | Vibrio species | /ml | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |

BDL* - Below Detection Limit



Table No.: 4.3 - Sea Water Quality Analysis Results of CB1 End Towards Channel From Sea Basin:

| | | | RESULTS OF SEA WATER | | | | | | | | | | | |
|--------|---|------------------------------|-----------------------|-----------------|--------------------|--------------------|----------------------|-------------------|---------------|--------------------|-----------------|--------------|-------------------|-------------------|
| S. NO. | TEST PARAMETERS | UNIT | Apr | il-16 | May | /-16 | Jun | e-16 | July | y-16 | Augus | t-16 | Septen | nber-16 |
| | | | SURFACE | BOTTOM | SURFACE | BOTTOM | SURFACE | BOTTOM | SURFACE | BOTTOM | SURFACE | BOTTOM | SURFACE | BOTTOM |
| 1 | pН | | 7.91 | 8.07 | 7.80 | 7.92 | 7.97 | 7.99 | 7.53 | 7.90 | 7.90 | 8.13 | 7.63 | 7.98 |
| 2 | Temperature | °C | 29 | 30 | 30 | 29 | 30 | 29 | 30 | 29 | 30 | 29 | 29 | 30 |
| 3 | Total Suspended Solids | mg/L | 166 | 234 | 310 | 330 | 370 | 490 | 370 | 450 | 210 | 300 | 272 | 540 |
| 4 | BOD (3 Days @ 27 °C) | mg/L | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | 4.5 | 5.5 | BDL* | BDL* | 6 | 4 |
| 5 | Dissolved Oxygen | mg/L | 5.4 | 4.6 | 5.4 | 4.8 | 5.4 | 4.8 | 5.4 | 4.8 | 5.2 | 4.6 | 5.4 | 4.6 |
| 6 | Salinity | ppt | 36.88 | 37.54 | 36.66 | 37.96 | 35.35 | 36.06 | 35.20 | 35.90 | 35.70 | 36.40 | 35.20 | 36.90 |
| 7 | Oil & Grease | mg/L | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* |
| 8 | Nitrate as NO3 | mg/L | 0.026 | 0.070 | 1.950 | 3.780 | 0.070 | 0.080 | 0.053 | 0.061 | 0.052 | 0.068 | 0.091 | 0.076 |
| 9 | Nitrite as NO ₂ | mg/L | BDL* | BDL* | 2.22 | 3.7 | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* |
| 10 | Ammonical Nitrogen as NH ₃ | mg/L | 1.97 | 2.54 | 1.91 | 2.12 | 2.12 | 2.54 | 2.12 | 2.33 | 2.02 | 2.86 | 2.22 | 2.40 |
| 11 | Phosphates as PO ₄ | mg/L | 0.59 | 0.71 | 2.05 | 3.66 | 0.18 | 0.35 | 0.58 | 0.44 | 0.46 | 0.53 | 0.57 | 0.63 |
| 12 | Total Nitrogen | mg/L | 1.99 | 2.61 | 6.08 | 9.57 | 2.19 | 2.62 | 2.17 | 2.39 | 2.05 | 3.46 | 2.31 | 3.03 |
| 13 | Petroleum Hydrocarbon | µg/L | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | 12 | BDL* |
| 14 | Total Dissolved Solids | mg/L | 40780 | 41130 | 45090 | 46410 | 41260 | 41930 | 36830 | 37040 | 38920 | 39990 | 40390 | 42240 |
| 15 | COD | mg/L | 24 | 20 | 24 | 28 | 20 | 18 | 18 | 20 | 20 | 16 | 24 | 14 |
| 16 | Oxidisable Particular Organic Carbon | % | 1.72 | 1.0 | 1.40 | 0.80 | 0.70 | 0.66 | 0.48 | 0.60 | 1.32 | 0.98 | 0.70 | 0.47 |
| 17 | Turbidity | NTU | 18 | 129 | 20 | 98 | 15.40 | 18.80 | 16.60 | 17.40 | 14.40 | 15.60 | 12.60 | 14.40 |
| Α | Flora and Fauna | | • | • | | • | • | • | | | • | • | | |
| 17.1 | Primary Productivity | mgC/L/d ay | 2.65 | 0.81 | 1.66 | 0.56 | 1.10 | 0.51 | 1.55 | 0.81 | 2.99 | 0.79 | 1.77 | 0.45 |
| В | Phytoplankton | | | | | | | | | | | | | |
| 18.1 | Chlorophyll | mg/m³ | 2.480 | 0.534 | 2.109 | 0.587 | 2.450 | 0.560 | 2.937 | 0.641 | 3.250 | 0.668 | 1.460 | 0.374 |
| 18.2 | Phaeophytin | mg/m ³ | BDL* | 1.720 | BDL* | 1.469 | 0.011 | 1.320 | BDL* | 1.240 | BDL* | 1.220 | 0.419 | 1.510 |
| 18.3 | Cell Count | Unit x 10 ³ /L | 244 | 57 | 216 | 28 | 198 | 16 | 115 | 12 | 230 | 24 | 260 | 72 |
| | | | Bacillarioph | Bacillarioph | Bacillarioph | Bacillarioph | Bacillarioph | Bacillarioph | Bacillarioph | Bacillarioph | Bacillariophyc | Bacillarioph | Bacillarioph | Bacillarioph |
| | | | yceae | усеае | усеае | усеае | усеае | усеае | yceae | усеае | eae | yceae | yceae | усеае |
| | | | Navicula sp. | Navicula sp. | Navicula sp. | Nitzschia | Asterionella | Navicula sp. | Amphora | Navicula sp. | Coscinodiscus | Synedra sp. | Gyrosigma | Pinnularia |
| | | | Rhizosoleni | Pinnularia | Nitzschia | sp. | sp. Cassiaadiaa | Nitzschia | sp. | Nitzschia | sp. | Cheatocero | sp. | sp. Cumballa |
| | | | a sp. Coccionadica | sp. Comphana | sp. Cuclotella | Flagiliaria | Coscinouisc | sp. Biddulahia | Navicula sp. | sp. Econillacia | Piagiliaria sp. | US SP. | Coccorrers | Cymbella |
| | | | | maiso | cyclotella | sp. Coscinodisc | US SP. Skeletonem | Biodolphia | Coscinodisc | Flayillaria | Navicula sp. | Cynoena | sp. Skeletonem | sp. Svoedra so |
| | Name of Group Number | | Cymbella | Rhizosoleni | Sp. Coscinodisc | | aso | Cocconeis | | Pleurosioma | Gyrosioma so | Cyanophyce | a so | Melosira so |
| 18.4 | and name of group | | SD. | a sp. | | Rhizosoleni | Pinnularia | SD. | Rhizosoleni | sn. | Nitzschia sp. | ae | Nitzschia | Biddulohia |
| | species of each group | | Fragillaria | Coscinodisc | Skeletonem | a sp. | SD. | Svnedra sp. | a sp. | Pinnularia | Cvanophycea | Microcystis | SD. | SD. |
| | | | SD. | US SD. | a sp. | | Gyrosigma | | Skeletonem | SD. | e | SD. | Fragillaria | |
| | | | Skeletonem | Cyanophyce | Pleurosigma | | sp. | | a sp. | | Anabaena sp. | Oscillatoria | sp. | |
| | | | a sp. | ae | sp. | | Thallasiosir | | Surirella sp. | | Oscillatoria | sp. | Cyanophyce | |
| | | | Pinnularia | Oscillatoria | Pinnularia | | a sp. | | Tabellaria | | sp. | | ae | |
| | | | sp. | sp. | sp. | | Biddulphia | | sp. | | Green Algae | | Spirulina sp. | |
| | | | Cocconeis | Microcystis | Fragillaria | | sp. | | Cyanophyce | | Pediastrum | | Oscillatoria | |



| | | | sp. | sp. | sp. | | Synedra sp. | | ae | | sp. | | sp. | |
|----------|--------------------------|--------------------------|---------------|-------------|---------------|------------|--------------|-------------|---------------|-------------|--------------|-------------|-------------|------------|
| | | | Cyanophyce | Green Algae | Cyanophyce | | Cyanophyce | | Spirulina sp. | | Ulothrix sp. | | Green Algae | |
| | | | ае | Pandorina | ae | | ae | | Oscillatoria | | | | Pediastrum | |
| | | | Anabaena | sp. | Oscillatoria | | Anabaena | | sp. | | | | sp. | |
| | | | sp. | Ankistrodes | sp. | | sp. | | Green Algae | | | | Ankistrodes | |
| | | | Oscillatoria | mus sp. | Green Algae | | Oscillatoria | | Ulothrix sp. | | | | mus sp. | |
| | | | sp. | | Chlorella sp. | | sp. | | Ankistrodes | | | | Scenedesm | |
| | | | Green Algae | | Ankistrodes | | Green Algae | | mus sp. | | | | us sp. | |
| | | | Chiorella sp. | | mus sp | | Нубгобістуб | | Chiorella sp. | | | | | |
| | | | Pediastrum | | | | n sp. | | | | | | | |
| <u> </u> | Zooplanktons | | sp. | | | | volvox sp. | | | | | | | |
| 19.1 | Abundance (Population) | no/m ² | 225 | 75 | 180 | 20 | 225 | 25 | 180 | 20 | 300 | 33 | 210 | 50 |
| 12.1 | | 110/111 | 225 | 15 | 100 | 20 | 225 | 25 | 100 | 20 | 500 | 55 | Copenads | Gastronods |
| | | | Conenods | | | | Conenods | Polychaetes | Conenods | Polychaetes | | | Decanods | Polychaete |
| | | | Polychaete | Molluscans | Polychaete | Polychaete | Decapods | Worms | Decapods | Worms | Polychaetes | | Polychaete | worms |
| 10.0 | Name of Group Number | | worms | Nematodes | worms | worms | Mysids | Gastropods | Mysids | Gastropods | Worms | Crustaceans | worms | Molluscans |
| 19.2 | and name of group | | Krill | INIYSIOS | Decapods | | Molluscans | ' | Molluscans | ' | Nematodes | Shall | Gastropods | |
| | species of each group | | Molluscans | | Gastropods | | Echinoderm | | Echinoderm | | Copepods | | Crustaceans | |
| | | | Crustaceans | | | | S | | S | | | | Snail | |
| | | | | | | | | | | | | | Bivalves | |
| 19.3 | Total Biomass | ml/100 m ³ | 118 | 20.20 | 99.65 | 1.40 | 89.80 | 1.14 | 93.25 | 10.24 | 116 | 25 | 145 | 89.60 |
| D | Microbiological Paramete | rs | | | | | | | | | | | | |
| 20.1 | Total Bacterial Count | CFU/mI | 1880 | 1450 | 1860 | 1620 | 1580 | 1410 | 1580 | 1270 | 1580 | 1290 | 1590 | 1340 |
| 20.2 | Total Coliform | /ml | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 20.3 | E.coli | /ml | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 20.4 | Enterococcus species | /ml | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 20.5 | Salmonella species | /ml | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 20.6 | Shigella species | /ml | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| 20.7 | Vibrio species | /ml | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |

BDL* - Below Detection Limit

E. SEA SEDIMENT QUALITY MONITORING: -

| Table No.: 5.1 - Sea Sediment Qualit | y Results Of CB2 South End Towards Landside: |
|--------------------------------------|--|
|--------------------------------------|--|

| S. | DADAMETEDS | | CB2 SOUTH END TOWARDS LANDSIDE FROM SEA BASIN (N - 21° 05.163' E - 72° 37.408') | | | | | | | |
|-----|--|--------------------|--|--|--|--|--|--|--|--|
| NO. | | ONIT | Apr-16 | May-16 | Jun-16 | Jul-16 | Aug-16 | Sep-16 | | |
| 1 | Organic Matter | % | 0.642 | 0.64 | 0.648 | 0.664 | 0.688 | 0.622 | | |
| 2 | Phosphorus as P | mg/kg | 248 | 210 | 188 | 205 | 206 | 185 | | |
| 3 | Texture | | Sandy Silt | Sandy Silt | Sandy Silt | Sandy Silt | Sandy Silt | Sandy Silt | | |
| 4 | Petroleum Hydrocarbon | mg/kg | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | | |
| 5 | Heavy Metals | | | | | | | | | |
| 5.1 | Aluminum as Al | % | 5.12 | 5.56 | 5.55 | 5.57 | 5.4 | 5.59 | | |
| 5.2 | Total Chromium as Cr^{+3} | mg/kg | 116 | 108 | 107 | 110 | 131 | 102 | | |
| 5.3 | Manganese as Mn | mg/kg | 467 | 770 | 590 | 590 | 620 | 590 | | |
| 5.4 | Iron as Fe | % | 3.04 | 2.63 | 2.26 | 2.26 | 1.92 | 2.46 | | |
| 5.5 | Nickel as Ni | mg/kg | 60.35 | 72.71 | 74.6 | 74 | 60.7 | 76 | | |
| 5.6 | Copper as Cu | mg/kg | 88.33 | 47.33 | 66.36 | 59.16 | 68.54 | 66 | | |
| 5.7 | Zinc as Zn | mg/kg | 176 | 162 | 212 | 201 | 188 | 196 | | |
| 5.8 | Lead as Pb | mg/kg | 1.47 | 1.74 | 1.29 | 1.3 | 1.22 | 1.44 | | |
| 5.9 | Mercury as Hg | mg/kg | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* | | |
| 6 | Benthic Organisms | | | | | | | | | |
| 6.1 | Macrobenthos (No and name of groups present, No and name of species of each group present) | | Polychaete worms Echinoder ms Crabs | Polychaet e worms Crabs Isopods Mysids | Polychaet e worms Bivalves Mysids | Turbellaria Amphipods Mysids Corals | Decapods Mysids Isopods Echinoder ms | Polychaete worms Decapods Crabs Mysids | | |
| 6.2 | MeioBenthos (No and name of groups present, No and name of species of each group present) | | Nematode s Copepods | Ostracods Ciliates | Nematode s Ciliates | Gastrotrich es | Foraminifer ans Nematodes | Foraminife rans | | |
| 6.3 | Population | No./m ² | 357 | 440 | 337 | 461 | 337 | 329 | | |

BDL* - Below Detection Limit


Table No.: 5.2 - Sea Sediment Quality Results of MP1 West End Towards Channel of Sea Basin:

| S. | PARAMETERS | | MP1 WEST END TOWARDS CHANNEL OF SEA BASI (N - 21° 05.032' E - 72° 37.943') | | | | | IN |
|-----|--|--------------------|---|--|--|--|--|--|
| NO. | T NO MIE TENO | 0111 | Apr-16 | May-16 | Jun-16 | Jul-16 | Aug-16 | Sep-16 |
| 1 | Organic Matter | % | 0.554 | 0.75 | 0.63 | 0.7 | 0.64 | 0.64 |
| 2 | Phosphorus as P | mg/kg | 196 | 205 | 238 | 234 | 236 | 236 |
| 3 | Texture | | Sandy Silt | Sandy Silt | Sandy Silt | Sandy Silt | Sandy Silt | Sandy Silt |
| 4 | Petroleum Hydrocarbon | mg/kg | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* |
| 5 | Heavy Metals | | | | | | | |
| 5.1 | Aluminum as Al | % | 5.12 | 5.56 | 5.55 | 5.57 | 5.4 | 5.59 |
| 5.2 | Total Chromium as Cr ⁺³ | mg/kg | 116 | 108 | 107 | 110 | 131 | 102 |
| 5.3 | Manganese as Mn | mg/kg | 467 | 770 | 590 | 590 | 620 | 590 |
| 5.4 | Iron as Fe | % | 3.04 | 2.63 | 2.26 | 2.26 | 1.92 | 2.46 |
| 5.5 | Nickel as Ni | mg/kg | 60.35 | 72.71 | 74.6 | 74 | 60.7 | 76 |
| 5.6 | Copper as Cu | mg/kg | 88.33 | 47.33 | 66.36 | 59.16 | 68.54 | 66 |
| 5.7 | Zinc as Zn | mg/kg | 176 | 162 | 212 | 201 | 188 | 196 |
| 5.8 | Lead as Pb | mg/kg | 1.47 | 1.74 | 1.29 | 1.3 | 1.22 | 1.44 |
| 5.9 | Mercury as Hg | mg/kg | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* |
| 6 | | | Ber | nthic Organi | sms | | | |
| 6.1 | Macrobenthos (No and name of groups present, No and name of species of each group present) | | Polychaete worms Echinoder ms Crabs | Polychaet e worms Crabs Isopods Mysids | Polychaet e worms Bivalves Mysids | Turbellaria Amphipods Mysids Corals | Decapods Mysids Isopods Echinoder ms | Polychaete worms Decapods Crabs Mysids |
| 6.2 | MeioBenthos (No and name of groups present, No and name of species of each group present) | | Nematode s Copepods | Ostracods Ciliates | Nematode s Ciliates | Gastrotrich es | Foraminifer ans Nematodes | Foraminife rans |
| 6.3 | Population | No./m ² | 357 | 440 | 337 | 461 | 337 | 329 |

BDL* - Below Detection Limit



| Table No.: 5.3 - Sea Sediment | Quality Results of CB1 [| End Towards Channel: |
|-------------------------------|--------------------------|----------------------|
| | | |

| S. | PARAMETERS | UNIT | MP1 WEST END TOWARDS CHANNEL OF SEA BASIN (N - 21° 05.032' E - 72° 37.943') | | | | | |
|-----|--|--------------------|--|---|---|--|---|---|
| NO. | | 0111 | Apr-16 | May-16 | Jun-16 | Jul-16 | Aug-16 | Sep-16 |
| 1 | Organic Matter | % | 0.592 | 0.86 | 0.672 | 0.706 | 0.7 | 0.7 |
| 2 | Phosphorus as P | mg/kg | 206 | 223 | 230 | 194 | 212 | 212 |
| 3 | Texture | | Sandy Silt | Sandy Silt | Sandy Silt | Sandy Silt | Sandy Silt | Sandy Silt |
| 4 | Petroleum Hydrocarbon | mg/kg | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* |
| 5 | Heavy Metals | | | | | | | |
| 5.1 | Aluminum as Al | % | 5.24 | 5.83 | 5.31 | 5.45 | 5.24 | 5.24 |
| 5.2 | Total Chromium as Cr ⁺³ | mg/kg | 108 | 136 | 129 | 141 | 122 | 126 |
| 5.3 | Manganese as Mn | mg/kg | 491 | 613 | 514 | 522 | 540 | 525 |
| 5.4 | Iron as Fe | % | 2.64 | 3.4 | 4 | 3.39 | 3.88 | 3.56 |
| 5.5 | Nickel as Ni | mg/kg | 56.32 | 70 | 64.04 | 61 | 70.66 | 66 |
| 5.6 | Copper as Cu | mg/kg | 63.53 | 58 | 52.08 | 55.83 | 60.8 | 53 |
| 5.7 | Zinc as Zn | mg/kg | 191 | 167 | 190 | 180 | 200 | 176 |
| 5.8 | Lead as Pb | mg/kg | 1.79 | 1.71 | 1.38 | 1.53 | 1.64 | 1.35 |
| 5.9 | Mercury as Hg | mg/kg | BDL* | BDL* | BDL* | BDL* | BDL* | BDL* |
| 6 | Benthic Organisms | | | - | | | | |
| 6.1 | Macrobenthos (No and name of groups present, No and name of species of each group present) | | Polychaete worms Echinoder ms Mysids | Snails Crabs Decapods Copepods Mysids | Polychaete worms Bivalves Mysids | Polychaete worms Bivalves Isopods | Amphipods Decapods Echinoderms Polychaete worms | Echinoderms Amphipods Decapods Crabs |
| 6.2 | MeioBenthos (No and name of groups present, No and name of species of each group present) | | Ostracods Copepods Nematodes | Hydrozoa Ostracods | Gastrotrich es Nematodes | Ostrapodes | Hydrozoa Bryozoans Nematodes | Copepods Hydrozoa Bryozoans |
| 6.3 | Population | No./m ² | 317 | 433 | 433 | 329 | 240 | 385 |

BDL* - Below Detection Limit

F. AMBIENT NOISE LEVEL MONITORING: -

ar

90

| Table No.: 6.1 - Ambient Noise | Level Monitoring | Results During | Day Time In | Leq. dB(A): |
|--------------------------------|------------------|-----------------------|-------------|-------------|
| | | | | |

| Sampling Location | | | 1 - Near Po | rt Gate No.: 2 | 2 | | | |
|-----------------------------------|-------------|----------------------------|---------------|----------------|---------------------------|------------|--|--|
| Longitude Latitude | | N 21° 05.426′ E 72°37.739′ | | | | | | |
| Date of Monitoring | 01/04/16 | 05/05/16 | 02/06/16 | 04/07/16 | 01/08/16 | 01/09/16 | | |
| 6:00-7:00 | 62.9 | 63.0 | 61.6 | 61.7 | 60.5 | 61.5 | | |
| 7:00-8:00 | 64.5 | 68.1 | 69.2 | 68.3 | 69.8 | 68.7 | | |
| 8:00-9:00 | 68.3 | 70.5 | 70.3 | 67.9 | 66.5 | 66.9 | | |
| 9:00-10:00 | 65.3 | 67.3 | 65.2 | 66.5 | 66.4 | 68.4 | | |
| 10:00-11:00 | 68.2 | 70.8 | 67.3 | 68.6 | 70.1 | 67.4 | | |
| 11:00-12:00 | 67.2 | 67.1 | 68.2 | 68.4 | 69.6 | 66.2 | | |
| 12:00-13:00 | 69.9 | 72.8 | 70.2 | 66.3 | 64.1 | 64.7 | | |
| 13:00-14:00 | 66.5 | 63.5 | 66.2 | 67.4 | 66.9 | 67.7 | | |
| 14:00-15:00 | 68.4 | 65.6 | 62.8 | 62.0 | 62.2 | 64.8 | | |
| 15:00-16:00 | 65.5 | 64.9 | 64.2 | 63.4 | 64.5 | 62.9 | | |
| 16:00-17:00 | 66.4 | 62.5 | 59.1 | 60.2 | 59.3 | 56.1 | | |
| 17:00-18:00 | 69.2 | 66.3 | 64.7 | 66.2 | 67.5 | 69.0 | | |
| 18:00-19:00 | 67.6 | 67.9 | 65.5 | 67.7 | 68.8 | 68.6 | | |
| 19:00-20:00 | 63.5 | 65.0 | 67.9 | 66.0 | 67.7 | 66.6 | | |
| 20:00-21:00 | 62.9 | 63.0 | 61.6 | 61.7 | 60.5 | 61.5 | | |
| 21:00-22:00 | 64.5 | 68.1 | 69.2 | 68.3 | 69.8 | 68.7 | | |
| [#] dB(A) Leq. denotes t | he time wei | ghted avera | age of the le | vel of sound | in decibels | on scale A | | |
| which is relatable to h | uman heari | ng. | | | | | | |
| Day Time shall mean f | rom 6:00 a | im to 10:00 | pm and Nig | ht Time shal | l mean fr <mark>om</mark> | 10:00 pm | | |
| to 06:00 am. | | | | | | | | |

| Table No.: 6.2 | · Noise Level | Monitoring | Results During |) Night Tim | e In Leq. | dB(A): |
|----------------|---------------|------------|----------------|-------------|-----------|--------|
| | | | | | | |

| Sampling Location | | 1 - Near Port Gate No.: 2 | | | | | | |
|---|---------------------------|----------------------------|---------------------------|---------------------------|---------------------------|---------------------------|--|--|
| Longitude Latitude | | N 21° 05.426′ E 72°37.739′ | | | | | | |
| Date of Monitoring | 01/04/16 & 02/04/16 | 05/05/16 & 06/05/16 | 02/06/16 & 03/06/16 | 04/07/16 & 05/07/16 | 01/08/16 & 02/08/16 | 01/09/16 & 02/09/16 | | |
| 22:00-23:00 | 61.0 | 58.6 | 60.1 | 59.4 | 57.2 | 57.6 | | |
| 23:00-00:00 | 61.3 | 60.6 | 63.1 | 61.8 | 59.7 | 60.3 | | |
| 00:00-01:00 | 61.2 | 61.9 | 64.9 | 62.4 | 62.3 | 64.8 | | |
| 01:00-02:00 | 62.0 | 63.3 | 62.1 | 62.0 | 60.8 | 62.0 | | |
| 02:00-03:00 | 59.1 | 56.7 | 56.0 | 57.4 | 57.3 | 60.5 | | |
| 03:00-04:00 | 59.2 | 59.8 | 58.6 | 58.9 | 58.0 | 55.3 | | |
| 04:00-05:00 | 56.5 | 55.2 | 54.8 | 54.5 | 55.5 | 54.7 | | |
| 05:00-06:00 | 55.8 | 53.9 | 51.0 | 50.3 | 49.2 | 48.1 | | |
| [#] dB(A) Leq. denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing. | | | | | | | | |
| Day Time shall mean to 06:00 am. | from 6:00 a | am to 10:00 | pm and Nig | ht Time sha | ll mean fron | n 10:00 pm | | |



| Sampling Location | | | 2 - Ne | ear STP | | |
|--------------------------------------|-------------|------------|---------------|---------------|--------------|------------|
| Longitude Latitude | | 1 | N 21° 05.211 | ' E 72° 38.60 |)5' | |
| Date of Monitoring | 07/04/16 | 12/05/16 | 13/06/16 | 11/07/16 | 11/08/16 | 01/09/16 |
| 6:00-7:00 | 58.2 | 61.9 | 61.3 | 62.9 | 61.0 | 63.0 |
| 7:00-8:00 | 60.1 | 57.3 | 55.2 | 55.5 | 53.6 | 50.7 |
| 8:00-9:00 | 62.4 | 62.1 | 65.4 | 66.7 | 64.6 | 63.9 |
| 9:00-10:00 | 64.9 | 65.5 | 67.7 | 65.3 | 64.8 | 65.9 |
| 10:00-11:00 | 67.3 | 66.1 | 66.5 | 67.8 | 65.7 | 64.4 |
| 11:00-12:00 | 63.9 | 65.7 | 68.3 | 69.0 | 69.1 | 70.1 |
| 12:00-13:00 | 65.0 | 68.3 | 69.7 | 71.5 | 71.6 | 73.7 |
| 13:00-14:00 | 65.1 | 62.7 | 63.4 | 61.9 | 60.6 | 58.7 |
| 14:00-15:00 | 67.2 | 68.2 | 65.3 | 65.1 | 65.8 | 65.4 |
| 15:00-16:00 | 67.9 | 69.0 | 68.5 | 66.4 | 63.8 | 64.9 |
| 16:00-17:00 | 69.5 | 71.6 | 70.6 | 71.2 | 72.9 | 68.1 |
| 17:00-18:00 | 67.0 | 69.7 | 68.9 | 70.4 | 70.4 | 71.6 |
| 18:00-19:00 | 68.8 | 67.5 | 65.6 | 65.8 | 68.7 | 70.9 |
| 19:00-20:00 | 70.0 | 69.1 | 69.1 | 66.8 | 65.0 | 64.6 |
| 20:00-21:00 | 68.6 | 70.6 | 67.2 | 67.2 | 66.8 | 66.1 |
| 21:00-22:00 | 64.4 | 63.7 | 62.5 | 61.3 | 59.0 | 57.0 |
| [#] dB(A) Leq. denotes t | he time wei | ghted aver | age of the le | evel of sound | in decibels | on scale A |
| which is relatable to human hearing. | | | | | | |
| Day Time shall mean f | rom 6:00 a | m to 10:00 | pm and Nig | ht Time sha | ll mean from | 10:00 pm |
| to 06:00 am. | | | | | | |

Table No.: 6.3 - Ambient Noise Level Monitoring Results During Day Time In Leq. dB(A):

Table No.: 6.4 - Noise Level Monitoring Results During Night Time In Leq. dB(A):

| Sampling Location | 2 - Near STP | | | | | | |
|----------------------------------|-----------------------------|---------------|---------------|---------------|---------------|------------|--|
| Longitude Latitude | N 21° 05.211′ E 72° 38.605′ | | | | | | |
| | 07/04/16 | 12/05/16 | 13/06/16 | 11/07/16 | 11/08/16 | 05/09/16 | |
| Date of Monitoring | 08/04/16 | 5 13/05/16 | 2 14/06/16 | 2 12/07/16 | 2 12/08/16 | 06/09/16 | |
| 22:00-23:00 | 65.2 | 63.2 | 63.9 | 65.9 | 65.3 | 63.7 | |
| 23:00-00:00 | 63.5 | 66.5 | 64.5 | 62.6 | 64.6 | 67.0 | |
| 00:00-01:00 | 62.3 | 63.1 | 65.1 | 66.9 | 66.8 | 66.9 | |
| 01:00-02:00 | 63.9 | 64.0 | 61.3 | 60.2 | 59.3 | 56.6 | |
| 02:00-03:00 | 60.1 | 59.0 | 57.3 | 56.3 | 58.4 | 62.6 | |
| 03:00-04:00 | 58.3 | 57.1 | 60.0 | 58.0 | 57.8 | 60.1 | |
| 04:00-05:00 | 59.4 | 56.0 | 56.2 | 56.2 | 55.8 | 58.1 | |
| 05:00-06:00 | 56.9 | 54.6 | 53.6 | 51.5 | 49.7 | 52.7 | |
| [#] dB(A) Leq. denotes | the time we | ighted avera | age of the le | evel of sound | d in decibels | on scale A | |
| which is relatable to | human heari | ing. | | | | | |
| Day Time shall mean to 06:00 am. | from 6:00 a | am to 10:00 | pm and Nig | ht Time sha | ll mean fron | n 10:00 pm | |



| Sampling Location | | 3 - | Central Wa | ter Pump Ho | use | |
|-----------------------------------|-------------|--------------|---------------|---------------------------|--------------|------------|
| Longitude Latitude | | N | l 21º 04.697 | ' E 72 [°] 38.42 | 2 0' | |
| Date of Monitoring | 08/04/16 | 19/05/16 | 09/06/16 | 14/07/16 | 15/08/16 | 01/09/16 |
| 6:00-7:00 | 59.8 | 59.1 | 59.4 | 60.1 | 60.2 | 57.1 |
| 7:00-8:00 | 66.8 | 65.8 | 65.1 | 64.1 | 65.3 | 67.3 |
| 8:00-9:00 | 64.4 | 60.0 | 61.2 | 60.9 | 59.2 | 60.7 |
| 9:00-10:00 | 63.7 | 64.7 | 64.6 | 63.2 | 63.4 | 63.3 |
| 10:00-11:00 | 69.6 | 72.7 | 72.7 | 70.9 | 70.3 | 71.8 |
| 11:00-12:00 | 64.5 | 62.3 | 60.3 | 58.1 | 57.6 | 57.2 |
| 12:00-13:00 | 66.9 | 66.2 | 64.1 | 64.2 | 62.7 | 65.7 |
| 13:00-14:00 | 69.0 | 69.3 | 69.3 | 68.5 | 70.2 | 69.3 |
| 14:00-15:00 | 70.8 | 73.4 | 72.1 | 71.6 | 69.7 | 72.5 |
| 15:00-16:00 | 65.4 | 65.4 | 67.8 | 67.6 | 67.6 | 67.8 |
| 16:00-17:00 | 70.7 | 72.2 | 71.3 | 72.9 | 74.2 | 72.4 |
| 17:00-18:00 | 65.8 | 68.4 | 70.5 | 71.7 | 71.7 | 70.4 |
| 18:00-19:00 | 67.9 | 66.8 | 66.3 | 65.7 | 64.3 | 60.8 |
| 19:00-20:00 | 72.0 | 71.9 | 72.2 | 71.8 | 72.7 | 66.3 |
| 20:00-21:00 | 69.8 | 69.9 | 66.4 | 66.1 | 64.0 | 63.4 |
| 21:00-22:00 | 65.7 | 65.1 | 68.1 | 67.3 | 68.9 | 71.0 |
| [#] dB(A) Leq. denotes t | the time we | ighted avera | age of the le | vel of sound | in decibels | on scale A |
| which is relatable to l | numan heari | ng. | | | | |
| Day Time shall mean | from 6:00 a | m to 10:00 | pm and Nig | ht Time sha | ll mean from | 10:00 pm |
| to 06:00 am. | | | | | | |

Table No.: 6.5 - Ambient Noise Level Monitoring Results During Day Time In Leq. dB(A):

Table No.: 6.6 - Noise Level Monitoring Results During Night Time In Leq. dB(A):

| Sampling Location | | 3 - Central Water Pump House | | | | | | |
|---------------------------------|-----------------------------|------------------------------|---------------|--------------|-----------------------------|------------|--|--|
| Longitude Latitude | N 21° 04.697′ E 72° 38.420′ | | | | | | | |
| | 08/04/16 | 19/05/16 | 09/06/16 | 14/07/16 | 15/08/16 | 08/09/16 | | |
| Date of Monitoring | 8 | 8 | 8 | 8 | 8 | 8 | | |
| | 09/04/16 | 20/05/16 | 10/06/16 | 15/07/16 | 16/08/16 | 09/09/16 | | |
| 22:00-23:00 | 65.3 | 59.7 | 59.7 | 56.6 | 58.2 | 60.8 | | |
| 23:00-00:00 | 62.2 | 61.1 | 61.1 | 64.1 | 63.1 | 65.8 | | |
| 00:00-01:00 | 61.9 | 62.6 | 62.6 | 64.2 | 66.1 | 63.6 | | |
| 01:00-02:00 | 63.5 | 63.7 | 63.7 | 66.7 | 64.4 | 58.7 | | |
| 02:00-03:00 | 58.4 | 61.0 | 61.0 | 58.7 | 57.9 | 56.0 | | |
| 03:00-04:00 | 61.1 | 60.0 | 60.0 | 55.7 | 55.7 | 57.2 | | |
| 04:00-05:00 | 62.4 | 58.1 | 58.1 | 56.7 | 56.1 | 53.5 | | |
| 05:00-06:00 | 61.7 | 64.5 | 64.5 | 66.8 | 64.8 | 63.4 | | |
| [#] dB(A) Leq. denotes | the time we | ighted avera | age of the le | vel of sound | d in decibels | on scale A | | |
| which is relatable to | human hear | ing. | | | | | | |
| Day Time shall mean | from 6:00 a | am to 10:00 | pm and Nig | ht Time sha | ill mean f <mark>ron</mark> | n 10:00 pm | | |
| to 06:00 am. | | | | | | | | |



| Sampling Location | | 4 - Container Terminal | | | | | | | | |
|---|--------------------------|-----------------------------|--------------|--------------|---------------|--------------|--|--|--|--|
| Longitude Latitude | | N 21° 05.187′ E 72° 37.774′ | | | | | | | | |
| Date of Monitoring | 14/04/16 | 06/05/16 | 06/06/16 | 07/07/16 | 08/08/16 | 01/09/016 | | | | |
| 6:00-7:00 | 62.9 | 62.2 | 61.5 | 60.7 | 59.1 | 61.0 | | | | |
| 7:00-8:00 | 65.1 | 67.7 | 70.4 | 72.4 | 73.0 | 70.6 | | | | |
| 8:00-9:00 | 66.1 | 65.2 | 66.7 | 65.9 | 64.2 | 61.6 | | | | |
| 9:00-10:00 | 68.9 | 69.8 | 72.5 | 70.5 | 70.6 | 70.3 | | | | |
| 10:00-11:00 | 70.2 | 70.9 | 68.6 | 68.2 | 66.6 | 67.1 | | | | |
| 11:00-12:00 | 71.4 | 72.9 | 70.7 | 72.3 | 70.5 | 69.7 | | | | |
| 12:00-13:00 | 70.5 | 73.5 | 72.4 | 70.6 | 72.0 | 71.5 | | | | |
| 13:00-14:00 | 69.0 | 67.2 | 64.4 | 65.6 | 64.4 | 65.3 | | | | |
| 14:00-15:00 | 68.4 | 66.7 | 68.0 | 69.2 | 68.0 | 66.7 | | | | |
| 15:00-16:00 | 70.6 | 72.1 | 73.6 | 73.0 | 71.3 | 72.0 | | | | |
| 16:00-17:00 | 72.3 | 70.3 | 67.5 | 65.5 | 66.7 | 67.0 | | | | |
| 17:00-18:00 | 68.8 | 71.7 | 71.6 | 73.2 | 74.1 | 74.5 | | | | |
| 18:00-19:00 | 69.4 | 69.2 | 67.6 | 68.8 | 66.3 | 67.9 | | | | |
| 19:00-20:00 | 70.3 | 72.6 | 73.8 | 74.0 | 71.5 | 69.1 | | | | |
| 20:00-21:00 | 68.9 | 68.5 | 68.4 | 67.1 | 67.1 | 67.2 | | | | |
| 21:00-22:00 | 65.7 | 67.4 | 66.8 | 64.8 | 66.0 | 68.0 | | | | |
| [#] dB(A) Leq. denotes which is relatable to | the time w human hear | eighted aver ing. | age of the l | evel of sour | nd in decibel | s on scale A | | | | |
| Day Time shall mean 06:00 am. | from 6:00 | am to 10:00 | pm and Nigl | ht Time shal | l mean from | 10:00 pm to | | | | |

| Table No.: 6.7 - Noise Level Monitori | g Results During Day | Time In Leq. dB(A): |
|---------------------------------------|----------------------|---------------------|
|---------------------------------------|----------------------|---------------------|

| Table No.: 6.8 | - Noise Leve | Monitoring Results | During Night Ti | me In Leq. dB(A): |
|----------------|--------------|--------------------|------------------------|-------------------|
|----------------|--------------|--------------------|------------------------|-------------------|

| Sampling Location | 4 - Container Terminal | | | | | | | |
|--|--|---------------|---------------|---------------|---------------|----------------|--|--|
| Longitude Latitude | N 21° 05.187' E 72° 37.774' | | | | | | | |
| | 14/04/16 06/05/16 06/06/16 07/07/16 08/08/16 12/09 | | | | | | | |
| Date of Monitoring | 8 15/04/16 | & 07/05/16 | 8 07/06/16 | 8 08/07/16 | & 09/08/16 | 8 13/09/016 | | |
| | 13/04/10 | 0//05/10 | 07700710 | 00/07/10 | 03/00/10 | 15/05/010 | | |
| 22:00-23:00 | 62.5 | 65.1 | 67.1 | 68.5 | 67.0 | 68.5 | | |
| 23:00-00:00 | 62.8 | 63.6 | 61.8 | 59.9 | 58.3 | 58.8 | | |
| 00:00-01:00 | 59.7 | 57.7 | 60.3 | 60.4 | 58.9 | 57.8 | | |
| 01:00-02:00 | 63.4 | 66.8 | 64.4 | 62.7 | 63.0 | 65.7 | | |
| 02:00-03:00 | 59.6 | 60.1 | 59.3 | 60.6 | 61.1 | 60.0 | | |
| 03:00-04:00 | 60.2 | 62.0 | 60.5 | 58.8 | 59.4 | 56.2 | | |
| 04:00-05:00 | 58.8 | 55.3 | 53.0 | 54.3 | 53.4 | 58.3 | | |
| 05:00-06:00 | 59.5 | 56.1 | 57.8 | 56.5 | 56.8 | 59.4 | | |
| [#] dB(A) Leg. denotes the time weighted average of the level of sound in decibels on scale A | | | | | | | | |
| which is relatable to h | uman hearir | ng. | _ | | | | | |
| Day Time shall mean f | rom 6:00 a | m to 10:00 p | om and Nigh | t Time shall | mean from ' | 10:00 pm to | | |
| 06:00 am. | | | | | | | | |

| Sampling Location | 5 - Hazira Village | | | | | | | |
|---|---|-------------|------------|--------------|---------------|------------|--|--|
| Longitude Latitude | N 21° 05.44′ E 72° 38.44′ | | | | | | | |
| Date of Monitoring | 15/04/16 27/05/16 16/06/16 21/07/16 19/08/16 01/0 | | | | | | | |
| 6:00-7:00 | 61.4 | 60.9 | 60.6 | 60.3 | 60.3 | 60.0 | | |
| 7:00-8:00 | 65.7 | 64.8 | 67.1 | 67.0 | 67.3 | 67.5 | | |
| 8:00-9:00 | 65.2 | 66.9 | 63.6 | 63.6 | 65.1 | 65.0 | | |
| 9:00-10:00 | 61.8 | 62.4 | 62.7 | 62.2 | 60.9 | 59.9 | | |
| 10:00-11:00 | 69.1 | 68.9 | 70.9 | 69.4 | 70.7 | 70.8 | | |
| 11:00-12:00 | 63.8 | 66.6 | 65.9 | 67.5 | 66.1 | 67.6 | | |
| 12:00-13:00 | 66.8 | 65.9 | 63.3 | 63.7 | 64.9 | 66.8 | | |
| 13:00-14:00 | 67.3 | 70.7 | 71.5 | 69.1 | 70.8 | 72.1 | | |
| 14:00-15:00 | 69.4 | 69.4 | 69.6 | 71.1 | 69.2 | 68.8 | | |
| 15:00-16:00 | 67.3 | 65.3 | 71.4 | 70.0 | 70 | 70.7 | | |
| 16:00-17:00 | 70.1 | 72.3 | 72.9 | 72.2 | 71.8 | 68.5 | | |
| 17:00-18:00 | 65.6 | 69.5 | 70.1 | 69.7 | 71.0 | 73.1 | | |
| 18:00-19:00 | 66.3 | 63.2 | 64.0 | 62.4 | 62.9 | 64.5 | | |
| 19:00-20:00 | 68.8 | 67.0 | 67.0 | 64.9 | 63.9 | 63.1 | | |
| 20:00-21:00 | 67.5 | 66.4 | 65.0 | 62.7 | 63.7 | 65.1 | | |
| 21:00-22:00 | 64.6 | 62.9 | 63.8 | 63.0 | 61.2 | 63.2 | | |
| [#] dB(A) Leq. denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing. | | | | | | | | |
| Day Time shall mean to 06:00 am. | from 6:00 a | am to 10:00 | pm and Nig | jht Time sha | III mean fron | n 10:00 pm | | |

Table No.: 6.9 - Noise Level Monitoring Results During Day Time In Leq. dB(A):

adani

|--|

| Sampling Location | 5 - Hazira Village | | | | | | | |
|---|---|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|--|--|
| Longitude Latitude | N 21° 05.44′ E 72° 38.44′ | | | | | | | |
| Date of Monitoring | 15/04/16 & 16/04/16 | 27/05/16 & 28/05/16 | 16/06/16 & 17/06/16 | 21/07/16 & 22/07/16 | 19/08/16 ව 20/08/16 | 15/09/16 & 16/09/16 | | |
| 22:00-23:00 | 62.7 | 62.1 | 60.7 | 62.5 | 63.8 | 65.9 | | |
| 23:00-00:00 | 60.2 | 59.9 | 58.5 | 56.4 | 54.1 | 50.8 | | |
| 00:00-01:00 | 62.1 | 63.4 | 62.2 | 61.1 | 58.7 | 56.1 | | |
| 01:00-02:00 | 59.6 | 62.2 | 60.2 | 60.1 | 57.6 | 59.3 | | |
| 02:00-03:00 | 57.4 | 56.8 | 54.4 | 56.1 | 54.7 | 53.2 | | |
| 03:00-04:00 | 58.5 | 59.1 | 56.9 | 58.2 | 58.6 | 60.2 | | |
| 04:00-05:00 | 58.4 | 60.3 | 58.9 | 57.5 | 56.7 | 55.7 | | |
| 05:00-06:00 | 60.4 | 57.2 | 56.3 | 58.1 | 58.5 | 58.6 | | |
| [#] dB(A) Leq. denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing. | | | | | | | | |
| Day Time shall mean to 06:00 am. | Day Time shall mean from 6:00 am to 10:00 pm and Night Time shall mean from 10:00 pm to 06:00 am. | | | | | | | |

G. DG SETS STACK EMISSION MONITORING: -

90

an

Table No.: 7.1 - DG Set Stack Emission Monitoring Results:

| S. No. | Parameters | Unit | DG Set TOYO DENKI -1 | DG Set TOYO DENKI -2 | DG Set TOYO DENKI -3 | Limit |
|-----------|-----------------------------------|--------------------|----------------------------|----------------------------|----------------------------|------------------|
| 1 | Particulate Matter | mg/Nm ³ | 18.75 | 15.80 | 12.67 | 150 |
| 2 | Sulphur Dioxide | ppm | 6.99 | 7.29 | 4.60 | 100 |
| 3 | Oxide of Nitrogen | ppm | 31.75 | 37.08 | 33.74 | 50 |
| 4 | Carbon Monoxide (CO) | mg/m³ | 7.99 | 6.39 | 10.57 | Not Specified |
| 5 | Non Methyl Hydro Carbon (NMHC) | mg/m³ | BDL* | BDL* | BDL* | Not Specified |

H. DG SETS NOISE LEVEL MONITORING: -

Table No.: 8.1 - DG Sets Noise Level Monitoring Results:

| | Sampling Date | 18/07/2016 | | | | |
|--------|----------------------|------------------------------------|--|--|--|--|
| S. No. | | Average Noise Level In Leq. dB(A) | | | | |
| | | At 1 M Distance From The Enclosure | | | | |
| 1. | DG SET TOYO DENKI -1 | 71.2 | | | | |
| 2. | DG SET TOYO DENKI -2 | 73.4 | | | | |
| 3. | DG SET TOYO DENKI -3 | 72.3 | | | | |

I. DUMP POND DISCHARGE WATER QUALITY MONITORING: -

Table No.: 9.1 - Dump Pond Discharge Water Quality Monitoring Results:

| S. | Paramotors | Lloit | May-16 | July-16 | | |
|-----|-------------------------------------|-------|--------------|-----------|--------------|--|
| No. | Foldmeters | Onic | Petcock Yard | Coal Yard | Petcock Yard | |
| 1 | рН | | 8.41 | 8.58 | 8.04 | |
| 2 | Total Dissolved Solids | mg/l | 10483 | 6116 | 124 | |
| 3 | Total Suspended Solids | mg/l | 108 | 106 | 180 | |
| 4 | Turbidity | NTU | 12.4 | 3.9 | 15.22 | |
| 5 | BOD (3 Days @ 27 °C) | mg/l | 135 | 18 | BDL* | |
| 6 | Dissolved Oxygen | mg/l | 5.4 | 4.4 | 5 | |
| 7 | COD | mg/l | 565 | 78.7 | 10 | |
| 8 | Salinity | ppt | 8.75 | 5.54 | 0.041 | |
| 9 | Oil & Grease | mg/l | 1.02 | BDL* | BDL* | |
| 10 | Total Hardness as CaCO ₃ | mg/l | 944 | 680 | 57 | |
| 11 | Fluoride as F | mg/l | 1.14 | 0.109 | BDL* | |
| 12 | Chloride as Cl | mg/l | 4848 | 3069 | 22.99 | |
| 13 | Zinc as Zn | mg/l | 0.04 | 0.096 | 0.053 | |
| 14 | Cadmium as Cd | mg/l | BDL* | BDL* | BDL* | |
| 15 | Lead as Pb | mg/l | BDL* | 0.08 | 0.093 | |
| 16 | Mercury as Hg | mg/l | BDL* | BDL* | BDL* | |

BDL* - Below Detection Limit



J. SURFACE WATER QUALITY MONITORING: -

Table No.: 10.1 - Surface Water Quality Monitoring Results:

| S. | S. Decemeters | | At Mora Village | | | | | | | |
|-----|----------------------------|------------|-----------------|-----------|-----------|-----------|-----------|-----------|--|--|
| No. | Parameters | Unic | Apr-16 | May-16 | Jun-16 | Jul-16 | Aug-16 | Sep-16 | | |
| 1 | Odour | | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | | |
| 2 | Colour | Hazen | 2 | 2 | 3 | 3 | 4 | 3 | | |
| 3 | Taste | | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | | |
| 4 | pH Value | | 8.18 | 8.05 | 8.27 | 8.41 | 8.43 | 8.14 | | |
| 5 | Turbidity | NTU | 0.79 | 0.68 | 0.72 | 0.72 | 3.79 | 2.14 | | |
| 6 | Total Dissolved Solids | mg/l | 468 | 422 | 486 | 328 | 1270 | 1050 | | |
| 7 | Total Hardness as CaCO3 | mg/l | 158 | 134 | 198 | 196 | 272 | 224 | | |
| 8 | Chloride as Cl | mg/l | 102 | 96 | 118 | 19.99 | 251 | 315 | | |
| 9 | Fluoride as F | mg/l | 0.52 | 0.5 | 0.67 | 0.54 | 0.54 | 0.49 | | |
| 10 | Iron as Fe | mg/l | 0.43 | 0.47 | 0.28 | 0.41 | 0.37 | 0.33 | | |
| 11 | Coliform | /100 ml | Present | Present | Absent | Absent | Absent | Absent | | |
| 12 | E-Coli | /100 ml | Absent | Absent | Absent | Absent | Absent | Absent | | |



K. DRINKING WATER QUALITY MONITORING: -

| S. NO. | PARAMETERS | UNIT | May-16 | Jul-16 | Aug-16 | Sep-16 |
|-----------|--|-------|-----------|-----------|-----------|-----------|
| 1 | Colour | Hazen | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 2 | Odour | | Agreeable | Agreeable | Agreeable | Agreeable |
| 3 | Taste | | Agreeable | Agreeable | Agreeable | Agreeable |
| 4 | Turbidity | NTU | 0.44 | 0.01 | 0.58 | 0.02 |
| 5 | pH Value | | 7.09 | 7.2 | 7.09 | 7.52 |
| 6 | Total Hardness as CaCO ₃ | mg/L | 10 | 12 | 7 | 10 |
| 7 | Iron as Fe | mg/L | 0.026 | BDL* | 0.017 | 0.033 |
| 8 | Chloride as Cl | mg/L | 8.99 | 29.99 | 12.99 | 19.99 |
| 9 | Residual Free Chlorine | mg/L | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 10 | Fluoride as F | mg/L | 0.12 | 0.09 | 0.13 | 0.07 |
| 11 | Total Dissolved Solids | mg/L | 26 | 87 | 43 | 69 |
| 12 | Calcium as Ca | mg/L | 1.2 | 2 | 1.2 | 2 |
| 13 | Magnesium as Mg | mg/L | 1.68 | 1.68 | 0.96 | 1.2 |
| 14 | Copper as Cu | mg/L | 0.03 | 0.03 | 0.022 | 0.037 |
| 15 | Manganese as Mn | mg/L | BDL* | BDL* | BDL* | BDL* |
| 16 | Sulphate as SO_4 | mg/L | 1.17 | 4.54 | 3.2 | 2.78 |
| 17 | Nitrate Nitrogen as NO ₃ | mg/L | BDL* | BDL* | BDL* | BDL* |
| 18 | Phenolic compounds as C ₆ H₅OH | mg/L | BDL* | BDL* | BDL* | BDL* |
| 19 | Mercury as Hg | mg/L | BDL* | BDL* | BDL* | BDL* |
| 20 | Cadmium as Cd | mg/L | BDL* | BDL* | BDL* | BDL* |
| 21 | Selenium as Se | mg/L | BDL* | BDL* | BDL* | BDL* |
| 22 | Arsenic as As | mg/L | BDL* | BDL* | BDL* | BDL* |
| 23 | Cyanide as CN | mg/L | BDL* | BDL* | BDL* | BDL* |
| 24 | Lead as Pb | mg/L | BDL* | 0.009 | BDL* | BDL* |
| 25 | Zinc as Zn | mg/L | 0.018 | BDL* | BDL* | BDL* |
| 26 | Anionic Detergents as MBAS | mg/L | BDL* | BDL* | BDL* | BDL* |
| 27 | Chromium as Cr ⁺⁶ | mg/L | BDL* | BDL* | BDL* | BDL* |

Table No.: 11.1 - Drinking Water Quality Monitoring Results:



Adani Hazira Port Private Limited

From : Apr., 2016 To : Sept., 2016

| 28 | Mineral Oil | mg/L | BDL* | BDL* | BDL* | BDL* |
|-------|---|------|---------|---------|---------|---------|
| 29 | Alkalinity | mg/L | 11 | 20 | 10 | 16 |
| 30 | Aluminum as Al | mg/L | BDL* | BDL* | BDL* | BDL* |
| 31 | Boron as B | mg/L | BDL* | BDL* | BDL* | BDL* |
| 32 | Pesticide | • | | | | |
| 32.1 | Alachor | µg/L | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 32.2 | Atrazine | µg/L | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 32.3 | Aldrin/Dieldrine | µg/L | < 0.015 | < 0.015 | < 0.015 | < 0.015 |
| 32.4 | Alpha HCH | µg/L | < 0.005 | < 0.005 | < 0.005 | < 0.005 |
| 32.5 | Beta HCH | µg/L | < 0.02 | < 0.02 | < 0.02 | < 0.02 |
| 32.6 | Butachlor | µg/L | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 32.7 | Chlorpyriphos | µg/L | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 32.8 | Delta HCH | µg/L | < 0.02 | < 0.02 | < 0.02 | < 0.02 |
| 32.9 | 2,4-Dichlorophrnoxy acetic acid | µg/L | < 15 | < 15 | < 15 | < 15 |
| 32.10 | DDT (o,p & p,p-Isomers of DDT, DDE & DDD | µg/L | < 0.5 | < 0.5 | < 0.5 | < 0.5 |
| 32.11 | Endosulfan (alpha, beta, and sulphate) | µg/L | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 32.12 | Ethion | µg/L | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 32.13 | Gamma – HCH (Lindane) | µg/L | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 32.14 | lsoproturon | µg/L | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 32.15 | Malathion | µg/L | < 95 | < 95 | < 95 | < 95 |
| 32.16 | Methyl Parathion | µg/L | < 0.15 | < 0.15 | < 0.15 | < 0.15 |
| 32.17 | Monocrotophos | µg/L | < 0.5 | < 0.5 | < 0.5 | < 0.5 |
| 32.18 | Phorate | µg/L | < 1.0 | < 1.0 | < 1.0 | < 1.0 |

Note: BDL*: Below Detection Limit, Minimum Detection Limit, Iron as Fe:0.1 mg/L Nitrate Nitrogen as NO₃:0.15 mg/L, Phenolic compounds as C₆H₅OH: 0.001 mg/L, Mercury as Hg: 0.00025 mg/L, Selenium as Se: 0.002 mg/L, Arsenic as As: 0.00015 mg/L, Cyanide as CN: 0.0001 mg/L, Anionic Detergents as MBAS: 0.06 mg/L, Chromium as Cr⁺⁶: 0.02 mg/L, Mineral Oil: 1.0 mg/L, Aluminum as AI: 0.03 mg/L, Cadmium as Cd:0.001 mg/L.



ANNEXURE - 6:

DETAILS OF ENVIRONMENT MANAGEMENT BUDGET FOR THE FINANCIAL YEAR: 2016-17



| S. No. | Activity | Amount (INR In Lacs) |
|----------------------------|---|-------------------------|
| 1. | Manpower Cost | 49.44 |
| 2. | Environmental Study / Audit and Consultancy Services | 25.50 |
| 3. | Legal & Statutory Expenses | 8.00 |
| 4. | Environmental Monitoring Services | 18.75 |
| 5. | Mangrove Afforestation/Plantation & Bio-Shielding Pilot Project | 10.00 |
| 6. | Hazardous Waste Management & Disposal | 15.00 |
| 7. | Horticulture Development - Greenery and Plantation | 107.29 |
| 8. | O&M of Sewage Treatment and Effluent Treatment Plants | 50.96 |
| 9. | Environment Day Celebration | 2.25 |
| 10. | Treatment and Disposal of Bio-Medical Waste | 0.70 |
| Total Amount (INR In Lacs) | | 287.89 |



ANNEXURE - 7:

MEMBERSHIP CERTIFICATES OF CHWIF SITES



Annexure - 7: Membership Certificates of CHWIF Sites: -







Plot No. 9701-16 GIDC Estate, Post Box No. 82, Ankleshwar 393 002, Dist. : Bharuch (Gujarat) Phones (02646) 253135, 225228 • Fax : (02646) 222849 • E-mail : panjwania@uniphos.com