

Sr. No.	Clause No	Page No	Reference Clause	Query	IWAI Response
1.	Para 6, IFB	4	For submission of the bid, the bidder is required to have Digital Signature Certificate (DSC) from one of the Certifying Authorities authorized by Government of India for issuing DSC. Aspiring bidders who have not obtained the user ID and password for participating in e-procurement in this Project, may obtain the same from the website: https://eprocure.gov.in/cppp/download/disp , a non-refundable fee of Rs 6,000/- (inclusive of tax) is required to be paid. The mode of payment shall be in the form of DD drawn in favour of IWAI Fund Jal Marg Vikas, payable at Noida , from any Scheduled/ Nationalized Bank. Payment documents are to be submitted along with other documents listed in paragraph 9 below before the bid submission deadline.	The published tender document mentions "IWAI Fund Jal Marg Vikas", whereas the tender listing on eProcure.gov.in website mentioned "JMVP Fund" as the Beneficiary when getting the DD drawn. Please reconfirm the name of the beneficiary.	For Bank details, please refer Section – II, BDS: ITB 19.1 (Page 38) Advising Bank: CANARA BANK Bank Account no.: 87781010014534 IFSC Code: CNRB0018778 Beneficiary: IWAI FUND Jal Marg Vikas Branch: Morna - Sector 18, NOIDA Address: B 16 /17, Ground Floor, Sector-18, NOIDA – 201301
2.	Para 7, IFB	4	All Bids must be accompanied by a bid security of the amount specified for the work in the table below, drawn in favour of IWAI Fund Jal Marg Vikas . Bid security will have to be in any one of the forms as specified in the bidding document and shall have to be valid for 45 days beyond the validity of the bid. Procedure for submission of bid security is described in Para 9.	The published tender document mentions "IWAI Fund Jal Marg Vikas", whereas the tender listing on eProcure.gov.in website mentioned "JMVP Fund" as the Beneficiary of the Bid Security. Please reconfirm the name of the beneficiary.	
3.	Section-II, BDS: ITB 18.1	40	The bid validity period shall be 120 days	Request to keep 60 days as committing the equipment for long bid validity may have adverse impact on cost.	No changes, tender conditions prevail.
4.	Section-II, BDS: ITB 33.3	42	(a) Contractor's proposed subcontracting: Maximum percentage of subcontracting permitted is: 25% of the total contract amount . (b) Bidders planning to subcontract more than 10% of total volume of work shall specify, in the Letter of Bid, the activity (ies) or parts of the works to be subcontracted along with complete details of the sub-contractors and their qualification and experience. The qualification and experience of the sub-contractors must meet the minimum criteria for the relevant work to be sub-contracted failing which such sub-contractors will not be permitted to participate. (c) Sub-contractors' qualification and experience will not be considered for evaluation of the Bidder . The Bidder on its own (without taking into account the qualification and experience of the sub-contractor) should meet the qualification criteria. [Note: Work should not be split into small parts and sub-contracted].	Please keep this within 10% limit as per industry practice.	No changes, tender conditions prevail.

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5.	Section-III, Evaluation & QC, Clause 2.4.2 (b)	55	<p>Bidder should have successfully completed as a prime contractor, JV member, management contractor or sub-contractor, minimum:</p> <p>(a) Three similar works each costing not less than INR 12,74,01,120.00 or Dredged Quantity of 2,46,400 cum; OR</p> <p>(b) Two similar works each costing not less than INR 15,92,51,400.00 or Dredged Quantity of 3,08,000 cum OR</p> <p>(c) One similar work costing not less than INR 25,48,02,240.00 or Dredged Quantity of 4,92,800 cum</p> <p>For the purpose of completed works, the value of the completed contract for similar works should not be less than 80% of the contract value.</p>	<p>Qualification Criteria for “Similar Work Experience” is not aligned with Guidelines. It is apparent that this Eligibility Criteria is based on Only ONE Year of contract value.</p> <p>Further, this is LAD Contract and hence, the Volume should not be considered as qualification criteria.</p> <p>It is pertinent to note that financial criteria, i.e., “Avg. Annual Turnover” and “Cash Flow for 6 months”, are in line with the Guidelines.</p>	No changes, tender conditions prevail.
6.	Section-VII, Description of Services: Clause 13 - Monitoring	120	<p>“Monitoring shall be undertaken by the Employer... ... Contractor shall install the Online Dredging monitoring software developed by NTCPWC at his cost.”</p>	<p>Please share the details of the said monitoring software to understand the functioning as well as compatibility with the dredgers.</p> <p>Also, it is very important to indicate its cost to incorporate the same in our bid.</p>	<p>Bidders may contact NTCPWC, IIT- Madras for the details of ‘Online Dredging Monitoring Software’.</p> <p>No changes, tender conditions prevail.</p>
7.	Section-VII, Description of Services: Clause 18. Multi Beam Echo Sounder	122	<p>“The digital echo sounder for hydrographic surveys shall in principle be operated in the 210 kilo Hertz range (narrow beam transducer). It shall not be permitted for any reason to use a lower operational frequency of the echo sounder for the post-dredging survey than that has been used for the Pre-dredging survey. The digital echo sounder shall have an accuracy of not less than 0.1 m. ...”</p>	<p>Request to specify a range between 200 – 450 KHz as standard multibeam range.</p>	No changes, tender conditions prevail.
8.	Section-VII, Description of Services: Clause 19 – Environment Management Plan	122	<p>“The Contractor shall be required to dispose of dredged materials complying with environmental consideration as detailed under Environmental Management Plan, which has been published on IWAI’s website (http://www.iwai.nic.in) and same is appended to the bidding document as Annexure D.”</p>	<p>It is observed that Annexure D is missing in the Tender document published.</p> <p>Request to please share Annexure D.</p>	<p>Environmental Management Plan (EMP) attached as Annexure – D.</p> <p>Please refer Amendment Sheet.</p>

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9.	Annexure – A to Section VII – 1. Flow Discharges	127	“...The existing agreement between India and Bangladesh, includes specific water allocation rules during the low flow season. The treaty establishes that during the period January – May water shall be shared alternatively through the Farakka Barrage on a 10-day cycle in each month by both countries. ...”	It is understood that the diversion of flow toward Bangladesh leads to sudden reduction in water levels in the identified channel immediately upstream of Farakka Barrage. The regulation of flow between India and Bangladesh is beyond Contractor's control. Thus, we request you to look into relaxation in deductions for LAD shortfall in the event of such flow regulation measures, if occurs.	Sharing of water under Indo – Bangladesh water sharing treaty is annual affair. Relaxation for the event of water level falling below the 'minimum of last 30 years' from the CWC gauge situated at Bateshwar Sthan has already been included in the 'Force Majeure' event under Section – IX, Particular Conditions of Contract; GCC 62.1 (g) (Page – 192). No changes, tender conditions prevail.
10.	Section-VII, Description of Services: Clause 20 Other conditions	143	(f) The Service Provider may execute the work round the clock and on all days including Sundays and Public Holidays with the permission of the Engineer-in-charge in writing excepting National Holidays and subject to such restrictions as may be imposed by State Govt./local body.	Please confirm as no time restriction for working in this stretch.	There is no time restriction on working hours as mentioned at Section IX, Particular Conditions of Contract: GCC 65 (9) (Page 195). However, the successful bidder shall follow the guidelines of the local administration and EMP attached as Annexure D. No changes, tender conditions prevail.
11.	Appendix – C to GCC, Sr. No.: 1	167	'Consent to Establish' and 'Consent to Operate' shall be obtained from State Pollution Control Board under the Air (Prevention and Control of Pollution) Act, 1981 and the Water (Prevention and Control of Pollution) Act, 1974.	CTE and CTO are not applicable for dredging projects as there is no permanent establishment created or operated. Kindly delete this clause.	No changes, tender conditions prevail.
12.	Section-IX, Particular Conditions of Contract: GCC 7.1	173	The ceiling for sub-contracting is 25%. Hiding information about any sub-contracting not authorized by the Employer shall be treated as violation of Appendix A to General Conditions (Fraud and Corruption). The Contractor is specifically allowed to subcontract the following activities: (a) 20% of all dredging work; (b) Environmental and social monitoring.	Please keep this within 10% limit as per industry practice.	No changes, tender conditions prevail.
13.	Section-IX, Particular Conditions of Contract: GCC 9.1	173	If, for any reason beyond the reasonable control of the contractor, it becomes necessary to replace any of the key personnel, the contractor shall provide a replacement a person of equivalent or better qualification and experience with the approval of EIC/Project Manager.	Please replace as under: “If, for any reason beyond the reasonable control of the contractor, it becomes necessary to replace any of the key personnel, the contractor shall provide a replacement a person of equivalent or better qualification and experience than those as specified in the tender qualification criteria with the approval of EIC/Project Manager.”	No changes, tender conditions prevail.

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14.	Section-IX, Particular Conditions of Contract: GCC 9.10	174	The following is inserted as GCC 9.10: "The Contractor shall provide the Contractor's Personnel information and documentation that are clear and understandable regarding their terms and conditions of employment. The information and documentation shall set out their rights under relevant labour Laws applicable to the Contractor's Personnel (which will include any applicable collective agreements), including their rights related to hours of work, wages, overtime, compensation, and benefits, as well as those arising from any requirements in the Specification; and shall also include the Code of Conduct for Contractor's Personnel. The Contractor's Personnel shall be informed when any material changes to their terms or conditions of employment occur."	Sharing internal employment documents is breach of contract between employee and employer. Rather Contractor shall produce all compliances as required for Employment (such as PPF contribution etc.) to support the same. Please amend accordingly.	No changes, tender conditions prevail.
15.	Section-IX, Particular Conditions of Contract: GCC 13.6	174 – 178	1. Insurance of Works: Contractor is required to take Contractor's All Risk Policy or erection all risk policy (as the case may be)	Please remove the complete clause as GCC Clause 13.1 suffice the requirement. This was never part of earlier bids. <i>Since the contract is for maintaining the LAD on weekly basis, this clause will not be applicable and was not the part of earlier contracts.</i> Scope of Work as define in Clause 2, Section VII (Page 113) clarifies that no constructional activities are involved.	No changes, tender conditions prevail.
16.	Section-IX, Particular Conditions of Contract: GCC 16.2	178	ES Management Strategies and Implementation Plans The following is inserted as a new sub-clause 16.2: "16.2 The Contractor shall not carry out mobilization to Site (e.g. limited clearance for haul roads, site accesses and work site establishment, geotechnical investigations or investigations to select ancillary features such as quarries and borrow pits) unless the Project manager gives consent, a consent that shall not be unreasonably delayed, that appropriate measures are in place to address environmental and social risks and impacts, which at a minimum shall include applying the Management Strategies and Implementation Plans (MSIPs) and Code of Conduct for Contractor's Personnel submitted as part of the Bid and agreed as part of the Contract....."	This is again applicable for construction related projects. Please remove. Scope of Work as define in Clause 2, Section VII (Page 113) clarifies that no constructional activities are involved.	No changes, tender conditions prevail.

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17.	Section-IX, Particular Conditions of Contract: GCC 20.1	179	The Site Possession Date(s) shall be: Date on which Contractor mobilizes at site.	This clause is irrelevant to this Contract. Please remove.	Date of mobilization is Site Possession date. However, Date of Commencement of Services / Work shall be as per Section IX, Particular Conditions of Contract; GCC 1.1 (dd). No changes, tender conditions prevail.
18.	Section-IX, Particular Conditions of Contract: GCC 24.4	179	The procedure for adhoc arbitration will be as follows. (a) In case.....	At many places the guideline for inserting the clause/ clarification has not been deleted or amended. Request to share the clean version to analyze the clause in totality.	Section IX, Particular Conditions of Contract: GCC 24.4 (Page 179) is self-explanatory and complete. No changes, Tender conditions prevail.
19.	Section-IX, Particular Conditions of Contract: GCC 26.3	181	The period between Program updates is 90 days. The amount to be withheld for late submission of an updated Program is Rs. 500,000.	Since, Dredgers would be deployed and daily reports would be submitted, along with weekly billing surveys, the Program of execution will remain intact, and no changes are foreseen. Thus, this clause is irrelevant. The late submission withholding amount is unwarranted and will result in unwanted disputes. Requesting the authority to remove this clause.	No changes, tender conditions prevail.
20.	Section-IX, Particular Conditions of Contract: GCC 26.4	181	Add this after the clause GG 26.4: Any revision in Program should only be agreed in writing.	Please update the clause as under: "Add this after the clause GG 26.4: Any revision in Program should only be agreed in writing (hard copy or soft copy of signed correspondence)."	No changes, tender conditions prevail.
21.	Section-IX, Particular Conditions of Contract: GCC 27.2	181	The Contract is extendable for further period of 2 Years based on satisfactory performance of the contractor. For the purpose of rates, the same shall be worked out based on the average of the lump sum quoted amounts for three years in the awarded cost (their bid) with existing Terms and Conditions. Price Adjustment shall be payable as per existing Terms & Conditions for this extended period.	Amend the clause as under: "... For the purpose of rates, the same shall be worked out based on the average of the lump sum quoted amount for three years and extendable on mutual consent on yearly basis for another two years with minimum incremental rate of 10%* higher than the preceding year... " * Minimum 10% increment is proposed in line with Discounting Factor as stipulated in the Tender.	The base year for Price adjustment shall still be as per original 3-year contract. This will cater to increased costs in 4 th & 5 th years of extended contract period. No changes, tender conditions prevail.

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22.	Section-IX, Particular Conditions of Contract: GCC 40.3	182	“Measurements during weekly joint surveys: - Works & Services provided by the Contractor shall be checked every week through a Joint Survey ... The scale of surveys should be 1:5000 for all four weekly surveys in the month. Contractor will prepare the survey charts and submit to Employer for approval along with soft copy, Measurement Book etc. related to the measurement. Employer will issue the approved charts to the Contractor...”	Request you remove the requirement of the Measurement Book as they will not work with a Multibeam echosounder.	The depth & width of the navigation channel can be recorded in the measurement book and charts enclosed. No changes, tender conditions prevail.																														
23.	Section-IX, Particular Conditions of Contract: GCC 47.1	186	GC 47.1 to be read as. The Liquidated Damages (LD) is applicable.	Please replace the word “Liquidated Damages (LD)” with “Deductions”, as the word LD is misleading and has different legal meaning. The given calculation is for deduction and not Liquidated Damage. The definition of LD is as follows: Liquidated damages included in any contract to compensate one party if the other is late in fulfilling his obligations.	Under this clause of Section IX, Particular Conditions of Contract: GCC 47.1 (Page 186) – Liquidated Damages, the table gives the value of deductions to be made from the monthly bills. No changes, tender conditions prevail.																														
24.	Section-IX, Particular Conditions of Contract: GCC 47.1	186	<table border="1"> <thead> <tr> <th colspan="3">Table</th> </tr> <tr> <th>Sl. no</th> <th>Deductions for the Assured Depth Period of services from the Date of Commencement of Service</th> <th>Deduction to be applied as percentage of bill for each compliance found joint weekly during the month</th> </tr> </thead> <tbody> <tr> <td></td> <td>LAD Ⓣ 3.0 M & CBW Ⓣ 45 M</td> <td></td> </tr> <tr> <td>1</td> <td>On achieving the assured depth of 3.0 m & width of 45 m</td> <td>Nil</td> </tr> <tr> <td>2</td> <td>On achieving the assured depth of 2.9 m & width of 45 m</td> <td>20% for each default</td> </tr> <tr> <td>3</td> <td>On achieving the assured depth of 2.8m & width of 45 m</td> <td>30% for each default</td> </tr> <tr> <td>4</td> <td>On achieving the assured depth of 2.7 m & width of 45 m</td> <td>50% for each default</td> </tr> <tr> <td>5</td> <td>For a depth less than 2.7 m & width of 45 m</td> <td>100% for each default</td> </tr> </tbody> </table>	Table			Sl. no	Deductions for the Assured Depth Period of services from the Date of Commencement of Service	Deduction to be applied as percentage of bill for each compliance found joint weekly during the month		LAD Ⓣ 3.0 M & CBW Ⓣ 45 M		1	On achieving the assured depth of 3.0 m & width of 45 m	Nil	2	On achieving the assured depth of 2.9 m & width of 45 m	20% for each default	3	On achieving the assured depth of 2.8m & width of 45 m	30% for each default	4	On achieving the assured depth of 2.7 m & width of 45 m	50% for each default	5	For a depth less than 2.7 m & width of 45 m	100% for each default	Please reinstate the deductions as per existing Contract for the same stretch, as under: <table border="1"> <thead> <tr> <th>Deduction to be applied as percentage of monthly bill for each non-compliance found in a joint weekly survey during the month</th> </tr> </thead> <tbody> <tr> <td>Nil</td> </tr> <tr> <td>5% for each weekly default</td> </tr> <tr> <td>7.5% for each weekly default</td> </tr> <tr> <td>12.5% for each weekly default</td> </tr> <tr> <td>25% for each weekly default</td> </tr> </tbody> </table>	Deduction to be applied as percentage of monthly bill for each non-compliance found in a joint weekly survey during the month	Nil	5% for each weekly default	7.5% for each weekly default	12.5% for each weekly default	25% for each weekly default	No changes, tender conditions prevail.
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25.	Section-IX, Particular Conditions of Contract: GCC 47.1, Sr. No. 6 (a)	187	6(a). If a weekly joint survey establishes that the Service Provider failed to maintain the navigational marks according to stipulations in Section VII, Part A Description of Services to the Contract, deductions shall also be made from the respective monthly bill @ 5% of the verified payable amount for each such weekly default.	Not aligned with earlier Contracts in execution as well as Tenders floated by IWAI. Please reinstate @ 1% as taken for earlier contracts.	No changes, tender conditions prevail.
26.	Section-IX, Particular Conditions of Contract: GCC 49.1	188	GC 49.1 to be read as: The amount of the Advance Payment is ten (10) percent of the Contract Price.	We consider that the given Advance payment is an ' Interest free ' advance. Please confirm.	Please refer Section VIII General Conditions of Contract GCC 49.1 (Page 158). It is already mentioned that Interest shall not be charged on the Advance Payment. No changes, Tender conditions prevail.
27.	Section-IX, Particular Conditions of Contract: GCC 57.6	191	Foreclosure of Contract – New Clause Added If at any time after acceptance of the tender the Authority decides to abandon or reduce the scope of the works for reasons whatsoever and hence does not require the whole or any part of the works to be carried out, the Engineer-in- Charge (with the prior approval of competent authority) shall give notice in writing to that effect to the contractor. However, pro-rata payment shall be made for the completed works, as agreed mutually	The Contractor would deploy their Equipment and resources considering 3 years tenure and taking in account all the costs and overheads spread across the entire tenure when arriving at Bidding Price. Thus, it is not appropriate to compensate the Contractor for only “Completed Works”. Please consider payment of minimum 10% of Balance Contract value as foreclosure compensation in addition to payment of completed works.	No changes, tender conditions prevail.
28.	Section-IX, Particular Conditions of Contract: GCC 58.1	191	The percentage to apply to the value of the work not completed, representing the Employer’s additional cost for completing the Works, is 20%.	This clause does not suffice as a penalty in the form of deductions is already incorporated. Contractor should not be penalized more than once for the same activity.	No changes, tender conditions prevail.
29.	Section-IX, Particular Conditions of Contract: GCC 62.0 (d)	192	“Strike, sabotage, lockout, embargo, import restriction, port congestion, lack of usual means of public transportation and communication, industrial dispute, shipwreck, shortage or restriction of power supply, epidemics, quarantine and plague”	please insert..... strike, sabotage, lockout, embargo, import restriction, port congestion, lack of usual means of public transportation and communication, industrial dispute, shipwreck, shortage or restriction of power supply, epidemics, pandemic quarantine, and plague.	A pandemic is an epidemic that’s spread over multiple countries and continents. Since, epidemic is already included, pandemic also gets covered. No changes, tender conditions prevail.

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30.	Section-IX, Particular Conditions of Contract: GCC 64 Setting out of Works (new clause added)	193	Setting out the Works (new clause added) "The Employer shall furnish the relevant existing grid points with benchmarks with reference to permanent benchmarks . It shall be the Contractor's responsibility to set out the necessary central points on land and to set out alignment. The Contractor shall have in his employees, an efficient survey team for this purpose and the accuracy of such setting out works shall be Contractor's sole responsibility ..."	Please note that the said contract is based on LAD, where the water column is measured without any establish benchmark. The added clause does not apply in the tendered work and hence request to remove.	The successful bidder is to transfer the levels from the established Bench Mark (BM). No changes, tender conditions prevail.
31.	Section-IX, Particular Conditions of Contract: GCC 65 (3)	194	The decision of EIC to accept the work done with or without the Liquidated damages shall be final and binding.	Please revised the sentence as under: " The judicious/ reasonable decision of EIC to accept the work done with or without the deductions shall be final and binding."	Being Assured depth contract, the deductions are defined at Section IX Particular Conditions of Contract; GCC 47.1 (Page 186). No changes, tender conditions prevail.
32.	Item No. 1, 2 & 3 of Eligibility & Qualification Criteria: 2.5	59	Bidder to provide the details of the manpower along with the Bid. To be considered for evaluation.	Is there any minimum requirement of personnel in terms of numbers for this project which a bidder have to declare during bidding stage or shall a bidder declare the number of personnel under various categories on their own discretion?	During bidding stage, the bidder is to provide details & CV of 1 no. of Contract Manager / Project Manager, Surveyor and Dredger Master. Please refer Amendment sheet.
33.	2.6.3 & 2.6.5 of Eligibility & Qualification Criteria: 2.6	60	Tug Boats & Accommodation Boats	Please confirm us the Minimum Number of the said machineries which are desirable at the time of bidding.	Tug Boats and accommodation boats are to be deployed based on numbers of dredgers and manpower deployed by the contractor for execution of the work as per site requirement. Details of these equipment are desirable at the time of bidding. No changes, tender conditions prevail.
34.	Sl. No. 1.4 of Section – IV, Bidding Forms	64	Form FIN-3.1; FIN 3.1A; FIN 3.2; FIN 3.3	Due to non-availability of Form FIN3.3 in Tender Documents, we request you to provide the same.	Form FIN 3.3 written at Sl. No. 1.4 of Section IV; Bidding Forms is deleted. Refer Amendment Sheet.
35.	Format for the Affidavit	101 & 108	Format for the Affidavit	The Format for the Affidavit is provided at two different page nos. of Tender Documents. Please confirm us the exact Format which out of these two Format shall a bidder has to provide?	Both the formats for the Affidavit (Page 101 & 108) are exactly the same and any one may be used during bid submission. No changes, tender conditions prevail.

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36.	Section VII Description of Services (Work's requirement)	115	8. Quantity of dredging - The Stretch of Farakka - Kahalgaon (146 km) - Tentative Quantity of 18.48 Lakh Cum to be dredged during the lean season of (8) eight months (Mid-Oct to Mid-June) except for flood seasons (Mid-June to Mid-October)	With regards to the flood seasons (Mid-June to Mid-October), we would like to know from your end about what will be the advance Flood Alert Mechanism for contractors to prepare and take necessary measures to confront the impending flood? Further we assume that during the Flood season from Mid-June to Mid-October dredging work will have to be stopped as the Farakka Kahalgaon will be worst affected by flood. Please confirm.	LAD of 3.0 m; channel width of 45 m and sufficient day channel marks are to be maintained in flood season also. The indicative flood season is given in the clause. Flood forecasting etc. shall be obtained from concerned authorities. No changes, tender conditions prevail.
37.				Are the working hours at site flexible or specific? Is there any restriction from Government's end concerning working round the clock i.e., 24 hours a day? Please confirm.	Please refer pre-bid reply at S. No. 10. No changes, tender conditions prevail.
38.				There may be presence of Floating Steel Temporary bridges at various locations throughout the 146 Km. stretch between Farakka & Kahalgaon. In this context, we seek your kind assurance regarding all types of help from your end towards dismantling and shifting of the aforementioned bridges in order to aid a prospective contractor for smooth progress of work. Please confirm.	There are no floating Steel bridges in Farakka – Kahalgaon (146 Km) stretch of NW-1. No changes, tender conditions prevail.
39.				We request you to provide us the following mentioned documents in order to aid us in doing proper Cost Analysis of the said Project: - (a) Pre-survey Hydro & Topographic Drawings and (b) Soil Investigation Report	Relevant details are provided in Annexure A (Page no. 127) of Section – VII Description of Services (Work's Requirement). No changes, tender conditions prevail.
40.				Due to non-availability of any Format on "Power of Attorney", we request the authority to provide a format on the same.	A general standard Power of Attorney shall be used containing authorization to sign the contract etc. No changes, tender conditions prevail.

Amendment - 3 dated 7.7.2023

Inland Waterways Authority of India		Jal Marg Vikas Project									
Tender Reference No: - IN-IWAI-351794-CW-RFB											
CPPP Tender ID: - 2023_JMVP_758352_1											
Work Title: Fairway Maintenance of Farakka – Kahalgaon (146 Km) stretch of National Waterway – 1 (River Ganga)											
Sl. No.	Bid Document Reference	Existing Text	To be read as								
1.	IFB Clause – 10; Page no. 5	Topic: Pre-Bid Meeting	The replies of Pre-bid meeting held on 26.06.2023 are uploaded along with this Amendment at Appendix – A.								
2.	Section-III: Evaluation & Qualification Criteria – 2.5 Contractor's Representative & Key Personnel; Page no. 59	Section – III – Evaluation & Qualification Criteria S. No. 2.5 Contractor's Representative & Key Personnel	Section-III (Evaluation & Qualification Criteria) S. No. 2.5 (Contractor's Representative & Key Personnel) has been modified as Annexure A.								
3.	Sl. No. 1.4, Section IV, Bidding Forms Page no. 64	<table border="1"> <tr> <td>1.4</td> <td>Form FIN-3.1; Fim 3.1A; Fin 3.2; FIN 3.3</td> <td>Section-III, QR 2.3 (Financial) (2.3.1 to 2.3.2)</td> <td>Financial Situation and Performance; Cash Flow/ working Capital; Financial Resources; Average Annual Dredging Turn Over.</td> </tr> </table>	1.4	Form FIN-3.1; Fim 3.1A; Fin 3.2; FIN 3.3	Section-III, QR 2.3 (Financial) (2.3.1 to 2.3.2)	Financial Situation and Performance; Cash Flow/ working Capital; Financial Resources; Average Annual Dredging Turn Over.	<table border="1"> <tr> <td>1.4</td> <td>Form FIN-3.1; FIN 3.1A; FIN 3.2</td> <td>Section-III, QR 2.3 (Financial) (2.3.1 to 2.3.2)</td> <td>Financial Situation and Performance; Cash Flow/ working Capital; Financial Resources; Average Annual Dredging Turn Over.</td> </tr> </table>	1.4	Form FIN-3.1; FIN 3.1A; FIN 3.2	Section-III, QR 2.3 (Financial) (2.3.1 to 2.3.2)	Financial Situation and Performance; Cash Flow/ working Capital; Financial Resources; Average Annual Dredging Turn Over.
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4.	Form EXP – 2.5.0 (Schedule F) Page 91	Form EXP – 2.5.0 (Schedule F)	Form EXP – 2.5.0 (Schedule F) modified as Annexure B.								
5.	Forms for Personnel... Form EXP – 2.5.0 contd. Page no. 92	Forms for Personnel... Form EXP – 2.5.0 contd.	Forms for Personnel... Form EXP – 2.5.0 contd. modified as Annexure C								
6.	Section VII Description of Services (Work's Requirement) Para 19 Page no. 122	Environmental Management Plan (EMP) appended to the bidding document as Annexure D.	Environmental Management Plan (EMP) as Annexure D has been inserted.								
7.	All other Terms & Conditions of the Tender Document remain unaltered.										
OFFICER INVITING BIDS: - Vice – Chairman & Project Director (JMVP); Inland Waterways Authority of India; A – 13, Sector – 1, Noida – 201301, Uttar Pradesh – INDIA - Telephone No.: (91) 0120-2424544 Email.: vc.iwai@nic.in											

2.5 Contractors Representative & Key personnel

The Bidder must demonstrate that it will have a suitably qualified (and in adequate numbers) minimum key personnel, as described in the table below, that are required to perform the contract.

The Bidder shall provide details for the key personnel and such other Key Personnel that the Bidder considers appropriate, together with their academic qualifications and work experience.

The Bidder shall complete the relevant Forms in Section IV, Bidding Forms.

The Contractor shall require the Employer's consent to substitute or replace the Key Personnel.

Item No.	Position / specialization required for each lot	Relevant academic qualifications	Minimum years of relevant work experience	MUST meet requirement
1.	Contract Manager / Project Manager	Contract Manager shall have a Bachelor's degree in Civil / Mechanical engineering and an experience of minimum 10 years', out of which at least 7 years shall be in managing projects of similar nature. Personnel must have experience in executing dredging projects. The desirable age of the personnel as on the date of bid submission shall not be more than 50 years, however, if the personnel above 50 years is proposed, then the specific health fitness certificate shall be submitted with the bid.	7	Bidder to provide the details of the manpower along with the Bid. To be considered for evaluation.
2.	Surveyor	Diploma in Civil Engineering / Mechanical Engineering / Surveying with 3 years' experience in Hydrographic Survey or Survey Recorder I/II in Hydrographic Survey	3	
3.	Dredge Master	Dredging Experience in River/Canal/Port	7	
Suitable experts in the following specializations				
4.	Crew	Must have inland vessel certification		Desirable at the time of Bid Submission
5.	Social Expert	Graduate or equivalent in social sciences	3	
6.	Environment Expert	Graduate in Environmental Engineering / Environmental Sciences	3	
7.	Health & Safety Expert	Graduate in Engineering / Sciences and must have Diploma / Certification in health and safety	3	

The Bidder must not have in his employment:

- (i) the near relations (defined as first blood relations, and their spouses, of the bidder or the bidder's spouse) of persons of the following Government Departments: - All organization entities / agencies under Ministry of Ports, Shipping and Waterways
- (ii) without Government permission, any person who retired as gazetted officer within the last two years.

The Bidder shall provide details of the proposed personnel and their experience records in the relevant Forms included in Section IV, Bidding Forms.

Annexure B

Form EXP – 2.5.0 (Schedule-F)

Details of Deployment of Manpower (Main Bidder with CVs)	
Bidder's Name	<i>[insert full name]</i>
Date:	<i>[insert day, month, year]</i>
JV - Member Name	<i>[insert full name]:</i>
NCB No. and title	<i>[insert NCB number and title]</i>
Page...	<i>[insert page number] of [insert total number] pages</i>

To indicate the details of the Manpower to be deployed for carrying out the assignment along with their CVs

Sl. no	Position	Experience in yrs.	Details of Experience	CV Yes / No
1.	Contract / Project Manager	7 years	Contract/Project Manager shall have a bachelor's degree in Civil / Mechanical engineering and an experience of minimum 10 years', out of which at least 7 years shall be in managing projects of similar nature. Personnel must have experience in executing dredging projects. The desirable age of the personnel as on the date of bid submission shall not be more than 50 years, however, if the personnel above 50 years is proposed, then the specific health fitness certificate shall be submitted with the bid.	MUST MEET REQUIREMENT YES – To be submitted at the time of Bid Submission.
2.	Surveyor	3 years	Diploma in Civil Engineering / Surveying with 3 years' experience in Hydrographic Survey or Survey Recorder I/II in Hydrographic Survey	
3.	Dredge Master	7 years	Must have 7 years of experience in dredging in rivers / canals / ports.	

Details of the Sub - Contracting Agencies				
4.	Crew		Must have inland vessel certification	Desirable at the time of Bid Submission
5.	Social Specialist	3 years	Graduate or equivalent in social sciences with at least 3 years field experience.	
6.	Environmental Expert	3 years	Graduate in Environmental engineering / Environmental sciences with at least 3 years field experience.	
7.	Health & Safety Specialist	3 years	Graduate in Engineering/sciences with at least 3 years of experience in health and safety. Must have diploma / certification in health and safety.	

Annexure C

Forms for Personnel Form EXP – 2.5.0 contd.			
Item No.	Position / specialization required	Relevant academic qualifications Bidder to provide the details at the time of bid Submission (Must Meet Condition) Minimum years of relevant work experience	
1.	Contract / Project Manager	Contract / Project Manager shall have a bachelor's degree in Civil / Mechanical engineering and an experience of minimum 10 years', out of which at least 7 years shall be in managing projects of similar nature. Personnel must have experience in executing dredging projects. The desirable age of the personnel as on the date of bid submission shall not be more than 50 years, however, if the personnel above 50 years is proposed, then the specific health fitness certificate shall be submitted with the bid.	7 years
2.	Surveyor	Diploma in Civil Engineering / Surveying with 3 years' experience in Hydrographic Survey or Survey Recorder I / II in Hydrographic Survey	3 years
3.	Dredge Master	Dredging experience in River / Canal / Port	7 years
Details of other Suitable Manpower / experts in the following specializations are desirable at the time of bidding			
4.	Social Expert	Graduate or equivalent in social sciences with 3 years of field experience	3 years
5.	Environment Expert	Graduate in Environmental Engineering / Environmental Sciences with at least 3 years of field experience	3 years
6.	Health & Safety Expert	Graduate in Engineering / Sciences with at least 3 years of experience in Health & Safety and must have Diploma / Certification in Health and Safety.	3 years
7.	Crew	Must have inland vessel certification	

INLAND WATERWAYS AUTHORITY OF INDIA

Ministry of Shipping, Government of India

“CAPACITY AUGMENTATION OF NATIONAL WATERWAY-1”

(Jal Marg Vikas Project)

ANNEXURE - D

Environmental Management Plan (EMP)

for

Maintenance Dredging Between Farakka

(West Bengal) and Kahalgaon (Bihar),

River Ganga

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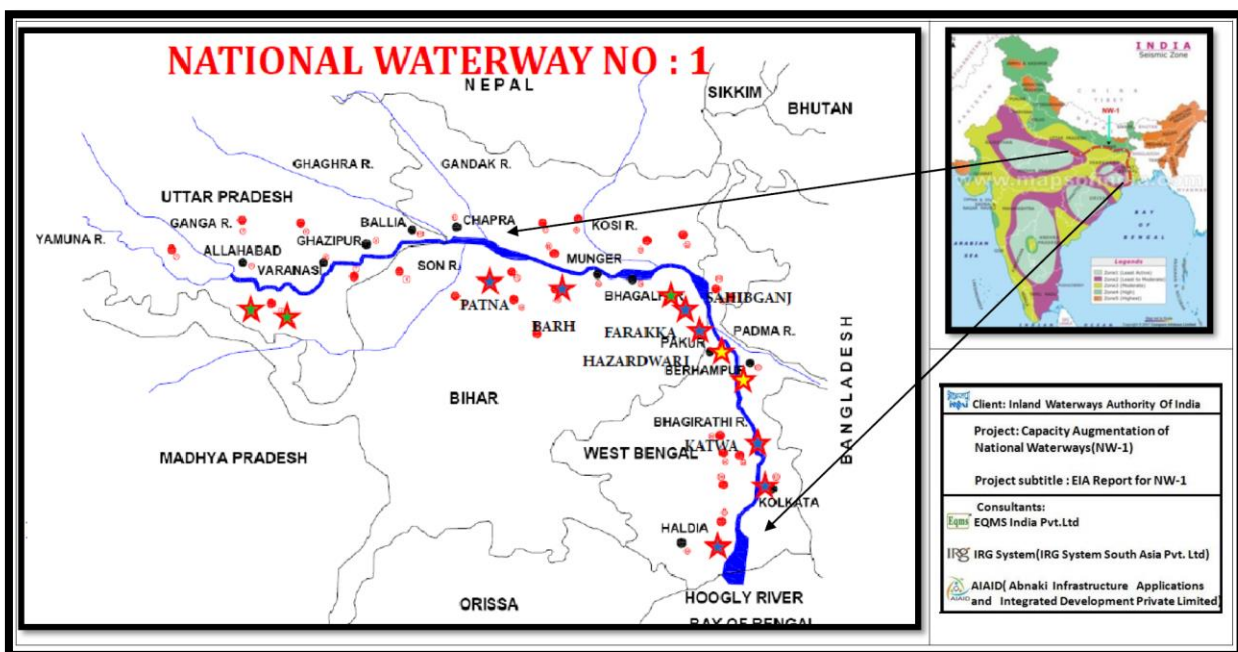
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Chapter 1. EMP FOR MAINTENANCE DREDGING

1.1. Introduction

Inland waterways Authority of India (IWAI) has proposed to augment the navigation capacity of waterway NW-1 (Haldia to Allahabad) and continue to maintain the entire stretch. Under this project, IWAI has proposed to develop the infrastructure facility like Multimodal terminals, Navigation aids for day & night navigation, River information system with all hardware and software, Ro-Ro jetties, Bank & slope protection, River training works, Equipment like tow barges, inland vessels, survey vessels including rescue boats & survey equipment and dredging of the navigation channel, to augment the navigation capacity of the waterway. Location map of NW-1 is given in **Figure 1.1**.

To improve the navigation in national waterways-1 IWAI has proposed a project "Capacity Augmentation of the Nation Waterway 1 (1620 kms, with minimum water depth of 2.2-3 m) between Haldia and Allahabad". For which maintenance dredging is required at different locations along the NW-1 and to be carried out so as to maintain the least available depth (LAD).



: Location Map

1.2. Description of Environment

The NW-1 stretch starts from Haldia to Allahabad (1620 KM long) on Ganga-Bhagirathi Hooghly River system. The Bhagirathi Hooghly River portion of the waterway from Haldia to Nabadwip is under tidal influence. From Nabadwip to Jangipur the NW-1 stretch is formed by Bhagirathi Hooghly River. Bhagirathi Hooghly River flow is regulated through feeder canal from barrage at Farakka and Jangipur. The feeder canal originating from Farakka barrage acts as link between Bhagirathi Hooghly River and Ganga River (upstream of Farrakka Barrage)¹. NW-1 is passing through four states namely UP, Bihar, Jharkhand and West

¹The ship movement beyond Farakka barrage to feeder canal is regulated through a Navigational lock. Upstream of Farakka the navigable route depends upon the main Ganga river flow.

Bengal. The salient environmental features around NW-1 within, 500m, 2km and 10km stretches are summarised in **Table 1.1**.

: Salient Environmental Features along the Farakka to Kahalgaon Stretch of NW-1

S. No	Environmental Features	Within NW-1 (500 M)	Within 2 km area around NW-1	Within 10 km area around NW-1	Environmental Sensitivity between Farakka and Kahalgaon
1	Ecological Environment				
A	Presence of National Park/Biosphere Reserves, Tiger reserve etc.	None	None	None	None
	Presence of Wildlife Sanctuary	Yes 1. Vikramshila Dolphin Sanctuary Kahalgaon to Sultanganj 2. Hilsa Sanctuary stretch in west Bengal	None	Yes Udhwa lake sanctuary in Jharkhand (about 9 km away from NW-1)	Vikramshila Dolphin Sanctuary and Udhwa lake sanctuary in Jharkhand (about 9 km away from Stretch)
B	Reserved /Protected Forests	None	None	Yes (Bethuadahari RF, Bahadurpur RF & RF near Rajmahal Hills)	None
C	Wetland of state and national interest	None	None	Yes (Udhwa Bird sanctuary)	Yes Udhwa lake sanctuary in Jharkhand (about 9 km away from Stretch)
D	Migratory route for wild terrestrial animals	None	None	None	None
E	Presence of Schedule-I Terrestrial Fauna	None	Yes Migratory birds near Farakka Barrage and surrounding	Yes Migratory birds at important birds' areas	Yes Migratory birds near Farakka Barrage and surrounding
F	Presence of Schedule-I Aquatic Fauna	Yes Dolphin, and Turtle	None	None	None

S. No	Environmental Features	Within NW-1 (500 M)	Within 2 km area around NW-1	Within 10 km area around NW-1	Environmental Sensitivity between Farakka and Kahalgaon
G	Important Bird Area	Vikramshila sanctuary area	Yes 1. Kurseala river course and diyara floodplain. 2. Farakka Barrage and surround area	Yes Udhwa lake sanctuary	Kurseala river course and diyara floodplain(2.32km, E) Farakka Barrage and surround area Udhwa lake sanctuary in Jharkhand (about 9 km away from Stretch
H	Seismicity	NW-1 falls in Zone-III (moderate risk) and zone IV (high damage risk zone) as per Seismic Zoning Map of India			Stretch falls in Zone-III (moderate risk) and zone IV (high damage risk zone) as per Seismic Zoning Map of India
B. Social Environment					
I	Physical Setting	Rural, Industrial and Urban			Rural, Industrial and Urban
	Densely populated area	Kahalgaon, Sahibganj, Farakka, Berhampore, Katwa, Kalna, Kolkatta and Haldia are densely populated areas.			Kurseala Manihari, Sahibganj, Maharajpur, Rajmahal, Farakka
J	Physical Sensitive Receptors	Yes Ghats, Temples, Schools, Colleges and Hospitals are present all along the NW-1.			Yes Ghats, Temples, Schools, Colleges and Hospitals are present all along the NW-1.
K	Archaeological Monuments	Yes There are 9 archaeological sites located within 300 m area of the NW-1 and these are Manmahal and observatory, St. John's Church, Temple of Gour Chandra and Krishnachandra at Chatra (Gaur Chandra Ghat), Hazardwari Palace, Sindhi Dalan and Jami Masjid.			Yes There are 2 archaeological sites located within 300 m area of the stretch and these are Jami Masjid(0.14km,W) Sindhi Dalan(0.3km,W)

1.3. Environmental Management Plans

Major activities associated with the project are construction and operation of the civil interventions, barge movement and maintenance dredging. Barge movement and maintenance dredging will be carried out during the operation phase of the project only

whereas development of civil interventions will have components distributed during design, construction and operation phases. Civil interventions include construction of jetties, terminals, river training works, bend corrections, barge maintenance facilities, and RO-RO jetties. A detailed environmental management plan for each associated development for all the three phases of the project, i.e., design/pre-construction, construction and operation phase is prepared as applicable. EMP lists the activities involved, associated impact with each activity on environment, suggestive mitigation measures, allocated environment budget for impact mitigation, implementation plan covering monitoring, reporting and implementation and supervisory responsibility.

Environmental Management Plan for Maintenance Dredging Between Farakka and Kahalgaon

Maintenance dredging will be carried out during operation phase of the project to maintain LAD for navigation. Maintenance dredging will be carried out as per the availability of the depth naturally and depth required for movement of the cargo depending on the size of the cargo planned to ply in the stretch. The design consultant had made estimation of the required amount of maintenance dredging in different stretch of the waterway. An analysis has been done during EIA study to establish the environmental, biological and social sensitivity of the waterway. The standalone dredging and dredge disposal management plans are prepared for each of the identified stretch separately. .

Stretch between Kahalgaon and Farakka traverses through 2 states, i.e. West Bengal and Bihar. Total length of the stretch is 146 km. It is planned to maintain LAD (assured depth) of 3.0 m between the Farakka and Kahalgaon stretch. Total dredging of 505,750 cum/year shall be carried out between this stretch to ensure assured depth of 3.0 m throughout the year. Dredging and dredge disposal management measures and Detailed EMP for maintenance dredging for the Farakka to Kahalgaon stretch is given in **Table 1.2** and **Table 1.3** respectively.

1.4. Environment Monitoring Plan

An Environment Monitoring Plan (included as **Table 1.4**) is prepared to monitor the effectiveness of mitigation measures proposed and environmental conditions during dredging and post dredging activities.

1.5. Environment Health and Safety Cell

It is essential to establish environment health and safety cell for the project by contractor to ensure the health & safety of workers and environmental management of impacted area through effective implementation of EMP. Qualified and experienced EHS (Environment, Health and Safety) specialist shall be considered to man the cell who shall ensure the effective implementation of the environment management plan.

1.6. Reporting Requirements:

It is required that contractor will submit quarterly compliance report to Project Management Consultants (PMC) as well as to PMU (Project Management Unit) of IWAI. PMC will analyze the report and notify the corrective action if any required to contractor under intimation to IWAI

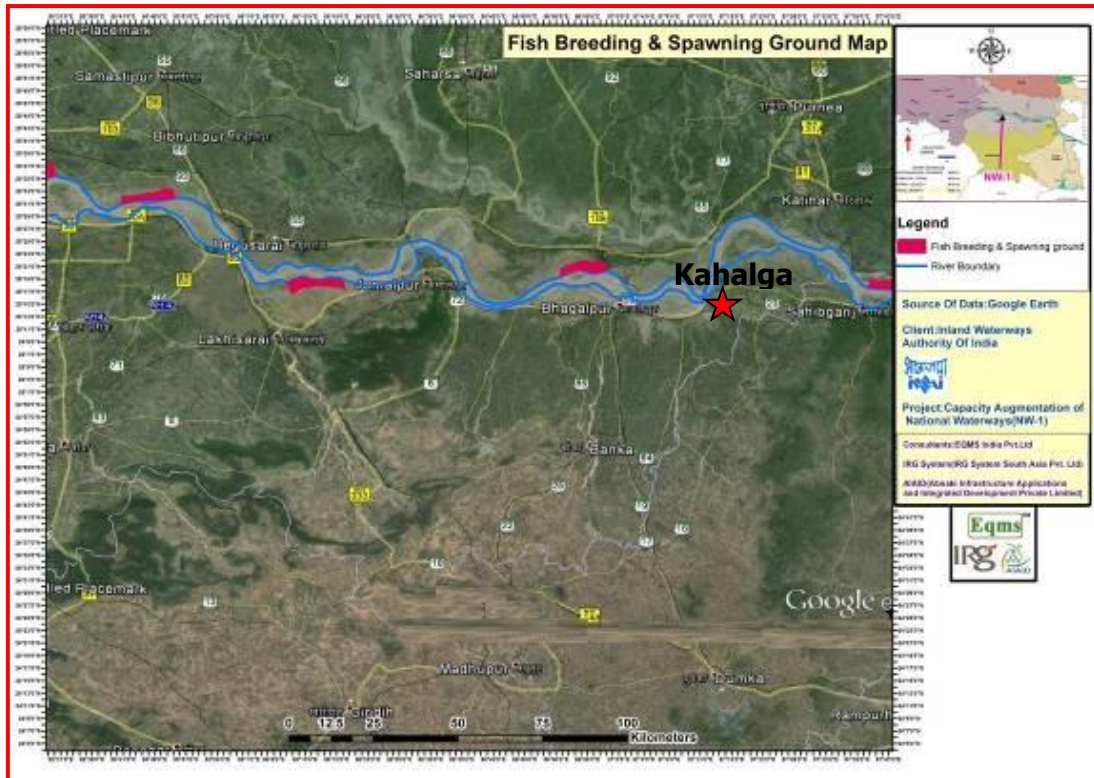
Dredging and Disposal Management Plan for Stretch Between Farakka and Kahalgaon

Stretch/Dredging Quantity & Quality/Proposed Disposal Location	Biological, cultural, social and religious Sensitivity	Aquatic sensitivity		Management Measures
		Sensitive zone	Breeding & Spawning Period and grounds*	
Stretch: Farakka to Kahalgaon Dredged Qty: 505,750 cum/yr between Tribeni to Farakka Dredged Quality: Not contaminated Disposal Location: In river/shoals/scours	Important Bird area- - Udhwa Lake Bird Sanctuary (9 km, W), Presence of dolphins, Vikramshila Gangetic Dolphin Sanctuary-VGDS (within NW-1) in buffer zone, (VGDS starts beyond Kahalgaon), Kurseala River Course and Diyara Flood Plains (Along NW-1) Archaeological: None within 300m regulated area. However Munger fort is located at 390 m away from the stretch Archaeological locations- Sindhi Dalan (300 m, W) & Jama Masjid (140 m, W), Religious locations: Community Temple at Sahibganj Terminal site (to be shifted)	Buffer Zone of Vikramshila Gangetic Dolphin Sanctuary (within NW-1) & Udhwa Lake Bird Sanctuary (9 km, W)	Major Birth season for Dolphin is October to March <i>Breeding Ground: Very shallow waters for giving birth</i>	Dredging should be regulated during breeding seasons of the dolphins from October to March. No dredging shall be carried out in and close to breeding area (at least within 300m of the boundary of the Sanctuary), or any other breeding area identified by experts and notified to the Contractor by IWAJ in future. Dredge disposal should not be carried out within Sanctuary area and other defined sensitive locations Dredge disposal shall not be carried out near the river banks and shallow waters of the river. Dredge disposal should be carried out at minimum distance of 100 m from bank Dredging & disposal should not be carried out during time & location of festivals/ghats

*Map Showing locations of breeding & spawning grounds between Farakka to Kahalgaon is given in **Figure 1.2-1.3**



: Fish Breeding and Spawning Grounds along NW-1 (Farakka to Baidyapur Stretch)



: Fish Breeding and Spawning Grounds along NW-1 (Baidyapur to Kahalgaon Stretch)

: Environmental Management Plan for Maintenance Dredging

Environmental Issue /Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
1. Physical Environment							
Impact on Soil quality & River Bed sediments	<ul style="list-style-type: none"> Standards should be developed by concerned authorities for onshore and off-shore dredged material disposal and development of the process to ensure its compliance Dredged material shall be checked for toxicity and contamination prior to its disposal for prevention of contamination of water and its impacts on aquatic life. International standards : criteria for onshore & off-shore disposal of dredged material are given at Annexure 1.1. If at any stage onland disposal of dredge material is required 	Water Act, 1974	Within River	During Dredging Operation	Part of Project Cost (IWAI & Contractor)	Contractor	IWAI/PMU/PMC ²

² It is proposed to set up Project Management Unit (PMU) in IWAI to manage social and environmental aspect of NW1 augmentation. PMC (Project Management Consultants) anticipated to be appointed for project management and quality check.

Environmental Issue /Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	<p>then dewatering of the dredged sediments should be carried out prior to its onland disposal.</p> <ul style="list-style-type: none"> • If dredge material is found contaminated at any particular location, then it should be disposed on land after decontamination. Onland disposal of dredged material should be carried out only at approved TSD site such as located at Haldia Dock Complex, Sagar. The contaminated dredge material shall be collected in the leak proof container for decontamination and disposal to the landfill site. • The disposal facilities should be designed with adequate liners to containe the leachate and also should have provision of leachate collection and testing to periodically check the functionality of the disposal site. • Dredge material should not be disposed on river banks, Disposal should done following dredging sensitivity analysis and related measures defined at Table 1.2 above. • If dredged material is disposed on land, then the care should be taken that the tail water is collected and made free from sediments prior to its discharge back to surface water body. 						

Environmental Issue /Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
Water and Air Quality	<ul style="list-style-type: none"> • Attempt shall be made to minimizing and optimizing the dredging requirements by effective assessment and study of the Thalweg profiles of the river. This can be achieved some of the following measures: <ul style="list-style-type: none"> ○ Increase use of bandalling which helps in diverting the flow of river towards the channel and reduces the quantity of dredging ○ Low draft vessels should be deployed which will reduce the requirement of dredging • Dredged material shall be checked for toxicity and contamination prior its disposal onshore for prevention of contamination of water and its impacts on aquatic life. (reference shall be made to International criteria for onshore & off-shore disposal of dredged material given at Annexure 1.1). • Dredging should not be carried out during very low flow seasons so as to minimize the dispersion of fine sediments • Usage of silt or air bubble screens/curtains should be explored to minimize the sediment release during dredging operations. Silt/air bubble screens can hang from surface floats or stands attached to the bottom and held upright by sub-surface floats (PIANC). (The use of silt curtains is reported to considerably reduce the loss of suspended sediments from the dredge area, by up to 75% where current velocities are very low. However, they are generally ineffective in areas with high current velocities which exceed 0.5 m/s) 	Water Act, 1974	Within River	During Dredging Operation	Part of Project Cost (IWAI & Contractor)	Contractor	IWAI/PMU/PMC ³

³ It is proposed to set up Project Management Unit (PMU) in IWAI to manage social and environmental aspect of NW1 augmentation. PMC (Project Management Consultants) anticipated to be appointed for project management and quality check.

Environmental Issue /Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	<ul style="list-style-type: none"> • To minimize the sediment dispersal during disposal of dredge sediments, it should be placed as close to the bed possible preferable at a level of 1m above the bed to minimise the dispersal of sediments. • Provision shall be made of emergency response equipment like floating blooms to deal with any emergency of oil spills or leakages. Regular servicing and maintenance of dredgers should be taken up so as to prevent any leakage of the dredged material. Leakage detection of the sediment transportation pipe shall be carried out regularly to prevent any sediment loss and water pollution at leakage location. Corrective actions should be taken immediately after detection of such leaks. • Cutter head of CSD should be selected according to material to be dredged so as to maximize the dredged material transport from dredging point to suction mouth and prevention of sediment loss and re-suspension. • Ratio of cutter revolutions and pump velocity should be adjusted to ensure that cutter advancement rate is not greater than the ability of the suction pump to remove the material that is cut. This will prevent the suspension of the dredged material. • Dredge cuts and lifts should be designed so as to prevent undercutting of material and hence a collapse of material locally at the cutter head, leading to an increase in the sediment being disturbed by dredging. • If dredge material is found contaminated at any particular location than it should be disposed off-shore. Off-shore disposal of dredged material 						

Environmental Issue /Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	<p>should be carried out only at approved TSDF site. .</p> <ul style="list-style-type: none"> • Dredge material if disposed on river banks or on land caution should be exercised as per the Dredging and Disposal Management Plan for NW-1 given at Table 1.2 above. • If dredged material is disposed at land, then the care should be taken that the tail water is collected and made free from sediments prior its discharge back to surface water body. Regular monitoring of the excess water should be done in case dredged material is disposed on land. This will help in assessing the efficiency of sediment trap system provided at site and controlling contamination of water by minimizing the sediments. • Dredgers should be equipped with adequate stack height (above the dredger height). It should use low sulphur diesel for the engine operations. • Dredger should not discharge any waste or oil or domestic waste to river. It should work on zero discharge concept (excluding the water suction and dredge disposal aspects) . Mobile toilet and bath station equipped with anaerobic digestion facility shall be provided for workers and staff involved in dredging operations at each of dredging locations. 						
2. Biological Environment							
Aquatic Ecology - Removal of benthic communities, increasing underwater noise levels,	<ul style="list-style-type: none"> • Dredging plan including timeframe should be prepared for each stretch prior to initiating dredging activity. • Dredging operations should not be carried out during the breeding and spawning season of the valued aquatic species which is from June to August (Monsoon season). Bends and meandering locations are the most potential breeding grounds as given at Fig 1.2 above.. 	Wildlife Protection Act, 1972 & 1993 and Bio-diversity Act, 2002	Within River	During Dredging	Part of Project Cost (IWAI & Contractor)	Contractor	IWAI/PMU/PMC

Environmental Issue /Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
increasing sediments/turbidity, release of locked pollutants in sediment, disposal of dredged material, increasing depth	<ul style="list-style-type: none"> Dredgers should be provided with Dolphin deflectors close to the sections near Dolphin Sanctuary at Sultanganj. This would prevent the sucking of the animals (fish) swimming nearby. But such dredgers are inefficient and costly. Measures like provision of bubble curtains or creation of agitation in water should be carried out prior to carrying out dredging operations so as to provide avoidance time and let the species move away from dredging point and to prevent any injury/mortality. Dredging operations should be halted in case of sighting of aquatic mammal in adjoin locations. Contractors should submit SOPs and action time chart with risk management plan prior to any dredging work. Dredging contractor should follow the defined safety procedures to avoid accidents and spills, and IWAI should ensure that other vessel users are provided with adequate information and instruction to avoid conflict with the dredgers. 						
Avifauna (Migratory & water birds)	<ul style="list-style-type: none"> Dredging operations should be restricted to day time only, i.e. 6:00 Am-10:00 Pm only to minimize noise impacts on the avifauna. Dredgers should be equipped with the noise reduction/masking equipment to reduce the noise generation inside and outside water. Noise from dredgers can be reduced at source (dredger) by isolation of exhaust system, by keeping engine room doors shut and by shielding. 	Wildlife Protection Act, 1972 & 1993 and Bio-diversity Act, 2002	Within River & bird areas along NW-1	During Dredging	Part of Project Cost (IWAI & Contractor)	Contractor	IWAI/PMU/PMC
3. Socio-Economic Environment							
Location of Socio-economic importance and socio-	<ul style="list-style-type: none"> Dredging operations should be restricted to day time only, i.e. 6:00 Am-10:00 Pm only to minimize noise impacts on the residents of nearby settlements. Dredgers should be equipped with the noise 	--	Area near the dredging operations and dredging locations	During dredging operation	Part of project cost (IWAI/Contractor)	Contractor	IWAI/PMU/PMC

Environmental Issue /Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
economic environment	<p>reduction/masking equipment to reduce the noise generation</p> <ul style="list-style-type: none"> • Dredgers should be placed in consultation with the fishermen so as to minimize the impact on their equipment/gears and their fishing activities • Dredging location should be away from bathing shelter being constructed for the women under this project. Dredge material should not be disposed close to these bathing shelters. • Dredging should not be carried out in the areas close to Ghats and buffer of 2 km should be maintained for dredging during time of religious gatherings during Chat and other important religious river related festivals. • In case contaminated dredged material is disposed on land, then it should be disposed at approved TSDF sites to prevent any harm to community residing in nearby areas. • Material to be disposed on land may create nuisance odour due to exposure of anaerobic sediments with air. Thus if land disposal is involved then disposal site should not be in upwind direction of any settlement area or sensitive locations like hospitals, schools etc. • Post-dredging monitoring of the sediment nature, rate of sedimentation shall be made by the contractor. This analysis output should be reviewed and dredging plan should be improved as may be required before start of next round of maintenance dredge. • Re-use of dredged material should be explored if dredged material is not contaminated. Economically and environmentally feasible options can be adopted to minimize the dredge spoil 						

Environmental Issue /Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	<p>burdens. Some of such measures include</p> <ul style="list-style-type: none"> ○ Usage for beach nourishment/development of artificial beach/deposition on shoal & thus enrichment of habitat ○ Usage for coast/bank protection purpose/flood protection ○ Usage as construction material for land filling, road foundations, dikes, mounds, noise/wind barriers constructions. . 						
4. Occupational Health and Safety							
Safety for workers and community	<ul style="list-style-type: none"> • Contractor should provide adequate safety training to each worker involved. Workers should also be provided with requisite PPE (such as ear muffs, hand gloves, safety boots, floats). • Log book should be maintained for recording the accidents at site/mortality of the any marine mammal should be maintained. Analysis shall be carried out to assess the reason for the accident/mortality and measures should be taken to prevent repetition of the event. • Contractors having experience of dredging and well trained staff should only be allowed to carry out dredging. This will help in prevention of spillage of dredged material or any accidents during the dredging operations • Contractors should submit method statement & risk assessment and Safety management plan prior to carrying out any dredging work. Dredger should follow the defined safety procedures to avoid accidents and spills, and IWAI should ensure that other vessel users are provided with adequate information and instruction to avoid conflict with the dredgers. 	--	Area near the dredging operations and dredging locations	During dredging operation	Part of project cost (IWAI/Contractor)	Contractor	IWAI/PMU/PMC

Environmental Issue /Component	Remedial Measure	Reference to laws and Contract Documents	Approximate Location	Time Frame	Indicative / Mitigation Cost	Institutional Responsibility	
						Implementation	Supervision
	<ul style="list-style-type: none"> Dredging plan should be prepared by contractor and submitted to IWAI for approval prior to carrying out dredging operations. Dredging plan should be reviewed considering its location w.r.t environmental sensitive locations/archaeological locations/cultural festival/pollution influx in the area/dredged material quality & texture/available depth etc.. 						

Environmental Monitoring Plan

Sr. No.	Aspect	Parameters to be monitored	No. of Sampling Locations & Frequency	Standard methods for sampling and analysis	Role & Responsibility	
					Implementation	Supervision
1.	Air Quality (Ambient Air Quality)	PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂ , HC and CO	2 locations within 100 m and 500 m of dredger location with frequency of once in month at dredging location	Fine Particulate Samplers for PM _{2.5} Respirable Dust Sampler fitted PM ₁₀ Respirable Dust Sampler fitted with Gaseous sampling arrangements for SO ₂ and NO ₂ , CO analyser / portable CO meter for CO portable HC meter or tubes for HC; TO-14A, TO-15, USEPA method for sampling and analysis of VOCs in ambient air	Contractor	IWAI & PMC
2.	Surface Water Quality	Physical, chemical and biological parameters	3 locations at dredging location, 100 m and 500 m from dredging location with frequency of once per month for all Physical, chemical and biological parameters 1 sample at dredge material disposal area in river	Grab sampling and analysis by using standard methods	Contractor	IWAI & PMC
3.	Drinking Water Quality	Physical, chemical and	Physical, chemical and	Grab sampling and analysis by using standard methods	Contractor	IWAI & PMC

		biological parameters	biological parameters for drinking water provided to the employee and labour			
4.	Noise Level	Day time and night time noise level (max, min & Leq levels)	2 location including 10 m of dredger location and 100 m of dredger location	Noise meter	Contractor	IWAI & PMC
5.	Dredged soil	For heavy metal, pesticide & insecticide contamination	Dredged sand samples- two samples from each location	--	Contractor	IWAI & PMC
6.	Visual checks for safe and hygienic disposal of the sediments	Proper disposal as mentioned in EMP	All throughout dredge disposal works	--	Contractor	IWAI & PMC
7.	Aquatic ecology	Big fishes, dolphins, turtles etc dead or collided during dredging operation	All throughout dredge disposal works	Register maintenance for accidents	Contractor	IWAI & PMC

Annexure 1.1: Standards for onshore & off-shore disposal of dredged material

Criteria for Disposal of Harmful Bottom Sediments: No specific standards are defined in India for disposal of dredged material. If dredged material is toxic / harmful then these sediments should either be disposed off in landfill or in Sea. Criteria followed in Japan are given in the **Table 1**.

Table 1: Criteria for Harmful Bottom Sediments, Japan (unit: mg/l)

Contaminated Material	Dumping in Landfills (mg/l)	Dumping at sea (mg/l)
Alkyl mercuric compounds	Not detectable	Not detectable
Mercury and its compounds	0.005	0.005
Cadmium and its compounds	0.1	0.1
Lead and its compounds	1	1
Organophosphorus compounds	1	1
Chromium (VI) compounds	0.5	0.5
Arsenic and its compounds	0.5	0.5
Cyanogen compounds	1	1
PCB	0.003	0.003
Copper and its compounds	-	3
Zinc and its compounds	-	5
Fluoride	-	15

Note: Criteria are based on the examination of dissolution of contaminated materials

Source: Assessment of the Environmental Impact of Port Development, United Nations, New York, 1992

Criteria for Off-shore dumping of Dredged material: No criteria are defined for off-shore disposal of dredged material in India, thus reference to the UN standards can be made and is given in **Table 2**.

Table 2: Criteria for Off-Shore Dumping of Dredged Material (unit: ppm or ppb)

Substance	Canada	USA
PCB (ppb)	100	380
Hg (ppm)	0.5	0.15
Cd (ppm)	0.60	0.7
Zn (ppm)	169	105
Cu (ppm)	45	68
As (ppm)	(5 – 25)	12.5
Pb (ppm)	45	33
Organochlorine pesticide (ppb)	10 for any compound	5.0 Sum of DDT, DDE and DDD
Polyaromatic hydrocarbon (ppb)	(1,000) Sum of 16 compounds	680

Substance	Canada	USA
		Sum of six low mol. Wt. compounds 2,690 Sum of 10 high mol. Wt. compounds

Source: *Assessment of the Environmental Impact of Port Development, United Nations, New York, 1992*