EXECUTIVE SUMMARY

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INTRODUCTION

1. This chapter constitutes the summary of EIA report. It will provide for overall justification for implementation of the project and explains how the adverse effects of the proposed project are mitigated.

PROJECT BRIEF

2. The proposed project is IAF Airport at Bihta Airport is spread over an area of 108.4075 Acres. The proposed project falls in Category A of project activity 7(a) of the Schedule vide EIA notification 2006 amended to date involving preparation of Environment Impact Assessment study and Environment Management Plan. The development of Civil Enclave at IAF base, Bihta has been planned in view of near saturation of the existing airport in Patna where due to land / other constraints, there is no scope of further expansion of Terminal Building/air side capacity/extension of runway length.

3. The Bihta airport site is located 35 km from Patna near NH-922. The site is located in Bihta block, in Patna district, in the state of Bihar. The proposed site for the airport is located at latitude 25°35'59.45" N and longitude of 84°53'24.26" E.

4. AAI proposed to develop airport at Bihta, Patna district. In the A new terminal building for handling annual capacity of 2.5 MPPA in Phase-I and 5 MPPA ultimate capacities will be developed. The peak hour capacity will be 2000 PHP

DESCRIPTION OF ENVIRONMENT

5. The baseline data for the project was collected during the October to December, 2019. covering an area of 10 km radius from the project site. There are no National Parks, Wildlife Sanctuaries or Biosphere Reserves within the study area.

6. Geographical Setting: The project site lies in Seismic Zone IV which is a moderate damage risk zone. The existing land is a non-agricultural Government land on river bed. The elevation of the site is 52.403 mRL to 53.925 mRL.

7. **Soil Quality:** Soil samples were collected from 5 locations and analysis of the samples indicated that soil of the study area is of low fertility with low Phosphorus and Potassium content, and agricultural activity, if any, would be highly dependent on the addition of external fertilizers.

8. **Traffic Volume Count:** Traffic volume count done in 3 locations indicated that the level of service of all the roads was under Category B & C indicating free flow of traffic.

9. **Air Environment:** Air monitoring was done in 9 locations and the samples were analysed for particulate matter (PM_{10} & $PM_{2.5}$), free silica and gaseous pollutants (SO_2, NO_2 and CO).

10. The 98 percentile concentration of PM_{10} and $PM_{2.5}$ varies from 60.6 µg/m^3 (AAQ8) to 86.2 µg/m3 (AAQ4) and 25.0µg/m^3 (AAQ6) to 46.3µg/m^3 (AAQ4) respectively. The results of the monitored data indicate that concentration of Particulate Matter (PM_{10}) is well within prescribed limit of 100 µg/m3. The PM2.5 values are also well within the prescribed limit of 60 µg/m^3. The maximum and minimum SO2 concentrations were recorded as 19.5µg/m^3 at AAQ4 and 12.1 µg/m^3 at AAQ6. Whereas, the minimum concentration of 18.0µg/m^3 for NO_2 was recorded at AAQ6 and maximum concentration of 27.9 µg/m^3 was observed at AAQ4. The concentration of SO_2 and NO_2 was found well within prescribed NAAQ standards. The lowest level of CO was observed at AAQ9 (0.48 mg/m^3) while the highest value (0.79 mg/m^3) was observed at AAQ7. These levels are found to be well within the NAAQ standard of 2.0 mg/m^3 for residential and industrial areas. These levels are found to be well within the NAAQ standard of 2.0 mg/m^3 for residential and industrial areas.

11. **Noise Level Assessment:** Noise level was monitored in 11 locations and it was observed that the present noise level is not exceeding the standard level of CPCB norms. The Leq was recorded in the range of 50.1 to 62.9 dB(A) during daytime and 40.9 to 46.1 dB(A) during night time.

12. Drainage Patten: In the 10km study area of the project site. The district falls in the Ganga Basin and is drained by the mighty Ganga in the North, by the Sone in the West, and by the Punpun and their tributaries in the central part of the terrain.

13. **Water Quality:** To assess the water quality, surface water samples were collected from 4 locations and ground water samples were collected from 5 locations.

14. The guidelines by CPCB are set using few parameters in such a way that the best use of that particular quality of water for human utilization can be known. Analysing these parameters for the four locations, it was found that the overall class of water for individual samples comes as "C" which signifies that water of Son River can be used as a drinking water source after conventional treatment and disinfection.

15. Analysis of the ground water samples indicated that the ground water quality does not indicate any industrial contamination and meets the standards of IS 10050:2012 and therefore can be used for drinking purposes.

16. **Ecology:** Common Few trees are present which are going to be retained by AAI. Since there is no organised forest in the entire study area, trees are only found in patches. Mango (Mangifera indica), Imli (Tamarindus indica), Gulmohar (Delonix regia), Peepal (Ficus religiosa), Jamun (Syzygium cumini), Guava (Psidium guajava) etc. are commonly found in the study area. Due to presence of two major rivers-Son and Ganga, the area act as habitat for variety of avifauna. The Danapur Cantonment area, which is around 15 km from the site, witnesses activities of birds, especially migratory birds like Asian Open Bill Storks and Siberian Cranes. As the place is restricted for outsiders, these birds find a safe haven and this flock the place each year. Apart from birds, no unique faunal community could be observed within the buffer zone of the project area, except common species like lizard, squirrel, monkeys, mongoose and domestic animals.

17. **Socio-economy:** There are 188 villages in the study area having a total population of 695995 out of which 366815 are males and 329180 are females as per Census of India 2011. The gender ratio of the project site has same 870 to 897 from 2001 to 2011. 6.9 % of the population in the study area is in SC category while 0.090 % is in ST category as per the 2011 Census. The female literacy rate was found to have increased from 32.51% in 2001 to 45.77% in 2011 in the study area. The percentage of non-workers is high (> 50%) in the study area as compared to the total workers. As far as educational facilities are concerned, the number of primary schools, numbers of middle school and secondary school has increased from 2001 to 2011. The number of senior secondary schools, however, has decreased. The medical facilities present in the study area do not seem to be appropriate to cater the population.

THE ANTICIPATED IMPACTS AND MITIGATION MEASURES

Sl. No.	Aspects	Construction Phase		Operation Phase	
		Impact	Mitigation Measures	Impact	Mitigation Measures
1	**Land-use:** • The 108.4075 acres/ 43.84 ha of land is identified by the District Administrative for the development of the proposed project. The western part of the project side is sloping towards North and North-East. Contour Map and Slope Map are attached as Figure 4.1 and Figure4.2.	• The site within the airport boundary, where the activities are going to take place has no plantations or settlements. Also no rehabilitation is involved but change in land use pattern due to construction has been envisaged	• Land acquisition shall be done as per proper rules. • Construction debris and waste generated during construction activities will be collected and disposed in environmentally sound manner as per applicable rules depending upon type of wastes. • Compulsory plantation in landside area shall be carried out.	-	-
2	**Solid waste:** • It is estimated that approximately 4.03 tonnes of Municipal solid waste and 330 kg/day deplane waste will be generated in the proposed	• There is possibility of muck generation during land leveling, spills of oils during loading, unloading, storing and handling. Waste oil shall be generated	Compaction and stabilization will be ensured during filling to make sure that no loose soil is washed away with run-off during rains. • Dust bins will be placed at	• During the operational phase, three types of waste would be generated namely the solid, e-waste and the hazardous waste. Municipal Solid waste	• Infrastructure like spillage collection chamber, concrete floor shall be provided at places of fuel storage and other chemical handling areas to ensure minimum spillage of oil or

Sl. No.	Aspects	Construction Phase		Operation Phase	
		Impact	Mitigation Measures	Impact	Mitigation Measures
	project. 10.32 MT construction waste will be generated. • Approximately 204217.95 m^3 of soil will be excavated from excavation for Main building and utility building.	as and when lubricating oil will be changed from engi nes of DG sets and construction machineries.	requisite locations at construction site and there will be segregation of wastes before disposal. • Used oil from maintenance of DG sets engines and construction equipment will be collected separately in drums and will be handed over to the authorized oil recyclers. • The excavated soil will be used for levelling and landscaping purpose.	(MSW) would be generated from the garbage/food waste from the restaurants and airport operations and paper and packaging waste generated in cargo section, while the hazardous waste that would be generated include sludge generated from STP, separated oil from oily wastewater treatment units and any waste generated due to spill containment in any untoward event.	chemicals thereby reducing contamination of soil. • Biodegradable portion of MSW will be treated at site by Organic Waste Converters and manure generated will be used for plantation. Recyclable waste will be disposed off by selling. Inert waste will be sent to MSW Disposal sites for land fill. • Hazardous waste shall be treated in accordance with Hazardous and Other Wastes (Management and Trans-boundary Movement) Rules, 2016 • Spent oil from DG sets shall be stored and mounted in concrete floors. • The e-wastes and used oil will be stored properly and handed over to

Sl. No.	Aspects	Construction Phase		Operation Phase	
		Impact	Mitigation Measures	Impact	Mitigation Measures
					authorized recyclers.
3	**Water Quality & Drainage:** There are no streams passing through the project site. • The source of water for the proposed project will be Ground water. • Surface water was monitored in 4 locations. The overall class of water for individual samples comes as "C" as per Designated Best Use of water as per CPCB which signifies the water of Son River can be used as a drinking water source after conventional treatment and disinfectant. • Ground water was monitored in 5 locations. The samples indicated that	• The waste generation from the labour camps may find its way into natural water bodies thereby polluting them. • The wastewater generation during site development and construction mainly includes the water run-off from the construction areas, stockpiles of construction materials and wastes, etc. mainly containing high suspended solids. • The repair and maintenance of construction	• Wastewater generated from the domestic activities will be treated in septic tank followed by soak pit. • A sediment trap will be provided to prevent the discharge of excessive suspended solids. • To prevent contamination from spillage of oil, storage areas will be made by cemented floor, bunded and will be cleaned at regular intervals. • Suitable drainage network would be made to ensure proper draining of wastewater from the construction sites. • Used oil will be	• As airport has a fuel storage area in 8000 m^2, fuel leakage and spillage from refuelling may take place. These can either leach into ground water or can contaminate storm water run-off which can pollute nearby water sources. • The total wastewater estimated to be generated in operation phase will be 665 KLD	• Proper oil & grease interceptors will be installed at outlet point of storm water drainage • Based on waste water calculation, an STP of 700 KLD capacity shall be installed at the site. The capacity of the STP is far more than the estimated wastewater generation. • The entire treated waste water shall be reused for various activities within the site.

Sl. No.	Aspects	Construction Phase		Operation Phase	
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	the ground water meets the standard of IS 10050:2012.	equipment / transport vehicles and washing of vehicles on-site may also generate wastewater containing oil and grease (though only in minimal quantities as normally these activities are not undertaken on-site).	given to authorized used oil recyclers. • The drain is disposing into circular culvert on East side through boundary wall which is further disposing into drain through village pedestrian path at East side.		
4	**Air Quality** Air quality was monitored in 11 locations and all the parameters were found to be within the stipulated limits of CPCB. Concentration of gaseous pollutants (SO_2, NO_2, & CO) are also within prescribed limits.	• The main source of dust pollution during the construction phase will be from the movement of Heavy Earth Moving Machineries (HEMMs) and other vehicles in the site, excavation for foundations and land grading, and storage of construction materials.	• Diesel powered vehicles will be properly maintained to minimize the exhaust emission as well as noise generation. Only "PUC" certified vehicles of contractor shall be deployed at site. • Water sprinkling shall be done	▪ From the modelling outputs, it could be observed that after the airport starts full-fledged operation,C O will be the highest contributor among other pollutants. The resultant GLC of CO is more than 300 µg/m^3 at the airstrip area in the boundary of	▪ Proper traffic management within the project premises to avoid congestion at any particular place.. ▪ Extensive greenbelt development along the periphery as well as in the open spaces shall work as a barrier to air pollution. ▪ Air Quality result is attached as Appendix 4.1

Sl. No.	Aspects	Construction Phase		Operation Phase	
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		Fugitive dust is the major pollutant in this stage of the project. • Fugitive dust due to specific settling velocity of dust particle will get settled within the site premises.	to minimize the dust emission from the excavation, leveling, transportation and stockpiling activities. • Minimizing dust emissions by wheel washing, damping down and employing the use of covered vehicles for transportation of construction and waste materials shall be done. • Green belt development will be undertaken along the boundaries, away from the landing funnel, which will help in arresting the dust particles to fly away from the construction areas by	project site. Beyond the project boundary, the GLC of NO_2 in inhabited areas will be more than 80 $\mu g/m^3$. As regards the GLC of SO_2, it is more than 30 $\mu g/m^3$, which will also be at the air strip area in the boundary of project site and the GLC of SO_2 in inhabited area will be less than 30 $\mu g/m^3$. ▪	

Sl. No.	Aspects	Construction Phase		Operation Phase	
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			creating a physical barrier.		
5	**Sound Pressure Level** • Leq during day time varies from 50.1 dB(A) to 62.9 dB(A) at the monitoring stations while Leq during night time varies from 40.9 dB(A) to 46.1 dB(A). • Leq is higher in few locations due to their proximity to major roads where vehicles keep plying continuously.	• The main source of noise pollution would be construction equipment, transportation activities. Noise from earthmoving equipment has the potential to cause nuisance, especially if large numbers of machinery used are in poor condition. • During construction phase noise will also be generated from vibrating machinery, movement of trucks, operation of frontend loaders and vehicle reversing alarms. • Other	• The highest noise level emitted from construction equipments merges with the highest standard noise level (55 dB during day time) at around 100 m from the source and the sound level keeps on decreasing with increasing distances. • The heavy construction and transport activities shall be restricted to daytime operations. • All around the construction activity area on the site periphery, about 2.5 meter high barrier GI Sheet shall restrict the noise impact by about 10dB(A). • Proper operation and maintenance of heavy	• The main sources of noise from the project operation are running of D.G. Sets and vehicular traffic.	▪ The sources are intermittent and shall generate sound for short duration. ▪ The vehicles playing within the site will be mainly of the residents and are hence not expected to cause unnecessary noise. ▪ The DG set shall be provided with proper exhaust muffler with insertion loss of minimum 25 dB(A). ▪ Adequate personnel protective equipment (PPE) will be provided to the personnel engaged in D.G. Set Room ▪ Proposed rows of plantation will further restrict the noise on other side of the plantation i.e. outside the boundary. ▪ Noise modeling and its result is

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		sources include generation of noise during the operation of DG Sets during concreting, hammering etc. and from mechanical operations like drilling, fitting etc.	equipment as well as transport vehicles shall also ensure lower noise emissions. • Ear plugs, ear muffs etc. will be provided to workers handling high noise level equipment or stone cutting operations. • Warning signs should be set up in active work areas, prohibiting entry to persons without ear protection.		attached as Appendix 4.3
6	**Traffic:** The baseline traffic survey was carried out in 8 locations. The surveyed roads were found to have LOS of B & C .	• There will be insignificant increase in traffic in the existing roads during the construction phase. • The vehicles carrying raw materials to the site will only operate for a specified period.	• The vehicles will be instructed to take the less busy route so that the existing traffic is not disturbed.	• It has been found that after expansion, the surveyed roads shall have LOS of C where the level of convenience shall significantly reduce. • Hence it is anticipated that the roads shall require	▪ Adequate funds will be allocated towards implementation of traffic management measures inside the airport. ▪ All vehicles inside the airport will be parked in designated parking area only. ▪ Road crossings to be used will be well marked and

Sl. No.	Aspects	Construction Phase		Operation Phase	
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				augmentation.	signalled. ▪ Personnel will be deployed to guide the vehicles and stop vehicles to avoid traffic jam. ▪ Traffic density is attached as Appendix 4.2 and traffic study is attached as Annexure 4.4.
7	**Ecology** • There are no notified forests within 10 km of the study area. • Also no Schedule I species of fauna have been reported from the study area as well.	▪ There are 126 trees found in the project site. ▪ Likely settling of dust to be generated by movement of vehicles for construction activities on leaves may results in to stunted growth of vegetation and may also affect the of production capacity. ▪ Dumping of huge quantity of excavated earth material may lead to loss of flora in the project area	▪ Trees will be relocated. Total proposed area for trees replantation is 5880 m^2. All the trees replanted on the Boundary wall of the Airport. Master plan of relocation of trees is attached as Annexure 4.3 which shows trees in the project site and proposed area for tree plantation. ▪ Plantation and landscaping from construction phase to strengthenin	▪ There may be chances of bird strike in the operational airport endangering aircraft safety. ▪ Artificial lighting and glare can affect bird's orientation if the birds rely on lighting, or absence of lighting for navigation. Light attracts insect prey which, in turn, attracts bats and birds and their predators. This can affect migration patterns.	▪ Proper landscaping, waste management measures, use of noise and flare guns may help to keep bird population at bay. ▪ Plantation will be done wherever possible. ▪ Plants for greenbelt development have been selected from CPCB's guidelines and the list is attached as Annex 4.1.

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		Impact	Mitigation Measures	Impact	Mitigation Measures
			g flora in the area. ▪ Air and noise emission during construction phase will be temporary and localised and restricted during day time. ▪ All the vehicles delivering materials to the site shall be covered to avoid spillage of material. ▪ All earth work shall be protected to minimize dust generation. ▪ All crusher used in construction shall confirm to relative dust emission devises.		
8	**Socio-economy** • There are 188 villages in the study area having a total population of 6,95,995 out of which 3,66,815 are	• The construction phases of the proposed airport will have beneficial impacts on	• It will be ensured that the work force is locally employed in order to avoid immigration of people leading to	• There will be increase in employment opportunities with impetus for skilled jobs both from the project along with	• Adequate provision of safety and security shall be made for the working staff. • The proponent will spend an estimated

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	males and 329180 are females as per Census of India 2011. • As far as educational facilities are concerned, the numbers of schools have increased over a span of 10 years, however, there are no facilities for higher education in the villages.	social environment as private land acquisition is not involved. Further, significant increase in income of local people is expected as local unskilled, semi-skilled and skilled persons will gain direct or indirect employment during construction phase.	social unrest.	secondary and tertiary sector services/ businesses. • Aggregative there shall be positive impact on socio-economic environment due to development of infrastructure in the area, growth of secondary and tertiary sector businesses and subsequent enhancement in the standards of living of the local populace.	amount of INR 950.76 lakhs on CER.

ENVIRONMENT MONITORING PLAN

18. The Environment Monitoring Programme is required to ensure sustainable development in the region adjoining the project, hence it needs to be an all-encompassing plan for which the AAI, government, regulating agencies like State Pollution Control Board, MoEF&CC, etc. working in the region and more importantly the affected population of the study area need to extend their co-operation and contribution.

19. The monitoring team will be responsible for planning, execution and monitoring of all aspects of the environment based on the procedures laid out the guidelines of CPCB through various notifications, starting from start to closure of mines.

20. The Environment Monitoring Cost has been estimated to be INR 46,35,000 per year.

ADDITIONAL STUDIES

21. As per the conditions prescribed in the TOR and Para 7 & Appendix-IV of the EIA Notification 2006, public consultation shall be conducted by Regional Office of MPPCB based on Draft EIA report submitted to the State Pollution Control Board along with other relevant documents and additional studies.

22. The Based on the TOR specified by the Ministry of Environment, Forest and Climate Change (MoEF&CC) issued vide letter no. 10-45/2019-IA,III dated 05.12.2019 for preparation of EIA/EMP Report for proposed project, several studies were conducted to provide a clear picture of the project area. The studies and activities suggested in EIA Notification also includes:

- Public Hearing and Consultation
- Risk Assessment Study and Disaster Management Plan

PROJECT BENEFITS

23. The proposed Airport development will enhance the safety, security and environmental standards and passenger comfort at Airport and also will help in catering to forecast future air traffic and passenger growth and national civil aviation vision.

24. Also, after proposed expansion of Terminal Building the aviation linked commercial development will evolve around airport including Basic Amenities, shopping plaza and office parks, hospitality industry, promotional activities of tourism, logistic park and housing.

25. There will be increased connectivity to the surrounding areas and will aid the economic development of the region. This will also increase various economical activities including the local industries and businesses, and would provide significant employment opportunities to the surrounding areas. Social and community infrastructure and services will be provided in response to the need of the local communities. The propose project will enhance the quality of life, equity, and social wellbeing through community support and awareness.

26. During the construction phase, employment opportunity to skilled, semi-skilled and unskilled persons will be provided. The construction contractors are likely to use unskilled labour drawn from local communities. It is anticipated that the construction labour inputs for the construction of the project will be mostly hired from the surrounding areas per day directly. Even during operation phase, significant numbers of persons will get direct and indirect employment opportunities.

ENVIRONMENT MANAGEMENT PLAN

27. The Environmental Management Plan (EMP) contains a description of proposed remedial measures and monitoring plan for the construction and operational period of the project. The EMP often covers construction / management guidelines that specifically address how the contractors are to incorporate environmental considerations into their work. EMP considers compensatory measures if mitigative measures are not feasible or cost-effective.

28. Waste management is an important facet of environment management. Thus, solid waste management is important from both aesthetics & environmental viewpoints.
29. The EMP cost has been calculated to be Rs. 9.60 Lakhs as capital cost and Rs. 2.94 lakhs as annual recurring cost in the construction phase and Rs. 68.75 Lakhs as capital cost and Rs. 12.20 lakhs as annual recurring cost in the operation phase.

30. The CER cost is estimated to be INR 950.76 lakhs.