

Report Date: 20/06/2020

Week: 25-2020

Number: 004

Period: 13/06/2020 to 19/06/2020

Project : Dredging, Land Reclamation and Revetment Works at Gulhifalhu
Contract number : AGR(471)-PIDS2/PRIV/2019/194
Project number [MIAS] : 462.10042

Document number : 462.10062-WQR-4
Contractor : Boskalis Westminster Contracting Ltd
Client : Ministry of National Planning and Infrastructure
Attention : shaana.farooq@planning.gov.mv

NTU - TSS Relationship	Correlation coefficient (NTU:TSS)	Monitoring equipment	TSS limit (mg/L)	Converted limit NTU	Limit applicability
	1.92	Eureka Manta	10	5.2	Maintain a threshold level for turbidity at all reefs within the atoll lagoon in proximity to the dredging site, measured as Total Suspended Solids (TSS) to a maximum of 10 mg/L not exceeding 20% of the measurements. Exceptions shall be made where background rates exceeded the threshold level and in reefs where extensive reclamation work has been undertaken (including e.g. Thilafushi, Gulhifalhu, Villigili, Malé, Hulhumalé). Considerations also shall be made to account for naturally elevated levels of turbidity which may occur during storm events or bad weather.

Activities	Activities and other observations
	Insitu water quality measurements performed. No unexpected values or exceedances. Plume monitoring. Reefscapers completed Coral Relocation inside Gulhifalhu lagoon. CDE placed new sediment traps at T19, T20 and T22. CDE retrieved and replaced sediment traps at T2, T4, T6, T7, T11, T21, T23 and T24. CDE performed coral reef health survey at T11. Ecoren siltscreen assemble.

Mitigation	Corrective actions taken if necessary
	Based on a visual observation of the turbidity pattern during works this week, the following vessels were stopped BHD Colbart 2246 min Bund construction itself is a mitigating measure, to contain reclamation sediment. Ecoren installed 50m (out of 100m test section) of new type of silt screen, to be tested on reef flat, in order to contain plume originating from bund construction.

Measurements	Measurements
	Measurements are taken using a Eureka Manta Multiparameter probe. The EIA requires measurements and water sample at the surface, at approximately 1 meter depth. For completeness, two additional depths are measured; 'bottom' and 'mid-water'. The 'bottom' measurement is taken at either: The maximum depth the probe will go to on a 30m cable (dependent on currents), or 90% of the water column if water depth is < 30m The 'mid-water' measurement is taken at approximately 0.5 * the 'bottom' depth Eureka Manta Turbidity sensor has an accuracy of 2% of reading or 0.2 (https://www.waterprobes.com/water-quality-sensor-specifications). Therefore, negative readings of up until -0.2 NTU indicate no turbidity.

Calibration			
	Eureka Manta Multiparameter probe		
	S/N: MT12183556	Calibration Date: 02/06/2020	Status: Used for measurements
	S/N: MT12183554	Calibration Date: N/A	Status: Spare

Locations

Location ID	Description
W2	Reclamation
W5	
W7	
W10	
W11	
W14	
W15	Villigili
W16	Reclamation
W19	Background
W20	Borrow area
W25	
W26	
W27	Background
W36	Borrow area
W45	
W46	
W47	
W51	



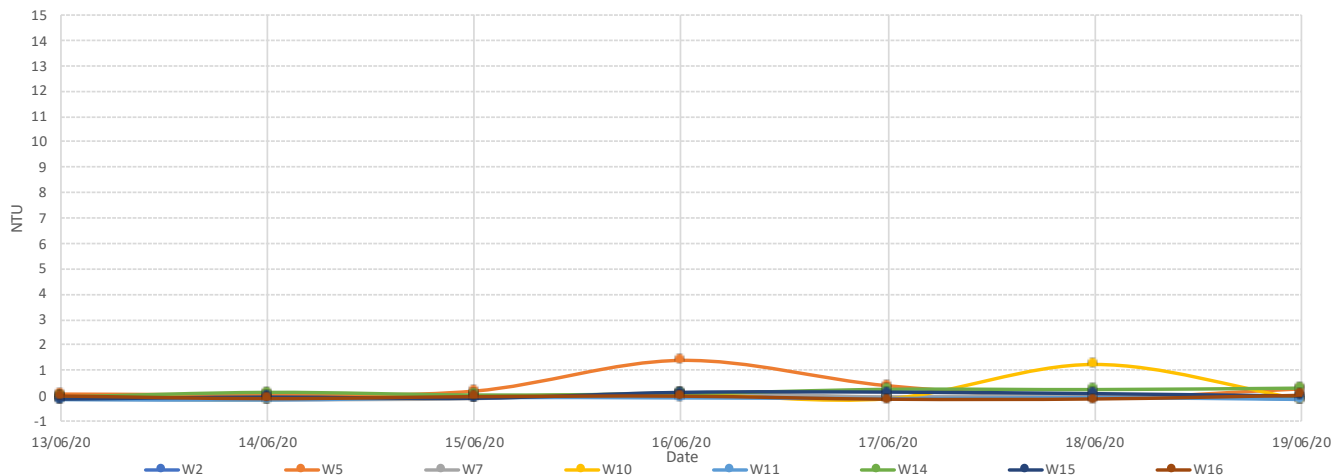
Signed by Contractor

Signed by Client

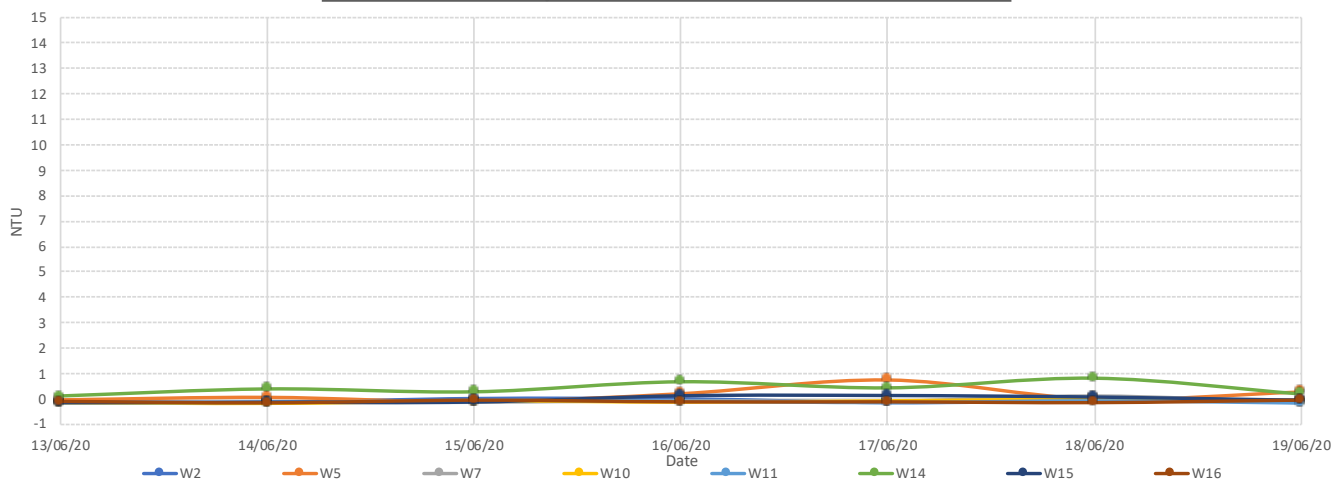
Report Date: 20/06/2020 Week: 25-2020 Period: 13/06/2020 to 19/06/2020

Project : Dredging, Land Reclamation and Revetment Works at Gulhifalhu	Document number : 462.10062-WQR-4.2
Contract number : AGR(471)-PIDS2/PRIV/2019/194	Contractor : Boskalis Westminster Contracting Ltd
Project number [MIAS] : 462.10042	Client : Ministry of National Planning and Infrastructure
	Attention : shaana.farooq@planning.gov.mv

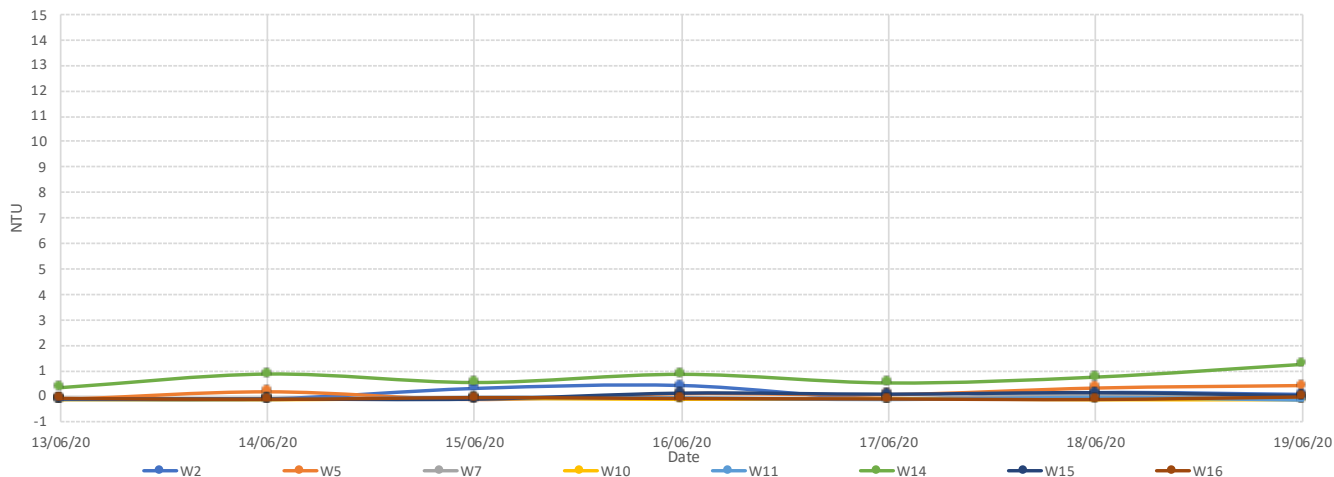
Surface Turbidity Measurements at the Reclamation Area



Mid Water Turbidity Measurements at the Reclamation Area



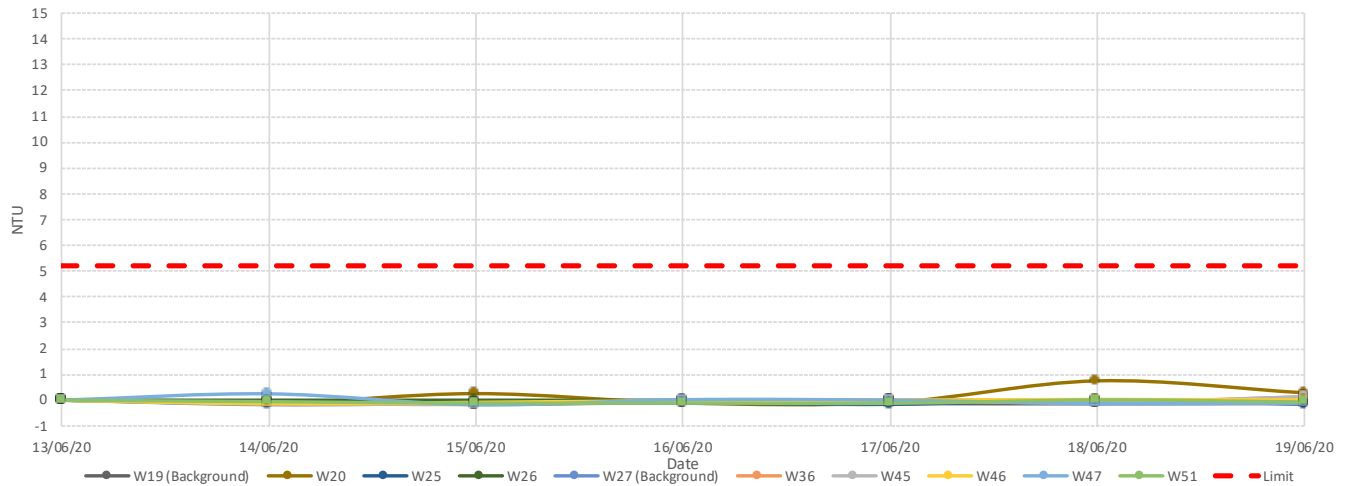
Bottom Turbidity Measurements at the Reclamation Area



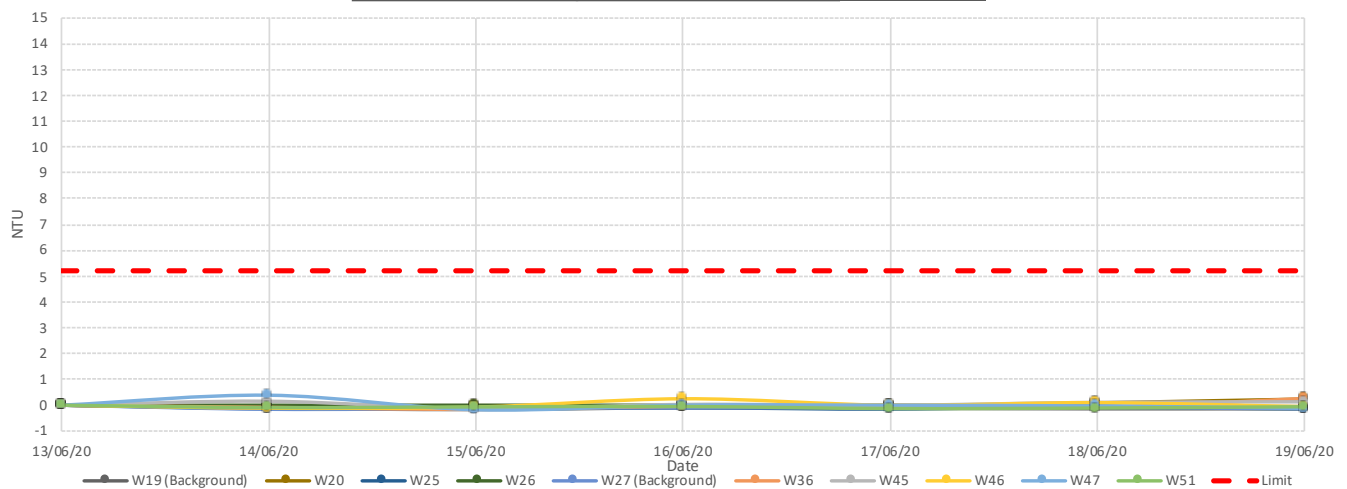
Period: 13/06/2020 to 19/06/2020

Document number : 462.10062-WQR-4.3
Contractor : Boskalis Westminster Contracting Ltd
Client : Ministry of National Planning and Infrastructure
Attention : shaana.farooq@clanning.gov.my

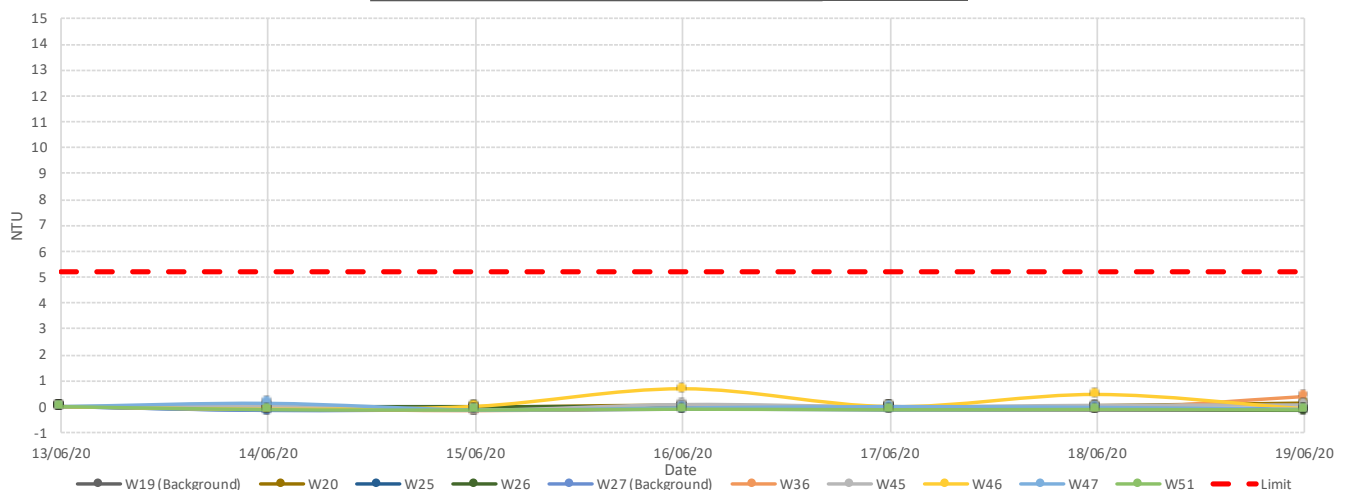
Surface Turbidity Measurements at the Borrow Area



Mid Water Turbidity Measurements at the Borrow Area



Bottom Turbidity Measurements at the Borrow Area



Date: 13/06/2020

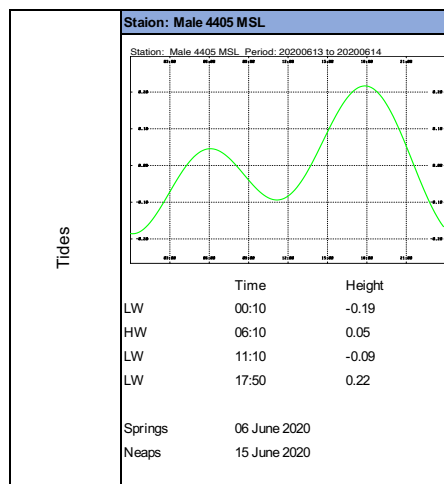
Time: 08:30-10:15

Project : Dredging, Land Reclamation and Revetment Works at Gulhifalhu
 Contract number : AGR(471)-PIDS2/PRIV/2019/194
 Project number [MIAS] : 462.10042

Document number : 462.10062-WQR-4.4
 Contractor : Boskalis Westminster Contracting Ltd
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Location	Section	Depth (m)	Temperature	pH	Conductivity (uS/cm)	Turbidity (NTU)
W2	Surface	1	29.5	7.8	52523	-0.07
	Mid-water	12	29.5	7.8	52548	-0.11
	Bottom	23	29.4	7.8	52492	-0.10
W5	Surface	1	29.5	8.2	52575	0.06
	Mid-water	11	29.4	8.2	52547	-0.03
	Bottom	23	29.4	8.2	52496	-0.13
W7	Surface	1	29.6	8.1	52496	-0.15
	Mid-water	12	29.5	8.0	52499	-0.14
	Bottom	24	29.5	7.5	52463	-0.12
W10	Surface	1	29.5	7.6	52537	-0.12
	Mid-water	12	29.5	7.5	52497	-0.14
	Bottom	23	29.5	7.7	52457	-0.14
W11	Surface	2	29.5	7.7	52542	-0.15
	Mid-water	13	29.5	7.6	52532	-0.14
	Bottom	24	29.5	7.6	52482	-0.13
W14	Surface	1	29.6	8.2	52534	-0.05
	Mid-water	6	29.5	8.4	52548	0.12
	Bottom	14	29.5	8.3	52557	0.34
W15	Surface	1	29.5	7.7	52603	-0.14
	Mid-water	10	29.5	8.0	52563	-0.14
	Bottom	22	29.5	8.1	52521	-0.11
W16	Surface	1	29.6	7.9	52594	-0.01
	Mid-water	11	29.5	7.7	52513	-0.09
	Bottom	21	29.3	7.8	52473	-0.09

Stoppages	Vessel	Stop	Start
	BHD Colbart	12:09	18:00



Remarks

As per Client request, started daily in-situ water quality monitoring already at 'Reclamation' locations defined by the EIA on 28/05/2020.
 10 mg/l TSS limit not applicable at the 'Reclamation' locations as per the EIA.

Weather

Time	WX	Winds						Waves						Vis	Clouds	Temp		
		10m			50m		Wind Wave		Swell			Wave			10m	Lowest	Air	
UTC		Dir	Spd (kts)	Gust (kts)	Risk (kts)	Spd (kts)	Gust (kts)	Hgt (m)	Per (sec)	Dir	Hgt (m)	Per (sec)	Hsig (m)	Max (m)	Risk (m)	(nm)	(ft)	(degC)
Saturday, 13 Jun 2020 - Maldives Project 04°11'N 073°28'E																		
03	SHRA	W	13	17	-	13	18	0.6	3	SW	0.9	8	1.1	1.8	-	3-5	3500	28
06	TS	W	14	28	28	14	28	0.6	4	SW	0.9	8	1.1	1.8	-	3-5	3500	28
09	SHRA	W	14	19	-	15	20	0.7	4	SW	0.9	8	1.1	1.9	-	3-5	3500	28
12	RA	W	17	23	-	20	26	0.9	4	SW	0.8	8	1.2	2.0	-	3-5	3500	28
15	SHRA	W	17	22	-	19	25	0.9	4	SW	0.9	8	1.3	2.1	-	3-5	3500	29
18	NSW	WSW	15	20	-	17	22	0.8	4	WSW	0.9	8	1.2	2.1	-	>5	3500	29
21	NSW	WSW	12	16	-	12	17	0.6	4	W	1.0	8	1.2	2.0	-	>5	NLC	29

Time: 08:17-14:08

Document number : 462.10062-WQR-4.5
Contractor : Boskalis Westminster Contracting Ltd
Client : Ministry of National Planning and Infrastructure
Attention : shaana.farooqi@planning.gov.my

Remarks	
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Weather

Time	WX	Winds								Waves							Vis	Clouds	Temp
		10m				50m		Wind Wave		Swell			Wave						
		Dir	Spd (kts)	Gust (kts)	Risk (kts)	Spd (kts)	Gust (kts)	Hgt (m)	Per (sec)	Dir	Hgt (m)	Per (sec)	Hsig (m)	Max (m)	Risk (m)				
		Sunday, 14 Jun 2020 - Maldives Project 04°11'N 073°28'E																	
		UTC														(nm)			
03	NSW	WNW	11	15	-	11	15	0.4	3	W	1.2	8	1.3	2.2	-	>5	3500	29	
06	NSW	W	12	16	-	13	18	0.4	3	W	1.2	9	1.3	2.2	-	>5	3500	29	
09	NSW	W	13	17	-	14	18	0.5	3	W	1.2	9	1.3	2.2	-	>5	3500	29	
12	NSW	WNW	12	16	-	12	17	0.4	3	W	1.2	9	1.3	2.1	-	>5	3500	29	
15	NSW	WNW	12	16	-	12	17	0.4	3	W	1.2	9	1.3	2.1	-	>5	3500	30	
18	NSW	WNW	12	17	-	13	17	0.4	3	W	1.2	9	1.3	2.1	-	>5	3500	29	
21	NSW	WNW	12	17	-	12	17	0.4	3	W	1.2	9	1.3	2.1	-	>5	3500	29	

Weather

Time	WX	Winds						Waves						Vis	Clouds	Temp		
UTC		10m				50m		Wind Wave		Swell			Wave			10m	Lowest	Air
		Dir	Spd (kts)	Gust (kts)	Risk (kts)	Spd (kts)	Gust (kts)	Hgt (m)	Per (sec)	Dir	Hgt (m)	Per (sec)	Hsig (m)	Max (m)	Risk (m)	(nm)	(ft)	(degC)
Monday, 15 Jun 2020 - Maldives Project 04°11'N 073°28'E																		
03	NSW	WNW	13	18	-	14	19	0.6	3	WSW	1.2	10	1.3	2.2	-	>5	3500	29
06	NSW	WNW	12	16	-	12	17	0.6	3	WSW	1.2	9	1.3	2.3	1.5	>5	3500	29
09	NSW	W	12	17	-	13	18	0.5	2	WSW	1.2	9	1.3	2.2	-	>5	3500	29
12	NSW	W	13	18	-	14	19	0.6	3	SW	1.2	9	1.4	2.3	1.5	>5	3500	29
15	NSW	W	13	18	-	15	20	0.6	3	WSW	1.2	9	1.4	2.3	1.5	>5	3500	29
18	SHRA	W	12	16	-	13	18	0.6	3	WSW	1.3	9	1.4	2.4	1.5	3-5	3500	29
21	SHRA	W	13	18	-	15	20	0.7	3	SW	1.2	9	1.4	2.3	1.5	3-5	3500	28

Unable to complete location W47, informed by the Marine Police that the envirc

Document number : 462.10062-WQR-4.7
Contractor : Boskalis Westminster Contracting Ltd
Client : Ministry of National Planning and Infrastructure
Attention : shaana.farooq@planning.gov.my

Results	Location	Section	Depth (m)	Temperature	pH	Conductivity (uS/cm)	Turbidity (NTU)
	W2	Surface	2	29.7	9.0	52739	0.06
		Mid-water	7	29.7	8.9	52701	0.01
		Bottom	22	29.6	8.8	52641	0.42
	W5	Surface	1	29.6	8.8	52658	1.39
		Mid-water	10	29.5	8.8	52673	0.21
		Bottom	20	29.5	9.2	52678	0.10
	W7	Surface	1	29.9	9.0	52736	0.12
		Mid-water	9	29.7	8.9	52728	-0.06
		Bottom	23	29.7	8.9	52695	-0.09
	W10	Surface	1	29.8	8.9	52666	0.05
		Mid-water	8	29.7	9.0	52763	-0.12
		Bottom	24	29.6	9.0	52682	-0.12
	W11	Surface	1	29.7	8.7	52694	-0.09
		Mid-water	9	29.7	8.9	52727	-0.08
		Bottom	23	29.6	9.0	52698	-0.07
	W14	Surface	1	29.8	9.0	52680	0.08
		Mid-water	7	29.6	9.0	52641	0.68
		Bottom	17	29.6	9.0	52562	0.86
W15	Surface	1	29.6	8.7	52633	0.13	
	Mid-water	10	29.6	8.7	52633	0.13	
	Bottom	21	29.6	8.7	52607	0.12	
W16	Surface	1	30.0	9.1	52796	-0.02	
	Mid-water	10	29.6	9.1	52698	-0.11	
	Bottom	23	29.6	9.2	52714	-0.09	
W19	Surface	1	29.7	9.1	52757	-0.10	
	Mid-water	11	29.5	9.1	52771	-0.10	
	Bottom	23	29.7	9.2	52873	-0.10	
W20	Surface	1	29.9	9.1	52683	-0.11	
	Mid-water	8	29.8	9.3	52644	-0.07	
	Bottom	23	29.5	9.1	52611	0.05	
W25	Surface	1	29.8	9.2	52677	-0.11	
	Mid-water	8	29.7	9.2	52671	-0.10	
	Bottom	20	29.5	9.3	52699	-0.09	
W27	Surface	1	29.5	9.3	52550	-0.12	
	Mid-water	10	29.5	9.3	52520	-0.10	
	Bottom	22	29.5	9.3	52470	-0.10	
W36	Surface	1	29.5	8.8	52625	-0.05	
	Mid-water	9	29.4	8.8	52620	-0.04	
	Bottom	24	29.3	8.8	52543	-0.06	
W45	Surface	1	29.7	9.0	52670	-0.01	
	Mid-water	11	29.7	9.0	52646	0.03	
	Bottom	23	29.7	9.1	52638	0.08	
W46	Surface	1	29.8	9.2	52631	-0.02	
	Mid-water	10	29.6	9.2	52636	0.25	
	Bottom	21	29.5	9.2	52598	0.69	
W47	Surface	1	29.7	9.3	52587	0.02	
	Mid-water	10	29.6	9.3	52579		
	Bottom	23	29.5	9.3	52607	-0.05	
W51	Surface	1	29.7	9.2	52627	-0.11	
	Mid-water	11	29.6	9.2	52588	-0.05	
	Bottom	21	29.5	8.9	52530	-0.10	

Stoppages	Vessel	Stop	Start
	BHD Colbart	10:45	17:00

Tides

Station: Male 4405 MSL

Station: Male 4405 MSL - Period: 20200616 to 20200617

Time	Height	
LW	03:20	-0.28
HW	10:50	0.18
LW	16:10	0.01
HW	21:00	0.14

	Time	Height
LW	03:20	-0.28
HW	10:50	0.18
LW	16:10	0.01
HW	21:00	0.14

Springs 23 June 2020

Neaps 15 June 2020

Remarks	
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Weather

Time	WX	Winds						Waves						Vis	Clouds	Temp		
UTC		10m			50m		Wind Wave		Swell			Wave			10m	Lowest	Air	
		Dir	Spd (kts)	Gust (kts)	Risk (kts)	Spd (kts)	Gust (kts)	Hgt (m)	Per (sec)	Dir	Hgt (m)	Per (sec)	Hsig (m)	Max (m)	Risk (m)	(nm)	(ft)	(degC)
Tuesday, 16 Jun 2020 - Maldives Project 04°11'N 073°28'E																		
03	NSW	W	13	18	-	15	20	0.6	4	WSW	1.3	9	1.5	2.4	1.6	>5	3500	29
06	NSW	W	13	18	-	15	20	0.6	4	WSW	1.3	9	1.4	2.4	1.6	>5	3500	30
09	NSW	W	12	17	-	13	18	0.6	3	W	1.4	9	1.5	2.5	1.6	>5	3500	29
12	NSW	W	11	16	-	12	16	0.4	3	W	1.4	9	1.5	2.4	1.5	>5	3500	30
15	NSW	W	11	15	-	11	16	0.4	3	W	1.4	9	1.5	2.4	1.5	>5	3500	30
18	NSW	W	12	16	-	13	18	0.5	3	WSW	1.4	9	1.5	2.5	1.5	>5	3500	29
21	NSW	W	12	16	-	13	18	0.5	3	WSW	1.4	9	1.5	2.5	1.6	>5	3500	29

Date: 17/06/2020

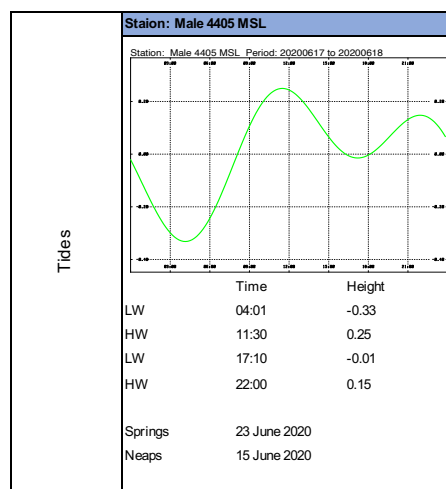
Time: 09:00-17:40

Project : Dredging, Land Reclamation and Revetment Works at Gulhifalhu
 Contract number : AGR(471)-PIDS2/PRIV/2019/194
 Project number [MIAS] : 462.10042

Document number : 462.10062-WQR-4.8
 Contractor : Boskalis Westminster Contracting Ltd
 Client : Ministry of National Planning and Infrastructure
 Attention : shaana.farooq@planning.gov.mv

Location	Section	Depth (m)	Temperature	pH	Conductivity (uS/cm)	Turbidity (NTU)
W2	Surface	1	29.6	9.1	52929	-0.12
	Mid-water	9	29.6	9.0	52889	-0.14
	Bottom	22	29.6	9.1	52836	-0.11
W5	Surface	1	29.6	9.1	46154	0.39
	Mid-water	8	29.6	9.1	52243	0.75
	Bottom	15	29.6	9.0	52908	0.06
W7	Surface	2	29.7	9.0	53039	-0.05
	Mid-water	10	29.7	9.0	53023	-0.09
	Bottom	23	29.7	9.0	53037	-0.11
W10	Surface	1	29.6	9.0	53073	-0.12
	Mid-water	9	29.6	9.0	53045	-0.07
	Bottom	20	29.6	9.1	53068	-0.10
W11	Surface	1	29.7	9.0	53103	-0.11
	Mid-water	8	29.7	9.0	53108	-0.14
	Bottom	19	29.7	9.0	53059	-0.13
W14	Surface	1	29.6	9.0	52772	0.25
	Mid-water	7	29.6	9.0	52785	0.44
	Bottom	16	29.6	9.0	52812	0.52
W15	Surface	1	29.6	9.1	52904	0.14
	Mid-water	11	29.6	9.0	52846	0.14
	Bottom	22	29.6	9.1	52787	0.08
W16	Surface	2	29.7	9.1	53026	-0.14
	Mid-water	8	29.7	9.1	53006	-0.11
	Bottom	20	29.7	9.1	52974	-0.11
W19	Surface	2	29.7	9.1	53078	-0.13
	Mid-water	5	29.7	9.1	53018	-0.12
	Bottom	16	29.7	9.2	52983	-0.11
W20	Surface	2	29.6	9.0	52778	-0.09
	Mid-water	9	29.5	9.0	52745	-0.07
	Bottom	21	29.5	9.0	52702	-0.07
W25	Surface	1	29.5	9.0	52741	-0.16
	Mid-water	9	29.5	9.0	52721	-0.15
	Bottom	21	29.6	9.0	52765	-0.12
W27	Surface	1	29.5	9.0	52698	-0.08
	Mid-water	9	29.5	9.0	52685	-0.10
	Bottom	22	29.5	9.0	52648	-0.07
W36	Surface					
	Mid-water					
	Bottom					
W45	Surface					
	Mid-water					
	Bottom					
W46	Surface					
	Mid-water					
	Bottom					
W47	Surface					
	Mid-water					
	Bottom					
W51	Surface	2	29.5	9.0	52638	-0.12
	Mid-water	9	29.5	9.0	52702	-0.13
	Bottom	21	29.5	9.0	52681	-0.12

Stoppages	Vessel	Stop	Start
	BHD Colbart	04:00	11:25



Remarks
Unable to complete locations W45, W46, W47 & W36, due to equipment problems.

Weather

Time	WX	Winds						Waves						Vis	Clouds	Temp		
UTC		10m				50m		Wind Wave		Swell			Wave			10m	Lowest	Air
		Dir	Spd (kts)	Gust (kts)	Risk (kts)	Spd (kts)	Gust (kts)	Hgt (m)	Per (sec)	Dir	Hgt (m)	Per (sec)	Hsig (m)	Max (m)	Risk (m)	(nm)	(ft)	(degC)
Wednesday, 17 Jun 2020 - Maldives Project 04°11'N 073°28'E																		
03	NSW	W	14	19	-	16	21	0.7	4	WSW	1.3	10	1.5	2.5	1.7	>5	3500	29
06	NSW	W	13	18	-	15	20	0.8	4	WSW	1.4	10	1.6	2.7	1.7	>5	3500	29
09	NSW	W	12	17	-	13	18	0.6	4	WSW	1.4	9	1.5	2.5	1.7	>5	3500	29
12	NSW	W	13	17	-	14	19	0.7	4	WSW	1.4	10	1.6	2.6	1.7	>5	3500	29
15	NSW	W	11	16	-	13	17	0.6	4	WSW	1.4	9	1.5	2.5	1.6	>5	3500	29
18	NSW	W	11	15	-	12	17	0.5	3	W	1.4	9	1.5	2.5	1.6	>5	3500	29
21	TS	W	9	20	26	10	21	0.3	3	W	1.4	9	1.4	2.4	1.6	3-5	3500	29



Date: 18/06/2020

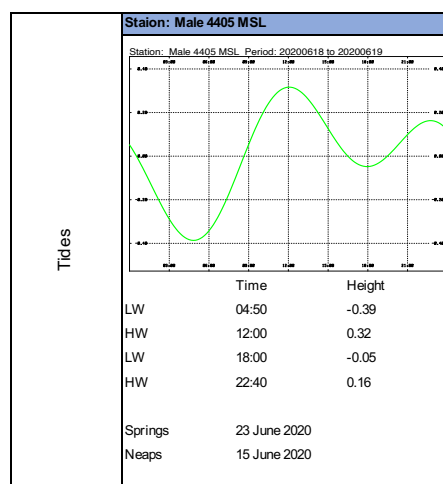
Time: 09:28-15:01

Project : Dredging, Land Reclamation and Revetment Works at Gulhifalhu
Contract number : AGR(471)-PIDS2/PRIV/2019/194
Project number [MIAS] : 462.10042

Document number : 462.10062-WQR-4.9
Contractor : Boskalis Westminster Contracting Ltd
Client : Ministry of National Planning and Infrastructure
Attention : shaana.farooqi@planning.gov.my

Results	Location	Section	Depth (m)	Temperature	pH	Conductivity (uS/cm)	Turbidity (NTU)
	W2	Surface	1	29.7	9.1	52391	-0.10
		Mid-water	11	29.6	9.1	52787	-0.07
		Bottom	23	29.5	9.2	52784	0.14
	W5	Surface	1	29.8	9.1	52847	-0.07
		Mid-water	11	29.6	9.1	52778	
		Bottom	23	29.5	9.1	52795	0.32
	W7	Surface	1	29.6	9.1	52880	0.05
		Mid-water	11	29.5	9.1	52934	0.12
		Bottom	21	29.5	9.2	52931	0.06
	W10	Surface	1	29.8	9.2	53042	1.23
		Mid-water	11	29.6	9.2	52771	-0.01
		Bottom	23	29.6	9.2	53108	-0.14
	W11	Surface	2	29.7	9.2	53041	-0.08
		Mid-water	13	29.6	9.2	53042	-0.07
		Bottom	24	29.5	9.3	53011	-0.05
	W14	Surface	1	29.7	9.1	52847	0.24
		Mid-water	9	29.6	9.1	52831	0.82
		Bottom	18	29.5	9.1	52796	0.75
	W15	Surface	1	30.3	9.1	52936	0.08
		Mid-water	11	29.7	9.0	52875	0.08
		Bottom	25	29.6	9.0	52902	0.14
	W16	Surface	1	29.7	9.2	52841	-0.13
		Mid-water	10	29.6	9.2	52839	-0.14
		Bottom	24	29.6	9.2	52871	-0.13
	W19	Surface	1	29.7	9.0	52925	-0.14
		Mid-water	11	29.7	9.1	53069	-0.14
		Bottom	24	29.6	9.2	53078	-0.13
	W20	Surface	1	30.0	9.3	52893	0.75
		Mid-water	11	29.5	9.2	52991	0.09
		Bottom	24	29.5	9.3	52973	0.04
	W25	Surface	1	30.2	9.2	52920	0.02
		Mid-water	10	29.6	9.2	52904	-0.05
		Bottom	25	29.6	9.2	52877	-0.10
	W26	Surface	1	30.1	9.2	52855	-0.03
		Mid-water	11	29.5	9.2	52684	-0.07
		Bottom	24	29.4	9.2	52654	-0.07
	W27	Surface	1	29.5	9.1	52752	-0.10
		Mid-water	10	29.5	9.0	52694	-0.09
		Bottom	22	29.5	9.0	52687	-0.08
	W36	Surface	1	29.9	9.1	52853	-0.09
		Mid-water	11	29.5	9.0	52915	-0.08
		Bottom	25	29.4	9.2	52946	-0.08
	W45	Surface	1	29.7	9.3	52846	-0.11
		Mid-water	12	29.5	9.2	52844	0.11
		Bottom	25	29.4	9.4	52853	0.05
	W46	Surface	1	30.0	9.4	52877	0.03
		Mid-water	12	29.5	9.4	52977	0.10
		Bottom	24	29.5	9.4	52982	0.47
	W47	Surface	1	30.2	9.3	52835	-0.13
		Mid-water	12	29.5	9.3	52833	-0.03
Bottom		24	29.4	9.3	52812	-0.03	
W51	Surface	1	29.8	9.2	52848	0.01	
	Mid-water	11	29.5	9.1	52859	-0.11	
	Bottom	25	29.5	9.2	52934	-0.11	

Stoppages	Vessel	Stop	Start
	BHD Colbart	04:00	06:40
	BHD Colbart	09:20	10:05



Remarks	
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Weather

Time	WX	Winds						Waves						Vis	Clouds	Temp			
		10m			50m			Wind Wave		Swell			Wave			10m	Lowest	Air	
		Dir	Spd (kts)	Gust (kts)	Risk (kts)	Spd (kts)	Gust (kts)	Hgt (m)	Per (sec)	Dir	Hgt (m)	Per (sec)	Hsigt (m)	Max (m)	Risk (m)	(nm)	(ft)	(degC)	
		Thursday, 18 Jun 2020 - Maldives Project 04°11'N 073°28'E																	
		UTC																	
03	TS	W	9	18	22	10	19	0.3	3	W	1.4	10	1.4	2.4	1.6	3-5	3500	28	
06	NSW	W	8	12	-	9	12	0.3	2	W	1.4	10	1.4	2.4	1.6	>5	3500	29	
09	NSW	WSW	7	10	-	7	11	0.2	2	W	1.4	10	1.4	2.4	1.5	>5	3500	29	
12	DZ	SW	5	8	-	5	8	0.1	2	W	1.4	10	1.4	2.3	1.5	3-5	3500	29	
15	DZ	WSW	6	9	-	7	10	0.2	2	WSW	1.4	10	1.4	2.4	1.5	3-5	3500	28	
18	DZ	SW	5	7	-	5	8	0.1	2	WSW	1.4	10	1.4	2.3	1.5	3-5	3500	28	
21	SHRA	SW	5	8	-	6	9	0.1	2	WSW	1.4	10	1.4	2.3	1.5	3-5	3500	29	



Date: 19/06/2020

Time: 09:07-14:00

Project : Dredging, Land Reclamation and Revetment Works at Gulhifalhu
Contract number : AGR(471)-PIDS2/PRIV/2019/194
Project number [MIAS] : 462.10042

Document number : 462.10062-WQR-4.10
Contractor : Boskalis Westminster Contracting Ltd
Client : Ministry of National Planning and Infrastructure
Attention : shaana.farooq@planning.gov.my

Results	Location	Section	Depth (m)	Temperature	pH	Conductivity (uS/cm)	Turbidity (NTU)
	W2	Surface	1	29.4	8.1	52652	-0.09
		Mid-water	11	29.4	8.5	52634	-0.04
		Bottom	23	29.4	8.5	52668	0.07
	W5	Surface	1	29.4	8.5	52608	0.27
		Mid-water	11	29.4	8.4	52613	0.28
		Bottom	22	29.4	8.5	52576	0.42
	W7	Surface	2	29.4	7.5	52482	-0.15
		Mid-water	9	29.4	7.6	52496	-0.15
		Bottom	24	29.5	7.5	52500	-0.14
	W10	Surface	1	29.4	7.6	52553	-0.14
		Mid-water	11	29.4	7.6	52548	-0.13
		Bottom	24	29.3	7.8	52486	-0.14
	W11	Surface	2	29.4	7.6	52556	-0.15
		Mid-water	11	29.4	6.9	52514	-0.16
		Bottom	24	29.3	7.5	52477	-0.15
	W14	Surface	1	29.6	8.3	52610	0.30
		Mid-water	11	29.6	8.1	52651	0.20
		Bottom	19	29.5	8.1	52682	1.25
	W15	Surface	1	29.3	8.1	52546	-0.01
		Mid-water	11	29.3	7.6	52518	-0.05
		Bottom	23	29.3	7.9	52531	0.02
	W16	Surface	2	29.5	8.1	52683	0.01
		Mid-water	11	29.5	7.8	52669	-0.04
		Bottom	21	29.5	7.9	52648	-0.03
	W19	Surface	2	29.6	8.1	52733	-0.13
		Mid-water	11	29.5	8.0	52802	-0.14
		Bottom	22	29.5	8.1	52794	-0.14
	W20	Surface	1	29.5	8.3	52686	0.29
		Mid-water	10	29.5	8.3	52651	0.24
		Bottom	23	29.5	8.7	52646	0.14
	W25	Surface	2	29.5	6.9	52598	-0.15
		Mid-water	12	29.5	8.0	52610	-0.13
		Bottom	23	29.4	8.5	52700	-0.08
	W26	Surface	1	29.4	8.4	52566	-0.15
		Mid-water	10	29.4	8.5	52538	-0.14
		Bottom	23	29.3	8.3	52511	-0.12
	W27	Surface	1	29.4	8.3	52534	-0.13
		Mid-water	10	29.4	7.7	52499	-0.15
		Bottom	23	29.4	8.0	52534	-0.11
	W36	Surface	2	29.5	9.0	52593	0.13
		Mid-water	11	29.4	8.7	52538	0.26
		Bottom	24	29.4	7.4	52515	0.39
	W45	Surface	1	29.4	9.0	52633	0.13
		Mid-water	12	29.4	9.0	52609	0.13
		Bottom	24	29.4	8.8	52597	0.07
	W46	Surface	2	29.5	9.1	52533	0.01
		Mid-water	11	29.4	9.1	52573	-0.06
		Bottom	23	29.4	9.2	52622	-0.08
	W47	Surface	1	29.5	9.1	52535	-0.11
		Mid-water	10	29.4	9.1	52500	-0.12
Bottom		23	29.3	9.1	52456	-0.10	
W51	Surface	2	29.5	7.6	52538	-0.07	
	Mid-water	12	29.4	6.6	52490	-0.06	
	Bottom	21	29.5	8.2	52648	-0.13	

Stoppages	Vessel	Stop	Start
	BHD Colbart	05:00	12:30

Tides

Staion: Male 4405 MSL

Station: Male 4405 MSL Period: 20200619 to 20200620

	Time	Height
LW	05:30	-0.44
HW	12:40	0.38
LW	18:30	-0.08
HW	23:30	0.18

Springs 23 June 2020

Neaps 15 June 2020

Remarks

Weather

Time	WX	Winds						Waves						Vis	Clouds	Temp		
		10m			50m		Wind Wave		Swell			Wave			10m	Lowest	Air	
		Dir	Spd (kts)	Gust (kts)	Risk (kts)	Spd (kts)	Gust (kts)	Hgt (m)	Per (sec)	Dir	Hgt (m)	Per (sec)	Hsig (m)	Max (m)	Risk (m)	(nm)	(ft)	(degC)
		Friday, 19 Jun 2020 - Maldives Project 04°11'N 073°28'E																
		03	NSW	W	6	9	-	7	10	0.1	2	WSW	1.4	10	1.4	2.3	1.5	>5
06	NSW	WNW	6	10	-	7	10	0.1	2	WSW	1.4	10	1.4	2.3	1.5	>5	3500	29
09	NSW	W	7	10	-	7	11	0.1	2	WSW	1.3	10	1.3	2.2	-	>5	3500	29
12	SHRA	WSW	8	11	-	9	12	0.2	2	WSW	1.3	10	1.3	2.2	-	3-5	3500	29
15	SHRA	WSW	7	10	-	7	10	0.2	2	WSW	1.3	10	1.3	2.2	-	3-5	3500	28
18	SHRA	W	8	11	-	8	12	0.2	2	WSW	1.3	10	1.3	2.2	-	3-5	3500	28
21	SHRA	WSW	8	11	-	8	12	0.2	2	WSW	1.3	10	1.3	2.2	-	3-5	3500	28