

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
5 Others	(1) Impacts during Construction	<p>(a) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)?</p> <p>(b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts?</p> <p>(c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?</p> <p>(d) If the construction activities might cause traffic congestion, are adequate measures considered to reduce such impacts?</p>	<p>(a) Y</p> <p>(b) Y</p> <p>(c) Y</p> <p>(d) Y</p>	<p>(a) The mitigation plan is through proper selection of construction equipment and vehicles, careful operation and maintenance, and proper construction methods. In addition, efforts will be made to minimize impacts by establishing a claims window and respond to complaints.</p> <p>(b) Since the project area is an area that has already been developed, construction will have almost no impact on the natural environment.</p> <p>(c) Possible impacts include the problems of security and the increase of infectious diseases associated with the entry and exist of construction workers from outside. The contractor will prepare plans for prevention of crimes and infectious diseases, and carry out awareness education and security measures.</p> <p>(d) When laying pipes along the main trunk road, traffic congestion may occur. Traffic congestion may be alleviated by securing detour roads and one-sided traffic, installing traffic signs and control staff, and advance notice of construction details and traffic regulations.</p>
	(2) Monitoring	<p>(a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts?</p> <p>(b) What are the items, methods and frequencies of the monitoring program?</p> <p>(c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)?</p> <p>(d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?</p>	<p>(a) Y</p> <p>(b) Y</p> <p>(c) Y</p> <p>(d) Y</p>	<p>(a) Monitoring will be carried out according to the proposed monitoring plan.</p> <p>(b) The environmental monitoring plan will set the methods and frequency for necessary environmental and social items.</p> <p>(c) WASA-F will secure the necessary budget for implementation of the environmental monitoring and will request the contractor to conduct proper monitoring.</p> <p>(d) These are specified in the environmental monitoring plan.</p>
6 Note	Reference to Checklist of Other Sectors	(a) When necessary, pertinent items described in the Dam and River Projects checklist should also be checked.	(a) n/a	(a) None of these items are applicable to this project.
	Note on Using Environmental Checklist	(a) If necessary, the impacts to transboundary or global issues should be confirmed (e.g., the	(a) n/a	(a) Impacts on transboundary or global issues are not expected.





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		project includes factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, or global warming).		

Note:

- 1) Regarding the term "Country's Standards" mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are required to be made.  
In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience)
- 2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item considering the characteristics of the project and the particular circumstances of the country and locality in which the project is located.



Environmental Management Plan

Impact Item	Mitigation Measure	Implementing Body	Responsible Organization	Cost
<b>Preparation and Construction Phase</b>				
Air Pollution	<ul style="list-style-type: none"> <li>Use of construction equipment with exhaust gas emission control</li> <li>Careful operation and self-regulation of speed of construction machineries and vehicles</li> <li>Watering to prevent dust</li> </ul>	Contractor	PIU/WASA-F	Costs not required due to measures taken in construction plan and construction methods
Water Pollution	<ul style="list-style-type: none"> <li>Control of soil flow out to RBC from the working area of Intake facility</li> <li>Preventive maintenance of construction machineries and vehicles</li> <li>Wastewater control at accommodation for workers</li> </ul>	Contractor	PIU/WASA-F	Costs not required due to measures taken in construction plan and construction methods
Solid Waste	<ul style="list-style-type: none"> <li>Proper waste handling at waste disposal site and treatment plant</li> <li>Guidance to workers on construction site regarding</li> </ul>	Contractor	PIU/WASA-F	Costs not required due to measures taken in construction plan and construction methods
Soil Contamination	<ul style="list-style-type: none"> <li>Prevention of fire safety of fuel and oil storage and disposal</li> <li>Prevention of oil leaks through proper inspection and maintenance of construction machineries</li> </ul>	Contractor	PIU/WASA-F	Costs not required due to measures taken in construction plan and construction methods
Noise and Vibration	<ul style="list-style-type: none"> <li>Active use of low-noise and low-vibrational construction machineries</li> <li>Careful operation and self-regulation of speed of construction machineries and vehicles</li> </ul>	Contractor	PIU/WASA-F	Costs not required due to measures taken in construction plan and construction methods
Hydrological Situation	<ul style="list-style-type: none"> <li>Banking design having minimal impact on hydrology</li> <li>Proper use of construction methods and materials</li> </ul>	Contractor	PIU/WASA-F	Costs not required due to measures taken in construction plan and construction methods
Local Economy (Livelihood, Employment, etc.)	<ul style="list-style-type: none"> <li>Effective traffic regulation to reduce impact on local economy</li> <li>Use of construction signs and other means to ensure traffic safety</li> </ul>	Contractor	PIU/WASA-F	Included in construction cost
Water Use and Water Rights	<ul style="list-style-type: none"> <li>Water intake restrictions during drought</li> <li>Regular meetings on water use</li> </ul>	WASA-F	PIU/WASA-F	Costs not required since WASA-F is responsible
Existing Social Infrastructures & Services	<ul style="list-style-type: none"> <li>Regular reports to existing infrastructures</li> <li>Advance notification during construction period</li> </ul>	Contractor	PIU/WASA-F	Included in construction cost
Landscap.	<ul style="list-style-type: none"> <li>Prevention of fencing to blind off</li> <li>Proper storage of excavated materials, soil and pipes</li> </ul>	Contractor	PIU/WASA-F	Included in construction cost
Infectious Diseases such as HIV, AIDS	<ul style="list-style-type: none"> <li>Awareness raising and guidance to workers on infection prevention</li> </ul>	Contractor	PIU/WASA-F	Costs not required since contractor is responsible
Working Conditions	<ul style="list-style-type: none"> <li>Inspection and execution of occupational safety and health guidelines</li> <li>Execution of regular safety meetings for workers</li> <li>Installation of safety signs</li> <li>Use of wetting to prevent dust and watering of soil when transporting soil</li> </ul>	Contractor	PIU/WASA-F	Costs not required since contractor is responsible
Accidents (Traffic accidents, etc.)	<ul style="list-style-type: none"> <li>Careful operation and self-regulation of speed of construction vehicles (30km/hr)</li> <li>Notification of construction details to traffic regulations</li> <li>Allocation of traffic control staff and warning signs</li> <li>Clear management guidance for workers</li> </ul>	Contractor	PIU/WASA-F	Costs not required since contractor is responsible

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Impact Item	Mitigation Measure	Implementing Body	Responsible Organization	Cost
Operation Phase				
Solid Waste	<ul style="list-style-type: none"> <li>Proper removal and disposal of sludge generated from the water treatment plant</li> </ul>	WASA-F	PIU/WASA-F	Included in the Q&M costs of WASA-F
Noise and Vibration	<ul style="list-style-type: none"> <li>Active use of low-noise and low-vibrational construction machineries</li> </ul>	WASA-F	PIU/WASA-F	Included in the Q&M costs of WASA-F
The Poor	<ul style="list-style-type: none"> <li>Introduction of a fee structure which considers income</li> </ul>	WASA-F	PIU/WASA-F	Included in the Q&M costs of WASA-F
Water Use and Water Rights	<ul style="list-style-type: none"> <li>Coordination with Irrigation Department on water use balance between drinking water and irrigation water</li> </ul>	WASA-F	PIU/WASA-F	Included in the Q&M costs of WASA-F

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### Environmental Monitoring Plan

Impact Item	Monitoring Parameter	Measurement Method	Frequency	Monitoring Organization	Cost
<b>Preparation and Construction Phase</b>					
Air Pollution	<ul style="list-style-type: none"> <li>Presence of dust during construction</li> <li>Air quality measurement CO &lt;5, SO<sub>2</sub> &lt;120, NO<sub>x</sub> &lt;80, PM<sub>10</sub> &lt;150 (µg/m<sup>3</sup>)</li> </ul>	<ul style="list-style-type: none"> <li>Physical observation</li> <li>Air quality measurement</li> </ul>	Four times in a year	Contractor	Included in construction cost
Water Pollution	<ul style="list-style-type: none"> <li>Effluent water quality analyses COD &lt;150, SS &lt;200 (mg/L)</li> <li>Drinking water quality standard (31 parameters)</li> </ul>	<ul style="list-style-type: none"> <li>Water quality analysis</li> </ul>	Twice in a year	Contractor	Included in construction cost
Solid Waste	<ul style="list-style-type: none"> <li>Proper waste handling at waste disposal site and treatment plant</li> <li>Guidance to workers on construction site cleaning</li> </ul>	<ul style="list-style-type: none"> <li>Physical observation</li> </ul>	Monthly	Contractor	Not required due to confirmation by site inspection only
Soil Contamination	<ul style="list-style-type: none"> <li>Confirmation on soil inflow of fuel, oil, grease, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Physical observation</li> </ul>	Monthly	Contractor	Not required due to confirmation by site inspection only
Noise and Vibration	<ul style="list-style-type: none"> <li>Noise level (Industrial area during daytime &lt;75dB)</li> </ul>	<ul style="list-style-type: none"> <li>Sound level meter</li> </ul>	Twice in a year	Contractor	Included in construction cost
Hydrological Situation	<ul style="list-style-type: none"> <li>Water level near intake point</li> </ul>	<ul style="list-style-type: none"> <li>Water level measurement</li> </ul>	Weekly	Contractor	Not required due to confirmation by site inspection only
Local Economy (Livelihood, Employment, etc.)	<ul style="list-style-type: none"> <li>Confirmation on regulation to ensure no impact on local economy</li> </ul>	<ul style="list-style-type: none"> <li>Inquiries to relevant persons</li> </ul>	Weekly	Contractor	Not required due to confirmation by site inspection only
Water Use and Water Rights	<ul style="list-style-type: none"> <li>Fluctuations in water quantity and quality in canal due to the construction of water intake facilities</li> </ul>	<ul style="list-style-type: none"> <li>Inquiries to relevant persons</li> <li>Physical observation</li> </ul>	Weekly	WASA-F	Not required due to inquiries done by WASA-F staff only
Existing Social Infrastructures & Services	<ul style="list-style-type: none"> <li>Existence of traffic obstruction or reduced access to existing infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>Inquiries to relevant persons</li> <li>Physical observation</li> </ul>	Weekly	Contractor	Not required due to confirmation by site inspection only
Landscape	<ul style="list-style-type: none"> <li>Changes in landscape around construction site</li> </ul>	<ul style="list-style-type: none"> <li>Physical observation</li> </ul>	Monthly	Contractor	Not required due to confirmation by site inspection only
Infectious Diseases such as HIV/AIDS	<ul style="list-style-type: none"> <li>Prevalence of infectious diseases</li> <li>Implementation of guidance on the prevention of infectious diseases</li> </ul>	<ul style="list-style-type: none"> <li>Physical observation</li> </ul>	Monthly	Contractor	Not required due to internal training
Working Conditions	<ul style="list-style-type: none"> <li>Working conditions of employees and regular safety meetings</li> </ul>	<ul style="list-style-type: none"> <li>Physical observation</li> <li>Reports on workshops and meetings</li> </ul>	Weekly	Contractor	Not required due to internal training
Accidents (Traffic accidents, etc.)	<ul style="list-style-type: none"> <li>Occurrence of accidents</li> </ul>	<ul style="list-style-type: none"> <li>Inquiries to relevant persons</li> <li>Physical observation</li> </ul>	Weekly	Contractor	Not required due to confirmation by site inspection only
Operation Phase					
Solid Waste	<ul style="list-style-type: none"> <li>Removal of people removal and disposal of generated sludge</li> </ul>	<ul style="list-style-type: none"> <li>Physical observation</li> </ul>	Monthly	WASA-F	Not required due to confirmation by site inspection only
Noise and Vibration	<ul style="list-style-type: none"> <li>Noise level (Industrial area during daytime &lt;75dB)</li> </ul>	<ul style="list-style-type: none"> <li>Portable sound level meter</li> </ul>	Every 6 months	WASA-F	Not required due to confirmation by staff



Impact Item	Measurement Parameter	Measurement Method	Frequency	Monitoring Organization	Cost
The Poor	Impact from water tariff system to household economy	<ul style="list-style-type: none"> <li>Inquiries to relevant person</li> </ul>	Every 6 months	WASA-F	Not required due to confirmation by staff
Water Use and Water Rights	<ul style="list-style-type: none"> <li>Changes in amounts of irrigated water to downstream</li> <li>to rural lands especially during drought periods</li> </ul>	<ul style="list-style-type: none"> <li>Physical observation</li> <li>Inquiries to Irrigation Dept.</li> </ul>	Quarterly	WASA-F	Not required due to confirmation by site inspection only

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