

3. Environmental Monitoring

ENVIRONMENTAL MONITORING FORMAT

The updated results of the following environmental monitoring items should be presented to JICA as part of the Quarterly Progress Report.

Station: Sta.14+700km	Monitoring No.: 1
Monitoring point: Sta.14+700km	Date: December 19,2018

STAGE DURING CONSTRUCTION WORKS**1. 1. Response / Action to the Comments and Orientations of the Government Authorities and the Public**

Monitoring Items	Monitoring results during the Report Period
Number and content of formal comments submitted by the public	
Number and content of responses by government agencies	

2. Pollution

Air quality

Measurement Point		Sta.22km+50					
Parameter	Unity	Average measured value	Maximum measured value	Country standard	Contractual Standard	International Reference Standard	Frequency
CO	ppm	Not detected	Not detected	-	<10ppm	<10ppm	Quarterly
TPS	µg/m3	0.0009	0.009	<260µg/m3	<260µg/m3	-	
PM10	µg/m3	7	7	<150µg/m3	<150µg/m3	<0.10mg/m3	
PM2.5	µg/m3	6	6	<65µg/m3	<65µg/m3	<35µg/m3	

Water quality

Measurement Point		Sta. 22km+240					
Parameter	Unity	Average measured value	Maximum measured value	Country standard	Contractual Standard	International Reference Standard	Frequency
pH		Not applicable		6.0 - 9.0	6.0 - 9.0	6.5 - 8.5	Quarterly
Turbidity	NTU	Not applicable		29 NTU	29 NTU	25mg/l	

Noise and Vibration

Measurement Point							
Parameter	Unity	Average measured value	Maximum measured value	Country standard	Contractual Standard	International Reference Standard	Frequency
Noise	dB	69.9	94.6	-	< 70 dB	< 70 dB	Quarterly

3. Others

Item	Monitoring results	Measures to be taken
Oil and grease spills	Not detected	
Water quality in Sta.22a	No Aplicable	
Water quality in Sta.22a	No Aplicable	
Water quality in Zamorano	No Aplicable	
Accidents	Not detected	

ENVIRONMENTAL MONITORING FORMAT

The updated results of the following environmental monitoring items should be presented to JICA as part of the Quarterly Progress Report.

Station: Sta.22km(a)	Monitoring No.: 2
Monitoring point: Sta.22+050km	Date: December 19,2018

STAGE DURING CONSTRUCTION WORKS

1. 1. Response / Action to the Comments and Orientations of the Government Authorities and the Public

Monitoring Items	Monitoring results during the Report Period
Number and content of formal comments submitted by the public	
Number and content of responses by government agencies	

2. Pollution

Air quality

Measurement Point		Sta.22km+50					Frequency
Parameter	Unity	Average measured value	Maximum measured value	Country standard	Contractual Standard	International Reference Standard	
CO	ppm	Not detected	Not detected	-	<10ppm	<10ppm	Quarterly
TPS	µg/m ³	0.0013	0.0013	<260µg/m ³	<260µg/m ³	-	
PM10	µg/m ³	10	10	<150µg/m ³	<150µg/m ³	<0.10mg/m ³	
PM2.5	µg/m ³	8	8	<65µg/m ³	<65µg/m ³	<35µg/m ³	

Water quality

Measurement Point		Sta. 22km+240					Frequency
Parameter	Unity	Average measured value	Maximum measured value	Country standard	Contractual Standard	International Reference Standard	
pH		4.58	4.58	6.0 - 9.0	6.0 - 9.0	6.5 - 8.5	Quarterly
Turbidity	NTU	0.36	0.36	29 NTU	29 NTU	25mg/l	

Noise and Vibration

Measurement Point							Frequency
Parameter	Unity	Average measured value	Maximum measured value	Country standard	Contractual Standard	International Reference Standard	
Noise	dB	63.3	82.8	-	< 70 dB	< 70 dB	Quarterly

3. Others

Item	Monitoring results	Measures to be taken
Oil and grease spills	Not detected	
Water quality in Sta.22a	Exit Catchment: Ph 4.58, turbidity 0.36	
Water quality in Sta.22a	Not detected(No water)	
Water quality in Zamorano	This data will inform next month	
Accidents	Not detected	

ENVIRONMENTAL MONITORING FORMAT

The updated results of the following environmental monitoring items should be presented to JICA as part of the Quarterly Progress Report.

Station: Sta.22km(b)	Monitoring No.: 3
Monitoring point: Sta.22+600km	Date: December 19,2018

STAGE DURING CONSTRUCTION WORKS

1. 1. Response / Action to the Comments and Orientations of the Government Authorities and the Public

Monitoring Items	Monitoring results during the Report Period
Number and content of formal comments submitted by the public	
Number and content of responses by government agencies	

2. Pollution

Air quality

Measurement Point		Sta.22km+600					Frequency
Parameter	Unity	Average measured value	Maximum measured value	Country standard	Contractual Standard	International Reference Standard	
CO	ppm	Not detected	Not detected	-	<10ppm	< 10ppm	Quarterly
TPS	µg/m3	0.0007	0.0007	< 260µg/m3	<260µg/m3	-	
PM10	µg/m3	6	6	< 150µg/m3	<150µg/m3	< 0.10mg/m3	
PM2.5	µg/m3	5	5	< 65µg/m3	<65µg/m3	< 35µg/m3	

Water quality

Measurement Point		Sta. 22km+600					Frequency
Parameter	Unity	Average measured value	Maximum measured value	Country standard	Contractual Standard	International Reference Standard	
pH		3.32	3.32	6.0 - 9.0	6.0 - 9.0	6.5 - 8.5	Quarterly
Turbidity	NTU	0	0	29 NTU	29 NTU	25mg/l	

Noise and Vibration

Measurement Point							Frequency
Parameter	Unity	Average measured value	Maximum measured value	Country standard	Contractual Standard	International Reference Standard	
Noise	dB	65.7	91.0	-	< 70 dB	< 70 dB	Quarterly

3. Others

Item	Monitoring results	Measures to be taken
Oil and grease spills	Not detected	
Water quality in Sta.22a	No Aplicable	
Water quality in Sta.22a	No Aplicable	
Water quality in Zamorano	No Aplicable	
Accidents	Not detected	

ENVIRONMENTAL MONITORING FORMAT

The updated results of the following environmental monitoring items should be presented to JICA as part of the Quarterly Progress Report.

Station: Sta.63km	Monitoring No.: 4
Monitoring point: Sta.63+000km	Date: December 19,2018

STAGE DURING CONSTRUCTION WORKS

1. 1. Response / Action to the Comments and Orientations of the Government Authorities and the Public

Monitoring Items	Monitoring results during the Report Period
Number and content of formal comments submitted by the public	
Number and content of responses by government agencies	

2. Pollution

Air quality

Measurement Point		Sta.22km+50					Frequency
Parameter	Unity	Average measured value	Maximum measured value	Country standard	Contractual Standard	International Reference Standard	
CO	ppm	Not detected	Not detected	-	<10ppm	< 10ppm	Quarterly
TPS	µg/m3	0.0012	0.0012	< 260µg/m3	<260µg/m3	-	
PM10	µg/m3	9	9	< 150µg/m3	<150µg/m3	< 0.10mg/m3	
PM2.5	µg/m3	7	7	< 65µg/m3	<65µg/m3	< 35µg/m3	

Water quality

Measurement Point		Sta. 22km+240					Frequency
Parameter	Unity	Average measured value	Maximum measured value	Country standard	Contractual Standard	International Reference Standard	
pH		No Aplicable		6.0 - 9.0	6.0 - 9.0	6.5 - 8.5	Quarterly
Turbidity	NTU	No Aplicable		29 NTU	29 NTU	25mg/l	

Noise and Vibration

Measurement Point							Frequency
Parameter	Unity	Average measured value	Maximum measured value	Country standard	Contractual Standard	International Reference Standard	
Noise	dB	68.5	79.6	-	< 70 dB	< 70 dB	Quarterly

3. Others

Item	Monitoring results	Measures to be taken
Oil and grease spills	Not detected	
Water quality in Sta.22a	No Aplicable	
Water quality in Sta.22a	No Aplicable	
Water quality in Zamorano	No Aplicable	
Accidents	Not detected	