

MONITORING FORM

If environmental reviews indicate the need of monitoring by JICA, JICA undertakes monitoring for necessary items that are decided by environmental reviews. JICA undertakes monitoring based on regular reports including measured data submitted by the project proponent. When necessary, the project proponent should refer to the following monitoring form for submitting reports.

When monitoring plans including monitoring items, frequencies and methods are decided, project phase or project life cycle (such as construction phase and operation phase) should be considered.

1. Responses/Actions to Comments and Guidance from Government Authorities and the Public

Monitoring Item	Monitoring Results during Report Period
ex.) Responses/Actions to Comments and Guidance from Government Authorities	July 2020- September 2020

2. Mitigation Measures

The summary of the Environmental Monitoring is shown below.

[Construction Phase]

Item	Parameter	Frequency and Duration	Locations(At least)
Air	PM ₁₀	2×24hours Twice/month During entire civil construction stage or even later, if directed by DMRC	20 locations
Water	Groundwaterquality (IS 10500:1991)	Once/6months During entire civil construction stage or even later, if directed by DMRC	20 locations
Noise	Noise Level (Leq and Lmax)	24hours Once/week During entire civil construction stage or even later, if directed by DMRC	30 locations
Vibration	Vibration (RMS)	24hours Once/week During entire civil construction stage or even later, if directed by DMRC	10 locations
Soil	Heavy Metal	Once/6moths During entire civil construction stage	In each Underground Construction Contract
Ecology	Felled and planted trees	Once a year till all trees that were to be planted by Delhi Government on behalf of DMRC, are planted	All the trees felled and newly planted trees

[Operation Phase]

Item	Parameter	Frequency and Duration	Locations
Air	PM ₁₀	2×24hours Once/month For 3years	10 locations
Water	Effluent	Once/4months For 3years	3 locations(Depot)
	Groundwater quality (IS 10500:1991)	Once/year For 3years	3 locations(Depot)
Noise	Noise Level (Leq)	24hours Once/year For 3years	15 locations (Sensitive Receptors along the elevated section)
Vibration	Vibration level VdB	24hours Once/year For 3years	15 locations (Sensitive Receptors along the elevated and underground section)
Ecology	Bird Strike	4times/year(If no bird hit is reported in this duration, then this monitoring may be discontinued, else it will continue). From the beginning, DMRC will instruct its train operator to compulsorily blow the horn while on the bridge across the Yamuna.	On the DMRC Yamuna bridge near Okhla Bird Sanctuary

2.1 During Construction

When a measured value exceeds the standards, the value is written in bold letters.

Air Quality (Ambient Air Quality)

Date: July 2020 Location: CC-127 (Dwarka Sector-21 to 25) (UG)

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³	Batching Plant - 119.6	126.3	100 (24hours) (CPCB)	-	2×24hours Twice/month During entire civil construction stage or even later, if directed by DMRC
		Station Area - 117.3	129.2			
		Cut & Cover Area -126.6	131.4			

Date: Location:

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³			100 (24hours) (CPCB)	-	2×24hours Twice/month During entire civil construction stage or even later, if directed by DMRC

Date: July 2020 Location: CC-129 (elevated stabling depot) (Elevated)

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³	Near S.P.-14- 98.1	103.6	100 (24hours) (CPCB)	-	2×24hours Twice/month During entire civil construction stage or even later, if directed by DMRC
		Near office:- 103	109.4			

Date: Location:

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³	-		100 (24hours) (CPCB)	-	2×24hours Twice/month During entire civil construction stage or even later, if directed by DMRC

Ground Water Quality (Drinking Water Quality: IS 10500:1991)

Date: June 2020 Location: CC-127 (Dwarka Sector-21 to 25) (UG)

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
Color, Hazen units, Max		<5		5(25)	-	20 locations Once/6 months During entire civil construction stage or even later, if directed by DMRC
Odour	-	Agreeable		Unobjectionable	-	
Taste	-	Agreeable		Agreeable	-	
Turbidity, NTU, Max	-	<1.0		5(10)	-	
pH Value	-	7.12		6.5-8.5	-	
Total Hardness (as CaCO ₃), Max	mg/l	196		300(600)	-	
Iron(as Fe), max	mg/l	0.21		0.3(1.0)	-	
Chloride(as Cl), Max	mg/l	128		250(1000)	-	
Residual free Chlorine, Min	mg/l	Nil		0.2	-	
Fluoride(as F), Max	mg/l	0.13		1.0(1.5)	-	
Dissolved solids, Max	mg/l	582.0		500(2000)	-	
Calcium(as	mg/l	39.0		75(200)	-	

Ca), Max					
Magnesium(as Mg), Max	mg/l	24		30(100)	-
Copper(as Cu), Max	mg/l	BDL		0.05(1.5)	-
Manganese(as Mn), Max	mg/l	BDL		0.1(0.3)	-
Sulphate(as SO ₄), Max	mg/l	84		200(400)	-
Nitrate(as NO ₂), Max	mg/l	3.82		45(100)	-
Phenolic compounds (as C ₆ H ₅ OH),Max	mg/l	BDL		0.001(0.002)	-
Mercury(as Hg), Max	mg/l	BDL		0.001	-
Cadmium(as Cd), Max	mg/l	BDL		0.01	-
Selenium(as Se), Max	mg/l	-		0.01	-
Arsenic(as As), Max	mg/l	BDL		0.05	-
Cyanide(as CN), Max	mg/l	<0.05		0.05	-
Lead(as Pb), Max	mg/l	BDL		0.05	-
Zinc(as Zn), Max	mg/l	BDL		5(15)	-
Anionic Detergents (as MBAS),Max	mg/l	BDL		0.2(1.0)	-
Chromium (as Cr ⁶⁺),Max	mg/l	BDL		0.05	-
Polynuclear aromatic hydrocarbons(as PAH),Max	mg/l			-	-
Mineral Oil	mg/l	BDL		0.01	-
Pesticides, Max	mg/l	-		Absent	-
Radioactive Materials, Max a) Alpha emitters	Bq/l	-		-(0.1)	-
Radioactive Materials, Max	Pci/l	-		-(1)	-

b) Beta emitters					
Alkalinity, Max	mg/l	346		200(600)	-
Aluminum(as Al), Max	mg/l	BDL		0.03(0.2)	-
Boron,Max	mg/l	-		1(5)	-

Date:

Location:

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
Color,Hazen units,Max		-		5(25)	-	20 locations Once/6 months During entire civil construction stage or even later, if directed by DMRC
Odour	-			Unobjectionable	-	
Taste	-			Agreeable	-	
Turbidity,NTU, Max	-			5(10)	-	
pH Value	-			6.5-8.5	-	
Total Hardness (as CaCO ₃), Max	mg/l			300(600)	-	
Iron(as Fe), max	mg/l			0.3(1.0)	-	
Chloride(as Cl), Max	mg/l			250(1000)	-	
Residual free Chlorine, Min	mg/l			0.2	-	
Fluoride(as F), Max	mg/l			1.0(1.5)	-	
Dissolved solids, Max	mg/l			500(2000)	-	
Calcium(as Ca), Max	mg/l			75(200)	-	
Magnesium(as Mg), Max	mg/l			30(100)	-	
Copper(as Cu), Max	mg/l			0.05(1.5)	-	
Manganese(as Mn), Max	mg/l			0.1(0.3)	-	
Sulphate(as SO ₄), Max	mg/l			200(400)	-	
Nitrate(as NO ₂),	mg/l			45(100)	-	

Max					
Phenolic compounds (as C ₆ H ₅ OH), Max	mg/l			0.001(0.002)	-
Mercury(as Hg), Max	mg/l			0.001	-
Cadmium(as Cd), Max	mg/l			0.01	-
Selenium(as Se), Max	mg/l			0.01	-
Arsenic(as As), Max	mg/l			0.05	-
Cyanide(as CN), Max	mg/l			0.05	-
Lead(as Pb), Max	mg/l			0.05	-
Zinc(as Zn), Max	mg/l			5(15)	-
Anionic Detergents (as MBAS), Max	mg/l			0.2(1.0)	-
Chromium (as Cr ⁶⁺), Max	mg/l			0.05	-
Polynuclear aromatic hydrocarbons(as PAH), Max	mg/l			-	-
Mineral Oil	mg/l			0.01	-
Pesticides, Max	mg/l			Absent	-
Radioactive Materials, Max c) Alpha emitters	Bq/l			-(0.1)	-
Radioactive Materials, Max d) Beta emitters	Pci/l			-(1)	-
Alkalinity, Max	mg/l			200(600)	-
Aluminum(as Al), Max	mg/l			0.03(0.2)	-
Boron, Max	mg/l			1(5)	-

Date: Location:

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
Color, Hazen units, Max				5(25)	-	20 locations Once/6 months During entire civil construction stage or even later, if directed by DMRC
Odour	-			Unobjectionable	-	
Taste	-			Agreeable	-	
Turbidity, NTU, Max	-			5(10)	-	
pH Value	-			6.5-8.5	-	
Total Hardness (as CaCO ₃), Max	mg/l			300(600)	-	
Iron(as Fe), max	mg/l			0.3(1.0)	-	
Chloride(as Cl), Max	mg/l			250(1000)	-	
Residual free Chlorine, Min	mg/l			0.2	-	
Fluoride(as F), Max	mg/l			1.0(1.5)	-	
Dissolved solids, Max	mg/l			500(2000)	-	
Calcium(as Ca), Max	mg/l			75(200)	-	
Magnesium(as Mg), Max	mg/l			30(100)	-	
Copper(as Cu), Max	mg/l			0.05(1.5)	-	
Manganese(as Mn), Max	mg/l			0.1(0.3)	-	
Sulphate(as SO ₄), Max	mg/l			200(400)	-	
Nitrate(as NO ₂), Max	mg/l			45(100)	-	
Phenolic compounds (as C ₆ H ₅ OH), Max	mg/l			0.001(0.002)	-	
Mercury(as Hg), Max	mg/l			0.001	-	
Cadmium(as Cd), Max	mg/l			0.01	-	

Selenium(as Se), Max	mg/l			0.01	-	
Arsenic(as As), Max	mg/l			0.05	-	
Cyanide(as CN), Max	mg/l			0.05	-	
Lead(as Pb), Max	mg/l			0.05	-	
Zinc(as Zn), Max	mg/l			5(15)	-	
Anionic Detergents (as MBAS), Max	mg/l			0.2(1.0)	-	
Chromium (as Cr6 ⁺), Max	mg/l			0.05	-	
Polynuclear aromatic hydrocarbons(as PAH), Max	mg/l			-	-	
Mineral Oil	mg/l			0.01	-	
Pesticides, Max	mg/l			Absent	-	
Radioactive Materials, Max e) Alpha emitters	Bq/l			-(0.1)	-	
Radioactive Materials, Max f) Beta emitters	Pci/l			-(1)	-	
Alkalinity, Max	mg/l			200(600)	-	
Aluminum(as Al), Max	mg/l			0.03(0.2)	-	
Boron, Max	mg/l			1(5)	-	

Date:

Location:

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
Color, Hazen units, Max				5(25)	-	20 locations
Odour	-			Unobjectionable	-	Once/6 months
Taste	-			Agreeable	-	During entire civil
Turbidity, NTU,	-			5(10)	-	

Max						construction stage or even later, if directed by DMRC
pH Value	-			6.5-8.5	-	
Total Hardness (as CaCO ₃), Max	mg/l			300(600)	-	
Iron(as Fe), max	mg/l			0.3(1.0)	-	
Chloride(as Cl), Max	mg/l			250(1000)	-	
Residual free Chlorine, Min	mg/l			0.2	-	
Fluoride(as F), Max	mg/l			1.0(1.5)	-	
Dissolved solids, Max	mg/l			500(2000)	-	
Calcium(as Ca), Max	mg/l			75(200)	-	
Magnesium(as Mg), Max	mg/l			30(100)	-	
Copper(as Cu), Max	mg/l			0.05(1.5)	-	
Manganese(as Mn), Max	mg/l			0.1(0.3)	-	
Sulphate(as SO ₄), Max	mg/l			200(400)	-	
Nitrate(as NO ₂), Max	mg/l			45(100)	-	
Phenolic compounds (as C ₆ H ₅ OH), Max	mg/l			0.001(0.002)	-	
Mercury(as Hg), Max	mg/l			0.001	-	
Cadmium(as Cd), Max	mg/l			0.01	-	
Selenium(as Se), Max	mg/l			0.01	-	
Arsenic(as As), Max	mg/l			0.05	-	
Cyanide(as CN), Max	mg/l			0.05	-	
Lead(as Pb), Max	mg/l			0.05	-	
Zinc(as Zn), Max	mg/l			5(15)	-	

Anionic Detergents (as MBAS), Max	mg/l			0.2(1.0)	-
Chromium (as Cr6 ⁺), Max	mg/l			0.05	-
Polynuclear aromatic hydrocarbons (as PAH), Max	mg/l			-	-
Mineral Oil	mg/l			0.01	-
Pesticides, Max	mg/l			Absent	-
Radioactive Materials, Max g) Alpha emitters	Bq/l			-(0.1)	-
Radioactive Materials, Max h) Beta emitters	Pci/l			-(1)	-
Alkalinity, Max	mg/l			200(600)	-
Aluminum (as Al), Max	mg/l			0.03(0.2)	-
Boron, Max	mg/l			1(5)	-

Noise / Vibration

Date: January 2020 Location: CC-129 Stabling Line (Elevated)

Item	Unit	Measured Value (L _{eq})	Measured Value (L _{Max})	Country's Standards (Environmental Management Manual by DMRC)	Occupancy	Remarks (Measurement Point, Frequency, Method, etc.)
Noise level (L _{eq}) and L _{max}	dB(A)	Near S.P.-14 Leq (d)-66.2 Leq (n)- 59.7 Lmin- 42.2 Near Casting Yard Leq (d)-64.5 Leq (n)- 60.5 Lmin- 38.2	75.4 78.8	<u>National Standards</u> <u>Area Leq(d) Leq(h)</u> Resi 55 45 Comm 65 55 Indstl 75 70 Silence 50 40 <u>DMRC Env Manual</u> (when pre construction levels are not known) Resi Lmax	Commercial /residence	30 locations 24 hours/time Once/week During entire civil construction stage or even later, if directed by DMRC

				Daytime: 75 Nighttime: 65 Comm & and Indstl At all time: 85		
Vibration level	RMS (mm/s)			Structures in good condition:25 in fair condition:12 in poor condition:5 Water supply Structures:5 Heritage structure/ Bridge structures:5	-	10locations 24hours/time Once/week During entire civil construction stage or even later, if directed by DMRC.

Date: July 2020 Location: Dwarka Sec-25 CC-127 (UG)

Item	Unit	Measured Value (L _{eq})	Measured Value (L _{Max})	Country's Standards (Environmental Management Manual by DMRC)	Occupancy	Remarks (Measurement Point, Frequency, Method, etc.)
Noise level (Leq) and Lmax	dB(A)	Batching Plant Leq(d) – 61.8 Leq(n) – 58.6 Lmin – 37.6 Station Area Leq(d) – 64.8 Leq(n) – 61.3 Lmin – 40.8 Cut & Cover Area Leq(d) – 60.6 Leq(n) – 59.2 Lmin – 39.3	78.5 81.4 74.8	<u>National Standards</u> <u>AreaLeq(d)Leq(n)</u> Resi 55 45 Comm 65 55 Indstl 75 70 Silence 50 40 <u>DMRC Env Manual</u> (when pre construction levels are not known) Resi Lmax Daytime: 75 Nighttime: 65 Comm & and Indstl At all time: 85	Commercial / residence	30locations 24hours/time Once/week During entire civil construction stage or even later, if directed by DMRC.
Vibration level	RMS (mm/s)			Structures in good	-	10locations

				condition:25 in fair condition:12 in poor condition:5 Water supply Structures:5 Heritage structure/ Bridge structures:5		24hours/ti me Once/week During entire civil constructio n stage or even later, if directed by DMRC
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Date: Location:

Item	Unit	Measured Value (L _{eq})	Measured Value (L _{Max})	Country's Standards (Environmental Management Manual by DMRC)	Occupancy	Remarks (Measurement Point, Frequency, Method, etc.)
Noise level (L _{eq}) and L _{max}	dB(A)			<u>National Standards</u> Area L _{eq} (d) L _{eq} (n) Resi 55 45 Comm 65 55 Indstl 75 70 Silence 50 40 <u>DMRC Env Manual</u> (when pre construction levels are not known) Resi L _{max} Daytime: 75 Nighttime: 65 Comm & and Indstl At all time: 85	Commercial / residence	30locations 24hours/tim e Once/week During entire civil constructio n stage or even later, if directed by DMRC
Vibration level	RMS (mm/s)			Structures in good condition:25 in fair condition:12 in poor condition:5 Water supply Structures:5 Heritage structure/		10locations 24hours/tim e Once/week During entire civil constructio n stage or even later,

				Bridge structures:5		if directed by DMRC
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Date: Location:

Item	Unit	Measured Value (L _{eq})	Measured Value (L _{Max})	Country's Standards (Environmental Management Manual by DMRC)	Occupancy	Remarks (Measurement Point, Frequency, Method, etc.)
Noise level (Leq) and Lmax	dB(A)			<u>National Standards</u> Area Leq(d) Leq(n) Resi 55 45 Comm 65 55 Indstl 75 70 Silence 50 40 <u>DMRC Env Manual</u> (when pre construction levels are not known) Resi Lmax Daytime: 75 Nighttime: 65 Comm & Indstl At all time: 85	Commercial / residence	30 locations 24 hours/time Once/week During entire civil construction stage or even later, if directed by DMRC
Vibration level	RMS (mm/s)			Structures in good condition: 25 in fair condition: 12 in poor condition: 5 Water supply Structures: 5 Heritage structure/ Bridge structures: 5	-	10 locations 24 hours/time Once/week During entire civil construction stage or even later, if directed by DMRC

Excavated soil (Leaching test)

Date: July 2020

Location: CC-127 (Dwarka Sector-21 to 25) (UG)

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
Mercury(as Hg)	mg/l	ND		-	0.0005	In each Underground Construction Contract Once/6months During entire civil construction stage Samples should be taken from the underground lowest point.
Cadmium(as Cd)	mg/l	ND		-	0.01	
Arsenic(as As)	mg/l	ND		-	0.01	
Cyanide(as CN)	mg/l	ND		-	Not detected	
Lead(as Pb)	mg/l	ND		-	0.01	
Chromium(as Cr6 ⁺)	mg/l	ND		-	0.05	

Date:

Location:

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
Mercury(as Hg)	mg/l			-	0.0005	In each Underground Construction Contract Once/6months During entire civil construction stage Samples should be taken from the underground lowest point.
Cadmium(as Cd)	mg/l			-	0.01	
Arsenic(as As)	mg/l			-	0.01	
Cyanide(as CN)	mg/l			-	Not detected	
Lead(as Pb)	mg/l			-	0.01	
Chromium(as Cr6 ⁺)	mg/l			-	0.05	

Excavated soil (Amount)

Line	Excavated Amount Approx. ('000 m ³)	Name of Disposed Site	Disposed Amount Approx. ('000 m ³)
Line-2*	-	-	-
Line-6	-	-	-

Line-7*	-	-	-
Line-8	-	-	-

Ecological Monitoring(Flora Monitoring)

CPM	Permissio n to fell trees	No. of trees actually felled	No of trees planted	No of trees transpla nted	Location of plantation
CPM-1*	-	-	-	-	
CPM-2*	-	-	-	-	
CPM-3*	-	-	-	-	
CPM-4*	-	-	-	-	
CPM-5*	-	-	-	-	
CPM-6	-	-	-	-	
CPM-7*	-	-	-	-	
CPM-8	-	-	-	-	
CPM-9*	-	-	-	-	
CPM-10*	-	-	-	-	
ED/Civil	-	-	-	-	

*Data under process.

2.2 During Operation

When a measured value exceeds the standards, the value is written in bold letters.

Air Quality (Ambient Air Quality)

Date: August 2020 Location: Shaheed Sihal (Line-1)

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³	63.25	71.565	100 (24hours) (CPCB)	IS 5182 (Part 23)	48hours/time Once/month For 3 years

Air Quality (Ambient Air Quality)

Date: August 2020 Location: Karkarduma (Line-7)

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³	78.105	94.8	100 (24hours) (CPCB)	IS 5182 (Part 23)	48hours/time Once/month For 3 years

Air Quality (Ambient Air Quality)

Date: August 2020 Location: Brigadier Hoshiyar Singh (Line-5)

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³	63.085	68.46	100 (24hours) (CPCB)	IS 5182 (Part 23)	48hours/time Once/month For 3 years

Air Quality (Ambient Air Quality)

Date: August 2020 Location: Nangli (Line-9)

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³	75.86	82.33	100 (24hours) (CPCB)	IS 5182 (Part 23)	48hours/time Once/month For 3 years

Air Quality (Ambient Air Quality)

Date:August 2020Location:Hauz Khas (Line-8)

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³	53.59	56.25	100 (24hours) (CPCB)	IS 5182 (Part 23)	48hours/time Once/month For 3 years

Air Quality (Ambient Air Quality)

Date:August 2020Location:Okhla NSIC (Line-8)

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³	69.045	72.72	100 (24hours) (CPCB)	IS 5182 (Part 23)	48hours/time Once/month For 3 years

Air Quality (Ambient Air Quality)

Date:August 2020Location:ESI Basai Hospital (Line-7)

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³	90.58	93.81	100 (24hours) (CPCB)	IS 5182 (Part 23)	48hours/time Once/month For 3 years

Air Quality (Ambient Air Quality)

Date:August 2020Location:Badli Mor (Line-2)

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³	81.37	78.78	100 (24hours) (CPCB)	IS 5182 (Part 23)	48hours/time Once/month For 3 years

Air Quality (Ambient Air Quality)

Date:August 2020Location:Noida Sector-34

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³	72.19	76.57	100	IS 5182	48hours/time

				(24hours) (CPCB)	(Part 23)	Once/month For 3 years
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Air Quality (Ambient Air Quality)

Date: August 2020 Location: NHPC Chowk

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
PM ₁₀	µg/m ³	88.985	102.56	100 (24hours) (CPCB)	IS 5182 (Part 23)	48hours/time Once/month For 3 years

Effluent at Depot

Date: September 2020 Location: Ajronda

Item	Unit	Measured Value (Mean)		Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
		Inlet	Outlet				
pH	-	7.92	7.7	-	5.5-9.0	-	(Depot) Once/4 months For 3 years
TSS	mg/l	135	100	-	100	-	
BOD	mg/l	27	BDL	-	30	-	
COD	mg/l	48	8.6	-	250	-	
Oil/Grease	mg/l	2.4	BDL	-	10	-	

Effluent at Depot

Date: September 2020

Location: Kalindi Kunj depot

Item	Unit	Measured Value (Mean)		Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
		Inlet	Outlet				
pH	-	7.6	7.85	-	5.5-9.0	-	(Depot) Once/4 months For 3 years
TSS	mg/l	86	8	-	100	-	
BOD	mg/l	12	2	-	30	-	
COD	mg/l	37.4	8.3	-	250	-	
Oil/Grease	mg/l	1.2	BDL	-	10	-	

Effluent at Depot

Date: September 2020

Location: Vinod Nagar

Item	Unit	Measured Value (Mean)		Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
		Inlet	Outlet				
pH	-			-	5.5-9.0	-	(Depot) Once/4 months For 3 years
TSS	mg/l			-	100	-	
BOD	mg/l			-	30	-	
COD	mg/l			-	250	-	
Oil/Grease	mg/l			-	10	-	

Ground Water Quality(Drinking Water Quality:IS 10500:1991)

Date: Location:

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
Color, Hazen units, Max	-		-	5(25)	-	(Depot) Once/year For 3 years
Odour	-		-	Unobjectionable	-	
Taste	-		-	Agreeable	-	
Turbidity, NTU, Max	-		-	5(10)	-	
pH Value	-		-	6.5-8.5	-	
Total Hardness (as CaCO ₃), Max	mg/l		-	300(600)	-	
Iron(as Fe), max	mg/l		-	0.3(1.0)	-	
Chloride(as Cl), Max	mg/l		-	250(1000)	-	
Residual free Chlorine, Min	mg/l		-	0.2	-	
Fluoride(as F), Max	mg/l		-	1.0(1.5)	-	
Dissolved solids, Max	mg/l		-	500(2000)	-	
Calcium(as Ca), Max	mg/l		-	75(200)	-	
Magnesium(as Mg), Max	mg/l		-	30(100)	-	
Copper(as Cu), Max	mg/l		-	0.05(1.5)	-	
Manganese(as Mn), Max	mg/l		-	0.1(0.3)	-	
Sulphate(as SO ₄),	mg/l		-	200(400)	-	

Max					
Nitrate(as NO ₂), Max	mg/l		-	45(100)	-
Phenolic compounds (as C ₆ H ₅ OH),Max	mg/l		-	0.001(0.002)	-
Mercury(as Hg), Max	mg/l		-	0.001	-
Cadmium(as Cd), Max	mg/l		-	0.01	-
Selenium(as Se), Max	mg/l		-	0.01	-
Arsenic(as As), Max	mg/l		-	0.05	-
Cyanide(as CN), Max	mg/l		-	0.05	-
Lead(as Pb), Max	mg/l		-	0.05	-
Zinc(as Zn), Max	mg/l		-	5(15)	-
Anionic Detergents (as MBAS),Max	mg/l		-	0.2(1.0)	-
Chromium (as Cr ⁶⁺),Max	mg/l		-	0.05	-
Polynuclear aromatic hydrocarbons(a s PAH),Max	mg/l		-	-	-
Mineral Oil	mg/l		-	0.01	-
Pesticides, Max	mg/l		-	Absent	-
Radioactive Materials, Max i) Alpha emitters	Bq/l		-	-(0.1)	-
Radioactive Materials, Max j) Beta emitters	Pci/l		-	-	-
Alkalinity, Max	mg/l		-	200(600)	-
Aluminum(as Al), Max	mg/l		-	0.03(0.2)	-
Boron,Max	mg/l		-	1(5)	-
TSS	mg/l		-	600	-
BOD	mg/l		-	350	-
COD	mg/l		-	-	-
Oil/Grease	mg/l		-	20	-

Noise / Vibration

Date:

Location:

Item	Unit	Measured RMS Value (Mean)	Measured RMS Value (Max.)	Country's Standards Max. PPV mm/s	Referred International Standards	Remarks (Measurement Point, Frequency, Method, etc.)
Vibration level	mm/s			Structures in:- Good condition = 25 Fair condition = 12 Poor condition = 5 Water supply structures = 5 Heritage structures = 5	Federal Transmission Administration (FTA), US	As and when complaint arises at the ground floor of building above the tunnel.

Ecological Monitoring

Date:

Location:

Duration: From / / to / /

Item	Number of Interviews with Train Operators who reported the accident during monitoring period	Number of Accidents Reported during the monitoring period	Name of Species lost in the accident	Remarks (Place of accident, frequency, Method, etc.)
Train Accidents involving bird fatality				4times/year For 2years Visual observation (If no bird hit is reported in this duration, then this monitoring may be discontinued, else it will continue). From the beginning, DMRC will instruct its train operator to compulsorily blow the horn while on the bridge across the Yamuna.