F. No. J-11011/98/2010- IA II (I)
Government of India
Ministry of Environment and Forests
(I.A. Division)

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Dated 23rd November, 2010

To,

Mr. Mark Blanche, Director – Upstream Operations
M/s Cairn Energy India Pty. Ltd.
4th Floor, Vipul Plaza Suncity,
Sector-54, Gurgaon-122002 (Haryana)

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Subject: Augmentation of Crude Oil Production & Processing Capacity (140,000 BoPD to 1,60,000 BoPD) and Associated Gas Production (20.4 MMSCFD to 32 MMSCFD) at Mangala Processing Terminal (MPT) and Well Pads within RJ-ON-90/1 Block at District Barmer, Rajasthan from by M/s Cairn Energy India Pty. Limited – Environment clearance reg.

Ref. : Your letter no. ENV/RJ-ON/EC/10-02 dated 23rd June, 2010.

Sir,

This has reference to your letter no. ENV/RJ-ON/EC/10-02 dated 23rd June, 2010 on the above mentioned subject alongwith project documents including Prefeasibility Report, Draft Terms of References, EIA/EMP report and subsequent communications vide letters dated 14th & 20th September, 2010 and 3rd November, 2010 on the above mentioned subject.

2.0 The Ministry of Environment & Forests has examined your application. It is noted that the project involves augmentation of Crude Oil Production & Processing Capacity (140,000 BoPD to 1,60,000 BoPD) and Associated Gas Production (20.4 MMSCFD to 32 MMSCFD) at Mangala Processing Terminal (MPT) and Well Pads within RJ-ON-90/1 Block at District Barmer, Rajasthan from by M/s Cairn Energy India Pty. Limited. No additional land will be required for the crude production augmentation at MPT. The RJ-ON-90/1 block spread in 3,111 Km^2 lies between $24^O59'08"$ N latitude and $71^O52'49"$ to $71^O18'09"$ E longitudes between Barmer and Jalore Districts of Rajasthan. No national parks, sanctuaries or reserve forests are located within 10 Km. No litigation/court case is pending against the project. Environmental clearance has been accorded by the Ministry vide letter no. J-11011/382/2005-IAII(I) dated 21st March, 2006 for hydrocarbon development in RJ-ON-90/1 block in Barmer, Rajasthan (Mangla, Aishwariya & Raagshwari fields). Environmental clearance has also been accorded for hydrocarbon development in Bhagyam field in March 2008. Total cost of project is Rs. 500.00 Crores for the installation of three additional well pads. Following are the major activities for which environmental clearances have been accorded till date:

S. N.	Facilities	EC granted in 2006	EC granted in 2008	Additional required	Total
MANGALA FIELD					
1	Well Pad	15	--	3	18
2	Production / Injection Wells	195 / 195	--	--	195/195
BHAGYAM FIELD					
3	Well Pad	--	15	--	15
4	Production / Injection Wells	--	51/30	--	51/30
AISWARIYA FIELD					
5	Well Pad	8	--	--	8
6	Production / Injection Wells	50/40	--	--	50/40
7	Production capacity (BOPD)	20,000	--	--	20,000
MANGALA PROCESSING TERMINAL					
8	Production capacity (Oil) (BOPD)	100,000	40,000	20,000	160,000
9	Production capacity (Gas) (MMscfd)	20	3.4	8	31.4
10	Power Generation (MW)	50	12	--	62

3.0 The processing facilities installed in MPT comprising Train-1, 2 & 3 have combined fluid handling capacity of 4,75,000 bfpd. The crude evacuation pipeline has capacity to pump 150,000 BOPD. Additional provision has been made for trucking of 40,000 BOPD crude oil. Total 195 production wells and 195 injection wells from 18 well pads (15 existing + 3 proposed) are being drilled. 3 additional well pads (15+3) are being developed within existing land already acquired. The installed process and ancillary systems to produce upto 160,000 BOPD from a combination of 3 trains are adequate and crude oil evacuation pipeline has the adequate capacity to flow upto 175,000 BOPD.

4.0 The process for crude oil production from Mangala will involve extraction of well fluids from production wells located in well pads (18 nos.), transport of well fluids to the MPT through in field pipelines, where phase separation will be carried out at the processing trains to separate crude, water and associated gas. The crude will be stored temporarily in storage tanks and evacuated mainly through an evacuation pipeline and partly through trucking to buyer facilities. The entire associated gas or natural gas from Raageshwari gas field will be used to meet the power and heating requirements. Produced water will be treated and injected into the subsurface for reservoir pressure support.

5.0 The emissions from steam boilers, diesel generators, flare system, incinerator etc. will be controlled by providing stacks of adequate height. Low NOx burner will be provided to reduce NOx emissions. Vent Gas Recovery Units (VGRU) will be provided at MPT to recover the hydrocarbon vapours from various process units/vessels/tanks and fed into fuel gas system. The flare system will be provided to safely route operational and emergency release of hydrocarbons to the Flare Knock Out (KO) drums and then to flare tips. Saline ground water requirement from Thumbli aquifer will be 32,500 m^3/day after augmentation and permission is obtained. Wastewater streams (i.e. produced water, desalination reject, CPP blow down) and minor streams will be co-mingled with the injection water and injected into the reservoir. The produced water will be treated in the produce water treatment plant to separate solids and oil traces through induced gas floatation process. No surface water discharge will be outside the MPT facilities. Existing common integrated captive landfill disposal facility including an incinerator is established within the MPT facility and will be used during augmentation. Leachate from landfill will be collected into a collection tank and evaporated in the solar evaporation tank.

Oily waste/oily sands/oil contaminated drill cutting, bottom oil sludge and resins/sludge waste will be incinerated in the incinerator. Incineration ash will be disposed off to landfill.

5.0 The proposal was considered by the Expert Appraisal Committee (Industry-2) in its 9th Meeting of the Expert Appraisal Committee (Industry) held during 18th-19th March, 2010 for prescribing 'Terms of References' for undertaking detailed EIA/EMP.

6.0 Public hearing/consultation was exempted under para 7(ii) of EIA Notification, 2006.

7.0 The Ministry of Environment and Forests hereby accords environmental clearance to the above project under the provisions of EIA Notification dated 14th September, 2006 subject to strict compliance of the following specific and general conditions:

A. SPECIFIC CONDITIONS :

i. Compliance to all the environmental conditions stipulated in the environmental clearance letter nos. J-11011/382/2005-IAII(I) dated 21st March, 2006 and J-11011/174/2007-IAII(I) dated 12th March, 2008 shall be satisfactorily implemented.

ii. Ambient air quality shall be monitored near the closest human settlements as per the National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16th November, 2009 for PM_{10}, $PM_{2.5}$, SO_2, NO_X, CO, CH_4, VOCs, HC (Non-methane) etc.

iii. Ambient air quality monitoring shall be carried out regularly and trend analysis w.r.t past monitoring results shall also be carried out. Adequate measures based on the trend analysis shall be taken to improve the ambient air quality in the project area. Mercury shall be analyzed in air, water and drill cuttings twice during drilling period.

iv. Low NOx burner shall be used in gas based power plant to reduce NOx emission into the atmosphere. On-line NOx monitoring system shall be installed. Vent Gas Recovery Units (VGRU) shall be provided to recover the hydrocarbon vapour from various process units/vessels/tanks including oil storage tanks and fed into fuel gas system.

v. As proposed, vent gas recovery units shall be placed to recover the Hydrocarbon vapour from various process units/vessels/tanks including oil storage tanks and fed into 2-stage vapour recovery unit and fuel gas system.

vi. The flare system shall be designed as per good oil field practices and Oil Industry Safety Directorate (OISD) guidelines. The stack height shall be provided as per the regulatory requirements and emissions from stacks shall meet the MOEF/CPCB guidelines.

vii. The Company shall take necessary measures to prevent fire hazards, containing oil spill and soil remediation as needed. At place of ground flaring, the overhead flaring stack with knockout drums shall be installed to minimize gaseous emissions during operation. To prevent fire and explosion at oil and gas facility, potential ignition sources shall be kept to a minimum and adequate separation distance between potential ignition sources and flammable material shall be in place.

viii. No additional quantity of gas will be flared from the additional processing of oil carried out. Efforts shall be made to reduce existing flaring. Flaring shall be measured and recorded.

ix. Regular stack monitoring of incinerator shall be carried out as per guidelines prescribed by CPCB/MoEF. Control of Dioxin & Furan shall be ensured. Efficiency of pollution control device shall also be monitored time to time and records maintained.

x. The company shall make the arrangement for control of noise from the drilling activity and DG sets. The Company shall take necessary measures to reduce noise levels such as proper casing at the drill site and meet DG set norms notified by the MoEF.

xi. Total saline ground water requirement from Thumbli aquifer after proposed augmentation shall not exceed 32,500 m^3/day. Permission for additional water requirement i.e. 7,500 m^3/day for proposed expansion shall be obtained from CGWA/SGWB. All the recommendations of the CGWA/SGWB shall be implemented. Validity of environmental clearance for the above project shall be subject to the extension of permission of CGWA for abstraction of water. A copy of the permission shall be submitted to the Ministry's Regional Office at Lucknow within 3 months of issue of environmental clearance.

xii. Treated wastewater (produced water/desalination rejects/CPP blow down/ formation water/sanitary sewage) shall comply with the standards notified under the Environment (Protection) Act, 1986. As proposed, the produced water generated shall be treated in the produce water treatment plant to separate solids and oil traces through induced gas floatation process. No water will be discharged outside the facility boundary.

xiii. Domestic wastewater shall be treated in Sewage Treatment Plant (STP) and recycle/reuse entire treated wastewater for green belt development and various activities at the site.

xiv. Adequate numbers of ground water quality monitoring stations by providing piezometers around the captive landfill site and project area shall be set up. Sampling and trend analysis monitoring must be made on monthly a basis and report submitted to Rajasthan Pollution Control Board and this Ministry.

xv. The drill cutting (DC) wash water shall be treated to conform to limits notified vide GSR.546(E) dated 30th August, 2005 under the Environment (Protection) Act, 1986 before disposal of solid waste, drill cutting and drilling fluids for onshore drilling operation. The treated effluent shall be monitored regularly.

xvi. Only water based drilling mud shall be used. Quantities of storage and chemicals and additives required for drilling mud preparation shall be below the specified threshold for specified storage permitted under the MSIHC Rules.

xvii. Non-recyclable waste generated from the MPT operation, associated well and incineration ash shall be segregated and disposed off into hazardous and non-hazardous waste section of the landfill and finally burnt in the existing incinerator. Leachate from the landfill and liquid waste from laboratory shall be collected into a collection tank and evaporated in the solar evaporation tank. Oily waste/oily sands/oil

contaminated drill cutting, bottom oil sludge and resins/sludge waste shall also be incinerated in the incinerator. Spent / waste shall be sold to authorized recyclers.

xviii. All the hazardous waste generated shall be properly treated and disposed off in accordance with the Hazardous Waste (Management, Handling and Transboundary Movement) Rules 2008. Used oil shall be sold to MoEF/CPCB authorized recyclers/reprocessors.

xix. The company shall construct the garland drain all around the drilling site to prevent runoff of any oil containing waste into the nearby water bodies. Separate drainage system shall be created for oil contaminated and non-oil contaminated. Effluent shall be properly treated and treated wastewater shall conform to CPCB standards.

xx. Oil spillage scheme shall be prepared. In case of oil spillage/contamination, action plan shall be prepared to clean the site by adopting proven technology. The recyclable waste (oily sludge) and spent oil shall be disposed off to the authorized recyclers/reprocessors.

xxi. The company shall develop a contingency plan for H_2S release including all necessary aspects from evacuation to resumption of normal operations. The workers shall be provided with personal H_2S detectors in locations of high risk of exposure along with self containing breathing apparatus.

xxii. The top soil removed shall be stacked separately for reuse during restoration process.

xxiii. Full drawings and details of Blow Out Preventor (BOP) to encounter well kick due to high formation presence, if encountered, shall be submitted to the Ministry within 3 months of the issue of environment clearance. BOP measures during drilling shall focus on maintaining well bore hydrostatic pressure by proper pre-well planning and drilling fluid logging etc.

xxiv. Emergency Response Plan shall be based on the guidelines prepared by OISD, DGMS and Govt. of India.

xxv. On completion of activities, the well shall be either plugged and suspended (if the well evaluation indicate commercial quantities of hydrocarbon) or killed and permanently abandoned with mechanical plugs and well cap. If well is suspended, it shall be filled with a brine solution containing small quantities of inhibitors to protect the well. In the event that no economic quantity of hydrocarbon is found a full abandonment plan shall be implemented for the drilling site in accordance with the applicable Indian Petroleum Regulations. In case the commercial viability of the project is established, the Company shall prepare a detailed plan for development of oil and gas fields and obtain fresh environmental clearance from the Ministry.

xxvi. Occupational health surveillance of the workers shall be carried out as per the prevailing Acts and Rules.

xxvii. The project proponent shall also comply with the environmental protection measures and safeguards recommended in the EIA / EMP / RA report.

xxviii. Recommendations mentioned in the Risk Assessment & Consequence Analysis and Disaster Management Plan shall be strictly followed.

xxix. The surface facilities shall be installed as per applicable codes and standards, international practices and applicable local regulations.

xxx. Pre-hire rig inspection, safety meetings, tool box meeting, job safety analysis and audits shall be carried out to identify hidden potential hazardous.

xxxi. The design, material of construction, assembly, inspection, testing and safety aspects of operation and maintenance of pipeline and transporting the natural gas/oil shall be governed by ASME/ANSI B 31.8/B31.4 and OISD standard 141.

xxxii. The project authorities shall install SCADA system with dedicated optical fiber based telecommunication link for safe operation of pipeline and Leak Detection System. Intelligent pigging facility shall be provided for the entire pipeline system for internal corrosion monitoring. Coating and impressed current cathodic protection system shall be provided to prevent external corrosion.

xxxiii. The company shall undertake rainwater harvesting measures to recharge the ground water. The storm water shall be passed through oil trap before discharging into rain water storage tank.

xxxiv. Adequate funds both recurring and non-recurring shall be earmarked to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government alongwith the implementation schedule for all the conditions stipulated herein. The funds so provided shall not be diverted for any other purposes.

xxxv. Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, Safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.

B. GENERAL CONDITIONS:

i. The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board (SPCB), State Government and any other statutory authority.

ii. No further expansion or modification in the project shall be carried out without prior approval of the Ministry of Environment & Forests. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.

iii. The project authorities must strictly comply with the rules and regulations under Manufacture, Storage and Import of Hazardous Chemicals Rules, 2000 as amended subsequently. Prior approvals from Chief Inspectorate of Factories, Chief Controller of Explosives, Fire Safety Inspectorate etc. must be obtained, wherever applicable.

iv. The project authorities must strictly comply with the rules and regulation with regarding to handling and disposal of Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 wherever applicable. Authorization from

the State Pollution Control Board must be obtained for collections/ treatment/storage/disposal of hazardous wastes.

v. The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (daytime) and 70 dBA (nighttime).

vi. A separate Environmental Management Cell equipped with full fledged laboratory facilities must be set up to carry out the environmental management and monitoring functions.

vii. The project authorities shall provide adequate funds both recurring and non-recurring to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government alongwith the implementation schedule for all the conditions stipulated herein. The funds so provided shall not be diverted for any other purposes.

viii. The Regional Office of this Ministry/Central Pollution Control Board/State Pollution Control Board will monitor the stipulated conditions. A six monthly compliance report and the monitored data along with statistical interpretation shall be submitted to them regularly.

ix. A copy of clearance letter shall be sent by the proponent 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 web site of the company by the proponent.

x. The project proponent shall upload the status of compliance of the stipulated environment clearance 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 the MOEF, the respective Zonal Office of CPCB and the RSPCB. The criteria pollutant levels namely; SPM, RSPM, SO_2, NOx, HC (Methane & Non-methane), VOCs (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.

xi. The project proponent shall also submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MOEF, the respective Zonal Office of CPCB and the RSPCB. The Regional Office of this Ministry / CPCB / RSPCB shall monitor the stipulated conditions.

xii. The environmental statement for each financial year ending 31st 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 alongwith the status of compliance of environmental conditions and shall also be sent to the respective Regional Offices of the MOEF by e-mail.

xiii. The Project Proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the RSPCB and may also be seen at Website of the Ministry of Environment and Forests at http:/envfor.nic.in. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the Regional office.

xiv. Project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work.

8.0 The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.

9.0 The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.

10.0 Any appeal against this environmental clearance shall lie with the National Environment Appellate Authority, if preferred within a period of 30 days as prescribed under Section 11 of the National Environment Appellate Act, 1997.

11.0 The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous Wastes (Management and Handling) Rules, 2003 and the Public (Insurance) Liability Act, 1991 along with their amendments and rules

(Dr. P. B. Rastogi)
Scientist 'F'

Copy to:

1. Secretary, Department of Environment and Forests, Government of Rajasthan, Jaipur, Rajasthan
2. Chief Conservator of Forests (Central), Ministry of Environment and Forests (Central Region), Kendriya Sadan, 5th Floor, Sector H, Aliganj, Lucknow – 226 020, U.P.
3. Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD-cum-Office Complex, East Arjun Nagar, Delhi - 110032.
4. Chairman, Rajasthan State Pollution Control Board, 4, Institutional area, Jhalana, Doongri, Jaipur, Rajasthan.
5. Joint Secretary (CCI-I), Ministry of Environment and Forests, Paryavaran Bhawan, CGO Complex, New Delhi.
6. Monitoring Cell, Ministry of Environment and Forests, Paryavaran Bhawan, CGO Complex, New Delhi.
7. Guard File.
8. Record File

23/11/10

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