

F.No. 21-67/2010-I.A.III
Government of India
Ministry of Environment & Forests
(IA.III Division)

Paryavaran Bhawan,
CGO Complex, Lodhi Road,
New Delhi-110 003.

Dated: 1st June .2011

To
Prof. M. V. N. Murthy
Member, INO PMC
M/s.The Institute of Mathematical Sciences
C. I. T. Campus, Taramani P.O.
Chennai - 600 113

Subject: Environmental Clearance for construction of India-based Neutrino Observatory (INO) project at Bodi West Hills, Pottipuram Village, Theni District, Tamil Nadu by M/s. Institute of Mathematical Sciences - Regarding.

Sir,

This has reference to letter no. SEIAA/TN/F.No.336/2010 dated 5.5.2010 and subsequent letters dated 6.7.2010, 31.12.2010 and 1.3.2011 seeking prior Environmental Clearance for the above project under the EIA Notification, 2006. The proposal has been appraised as per prescribed procedure in the lights of provisions under the EIA Notification, 2006 on the basis of the mandatory documents enclosed with the application viz., the Form-1 & 1A, Conceptual Plans and the additional clarifications furnished in response to the observations of the Expert Appraisal Committee constituted by the competent authority in its meetings held on 18-20th January, 2011 & 5-6th April, 2011 and recommended Environmental Clearance for the project.

2. It is, interalia, noted that the India-based Neutrino Observatory (INO) project is a proposal to construct an underground laboratory for experiments at the cutting edge of neutrino physics. Its immediate goal is the creation of the underground laboratory as well as building of a large magnetized iron calorimeter detector housed in it, to study naturally-produced neutrinos in the Earth's atmosphere. In the long run, the laboratory may include experiments in other fields in Physics, Biology and Geology as well. INO is listed by the Planning Commission as one of the Mega Projects in Science under the XI five year plan. The project will be jointly funded by the Department of Atomic Energy and Department of Science and Technology.

The area covered by the underground facilities (tunnels plus caverns) will be 2.05 ha whereas the over-ground construction will cover an area of about 1.07 ha. Additional temporary areas will be used for muck storage, temporary labour quarters and project buildings. The total water requirement is 340 KLD (drinking & service water - 20 KLD + cooling system-320 KLD). The power requirement is 3 MW.



The construction involves building an approximately 2000 m long horizontal tunnel to reach the underground laboratory. One large and two small laboratory caverns are to be built with an overall rock overburden of about 1000 m to house the experiments. The total cost of building the underground laboratory, installing the detector, and running expenses, together spread over two plan periods, is estimated to be approximately Rs.1,260 Crores.

Forest clearance was applied for in March of 2010 and stage I clearance was given on 27 October 2010 after due considerations. About 4.62 ha of forest land has been diverted for the purpose of setting up INO underground laboratory. This is notional as no forest land is expected to be occupied since both the tunnels and laboratories are underground.

3. The Expert Appraisal Committee, after due consideration of the relevant documents submitted by the project proponent have recommended for the grant of Environmental Clearance for the project mentioned above, Accordingly, the Ministry hereby accord necessary Environmental Clearance for the above project as per the provisions of Environmental Impact Assessment Notification – 2006 and its subsequent amendments, subject to strict compliance of the terms and conditions as follows:

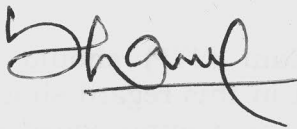
PART A – SPECIFIC CONDITIONS

I. Construction Phase

- (i) “Consent for Establishment” shall be obtained from Tamil Nadu State Pollution Control Board under Air and Water Act and a copy shall be submitted to the Ministry before start of any construction work at the site.
- (ii) 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.
- (iii) A First Aid Room shall be provided in the project both during construction and operation of the project.
- (iv) All the topsoil excavated during construction activities should be stored for use in horticulture/landscape development within the project site.
- (v) Disposal of muck during construction phase should not create any adverse effect on the neighbouring communities and be disposed taking the necessary precautions for general safety and health aspects of people, only in approved sites with the approval of competent authority.



- (vi) Soil and ground water samples shall be tested regularly to ascertain that there is no threat to ground water quality by leaching of heavy metals and other toxic contaminants.
- (vii) Construction spoils, including bituminous material and other hazardous materials, must not be allowed to contaminate watercourses and the dump sites for such material must be secured so that they should not leach into the ground water.
- (viii) Any hazardous waste generated during construction phase, shall be disposed off as per applicable rules and norms with necessary approvals of the Tamil Nadu State Pollution Control Board.
- (ix) The diesel generator sets to be used during construction phase shall be low sulphur diesel type and should conform to Environment (Protection) Rules prescribed for air and noise emission standards.
- (x) The diesel required for operating DG sets shall be stored in underground tanks and if required, clearance from Chief Controller of Explosives shall be taken.
- (xi) Vehicles hired for bringing construction material to the site shall be in good condition and should have a pollution check certificate and should conform to applicable air and noise emission standards and should be operated only during non-peak hours.
- (xii) Ambient noise levels shall conform to residential standards both during day and night. Incremental pollution loads on the ambient air and noise quality should be closely monitored during construction phase. Adequate measures should be made to reduce ambient air and noise level during construction phase, so as to conform to the stipulated standards by CPCB/ TNPCB.
- (xiii) Fly ash shall be used as building material in the construction as per the provisions of Fly Ash Notification of September, 1999 and amended as on 27th August, 2003. (The above condition is applicable only if the project site is located within the 100 km of Thermal Power Plant).
- (xiv) Ready mixed concrete shall be used in the construction activities.
- (xv) Storm water control and its re-use as per CGWB and BIS standards for various applications.
- (xvi) Water demand during construction should be reduced by use of pre-mixed concrete, curing agents and other best practices referred.
- (xvii) Permission to draw ground water shall be obtained from the competent Authority prior to construction/operation of the project.



- (xviii) Separation of grey and black water should be done by the use of dual plumbing line for separation of grey and black water.
- (xix) Fixtures for showers, toilet flushing and drinking should be of low flow either by use of aerators or pressure reducing devices or sensor based control.
- (xx) Use of glass may be reduced by up-to 40% to reduce the electricity consumption and load on air-conditioning. If necessary, use high quality double glass with special reflective coating in windows.
- (xxi) Roof should meet prescriptive requirement as per Energy Conservation Building Code by using appropriate thermal insulation material to fulfill requirement.
- (xxii) Opaque wall should meet prescriptive requirement as per Energy Conservation Building Code which is proposed to be mandatory for all air-conditioned spaces while it is aspirational for non-airconditioned spaces by use of appropriate thermal insulation material to fulfill requirement.
- (xxiii) The approval of the competent authority shall be obtained for structural safety of the buildings due to earthquake, adequacy of fire fighting equipments, etc. as per National Building Code including protection measures from lightening etc.
- (xxiv) Regular supervision of the above and other measures for monitoring should be in place all through the construction phase, so as to avoid disturbance to the surroundings.
- (xxv) Under the provisions of Environment (Protection) Act, 1986, legal action shall be initiated against the project proponent if it was found that construction of the project has been started without obtaining environmental clearance.
- (xxvi) The project shall be executed in close coordination with district forest officials and necessary precautions shall be taken during the construction phase.
- (xxvii) About 2.3 lakh m³ of debris will be generated due to excavation of the tunnel and caverns for the INO project. Out of this 10% shall be utilized for the laying of roads and construction of the buildings. The balance shall be disposed off in consultation with the Forest Department.

II. Operation Phase

- i) The installation of the Sewage Treatment Plant (STP) should be certified by an independent expert and a report in this regard should be submitted to the Ministry before the project is commissioned for operation. Treated affluent emanating from STP shall be recycled/



reused to the maximum extent possible. Treatment of 100% grey water by decentralized treatment should be done. Discharge of unused treated affluent shall conform to the norms and standards of the Tamil Nadu State Pollution Control Board. Necessary measures should be made to mitigate the odour problem from STP.

- ii) The baffle reactor, root-zone treatment and other appropriate methods for collection and disposal of sewage shall be adopted. This shall be done in consultation with Tamil Nadu Pollution Control Board.
- iii) The solid waste generated should be properly collected and segregated. Wet garbage should be composted and dry / inert solid waste should be disposed off to the approved sites for land filling after recovering recyclable material.
- iv) Diesel power generating sets proposed as source of back-up power for elevators and common area illumination during operation phase should be of enclosed type and conform to rules made under the Environment (Protection) Act, 1986. The height of stack of DG sets should be equal to the height needed for the combined capacity of all proposed DG sets. Use low sulphur diesel. The location of the DG sets may be decided with in consultation with Tamil Nadu Pollution Control Board.
- v) Noise should be controlled to ensure that it does not exceed the prescribed standards. During night time the noise levels measured at the boundary of the building shall be restricted to the permissible levels to comply with the prevalent regulations.
- vi) The green belt of the adequate width and density preferably with local species along the periphery of the plot shall be raised so as to provide protection against particulates and noise.
- vii) Weep holes in the compound walls shall be provided to ensure natural drainage of rain water in the catchment area during the monsoon period.
- viii) Rain water harvesting for roof run- off and surface run- off, as plan submitted should be implemented. Before recharging the surface run off, pre-treatment must be done to remove suspended matter, oil and grease. The borewell for rainwater recharging should be kept at least 5 mts. above the highest ground water table.
- ix) The ground water level and its quality should be monitored regularly in consultation with Central Ground Water Authority.
- x) Traffic congestion near the entry and exit points from the roads adjoining the proposed project site must be avoided. Parking should be fully internalized and no public space should be utilized.



- xi) A Report on the energy conservation measures confirming to energy conservation norms finalise by Bureau of Energy Efficiency should be prepared incorporating details about building materials & technology, R & U Factors etc and submit to the Ministry in three months time.
- xii) Energy conservation measures like installation of CFLs/TFLs for the lighting the areas outside the building should be integral part of the project design and should be in place before project commissioning. Use CFLs and TFLs should be properly collected and disposed off/sent for recycling as per the prevailing guidelines/ rules of the regulatory authority to avoid mercury contamination. Use of solar panels may be done to the extent possible.
- xiii) Adequate measures should be taken to prevent odour problem from solid waste processing plant and STP.
- xiv) The building should have adequate distance between them to allow movement of fresh air and passage of natural light, air and ventilation.
- xv) Necessary precautions shall be taken to minimize impacts on the flora and fauna of the area.

PART – B. GENERAL CONDITIONS

- i) The project proponent shall also submit six monthly reports on the status of compliance of the stipulated EC conditions including results of monitored data (both in hard copies as well as by e-mail) to the respective Regional Office of MoEF, the respective Zonal Office of CPCB and the TNPCB.
4. Officials from the Regional Office of MOEF, Bangalore who would be monitoring the implementation of environmental safeguards should be given full cooperation, facilities and documents/data by the project proponents during their inspection. A complete set of all the documents submitted to MoEF should be forwarded to the CCF, Regional office of MOEF, Bangalore.
 5. In the case of any change(s) in the scope of the project, the project would require a fresh appraisal by this Ministry.
 6. The Ministry reserves the right to add additional safeguard measures subsequently, if found necessary, and to take action including revoking of the environment clearance under the provisions of the Environmental (Protection) Act, 1986, to ensure effective implementation of the suggested safeguard measures in a time bound and satisfactory manner.
 7. All other statutory clearances such as the approvals for storage of diesel from Chief Controller of Explosives, Fire Department, Civil Aviation Department, Forest Conservation Act, 1980 and Wildlife (Protection) Act, 1972



etc. shall be obtained, as applicable by project proponents from the respective competent authorities.

8. These stipulations would be enforced among others under the provisions of Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and control of Pollution) act 1981, the Environment (Protection) Act, 1986, the Public Liability (Insurance) Act, 1991 and EIA Notification, 2006.

9. The project proponent should 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 Environmental Clearance and copies of clearance letters are available with the Kerala Pollution Control Board and may also be seen on the website of the Ministry of Environment and Forests at <http://www.envfor.nic.in>. The advertisement should be made within 10 days from the date of receipt of the Clearance letter and a copy of the same should be forwarded to the Regional office of this Ministry at Bangalore.

10. Environmental clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation v/s. Union of India in Writ Petition (Civil) No.460 of 2004 as may be applicable to this project.

11. A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zilla Parisad/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.

12. 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 criteria pollutant levels namely; SPM, RSPM, SO₂, NO_x (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the project shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.

13. 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 along with the status of compliance of EC conditions and shall also be sent to the respective Regional Offices of MoEF by e-mail.

Yours faithfully,



(Bharat Bhushan)
Director (IA)

Copy to:

- (1) The Secretary, Environment & Forests (FR.10) Department, Government of Tamil Nadu, Secretariat, Chennai – 600 008.
- (2) The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-cum-Office Complex, East Arjun Nagar, Delhi – 110 032.
- (3) The Member Secretary, Tamil Nadu State Pollution Control Board, 76-Mount Salai, Guindy, Chennai – 600 032
- (4) The CCF, Regional Office, Ministry of Environment & Forests(SZ), Kendriya Sadan, IVth floor, E&F wings, 17th Main Road, Koramangala II Block, Bangalore – 560 034.
- (5) IA - Division, Monitoring Cell, MOEF, New Delhi - 110003.
- (6) Guard file.

(Bharat Bhushan)
Director (IA)