

# Environmental Monitoring Report

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Semestral Report  
June 2016

For the period January – June 2015

## IND: Jammu and Kashmir Urban Sector Development Investment Program, Project 3

Prepared by the Economic Reconstruction Agency for the Government of Jammu and Kashmir and the Asian Development Bank.

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# **Semi-Annual Environmental Monitoring Report**

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**Loan Number: 3132 IND**  
**Period: January 2015 to June 2015**

**IND: Jammu and Kashmir Urban Sector Development  
Investment Program**

Submitted By:  
Economic Reconstruction Agency, Government of Jammu and Kashmir

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## 1. INTRODUCTION

### 1.1. Overall Project Description:

1. The State of Jammu and Kashmir lies in the northernmost part of the country and shares international border with Pakistan and China. This physiographic situation attaches strategic importance to the region as well as the infrastructural development in the state. The state has three main geographical regions namely Jammu, Kashmir valley and highlands of Ladakh. As per details from Census 2011, Jammu and Kashmir has population of 1.25 Crores, an increase from figure of 1.01 Crore in 2001 census. The population forms 1.04% of India in 2011, compared to 0.99% in 2001. As per census 2011, the Sex Ratio of female is 889 per 1000 male, which is below national average of 940. While in 2001 the sex ratio of female was 900 per 1000 males. The literacy rate has seen an upward trend at 67.16% as per 2011 census as compared to the national literacy rate of 64.80%, while in 2001 literacy rate stood at 55.52%.
2. Jammu and Srinagar are the two major cities where majority of urban population is concentrated while other smaller towns share the rest. Urban infrastructure in these places for long has been neglected and hence, is subject to severe urban infrastructure problems. Although, at least, majority of population in Jammu and Srinagar cities have been provided with piped water supplies, the other urban amenities remain neglected. This is mainly due to meager investments made in the urban infrastructure either by private or by public sector.
3. The Government of Jammu and Kashmir (GoJK), apart from the ADB financed Multi-Sector Project for Infrastructure Rehabilitation (MPIR) in Jammu and Kashmir, again approached ADB for assistance in urban sector development for more development works and studies so as to implement comprehensively the urban sector reforms. The GoJK through Jammu and Kashmir Economic Reconstruction Agency has conceived the Jammu and Kashmir Urban Sector Development Investment Program (JKUSDIP) in its effort to boost economic growth in Jammu and Kashmir State. The primary objective of JKUSDIP is to promote economic development in Jammu and Kashmir State through expansion of basic services such as water supply, sewerage, sanitation, drainage, solid waste management, urban transport and other municipal functions in Jammu, Srinagar and other important urban centers of the State. JKUSDIP will also strengthen the service delivery capacity of the responsible state urban agencies and urban local bodies through management reforms, capacity building and training.

### 1.2. Project Objectives:

4. The proposed JKUSDIP will foster the economic growth in Jammu and Kashmir State. The long term Project objectives are to contribute to the economic development of Jammu and Kashmir through enhanced and sustainable growth in the main urban areas with emphasis on promoting commerce and on improvement of livelihood for the poor.
5. The urban sector sub-projects are aimed at expansion of basic services such as water

supply, sanitation, waste management, urban transport and other municipal functions in Jammu and Srinagar cities and other urban centers in order to cater to the demands and requirements of the increasing population. The overall program envisages the following broad benefits:

- i. Improved water supply system
- ii. Improved drainage waste management systems
- iii. Improved road and traffic (urban transport) conditions
- iv. Other municipal facilities.
- v. Adequate Mechanized Parking.

### **1.3. Environmental Category:**

6. The Project 3 (Tranche-3) under JKUSDIP was categorized as Environmental Category “B”, according to ADB’s Safeguard Policy Statement (2009). All the subprojects under execution in Srinagar and Jammu have been categorized as Category “B”.

### **1.4. Environmental Performance Indicators, if any:**

7. For effective monitoring, selected environmental parameters have been identified as indicators which may be qualitatively and quantitatively measured and compared over a period of time in order to assess/ensure the compliance to environmental management plans (EMPs). The environmental performance indicators selected are physical, biological and social characteristics identified as most important in affecting the environment at critical locations all along the sub-project corridors. The parameters identified as performance indicators are:
  - i. Compliance with environmental management and monitoring plan.
  - ii. Compliance to State/National environmental regulations.
  - iii. Monitoring of ambient air quality, water quality and noise levels and comparison with baseline environmental quality and State/National standards.

### **1.5. Overall project progress, agreed milestones and implementation schedules:**

8. In Srinagar, following subprojects are under execution:
  - i. Construction of Surface water Drainage System for Rawalpora-Channapora area with a total catchment area of 284 Ha.”

A comprehensive drainage Network including construction of trunk drain, main drains, sub-mains, laterals and pumping stations for collection of surface run-off and its proper disposal has been envisaged in the package. The total length of the drain is about 26.22 Km with 1.1 Km trunk drain, 3.9 Km main drain and 21.22 Km sub main drain.

Based on survey and the catchment, the sub project has been divided in three Zones viz., Zone-1 with total catchment area of 58.74 Ha, Zone-2 with total Catchment area of 79.17 Ha and Zone-3 with total catchment area of 146.84 Ha.

**Overall progress of the contract is about 25.76%**

- ii. Providing and laying of Raw Water main from higher reaches of Doodhganga Nallah to Kralpora Treatment plant at Srinagar.

The proposed subproject will include the construction of an 18.5 km long, 750mm and 600mm internal diameter raw water transmission main from near upper reaches of Doodhganga stream to Kralpora water treatment plant.

**Overall progress of the contract is about 8.60%**

- iii. Construction of New Mehjoor Bridge at Jawahar Nagar and Two Grade Separators in Srinagar city”.

**Contract Agreement signed on 20-05-2015, work started and one test pile has been cast.**

9. In Jammu, following sub-project is under execution

- i. Rehabilitation of Water Supply Network in Identified Areas within Zone 2, 3, 4 and 5 in Jammu City. Contract Package No: JKUSDIP/Jammu/WS 05. Multilevel Mechanized Semi- Automatic Car Parking facility at City Chowk Jammu. Contract Package No: JKUSDIP/Jammu/UT 02.

About 188 kms of Ductile Iron pipeline to rehabilitate old leaking pipelines and to provide new distribution network developed area shall be constructed and commissioned.

**Overall progress of the contract is about 9.59%**

- 1.6. **Any other information useful for assessing environmental performance of the project:**

**Sensitization Workshop with Contractors on Gender Responsive Targets and Core Labour Standards**

10. In order to attain one of the objectives enlisted in the gender action plan, i) to build awareness on **gender issues** and to **ensure labour safety and safeguard**; ERA organized a workshop in collaboration with the consultants and contractors to develop understanding on gender awareness, social inclusion, core labour standards and safeguard of the labours and local community. The workshop cum training programme was organized on 12<sup>th</sup> May in Srinagar in the following location for the Tranche-3

- Rawalpura Drainage Construction Site – Rawalpura Chanpora Drainage Project

11. The workshop sessions were divided into three parts (i) inaugural session (ii) generic and site specific discussion on Gender and Safety/ Safeguards of workers and local communities along the working corridor (iii) interactive discussion with labours/ workers and finding solutions to challenges.

The key areas of discussion are as follows:

- The co-relation between infrastructure, gender, improved health and hygiene;
- The importance of the safety gears (Personal Protective Equipment) and constant use while on site/ during construction activity. Few real life examples were also shared with the labours as a motivation to wear safety gears;



- Brief introduction on applicable labour Laws and issues like minimum wages and insurance policy, provisions against use of child labour and equal wages irrespective of gender, caste / creed and religion.
  - The provision of environmental protection in every contract document and implementation of EMP.
12. More than 200 participants of ERA, Contractors (site workers and officials), PMC and DSC participated in the said workshops for all tranches. Most importantly site workers participated positively and openly discussed their concerns. Many even openly admitted to their reluctance for using Personal Protective Equipment while as some workers opined that adequate PPE were not provided timely by the contractor. Every point were discussed earnestly and possible solutions were also discussed.



Workshop in progress at construction site near Rawalpura of "Construction of Storm water drainage system in Rawalpura Area, Srinagar

## 2. COMPLIANCE STATUS WITH NATIONAL /STATE /LOCAL STATUTORY ENVIRONMENTAL REQUIREMENTS

13. **Table-1:** Status of statutory environmental requirements is shown in the following table:

S. N.	Name of Sub-project	Statutory Environmental Requirements	Status of Compliance	Actions Required
1.	Construction of Surface water drainage system for Rawalpura-Channapora area with a total catchment of 284.75 Ha. (Package: JKUSDIP Srinagar/SWD/02).	Environmental clearance under EIA Notification, 2006.	Not applicable	Contractor has applied to SPCB for consent to establish/ operate D.G Sets, batching plant and HMM plant consent renewal (vide letter no. HRCC/consent order/223/14-15 dated. 03/09/2014) and is under process. Consents are in process at SPCB level and are expecting soon.
		Approval for tree cutting	Not required	
		Consent to establish/operate for stone crusher.	Obtained and submitted by Contractor. • Consent No: 818 of 2012 Valid upto March 2015 • Fresh consent submitted by the Contractor: Consent No. 463 of 2015 and valid upto September 2015	
		Consent to establish & operate Hot Mix Plant	Contractor has submitted consent of HMM Plant bearing consent No. 1996 valid upto October 2014. For fresh renewed consents, contractor has initiated action vide letter no. HRCC/consent order/223/14-15 dated 03.09.2014	
		Consent to establish & operate Batching Plant	Consent certificate of batching plant not submitted by the contractor. Contractor ensured timely submission of consents	
		Consent to establish and operate DG Sets	Consent to establish/ operate for D.G set required and contractor has applied to SPCB and is under process	
		PUC certificates for contractor's vehicles.	Submitted by contractor	
2.	Providing and Laying of Raw water main from higher reaches of	Environmental clearance under EIA	Not applicable	



	Doodhganga nallah to Kralpora Water Treatment Plant. (Package: Srinagar/WS/02). JKUSDIP	Notification (MoEF), 2006.		
		Approval for tree cutting	Not required	
		Consent to establish/operate Stone Crusher Plant from SPCB	<ul style="list-style-type: none"> <li>• Consent no of 321 of 2014 valid upto March 2015.</li> <li>• Fresh renewed consent no of 304 of 2015 and valid up to March 2016</li> </ul>	
		Consent to establish/operate DG Set from SPCB (If required).	Not required for the present period	
		PUC certificates for contractor's vehicles.	Submitted	
3.	Construction of New Mehjoor Bridge at Jawahar Nagar and Two Grade Separators in Srinagar city	Environmental clearance under EIA Notification, 2006.	Not Applicable	D.G set consent required from contractor.  Contractor has applied to SPCB for consent to establish/ operate D.G sets and the case is under process.
		Approval for tree cutting	NOC (DS/Plan/2014-15/537-38) dt. 28.5.2015 obtained from Dept. of Sericulture for cutting 11 trees. 11 no. of Mulberry trees were cut.	
		Consent to establish/operate for stone crusher.	Consent no.463 of 2015 and valid up to September 2015	
		Consent to establish & operate Hot Mix Plant	Not required for the present period.	
		Consent to establish and operate DG Sets	Consent to establish/ operate for D.G sets required and contractor has applied to SPCB and is under process.	
		PUC certificates for contractor's vehicles.		

Jammu.		
4	Rehabilitation of Water Supply Network in Identified Areas within Zone 2, 3, 4 and 5 in Jammu City. Package No.: JKUSDIP/Jammu/WS 05	Physical Work not yet started
5.	Mechanized Semi-Automatic Parking facility at Super Bazaar City Chowk Jammu. Package No.: JKUSDIP/Jammu/UT 02	Technical Bid Evaluation Report(TBER) submitted to ADB for approval (Date of submission of TBER- 26/06/2015)
6.	Providing, Laying, Jointing, Testing and Commissioning of Sewerage network in Bakshi Nagar, Ranbir Collector, Janipur, Shiv Nagar and Shakti Nagar of division 'A' Phase-II at Jammu." (Balance works of WW-01 & WW-02). Package No. JKUSDIP/Jammu/WW-07.	Letter of acceptance issued by the competent authority to the lowest bidder.

### 3. Compliance Status With The Environmental Covenants As Stipulated In The Loan Agreement

14. **Table-2:** Status of compliance with environmental loan covenants of Tranche-3 is presented below:

Loan Covenants	Compliance status
The Borrower shall ensure, or cause the EA to ensure that;	
the preparation, design, construction, implementation, operation and decommissioning of the project, and all subproject facilities comply with; (i) all applicable laws and regulations of the Borrower and the State relating to environment, health, safety; (ii) the Environmental Safeguards; (iii) EARF; and (iv) all measures and requirements set forth in the respective IEE and EMP, and any corrective or preventative actions set forth in a Safeguards Monitoring Report.	Being complied with.
All bidding documents and contracts for Works contain provisions that require contractors to:-	The bidding documents and contract agreements for work are incorporated with provisions set forth in the IEE and EMP and are being complied with.
– Comply with the measures and requirements relevant to the contractor set forth in the IEE and EMP; and any corrective or preventive actions set out in a Safeguards Monitoring Report.	
– Make available a budget for all such environmental measures.	Environmental monitoring and mitigation costs allocated/ incorporated in contract agreements.
– Provide the EA with a written notice of any unanticipated environmental impacts that arise during construction, implementation or operation of the project that were not considered in the IEE and in the EMP.	Being complied with
– Adequately record the condition of roads, agricultural land and other infrastructure prior to starting to transport materials and construction.	The existing condition of roads and other infrastructure has been recorded in the form of photographs and video recording as well.
– Fully reinstate pathways, other local infrastructure, and agricultural land to at least their pre-project condition upon the completion of construction.	All the areas that if disturbed by construction activities will be cleared and restored to pre-project condition.
– Submit semi-annual Safeguards Monitoring to ADB and disclose relevant information from such reports to affected persons promptly upon submission;	Semi-annual report prepared and submitted to ADB as per the guidelines.
– If any unanticipated environmental risks and impacts arise during construction, implementation or operation of the Project that were not considered in the IEE and EMP as applicable, promptly inform ADB of the occurrence of such risks or impacts, with detailed description of the event and proposed corrective action plan; and	In case of any unanticipated environmental risks and impacts arise during construction, implementation or operation of the Project that were not considered in the IEE and EMP as applicable that shall be immediately informed to ADB with detailed description of the event and proposed corrective action plan.
– Report any breach of compliance with the measures and requirements set forth in the EMP, promptly after becoming aware of the breach.	Breach will be reported to ADB immediately after becoming aware of it.

**4. COMPLIANCE STATUS WITH ENVIRONMENTAL MANAGEMENT AND MONITORING PLANS AS STIPULATED IN THE ENVIRONMENTAL DOCUMENTATION AS AGREED WITH ADB.**

15. **Table-3:**The compliance status with environmental management and monitoring plan is shown in the following table:

S. No	Sub-project Name	EMP Part of Contract Documents	EMP Being Implemented	Status of EMP Implementation	Actions Proposed/ Additional Corrective Measures Required
		(Yes/No)	(Yes/No)	(Excellent/ Satisfactory/ Partially Satisfactory/ Below Satisfaction)	
1.	Construction of Storm water drainage system for Rawalpura-Channapora area with a total catchment of 284.75 Ha. (Package: JKUSDIP Srinagar/SWD/02).	Yes	Yes	Satisfactory	Due to the nature of construction work which involves frequent excavation and dust generation from soil is eminent which is having short term impact. Contractor is more often instructed to use frequent mopping and scrapping of leftover soil as first hand measure to control the dust generation in sensitive zones apart from water sprinkling.
2.	Providing and Laying of Raw water main from higher reaches of Doodhganga nallah to Kralpora Water Treatment Plant. (Package: JKUSDIP Srinagar/WS/02).	Yes	Yes	Satisfactory	Since this subproject also involve excavation activity for laying of DI pipes and dust generation from soil is eminent which is having short term impact. Contractor is more often instructed to use frequent mopping and scrapping of leftover soil as first hand measure to control the dust generation in sensitive zones apart from water sprinkling.

3.	Construction of New Mehjoor Bridge at Jawahar Nagar and Two Grade Separators in Srinagar city	Yes	Preliminary works are in progress and civil works yet to start. Contractor already issued with all the environmental reporting formats pertaining to submission of statutory consents, documents, EMP implementation mobilization of environmental safeguard/ safety officer etc.	
Jammu.				
4.	Rehabilitation of Water Supply Network in Identified Areas within Zone 2, 3, 4 and 5 in Jammu City. Package No.: JKUSDIP/Jammu/WS 05	Yes	No	Physical Work not yet started
5.	Mechanized Semi-Automatic Parking facility at Super Bazaar City Chowk Jammu. Package No.: JKUSDIP/Jammu/UT 02	Yes	Technical Bid Evaluation Report(TBER) submitted to ADB for approval (Date of submission of TBER- 26/06/2015)	
6.	Providing, Laying, Jointing, Testing and Commissioning of Sewerage network in Bakshi Nagar, Ranbir Collector, Janipur, Shiv Nagar and Shakti Nagar of division 'A' Phase-II at Jammu." (Balance works of WW-01 & WW-02). Package No. JKUSDIP/Jammu/WW-07.	No	Letter of acceptance issued by the competent authority to the lowest bidder.	

16. Details of amount withheld from the IPC's for Non-compliance of various components of EMP, in accordance with ERA Circular No.: ERA/CEO/1038/ADM/9629-42, DATED 10/01/2013, during the period January 2015 – June 2015.

**Table-4:** Updated status of amount withheld from the IPC's for Non-compliance of EMP, Srinagar

S. No.	Contract Package	Bill No.	Total Recommended Deductions
1	Construction of Storm water drainage system for Rawalpura-Channapura area with a total catchment of 284.75 Ha. (Package: JKUSDIP Srinagar/SWD/02).	IPC-12 <sup>th</sup>	1,37,614
		IPC-13 <sup>th</sup>	1,15,000

## **5. APPROACH AND METHODOLOGY ENGAGED FOR ENVIRONMENTAL MONITORING OF THE PROJECT**

17. In Srinagar, construction works on 3 subprojects are under execution. Monitoring schedules and reporting formats were issued to each contractor for compliance and implementation of EMP of each site. The contracting firms of all subprojects have nominated/ mobilized Environmental Safety Officers and are submitting site environmental reports at the end of each month.
18. One Subproject -Rehabilitation of Water Supply Network in Identified Areas within Zone 2, 3, 4 and 5 in Jammu City, Package No.: JKUSDIP/Jammu/WS 05 has been awarded and physical work is yet to start.
19. Site visit/ inspections are being carried out on regular basis to assess the EMP implementation of Tranche-3 subprojects under execution.
20. Public consultation was conducted for the subprojects of Storm Water Drainage (Rawalpora) and Doodhganga Water Supply. During consultation with different stakeholders, issue of “fugitive dust generation” was addressed. They have also suggested measures apart from normal water sprinkling by way of water tankers like “frequent mopping and scrapping of the left-over soil produced from excavation activities” must be implemented. Since, ongoing works have a limited construction period and hence have only temporary and short-term impact within the impact corridor. Contracting forms are being instructed for strict follow-up of mitigation measures as devised in EMP. Refer Appendix 1-3 for Public Consultation (participant details).
21. Public consultation shall be a regular process throughout the construction and operation phases of the subprojects to solve any issues arising out of the ongoing works.
22. The safeguards staff conducts frequent site visits to monitor the implementation of safeguard measures on sites and report to concerned official about issues/problems related to environmental non-compliance. Necessary directions in the form of corrective action measures, in case of non-compliances, are being issued to the contractors on the site and through letters about the procedures to resolve problems/issues or requirements.

## **6. MONITORING OF ENVIRONMENTAL RECEPTORS/ ATTRIBUTES**

### **1.7. Monitoring basis**

23. Air quality, water quality and noise levels are required to be monitored to check if any adverse impact is being caused by the construction activities. The monitoring of these variables is to be carried out in construction areas at sensitive locations within 100 m impact zone of the subproject. The monitoring of environmental variables is to be carried out as per the agreed Environmental Monitoring Plan.

### **1.8. Type of environmental receptor/attribute to be monitored(for each type)**



24. The environmental attributes monitored include the air, noise and water quality parameters at the construction sites in sub-project corridors. The air quality parameters monitored include RSPM ( $PM_{10}$ ),  $SO_2$  and  $NO_2$ . The water quality parameters include temperature, pH, electrical conductivity (EC), dissolved oxygen (DO), biochemical oxygen demand ( $BOD_5$ ), chemical oxygen demand (COD), total suspended solids (TSS), total dissolved solids (TDS), turbidity (NTU), total alkalinity, total hardness, calcium hardness and magnesium hardness. In case of noise quality, the day time dB  $L_{eq}$  values are monitored.

### 1.9. Methodology, Regulatory Standards of monitoring and equipment's adopted for Environmental Monitoring Laboratory (EML):

25. The following standard methods and equipment's are being used for monitoring.

26. **Table-5:** List of Assessment Methodology, Acceptable Standards and equipment's adopted.

S.No	Parameters	Assessment Methodology	Acceptable Standards	Cause for rejection	Equipment's in Use
<b>A.</b>	<b>Ambient Air Quality (<sup>2</sup>NAAQ Standards, 2009)- Time weighted average</b>				
1.	<i>RSPM– particulate matter</i> $PM_{10}$	Gravimetric High Volume Sampler method (attached with cyclone).	$100 \mu g/m^3$ $60 \mu g/m^3$		Respirable Dust Sampler, Envirotech - APM 460 BL Digital Balance, Schimadzu – BL-220H
2	<sup>3</sup> <i>Fine particulate matter</i> $PM_{2.5}$ ,	Gravimetric method.	$60 \mu g/m^3$ $40 \mu g/m^3$		Ambient Fine Dust Sampler, Instrumex.
3.	$SO_2$	Modified West and Gaeke Method.	$80 \mu g/m^3$		High Volume Air Sampler, Envirotech – APM 460BL. Thermo-electrically cooled gaseous sampling attachment, Envirotech – APM 411TE Digital Spectrophotometer, EI-305.

<sup>1</sup>CPHEEO Manual, MoUD, GOI, May 1999; and MoEF, Act and Rules, 1986 & Amendments 2000

<sup>2</sup> National Ambient Air Quality Standards (NAAQS)

<sup>3</sup>RSPM<sub>2.5</sub> sampler procured by the JK ERA for EML and next reporting period (July-Dec 2015) will form part of env. Monitoring.

4.	$NO_2$	Modified Jacob & Hochheiser Method.	$80 \mu g/m^3$		High Volume Air Sampler, Envirotech – APM 460BL. Thermo-electrically cooled gaseous sampling attachment, Envirotech – APM 411TE Digital Spectrophotometer, EI-305.
<b>B. <sup>4</sup>Ambient Noise Level</b>					
1.	Residential Area	Direct Reading in Decibel Sound Level Meter.	$55dB(A)$ $L_{eq}$ (Day time)		Digital Sound Level Meter, AZ-8928
2.	Commercial Area	Direct Reading in Decibel Sound Level Meter.	$65 dB(A)$ $L_{eq}$ (Day time))		Digital Sound Level Meter, AZ-8928
<b>C. <sup>5</sup>Ambient Water Quality (For Drinking / Ground Water)</b>					
1.	Temp (in °C)	Digital/Mercury Thermometer Method.	$>20 ^\circ C$		Digital/Mercury Thermometer
2.	Color (Hazen units)	Hazen Method	5 Platinum cobalt scale	25	-
3.	Taste and Odour		Unobjectionable	Objectionable	-
4.	pH value	Electrometric Method.	6.5-8.5	$>8.5$	Digital pH Meter, HANNA – HI98127,
5.	Electrical Conductivity (EC) $\mu s/cm$	Electrometric Method.	$\leq 500 \mu s/cm$	1000 $\mu s/cm$	Digital TDS/EC Meter, HANNA – HI-96311
6.	Dissolved Oxygen (DO) mg/l	Winkler's Method Using Azide Modification	$> 6 mg/l$		Winkler's Method
7.	Total Suspended Solids (TSS) mg/l	Gravimetric (Filtration and Drying at $105^\circ C$ )	$<120 mg/L$		Hot Air Oven, Digital Balance, Schimadzu-BL-220H
8.	Total Dissolved Solids (TDS) mg/l	Digital Meter Method.	$\leq 500 mg/l$	2000 mg/l	BOD Incubator
9.	Turbidity (NTU)	Nephelo Turbidity	1mg/l	10 mg/l	Nephelo Turbidity Meter, Systronics –

<sup>4</sup> Standards specified in the schedule of Noise Pollution (Regulation And Control) Rules, 2000 of Government of India The Principal Rules were published in the Gazette of India, vide S.O. 123(E), dated 14.2.2000 and subsequently amended vide S.O. 1046(E), dated 22.11.2000, S.O. 1088(E), dated 11.10.2002, S.O. 1569 (E), dated 19.09.2006 and S.O. 50 (E) dated 11.01.2010 under the Environment (Protection) Act, 1986.

<sup>5</sup> Drinking water Specifications, IS-10500

		Method.			132
10.	Total Hardness (as CaCO <sub>3</sub> ) mg/l	EDTA Titrimetric	300 mg/l	600 mg/l	-
11.	Total Alkalinity (as CaCO <sub>3</sub> ) mg/l	Titrimetric (Methyl Orange)	200 mg/l	600 mg/l	-
12.	Calcium Hardness (Ca) mg/l	EDTA Titrimetric	75 mg/l	200 mg/l	-
13.	Magnesium Hardness (Mg) mg/l	Calculation from total Hardness and Calcium	30 mg/l	150 mg/l	-
D.	<b><sup>6</sup>Waste Water Quality (Storm/ drain water, dry weather flow)</b>				
1.	Temp (in °C)	Digital/Mercury Thermometer Method.	Shall not exceed 5°C above the receiving water temperature		Digital/ Mercury Thermometer
2.	Color (Hazen units) Platinum cobalt scale	-	5	25	-
3.	Odour	Objectionable/ Non-objectionable	Non-objectionable		-
4.	pH value	Electrometric Method.	5.5-9.2		Digital pH Meter, HANNA – HI98127,
5.	Electrical Conductivity (EC) µs/cm	Electrometric Method.	< 2000		Digital TDS/EC Meter, HANNA – HI-96311
6.	Dissolved Oxygen (DO) mg/l	Winkler's Method Using Azide Modification	> 6 mg/L		Winkler's Method
7.	Biochemical Oxygen Demand (BOD <sub>5</sub> ) mg/l	Five Days BOD as per APHA 2005	30 mg/l		BOD Incubator
8.	Chemical Oxygen Demand (COD) m/l	Dichromate Method (APHA 2005)	250 mg/l		
9.	Total Dissolved Solids (TDS) mg/l	Digital Meter Method.	≤500 mg/L	2100 mg/L	Digital TDS/EC Meter, HANNA – HI-96311
10.	Total Suspended Solids (TSS) mg/l	Gravimetric (Filtration and Drying at 105°C)	<120 mg/L		Hot Air Oven, Digital Balance, Schimadzu-BL-220H

<sup>6</sup> Standards for Discharge of Environmental Pollutants, IS-10500

11.	Turbidity (NTU)	Nephelo Turbidity Method.	5 mg/L	10 mg/L	Nephelo Turbidity Meter, Systronics – 132
12.	Total Alkalinity (as CaCO <sub>3</sub> ) mg/l	Titrimetric (Methyl Orange)	200	600	

Annotation: BOD= biochemical oxygen demand; DO= dissolved oxygen; EC= electrical conductivity; NO<sub>2</sub>= nitrogen dioxide; PM<sub>10</sub>= particulate matter with particle size less than 10µ; RSPM= respirable suspended particulate matter; SO<sub>2</sub>= Sulphur dioxide; TDS= total dissolved solids; TSS= total suspended solids.

### 1.10. Monitoring results and comparison with statutory requirements at National levels.

27. The environmental monitoring for air quality, water quality and noise levels for subprojects under Tranche-3 in both Srinagar and Jammu. Monitoring was conducted during the reporting period of January-June 2015 by Environmental Monitoring Laboratory of J&K ERA. Results are tabulated below;

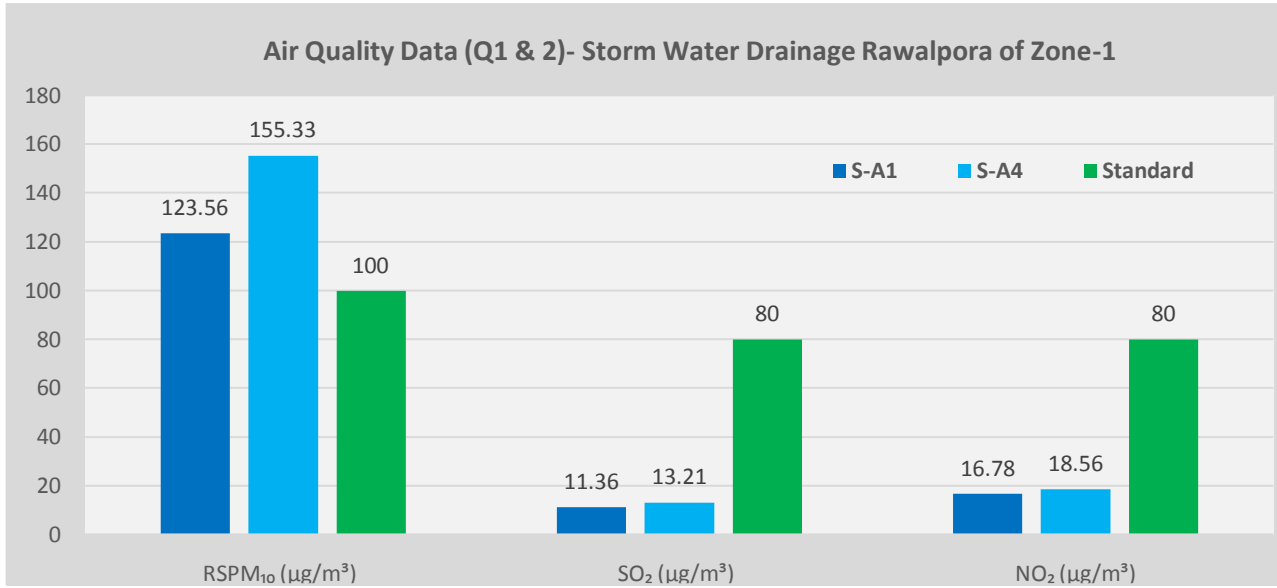
#### A. Air Quality

28. The results of air quality monitoring conducted on various sampling locations (Srinagar and Jammu) of the subprojects under Tranche-III are represented below;

29. **Table-6:** Construction of Storm Water Drainage for Rawalpura and Channapura Area, Srinagar

Srinagar Subprojects							
Ambient Air Quality							
Site Code	Quarter	Month of Sampling with date	Sampling Site/ Location	Site Type	RSPM <sub>10</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )
					Permissible Limits/ Standards		
					100	80	80
S-A4	Q1 (Jan-March)	January 08-01-2015	Near Channapura Bridge at Rawalpura	Commercial but along Residential area	153.33	13.21	18.56
S-A1	Q2 (Apr-June)	June 30-06-2015	Rawalpura near construction site	Commercial but along Residential area	123.56	11.36	16.78

30. Sampling locations near Channapura Bridge (S-A4) and S-A1 near Rawalpura Chowk shows higher values of RSPM<sub>10</sub> than the permissible level of NAAQ standards. Higher values of particulate matter (PM<sub>10</sub>) are mainly attributed to high vehicular traffic and ongoing construction activities of Zone-1 near NH-1A. Result shows dust emanating from construction zone due to the plying of the heavy traffic in NH-1A which directly correlated to insufficient dust control measures. Necessary instruction with proper protocol given to the contracting firm.. The oxides of SO<sub>2</sub>& NO<sub>2</sub> were well within the limits.

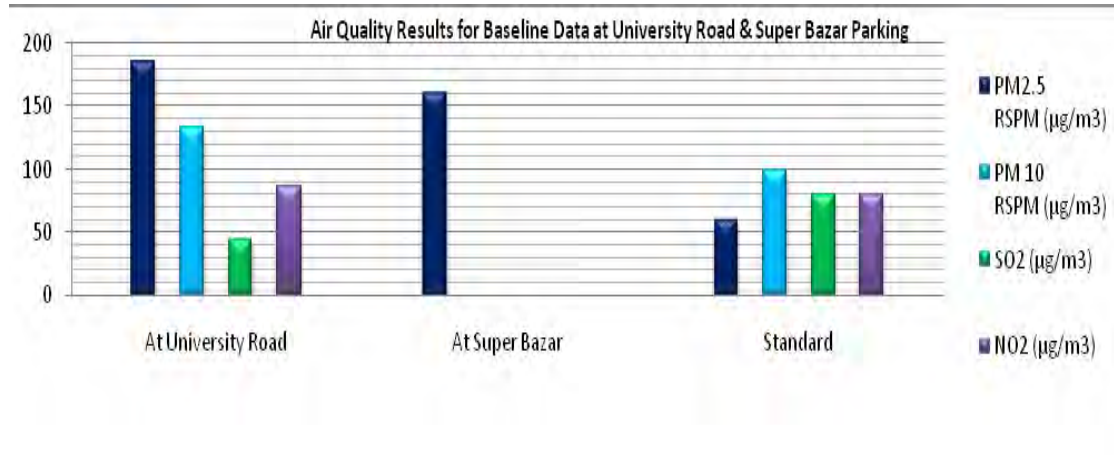


**Figure 1:** Comparison of Air Quality parameters observed of Rawalpura sites with NAAQ standards in Srinagar.

31. **Table-7:** Air quality baseline data of subprojects in Jammu

Baseline data for Air Quality- Jammu Subprojects under Tranche 3								
Site Code	Quarter	Month of Sampling with date	Sampling Site/ Location	Site Type	PM 2.5	RSPM <sub>10</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )
					Permissible Limits			
					60	100	80	80
<b>Rehabilitation of Water Supply Network in Identified Areas within Zone 2, 3, 4 and 5 in Jammu City</b>								
S1	Q2	17-06-15	At University Road	Residential, Rural and other areas	185.64	132.93	44.79	86.38
<b>Construction of Mechanized automated Multi Level Parking Facility at Super Bazar, Jammu.</b>								
S2	Q2	23-06-15	At Super Bazar	Residential, Rural and other areas	160.89			

32. Air monitoring was carried out at source in order to establish additional baseline data to correlate and compare with the monitoring during construction phase at this point. The values of RSPM PM<sub>10</sub>, Fine particulate matter PM<sub>2.5</sub> and NO<sub>2</sub> are above permissible limit, due to high frequency of traffic movement at both the sites. Whereas value of SO<sub>2</sub> is within permissible limit.



**Figure 2:** Comparison of Air Quality parameters observed at University road and super bazaar parking source with NAAQ standards.

### B. Noise Quality

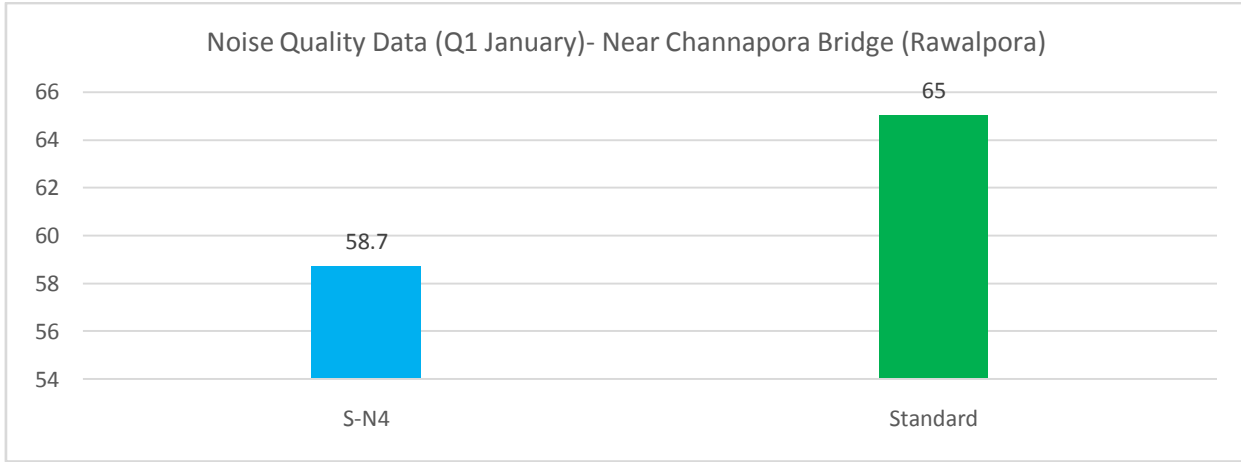
33. The measured noise quality data at various locations is given below:

34. **Table-8:** Construction of Surface Water Drainage System for Rawalpura- Channapora Area

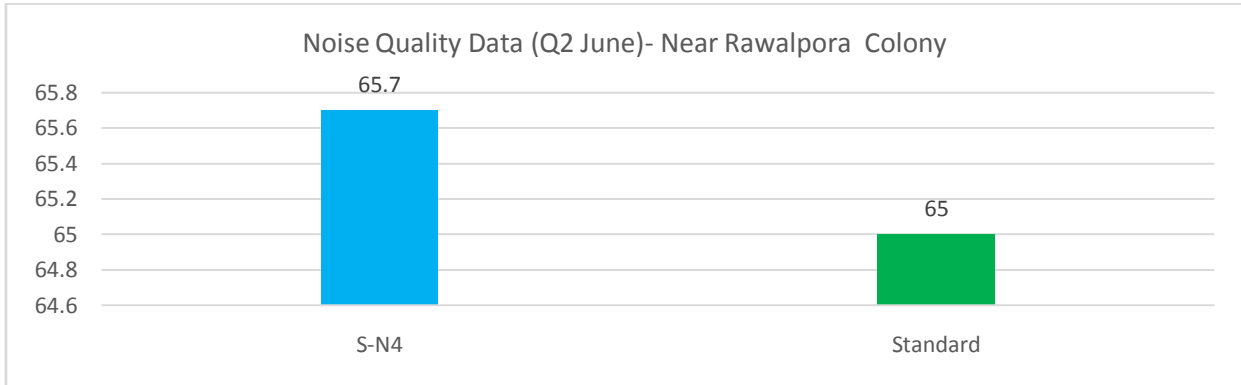
Srinagar Subprojects						
Site Code	Quarter	Month of Sampling with date	Sampling Site/ Location	Site Type	Day Time Noise Levels dB (A) Leq	Day Time Noise Quality Standards dB (A) L <sub>eq</sub>
<i>Construction of Flyover/ Express Corridor from Jehangir Chowk to Rambagh</i>						
S-N4	Q1 (Jan-March)	January 08-01-2015	Near Chanapora bridge at Rawalpura Chowk (residential area)	Residential Colony but falls under commercial zone along NH-Byepass	58.7	65
S-N1	Q2 (April-June)	June 20-06-2015	Near Rawalpura Colony (within residential area)	Residential Colony but falls under commercial zone along NH-Byepass	65.7	65

35. The noise quality monitoring shows Leq values observed is above permissible limits at site SN1, which is mainly responsible to the heavy vehicular movement at NH1A-Byepass which is in close proximity with drainage corridor from Channapora Bridge to Rawalpura chowk and partly by construction activities going on at the site. Construction activity in Zone-1 like JCB engaged with

dumpers carrying excess excavated material. However, contractor was instructed to proper maintenance of vehicles and application of mitigation measures along link roads within the colony.



**Figure 3:** Comparison of day time noise levels observed near Channapora bridge (Rawalpura) monitoring site with National noise standards in Srinagar.



**Figure 4:** Comparison of day time noise levels observed near Rawalpura colony monitoring site with National noise standards in Srinagar.

36. **Table-9:** Noise Quality baseline data of subprojects in Jammu

Baseline data for Noise Quality- Jammu Subprojects under Tranche 3						
Site Code	Quarter	Month of Sampling with date	Sampling Site/ Location	Site Type	Noise Levels (dB Leq)	Standards
<b>Rehabilitation of Water Supply Network in Identified Areas within Zone 2, 3, 4 and 5 in Jammu City.</b>						
S1	Q2	17-06-15	At University Road	Residential, Rural and other areas	75.5	55
<b>Construction of Mechanized automated Multi Level Parking Facility at Super Bazar, Jammu.</b>						
S2	Q2	23-06-15	At Super Bazar	Residential, Rural and other areas	63.9	55



37. Noise monitoring was carried out at source in order to establish additional baseline data to correlate and compare with the monitoring during construction phase at this point. The values of noise level are above permissible limit, due to high frequency of traffic movement at both the sites.

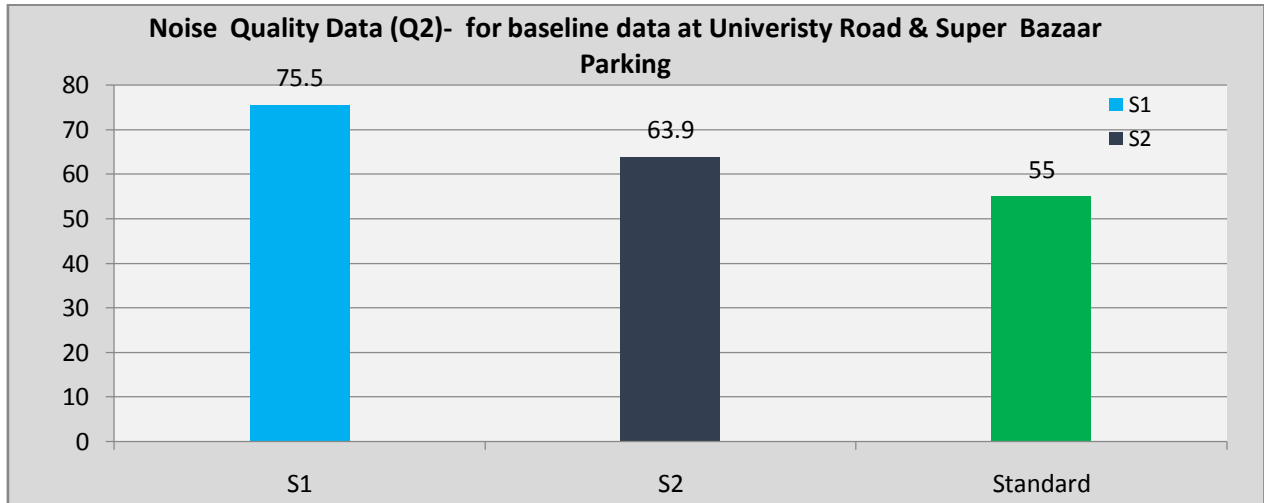


Figure 5: Comparison of day time noise levels observed at University road and Super Bazaar Parking

### C. Water Quality

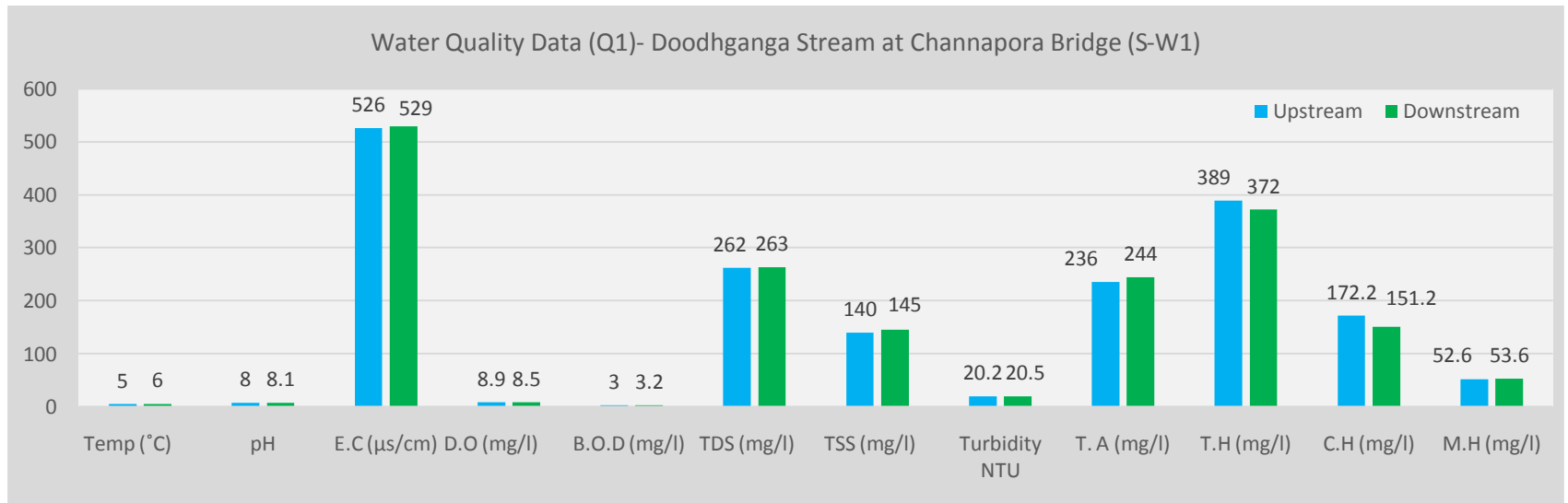
38. The results of water quality analysis conducted at sites in Srinagar are presented below:

39. **Table-10:** Construction of Construction of Surface water drainage system for Rawalpura-Channapura area, Srinagar

Site Code	Quarter	Month of Sampling with date	Sampling Site	Location	Temp °C	pH	E.C µs/cm	D.O mg/l	B.O.D mg/l	TDS mg/l	TSS mg/l	Turbidity NTU	T.A	T.H	C. H	M.H										
																	Permissible Limits									
																	6.5-8.5	≤500	>6	5	≤500	≤120	5-10	200 - 600	300 - 600	75-200
S-W1	Q1 (Jan-March)	January 08-01-2015	Doodhganga Stream near Channapura Bridge	Upstream	5	8.0	526	8.9	3.0	262	140	20.2	236	389	172.2	52.6										
				Downstream	6	8.1	529	8.5	3.2	263	145	20.5	244	372	151.2	53.6										
S-W4	Q2 (Apr-June)	June 22-06-2015	Doodhganga Flood spill channel at Rawalpura	Upstream	13	7.8	140	8.8	15	70	220	7.0	60	88	55.4	8.0										
				Downstream	13	7.7	138	8.4	16	68	230	7.3	56	80	51.2	7.0										

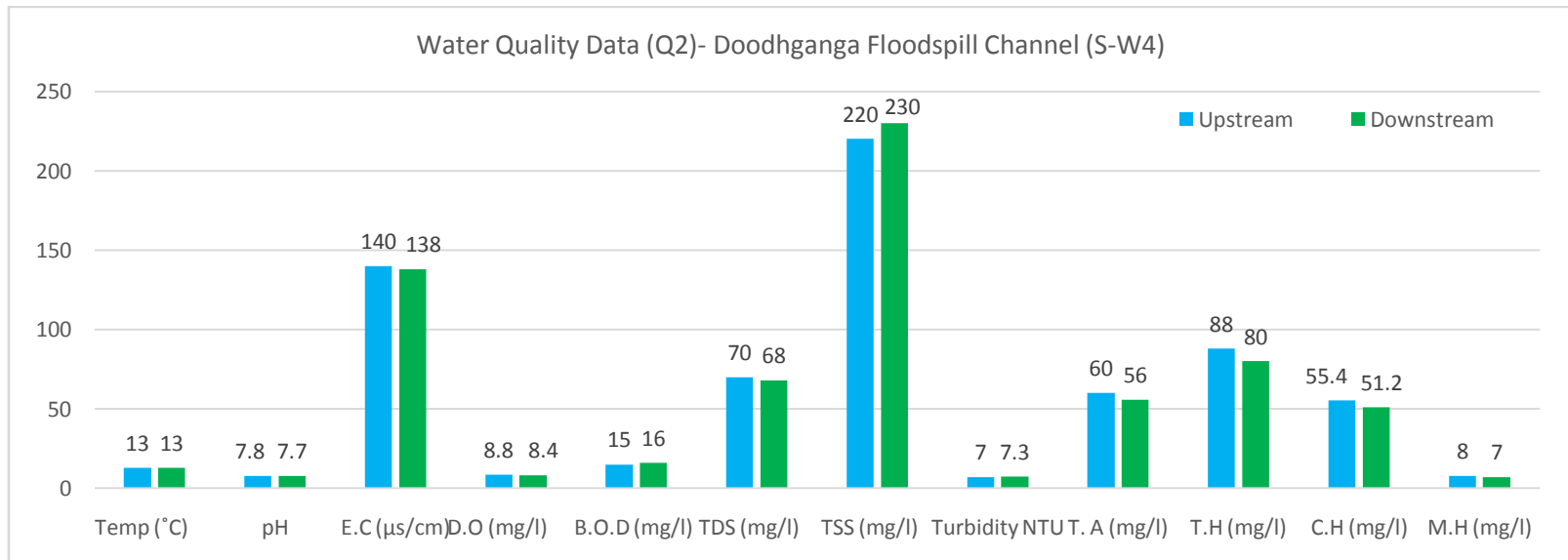
Annotations: TA- Total Alkalinity; TH- Total Hardness; CH- Calcium Hardness; MH-Magnesium Hardness

40. Q1 monitoring of Doodhganga stream shows physio-chemical characteristics of most parameters within the permissible level. Whereas, Electrical Conductivity, TSS and Turbidity has shown higher values. Mainly attributed to number of storm and waste water disposal (both point and non-point source) into stream. Water level was minimum during sampling in January. Usually in winter stream shows characteristic lean period with minimum discharge. Also in this river suspended substances and litter was present in good quantity. The water in the concerned stream was found to be turbid and odourless. Dissolved Oxygen of the stream was found in healthy state along with BOD values of the concerned river were also normal due to less organic load.
41. Throughout the present and last year's reporting of the Doodhganga stream, physio-chemical characteristics were generally same. The TSS and Turbidity was observed to be higher due to the presence of high litter content and may be also due to the clay and silt which the river brings from the upper reaches of the mountain. Comparative analysis of the stream is illustrated in Figure 5 below;



**Figure 6:** Water quality characteristics of Doodhganga Stream at Channapora (S-W1), Srinagar.

42. In Q2 monitoring, sampling was conducted of Doodhganga Flood Spill Channel (Upstream/ Downstream) in Rawalpura area. The Flood spill channel was almost stagnant and greenish in colour. It was found to be full of algal (Chlorophyta and Bacillariophyta type) growth. At many places on this spill channel direct dumping of the domestic wastes were witnessed. Also in this channel suspended substances and litter was present in good quantity. The water in the concerned stream was found to be slightly Turbid with fishy odour. DO of the spill channel was found to be healthy due to the presence of Algae and availability of direct sunlight. BOD of the Flood Spill channel is high and may be due to the presence of high organic load. Conductivity and TDS values were found to be in normal range. TSS and Turbidity were observed to be higher and it may be due to the presence of lot of litter. Low concentrations of Alkalinity and Hardness were found in the water body.
43. The characteristics of flood spill channel of Doodhganga in Rawalpura area is illustrated in Figure 6 below;



**Figure 6:** Water quality characteristics of Doodhganga Floodspill Channel at Rawalpura area (S-W4), Srinagar.

**7. ANY OTHER ENVIRONMENTAL ASPECTS, IMPACTS OBSERVED DURING IMPLEMENTATION WHICH WERE NOT COVERED EARLIER**

44. No such aspect/impact observed during this period under report.

**8. DETAILS OF COMPLAINTS RECEIVED FROM PUBLIC AND ACTIONS TAKEN THEREOF TO RESOLVE**

45. **Table-11:** Details of complaints (maintained in Public Grievance Register at site) were received from public generally pertaining to ongoing works of Surface Water Drainage at Rawalpura in Srinagar.

S. No	Subproject Name	Date of compliant registered	Type of Compliant Received (Public Grievance Register at Site)	Action Taken/ Corrective Measures	Remarks
01	Procurement of works of storm water drainage system including all	10-05-2015	Dust generation from existing roads.	Dust Suppression measures by way of water sprinkling were immediately initiated to address the problem.	Issue addressed & resolved. Record maintained at site office and DSC.
02	civil, Mechanical & electrical works in Rawalpura Chanapora Bridge catchment areas at NH bypass Srinagar	06-06-2015	Fence wall of a resident was damaged because of JCB excavator during construction works	Particular fencing wall was rectified and brought back to its position.	Issue addressed & resolved. Record maintained at site office and DSC.

**9. FOLLOW-UP ACTIONS AND CONCLUSIONS**

46. Site supervision of above subprojects under execution is being carried out regularly to ensure that environmental impacts are adequately mitigated and to ensure continuation of compliance with statutory regulations as required by laws and agreed upon EMP. The contractors are being regularly guided and instructed to adhere to the provisions of EMP under contractual conditions.

47. As part of Capacity Building Programme for JKUSDIP subprojects training programs for the engineers, the contractors and project staff will be conducted and regular informal onsite orientation for the contractor’s supervisory staff and site engineers on EMP implementation will be continued.

### Appendix-1 Public Consultation (Participants) Details of Rawalpura Storm Water Drainage

Public Consultation Format (Environmental & Social Safeguards) Jammu & Kashmir Urban Development Investment Programme (JKUSDIP), J&K ERA

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Name of the Sub-project: Storm water drainage system in Rawalpura Chowk to Chanapura Bridge catchment areas at NH Bypass Srinagar

Location: Zone 1, 2. Time: 11:am - 5:00pm.

Date: 11, June, 2015 PC Conducted by: OSC

S.No	Name	Occupation	Address	Signature
1	Farooq Ahmad Bhat	Shopkeeper	Syed Jafferpora	Farooq A.
2	Ali Mohammad Dar	Shopkeeper	Syed Jafferpora	Ali M.D.
3	Zehra ul Fatma	Student	Gayoom colony Rawalpura	Zehra ul Fatma
4	Masrah Din	Student	Syed Jafferpora	Masrah D.
5	Muhammad Shah	Housewife	Asthanpora	Muhammad S.
6	Rehana	Housewife	Gayoom colony	Rehana
7	Bilal ah Jan	Govt employee	Rawalpura	Bilal J.
8	Mahima Khatun	Student	Rawalpura	Mahima K.
9	Mohd Jaseem Khan	Student	Rawalpura	Mohd J.



## Public Consultation Format (Environmental &amp; Social Safeguards) Jammu &amp; Kashmir Urban Development Investment Programme (JKUSDIP), J&amp;K ERA

S.No	Name	Occupation	Address	Signature
10	Samadullah Jan	Business	Rawalpore Chirchote	Samadullah Jan
11	Ab. Ashman Vats	Govt. Employee	Rawalpore	Ab. Ashman
12	Mohammad Yams	Business	Rawalpore	Mohammad Yams
13	Rafiq	Housewife	Hakeem Bagh	Rafiq
14	Masrat Noor	Govt. Employee	Alfaraaz Colony Rawalpore	Masrat Noor
15	Ab. Wali. Mir	Business	Hakeem Bagh Rawalpore	Ab. Wali. Mir
16	Abdul Samad Feroz	Business	Pine Avenue	Abdul Samad Feroz
17	Dr. Sajad	Radiologist	Pine Avenue	Dr. Sajad
18	Mehar. Ashraf	Bank Employee	Martina Enclave	Mehar. Ashraf
19	Sabha Malik	Dental Surgeon	Alfaraaz Colony	Sabha Malik
20	Syed Insha Ehsan	Bank Employee	Alfaraaz colony	Syed Insha Ehsan



Appendix-1 Continued...

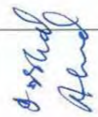





JAMMU AND KASHMIR URBAN DEVELOPMENT INVESTMENT PROGRAMME (JKUSDIP), J&K ERA

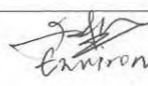
LIST OF PARTICIPANTS IN PUBLIC CONSULTATION WITH SIGNATURES

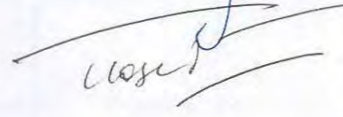
SUB-PROJECT NAME: Const. of storm water Drainages

LOCATION OF MEETING/ CONSULTATION: Rawalpora, near Boy's Higher Sec Sch

DATE AND TIME: 30/10/2018 - 11:00 to 1:30 pm.

S.NO	Name	Age/ Sex	Occupation	Address	Signature
1.	Irshad Ahmed	M. 58	Business	Rawalpora,	
2.	Farooq Ahmad	M. 48	Business	Rawalpora	
3.	Abdul Dayoon	M. 60	veg. vendors	Satbuzh.	A.P.R.
4.	Bilal Ahmed	M 33	Govt. Employee	Rawalpora, Hakeem Bagh.	r. Bilal
5.	Khulid Hussain	M 40	Govt. Employee	Rawalpora, Hakeem Bagh	AKHIL
6.	Masroor Ahmad Shah	M. 42	Es.	Rawalpora Hakeem Bagh.	
7.	Nasir Akh Shah	M 48	Govt. Director S&T.	Rawalpora Hakeem Bagh.	
8.	Hakeem Shuk Jellani	M 65	Retd. Secretary SSB.	Rawalpora Hakeem Bagh.	Zahid
9.	Adnan Mirjeet	M. 27	Business	Rawalpora L.D Colony	
10.	Jameel Akh Mir	M 28	Govt. Employee	Rawalpora Clock crossing	

  
Environmental Safeguards  
PMC, JKUSDIP.

  
Close







**Appendix-2: Public Consultation (Participants) Details of Doodhganga Water Supply Subproject.**

LIST OF PARTICIPANTS IN PUBLIC CONSULTATION WITH SIGNATURES

SUB-PROJECT NAME: Doodh Ganga water supply

LOCATION OF MEETING/ CONSULTATION: Kunalpara cum Gopalpara

DATE AND TIME: 27-6-2015 - 10:30 am

S.NO	Name ,age and Address	Occupation and Contact Address/PH	Signature
1.	Fayaz Ahmad Gopalpara	Shop keeper	
2.	Mohd. Rafiq, Gopalpara	labarer	
3.	Gho. Mod. Gopalpara	Shop keeper	
4.	Fayaz Ahmad Gopalpara	Resident	
5.	Jala	Resident.	
6.	Mushfaq Ahmad	Resident.	
7.	Khushheed Ahmad	Shopkeeper	
8.	Mohd Amir Nasir Gopalpara	Resident.	
9.	Syed Basim Ahmad Gopalpara	Resident	
10.	Manzoos Ahmad Akher - Gopalpara	Resident	



### Appendix -3 Public Consultation Photos of Tranche-3





**Appendix-4 : Sampling site location map of Surface Water Drainage at Rawalpura (Zone-1), Srinagar**





Appendix-5: Sampling site location map of Multilevel parking and Rehabilitation of Water Supply Network.

