Government of Sindh, Pakistan
Irrigation Department

Sindh Barrages Improvement Project -
Sukkur Barrage Rehabilitation and Modernization

Environmental and Social Management Plan
SBIP/S4: Desilting of Rice Canal in Head Reach (RD 0 to 82.4)

Sindh Irrigation Department

February 2023

Contents

List of Acronyms

AED	Anti Encroachment Drive
BCM	Billion Cubic Meter
BDL	Below Detectable Limit
CEAP	Construction Environmental Action Plan
CSC	Construction Supervision Consultant
Cumec	Cubic meters per second (m³/s)
Cusec	Cubic feet per second (cf/s)
ECP	Environmental code of Practice
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ESA	Environmental and Social Assessment
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
GoS	Government of Sindh
IEE	Initial Environmental Examination
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
MEC	Monitoring and Evaluation Consultant
MCM	Million Cubic Meters
NEQS	National Environmental Quality Standards
OHS	Occupational Health and Safety Specialist
PAK EPA	Pakistan Environmental Protection Agency
PCMU	Project Coordination and Management Unit
PMO	Project Management Office
POE	Panel of Experts
PPE	Personal Protective Equipment
RAMSAR	Convention on Wetlands Signed in Ramsar Iran
RAP	Resettlement Action Plan
RCC	Reinforced Cement Concrete
RPF	Resettlement Policy Framework
SAP	Social Action Plan
SBIP	Sindh Barrages Improvement Project
SEPA	Sindh Environmental Protection Act
Sindh-EPA	Sindh Environmental Protection Agency
SID	Sindh Irrigation Department
SIDA	Sindh Irrigation and Drainage Authority
SMF	Social Management Framework
WBG	World Bank Group
WWF	World Wide Fund for Nature

Conversions

British Units	Metric Units	Metric Units	British Units
1 ft	0.305 m	1 m	3.28 ft
1 mile	1.609 km	1 km	0.621 miles
1 cusec (cf/s)	0.283 cumec (m³/s)	1 cumec (m³/s)	35.315 cusec (cf/s)
1 ac	0.405 Ha	1 ha	2.47 ac
1 MAF	1.2335 BCM	1 BCM	0.8107 MAF

Executive Summary

Scope of this document. This document covers the Site-Specific Environmental and Social Management Plan of Contract S4 of the Sindh Barrages Improvement Project (SBIP). Contract S4 involves the desilting of the Rice Canal. Although the Environmental and Social Assessment (ESA) of SBIP include desilting of the Rice Canal, some changes have been made in the scope of desilting works. Hence, this ESMP has been prepared as an addendum to the original ESA.

Scope of Contract S4. The scope of civil works in Contract S4 includes the removal of approximately 4.94 million cubic meters (MCM) of silt from a 25km length of Rice Canal (RD 0 to RD82.4) and disposal in agreed areas. The initial reach of the Rice Canal, from RDO to RD26, has been previously subjected to Anti-Encroachment Drive (AED), following the orders of the Supreme Court, to remove the squatters from the embankment. The desilting works from RD0 to RD26 will be confined to the existing canal bed width and side slopes, and no work will be carried out on the embankments.

Disposal Sites for Excavated Sediments. Six sites have been identified for the disposal of sediments, and six other sites are identified as potential sites in case more sites are needed. These sites have been identified in consultation with local stakeholders and through an environmental and social (E&S) screening assessment. The locations of these sites are the screening criteria provided in the main report.

Construction Period. The Contractor will undertake the desilting works during the Rice Canal annual closure period of 6 months from November 2023 to April 2024. The works must be completed within this timeframe before the canal is reopened in May 2024.

Potential E&S impacts and risks during construction. The potential E&S impacts of the S4 contracts are associated with the excavation, hauling and disposal of sediments from the canal. The key impacts include potential disruptions to the irrigation water supply from the canal, interactions with AED-affected areas, workers' health and safety, community health and safety, including SEA/SH risks and traffic safety, air and noise pollution, risk of stranded dolphins in the canals, damage to vegetation along the canal. Many of these impacts are short-term and localized and can be mitigated by implementing the mitigation measures provided in the main report.

Key Mitigation Measures. The proposed construction works will be carried out during the six-month regular canal closure period to ensure farmers get the required supplies for the critical seeding period in May. The workers for the Construction (about 50 workers required for Construction) will be hired from the local communities to minimize the impacts of labour influx and potential cultural conflicts with the local community. Any outside workers will be accommodated in the construction camps with adequate water and sanitation facilities. The workers will need to sign a code of conduct, as a part of their employment contracts, on the prevention of SEA/SH risks. The contractor will develop and implement an OHS plan, which will be reviewed and approved by the CSC and PMO. The contractor's OHS officer is responsible for conducting job hazard assessments at the work sites, regular safety audits and training workers. If any dolphins or other aquatic species are found stranded in the canals, the Contractor will rescue them with the support of CSC and the wildlife department. As part of the original Project, a series of Environmental Code of Practices (ECPs) have been prepared to address routine E&S impacts associated with the Construction works, such as waste, hazardous waste, dust, air and noise pollution, soil and water pollution, and so on. These ECPs will be included in the bidding documents. During the Construction, regular monitoring will be carried out by the CSC and PMO on the implementation of ESMP.

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Potential Interaction with AED-affected Areas. The Sindh Irrigation Department (SID) confirms that the proposed works in this contract will not disturb any squatters and their structures and will have no interaction/physical contact with the AED-affected areas. These areas that were impacted by the AED are particularly sensitive in the project area. Keeping this sensitivity in view, it is critical that the areas subjected to the Govt led AED is ringfenced and no works will be undertaken on the embankments impacted by the AED, no materials will be stored, and these areas are not used for transportation or for any other activity related to this contract. The AED areas will be separated from the construction works through fencing around the construction sites.

Potential E&S impacts and risks during Operation. The proposed works will not have any adverse impacts during the routine operational stages of the Sukkur barrage and Rice Canal. The barrage and canals have been in operation for about 85 years, and the proposed rehabilitation works will not alter the current operational regime of the barrage and hence will not create any additional impacts. The desilting works will have a positive impact on the increased flow rates that can be passed down Rice Canal to farmers downstream.

Implementation of ESMP. In order to make the Contractors fully aware of the implications of the ESMP and responsible for ensuring compliance, technical specifications in the tender documents will include compliance with mitigation measures proposed in ESMP. The Contractor will be made accountable through contract documents for the obligations regarding the environmental and social components of the Project. PMO will propose adequate Environmental, Social, Health and Safety (ESHS) Conditions, as identified in the ESMP, in the bidding documents. These include (i) Past performance of the Contractor on ESHS aspects, including SEA/SH, (ii) one percent of the contract value as Environmental and Social Performance Security, (iii) Code of Conduct of Contractor's Personnel, and Progressive penalties where there has been a failure to perform an ESHS obligation.

Responsible Staff for Implementation of ESMP. The Project Management Office (PMO) of SBIP is responsible for overall coordination on the implementation of ESMP. It has a Deputy Director Environment, a Deputy Director Social and a Deputy Director Communications. The Contractor shall be responsible for the implementation of all mitigation measures associated with the construction-related impacts. The Contractor's staff includes an environmental coordinator, an OHS officer, a community liaison officer and a social safeguard officer. In addition, the Construction supervision consultant will also have an environmental specialist and a social specialist to oversee the implementation of the ESMP by the contractor.

Grievances Management. A project-level grievance redress mechanism (GRM) has already been established. As a general policy, the Contractor and PMO will work proactively towards preventing grievances by implementing impact mitigation measures and community liaison activities that anticipate and address potential issues before they become grievances. Complaints which are not resolved at the site by the Contractor are to be forwarded to the Project executing authority (PMO) to address. For this purpose, a complaint cell has been set up at PMO in Sukkur, chaired by the Deputy Project Director. If a complaint is not resolved locally, it could be escalated to a Grievance Redress Committee set up in Karachi.

Consultations. Consultations on the proposed works have been carried out with community leaders and members near the construction sites, land owners and community members near the proposed disposal areas, and relevant government agencies, including the Sindh Wildlife Department. The feedback from consultations was overall supportive of the proposed desilting works from both local communities and government agencies, as they will restore the irrigation and drinking water supplies in the canal.

Disclosure. The ESA summary and ESA reports are already disclosed on the SID website and World Bank's external website. This ESMP of Rice Canal Desilting will also be disclosed on the SID website. The hard copies of the documents will be made available to the communities through the library of the Sukkur Barrage.

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1 Introduction

The **Sukkur Barrage Rehabilitation and Modernization Project (the Project)** is a project of the Government of Sindh (GoS) to rehabilitate the 85-year-old Sukkur barrage to enhance its useful life to safeguard the reliable supply of irrigation water to about 3.34 million ha[1]. The Project is located near the towns of Sukkur and Rohri in Sindh province. The World Bank is funding this Project through Additional Financing (AF) under 'Sindh Barrages Improvement Project' (SBIP). Sindh Irrigation Department (SID) is the executing agency of the Project. **A comprehensive Environmental and Social Assessment (ESA) has been carried out for the Project in 2017**, which was approved by the World Bank[2] and Sindh Environmental Protection Agency. This included an Environmental and Social Management Plan (ESMP). It was disclosed in 2018.

An Environmental and Social Management Plan (ESMP) for Cofferdams was prepared in January 2022 as an addendum to the ESA for the works which are not covered in the original ESA. This Addendum also covered additional environmental and social issues, such as COVID-19 and Sexual Exploitation and Abuse (SEA)/Sexual Harassment (SH).

The construction works in the Project have been divided into the following four construction contracts;

- SBIP/S1: Restoration and up-gradation of Sukkur Barrage
- SBIP/S2: Dredging and excavation from the pocket, approach and tail channels of Sukkur Barrage
- SBIP/S3: Procurement of dredger and performance demonstration
- SBIP/S4: Desilting of Rice Canal

The proposed works in Contract SBIP/S4 have changed to some extent from the original project description provided in the ESA of 2008 and Addendum ESMP 2022. Originally, desilting in all three canals off-taking from the Right Bank of Sukkur Barrage was envisaged, with material excavated from the canals being reused for embankment remodelling. The scope has now been reduced to desilting of the head reach of Rice Canal from RD 0 to RD 82.4 with no embankment remodelling.

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Therefore a **Site-Specific Environmental and Social Management Plan for SBIP/S4 Desilting of Rice Canal has been developed and presented in this report.** This ESMP report supplements the above-referred ESA and Addendum documents and should be read in conjunction with these reports.

1.1 Background

Location: Sukkur barrage is located at longitude 68° 51'E and latitude 27°41'N across the River Indus, some 362 km from Karachi. The Sukkur city (population 0.523 million) is located on the right bank of the barrage and the Rohri town is located on the left bank of the barrage (facing downstream). The location map of the Sukkur barrage and its command area is shown in Figure 1.1. The Barrage is located about 118 km downstream of Guddu Barrage and about 253 km upstream of Kotri Barrage.

Need for improvement of Sukkur barrage and Right Bank Canals. After eight decades of its useful life, the Sukkur barrage in Sindh has developed major safety issues. The feasibility study

[1] The potential command area of Sukkur barrage is about 3.34 million ha, but actual irrigation area is about 3.08 million ha. About 600,000 farming households are directly benefitted by the barrage.

[2] https://documents.worldbank.org/en/publication/documents-reports/documentdetail/356891516200660593/environmental-and-social-assessment

of the Sukkur barrage has identified many issues such as (i) insufficient flood evacuation capacity through the barrage arches under the gates, (ii) sedimentation of the left and right pockets in front of the intakes of the canals, (iii) silting up of Right Bank Canals, (iv) scour at the left pocket, (v) outdated equipment and electrical system, and (vi) need for some local structural repairs on arches, piers and road deck. There is a risk to the barrage in case of large flood events, and any failure of the barrage during those events is likely to be catastrophic, affecting water supplies to all the irrigated areas of the barrage and flooding the Sukkur town. The feasibility study concluded that substantial rehabilitation, maintenance and improvement works were needed, and that works are also required to increase the flood passage capacity of the barrage to 1.2 million cusecs (33,980 m^3/s) from the current flood capacity of 0.9 million cusec (25,485 m^3/s). It also concluded that sedimentation was a major issue, particularly in the Right Bank Canals. This reduced canal capacity is resulting in insufficient irrigation flows being supplied to farmers.

Original Scope of the SBIP/S4 contract for Right Bank Canals desilting works. As per the feasibility study and ESA, the proposed desilting works include the following:

- Removal of approximately 4.24 million cubic metres (MCM) of silt from the Right Bank Canals (3.07 MCM from a 25 km length of Rice Canal; 0.92 MCM from a 7 km length of North-Western Canal; and 0.25 MCM from a 7 km length of Dadu Canal)

Updated Scope of the SBIP/S4 contract Right Bank Canals desilting works. Based on the updated engineering designs, the new scope of the desilting works are:

- Removal of approximately 4.94 MCM of silt from a 25km length of Rice Canal (RD[3]0 to RD82.4) and disposal in agreed areas.

Rationale for changes in the SBIP/S4 scope of work. Studies for the rehabilitation and remodeling of all three Right Bank Canals will be undertaken under a separate future World Bank-funded project (Sindh Water and Agricultural Transformation project). It was therefore decided by the government, with the approval of the World Bank, to undertake only desilting of the head reach of Rice Canal under SBIP as an emergency 'no regret' measure.

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1.2 The Environmental and Social Assessment

Original Environmental and Social Assessment of the Project. The Sindh Irrigation Department (SID) prepared an ESA and Social Management Framework (SMF) for the Sukkur Barrage Rehabilitation between 2012 and 2017. The ESA adequately assessed all potential impacts associated with the implementation of Sukkur rehabilitation and includes an environmental and social management plan (ESMP). During the preparation of SBIP, no land acquisition or resettlement was anticipated for Sukkur Barrage rehabilitation. The SMF was prepared, including Resettlement Policy Framework (RPF) to guide the preparation of resettlement action plans (RAP) for any unforeseen land acquisition, and a Communication Strategy to support continued consultations during project implementation. These documents were approved by the World Bank in December 2017 and disclosed in 2018.

Dolphin Management Plan. The Indus River between Guddu and Sukkur barrages is the nationally designated Indus Dolphin Reserve for Indus River Dolphin and also a RAMSAR wetland of international importance. This part of the river contains a large population of dolphins. Impacts of construction activities on dolphins were assessed, and mitigation measures are

[3] RD (Reduced Distance) is a measurement of canal chainage. Distance between each RD is 1000 ft

proposed in the ESA 2018. A dolphin conservation and management plan is being implemented under SBIP to strengthen the ongoing conservation activities.

Scope of this current ESMP. This ESMP only covers the environmental and social impacts and risks associated with implementing the SBIP/S4 Desilting of Rice Canal contract package. The scope of work for this package is only desilting works (as described in section 1.1). The regulatory framework, environmental and social baseline conditions in the project area, and impact assessment presented for the original scope of work in the ESA remain the same and are not repeated in this document. This ESMP, along with the previous ESA and Addendum documents, will be referred to in the bidding documents of this particular contract. Prior to the start of the construction works, the Contractor will develop Contractor's Environmental and Social Management Plan (C-ESMP) based on this ESMP and aforementioned ESA and Addendum for the approval of the construction supervision firm (CSC).

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Contents of the present document: Detailed description of the proposed SBIP/S4 contract activities and an analysis of alternatives are given in Chapter 2. Potential adverse impacts of the proposed activities are described in Chapter 3. The assessment of impacts and mitigation measures, institutional arrangements and conditions to be included in the bidding documents are described in Chapter 4. Chapter 5 describes the stakeholder consultations.

Anti-Encroachment Drive: Though the embankments of the right bank canals are not part of the project scope however, as shown in Figure 1.3, approximately 26 RDs of the embankments of the Right Bank Canals were previously encroached by squatters, and the government has removed some of the encroachers under the Anti-Encroachment Drive (AED) following the orders of the Supreme Court. These areas that were impacted by the AED are particularly sensitive in the project area. Keeping this sensitivity in view, it is critical that the areas subjected to the Govt led AED are ringfenced and no works will be undertaken on the embankments impacted by the AED, no materials will be stored and these areas are not used for the transportation or for any other activity related to this contract. The desilting works from RD0 to RD26 will be confined to the existing canal bed width and side slopes. The AED areas will be separated from the construction works through fencing around the construction sites. Figure 1.4 presents the location of AED-affected structures near the vicinity of the SBIP/S4 construction sites. **The SID confirms that the proposed works in this contract will not disturb any squatters and their structures and will have no interaction/physical contact with the AED-affected areas**.

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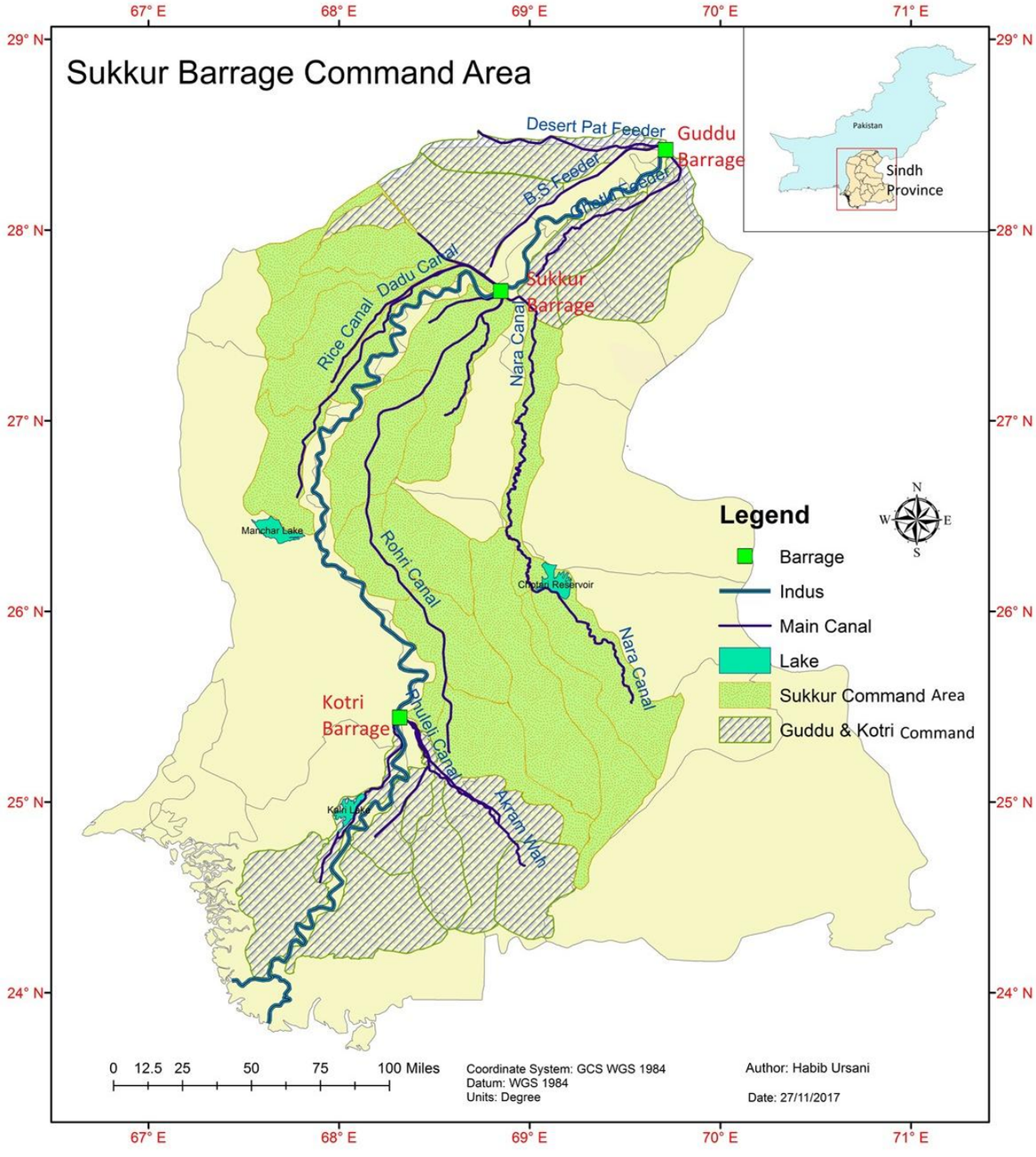

Figure 1.1: Location of Sukkur Barrage and its command area (including Rice Canal)

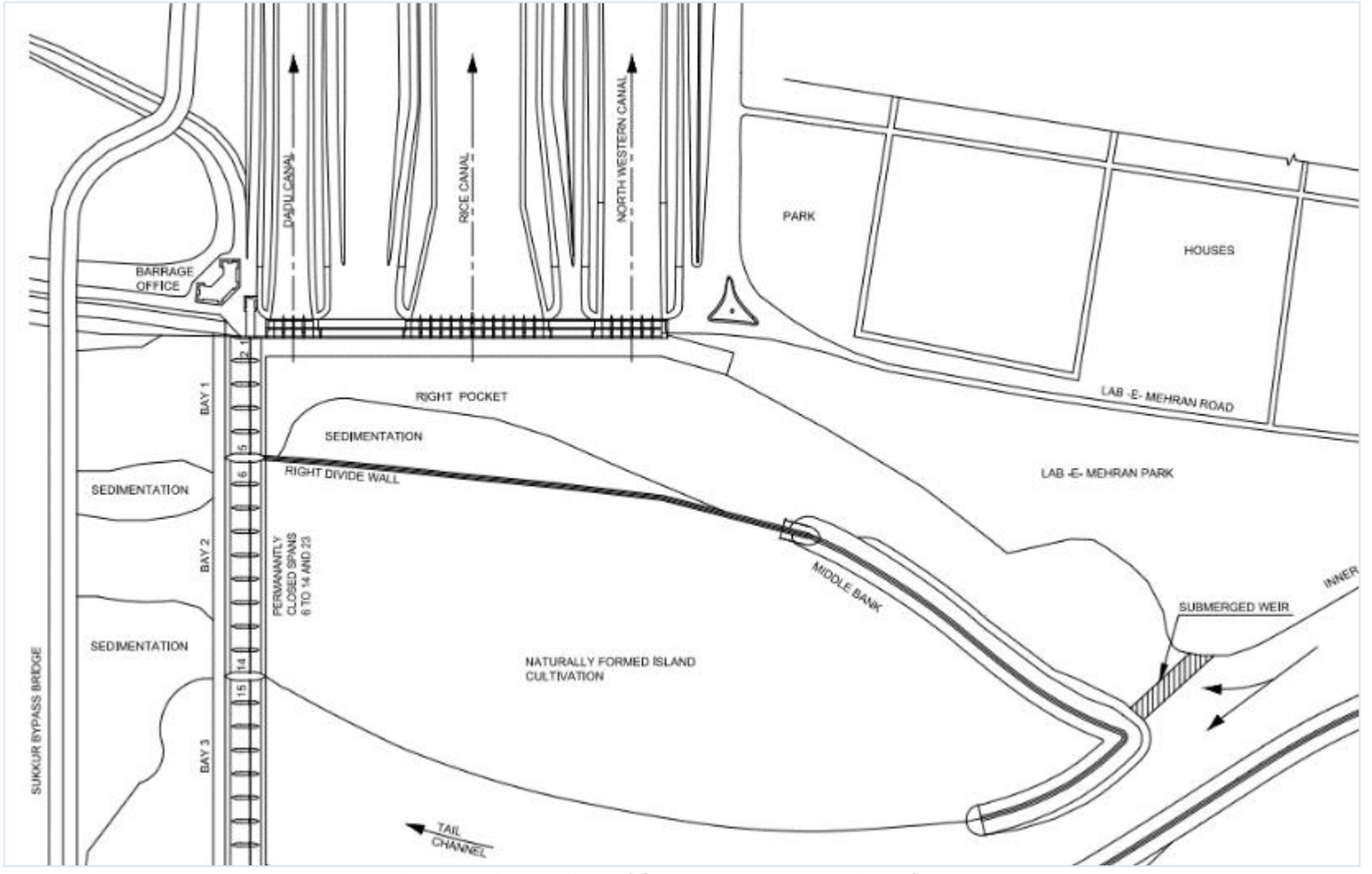

Figure 1.2: Location of Sukkur Barrage and Rice Canal

Figure 1.3: Location of AED Affected Areas

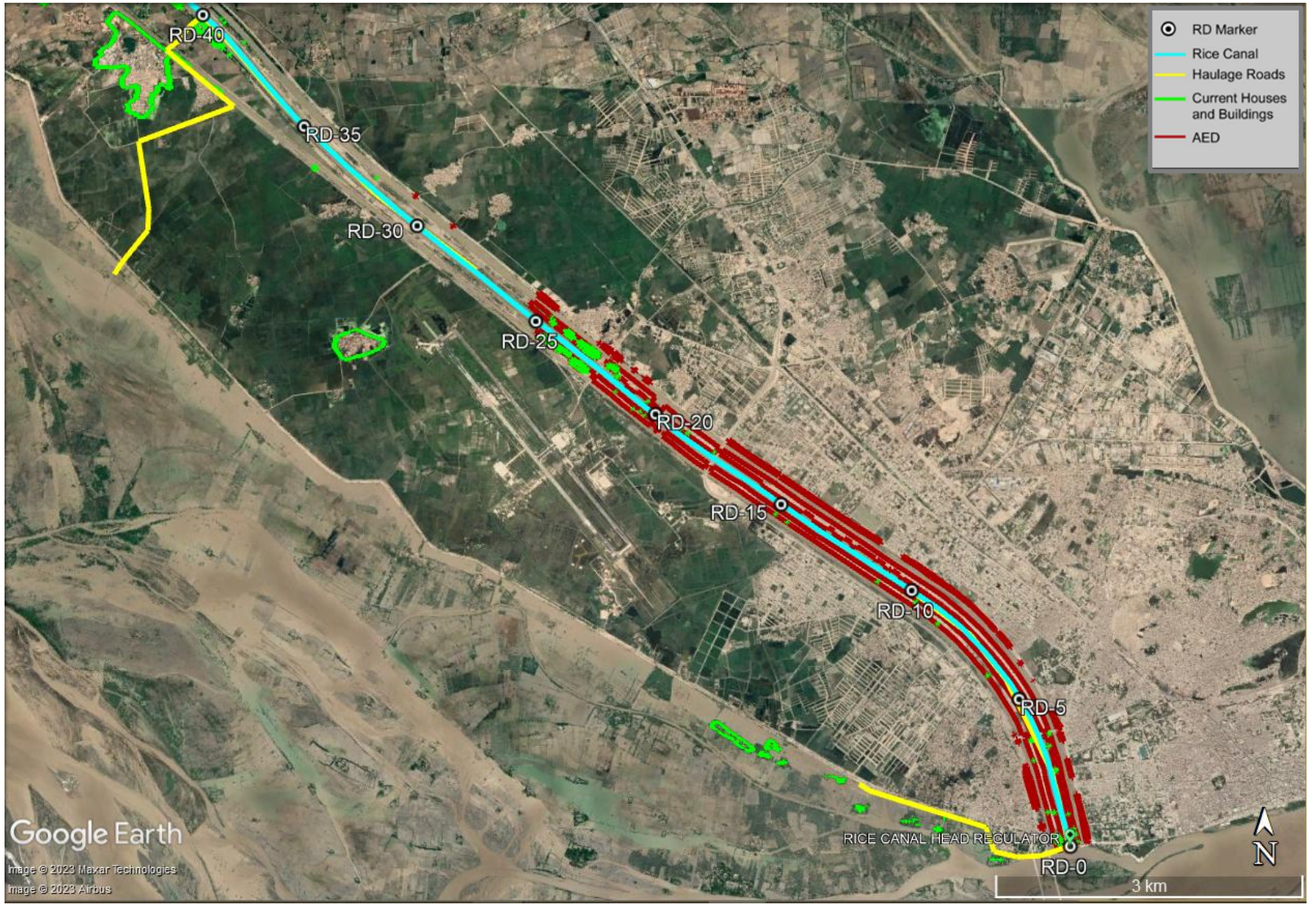

Figure 1.4(a): Location of current buildings (including housing) in project area: RD0 - 40

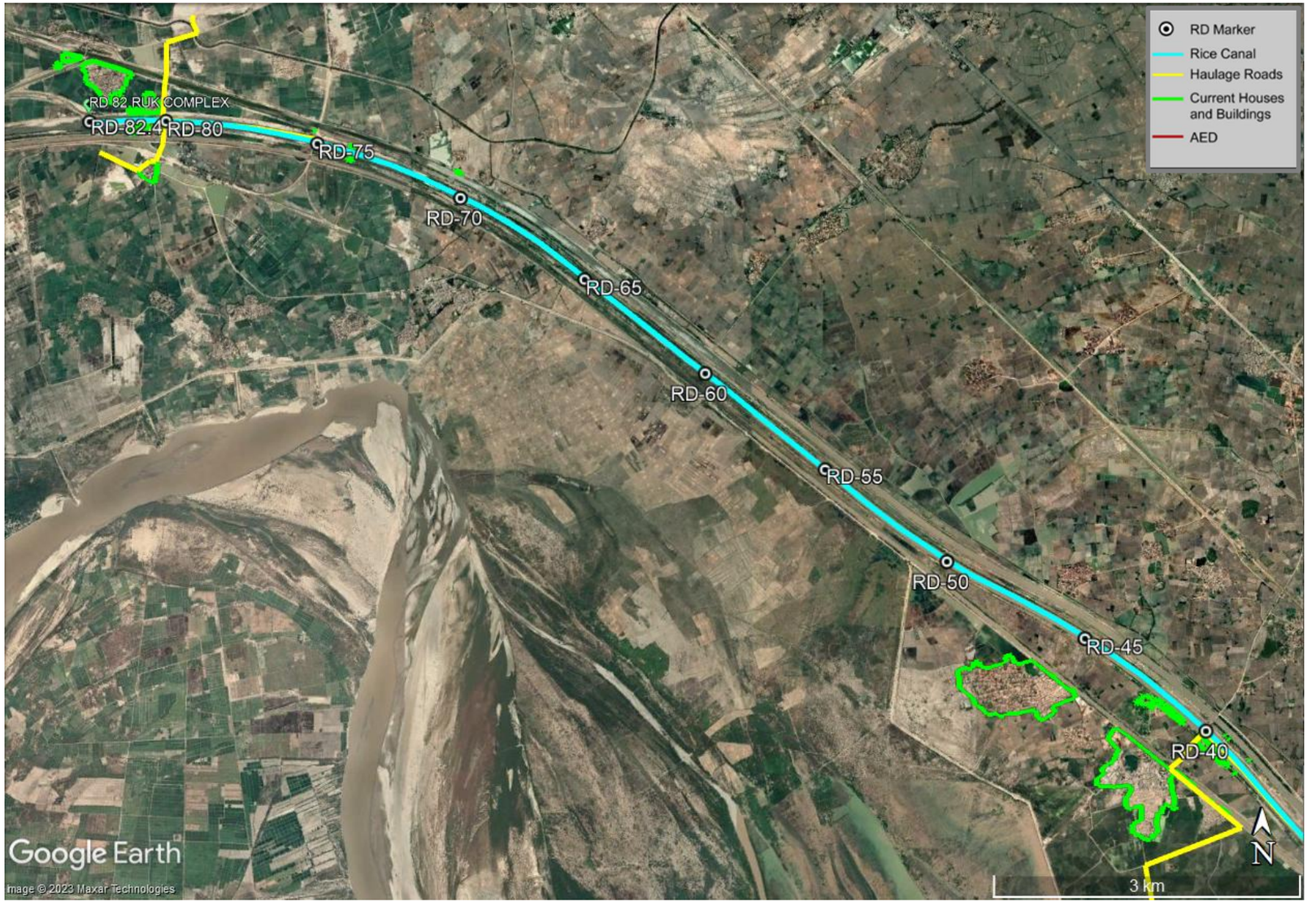

Figure 1.4 (b): Location of current buildings (including housing) in project area: RD40 – 82.4

2 Project Description

2.1 Background

Rehabilitation works: Sukkur Barrage has three canals offtaking from the right bank, the Rice, Dadu and NW Canals. The feasibility study for the rehabilitation of Sukkur Barrage concluded that sedimentation was a major issue, particularly in the Right Bank Canals. This reduced canal capacity is resulting in insufficient irrigation flows being supplied to farmers.

As described in the original ESA/ESMP 2018, the Indus in this area is dominated by characteristics of the braided river (meandering channels, temporary shoals and alluvial sand tracts), barrage pondage and floodplain agriculture. The river generally carries water through its entire width during the high-flow season of June to September, while the water will be limited to a few channels during the remaining months. The river carries high sediment loads during the months of July and August when the river flows are at maximum (concentrations of about 100 to 110 million tons of sediments). During the remaining months of the year, it carries about 40 million tons of sediment. The water quality of the Indus in high flow season is highly turbid, ranging from 970 to 1220 NTU and with total suspended solids of 1275 to 1860 mg/L. The high sediment loads in the river water cause continuous siltation of canals, thus reducing their capacity and efficiency. The proposed works will restore the original capacity of the Rice Canal and improve the irrigation water distribution, reliability, and equity of irrigation flows. The irrigation flows will be reached all the farmers in the entire command area.

2.2 Description of Proposed Desilting Works

The scope of desilting works for SBIP/S4 has changed since the original ESA/ESMP. Further studies for the rehabilitation and remodeling of all three Right Bank Canals will be undertaken under a separate future project (Sindh Water and Agricultural Transformation project). It was therefore agreed to undertake the desilting of Rice Canal under SBIP as an emergency 'no regret' measure. The canal was surveyed in January 2022, and the quantities of silt to be excavated for the desilting design were re-calculated (as summarized in section 2.2.2).

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The proposed works under the updated SBIP/S4 scope of work are given below:

- Removal of approximately 4.94 MCM (174 million cubic ft) of sediments from a 25km length of the head reach of Rice Canal (RD0 to RD82.4) and disposal in agreed areas

It should be noted that the desilting methodology and programme for the desilting presented in this ESMP are subject to further refinement by the Contractor during the implementation phase. This is because there could be some changes in bed levels and silt quantities since the design survey in January 2022, and Contractor may also propose other disposal sites.

2.2.1 Construction Programme

The desilting works will be undertaken by the Contractor during the Rice Canal annual closure period of 6 months from November 2023 to April 2024. The works must be completed within this timeframe before the canal is reopened in May 2024. The Contractor must develop a methodology to ensure the works are completed in this time. This is discussed further in mitigation measures. Chief Engineer Office Sukkur Barrage is responsible to ensure that no discharges are released during this time.

2.2.2 Design Features of Desilting

The desilting design discharge is proposed as 13,551 cusecs as per the previous design (from 1979). This discharge is sufficient for Rice Canal, on the basis that Warah Branch is to be

supplied solely from North West canal. This is understood to be possible following the desilting of NW Canal carried out by the Irrigation Department in the last closure period. The upstream and downstream design water levels are based on the Design Statement provided by the Irrigation Department. The required hydraulic gradient to establish a regime channel has been reviewed using the specialist software (CADIS) and adopting sediment parameters based on fieldwork carried out in 2022.

The resulting design has a slope of 1:12,500. The design cross-sections have been compared against the current survey levels to obtain the required desilting (cut) volume. An example cross-section for RD10 is shown in Figure 2.1.

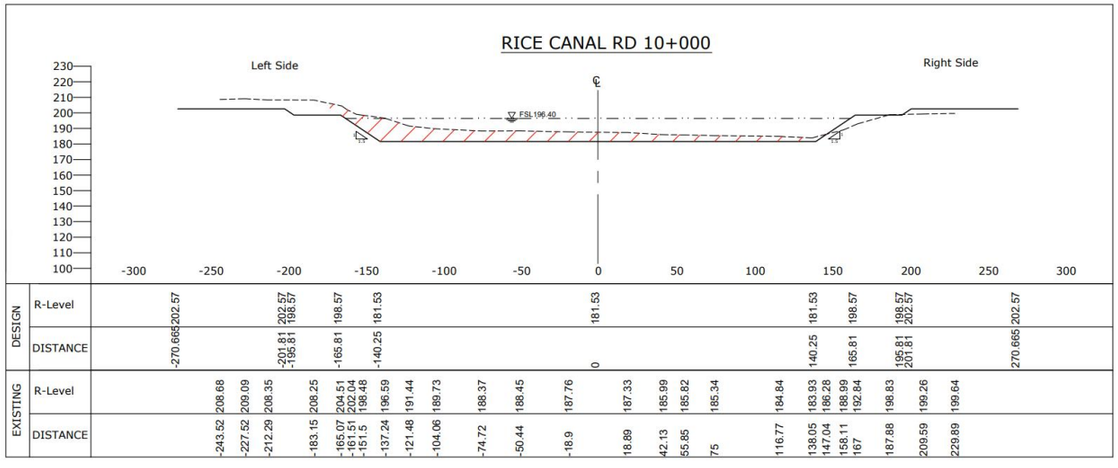

Figure 2.1: Example cross-section showing Rice Canal desilting works

2.2.3 Methodology of Desilting

Desilting Equipment: The works will be undertaken during the closure period when the canal is not flowing. It should however be noted that the water table in the surrounding ground may result in wet conditions and some dewatering measures may be required.

It is anticipated that a combination of construction equipment will be required, including front loaders and excavators in the canal, with dump trucks hauling the material to the agreed disposal areas. Temporary storage piles will be established at regular points along the canal bed. This equipment and methodology will be confirmed by the Contractor. Due to high groundwater levels from adjacent canals, the Contractor will likely need to undertake some dewatering works using pumps. The dewatered water will be released back into the canal.

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Disposal Material: The material will be transported by the Contractor to the approved disposal areas. The material quality was tested during the ESA study, and it found that the material was free of any contamination. The disposal method will follow the mitigation measures in this ESMP.

2.2.4 Alternatives for Desilting

There is urgent demand to restore supplies to the farmers who are served by the Right Bank Canals, in particular Rice Canal which has significant siltation. It requires urgent desilting in the short term, as well as studies and remodeling works to improve sediment management in the medium and long term.

An alternative method to increase flows down Rice Canal would be to increase the operating water levels. However, the pond level at Sukkur Barrage has already been increased above safe design levels; it should not be increased further at this time (noting the upcoming works under the SBIP/S1 contract). Other possible interventions, such as alteration of the Ruk Complex, requires detailed study before intervention. It is understood that these studies are planned under a separate future project (SWAT).

Desilting remains as the most viable option to restore the irrigation supplies, as per the latest desilting design. As the section between RD0 and RD 26 was affected by the Govt.-led anti encroachment drive, the civil works within the reach between RD0 to RD 26 will be carried out within the existing canal bed. This desilting design is therefore considered a 'no regret' measure.

As outlined in the original ESA 2018, an alternative to desilting in the closure period would be dredging during regular canal flow season. This however would require material transportation along the embankments, which is not possible in the area previously impacted by the AED (RD0 to RD26). Therefore undertaking the work in the dry means that the canal bed can be used for movement of excavators and transport of sediment through trucks. In addition, plant for dredging is more specialized and less readily available than plant for desilting.

Despite the Environmental and Social impacts of desilting, it is considered a critical intervention to restore adequate supplies to farmers in the command area.

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2.2.5 Review of Potential Disposal Areas

Various potential disposal areas have been identified in consultation with local stakeholders. Environmental and Social screening assessments have been undertaken of each potential area, to record the current land use and review if there are any environmental or social receptors that would be negatively impacted by the disposal of silt. Details are shown in Annex A.

Sites are considered most feasible if they fulfil the following criteria:

- Area that the previous AED did not impact.
- Land is owned by the Irrigation Department.
- Locations where the material can be re-used for benefit, such as flood affected low lying areas or housing developments.
- Minimal haulage distance to reduce cost/carbon and minimise E&S impact, such as traffic disruption to local communities.
- Minimal social receptors, such no nearby settlements that would be impacted by construction noise.
- Minimal environmental receptors, such as limited existing vegetation that would be impacted by disposal of silt.

The short list of options and summary of E&S screening is shown in Table 2.1 and in Figure 2.2. The options which are considered the most feasible are highlighted. For full details of the E&S screening checklists, see Annex A.

Table 2.1: Summary of assessment of potential disposal areas						
Sr.	**Name**	**Location**	**Land ownership**	**Technical comment**	**Environmental & Social - Key Aspects (see screening assessments for full detail)**	**Feasible**
1	River Indus downstream right side	27°41'14.54"N 68°50'7.71"E	Irrigation Department	High potential capacity	Proposed in initial ESA. Meandering / braided river and flood plain of the Indus which are cultivated in the higher / more substantiated shoals. The extent of the shoals (belas) varies every year due to erosion of the river or deposition of more silts by the river Certain cultivation areas were impacted by the August 2022 floods and filling the depressions may be beneficial. Community members have confirmed they want the material and have proposed the specific area (to be confirmed during implementation phase).	Yes
2	RD 30 to 82.4 right side common embankment (Rice-NWC)	RD58: 27°47'24.98"N 68°42'50.52"E	Irrigation Department	No haulage. Beneficial to build-back eroded embankments to reduce chance of failure. Relatively high capacity.	Specific areas with E&S receptors (e.g. existing cultivation, trees) have been removed from analysis and will be avoided. Ongoing access by Irrigation Department along inspection paths will be required.	Yes
3	RD 30 to 82.4 left side common embankment (Rice-Dadu)	RD63: 27°47'24.98"N 68°42'50.52"E	Irrigation Department	No haulage. Beneficial to build back eroded embankments to reduce the chance of failure	Specific areas with E&S receptors (e.g. existing cultivation, trees) have been removed from analysis and will be avoided. RD 40 to 50 is a private land owner and will not be utilized. Ongoing access by Irrigation Department along inspection paths will be required.	Yes
4	Land opposite sports complex	27°46'47.18"N 68°46'45.45"E	Private	Land for future housing development. Land owner indicated that the timing of receiving the material from SBIP-S4 would be acceptable. Adjacent to main road.	Barren land - minimal vegetation. Utility line and minor access road crossing the site.	Potential
5	Land within the sports complex (stadium ground)	27°46'48.52"N 68°47'5.19"E	Private	The timing of receiving the material may not match the construction schedule of the sports complex. Ongoing construction works are programmed to complete before SBIP-S4.	Existing construction site. Land proposed is the stadium ground and has already been cleared, with no further E&S impacts. Assumed that the additional traffic from SBIP-S4 haulage trucks in the vicinity of the area would be nominal	Potential
6	River Indus right side Flood embankment toe ROW	27°44'52.21"N 68°44'35.00"E	Irrigation Department	Certain areas of the toe were impacted by the August 2022 floods, and filling the depressions may be beneficial to the embankment	In some places the ROW is being cultivated by encroachers – however the material may be beneficial in protecting the embankment.	No
7	Village Arbab Ali Khan Ghumro – pond area	27°46'0.25"N 68°44'26.89"E	Private	Relatively low capacity	Pond area within the village with hyacinth vegetation. Potential utilized as drainage area – filling this may have adverse impacts	No

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8	Village Haji Yar Muhammad Ghumro – pond area	27°45'36.52"N 68°45'3.06"E	Private	Relatively low capacity	Pond area within the village with minimal wetland vegetation. Potential utilized as drainage area (noting structures which may be outfall drains) – filling this may have adverse impacts	No
9	Land adjacent to Bagarji Sukkur Road	27°45'4.60"N 68°45'50.64"E	Private	Relatively low capacity. The area was previously excavated.	Requested by the landowner – positive benefit	Yes
10	Barren land north-east of Ruk Complex	27°49'36.66"N 68°39'32.18"E	Private	Relatively high capacity	Barren land – minimal vegetation. Some waterlogged areas	Yes
11	Housing developers – Sukkur City	Various 27°42'2.98"N 68°49'34.29"E	Private	Relatively high capacity	The positive benefit of reusing material	Potential
12	Housing developers – near sports complex	Various 27°46'11.57"N 68°47'25.58"E	Private	Relatively high capacity	The positive benefit of reusing material	Potential
13	Floodplain area Jhali Kalwari	27°47'23.17"N 68°42'17.51"E	Private	High potential capacity	The extent of the shoals (belas) varies every year due to erosion of the river or deposition of more silts by the river. This area was impacted by the August 2022 floods and filling the depressions may be beneficial.	Potential
14	Depression areas near Ruk Complex	27°48'36.88"N 68°38'53.62"E	Private	Relatively low capacity	Depression ponded area, redundant fish pond, and agricultural fields (low lying). Railway embankment ROW to be avoided. Wetland areas to be avoided. This will leave reasonable percentage habitat for birds.	Yes
15	RD 0 to 30 left side and right side common embankment	RD10: 27°42'34.12"N 68°49'49.95"E	Irrigation Department	No haulage. Beneficial to build-back eroded embankments to reduce chance of failure. Relatively high capacity.	Subject to previous AED – cannot be used	No
16	Famers collect from temporary disposal areas	Unspecified	Various	Challenging to formalize the coordination schedule and temporary storage areas	The positive benefit of reusing material. Less control of haulage potential negative impacts/mitigation measures	Potential

2.2.6 Haulage Routes

The various potential haulage routes from Rice Canal to the disposal areas have been reviewed, with the final options verified on-site to confirm that they are suitable for haulage trucks. The following criteria have been reviewed:

- No interaction with the areas subjected to Government led AED
- The suitable road surface is in good condition
- No obstructions (such as a bridge with limited loading capacity)
- Not susceptible to regular flooding
- Minimum haulage distance
- Minimum disruption to local communities. In some cases, longer main roads have been chosen over shorter routes passing directly through villages.

It is anticipated that up to 150 haulage trucks will be utilized for the works, undergoing approximately 10 trips a day (in sociable working hours within the contractual working hours of 8am to 5pm). The impact and mitigation measures of haulage activities are discussed further in Chapter 3.

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2.3 Summary

The specific quantity for each reach of Rice Canal has been matched with a suitable disposal area with an acceptable haulage route. A summary map of the proposed haulage routes and disposal areas is shown in Figure 2.2.

It is noted that the situation may change in the 8 months before the commencement of SBIP/S4, such as a change in the quantity of silt to be excavated, change in land ownership or land use of potential disposal areas (such as increased cultivation by encroachers). For this reason, the proposed disposal areas and haulage routes are tentative and must be reviewed by the Contractor's staff and CSC E&S team before commencing any work. The Contractor can also propose disposal areas following the criteria above, which will be inspected by the E&S team of the CSC and PMO for approval.

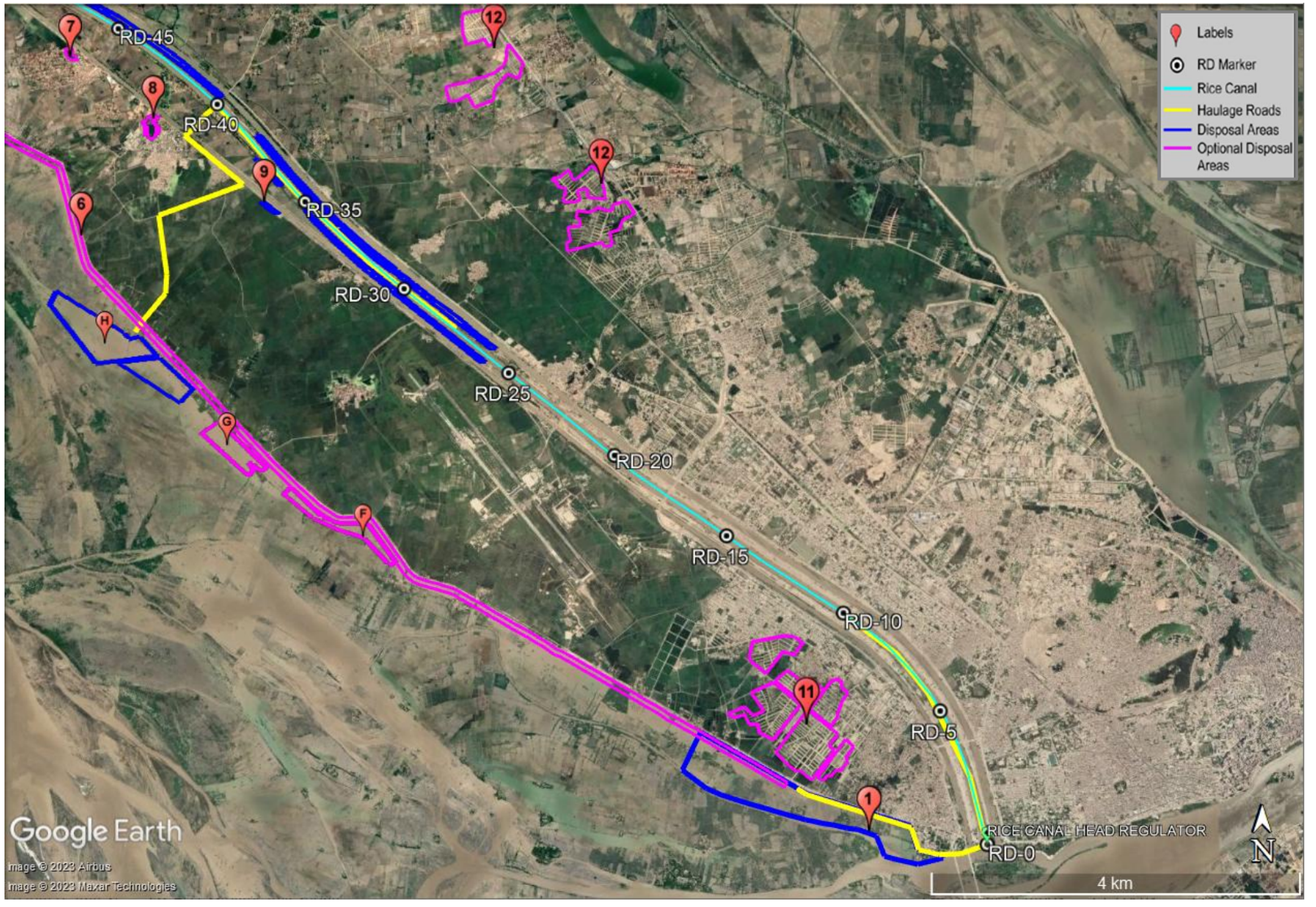

Figure 2.2 (a): Location map of potential disposal areas and haulage routes for RD0 - 45

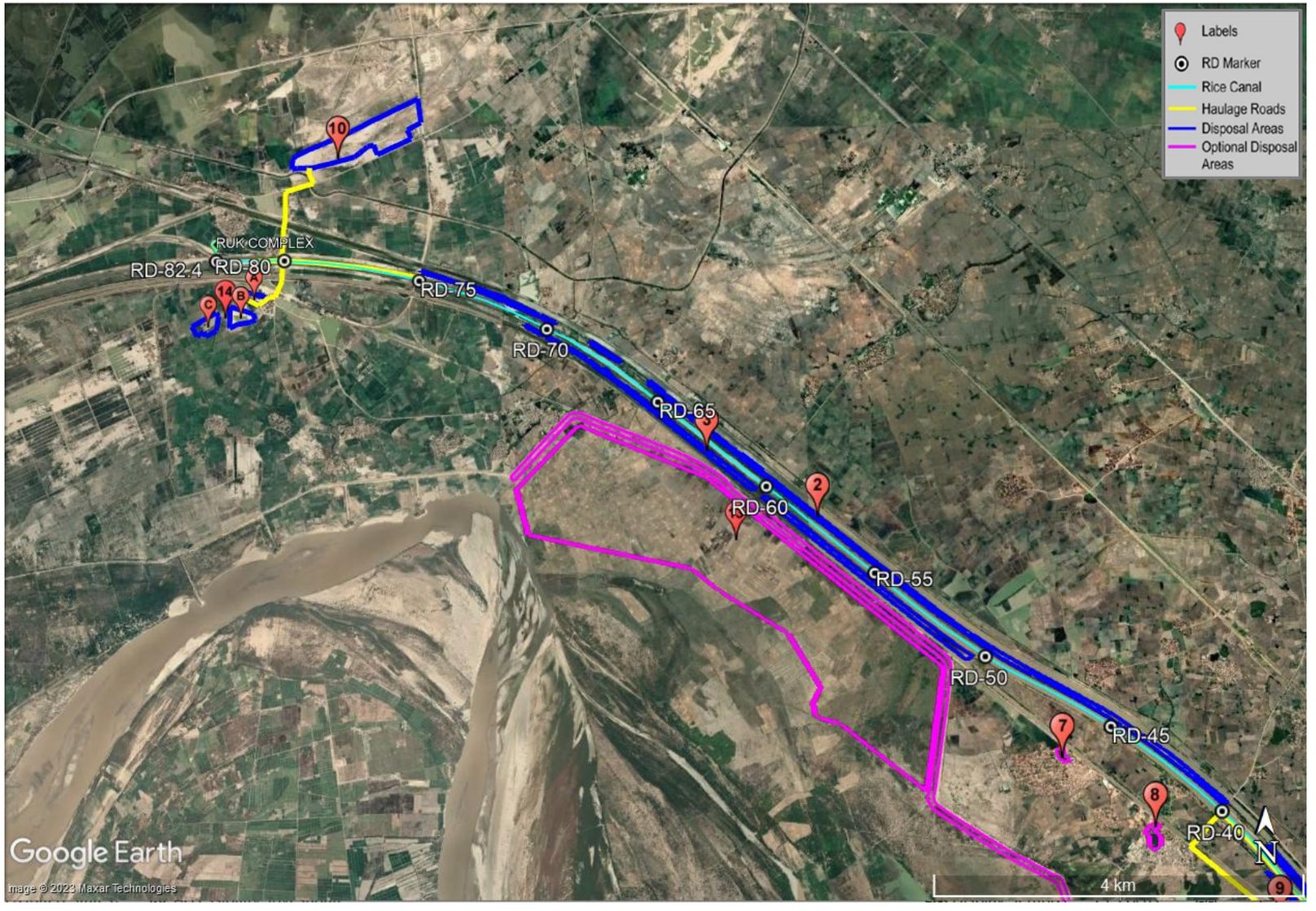

Figure 2.2 (b): Location map of potential disposal areas and haulage routes for RD45 – 82.4

3 Potential Impacts and Mitigation Measures

3.1 Baseline Conditions in the dredging areas of the Rice Canal

The Rice canal mainly passes through the rural areas dominated by agricultural lands. The initial section of the canal passes through the urban areas of Sukkur and later sections in the rural areas. Within urban areas, the canal's right of way was heavily encroached upon by settlements that were removed by the government's anti-encroachment drive, carried out with the Supreme Court orders. The land use in rural areas includes villages and smaller hamlets, housing areas, cattle farming, poultry farms, graveyards, shrines and houses/shops. The embankments are also dominated by shrubs in some sections. The terrain is mostly plain. Beyond the RoW, agriculture is practiced on a larger scale, with cotton, wheat, rice and sugar cane being the dominant crops in the area. Cultivated areas are interrupted by large expanses of barren land. No environmentally sensitive areas are located close to the proposed construction areas. The current status and baseline conditions of the proposed dredging areas of the Rice Canal are shown in Figure 3.1. These photographs were taken in March 2023 during the regular canal closure period.

A view of the Rice Canal at RD 10

A view of the Rice Canal at RD 20

Figure 3: Current Conditions of the Rice Canal at the Proposed Dredging Sites

3.2 Potential Impacts of Rice Canal Desilting

Detailed analysis of potential impacts of the original scope of the Project is given in the ESA/ESMP 2018. This section covers only the impacts and risks associated with the S4 Rice Canal Desilting works. Most of these impacts from the proposed activities associated with the desilting works are temporary in nature and limited to the construction period. The negative impacts are mostly related to the haulage and disposal of silt. As outlined in chapter 2, the areas chosen for haulage and disposal have been selected on the basis of minimal impacts.

The proposed works will not have any adverse impacts during the routine operational stages of the Sukkur barrage and Rice Canal. The barrage and canals have been in operation for about 85 years, and the proposed rehabilitation works will not alter the current operational regime of the barrage and hence will not create any additional impacts. The desilting works will have a positive impact on the increased flowrates that can be passed down Rice Canal to farmers downstream.

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The following is the list of impacts for the various aspects of the S4 works (desilting, haulage and disposal) and 'general' impacts that apply to all the works.

General:

- Disruptions in irrigation supplies during the construction (desilting) works
- Interaction with AED-affected Areas
- Generation of employment and impacts from labour influx
- Possible cultural conflicts impacts (including women's privacy, access to livestock grazing and areas of archeological or cultural importance)
- SEA/SH risks
- Workers' health and safety risks
- COVID-19
- Air and noise pollution from construction and traffic

Desilting:

- Unexpected items / unsound materials uncovered during desilting
- Stranded dolphins, turtles, and other aquatic fauna during the closure period
- Damage or destruction of vegetation and associated habitats along the canal
- Potential risk of soil and groundwater pollution by construction works

Haulage:

- Safety hazards and disruption due to increased traffic
- Impact of traffic on haulage roads from heavy loading
- Transporters taking undesignated routes to save on fuel

Disposal:

- Damage or destruction of vegetation and associated habitats in the disposal areas
- Sediment dispersion risks from disposal activities adjacent to water
- Impact on river morphology (for the option of disposal into the river)
- Increase of flooding risk if natural drainage is disrupted
- Dumping of excavated material at undesignated sites

3.3 Key Impacts and Mitigation Measures

The following sub-sections outline the key Environmental & Social impacts that are not already fully covered by the ESA/ESMP 2018.

3.3.1 Disruptions in Irrigation Supplies during the Construction

As outlined in the previous chapter, the works must be undertaken during the 6 month annual closure period. The works must be completed by the end of this period, to ensure that farmers get the required supplies for the critical seeding period. Any delay or disruption to this supply would therefore result in secondary impacts, such as impact of livelihood to farmers and risk of conflict.

Mitigation

Mitigation measures are as follows:

- Construction period in the contract to be 6 months with importance of this requirement noted and delayed damages applied.
- Detailed work plan to be provided by the Contractor with some in-built contingency (including time and provision for additional plant/workers) for potential delays.
- CSC to closely monitor the progress of works and issue clear warnings for delays.

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3.3.2 Potential Interaction with area impacted by previous AED

There will be no resettlement as part of the S4 project. The areas which were subjected to Govt led Anti encroachment drive are out of the scope of S4 activities. The area previously impacted by the Anti-encroachment drive (AED between RD0 and RD26) is highly sensitive. No work is permitted in this area by demarcating construction areas through fencing Desilting activities have been carefully ringfenced ensuring that they do not interact with these area. Where possible, disposal areas have also been sited away from areas of adjacent housing to reduce temporary construction related impacts (such as noise). The works must be undertaken in the canal itself for the full reach between RD0 and RD 82.4, therefore some temporary construction related impacts from the excavation are unavoidable to any houses living near the canals, but can be mitigated.

In the design for S4 desilting, a buffer zone from RD26 to RD30 has been included where no works on the embankment are permitted in order to reduce the risk of the desilting works being considered to be related to the previous AED. Desilting works to be conducted in the S4 works will be confined to the canal bed width and side slopes, and these embankments remain out of the scope of work and all social and environmental impacts are avoided on these embankments.

Mitigation

Mitigation measures are as follows:

- A map showing the AED area is provided to all Contractors (S1, S2, S3 and S4) to reiterate where no work is permitted.
- AED map (Figure 1.3 of this ESMP) will be included in the Site Data for S4 bidding documents.
- CSC will thoroughly review the Contractor's S4 C-ESMP to ensure the requirement for no embankment work (including temporary haulage) is fully understood.
- The sufficient demarcation and signboards should be placed to indicate prohibition to enter AED affected area.
- Potential S4 bidders will be appropriately briefed during the S4 pre-bid meeting.
- Requirement for Contractor to hire Community Liaison Officer (CLO) and social safeguard officer for implementing and monitoring.
- CSC and PMO to monitor.

Even if the embankments are not used, there is still a remaining risk that works within the canal bed will be perceived as linked with the previous AED. Strict adherence of the mitigation measures above will be ensured to minimize this risk.

3.3.3 Generation of Employment and Labour Influx

About 50 skilled and non skilled workers will be required during construction on continuous basis for about 6 months. The project offers good opportunities for local residents to apply for employment as unskilled and skilled construction workers. Contractor is recommended to employ local workers and technicians to the extent possible. Employing local people will also generally diffuse the conflicts between migrant workers and local community. The labour influx for the proposed works is expected to be very limited, and hence the associated risks expected to be minimial.

Mitigation

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- The Contractor shall ensure provision of adequate accommodation, transportation, and basic services including water, sanitation and medical care for all migrant works.
- The provisions for contractors work site will comply with the Guidance on Workers Accommodation developed by IFC and EBRD
- A grievance redress mechanism will be in place by the contractor to raise work place concerns..
- First aid facilities and adequate medicines will be made available at the camp site. The workers will undergo initial health screening and regular health check-ups.
- Complete details of the labour influx management are given in the ECP 16: Labour Influx Management and Contractors Camp Management .

3.3.4 Possible cultural conflicts impacts (including women's privacy, access to livestock grazing and areas of archeological or cultural importance)

There are people living in the vicinity of the desilting works who may temporarily lose access to the canal. This includes a few encroacher settlements living within the ROW of Rice Canal and villages established on the far left and right banks of the RBC canals. The canal is used by these communities for purposes such as washing clothes and for water for buffalo. Access should not be disrupted by the works. During the routine annual closure period, there is no water to use for these activities, so SBIP/S4 will not cause disruption in this regard. However, the construction works may disturb privacy of the communities, which for women in particular, may cause distress. It should be noted that the Irrigation Department uses its ROW and inspection paths for routine inspections and maintenance works, so it will not be a new impact on the communities. There are also areas adjacent to the canals and potential disposal areas that are used by local farmers for the cultivation of crops. These specific areas have been avoided for use in construction; however potential disruption or privacy issues may occur if communities are working nearby.

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There have not been any sites of archeological or cultural importance identified in the immediate area of the works. Any access disruption to sites of archeological or cultural importance identified by the communities during consultations must be avoided.

The labour influx in this contract is expected to be low as most of the estimated 50 workers in this contract will be engaged from the local communities.

Mitigation

- Dissemination of information about the project by the Employer in April 2023. Further sessions in summer 2023, prior to the mobilization of the Contractor
- Sessions with Contractor CLO in the local community to discuss construction works and schedule, reasons for the works, to identify any sensitive areas that should be avoided, and to document any further concerns the communities may have which have not arisen during the consultation phase.
- Specific sessions with PMO's female social expert for women in the communities
- No work during the night time.
- General work schedules are to be developed and adhered to ensure a routine by the workers and for communities, especially women, to readjust their activities in or around work sites
- Signs and barricades are to be placed where necessary to demonstrate work in progress

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With the above mitigation measures, the residual impacts have been assessed as minimal.

3.3.5 SEA/SH Risks

The SEA/SH risks are assessed to be low. The risk assessment is based on the country and legal context, gender norms and beliefs, and national capacity to respond. In addition, several project specific factors including project location, type of infrastructure, accessibility of women for consultations, poverty levels, accessibility for supervision of project and others have been considered for determining the risk levels. Though the SEA/SH risks are assessed as low, proactive measures will be put in place to prevent SEA/SH.

Mitigation:

These mitigation measures proposed are as below:

- Inclusion of clauses on SEA/SH behavior obligations in the employment contracts of all employees and construction workers aimed at strengthening measures to address and prevent SEA/SH in the workplace and construction areas;
- Preparing Code of Conduct (CoCs) for Contractors and Sub-contractors;
- Translating CoCs into Urdu and dissemination of CoC and the consequences (warnings, penalties, termination and legal actions) of its breach to all employees and workers;
- Awareness training of PMO, Consultants, Contractor, sub-contractor and service providers staff to sensitize them about SEA and SH;
- Posting of CoCs in public spaces at Contractor's work camps and living areas, and village information centers and public places of adjoining/neighboring communities in the Urdu language;
- Awareness to explain suspicious situations and the signs of SEA/SH;
- Awareness to communities, particularly vulnerable groups including women and male and female children, to understand the risks of SEA and SH and the roles and responsibilities of parties involved in project implementation on SEA and SH prevention, processes for reporting incidents of project-related SEA/SH, and the corresponding accountability structures;
- Strengthen the Contractors' obligations and capacity to public health and safety risks and ensure contractor supervision capacity to monitor the mitigation of these risks (such as security agencies, catering, transport, or any other services) on SEA/SH prevention and by integrating these measures/clauses in bidding documents;
- Proactive SEA/SH prevention measures will be implemented, such as SEA/SH related training to sensitize workers and the local population along the project implementation area and ensure that GRM for the project will also take care of GBV-related issues, if any.
- The Contractor will employ their skilled staff and apply unskilled construction labor from the local population as far as possible to minimize an influx of outsiders into the communities.
- The PMO will ensure compliance with the GoS Act and policy and WB requirements related to SEA/SH.
- Documentation and reporting of prevention and response in the progress reports of the project.

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3.3.6 Workers Health and Safety

The Occupational Health and Safety risks associated with the desilting include: collision with vehicles and machinery, road traffic, social/conflict, excavation/disposal pile hazards, dust, and exposure to electrical hazards from the use of tools and machinery.

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Mitigation:

The following mitigation measures will be implemented:

- Contractor will prepare, obtain approval for, and implement an Occupational Health and Safety (OHS) Implementation Plan. OHS Plan should contain general guidance for all identified hazards under each work activity, and site-specific OHS hazards and risks during construction, and control and preventive Measures proposed by the Contractor. The Plan shall be reviewed and updated if there are any changes in the construction methodologies.
- OHS Plan should contain general guidance for all identified hazards under each work activity and they should be presented in three discrete headings, (a) Contractor's Standards on the identified hazard management, (b) Expected Site-specific OHS hazard and risks during construction, and (c) Control and Preventive Measures proposed by the Contractor.
- The OHS plan will be reviewed by the CSC and PMO
- Conduct a Job Hazard Analysis at the excavation sites regularly to identify potential hazards that may arise from the proposed works or working conditions for the project workers and implement necessary control measures. The job hazard analysis should be part of the Contractor's method statements.
- The Contractor will prepare a Permit to Work system based on the Job Hazard Analysis and competency assessment for staff required for the activity in question. Capacity building may be required for workers (including training, safety briefings, etc.). The Permit to Work system will follow best practice guidance
- Regular site inspections by the CSC.
- Regular training program for workers on occupational health safety (monthly training and daily toolbox talks). Special attention will be focused on the use of life vests, ring buoys, hazard awareness, and emergency response plan.
- Incident investigation and reporting, including a complete record of accidents and near misses, will be maintained.
- First aid facilities will be made available at the worksites and in the camps. The contractors will engage qualified first aider(s). Availability of medical and rescue facilities at the site for the implementation of an emergency response plan
- Contractors will have dedicated and qualified staff to ensure compliance with the OHS Plan.
- Awareness-raising material will be used, including posters, signage, booklets, and others at the worksites.
- The Contractor shall plan their operations to be completed based on a six-day working week from 8am to 5pm, in line with the national labour laws.

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With the implementation of the above mitigation measures, the residual impact on workers' health and safety has been assessed as minimal.

3.3.7 COVID-19

COVID-19 poses a health risk to construction workers and members of the public. The Contractor will prepare a COVID-19 mitigation plan as part of their C-ESMP. This should follow local and national requirements, best practice guidelines, WHO and World Bank guidelines.

Mitigation:

Mitigation measures will likely include:

- Temperature screening of people entering camps / work areas. If the temperature is found to be abnormal then entrance is stopped and they are advised to consult with Doctor and non-resident personnel are sent back asked to quarantine. Resident personnel and anyone

who comes in contact with any other displaying COVID symptoms quarantined for 14 days or 7 days after symptoms end (whichever is longest).

- Contractors, supervision staff and labour to wear PPE (masks and gloves) during periods of high cases.
- All personnel should be encouraged to be vaccinated.
- All staff should be encouraged to wash and disinfect hands and working surfaces frequently. Corresponding supplies of water, hand sanitizer etc. will be provided by the Contractor.
- Vehicles and offices to be disinfected regularly.
- Driving guidelines to be developed to minimize COVID-19 transmission (e.g. appropriate spacing in vehicles, ventilation, etc).
- The Contractors to give tool-box talks to their staff about the virus, its prevention and its symptoms with regular refresher presentations.

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Periodic reviews of applicable regulations and guidelines should be undertaken by the Contractor with mitigation measures updated appropriately. The resulting risk is considered minimal.

3.3.8 Air and noise pollution from construction works and traffic

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Air pollution may be caused by emissions from construction related traffic and machinery. A lot of noise and dust will be produced by earth works at river training works, other machinery, concrete mixing, and traffic from trucks and vehicles. Noise levels at nearby villages may exceed the national standards.

Mitigation

The following mitigation measures will be implemented:

- Construction equipment and vehicles will be regularly maintained according to the instructions provided by the manufacturers, so that emissions are minimal and comply with emission standards of NEQS.
- Dust generation from construction sites will be restricted as much as possible and water sprinkling will be carried out as appropriate, especially at those places where earthmoving, excavation will be carried out.
- Contractor will be required to implement the measures prescribed in the Environmental Code of Practices (ECP), which will be included in the contracts.
- Construction activities near the settlements will be limited to day time only. High noise producing equipment will be provided with mufflers or acoustic enclosures.

3.3.9 Unexpected items / unsound materials uncovered during desilting

It is possible that other materials or items are contained within the silt deposits on the canal bed, such as discarded plastic waste. This may pose a risk to Contractor workers if handled unsafely.

Mitigation:

- Contractor to develop measures in C-ESMP, depending on methodology and plant being used.
- Process for unsound materials and hazardous waste contained in the Specification to be followed.
- Ensure handling of material is minimal.

- Unexpected items or materials found to be reported to the CSC. To be investigated by the safely Contractor using agreed appropriate handling methods.

With the above mitigation measures, the residual impacts have been assessed as minimal.

3.3.10 Stranded dolphins, turtles, and other aquatic fauna during the closure period

A 170 km stretch of the River Indus between two irrigation barrages Guddu and Sukkur, is designated as a national protected area for Indus dolphins. There have been situations previously where dolphins have entered the canals. There is a risk that they become stranded during closure period and lead to fatalities. The S4 works will not increase the risk of this occurring but there will be chances to encounter stranded dolphins in the Rice Canal during the closure period. The increased presence from the Contractor can be considered an enhancement, as there will be more chance of quickly spotting stranded animals. The Contractor (supported by CSC) will be required to monitor the canal closely after closure for dolphins and other stranded fauna, and enact response plan. Sindh Wildlife department are responsible for rescues and will be contacted as required.

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Mitigation:

Mitigation measures to avoid dolphin fatalities:

- Prior to the works, a dolphin rescue plan will be developed by the Contractor in consultation with Sindh Forest and Wildlife department and other relevant stakeholders
- Before the start of work, presence of stranded dolphin should be checked in coordination with Sindh Forest and Wildlife Department
- The Contractor will hire an environmental coordinator for implementation and monitoring.

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The above measures are considered an enhancement to the existing situation.

3.3.11 Damage or destruction of vegetation and associated habitats along the canal

As per the Environmental and Social screening assessments undertaken in 2022 for this SS-ESMP, there are areas of vegetation and trees along the canals. The areas of denser vegetation have been removed from the potential disposal areas to avoid any negative impact to the vegetation and the potential species using it as habitat.

There is a possibility that minor areas of vegetation may need to be cleared from the canal side slopes to allow access of plant and transportation of silt to the haulage trucks.

It should be noted that the Irrigation Department have a remit for regular vegetation clearance to allow their routine inspection and maintenance works to occur. Also that full canal re-modelling may be done under a future project, which would result in extensive scrub clearance. In comparison, any vegetation clearance required under S4 is relatively minor.

Mitigation:

- Any essential area of vegetation clearance proposed by the Contractor must be reviewed by their environmentalist. This assessment must then be shared with CSC for review and approval, prior to any works.
- Sequence of vegetation clearance to be considered to encourage any species to leave the area prior to main clearance.
- No clearance of areas with nesting birds.
- Monitored by Contractor, CSC and PMO environmental specialists.

With the general principle of avoidance, together with the mitigation measures above, the resulting impact is considered minimal.

3.3.12 Potential risk of soil and groundwater pollution by construction works

During construction there is a high risk of accidental spills and leakages from fuel and oil tanks, vehicles, machinery and stored chemicals that are used in construction areas, yards, batching plants, worker camps, and storage sites. These spills can pollute soils and contaminate surface and groundwater in the area. There is also a risk of water pollution from these activities through accidental spillage of fuels, hazardous material and bilge water.

Mitigation

Following mitigation measures will be carried out by the contractor to minimize soil and water pollution.

- The contractor will take utmost care to prevent such risks and will prepare an emergency preparedness plan to address these risks. The contractor will make absorbents available on site along with trained personnel to recover spilled oils from water surface.
- All waterborne plant shall be regularly serviced as per the manufacturer's guidelines and be inspected daily prior to operation.
- Refuelling of excavators will be properly carried out to avoid any spills. Spill kits and other absorbent material will be made available at refuelling points on the barges.
- Additional mitigation measures are given in ECP 3: Fuels and Hazardous Goods Management, ECP 3: Water Resources Management, ECP 5: Soil Quality Management, and ECP 7: Erosion and Sediment Control.

3.3.13 Haulage-related impacts

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It is inevitable that disposed material will have to be transported to appropriate approved disposal areas. This will worsen traffic; the secondary impacts of this on the local communities include disruption to travel (e.g. school, work), increasing road safety risks (notable for children and elderly), and increased privacy concerns.

The haulage trucks are transporting loose silt so there is risk of increasing mobile dust and increasing mud pollution on roads. There is also a risk of damaging haulage roads from heavy loading/traffic and disturbances to local traffic movement if there is any breakdown of vehicles.

Mitigation:

- Haulage routes are chosen which have suitable road surfaces in good condition. The Contractor is responsible for restoring any damage (as per the Contract)
- Minimum distance balanced with minimum disruption. Utilizing main roads rather than small village access roads where possible
- Dust suppression methods such as water sprinkling are to be used on haulage routes as required.
- Canal beds will be used where possible for the movement of construction equipment and vehicles instead of canal embankments
- Haulage trucks of suitable size, quality and condition will be chosen. The desilted material will be carried out in covered trucks to control the dust emissions

- Desilting activities and haulage will be limited to daytime hours to avoid nuisance to the local communities in unsociable hours
- Strict traffic management will be in place by the Contractor with adequate traffic signals
  and traffic control personnel along the routes used by the trucks for transport
- Ensure that all construction vehicles observe speed limits on the construction sites and on public roads
- Sessions with Contractor CLO will be undertaken in local communities to discuss routes, reasons for the works, schedule, etc.
- Haulage log books are to be kept to monitor any excessive use along certain routes.
- Contractor will develop a traffic management plan in compliance with ECP 15 on Traffic Management

With the above mitigation measures, the residual impacts have been assessed as moderate to minimal.

3.3.14 Disposal-related Impacts

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The disposal sites have been identified and assessed based on the Environmental & Social criteria outlined in section 2.2.5. Sites are chosen for minimal Environmental & Social impact. Crucially, no resettlement will be undertaken for disposal areas, and no area impacted by the previous AED will be used. As outlined, there may be changes in the disposal areas before the works commence, and further assessment of impacts may be required.

Mitigation

The following mitigation measures will be implemented during the works:

- Only disposal areas that are approved by CSC will be used by the Contractor.
- Suitable material excavated from the canal shall, only where approved by CSC, be placed within the RoW.
- Contractor environmentalist and sociologist must review the site just before disposal begins to ensure that there no further E&S receptors.
- Dust suppression methods such as water sprinkling to be used within the disposal area, including access roads
- Excavated material containing stumps, roots, vegetable matter and other objectionable materials that are otherwise unsuitable shall be placed in the designated spoil areas as directed by CSC.
- Restoration Plan will be developed and implemented, including measures such as all spoil banks shall be levelled and graded to a safe slope.
- Contractor staff will supervise the work as required.
- CSC and PMO staff will regularly monitor the disposal sites.

Resulting impacts are considered minimal (noting the importance of only the approved disposal areas to be used as these have been selected on the based on minimum existing E&S receptors)

4 Site Specific Environmental and Social Management Plan

4.1 Objectives of ESMP

This ESMP will be an addendum to the ESMP of the original Project (SBIP) and will be used as a tool by the project management authorities to manage the impacts associated with the proposed project activities. Specific objectives are:

- Ensure the area previously impacted by Anti-encroachment Drive is not utilized for this work.
- Minimise disruption to local communities related to desilting and haulage of silt.

4.2 Institutional Arrangements

The existing PMO's organogram for implementation of the SBIP, including this ESMP, is shown in Figure 4.1.

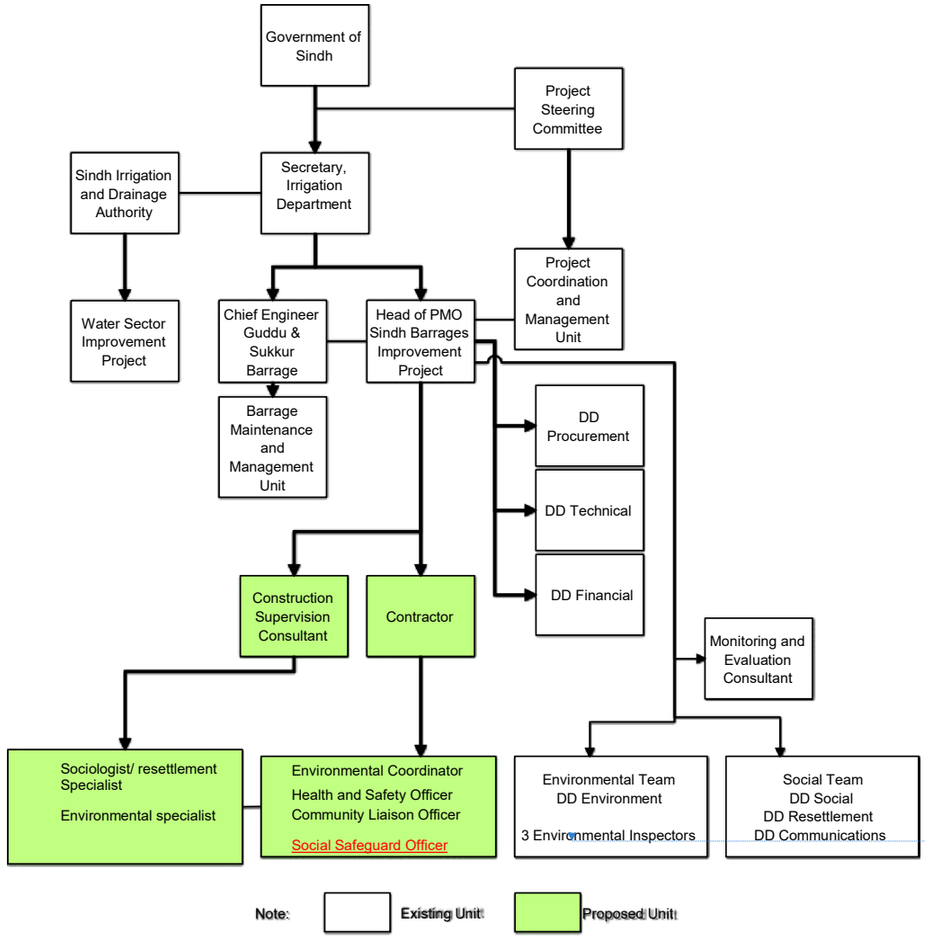

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Figure 4.1: Proposed Institutional Structure for Implementation of ESMP

4.2.1 Project Management Office (PMO)

Sindh Irrigation Department (SID) is the Project proponent. The PMO, already established under the secretary of the SID, will monitor and coordinate all project implementation activities. PMO would be responsible for all aspects of project implementation, including technical, operational, financial management, and overseeing the implementation of ESMP. The PMO has included the following environmental and social staff.

- Deputy Director Environment,
- Deputy Director Resettlement
- Deputy Director Social and
- Deputy Director Communications.
- Various social and environmental inspectors (site-based and visiting experts)

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4.2.2 Contractors

Contractors will also be required to appoint the following environmental staff to implement ESMP in the field, particularly the mitigation measures.

The Contractor will develop various plans for health, safety, the environment and social issues and get them reviewed and approved by the CSC and PMO. These plans will also be reviewed by the World Bank for any advice. The Contractor will also be responsible for communicating with and training its staff in the environmental/social aspects before starting the physical works on site. The following key personnel are required in the Contractor's ESHS team:

- Environmental Coordinator
- Health and Safety Officer
- Community Liaison Officer
- Social Safeguard Officer

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Other staff are recommended, such as a Human Resources Officer and medical staff (paramedic and first aid trained staff).

4.3 Inclusion of ESMP in contract documents

In order to make the Contractors fully aware of the implications of the ESMP and responsible for ensuring compliance, technical specifications in the tender documents will include compliance with mitigation measures proposed in ESMP. The Contractor will be made accountable through contract documents for the obligations regarding the environmental and social components of the Project.

PMO will include the following Environmental, Social, Health and Safety (ESHS) Conditions in the bidding documents:

- ESHS Policies
- Past performance of the Contractor on ESHS aspects, including SEA/SH
- ESHS Staff with the Contractor
- Environmental and Social Management Plan - SBIP/S4: Desilting of Rice Canal in Head Reach (RD 0 to 82.4)
- Environmental and Social Performance Security
- Mitigation measures to address construction impacts
- Payments for the implementation of ESHS measures
- Code of Conduct of Contractor's Personnel
- Management Strategies and Implementation Plans (MSIP) to manage the ESHS

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Risks

- Progressive penalties where there has been a failure to perform an ESHS obligation:
  - Verbal warning
  - Written warning
  - Withholding a portion of the interim payment for the BOQ item for monthly C-ESMP compliance (as per relevant Measurement & Payment clause)
  - Suspension of the person or works as required

Each of the above conditions is elaborated in Table 4.1.

Table 4.1: ESHS Conditions in the Bidding Documents

Condition	The rationale for the inclusion of this Condition in the Contract	Specifications to be included in the Bidding Documents	Responsibility	
			Bidders	PMO
1. Past performance of the Contractor on ESHS is one of the eligibility criteria for the post-qualification process	The Contractor's past performance on compliance with ESHS is an indicator of the Contractor's commitment and capability for implementation of the ESMP	The Bidder shall "declare any civil work contracts that have been suspended or terminated and/or performance security called by an employer for reasons related to the non-compliance of any environmental, or social (including sexual exploitation and abuse (SEA) and sexual harassment (SH) or health or safety requirements or safeguard in the past five years."	Bidder to make the Declaration	PMO uses this information to seek further information or clarifications in carrying out its due diligence
2. Contractor shall submit E&S Performance Security for compliance with ESHS obligations	The Contractor should have a financial implication if he could not comply with ESHS requirements. Hence performance security will be collected from the contractor	The Bidder shall submit the E&S Performance Security in the form of a "demand guarantee" in the amount of one percent (1%) of the Contract Amount.	The bidder will submit a Performance Security	
3. Contractor shall propose adequate ESHS staff in his team	The Contractor's staff should include an ESHS Manager who is responsible for the implementation of all mitigation measures on ESHS risks and compliance with ESMP with the following support staff (i) Environmental Coordinator, (ii) CLO, (iii) Social Safeguard Officer, (iv) H&S office and (v) adequate ESHS Site Supervisors to supplement the above roles	The Bidder shall propose adequate ESHS staff, which shall include at a minimum, an Environmental Coordinator, an HS Officer, Social Safeguard Officer and a CLO / Social Officer with adequate ESHS Site Supervisors. The Bidder shall provide details, including academic qualifications and work experience. The number of years of experience is as defined in the Tender documents	The Bidder to submit the CV of the proposed staff	PMO will review and approve
4. Implement Mitigation	The mitigation measures to address potential	Specification of the Bidding Document will include a clear link		PMO will include this

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Measures to Address Construction-Related Impacts given in ESMP	ESHS risks and impacts should be included in the bidding documents. The Contractor shall be made responsible for the implementation of the mitigation measures through the necessary conditions in the contract.	to ESA and ESMPs. **Table 4.2** (measures during pre-construction), **Table 4.3** (measures during construction), **Table 4.4** (monitoring measures during construction) and ECPs (**Annex D of the original ESA**) in particular will be required to be included by the Contractor. The Contractor shall implement the mitigation and monitoring measures given in the ESMP to address ESHS risks associated with the construction works. The Consultant shall refer to the ESA of the Project, which is available on the SID / SBIP website, for further guidance. • The Contractor shall comply with the World Bank Group's General Environmental Health and Safety Guidelines and Environmental Code of Practices		condition in the bidding document
5. Payments for implementation of ESHS Mitigation and Monitoring Measures	BOQs on ESHS implementation are included in the Bidding Documents	The budget will be allotted to implement C-ESMP (including OHS Plan) and monitoring plans.	Bidder will quote for the ESHS Management	PMO will include this i the general specifications / BOQ of the bid document
6. Code of Conduct for Contractor's Personnel	All workers hired by the Contractor should sign a code of Conduct to ensure compliance with ESHS obligations of the Contract	The Bidder shall submit the Code of Conduct that will apply to the Contractor's employees and subcontractors. The Code of Conduct will state that the workers will comply with the following ESHS requirements: • Wearing Personal Protective Equipment (PPE's) in the workplace at all times • Non-discrimination in dealing with the local community by race, ethnicity, gender, religion, disability, sexual orientation, gender identity, social, or health status. • Respectful attitude while interacting with the local community. • Prohibit sexual exploitation and abuse and sexual harassment. • Prohibit violence, including sexual and/ or gender-based violence.	Bidder shall submit Code of Conduct with the bid documents	

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		• Protection and Proposer use of the property • Awareness raising, communication and dissemination of information campaigns for employees, workers and communities residing around the construction sites on SEA, SH and GRM.		
7. Contractor's Management Strategies and Implementation Plans (MSIP) to manage the ESHS Risk	The Contractor proposal should include his understanding of the ESHS requirements of the Project and the proposed strategies to manage the ESHS risks	The Bidder shall submit Management Strategies and Implementation Plans (MSIP) to manage the following key ESHS risks: • Strategy for the protection of workers and community from the construction-related hazards • Pollution prevention (wastewater, air and noise emissions) and management • A waste management plan for proper collection and disposal of waste • Hazardous material management plan safe storage and handling • Strategy to address labor influx impacts on the local communities. • Sexual exploitation and abuse/sexual harassment prevention and response action plan • Emergency response plan and early warning system The Contractor shall be subsequently required to submit (before mobilization) Contractor's Environment and Social Management Plan (C-ESMP) by the above strategies and Condition 4 of this Table.	The Bidder will submit MSIP along with the Bid Documents	
8. Withholding an interim payment	Withholding an interim payment where there has been a failure to perform an ESHS obligation	To ensure the performance and commitment of the contractor/bidder, payment will be made based on the percentage compliance of E&S activities mentioned in the monitoring checklist of that particular month (approved by the CSC). Withholding of payment can be undertaken in case the Contractor failed to perform/implement ESHS		PMO will include this i the general specifications

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		obligations.		

4.4 Environmental and Social Management During Construction

4.4.1 Environmental Codes of Practices

The ECPs will provide guidelines for best-operating practices and environmental management guidelines to be followed by the contractors for sustainable management of all environmental issues. These ECPs have been prepared based on the experiences in the construction of irrigation and hydropower projects, including World Bank-funded projects in Pakistan and also in conformity with the WBG EHSGs and Good International Industry Practice. The ECPs are presented in **Annex D of the original ESA and Annex A in the Addendum.** They are considered relevant for S4 and will be included in the bidding documents (item 3 of Table 4.1) to ensure their implementation. The list of ECPs prepared for the overall Project is given below, noting all have some relevance to S4.

- ECP 1: Waste Management;
- ECP 2: Fuels and Hazardous Goods Management;
- ECP 3: Water Resources Management;
- ECP 4: Drainage Management;
- ECP 5: Soil Quality Management;
- ECP 6: Erosion and Sediment Control;
- ECP 7: Top Soil Management;
- ECP 8: Topography and Landscaping;
- ECP 9: Quarry Areas Development and Operation;
- ECP 10: Air Quality Management;
- ECP 11: Noise and Vibration Management;
- ECP 12: Protection of Flora;
- ECP 13: Protection of Fauna;
- ECP 14: Protection of Fish;
- ECP 15: Road Transport and Road Traffic Management;
- ECP 16: Labour Influx Management and Construction Camp Management;
- ECP 17: Cultural and Religious Issues;
- ECP 18: Workers Health and Safety;
- ECP 19: Dredging Management;
- ECP 20: Dolphins Management from Construction Impacts**.**

4.4.2 Pre-construction Stage Mitigation Plans

Pre-construction stage will mainly include the mobilization of the Contractor and finalization of the following conditions/documentation by the Contractor:

- Contractor's Environmental and Social Management Plan (C-ESMP) with site-specific management plans;
- Labour Management Procedures to be followed for hiring and management of labour;
- The mobilization of ESHS Specialists

Each of the above conditions is elaborated in Table 4.2.

Table 4.2: ESHS Conditions in the Pre-Construction Stage

Condition	The rationale	Description of the Condition	Responsibility

	for the inclusion of this Condition		Implementation	Supervision
1. Preparation of Contractor's Environmental and Social Management Plan (C-ESMP)	The Contractor shall submit site-specific management plans to address ESHS risks following the ESMP requirements and MSIP proposed in the bid documents.	The Contractor to submit for approval and subsequently implement their Environment and Social Management Plan (C-ESMP). The C-ESMP should be submitted before the commencement of construction works, and no construction activities will be carried out under the Project until approval of the C-ESMP by CSC. The C-ESMP will include the following site-specific management plans: • Detailed plans and drawings along with desilting methodology aligned with this ESMP to ring fence the areas impacted by Govt led AED. • Occupational health and safety management plan • Waste management plan • Wastewater discharges management plan • Hazardous material management and spill control plan • Traffic Management Plan • Dolphin Rescue Plan • Training plan for ESHS risks including HIV/AIDS, sexual exploitation and abuse, and gender-based violence. • Emergency Response Plan • Grievance Redress Mechanism • Demobilization plan after completion of works	Contractor	PMO, CSC
2. Mobilization of ESHS Specialists	The ESHS Specialists should be mobilized during pre-construction for preparation of C-ESMP	The Contractor shall submit the CVs of the following ESHS Specialists for PMO review and approval and mobilize them. • Environmental Officer (with ecology experience) • Health and Safety Officer • Community Liaison Officer • Social Safeguard Officer The ESHS Specialists should be present at the site throughout the construction period.	Contractor	PMO, CSC
3. The hiring of Construction Labour	Hiring procedure for construction	The procedures will include terms and conditions of employment, including hours of work, wages,	Contractor	PMO, CSO

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	workers including the signing of code of Conduct	overtime, compensation and benefits, holidays, leaves, and so on. The procedures will set out measures to prevent and address harassment, intimidation and/or exploitation. No child labour policy will be strictly enforced. Any advertisement for hiring labour will clearly state, "No child labour allowed". All workers shall sign the code of Conduct (see Item 6 of Table 4.1).		
4. Construction camp and storage facilities	The Contractor will need areas for setting up camp and storage areas.	Contractor shall set up camp and storage facilities within sites approved by the PMO with the adequate facilities	Contractor	PMO

4.4.3 Construction Stage Mitigation Plans

Detailed mitigation plans for construction stage impacts have been prepared based on the detailed impact assessment covered under Chapter 3 and presented in Table 4.3. These plans are project-specific, and to the extent possible, site-specific; however, contractors will be required to prepare site-specific management plans as part of C-ESMP for review and approval of PMO.

Table 4.3: ESHS Impacts and Risks in Construction and Mitigation Measures

Impact	Mitigation Measures	Generic Mitigation Measures	Responsibility	
			Implementation	Supervision
Delay to construction (desilting) works causing disruptions to supply	• Detailed work plan to be provided by the Contractor with some in-built contingency (including time and provision for additional plant/workers) for potential delays. • CSC to closely monitor the progress of works and issue clear warnings for delays		Contractor	CSC
Land acquisition and resettlement: area impacted by previous AED	• A map showing AED area is provided to S4 Contractor and no working zone is to be adhered to • Requirement for Contractor to hire CLO and social safeguard officer for implementing and monitoring. • CSC and PMO will regularly monitor.	ECP 17	Contractor	PMO CSC 3rd party if required
Generation of employment	As per ESA/ESMP 2018			
Impacts from the influx of labour from the outside areas	As per ESA/ESMP 2018			
Child labour	• Ensuring that children under 18 years of age are not employed directly or indirectly on the project. • Local community provided with information on Contractor's policies and Code of Conduct			
Possible cultural conflicts impacts (including women's privacy, access for livestock grazing and areas of archeological or cultural importance)	• Sessions with Contractor CLO in local community to discuss construction works and schedule, reasons for the works, and to document any further concerns the communities may have, which have not arisen during the consultation phase. • Specific sessions with Employer female social expert for women in the communities • Work kept to sociable hours (including no night-time working) • General work schedules are to be developed and adhered to ensure a routine by the workers and for communities, especially women, to readjust their activities in or around work sites • Signs and barricades are to be placed where necessary to demonstrate work in progress	ECP 17	Contractor PMO	CSC

SEA/SH	As per ESA/ESMP 2018 & Addendum 2022			
Workers health and safety risks	• Occupational Health and Safety plan to be implemented by the Contractor • Conduct a Job Hazard Analysis at all construction sites to identify potential hazards that may arise from the proposed works or working conditions for the project workers and implement necessary control measures. The job hazard analysis should be part of the Contractor's method statements. • The Contractor will prepare a Permit to Work system, based on the Job Hazard Analysis and competency assessment for staff required for the activity in question. Capacity building may be required for workers (including training, safety briefings, etc.). The Permit to Work system will follow best practice guidance • Regular site inspections by the CSC. • Regular training program for workers on occupational health safety (monthly training and daily toolbox talks). Special attention will be focused on using life vests, ring buoys, hazard awareness, and emergency response plan. • Incident investigation and reporting will be maintained, including a complete record of accidents and near misses. • First aid facilities will be made available at the worksites and in the camps. The contractors will engage qualified first aider(s). Availability of medical and rescue facilities at the site for the implementation of an emergency response plan • Contractors will have dedicated and qualified staff to ensure OHS Plan compliance. • Awareness-raising material will be used, including posters, signage, booklets, and others at the worksites. • The Contractor shall plan their operations to be completed based on a six-day working week from 8am to 5pm, in line with the national labour laws.	ECP 16 ECP 18	Contractor	PMO CSC
COVID-19	• Temperature screening of people entering camps / work areas. If the temperature is found to be abnormal then entrance is stopped and they are advised to consult with Doctor and non-resident personnel are sent back asked to quarantine. Resident personnel and anyone who comes in		Contractor	CSC

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	contact with any other displaying COVID symptoms quarantined for 14 days or 7 days after symptoms end (whichever is longest). • Contractors, supervision staff and labour to wear PPE (masks and gloves) during periods of high cases. • All personnel should be encouraged to be vaccinated. • All staff should be encouraged to wash and disinfect hands and working surfaces frequently. Corresponding supplies of water, hand sanitizer etc. will be provided by the Contractor. • Face to face meetings to be kept to a minimum, hand shaking is discouraged. • Vehicles and offices to be disinfected regularly. • Driving guidelines to be developed to minimize COVID-19 transmission (e.g. appropriate spacing in vehicles, ventilation, etc). • The Contractors to give tool-box talks to their staff about the virus, its prevention and its symptoms with regular refresher presentations.			
Air and noise pollution from construction and traffic	As per ESA/ESMP 2018			
Risk of pollution from solid waste and waste effluents	As per ESA/ESMP 2018			
Unexpected items / unsound materials uncovered during desilting	• Contractor to develop measures in C-ESMP, depending on methodology and plant being used. • Process for unsound materials and hazardous waste contained in the Specification to be followed. • Ensure handling of material is minimal. • Unexpected items or materials found to be reported to the CSC. To be investigated by the safely Contractor using agreed appropriate handling methods.	ECP 2 ECP 18	Contractor	CSC
Stranded dolphins, turtles, and other aquatic fauna during closure period	• Implementation of dolphin rescue plan (developed by the Contractor in consultation with relevant stakeholders, namely Sindh Wildlife department) • The Contractor will hire an environmentalist for implementing and monitoring.	ECP 20	Contractor Sindh Wildlife Department	PMO CSC
Damage or destruction of	• Any essential area of vegetation clearance proposed by		Contractor	CSC

vegetation and associated habitats along the canal	the Contractor must be reviewed by their environmentalist. This assessment must then be shared with CSC for review and approval, prior to any works. • Sequence of vegetation clearance to be considered to encourage any species to leave the area prior to main clearance. • Monitored by Contractor, CSC and the Employer experts.			
Potential risk of soil and ground water pollution by construction works	As per ESA/ESMP 2018			
Safety hazards and disruption due to increased traffic Increase of pollution on roads Impact of traffic on haulage roads from heavy loading	• Haulage routes chosen which have suitable road surface in good condition. Contractor responsible for restoring any damage (as per Contract) • Minimum distance balanced with minimum disruption. Utilizing main roads rather than small village access roads where possible • Desilting activities will be carried out only in canal closure periods. • Canal beds will be used where possible for movement of construction equipment and vehicles, instead of canal embankments • Haulage trucks of suitable size/capacity will be chosen. The desilted material will be carried out in covered trucks to control the dust emissions • Desilting activities will be limited to daytime hours to avoid nuisance to the local communities in unsociable hours • Strict traffic management will be in place by the Contractor with adequate traffic signals and traffic control personnel along the routes used by the trucks for transport • Ensure that all construction vehicles observe speed limits on the construction sites and on public roads • Sessions with Contractor CLO will be undertaken in local communities to discuss routes, reasons for the works, schedule, etc. • Haulage log books to be kept to monitor any excessive use along certain routes. • Contractor to ensure maintenance of vehicles used for transportation of excavated materials to avoid breakdowns on main roads	ECP 15 ECP 17	Contractor	CSC

	• Contractor will develop a traffic management plan in compliance with ECP 15 on traffic management Traffic Management			
Damage or destruction of vegetation and associated habitats in the disposal areas Sediment dispersion risks from disposal activities adjacent to water Impact on river morphology (for option of disposal into river) Increase of flooding risk if natural drainage is disrupted	• Only disposal areas prior approved by CSC will be used by the Contractor. • Suitable material excavated from the canal shall, only where approved by CSC, be placed within the RoW. • Contractor environmentalist and sociologist must review the site just before disposal begins to ensure no further E&S receptors. • Dust suppression methods such as water sprinkling to be used within the disposal area including access • Excavated material containing stumps, roots, vegetable matter and other objectionable material that are otherwise unsuitable shall be placed in the designated spoil areas as directed by CSC. • Restoration Plan will be developed, including measures such as all spoil banks shall be levelled and sloped to a safe gradient. • Contractor staff will supervise the works as required. • CSC and PMO staff will monitor throughout disposal.	ECP 12 ECP 13 ECP 14		

4.5 Monitoring Plan

Proposed monitoring plan to be carried during the implementation of the Project to ensure the Contractor's compliance with the mitigation measures is given in Table 4.4, along with the monitoring indicators and frequency. CSC will be responsible for the supervision of the implementation of the plan.

Table 4.4: Effects Monitoring Plan

Parameter	Means of Monitoring	Frequency	Responsible Agency	
			Implementation	Supervision
No work in AED area	Visual inspection and reporting to ensure no works occurring in AED area.	Daily	Contractor	CSC, PMO
Ecological monitoring (dolphins)	Field investigations for observations on dolphin or turtle entrapment or their presence in dewatered Rice Canal	Hourly during initial closure. Then daily.	Contractor	CSC, PMO
Air Quality (dust, smoke)	Visual inspection to ensure good standard equipment is in use	Daily	Contractor	CSC, PMO
	Third-party air quality testing	Quarterly	Contractor	CSC, PMO
	Visual inspection to ensure the dust suppression work plan is being implemented	Daily	Contractor	CSC, PMO
Emissions from plant and equipment	Visual inspection	Daily	Contractor	CSC, PMO
	Third party emissions testing	Quarterly	Contractor	CSC, PMO
Noise and vibration	Spot measurements	Monthly	Contractor	CSC, PMO
Waste Management	Visual inspection that solid waste is disposed of at designated sites	Daily	Contractor	CSC, PMO
Spills from hydrocarbon and chemical storage	Visual inspection for leaks and spills	Monthly	Contractor	CSC, PMO
Labor management	Records on terms and conditions of employment, including hours of work, wages, overtime, compensation and benefits, holidays, leaves, CoCs and other requirements. Review of grievances and actions taken	Monthly	Contractor	CSC, PMO
Safety of workers	Usage of personal protective equipment Availability of rescue equipment for drowning Safety drills	Daily	Contractor	CSC, PMO
Traffic management	Visual inspection of haulage roads for damage Check of vehicle log books	Monthly	Contractor	CSC, PMO
Water quality testing (drinking for labourers)	Third party water quality testing	Quarterly	Contractor	CSC, PMO

4.6 Reporting on ESMP Compliance

PMO and its Contractors will prepare periodic monitoring reports on the status of implementation of ESMP and will be submitted to World Bank for their review and feedback. Details of these reports and their content are given in Table 4.5. As discussed in the original ESA, external third - party environmental monitoring and audits will be undertaken as required.

Table 4.5: ESMP Monitoring and Compliance Reports

#	Title of the Report	Contents of the Report	Frequency of Report Preparation	Report to be prepared by
1	ESHS Monitoring Report	The compliance status of the Project with environmental and social mitigation and monitoring measures. Besides, the report also covers: • Environmental incidents • Health and Safety incidents • Health and Safety supervision • Major compliance issues • Labour management and worker accommodations • Training conducted and workers participated • Worker's grievances • Community grievances, including incidents of SEA/SH • Chance find (if any)	Monthly	Contractor
2	ESMP Monitoring Report	The compliance status of the overall Project with ESMP requirements	3 months	PMO
3	Incident Reports	Incident investigation reports for all major incidents covering details of the incident, root cause analysis, and actions taken to address the future recurrence of this event	Initial investigation report within 24 hours. Detailed Investigation Report within ten days	Contractor

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4.7 Capacity Building and Training

The environmental and social training will help to ensure that the requirements of the ESMP are clearly understood and followed by all project personnel. ESHS specialists of the Contractor are responsible for delivering these programs for their staff.

Table 4.6: Environmental and Social Training Programs

Contents	Participants	Trainer	Schedule
Environmental and social management plan: - Ring fencing of the areas impacted by AED. - impacts of the Project - World Bank Group Environmental Health and Safety Guidelines. - Indus River Dolphin Rescue/Protection	PMO / SID ESHS staff of the Contractor	CSC with the support of WWF Indus River Dolphin Recue Team	During the initial stages of the Project implementation.
Code of Conduct Occupational Health and Safety	Construction crew	Contractor ESHS Staff	Prior to the start of the construction activities
Environmental and Social issues	Site Engineers of	Contractors	Months 2, 4 and 6

associated with the ongoing construction works	the Contractor (PMO/ CSC witness)	ESHS Staff	

The specific training contents is as follows and will be included in the specification.

Table 4.7: Environmental and Social Training – modules recommended

Subject	Target Audience
Ring fencing approach and methodology to avoid areas impacted by Govt led AED.	All construction staff
Handling, use & disposal of hazardous material	Construction workers with authorised access to hazardous material storage areas and required to use hazardous materials during their works
Waste Management	All staff (construction and camp staff)
Efficient & safe driving practices, including road & vehicle restrictions	Mandatory for all drivers & mobile plant operators
Actions to be taken in the event of major or minor pollution event on land	All construction staff
Pollution prevention: Best practice	All staff
Pollution prevention: Refuelling waterborne plant and vehicles	Operators of waterborne plant and vehicles
Pollution control: Use of spill kits and flexible booms	All construction staff working near water
Health & Safety: Safe way to work & hazard awareness, including working on or close to water	All construction staff
Health & Safety: Safe use of plant & equipment, including water based plant and equipment	Operators of plant & equipment
Health & Safety: Working at height	Staff colony construction staff
Health & Safety: Use of PPE	All construction staff
Emergency procedures and evacuation	All staff
Fire fighting	All staff
Site inductions, including requirements under the Environmental Management Plan & details of environmentally sensitive areas of the site, with a focus on the Indus Dolphin Reserve	All staff
Culturally sensitive awareness raising on HIV/AIDS and the spread of sexually transmitted diseases. Awareness raising on risks, prevention and available treatment of vector-borne diseases	All staff
Cultural sensitivities of the local population	On induction of all migrant staff
Modules of SEA/SH	On induction of all workers

4.8 Grievances[4]

As per the original ESA, grievances are actual or perceived problems that might give grounds for complaints. As a general policy, the Contractor and PMO will work proactively towards preventing grievances through the implementation of impact mitigation measures and community liaison activities that anticipate and address potential issues before they become grievances. As described in the ESA, for the original Project, a project level grievance redress mechanism (GRM) has been established and the same will be used for Sukkur Project also. Community grievance redress mechanism (CGRM) addresses complaints related to both Guddu and Sukkur's ESMP/SMF as well as the project implementation, while procurement grievance redress mechanism (PGRM) specifically addresses procurement related issues. For CGRM, the Contractor will be responsible for establishing a Complaint Cell and corresponding procedure that follows the required guidelines.

Complaints which are not resolved at site by the Contractor are to be forwarded to the project executing authority (PMO) to address. For this purpose, a complaint cell has been set up at PMO in Sukkur, chaired by the Deputy Project Director. If a complaint is not resolved locally, it could be escalated to a Grievance Redress Committee set up in Karachi. The Grievance Redress Mechanism is shown in Figure 4.2 and the members of the complaint cell are shown in Table 4.7. SBIP grievance redress mechanism is detailed in SMF.

Table 4.7: PMO Complaint Cell

S No.	Designation	Position
1	Deputy Project Director, PMO-SBIP	Chairman
2	Executive Engineer (Guddu Barrage) or Executive Engineer (Sukkur Barrage)	Member
3	Deputy Director (Environment) PMO	Member
4	Representative of CSC	Member
5	Representative of Contractor	Member
6	Technical Officer PMO	Member
7	Deputy Director (Resettlement) PMO	Secretary

Formatted Table[World Bank -Social Team]

[4] Detailed GRM is given in Updated SMF of SBIP.

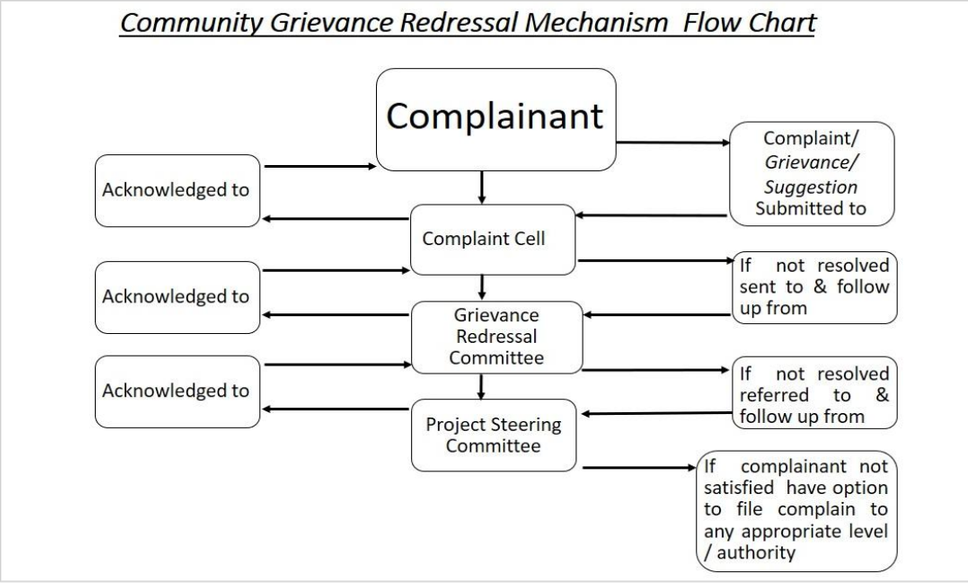

Figure 4.2: Grievance Redress Mechanism

Updated guidelines on SEA/SH have been developed since this GRM was developed at the onset of the project, noting World Bank Guidelines on SEA/SH in 2020[5]. The GRM for S4 will be reviewed and enhanced to include a mechanism to report SEA/SH issues. This will include aspects such as methods to report anonymously, use of gender specialist CLOs, consultation with local community groups (inc. GBV service provider), confidential data collection, etc.

[5] ESFGoodPracticeNoteonGBVinMajorCivilWorksv2.pdf (worldbank.org)

5 Stakeholder Consultations and Disclosure

5.1 Previous Consultations

For the original ESA 2018, extensive consultations were carried out throughout the project preparation. Initial consultations were held at the early stages of the project preparation (2012-2013) and also during 2015 with the farming communities in the canal command areas to share the project objectives and terms of references of the proposed environmental assessment study. Consultations involved multiple methods – for example, household level interviews, village wise meetings, focus group discussions and workshops. Second round of consultations were carried out in 2017 to share the findings of the draft ESA. The participants consulted include (i) population around the project area and community representatives. (ii) farmers in the command area of Sukkur barrage, (iii) squatters in the project area, (iv) district and provincial government authorities responsible for district administration, forest, agriculture, fisheries, wildlife and environmental protection, (v) conservation agencies such as WWF and (vi) community -based organizations.

During first round of consultations, 785 people were consulted through village wise meetings in the barrage command areas, and meetings with the communities around the barrage site. The Project information has also been shared with 148 experts participated in the international seminar on dolphin conservation and management conducted by SBIP in May 2017.

The second round of consultations were carried out through public consultations at Sukkur and consultation workshops at downstream Kotri barrage, and in Karachi. Public consultations were conducted on 7th August 2017 at PMO office in Sukkur. Prior notices were given through newspaper advertisements (in English and Sindhi dailies on 29th July 2017) and invitation letters. The EIA and SIA documents prepared by the design consultants have been disclosed on the website of SID prior to the consultations.

For the Addendum 2022, due to the limitations inherent in the emergence of COVID - 19 and the difficulties of coordinating the project agenda with the different stakeholders, consultation with the general public was potentially risky and only limited consultation with the Sindh Wildlife and WWF could be carried out. The outcomes of this are described in the Addendum 2022.

5.2 Consultations for S4 ESMP

For SBIP-S4, consultations have been carried out with the following stakeholders:

- Irrigation Department – E&S
- Irrigation Department – Sukkur barrage officials at the site
- Various landowners of potential disposal areas
- Community leaders and community members near the construction sites
- Landowner and community members in the vicinity of disposal areas
- Sindh Wildlife Department

The feedback from consultations was overall supportive of the proposed desilting works from both local communities and government agencies, as they will restore the irrigation and drinking water supplies in the canal. The communities want to use the desilted material in their agricultural lands and raise their residential plots. They also want to participate in construction activities. Dust, noise and traffic safety during the construction were the community's major concerns, and they were informed that these concerns were addressed in the ESMP.

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Figure 5.1: PMO and PIC discussions with farmers in the vicinity of option 15

Figure 5.2: PMO and PIC discussions with local community in vicinity of option 1

Further consultations will be carried out prior to the commencement of the works. These consultations will focus on the communities in the vicinity of the excavation / disposal areas and haulage routes.

The itinerary of the consultations will be as follows:

- Overview of need for project
- Overview of scope of works and selection of disposal areas
- Discussion regarding haulage traffic
- Discussion regarding other key E&S impacts

Separate gendered sessions should be held as appropriate.

Further consultations will be carried out during the project implementation following the consultation and communication matrix included as a part of the Social Management Framework (SMF) prepared for the project.

5.3 Disclosure

The ESA summary and ESA reports are already disclosed on the SID and website and World Bank's external website. This ESMP of Rice Canal Desilting will also be disclosed on the SID website. The hard copies of the documents will be made available to the communities through the library of the Sukkur Barrage.

Annex A – Environmental & Social Screening Checklists of Potential Disposal Areas

1. E&S Screening Checklist for Option 1

Background Information	
Name of site	Option 1 - River Indus downstream right side
Coordinates	27°41'14.54"N 68°50'7.71"E
Date of assessment	23-11-2022
Who is the landowner?	Government land
Are the ownership documents available?	N/A
What is the current use of the land?	River plain within flood embankments. Some cultivation in various areas
Has the area been subjected to any Govt led AED?	No

Sr	Description	Y / N / N/A	Notes
1	If the land is privately owned, is there written consent from the landowner?	N/A	-
2	Was the area or access route impacted by previous Anti Encroachment Drive (AED)?	No	-
3	Is there an existing established access road (and is it well maintained)?	Yes	Two possible main access roads from the right site barrage office, but bridge restriction on one. Access from the flood embankment to the main river is more challenging – may need strengthening
4	If not, is there a suitable location for an access road?	Possibly	Existing access routes that could be strengthened
5	Are there any settlements within 500 meters of the area or access road?	Yes	Residential city area right side barrage. Smaller settlements established on bellas (shoals) – which have been impacted by the August 2022 floods
6	Will the access road result in disruption to local communities (including livestock access)?	Possibly	Haulage routes are to be analyzed with mitigation measures required to minimize traffic impact
7	Is there vegetation that would require clearing?	No	Specific areas can be selected with minimal established vegetation
8	If yes, is the vegetation loss significant (e.g. provides habitat to animals, established trees)?	N/A	-
9	Will any tree need to be uprooted?	No	-
10	Is there existing fencing to avoid public and animal access?	No	Temporary barricades may be required
11	Could drainage be impacted by disposing here; could this increase flood risk?	No	Could reduce barrage capacity if large quantity disposed of directly downstream of barrage – this area to be avoided

Sr	Description	Y / N / N/A	Notes
12	Is the proposed disposal area within wetlands?	Yes	Specific areas can be selected with minimal wetland habitat
13	Are there any species living in the area or that use the area (such as livestock) that would be impacted?	Possibly	Grazing buffalo in certain areas – to be avoided
14	Are there any cultural, religious, archaeological or historical aspects that could be impacted negatively by disposal?	Yes	Mosque is adjacent to the barrage office on a potential haulage route.
15	Are there any existing receptors that could be impacted by silt being disposed of here (e.g. drinking water supplies, fish pond)?	No	Same quality as the main river
16	Any other comment	Originally chosen in ESA assessment. Change in geomorphology of area due to annual flooding - notably change following August 2022 flood.	

The area downstream of the barrage

Bridge restriction on potential haulage route

2. E&S Screening Checklist for Option 2

Background Information	
Name of site	Option 2 - RD 30 to 82.4 right side common embankment (Rice/NWC)
Coordinates	27°47'24.98"N 68°42'50.52"E
Date of assessment	23-11-2022
Who is the landowner?	Government land (ROW)
Are the ownership documents available?	N/A
What is the current use of the land?	The canal embankment is used for Inspection Path by the Irrigation Department. Over the years the center of the embankment has been dug away (this damage could cause canal breach) and some areas used by encroachers for cultivation.
Has the area been subjected to any Govt led AED?	No

Sr.	Description	Y / N / N/A	Notes
1	If the land is privately owned, is there written consent from the landowner?	N/A	-
2	Was the area or access route impacted by previous Anti Encroachment Drive (AED)?	No	AED was between RD0 and RD26
3	Is there an existing established access road (and is it well maintained)?	Yes	Existing inspection paths partially maintained, may need strengthening. Access to the area can be done via well maintained paved road (N-5 Sukkur Shikarpur Road).
4	If no, is there a suitable location for access road?	N/A	-
5	Are there any settlements within 500 meters of the area or access road?	Yes	Some settlements adjacent to the area as shown on mapping. No housing noted on the embankment but some evidence of cultivation.
6	Will the access road results in disruption to local communities (including livestock access)?	Yes	Grazing and swimming activities of the buffalo may be impacted depending on access routes and timings. Goat herding is also witnessed nearby
7	Is there vegetation that would require clearing?	No	There are some areas of more established vegetation, particularly from RD60 onwards. These areas can be avoided
8	If yes, is the vegetation loss significant (e.g. provides habitat to animals, established trees)?	N/A	Densely vegetated areas to be avoided
9	Will any tree need to be uprooted?	No	There are some trees along the canal bank, but the disposal area can be used without cutting down
10	Is there existing fencing to avoid public and animal access?	No	-
11	Could drainage by impacted by disposing here; could this increase flood risk?	No	-
12	Is the proposed disposal area within wetlands?	No	There are no wetlands in the embankment area

Sr.	Description	Y / N / N/A	Notes
13	Are there any species living in the area or that use the area (such as livestock) that would be impacted?	Possibly	Buffalo and goat herding as above. Potential for nesting birds – these areas to be avoided.
14	Are there any cultural, religious, archaeological or historical aspects that could be impacted negatively by disposal?	No	The embankment does not have any known cultural religious, archaeological or historical site.
15	Are there any existing receptors that could be impacted by silt being disposed of here (e.g. drinking water supplies, fish pond)?	No	-
16	Any other comment	Specific areas to be avoided which have receptors (including denser vegetation or cultivation of land by encroachers). Filling back-in of canal embankment is required for embankment stability and to prevent canal breach. Utility crossings present.	

Facing upstream to bridge at RD 40

Bridge at RD 40

RD 40-50 Rice Canal showing dug-out embankment and utility crossing


RD 50-60 Rice Canal


RD 60-70 Rice Canal – evidence of cultivation by encroachers

3. E&S Screening Checklist for Option 3

Background Information	
Name of site	Option 3 - RD 30 to 82.4 left side common embankment (Dadu/ Rice)
Coordinates	27°47'48.48"N 68°42'5.66"E
Date of assessment	23-11-2022
Who is the landowner?	Government land (ROW)
Are the ownership documents available?	N/A
What is the current use of the land?	The canal embankment is used for Inspection Path by the Irrigation Department. Over the years the center of the embankment has been dug away and some areas used by encroachers for cultivation.
Has the area been subjected to any Govt led AED?	No

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Sr.	Description	Y / N / N/A	Notes
1	If the land is privately owned, is there written consent from the landowner?	N/A	-
2	Was the area or access route impacted by previous Anti Encroachment Drive (AED)?	No	AED was between RD0 and RD26
3	Is there an existing established access road (and is it well maintained)?	Yes	Existing inspection paths partially maintained, may need strengthening. Access to the area can be done via well maintained paved road (N-5 Sukkur Shikarpur Road).
4	If no, is there a suitable location for access road?	N/A	-
5	Are there any settlements within 500 meters of the area or access road?	Yes	Some settlements are adjacent to the area. Settlement at RD40 – to be avoided. Some evidence of cultivation
6	Will the access road results in disruption to local communities (including livestock access)?	Yes	Grazing and swimming activities of the buffalo may be impacted depending on access routes and timings. Goat herding is also noticed nearby
7	Is there vegetation that would require clearing?	No	There are some areas of more established vegetation, particularly from RD60 onwards. These areas to be avoided
8	If yes, is the vegetation loss significant (e.g. provides habitat to animals, established trees)?	N/A	Densely vegetated areas to be avoided
9	Will any tree need to be uprooted?	No	There are some trees along the canal bank, but the disposal area can be used without cutting down
10	Is there existing fencing to avoid public and animal access?	No	-
11	Could drainage by impacted by disposing here; could this increase flood risk?	No	-
12	Is the proposed disposal area within wetlands?	No	There are no wetlands on the embankment area, some ponded / water-logged areas.
13	Are there any species living in the area or that use the area (such as livestock) that would be impacted?	Possibly	Buffalo and goat herding as above. Potential for nesting birds – these areas to be avoided.
14	Are there any cultural, religious, archaeological or	No	The embankment does not have any known

Sr.	Description	Y / N / N/A	Notes
	historical aspects that could be impacted negatively by disposal?		cultural, religious, archaeological or historical site (other than within the settlement at RD40)
15	Are there any existing receptors that could be impacted by silt being disposed of here (e.g. drinking water supplies, fish pond)?	No	-
16	Any other comment	Specific areas to be avoided which have receptors (including denser vegetation or cultivation of land by encroachers). Filling back-in of canal embankment is required for embankment stability and to prevent canal breach.	

Rice Canal at RD 40 facing left bank / downstream

Bridge at RD 40

RD 40-50 Rice Canal

RD 70-80 Rice Canal – cultivation

RD 80-82.4 Rice Canal – cultivation and ponding

4. E&S Screening Checklist for Option 4

Background Information	
Name of site	Option 4 - Land opposite the sports complex
Coordinates	27°46'47.18"N 68°46'45.45"E
Date of assessment	22-11-2022
Who is the landowner?	Private landowner (known to Employer)
Are the ownership documents available?	To be confirmed
What is the current use of the land?	Open barren band for future development of commercial/residential plots
Has the area been subjected to any Govt led AED?	No

Sr.	Description	Y / N / N/A	Notes
1	If the land is privately owned, is there written consent from the landowner?	No	In discussion with Employer. Before commencement, an agreement would be written
2	Was the area or access route impacted by previous Anti Encroachment Drive (AED)?	No	-
3	Is there an existing established access road (and is it well maintained)?	Yes	Well-maintained paved road via N-5 Sukkur Shikarpur Road
4	If no, is there a suitable location for access road?	N/A	-
5	Are there any settlements within 500 meters of the area or access road?	No	A brick business using the area as an access way – to be kept clear for minimal disruption
6	Will the access road results in disruption to local communities (including livestock access)?	No	Some evidence of previous livestock grazing, but area fenced off now by developers.
7	Is there vegetation that would require clearing?	No	Open plot with barren land
8	If yes, is the vegetation loss significant (e.g. provides habitat to animals, established trees)?	N/A	-
9	Will any tree need to be uprooted?	No	-
10	Is there existing fencing to avoid public and animal access?	Yes	Partial fencing and wall – could be improved.
11	Could drainage by impacted by disposing here; could this increase flood risk?	No	No drainage impacts anticipated
12	Is the proposed disposal area within wetlands?	No	-
13	Are there any species living in the area or that use the area (such as livestock) that would be impacted?	Possibly	Potential evidence of previous grazing route.
14	Are there any cultural, religious, archaeological or historical aspects that could be impacted negatively by disposal?	No	The area does not have any known cultural, religious, archaeological or historical site
15	Are there any existing receptors that could be impacted by silt being disposed of here (e.g. drinking water supplies, fish pond)?	No	-
16	Any other comment	Area under utility lines to be avoided. Re-use of waste silt material is beneficial.	

Barren plot for land development

Barren plot for land development – utility line shown

Adjacent access road. Discussions on site

Partial fencing and adjacent brick business

5. E&S Screening Checklist for Option 5

Background Information	
Name of site	Option 5 - Land within the sports complex (stadium floor)
Coordinates	27°46'48.52"N 68°47'5.19"E
Date of assessment	22-11-2022
Who is the landowner?	Government land
Are the ownership documents available?	N/A
What is the current use of the land?	The project is under development into a complex for different sports activities (cricket, football, swimming, etc.)
Has the area been subjected to any Govt led AED?	No

Sr.	Description	Y / N / N/A	Notes
1	If the land is privately owned, is there written consent from the landowner?	No	In discussion with Employer. Before commencement, an agreement would be written
2	Was the area or access route impacted by the previous Anti Encroachment Drive (AED)?	No	-
3	Is there an existing established access road (and is it well maintained)?	Yes	Well-maintained paved road via N-5 Sukkur Shikarpur Road. Temporary access routes available through the construction site (coordination with works would be required)
4	If not, is there a suitable location for an access road?	N/A	-
5	Are there any settlements within 500 meters of the area or access road?	No	-
6	Will the access road result in disruption to local communities (including livestock access)?	No	There is no disruption of local communities at the disposal area. Haulage traffic to be considered.
7	Is there vegetation that would require clearing?	No	There is no vegetation in the sport complex.
8	If yes, is the vegetation loss significant (e.g. provides habitat to animals, established trees)?	N/A	-
9	Will any tree need to be uprooted?	No	There are no trees to be uprooted
10	Is there existing fencing to avoid public and animal access?	Yes	Being constructed as part of the sports complex.
11	Could drainage be impacted by disposing here; could this increase flood risk?	No	-
12	Is the proposed disposal area within wetlands?	No	-
13	Are there any species living in the area or that use the area (such as livestock) that would be impacted?	No	There are no species living in the area
14	Are there any cultural, religious, archaeological or historical aspects that could be impacted negatively by disposal?	No	-
15	Are there any existing receptors that could be impacted by silt being disposed of here (e.g. drinking water supplies, fish pond)?	No	-

Sr.	Description	Y / N / N/A	Notes
16	Any other comment		Live construction site – earth fill material needed for cricket stadium. Landowner tentatively confirmed that they would want this material. However construction of complex scheduled to finish before the SBIP/S4 works.

The floor of the stadium to be filled

Discussions with the construction staff

The land of the stadium to be filled

6. E&S Screening Checklist for Option 6

Background Information	
Name of site	Option 6 – River Indus right side, flood embankment toe ROW
Coordinates	27°44'52.21"N 68°44'35.00"E
Date of assessment	23-11-2022
Who is the landowner?	Government land – the ROW of flood embankment is 200ft wide
Are the ownership documents available?	N/A
What is the current use of the land?	The open land is available, which is parallel to the embankment and to be backfilled for the protection of the embankment sites
Has the area been subjected to any Govt led AED?	No

Sr.	Description	Y / N / N/A	Notes
1	If the land is privately owned, is there written consent from the landowner?	NA	-
2	Was the area or access route impacted by the previous Anti Encroachment Drive (AED)?	No	-
3	Is there an existing established access road (and is it well maintained)?	Possibly	Metaled road via Bagari Madeji Road. Smaller access roads are available down the flood embankment (some temporary strengthening may be required)
4	If not, is there a suitable location for an access road?	N/A	-
5	Are there any settlements within 500 meters of the area or access road?	Yes	Some villages (e.g. Jhali Kalwari) and smaller housing settlements
6	Will the access road result in disruption to local communities (including livestock access)?	Possibly	Haulage traffic to be minimized where possible
7	Is there vegetation that would require clearing?	Possibly	Some areas of scrub vegetation. Encroachers are cultivating the ROW in some areas.
8	If yes, is the vegetation loss significant (e.g. provides habitat to animals, established trees)?	No	Areas of denser vegetation can be avoided
9	Will any tree need to be uprooted?	No	Any trees can be avoided
10	Is there existing fencing to avoid public and animal access?	No	-
11	Could drainage be impacted by disposing of here; could this increase flood risk?	No	-
12	Is the proposed disposal area within wetlands?	No	-
13	Are there any species living in the area or that use the area (such as livestock) that would be impacted?	Possibly	Detailed screening would be required of specific areas before commencing the works.

Sr.	Description	Y / N / N/A	Notes
14	Are there any cultural, religious, archaeological or historical aspects that could be impacted negatively by disposal?	No	Not within ROW
15	Are there any existing receptors that could be impacted by silt being disposed of here (e.g. drinking water supplies, fish pond)?	No	Not known within the ROW
16	Any other comment	Large impact in the wider area from the recent August 2022 floods; building back eroded areas may be beneficial.	

Embankment ROW Near Jhali Kalwari Police Station via Bagari Madeeji Road (RD70-80)

Access road (shown in the far background)

7. E&S Screening Checklist for Option 7

Background Information	
Name of site	Option 7 - Village Arbab Ali Khan Ghumro – pond area
Coordinates	27°46'0.25"N 68°44'26.89"E
Date of assessment	23-11-2022
Who is the landowner?	Private. Land ownership is to be clarified during the stakeholder consultation stage
Are the ownership documents available?	As above
What is the current use of the land?	Depression pond area
Has the area been subjected to any Govt led AED?	No

Sr.	Description	Y / N / N/A	Notes
1	If the land is privately owned, is there written consent from the landowner?	No	The legal formalities would be completed during the execution and final disposal selection stage
2	Was the area or access route impacted by the previous Anti Encroachment Drive (AED)?	No	-
3	Is there an existing established access road (and is it well maintained)?	Yes	Adjacent to a suitable paved road (Begari Sukkur Road)
4	If not, is there a suitable location for an access road?	N/A	-
5	Are there any settlements within 500 meters of the area or access road?	Yes	Within village
6	Will the access road result in disruption to local communities (including livestock access)?	Possibly	Buffalo access nearby may be impacted by increased traffic on the main road.
7	Is there vegetation that would require clearing?	Yes	Hyacinth in the pond area
8	If yes, is the vegetation loss significant (e.g. provides habitat to animals, established trees)?	Possibly	May provide habitat to aquatic life
9	Will any tree need to be uprooted?	No	-
10	Is there existing fencing to avoid public and animal access?	No	-
11	Could drainage be impacted by disposing of here; could this increase flood risk?	Possibly	Potentially utilized as drainage area – filling this may have adverse impacts
12	Is the proposed disposal area within wetlands?	Yes	Potential small area wetland habitat around the pond
13	Are there any species living in the area or that use the area (such as livestock) that would be impacted?	Possibly	It may be used by buffalo
14	Are there any cultural, religious, archaeological or historical aspects that could be impacted negatively by disposal?	No	The site does not have any known cultural, religious, archaeological or historical site
15	Are there any existing receptors that could be impacted by silt being disposed of here (e.g. drinking water supplies, fish pond)?	Possibly	Unknown if used as a water source for local village

Sr.	Description	Y / N / N/A	Notes
16	Any other comment	Assessment of habitat and impact on drainage would be required to proceed further.	

Village Arbab Ali khan Ghumro pond area – common hyacinth

8. E&S Screening Checklist for Option 8

Background Information	
Name of site	Option 8 - Village Haji Yar Muhammad Ghumro – pond area
Coordinates	27°45'36.52"N 68°45'3.06"E
Date of assessment	23-11-2022
Who is the landowner?	Private. Land ownership is to be clarified during the stakeholder consultation stage
Are the ownership documents available?	As above
What is the current use of the land?	Open land with floodwater storage
Has the area been subjected to any Govt led AED?	No

Sr.	Description	Y / N / N/A	Notes
1	If the land is privately owned, is there written consent from the landowner?	No	The legal formalities would be completed during the execution and final disposal selection stage
2	Was the area or access route impacted by the previous Anti Encroachment Drive (AED)?	No	-
3	Is there an existing established access road (and is it well maintained)?	Yes	Adjacent to a suitable paved road (Begari Sukkur Road)
4	If not, is there a suitable location for an access road?	N/A	-
5	Are there any settlements within 500 meters of the area or access road?	Yes	Village Yar Muhammad Ghumro adjacent
6	Will the access road result in disruption to local communities (including livestock access)?	Possibly	Buffalo access may be impacted by increased traffic on the main road.
7	Is there vegetation that would require clearing?	No	-
8	If yes, is the vegetation loss significant (e.g. provides habitat to animals, established trees)?	N/A	-
9	Will any tree need to be uprooted?	No	-
10	Is there existing fencing to avoid public and animal access?	No	-
11	Could drainage be impacted by disposing of here; could this increase flood risk?	Possibly	Potential utilized as drainage area (noting structures which may be outfall drains) – filling this may have adverse impacts
12	Is the proposed disposal area within wetlands?	No	There is no evidence of wetland vegetation
13	Are there any species living in the area or that use the area (such as livestock) that would be impacted?	No	Not witnessed
14	Are there any cultural, religious, archaeological or historical aspects that could be impacted negatively by disposal?	No	The site does not have any known cultural, religious, archaeological or historical site
15	Are there any existing receptors that could be impacted by silt being disposed of here (e.g. drinking water supplies, fish pond)?	No	-
16	Any other comment	Assessment of impact on drainage would be required to proceed further.	

	
Water logged area	Access from an adjacent road
	
E&S team visit	Adjacent walls/buildings

9. E&S Screening Checklist for Option 9

Background Information	
Name of site	Option 9 - Land adjacent to Bagarji Sukkur Road
Coordinates	27°45'4.60"N 68°45'50.64"E
Date of assessment	23-11-2022
Who is the landowner?	Private
Are the ownership documents available?	To be confirmed
What is the current use of the land?	Unused ditch area – water logged
Has the area been subjected to any Govt led AED?	No

Sr.	Description	Y / N / N/A	Notes
1	If the land is privately owned, is there written consent from the landowner?	No	-
2	Was the area or access route impacted by the previous Anti Encroachment Drive (AED)?	No	-
3	Is there an existing established access road (and is it well maintained)?	Yes	Adjacent to a suitable paved road (Begari Sukkur Road)
4	If not, is there a suitable location for an access road?	N/A	-
5	Are there any settlements within 500 meters of the area or access road?	No	Ghumra village is around 500m away.
6	Will the access road result in disruption to local communities (including livestock access)?	Possibly	The access road may be impacted by increased traffic on the main road.
7	Is there vegetation that would require clearing?	No	-
8	If yes, is the vegetation loss significant (e.g. provides habitat to animals, established trees)?	No	-
9	Will any tree need to be uprooted?	No	There is a tree in the corner of the ditch that could be avoided.
10	Is there existing fencing to avoid public and animal access?	No	-
11	Could drainage be impacted by disposing of silt here; could this increase flood risk?	Possibly	Potential utilized as drainage area – filling this may have adverse impacts
12	Is the proposed disposal area within wetlands?	No	
13	Are there any species living in the area or that use the area (such as livestock) that would be impacted?	Possibly	Mongoose witnessed in the adjacent field
14	Are there any cultural, religious, archaeological or historical aspects that could be impacted negatively by disposal?	No	-
15	Are there any existing receptors that could be impacted by silt being disposed of here (e.g. drinking water supplies, fish pond)?	No	-
16	Any other comment	Landowner confirmed it is an unused site that would benefit from being filled	

	
Ditch area facing south	Tree in the northern corner (mongoose witnessed on the adjacent grassed area to the right of image)

10. E&S Screening Checklist for Option 10

Background Information	
Name of site	Option 10 - Barren land north-east of Ruk Complex
Coordinates	27°49'36.66"N 68°39'32.18"E
Date of assessment	24-11-2022
Who is the landowner?	Private
Are the ownership documents available?	To be confirmed
What is the current use of the land?	Barren land – some evidence of access to grazing
Has the area been subjected to any Govt led AED?	No

Sr.	Description	Y / N / N/A	Notes
1	If the land is privately owned, is there written consent from the landowner?	No	
2	Was the area or access route impacted by the previous Anti Encroachment Drive (AED)?	No	
3	Is there an existing established access road (and is it well maintained)?	Yes	Adjacent road - see photograph
4	If not, is there a suitable location for an access road?	N/A	
5	Are there any settlements within 500 meters of the area or access road?	No	Some villages around 800-1000m away
6	Will the access road result in disruption to local communities (including livestock access)?	Possibly	Increased traffic may have an impact
7	Is there vegetation that would require clearing?	No	Areas of denser scrub would be avoided with the disposal of the more barren areas.
8	If yes, is the vegetation loss significant (e.g. provides habitat to animals, established trees)?	N/A	
9	Will any tree need to be uprooted?	No	
10	Is there existing fencing to avoid public and animal access?	No	
11	Could drainage be impacted by disposing of here; could this increase flood risk?	Possibly	Waterlogged areas present
12	Is the proposed disposal area within wetlands?	No	
13	Are there any species living in the area or that use the area (such as livestock) that would be impacted?	Possibly	Possibly used for livestock grazing/access
14	Are there any cultural, religious, archaeological or historical aspects that could be impacted negatively by disposal?	No	No known sites – to confirm during consultations
15	Are there any existing receptors that could be impacted by silt being disposed of here (e.g. drinking water supplies, fish pond)?	No	Not identified at this stage
16	Any other comment	Likely that there are suitable specific areas within the wider area with minimal vegetation and relatively high capacity.	

Some waterlogged areas and minor scrub

Adjacent access road

11. E&S Screening Checklist for Option 11

Background Information	
Name of site	Option 11 - Housing developers – Sukkur City
Coordinates	Various 27°42'2.98"N 68°49'34.29"E
Date of assessment	Assessment is undertaken remotely
Who is the landowner?	Private developers
Are the ownership documents available?	To be confirmed
What is the current use of the land?	Plot for housing developments
Has the area been subjected to any Govt led AED?	No

Sr.	Description	Y / N / N/A	Notes
1	If the land is privately owned, is there written consent from the landowner?	No	Discussions required with the landowner
2	Was the area or access route impacted by the previous Anti Encroachment Drive (AED)?	No	-
3	Is there an existing established access road (and is it well maintained)?	Yes	Adjacent to a suitable paved road
4	If not, is there a suitable location for an access road?	N/A	-
5	Are there any settlements within 500 meters of the area or access road?	Yes	Within Sukkur city
6	Will the access road result in disruption to local communities (including livestock access)?	Possibly	This may increase traffic in Sukkur city.
7	Is there vegetation that would require clearing?	No	Some minor scrub. The site is already being cleared for housing development
8	If yes, is the vegetation loss significant (e.g. provides habitat to animals, established trees)?	No	-
9	Will any tree need to be uprooted?	No	-
10	Is there existing fencing to avoid public and animal access?	Yes	-
11	Could drainage be impacted by disposing of here; could this increase flood risk?	No	-
12	Is the proposed disposal area within wetlands?	No	-
13	Are there any species living in the area or that use the area (such as livestock) that would be impacted?	No	-
14	Are there any cultural, religious, archaeological or historical aspects that could be impacted negatively by disposal?	No	-
15	Are there any existing receptors that could be impacted by silt being disposed of here (e.g. drinking water supplies, fish pond)?	No	-
16	Any other comment	The timing of receiving the silt material may not be useful for the housing developers, depending on their construction program. Plots under various stages of development – generally, land appears to have been cleared or scrub	

Sr.	Description	Y / N / N/A	Notes
		remaining.	

Example plot adjacent to the road

12. E&S Screening Checklist for Option 12

Background Information	
Name of site	Option 12 - Housing developers – near sports complex
Coordinates	27°46'11.57"N 68°47'25.58"E
Date of assessment	Assessment is undertaken remotely
Who is the landowner?	Private developers
Are the ownership documents available?	To be confirmed
What is the current use of the land?	Plot for housing developments
Has the area been subjected to any Govt led AED?	No

Sr.	Description	Y / N / N/A	Notes
1	If the land is privately owned, is there written consent from the landowner?	No	Discussions required with the landowner
2	Was the area or access route impacted by the previous Anti Encroachment Drive (AED)?	No	-
3	Is there an existing established access road (and is it well maintained)?	Yes	Adjacent to the suitable paved road
4	If not, is there a suitable location for an access road?	N/A	-
5	Are there any settlements within 500 meters of the area or access road?	Yes	Adjacent to other housing developments on the edge of Sukkur city
6	Will the access road result in disruption to local communities (including livestock access)?	Possibly	May increase traffic – noting the adjacent road already has heavy traffic (i.e. additional impact may be minimal)
7	Is there vegetation that would require clearing?	No	Some minor scrub. The site is already being cleared for housing development
8	If yes, is the vegetation loss significant (e.g. provides habitat to animals, established trees)?	No	-
9	Will any tree need to be uprooted?	No	-
10	Is there existing fencing to avoid public and animal access?	Yes	-
11	Could drainage be impacted by disposing of here; could this increase flood risk?	No	-
12	Is the proposed disposal area within wetlands?	No	-
13	Are there any species living in the area or that use the area (such as livestock) that would be impacted?	No	-
14	Are there any cultural, religious, archaeological or historical aspects that could be impacted negatively by disposal?	No	-
15	Are there any existing receptors that could be impacted by silt being disposed of here (e.g. drinking water supplies, fish pond)?	No	-

Sr.	Description	Y / N / N/A	Notes
16	Any other comment	The timing of receiving the silt material may not be useful for the housing developers, depending on their construction program. Plots under various stages of development – generally land appears to have been cleared or scrub remaining.	

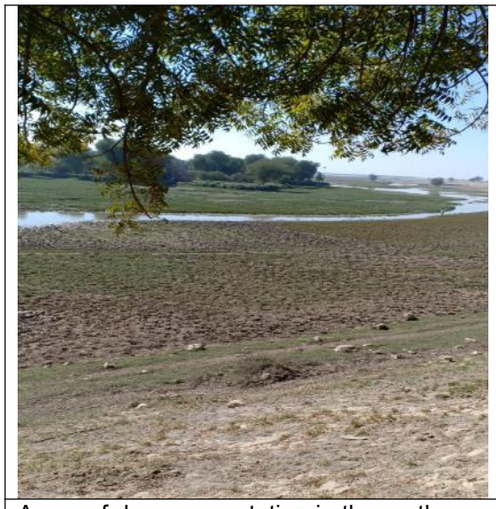
Plots under various stages of development.

13. E&S Screening Checklist for Option 13

Background Information	
Name of site	Option 13 - Flood plain area Jhali Kalwari
Coordinates	27°47'23.17"N 68°42'17.51"E
Date of assessment	23-11-2022
Who is the landowner?	Government
Are the ownership documents available?	N/A
What is the current use of the land?	Flood plain within River Indus flood embankments. Some land is in use for cultivation and housing on temporary bellas.
Has the area been subjected to any Govt led AED?	No

Sr.	Description	Y / N / N/A	Notes
1	If the land is privately owned, is there written consent from the landowner?	N/A	-
2	Was the area or access route impacted by the previous Anti Encroachment Drive (AED)?	No	-
3	Is there an existing established access road (and is it well maintained)?	Possibly	Metaled road via Bagari Madeji Road. Smaller access roads are available down the flood embankment (some temporary strengthening may be required)
4	If not, is there a suitable location for an access road?	N/A	
5	Are there any settlements within 500 meters of the area or access road?	Yes	Some villages (e.g. Jhali Kalwari) and smaller housing settlements
6	Will the access road result in disruption to local communities (including livestock access)?	Possibly	Haulage traffic to be minimized where possible
7	Is there vegetation that would require clearing?	Possibly	Some areas of scrub vegetation. Some areas of cultivation
8	If yes, is the vegetation loss significant (e.g. provides habitat to animals, established trees)?	No	Denser vegetation to be avoided
9	Will any tree need to be uprooted?	No	Any trees to be avoided
10	Is there existing fencing to avoid public and animal access?	No	-
11	Could drainage be impacted by disposing of here; could this increase flood risk?	Possibly	Specific areas are to be chosen to avoid blocking flow channels. Amount of disposal material unlikely to significantly reduce the capacity of the floodplain
12	Is the proposed disposal area within wetlands?	Possibly	Specific wetland areas to be avoided
13	Are there any species living in the area or that use the area (such as livestock) that would be impacted?	Possibly	Detailed assessment required / specific areas to be avoided
14	Are there any cultural, religious, archaeological or historical aspects that could be impacted negatively by disposal?	Possibly	To be confirmed following further consultation / specific areas to be avoided
15	Are there any existing receptors that could be impacted by silt being disposed of here (e.g. drinking water supplies, fish pond)?	Possibly	To be confirmed following further consultation / specific areas to be avoided

Sr.	Description	Y / N / N/A	Notes
16	Any other comment	A large area within the River Indus flood plain. Changing land use due to annual floods. Some cultivation from encroachers is present (notably downstream of Barrage). The large impact from the recent August 2022 floods; building back eroded areas may be beneficial	

	
Areas of denser vegetation in the northern area of the site	Areas of some depressions and cultivation

14. E&S Screening Checklist for Option 14

Background Information	
Name of site	Option 14 – Depression areas near Ruk Complex
Coordinates	27°48'36.88"N 68°38'53.62"E
Date of assessment	31-01-2023
Who is the landowner?	Private
Are the ownership documents available?	N/A
What is the current use of the land?	Depression ponded area, redundant fish pond, and agricultural fields (low-lying)
Has the area been subjected to any Govt led AED?	No

Sr.	Description	Y / N / N/A	Notes
1	If the land is privately owned, is there written consent from the landowner?	No	Landowner requested this and gave approval in principle for the use of land.
2	Was the area or access route impacted by the previous Anti Encroachment Drive (AED)?	No	-
3	Is there an existing established access road (and is it well maintained)?	Yes	Smaller access roads are available but limited width and rough condition
4	If not, is there a suitable location for an access road?	N/A	
5	Are there any settlements within 500 meters of the area or access road?	Yes	Small housing settlement at the entrance to the area
6	Will the access road result in disruption to local communities (including livestock access)?	Possibly	Other landowners that use the road may be impacted
7	Is there vegetation that would require clearing?	Possibly	Some areas of scrub vegetation. Some areas of cultivation
8	If yes, is the vegetation loss significant (e.g. provides habitat to animals, established trees)?	No	Denser vegetation to be avoided
9	Will any tree need to be uprooted?	No	Any trees to be avoided
10	Is there existing fencing to avoid public and animal access?	No	-
11	Could drainage be impacted by disposing of here; could this increase flood risk?	Possibly	Currently is a seepage/drainage area. Specific areas are to be chosen to avoid blocking flow channels.
12	Is the proposed disposal area within wetlands?	Possibly	The seepage area has some vegetation and potential wetland habitat. Specific wetland areas to be avoided
13	Are there any species living in the area or that use the area (such as livestock) that would be impacted?	Yes	Wetland birds noted. Detailed assessment required / specific areas to be avoided
14	Are there any cultural, religious, archaeological or historical aspects that could be impacted negatively by disposal?	No	None reported by the landowner
15	Are there any existing receptors that could be impacted by silt being disposed of here (e.g. drinking water supplies, fish pond)?	No	

Sr.	Description	Y / N / N/A	Notes
16	Any other comment	Railway embankment ROW to be avoided. Wetland areas to be avoided. This will leave a reasonable percentage of habitat for birds – it is also noted that there are other open water sources nearby that would be suitable for them.	

	
Depression flooded the area adjacent to the railway embankment.	Access road to field/fish pond areas.