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DAFTAR LAMPIRAN

Lampiran 1. Lembar Hasil Uji Laboratorium

LABORATORIUM KUALITAS AIR
DEPARTEMEN TEKNIK LINGKUNGAN FAKULTAS TEKNIK UNIVERSITAS HASANUDDIN
Lantai 3 Gedung Sipil Fakultas Teknik Universitas Hasanuddin
Jln. Poros Malino KM.6, Bonto Marannu (92172) Gowa, Sulawesi Selatan

WATER QUALITY LABORATORY

LEMBAR HASIL PENGUJIAN

NAMA : Ahmad Amiruddin
TIPE SAMPEL : Air Sungai

Parameter BOD Final

No	Kode	Kadar BOD	Spesifikasi Metode
1	Sampel Titik 1	15 mg/L	Winkler
2	Sampel Titik 2	10 mg/L	Winkler
3	Sampel Titik 3	6 mg/L	Winkler
4	Sampel Titik 4	4 mg/L	Winkler
5	Sampel Titik 5	3 mg/L	Winkler

Parameter DO

No	Kode	Volume Larutan Contoh Uji	Kadar DO	Spesifikasi Metode
1	Sampel Titik 1	50 ml	6.8 mg/L	SNI 06-6989.142004
2	Sampel Titik 2	50 ml	6.2 mg/L	SNI 06-6989.142004
3	Sampel Titik 3	50 ml	5.2 mg/L	SNI 06-6989.142004
4	Sampel Titik 4	50 ml	4 mg/L	SNI 06-6989.142004
5	Sampel Titik 5	50 ml	3.5 mg/L	SNI 06-6989.142004

Parameter Amonia (NH3)

No	Kode	Konsentrasi	Spesifikasi Metode
1	Sampel Titik 1	0.1 mg/L	SNI 06-689.30-2005
2	Sampel Titik 2	0.2 mg/L	SNI 06-689.30-2005
3	Sampel Titik 3	0.37 mg/L	SNI 06-689.30-2005
4	Sampel Titik 4	0.47 mg/L	SNI 06-689.30-2005
5	Sampel Titik 5	0.5 mg/L	SNI 06-689.30-2005

Parameter Orthophospat

No	Kode	Volume Larutan Contoh Uji	Kadar	Spesifikasi Metode
1	Sampel Titik 1	50 ml	0.1 mg/L	SNI 6989.31:2005
2	Sampel Titik 2	50 ml	0.12 mg/L	SNI 6989.31:2005
3	Sampel Titik 3	50 ml	0.19 mg/L	SNI 6989.31:2005
4	Sampel Titik 4	50 ml	0.27 mg/L	SNI 6989.31:2005
5	Sampel Titik 5	50 ml	0.3 mg/L	SNI 6989.31:2005

Gowa, 17 Februari 2024

Asisten Uji

(Muh. Renaldy P.S)

NIM. D131181325

LABORATORIUM KUALITAS AIR
DEPARTEMEN TEKNIK LINGKUNGAN FAKULTAS
TEKNIK UNIVERSITAS HASANUDDIN
Lantai 3 Gedung Sipil Fakultas Teknik Universitas Hasanuddin
Jln. Poros Malino KM.6, Bonto Marannu (92172) Gowa, Sulawesi Selatan

LEMBAR HASIL PENGUJIAN

NAMA : Ahmad Amiruddin
TIPE SAMPEL : Air Sungai

Parameter BOD Final

No	Kode	Kadar BOD	Spesifikasi Metode
1	Sampel Titik 1	18 mg/L	Winkler
2	Sampel Titik 2	12 mg/L	Winkler
3	Sampel Titik 3	8 mg/L	Winkler
4	Sampel Titik 4	7 mg/L	Winkler
5	Sampel Titik 5	6 mg/L	Winkler

Parameter DO

No	Kode	Volume Larutan Contoh Uji	Kadar DO	Spesifikasi Metode
1	Sampel Titik 1	50 ml	4.8 mg/L	SNI 06-6989.142004
2	Sampel Titik 2	50 ml	4.6 mg/L	SNI 06-6989.142004
3	Sampel Titik 3	50 ml	3.3 mg/L	SNI 06-6989.142004
4	Sampel Titik 4	50 ml	3.2 mg/L	SNI 06-6989.142004
5	Sampel Titik 5	50 ml	2.9 mg/L	SNI 06-6989.142004

Parameter Amonia (NH3)

No	Kode	Konsentrasi	Spesifikasi Metode
1	Sampel Titik 1	0.18 mg/L	SNI 06-689.30-2005
2	Sampel Titik 2	0.28 mg/L	SNI 06-689.30-2005
3	Sampel Titik 3	0.45 mg/L	SNI 06-689.30-2005
4	Sampel Titik 4	0.5 mg/L	SNI 06-689.30-2005
5	Sampel Titik 5	0.53 mg/L	SNI 06-689.30-2005

Parameter Orthophospat

No	Kode	Volume Larutan Contoh Uji	Kadar	Spesifikasi Metode
1	Sampel Titik 1	50 ml	0.14 mg/L	SNI 6989.31:2005
2	Sampel Titik 2	50 ml	0.15 mg/L	SNI 6989.31:2005
3	Sampel Titik 3	50 ml	0.25 mg/L	SNI 6989.31:2005
4	Sampel Titik 4	50 ml	0.27 mg/L	SNI 6989.31:2005
5	Sampel Titik 5	50 ml	0.27 mg/L	SNI 6989.31:2005

Gowa, 27 Februari 2024

Asisten Uji

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Jln. Poros Malino KM.6, Bonto Marannu (92172) Gowa, Sulawesi Selatan

LEMBAR HASIL PENGUJIAN

NAMA : Ahmad Amiruddin

TIPE SAMPEL : Air Sungai

Parameter BOD Final

No	Kode	Kadar BOD	Spesifikasi Metode
1	Sampel Titik 1 A	12 mg/L	Winkler
2	Sampel Titik 1 B	15 mg/L	Winkler
3	Sampel Titik 1 C	14 mg/L	Winkler
2	Sampel Titik 2	9 mg/L	Winkler
3	Sampel Titik 3	8 mg/L	Winkler
4	Sampel Titik 4	7 mg/L	Winkler
5	Sampel Titik 5	5 mg/L	Winkler

Parameter DO

No	Kode	Volume Larutan Contoh Uji	Kadar DO	Spesifikasi Metode
1	Sampel Titik 1 A	50 ml	4.1 mg/L	SNI 06-6989.14-2004
2	Sampel Titik 1 B	50 ml	4.3 mg/L	SNI 06-6989.14-2004
3	Sampel Titik 1 C	50 ml	4 mg/L	SNI 06-6989.14-2004
2	Sampel Titik 2	50 ml	3.4 mg/L	SNI 06-6989.14-2004
3	Sampel Titik 3	50 ml	3.2 mg/L	SNI 06-6989.14-2004
4	Sampel Titik 4	50 ml	3 mg/L	SNI 06-6989.14-2004
5	Sampel Titik 5	50 ml	2.2 mg/L	SNI 06-6989.14-2004

Parameter Amonia (NH3)

No	Kode	Konsentrasi	Spesifikasi Metode
1	**Sampel Titik 1 A**	0.23 mg/L	SNI 06-689.30-2005
2	**Sampel Titik 1 B**	0.27 mg/L	SNI 06-689.30-2005
3	**Sampel Titik 1 C**	0.23 mg/L	SNI 06-689.30-2005
2	**Sampel Titik 2**	0.31 mg/L	SNI 06-689.30-2005
3	**Sampel Titik 3**	0.4 mg/L	SNI 06-689.30-2005
4	**Sampel Titik 4**	0.47 mg/L	SNI 06-689.30-2005
5	**Sampel Titik 5**	0.52 mg/L	SNI 06-689.30-2005

Parameter Orthophospat

No	Kode	Volume Larutan Contoh Uji	Kadar	Spesifikasi Metode
1	**Sampel Titik 1 A**	**50 ml**	0.15 mg/L	SNI 6989.31:2005
2	**Sampe l Titik 1 B**	**50 ml**	0.16 mg/L	SNI 6989.31:2005
3	**Sampe l Titik 1 C**	**50 ml**	0.17 mg/L	SNI 6989.31:2005
2	**Sampel Titik 2**	**50 ml**	0.21 mg/L	SNI 6989.31:2005
3	**Sampel Titik 3**	**50 ml**	0.4 mg/L	SNI 6989.31:2005
4	**Sampel Titik 4**	**50 ml**	0.45 mg/L	SNI 6989.31:2005
5	**Sampel Titik 5**	**50 ml**	0.48 mg/L	SNI 6989.31:2005

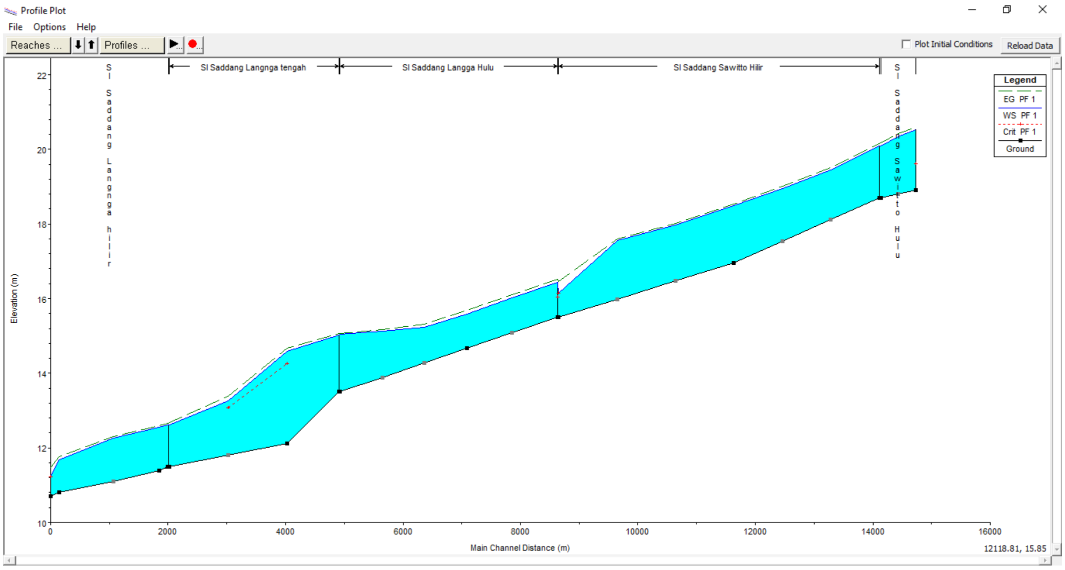
Gowa, 04 Maret 2024

Asisten Uji

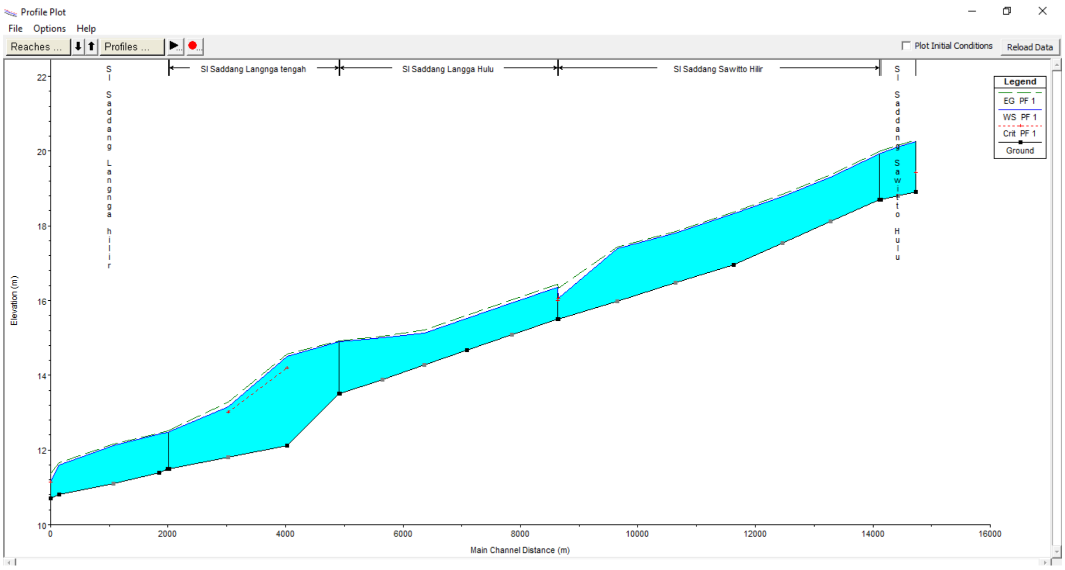
(Muh. Renaldy P.S)

NIM. D131181325

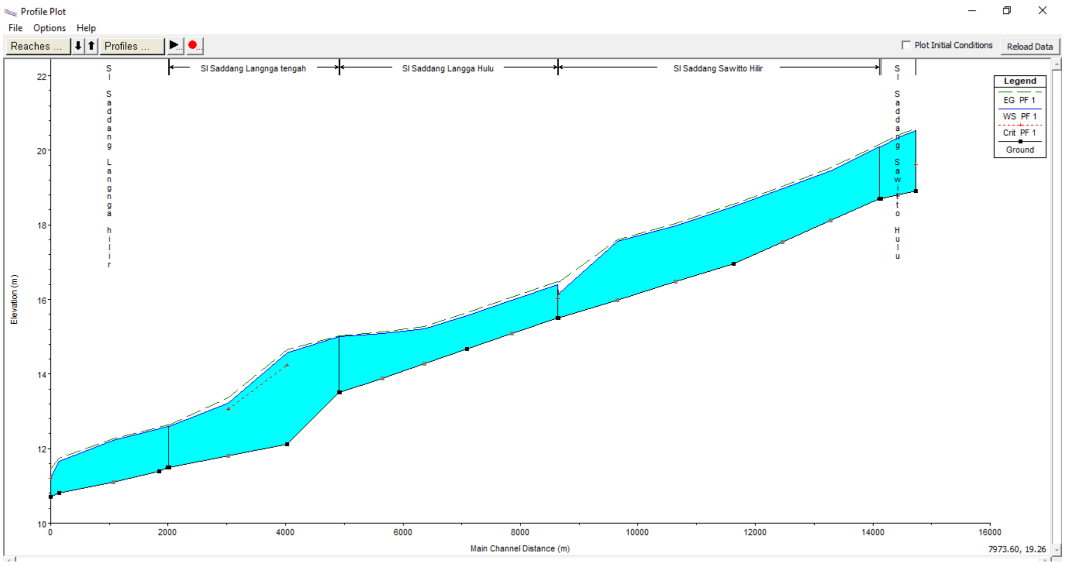
Lampiran 2 Profile Plot



Profile Plot 17 Februari 2024

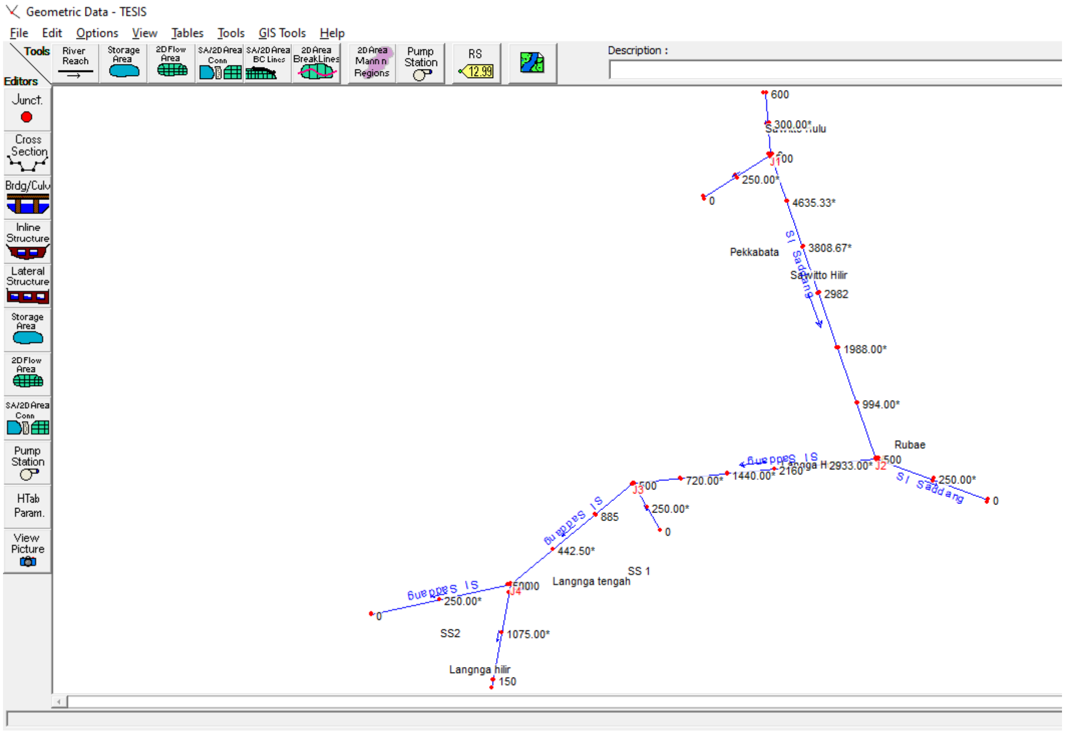


Profile Plot 27 Februari 2024

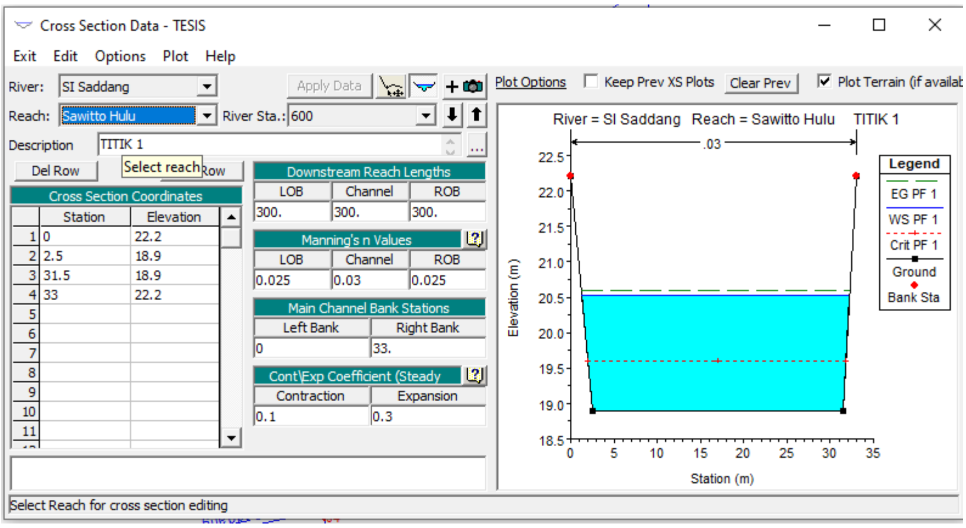


Profile Plote 04 Maret 2024

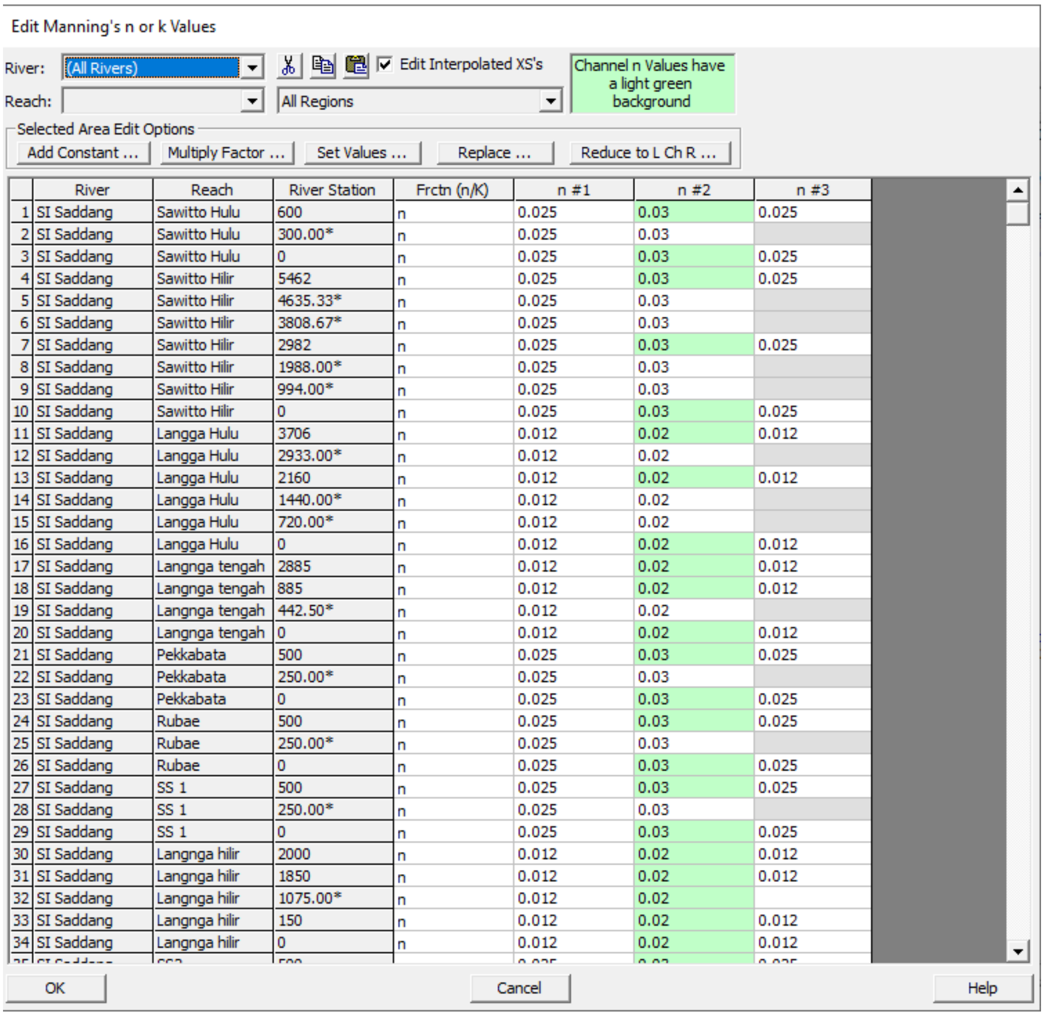
Lampiran 3 Proses pemodelan dengan HECRAS



Pembuatan Geometric terdiri dari *Reach, Cross Section* dan *Junction*



Inputan *Cross Section*



Edit Manning's n or k Values

River: (All Rivers) | Edit Interpolated XS's | Channel n Values have a light green background

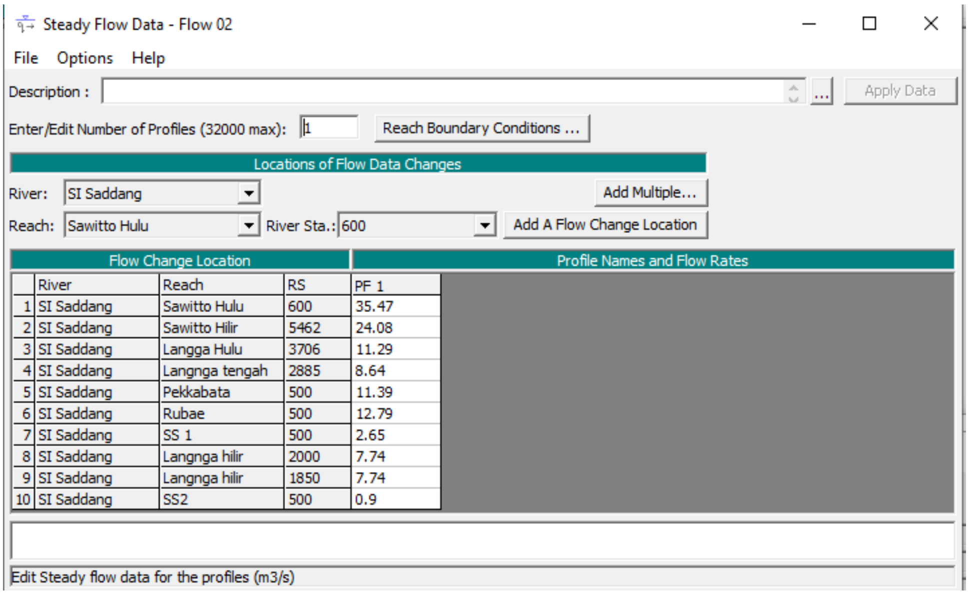
Reach: | All Regions

Selected Area Edit Options: Add Constant ... | Multiply Factor ... | Set Values ... | Replace ... | Reduce to L Ch R ...

	River	Reach	River Station	Frctn (n/K)	n #1	n #2	n #3
1	SI Saddang	Sawitto Hulu	600	n	0.025	0.03	0.025
2	SI Saddang	Sawitto Hulu	300.00*	n	0.025	0.03	
3	SI Saddang	Sawitto Hulu	0	n	0.025	0.03	0.025
4	SI Saddang	Sawitto Hilir	5462	n	0.025	0.03	0.025
5	SI Saddang	Sawitto Hilir	4635.33*	n	0.025	0.03	
6	SI Saddang	Sawitto Hilir	3808.67*	n	0.025	0.03	
7	SI Saddang	Sawitto Hilir	2982	n	0.025	0.03	0.025
8	SI Saddang	Sawitto Hilir	1988.00*	n	0.025	0.03	
9	SI Saddang	Sawitto Hilir	994.00*	n	0.025	0.03	
10	SI Saddang	Sawitto Hilir	0	n	0.025	0.03	0.025
11	SI Saddang	Langga Hulu	3706	n	0.012	0.02	0.012
12	SI Saddang	Langga Hulu	2933.00*	n	0.012	0.02	
13	SI Saddang	Langga Hulu	2160	n	0.012	0.02	0.012
14	SI Saddang	Langga Hulu	1440.00*	n	0.012	0.02	
15	SI Saddang	Langga Hulu	720.00*	n	0.012	0.02	
16	SI Saddang	Langga Hulu	0	n	0.012	0.02	0.012
17	SI Saddang	Langnga tengah	2885	n	0.012	0.02	0.012
18	SI Saddang	Langnga tengah	885	n	0.012	0.02	0.012
19	SI Saddang	Langnga tengah	442.50*	n	0.012	0.02	
20	SI Saddang	Langnga tengah	0	n	0.012	0.02	0.012
21	SI Saddang	Pekkabata	500	n	0.025	0.03	0.025
22	SI Saddang	Pekkabata	250.00*	n	0.025	0.03	
23	SI Saddang	Pekkabata	0	n	0.025	0.03	0.025
24	SI Saddang	Rubae	500	n	0.025	0.03	0.025
25	SI Saddang	Rubae	250.00*	n	0.025	0.03	
26	SI Saddang	Rubae	0	n	0.025	0.03	0.025
27	SI Saddang	SS 1	500	n	0.025	0.03	0.025
28	SI Saddang	SS 1	250.00*	n	0.025	0.03	
29	SI Saddang	SS 1	0	n	0.025	0.03	0.025
30	SI Saddang	Langnga hilir	2000	n	0.012	0.02	0.012
31	SI Saddang	Langnga hilir	1850	n	0.012	0.02	0.012
32	SI Saddang	Langnga hilir	1075.00*	n	0.012	0.02	
33	SI Saddang	Langnga hilir	150	n	0.012	0.02	0.012
34	SI Saddang	Langnga hilir	0	n	0.012	0.02	0.012

OK | Cancel | Help

Input Kekasaran Manning



Steady Flow Data - Flow 02

File Options Help

Description : | Apply Data

Enter/Edit Number of Profiles (32000 max): 1 | Reach Boundary Conditions ...

Locations of Flow Data Changes

River: SI Saddang | Add Multiple...

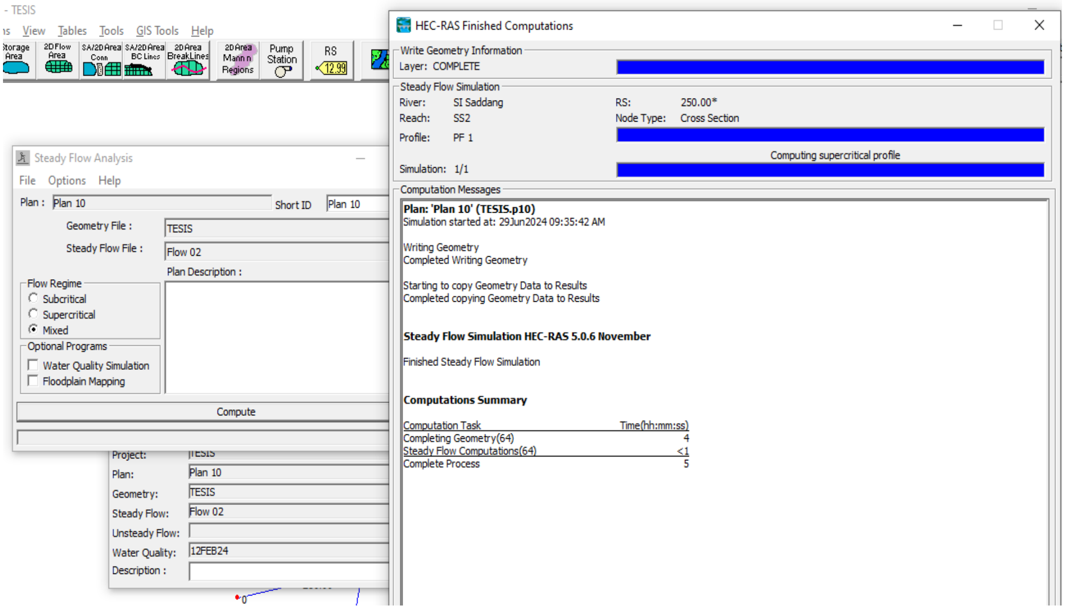
Reach: Sawitto Hulu | River Sta.: 600 | Add A Flow Change Location

Flow Change Location | Profile Names and Flow Rates

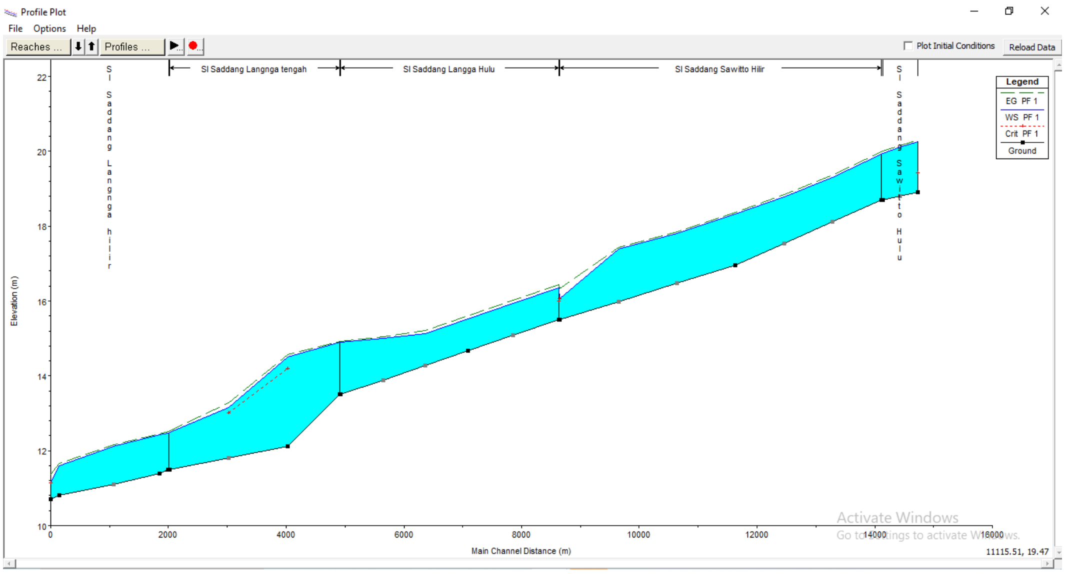
	River	Reach	RS	PF 1
1	SI Saddang	Sawitto Hulu	600	35.47
2	SI Saddang	Sawitto Hilir	5462	24.08
3	SI Saddang	Langga Hulu	3706	11.29
4	SI Saddang	Langnga tengah	2885	8.64
5	SI Saddang	Pekkabata	500	11.39
6	SI Saddang	Rubae	500	12.79
7	SI Saddang	SS 1	500	2.65
8	SI Saddang	Langnga hilir	2000	7.74
9	SI Saddang	Langnga hilir	1850	7.74
10	SI Saddang	SS2	500	0.9

Edit Steady flow data for the profiles (m3/s)

Input Running Steady Flow Data



Proses *Running Steady Flow Data*



Hasil *Profile Plot*

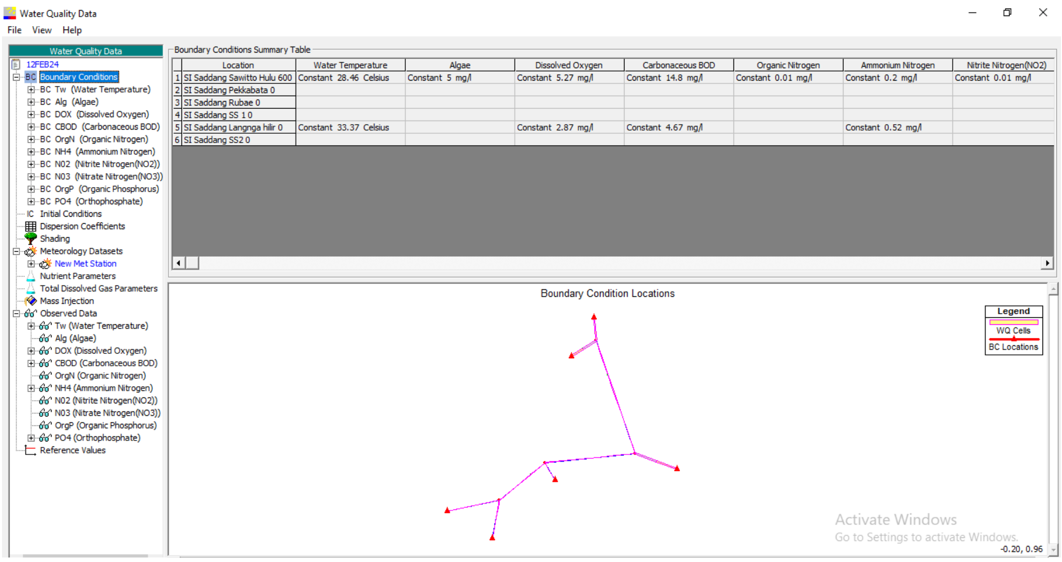
Profile Output Table - Standard Table 1

File Options Std. Tables Locations Help

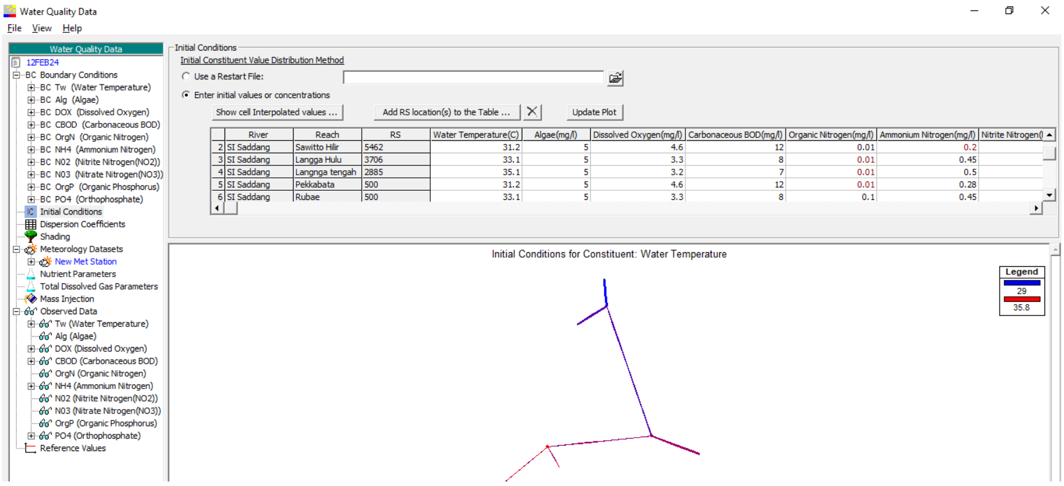
HEC-RAS Plan: Plan 10 Profile: PF 1 — Reload Data

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)
Sawitto Hulu	600	PF 1	35.47	18.90	20.25	19.43	20.29	0.000520	0.88	40.23	30.64
Sawitto Hulu	300.00*	PF 1	35.47	18.80	20.11		20.15	0.000397	0.91	39.02	30.54
Sawitto Hulu	0	PF 1	35.47	18.70	19.95		20.00	0.000663	0.95	37.26	30.39
Sawitto Hilir	5462	PF 1	24.08	18.70	19.93		19.99	0.000852	1.04	23.16	19.64
Sawitto Hilir	4635.33*	PF 1	24.08	18.12	19.29		19.35	0.000687	1.09	22.10	19.66
Sawitto Hilir	3808.67*	PF 1	24.08	17.54	18.79		18.84	0.000555	1.02	23.69	19.89
Sawitto Hilir	2982	PF 1	24.08	16.96	18.32		18.36	0.000601	0.93	25.97	20.19
Sawitto Hilir	1988.00*	PF 1	24.08	16.47	17.80		17.85	0.000454	0.95	25.25	20.00
Sawitto Hilir	994.00*	PF 1	24.08	15.99	17.40		17.44	0.000377	0.90	26.75	19.99
Sawitto Hilir	0	PF 1	24.08	15.50	16.06	16.06	16.34	0.011353	2.33	10.31	18.75
Langga Hulu	3706	PF 1	11.29	15.50	16.35	16.00	16.44	0.000963	1.28	8.84	10.71
Langga Hulu	2933.00*	PF 1	11.29	15.08	15.94		16.02	0.000346	1.27	8.86	10.79
Langga Hulu	2160	PF 1	11.29	14.67	15.52		15.60	0.000972	1.28	8.84	10.89
Langga Hulu	1440.00*	PF 1	11.29	14.28	15.12		15.21	0.000347	1.27	8.88	11.02
Langga Hulu	720.00*	PF 1	11.29	13.89	15.00		15.05	0.000139	0.94	11.97	11.55
Langga Hulu	0	PF 1	11.29	13.50	14.90		14.93	0.000173	0.72	15.67	12.34
Langnga tengah	2885	PF 1	8.64	13.50	14.90		14.93	0.000168	0.69	12.52	9.87
Langnga tengah	885	PF 1	8.64	12.11	14.51	14.20	14.58	0.001727	1.18	7.30	10.00
Langnga tengah	442.50*	PF 1	8.64	11.80	13.16	13.01	13.28	0.001009	1.53	5.63	10.00
Langnga tengah	0	PF 1	8.64	11.50	12.48		12.53	0.000540	1.02	8.49	9.31
Langnga hilir	2000	PF 1	7.74	11.50	12.48		12.52	0.000437	0.91	8.46	9.30
Langnga hilir	1850	PF 1	7.74	11.40	12.42		12.46	0.000382	0.87	8.85	9.36
Langnga hilir	1075.00*	PF 1	7.74	11.10	12.13		12.17	0.000372	0.87	8.93	9.37
Langnga hilir	150	PF 1	7.74	10.80	11.59		11.66	0.000885	1.15	6.73	9.05
Langnga hilir	0	PF 1	7.74	10.70	11.15	11.15	11.37	0.005631	2.07	3.73	8.60

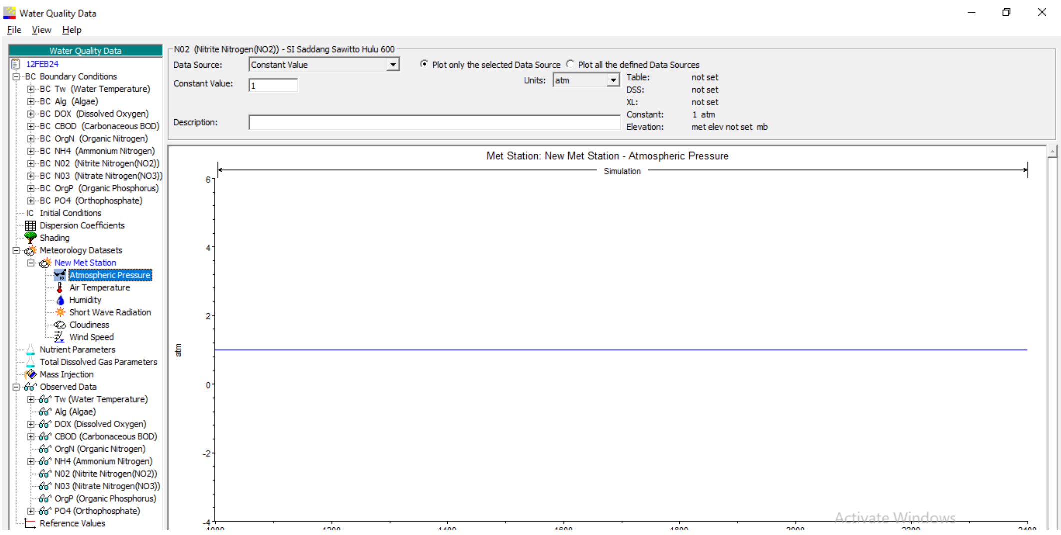
Profile Output Table



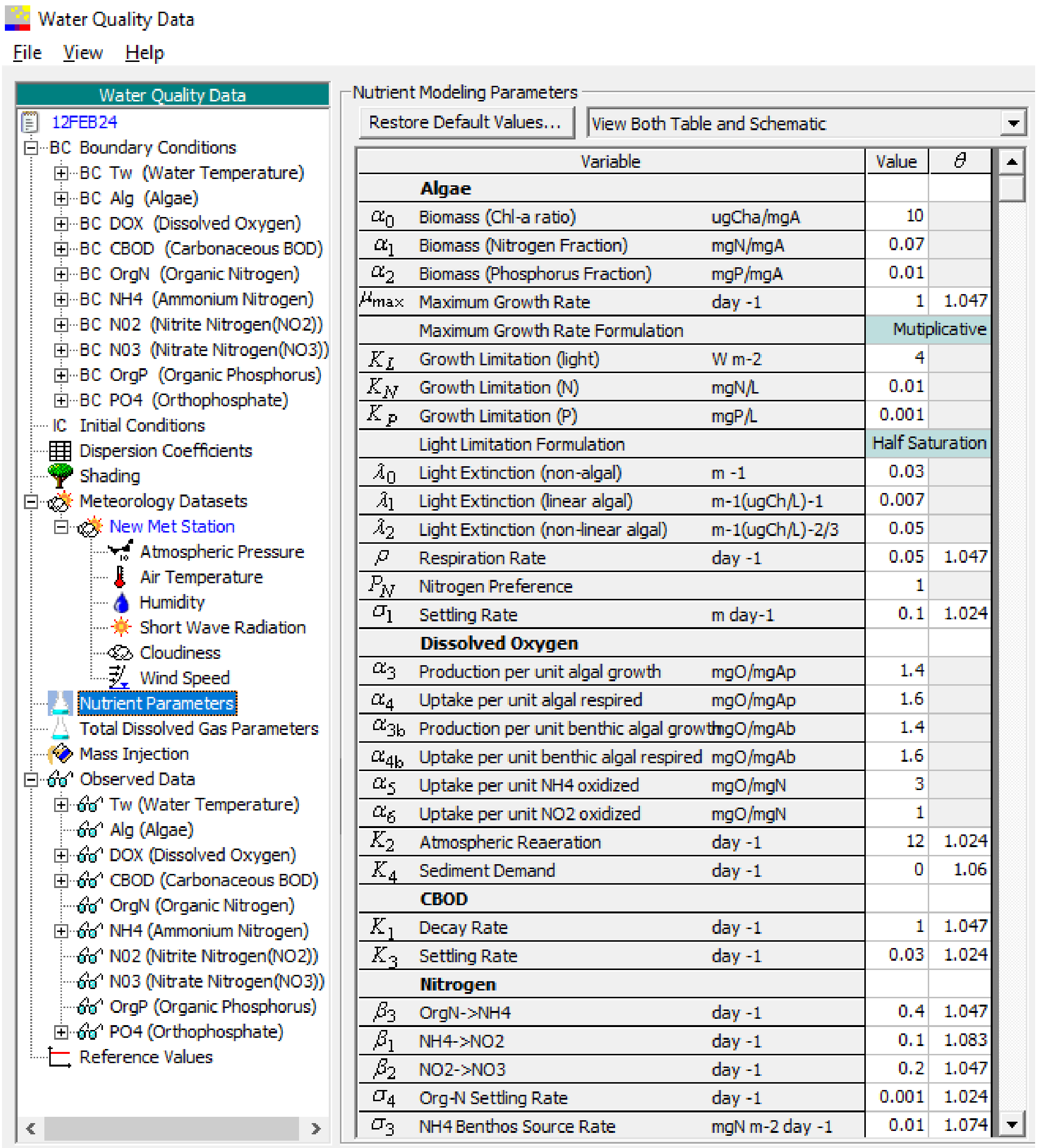
Indput Boundary Condition



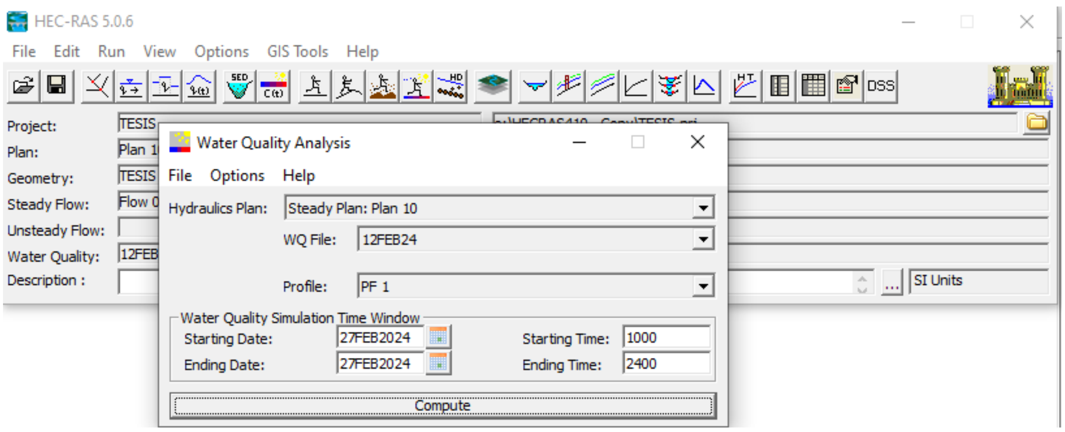
Input Initial Coeficient



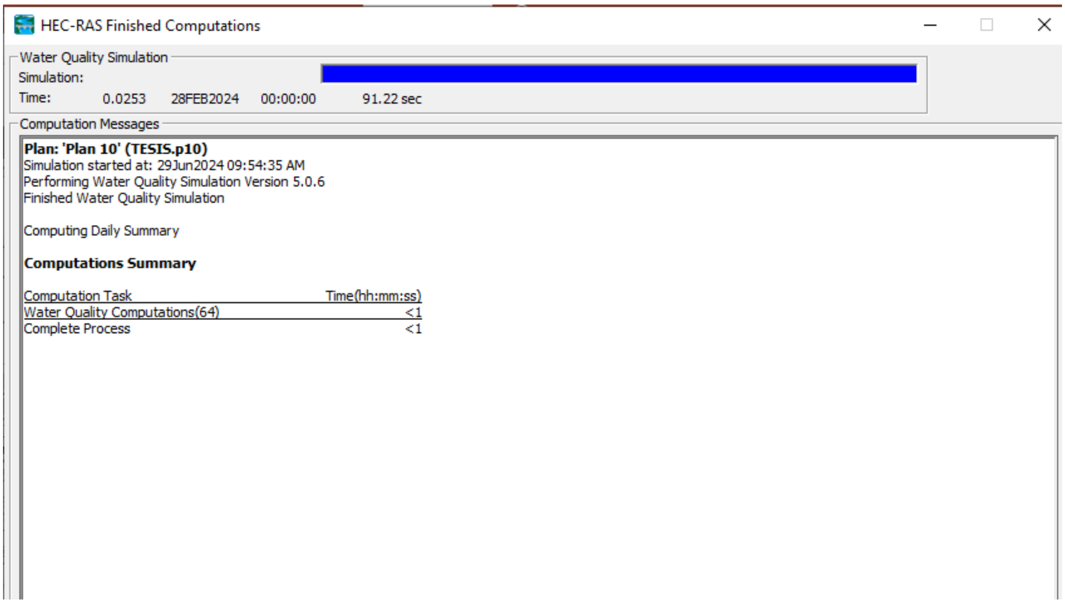
Input Meteorology Dataset



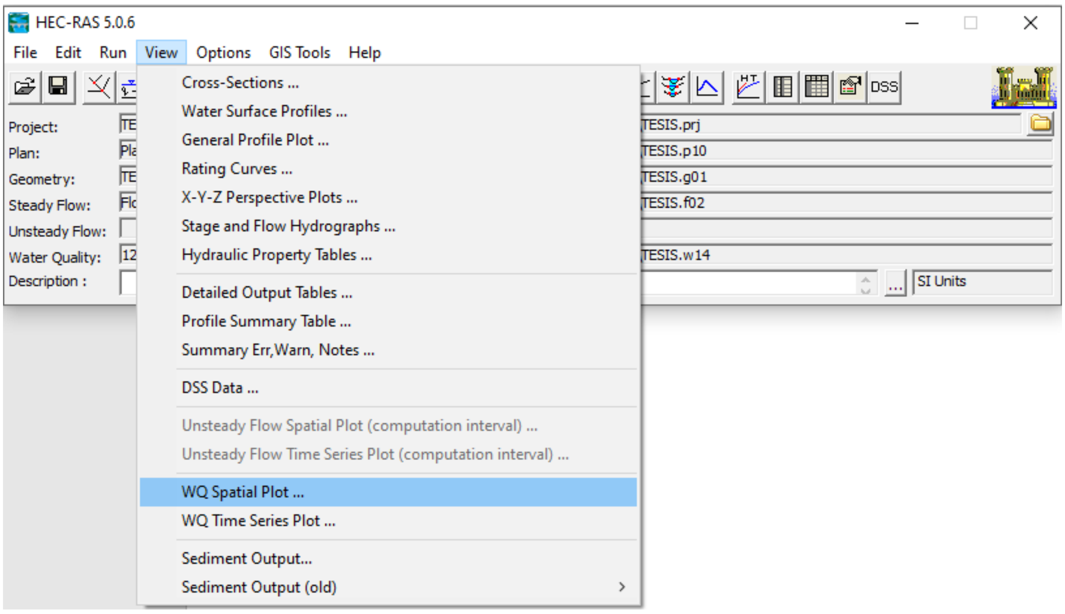
Input Nutrient Parameter



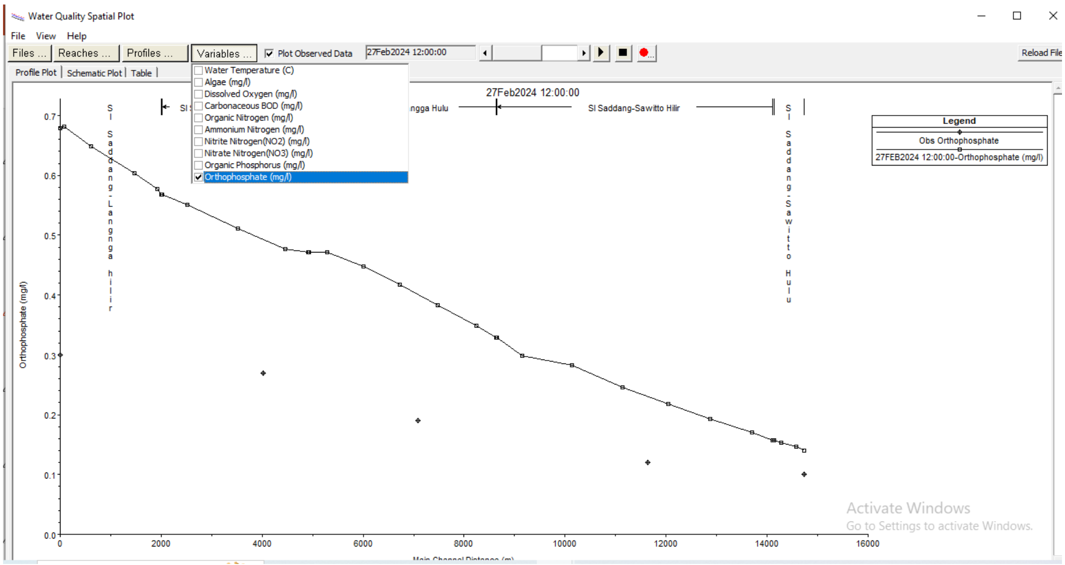
Input Water Quality Analysis



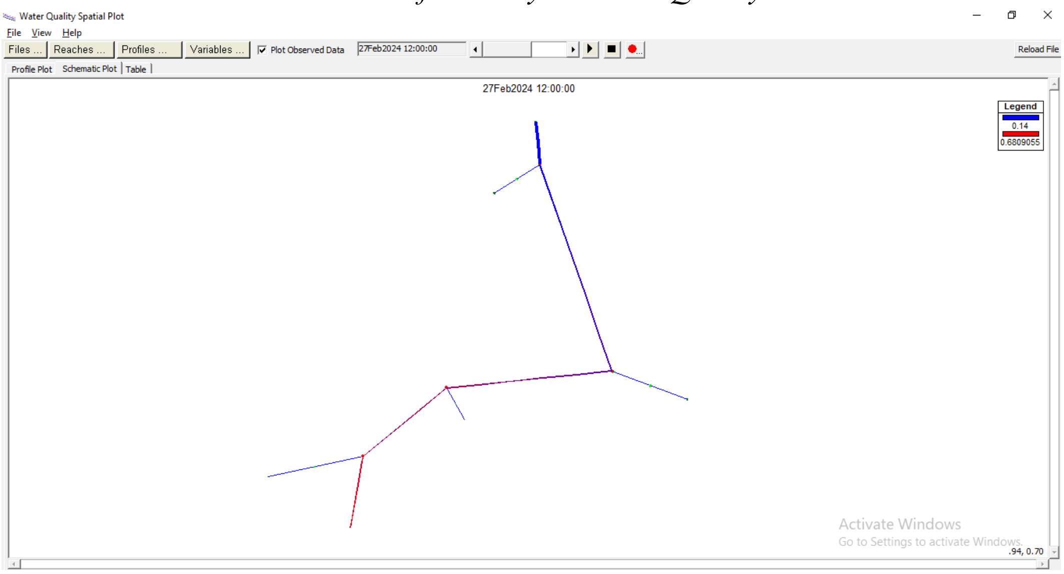
Proses *Water Quality Analysis HEC-RAS*



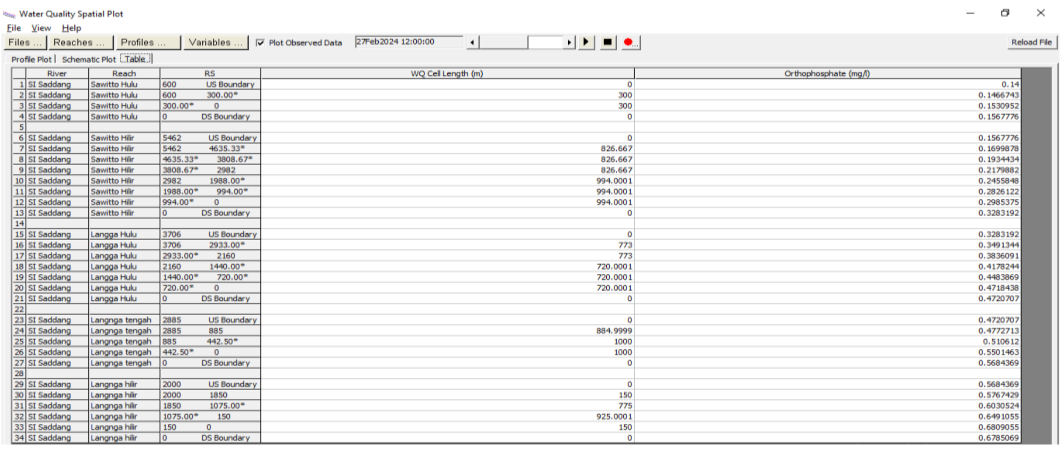
Cara Melihat Hasil Ranning *Water Quality Analysis*



Hasil *Profile Analysis Water Quality*



Hasil *Schematic Plot Water Quality*



	River	Reach	RS	WQ Cell Length (m)	Orthophosphate (mg/l)
1	SI Saddang	Sawitto Hulu	600 US Boundary	0	0.14
2	SI Saddang	Sawitto Hulu	600 300.00*	300	0.1466743
3	SI Saddang	Sawitto Hulu	300.00* 0	300	0.1530952
4	SI Saddang	Sawitto Hulu	0 DS Boundary	0	0.1567776
5					
6	SI Saddang	Sawitto Hilir	5462 US Boundary	0	0.1567776
7	SI Saddang	Sawitto Hilir	5462 4635.33*	826.667	0.1699878
8	SI Saddang	Sawitto Hilir	4635.33* 3808.67*	826.667	0.1934434
9	SI Saddang	Sawitto Hilir	3808.67* 2982	826.667	0.2179882
10	SI Saddang	Sawitto Hilir	2982 1988.00*	994.0001	0.2455848
11	SI Saddang	Sawitto Hilir	1988.00* 994.00*	994.0001	0.2826122
12	SI Saddang	Sawitto Hilir	994.00* 0	994.0001	0.2985375
13	SI Saddang	Sawitto Hilir	0 DS Boundary	0	0.3283192
14					
15	SI Saddang	Langga Hulu	3706 US Boundary	0	0.3283192
16	SI Saddang	Langga Hulu	3706 2933.00*	773	0.3491344
17	SI Saddang	Langga Hulu	2933.00* 2160	773	0.3836091
18	SI Saddang	Langga Hulu	2160 1440.00*	720.0001	0.4178244
19	SI Saddang	Langga Hulu	1440.00* 720.00*	720.0001	0.4483869
20	SI Saddang	Langga Hulu	720.00* 0	720.0001	0.4718438
21	SI Saddang	Langga Hulu	0 DS Boundary	0	0.4720707
22					
23	SI Saddang	Langnga tengah	2885 US Boundary	0	0.4720707
24	SI Saddang	Langnga tengah	2885 885	884.9999	0.4772713
25	SI Saddang	Langnga tengah	885 442.50*	1000	0.510612
26	SI Saddang	Langnga tengah	442.50* 0	1000	0.5501463
27	SI Saddang	Langnga tengah	0 DS Boundary	0	0.5684369
28					
29	SI Saddang	Langnga hilir	2000 US Boundary	0	0.5684369
30	SI Saddang	Langnga hilir	2000 1850	150	0.5767429
31	SI Saddang	Langnga hilir	1850 1075.00*	775	0.6030524
32	SI Saddang	Langnga hilir	1075.00* 150	925.0001	0.6491055
33	SI Saddang	Langnga hilir	150 0	150	0.6809055
34	SI Saddang	Langnga hilir	0 DS Boundary	0	0.6785069

Hasil *Table Water Quality Analysis*

Lampiran 4 Input yang disarankan untuk parameter nitrogen dan fosfat.

Profile Output Table - Standard Table 1

File Options Std. Tables Locations Help

HEC-RAS Plan: Plan 10 Profile: PF 1 Reload Data

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)
Sawitto Hulu	600	PF 1	55.17	18.90	20.53	19.61	20.60	0.000670	1.13	48.99	30.98
Sawitto Hulu	300.00*	PF 1	55.17	18.80	20.34		20.41	0.000566	1.20	46.04	30.81
Sawitto Hulu	0	PF 1	55.17	18.70	20.08		20.18	0.001161	1.34	41.20	30.54
Sawitto Hilir	5462	PF 1	29.30	18.70	20.08		20.15	0.000860	1.12	26.16	19.84
Sawitto Hilir	4635.33*	PF 1	29.30	18.12	19.45		19.52	0.000675	1.16	25.18	19.88
Sawitto Hilir	3808.67*	PF 1	29.30	17.54	18.96		19.02	0.000544	1.08	27.01	20.14
Sawitto Hilir	2982	PF 1	29.30	16.96	18.49		18.54	0.000604	1.00	29.41	20.47
Sawitto Hilir	1988.00*	PF 1	29.30	16.47	17.97		18.02	0.000456	1.02	28.59	20.25
Sawitto Hilir	994.00*	PF 1	29.30	15.99	17.55		17.60	0.000398	0.98	29.82	20.21
Sawitto Hilir	0	PF 1	29.30	15.50	16.14	16.14	16.45	0.010940	2.49	11.78	18.85
Langga Hulu	3706	PF 1	12.98	15.50	16.43	16.05	16.52	0.000963	1.34	9.67	10.78
Langga Hulu	2933.00*	PF 1	12.98	15.08	16.01		16.10	0.000348	1.34	9.67	10.86
Langga Hulu	2160	PF 1	12.98	14.67	15.59		15.68	0.000970	1.34	9.67	10.97
Langga Hulu	1440.00*	PF 1	12.98	14.28	15.24		15.32	0.000301	1.28	10.17	11.15
Langga Hulu	720.00*	PF 1	12.98	13.89	15.13		15.18	0.000127	0.96	13.49	11.73
Langga Hulu	0	PF 1	12.98	13.50	15.04		15.07	0.000167	0.75	17.38	12.50
Langnga tengah	2885	PF 1	10.68	13.50	15.03		15.06	0.000190	0.77	13.85	10.00
Langnga tengah	885	PF 1	10.68	12.11	14.58	14.26	14.67	0.001916	1.32	8.07	10.00
Langnga tengah	442.50*	PF 1	10.68	11.80	13.26	13.08	13.39	0.000911	1.61	6.64	10.00
Langnga tengah	0	PF 1	10.68	11.50	12.62		12.68	0.000540	1.09	9.76	9.49
Langnga hilir	2000	PF 1	9.58	11.50	12.61		12.66	0.000437	0.98	9.75	9.49
Langnga hilir	1850	PF 1	9.58	11.40	12.56		12.60	0.000388	0.95	10.13	9.54
Langnga hilir	1075.00*	PF 1	9.58	11.10	12.25		12.30	0.000389	0.95	10.12	9.54
Langnga hilir	150	PF 1	9.58	10.80	11.69		11.77	0.000930	1.26	7.61	9.18
Langnga hilir	0	PF 1	9.58	10.70	11.22	11.22	11.47	0.005438	2.22	4.32	8.69

Profile Output Table 17 Februari 2024

Profile Output Table - Standard Table 1

File Options Std. Tables Locations Help

HEC-RAS Plan: Plan 10 Profile: PF 1 Reload Data

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)
Sawitto Hulu	600	PF 1	35.47	18.90	20.25	19.43	20.29	0.000520	0.88	40.23	30.64
Sawitto Hulu	300.00*	PF 1	35.47	18.80	20.11		20.15	0.000397	0.91	39.02	30.54
Sawitto Hulu	0	PF 1	35.47	18.70	19.95		20.00	0.000663	0.95	37.26	30.39
Sawitto Hilir	5462	PF 1	24.08	18.70	19.93		19.99	0.000852	1.04	23.16	19.64
Sawitto Hilir	4635.33*	PF 1	24.08	18.12	19.29		19.35	0.000687	1.09	22.10	19.66
Sawitto Hilir	3808.67*	PF 1	24.08	17.54	18.79		18.84	0.000555	1.02	23.69	19.89
Sawitto Hilir	2982	PF 1	24.08	16.96	18.32		18.36	0.000601	0.93	25.97	20.19
Sawitto Hilir	1988.00*	PF 1	24.08	16.47	17.80		17.85	0.000454	0.95	25.25	20.00
Sawitto Hilir	994.00*	PF 1	24.08	15.99	17.40		17.44	0.000377	0.90	26.75	19.99
Sawitto Hilir	0	PF 1	24.08	15.50	16.06	16.06	16.34	0.011353	2.33	10.31	18.75
Langga Hulu	3706	PF 1	11.29	15.50	16.35	16.00	16.44	0.000963	1.28	8.84	10.71
Langga Hulu	2933.00*	PF 1	11.29	15.08	15.94		16.02	0.000346	1.27	8.86	10.79
Langga Hulu	2160	PF 1	11.29	14.67	15.52		15.60	0.000972	1.28	8.84	10.89
Langga Hulu	1440.00*	PF 1	11.29	14.28	15.12		15.21	0.000347	1.27	8.88	11.02
Langga Hulu	720.00*	PF 1	11.29	13.89	15.00		15.05	0.000139	0.94	11.97	11.55
Langga Hulu	0	PF 1	11.29	13.50	14.90		14.93	0.000173	0.72	15.67	12.34
Langnga tengah	2885	PF 1	8.64	13.50	14.90		14.93	0.000168	0.69	12.52	9.87
Langnga tengah	885	PF 1	8.64	12.11	14.51	14.20	14.58	0.001727	1.18	7.30	10.00
Langnga tengah	442.50*	PF 1	8.64	11.80	13.16	13.01	13.28	0.001009	1.53	5.63	10.00
Langnga tengah	0	PF 1	8.64	11.50	12.48		12.53	0.000540	1.02	8.49	9.31
Langnga hilir	2000	PF 1	7.74	11.50	12.48		12.52	0.000437	0.91	8.46	9.30
Langnga hilir	1850	PF 1	7.74	11.40	12.42		12.46	0.000382	0.87	8.85	9.36
Langnga hilir	1075.00*	PF 1	7.74	11.10	12.13		12.17	0.000372	0.87	8.93	9.37
Langnga hilir	150	PF 1	7.74	10.80	11.59		11.66	0.000885	1.15	6.73	9.05
Langnga hilir	0	PF 1	7.74	10.70	11.15	11.15	11.37	0.005631	2.07	3.73	8.60

Profile Output Table 27 Februari 2024

Profile Output Table - Standard Table 1

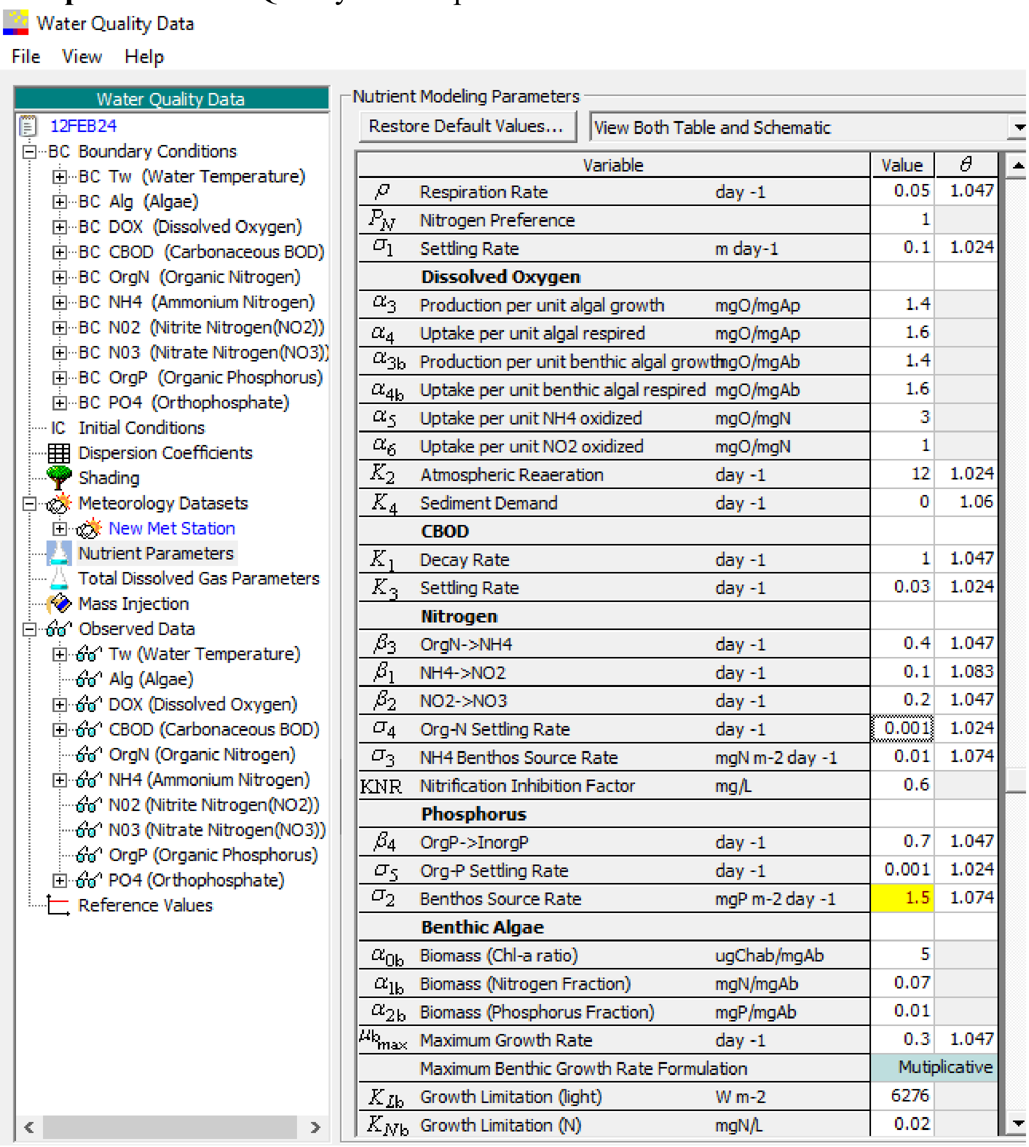
File Options Std. Tables Locations Help

HEC-RAS Plan: Plan 10 Profile: PF 1 | Reload Data

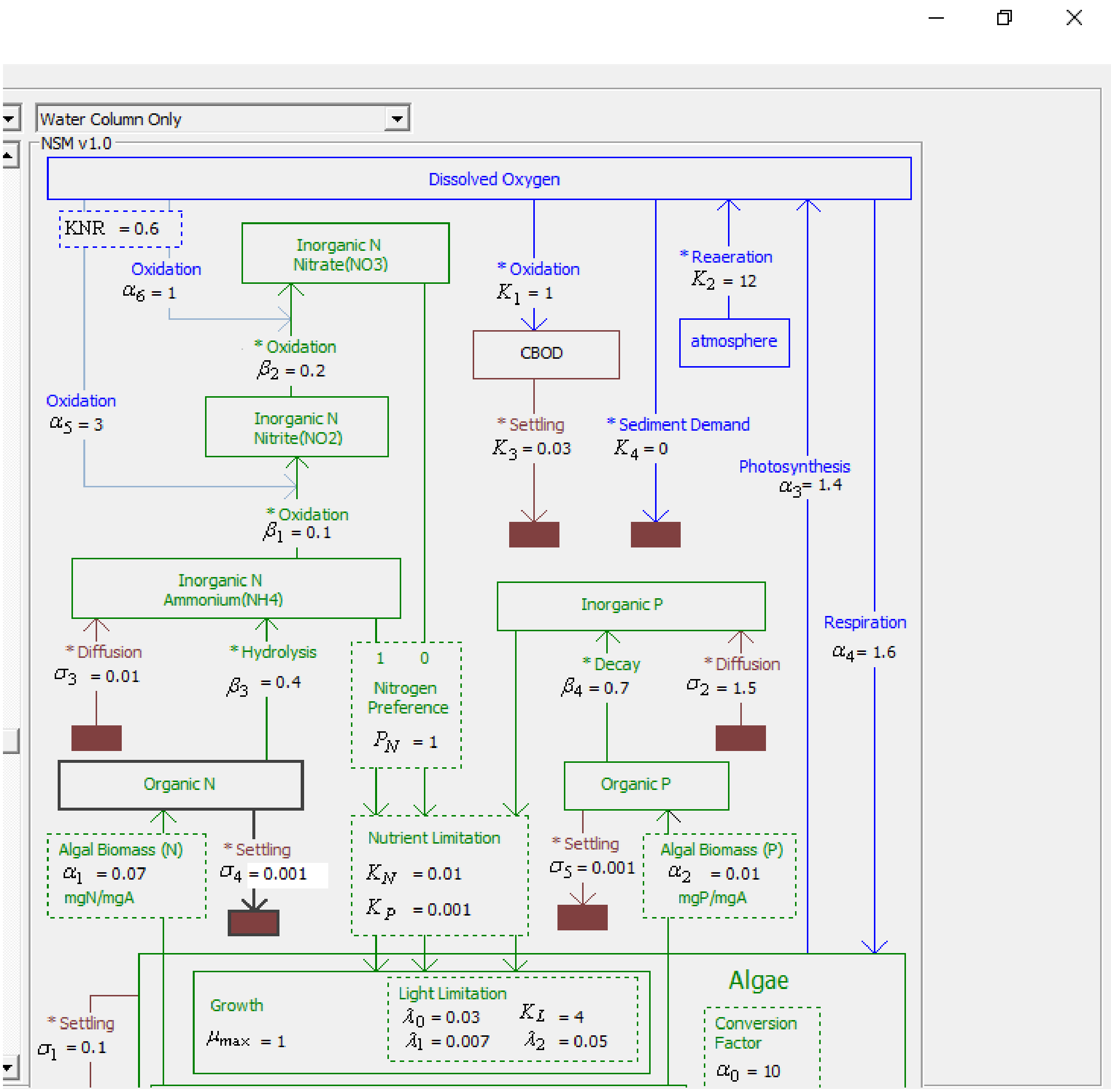
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)
Sawitto Hulu	600	PF 1	54.28	18.90	20.53	19.60	20.59	0.000658	1.11	48.76	30.97
Sawitto Hulu	300.00*	PF 1	54.28	18.80	20.34		20.41	0.000551	1.18	45.96	30.81
Sawitto Hulu	0	PF 1	54.28	18.70	20.09		20.18	0.001103	1.31	41.44	30.55
Sawitto Hilir	5462	PF 1	29.50	18.70	20.09		20.15	0.000860	1.12	26.27	19.85
Sawitto Hilir	4635.33*	PF 1	29.50	18.12	19.46		19.52	0.000674	1.17	25.30	19.89
Sawitto Hilir	3808.67*	PF 1	29.50	17.54	18.96		19.02	0.000544	1.09	27.13	20.14
Sawitto Hilir	2982	PF 1	29.50	16.96	18.50		18.55	0.000604	1.00	29.54	20.48
Sawitto Hilir	1988.00*	PF 1	29.50	16.47	17.97		18.03	0.000456	1.03	28.71	20.26
Sawitto Hilir	994.00*	PF 1	29.50	15.99	17.55		17.60	0.000399	0.99	29.93	20.22
Sawitto Hilir	0	PF 1	29.50	15.50	16.14	16.14	16.46	0.010930	2.49	11.83	18.86
Langga Hulu	3706	PF 1	12.27	15.50	16.40	16.03	16.49	0.000963	1.32	9.33	10.75
Langga Hulu	2933.00*	PF 1	12.27	15.08	15.98		16.07	0.000349	1.32	9.32	10.83
Langga Hulu	2160	PF 1	12.27	14.67	15.56		15.65	0.000976	1.32	9.31	10.94
Langga Hulu	1440.00*	PF 1	12.27	14.28	15.20		15.28	0.000308	1.26	9.73	11.11
Langga Hulu	720.00*	PF 1	12.27	13.89	15.09		15.14	0.000127	0.94	13.02	11.68
Langga Hulu	0	PF 1	12.27	13.50	15.00		15.03	0.000163	0.73	16.89	12.50
Langnga tengah	2885	PF 1	10.06	13.50	15.00		15.02	0.000183	0.75	13.46	9.99
Langnga tengah	885	PF 1	10.06	12.11	14.56	14.24	14.64	0.001856	1.28	7.85	10.00
Langnga tengah	442.50*	PF 1	10.06	11.80	13.22	13.06	13.35	0.000943	1.59	6.33	10.00
Langnga tengah	0	PF 1	10.06	11.50	12.59		12.65	0.000519	1.06	9.51	9.45
Langnga hilir	2000	PF 1	9.18	11.50	12.59		12.63	0.000436	0.97	9.48	9.45
Langnga hilir	1850	PF 1	9.18	11.40	12.53		12.57	0.000386	0.93	9.86	9.50
Langnga hilir	1075.00*	PF 1	9.18	11.10	12.23		12.27	0.000385	0.93	9.87	9.50
Langnga hilir	150	PF 1	9.18	10.80	11.66		11.74	0.000924	1.24	7.41	9.15
Langnga hilir	0	PF 1	9.18	10.70	11.20	11.20	11.45	0.005470	2.19	4.19	8.67

Profile Output Table 04 Maret 2024

Lampiran 5 Water Quality Data Input.



	Variable		Value	θ
ρ	Respiration Rate	day -1	0.05	1.047
P_N	Nitrogen Preference		1	
σ_1	Settling Rate	m day-1	0.1	1.024
	Dissolved Oxygen			
α_3	Production per unit algal growth	mgO/mgAp	1.4	
α_4	Uptake per unit algal respired	mgO/mgAp	1.6	
α_{3b}	Production per unit benthic algal growth	mgO/mgAb	1.4	
α_{4b}	Uptake per unit benthic algal respired	mgO/mgAb	1.6	
α_5	Uptake per unit NH4 oxidized	mgO/mgN	3	
α_6	Uptake per unit NO2 oxidized	mgO/mgN	1	
K_2	Atmospheric Reaeration	day -1	12	1.024
K_4	Sediment Demand	day -1	0	1.06
	CBOD			
K_1	Decay Rate	day -1	1	1.047
K_3	Settling Rate	day -1	0.03	1.024
	Nitrogen			
β_3	OrgN->NH4	day -1	0.4	1.047
β_1	NH4->NO2	day -1	0.1	1.083
β_2	NO2->NO3	day -1	0.2	1.047
σ_4	Org-N Settling Rate	day -1	0.001	1.024
σ_3	NH4 Benthos Source Rate	mgN m-2 day -1	0.01	1.074
KNR	Nitrification Inhibition Factor	mg/L	0.6	
	Phosphorus			
β_4	OrgP->InorgP	day -1	0.7	1.047
σ_5	Org-P Settling Rate	day -1	0.001	1.024
σ_2	Benthos Source Rate	mgP m-2 day -1	1.5	1.074
	Benthic Algae			
α_{0b}	Biomass (Chl-a ratio)	ugChab/mgAb	5	
α_{1b}	Biomass (Nitrogen Fraction)	mgN/mgAb	0.07	
α_{2b}	Biomass (Phosphorus Fraction)	mgP/mgAb	0.01	
$\mu_{b_{max}}$	Maximum Growth Rate	day -1	0.3	1.047
	Maximum Benthic Growth Rate Formulation		Mutiplicative	
K_{Lb}	Growth Limitation (light)	W m-2	6276	
K_{Nb}	Growth Limitation (N)	mgN/L	0.02	


Water Column Only
NSM v1.0
Dissolved Oxygen
KNR = 0.6
Oxidation
α6 = 1
Inorganic N Nitrate(NO3)
* Oxidation
β2 = 0.2
Oxidation
α5 = 3
Inorganic N Nitrite(NO2)
* Oxidation
β1 = 0.1
Inorganic N Ammonium(NH4)
* Oxidation
K1 = 1
CBOD
* Reaeration
K2 = 12
atmosphere
* Settling
K3 = 0.03
* Sediment Demand
K4 = 0
Photosynthesis
α3 = 1.4
Respiration
α4 = 1.6
* Diffusion
σ3 = 0.01
* Hydrolysis
β3 = 0.4
1 0
Nitrogen Preference
PN = 1
Inorganic P
* Decay
β4 = 0.7
* Diffusion
σ2 = 1.5
Organic N
Organic P
Algal Biomass (N)
α1 = 0.07
mgN/mgA
* Settling
σ4 = 0.001
Nutrient Limitation
KN = 0.01
KP = 0.001
* Settling
σ5 = 0.001
Algal Biomass (P)
α2 = 0.01
mgP/mgA
Algae
Growth
μmax = 1
Light Limitation
λ0 = 0.03
λ1 = 0.007
KL = 4
λ2 = 0.05
Conversion Factor
α0 = 10
* Settling
σ1 = 0.1

Lampiran 6. Uji Nash-Sutchliffe

$$E_{Ns} = 1 - \frac{\sum_{i=1}^{n}(Q_{Mi} - Q_{Si})^2}{\sum_{i=1}^{n}(Q_{Mi} - Q_M)^2} \quad (12)$$

dimana:

E_{NS} : Koeffisien Nash-sutchllife
Q_{si} : Nilai simulasi model (nilai pemodelan)
Q_{Mi} : Nilai observasi (nilai hasil pengukuran)
Q_M : Rata-rata nilai observasi (nilai hasil pengukuran)
N : Jumlah data

	BOD	DO	NH3	Orthophospahte	Temperature	Tanggal Sampel
TS 1	15	6.8	0.1	0.1	27.4	17 Februari 2024
TS 2	10	6.2	0.2	0.12	29.9	
TS 3	6	5.2	0.37	0.19	32.1	
TS 4	4	4	0.47	0.27	34.6	
TS 5	3	3.5	0.5	0.3	35.2	
TS 1	18	4.8	0.18	0.14	29	27 Februari 2024
TS 2	12	4.6	0.28	0.15	31.2	
TS 3	8	3.3	0.45	0.25	33.1	
TS 4	7	3.2	0.5	0.27	35.1	
TS 5	6	2.9	0.53	0.27	35.8	
TS 1	13.6	4.2	0.24	0.15	28.6	04 Maret 2024
TS 2	9	3.4	0.31	0.21	28.9	
TS 3	8	3.2	0.4	0.4	28.5	
TS 4	7	3	0.47	0.45	28.4	
TS 5	5	2.2	0.52	0.48	29.1	

Data Hasil Observasi

	BOD	DO	NH3	Orthophospahte	Temperature	Tanggal Sampel
TS 1	14.80	5.27	0.20	0.14	28.4	17 Februari 2024
TS 2	13.96	5.64	0.20	0.23	30.4	
TS 3	12.13	5.93	0.19	0.35	33.12	
TS 4	9.02	6.17	0.19	0.39	34.66	
TS 5	6.58	6.3	0.30	0.53	37.04	
TS 1	14.80	5.27	0.20	0.14	28.46	27 Februari 2024
TS 2	13.84	5.69	0.20	0.25	28.45	
TS 3	12.46	5.54	0.23	0.42	29.45	
TS 4	10.48	5.45	0.27	0.49	30.89	
TS 5	7.65	5.27	0.40	0.69	32.23	
TS 1	14.80	5.27	0.20	0.14	28.46	04 Maret 2024
TS 2	13.84	5.69	0.20	0.25	30.4	
TS 3	12.46	5.54	0.23	0.42	33.13	
TS 4	10.48	5.45	0.27	0.49	34.02	
TS 5	7.65	5.27	0.40	0.69	34.8	

Data Hasil Simulasi

TS	Vobs	Vs	(Qmi-Qsi)^2	Qm	(Qmi-Qm)^2	$\sum_{i=1}^{n}(Q_{Mi}-Q_{Si})^2$	$\sum_{i=1}^{n}(Q_{Mi}-Q_{M})^2$	$1-\frac{\sum_{i=1}^{n}(Q_{Mi}-Q_{Si})^2}{\sum_{i=1}^{n}(Q_{Mi}-Q_{M})^2}$
1	0.93	1.13	0.039	0.9044	0.0046	0.07	0.0128	**0.81**
	0.83	0.88	0.002		0.001			
	1	1.11	0.026		0.007			
2	0.84	1.00	0.025	0.86	0.000	0.04	0.0009	**0.98**
	0.86	0.93	0.004		0.000			
	0.89	1.00	0.013		0.001			
3	1.20	1.34	0.020	1.2	0.000	0.04	0.0018	**0.95**
	1.17	1.28	0.012		0.001			
	1.23	1.32	0.008		0.001			
4	1.21	1.32	0.012	1.09	0.014	0.09	0.0219	**0.76**
	1.04	1.17	0.017		0.003			
	1.02	1.27	0.063		0.005			
5	1.05	1.32	0.073	1.15	0.010	0.039	0.0614	**0.84**
	1.30	1.15	0.023		0.023			
	0.98	1.52	0.292		0.029			

Uji Nash-Sutchliffe V (kecepatan)

TS	NH4obs	NH4s	(Qmi-Qsi)^2	Qm	(Qmi-Qm)^2	$\sum_{i=1}^{n}(Q_{Mi}-Q_{Si})^2$	$\sum_{i=1}^{n}(Q_{Mi}-Q_{M})^2$	$1-\frac{\sum_{i=1}^{n}(Q_{Mi}-Q_{Si})^2}{\sum_{i=1}^{n}(Q_{Mi}-Q_{M})^2}$
1	0.1	0.20	0.01000	0.1744	0.00554	0.01	0.0103	**0.16**
	0.18	0.20	0.00040		0.00003			
	0.243333	0.20	0.00188		0.00475			
2	0.2	0.20	0.00000	0.2633	0.00401	0.02	0.0065	**0.64**
	0.28	0.20	0.00626		0.00028			
	0.31	0.20	0.01190		0.00218			
3	0.37	0.19	0.03254	0.4067	0.16538	0.11	0.1673	**-0.48**
	0.45	0.23	0.05007		0.00188			
	0.4	0.23	0.03019		0.00004			
4	0.47	0.19	0.07639	0.48	0.00010	0.17	0.0006	**1**
	0.5	0.27	0.05087		0.00040			
	0.47	0.27	0.03823		0.00010			
5	0.5	0.30	0.04171	0.5167	0.00028	0.07	0.0005	**0.99**
	0.53	0.40	0.01719		0.00018			
	0.52	0.40	0.01467		0.00001			

Uji Nash-Sutchliffe NH4

TS	ORTHOobs	ORTHOs	(Qmi-Qsi)^2	Qm	(Qmi-Qm)^2	$\sum_{i=1}^{n}(Q_{Mi}-Q_{Si})^2$	$\sum_{i=1}^{n}(Q_{Mi}-Q_{M})^2$	$1-\frac{\sum_{i=1}^{n}(Q_{Mi}-Q_{Si})^2}{\sum_{i=1}^{n}(Q_{Mi}-Q_{M})^2}$
1	0.10	0.14	0.00160	0.13	0.00097	0.00	0.0015	**0.13**
	0.14	0.14	0.00000		0.00008			
	0.15	0.14	0.00018		0.00049			
2	0.12	0.23	0.01133	0.16	0.00160	0.02	0.0042	**0.81**
	0.15	0.25	0.00975		0.00010			
	0.21	0.25	0.00150		0.00250			
3	0.19	0.35	0.02575	0.28	0.00810	0.06	0.0234	**0.59**
	0.25	0.42	0.03056		0.00090			
	0.40	0.42	0.00062		0.01440			
4	0.27	0.39	0.01407	0.33	0.00360	0.06	0.0216	**0.65**
	0.27	0.49	0.04626		0.00360			
	0.45	0.49	0.00123		0.01440			
5	0.30	0.53	0.05235	0.35	0.00250	0.27	0.0256	**0.91**
	0.27	0.69	0.17616		0.00640			
	0.48	0.69	0.04398		0.01690			

Uji Nash-Sutchliffe Orthophosphate

TS	BODobs	BODs	(Qmi-Qsi)^2	Qm	(Qmi-Qm)^2	$\sum_{i=1}^{n}(Q_{Mi}-Q_{Si})^2$	$\sum_{i=1}^{n}(Q_{Mi}-Q_{M})^2$	$1-\frac{\sum_{i=1}^{n}(Q_{Mi}-Q_{Si})^2}{\sum_{i=1}^{n}(Q_{Mi}-Q_{M})^2}$
1	15	14.80	0.04	15.556	0.3086	11.56	9.8519	**0.15**
	18	14.8	10.24		5.9753			
	13.66667	14.8	1.28		3.5679			
2	10	13.96	15.68	10.33	0.1111	42.49	4.6667	**0.89**
	12	13.84	3.39		2.7778			
	9	13.84	23.43		1.7778			
3	6	5.07	0.86	7.33	1.7778	17.00	2.6667	**0.84**
	8	5.12	8.29		0.4444			
	8	5.2	7.84		0.4444			
4	4	9.02	25.20	6	4.0000	37.90	6.0000	**0.84**
	7	10.48	12.11		1.0000			
	7	6.23	0.59		1.0000			
5	3	6.58	12.82	4.7667	3.1211	22.26	6.1267	**0.72**
	6.5	7.65	1.32		3.0044			
	4.8	7.65	8.12		0.0011			

Uji Nash-Sutchliffe BOD

TS	DOobs	DOs	(Qmi-Qsi)^2	Qm	(Qmi-Qm)^2	$\sum_{i=1}^{n}(Q_{Mi}-Q_{Si})^2$	$\sum_{i=1}^{n}(Q_{Mi}-Q_{M})^2$	$1-\frac{\sum_{i=1}^{n}(Q_{Mi}-Q_{Si})^2}{\sum_{i=1}^{n}(Q_{Mi}-Q_{M})^2}$
1	6.8	5.27	2.3409	5.2667	2.351	3.71	3.70	**0.00**
	4.8	5.27	0.2209		0.218			
	4.2	5.27	1.1449		1.138			
2	6.2	5.64	0.3136	4.7333	2.151	6.75	3.94	**0.41**
	4.6	5.69	1.1881		0.018			
	3.4	5.69	5.2441		1.778			
3	5.2	5.93	0.5329	3.9	1.690	11.03	2.54	**0.77**
	3.3	5.54	5.0176		0.360			
	3.2	5.54	5.4756		0.490			
4	4	6.17	4.7089	3.4	0.360	15.77	0.56	**0.96**
	3.2	5.45	5.0625		0.040			
	3	5.45	6.0025		0.160			
5	3.5	6.3	7.84	2.8667	0.401	22.88	0.84	**0.96**
	2.9	5.27	5.6169		0.001			
	2.2	5.27	9.4249		0.444			

Uji Nash-Sutchliffe DO

TS	TEMPobs	TEMPs	(Qmi-Qsi)^2	Qm	(Qmi-Qm)^2	$\sum_{i=1}^{n}(Q_{Mi}-Q_{Si})^2$	$\sum_{i=1}^{n}(Q_{Mi}-Q_{M})^2$	$1-\frac{\sum_{i=1}^{n}(Q_{Mi}-Q_{Si})^2}{\sum_{i=1}^{n}(Q_{Mi}-Q_{M})^2}$
1	27.40	28.40	1.000	28.344	0.892	1.32	1.4052	**-0.06**
	29.00	28.46	0.292		0.430			
	28.63	28.46	0.030		0.083			
2	29.90	30.40	0.250	30	0.010	10.06	2.6600	**0.74**
	31.20	28.45	7.563		1.440			
	28.90	30.40	2.250		1.210			
3	32.10	33.12	1.040	31.23	0.751	35.80	11.7067	**0.67**
	33.10	29.45	13.323		3.484			
	28.50	33.13	21.437		7.471			
4	34.60	34.66	0.004	32.7	3.610	49.31	27.8600	**0.44**
	35.10	30.89	17.724		5.760			
	28.40	34.02	31.584		18.490			
5	35.20	37.04	3.386	33.367	3.361	48.62	27.4867	**0.43**
	35.80	32.23	12.745		5.921			
	29.10	34.80	32.490		18.204			

Uji Nash-Sutchliffe Temperatur

Lampiran 7. Uji Kesalahan Relatif

$$Kesalahan\ Relatif\ (KR) = \frac{(D_L - D_p)}{(D_p)} x100\% \quad (8)$$

dimana:

KR : Kesalahan relatif
DL : Data lapangan
DP : Data Pemodelan

TS	Vobs	Vs	$\sum_{i=1}^{n} DL$	$\sum_{i=1}^{n} DP$	$\frac{(D_L - D_p)}{(D_p)} x100\%$
1	0.93	1.13	2.71	3.12	0.13%
	0.83	0.88			
	1	1.11			
2	0.84	1.00	2.59	2.93	0.12%
	0.86	0.93			
	0.89	1.00			
3	1.20	1.34	3.27	3.76	0.09%
	1.17	1.28			
	1.23	1.32			
4	1.21	1.32	3.27	3.76	0.13%
	1.04	1.17			
	1.02	1.27			
5	1.05	1.32	3.33	3.99	0.17%
	1.30	1.15			
	0.98	1.52			

Uji Kesalahan Relatif V (Kecepatan)

TS	NH4obs	NH4s	$\sum_{i=1}^{n} DL$	$\sum_{i=1}^{n} DP$	$\frac{(D_L - D_p)}{(D_p)} x100\%$
1	0.1	0.20	0.52	0.60	0.13%
	0.18	0.20			
	0.243333	0.20			
2	0.2	0.20	0.79	0.60	0.31%
	0.28	0.20			
	0.31	0.20			
3	0.37	0.19	1.22	0.64	0.9%
	0.45	0.23			
	0.4	0.23			
4	0.47	0.19	1.44	0.74	0.939%
	0.5	0.27			
	0.47	0.27			
5	0.5	0.30	1.55	1.09	0.417%
	0.53	0.40			
	0.52	0.40			

Uji Kesalahan Relatif NH4

TS	ORTHOobs	ORTHOs	$\sum_{i=1}^{n} DL$	$\sum_{i=1}^{n} DP$	$\frac{(D_L - D_p)}{(D_p)} x100\%$
1	0.10	0.14	0.39	0.42	**0.06%**
	0.14	0.14			
	0.15	0.14			
2	0.12	0.23	0.48	0.72	**0.34%**
	0.15	0.25			
	0.21	0.25			
3	0.19	0.35	0.84	1.20	**0.3%**
	0.25	0.42			
	0.40	0.42			
4	0.27	0.39	0.99	1.36	**0.27%**
	0.27	0.49			
	0.45	0.49			
5	0.30	0.53	1.05	1.91	**0.45%**
	0.27	0.69			
	0.48	0.69			

Uji Kesalahan Relatif Orthophosphate

TS	BODobs	BODs	$\sum_{i=1}^{n} DL$	$\sum_{i=1}^{n} DP$	$\frac{(D_L - D_p)}{(D_p)} x100\%$
1	15	14.80	46.67	44.40	**0.051%**
	18	14.8			
	13.66667	14.8			
2	10	13.96	31.00	41.64	**0.26%**
	12	13.84			
	9	13.84			
3	6	5.07	22.00	15.39	**0.429%**
	8	5.12			
	8	5.2			
4	4	9.02	18.00	25.73	**0.3%**
	7	10.48			
	7	6.23			
5	3	6.58	14.30	21.88	**0.35%**
	6.5	7.65			
	4.8	7.65			

Uji Kesalahan Relatif BOD

TS	DOobs	DOs	$\sum_{i=1}^{n} DL$	$\sum_{i=1}^{n} DP$	$\frac{(D_L - D_p)}{(D_p)} x100\%$
1	6.8	5.27	15.80	15.81	**0.0006%**
	4.8	5.27			
	4.2	5.27			
2	6.2	5.64	14.20	17.02	**0.1656%**
	4.6	5.69			
	3.4	5.69			
3	5.2	5.93	11.70	17.01	**0.31216%**
	3.3	5.54			
	3.2	5.54			
4	4	6.17	10.20	17.07	**0.4024%**
	3.2	5.45			
	3	5.45			
5	3.5	6.3	8.60	16.84	**0.489%**
	2.9	5.27			
	2.2	5.27			

Uji Kesalahan Relatif DO

TS	TEMPobs	TEMPs	$\sum_{i=1}^{n} DL$	$\sum_{i=1}^{n} DP$	$\frac{(D_L - D_p)}{(D_p)} x100\%$
1	27.40	28.40	85.03	85.32	**0.003%**
	29.00	28.46			
	28.63	28.46			
2	29.90	30.40	90.00	89.25	**0.008%**
	31.20	28.45			
	28.90	30.40			
3	32.10	33.12	93.70	95.70	**0.02%**
	33.10	29.45			
	28.50	33.13			
4	34.60	34.66	98.10	99.57	**0.014%**
	35.10	30.89			
	28.40	34.02			
5	35.20	37.04	100.10	104.07	**0.038%**
	35.80	32.23			
	29.10	34.80			

Uji Kesalahan Temperatur

Lampiran 8. Dokumentasi Penelitian

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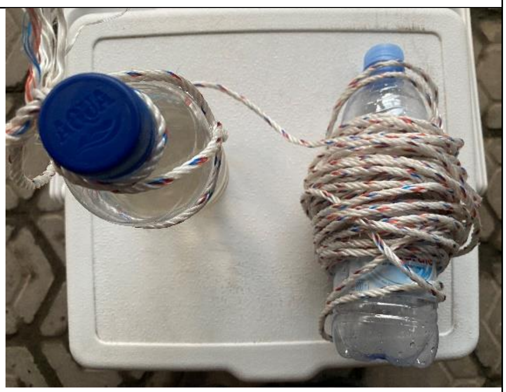
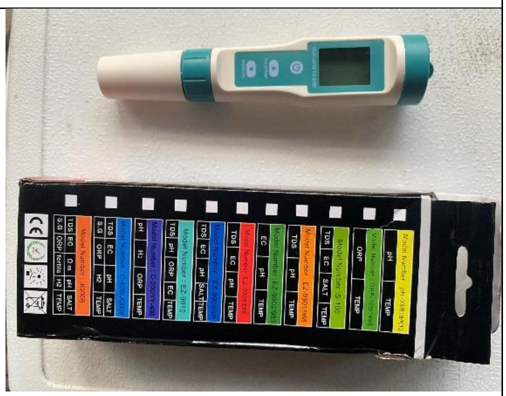
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
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<tr><th colspan="2">SURVEY AWAL</th></tr>
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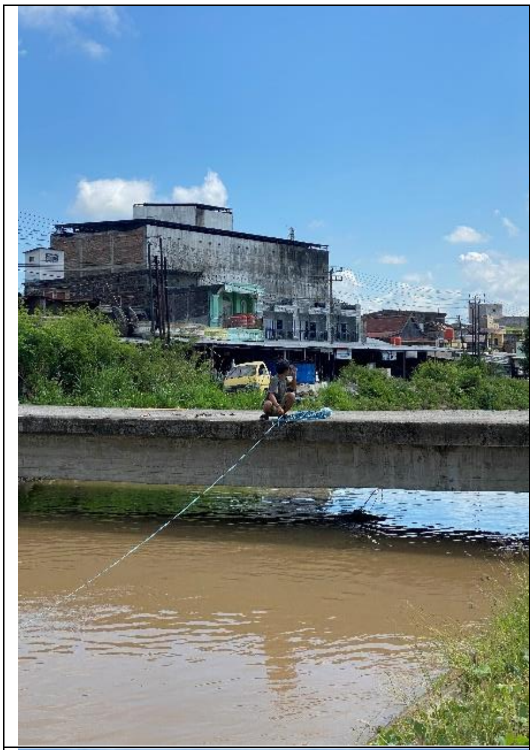
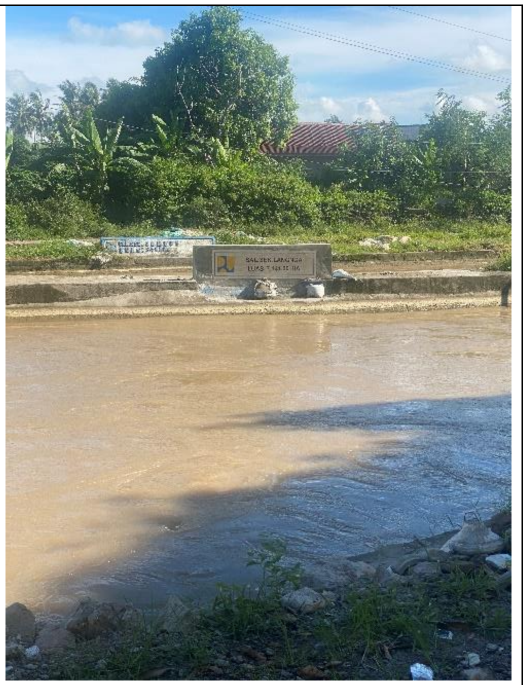
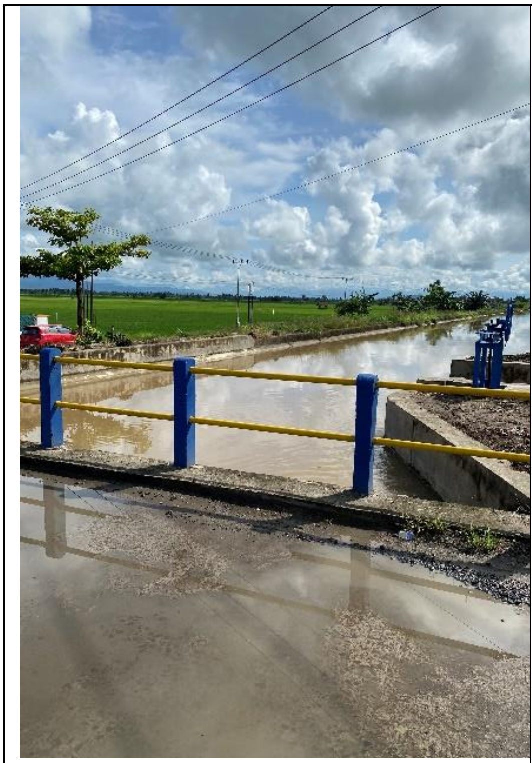
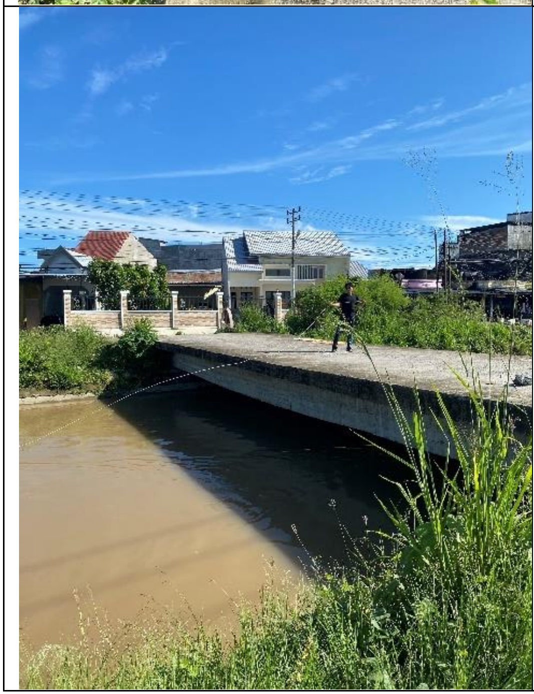
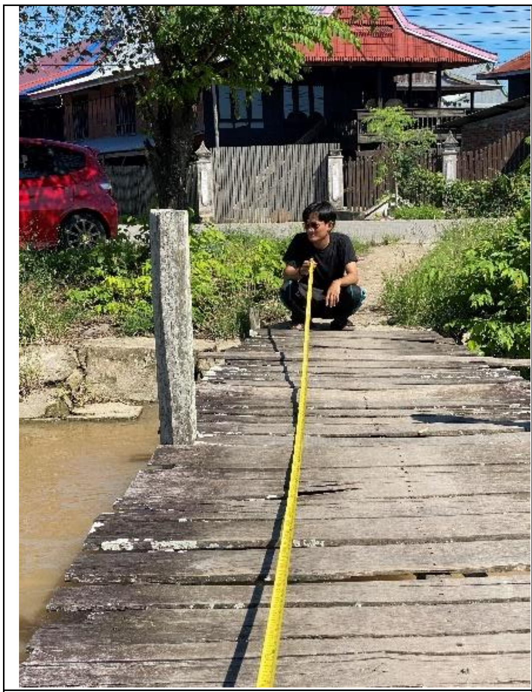






SURVEY 17 FEBRUARI 2024

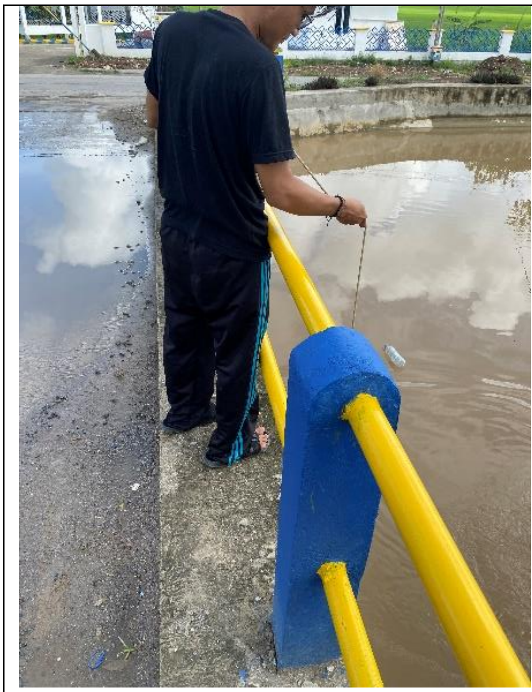


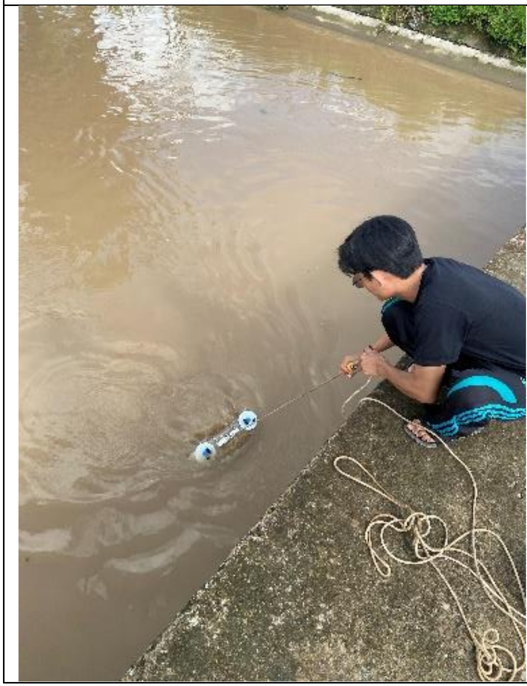


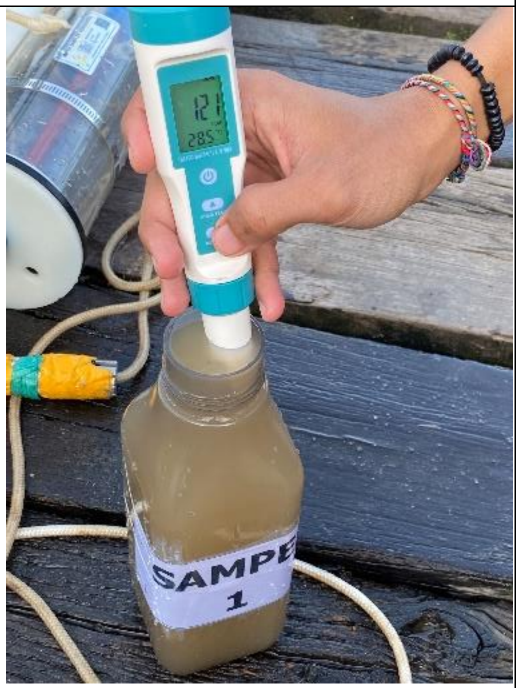

SAMPE
3


AMPEL
5

SURVEY 27 FEBRUARI 2024



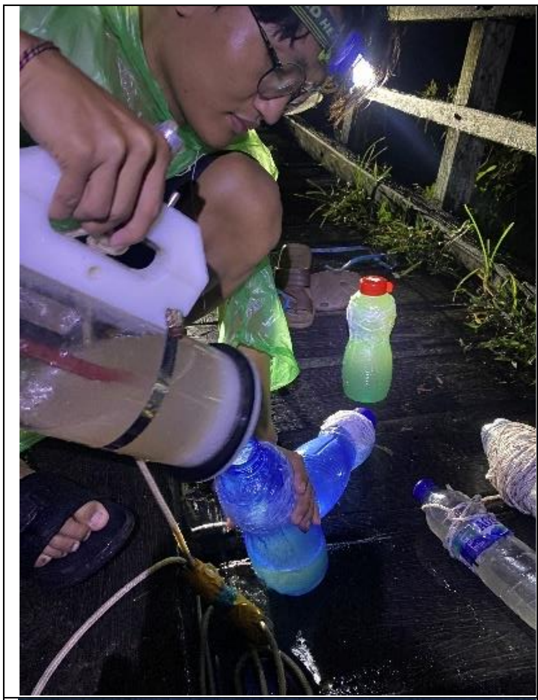


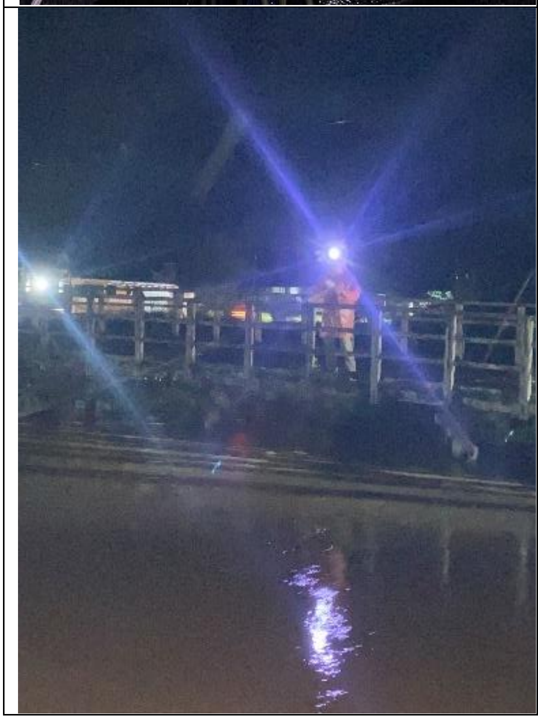
	
	SAMPE 1

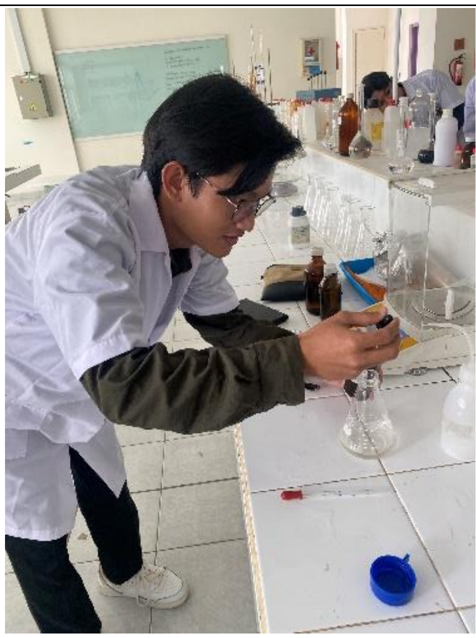
	

SURVEY HUJAN (14 MARET 2024)	
	





ANALISIS LABORATORIUM	
	
	



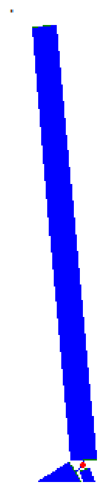
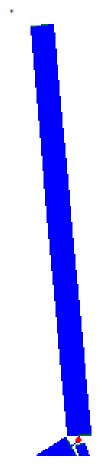
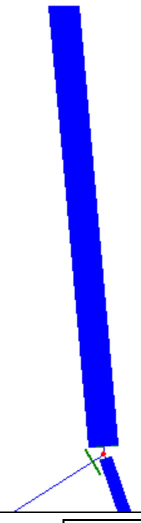


AMPEL
5

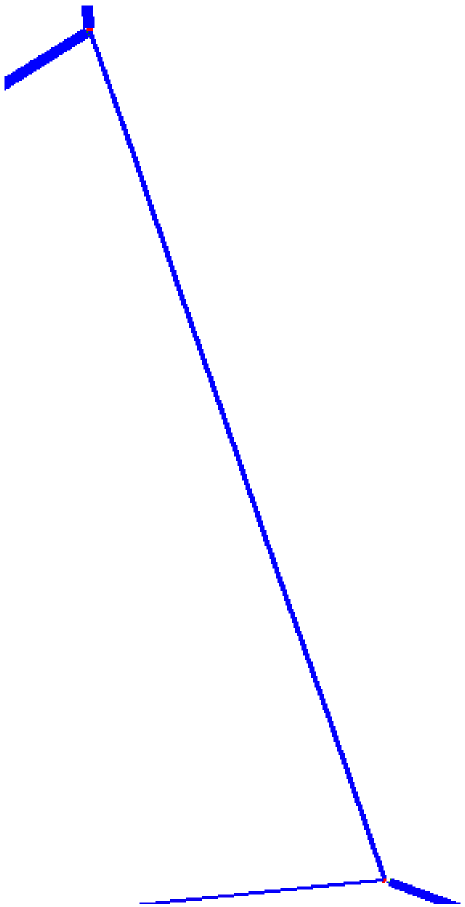
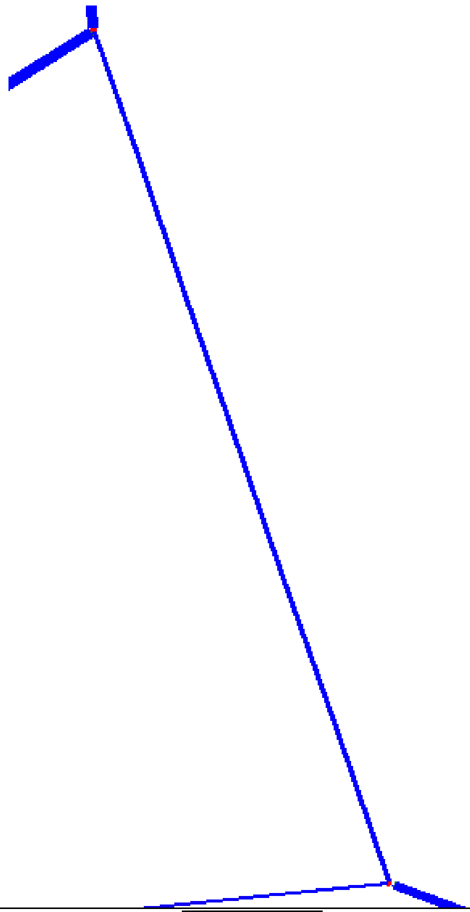
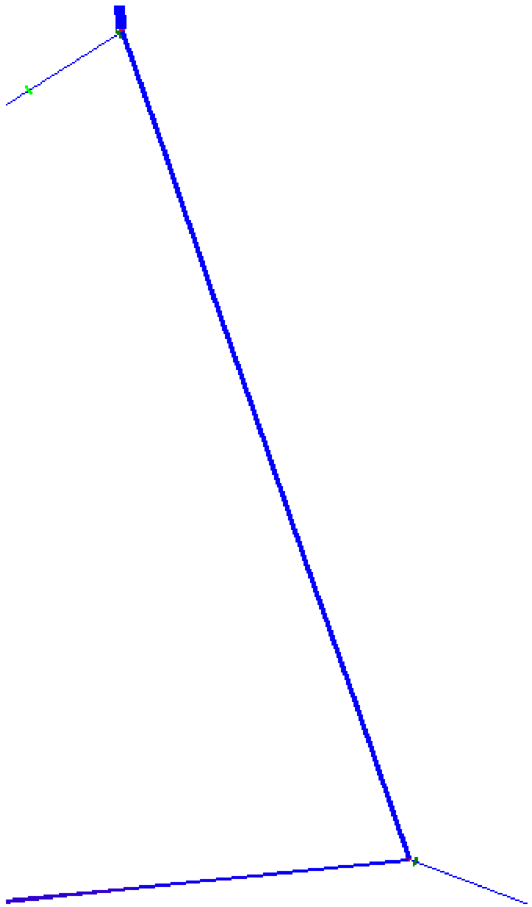

KUALITAS AIR
NIK LINGKU
ERSITAS HA

Lampiran 9 Plot penyebaran parameter kualitas air Sungai Saddang

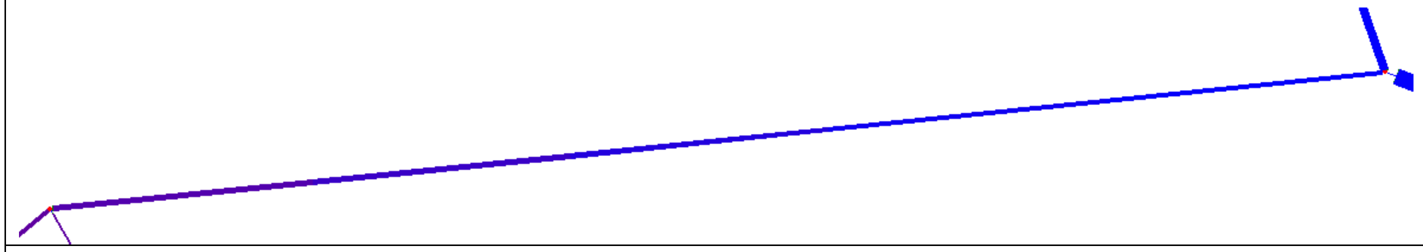
KONDISI NH4 REACH SAWITTO HULU (RSHI)

		
LEGEND 0.14 0.5288097	Legend 0.2 0.3988926	Legend 0.2 0.3639951
17 Februari 2024	**27 Februari 2024**	**04 Maret 2024**

KONDISI NH4 REACH SAWITTO HILIR (RSHI)

		
LEGEND **0.14** **0.5288097**	Legend 0.2 0.3988926	Legend 0.2 0.3639951
17 Februari 2024	**27 Februari 2024**	**04 Maret 2024**

KONDISI NH4 REACH LANGNGA HULU (RLHU)

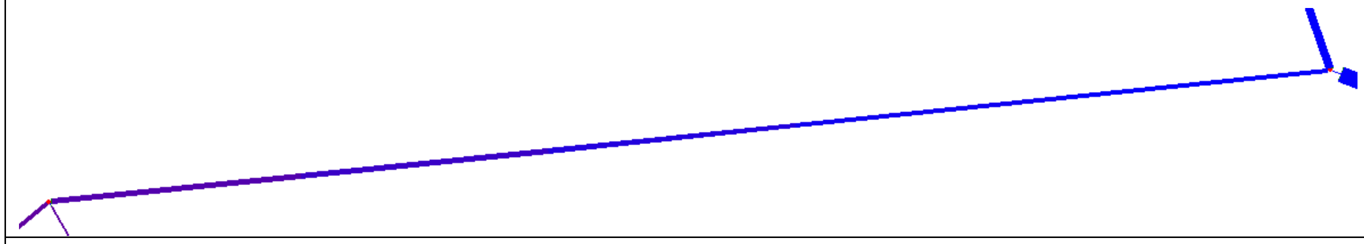


17 FEBRUARI 2024

LEGEND

0.14

0.5288097

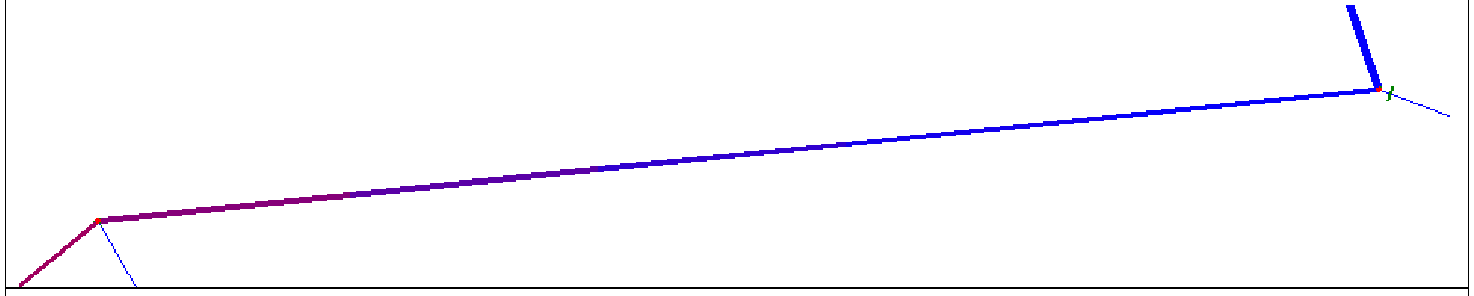


27 FEBRUARI 2024

Legend

0.2

0.3988926



04 MARET 2024

Legend

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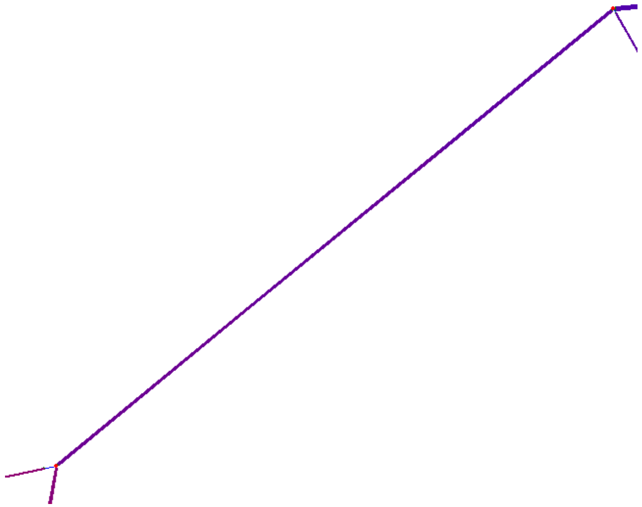
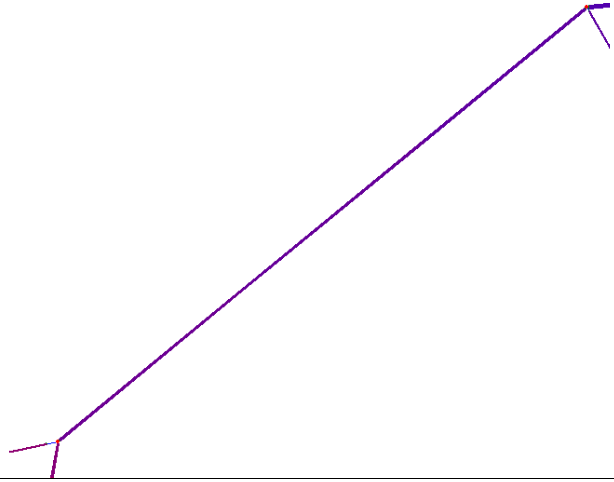
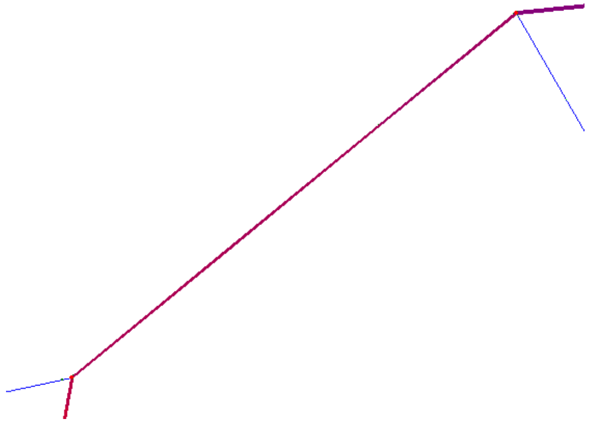
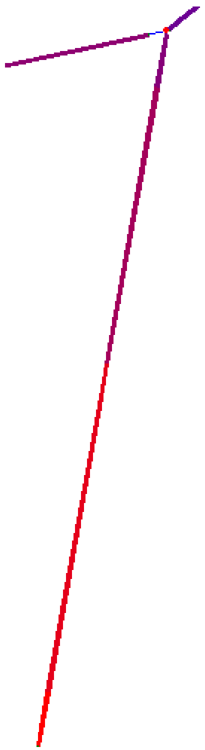
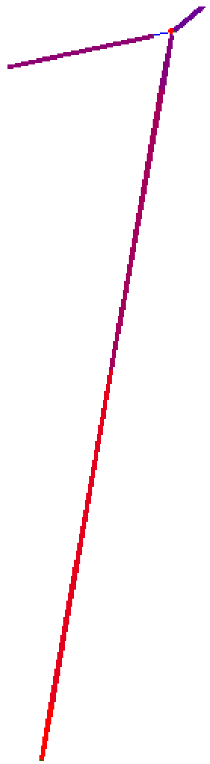
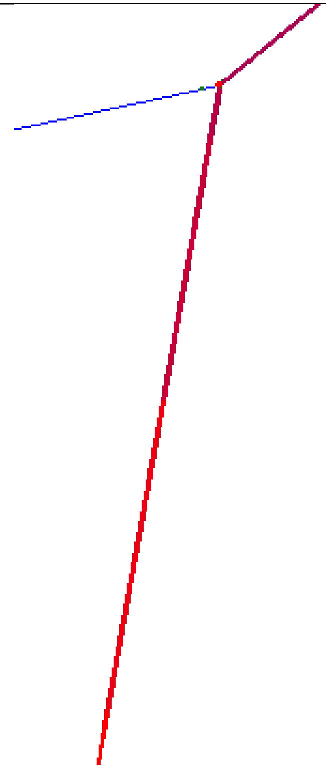
0.3639951

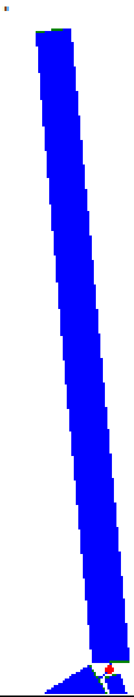
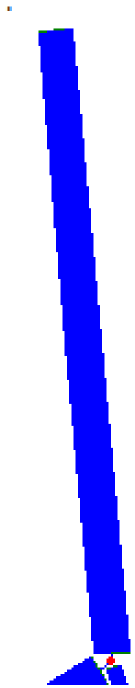
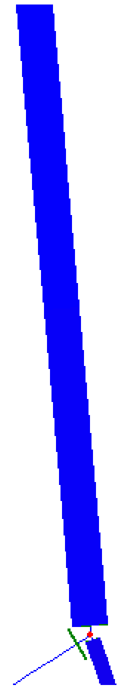
KONDISI NH4 REACH LANGNGA TENGAH (RLHT)

		
LEGEND 0.14 0.5288097	Legend 0.2 0.3988926	Legend 0.2 0.3639951
17 Februari 2024	27 Februari 2024	04 Maret 2024

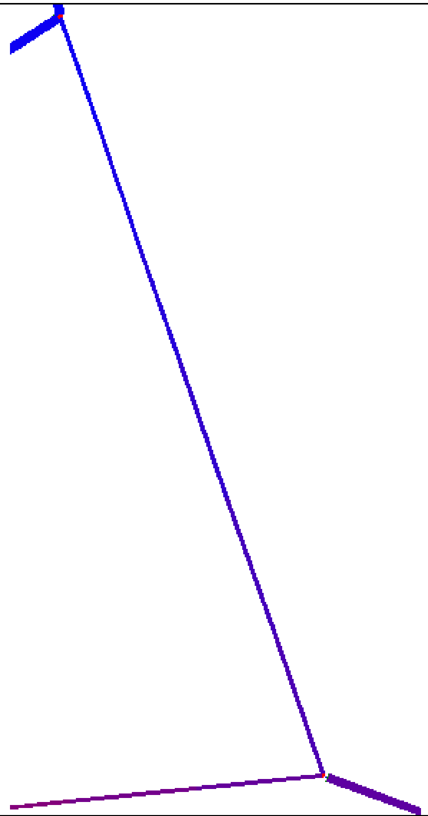
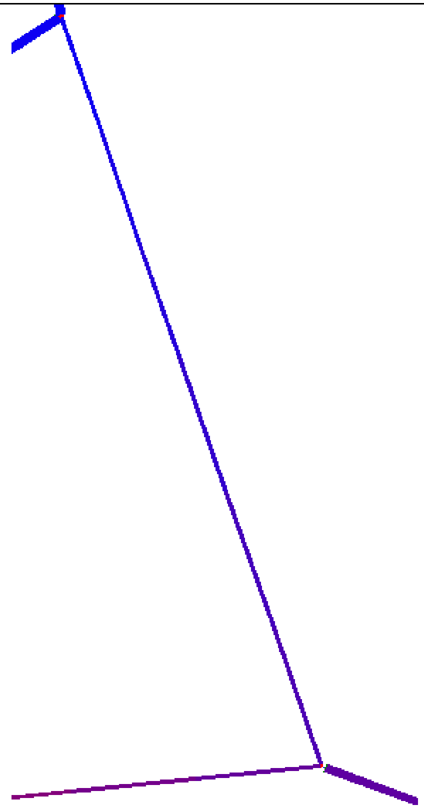
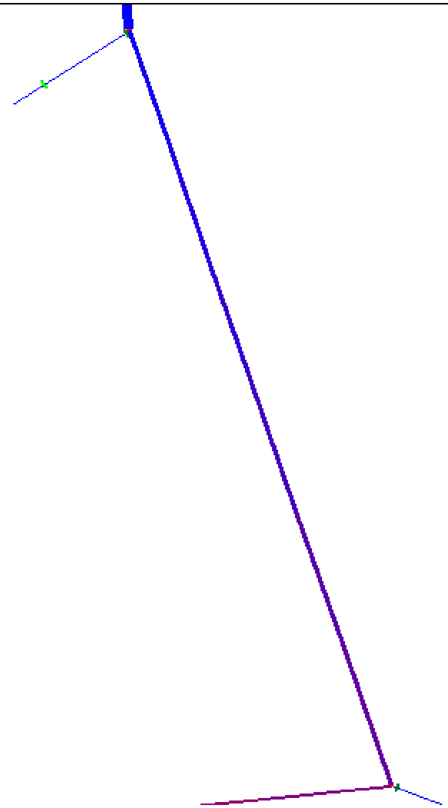
KONDISI NH4 REACH LANGNGA HILIR (RLHI)

		
LEGEND 0.14 0.5288097	Legend 0.2 0.3988926	Legend 0.2 0.3639951
17 Februari 2024	**27 Februari 2024**	**04 Maret 2024**

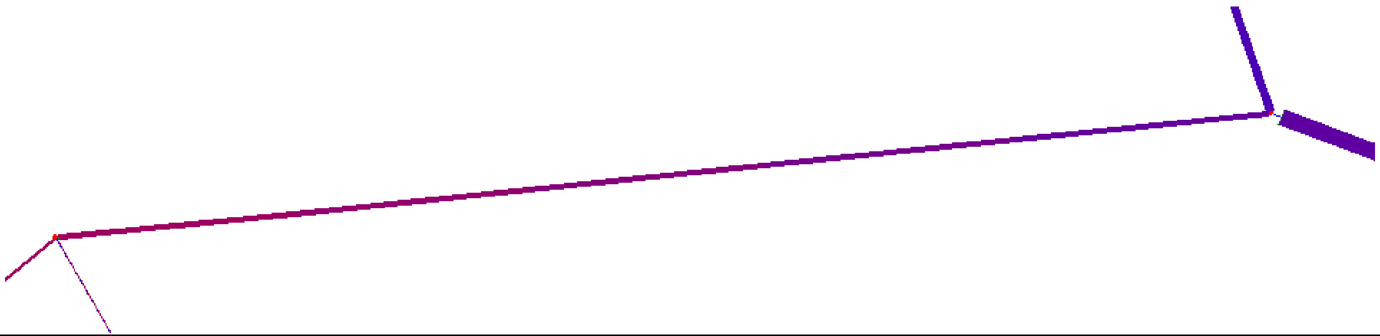
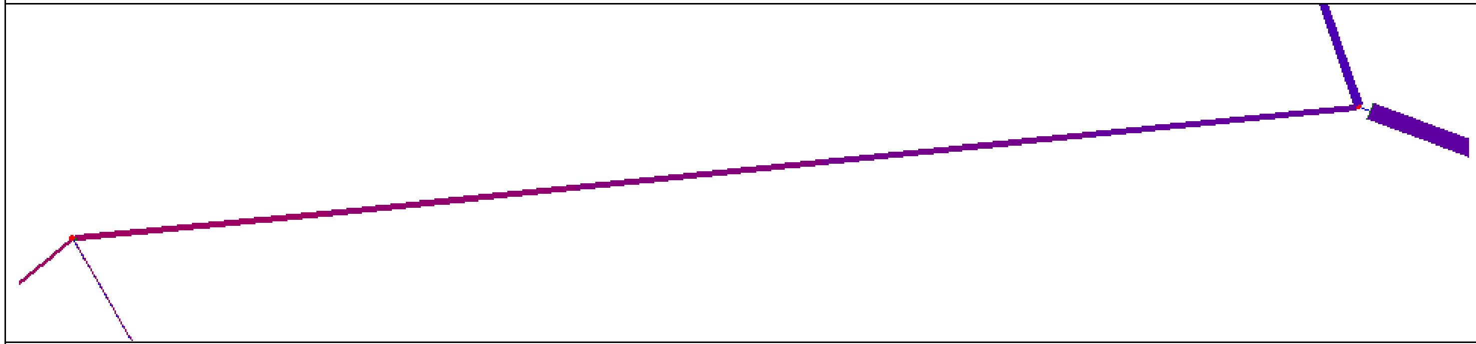
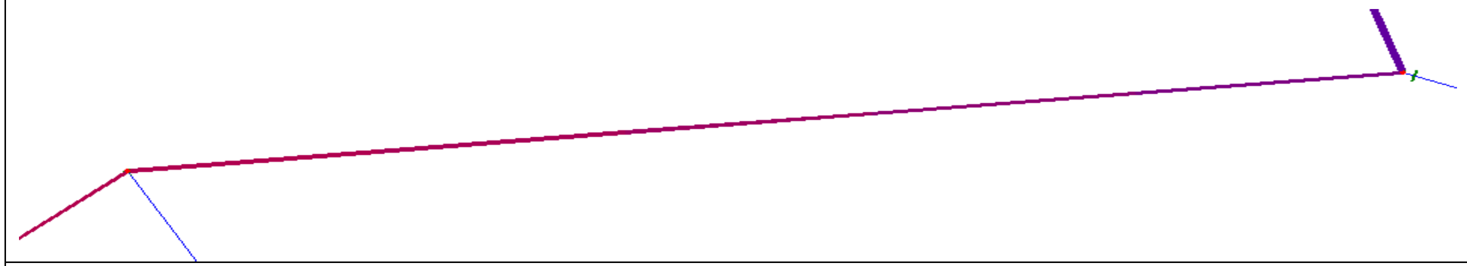
KONDISI ORTHOPHOSPHAT REACH SAWITTO HULU (RSHI)

		
LEGEND 0.1885817 0.2957727	LEGEND 0.2 0.3988926	LEGEND 0.2 0.3639951
17 Februari 2024	27 Februari 2024	04 Maret 2024

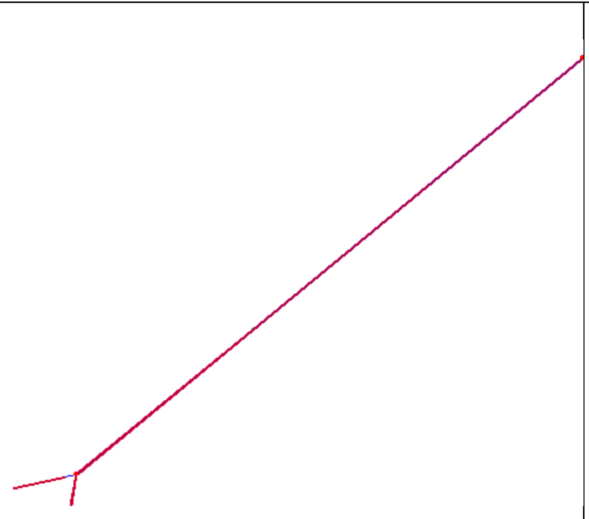
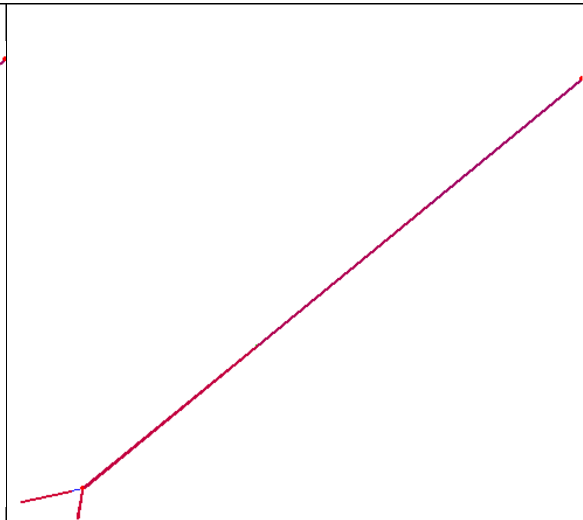
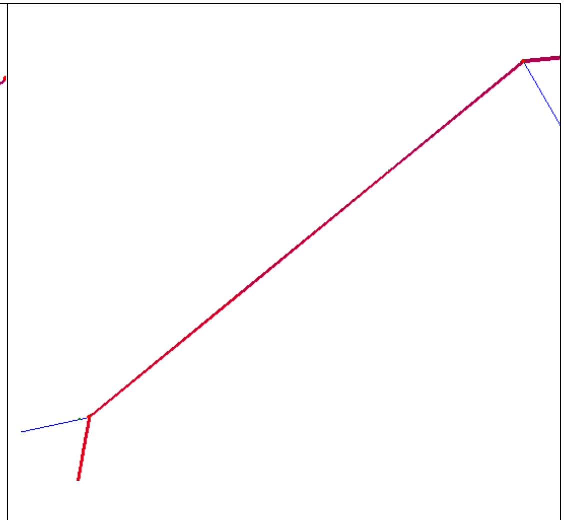
KONDISI ORTHOPHOSPHAT REACH SAWITTO HILIR (RSHI)

		
LEGEND 0.1885817 0.2957727	LEGEND 0.2 0.3988926	LEGEND 0.2 0.3639951
17 Februari 2024	**27 Februari 2024**	**04 Maret 2024**

KONDISI ORTHOPHOSPHAT REACH LANGNGA HULU (RLHU)

	LEGEND 0.1885817 0.2957727
17 FEBRUARI 2024	
	LEGEND 0.2 0.3988926
27 FEBRUARI 2024	
	LEGEND 0.2 0.3639951
]04 MARET 2024	

KONDISI ORTHOPHOSPHAT REACH LANGNGA TENGAH (RLHT)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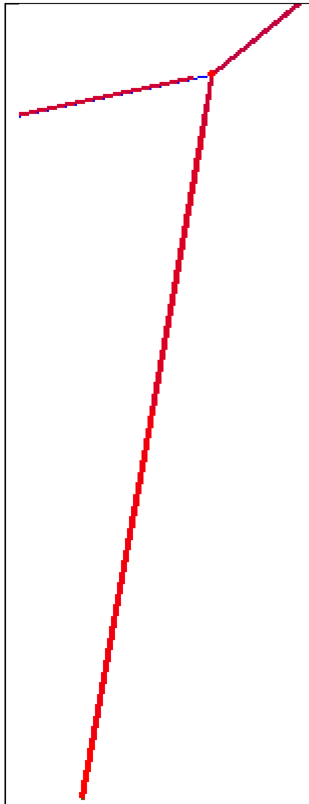
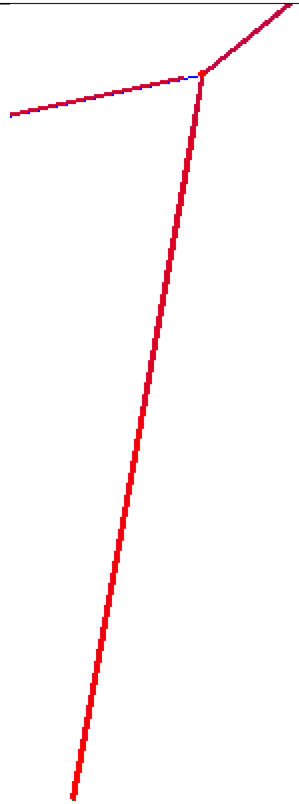
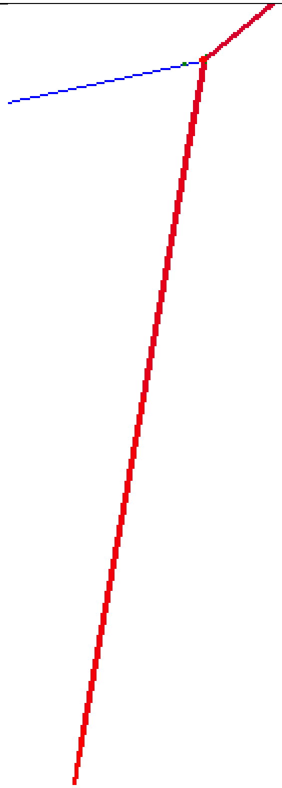
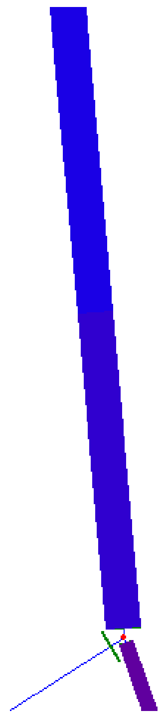
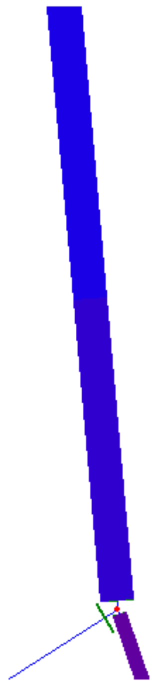
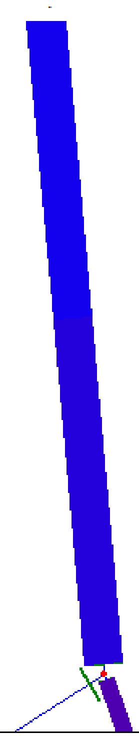
17 Februari 2024	27 Februari 2024	04 Maret 2024

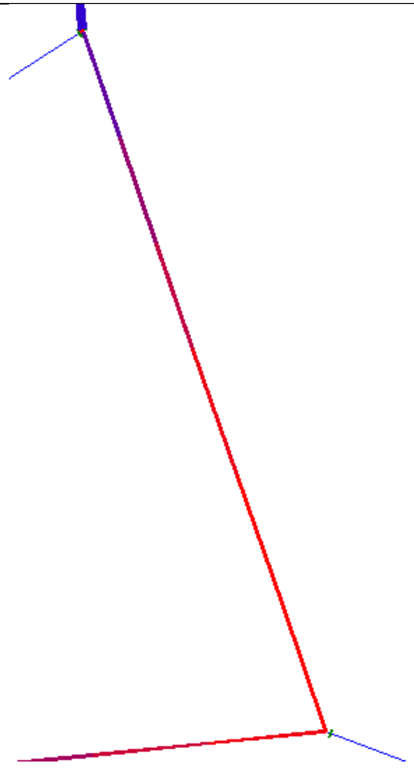
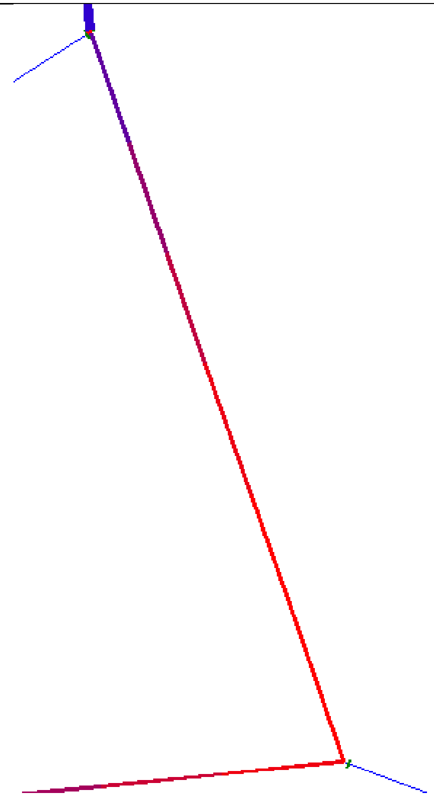
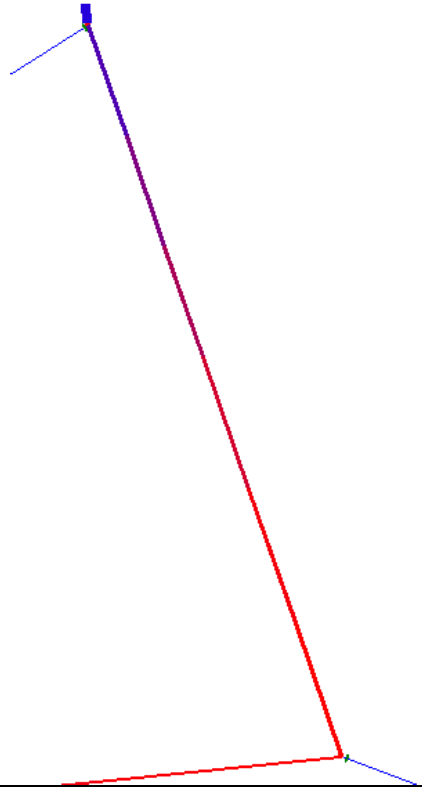
KONDISI ORTHOPHOSPHAT REACH LANGNGA HILIR (RLHI)

		
LEGEND 0.1885817 0.2957727	LEGEND 0.2 0.3988926	LEGEND 0.2 0.3639951
17 Februari 2024	27 Februari 2024	04 Maret 2024

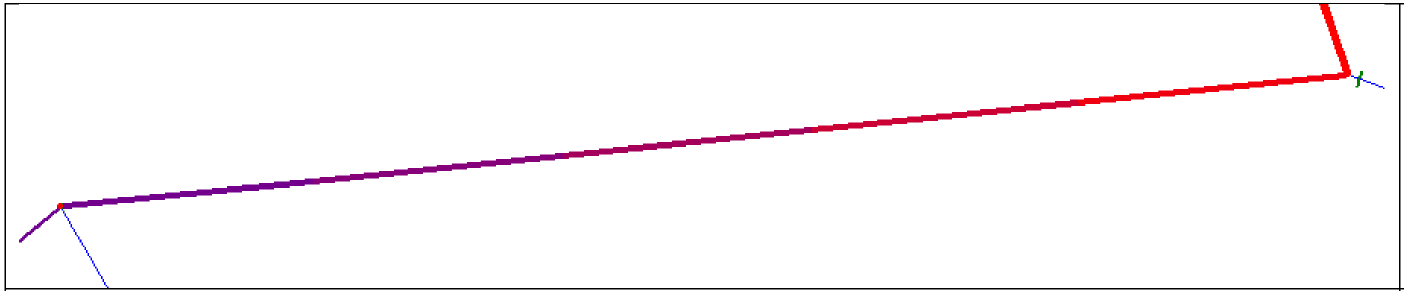
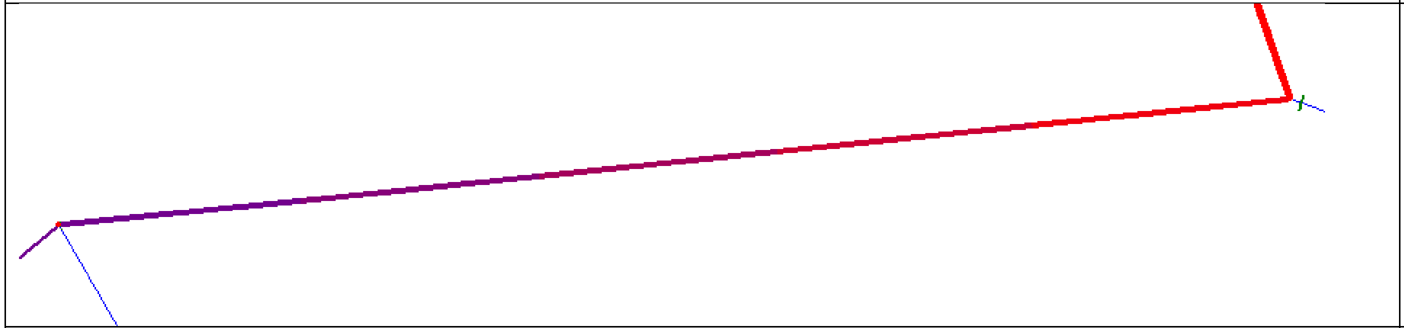
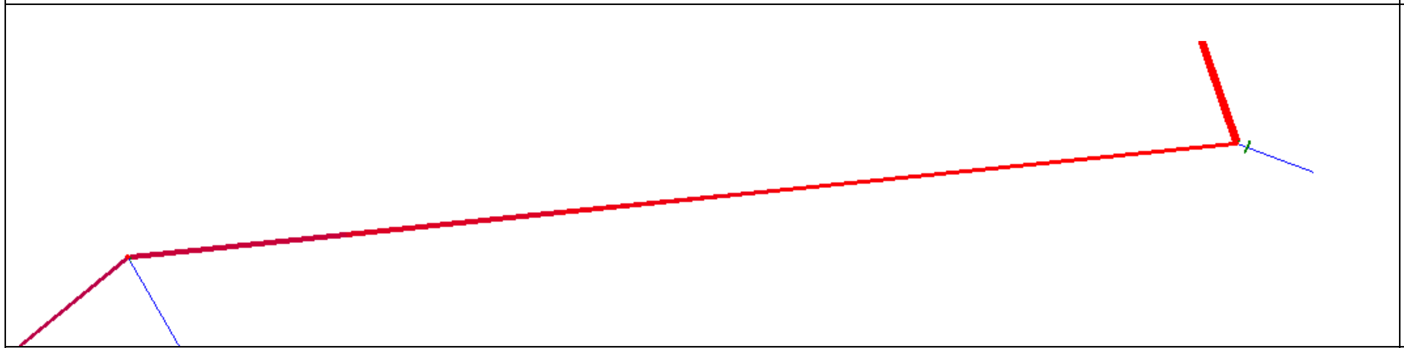
KONDISI DO REACH SAWITTO HULU (RSHI)

		
Legend 5.27 6.176128	LEGEND 5.27 5.7	Legend 5.27 5.730816
17 Februari 2024	**27 Februari 2024**	**04 Maret 2024**

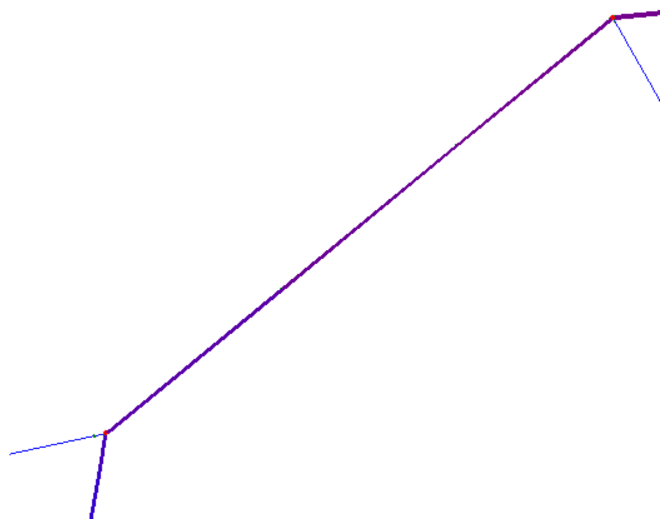
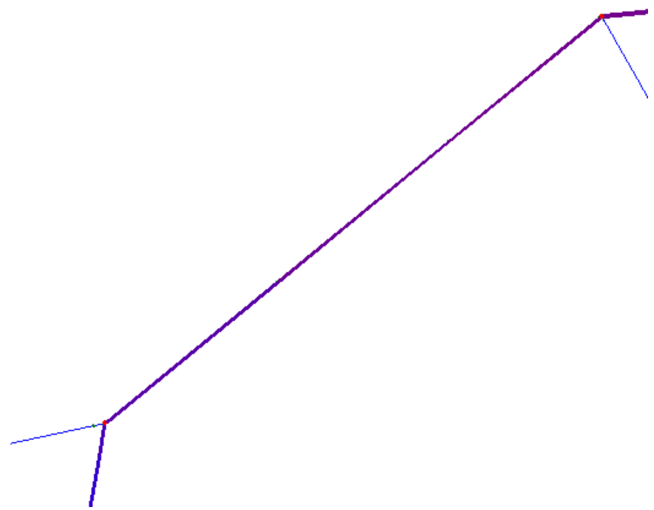
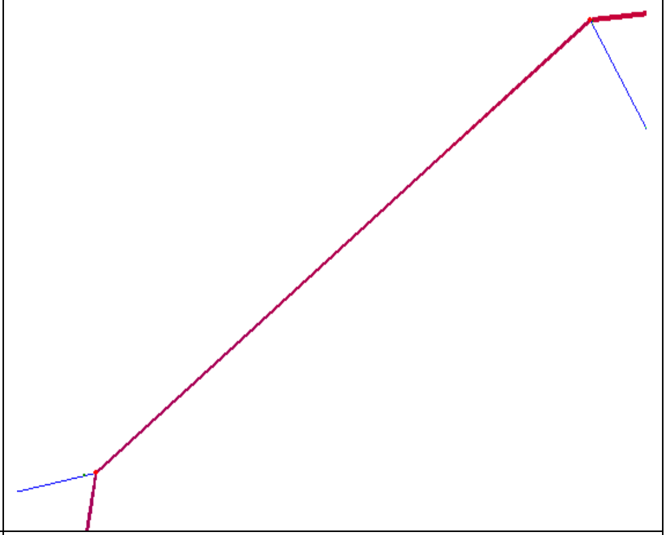
KONDISI DO REACH SAWITTO HILIR (RSHI)

		
Legend 5.27 6.176128	LEGEND 5.27 5.7	Legend 5.27 5.730816
17 Februari 2024	**27 Februari 2024**	**04 Maret 2024**

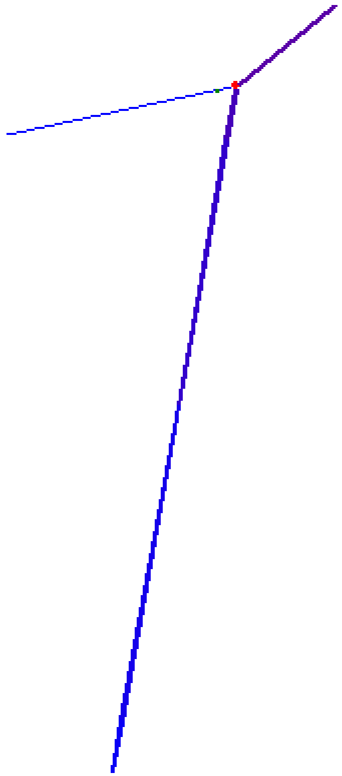
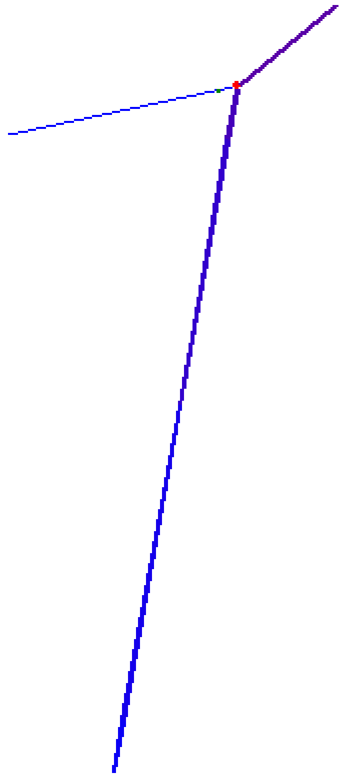
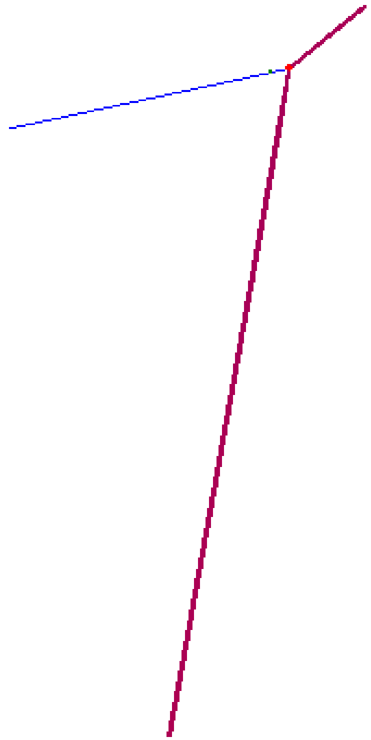
KONDISI DO REACH LANGNGA HULU (RLHU)

	Legend 5.27 6.176128
17 FEBRUARI 2024	
	**LEGEND** **5.27** **5.7**
27 FEBRUARI 2024	
	Legend 5.27 5.730816
04 MARET 2024	

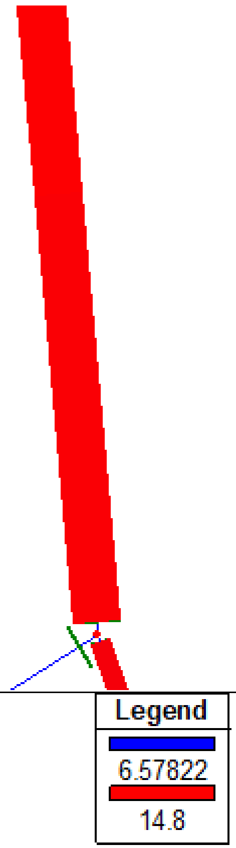
KONDISI DO REACH LANGNGA TENGAH (RLHT)

		
Legend 5.27 6.176128	LEGEND 5.27 5.7	Legend 5.27 5.730816
17 Februari 2024	**27 Februari 2024**	**04 Maret 2024**

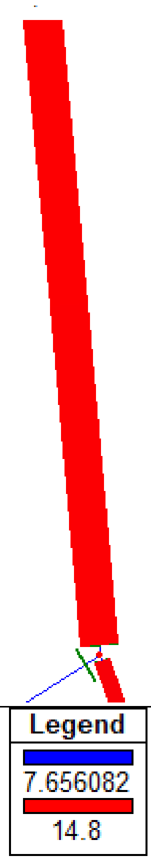
KONDISI DO REACH LANGNGA HILIR (RLHI)

		
Legend 5.27 6.176128	LEGEND 5.27 5.7	Legend 5.27 5.730816
17 Februari 2024	**27 Februari 2024**	**04 Maret 2024**

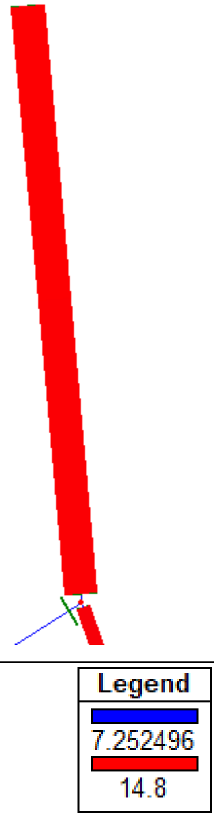
KONDISI BOD REACH SAWITTO HULU (RSHI)



17 Februari 2024

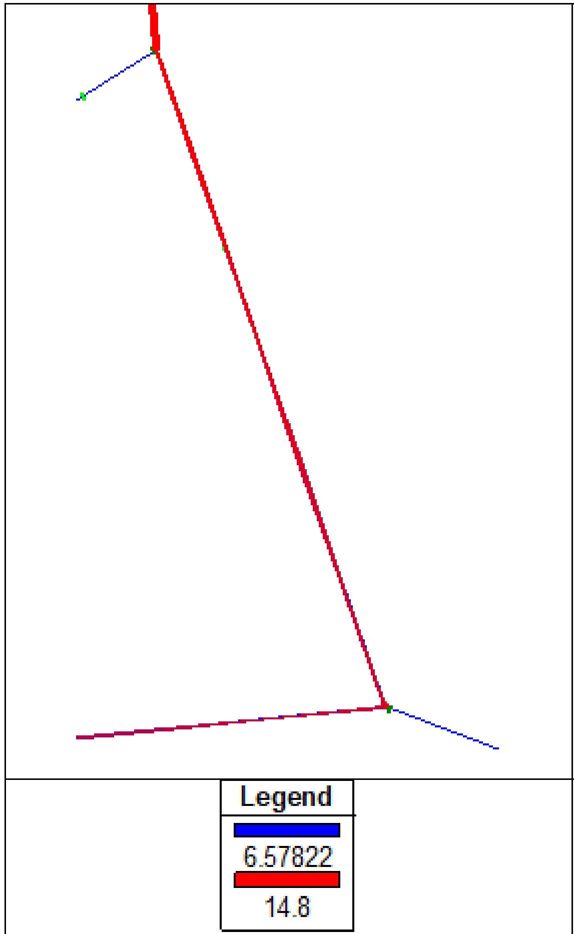


27 Februari 2024

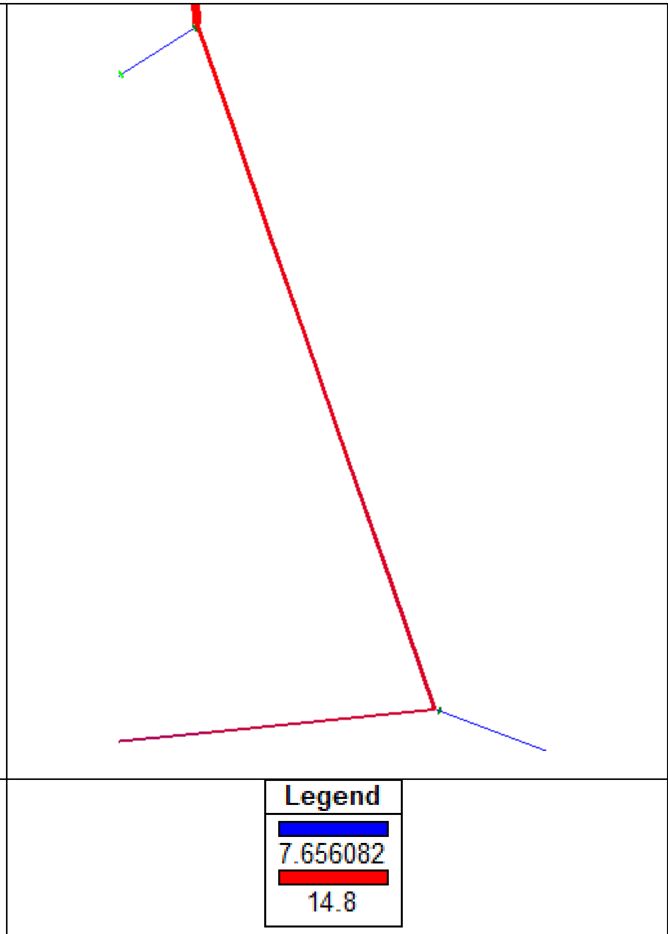


04 Maret 2024

KONDISI BOD REACH SAWITTO HILIR (RSHI)



17 Februari 2024



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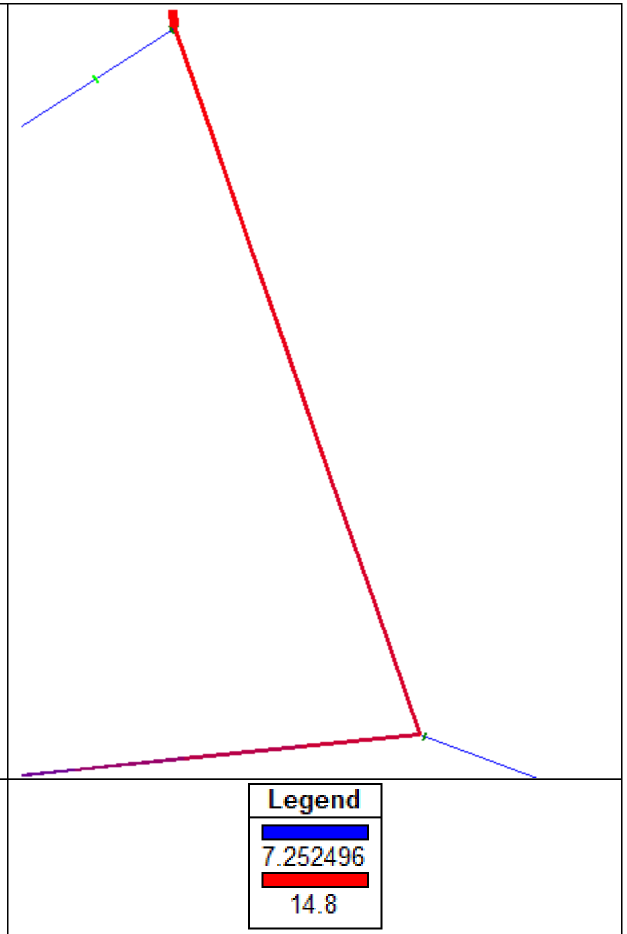
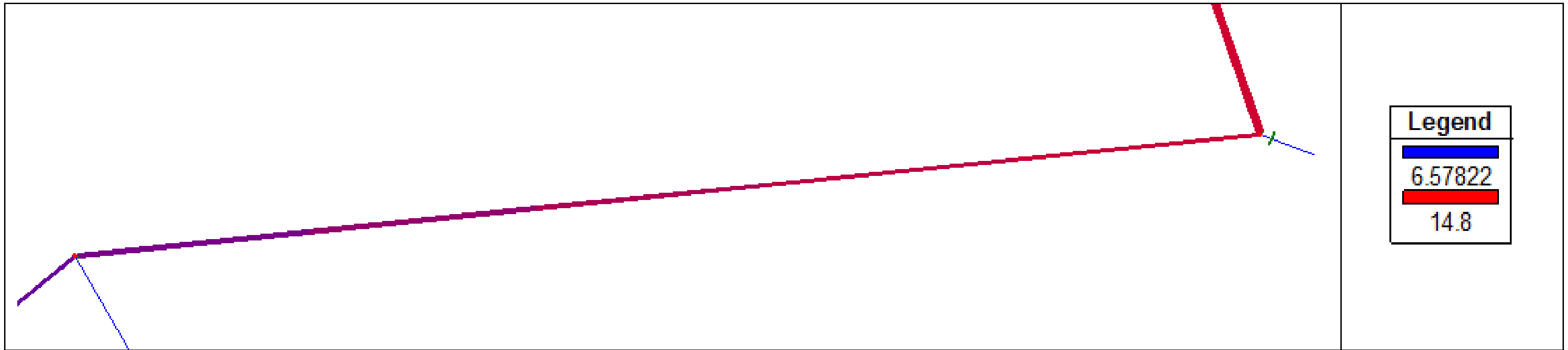


04 Maret 2024

KONDISI BOD REACH LANGNGA HULU (RLHU)



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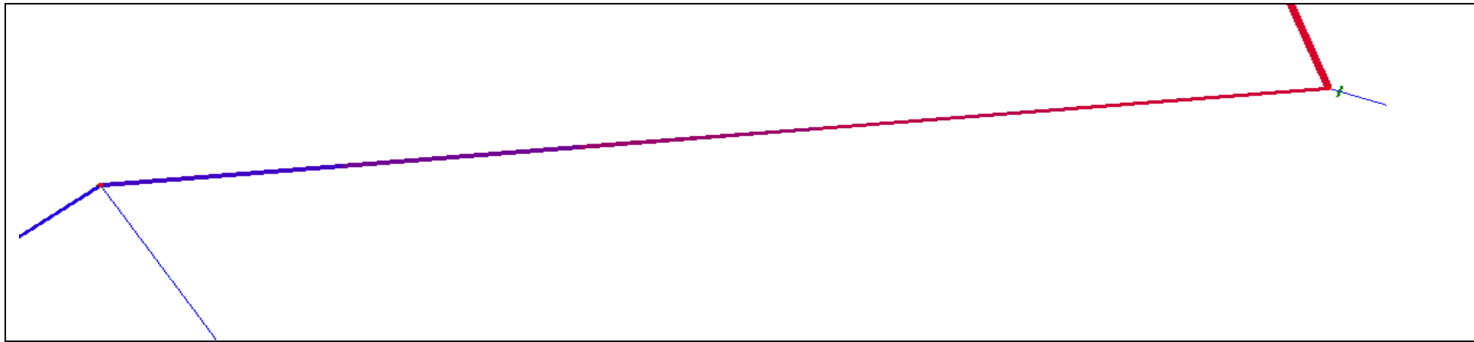

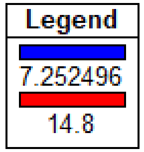

4 Maret 2024

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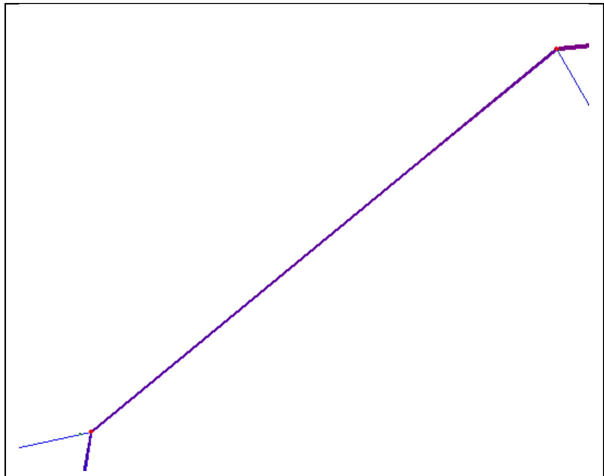

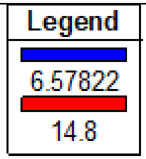

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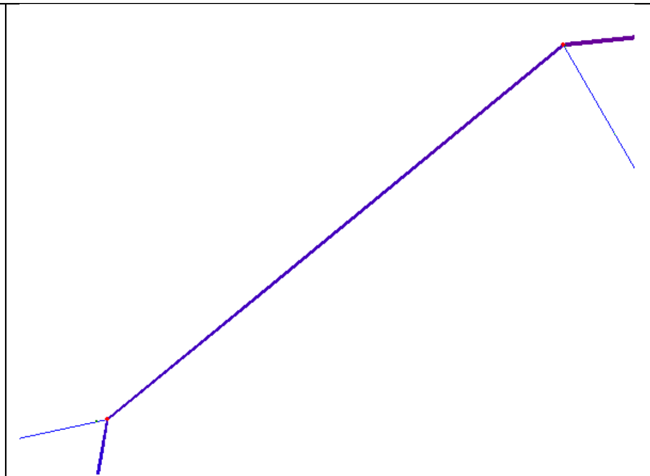

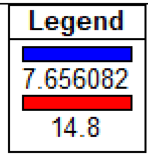

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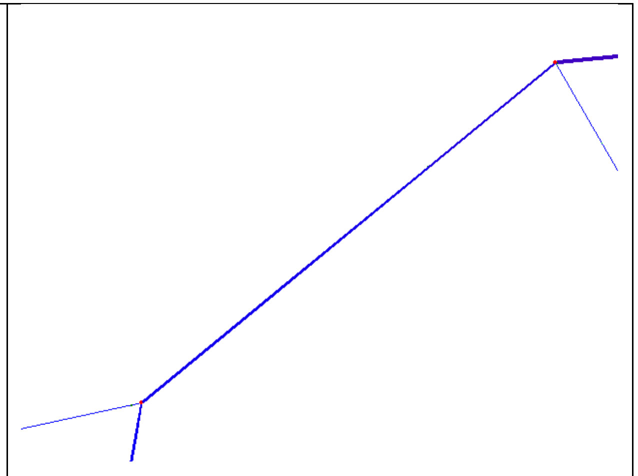

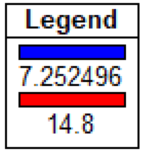

04 Maret 2024

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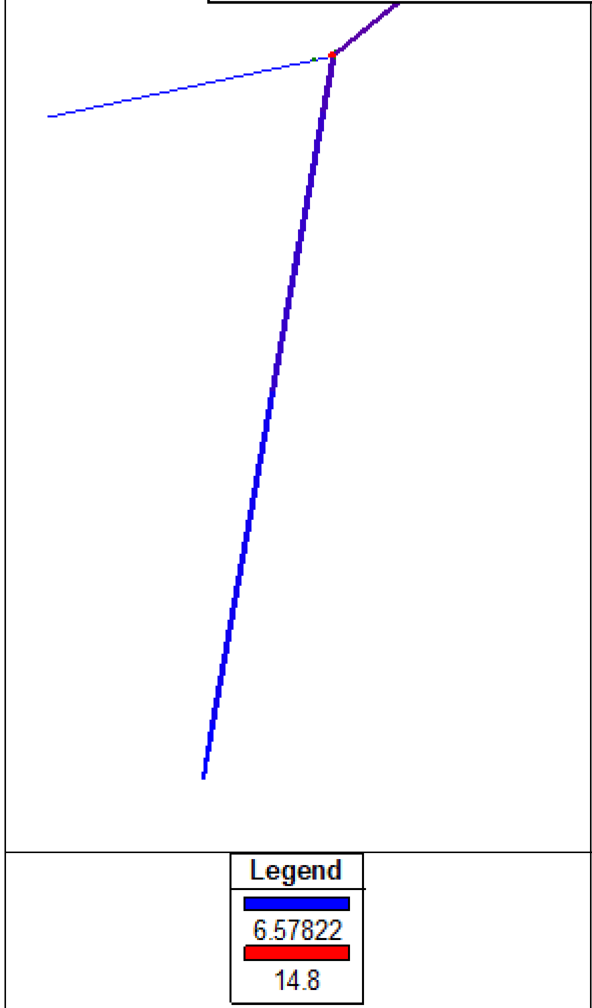

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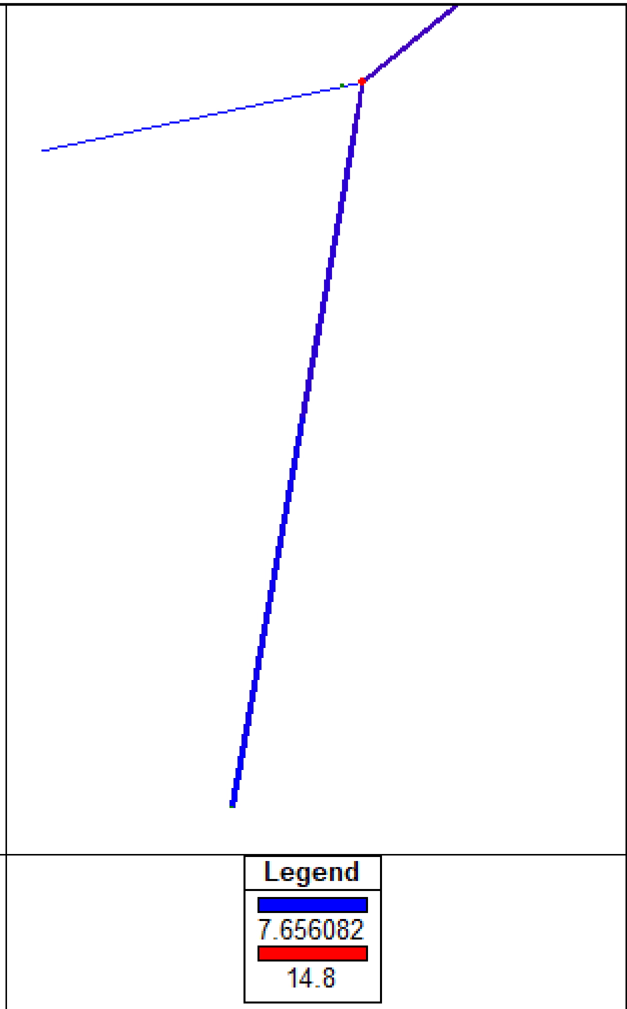

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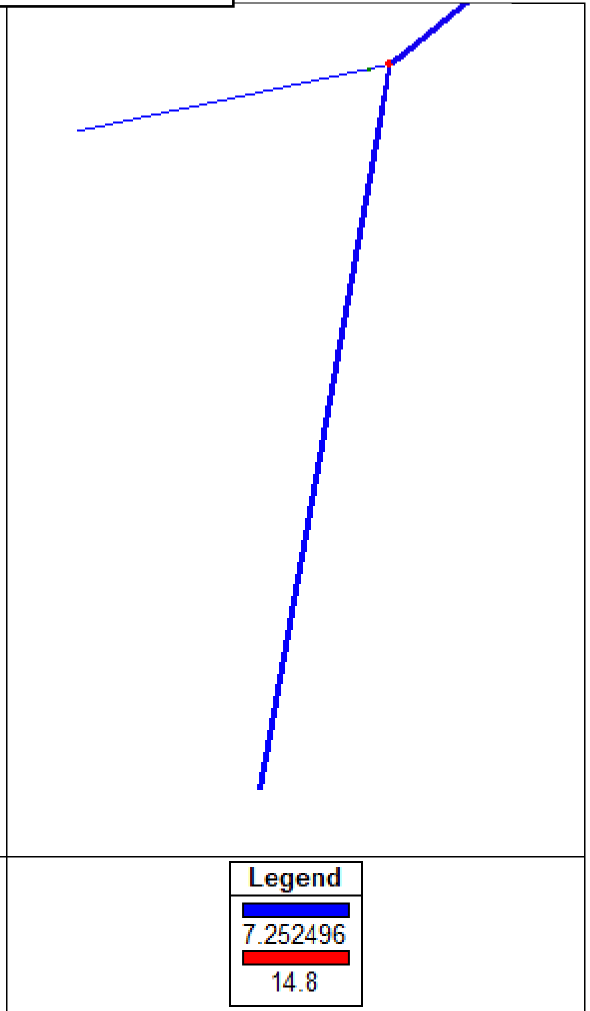
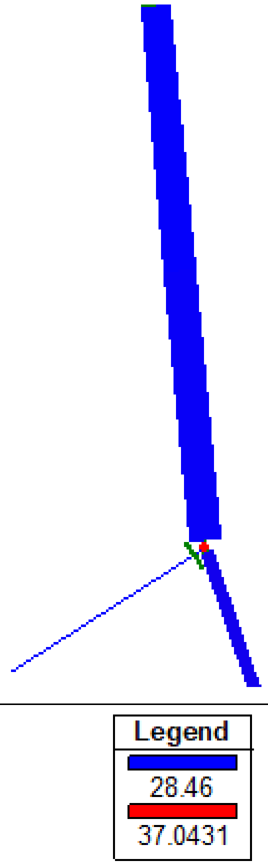
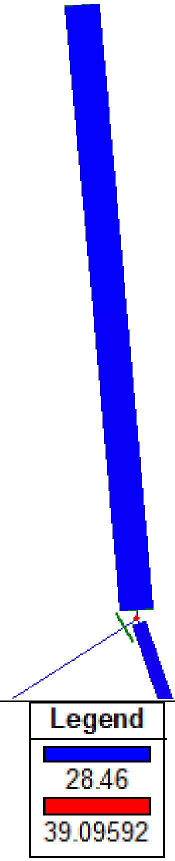
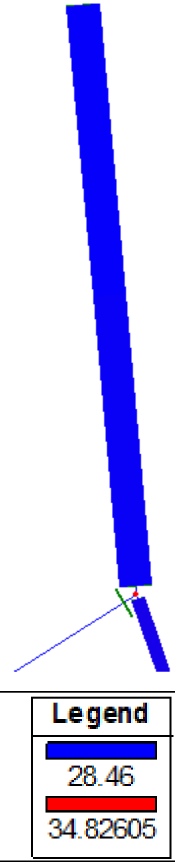
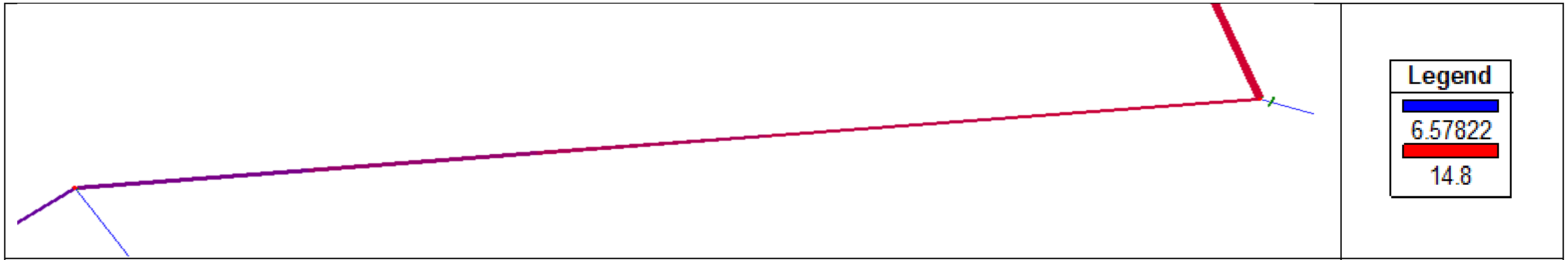


04 Maret 2024

KONDISI TEMPERATUR REACH SAWITTO HULU (RSHI)

		
17 Februari 2024	**27 Februari 2024**	**04 Maret 2024**

KONDISI BOD REACH LANGNGA HULU (RLHU)



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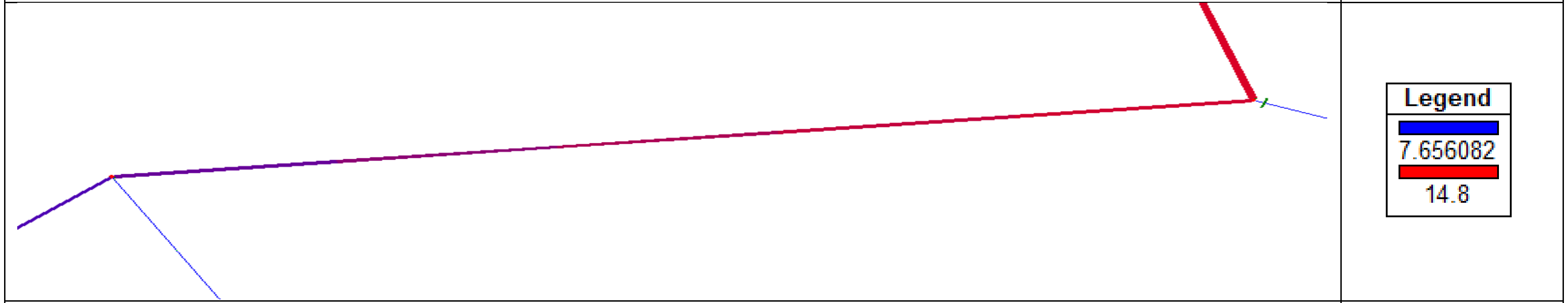

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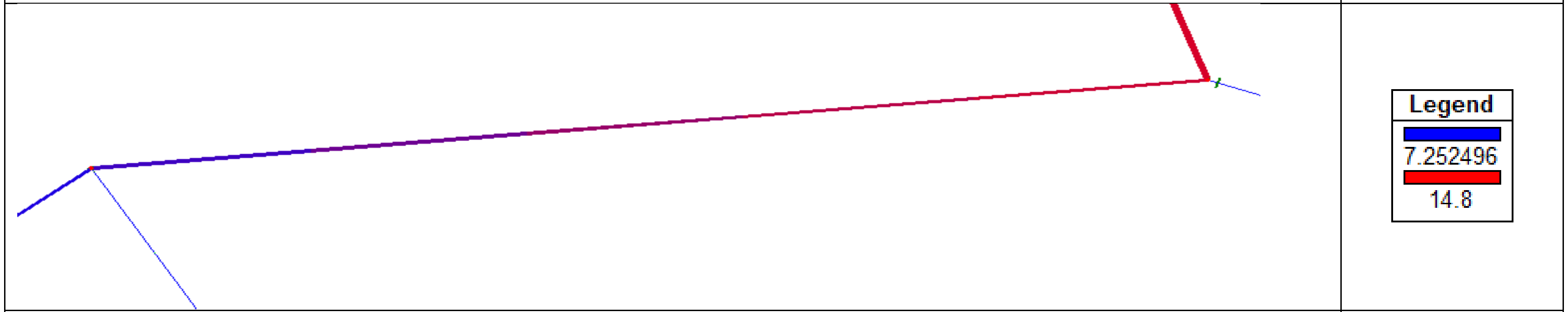
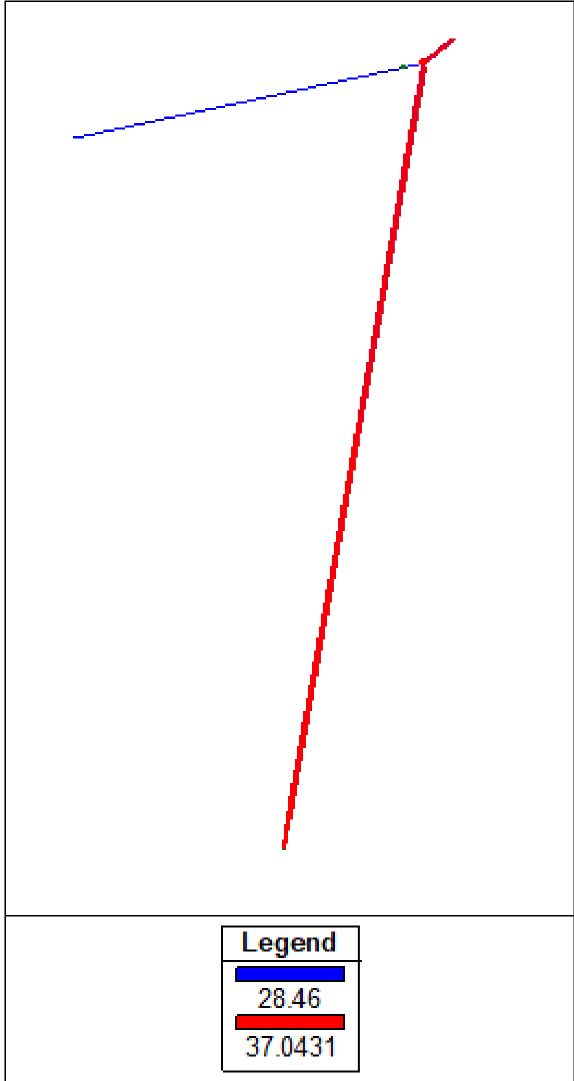


4 Maret 2024

KONDISI TEMPERATUR REACH LANGNGA TENGAH (RLHT)



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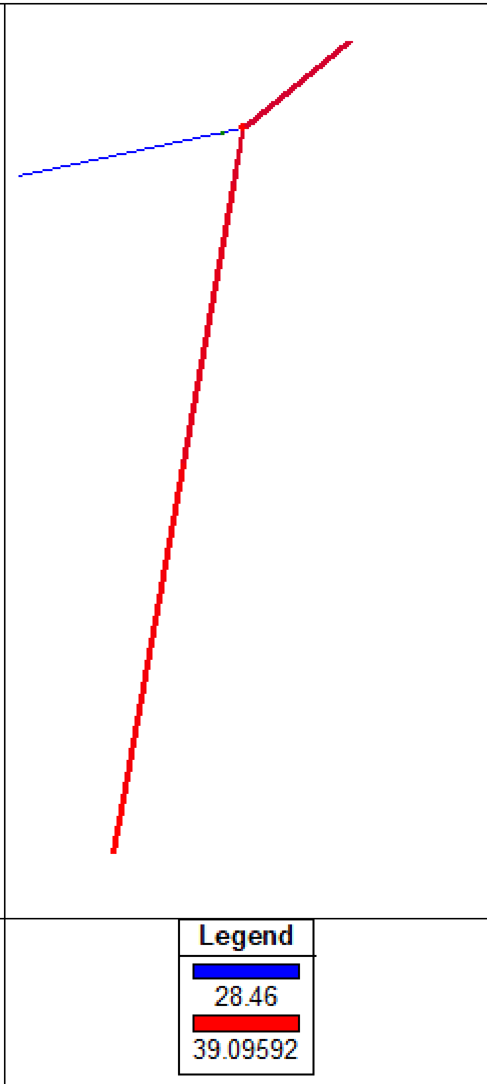

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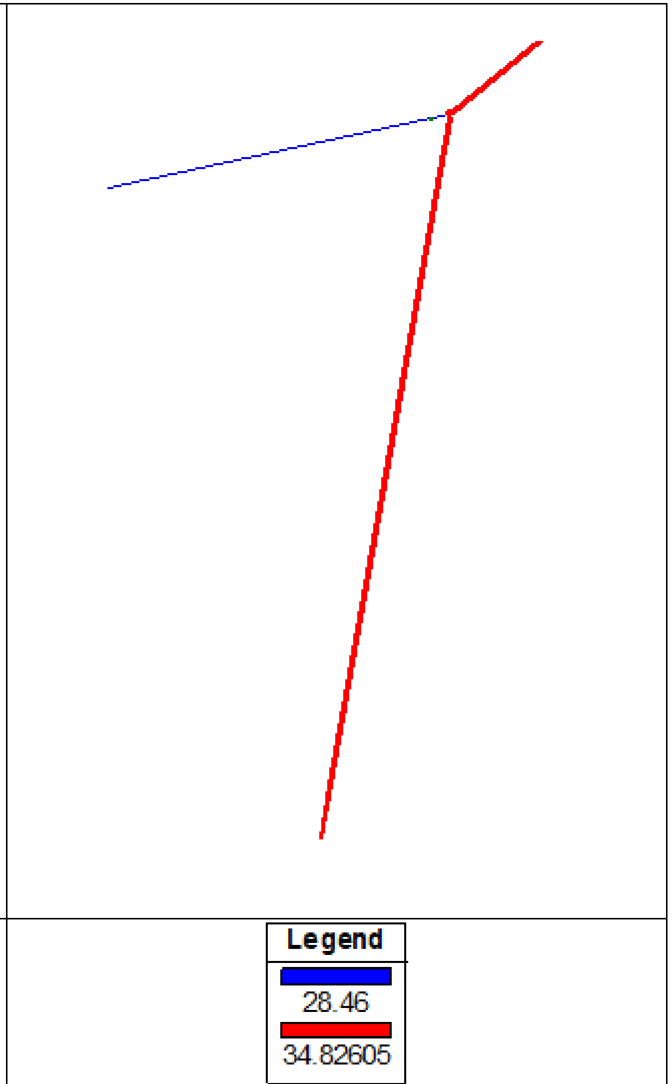

04 Maret 2024