

CMARA MUNICIPAL DE CASCAIS

ELABORAÇÃO DA CARTA DE REAS INUNDADAS  
DO CONCELHO DE CASCAIS PARA O PERODO DE  
RETORNO DE 100 ANOS

RELATRIO FINAL



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# 1 Introdução

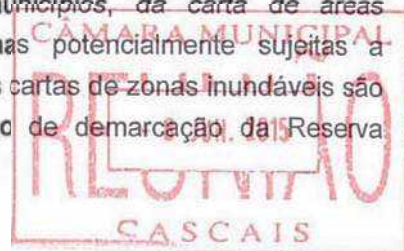
## 1.1 Âmbito, enquadramento e objectivos do estudo

Por contrato celebrado com a Câmara Municipal de Cascais, foi a HIDROPROJECTO, Engenharia e Gestão, S.A., encarregada de elaborar a Carta das Áreas Inundáveis do Concelho de Cascais.

O estudo tem por objectivo a delimitação das áreas inundáveis prováveis por cheias correspondente à frequência de ocorrência de uma vez em 100 anos (período de retorno de 100 anos) e, conseqüentemente, determinação dos respectivos níveis, nas bacias dominadas pelas seguintes linhas de água:

1. Ribeira do "Assobio"
2. Ribeira da "Grotá"
3. Ribeira da "Praia"
4. Ribeira do Arneiro;
5. Ribeira da Foz do Guincho
6. Ribeira dos Mochos
7. Ribeira das Vinhas
8. Ribeira de Castelhana
9. Ribeira da Cadaveira
10. Ribeira de Bicesse
11. Ribeira de Manique
12. Ribeira das Marianas
13. Ribeira de Sassoeiros
14. Ribeira da Laje
15. Ribeira da "Polima" afluente da ribeira da Laje
16. Ribeira do "Arneiro" afluente da ribeira da Laje

Face ao tipo de estudo em causa, importa ter em atenção a legislação vigente sobre o assunto, nomeadamente o Decreto-Lei N.º 364/98, de 21 Novembro, que estabelece a obrigatoriedade de elaboração, por parte dos municípios, da carta de áreas inundáveis, constituída pela delimitação das zonas potencialmente sujeitas a inundaçãõ, para o período de retorno de 100 anos. As cartas de zonas inundáveis são também uma ferramenta indispensável no processo de demarcação da Reserva Ecológica Nacional.



Durante esta fase do estudo foi utilizada a informação cartográfica dos Concelhos de Sintra e Cascais, esta última disponibilizada pela Câmara Municipal de Cascais.

## 1.2 Organização do estudo

O estudo foi organizado em duas fases; uma primeira que consistiu na delimitação e caracterização das bacias hidrográficas a estudar e na avaliação dos caudais de ponta de cheia e, uma segunda fase, na qual se estabeleceram os modelos de simulação hidráulica e se elaboraram os mapas de inundação

O presente documento trata-se do relatório final, resultante da elaboração das duas referidas fases e é constituído por cinco capítulos, dos quais o primeiro é a presente Introdução.

No Capítulo 2, procede-se à caracterização das bacias hidrográficas em estudo e das respectivas sub-bacias, definidas em secções convenientemente localizadas em função dos objectivos da análise a realizar e que, sempre que possível e adequado, se fizeram coincidir com as passagens hidráulicas existentes a estudar.

No Capítulo 3, apresentam-se os resultados do cálculo dos valores dos tempos de concentração das bacias em estudo e, no Capítulo 4 os resultados do cálculo dos caudais de ponta de cheia para as bacias hidrográficas consideradas, para o período de retorno de 100 anos, recorrendo ao modelo cinemático do *Soil Conservation Service* (S.C.S).

Finalmente, no capítulo 5, apresenta-se o resultado da simulação das condições de propagação das ondas de cheia, através da aplicação do modelo unidimensional, HEC-RAS, o que permitiu a elaboração do pré-zonamento das áreas potencialmente sujeitas a inundação no Concelho de Cascais, para um período de retorno de 100 anos.



## 2 Características fisiográficas das bacias

### 2.1 Considerações gerais

A análise das condições hidrológicas será efectuada tendo em conta as características morfológicas das zonas diferenciadas do concelho de Cascais, focando-se nas bacias dominadas pelas seguintes ribeiras: Ribeira do "Assobio", Ribeira da "Grotta", Ribeira da "Praia", Ribeira do Arneiro, Ribeira da Foz do Guincho, Ribeira dos Mochos, Ribeira das Vinhas, Ribeira de Castelhana, Ribeira da Cadaveira, Ribeira de Bicesse, Ribeira de Manique, Ribeira das Marianas, Ribeira de Sassoeiros e Ribeira da Laje.

### 2.2 Descrição das variáveis presentes no estudo hidrológico

Altitude média ou cota média ( $\bar{Z}$ ), é dada por:

$$\bar{Z} = \frac{\sum Z_i A_i}{A}$$

Onde  $\bar{Z}$  é altitude média da bacia,  $Z_i$  a altitude média e  $A_i$  a área, entre duas curvas de nível consecutivas, e  $A$  a área total da bacia.

Altura média,  $\bar{H}$ , Define-se de modo semelhante à anterior, mas em vez de se referir a cotas acima do nível médio do mar,  $Z$  (altitudes), refere-se a cotas acima da secção de estudo,  $H$  (alturas), assim:

$$\bar{H} = \frac{\sum H_i A_i}{A}$$

ou

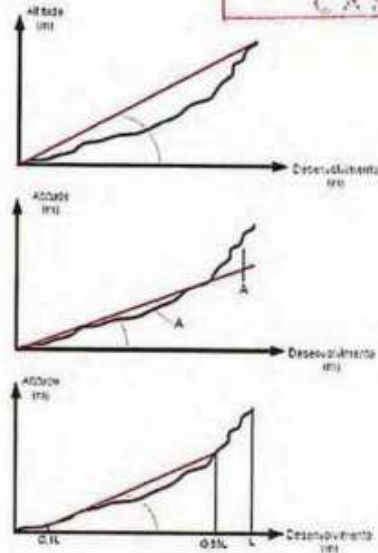
$$\bar{H} = \bar{Z} - Z_{100}$$

Onde  $Z_{100}$ , é a cota que está a 100% da área da bacia acima dessa cota.

Declive equivalente: é o declive da recta que subtende, com o eixo das abcissas, uma área igual à do perfil longitudinal, ou seja, o declive da recta que, intersectando o perfil longitudinal, determina acima e abaixo deste áreas iguais.

Declive  $d_{10,85}$ : é o declive médio no troço entre secções, às distâncias de referência, iguais a 10%, na extremidade de jusante, e a 85%, na extremidade a montante, do comprimento total do curso de água principal (elimina os troços de maior e menor declives).

- Declive médio
- Declive equivalente do leito
- Declive 10, 85



Nas bacias em estudo e dado que o maior declive se verifica a montante (cabeceras) optou-se por considerar a distância de referência a igual a 85% do comprimento total do curso de água.

Comprimento equivalente: é a distância de referência igual a 85% (no presente estudo) do comprimento total do curso de água.

Cota máxima equivalente: é a cota verificada no local a montante dos 85% do comprimento total da linha de água.

Apresentam-se, seguidamente, as características físicas das bacias hidrográficas necessárias à determinação do tempo de concentração.

## 2.3 Bacia da Ribeira do "Assobio"

Na Figura 2.1 apresenta-se a localização da bacia hidrográfica da ribeira do "Assobio", no Concelho.



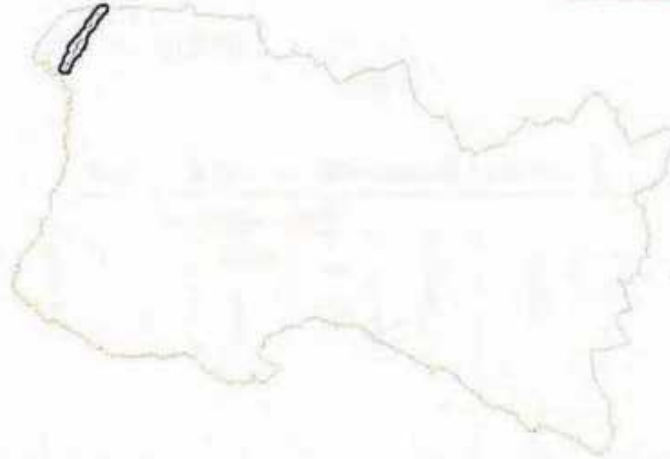


Figura 2.1 – Localização bacia hidrográfica da ribeira do "Assobio", no Concelho

A Figura 2.2 mostra a localização das secções de cálculo das sub-bacias hidrográficas estudadas.

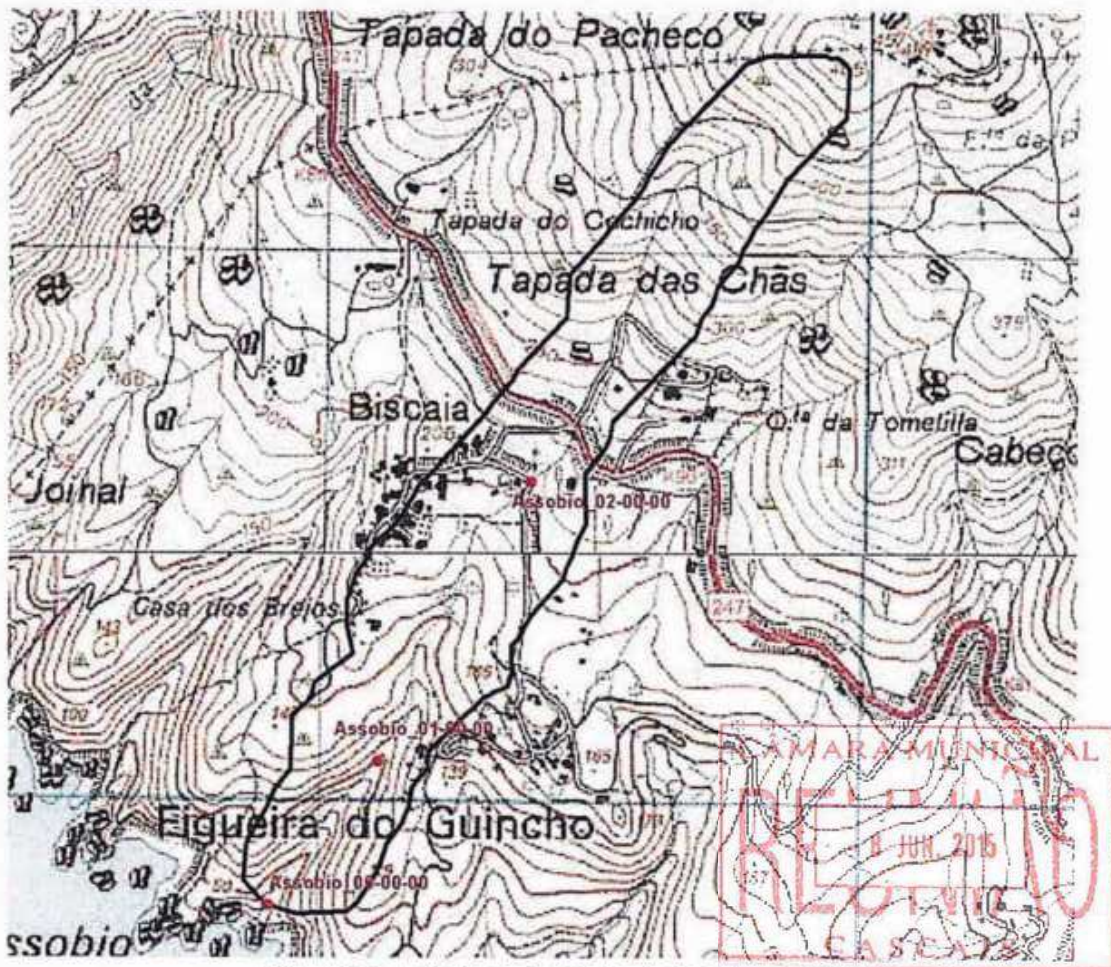


Figura 2.2 – Ribeira do "Assobio". Secções de cálculo

Na Tabela 2.1 apresentam-se as principais características fisiográficas das sub-bacias nas secções de cálculo consideradas.

**Tabela 2.1 – Características fisiográficas das sub-bacias**

Bacias hidrográficas	Bacia hidrográfica							N <sub>ANC III</sub> (SCS)
	Perímetro (km)	Área (km <sup>2</sup> )	Cotas (m)			Altura média	Declive médio (%)	
			Média	Mínima	Máxima			
Assobio 00-00-00	4.13	0.44	222.0	8.4	464.0	213.6	31.9	79.4
Assobio 01-00-00	3.41	0.36	242.4	77.5	464.0	164.9	28.3	79.4
Assobio 02-00-00	2.20	0.19	317.8	200.1	464.0	117.7	30.3	76.2

Na Tabela 2.2 apresentam-se as principais características das linhas de água nas secções de cálculo.

**Tabela 2.2 – Principais características das linhas de água das sub-bacias**

Bacias hidrográficas	Linha de água								
	Comprimento total (km)	Comp. ao centro de gravidade (km)	Cotas (m)		Declive médio (%)	Comprimento equivalente (km)	Cotas (m)		Declive equivalente (m/m)
			Mínima	Máxima			Mínima	Máxima - equivalente	
Assobio 00-00-00	1.7	0.953	8.4	382.3	26.4	1.473	8.4	319.3	0.211
Assobio 01-00-00	1.4	0.769	77.5	382.3	25.3	1.189	77.5	331.6	0.214
Assobio 02-00-00	0.8	0.425	200.1	382.3	27.6	0.657	200.1	382.3	0.277

## 2.4 Bacia da Ribeira de "Grota"

Na Figura 2.3 apresenta-se a localização da bacia hidrográfica da ribeira do "Grota", no Concelho.



**Figura 2.3 – Localização bacia hidrográfica da ribeira de “Grota”, no Concelho**

A Figura 2.4 mostra a localização das secções de cálculo das sub-bacias hidrográficas estudadas.



**Figura 2.4 – Ribeira de” Grota”, secções de cálculo**

Na Tabela 2.3 apresentam-se as principais características fisiográficas das sub-bacias nas secções de cálculo consideradas.

**Tabela 2.3 – Características fisiográficas das sub-bacias**

Bacias hidrográficas	Bacia hidrográfica							N <sub>AMC III</sub> (SCS)
	Perímetro (km)	Área (km <sup>2</sup> )	Cotas (m)			Altura média	Declive médio (%)	
			Média	Mínima	Máxima			
Grota 00-00-00	5.36	1.05	215.6	16.0	485.0	199.6	30.0	84.0
Grota 01-00-00	5.08	0.98	227.4	46.0	485.0	181.4	29.2	83.9
Grota 01-01-00	1.09	0.07	128.9	64.2	183.7	64.7	33.8	90.0
Grota 02-00-00	3.99	0.73	255.5	92.4	485.0	163.1	27.2	82.0
Grota 02-01-00	1.39	0.11	210.6	114.8	313.0	95.8	26.8	87.5
Grota 03-00-00	2.35	0.30	344.9	214.2	485.0	130.7	31.6	76.6

Na Tabela 2.4 apresentam-se as principais características das linhas de água nas secções de cálculo.

**Tabela 2.4 – Principais características das linhas de água das sub-bacias**

Bacias hidrográficas	Linha de água								
	Comprimento total (km)	Comp. ao centro de gravidade (km)	Cotas (m)		Declive médio (%)	Comprimento equivalente (km)	Cotas (m)		Declive equivalente (m/m)
			Mínima	Máxima			Mínima	Máxima - equivalente	
Grota 00-00-00	2.3	1.262	16.0	432.9	23.0	1.950	16.0	342.5	0.1674
Grota 01-00-00	2.1	1.136	46.0	432.9	23.6	1.755	46.0	354.5	0.1758
Grota 01-01-00	0.3	0.138	64.2	123.4	25.5	0.213	64.2	113.2	0.2300
Grota 02-00-00	1.6	0.857	92.4	432.9	23.5	1.324	92.4	378.2	0.2159
Grota 02-01-00	0.3	0.161	114.8	223.0	24.3	0.249	114.8	213.4	0.3960
Grota 03-00-00	0.8	0.419	214.2	432.9	28.9	0.647	214.2	401.6	0.2896

## 2.5 Bacia da Ribeira de "Praia"

Na Figura 2.5 apresenta-se a localização da bacia hidrográfica da ribeira da "Praia", no Concelho.

Figura 2.5 – Localização bacia hidrográfica da ribeira de "Praia", no Concelho

A Figura 2.6 mostra a localização das secções de cálculo das sub-bacias hidrográficas estudadas.

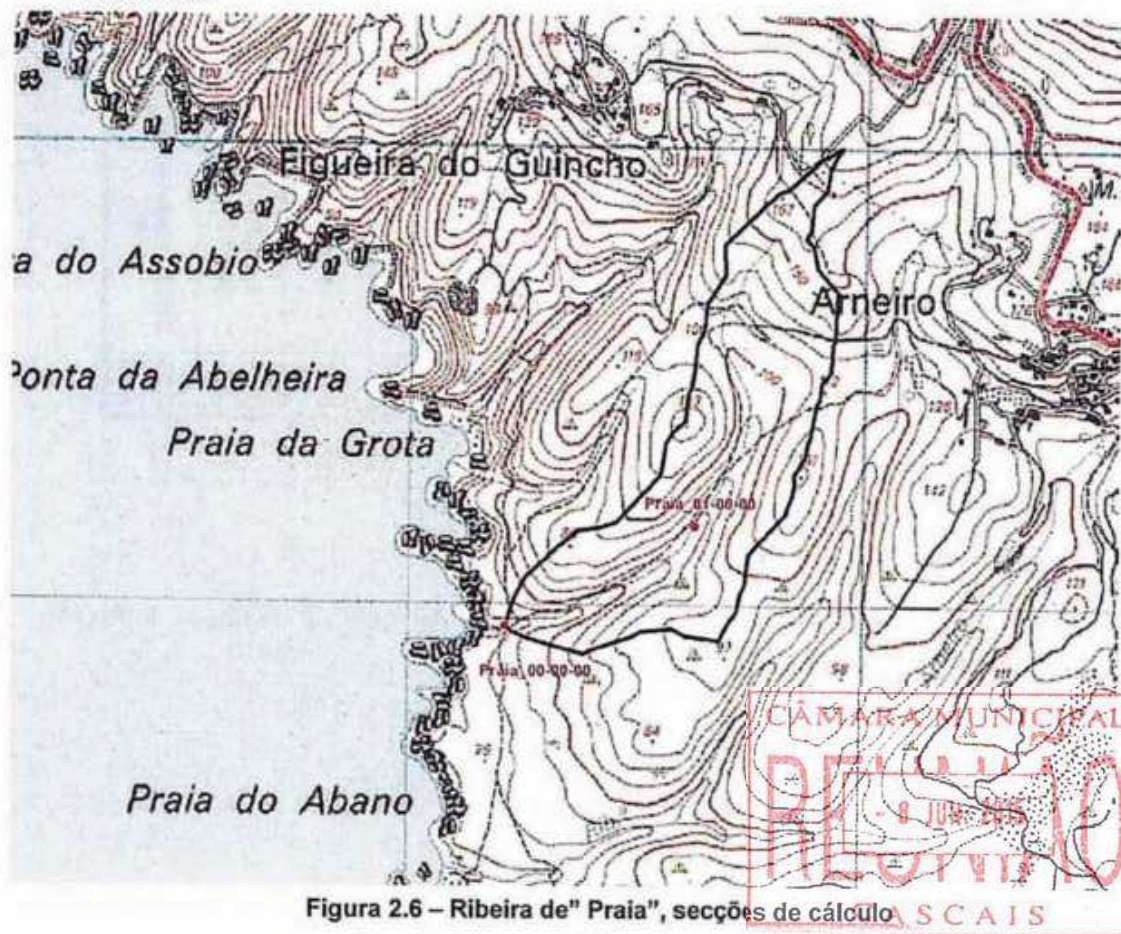


Figura 2.6 – Ribeira de "Praia", secções de cálculo

Na Tabela 2.5 apresentam-se as principais características fisiográficas das sub-bacias nas secções de cálculo consideradas.

**Tabela 2.5 – Características fisiográficas das sub-bacias**

Bacias hidrográficas	Bacia hidrográfica						N <sub>AMC III</sub> (SCS)	
	Perímetro (km)	Área (km <sup>2</sup> )	Cotas (m)			Altura média		Declive médio (%)
			Média	Mínima	Máxima			
Praia 00-00-00	3.06	0.31	100.5	24.0	189.7	76.5	28.0	90.0
Praia 01-00-00	2.03	0.18	115.9	64.0	189.7	51.9	25.7	89.9

Na Tabela 2.6 apresentam-se as principais características das linhas de água nas secções de cálculo.

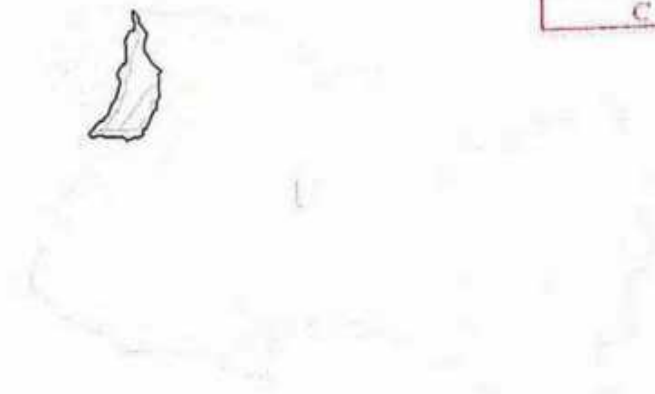
**Tabela 2.6 – Principais características das linhas de água das sub-bacias**

Bacias hidrográficas	Linha de água								
	Comprimento total (km)	Comp. ao centro de gravidade (km)	Cotas (m)		Declive médio (%)	Comprimento equivalente (km)	Cotas (m)		Declive equivalente (m/m)
			Mínima	Máxima			Mínima	Máxima - equivalente	
Praia 00-00-00	1.2	0.669	24.0	151.8	14.6	1.034	24.0	114.2	0.0872
Praia 01-00-00	0.7	0.394	64.0	151.8	13.2	0.609	64.0	127.5	0.1043

## 2.6 Bacia da Ribeira do Arneiro

Na Figura 2.7 apresenta-se a localização da bacia hidrográfica da ribeira do Arneiro, no Concelho.





**Figura 2.7 – Localização bacia hidrográfica da ribeira do Arneiro, no Concelho**

A Figura 2.8 mostra a localização das secções de cálculo das sub-bacias hidrográficas estudadas.





Figura 2.8 – Ribeira do Arneiro, secções de cálculo

Na Tabela 2.7 apresentam-se as principais características fisiográficas das sub-bacias nas secções de cálculo consideradas.

Tabela 2.7 – Características fisiográficas das sub-bacias

Bacias hidrográficas	Bacia hidrográfica							
	Perímetro (km)	Área (km <sup>2</sup> )	Cotas (m)			Altura média	Declive médio (%)	N <sub>AMC III</sub> (SCS)
			Média	Mínima	Máxima			
Arneiro 00-00-00	8.58	2.29	147.0	10.0	467.0	137.0	23.4	89.5
Arneiro 01-00-00	7.93	2.18	152.9	32.0	467.0	120.9	23.5	89.5
Arneiro 01-01-00	5.31	0.86	212.0	66.5	467.0	145.5	28.0	86.0

Bacias hidrográficas	Bacia hidrográfica							N <sub>AVC III</sub> (SCS)
	Perímetro (km)	Área (km <sup>2</sup> )	Cotas (m)			Altura média	Declive médio (%)	
			Média	Mínima	Máxima			
Arneiro 01-02-00	4.14	0.63	245.5	113.7	467.0	131.8	29.2	84.5
Arneiro 01-03-00	2.58	0.27	315.2	191.5	467.0	123.7	34.1	76.9
Arneiro 02-00-00	5.31	1.03	121.0	51.0	298.1	70.0	18.5	92.0
Arneiro 02-01-00	2.43	0.22	113.0	80.0	175.0	33.0	18.5	94.5
Arneiro 02-02-00	1.82	0.14	120.4	86.4	175.0	34.0	12.2	94.5
Arneiro 03-00-00	2.30	0.18	179.8	131.0	298.1	48.8	18.3	91.9

Na Tabela 2.8 apresentam-se as principais características das linhas de água nas secções de cálculo.

Tabela 2.8 – Principais características das linhas de água das sub-bacias

Bacias hidrográficas	Linha de água								
	Comprimento total (km)	Comp. ao centro de gravidade (km)	Cotas (m)		Declive médio (%)	Comprimento equivalente (km)	Cotas (m)		Declive equivalente (m/m)
			Mínima	Máxima			Mínima	Máxima - equivalente	
Arneiro 00-00-00	3.3	1.789	10.0	269.6	17.3	2.765	10.0	273.1	0.0952
Arneiro 01-00-00	2.8	1.537	32.0	369.6	17.5	2.375	32.0	253.2	0.0931
Arneiro 01-01-00	2.0	1.121	66.5	370.0	18.5	1.732	66.5	288.1	0.1279
Arneiro 01-02-00	1.3	0.739	113.7	369.6	21.4	1.142	113.7	324.0	0.1842
Arneiro 01-03-00	0.6	0.344	191.5	369.6	28.8	0.532	191.5	350.4	0.2987
Arneiro 02-00-00	1.5	0.813	51.0	146.2	11.2	1.257	51.0	125.0	0.0589
Arneiro 02-01-00	1.5	0.813	80.0	151.0	8.7	1.257	80.0	130.1	0.0399
Arneiro 02-02-00	0.7	0.367	86.4	151.0	9.8	0.568	86.4	136.1	0.0875
Arneiro 03-00-00	0.2	0.083	131.0	146.2	11.9	0.128	131.0	141.0	0.0781

## 2.7 Bacia da Ribeira da Foz do Guincho

Na Figura 2.9 apresenta-se a localização da bacia hidrográfica da ribeira da Foz do Guincho, no Concelho.



**Figura 2.9 – Localização bacia hidrográfica da ribeira da Foz do Guincho, no Concelho**

A Figura 2.10 mostra a localização das secções de cálculo das sub-bacias hidrográficas estudadas.

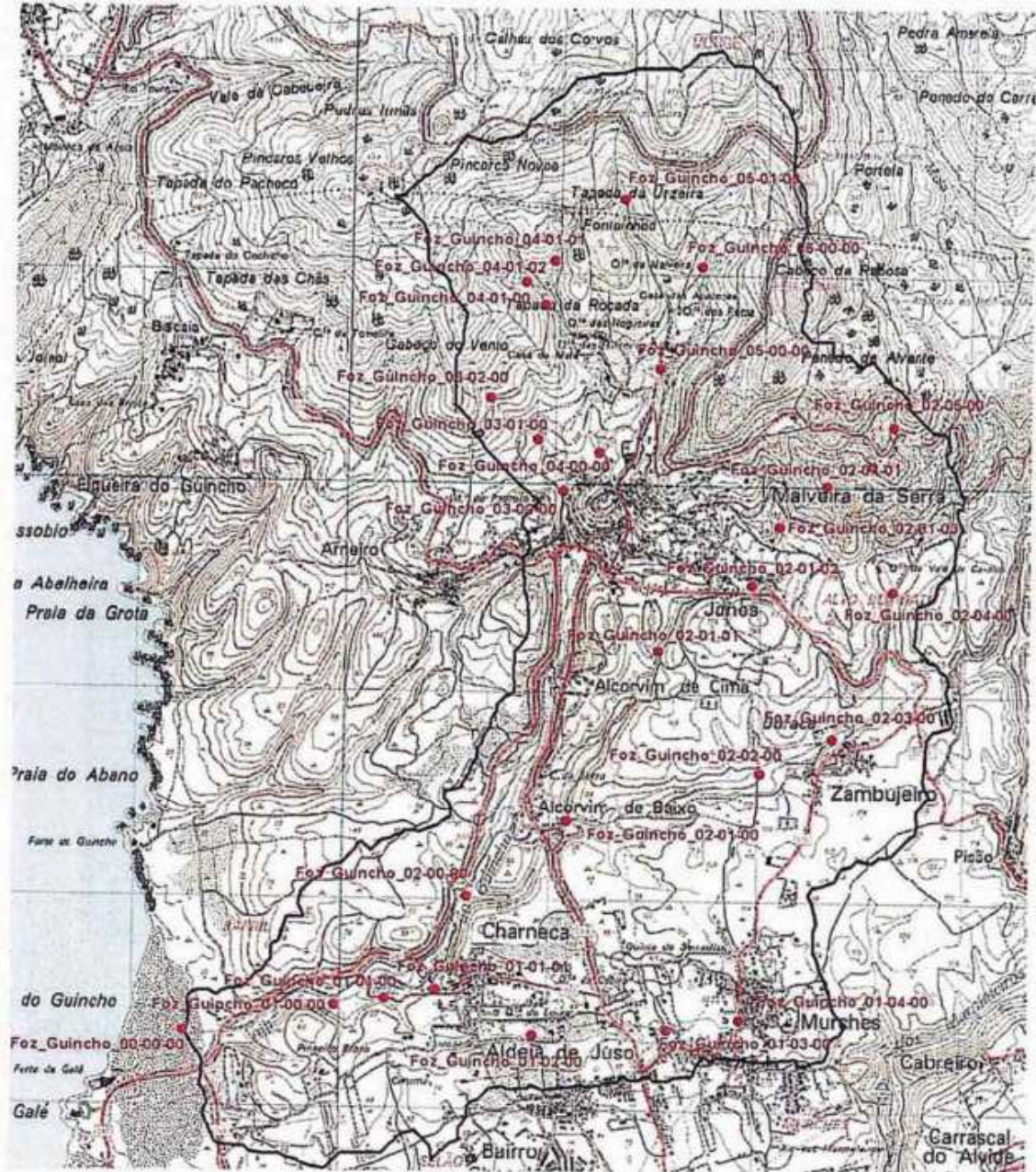


Figura 2.10 – Ribeira da Foz do Guincho, secções de cálculo

Na Tabela 2.9 apresentam-se as principais características fisiográficas das sub-bacias nas secções de cálculo consideradas.

**Tabela 2.9 – Características fisiográficas das sub-bacias**

Bacias hidrográficas	Bacia hidrográfica							N <sub>AMC III</sub> (SCS)
	Perímetro (km)	Área (km <sup>2</sup> )	Cotas (m)			Altura média	Declive médio (%)	
			Média	Mínima	Máxima			
Foz do Guincho 00-00-00	17.86	10.70	174.6	7.0	490.0	167.6	20.1	88.3
Foz do Guincho 01-00-00	16.87	9.87	185.4	19.0	490.0	166.4	20.6	88.2
Foz do Guincho 01-01-00	6.65	1.64	86.3	34.1	119.0	52.2	7.9	90.8
Foz do Guincho 01-02-00	4.47	0.79	94.1	65.0	119.0	29.1	7.2	91.9
Foz do Guincho 01-03-00	3.18	0.52	101.9	85.8	119.0	16.1	6.8	92.2
Foz do Guincho 01-04-00	2.45	0.25	107.1	92.5	119.0	14.6	7.3	91.4
Foz do Guincho 02-00-00	13.56	7.73	213.4	39.5	490.0	173.9	23.3	87.5
Foz do Guincho 02-01-00	8.70	3.85	158.8	67.0	379.2	91.8	19.0	90.5
Foz do Guincho 02-02-00	6.81	1.40	192.4	96.9	379.2	95.5	23.5	89.8
Foz do Guincho 02-03-00	5.97	1.16	206.1	107.6	379.2	98.5	24.9	89.6
Foz do Guincho 02-04-00	4.02	0.73	239.4	139.7	379.2	99.7	29.0	88.3
Foz do Guincho 02-05-00	1.17	0.07	287.3	236.4	361.0	50.9	32.5	90.5
Foz do Guincho 03-00-00	6.98	2.93	318.4	144.4	490.0	174.0	28.6	79.9
Foz do Guincho 03-01-00	1.81	0.23	269.1	179.0	375.0	90.1	31.4	81.2
Foz do Guincho 03-02-00	1.00	0.05	300.5	246.6	375.0	53.9	35.1	77.6
Foz do Guincho 04-00-00	6.56	2.52	331.8	158.2	490.0	173.6	28.7	78.8
Foz do Guincho 04-01-00	3.25	0.61	366.9	241.0	485.0	125.9	30.3	77.6
Foz do Guincho 04-01-01	1.91	0.19	383.1	285.6	485.0	97.5	27.5	77.8
Foz do Guincho 04-01-02	2.30	0.32	376.4	274.7	480.0	101.7	31.2	77.6
Foz do Guincho 05-00-00	4.82	1.37	350.1	218.0	490.0	132.1	29.2	78.1
Foz do Guincho 05-01-00	2.00	0.25	422.0	321.9	489.0	100.1	28.5	77.8
Foz do Guincho 06-00-00	3.24	0.62	265.8	244.0	490.0	21.8	29.5	78.2

Na tabela 15 apresentam-se as principais características das linhas de água nas secções de cálculo.

**Tabela 2.10 – Principais características das linhas de água das sub-bacias**

Bacias hidrográficas	Linha de água								
	Comprimento total (km)	Comp. ao centro de gravidade (km)	Cotas (m)		Declive médio (%)	Comprimento equivalente (km)	Cotas (m)		Declive equivalente (m/m)
			Mínima	Máxima			Mínima	Máxima - equivalente	
Foz do Guincho 00-00-00	6.3	3.444	7.0	449.7	12.2	5.322	7.0	265.7	0.0486
Foz do Guincho 01-00-00	5.4	2.991	19.0	449.7	13.1	4.623	19.0	278.4	0.0561
Foz do Guincho 01-01-00	2.5	1.392	34.1	104.0	5.8	2.151	34.1	97.0	0.0292
Foz do Guincho 01-02-00	1.7	0.926	65.0	104.0	3.7	1.431	65.0	99.0	0.0238
Foz do Guincho 01-03-00	1.0	0.543	85.8	104.0	2.3	0.840	85.8	101.0	0.0181
Foz do Guincho 01-04-00	0.6	0.323	92.5	104.0	2.4	0.500	92.5	102.2	0.0194
Foz do Guincho 02-00-00	4.5	2.481	39.5	449.7	13.6	3.834	39.5	293.3	0.0662
Foz do Guincho 02-01-00	3.6	1.988	67.0	301.7	12.5	3.073	67.0	209.6	0.0464
Foz do Guincho 02-02-00	2.6	1.411	96.9	301.7	13.2	2.181	96.9	231.3	0.0616
Foz do Guincho 02-03-00	2.2	1.183	107.6	301.7	13.6	1.828	107.6	237.0	0.0708
Foz do Guincho 02-04-00	1.3	0.702	139.7	301.7	15.7	1.085	139.7	256.3	0.1075
Foz do Guincho 02-05-00	0.2	0.137	236.4	301.7	24.5	0.212	236.4	293.2	0.2681
Foz do Guincho 03-00-00	2.4	1.315	144.4	449.7	16.9	2.032	144.4	344.7	0.0986
Foz do Guincho 03-01-00	0.6	0.329	179.0	321.4	23.9	0.508	179.0	290.3	0.2191
Foz do Guincho 03-02-00	0.2	0.098	246.6	302.1	29.0	0.152	246.6	297.2	0.3329
Foz do Guincho 04-00-00	2.1	1.157	158.2	449.7	16.7	1.788	158.2	359.4	0.1125
Foz do Guincho 04-01-00	0.7	0.405	241.0	411.2	23.6	0.626	241.0	385.5	0.2308
Foz do Guincho 04-01-01	0.3	0.161	285.6	355.8	26.9	0.248	285.6	346.8	0.2468
Foz do Guincho 04-01-02	0.6	0.329	274.7	411.2	24.9	0.508	274.7	390.8	0.2285
Foz do Guincho 05-00-00	1.6	0.862	218.0	449.7	18.2	1.332	218.0	385.1	0.1255
Foz do Guincho 05-01-00	0.6	0.323	321.9	443.9	21.7	0.499	321.9	432.5	0.2216
Foz do Guincho 06-00-00	1.0	0.546	244.0	449.7	23.0	0.844	244.0	410.1	0.1968

## 2.8 Bacia da Ribeira dos Mochos

Na Figura 2.11 apresenta-se a localização da bacia hidrográfica da ribeira dos Mochos, no Concelho.



**Figura 2.11 – Localização bacia hidrográfica da ribeira dos Mochos, no Concelho**

A Figura 2.12 mostra a localização das secções de cálculo das sub-bacias hidrográficas estudadas.







Figura 2.12 – Ribeira dos Mochos, secções de cálculo

Na Tabela 2.11 apresentam-se as principais características fisiográficas das sub-bacias nas secções de cálculo consideradas.

**Tabela 2.11 – Características fisiográficas das sub-bacias**

Bacias hidrográficas	Bacia hidrográfica							NAMC III (SCS)
	Perímetro (km)	Área (km <sup>2</sup> )	Cotas (m)			Altura média	Declive médio (%)	
			Média	Mínima	Máxima			
Mochos 00-00-00	14.35	5.51	58.1	1.0	118.0	57.1	6.3	93.7
Mochos 01-00-00	12.37	4.85	63.3	15.6	118.0	47.7	6.3	91.2
Mochos 02-00-00	9.97	3.96	67.9	34.0	118.0	33.9	6.0	93.1
Mochos 03-00-00	6.38	1.73	72.7	49.0	118.0	23.7	5.3	92.3
Mochos 04-00-00	5.26	1.09	75.9	57.0	118.0	18.9	5.4	92.5

Na Tabela 2.12 apresentam-se as principais características das linhas de água nas secções de cálculo.

**Tabela 2.12 – Principais características das linhas de água das sub-bacias**

Bacias hidrográficas	Linha de água								
	Comprimento total (km)	Comp. ao centro de gravidade (km)	Cotas (m)		Declive médio (%)	Comprimento equivalente (km)	Cotas (m)		Declive equivalente (m/m)
			Mínima	Máxima			Mínima	Máxima - equivalente	
Mochos 00-00-00	6.0	3.293	1.0	92.5	6.5	5.089	1.0	64.7	0.0125
Mochos 01-00-00	5.0	2.742	15.6	92.5	5.6	4.238	15.6	67.8	0.0123
Mochos 02-00-00	3.7	2.048	34.0	92.5	4.5	3.165	34.0	73.0	0.0123
Mochos 03-00-00	1.9	1.067	49.0	92.5	4.2	1.649	49.0	79.2	0.0183
Mochos 04-00-00	1.4	0.784	57.0	92.5	3.2	1.211	57.0	80.7	0.0196

## 2.9 Bacia da Ribeira das Vinhas

Na Figura 2.13 apresenta-se a localização da bacia hidrográfica da ribeira das Vinhas, no Concelho.






**Figura 2.13 – Localização bacia hidrográfica da ribeira das Vinhas, no Concelho**

A Figura 2.14 mostra a localização das secções de cálculo das sub-bacias hidrográficas estudadas.





Figura 2.14 – Ribeira das Vinhas, secções de cálculo



Na Tabela 2.13 apresentam-se as principais características fisiográficas das sub-bacias nas secções de cálculo consideradas.

**Tabela 2.13 – Características fisiográficas das sub-bacias**

Bacias hidrográficas	Bacia hidrográfica							N <sub>AMC III</sub> (SCS)
	Perímetro (km)	Área (km <sup>2</sup> )	Cotas (m)			Altura média	Declive médio (%)	
			Média	Mínima	Máxima			
Vinhas 00-00-00	33.20	27.20	173.6	5.0	525.0	168.6	18.7	88.5
Vinhas 01-00-00	31.27	26.60	177.1	5.0	525.0	172.1	19.2	88.3
Vinhas 02-00-00	30.70	25.59	181.4	6.0	525.0	175.4	19.5	88.0
Vinhas 03-00-00	27.36	23.96	190.0	24.0	525.0	166.0	19.7	87.6
Vinhas 04-00-00	27.07	23.67	191.6	28.0	525.0	163.6	19.8	87.6
Vinhas 05-00-00	24.65	21.83	199.3	39.0	525.0	160.3	20.4	87.2
Vinhas 06-00-00	22.52	20.54	205.6	59.0	525.0	146.6	20.4	87.0
Vinhas 06-01-00	16.91	8.93	229.8	62.1	490.0	167.7	25.6	85.6
Vinhas 06-02-00	15.34	7.61	248.3	74.7	490.0	173.6	27.3	84.5
Vinhas 06-03-00	13.38	6.40	259.4	90.0	490.0	169.4	27.4	83.9
Vinhas 06-04-00	12.74	6.77	263.0	102.0	490.0	161.0	27.2	83.7
Vinhas 06-04-01	3.08	0.44	298.2	206.0	406.9	92.2	29.2	88.2
Vinhas 06-05-00	12.41	5.69	270.4	108.6	490.0	161.8	26.6	82.7
Vinhas 07-00-00	17.06	10.79	193.4	79.8	525.0	113.6	16.1	87.9
Vinhas 07-01-00	3.75	0.71	148.7	110.9	193.0	37.8	13.7	90.5
Vinhas 07-01-01	1.22	0.08	157.5	133.1	177.0	24.4	14.6	92.2
Vinhas 07-02-00	1.77	0.17	165.9	139.5	193.0	26.4	12.8	88.8
Vinhas 08-00-00	14.44	8.68	209.6	91.1	525.0	118.5	15.9	87.3
Vinhas 08-01-00	7.09	1.60	149.0	118.0	204.8	31.0	5.1	90.5
Vinhas 08-02-00	5.61	1.36	152.5	130.0	204.8	22.5	5.4	90.2
Vinhas 08-03-00	2.62	0.32	152.9	143.9	164.0	9.0	3.9	90.0
Vinhas 09-00-00	11.39	6.38	234.1	100.5	525.0	133.6	20.1	85.9
Vinhas 09-01-00	4.97	0.84	151.4	110.3	199.2	41.1	7.7	90.8
Vinhas 09-02-00	3.22	0.47	163.2	138.0	199.2	25.2	8.4	89.9
Vinhas 09-02-01	2.20	0.22	166.3	139.0	189.6	27.3	8.5	89.9
Vinhas 09-03-00	2.49	0.20	164.3	144.0	199.2	20.3	8.7	89.9
Vinhas 10-00-00	10.57	5.37	250.6	109.0	525.0	141.6	22.2	85.1

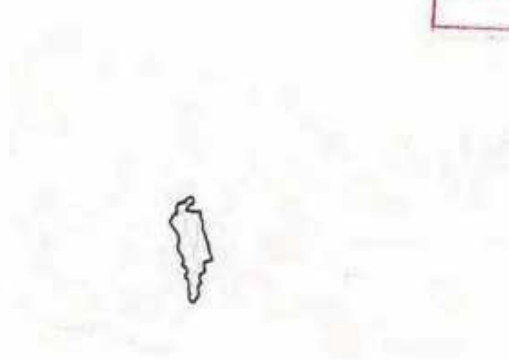
Na Tabela 2.14 apresentam-se as principais características das linhas de água nas secções de cálculo.

**Tabela 2.14 – Principais características das linhas de água das sub-bacias**

Bacias hidrográficas	Linha de água								
	Comprimento total (km)	Comp. ao centro de gravidade (km)	Cotas (m)		Declive médio (%)	Comprimento equivalente (km)	Cotas (m)		Declive equivalente (m/m)
			Mínima	Máxima			Mínima	Máxima - equivalente	
Vinhas 00-00-00	11.8	6.497	5.0	395.3	9.6	10.040	5.0	172.6	0.0167
Vinhas 01-00-00	11.6	6.367	5.0	395.3	9.8	9.840	5.0	175.0	0.0173
Vinhas 02-00-00	11.1	6.115	6.0	395.3	10.1	9.450	6.0	179.9	0.0184
Vinhas 03-00-00	9.4	5.157	24.0	395.3	10.5	7.970	24.0	195.3	0.0215
Vinhas 04-00-00	9.0	4.974	28.0	395.3	10.6	7.687	28.0	204.0	0.0229
Vinhas 05-00-00	7.9	4.341	39.0	395.3	10.0	6.708	39.0	220.0	0.0270
Vinhas 06-00-00	6.7	3.664	59.0	395.3	9.3	5.663	59.0	238.0	0.0316
Vinhas 06-01-00	5.6	3.066	62.1	440.1	18.1	4.739	62.1	245.0	0.0386
Vinhas 06-02-00	5.1	2.782	74.7	440.1	18.5	4.299	74.7	257.0	0.0424
Vinhas 06-03-00	4.2	2.327	90.0	440.1	17.2	3.596	90.0	273.9	0.0511
Vinhas 06-04-00	3.7	2.028	102.0	440.1	17.0	3.135	102.0	289.1	0.0597
Vinhas 06-04-01	0.9	0.505	208.0	335.2	20.0	0.780	206.0	305.0	0.1269
Vinhas 06-05-00	3.1	1.688	108.6	440.1	16.3	2.609	108.6	302.2	0.0742
Vinhas 07-00-00	5.5	3.048	79.8	395.3	8.5	4.711	79.8	254.9	0.0372
Vinhas 07-01-00	0.9	0.483	110.9	163.3	6.7	0.747	110.9	147.9	0.0495
Vinhas 07-01-01	0.4	0.206	133.1	168.3	9.4	0.318	133.1	161.4	0.0890
Vinhas 07-02-00	0.4	0.197	139.5	174.3	9.5	0.304	139.5	169.3	0.0980
Vinhas 08-00-00	4.4	2.406	91.1	395.3	9.9	3.719	91.1	275.0	0.0494
Vinhas 08-01-00	3.0	1.626	118.0	158.8	4.1	2.513	118.0	149.4	0.0125
Vinhas 08-02-00	2.1	1.144	130.0	158.8	3.0	1.768	130.0	152.7	0.0128
Vinhas 08-03-00	1.0	0.547	143.9	158.8	1.9	0.845	143.9	158.1	0.0168
Vinhas 09-00-00	3.7	2.025	100.5	395.3	11.4	3.130	100.5	285.0	0.0589
Vinhas 09-01-00	1.8	0.966	110.3	175.0	7.9	1.493	110.3	156.0	0.0306
Vinhas 09-02-00	0.9	0.481	138.0	175.0	11.0	0.744	138.0	162.3	0.0327
Vinhas 09-02-01	0.7	0.380	139.0	178.1	5.8	0.587	139.0	174.8	0.0610
Vinhas 09-03-00	0.7	0.394	144.0	175.0	11.5	0.609	144.0	163.3	0.0317
Vinhas 10-00-00	3.3	1.817	109.0	395.3	12.0	2.808	109.0	300.2	0.0681

## 2.10 Bacia da Ribeira de Castelhana

Na Figura 2.15 apresenta-se a localização da bacia hidrográfica da ribeira de Castelhana, no Concelho.



**Figura 2.15 – Localização bacia hidrográfica da ribeira de Castelhana, no Concelho**

A Figura 2.16 mostra a localização das secções de cálculo das sub-bacias hidrográficas estudadas.





Figura 2.16 – Ribeira de Castelhana, secções de cálculo

Na Tabela 2.15 apresentam-se as principais características fisiográficas das sub-bacias nas secções de cálculo consideradas.



**Tabela 2.15 – Características fisiográficas das sub-bacias**

Bacias hidrográficas	Bacia hidrográfica							N <sub>AMC III</sub> (SCS)
	Perímetro (km)	Área (km <sup>2</sup> )	Cotas (m)			Altura média	Declive médio (%)	
			Média	Mínima	Máxima			
Castelhana 00-00-00	8.03	1.71	71.6	8.2	123.0	63.4	15.0	92.1
Castelhana 01-00-00	6.54	1.50	75.0	30.0	123.0	45.0	13.6	92.2
Castelhana 02-00-00	6.06	1.25	78.9	39.0	123.0	39.9	12.7	92.1
Castelhana 03-00-00	5.14	0.97	83.5	46.4	123.0	37.1	12.9	91.8
Castelhana 03-01-00	21.12	0.18	78.7	56.0	105.0	22.7	12.7	93.1
Castelhana 04-00-00	3.71	0.44	95.4	65.5	123.0	29.9	14.9	91.0
Castelhana 05-00-00	2.33	0.18	103.1	77.0	122.4	26.1	16.4	90.0

Na Tabela 2.16 apresentam-se as principais características das linhas de água nas secções de cálculo.

**Tabela 2.16 – Principais características das linhas de água das sub-bacias**

Bacias hidrográficas	Linha de água								
	Comprimento total (km)	Comp. ao centro de gravidade (km)	Cotas (m)		Declive médio (%)	Comprimento equivalente (km)	Cotas (m)		Declive equivalente (m/m)
			Mínima	Máxima			Mínima	Máxima - equivalente	
Castelhana 00-00-00	3.4	1.851	8.2	108.8	9.3	2.861	8.2	86.7	0.0274
Castelhana 01-00-00	2.6	1.415	30.0	108.8	8.6	2.186	30.0	92.0	0.0284
Castelhana 02-00-00	2.0	1.088	39.0	108.8	7.4	1.682	39.0	97.5	0.0348
Castelhana 03-00-00	1.6	0.903	46.4	108.8	7.8	1.396	46.4	100.9	0.0390
Castelhana 03-01-00	0.7	0.362	56.0	90.0	5.4	0.559	56.0	84.0	0.0501
Castelhana 04-00-00	1.0	0.569	65.5	108.8	10.3	0.880	65.5	105.3	0.0452
Castelhana 05-00-00	0.6	0.314	77.0	108.8	9.0	0.485	77.0	106.0	0.0598

## 2.11 Bacia da Ribeira de Cadaveira

Na Figura 2.17 apresenta-se a localização da bacia hidrográfica da ribeira de Castelhana, no Concelho.






**Figura 2.17 – Localização bacia hidrográfica da ribeira de Cadaveira, no Concelho**

A Figura 2.18 mostra a localização das secções de cálculo das sub-bacias hidrográficas estudadas.

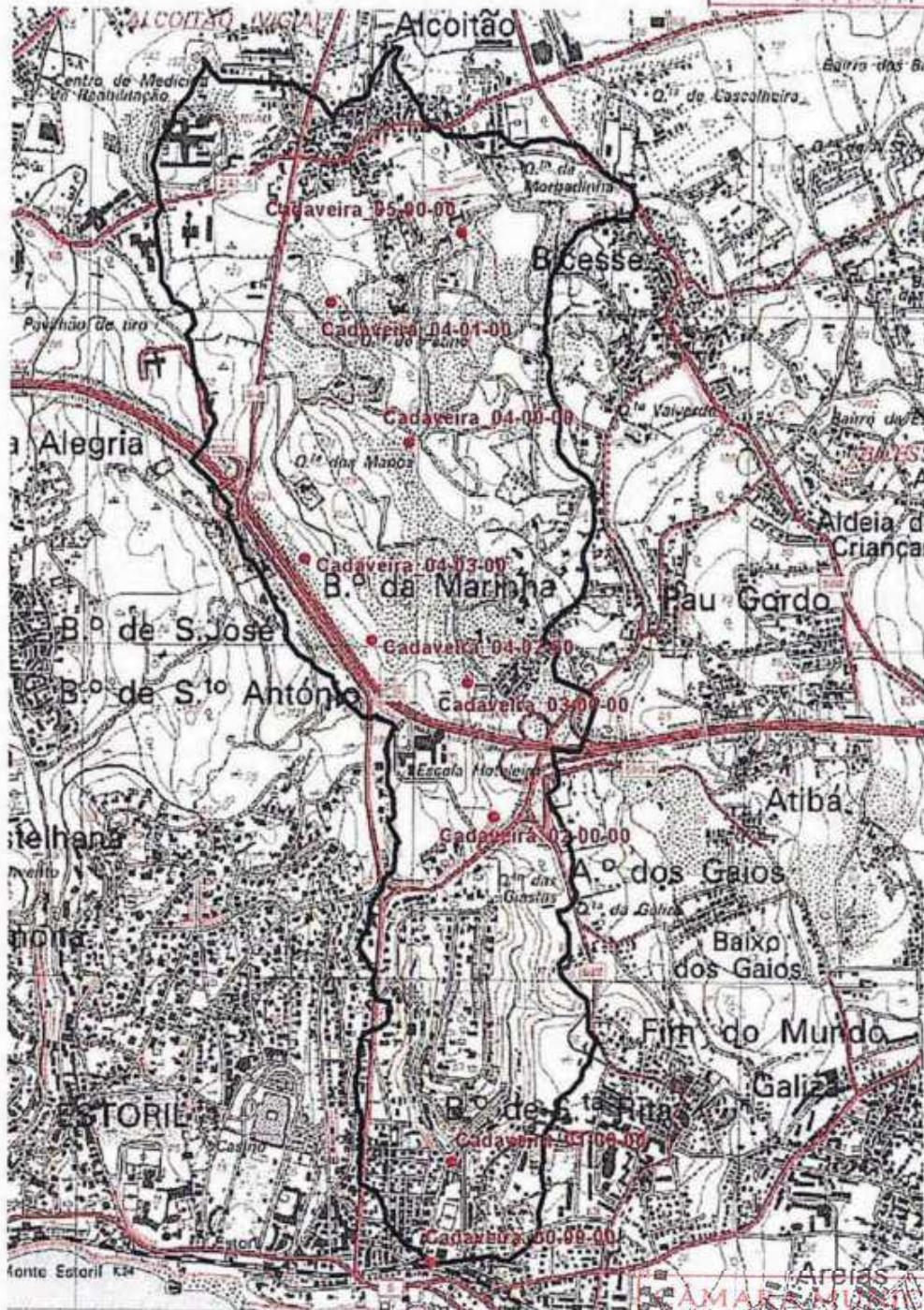


Figura 2.18 – Ribeira de Cadaveira, secções de cálculo

Na Tabela 2.17 apresentam-se as principais características fisiográficas das sub-bacias nas secções de cálculo consideradas.

**Tabela 2.17 – Características fisiográficas das sub-bacias**

Bacias hidrográficas	Bacia hidrográfica							N <sub>AMC III</sub> (SCS)
	Perímetro (km)	Área (km <sup>2</sup> )	Cotas (m)			Altura média	Declive médio (%)	
			Média	Mínima	Máxima			
Cadaveira 00-00-00	10.28	2.89	87.0	8.0	154.2	79.0	14.8	95.2
Cadaveira 01-00-00	9.68	2.71	91.0	12.3	153.5	78.7	14.7	95.2
Cadaveira 02-00-00	7.27	2.12	100.7	47.0	153.5	53.7	12.6	94.9
Cadaveira 03-00-00	6.38	1.89	103.8	62.0	153.5	41.8	12.4	94.7
Cadaveira 04-00-00	5.01	0.99	113.0	75.2	153.5	37.8	11.1	95.5
Cadaveira 04-01-00	2.62	0.36	125.5	88.1	154.0	37.4	7.0	95.7
Cadaveira 04-02-00	3.25	0.39	106.1	78.0	136.0	28.1	15.2	92.1
Cadaveira 04-03-00	2.59	0.28	109.4	85.6	136.0	23.8	13.8	92.0
Cadaveira 05-00-00	2.62	0.25	114.9	89.0	136.0	25.9	8.6	94.8

Na Tabela 2.18 apresentam-se as principais características das linhas de água nas secções de cálculo.

**Tabela 2.18 – Principais características das linhas de água das sub-bacias**

Bacias hidrográficas	Linha de água								
	Comprimento total (km)	Comp. ao centro de gravidade (km)	Cotas (m)		Declive médio (%)	Comprimento equivalente (km)	Cotas (m)		Declive equivalente (m/m)
			Mínima	Máxima			Mínima	Máxima - equivalente	
Cadaveira 00-00-00	4.0	2.207	8.0	113.0	9.7	3.411	8.0	89.0	0.0237
Cadaveira 01-00-00	3.7	2.037	12.3	113.0	10.2	3.148	12.3	90.0	0.0247
Cadaveira 02-00-00	2.5	1.368	47.0	113.0	9.5	2.114	47.0	96.6	0.0235
Cadaveira 03-00-00	2.0	1.117	62.0	113.0	6.2	1.726	62.0	100.4	0.0222
Cadaveira 04-00-00	1.2	0.683	75.2	113.0	5.6	1.056	75.2	106.7	0.0298
Cadaveira 04-01-00	0.5	0.292	88.1	132.0	7.8	0.451	88.1	127.6	0.0876
Cadaveira 04-02-00	1.3	0.706	78.0	122.0	10.6	1.091	78.0	111.3	0.0305
Cadaveira 04-03-00	0.9	0.522	85.6	122.0	9.2	0.807	85.6	113.2	0.0342
Cadaveira 05-00-00	0.5	0.270	89.0	113.0	5.4	0.417	89.0	112.0	0.0552

## 2.12 Bacia da Ribeira de Bicesse

Na Figura 2.19 apresenta-se a localização da bacia hidrográfica da ribeira de Bicesse, no Concelho.






**Figura 2.19 – Localização bacia hidrográfica da ribeira de Bicesse, no Concelho**

A Figura 2.20 mostra a localização das secções de cálculo das sub-bacias hidrográficas estudadas.



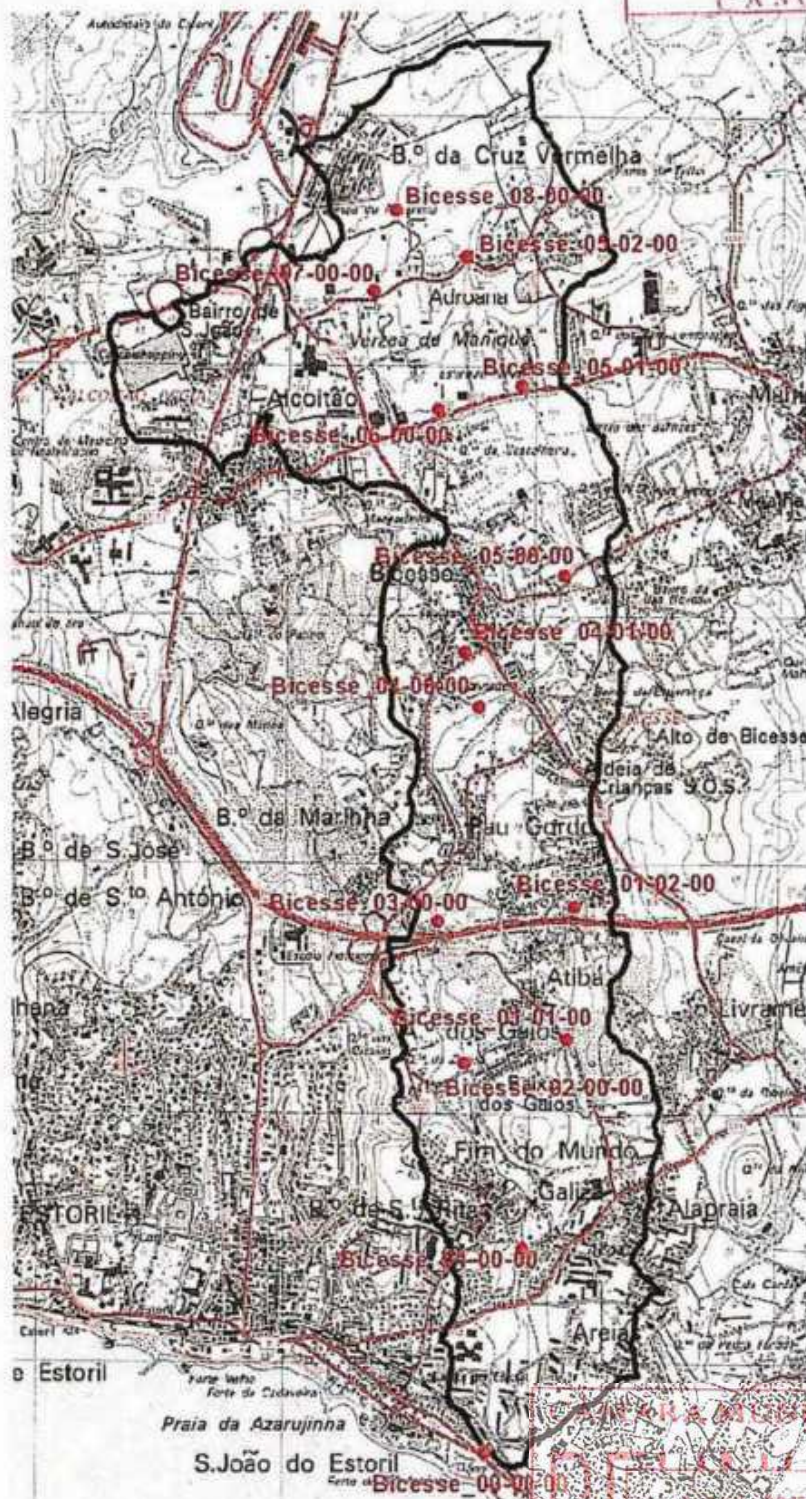


Figura 2.20 – Ribeira de Bicesse, secções de cálculo

Na Tabela 2.19 apresentam-se as principais características fisiográficas das sub-bacias nas secções de cálculo consideradas.

**Tabela 2.19 – Características fisiográficas das sub-bacias**

Bacias hidrográficas	Bacia hidrográfica							N <sub>AMC III</sub> (SCS)
	Perímetro (km)	Área (km <sup>2</sup> )	Cotas (m)			Altura média	Declive médio (%)	
			Média	Mínima	Máxima			
Bicesse 00-00-00	16.68	5.46	90.2	4.2	156.0	86.0	94.6	94.6
Bicesse 01-00-00	15.10	4.84	97.1	25.0	156.0	72.1	8.0	94.6
Bicesse 01-01-00	3.84	0.56	75.6	47.0	128.4	28.6	11.2	95.4
Bicesse 01-02-00	2.58	0.34	82.3	56.0	128.8	26.3	9.7	95.0
Bicesse 02-00-00	13.66	3.59	110.5	40.0	156.0	70.5	7.0	94.2
Bicesse 03-00-00	12.12	3.38	114.2	53.3	156.0	60.9	6.6	93.9
Bicesse 04-00-00	10.04	2.92	118.1	84.0	156.0	34.1	5.9	93.7
Bicesse 04-01-00	1.37	0.12	109.2	90.2	127.0	19.0	7.0	95.5
Bicesse 05-00-00	8.47	2.47	121.1	96.0	156.0	25.1	5.4	93.3
Bicesse 05-01-00	3.58	0.37	126.4	101.0	147.9	25.4	7.3	91.2
Bicesse 05-02-00	2.49	0.24	131.9	113.9	147.9	18.0	5.4	96.3
Bicesse 06-00-00	7.10	1.38	126.2	101.9	156.0	24.3	4.7	93.9
Bicesse 07-00-00	3.40	0.46	132.0	116.0	148.0	16.0	3.9	94.2
Bicesse 08-00-00	2.90	0.34	134.2	123.0	148.0	11.2	3.1	93.3

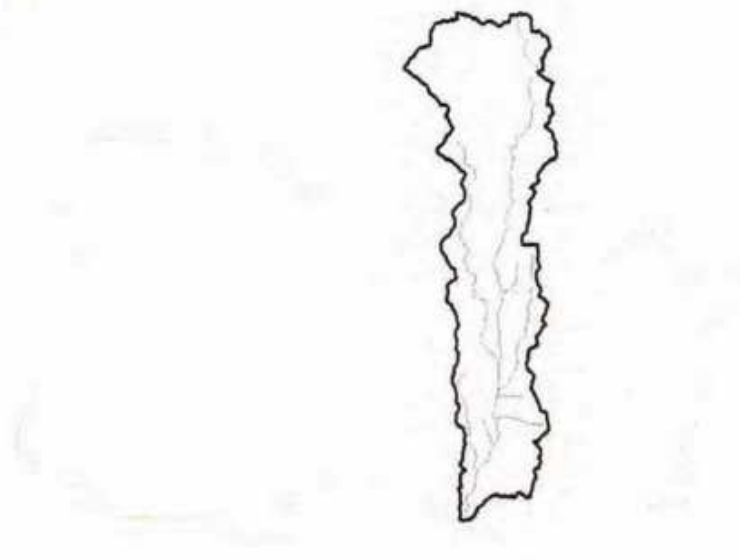
Na Tabela 2.20 apresentam-se as principais características das linhas de água nas secções de cálculo.

**Tabela 2.20 – Principais características das linhas de água das sub-bacias**

Bacias hidrográficas	Linha de água									
	Comprimento total (km)	Comp. ao centro de gravidade (km)	Cotas (m)			Declive médio (%)	Comprimento equivalente (km)	Cotas (m)		Declive equivalente (m/m)
			Mínima	Máxima	Mínima			Máxima - equivalente		
Bicesse 00-00-00	7.1	3.919	4.2	146.8	6.8	6.056	4.2	123.0	0.0196	
Bicesse 01-00-00	6.2	3.437	25.0	146.8	6.7	5.312	25.0	122.1	0.0183	
Bicesse 01-01-00	1.1	0.589	47.0	78.3	7.1	0.910	47.0	73.1	0.0287	
Bicesse 01-02-00	0.5	0.288	56.0	78.3	4.3	0.445	56.0	75.6	0.0440	
Bicesse 02-00-00	5.4	2.978	40.0	146.8	6.8	4.603	40.0	126.0	0.0187	
Bicesse 03-00-00	4.8	2.633	53.3	146.8	5.8	4.070	53.3	128.6	0.0185	
Bicesse 04-00-00	3.7	2.054	84.0	146.8	3.5	3.175	84.0	131.7	0.0150	
Bicesse 04-01-00	0.3	0.190	90.2	110.5	6.8	0.293	90.2	108.1	0.0611	
Bicesse 05-00-00	3.0	1.648	96.0	146.8	3.3	2.547	96.0	137.5	0.0163	
Bicesse 05-01-00	1.1	0.603	101.0	130.2	3.2	0.932	101.0	128.4	0.0294	
Bicesse 05-02-00	0.5	0.285	113.9	130.2	1.9	0.441	113.9	130.0	0.0365	
Bicesse 06-00-00	2.0	1.081	101.9	146.8	3.9	1.671	101.9	141.5	0.0237	
Bicesse 07-00-00	1.3	0.702	116.0	146.8	4.1	1.085	116.0	143.4	0.0253	
Bicesse 08-00-00	0.9	0.485	123.0	146.8	3.3	0.750	123.0	144.0	0.0280	

## 2.13 Bacia da Ribeira de Manique

Na Figura 2.21 apresenta-se a localização da bacia hidrográfica da ribeira de Manique, no Concelho.



**Figura 2.21 – Localização bacia hidrográfica da ribeira de Manique, no Concelho**

A Figura 2.22 mostra a localização das secções de cálculo das sub-bacias hidrográficas estudadas.



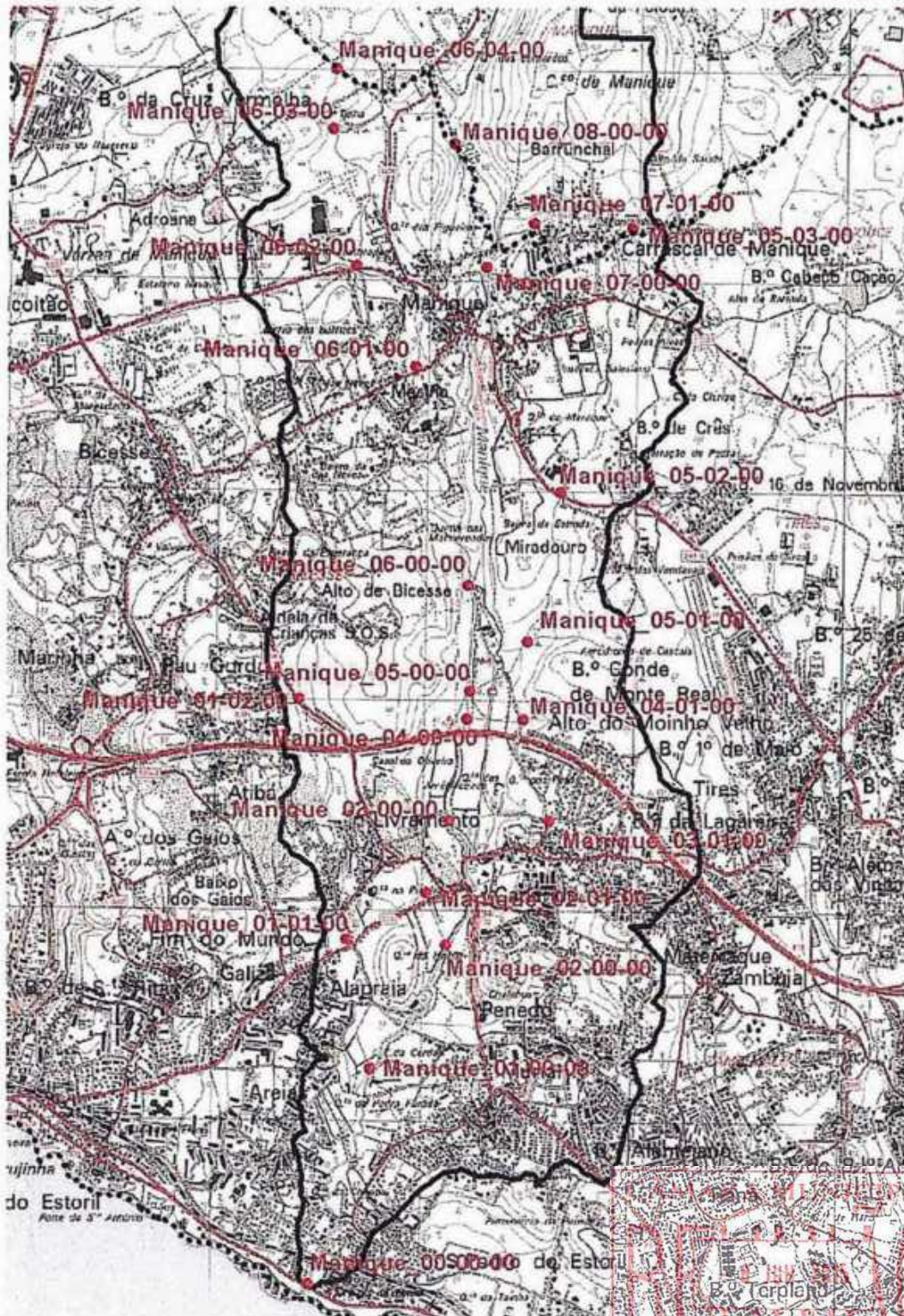


Figura 2.22 – Ribeira de Manique, secções de cálculo

Na Tabela 2.21 apresentam-se as principais características fisiográficas das sub-bacias nas secções de cálculo consideradas.

**Tabela 2.21 – Características fisiográficas das sub-bacias**

Bacias hidrográficas	Bacia hidrográfica							N <sub>AMC III</sub> (SCS)
	Perímetro (km)	Área (km <sup>2</sup> )	Cotas (m)			Altura média	Declive médio (%)	
			Média	Mínima	Máxima			
Manique 00-00-00	31.08	20.19	144.3	14.0	525.0	130.3	10.4	91.2
Manique 01-00-00	29.62	19.46	148.4	15.9	525.0	132.5	10.5	91.1
Manique 01-01-00	4.88	0.69	77.3	37.9	129.0	39.4	11.0	91.9
Manique 01-02-00	2.11	0.24	93.7	68.0	129.0	25.7	12.1	92.6
Manique 02-00-00	27.26	17.33	158.8	36.0	525.0	122.8	10.6	90.9
Manique 02-01-00	1.46	0.10	54.3	39.0	76.0	15.3	11.9	89.5
Manique 03-00-00	27.08	16.86	161.6	44.8	525.0	116.8	10.6	90.9
Manique 03-01-00	2.44	0.35	87.0	69.1	105.0	17.9	6.4	94.7
Manique 04-00-00	25.50	15.99	166.5	49.0	525.0	117.5	10.6	90.8
Manique 04-01-00	2.16	0.19	85.5	64.0	2.1	21.5	7.5	89.5
Manique 05-00-00	24.56	15.73	167.9	50.0	525.0	117.9	10.7	90.8
Manique 05-01-00	7.68	1.35	111.2	63.0	197.0	48.2	6.6	91.3
Manique 05-02-00	5.98	1.02	119.5	89.0	197.0	30.5	5.5	91.9
Manique 05-03-00	2.31	0.21	166.7	119.3	197.0	47.4	10.3	93.1
Manique 06-00-00	22.32	14.00	175.9	56.0	525.0	119.9	11.0	90.8
Manique 06-01-00	10.82	2.13	136.7	87.0	210.0	49.7	6.9	92.2
Manique 06-02-00	10.07	1.97	139.7	97.0	210.0	42.7	6.7	92.0
Manique 06-03-00	7.80	1.36	153.0	116.0	210.0	37.0	5.4	91.7
Manique 06-04-00	6.71	1.03	158.9	123.4	210.0	35.5	4.9	90.8
Manique 07-00-00	18.32	10.29	197.1	82.0	525.0	115.1	12.1	90.1
Manique 07-01-00	2.22	0.26	156.4	101.3	197.0	55.1	13.8	93.8
Manique 08-00-00	17.19	9.72	201.0	98.0	525.0	103.0	11.8	90.0

Na Tabela 2.22 apresentam-se as principais características das linhas de água nas secções de cálculo.

**Tabela 2.22 – Principais características das linhas de água das sub-bacias**

Bacias hidrográficas	Linha de água								
	Comprimento total (km)	Comp. centro gravidade (km)	Cotas (m)		Declive médio (%)	Comprimento equivalente (km)	Cotas (m)		Declive equivalente (m/m)
			Mínima	Máxima			Mínima	Máxima - equivalente	
Manique 00-00-00	12.6	6.919	14.0	249.2	6.6	10.693	14.0	168.0	0.0144
Manique 01-00-00	11.4	6.245	15.9	249.2	6.8	9.652	15.9	171.1	0.0161
Manique 01-01-00	1.7	0.943	37.9	84.9	5.9	1.458	37.9	173.0	0.0241
Manique 01-02-00	0.5	0.260	68.0	84.9	7.2	0.402	68.0	75.2	0.0179
Manique 02-00-00	10.6	5.830	36.0	249.2	7.0	9.010	36.0	173.2	0.0152
Manique 02-01-00	0.4	0.228	39.0	53.6	4.6	0.352	39.0	51.0	0.0341
Manique 03-00-00	9.9	5.443	44.8	249.2	7.1	8.412	44.8	174.2	0.0154
Manique 03-01-00	0.6	0.347	69.1	91.3	5.1	0.536	69.1	88.9	0.0369

Bacias hidrográficas	Linha de água								
	Comprimento total (km)	Comp. centro gravidade (km)	Cotas (m)		Declive médio (%)	Comprimento equivalente (km)	Cotas (m)		Declive equivalente (m/m)
			Mínima	Máxima			Mínima	Máxima - equivalente	
Manique 04-00-00	9.4	5.157	49.0	249.2	7.5	7.970	49.0	178.2	0.0162
Manique 04-01-00	0.3	0.139	64.0	78.3	6.1	0.214	64.0	76.1	0.0565
Manique 05-00-00	9.2	5.081	50.0	249.2	7.5	7.853	50.0	177.3	0.0162
Manique 05-01-00	3.0	1.648	63.0	175.9	5.9	2.547	63.0	138.1	0.0295
Manique 05-02-00	2.2	1.216	89.0	175.9	5.4	1.879	89.0	144.9	0.0297
Manique 05-03-00	0.7	0.393	119.3	175.9	8.8	0.607	119.3	166.4	0.0776
Manique 06-00-00	8.7	4.797	56.0	249.2	7.7	7.413	56.0	178.0	0.0165
Manique 06-01-00	4.7	2.586	87.0	188.2	3.4	3.997	87.0	188.2	0.0253
Manique 06-02-00	4.0	2.209	97.0	188.2	3.5	3.414	97.0	159.1	0.0182
Manique 06-03-00	3.2	1.756	116.0	188.2	3.6	2.714	116.0	162.0	0.0169
Manique 06-04-00	2.8	1.567	123.4	210.0	3.6	2.422	123.4	165.0	0.0172
Manique 07-00-00	7.1	3.909	82.0	249.2	7.7	6.042	82.0	185.2	0.0171
Manique 07-01-00	0.5	0.294	101.3	160.5	14.3	0.454	101.3	150.2	0.1077
Manique 08-00-00	6.4	3.544	98.0	249.2	7.2	5.477	98.0	198.3	0.0183

## 2.14 Bacia da Ribeira das Marianas

Na Figura 2.23 apresenta-se a localização da bacia hidrográfica da ribeira das Marianas, no Concelho.

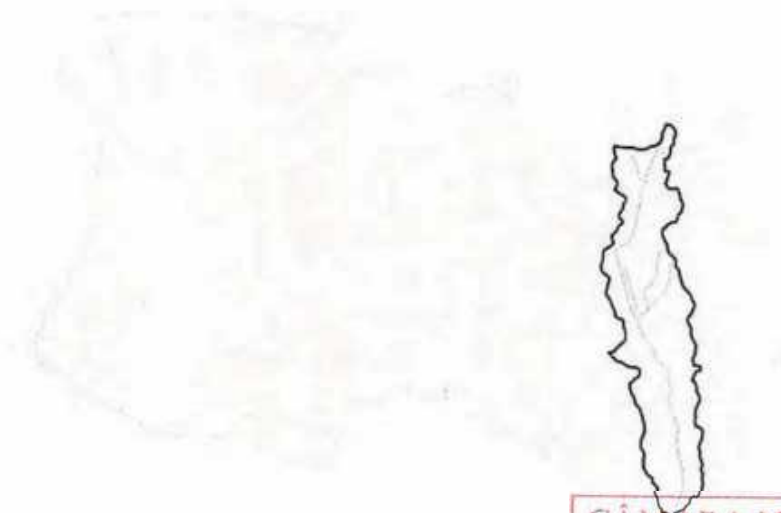


Figura 2.23 – Localização bacia hidrográfica da ribeira das Marianas, no Concelho

A Figura 2.24 mostra a localização das secções de cálculo das sub-bacias hidrográficas estudadas.

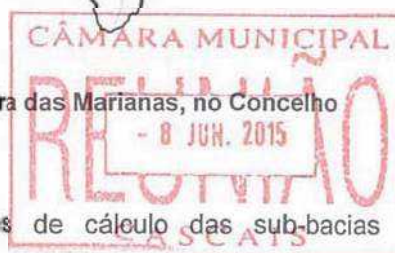




Figura 2.24 – Ribeira das Marianas, secções de cálculo

Na Tabela 2.23 apresentam-se as principais características fisiográficas das sub-bacias nas secções de cálculo consideradas.

**Tabela 2.23 – Características fisiográficas das sub-bacias**

Bacias hidrográficas	Bacia hidrográfica							N <sub>AMC III</sub> (SCS)
	Perímetro (km)	Área (km <sup>2</sup> )	Cotas (m)			Altura média	Declive médio (%)	
			Média	Mínima	Máxima			
Marianas 00-00-00	19.95	8.40	82.3	4.0	184.0	78.3	5.6	92.9
Marianas 01-00-00	18.50	7.54	88.7	20.0	184.0	68.7	5.8	92.6
Marianas 02-00-00	17.91	7.31	90.4	23.0	184.0	67.4	5.8	92.5
Marianas 03-00-00	16.54	6.25	96.2	36.0	184.0	60.2	5.8	92.1
Marianas 04-00-00	15.17	5.99	97.9	52.0	184.0	45.9	5.6	92.0
Marianas 05-00-00	13.67	5.15	101.3	62.0	184.0	39.3	4.9	91.9
Marianas 06-00-00	11.96	4.15	104.6	69.0	184.0	35.6	4.6	91.1
Marianas 07-00-00	10.91	3.76	107.0	80.0	184.0	27.0	4.5	90.7
Marianas 07-01-00	4.17	0.89	98.9	81.3	115.0	17.6	4.0	91.8
Marianas 07-01-01	2.56	0.23	100.2	85.9	113.0	14.3	4.1	92.6
Marianas 07-02-00	2.92	0.48	102.2	90.8	115.0	11.4	4.3	89.7
Marianas 07-03-00	2.44	0.25	104.3	92.0	115.0	12.3	4.4	89.4
Marianas 08-00-00	10.82	2.81	102.0	82.0	184.0	20.0	4.6	90.3
Marianas 09-00-00	7.76	2.09	115.9	97.0	184.0	18.9	4.9	89.9
Marianas 10-00-00	7.44	2.00	116.5	99.1	184.0	17.4	5.1	89.7
Marianas 11-00-00	6.49	1.66	118.5	104.0	184.0	14.5	5.5	89.4
Marianas 12-00-00	4.92	0.98	122.7	108.3	184.0	14.4	6.8	89.4
Marianas 13-00-00	4.21	0.64	124.0	110.1	184.0	13.9	6.9	89.4
Marianas 13-01-00	1.62	0.16	136.7	114.9	184.0	21.8	11.6	89.4
Marianas 14-00-00	1.80	0.15	122.4	115.1	131.0	7.3	4.5	89.4

Na Tabela 2.24 apresentam-se as principais características das linhas de água nas secções de cálculo.

**Tabela 2.24 – Principais características das linhas de água das sub-bacias**

Bacias hidrográficas	Linha de água								
	Comprimento total (km)	Comp. centro gravidade (km)	Cotas (m)		Declive médio (%)	Comprimento equivalente (km)	Cotas (m)		Declive equivalente (m/m)
			Mínima	Máxima			Mínima	Máxima - equivalente	
Marianas 00-00-00	8.4	4.640	4.0	126.0	4.5	7.171	4.0	109.4	0.0147
Marianas 01-00-00	7.8	4.266	20.0	126.0	4.6	6.593	20.0	110.5	0.0137
Marianas 02-00-00	7.5	4.107	23.0	126.0	4.6	6.348	23.0	112.2	0.0141
Marianas 03-00-00	6.8	3.753	36.0	126.0	4.4	5.800	36.0	112.7	0.0132
Marianas 04-00-00	6.0	3.310	52.0	126.0	4.1	5.115	52.0	113.0	0.0119
Marianas 05-00-00	5.3	2.920	62.0	126.0	3.2	4.513	62.0	114.0	0.0115
Marianas 06-00-00	4.9	2.668	69.0	126.0	3.0	4.123	69.0	114.4	0.0110
Marianas 07-00-00	4.2	2.323	80.0	126.0	3.0	3.590	80.0	115.0	0.0097
Marianas 07-01-00	1.4	0.789	81.3	107.7	2.3	1.220	81.3	101.3	0.0164
Marianas 07-01-01	0.9	0.486	85.9	109.2	3.0	0.751	85.9	105.0	0.0254
Marianas 07-02-00	0.8	0.442	90.8	107.7	2.5	0.683	90.8	103.7	0.0189
Marianas 07-03-00	0.6	0.351	92.0	107.7	2.9	0.542	92.0	104.4	0.0229

Bacias hidrográficas	Linha de água								
	Comprimento total (km)	Comp. centro gravidade (km)	Cotas (m)		Declive médio (%)	Comprimento equivalente (km)	Cotas (m)		Declive equivalente (m/m)
			Mínima	Máxima			Mínima	Máxima - equivalente	
Marianas 08-00-00	4.1	2.231	82.0	126.0	3.1	3.448	82.0	115.0	0.0096
Marianas 09-00-00	2.8	1.535	97.0	126.0	1.8	2.372	97.0	118.6	0.0091
Marianas 10-00-00	2.6	1.449	99.1	126.0	1.6	2.240	99.1	119.0	0.0089
Marianas 11-00-00	2.0	1.123	104.0	126.0	1.6	1.735	104.0	120.1	0.0093
Marianas 12-00-00	1.4	0.768	108.3	126.0	1.8	1.187	108.3	121.8	0.0114
Marianas 13-00-00	1.2	0.645	110.1	126.0	2.0	0.997	110.1	122.0	0.0119
Marianas 13-01-00	0.3	0.170	114.9	130.0	5.1	0.263	114.9	126.4	0.0437
Marianas 14-00-00	0.6	0.312	115.1	126.0	3.1	0.483	115.1	125.7	0.0219

## 2.15 Bacia da Ribeira de Sassoeiros

Na Figura 2.25 apresenta-se a localização da bacia hidrográfica da ribeira de Sassoeiros, no Concelho.



Figura 2.25 – Localização bacia hidrográfica da ribeira de Sassoeiros, no Concelho

A Figura 2.26 mostra a localização das secções de cálculo das sub-bacias hidrográficas estudadas.

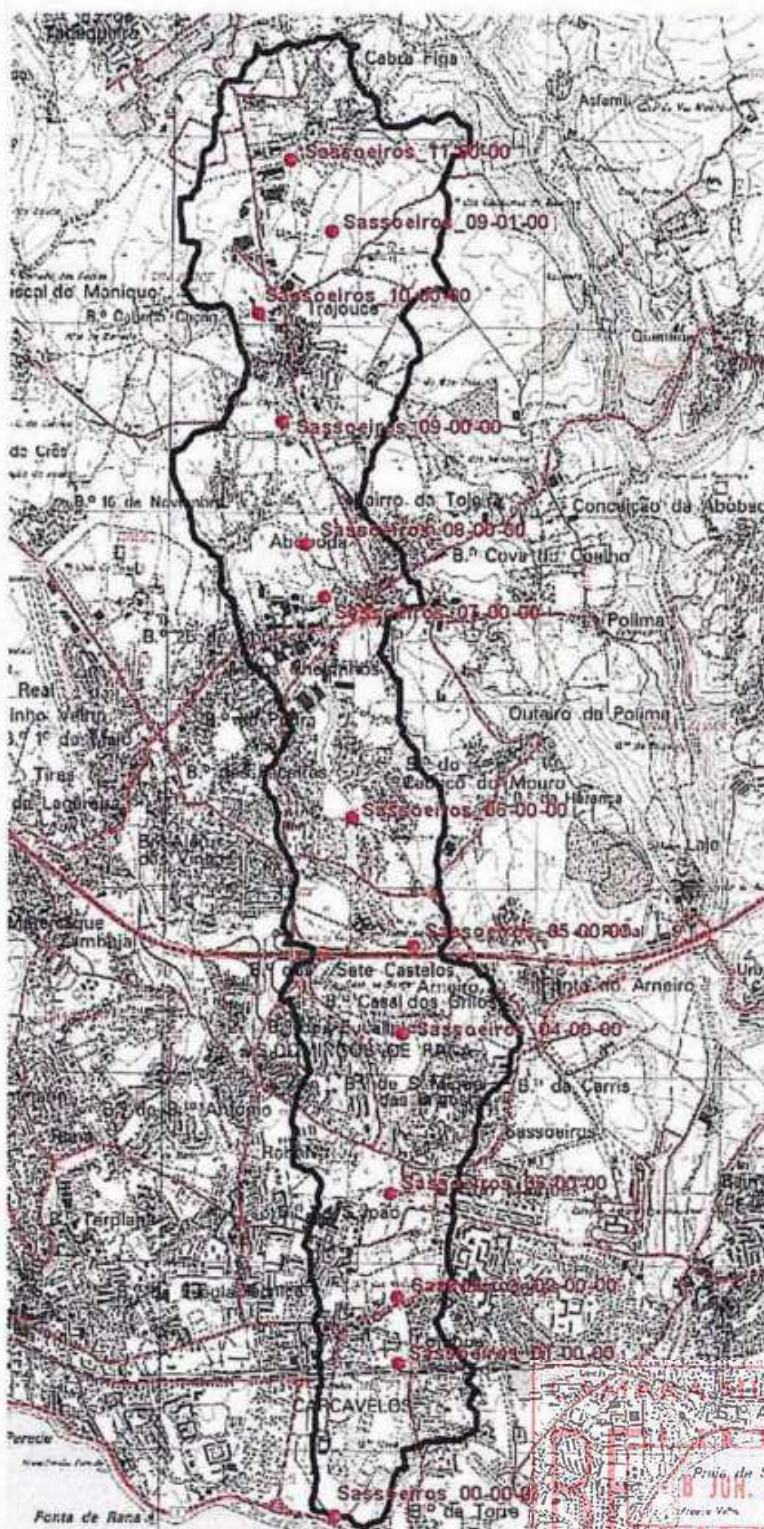


Figura 2.26 – Ribeira de Sassoelros, secções de cálculo

Na Tabela 2.25 apresentam-se as principais características fisiográficas das sub-bacias nas secções de cálculo consideradas.

**Tabela 2.25 – Características fisiográficas das sub-bacias**

Bacias hidrográficas	Bacia hidrográfica							NAMC III (SCS)
	Perímetro (km)	Área (km <sup>2</sup> )	Cotas (m)			Altura média	Declive médio (%)	
			Média	Mínima	Máxima			
Sassoeiros 00-00-00	21.04	7.10	85.7	6.0	153.0	79.7	5.5	91.7
Sassoeiros 01-00-00	19.01	6.45	92.4	10.0	153.0	82.4	6.0	91.7
Sassoeiros 02-00-00	18.08	6.04	96.9	16.0	153.0	80.9	5.5	91.7
Sassoeiros 03-00-00	17.19	5.89	98.6	24.0	153.0	74.6	5.5	91.7
Sassoeiros 04-00-00	14.68	4.84	108.2	43.0	153.0	65.2	4.7	91.3
Sassoeiros 05-00-00	13.56	4.48	111.0	68.0	153.0	43.0	4.5	91.5
Sassoeiros 06-00-00	12.12	3.92	114.1	83.0	153.0	31.1	4.1	91.5
Sassoeiros 07-00-00	9.28	3.04	118.8	96.8	153.0	22.0	3.9	91.0
Sassoeiros 08-00-00	8.66	2.77	120.3	99.0	153.0	21.3	3.9	91.0
Sassoeiros 09-00-00	6.95	2.14	123.5	107.0	153.0	16.5	4.1	91.4
Sassoeiros 09-01-00	2.45	0.32	133.0	119.0	153.0	14.0	4.9	89.5
Sassoeiros 10-00-00	4.55	0.94	123.0	114.0	147.7	9.0	4.3	92.0
Sassoeiros 11-00-00	2.27	0.30	127.6	119.0	141.8	8.6	4.9	93.4

Na Tabela 2.26 apresentam-se as principais características das linhas de água nas secções de cálculo.

**Tabela 2.26 – Principais características das linhas de água das sub-bacias**

Bacias hidrográficas	Linha de água								
	Comprimento total (km)	Comp. centro gravidade (km)	Cotas (m)		Declive médio (%)	Comprimento equivalente (km)	Cotas (m)		Declive equivalente (m/m)
			Mínima	Máxima			Mínima	Máxima - equivalente	
Sassoeiros 00-00-00	8.6	4.706	6.0	123.3	6.4	7.273	6.0	115.0	0.0150
Sassoeiros 01-00-00	7.6	4.182	10.0	123.3	6.3	6.463	10.0	116.9	0.0165
Sassoeiros 02-00-00	7.2	3.983	16.0	123.3	5.5	6.156	16.0	116.6	0.0163
Sassoeiros 03-00-00	6.7	3.676	24.0	123.3	5.4	5.681	24.0	123.3	0.0175
Sassoeiros 04-00-00	5.8	3.166	43.0	123.3	5.2	4.893	43.0	116.0	0.0149
Sassoeiros 05-00-00	5.2	2.865	68.0	123.3	4.2	4.428	68.0	117.1	0.0111
Sassoeiros 06-00-00	4.4	2.398	83.0	123.3	3.0	3.706	83.0	118.6	0.0096
Sassoeiros 07-00-00	3.1	1.698	96.8	123.3	2.1	2.624	96.8	119.5	0.0097
Sassoeiros 08-00-00	2.8	1.526	99.0	123.3	2.1	2.359	99.0	120.0	0.0089
Sassoeiros 09-00-00	2.0	1.114	107.0	123.3	1.9	1.721	107.0	120.0	0.0076
Sassoeiros 09-01-00	1.0	0.529	119.0	145.0	3.0	0.817	119.0	144.2	0.0308
Sassoeiros 10-00-00	1.4	0.767	114.0	123.3	1.8	1.185	114.0	121.5	0.0063
Sassoeiros 11-00-00	0.5	0.283	119.0	123.3	1.6	0.437	119.0	123.0	0.0092





## 2.16 Bacia da Ribeira da Laje

Na Figura 2.27 apresenta-se a localização da bacia hidrográfica da ribeira da Laje, no Concelho.

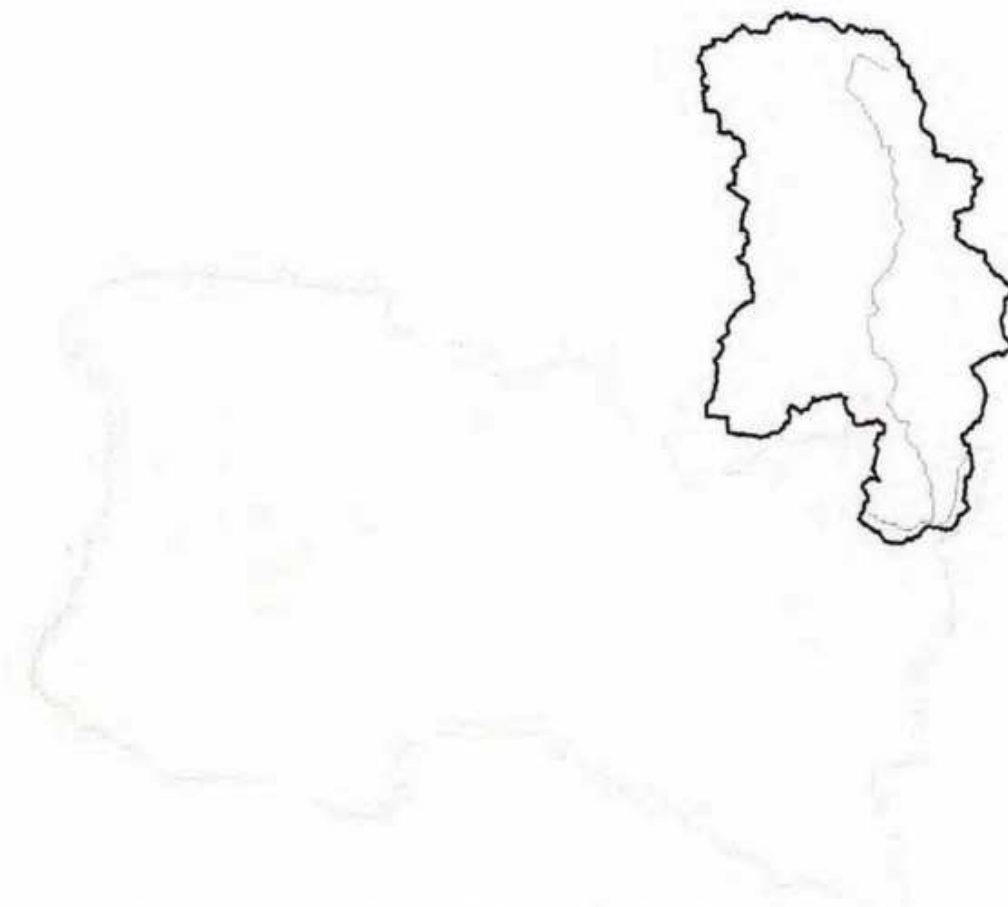


Figura 2.27 – Localização bacia hidrográfica da ribeira da Laje, no Concelho

A Figura 2.28 mostra a localização das secções de cálculo das sub-bacias hidrográficas estudadas.





Figura 2.28 – Ribeira da Laje, secções de cálculo

Na Tabela 2.27 apresentam-se as principais características fisiográficas das sub-bacias nas secções de cálculo consideradas.

**Tabela 2.27 – Características fisiográficas das sub-bacias**

Bacias hidrográficas	Bacia hidrográfica							N <sub>AMC III</sub> (SCS)
	Perímetro (km)	Área (km <sup>2</sup> )	Cotas (m)			Altura média	Declive médio (%)	
			Média	Mínima	Máxima			
Laje 00-00-00	31.15	26.83	151.1	52.0	261.0	99.1	10.4	93.3
Laje 00-01-00	2.44	0.23	134.7	108.0	162.0	26.7	12.8	95.1
Laje 01-00-00	31.15	26.35	151.8	54.0	261.0	97.8	10.3	93.2
Laje 01-01-00	3.25	0.55	128.7	100.0	149.0	28.7	6.0	91.5
Laje 02-00-00	27.97	24.53	154.9	70.0	261.0	84.9	9.9	93.3

Na Tabela 2.28 apresentam-se as principais características das linhas de água nas secções de cálculo.

**Tabela 2.28 – Principais características das linhas de água das sub-bacias**

Bacias hidrográficas	Linha de água								
	Comprimento total (km)	Comp. ao centro de gravidade (km)	Cotas (m)		Declive médio (%)	Comprimento equivalente (km)	Cotas (m)		Declive equivalente (m/m)
			Mínima	Máxima			Mínima	Máxima - equivalente	
Laje 00-00-00	9.8	5.391	52.0	191.1	11.4	8.331	52.0	150.0	0.0118
Laje 00-01-00	0.5	0.254	108.0	157.0	11.6	0.393	108.0	140.3	0.0822
Laje 01-00-00	9.7	5.338	54.0	191.1	11.4	8.249	54.0	152.1	0.0119
Laje 01-01-00	0.7	0.381	100.0	120.8	5.8	0.589	100.0	119.5	0.0331
Laje 02-00-00	8.2	4.517	70.0	191.1	11.4	6.981	70.0	152.0	0.0117

## 2.17 Bacia da Ribeira da "Polima" (afluente da Ribeira da Laje)

Na Figura 2.29 apresenta-se a localização da bacia hidrográfica da ribeira da "Polima", no Concelho.



**Figura 2.29 – Localização bacia hidrográfica da ribeira da “Polima” (afluente da Ribeira da Laje), no Concelho**

A Figura 2.30 mostra a localização das secções de cálculo das sub-bacias hidrográficas estudadas.



Figura 2.30 – Ribeira da "Polima" (afluente da Ribeira da Laje), secções de cálculo

Na Tabela 2.29 apresentam-se as principais características fisiográficas das sub-bacias nas secções de cálculo consideradas.

Tabela 2.29 – Características fisiográficas das sub-bacias

Bacias hidrográficas	Bacia hidrográfica							N <sup>o</sup> AMC III (SCS)
	Perímetro (km)	Área (km <sup>2</sup> )	Cotas (m)			Altura média	Declive médio (%)	
			Média	Mínima	Máxima			
Polima-Laje 00-00-00	7.17	1.90	94.8	49.0	123.0	45.8	8.1	90.8
Polima-Laje 01-00-00	6.29	1.63	98.1	64.0	123.0	34.1	6.5	90.7
Polima-Laje 01-01-00	4.83	1.00	99.9	66.9	122.0	33.0	5.1	91.2
Polima-Laje 01-02-00	4.44	0.92	101.5	72.0	122.0	29.5	4.7	91.4
Polima-Laje 01-03-00	3.09	0.35	97.2	82.0	119.5	15.2	4.8	91.4
Polima-Laje 02-00-00	2.96	0.50	98.1	72.9	123.0	25.2	7.9	90.0
Polima-Laje 03-00-00	1.99	0.18	100.3	89.9	115.2	10.4	4.4	91.0

Na Tabela 2.30 apresentam-se as principais características das linhas de água nas secções de cálculo.

**Tabela 2.30 – Principais características das linhas de água das sub-bacias**

Bacias hidrográficas	Linha de água								
	Comprimento total (km)	Comp. centro gravidade (km)	Cotas (m)		Declive médio (%)	Comprimento equivalente (km)	Cotas (m)		Declive equivalente (m/m)
			Mínima	Máxima			Mínima	Máxima - equivalente	
Polima-Laje 00-00-00	2.4	1.346	49.0	113.7	4.9	2.081	49.0	104.0	0.0264
Polima-Laje 01-00-00	1.7	0.949	64.0	113.7	4.8	1.466	64.0	106.9	0.0293
Polima-Laje 01-01-00	1.6	0.898	66.9	113.7	4.7	1.387	66.9	107.5	0.0293
Polima-Laje 01-02-00	1.5	0.800	72.0	113.7	3.9	1.236	72.0	108.0	0.0291
Polima-Laje 01-03-00	0.5	0.248	82.0	94.4	4.0	0.383	82.0	92.4	0.0272
Polima-Laje 02-00-00	0.7	0.396	72.9	99.4	6.5	0.612	72.9	97.1	0.0395
Polima-Laje 03-00-00	0.3	0.179	89.9	99.4	3.9	0.277	89.9	98.0	0.0292

## 2.18 Bacia da Ribeira do "Arneiro" (afluente da Ribeira da Laje)

Na Figura 2.31 apresenta-se a localização da bacia hidrográfica da ribeira da "Arneiro", no Concelho.

**Figura 2.31 – Localização bacia hidrográfica da ribeira do "Arneiro" (afluente da Ribeira da Laje), no Concelho**

A Figura 2.32 mostra a localização das secções de cálculo das sub-bacias hidrográficas estudadas.

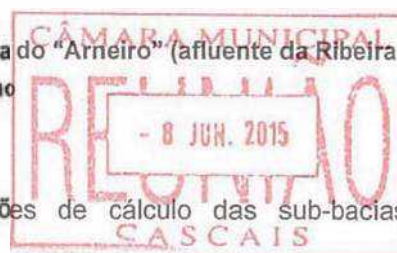





Figura 2.32 – Ribeira do “Arneiro” (afluente da Ribeira da Laje), secções de cálculo

Na Tabela 2.31 apresentam-se as principais características fisiográficas das sub-bacias nas secções de cálculo consideradas.

Tabela 2.31 – Características fisiográficas das sub bacias

Bacias hidrográficas	Bacia hidrográfica		Cotas (m)			Altura média	Declive médio (%)	N.A.M.C. II (SCS)
	Perímetro (km)	Área (km <sup>2</sup> )	Média	Minima	Máxima			
			Arneiro-Laje 00-00-00	3.71	0.52			
Arneiro-Laje 01-00-00	3.04	0.44	85.6	57.3	120.0	28.3	8.3	90.7
Arneiro-Laje 02-00-00	2.24	0.25	92.2	72.0	120.0	20.2	6.8	89.4

Na Tabela 2.32 apresentam-se as principais características das linhas de água nas secções de cálculo.

**Tabela 2.32 – Principais características das linhas de água das sub-bacias**

Bacias hidrográficas	Linha de água								
	Comprimento total (km)	Comp. ao centro de gravidade (km)	Cotas (m)		Declive médio (%)	Comprimento equivalente (km)	Cotas (m)		Declive equivalente (m/m)
			Mínima	Máxima			Mínima	Máxima - equivalente	
Arneiro-Laje 00-00-00	1.1	0.578	47.5	92.3	8.3	0.893	47.5	85.0	0.0420
Arneiro-Laje 01-00-00	0.8	0.421	57.3	92.3	8.6	0.651	57.3	87.5	0.0464
Arneiro-Laje 02-00-00	0.4	0.242	72.0	92.3	7.1	0.374	72.0	90.0	0.0481





### 3 Tempo de concentração ( $T_c$ )

#### 3.1 Considerações gerais

O tempo de concentração ( $T_c$ ) da bacia define-se como sendo o tempo necessário para que uma gota de água caída no ponto mais afastado da bacia chegue à secção em estudo.

A estimativa do tempo de concentração ( $T_c$ ) foi efectuada por aplicação de várias fórmulas (*Soil Conservation Service - SCS; Kirpich; Kirpich Modificado por Chow; Temez; Ven Te Chow, U. S. Corps of Engineers*). O valor adoptado foi a média dos valores obtidos excluindo os valores extremos.

Nos pontos seguintes apresentam-se os tempos de concentração em horas determinados por vários métodos e os tempos de concentração adoptados para cada bacia e sub-bacias consideradas no estudo.

#### 3.2 Bacia da Ribeira do "Assobio"

Na Tabela 3.1 apresentam-se os tempos de concentração em horas determinados por vários métodos e os tempos de concentração adoptados para as sub-bacias da ribeira do "Assobio".

Tabela 3.1 – Tempo de concentração para as várias sub-bacias da Ribeira do "Assobio"

Bacias hidrográficas	Tempo de concentração (h)								Veloc. correspondente a $T_c$ (m/s)
	S C Service	Kirpich	Kirpich Modificado por Chow	Temez	Vem Te Chow	U S Corps of Engineers	$T_c$ calculado	$T_c$ adoptado	
Assobio 00-00-00	0.38	0.18	0.18	0.26	0.22	0.25	0.23	0.23	2.093
Assobio 01-00-00	0.34	0.15	0.15	0.22	0.19	0.21	0.19	0.20	1.943
Assobio 02-00-00	0.23	0.09	0.09	0.13	0.13	0.13	0.12	0.12	1.789

#### 3.3 Bacia da Ribeira da Ribeira de "Grotta"

Na Tabela 3.2 apresentam-se os tempos de concentração em horas determinados por vários métodos e os tempos de concentração adoptados para as sub-bacias da ribeira de "Grotta".

**Tabela 3.2 – Tempo de concentração para as várias sub-bacias da Ribeira de “Grotas”**

Bacias hidrográficas	Tempo de concentração (h)								Veloc. correspondente a $T_c$ (m/s)
	S C Service	Kirpich	Kirpich Modificado por Chow	Temez	Vem Te Chow	U S Corps of Engineers	$T_c$ calculado	$T_c$ adoptado	
Grota 00-00-00	0.43	0.24	0.24	0.33	0.28	0.31	0.29	0.28	2.276
Grota 01-00-00	0.40	0.22	0.22	0.30	0.26	0.29	0.27	0.27	2.124
Grota 01-01-00	0.05	0.04	0.04	0.06	0.06	0.06	0.05	0.05	1.394
Grota 02-00-00	0.35	0.17	0.17	0.23	0.21	0.23	0.21	0.22	1.967
Grota 02-01-00	0.08	0.04	0.04	0.06	0.06	0.06	0.06	0.05	1.628
Grota 03-00-00	0.22	0.09	0.09	0.13	0.12	0.12	0.12	0.12	1.762

### 3.4 Bacia da Ribeira de “Praia”

Na Tabela 3.3 apresentam-se os tempos de concentração em horas determinados por vários métodos e os tempos de concentração adoptados para as sub-bacias da ribeira de “Praia”.

**Tabela 3.3 — Tempo de concentração para as várias sub-bacias da Ribeira de “Praia”**

Bacias hidrográficas	Tempo de concentração (h)								Veloc. correspondente a $T_c$ (m/s)
	S C Service	Kirpich	Kirpich Modificado por Chow	Temez	Vem Te Chow	U S Corps of Engineers	$T_c$ calculado	$T_c$ adoptado	
Praia 00-00-00	0.21	0.18	0.18	0.23	0.22	0.22	0.21	0.20	1.690
Praia 01-00-00	0.15	0.12	0.11	0.15	0.15	0.14	0.14	0.13	1.532

### 3.5 Bacia da Ribeira do Arneiro

Na Tabela 3.4 apresentam-se os tempos de concentração em horas determinados por vários métodos e os tempos de concentração adoptados para as sub-bacias da ribeira do Arneiro.

**Tabela 3.4 – Tempo de concentração para as várias sub-bacias da Ribeira do Arneiro**

Bacias hidrográficas	Tempo de concentração (h)								Veloc. correspondente a $T_c$ (m/s)
	S C Service	Kirpich	Kirpich Modificado por Chow	Temez	Vem Te Chow	U S Corps of Engineers	$T_c$ calculado	$T_c$ adoptado	
Arneiro 00-00-00	0.52	0.44	0.43	0.48	0.46	0.48	0.47	<b>0.47</b>	1.923
Arneiro 01-00-00	0.46	0.33	0.33	0.43	0.37	0.39	0.38	<b>0.38</b>	2.042
Arneiro 01-01-00	0.37	0.24	0.24	0.32	0.28	0.30	0.29	<b>0.28</b>	2.022
Arneiro 01-02-00	0.28	0.16	0.16	0.22	0.20	0.21	0.20	<b>0.20</b>	1.865
Arneiro 01-03-00	0.18	0.07	0.07	0.11	0.11	0.11	0.10	<b>0.10</b>	1.739
Arneiro 02-00-00	0.28	0.26	0.25	0.29	0.30	0.27	0.28	<b>0.28</b>	1.467
Arneiro 02-01-00	0.25	0.29	0.28	0.31	0.33	0.29	0.29	<b>0.30</b>	1.369
Arneiro 02-02-00	0.16	0.12	0.12	0.15	0.16	0.14	0.14	<b>0.15</b>	1.237
Arneiro 03-00-00	0.05	0.04	0.04	0.05	0.06	0.04	0.05	<b>0.05</b>	0.833

### 3.6 Bacia da Ribeira da Foz do Guincho

Na Tabela 3.5 apresentam-se os tempos de concentração em horas determinados por vários métodos e os tempos de concentração adoptados para as sub-bacias da ribeira da Foz do Guincho.

**Tabela 3.5 – Tempo de concentração para as várias sub-bacias da Ribeira da Foz do Guincho**

Bacias hidrográficas	Tempo de concentração (h)								Veloc. correspondente a $T_c$ (m/s)
	S C Service	Kirpich	Kirpich Modificado por Chow	Temez	Vem Te Chow	U S Corps of Engineers	$T_c$ calculado	$T_c$ adoptado	
Foz do Guincho 00-00-00	1.00	0.75	0.74	0.90	0.73	0.81	0.77	<b>0.77</b>	2.259
Foz do Guincho 01-00-00	0.88	0.65	0.64	0.78	0.64	0.71	0.67	<b>0.67</b>	2.255
Foz do Guincho 01-01-00	0.70	0.54	0.53	0.50	0.55	0.48	0.53	<b>0.53</b>	1.327
Foz do Guincho 01-02-00	0.50	0.42	0.41	0.38	0.45	0.37	0.42	<b>0.42</b>	1.113
Foz do Guincho 01-03-00	0.33	0.31	0.30	0.27	0.34	0.26	0.30	<b>0.30</b>	0.915
Foz do Guincho 01-04-00	0.22	0.20	0.20	0.18	0.24	0.17	0.20	<b>0.20</b>	0.817
Foz do Guincho 02-00-00	0.73	0.53	0.53	0.66	0.54	0.60	0.58	<b>0.58</b>	2.160
Foz do Guincho 02-01-00	0.60	0.51	0.50	0.60	0.53	0.54	0.55	<b>0.55</b>	1.826
Foz do Guincho 02-02-00	0.42	0.36	0.36	0.43	0.39	0.40	0.39	<b>0.40</b>	1.782
Foz do Guincho 02-03-00	0.36	0.30	0.30	0.37	0.34	0.34	0.34	<b>0.33</b>	1.810
Foz do Guincho 02-04-00	0.23	0.18	0.18	0.23	0.22	0.22	0.21	<b>0.22</b>	1.611
Foz do Guincho 02-05-00	0.05	0.04	0.04	0.06	0.06	0.05	0.05	<b>0.05</b>	1.383
Foz do Guincho 03-00-00	0.52	0.29	0.28	0.38	0.32	0.35	0.34	<b>0.33</b>	2.012
Foz do Guincho 03-01-00	0.16	0.08	0.08	0.11	0.11	0.11	0.10	<b>0.10</b>	1.661
Foz do Guincho 03-02-00	0.06	0.03	0.03	0.04	0.05	0.04	0.04	<b>0.03</b>	1.657
Foz do Guincho 04-00-00	0.48	0.25	0.25	0.33	0.29	0.31	0.30	<b>0.30</b>	1.948
Foz do Guincho 04-01-00	0.21	0.09	0.09	0.13	0.13	0.13	0.12	<b>0.12</b>	1.706

Bacias hidrográficas	Tempo de concentração (h)								Veloc. correspondente a $T_c$ (m/s)
	S C Service	Kirpich	Kirpich Modificado por Chow	Temez	Vem Te Chow	U S Corps of Engineers	$T_c$ calculado	$T_c$ adoptado	
Foz do Guincho 04-01-01	0.10	0.04	0.04	0.06	0.07	0.06	0.06	0.05	1.622
Foz do Guincho 04-01-02	0.17	0.08	0.08	0.11	0.11	0.11	0.10	0.10	1.661
Foz do Guincho 05-00-00	0.39	0.20	0.19	0.26	0.24	0.24	0.24	0.23	1.893
Foz do Guincho 05-01-00	0.18	0.08	0.08	0.11	0.11	0.11	0.10	0.10	1.631
Foz do Guincho 06-00-00	0.26	0.12	0.12	0.17	0.16	0.16	0.15	0.15	1.839

### 3.7 Bacia da Ribeira dos Mochos

Na Tabela 3.6 apresentam-se os tempos de concentração em horas determinados por vários métodos e os tempos de concentração adoptados para as sub-bacias da ribeira dos Mochos.

Tabela 3.6 – Tempo de concentração para as várias sub bacias da Ribeira dos Mochos

Bacias hidrográficas	Tempo de concentração (h)								Veloc. correspondente a $T_c$ (m/s)
	S C Service	Kirpich	Kirpich Modificado por Chow	Temez	Vem Te Chow	U S Corps of Engineers	$T_c$ calculado	$T_c$ adoptado	
Mochos 00-00-00	1.36	1.31	1.29	1.12	1.15	1.04	1.22	1.22	1.363
Mochos 01-00-00	1.32	1.14	1.11	0.98	1.02	0.91	1.06	1.07	1.294
Mochos 02-00-00	0.98	0.90	0.88	0.78	0.84	0.72	0.85	0.85	1.217
Mochos 03-00-00	0.64	0.48	0.47	0.44	0.50	0.41	0.47	0.47	1.147
Mochos 04-00-00	0.49	0.36	0.35	0.35	0.39	0.32	0.36	0.37	1.070

### 3.8 Bacia da Ribeira das Vinhas

Na Tabela 3.7 apresentam-se os tempos de concentração em horas determinados por vários métodos e os tempos de concentração adoptados para as sub-bacias da ribeira das Vinhas.

**Tabela 3.7 – Tempo de concentração para as várias sub-bacias da Ribeira das Vinhas**

Bacias hidrográficas	Tempo de concentração (h)								Veloc. correspondente a $T_c$ (m/s)
	S C Service	Kirpich	Kirpich Modificado por Chow	Temez	Vem Te Chow	U S Corps of Engineers	$T_c$ calculado	$T_c$ adoptado	
Vinhas 00-00-00	1.70	1.65	1.62	1.78	1.39	1.51	1.59	1.60	2.051
Vinhas 01-00-00	1.67	1.61	1.58	1.74	1.36	1.48	1.56	1.55	2.075
Vinhas 02-00-00	1.62	1.54	1.51	1.67	1.31	1.43	1.49	1.50	2.059
Vinhas 03-00-00	1.43	1.29	1.27	1.42	1.13	1.23	1.26	1.27	2.051
Vinhas 04-00-00	1.39	1.24	1.22	1.37	1.10	1.19	1.22	1.22	2.059
Vinhas 05-00-00	1.24	1.07	1.05	1.19	0.97	1.05	1.06	1.05	2.088
Vinhas 06-00-00	1.09	0.90	0.89	1.02	0.84	0.90	0.90	0.90	2.056
Vinhas 06-01-00	0.89	0.70	0.69	0.86	0.68	0.75	0.71	0.72	2.151
Vinhas 06-02-00	0.83	0.64	0.63	0.78	0.63	0.68	0.68	0.68	2.066
Vinhas 06-03-00	0.73	0.53	0.52	0.66	0.54	0.58	0.58	0.58	2.026
Vinhas 06-04-00	0.66	0.45	0.45	0.58	0.48	0.51	0.51	0.50	2.049
Vinhas 06-04-01	0.18	0.13	0.13	0.17	0.17	0.16	0.16	0.15	1.700
Vinhas 06-05-00	0.60	0.37	0.37	0.48	0.40	0.43	0.42	0.42	2.030
Vinhas 07-00-00	1.03	0.75	0.74	0.86	0.72	0.77	0.75	0.75	2.053
Vinhas 07-01-00	0.23	0.18	0.18	0.20	0.22	0.19	0.20	0.20	1.221
Vinhas 07-01-01	0.10	0.08	0.08	0.09	0.11	0.09	0.09	0.08	1.299
Vinhas 07-02-00	0.12	0.07	0.07	0.09	0.11	0.09	0.09	0.08	1.243
Vinhas 08-00-00	0.87	0.58	0.57	0.68	0.58	0.62	0.59	0.60	2.025
Vinhas 08-01-00	0.99	0.79	0.78	0.66	0.76	0.62	0.75	0.75	1.095
Vinhas 08-02-00	0.74	0.61	0.59	0.50	0.61	0.48	0.58	0.58	0.996
Vinhas 08-03-00	0.48	0.33	0.33	0.27	0.37	0.27	0.33	0.33	0.837
Vinhas 09-00-00	0.71	0.48	0.47	0.58	0.50	0.53	0.52	0.52	1.967
Vinhas 09-01-00	0.53	0.36	0.36	0.37	0.40	0.35	0.37	0.37	1.318
Vinhas 09-02-00	0.30	0.20	0.20	0.22	0.24	0.20	0.22	0.22	1.105
Vinhas 09-02-01	0.25	0.15	0.15	0.16	0.19	0.16	0.17	0.17	1.129
Vinhas 09-03-00	0.25	0.17	0.17	0.19	0.21	0.17	0.19	0.18	1.105
Vinhas 10-00-00	0.64	0.43	0.42	0.52	0.45	0.48	0.47	0.47	1.953

### 3.9 Bacia da Ribeira de Castelhana

Na Tabela 3.8 apresentam-se os tempos de concentração em horas determinados por vários métodos e os tempos de concentração adoptados para as sub-bacias da ribeira de Castelhana.

**Tabela 3.8 – Tempo de concentração para as várias sub-bacias da Ribeira de Castelhana**

Bacias hidrográficas	Tempo de concentração (h)								Veloc. correspondente a $T_c$ (m/s)
	S C Service	Kirpich	Kirpich Modificado por Chow	Temez	Vem Te Chow	U S Corps of Engineers	$T_c$ calculado	$T_c$ adoptado	
Castelhana 00-00-00	0.60	0.65	0.64	0.62	0.64	0.59	0.63	0.63	1.484
Castelhana 01-00-00	0.51	0.53	0.52	0.50	0.54	0.48	0.52	0.52	1.374
Castelhana 02-00-00	0.43	0.41	0.40	0.40	0.43	0.38	0.41	0.42	1.309
Castelhana 03-00-00	0.37	0.34	0.34	0.34	0.38	0.33	0.35	0.35	1.303
Castelhana 03-01-00	0.17	0.15	0.15	0.16	0.19	0.15	0.16	0.15	1.219
Castelhana 04-00-00	0.25	0.23	0.23	0.23	0.27	0.23	0.24	0.23	1.250
Castelhana 05-00-00	0.15	0.13	0.13	0.14	0.17	0.14	0.14	0.13	1.218

### 3.10 Bacia da Ribeira de Cadaveira

Na Tabela 3.9 apresentam-se os tempos de concentração em horas determinados por vários métodos e os tempos de concentração adoptados para as sub-bacias da ribeira de Cadaveira.

**Tabela 3.9 – Tempo de concentração para as várias sub-bacias da Ribeira de Cadaveira**

Bacias hidrográficas	Tempo de concentração (h)								Veloc. correspondente a $T_c$ (m/s)
	S C Service	Kirpich	Kirpich Modificado por Chow	Temez	Vem Te Chow	U S Corps of Engineers	$T_c$ calculado	$T_c$ adoptado	
Cadaveira 00-00-00	0.60	0.79	0.77	0.73	0.75	0.70	0.74	0.73	1.527
Cadaveira 01-00-00	0.56	0.73	0.71	0.68	0.70	0.65	0.69	0.68	1.513
Cadaveira 02-00-00	0.45	0.54	0.53	0.51	0.55	0.48	0.52	0.52	1.329
Cadaveira 03-00-00	0.39	0.47	0.46	0.44	0.49	0.42	0.45	0.45	1.254
Cadaveira 04-00-00	0.27	0.30	0.29	0.29	0.34	0.28	0.29	0.28	1.232
Cadaveira 04-01-00	0.17	0.11	0.10	0.12	0.14	0.12	0.12	0.12	1.229
Cadaveira 04-02-00	0.28	0.29	0.29	0.29	0.33	0.28	0.29	0.28	1.274
Cadaveira 04-03-00	0.23	0.22	0.22	0.23	0.26	0.22	0.23	0.23	1.146
Cadaveira 05-00-00	0.15	0.12	0.12	0.13	0.16	0.13	0.13	0.13	1.049

### 3.11 Bacia da Ribeira de Bicesse

Na Tabela 3.10 apresentam-se os tempos de concentração em horas determinados por vários métodos e os tempos de concentração adoptados para as sub-bacias da ribeira de Bicesse.

**Tabela 3.10 – Tempo de concentração para as várias sub-bacias da Ribeira de Bicesse**

Bacias hidrográficas	Tempo de concentração (h)								Veloc. correspondente a $T_c$ (m/s)
	S C Service	Kirpich	Kirpich Modificado por Chow	Temez	Vem Te Chow	U S Corps of Engineers	$T_c$ calculado	$T_c$ adoptado	
Bicesse 00-00-00	0.39	1.36	1.33	1.17	1.18	1.13	1.20	1.20	1.649
Bicesse 01-00-00	1.20	1.24	1.21	1.08	1.10	1.03	1.15	1.15	1.509
Bicesse 01-01-00	0.24	0.27	0.27	0.26	0.31	0.25	0.26	0.27	1.102
Bicesse 01-02-00	0.15	0.14	0.13	0.14	0.17	0.13	0.14	0.13	1.118
Bicesse 02-00-00	1.17	1.10	1.08	0.96	1.00	0.92	1.04	1.03	1.460
Bicesse 03-00-00	1.10	1.01	0.99	0.88	0.92	0.84	0.95	0.95	1.400
Bicesse 04-00-00	0.97	0.88	0.86	0.76	0.83	0.72	0.83	0.83	1.250
Bicesse 04-01-00	0.12	0.09	0.09	0.09	0.12	0.09	0.10	0.10	0.958
Bicesse 05-00-00	0.86	0.74	0.73	0.63	0.72	0.60	0.71	0.70	1.189
Bicesse 05-01-00	0.36	0.29	0.28	0.26	0.33	0.26	0.29	0.28	1.087
Bicesse 05-02-00	0.18	0.15	0.15	0.14	0.19	0.14	0.16	0.15	0.961
Bicesse 06-00-00	0.64	0.48	0.47	0.43	0.50	0.42	0.47	0.47	1.162
Bicesse 07-00-00	0.49	0.34	0.33	0.30	0.37	0.30	0.34	0.33	1.075
Bicesse 08-00-00	0.43	0.24	0.24	0.22	0.28	0.22	0.25	0.25	0.980

### 3.12 Bacia da Ribeira de Manique

Na Tabela 3.11 apresentam-se os tempos de concentração em horas determinados por vários métodos e os tempos de concentração adoptados para as sub-bacias da ribeira de Manique.

**Tabela 3.11 – Tempo de concentração para as várias sub-bacias da Ribeira de Manique**

Bacias hidrográficas	Tempo de concentração (h)								Veloc. correspondente a $T_c$ (m/s)
	S C Service	Kirpich	Kirpich Modificado por Chow	Temez	Vem Te Chow	U S Corps of Engineers	$T_c$ calculado	$T_c$ adoptado	
Manique 00-00-00	2.15	2.16	2.11	1.92	1.74	1.77	1.93	1.93	1.811
Manique 01-00-00	1.98	1.92	1.88	1.74	1.58	1.61	1.74	1.75	1.802
Manique 01-01-00	0.41	0.40	0.39	0.38	0.43	0.36	0.40	0.40	1.191
Manique 01-02-00	0.14	0.13	0.13	0.15	0.17	0.13	0.14	0.13	1.011
Manique 02-00-00	1.88	1.84	1.80	1.67	1.52	1.53	1.67	1.67	1.763
Manique 02-01-00	0.14	0.12	0.12	0.12	0.16	0.12	0.13	0.13	0.885

Bacias hidrográficas	Tempo de concentração (h)								Veloc. correspondente a T <sub>c</sub> (m/s)
	S C Service	Kirpich	Kirpich Modificado por Chow	Temez	Vem Te Chow	U S Corps of Engineers	T <sub>c</sub> calculado	T <sub>c</sub> adoptado	
Manique 03-00-00	1.78	1.72	1.69	1.58	1.44	1.44	1.57	1.57	1.751
Manique 03-01-00	0.21	0.17	0.17	0.16	0.21	0.16	0.18	0.18	0.972
Manique 04-00-00	1.71	1.63	1.60	1.50	1.38	1.38	1.49	1.50	1.736
Manique 04-01-00	0.12	0.07	0.07	0.08	0.10	0.07	0.08	0.08	0.875
Manique 05-00-00	1.68	1.61	1.58	1.48	1.36	1.36	1.47	1.47	1.746
Manique 05-01-00	0.85	0.55	0.54	0.56	0.55	0.52	0.55	0.55	1.513
Manique 05-02-00	0.71	0.42	0.42	0.45	0.45	0.41	0.44	0.43	1.428
Manique 05-03-00	0.20	0.14	0.13	0.16	0.17	0.15	0.16	0.15	1.322
Manique 06-00-00	1.59	1.52	1.49	1.41	1.30	1.29	1.40	1.40	1.730
Manique 06-01-00	1.15	0.96	0.94	0.82	0.89	0.81	0.90	0.90	1.451
Manique 06-02-00	1.04	0.83	0.81	0.77	0.79	0.71	0.80	0.80	1.394
Manique 06-03-00	0.98	0.70	0.68	0.66	0.68	0.60	0.68	0.68	1.304
Manique 06-04-00	0.97	0.57	0.56	0.60	0.57	0.52	0.58	0.58	1.364
Manique 07-00-00	1.32	1.27	1.25	1.20	1.12	1.10	1.19	1.18	1.673
Manique 07-01-00	0.13	0.10	0.09	0.12	0.13	0.11	0.12	0.12	1.236
Manique 08-00-00	1.24	1.18	1.16	1.10	1.05	1.02	1.10	1.10	1.627

### 3.13 Bacia da Ribeira das Marianas

Na Tabela 3.12 apresentam-se os tempos de concentração em horas determinados por vários métodos e os tempos de concentração adoptados para as sub-bacias da ribeira das Marianas.

Tabela 3.12 – Tempo de concentração para as várias sub bacias da Ribeira das Marianas

Bacias hidrográficas	Tempo de concentração (h)								Veloc. correspondente a T <sub>c</sub> (m/s)
	S C Service	Kirpich	Kirpich Modificado por Chow	Temez	Vem Te Chow	U S Corps of Engineers	T <sub>c</sub> calculado	T <sub>c</sub> adoptado	
Marianas 00-00-00	1.98	1.75	1.71	1.41	1.46	1.37	1.58	1.58	1.483
Marianas 01-00-00	1.84	1.67	1.64	1.34	1.41	1.30	1.52	1.52	1.417
Marianas 02-00-00	1.79	1.62	1.59	1.30	1.37	1.26	1.47	1.47	1.411
Marianas 03-00-00	1.70	1.54	1.50	1.22	1.31	1.19	1.39	1.40	1.354
Marianas 04-00-00	1.57	1.44	1.40	1.14	1.24	1.09	1.31	1.30	1.286
Marianas 05-00-00	1.52	1.31	1.28	1.04	1.15	1.00	1.20	1.20	1.229
Marianas 06-00-00	1.51	1.24	1.21	0.98	1.09	0.93	1.13	1.13	1.192
Marianas 07-00-00	1.40	1.15	1.12	0.90	1.03	0.86	1.05	1.05	1.117
Marianas 07-01-00	0.60	0.41	0.40	0.36	0.44	0.34	0.40	0.40	0.997
Marianas 07-01-01	0.39	0.24	0.24	0.23	0.28	0.22	0.25	0.25	0.982
Marianas 07-02-00	0.39	0.25	0.24	0.23	0.29	0.21	0.25	0.25	0.893
Marianas 07-03-00	0.33	0.20	0.19	0.18	0.24	0.17	0.20	0.20	0.886
Marianas 08-00-00	1.36	1.11	1.09	0.88	1.00	0.83	1.02	1.02	1.505



Bacias hidrográficas	Tempo de concentração (h)								Veloc. correspondente a $T_c$ (m/s)
	S C Service	Kirpich	Kirpich Modificado por Chow	Temez	Vem Te Chow	U S Corps of Engineers	$T_c$ calculado	$T_c$ adoptado	
Marianas 09-00-00	0.99	0.85	0.83	0.67	0.80	0.63	0.79	0.78	0.994
Marianas 10-00-00	0.94	0.82	0.80	0.64	0.78	0.60	0.76	0.77	0.951
Marianas 11-00-00	0.74	0.66	0.64	0.52	0.65	0.49	0.62	0.62	0.914
Marianas 12-00-00	0.49	0.46	0.45	0.38	0.48	0.36	0.44	0.45	0.862
Marianas 13-00-00	0.43	0.39	0.38	0.33	0.42	0.31	0.38	0.38	0.857
Marianas 13-01-00	0.11	0.09	0.08	0.09	0.12	0.09	0.10	0.10	0.858
Marianas 14-00-00	0.30	0.20	0.19	0.17	0.24	0.17	0.20	0.20	0.789

### 3.14 Bacia da Ribeira de Sassoeiros

Na Tabela 3.13 apresentam-se os tempos de concentração em horas determinados por vários métodos e os tempos de concentração adoptados para as sub-bacias da ribeira de Sassoeiros.

Tabela 3.13 – Tempo de concentração para as várias sub-bacias da Ribeira de Sassoeiros

Bacias hidrográficas	Tempo de concentração (h)								Veloc. correspondente a $T_c$ (m/s)
	S C Service	Kirpich	Kirpich Modificado por Chow	Temez	Vem Te Chow	U S Corps of Engineers	$T_c$ calculado	$T_c$ adoptado	
Sassoeiros 00-00-00	2.12	1.81	1.76	1.42	1.50	1.40	1.62	1.62	1.467
Sassoeiros 01-00-00	1.85	1.60	1.56	1.27	1.35	1.26	1.45	1.45	1.457
Sassoeiros 02-00-00	1.86	1.54	1.51	1.23	1.32	1.21	1.40	1.40	1.437
Sassoeiros 03-00-00	1.75	1.45	1.42	1.14	1.25	1.14	1.32	1.32	1.406
Sassoeiros 04-00-00	1.70	1.32	1.29	1.05	1.16	1.03	1.21	1.20	1.333
Sassoeiros 05-00-00	1.60	1.36	1.33	1.03	1.19	1.01	1.23	1.23	1.176
Sassoeiros 06-00-00	1.45	1.25	1.22	0.93	1.11	0.90	1.13	1.13	1.072
Sassoeiros 07-00-00	1.15	0.99	0.96	0.73	0.91	0.70	0.90	0.90	0.953
Sassoeiros 08-00-00	1.06	0.90	0.88	0.67	0.84	0.65	0.82	0.82	0.940
Sassoeiros 09-00-00	0.79	0.73	0.71	0.54	0.71	0.52	0.67	0.67	0.840
Sassoeiros 09-01-00	0.43	0.26	0.25	0.24	0.30	0.23	0.26	0.27	0.989
Sassoeiros 10-00-00	0.56	0.59	0.57	0.42	0.59	0.40	0.54	0.53	0.731
Sassoeiros 11-00-00	0.22	0.25	0.24	0.18	0.29	0.18	0.22	0.22	0.649

### 3.15 Bacia da Ribeira da Laje

Na Tabela 3.14 apresentam-se os tempos de concentração em horas determinados por vários métodos e os tempos de concentração adoptados para as sub-bacias da ribeira da Laje.



**Tabela 3.14 – Tempo de concentração para as várias sub-bacias da Ribeira da Laje**

Bacias hidrográficas	Tempo de concentração (h)								Veloc. correspondente a $T_c$ (m/s)
	S C Service	Kirpich	Kirpich Modificado por Chow	Temez	Vem Te Chow	U S Corps of Engineers	$T_c$ calculado	$T_c$ adoptado	
Laje 00-00-00	1.61	1.98	1.93	1.65	1.62	1.54	1.73	<b>1.73</b>	1.574
Laje 00-01-00	0.11	0.09	0.09	0.11	0.12	0.10	0.10	<b>0.10</b>	1.283
Laje 01-00-00	1.60	1.97	1.92	1.63	1.61	1.53	1.72	<b>1.72</b>	1.567
Laje 01-01-00	0.28	0.19	0.19	0.18	0.23	0.18	0.20	<b>0.20</b>	0.963
Laje 02-00-00	1.42	1.70	1.66	1.44	1.43	1.34	1.51	<b>1.52</b>	1.501

### 3.16 Bacia da Ribeira da "Polima" (afluente da Ribeira da Laje)

Na Tabela 3.15 apresentam-se os tempos de concentração em horas determinados por vários métodos e os tempos de concentração adoptados para as sub-bacias da ribeira de "Polima".

**Tabela 3.15 – Tempo de concentração para as várias sub-bacias da Ribeira da "Polima"**

Bacias hidrográficas	Tempo de concentração (h)								Veloc. correspondente a $T_c$ (m/s)
	S C Service	Kirpich	Kirpich Modificado por Chow	Temez	Vem Te Chow	U S Corps of Engineers	$T_c$ calculado	$T_c$ adoptado	
Polima-Laje 00-00-00	0.67	0.54	0.52	0.49	0.55	0.48	0.53	<b>0.53</b>	1.283
Polima-Laje 01-00-00	0.57	0.40	0.39	0.37	0.42	0.36	0.40	<b>0.40</b>	1.198
Polima-Laje 01-01-00	0.60	0.38	0.37	0.35	0.41	0.34	0.38	<b>0.38</b>	1.193
Polima-Laje 01-02-00	0.56	0.35	0.34	0.33	0.38	0.32	0.35	<b>0.35</b>	1.154
Polima-Laje 01-03-00	0.22	0.14	0.14	0.14	0.18	0.13	0.15	<b>0.15</b>	0.835
Polima-Laje 02-00-00	0.26	0.18	0.18	0.18	0.22	0.18	0.19	<b>0.18</b>	1.111
Polima-Laje 03-00-00	0.18	0.11	0.11	0.10	0.15	0.10	0.12	<b>0.12</b>	0.755

### 3.17 Bacia da Ribeira do "Arneiro" (afluente da Ribeira da Laje)

Na Tabela 3.16 apresentam-se os tempos de concentração em horas determinados por vários métodos e os tempos de concentração adoptados para as sub-bacias da ribeira do "Arneiro".

**Tabela 3.16 – Tempo de concentração para as várias sub-bacias da Ribeira do “Arneiro”**

Bacias hidrográficas	Tempo de concentração (h)								Veloc. correspondente a $T_c$ (m/s)
	S C Service	Kirpich	Kirpich Modificado por Chow	Termez	Vem Te Chow	U S Corps of Engineers	$T_c$ calculado	$T_c$ adoptado	
Arneiro-Laje 00-00-00	0.32	0.23	0.23	0.24	0.27	0.23	0.24	<b>0.25</b>	1.168
Arneiro-Laje 01-00-00	0.26	0.18	0.17	0.18	0.22	0.18	0.19	<b>0.18</b>	1.182
Arneiro-Laje 02-00-00	0.20	0.12	0.11	0.12	0.15	0.12	0.13	<b>0.13</b>	0.940

## 4 Caudais de ponta de cheia

### 4.1 Curva de possibilidade udométrica

Para o cálculo dos caudais de ponta e dos volumes de cheia de um dado período de retorno é essencial conhecer-se o valor da precipitação total com diversas durações e com o mesmo período de retorno.

Para o cálculo da precipitação total para  $T = 100$  anos e para várias durações de chuvadas, foram utilizadas a curva de possibilidade udométrica de Lisboa (IGIDL) do INAG<sup>1</sup> e a curva IDF de Lisboa do LNEC<sup>2</sup>, conforme a que originava o caudal de ponta de cheia mais gravoso, assim temos:

$$I_{(mm/h)} = a D_{(min)}^b$$

Na Tabela 4.1 apresentam-se os parâmetros das curvas IDF utilizadas no presente estudo.

Tabela 4.1 – Parâmetros das curvas IDF utilizadas

Durações	Lisboa (IGIDL)		IDF de Lisboa	
	a	b	a	b
De 5 a 30 minutos	319,86	-0,461	365,62	-0,508
De 30 minutos a 6 horas	601,92	-0,642		

### 4.2 Caudais de ponta de cheia

Os caudais de ponta de cheia foram determinados pelo método do *Soil Conservation Service* (SCS) que se apresenta a seguir.

O volume total do hidrograma triangular equivalente ao hidrograma unitário sintético adimensional do SCS pode ser definido pela expressão:

$$V = \frac{Q_p T_p}{2} + \frac{Q_p + T_r}{2} = \frac{Q_p}{2} (T_p + T_r)$$

onde:

<sup>1</sup> Cláudia Brandão; Rui Rodrigues e Joaquim Pinto da Costa. – Análise de fenómenos extremos – Precipitações intensas em Portugal Continental, INAG 2001.

<sup>2</sup> Maria Rafaela Matos e Madalena H. da Silva – Estudo de precipitação com aplicação no projecto de sistemas de drenagem pluvial, Lisboa 1986.





V = volume do hidrograma (mm);  
Q<sub>p</sub> = caudal de ponta (mm/h);  
T<sub>p</sub> = tempo de crescimento ou tempo para a ponta (h);  
T<sub>r</sub> = tempo de decrescimento ou de recessão (h).

Da expressão anterior poderá obter-se o caudal de ponta:

$$Q_p = \frac{2V}{T_p + T_r}$$

Definindo o coeficiente "K" através da relação:

$$K = \frac{2}{1 + \frac{T_r}{T_p}}$$

tendo em consideração a área da bacia ("A", km<sup>2</sup>), admitindo que V = h<sub>u</sub> (precipitação útil) e exprimindo o caudal de ponta em m<sup>3</sup>/s tem-se:

$$Q_p = \frac{KAh_u}{3.6T_p}$$

sendo esta a equação do SCS para determinar o caudal de ponta de cheia<sup>3</sup>.

Tendo em consideração a relação T<sub>r</sub> = 1.67T<sub>p</sub>, obtida do hidrograma do SCS, ter-se-á K= 0.75.

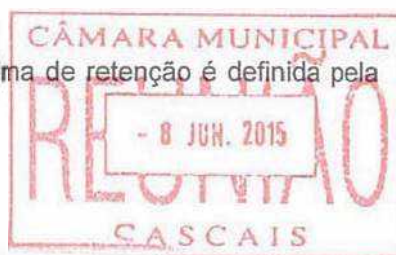
A precipitação útil (h<sub>u</sub>, mm) poderá ser estimada pela expressão:

$$h_u = \frac{(P - I_a)^2}{P - I_a + S}$$

onde:

P= precipitação total (mm);  
I<sub>a</sub>= perdas iniciais (mm);  
S= capacidade de retenção (mm).

De acordo com esta metodologia, a capacidade máxima de retenção é definida pela expressão:



<sup>3</sup> Lições de Hidrologia – A. Lencastre e F. M. Franco, 1984

$$S = \frac{25400}{N} - 254$$

onde "N" representa o número de escoamento, que depende do grupo hidrológico do solo e do tipo de cobertura, sendo dado por tabelas do SCS.

Assim, o número de escoamento "N" foi estimado tendo em consideração o tipo de solos predominante nas diversas sub-bacias e a sua ocupação.

As perdas iniciais por infiltração são função do número de escoamento (características do solo e da sua cobertura) e da intensidade da precipitação (i). Nunes Correia (1984) propõe a seguinte expressão para o cálculo de  $I_a$ :

$$I_a = \frac{0.18069N^2 - 36.1382N + 1806.91}{0.08052N + i - 8.052}$$

quando  $N > 75$ , como é o caso em todas as bacias em estudo, a intensidade da precipitação (i) será igual a  $i = P / d$ , onde d é a duração total da chuvada.

Adoptando o hidrograma unitário sintético adimensional do SCS, o tempo de crescimento ou tempo para a ponta ( $T_p$ ) é definido pela expressão:

$$T_p = \frac{d_u}{2} + 0.6T_c \text{ para } d_u < T_c$$

ou  $T_p = T_c$  para  $d_u \geq T_c$ , onde  $d_u$  será a duração da chuvada útil. Esta poderá ser determinada através da expressão:

$$d_u = \left(1 - \frac{I_a}{P}\right)d$$

onde d será a duração total da chuvada, isto é o tempo durante o qual ocorrerá a precipitação total (P).

Tendo em consideração os valores da precipitação total correspondentes aos diversos períodos de retorno, calculados a partir da curva de possibilidade udométrica, apresentam-se, nos pontos seguintes, os valores dos caudais de ponta de cheia, para o período de retorno de 100 anos, obtidos para as bacias em estudo.



#### 4.2.1 Bacia da Ribeira do "Assobio"

Na Tabela 4.2 apresentam-se os caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira do "Assobio".

**Tabela 4.2 – Caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira do "Assobio"**

Bacias hidrográficas	Precipitação com Dt=Tc (mm)		Caudal Ponta T=100 anos (m <sup>3</sup> /s)			
	LNEC 1986 <sup>4</sup>	INAG 2001 <sup>5</sup>	SCS		C <sub>p</sub> adoptado	C <sub>p</sub> específico (m <sup>3</sup> /s/km <sup>2</sup> )
			LNEC	INAG		
Assobio 00-00-00	22.17	21.94	2.22	2.19	2.2	5.033
Assobio 01-00-00	20.69	20.35	1.98	1.95	2.0	5.542
Assobio 02-00-00	16.09	15.45	0.85	0.79	0.9	4.405

#### 4.2.2 Bacia da Ribeira da Ribeira de "Grota"

Na Tabela 4.3 apresentam-se os caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira de "Grota".

**Tabela 4.3 – Caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira de "Grota"**

Bacias hidrográficas	Precipitação com Dt=Tc (mm)		Caudal Ponta T=100 anos (m <sup>3</sup> /s)			
	LNEC 1986 <sup>1</sup>	INAG 2001 <sup>2</sup>	SCS		C <sub>p</sub> adoptado	C <sub>p</sub> específico (m <sup>3</sup> /s/km <sup>2</sup> )
			LNEC	INAG		
Grota 00-00-00	24.42	24.39	7.10	7.22	7.2	6.895
Grota 01-00-00	23.99	23.92	6.71	6.83	6.8	6.974
Grota 01-01-00	10.46	9.64	1.03	0.97	1.0	14.490
Grota 02-00-00	21.69	21.42	4.33	4.27	4.3	5.962
Grota 02-01-00	10.46	9.64	1.24	1.16	1.2	11.081
Grota 03-00-00	16.09	15.45	1.37	1.27	1.4	4.502

<sup>4</sup> Maria Rafaela Matos e Madalena H. da Silva – Estudo de precipitação com aplicação no projecto de sistemas de drenagem pluvial, Lisboa 1986.

<sup>5</sup> Cláudia Brandão; Rui Rodrigues e Joaquim Pinto da Costa. – Análise de fenómenos extremos – Precipitações intensas em Portugal Continental, INAG 2001.

#### 4.2.3 Bacia da Ribeira de "Praia"

Na Tabela 4.4 apresentam-se os caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira de "Praia".

**Tabela 4.4 – Caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira de "Praia"**

Bacias hidrográficas	Precipitação com Dt=Tc (mm)		Caudal Ponta T=100 anos (m <sup>3</sup> /s)			
	LNEC 1986 <sup>1</sup>	INAG 2001 <sup>2</sup>	SCS		C <sub>p</sub> adoptado	C <sub>p</sub> específico (m <sup>3</sup> /s/km <sup>2</sup> )
			LNEC	INAG		
Praia 00-00-00	20.69	20.35	3.13	3.09	3.1	9.989
Praia 01-00-00	16.74	16.13	1.63	1.54	1.6	9.224

#### 4.2.4 Bacia da Ribeira do Arneiro

Na Tabela 4.5 apresentam-se os caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira do Arneiro.

**Tabela 4.5 – Caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira do Arneiro**

Bacias hidrográficas	Precipitação com Dt=Tc (mm)		Caudal Ponta T=100 anos (m <sup>3</sup> /s)			
	LNEC 1986 <sup>6</sup>	INAG 2001 <sup>7</sup>	SCS		C <sub>p</sub> adoptado	C <sub>p</sub> específico (m <sup>3</sup> /s/km <sup>2</sup> )
			LNEC	INAG		
Arneiro 00-00-00	31.51	32.25	18.20	19.08	19.1	8.352
Arneiro 01-00-00	28.38	28.76	18.32	18.93	18.9	8.702
Arneiro 01-01-00	24.42	24.39	6.50	6.60	6.6	7.64
Arneiro 01-02-00	20.69	20.35	4.54	4.47	4.5	7.236
Arneiro 01-03-00	14.71	14.00	1.41	1.30	1.4	5.267
Arneiro 02-00-00	24.42	24.39	10.98	11.08	11.1	10.709
Arneiro 02-01-00	25.28	25.32	2.67	2.69	2.7	12.236
Arneiro 02-02-00	17.96	17.42	1.53	1.48	1.5	10.962
Arneiro 03-00-00	10.46	9.64	2.76	2.60	2.8	15.164

<sup>6</sup> Maria Rafaela Matos e Madalena H. da Silva – Estudo de precipitação com aplicação no projecto de sistemas de drenagem pluvial, Lisboa 1986.

<sup>7</sup> Cláudia Brandão; Rui Rodrigues e Joaquim Pinto da Costa. - Análise de fenómenos extremos – Precipitações intensas em Portugal Continental, INAG 2001.





#### 4.2.5 Bacia da Ribeira da Foz do Guincho

Na Tabela 4.6 apresentam-se os caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira da Foz do Guincho.

Tabela 4.6 – Caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira da Foz do Guincho

Bacias hidrográficas	Precipitação com Dt=Tc (mm)		Caudal Ponta T=100 anos (m <sup>3</sup> /s)			
	LNEC 1986 <sup>1</sup>	INAG 2001 <sup>2</sup>	SCS		C <sub>p</sub> adoptado	C <sub>p</sub> específico (m <sup>3</sup> /s/km <sup>2</sup> )
			LNEC	INAG		
Foz do Guincho 00-00-00	40.17	39.57	69.75	66.79	69.8	6.521
Foz do Guincho 01-00-00	37.51	37.64	66.74	65.59	66.7	6.762
Foz do Guincho 01-01-00	33.42	34.61	13.14	13.80	13.8	8.434
Foz do Guincho 01-02-00	29.81	30.35	7.24	7.93	7.9	10.044
Foz do Guincho 01-03-00	25.26	25.32	5.44	6.32	6.3	12.149
Foz do Guincho 01-04-00	20.69	20.35	2.72	3.45	3.4	14.016
Foz do Guincho 02-00-00	34.94	35.75	52.53	53.16	53.2	6.874
Foz do Guincho 02-01-00	34.04	35.08	29.79	31.02	31.0	8.059
Foz do Guincho 02-02-00	29.10	29.56	11.75	12.95	13.0	9.224
Foz do Guincho 02-03-00	26.47	26.65	9.72	11.24	11.2	9.714
Foz do Guincho 02-04-00	21.69	21.42	6.20	7.86	7.9	10.794
Foz do Guincho 02-05-00	10.46	9.64	0.91	1.31	1.3	19.488
Foz do Guincho 03-00-00	26.47	26.65	14.75	17.52	17.5	5.980
Foz do Guincho 03-01-00	14.71	14.00	1.51	2.34	2.3	10.243
Foz do Guincho 03-02-00	8.14	7.32	0.30	0.46	0.5	9.651
Foz do Guincho 04-00-00	25.26	25.32	12.75	15.27	15.3	6.053
Foz do Guincho 04-01-00	16.09	15.45	2.90	4.46	4.5	7.311
Foz do Guincho 04-01-01	10.46	9.64	1.24	1.90	1.9	9.724
Foz do Guincho 04-01-02	14.71	14.00	1.73	2.72	2.7	8.642
Foz do Guincho 05-00-00	22.17	21.94	6.47	8.42	8.4	6.130
Foz do Guincho 05-01-00	14.71	14.00	1.36	2.14	2.1	8.624
Foz do Guincho 06-00-00	17.96	17.42	3.58	3.39	3.6	5.814

#### 4.2.6 Bacia da Ribeira dos Mochos

Na Tabela 4.7 apresentam-se os caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira dos Mochos.

**Tabela 4.7 – Caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira dos Mochos**

Bacias hidrográficas	Precipitação com Dt=Tc (mm)		Caudal Ponta T=100 anos (m <sup>3</sup> /s)			
	LNEC 1986 <sup>8</sup>	INAG 2001 <sup>9</sup>	SCS		C <sub>p</sub> adoptado	C <sub>p</sub> específico (m <sup>3</sup> /s/km <sup>2</sup> )
			LNEC	INAG		
Mochos 00-00-00	50.38	46.65	38.80	35.17	38.8	7.042
Mochos 01-00-00	47.23	44.51	32.24	29.28	32.2	6.653
Mochos 02-00-00	42.17	40.99	30.70	29.53	30.7	7.759
Mochos 03-00-00	31.51	32.25	15.99	16.74	16.7	9.673
Mochos 04-00-00	28.01	28.35	11.03	12.04	12.0	11.038

#### 4.2.7 Bacia da Ribeira das Vinhas

Na Tabela 4.8 apresentam-se os caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira das Vinhas.

**Tabela 4.8 – Caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira das Vinhas**

Bacias hidrográficas	Precipitação com Dt=Tc (mm)		Caudal Ponta T=100 anos (m <sup>3</sup> /s)			
	LNEC 1986 <sup>1</sup>	INAG 2001 <sup>2</sup>	SCS		C <sub>p</sub> adoptado	C <sub>p</sub> específico (m <sup>3</sup> /s/km <sup>2</sup> )
			LNEC	INAG		
Vinhas 00-00-00	57.56	51.41	142.77	120.07	142.8	5.249
Vinhas 01-00-00	56.67	50.83	138.03	118.15	138.0	5.189
Vinhas 02-00-00	55.77	50.24	134.55	114.13	134.6	5.258
Vinhas 03-00-00	51.38	47.33	130.25	113.78	130.3	5.437
Vinhas 04-00-00	50.38	46.65	128.96	114.74	129.0	5.449
Vinhas 05-00-00	46.79	44.21	121.71	111.72	121.7	5.576
Vinhas 06-00-00	43.37	41.84	120.03	112.50	120.0	5.845
Vinhas 06-01-00	38.86	38.63	51.67	50.87	51.7	5.788
Vinhas 06-02-00	37.79	37.84	43.29	42.39	43.3	5.689
Vinhas 06-03-00	34.94	35.75	40.24	40.71	40.7	6.361
Vinhas 06-04-00	32.48	33.34	39.45	41.66	41.7	6.158
Vinhas 06-04-01	17.96	17.42	3.01	4.18	4.2	9.430
Vinhas 06-05-00	29.81	30.35	32.24	35.94	35.9	6.320
Vinhas 07-00-00	39.65	39.20	67.76	66.52	67.8	6.279
Vinhas 07-01-00	20.69	20.35	7.40	9.42	9.4	13.197
Vinhas 07-01-01	13.18	12.42	1.25	1.82	1.8	21.422

<sup>8</sup> Maria Rafaela Matos e Madalena H. da Silva – Estudo de precipitação com aplicação no projecto de sistemas de drenagem pluvial, Lisboa 1986

<sup>9</sup> Cláudia Brandão; Rui Rodrigues e Joaquim Pinto da Costa. - Análise de fenómenos extremos – Precipitações intensas em Portugal Continental, INAG 2001

Bacias hidrográficas	Precipitação com Dt=Tc (mm)		Caudal Ponta T=100 anos (m <sup>3</sup> /s)			
	LNEC 1986 <sup>1</sup>	INAG 2001 <sup>2</sup>	SCS		Q <sub>p</sub> adoptado	Q <sub>p</sub> específico (m <sup>3</sup> /s/km <sup>2</sup> )
			LNEC	INAG		
Vinhas 07-02-00	13.18	12.42	2.45	3.58	3.6	21.558
Vinhas 08-00-00	35.53	36.19	57.39	58.35	58.4	6.724
Vinhas 08-01-00	39.65	39.20	11.37	11.16	11.4	7.127
Vinhas 08-02-00	34.94	35.75	10.50	10.64	10.6	7.844
Vinhas 08-03-00	26.47	26.65	2.80	3.24	3.2	9.987
Vinhas 09-00-00	33.11	34.38	40.50	42.83	42.8	6.712
Vinhas 09-01-00	28.01	28.35	7.64	8.37	8.4	10.012
Vinhas 09-02-00	21.69	21.42	4.40	5.54	5.5	11.909
Vinhas 09-02-01	19.10	18.64	2.38	3.00	3.0	13.414
Vinhas 09-03-00	19.65	19.22	2.11	2.68	2.7	13.285
Vinhas 10-00-00	31.51	32.25	34.43	36.24	36.2	6.743

#### 4.2.8 Bacia da Ribeira de Castelhana

Na Tabela 4.9 apresentam-se os caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira de Castelhana.

Tabela 4.9 – Caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira de Castelhana

Bacias hidrográficas	Precipitação com Dt=Tc (mm)		Caudal Ponta T=100 anos (m <sup>3</sup> /s)			
	LNEC 1986 <sup>1</sup>	INAG 2001 <sup>2</sup>	SCS		Q <sub>p</sub> adoptado	Q <sub>p</sub> específico (m <sup>3</sup> /s/km <sup>2</sup> )
			LNEC	INAG		
Castelhana 00-00-00	36.39	36.82	13.97	12.36	14.0	8.192
Castelhana 01-00-00	33.11	34.38	13.12	12.02	13.1	8.750
Castelhana 02-00-00	29.81	30.35	11.64	11.10	11.6	9.279
Castelhana 03-00-00	27.25	27.51	8.91	8.77	8.9	9.146
Castelhana 03-01-00	17.96	17.42	1.74	2.01	2.0	11.191
Castelhana 04-00-00	22.17	21.94	4.33	4.62	4.6	10.458
Castelhana 05-00-00	16.74	16.13	1.69	2.03	2.0	11.232

#### 4.2.9 Bacia da Ribeira de Cadaveira

Na Tabela 4.10 apresentam-se os caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira de Cadaveira.



**Tabela 4.10 – Caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira de Cadaveira**

Bacias hidrográficas	Precipitação com Dt=Tc (mm)		Caudal Ponta T=100 anos (m <sup>3</sup> /s)			
	LNEC 1986 <sup>1</sup>	INAG 2001 <sup>2</sup>	SCS		Q <sub>p</sub> adoptado	Q <sub>p</sub> específico (m <sup>3</sup> /s/km <sup>2</sup> )
			LNEC	INAG		
Cadaveira 00-00-00	39.13	38.82	26.61	28.13	28.1	9.738
Cadaveira 01-00-00	37.79	37.84	25.69	27.29	27.3	10.070
Cadaveira 02-00-00	33.11	34.38	21.77	22.60	22.6	10.639
Cadaveira 03-00-00	30.84	31.50	19.56	20.15	20.1	10.665
Cadaveira 04-00-00	24.42	24.39	13.30	13.42	13.4	13.609
Cadaveira 04-01-00	16.09	15.45	5.81	5.51	5.8	16.310
Cadaveira 04-02-00	24.42	24.39	4.18	4.22	4.2	10.789
Cadaveira 04-03-00	22.17	21.94	2.91	2.88	2.9	10.476
Cadaveira 05-00-00	16.74	16.13	3.45	3.31	3.5	13.703

#### 4.2.10 Bacia da Ribeira de Bicesse

Na Tabela 4.11 apresentam-se os caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira de Bicesse.

**Tabela 4.11 – Caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira de Bicesse**

Bacias hidrográficas	Precipitação com Dt=Tc (mm)		Caudal Ponta T=100 anos (m <sup>3</sup> /s)			
	LNEC 1986 <sup>1</sup>	INAG 2001 <sup>2</sup>	SCS		Q <sub>p</sub> adoptado	Q <sub>p</sub> específico (m <sup>3</sup> /s/km <sup>2</sup> )
			LNEC	INAG		
Bicesse 00-00-00	49.97	46.38	40.18	36.54	40.2	7.352
Bicesse 01-00-00	48.93	45.68	36.14	29.36	36.1	7.462
Bicesse 01-01-00	23.99	23.92	7.70	7.75	7.8	13.792
Bicesse 01-02-00	16.74	16.13	4.72	4.49	4.7	13.912
Bicesse 02-00-00	46.35	43.91	27.49	25.65	27.5	7.651
Bicesse 03-00-00	44.54	42.66	26.01	24.57	26.0	7.698
Bicesse 04-00-00	41.68	40.64	23.65	22.85	23.7	8.104
Bicesse 04-01-00	14.71	14.00	2.25	2.12	2.2	18.554
Bicesse 05-00-00	38.33	38.24	20.92	20.75	20.9	8.482
Bicesse 05-01-00	24.42	24.39	3.73	3.76	3.8	10.196
Bicesse 05-02-00	17.96	17.42	3.10	2.99	3.1	12.924
Bicesse 06-00-00	31.51	32.25	13.92	14.49	14.5	10.530
Bicesse 07-00-00	26.47	26.65	5.11	5.17	5.2	11.363
Bicesse 08-00-00	23.09	22.95	3.61	3.58	3.6	10.515

#### 4.2.11 Bacia da Ribeira de Manique

Na Tabela 4.12 apresentam-se os caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira de Manique.

Tabela 4.12 – Caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira de Manique

Bacias hidrográficas	Precipitação com Dt=Tc (mm)		Caudal Ponta T=100 anos (m <sup>3</sup> /s)			
	LNEC 1986 <sup>1</sup>	INAG 2001 <sup>2</sup>	SCS		Q <sub>p</sub> adoptado	Q <sub>p</sub> específico (m <sup>3</sup> /s/km <sup>2</sup> )
			LNEC	INAG		
Manique 00-00-00	63.13	54.98	108.10	90.11	108.1	5.354
Manique 01-00-00	60.16	53.09	107.77	91.32	107.8	5.539
Manique 01-01-00	29.10	29.56	6.53	6.73	6.7	9.708
Manique 01-02-00	16.74	16.13	2.77	2.63	2.8	11.369
Manique 02-00-00	58.79	52.20	96.59	82.42	96.6	5.573
Manique 02-01-00	16.74	16.13	0.89	0.85	0.9	8.940
Manique 03-00-00	57.03	51.06	95.93	82.71	95.9	5.690
Manique 03-01-00	19.65	19.22	5.12	5.02	5.1	14.704
Manique 04-00-00	55.77	50.24	92.69	80.19	92.7	5.799
Manique 04-01-00	13.18	12.42	2.29	3.40	3.4	17.871
Manique 05-00-00	55.21	49.87	91.36	79.65	91.4	5.808
Manique 05-01-00	34.04	35.08	10.91	11.35	11.3	8.388
Manique 05-02-00	30.16	30.74	9.16	9.46	9.5	9.316
Manique 05-03-00	17.96	17.42	2.04	1.96	2.0	9.689
Manique 06-00-00	53.90	49.01	83.22	72.83	83.2	5.944
Manique 06-01-00	43.37	41.84	15.69	14.86	15.7	7.367
Manique 06-02-00	40.93	40.11	14.95	14.45	15.0	7.575
Manique 06-03-00	37.79	37.84	10.75	10.61	10.8	7.928
Manique 06-04-00	34.94	35.75	8.21	7.23	8.2	7.959
Manique 07-00-00	49.56	46.10	63.35	56.65	63.4	6.156
Manique 07-01-00	16.09	15.45	3.51	3.32	3.5	13.662
Manique 08-00-00	47.87	44.96	60.74	55.27	60.7	6.250

#### 4.2.12 Bacia da Ribeira das Marianas

Na Tabela 4.13 apresentam-se os caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira das Marianas.

**Tabela 4.13 – Caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira das Marianas**

Bacias hidrográficas	Precipitação com Dt=Tc (mm)		Caudal Ponta T=100 anos (m <sup>3</sup> /s)			
	LNEC 1986 <sup>1</sup>	INAG 2001 <sup>2</sup>	SCS		Q <sub>p</sub> adoptado	Q <sub>p</sub> específico (m <sup>3</sup> /s/km <sup>2</sup> )
			LNEC	INAG		
Marianas 00-00-00	57.21	51.18	51.48	44.64	51.5	6.127
Marianas 01-00-00	56.13	50.47	46.59	40.60	46.6	6.182
Marianas 02-00-00	55.21	49.87	45.41	39.81	45.4	6.209
Marianas 03-00-00	53.90	49.01	39.09	34.37	39.1	6.253
Marianas 04-00-00	51.97	47.73	38.35	34.12	38.3	6.402
Marianas 05-00-00	49.97	46.38	33.80	30.46	33.8	6.567
Marianas 06-00-00	48.51	45.39	26.82	24.48	26.8	6.466
Marianas 07-00-00	46.79	44.21	24.37	22.52	24.4	6.478
Marianas 07-01-00	29.10	29.56	8.28	8.55	8.6	9.632
Marianas 07-01-01	23.09	22.95	2.28	2.26	2.3	9.992
Marianas 07-02-00	23.09	22.95	3.97	3.94	4.0	8.271
Marianas 07-03-00	20.69	20.35	2.44	2.41	2.4	9.658
Marianas 08-00-00	46.13	43.76	18.18	16.86	18.2	6.465
Marianas 09-00-00	40.42	39.75	14.59	13.88	14.6	6.976
Marianas 10-00-00	40.17	39.57	13.95	13.37	13.9	6.957
Marianas 11-00-00	36.11	36.61	11.94	12.16	12.2	7.341
Marianas 12-00-00	30.84	31.50	7.49	7.75	7.8	7.894
Marianas 13-00-00	28.38	28.76	5.41	5.59	5.6	8.677
Marianas 13-01-00	14.71	14.00	1.73	1.61	1.7	11.166
Marianas 14-00-00	20.69	20.35	1.48	1.46	1.5	9.646

#### 4.2.13 Bacia da Ribeira de Sassoeiros

Na Tabela 4.14 apresentam-se os caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira de Sassoeiros.

**Tabela 4.14 – Caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira de Sassoeiros**

Bacias hidrográficas	Precipitação com Dt=Tc (mm)		Caudal Ponta T=100 anos (m <sup>3</sup> /s)			
	LNEC 1986 <sup>1</sup>	INAG 2001 <sup>2</sup>	SCS		Q <sub>p</sub> adoptado	Q <sub>p</sub> específico (m <sup>3</sup> /s/km <sup>2</sup> )
			LNEC	INAG		
Sassoeiros 00-00-00	57.92	51.64	41.42	35.58	41.4	5.835
Sassoeiros 01-00-00	54.84	49.63	39.09	34.25	39.1	6.061
Sassoeiros 02-00-00	53.90	49.01	37.13	32.59	37.1	6.152
Sassoeiros 03-00-00	52.37	47.99	36.94	32.82	36.9	6.273

Bacias hidrográficas	Precipitação com Dt=Tc (mm)		Caudal Ponta T=100 anos (m <sup>3</sup> /s)			
	LNEC 1986 <sup>1</sup>	INAG 2001 <sup>2</sup>	SCS		Q <sub>p</sub> adoptado	Q <sub>p</sub> específico (m <sup>3</sup> /s/km <sup>2</sup> )
			LNEC	INAG		
Sassoeiros 04-00-00	49.97	46.38	30.98	27.87	31.0	6.407
Sassoeiros 05-00-00	50.58	46.79	28.55	25.70	28.6	6.369
Sassoeiros 06-00-00	48.51	45.39	25.77	23.54	25.8	6.574
Sassoeiros 07-00-00	43.37	41.84	21.17	20.00	21.2	6.961
Sassoeiros 08-00-00	41.43	40.47	19.82	19.14	19.8	7.150
Sassoeiros 09-00-00	37.51	37.64	16.60	16.60	16.6	7.771
Sassoeiros 09-01-00	23.99	23.92	3.01	3.05	3.1	9.423
Sassoeiros 10-00-00	33.42	34.61	8.07	8.45	8.4	8.986
Sassoeiros 11-00-00	21.69	21.42	3.64	3.59	3.6	12.027

#### 4.2.14 Bacia da Ribeira da Laje

Na Tabela 4.15 apresentam-se os caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira da Laje.

Tabela 4.15 – Caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira da Laje

Bacias hidrográficas	Precipitação com Dt=Tc (mm)		Caudal Ponta T=100 anos (m <sup>3</sup> /s)			
	LNEC 1986 <sup>1</sup>	INAG 2001 <sup>2</sup>	SCS		Q <sub>p</sub> adoptado	Q <sub>p</sub> específico (m <sup>3</sup> /s/km <sup>2</sup> )
			LNEC	INAG		
Laje 00-00-00	59.82	52.87	161.91	138.62	161.9	6.034
Laje 00-01-00	14.71	14.00	4.06	3.83	4.1	17.747
Laje 01-00-00	59.65	52.76	159.18	136.34	159.2	6.042
Laje 01-01-00	20.69	20.35	6.13	6.01	6.1	11.100
Laje 02-00-00	56.13	50.47	156.13	136.43	156.1	6.365

#### 4.2.15 Bacia da Ribeira da "Polima" (afluente da Ribeira da Laje)

Na Tabela 4.16 apresentam-se os caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira da "Polima".



**Tabela 4.16 – Caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira da “Polima”**

Bacias hidrográficas	Precipitação com Dt=Tc (mm)		Caudal Ponta T=100 anos (m <sup>3</sup> /s)			
	LNEC 1986 <sup>1</sup>	INAG 2001 <sup>2</sup>	SCS		C <sub>p</sub> adoptado	C <sub>p</sub> específico (m <sup>3</sup> /s/km <sup>2</sup> )
			LNEC	INAG		
Polima-Laje 00-00-00	33.42	34.61	15.36	16.10	16.1	8.455
Polima-Laje 01-00-00	29.10	29.56	14.31	14.79	14.8	9.087
Polima-Laje 01-01-00	28.38	28.76	9.26	9.54	9.5	9.581
Polima-Laje 01-02-00	27.25	27.51	8.17	8.31	8.3	9.059
Polima-Laje 01-03-00	17.96	17.42	2.95	2.83	3.0	8.535
Polima-Laje 02-00-00	19.65	19.22	5.30	5.23	5.3	10.491
Polima-Laje 03-00-00	16.09	15.45	1.96	1.84	2.0	10.927

#### 4.2.16 Bacia da Ribeira do “Arneiro” (afluente da Ribeira da Laje)

Na Tabela 4.17 apresentam-se os caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira do “Arneiro”.

**Tabela 4.17 – Caudais de ponta de cheia para T=100 anos, para as sub-bacias da Ribeira do “Arneiro”**

Bacias hidrográficas	Precipitação com Dt=Tc (mm)		Caudal Ponta T=100 anos (m <sup>3</sup> /s)			
	LNEC 1986 <sup>1</sup>	INAG 2001 <sup>2</sup>	SCS		C <sub>p</sub> adoptado	C <sub>p</sub> específico (m <sup>3</sup> /s/km <sup>2</sup> )
			LNEC	INAG		
Arneiro-Laje 00-00-00	33.42	34.61	15.36	16.10	16.1	8.455
Arneiro-Laje 01-00-00	29.10	29.56	14.31	14.79	14.8	9.087
Arneiro-Laje 02-00-00	28.38	28.76	9.26	9.54	9.5	9.581



## 5 Modelação

### 5.1 Considerações gerais

As condições de escoamento nas linhas de água foram simuladas com o recurso ao programa HEC-RAS desenvolvido pelo *Hydrologic Engineering Center* do *U.S. Army Corps of Engineers*<sup>10</sup>. Este modelo é um sistema de simulação unidimensional para a realização de cálculos hidráulicos de canais artificiais ou naturais e tem componentes de modelação que permitem analisar, separadamente, o nível de superfície livre de escoamentos em regime permanente e variável.

As linhas de água modeladas correspondem às bacias hidrográficas em estudo que, a seguir, se listam de novo:

1. Ribeira do "Assobio";
2. Ribeira da "Grotta";
3. Ribeira da "Praia";
4. Ribeira do Arneiro;
5. Ribeira da Foz do Guincho;
6. Ribeira dos Mochos;
7. Ribeira das Vinhas;
8. Ribeira de Castelhana;
9. Ribeira da Cadaveira;
10. Ribeira de Bicesse;
11. Ribeira de Manique;
12. Ribeira das Marianas;
13. Ribeira de Sassoeiros;
14. Ribeira da Laje;
15. Ribeira da "Polima" afluente da ribeira da Laje;
16. Ribeira do "Arneiro" afluente da ribeira da Laje.

#### 5.1.1 Bacia da ribeira do "Assobio"

A localização das secções transversais utilizadas na modelação, encontram-se representadas na Figura 5.1, sendo a secção de montante a 968,3595, numeração esta que corresponde à distância (em metros) para a secção da bacia hidrográfica.



<sup>10</sup> <http://www.hec.usace.army.mil/software/hec-ras/>

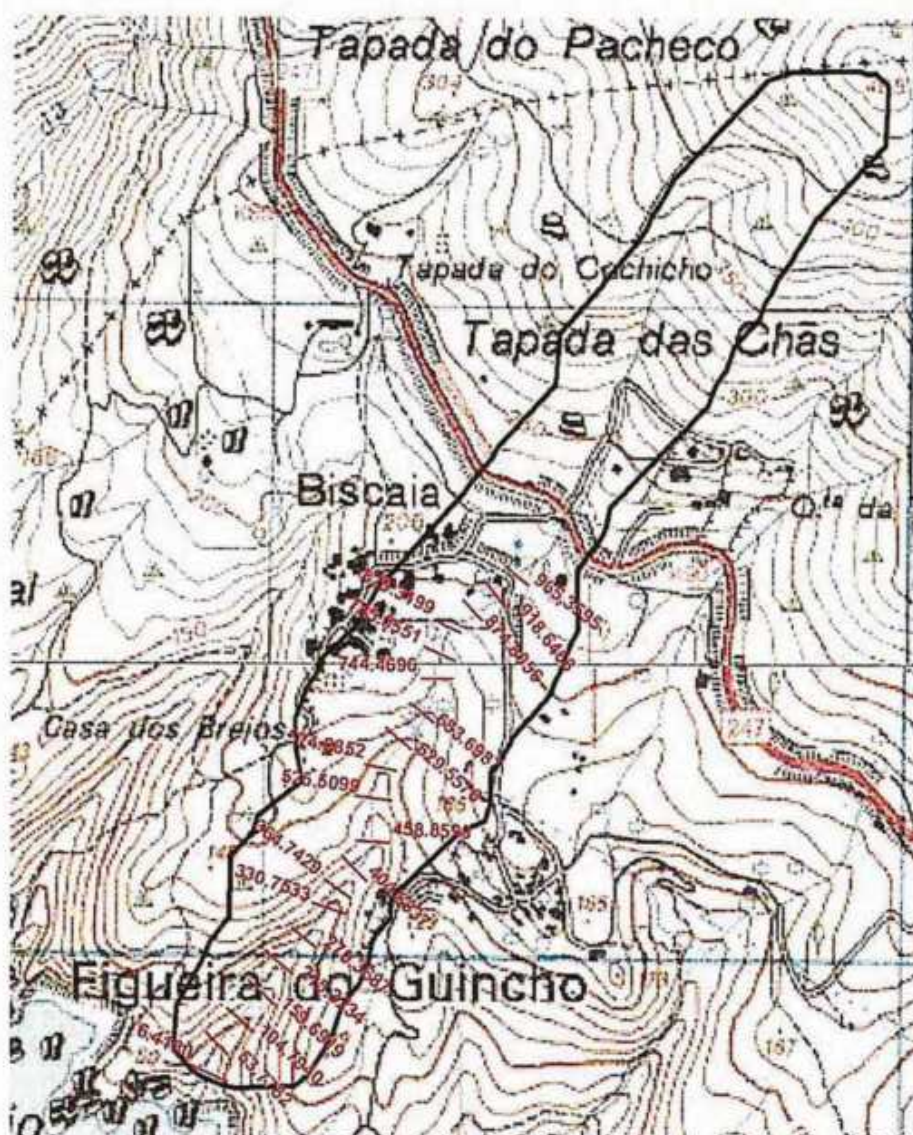


Figura 5.1 – Ribeira do “Assobio”, localização das secções utilizadas na modelação

Na Tabela 5.1 apresenta-se o resultado da modelação da propagação dos caudais de ponta de cheia correspondentes ao período de retorno de 100 anos, nas secções de cálculo cuja localização se mostrou na Figura 5.1.



**Tabela 5.1 – Resultado da modelação para a ribeira do "Assobio"**

Sentido escoamento	Secção	Caudal (m <sup>3</sup> /s)	Cota terreno (m)	Nível água <sup>2</sup> (m)	Altura água (m)	Declive (m/m)	Velocidade (m/s)	Área secção (m <sup>2</sup> )	Largura superficial (m)
montante	965.360	0.90	203.92	204.17	0.25	0.0200	1.34	0.73	4.52
	918.647	0.90	199.00	199.22	0.22	0.0197	1.34	0.96	7.34
	874.806	0.90	194.53	194.73	0.20	0.0228	1.13	0.81	7.01
	829.320	0.90	184.14	184.40	0.26	0.0229	1.23	0.74	5.25
	785.055	0.90	175.00	175.23	0.23	0.0239	1.19	0.76	5.41
	744.470	0.90	167.10	167.36	0.26	0.0229	1.30	0.69	4.20
	683.699	0.90	157.84	158.09	0.25	0.0212	1.27	0.74	4.92
	629.558	0.90	148.03	148.30	0.27	0.0219	1.32	0.69	4.22
	574.885	0.90	141.00	141.31	0.31	0.0229	1.23	0.73	4.73
	525.510	0.90	132.96	133.20	0.24	0.0225	1.30	0.69	4.09
	458.859	0.90	119.00	119.26	0.26	0.0219	1.36	0.66	3.58
	404.884	0.90	110.05	110.40	0.35	0.0208	1.45	0.64	3.20
	364.743	0.90	102.90	103.20	0.30	0.0226	1.30	0.70	4.23
	330.753	2.00	96.43	96.86	0.43	0.0184	1.67	1.24	4.68
jusante	270.369	2.00	82.52	82.98	0.46	0.0165	1.80	1.22	4.36
	215.323	2.00	70.20	70.67	0.47	0.0173	1.76	1.21	4.34
	159.692	2.00	58.55	59.01	0.46	0.0205	1.58	1.27	5.32
	104.794	2.00	46.77	47.16	0.39	0.0177	1.77	1.16	3.95
	53.778	2.00	37.28	37.71	0.43	0.0184	1.68	1.22	4.65
	6.416	2.00	29.00	29.65	0.65	0.0100	1.36	1.47	4.27

Na Figura 5.2 é mostrada as prováveis áreas inundadas para o período de retorno de 100 anos na ribeira do "Assobio".

A representação gráfica de cada secção assim como o correspondente nível de água atingido é apresentada no anexo respectivo.

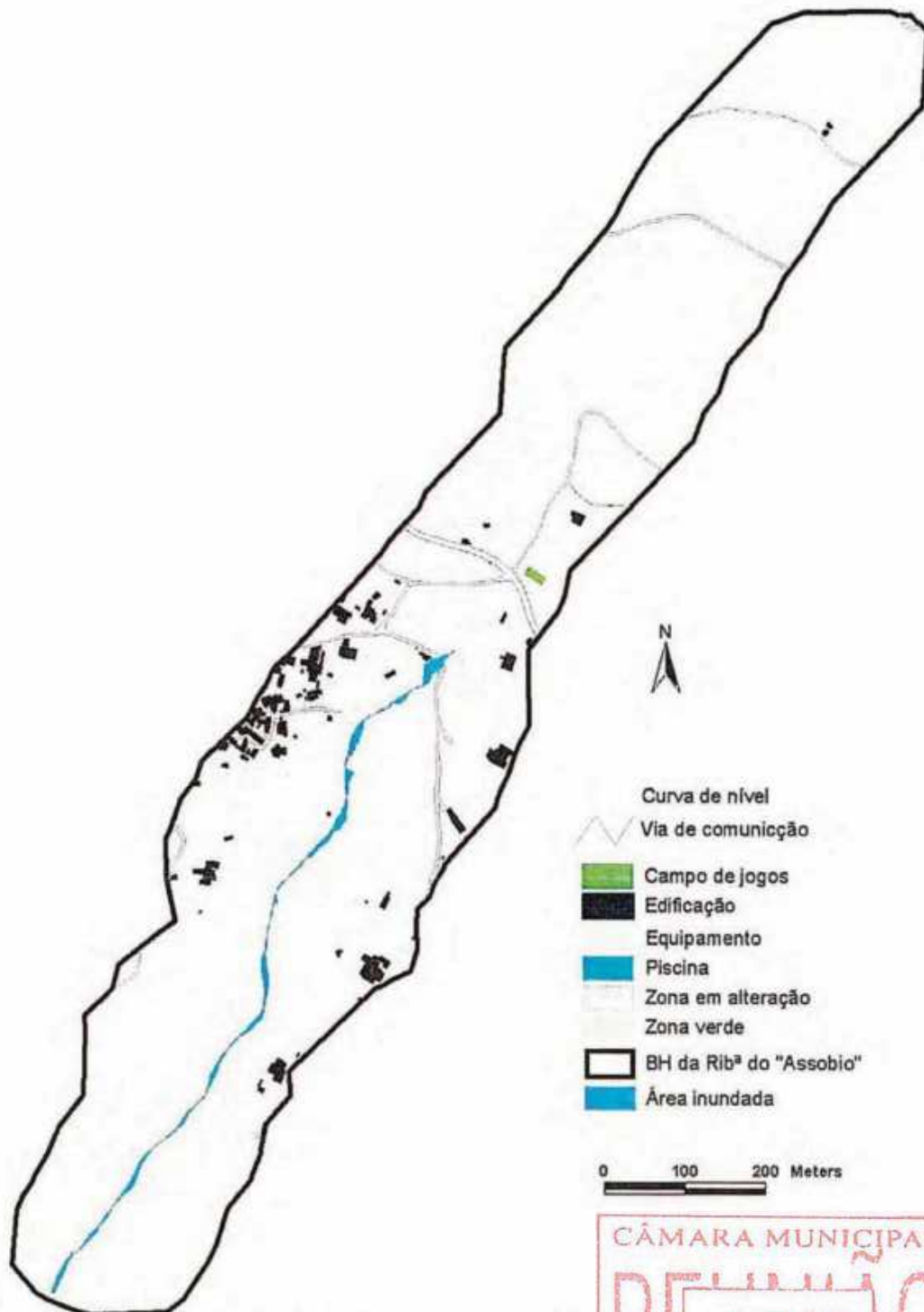


Figura 5.2 – Ribeira do "Assobio", prováveis áreas inundadas para T=100 anos



### 5.1.2 Bacia da ribeira de "Grota"

As localizações das secções transversais utilizadas na modelação encontram-se representadas na Figura 5.3, sendo a secção de montante a 1549,3448, numeração esta que corresponde à distância (em metros) para a secção da bacia hidrográfica.



Figura 5.3 – Ribeira da "Grota", localização das secções utilizadas na modelação



Na Tabela 5.2 apresenta-se o resultado da modelação da propagação dos caudais de ponta de cheia correspondentes ao período de retorno de 100 anos, nas secções de cálculo cuja localização se mostrou na Figura 5.3.

**Tabela 5.2 – Resultado da modelação para a ribeira da “Grota”**

Sentido escoamento	Linha de água	Secção	Caudal	Cota terreno	Nível água	Altura água	Declive	Velocidade	Área secção	Largura superficial
			(m <sup>3</sup> /s)	(m)	(m)	(m)				
montante	ME afluente	195.290	1.20	156.91	157.15	0.24	0.0182	1.39	1.01	6.20
		130.362	1.20	138.11	138.54	0.43	0.0162	1.66	0.83	3.57
		79.775	1.20	129.66	129.95	0.29	0.0217	1.31	0.93	5.86
		24.067	1.20	122.64	122.91	0.27	0.0199	1.37	0.95	5.50
		151.390	1.00	69.00	69.27	0.27	0.0193	1.45	0.74	3.88
		98.043	1.00	63.49	63.69	0.20	0.0207	1.28	0.84	5.61
	MD afl.	19.308	1.00	50.28	50.52	0.24	0.0182	1.37	0.90	5.75
		1549.345	1.40	232.10	232.45	0.35	0.0165	1.66	1.07	4.93
		1479.977	1.40	221.03	221.30	0.27	0.0189	1.49	1.29	7.44
		1376.558	1.40	204.43	204.71	0.28	0.0221	1.33	1.05	5.94
		1248.614	1.40	188.00	188.36	0.36	0.0217	1.44	0.98	4.87
		1131.846	1.40	175.62	175.90	0.28	0.0232	1.21	1.15	7.81
	GROTA montante	1034.153	1.40	165.64	165.86	0.22	0.0194	1.29	1.22	8.60
		909.248	1.40	144.51	144.79	0.28	0.0177	1.22	1.28	11.70
		814.182	1.40	129.85	130.12	0.27	0.0149	1.21	1.61	13.86
		740.090	1.40	121.09	121.44	0.35	0.0168	1.69	1.17	5.59
		708.658	4.30	117.71	118.18	0.47	0.0159	1.94	2.30	6.69
		631.167	4.30	106.00	106.63	0.63	0.0140	2.26	2.32	5.62
	GROTA intermédio	557.679	4.30	90.08	90.67	0.59	0.0147	2.24	2.48	6.34
		486.060	4.30	75.57	76.09	0.52	0.0169	1.83	2.45	7.98
419.419		4.30	67.00	67.49	0.49	0.0169	1.88	2.35	7.01	
367.574		4.30	59.00	59.55	0.55	0.0158	1.97	2.38	6.79	
305.282		4.30	54.49	55.06	0.57	0.0166	1.71	2.64	10.27	
240.401		4.30	49.00	49.51	0.51	0.0185	1.75	2.45	7.99	
jusante	GROTA jusante	199.433	6.80	45.11	45.86	0.75	0.0154	2.15	3.30	7.61
		120.929	6.80	37.82	38.57	0.75	0.0120	2.27	3.77	8.89
		59.764	6.80	33.85	34.48	0.63	0.0145	2.21	3.39	7.92
		11.335	6.80	29.38	30.31	0.93	0.0100	2.35	3.87	7.09

Na Figura 5.4 é mostrada as prováveis áreas inundadas para o período de retorno de 100 anos na ribeira da “Grota”.

A representação gráfica de cada secção assim como o correspondente nível de água atingido é apresentada no anexo respectivo.

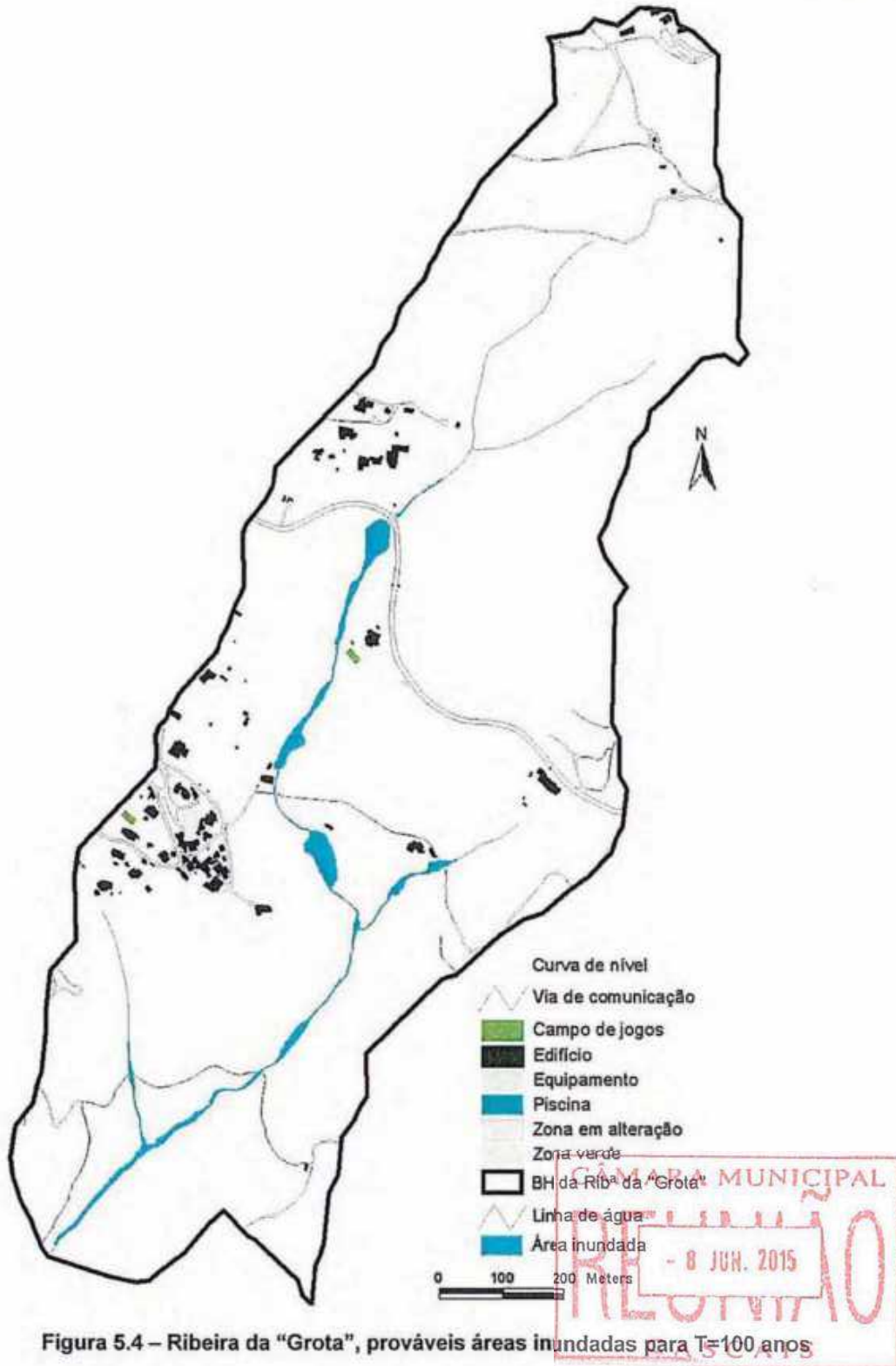


Figura 5.4 – Ribeira da "Grotta", prováveis áreas inundadas para T=100 anos

### 5.1.3 Bacia da ribeira da "Praia"

As localizações das secções transversais utilizadas na modelação encontram-se representadas na Figura 5.5, sendo a secção de montante a 484,1719, numeração esta que corresponde à distância (em metros) para a secção da bacia hidrográfica.

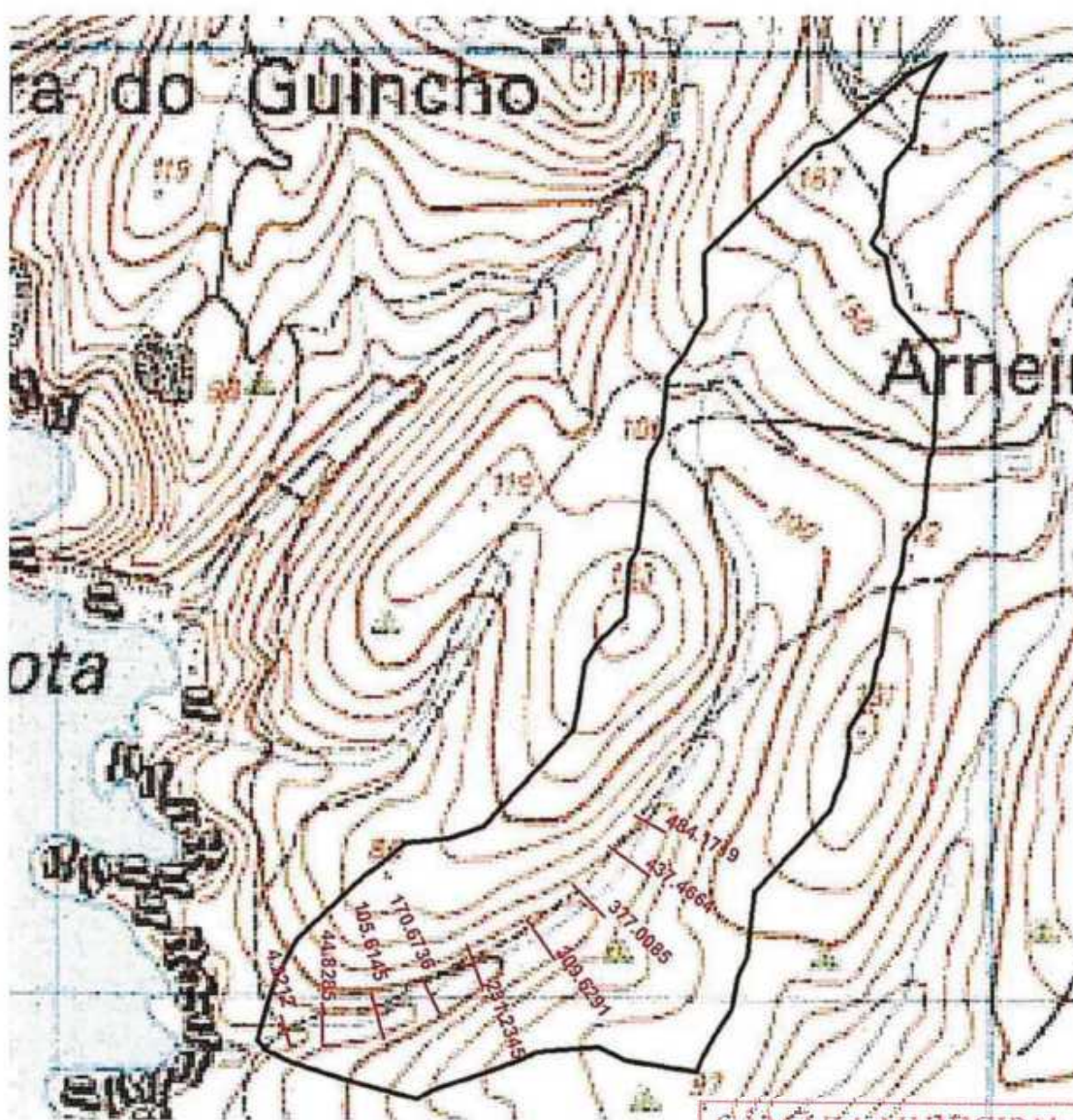


Figura 5.5 – Ribeira da "Praia", localização das secções utilizadas na modelação

Na Tabela 5.3 apresenta-se o resultado da modelação da propagação dos caudais de ponta de cheia correspondentes ao período de retorno de 100 anos, nas secções de cálculo cuja localização se mostrou na Figura 5.5.





**Tabela 5.3 – Resultado da modelação para a ribeira da "Praia"**

Sentido escoamento	Secção	Caudal	Cota terreno	Nível água <sup>2</sup>	Altura água	Declive	Velocidade	Área secção	Largura superficial
		(m <sup>3</sup> /s)	(m)	(m)	(m)				
montante	484.172	0.90	203.92	204.17	0.25	0.0200	1.34	0.73	4.52
	437.466	0.90	199.00	199.22	0.22	0.0197	1.34	0.96	7.34
	377.009	0.90	194.53	194.73	0.20	0.0228	1.13	0.81	7.01
	309.629	0.90	184.14	184.40	0.26	0.0229	1.23	0.74	5.25
	231.235	0.90	175.00	175.23	0.23	0.0239	1.19	0.76	5.41
jusante	170.674	0.90	167.10	167.36	0.26	0.0229	1.30	0.69	4.20
	105.615	0.90	157.84	158.09	0.25	0.0212	1.27	0.74	4.92
	44.828	0.90	148.03	148.30	0.27	0.0219	1.32	0.69	4.22
	4.221	0.90	141.00	141.31	0.31	0.0229	1.23	0.73	4.73

Na Figura 5.6 é mostrada as prováveis áreas inundadas para o período de retorno de 100 anos na ribeira da "Praia".

A representação gráfica de cada secção assim como o correspondente nível de água atingido é apresentada no anexo respectivo.

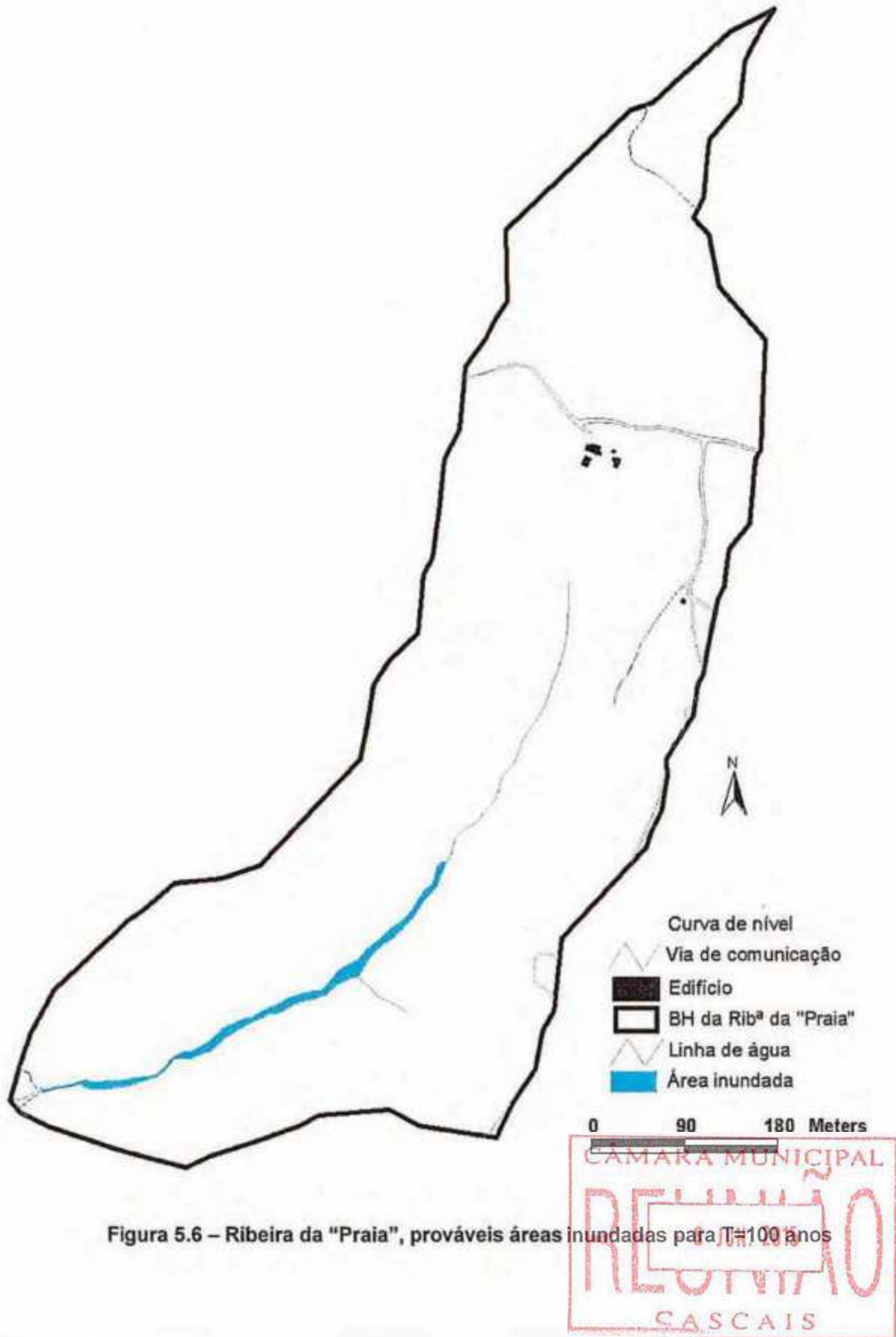


Figura 5.6 – Ribeira da "Praia", prováveis áreas inundadas para T=100 anos



#### 5.1.4 Bacia da ribeira do Arneiro

As localizações das secções transversais utilizadas na modelação encontram-se representadas na Figura 5.7, sendo a secção de montante a 2115,8300, numeração esta que corresponde à distância (em metros) para a secção da bacia hidrográfica.

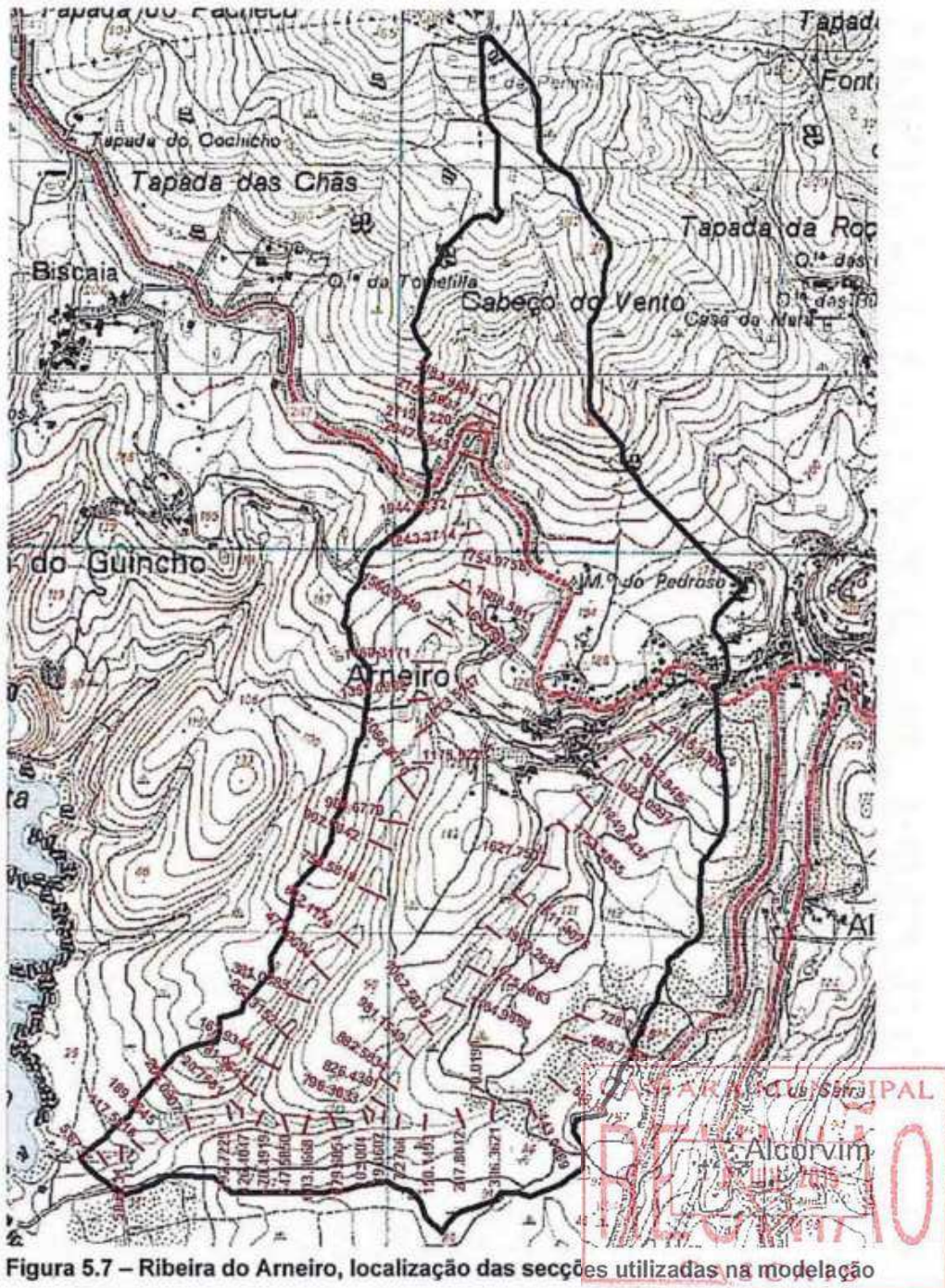


Figura 5.7 – Ribeira do Arneiro, localização das secções utilizadas na modelação

Na Tabela 5.4 apresenta-se o resultado da modelação da propagação dos caudais de ponta de cheia correspondentes ao período de retorno de 100 anos, nas secções de cálculo cuja localização se mostrou na Figura 5.7.

Tabela 5.4 – Resultado da modelação para a ribeira do Arneiro

Sentido escoamento	Linha de água	Secção	Caudal (m <sup>3</sup> /s)	Cota terreno (m)	Nível água (m)	Altura água (m)	Declive (m/m)	Velocidade (m/s)	Área secção (m <sup>2</sup> )	Largura superficial (m)
ME afluente		728.712	1.50	93.45	93.66	0.21	0.0220	1.29	2.04	20.10
		665.756	1.50	89.65	89.89	0.24	0.0181	1.28	1.56	12.34
		538.812	1.50	83.61	83.80	0.19	0.0225	1.14	1.48	13.28
		443.037	2.70	80.00	80.18	0.18	0.0217	1.21	2.32	16.83
		336.362	2.70	75.10	75.50	0.40	0.0163	1.81	2.21	9.60
		247.804	2.70	69.00	69.46	0.46	0.0151	1.70	1.89	8.15
		150.149	2.70	62.17	62.51	0.34	0.0159	1.57	2.28	11.56
		77.277	2.70	56.98	57.20	0.22	0.0214	1.37	1.98	10.53
		39.060	2.70	54.00	54.41	0.41	0.0159	1.80	2.20	9.18
		10.900	2.70	51.83	52.16	0.33	0.0187	1.45	2.05	10.52
MD afluente		2183.968	1.40	211.41	211.70	0.29	0.0214	1.31	1.08	6.52
		2155.563	1.40	208.48	208.74	0.26	0.0193	1.45	1.22	7.35
		2119.022	1.40	202.58	202.86	0.28	0.0204	1.42	1.16	6.90
		2047.584	1.40	191.62	191.94	0.32	0.0213	1.33	1.09	6.74
		1944.423	1.40	176.38	176.70	0.32	0.0169	1.53	1.13	5.94
		1843.371	1.40	164.17	164.47	0.30	0.0173	1.49	1.08	5.57
		1754.976	1.40	154.00	154.39	0.39	0.0200	1.46	1.02	5.13
		1688.581	1.40	147.00	147.37	0.37	0.0169	1.55	1.03	5.20
		1630.892	1.40	139.87	140.13	0.26	0.0205	1.39	1.04	5.63
		1560.935	1.40	131.31	131.67	0.36	0.0211	1.37	1.06	6.07
		1460.317	4.50	125.00	125.21	0.21	0.0220	1.30	3.45	20.17
		1356.069	4.50	115.00	115.66	0.66	0.0165	1.93	2.40	7.31
		1273.515	4.50	107.53	108.05	0.52	0.0153	1.74	2.90	11.33
		1178.522	4.50	99.11	99.65	0.54	0.0138	2.00	2.92	9.51
		1086.847	4.50	93.81	94.10	0.29	0.0208	1.41	3.21	16.53
		984.678	4.50	87.00	87.38	0.38	0.0193	1.57	2.91	12.15
		902.704	4.50	82.00	82.49	0.49	0.0173	1.91	2.98	10.60
		759.582	6.60	74.00	74.65	0.65	0.0167	1.99	3.36	8.79
		602.117	6.60	66.00	66.44	0.44	0.0172	1.87	3.65	10.86
		477.969	6.60	60.00	60.68	0.68	0.0129	2.37	4.23	10.78
381.038	6.60	53.42	53.89	0.47	0.0158	1.91	3.67	10.98		
264.315	6.60	47.00	47.57	0.57	0.0166	2.12	3.11	6.87		
167.934	6.60	42.00	42.65	0.65	0.0155	2.13	3.21	7.59		
81.964	6.60	37.00	37.64	0.64	0.0171	1.98	3.37	8.90		
20.768	6.60	33.30	34.11	0.81	0.0124	2.46	3.84	8.65		
Arneiro (montante)		2115.830	2.80	130.94	131.16	0.22	0.0207	1.88	2.10	11.58
		2013.949	2.80	121.00	121.35	0.35	0.0187	1.59	1.80	7.75
		1922.100	2.80	111.35	111.80	0.45	0.0156	1.88	1.81	6.27
		1842.644	2.80	104.32	104.71	0.39	0.0199	1.56	1.80	7.41
		1754.585	2.80	99.00	99.25	0.25	0.0210	1.29	2.27	14.93
		1627.754	2.80	93.00	93.26	0.26	0.0217	1.29	2.22	14.01
1511.408	2.80	87.00	87.30	0.30	0.0233	1.26	2.22	14.35		

Sentido escoamento	Linha de água	Secção	Caudal	Cota terreno	Nível água	Altura água	Declive	Velocidade	Área secção	Largura superficial
			(m <sup>3</sup> /s)	(m)	(m)	(m)		(m/s)	(m <sup>2</sup> )	(m)
jusante	Arneiro (intermédio)	1399.269	2.80	80.57	80.85	0.28	0.0182	1.48	2.04	10.38
		1275.966	2.80	75.00	75.49	0.49	0.0142	1.82	2.15	8.81
		1164.966	2.80	71.00	71.22	0.22	0.0206	1.38	2.07	11.13
		1062.588	2.80	66.32	66.74	0.42	0.0181	1.63	1.88	7.67
		981.155	2.80	62.00	62.46	0.46	0.0171	1.77	1.93	7.61
		882.583	2.80	57.65	58.01	0.36	0.0188	1.53	1.97	9.02
		826.439	2.80	54.00	54.41	0.41	0.0154	1.84	1.97	7.38
	796.363	2.80	52.00	52.25	0.25	0.0200	1.39	2.15	12.20	
	770.020	11.10	51.00	51.67	0.67	0.0134	2.38	5.12	10.24	
	679.685	11.10	47.00	47.76	0.76	0.0126	2.53	5.08	9.28	
	603.967	11.10	44.00	44.61	0.61	0.0147	2.23	5.29	11.45	
	547.585	11.10	41.00	41.65	0.65	0.0133	2.42	5.19	10.21	
	478.492	11.10	36.41	37.30	0.89	0.0121	2.72	5.02	8.20	
	426.405	11.10	34.00	35.08	1.08	0.0112	2.83	6.00	10.50	
	392.723	18.90	32.00	33.12	1.12	0.0125	3.21	8.92	12.42	
	266.091	18.90	26.00	27.34	1.34	0.0111	3.33	8.20	9.96	
	189.864	18.90	23.00	24.04	1.04	0.0113	3.06	7.65	10.02	
	117.522	18.90	18.04	19.81	1.77	0.0129	3.67	8.58	10.38	
	58.623	18.90	16.00	17.23	1.23	0.0111	3.05	7.47	9.87	
	5.674	18.90	13.00	14.97	1.97	0.0050	2.59	10.27	11.78	

Na Figura 5.8 é mostrada as prováveis áreas inundadas para o período de retorno de 100 anos na ribeira do Arneiro.

A representação gráfica de cada secção assim como o correspondente nível de água atingido é apresentada no anexo respectivo.

### 5.1.5 Bacia da ribeira da Foz do Guincho

As localizações das secções transversais utilizadas na modelação encontram-se representadas na Figura 5.9, sendo a secção de montante a 5123.1810 da linha de água principal, numeração esta que corresponde à distância (em metros) para a secção da bacia hidrográfica.

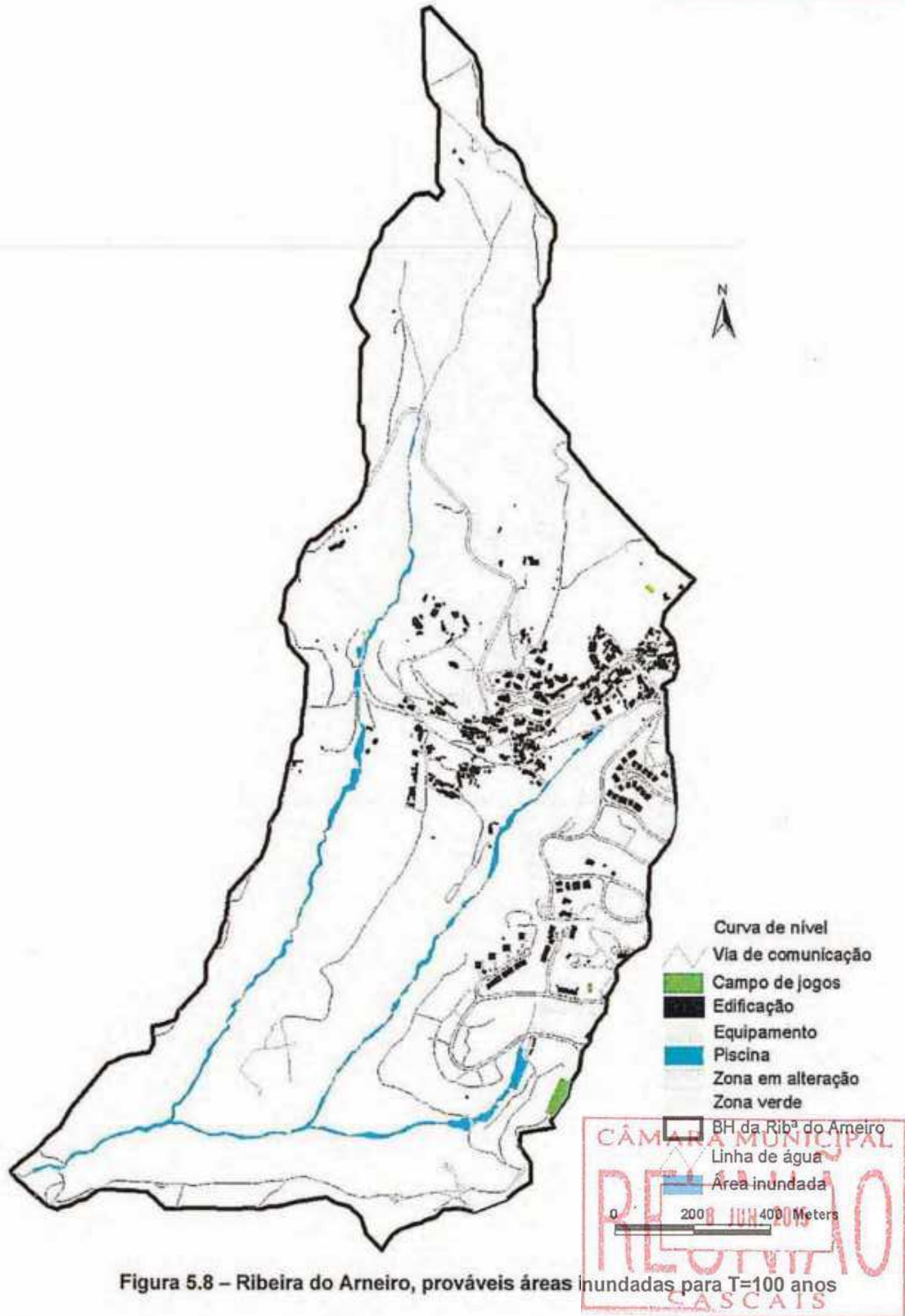


Figura 5.8 – Ribeira do Arneiro, prováveis áreas inundadas para T=100 anos

CÂMARA MUNICIPAL  
**RECEBIMOS**  
 12 JAN, 2015

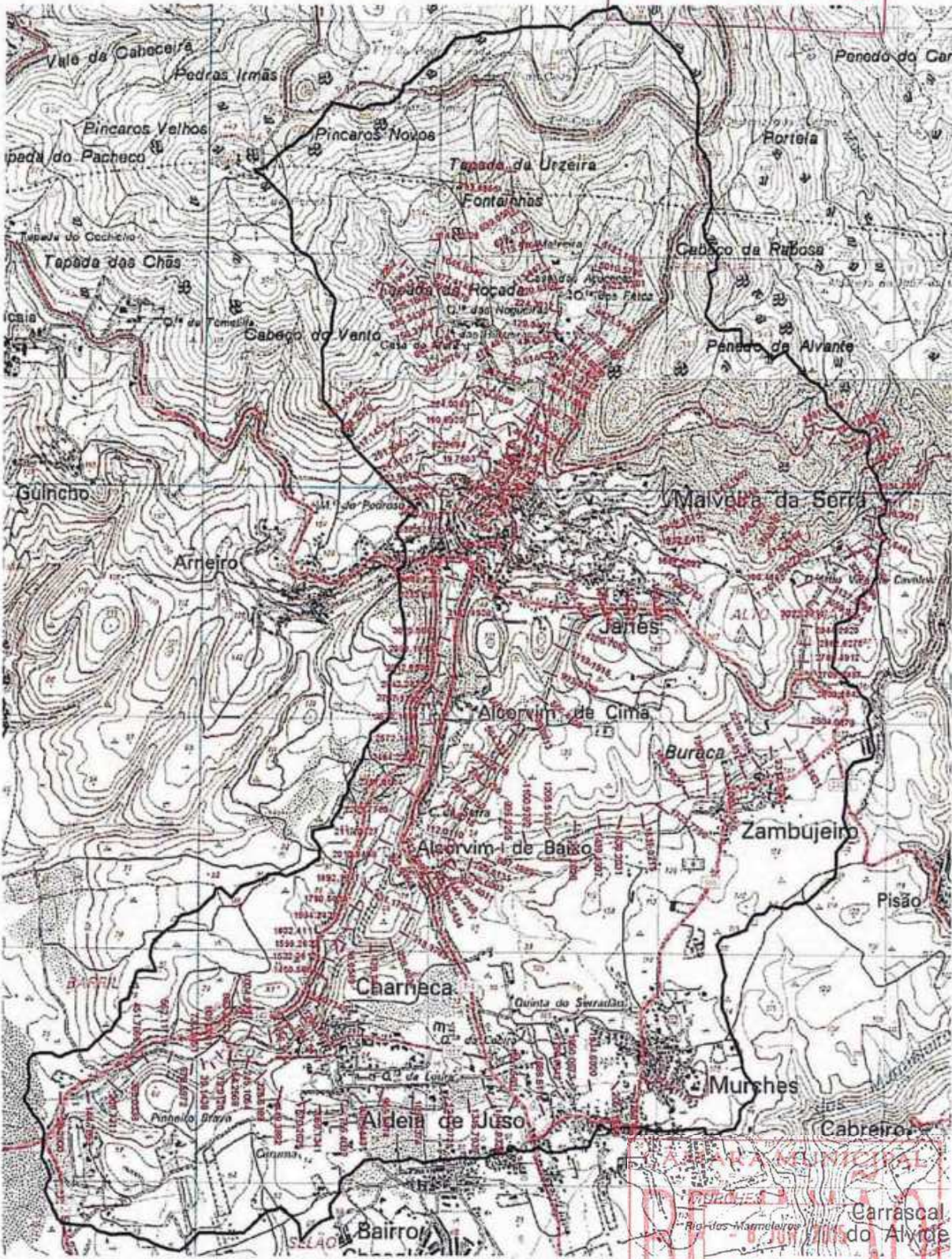


Figura 5.9 – Ribeira da Foz do Guincho, localização das secções utilizadas na modelação

CÂMARA MUNICIPAL  
**RECEBIMOS**  
 CASCAIS

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**HIDROPROJECTO**  
ENGENHARIA E GESTÃO, S.A.





Na Tabela 5.5 apresenta-se o resultado da modelação da propagação dos caudais de ponta de cheia correspondentes ao período de retorno de 100 anos, nas secções de cálculo cuja localização se mostrou na Figura 5.9.

**Tabela 5.5 – Resultado da modelação para a ribeira da Foz do Guincho**

Sentido escoamento	Linha de água	Secção	Caudal	Cota terreno (m)	Nível água (m)	Altura água (m)	Declive (m/m)	Velocidade (m/s)	Área secção (m <sup>2</sup> )	Largura superficial (m)
			(m <sup>3</sup> /s)							
montante	ME2 (afluente)	2235.112	3.40	92.87	93.08	0.21	0.0247	1.13	3.00	24.00
		2159.483	3.40	92.00	92.18	0.18	0.0058	0.51	6.68	60.57
		2051.609	3.40	91.12	91.29	0.17	0.0123	0.72	4.73	44.42
		1934.692	3.40	90.00	90.21	0.21	0.0072	0.72	4.74	30.24
		1850.067	3.40	89.00	89.16	0.16	0.0238	1.12	3.03	23.92
		1790.884	6.30	86.26	86.60	0.34	0.0196	1.55	4.08	17.56
		1688.612	6.30	83.65	84.01	0.36	0.0195	1.55	4.08	17.67
		1551.560	6.30	78.00	78.47	0.47	0.0195	1.59	3.98	16.84
		1440.933	6.30	75.55	75.97	0.42	0.0188	1.65	3.81	13.83
		1345.794	6.30	72.00	72.45	0.45	0.0197	1.58	3.99	16.30
		1242.073	6.30	70.00	70.29	0.29	0.0208	1.43	4.41	22.24
		1095.437	7.90	65.00	65.65	0.65	0.0056	1.14	6.98	18.91
		955.551	7.90	64.09	64.24	0.15	0.0234	1.17	6.74	49.20
		838.944	7.90	60.00	60.52	0.52	0.0191	1.66	4.79	18.65
		756.409	7.90	58.00	58.77	0.77	0.0159	2.34	3.38	6.14
		659.134	7.90	53.14	53.59	0.45	0.0178	1.80	4.42	14.20
		570.263	7.90	51.35	51.71	0.36	0.0202	1.52	5.22	23.53
		448.388	7.90	48.71	49.00	0.29	0.0218	1.33	5.93	33.40
		328.619	7.90	40.04	40.92	0.88	0.0161	2.13	3.71	8.03
		245.105	13.80	34.15	34.97	0.82	0.0162	2.09	6.62	15.13
164.257	13.80	24.89	25.79	0.90	0.0147	2.61	5.29	7.89		
79.912	13.80	21.00	21.51	0.51	0.0172	1.84	7.57	24.08		
39.144	13.80	20.00	21.08	1.08	0.0013	0.81	17.66	31.83		
	ME1-md2 (afluente)	2049.378	1.50	178.00	178.50	0.50	0.0219	1.86	0.81	2.33
		1972.742	1.50	169.47	169.72	0.25	0.0220	1.27	1.20	7.97
		1867.583	1.50	161.00	161.29	0.29	0.0219	1.30	1.16	7.24
		1764.276	1.50	156.97	157.09	0.12	0.0266	0.91	1.66	20.37
		1630.640	2.70	152.82	153.03	0.21	0.0255	1.08	2.50	21.69
		1512.732	2.70	148.23	148.49	0.26	0.0223	1.28	2.12	13.56
		1395.286	2.70	144.00	144.62	0.62	0.0193	1.87	1.44	4.15
		1304.443	2.70	139.00	139.36	0.36	0.0209	1.37	1.98	11.02
		1206.708	2.70	134.68	134.90	0.22	0.0233	1.21	2.22	15.08
		1119.151	2.70	131.00	131.34	0.34	0.0212	1.32	2.05	11.44
		993.836	11.00	120.00	120.82	0.82	0.0159	2.22	4.95	10.21
		866.461	11.00	106.00	106.80	0.80	0.0162	2.18	5.07	11.20
		780.081	11.00	99.77	100.50	0.73	0.0174	1.83	6.02	18.09
		669.071	11.00	95.27	95.78	0.51	0.0179	1.80	6.11	19.60
		564.335	11.00	89.00	89.97	0.97	0.0156	2.56	4.29	6.50
		482.728	11.00	85.50	86.41	0.91	0.0154	2.20	5.02	10.84
		396.143	11.00	82.76	83.62	0.86	0.0156	2.32	4.73	8.74
		297.875	11.00	79.00	79.95	0.95	0.0158	2.32	4.74	8.83
		211.432	11.00	77.00	77.72	0.72	0.0176	1.98	5.71	15.79
		112.011	11.00	73.32	73.84	0.52	0.0178	1.82	6.06	19.01
17.063	11.00	68.00	69.10	1.10	0.0149	2.54	4.37	7.42		

PAL  
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Sentido escoamento	Linha de água	Secção	Caudal (m <sup>3</sup> /s)	Cota terreno (m)	Nível água (m)	Altura água (m)	Declive (m/m)	Velocidade (m/s)	Área secção (m <sup>2</sup> )	Largura superficial (m)
ME1 (montante)	4061.138	2.80	71.00	71.22	0.22	0.0206	1.38	2.07	11.13	
	3940.880	2.80	66.32	66.74	0.42	0.0181	1.63	1.88	7.67	
	3839.595	2.80	62.00	62.46	0.46	0.0171	1.77	1.93	7.61	
	3738.647	2.80	57.65	58.01	0.36	0.0188	1.53	1.97	9.02	
	3634.780	2.80	54.00	54.41	0.41	0.0154	1.84	1.97	7.38	
	3535.903	2.80	52.00	52.25	0.25	0.0200	1.39	2.15	12.20	
	3441.846	11.10	51.00	51.67	0.67	0.0134	2.38	5.12	10.24	
	3339.636	11.10	47.00	47.76	0.76	0.0126	2.53	5.08	9.28	
	3250.754	11.10	44.00	44.61	0.61	0.0147	2.23	5.29	11.45	
	3137.580	11.10	41.00	41.65	0.65	0.0133	2.42	5.19	10.21	
3059.937	11.10	36.41	37.30	0.89	0.0121	2.72	5.02	8.20		
ME1 (intermédio)	3022.381	7.90	143.00	143.41	0.41	0.0157	1.57	5.06	18.59	
	2944.292	7.90	141.62	142.05	0.43	0.0187	1.69	4.68	16.76	
	2862.628	7.90	138.23	138.72	0.49	0.0176	1.82	4.38	13.95	
	2788.491	7.90	136.00	136.49	0.49	0.0184	1.69	4.73	17.68	
	2709.249	7.90	132.00	132.39	0.39	0.0181	1.71	4.65	16.72	
	2630.484	7.90	129.29	129.51	0.22	0.0219	1.28	6.22	39.19	
	2504.088	7.90	125.17	125.48	0.31	0.0224	1.32	5.98	35.52	
	2393.563	7.90	120.00	120.49	0.49	0.0194	1.61	4.91	20.1	
	2312.587	7.90	117.70	118.33	0.63	0.0179	1.7	4.73	17.71	
	2230.145	7.90	113.22	113.73	0.51	0.0173	1.84	4.4	13.98	
	2160.497	11.20	111.30	111.75	0.45	0.0154	1.91	6.52	20.57	
	2080.357	11.20	108.00	108.39	0.39	0.0176	1.76	6.44	22.02	
	1967.792	11.20	105.00	105.42	0.42	0.0191	1.57	7.15	30.05	
	1863.582	11.20	102.00	103.00	1.00	0.0157	2.62	4.28	6.45	
	1739.775	13.00	98.89	99.28	0.39	0.0181	1.76	7.37	23.79	
	1631.022	13.00	96.81	97.19	0.38	0.0162	1.59	8.21	28.76	
	1530.203	13.00	94.69	95.47	0.78	0.0148	2.39	5.47	9.99	
	1439.491	13.00	91.00	91.76	0.76	0.0166	1.96	6.65	17.51	
	1331.283	13.00	87.73	88.40	0.67	0.0157	2.19	5.95	12.94	
	1206.514	13.00	84.79	85.33	0.54	0.0162	2	6.56	17.35	
1100.978	13.00	81.21	81.86	0.65	0.0159	2.04	6.48	16.92		
996.926	13.00	78.00	78.79	0.79	0.0152	2.3	5.68	11.32		
897.489	13.00	75.00	75.65	0.65	0.0156	2.16	6.07	13.87		
789.813	13.00	70.00	71.07	1.07	0.0146	2.72	4.79	6.69		
716.600	13.00	68.00	68.86	0.86	0.0149	2.48	5.25	8.81		
687.401	31.00	67.00	68.71	1.71	0.0042	1.81	18.17	24.39		
644.727	31.00	67.00	68.13	1.13	0.0130	2.99	10.41	12.06		
606.543	31.00	65.75	67.77	2.02	0.0014	1.29	24.11	18.60		
572.809	31.00	66.43	67.43	1.00	0.0135	2.48	12.79	22.11		
522.946	31.00	63.00	64.53	1.53	0.0145	3.01	10.30	11.74		
431.175	31.00	59.70	61.16	1.46	0.0128	2.92	10.69	13.16		
318.979	31.00	56.00	57.40	1.40	0.0128	3.06	10.15	11.07		
236.403	31.00	51.32	53.16	1.84	0.0131	3.40	9.15	8.16		
139.761	31.00	46.00	47.63	1.63	0.0128	3.29	9.45	8.91		
19.955	31.00	40.00	41.44	1.44	0.0132	3.27	11.47	16.81		
603.031	0.50	254.00	254.20	0.20	0.0251	1.09	0.46	4.10		
508.257	0.50	228.31	228.42	0.11	0.0306	0.75	0.66	11.46		
417.144	0.50	211.07	211.25	0.18	0.0263	1.02	0.50	5.05		
291.506	0.50	183.62	183.83	0.21	0.0227	1.05	0.50	5.66		
224.613	0.50	177.00	177.20	0.20	0.0268	1.01	0.50	4.95		
123.964	0.50	165.88	166.05	0.17	0.0284	0.91	0.55	6.72		
50.610	0.50	157.30	157.50	0.20	0.0263	1.04	0.48	4.72		
13.342	0.50	154.00	154.13	0.13	0.0289	0.87	0.58	7.60		



Sentido escoamento	Linha de água	Secção	Caudal	Cota terreno	Nível água	Altura água	Declive	Velocidade	Área secção	Largura superficial
			(m³/s)	(m)	(m)	(m)				
MD2-md1 (aff.)		134.226	2.70	273.60	273.92	0.32	0.0177	1.53	1.91	9.33
		82.611	2.70	265.08	265.62	0.54	0.0142	1.91	1.72	5.80
		22.209	2.70	258.11	258.40	0.29	0.0208	1.41	1.93	10.17
MD2 (mont.)		1143.563	1.90	290.00	290.33	0.33	0.0207	1.47	1.29	5.95
		1045.834	1.90	273.33	273.79	0.46	0.0203	1.58	1.20	4.89
		977.415	1.90	260.03	260.30	0.27	0.0201	1.36	1.45	8.64
MD2 (usante)		955.287	1.90	257.92	258.23	0.31	0.0020	0.47	4.11	20.03
		925.180	4.50	257.60	257.91	0.31	0.0208	1.37	3.34	19.45
		835.344	4.50	250.37	250.88	0.51	0.0169	1.87	2.45	7.57
		750.310	4.50	236.95	237.41	0.46	0.0188	1.62	2.80	10.91
		662.458	4.50	229.00	229.53	0.53	0.0191	1.62	2.78	10.51
		564.368	4.50	220.00	220.32	0.32	0.0198	1.57	2.87	11.65
		478.408	4.50	212.00	212.48	0.48	0.0202	1.60	2.82	11.72
		402.147	4.50	205.78	206.11	0.33	0.0192	1.56	2.90	12.37
		313.606	4.50	200.78	201.21	0.43	0.0181	1.76	2.58	8.80
		224.008	4.50	194.05	194.56	0.51	0.0177	1.85	2.45	7.46
		150.692	4.50	189.49	190.03	0.54	0.0182	1.76	2.57	9.17
MD1 (afluente)		62.569	4.50	182.56	182.91	0.35	0.0207	1.44	3.13	15.62
		19.750	4.50	179.56	179.80	0.24	0.0229	1.22	3.71	26.48
		893.908	2.10	322.24	322.59	0.35	0.0195	1.51	1.41	6.53
		793.886	2.10	308.05	308.27	0.22	0.0200	1.34	1.67	10.22
		699.058	2.10	295.33	295.69	0.36	0.0190	1.52	1.45	6.98
		610.474	2.10	282.00	282.34	0.34	0.0199	1.51	1.41	6.32
		515.576	2.10	271.00	271.33	0.33	0.0219	1.34	1.57	8.77
		413.862	2.10	258.00	258.35	0.35	0.0202	1.54	1.36	5.69
		320.636	2.10	250.35	250.63	0.28	0.0207	1.34	1.61	9.36
		224.301	2.10	238.06	238.38	0.32	0.0207	1.42	1.49	7.68
		129.950	2.10	228.42	228.76	0.34	0.0217	1.38	1.52	8.02
FOZ do GUINCHO (montante)		43.424	2.10	220.02	220.36	0.34	0.0204	1.44	1.47	7.31
		20.614	2.10	218.39	218.67	0.28	0.0221	1.31	1.61	9.39
		5123.181	3.60	260.40	260.70	0.30	0.0192	1.47	2.54	12.87
		5016.575	3.60	251.89	252.21	0.32	0.0184	1.61	2.36	9.81
		4922.738	3.60	242.00	242.32	0.32	0.0185	1.57	2.43	10.69
		4823.514	3.60	236.32	236.76	0.44	0.0149	1.93	2.64	9.42
		4737.256	3.60	232.00	232.22	0.22	0.0263	1.06	3.39	30.92
		4645.073	3.60	225.76	226.12	0.36	0.0172	1.56	2.69	12.86
		4583.240	3.60	222.00	222.28	0.28	0.0179	1.56	2.60	12.23
		4561.372	3.60	219.00	219.40	0.40	0.0136	1.72	3.10	14.08
		4533.399	8.40	215.60	216.27	0.67	0.0142	2.21	4.03	9.25
FOZ do GUINCHO (intermédio 1)		4453.160	8.40	209.90	210.35	0.45	0.0173	1.87	4.49	13.06
		4352.772	8.40	204.41	204.89	0.48	0.0171	1.78	4.83	16.78
		4260.206	8.40	199.56	199.93	0.37	0.0196	1.53	5.54	25.14
		4186.473	8.40	195.57	196.17	0.60	0.0153	1.96	4.55	13.95
		4106.951	8.40	188.13	188.84	0.71	0.0172	1.94	4.33	11.53
		4057.394	8.40	182.32	182.74	0.42	0.0163	1.78	5.03	17.83
		4025.923	8.40	180.61	181.17	0.56	0.0164	1.99	4.60	18.50
		3998.569	15.30	177.66	178.32	0.66	0.0144	2.27	7.02	14.83
FOZ do GUINCHO (inter. 2)		3929.554	15.30	175.00	175.74	0.74	0.0164	2.06	7.46	18.67
		3856.793	15.30	165.88	167.01	1.13	0.0145	2.57	5.95	8.93
		3787.381	15.30	156.00	156.38	0.38	0.0179	1.77	8.69	28.48
		3741.769	15.30	154.00	154.70	0.70	0.0159	2.23	6.88	14.08
FOZ do GUINCHO (interm. 3)		3714.551	17.50	152.79	153.64	0.85	0.0139	2.30	7.87	16.29
		3641.971	17.50	148.15	149.22	1.07	0.0135	2.61	6.85	11.13
FOZ do GUINCHO (interm. 4)		3557.873	17.50	143.12	144.13	1.01	0.0141	2.46	7.18	12.41

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Sentido escoamento	Linha de água	Secção	Caudal	Cota terreno	Nível água	Altura água	Declive	Velocidade	Área secção	Largura superficial
			(m <sup>3</sup> /s)	(m)	(m)	(m)	(m/m)	(m/s)	(m <sup>2</sup> )	(m)
jusante	Linha de água	3467.567	17.50	136.00	136.99	0.99	0.0145	2.51	7.01	11.53
		3419.835	17.50	131.97	133.06	1.09	0.0140	2.60	6.75	10.21
		3348.724	17.50	128.00	128.94	0.94	0.0142	2.36	7.55	14.25
		3255.269	17.50	122.60	123.21	0.61	0.0157	2.05	8.77	22.37
		3167.493	17.50	117.00	117.94	0.94	0.0144	2.53	6.92	10.70
		3075.866	17.50	112.00	112.85	0.85	0.0157	2.22	7.88	16.00
		2998.184	17.50	109.00	109.75	0.75	0.0154	2.13	8.26	19.12
		2912.659	17.50	106.00	106.75	0.75	0.0156	2.24	7.81	15.65
		2843.237	17.50	100.76	101.84	1.08	0.0138	2.76	6.37	8.56
		2757.176	17.50	88.00	89.00	1.00	0.0148	2.46	7.13	11.79
		2670.166	17.50	83.00	83.93	0.93	0.0152	2.33	7.53	13.87
		2572.145	17.50	79.00	79.89	0.89	0.0143	2.37	7.56	14.69
		2484.223	17.50	75.00	75.97	0.97	0.0149	2.39	7.31	12.63
		2357.051	17.50	69.00	69.73	0.73	0.0150	2.18	8.20	18.97
		2228.776	17.50	63.00	63.89	0.89	0.0159	2.12	8.24	18.14
		2117.043	17.50	58.00	59.13	1.13	0.0150	2.31	7.59	14.20
		2010.847	17.50	54.00	54.78	0.78	0.0155	2.16	8.20	19.19
		1892.185	17.50	50.61	51.18	0.57	0.0167	1.89	9.46	28.20
		1790.503	17.50	47.00	47.67	0.67	0.0167	1.98	8.83	22.35
		1694.344	17.50	43.00	44.01	1.01	0.0154	2.32	7.53	14.16
	1632.411	17.50	40.21	41.52	1.31	0.0152	2.29	7.71	15.36	
	1599.263	53.20	39.00	40.58	1.58	0.0090	3.04	21.44	31.64	
	1532.361	53.20	37.00	38.92	1.92	0.0126	3.17	16.78	16.53	
	1450.568	53.20	36.00	37.71	1.71	0.0118	3.37	15.85	14.37	
	1344.735	53.20	33.00	34.98	1.98	0.0137	2.85	18.67	23.19	
	1260.993	53.20	31.00	32.50	1.50	0.0145	2.47	21.73	36.04	
	1191.948	53.20	30.00	31.04	1.04	0.0164	2.17	24.48	53.48	
	1096.515	53.20	28.00	29.23	1.23	0.0130	2.65	20.64	33.04	
	1004.926	53.20	25.00	26.64	1.64	0.0099	3.19	19.04	22.89	
	883.207	53.20	23.00	24.74	1.74	0.0097	2.88	22.13	37.13	
	809.020	53.20	22.00	22.98	0.98	0.0145	2.35	22.83	43.65	
	730.285	53.20	20.35	21.53	1.18	0.0137	2.66	19.96	27.96	
	670.597	66.70	19.00	20.45	1.45	0.0103	2.95	25.43	37.17	
	562.117	66.70	17.00	18.63	1.63	0.0118	3.22	21.00	22.22	
	451.787	66.70	15.96	17.23	1.27	0.0127	2.94	22.83	27.35	
	365.034	66.70	14.00	15.54	1.54	0.0117	3.20	21.44	22.61	
268.731	66.70	12.00	13.19	1.19	0.0139	2.60	25.79	39.02		
144.786	66.70	10.16	11.51	1.35	0.0075	2.41	29.13	36.60		
26.290	66.70	9.00	10.44	1.44	0.0100	2.59	26.57	35.44		

Na Figura 5.10 é mostrada as prováveis áreas inundadas para o período de retorno de 100 anos na ribeira da Foz do Guincho.

A representação gráfica de cada secção assim como o correspondente nível de água atingido é apresentada no anexo respectivo.



CÂMARA MUNICIPAL  
REQUISIÇÃO  
12 JAN. 2015  
CASCAIS

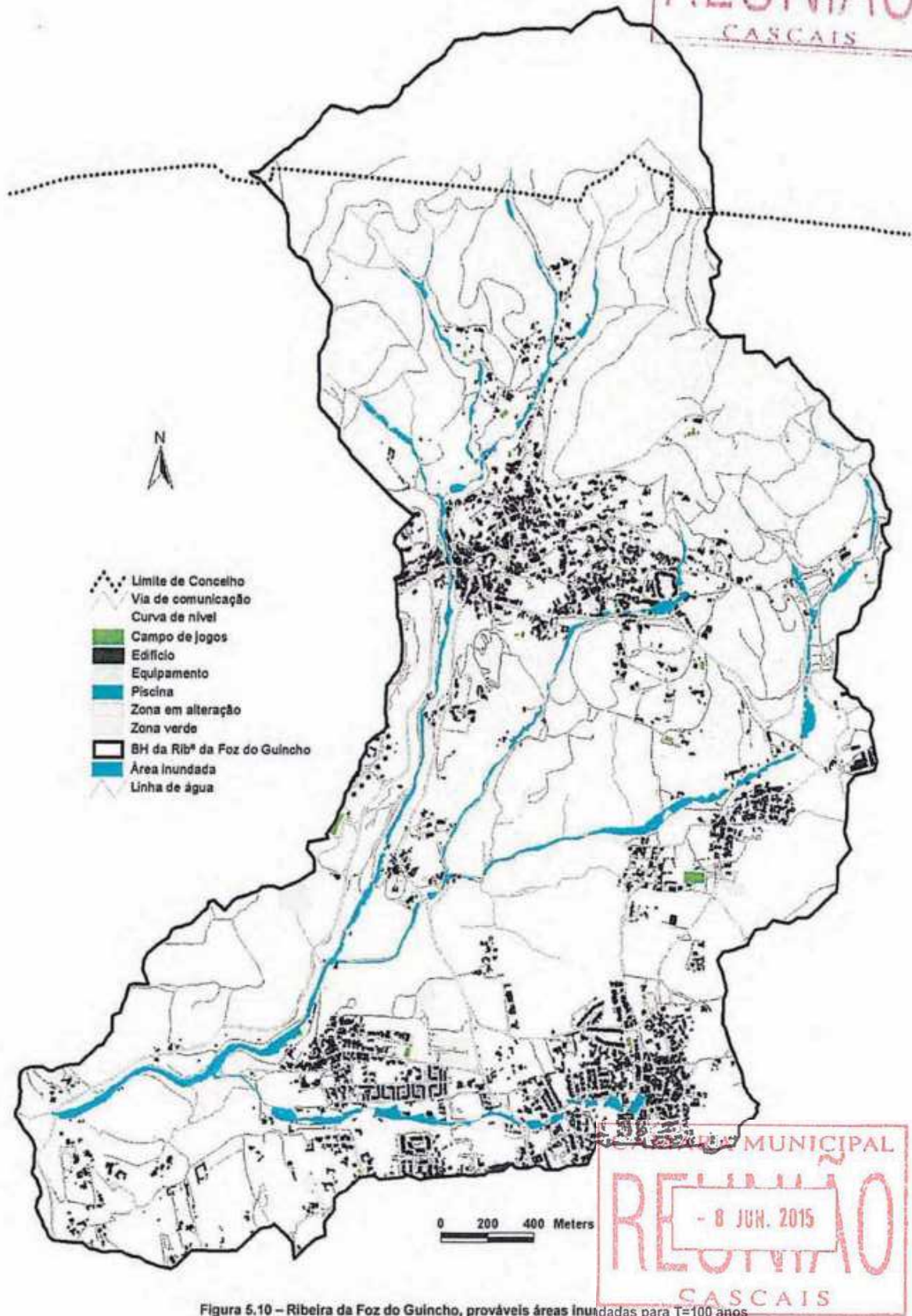


Figura 5.10 – Ribeira da Foz do Guincho, prováveis áreas inundadas para T=100 anos



### 5.1.6 Bacia da ribeira dos Mochos

As localizações das secções transversais utilizadas na modelação encontram-se representadas na Figura 5.11, sendo a secção de montante a 4560,2176, numeração esta que corresponde à distância (em metros) para a secção da bacia hidrográfica.

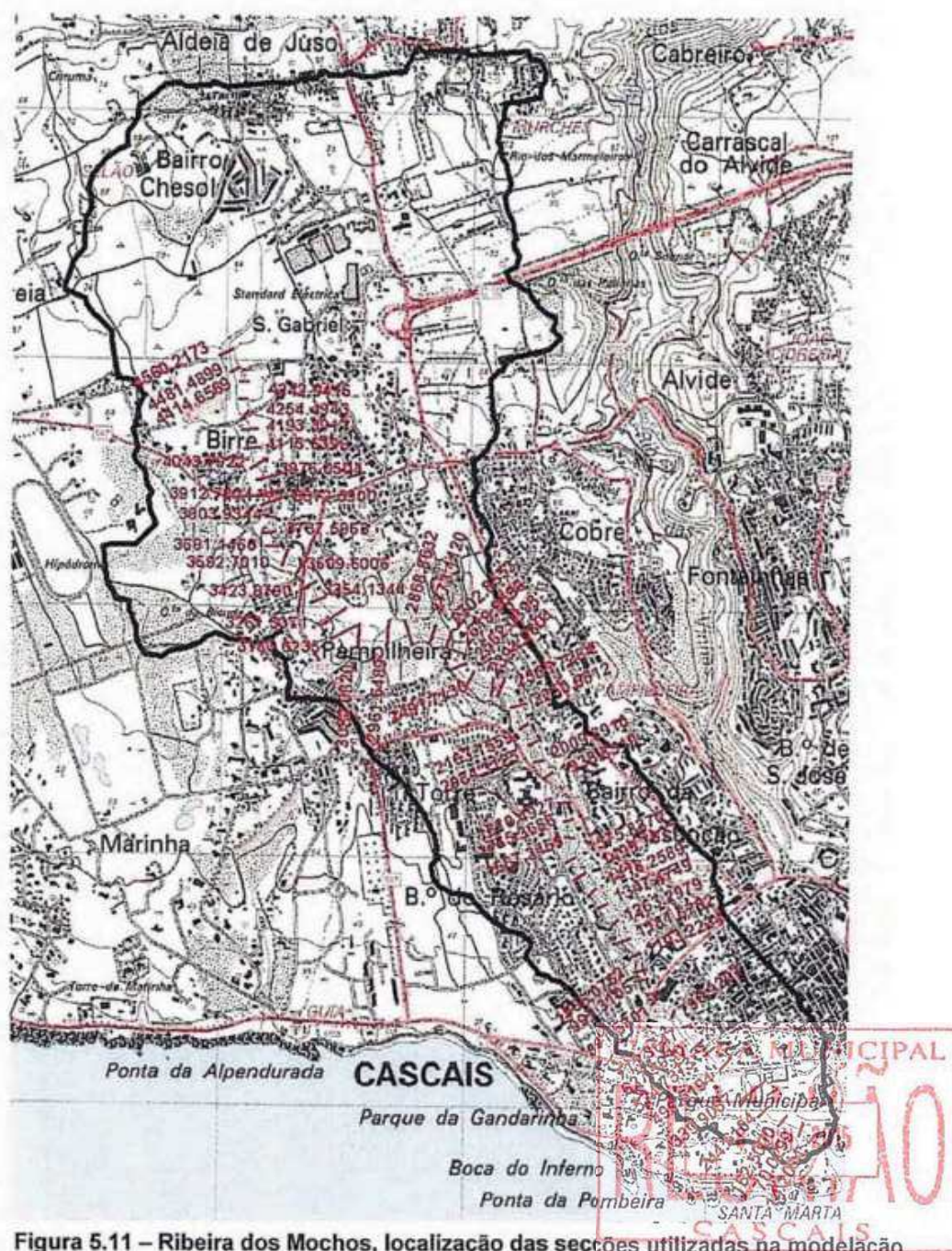


Figura 5.11 – Ribeira dos Mochos, localização das secções utilizadas na modelação

Na Tabela 5.6 apresenta-se o resultado da modelação da propagação dos caudais de ponta de cheia correspondentes ao período de retorno de 100 anos, nas secções de cálculo cuja localização se mostrou na Figura 5.11.

**Tabela 5.6 – Resultado da modelação para a ribeira dos Mochos**

Sentido escoamento	Secção	Caudal	Cota terreno	Nível água	Altura água	Declive	Velocidade	Área secção	Largura superficial
		(m <sup>3</sup> /s)	(m)	(m)	(m)				
montante	4560.217	12.00	57.70	58.36	0.66	0.0061	1.54	17.06	51.51
	4481.490	12.00	56.64	58.09	1.45	0.0020	1.44	15.07	20.48
	4414.657	12.00	56.66	57.67	1.01	0.0104	2.56	8.26	18.31
	4342.942	12.00	55.70	57.31	1.61	0.0018	1.49	14.07	17.21
	4254.494	12.00	55.64	56.78	1.14	0.0103	2.67	6.97	13.60
	4193.391	12.00	55.50	56.31	0.81	0.0035	1.38	19.12	47.13
	4115.540	12.00	55.13	56.03	0.90	0.0036	1.45	18.45	45.76
	4043.792	16.70	54.67	55.44	0.77	0.0146	2.49	14.92	46.97
	3976.050	16.70	53.73	54.66	0.93	0.0036	1.42	27.50	70.01
	3912.782	16.70	53.47	54.15	0.68	0.0163	2.49	15.11	51.11
	3872.390	16.70	52.51	53.42	0.91	0.0121	2.49	14.35	39.88
	3803.934	16.70	51.57	52.37	0.80	0.0141	2.53	14.09	40.96
	3737.585	16.70	49.53	50.88	1.35	0.0118	3.17	7.68	10.49
	3681.146	16.70	49.06	49.58	0.52	0.0056	1.37	27.73	91.32
	3592.701	16.70	47.57	48.67	1.10	0.0123	2.87	10.54	20.58
	3509.601	16.70	46.53	47.91	1.38	0.0057	2.20	15.22	30.44
	3423.879	16.70	46.26	47.23	0.97	0.0112	2.43	13.93	34.42
	3354.134	16.70	45.47	46.72	1.25	0.0059	2.01	17.06	36.07
	3261.307	16.70	45.23	46.04	0.81	0.0102	2.10	19.99	75.84
	3186.624	16.70	44.59	45.61	1.02	0.0042	1.51	28.40	88.69
	3082.082	16.70	44.12	44.97	0.85	0.0099	2.08	19.51	68.88
	2961.649	16.70	42.66	43.64	0.98	0.0110	2.55	14.80	42.64
	2868.863	16.70	41.27	43.13	1.86	0.0027	1.75	17.66	25.57
	2773.112	16.70	40.97	42.80	1.83	0.0035	2.02	15.92	26.58
	2702.855	16.70	40.41	42.15	1.74	0.0085	3.00	7.20	10.19
	2619.960	16.70	40.19	41.67	1.48	0.0084	2.50	12.83	30.98
	2562.040	16.70	39.42	40.43	1.01	0.0101	2.45	13.12	27.02
	2491.713	16.70	38.43	39.63	1.20	0.0102	2.71	11.87	24.67
	2394.030	16.70	37.93	39.07	1.14	0.0044	1.80	19.04	35.00
	2358.728	16.70	37.51	38.63	1.12	0.0126	2.92	10.81	24.32
	2250.681	30.70	35.50	37.23	1.73	0.0110	3.58	14.28	16.33
	2163.156	30.70	34.29	36.05	1.76	0.0071	2.82	19.96	23.78
	2084.313	30.70	33.55	35.16	1.61	0.0132	3.43	14.86	18.58
2009.891	30.70	32.00	34.00	2.00	0.0022	1.72	30.64	26.02	
1938.852	30.70	31.45	33.22	1.77	0.0123	3.86	12.00	11.35	
1810.493	30.70	27.50	29.48	1.98	0.0147	3.89	10.52	9.01	
1735.369	30.70	26.65	28.05	1.40	0.0125	3.24	16.62	22.64	
1667.347	30.70	25.68	27.02	1.34	0.0165	3.38	14.97	20.44	
1575.837	30.70	23.59	25.17	1.58	0.0126	3.56	14.57	17.78	
1499.798	30.70	22.50	24.08	1.58	0.0132	3.65	13.90	16.43	
1418.259	30.70	21.54	22.93	1.39	0.0139	3.41	16.13	23.05	
1347.475	30.70	20.50	21.95	1.45	0.0075	2.63	21.44	27.57	
1263.298	30.70	19.67	20.99	1.32	0.0137	3.31	16.72	24.80	
1181.670	30.70	18.90	20.28	1.38	0.0047	1.97	31.99	50.52	
1103.223	30.70	17.75	19.35	1.60	0.0137	3.59	13.39	15.20	






Sentido escoamento	Secção	Caudal (m <sup>3</sup> /s)	Cota terreno (m)	Nível água (m)	Altura água (m)	Declive (m/m)	Velocidade (m/s)	Área secção (m <sup>2</sup> )	Largura superficial (m)	
jusante		1035.076	30.70	16.55	18.02	1.47	0.0130	3.37	15.75	21.16
		997.311	32.20	16.27	17.79	1.52	0.0050	2.31	25.05	27.12
		891.670	32.20	14.51	16.47	1.96	0.0126	4.07	11.13	8.87
		798.921	32.20	12.60	14.43	1.83	0.0124	3.68	13.79	15.04
		715.365	32.20	10.62	12.03	1.41	0.0142	3.61	15.21	18.84
		627.993	32.20	9.84	11.30	1.46	0.0067	2.41	24.31	31.35
		574.737	32.20	9.61	10.66	1.05	0.0167	3.26	17.97	29.07
		493.519	32.20	9.02	10.41	1.39	0.0028	1.46	39.47	48.80
		339.909	32.20	8.60	9.52	0.92	0.0144	2.69	31.32	102.43
		244.610	32.20	6.50	7.80	1.30	0.0126	3.15	21.01	37.86
		162.500	32.20	4.54	6.31	1.77	0.0083	3.24	17.97	21.11
		70.030	32.20	3.69	5.26	1.57	0.0128	3.75	14.91	18.28
	14.208	32.20	1.40	2.98	1.58	0.0060	2.54	23.57	27.97	

Na Figura 5.12 é mostrada as prováveis áreas inundadas para o período de retorno de 100 anos na ribeira dos Mochos.

A representação gráfica de cada secção assim como o correspondente nível de água atingido é apresentada no anexo respectivo.





### 5.1.7 Bacia da ribeira das Vinhas

As localizações das secções transversais utilizadas na modelação encontram-se representadas na Figura 5.13, sendo a secção de montante a 9194.979, da linha de água principal, numeração esta que corresponde à distância (em metros) para a secção da bacia hidrográfica.





A handwritten signature in blue ink, appearing to be a stylized set of initials.

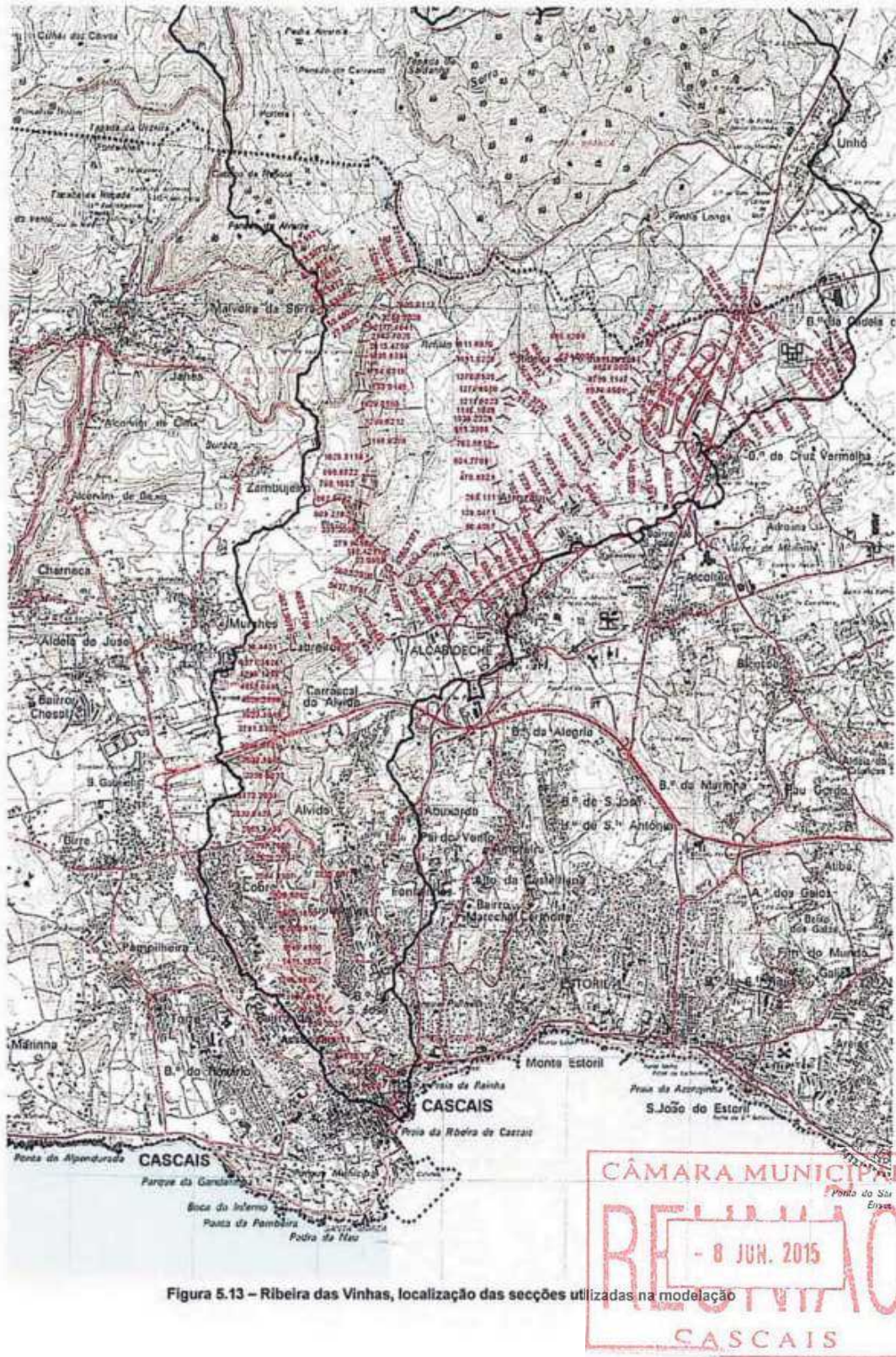


Figura 5.13 – Ribeira das Vinhas, localização das secções utilizadas na modelação



Na Tabela 5.7 apresenta-se o resultado da modelação da propagação dos caudais de ponta de cheia correspondentes ao período de retorno de 100 anos, nas secções de cálculo cuja localização se mostrou na Figura 5.13.

Tabela 5.7 – Resultado da modelação para a ribeira das Vinhas

Sentido escoamento	Linha de água	Secção	Caudal (m <sup>3</sup> /s)	Cota terreno (m)	Nível água (m)	Altura água (m)	Declive (m/m)	Velocidade (m/s)	Área secção (m <sup>2</sup> )	Largura superficial (m)	
											montante
VINHAS	montante	VINHAS montante	9194.979	36.20	111.50	112.99	1.49	0.0151	3.92	16.42	20.62
		9075.757	36.20	107.67	109.08	1.41	0.0129	3.28	23.12	40.30	
		8970.650	36.20	104.71	106.01	1.30	0.0104	2.95	24.58	39.46	
		8879.000	36.20	103.48	104.91	1.43	0.0123	3.34	23.43	41.71	
		8799.115	36.20	102.49	103.77	1.28	0.0131	3.27	19.52	26.25	
		8674.452	36.20	101.00	101.86	0.86	0.0202	3.47	22.44	48.45	
	interm1	VINHAS interm1	8564.195	42.80	99.53	101.14	1.61	0.0037	2.07	44.21	56.66
		8438.118	42.80	98.50	100.12	1.62	0.0127	3.58	22.33	28.84	
		8321.553	42.80	97.01	98.91	1.90	0.0009	1.13	77.14	76.04	
	interm2	VINHAS interm2	8258.035	58.40	96.48	98.33	1.85	0.0128	4.13	27.22	29.60
		8115.124	58.40	94.50	96.35	1.85	0.0132	4.12	26.47	27.82	
		7920.912	58.40	91.50	93.96	2.46	0.0023	2.03	59.04	50.75	
		7802.744	58.40	90.86	93.05	2.19	0.0103	4.17	26.35	24.79	
		7648.176	58.40	88.50	90.12	1.62	0.0091	3.20	34.33	37.13	
		7473.956	58.40	86.59	87.77	1.18	0.0202	3.89	29.05	43.18	
		7355.774	58.40	83.59	85.77	2.18	0.0089	3.56	31.21	31.82	
		7229.961	58.40	82.75	84.37	1.62	0.0146	3.80	30.14	39.97	
		7078.120	58.40	81.49	83.02	1.53	0.0076	2.72	48.20	73.28	
		6998.668	58.40	80.45	82.24	1.79	0.0094	3.41	37.31	49.19	
		6896.995	58.40	79.84	80.83	0.99	0.0220	3.83	33.74	66.85	
		interm3	VINHAS interm3	6850.430	67.80	79.60	80.51	0.91	0.0054	1.96	77.58
	6707.106		67.80	77.76	79.39	1.63	0.0077	3.19	48.43	77.68	
	6586.971		67.80	76.59	78.32	1.73	0.0048	2.40	63.06	82.00	
	6441.623		67.80	75.50	77.91	2.41	0.0022	1.88	77.64	75.30	
	6306.959		67.80	73.50	76.46	2.96	0.0107	5.03	20.59	11.91	
	6177.423		67.80	71.75	74.77	3.02	0.0105	4.80	22.48	14.36	
	6061.543		67.80	67.49	69.79	2.30	0.0134	4.70	24.20	17.80	
	5953.667		67.80	64.50	66.64	2.14	0.0128	4.37	29.38	28.54	
	5854.176		67.80	61.71	64.34	2.63	0.0101	4.10	31.15	29.48	
	5765.737		67.80	60.00	64.27	4.27	0.0003	1.06	106.16	38.79	
	jusante	VINHAS jusante	5718.660	120.00	58.81	63.08	4.27	0.0088	5.85	37.93	21.66
		5603.786	120.00	57.63	60.13	2.50	0.0127	5.01	45.95	34.79	
		5427.976	120.00	56.49	58.19	1.70	0.0131	3.81	64.18	72.87	
		5279.666	120.00	54.33	57.21	2.88	0.0039	3.20	64.30	33.48	
		5131.142	120.00	52.51	55.84	3.33	0.0117	4.90	37.49	18.77	
		4963.105	120.00	51.50	53.63	2.13	0.0178	4.36	41.90	33.24	

Sentido escoamento	Linha de água	Secção	Caudal	Cota terreno	Nível água	Altura água	Declive	Velocidade	Área secção	Largura superficial
			(m <sup>3</sup> /s)	(m)	(m)	(m)	(m/m)	(m/s)	(m <sup>2</sup> )	(m)
		4800.770	120.00	48.50	52.00	3.50	0.0060	4.27	51.25	26.09
		4671.908	120.00	46.65	50.65	4.00	0.0086	5.41	40.58	22.12
		4510.440	121.70	43.99	47.67	3.68	0.0080	5.32	35.05	17.16
		4371.163	121.70	42.00	45.66	3.66	0.0071	4.53	35.73	25.08
		4280.145	121.70	40.99	44.34	3.35	0.0066	4.50	46.76	33.76
		4152.048	121.70	37.01	41.24	4.23	0.0067	4.43	40.02	22.70
		4039.267	121.70	35.00	40.12	5.12	0.0109	5.42	37.07	19.80
		3923.402	121.70	33.71	36.86	3.15	0.0089	4.81	32.56	17.60
		3791.535	121.70	31.49	34.86	3.37	0.0112	5.71	37.12	20.27
		3646.810	121.70	30.50	32.81	2.31	0.0106	4.17	57.08	47.85
		3509.188	121.70	29.00	31.08	2.08	0.0146	4.62	56.81	61.41
		3356.061	129.00	27.58	29.72	2.14	0.0066	3.38	83.69	78.50
		3173.203	129.00	25.49	28.55	3.06	0.0050	3.66	65.97	36.06
		3030.644	130.30	24.49	27.34	2.85	0.0102	4.84	58.57	49.66
		2855.486	130.30	23.32	25.51	2.19	0.0037	2.62	101.33	80.29
		2697.769	130.30	21.57	24.23	2.66	0.0117	4.48	50.30	33.78
		2520.224	130.30	18.62	21.74	3.12	0.0121	5.60	42.75	25.01
		2364.311	130.30	17.49	20.06	2.57	0.0125	4.89	48.12	32.21
		2225.388	130.30	14.47	18.30	3.83	0.0094	5.40	42.87	21.65
		2036.506	130.30	12.50	16.20	3.70	0.0115	5.68	37.90	17.44
		1879.163	130.30	11.33	14.70	3.37	0.0110	5.21	48.19	32.87
		1715.091	130.30	9.50	12.44	2.94	0.0064	4.01	60.76	34.95
		1549.468	130.30	8.63	11.38	2.75	0.0063	4.11	59.40	32.68
		1411.163	130.30	7.57	9.78	2.21	0.0172	5.32	44.01	32.45
		1266.589	134.60	6.65	9.06	2.41	0.0029	2.43	106.92	72.81
		1106.912	134.60	5.50	8.57	3.07	0.0028	2.72	97.46	58.07
		961.568	134.60	5.50	7.45	1.95	0.0161	4.88	56.42	54.21
		824.333	138.00	4.46	7.19	2.73	0.0020	2.16	114.7	62.3
		635.817	138.00	4.45	6.93	2.48	0.0013	1.74	149.5	85.77
		446.651	138.00	4.33	6.64	2.31	0.0018	1.8	148.2	104.7
		252.218	138.00	4.31	6.30	1.99	0.0017	1.72	171.8	150.5
		119.307	138.00	3.55	5.52	1.97	0.0098	4.2	78.07	93.31
		19.082	138.00	3.07	5.22	2.15	0.0020	1.8	174	167.6
	MULA montante	2770.160	35.90	107.51	109.53	2.02	0.0021	1.47	40.05	35.68
		2630.349	35.90	107.35	109.18	1.83	0.0027	1.69	37.82	37.69
		2520.874	35.90	106.50	108.28	1.78	0.0112	3.71	16.63	18.34
		2405.011	35.90	104.41	105.44	1.03	0.0115	2.76	28.14	64
		2258.204	35.90	101.54	103.14	1.60	0.0070	2.72	28.96	45.96
		2177.404	35.90	101.50	103.00	1.50	0.0018	1.36	47.98	49.16
	MULA jusante	2143.703	41.70	101.38	102.68	1.30	0.0138	3.25	27.52	50.1
		2015.475	41.70	98.20	100.47	2.27	0.0128	4.24	14.35	11.09
		1895.839	41.70	94.03	96.59	2.56	0.0110	4.35	13.12	9.29

CÂMARA MUNICIPAL  
**RECEBIMOS**  
 CASCAIS





Sentido escoamento	Linha de água	Secção	Caudal	Cota terreno	Nível água	Altura água	Declive	Velocidade	Área secção	Largura superficial
			(m <sup>3</sup> /s)	(m)	(m)	(m)	(m/m)	(m/s)	(m <sup>2</sup> )	(m)
		1754.632	41.70	91.27	93.51	2.24	0.0124	3.9	16.39	15.15
		1609.015	40.70	89.48	90.80	1.32	0.0158	3.57	21.12	29.94
		1439.059	40.70	86.50	88.18	1.68	0.0113	3.54	22.12	28.48
		1299.621	40.70	83.13	85.17	2.04	0.0140	3.87	18.41	23.07
		1148.939	40.70	81.23	83.06	1.83	0.0157	3.55	18.39	21.14
		1028.312	40.70	79.26	80.87	1.61	0.0186	3.68	17.33	19.96
		898.652	40.70	76.20	78.07	1.87	0.0136	3.30	22.45	32.89
		798.165	43.30	75.21	76.43	1.22	0.0177	3.18	27.06	51.78
		667.644	43.30	72.50	74.11	1.61	0.0108	3.39	27.00	40.35
		509.219	43.30	70.42	72.50	2.08	0.0039	2.12	37.50	38.27
		393.310	43.30	69.91	71.46	1.55	0.0150	3.77	20.62	25.88
		279.906	51.70	66.13	68.04	1.91	0.0137	3.81	24.10	26.81
		148.421	51.70	62.48	64.80	2.32	0.0109	4.20	21.22	19.30
		23.060	51.70	59.00	64.23	5.23	0.0001	0.57	180.67	59.37
	mon- fante	1327.613	3.00	142.60	143.12	0.52	0.0085	1.47	3.81	25.52
		1249.015	3.00	140.50	141.03	0.53	0.0201	2.16	1.39	2.96
		1209.077	5.50	139.52	140.17	0.65	0.0078	1.60	7.76	41.79
		1058.209	5.50	137.64	138.28	0.64	0.0097	1.83	5.92	26.51
		927.676	5.50	130.59	131.18	0.59	0.0085	1.63	7.84	43.43
		791.067	5.50	128.81	129.56	0.75	0.0067	1.61	7.67	43.52
		640.612	5.50	126.06	126.87	0.81	0.0075	1.80	5.88	27.24
		511.566	5.50	122.51	123.28	0.77	0.0078	1.73	6.29	29.40
		335.294	8.40	110.51	111.37	0.86	0.0127	2.42	5.20	11.82
		208.980	8.40	104.87	105.80	0.93	0.0114	2.47	4.55	10.18
		106.760	8.40	102.54	103.25	0.71	0.0103	1.98	9.47	40.12
		30.064	8.40	100.84	101.82	0.98	0.0084	2.06	7.57	24.90
	MD1-VINHAS montante	1611.697	1.80	141.01	141.37	0.36	0.0216	1.85	0.97	2.82
		1481.022	1.80	130.62	130.96	0.34	0.0215	1.79	1.00	3.09
		1373.853	1.80	123.65	124.03	0.38	0.0099	1.35	2.16	17.05
		1274.805	1.80	118.28	118.63	0.35	0.0221	1.82	0.99	2.94
		1211.602	1.80	115.82	116.16	0.34	0.0102	1.28	2.71	24.64
		1145.104	9.40	112.51	113.49	0.98	0.0091	2.26	7.80	24.04
		1039.233	9.40	108.00	108.96	0.96	0.0088	2.11	8.89	30.59
		915.339	9.40	104.00	104.98	0.98	0.0090	2.22	7.02	19.82
		762.561	9.40	96.60	97.54	0.94	0.0092	2.22	7.91	24.15
		604.771	9.40	92.63	93.43	0.8	0.0109	2.12	8.89	31.79
		470.832	9.40	89.51	90.24	0.73	0.0118	2.20	8.09	25.71
		289.111	9.40	83.68	84.68	1	0.0101	2.54	5.71	11.90
		138.047	9.40	81.61	82.27	0.66	0.0086	1.88	9.82	40.76
		50.457	9.40	80.41	81.14	0.73	0.0085	1.79	14.02	72.89
	MD1- MULA afiuente	871.517	4.20	205.49	206.22	0.73	0.0112	1.92	2.76	11.34
		723.987	4.20	193.49	194.10	0.61	0.0216	2.42	1.74	2.93
		611.637	4.20	180.78	181.42	0.64	0.0172	2.29	1.92	4.66



Sentido escoamento	Linha de água	Secção	Caudal	Cota terreno	Nível água	Altura água	Declive	Velocidade	Área secção	Largura superficial
			(m <sup>3</sup> /s)	(m)	(m)	(m)	(m/m)	(m/s)	(m <sup>2</sup> )	(m)
jusante	Linha de água	496.435	4.20	164.13	164.73	0.6	0.0218	2.41	1.74	3.00
		366.187	4.20	150.46	151.07	0.61	0.0218	2.41	1.74	2.96
		276.633	4.20	137.99	138.61	0.62	0.0172	2.24	2.06	4.86
		159.480	4.20	114.04	114.65	0.61	0.0200	2.37	1.80	3.71
		27.887	4.20	105.60	106.31	0.71	0.0098	1.83	3.20	16.75
	ALGARVE rib°	2410.381	3.20	144.77	145.27	0.5	0.0046	1.13	5.80	28.34
		2295.983	3.20	143.63	144.16	0.53	0.0175	2.09	1.63	4.37
		2170.239	3.20	141.27	141.96	0.69	0.0045	1.27	4.69	24.64
		2069.563	3.20	140.88	141.30	0.42	0.0105	1.49	4.50	32.19
		1956.104	3.20	138.51	139.10	0.59	0.0044	1.17	5.35	28.81
		1768.973	3.20	137.62	138.11	0.49	0.0065	1.26	6.54	58.63
		1614.388	3.20	134.92	135.44	0.52	0.0192	2.10	1.53	2.99
		1442.439	3.20	131.47	131.97	0.50	0.0209	2.18	1.47	3.06
		1306.826	10.60	129.41	130.44	1.03	0.0021	1.20	17.53	32.71
		1173.376	10.60	128.71	130.17	1.46	0.0017	1.32	14.25	20.31
		913.765	10.60	128.50	129.29	0.79	0.0087	1.87	14.87	72.91
		730.221	10.60	122.79	123.79	1.00	0.0124	2.66	5.83	10.74
		610.855	10.60	119.81	121.31	1.50	0.0039	1.78	6.08	5.71
		488.820	10.60	119.24	120.33	1.09	0.0123	2.85	4.81	7.48
		313.931	10.60	110.00	111.18	1.18	0.0152	2.85	4.33	6.35
	140.121	10.60	100.38	101.32	0.94	0.0120	2.48	6.99	15.44	
	19.983	10.60	97.30	98.82	1.52	0.0003	0.61	37.17	45.33	
	AFL_ME1-VINHAS afluente	144.657	2.70	144.78	145.27	0.49	0.0080	1.40	3.57	27.32
		49.447	2.70	142.15	142.54	0.39	0.0196	1.91	1.41	3.88
		15.383	2.70	140.63	141.09	0.46	0.0186	2.01	1.38	4.33
		686.920	3.60	142.16	142.71	0.55	0.0119	1.89	2.51	9.42
		584.001	3.60	133.55	134.20	0.65	0.0069	1.48	4.58	29.23
		482.163	3.60	129.94	130.40	0.46	0.0100	1.50	4.90	30.69
		397.922	3.60	126.11	126.52	0.41	0.0201	2.01	1.79	4.38
		279.568	3.60	124.71	125.20	0.49	0.0080	1.39	5.95	42.67
		96.373	3.60	117.47	117.99	0.52	0.0213	2.24	1.61	3.18
		31.734	3.60	115.20	115.75	0.55	0.0212	2.28	1.58	3.03

Na Figura 5.14 é mostrada as prováveis áreas inundadas para o período de retorno de 100 anos na ribeira das Vinhas.

A representação gráfica de cada secção assim como o correspondente nível de água atingido é apresentada no anexo respectivo.

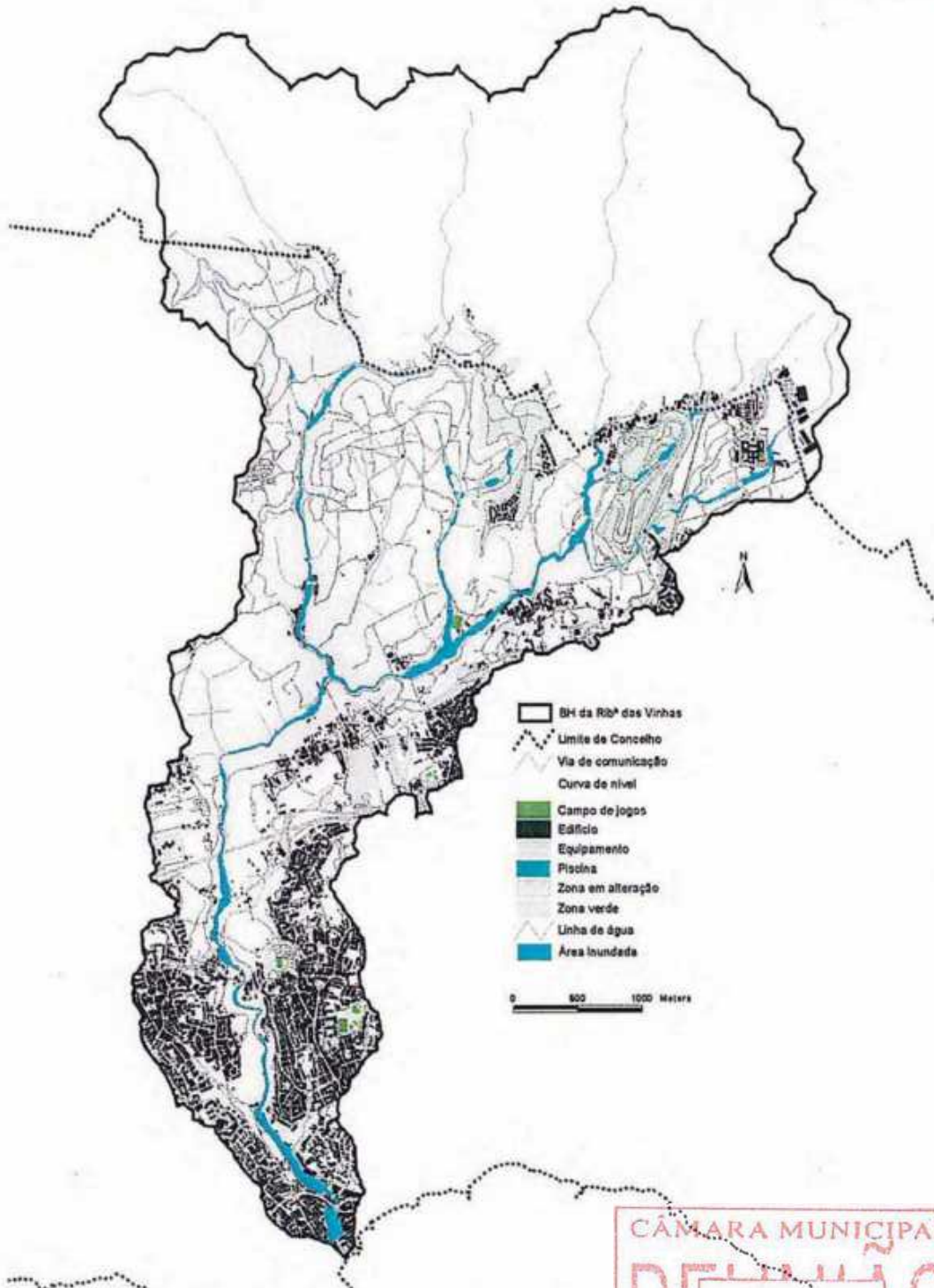


Figura 5.14 – Ribeira das Vinhas, prováveis áreas inundadas para T=100 anos



**HIDROPROJECTO**  
ENGENHARIA E GESTÃO, S.A.





### 5.1.8 Bacia da ribeira de Castelhana

As localizações das secções transversais utilizadas na modelação encontram-se representadas na Figura 5.15, sendo a secção de montante a 2672.6062, da linha de água principal, numeração esta que corresponde à distância (em metros) para a secção da bacia hidrográfica.



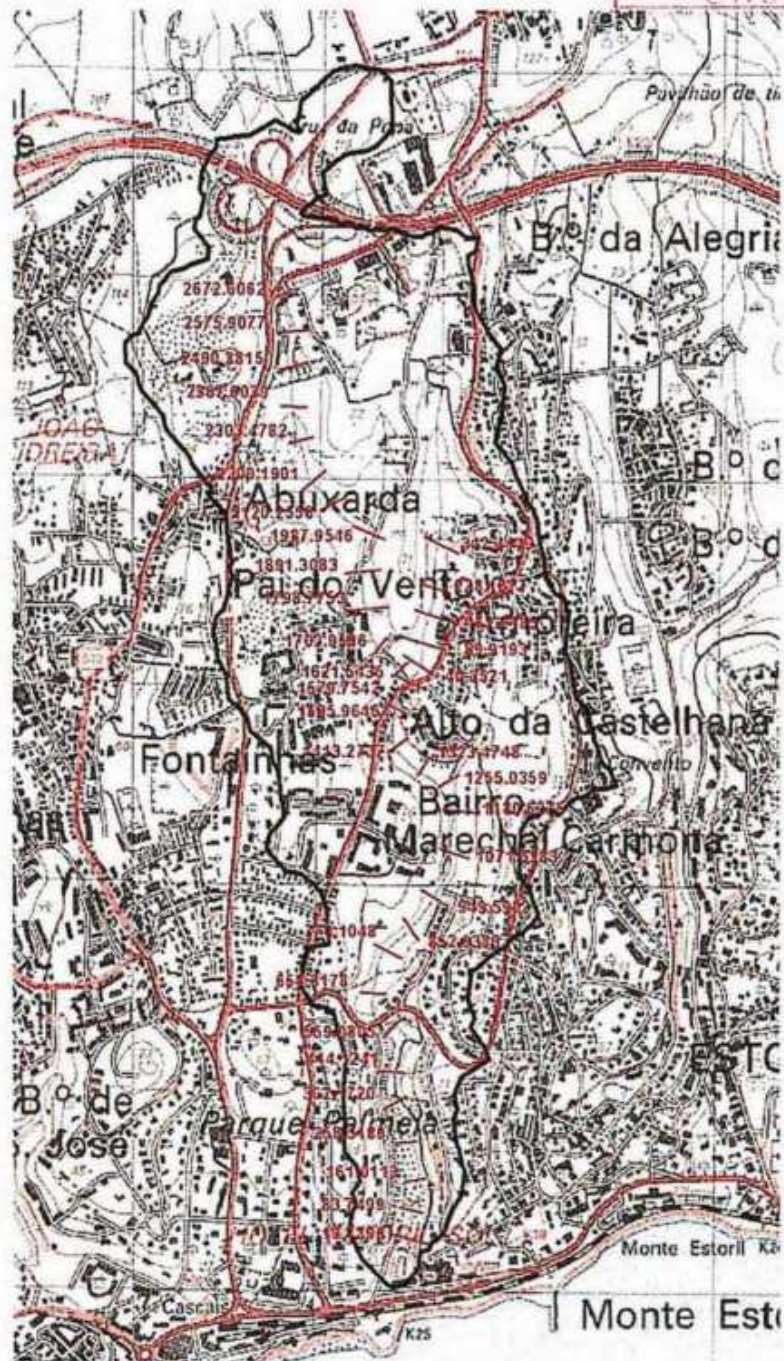


Figura 5.15 – Ribeira de Castelhana, localização das secções utilizadas na modelação

Na Tabela 5.8 apresenta-se o resultado da modelação da propagação dos caudais de ponta de cheia correspondentes ao período de retorno de 100 anos, nas secções de cálculo cuja localização se mostrou na Figura 5.15.

**Tabela 5.8 – Resultado da modelação para a ribeira da Castelhana**

Sentido escoamento	Linha de água	Secção	Caudal (m <sup>3</sup> /s)	Cota terreno (m)	Nível água (m)	Altura água (m)	Declive (m/m)	Velocidade (m/s)	Área secção (m <sup>2</sup> )	Largura superficial (m)
jusante	ME afluente	342.445	2.00	59.00	59.41	0.41	0.0201	1.88	1.07	3.00
		228.168	2.00	56.20	56.59	0.39	0.0218	1.91	1.05	2.83
		162.219	2.00	55.90	56.27	0.37	0.0216	1.89	1.06	2.93
		89.919	2.00	54.58	55.02	0.44	0.0057	1.11	4.05	43.32
		40.352	2.00	52.81	53.18	0.37	0.0209	1.86	1.08	3.07
	CASTELHANA (montante)	2672.606	2.00	81.31	81.73	0.42	0.0119	1.56	1.69	13.36
		2575.908	2.00	76.50	76.86	0.36	0.0224	1.89	1.06	3.00
		2490.282	2.00	72.64	73.00	0.36	0.0224	1.88	1.06	2.98
		2387.604	2.00	69.49	69.87	0.38	0.0219	1.89	1.06	2.92
		2303.478	2.00	67.46	67.85	0.39	0.0212	1.90	1.05	2.89
		2200.190	4.60	65.00	65.65	0.65	0.0102	1.93	3.85	15.91
		2120.256	4.60	62.53	63.29	0.76	0.0085	1.77	4.29	18.64
		1987.955	4.60	59.77	60.40	0.63	0.0108	1.97	3.78	13.56
		1891.308	4.60	57.74	58.42	0.68	0.0087	1.81	4.42	20.35
		1798.775	4.60	56.74	57.24	0.50	0.0124	1.82	5.14	26.03
		1702.959	4.60	54.72	55.42	0.70	0.0152	2.25	2.37	6.10
		1621.544	4.60	52.23	52.91	0.68	0.0132	2.19	2.54	7.30
		CASTELHANA (jusante)	1579.754	8.90	51.73	52.48	0.75	0.0091	1.92	10.84
	1505.965		8.90	49.03	49.93	0.90	0.0108	2.26	6.57	18.63
	1413.274		8.90	46.29	47.06	0.77	0.0104	2.07	8.45	28.93
	1323.475		8.90	42.56	43.70	1.14	0.0075	2.22	5.48	9.83
	1255.036		11.60	41.71	42.84	1.13	0.0123	3.01	5.02	7.01
	1180.527		11.60	39.56	40.99	1.43	0.0044	2.03	9.25	14.98
	1071.628		11.60	38.80	39.92	1.12	0.0179	2.71	4.28	5.72
	949.590		11.60	36.60	37.68	1.08	0.0124	2.84	5.77	9.39
	852.939		11.60	34.71	35.73	1.02	0.0102	2.45	8.46	20.42
	770.105		11.60	33.53	34.87	1.34	0.0027	1.51	15.97	32.81
	659.818		13.10	32.56	33.90	1.34	0.0131	3.10	5.10	6.71
	559.081		13.10	30.17	31.30	1.13	0.0111	2.67	7.93	14.92
	444.124		13.10	27.48	28.70	1.22	0.0099	2.62	8.39	17.47
	362.172		13.10	26.08	27.18	1.10	0.0108	2.50	9.16	20.59
	258.519		13.10	23.34	24.33	0.99	0.0106	2.49	10.43	27.26
	161.011	13.10	20.55	21.61	1.06	0.0116	2.70	8.18	16.24	
83.750	13.10	19.56	20.29	0.73	0.0139	2.37	11.40	34.26		
13.490	13.10	16.39	17.57	1.18	0.0003	0.34	46.39	43.14		

Na Figura 5.16 é mostrada as prováveis áreas inundadas para o período de retorno de 100 anos na ribeira da Castelhana.

A representação gráfica de cada secção assim como o correspondente nível de água atingido é apresentada no anexo respectivo.

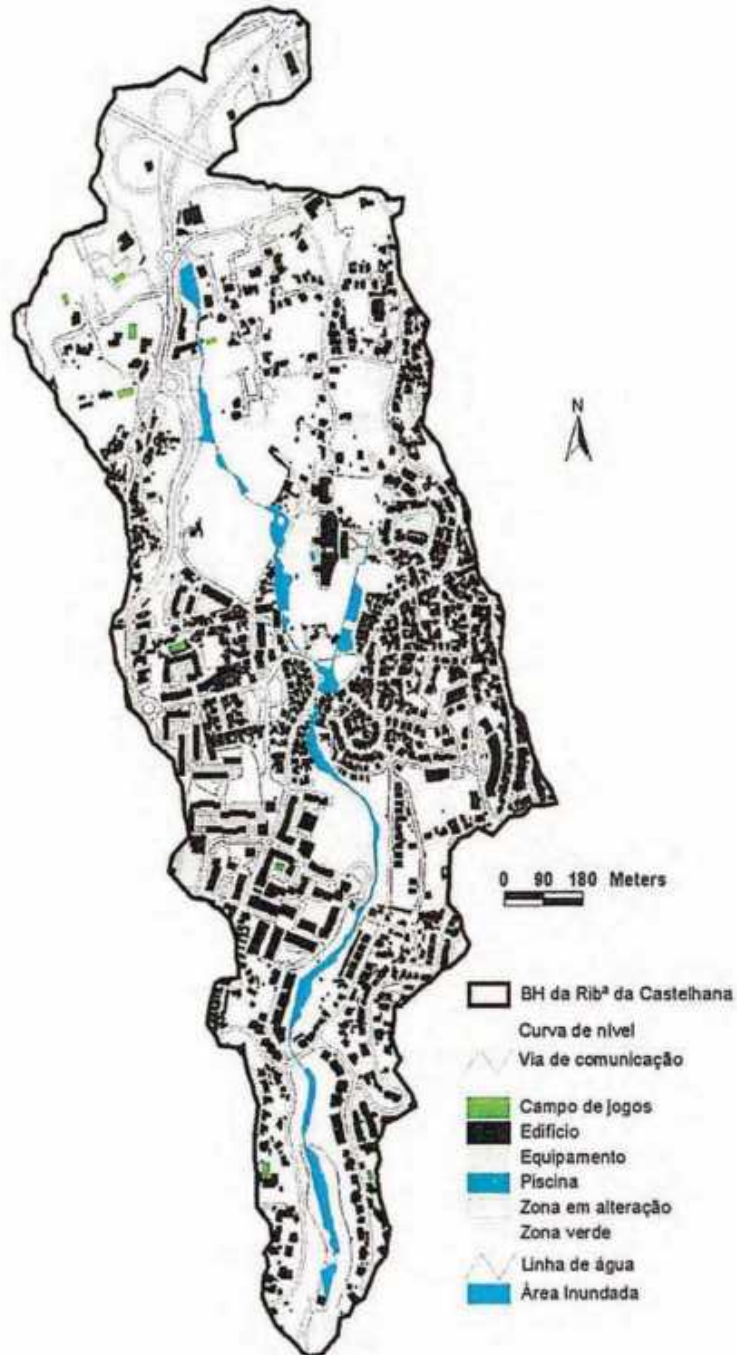


Figura 5.16 – Ribeira da Castelhana, prováveis áreas inundadas para T=100 anos





### 5.1.9 Bacia da ribeira de Cadaveira

As localizações das secções transversais utilizadas na modelação encontram-se representadas na Figura 5.17, sendo a secção de montante 3493.4109, da linha de água principal numeração esta que corresponde à distância (em metros) para a secção da bacia hidrográfica.

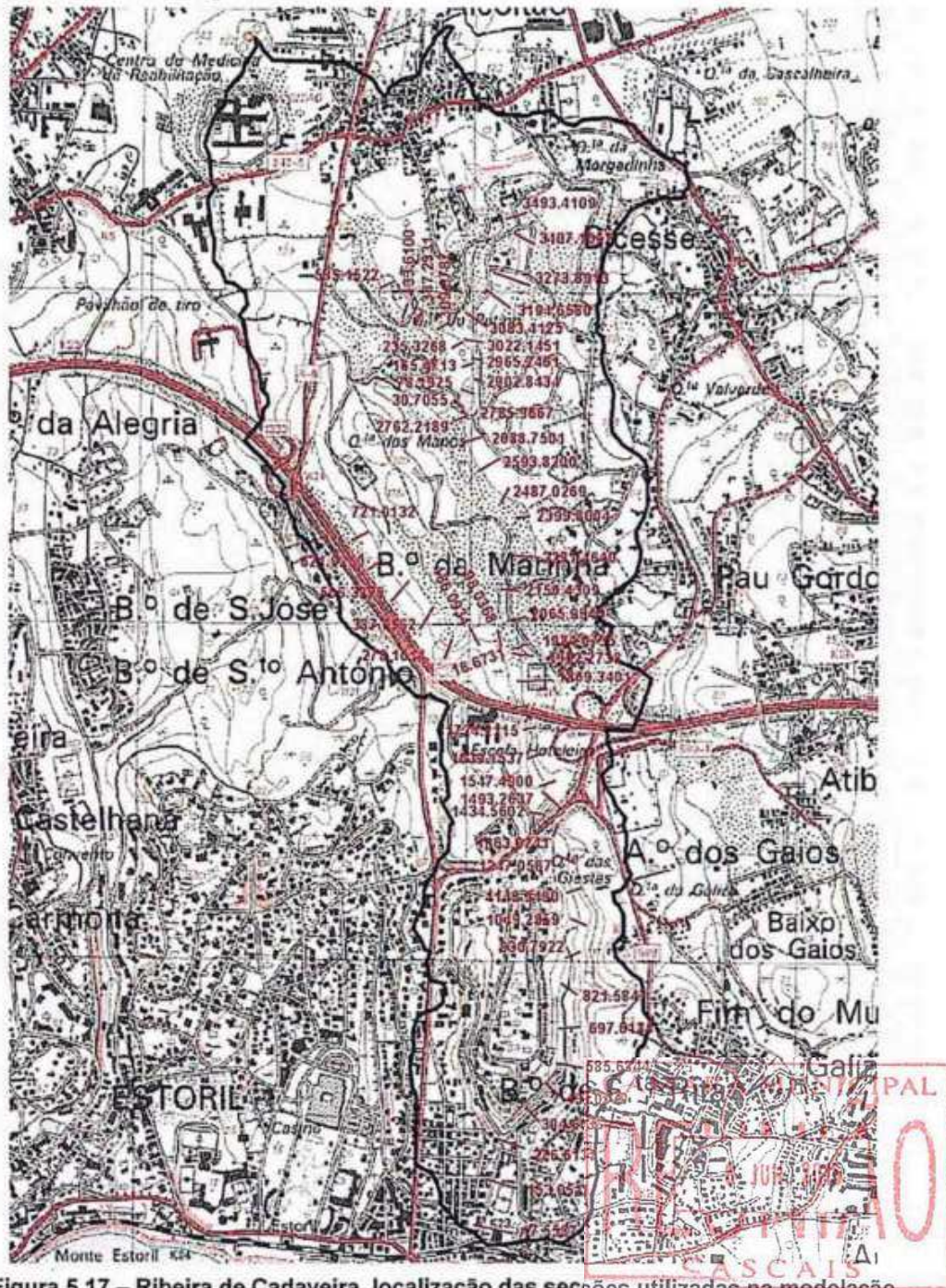


Figura 5.17 – Ribeira de Cadaveira, localização das secções utilizadas na modelação

Na Tabela 5.9 apresenta-se o resultado da modelação da propagação dos caudais de ponta de cheia correspondentes ao período de retorno de 100 anos, nas secções de cálculo cuja localização se mostrou na Figura 2.17.

**Tabela 5.9 – Resultado da modelação para a ribeira de Cadaveira**

Sentido escoamento	Linha de água	Secção	Caudal	Cota terreno	Nível água	Altura água	Declive	Velocidade	Área secção	Largura superficial		
			(m <sup>3</sup> /s)	(m)	(m)	(m)						
montante	MD2 (afluente)	721.013	3.40	92.87	93.08	0.21	0.0247	1.13	3.00	24.00		
		621.925	3.40	92.00	92.18	0.18	0.0058	0.51	6.68	60.57		
		506.328	3.40	91.12	91.29	0.17	0.0123	0.72	4.73	44.42		
		387.056	3.40	90.00	90.21	0.21	0.0072	0.72	4.74	30.24		
		278.151	3.40	89.00	89.16	0.16	0.0238	1.12	3.03	23.92		
		186.093	6.30	86.26	86.60	0.34	0.0196	1.55	4.08	17.56		
		98.037	6.30	83.65	84.01	0.36	0.0195	1.55	4.08	17.67		
		18.673	6.30	78.00	78.47	0.47	0.0195	1.59	3.98	16.84		
		535.152	6.30	75.55	75.97	0.42	0.0188	1.65	3.81	13.83		
		433.610	6.30	72.00	72.45	0.45	0.0197	1.58	3.99	16.30		
		387.233	6.30	70.00	70.29	0.29	0.0208	1.43	4.41	22.24		
		309.979	7.90	65.00	65.65	0.65	0.0056	1.14	6.98	18.91		
		235.327	7.90	64.09	64.24	0.15	0.0234	1.17	6.74	49.20		
		165.471	7.90	60.00	60.52	0.52	0.0191	1.66	4.79	18.65		
		78.192	7.90	58.00	58.77	0.77	0.0159	2.34	3.38	6.14		
		30.706	7.90	53.14	53.59	0.45	0.0178	1.80	4.42	14.20		
		CADAVEIRA (montante)	CADAVEIRA (montante)	3493.411	7.90	51.35	51.71	0.36	0.0202	1.52	5.22	23.53
				3407.101	7.90	48.71	49.00	0.29	0.0218	1.33	5.93	33.40
3273.891	7.90			40.04	40.92	0.88	0.0161	2.13	3.71	8.03		
3194.658	13.80			34.15	34.97	0.82	0.0162	2.09	6.62	15.13		
3083.412	13.80			24.89	25.79	0.90	0.0147	2.61	5.29	7.89		
3022.145	13.80			21.00	21.51	0.51	0.0172	1.84	7.57	24.08		
2965.246	13.80			20.00	21.08	1.08	0.0013	0.81	17.66	31.83		
2902.843	1.50			178.00	178.50	0.50	0.0219	1.86	0.81	2.33		
2785.367	1.50			169.47	169.72	0.25	0.0220	1.27	1.20	7.97		
2762.219	1.50			161.00	161.29	0.29	0.0219	1.30	1.16	7.24		
CADAVEIRA (intermédio)	CADAVEIRA (intermédio)	2688.750	1.50	156.97	157.09	0.12	0.0266	0.91	1.66	20.37		
		2593.820	2.70	152.82	153.03	0.21	0.0255	1.08	2.50	21.69		
		2487.027	2.70	148.23	148.49	0.26	0.0223	1.28	2.12	13.56		
		2399.800	2.70	144.00	144.62	0.62	0.0193	1.87	1.44	4.15		
		2281.464	2.70	139.00	139.36	0.36	0.0209	1.37	1.98	11.02		
		2156.431	2.70	134.68	134.90	0.22	0.0233	1.21	2.22	15.08		
		2065.934	2.70	131.00	131.34	0.34	0.0212	1.32	2.05	11.44		
		1984.074	11.00	120.00	120.82	0.82	0.0159	2.22	4.95	10.21		
		1952.274	11.00	106.00	106.80	0.80	0.0162	2.18	5.07	11.20		
		1869.340	11.00	99.77	100.50	0.73	0.0174	1.83	6.02	18.09		
CADAVEIRA (jusante)	CADAVEIRA (jusante)	1724.211	11.00	95.27	95.78	0.51	0.0179	1.80	6.11	19.60		
		1639.154	11.00	89.00	89.97	0.97	0.0156	2.56	4.29	6.50		
		1547.490	11.00	85.50	86.41	0.91	0.0154	2.20	5.02	10.84		
		1493.264	11.00	82.76	83.62	0.86	0.0156	2.32	4.73	8.74		
		1434.560	11.00	79.00	79.95	0.95	0.0158	2.32	4.74	8.83		
		1363.024	11.00	77.00	77.72	0.72	0.0176	1.93	5.71	15.79		

Sentido escoamento	Linha de água	Secção	Caudal	Cota terreno	Nível água	Altura água	Declive	Velocidade	Área secção	Largura superficial	
			(m <sup>3</sup> /s)	(m)	(m)	(m)					(m/m)
jusante			1247.057	11.00	73.32	73.84	0.52	0.0178	1.82	6.06	19.01
			1148.949	11.00	68.00	69.10	1.10	0.0149	2.54	4.37	7.42
			1049.286	2.80	71.00	71.22	0.22	0.0206	1.38	2.07	11.13
			930.792	2.80	66.32	66.74	0.42	0.0181	1.63	1.88	7.67
			821.585	2.80	62.00	62.46	0.46	0.0171	1.77	1.93	7.61
			697.618	2.80	57.65	58.01	0.36	0.0188	1.53	1.97	9.02
			585.684	2.80	54.00	54.41	0.41	0.0154	1.84	1.97	7.38
			493.057	2.80	52.00	52.25	0.25	0.0200	1.39	2.15	12.20
			394.604	11.10	51.00	51.67	0.67	0.0134	2.38	5.12	10.24
			276.613	11.10	47.00	47.76	0.76	0.0126	2.53	5.08	9.28
			153.051	11.10	44.00	44.61	0.61	0.0147	2.23	5.29	11.45
			17.559	11.10	41.00	41.65	0.65	0.0133	2.42	5.19	10.21

Na Figura 5.18 é mostrada as prováveis áreas inundadas para o período de retorno de 100 anos na ribeira de Cadaveira.

A representação gráfica de cada secção assim como o correspondente nível de água atingido é apresentada no anexo respectivo.

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Figura 5.18 – Ribeira de Cadaveira, prováveis áreas inundadas para T=100 anos



### 5.1.10 Bacia da ribeira de Bicesse

As localizações das secções transversais utilizadas na modelação encontram-se representadas na Figura 5.19, sendo a secção de montante a 6193,6992, da linha de água principal numeração esta que corresponde à distância (em metros) para a secção da bacia hidrográfica.



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12 JAN. 2015  
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RECEBIMOS  
- 8 JUN. 2015  
CASCAIS







**HIDROPROJECTO**  
ENGENHARIA E GESTÃO, S.A.





Na Tabela 5.10 apresenta-se o resultado da modelação da propagação dos caudais de ponta de cheia correspondentes ao período de retorno de 100 anos, nas secções de cálculo cuja localização se mostrou na Figura 5.19.

**Tabela 5.10 – Resultado da modelação para a ribeira de Bicesse**

Sentido escoamento	Linha de água	Secção	Caudal (m <sup>3</sup> /s)	Cota terreno (m)	Nível água (m)	Altura água (m)	Declive (m/m)	Velocidade (m/s)	Área secção (m <sup>2</sup> )	Largura superficial (m)
montante	ME2 (afluente)	1613.038	4.70	59.62	60.19	0.57	0.0088	1.60	6.28	34.10
		1593.135	4.70	59.14	59.78	0.64	0.0071	1.52	6.77	38.93
		1509.130	4.70	56.20	56.89	0.69	0.0145	2.23	2.42	6.48
		1392.379	4.70	54.54	55.27	0.73	0.0070	1.65	5.35	25.59
		1314.148	4.70	52.46	53.18	0.72	0.0100	1.92	3.59	13.25
		1209.786	4.70	49.52	50.24	0.72	0.0105	1.98	3.37	13.00
		1135.686	4.70	48.52	49.24	0.72	0.0072	1.63	5.57	29.27
		1056.015	7.80	47.20	48.03	0.83	0.0088	1.95	7.68	27.35
		952.608	7.80	45.61	46.48	0.87	0.0095	2.07	6.77	21.94
		838.992	7.80	42.54	43.46	0.92	0.0093	2.20	5.90	17.60
		710.274	7.80	40.57	41.30	0.73	0.0093	1.92	8.97	37.52
		595.023	7.80	37.92	38.49	0.57	0.0196	2.26	8.61	77.45
		474.155	7.80	35.67	36.38	0.71	0.0085	1.82	10.16	47.11
		364.986	7.80	33.55	34.26	0.71	0.0091	1.88	9.62	43.70
		277.478	7.80	31.90	32.35	0.45	0.0124	1.58	9.06	33.78
202.618	7.80	30.71	31.20	0.49	0.0131	1.88	10.52	62.45		
104.346	7.80	28.65	29.35	0.70	0.0086	1.78	10.83	55.82		
22.904	7.80	26.87	28.39	1.52	0.0002	0.40	44.26	71.93		
ME1 (afluente)	1408.799	3.10	123.73	124.28	0.55	0.0067	1.34	4.89	37.39	
	1318.093	3.10	117.47	118.10	0.63	0.0079	1.55	3.14	21.48	
	1236.116	3.10	113.17	113.74	0.57	0.0111	1.75	2.30	12.08	
	1140.335	3.10	107.08	107.58	0.50	0.0211	2.18	1.42	3.00	
	1013.893	3.10	103.57	104.18	0.61	0.0061	1.36	4.78	37.68	
	919.677	3.10	102.62	103.23	0.61	0.0067	1.39	4.70	36.37	
	832.624	3.80	101.91	102.26	0.35	0.0098	1.27	10.37	144.04	
	699.327	3.80	100.51	101.13	0.62	0.0065	1.41	6.43	54.55	
	601.542	3.80	99.66	100.45	0.79	0.0008	0.61	16.64	73.05	
	438.207	3.80	99.62	100.23	0.61	0.0022	0.85	11.78	64.94	
	233.347	3.80	98.50	99.18	0.68	0.0119	1.98	2.12	6.26	
	123.688	3.80	97.58	98.16	0.58	0.0088	1.63	4.30	24.08	
	21.639	3.80	96.55	97.95	1.40	0.0001	0.32	28.27	55.64	
MD1 (afluente)	245.431	2.20	91.65	92.05	0.40	0.0208	1.93	1.14	3.04	
	145.277	2.20	88.67	89.13	0.46	0.0073	1.29	3.55	34.54	
	74.075	2.20	86.76	87.17	0.41	0.0213	1.95	1.13	2.97	
	23.156	2.20	84.80	85.37	0.57	0.0040	1.11	3.27	17.58	
Bicesse (montante)	6193.699	3.60	123.01	123.87	0.86	0.0016	0.85	4.24	5.17	
	6157.786	3.60	122.97	123.80	0.83	0.0022	0.92	4.04	8.90	
	6123.919	3.60	122.87	123.78	0.91	0.0009	0.72	10.12	30.41	
	6053.939	3.60	122.85	123.42	0.57	0.0155	2.05	1.94	7.53	
	5957.885	3.60	121.62	122.24	0.62	0.0099	1.73	3.02	16.04	
	5816.145	5.20	119.26	120.02	0.76	0.0072	1.67	6.22	31.69	
	5703.681	5.20	115.52	116.26	0.74	0.0061	1.80	5.12	23.73	
	5600.034	5.20	111.52	112.21	0.69	0.0031	1.80	6.30	23.05	



Sentido escoamento	Linha de água	Secção	Caudal	Cota terreno	Nível água	Altura água	Declive	Velocidade	Área secção	Largura superficial
			(m <sup>3</sup> /s)	(m)	(m)	(m)	(m/m)	(m/s)	(m <sup>2</sup> )	(m)
jusante	Bicesse (interm.1)	5476.243	5.20	109.62	110.28	0.66	0.0078	1.64	6.91	35.69
		5366.685	5.20	107.52	108.27	0.75	0.0116	2.13	3.20	10.44
		5240.453	5.20	106.57	107.01	0.44	0.0091	1.46	10.93	99.50
		5121.556	14.50	104.61	105.53	0.92	0.0103	2.40	13.99	44.71
		5013.694	14.50	103.55	104.33	0.78	0.0101	2.06	18.80	87.34
		4868.329	14.50	101.33	102.77	1.44	0.0084	2.56	8.96	17.44
		4722.195	14.50	100.49	101.34	0.85	0.0137	2.54	14.01	55.22
		4524.667	14.50	99.76	100.49	0.73	0.0026	1.04	41.17	178.03
		4337.096	14.50	98.57	99.41	0.84	0.0138	2.44	17.21	99.30
		4193.345	14.50	97.68	98.75	1.07	0.0028	1.34	29.24	90.70
	4109.464	14.50	97.37	98.28	0.91	0.0089	2.19	15.80	51.51	
	Bicesse (interm.2)	4060.435	20.90	96.62	97.74	1.12	0.0102	2.68	17.60	44.08
		3955.087	20.90	95.76	96.59	0.83	0.0130	2.49	21.20	74.39
		3824.804	20.90	93.57	94.54	0.97	0.0108	2.49	21.14	66.75
		3751.342	20.90	92.61	93.73	1.12	0.0100	2.65	18.37	48.25
		3651.407	20.90	91.44	92.63	1.19	0.0114	2.79	16.15	40.17
		3529.293	20.90	89.02	90.36	1.34	0.0090	2.70	16.36	41.32
		3433.421	20.90	86.48	87.79	1.31	0.0098	2.91	14.28	27.59
		3356.850	20.90	84.73	85.58	0.85	0.0155	2.95	15.20	37.46
		3320.208	23.70	83.80	85.00	1.20	0.0103	2.74	18.34	43.47
		3216.774	23.70	81.64	82.96	1.32	0.0111	2.8	16.64	33.42
	Bicesse (jusante)	3108.527	23.70	79.50	80.86	1.36	0.0080	2.53	23.39	63.17
		2984.035	23.70	78.90	79.81	0.91	0.0054	1.65	32.4	80.55
		2852.816	23.70	77.55	78.57	1.02	0.0149	2.92	16.2	34.94
		2735.860	23.70	74.50	76.00	1.50	0.0132	3.07	13.05	20.85
		2624.283	23.70	71.89	73.58	1.69	0.0086	3.13	13.4	20.78
		2529.924	23.70	68.67	70.03	1.36	0.0111	3.07	12.13	18.65
		2420.598	23.70	62.61	64.27	1.66	0.0118	3.36	10.51	12.47
		2342.411	23.70	60.52	62.10	1.58	0.0121	3.18	11.78	15.98
		2276.978	26.00	57.00	58.88	1.88	0.0123	3.65	8.47	8.05
		2129.581	26.00	52.96	54.23	1.27	0.0116	2.94	18.42	36.86
	Bicesse (interm.1)	1983.300	26.00	49.63	50.67	1.04	0.0125	2.85	20.58	49.96
		1881.238	26.00	46.69	47.73	1.04	0.0137	2.87	19.35	44.47
		1788.006	26.00	43.65	45.36	1.71	0.0095	3.31	15.57	29.86
		1647.507	27.50	40.52	41.86	1.34	0.0103	2.95	20.92	44.67
		1499.891	27.50	38.52	39.58	1.06	0.0147	3.05	18.61	39.35
		1390.780	27.50	36.61	38.07	1.46	0.0109	3.19	16.74	28.34
		1309.036	27.50	35.54	36.68	1.14	0.0136	3.11	18.61	37.95
		1186.868	27.50	33.60	34.64	1.04	0.0146	2.96	19.15	40.54
		1058.193	27.50	30.52	32.09	1.57	0.0126	3.61	12.92	17.42
		946.419	27.50	28.79	30.01	1.22	0.0154	3.31	16.34	31.72
	Bicesse (jusante)	836.485	27.50	26.79	28.42	1.63	0.0043	2.27	25.69	36.63
		808.126	36.10	26.16	27.96	1.80	0.0115	3.46	17.76	22.22
		728.394	36.10	25.56	26.98	1.42	0.0026	1.61	47.69	65.30
		625.438	36.10	25.04	26.28	1.24	0.0139	3.24	24.90	50.64
508.202		36.10	22.32	23.33	1.01	0.0107	2.62	33.28	80.73	
382.122		36.10	20.56	21.85	1.29	0.0116	3.16	28.93	67.03	
275.888		36.10	18.68	19.66	0.98	0.0175	3.14	26.09	63.08	
167.530		36.10	16.77	18.09	1.32	0.0082	1.73	47.58	75.58	
72.082		36.10	14.61	18.08	3.47	0.0002	0.78	102.04	73.68	
12.787		36.10	13.64	17.97	4.33	0.0008	1.59	59.89	59.58	



Na Figura 5.20 é mostrada as prováveis áreas inundadas para o período de retorno de 100 anos na ribeira de Bicesse.

A representação gráfica de cada secção assim como o correspondente nível de água atingido é apresentada no anexo respectivo.

#### 5.1.11 Bacia da ribeira de Manique

As localizações das secções transversais utilizadas na modelação encontram-se representadas na Figura 5.21, sendo a secção de montante a 6124,2195, da linha de água principal, numeração esta que corresponde à distância (em metros) para a secção da bacia hidrográfica.

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Figura 5.20 – Ribeira de Bicesse, prováveis áreas inundadas para T=100 anos

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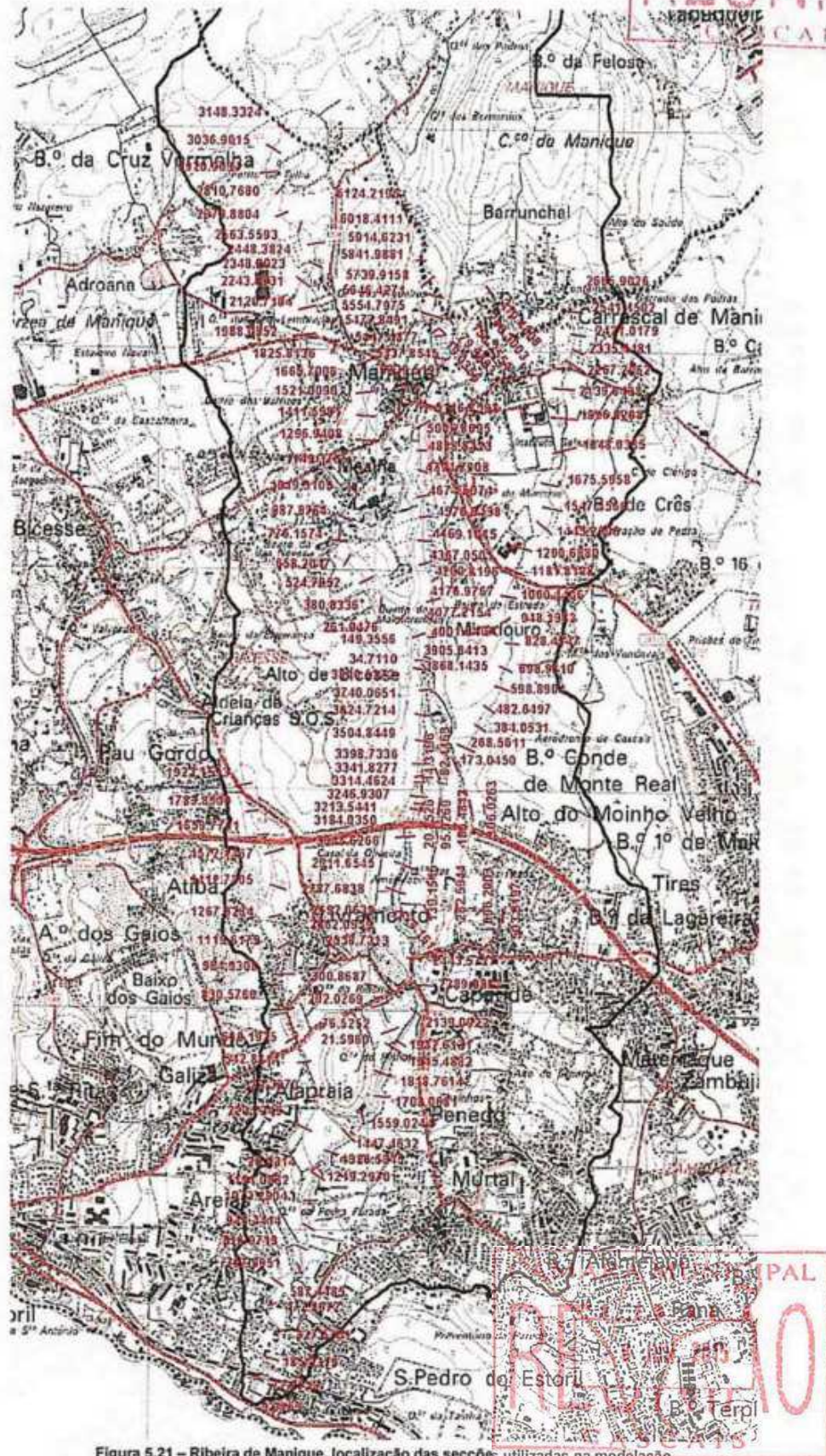


Figura 5.21 – Ribeira de Manique, localização das secções utilizadas na modelação

Na Tabela 5.11 apresenta-se o resultado da modelação da propagação dos caudais de ponta de cheia correspondentes ao período de retorno de 100 anos, nas secções de cálculo cuja localização se mostrou na Figura 5.21.

**Tabela 5.11 – Resultado da modelação para a ribeira de Manique**

Sentido escoamento	Linha de água	Secção	Caudal (m <sup>3</sup> /s)	Cota terreno (m)	Nível água (m)	Altura água (m)	Declive (m/m)	Velocidade (m/s)	Área secção (m <sup>2</sup> )	Largura superficial (m)
montante	ME4 (afluente)	503.920	5.10	68.03	68.76	0.73	0.0120	2.13	3.16	9.79
		396.290	5.10	62.05	62.80	0.75	0.0134	2.23	2.69	8.58
		282.594	5.10	54.48	55.25	0.77	0.0112	2.01	3.50	12.16
		139.152	5.10	47.87	48.60	0.73	0.0114	2.03	3.68	14.60
		24.162	5.10	44.54	46.37	1.83	0.0000	0.14	79.36	83.39
	ME3 (afluente)	306.026	3.40	65.08	66.00	0.92	0.0018	0.97	6.01	19.17
		248.723	3.40	65.00	65.53	0.53	0.0216	2.25	1.51	3.06
		186.484	3.40	56.44	57.03	0.59	0.0055	1.28	6.71	60.94
		95.027	3.40	50.75	51.32	0.57	0.0058	1.29	6.76	63.96
		20.853	3.40	49.34	50.62	1.28	0.0001	0.33	22.76	46.31
ME2 (afluente)	2665.903	2.00	119.06	119.44	0.38	0.0208	1.88	1.07	2.99	
	2541.450	2.00	115.24	115.63	0.39	0.0204	1.88	1.07	2.99	
	2421.018	2.00	112.26	112.61	0.35	0.0211	1.83	1.09	3.25	
	2335.448	2.00	109.50	109.87	0.37	0.0217	1.89	1.06	2.93	
	2267.206	2.00	107.53	107.92	0.39	0.0206	1.89	1.06	2.93	
	2139.841	2.00	104.17	104.55	0.38	0.0215	1.91	1.05	2.86	
	1996.830	2.00	101.70	102.15	0.45	0.0058	1.15	2.19	14.90	
	1848.639	2.00	100.26	100.68	0.42	0.0168	1.77	1.13	2.97	
	1675.596	2.00	97.58	97.97	0.39	0.0148	1.63	1.22	3.27	
	1547.457	2.00	95.94	96.41	0.47	0.0105	1.49	1.34	3.43	
	1445.231	2.00	94.51	94.89	0.38	0.0205	1.87	1.07	3.01	
	1290.688	2.00	90.89	91.26	0.37	0.0219	1.90	1.05	2.91	
	1181.820	9.50	89.51	90.29	0.78	0.0084	1.89	13.05	62.67	
	1060.441	9.50	84.48	85.47	0.99	0.0154	2.27	4.55	11.65	
	948.138	9.50	80.69	81.76	1.07	0.0143	2.89	3.73	5.39	
	828.495	9.50	74.94	75.91	0.97	0.0105	2.43	6.33	15.68	
	698.941	9.50	71.63	72.50	0.87	0.0093	2.11	9.45	33.07	
	598.890	9.50	68.50	69.48	0.98	0.0087	2.26	7.63	20.72	
	482.650	9.50	64.77	65.60	0.83	0.0103	2.24	8.45	27.51	
	384.053	11.30	62.49	63.33	0.84	0.0100	2.13	11.69	41.72	
	268.561	11.30	59.23	60.15	0.92	0.0082	1.98	14.10	58.99	
	173.045	11.30	55.54	56.41	0.87	0.0091	2.10	12.02	40.92	
	82.446	11.30	51.62	52.65	1.03	0.0118	2.47	7.73	18.50	
14.320	11.30	49.60	51.86	2.26	0.0002	0.57	36.27	30.94		
ME1 (afluente)	310.481	3.50	101.71	102.31	0.60	0.0184	2.23	1.58	3.62	
	236.300	3.50	95.83	96.37	0.54	0.0227	2.29	1.53	2.89	
	156.255	3.50	90.56	91.10	0.54	0.0218	2.28	1.54	2.93	
	79.989	3.50	86.72	87.30	0.58	0.0161	2.15	1.73	4.82	
	19.036	3.50	83.34	84.29	0.95	0.0007	0.60	12.34	37.22	
MD3 (afluente)	1923.159	2.80	67.60	68.06	0.46	0.0215	2.10	1.33	2.97	
	1783.891	2.80	65.01	65.61	0.60	0.0067	1.39	3.62	30.34	
	1659.775	2.80	61.60	62.18	0.58	0.0096	1.60	1.78	4.34	
	1572.147	2.80	60.58	61.11	0.53	0.0145	1.86	1.51	4.27	
	1412.730	2.80	57.81	58.28	0.47	0.0213	2.11	1.33	2.95	



Sentido escoamento	Linha de água	Secção	Caudal	Cota terreno	Nível água	Altura água	Declive	Velocidade	Área secção	Largura superficial
			(m <sup>3</sup> /s)	(m)	(m)	(m)	(m/m)	(m/s)	(m <sup>2</sup> )	(m)
		1267.828	2.80	54.49	54.95	0.46	0.0214	2.09	1.34	3.02
		1119.618	2.80	48.58	49.03	0.45	0.0208	2.06	1.36	3.14
		984.931	2.80	44.74	45.32	0.58	0.0066	1.36	3.84	33.72
		830.577	2.80	40.89	41.36	0.47	0.0211	2.10	1.33	2.99
		669.193	6.70	37.57	38.42	0.85	0.0096	2.15	5.06	16.95
		542.881	6.70	34.48	35.30	0.82	0.0044	1.37	12.00	55.00
		379.387	6.70	33.45	34.24	0.79	0.0088	1.86	6.74	25.19
		220.725	6.70	31.57	32.28	0.71	0.0081	1.72	9.82	56.09
		28.231	6.70	29.69	31.14	1.45	0.0001	0.27	57.47	87.82
	MD2 (afluente)	300.869	0.90	39.66	39.89	0.23	0.0199	1.36	0.66	2.96
		202.027	0.90	37.52	37.75	0.23	0.0231	1.48	0.61	2.73
		76.525	0.90	36.50	37.54	1.04	0.0000	0.05	46.50	137.63
		21.596	0.90	36.08	37.54	1.46	0.0000	0.09	20.23	33.08
	MD1 (afluente)	3148.332	8.20	122.90	123.70	0.80	0.0096	2.07	7.54	27.73
		3036.901	8.20	120.35	121.04	0.69	0.0089	1.81	10.23	46.66
		2920.903	8.20	118.89	119.92	1.03	0.0069	1.87	8.88	35.24
		2810.768	10.80	115.55	116.40	0.85	0.0091	2.13	9.60	29.41
		2673.880	10.80	111.77	112.56	0.79	0.0120	2.46	8.65	24.82
		2563.559	10.80	107.55	108.53	0.98	0.0109	2.5	7.32	16.73
		2448.382	10.80	102.13	103.09	0.96	0.0084	2.06	11.27	39.33
		2348.202	10.80	99.43	100.85	1.42	0.0030	1.64	12.41	24.41
		2243.453	10.80	99.52	100.23	0.71	0.0139	2.3	11.39	53.47
		2120.718	10.80	97.95	98.74	0.79	0.0107	2.14	11.04	40.3
		1988.085	15.00	96.59	97.61	1.02	0.0020	1.11	32.1	78.22
		1825.814	15.00	95.58	96.79	1.21	0.0094	2.66	10.48	22.91
		1665.701	15.00	93.40	94.32	0.92	0.0116	2.53	12.4	34.1
		1521.009	15.00	91.21	92.16	0.95	0.0114	2.47	12.53	34.29
		1411.598	15.00	88.51	89.61	1.10	0.0093	2.48	12.83	33.99
		1296.941	15.70	86.51	87.36	0.85	0.0104	2.23	17.67	64.01
		1149.377	15.70	83.58	84.74	1.16	0.0086	2.38	14.33	38.95
		1019.311	15.70	81.50	82.68	1.18	0.0093	2.57	12.41	30.45
		887.876	15.70	78.69	80.15	1.46	0.0132	2.69	6.27	13.27
		776.157	15.70	76.52	77.70	1.18	0.0094	2.64	11.97	28.47
		658.205	15.70	73.51	74.46	0.95	0.0098	2.34	15.03	45.09
		524.785	15.70	69.46	70.89	1.43	0.0081	2.66	10.67	22.85
		380.834	15.70	64.50	65.74	1.24	0.0095	2.71	10.89	23.68
		261.948	15.70	60.40	61.77	1.37	0.0108	2.90	8.46	14.41
		149.356	15.70	58.51	59.47	0.96	0.0097	2.34	16.15	52.10
		34.711	15.70	56.51	58.55	2.04	0.0004	0.79	43.69	56.02
	MANIQUE (montante)	6124.220	60.70	97.51	100.04	2.53	0.0112	4.68	21.46	15.57
		6018.411	60.70	93.60	95.84	2.24	0.0131	4.69	21.38	16.02
		5914.623	60.70	91.56	93.21	1.65	0.0163	4.31	25.18	25.85
		5841.988	60.70	89.60	91.87	2.27	0.0108	4.28	27.51	27.64
		5739.916	60.70	87.63	89.21	1.58	0.0144	4.01	33.61	50.19
		5646.427	60.70	85.46	87.16	1.70	0.0133	3.88	31.71	40.42
		5554.797	60.70	83.70	85.30	1.60	0.0108	3.55	38.88	57.50
		5477.849	60.70	82.51	84.39	1.88	0.0108	3.87	33.69	42.23
	MANIQUE (inter. 1)	5447.488	63.40	81.53	83.83	2.30	0.0077	3.83	39.54	50.20
		5337.855	63.40	79.60	81.81	2.21	0.0114	4.35	28.05	27.79
		5229.520	63.40	77.53	80.44	2.91	0.0066	3.81	35.66	38.66
		5116.860	63.40	76.56	78.87	2.31	0.0093	3.97	36.83	49.45
		5006.869	63.40	74.20	75.97	1.77	0.0118	3.83	38.14	56.15

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Sentido escoamento	Linha de água	Secção	Caudal	Cota terreno	Nível água	Altura água	Declive	Velocidade	Área secção	Largura superficial
			(m <sup>3</sup> /s)	(m)	(m)	(m)	(m/m)	(m/s)	(m <sup>2</sup> )	(m)
jusante		4888.842	63.40	71.51	73.89	2.38	0.0099	4.30	29.34	29.35
		4794.791	63.40	70.53	72.63	2.10	0.0113	4.19	30.72	34.09
		4674.51	63.40	68.60	70.61	2.01	0.0108	3.96	33.67	39.80
		4576.84	63.40	67.51	69.20	1.69	0.0142	4.08	31.53	39.02
		4469.11	63.40	64.60	67.11	2.51	0.0100	4.13	30.80	33.26
		4367.050	63.40	63.53	65.85	2.32	0.0084	3.93	36.92	45.76
		4280.820	63.40	62.45	64.52	2.07	0.0139	4.40	24.74	21.50
		4176.977	63.40	60.70	62.66	1.96	0.0100	3.87	38.79	54.00
		4077.215	63.40	58.55	61.10	2.55	0.0075	3.69	39.75	51.20
		4001.840	63.40	57.45	59.98	2.53	0.0126	4.71	21.50	14.81
		3905.841	63.40	56.52	58.68	2.16	0.0103	4.15	33.21	39.56
		3868.144	63.40	55.57	58.44	2.87	0.0027	2.44	53.31	41.56
		3840.527	83.20	55.58	57.92	2.34	0.0119	4.53	37.85	38.12
		3740.065	83.20	54.40	56.55	2.15	0.0108	4.01	40.61	38.90
		3624.721	83.20	53.60	55.34	1.74	0.0121	3.88	52.59	79.49
	3504.845	83.20	51.67	53.65	1.98	0.0142	4.23	42.52	55.63	
	3398.734	83.20	50.59	52.41	1.82	0.0090	3.46	54.39	71.50	
	3341.828	83.20	49.54	51.80	2.26	0.0093	3.86	50.03	62.00	
	3314.462	91.40	49.52	51.47	1.95	0.0125	4.29	50.32	67.15	
	3246.931	91.40	48.51	50.98	2.47	0.0026	2.24	103.89	113.70	
	3213.544	91.40	48.51	50.52	2.01	0.0124	4.31	46.24	53.19	
	3184.035	92.70	48.51	50.22	1.71	0.0122	3.80	53.81	69.96	
	3048.627	92.70	46.54	48.69	2.15	0.0099	4.09	57.14	79.53	
	2911.655	92.70	45.50	47.55	2.05	0.0024	1.91	112.30	120.48	
	2787.684	92.70	45.60	46.98	1.38	0.0085	2.80	72.76	105.23	
	2692.064	92.70	44.47	46.36	1.89	0.0050	2.60	70.83	66.84	
	2662.096	95.90	44.40	46.22	1.82	0.0048	2.57	74.20	68.22	
	2538.731	95.90	43.49	45.23	1.74	0.0112	3.74	54.79	64.09	
	2443.573	95.90	41.51	44.25	2.74	0.0075	4.12	58.58	66.98	
	2289.987	95.90	39.43	41.62	2.19	0.0131	4.50	43.62	43.28	
	2139.092	95.90	37.50	39.72	2.22	0.0097	3.95	52.37	53.82	
	1982.613	95.90	35.89	37.92	2.03	0.0128	4.40	50.98	65.12	
	1945.488	96.60	35.82	37.14	1.32	0.0158	4.05	59.90	101.57	
	1818.761	96.60	34.53	36.29	1.76	0.0047	2.42	86.62	97.51	
	1708.068	96.60	33.70	35.37	1.67	0.0122	3.63	57.08	76.84	
	1559.024	96.60	31.58	33.73	2.15	0.0087	3.53	50.69	43.76	
	1447.463	96.60	30.70	32.46	1.76	0.0148	4.26	52.22	78.13	
	1326.535	96.60	29.53	31.64	2.11	0.0027	2.12	104.79	105.56	
	1219.297	96.60	29.52	31.07	1.55	0.0085	3.04	65.93	77.77	
	1194.088	107.80	28.68	30.99	2.31	0.0038	2.58	98.65	107.92	
	1073.290	107.80	27.68	30.12	2.44	0.0091	4.00	61.18	65.86	
	948.441	107.80	26.58	28.64	2.06	0.0135	4.51	50.91	54.85	
	816.972	107.80	25.71	27.52	1.81	0.0078	3.30	70.47	80.71	
	707.995	107.80	24.60	26.32	1.72	0.0137	4.14	57.75	70.88	
	587.448	107.80	23.53	25.49	1.96	0.0055	2.86	83.19	89.39	
472.167	107.80	21.52	24.47	2.95	0.0075	4.38	56.22	54.70		
327.576	107.80	20.54	22.50	1.96	0.0136	4.45	54.96	65.08		
185.338	107.80	17.69	20.25	2.56	0.0083	4.23	66.79	79.82		
72.274	107.80	15.73	18.68	2.95	0.0082	4.37	60.10	62.22		
9.385	107.80	13.47	17.71	4.24	0.0020	2.79	94.32	65.04		

Na Figura 5.22 é mostrada as prováveis áreas inundadas para o período de retorno de 100 anos na ribeira de Manique.

A representação gráfica de cada secção assim como o correspondente nível de água atingido é apresentada no anexo respectivo.

### 5.1.12 Bacia da ribeira das Marianas

As localizações das secções transversais utilizadas na modelação encontram-se representadas na **Figura 5.23**, sendo a secção de montante a 7914,5259, da linha de água principal numeração esta que corresponde à distância (em metros) para a secção da bacia hidrográfica.

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Figura 5.22 – Ribeira de Manique, prováveis áreas inundadas para T=100 anos

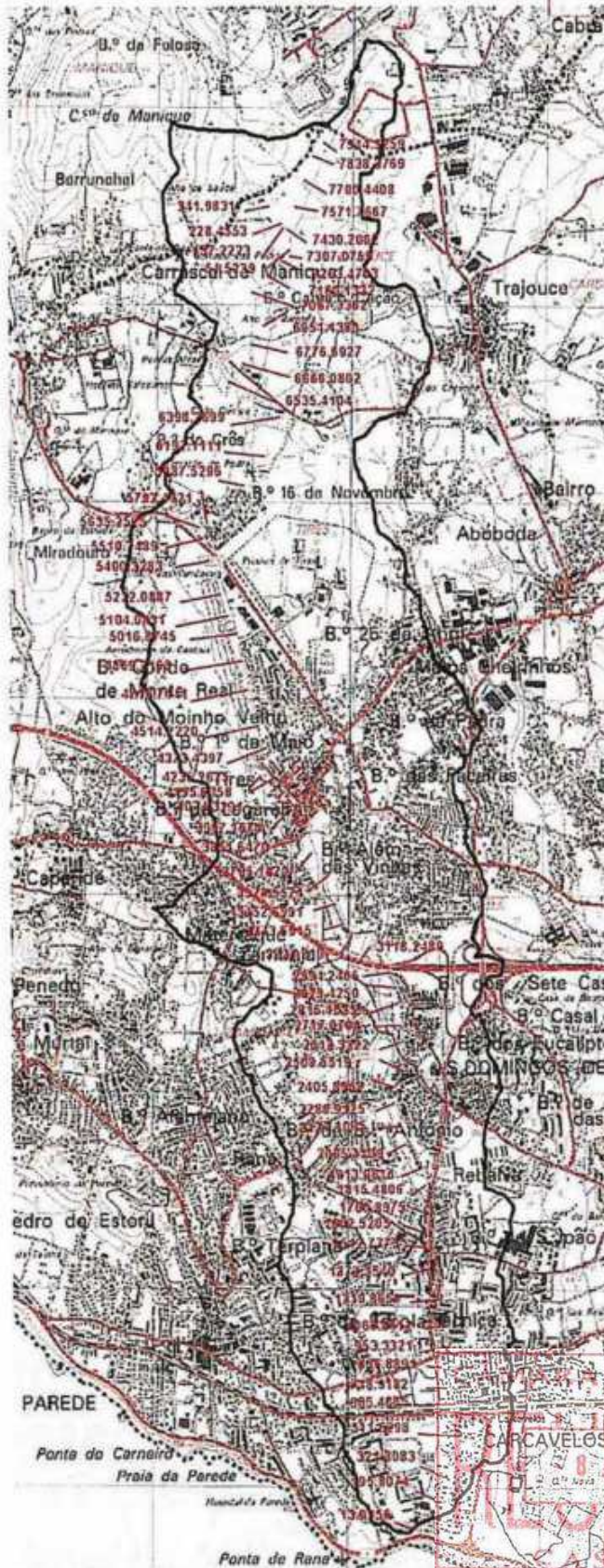


Figura 5.23 – Ribeira das Marianas, localização das secções utilizadas na modelação

Na Tabela 5.12 apresenta-se o resultado da modelação da propagação dos caudais de ponta de cheia correspondentes ao período de retorno de 100 anos, nas secções de cálculo cuja localização se mostrou na Figura 5.23.

Tabela 5.12 – Resultado da modelação para a ribeira das Marianas

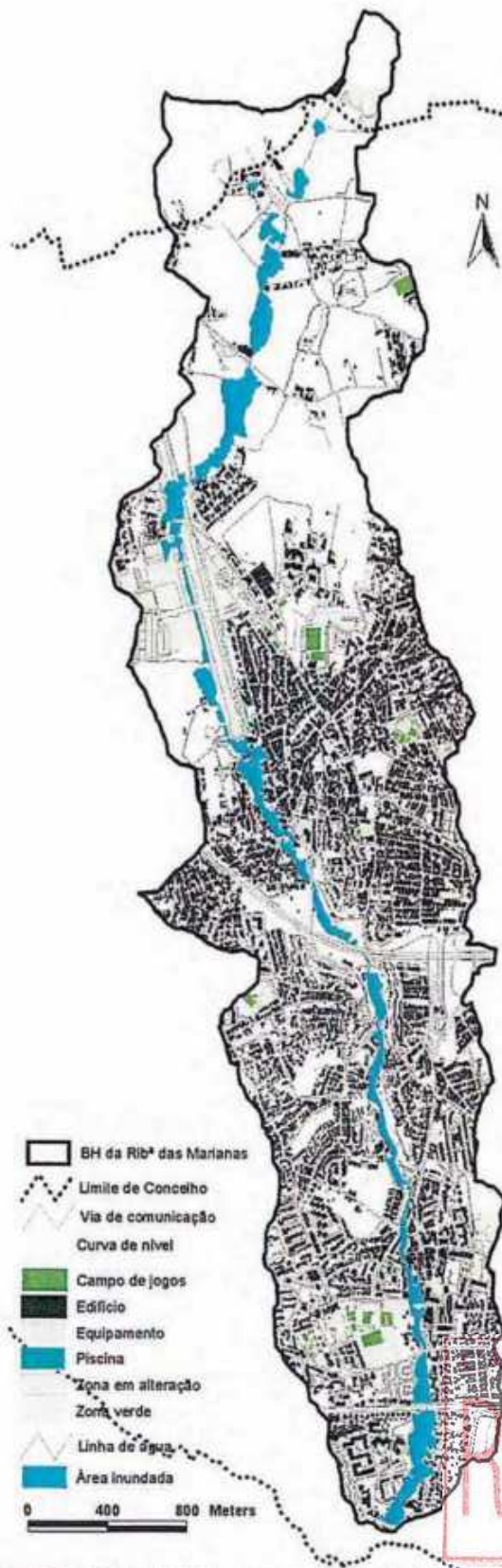
Sentido escoamento	Linha de água	Secção	Caudal	Cota terreno	Nível água	Altura água	Declive	Velocidade	Área secção	Largura superficial		
			(m <sup>3</sup> /s)	(m)	(m)	(m)	(m/m)	(m/s)	(m <sup>2</sup> )	(m)		
montante	ME1	110.644	8.60	81.69	82.39	0.70	0.0085	1.76	13.66	81.83		
		68.252	8.60	80.57	81.23	0.66	0.0090	1.78	13.07	71.56		
		13.880	8.60	80.00	80.79	0.79	0.0071	1.71	14.12	86.21		
MD1 afluente	MD1	341.983	1.70	115.34	115.49	0.15	0.0204	1.15	3.50	50.49		
		228.455	1.70	112.07	112.52	0.45	0.0109	1.46	1.16	2.91		
		137.222	1.70	110.99	111.41	0.42	0.0132	1.56	1.09	2.88		
MARIANAS (montante)	MARIANAS (montante)	54.524	1.70	110.08	110.54	0.46	0.0091	1.36	1.25	2.96		
		7914.526	1.50	116.09	116.40	0.31	0.0221	1.74	0.86	2.84		
		7838.377	1.50	114.73	115.18	0.45	0.0072	1.20	1.25	5.33		
		7700.441	1.50	113.51	113.91	0.40	0.0117	1.43	1.05	2.88		
		7571.767	1.50	112.85	113.44	0.59	0.0022	0.77	4.20	54.30		
		7430.206	1.50	112.35	112.71	0.36	0.0139	1.48	1.01	3.02		
		7307.076	1.50	110.24	110.56	0.32	0.0214	1.72	0.87	2.91		
		7263.476	5.60	109.50	110.18	0.68	0.0067	1.51	9.91	68.80		
		7160.133	5.60	108.57	109.24	0.67	0.0054	1.36	12.12	90.08		
		7067.336	7.80	107.90	108.57	0.67	0.0087	1.73	13.46	90.50		
		6954.139	7.80	106.61	107.68	1.07	0.0015	1.01	18.40	51.02		
		6776.693	7.80	106.50	107.16	0.66	0.0072	1.53	16.07	116.20		
		6666.086	7.80	105.58	106.34	0.76	0.0074	1.71	12.26	65.12		
		6535.410	7.80	104.51	105.29	0.78	0.0083	1.88	10.36	51.98		
		6398.270	12.20	103.51	104.33	0.82	0.0027	1.09	33.93	152.63		
6192.111	12.20	102.55	103.30	0.75	0.0107	1.94	19.21	115.66				
5987.530	12.20	100.50	101.32	0.82	0.0065	1.70	18.80	77.71				
MARIANAS (intermédio)	MARIANAS (intermédio)	5793.472	13.90	98.56	99.73	1.17	0.0086	2.53	10.83	26.45		
		5635.252	14.60	96.89	97.42	0.53	0.0179	2.09	17.22	87.61		
		5510.749	14.60	94.59	95.94	1.35	0.0059	2.17	16.55	60.64		
		5400.328	14.60	93.48	94.31	0.83	0.0097	2.04	20.39	99.59		
		5222.089	14.60	90.41	91.61	1.20	0.0106	2.69	9.03	16.86		
		5104.043	14.60	89.54	90.65	1.11	0.0076	2.28	11.95	23.48		
		5016.874	14.60	88.60	89.77	1.17	0.0107	2.71	9.04	17.30		
		4869.717	14.60	86.53	87.73	1.20	0.0108	2.76	8.84	17.09		
		4713.714	14.60	85.50	86.41	0.91	0.0070	1.89	21.80	92.49		
		4514.222	14.60	83.61	84.58	0.97	0.0107	2.52	12.00	31.90		
		4373.440	18.20	81.52	82.67	1.15	0.0112	2.68	13.10	28.29		
		4235.262	18.20	80.04	81.01	0.97	0.0099	2.39	19.95	70.18		
		MARIANAS (jusante)	MARIANAS (jusante)	4195.636	24.40	79.73	80.59	0.86	0.0065	1.84	33.35	97.50
				4074.329	24.40	77.88	78.89	1.01	0.0238	3.68	13.29	33.11
				3967.167	24.40	75.53	76.87	1.34	0.0112	3.13	15.59	29.08
3851.647	24.40			72.66	73.67	1.01	0.0131	2.82	19.81	47.42		
3705.192	24.40			70.57	71.70	1.13	0.0127	3.03	18.84	47.16		
3578.552	26.80			68.47	69.80	1.33	0.0092	2.74	22.90	52.50		
3452.699	26.80			66.03	67.71	1.68	0.0106	3.01	16.90	29.74		
3343.691	26.80			65.53	66.50	0.97	0.0142	2.79	21.62	55.31		
3224.214	26.80			63.52	65.03	1.51	0.0073	2.61	24.95	59.26		

Sentido escoamento	Linha de água	Secção	Caudal	Cota terreno	Nível água	Altura água	Declive	Velocidade	Área secção	Largura superficial
			(m <sup>3</sup> /s)	(m)	(m)	(m)				
jusante		3118.249	33.80	61.62	63.72	2.10	0.0066	3.08	22.64	36.38
		2994.240	33.80	60.67	62.46	1.79	0.0117	3.79	14.65	15.63
		2929.425	33.80	59.49	60.56	1.07	0.0142	2.96	27.52	70.99
		2815.153	33.80	57.45	58.87	1.42	0.0057	2.24	33.14	55.26
		2717.070	33.80	57.01	58.03	1.02	0.0123	2.59	27.36	59.56
		2613.332	33.80	55.48	56.61	1.13	0.0141	3.05	25.16	56.86
		2508.552	33.80	53.80	54.97	1.17	0.0142	3.30	22.12	42.45
		2405.897	38.30	51.54	53.08	1.54	0.0083	2.86	29.33	49.48
		2286.912	38.30	50.49	51.86	1.37	0.0121	3.28	27.34	55.04
		2177.110	38.30	48.52	50.20	1.68	0.0109	3.40	23.20	36.96
		2065.411	38.30	47.52	48.78	1.26	0.0155	3.49	22.03	36.92
		1913.082	38.30	44.59	46.43	1.84	0.0111	3.67	18.89	23.03
		1815.481	38.30	41.61	43.56	1.95	0.0084	3.14	25.98	41.55
		1700.898	38.30	37.60	39.58	1.98	0.0112	3.79	17.19	18.64
		1602.521	39.10	35.75	37.59	1.84	0.0104	3.44	23.31	35.55
		1512.777	39.10	33.69	35.64	1.95	0.0097	3.53	23.24	35.76
		1373.354	39.10	30.66	32.72	2.06	0.0109	3.94	16.19	15.58
		1219.866	39.10	28.79	30.15	1.36	0.0121	3.22	28.56	59.50
		1066.811	39.10	25.59	27.00	1.41	0.0188	4.20	17.66	25.96
		953.332	45.40	22.49	24.82	2.33	0.0088	3.94	20.98	21.54
		856.889	45.40	21.51	22.66	1.15	0.0174	3.50	28.47	56.08
		748.918	45.40	19.60	21.21	1.61	0.0062	2.62	41.45	72.63
		665.489	46.60	19.50	20.38	0.88	0.0183	3.01	39.64	120.69
		511.630	46.60	15.54	16.66	1.12	0.0157	3.33	37.90	102.78
		321.808	46.60	11.75	12.88	1.13	0.0140	3.24	39.42	104.33
195.807	46.60	8.61	10.22	1.61	0.0120	3.62	28.82	48.38		
13.996	46.60	5.49	7.79	2.30	0.0010	1.36	84.56	92.38		

Na Figura 5.24 é mostrada as prováveis áreas inundadas para o período de retorno de 100 anos na ribeira das Marianas.

A representação gráfica de cada secção assim como o correspondente nível de água atingido é apresentada no anexo respectivo.

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Figura 5.24 – Ribeira das Marianas, prováveis áreas inundadas para T=100 anos







### 5.1.13 Bacia da ribeira de Sassoeiros

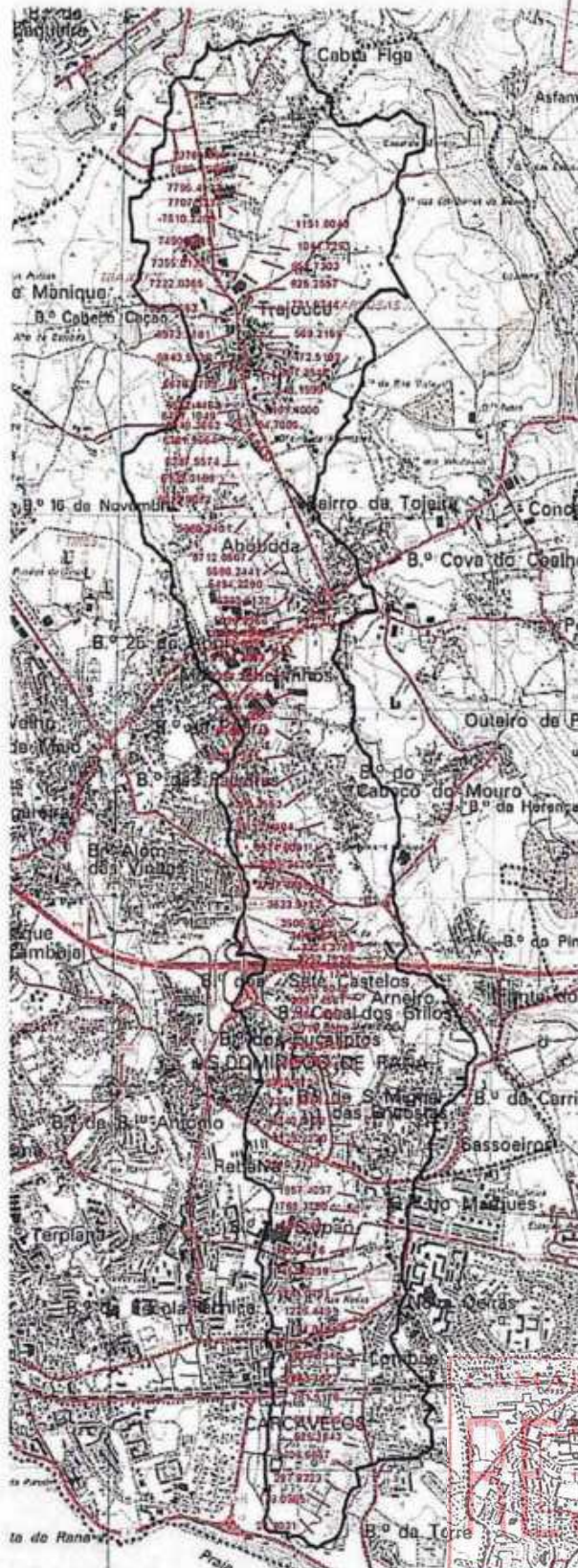
As localizações das secções transversais utilizadas na modelação encontram-se representadas na Figura 5.25, sendo a secção de montante a 7976,1354, da linha de água principal, numeração esta que corresponde à distância (em metros) para a secção da bacia hidrográfica.



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Figura 5.25 – Ribeira de Sasseiros, localização das secções utilizadas na modelação



Na Tabela 5.13 apresenta-se o resultado da modelação da propagação dos caudais de ponta de cheia correspondentes ao período de retorno de 100 anos, nas secções de cálculo cuja localização se mostrou na Figura 5.25.

Tabela 5.13 – Resultado da modelação para a ribeira de Sassoeiros

Sentido escoamento	Linha de água	Secção	Caudal	Cota terreno	Nível água	Altura água	Declive	Velocidade	Área secção	Largura superficial
			(m <sup>3</sup> /s)	(m)	(m)	(m)	(m/m)	(m/s)	(m <sup>2</sup> )	(m)
montante	Sassoeiros (montante)	7976.135	3.60	118.72	119.52	0.80	0.0009	0.64	13.79	47.73
		7889.715	3.60	118.63	119.24	0.61	0.0101	1.77	3.77	18.42
		7795.412	3.60	117.51	118.27	0.76	0.0097	1.80	3.06	15.67
		7707.524	3.60	116.19	116.69	0.50	0.0007	0.38	13.52	30.38
		7610.221	3.60	115.56	116.16	0.60	0.0082	1.52	5.45	36.59
		7490.648	3.60	115.44	116.02	0.58	0.0005	0.37	22.50	98.79
		7355.014	3.60	115.17	115.86	0.69	0.0033	1.01	11.36	104.24
		7222.037	3.60	114.59	115.22	0.63	0.0069	1.45	6.45	52.59
		7092.028	8.40	113.50	114.35	0.85	0.0049	1.45	16.60	81.93
		6973.218	8.40	112.84	113.65	0.81	0.0070	1.64	13.24	61.80
		6843.514	8.40	111.53	112.50	0.97	0.0096	2.20	7.98	27.54
		6676.379	8.40	108.50	109.41	0.91	0.0106	2.25	7.33	22.40
		6552.446	8.40	107.49	108.29	0.80	0.0089	1.88	13.06	76.47
		6487.185	8.40	106.71	107.64	0.93	0.0025	1.12	18.21	58.04
		6448.366	16.60	106.50	107.33	0.83	0.0129	2.32	18.95	76.82
		6381.966	16.60	105.66	106.85	1.19	0.0038	1.61	23.64	51.21
		6237.557	16.60	104.57	105.77	1.20	0.0120	2.94	11.10	22.14
		6139.316	16.60	103.87	104.55	0.68	0.0078	1.75	22.99	78.52
		6013.908	16.60	102.47	103.42	0.95	0.0098	2.23	21.52	89.97
		5868.240	16.60	100.62	101.77	1.15	0.0119	2.76	13.10	33.95
		5712.051	19.80	98.43	99.67	1.24	0.0044	1.71	29.16	74.98
		5586.244	19.80	97.58	98.70	1.12	0.0117	2.78	17.23	47.32
		5484.228	19.80	97.02	98.07	1.05	0.0049	1.65	28.25	71.70
		5390.513	21.20	96.42	97.23	0.81	0.0167	2.59	19.90	69.29
		5290.896	21.20	94.86	95.96	1.10	0.0053	1.83	30.31	83.85
		5235.694	21.20	93.63	95.45	1.82	0.0061	2.51	16.05	41.42
		5203.559	21.20	93.41	94.53	1.12	0.0111	2.61	16.94	35.87
		5116.390	21.20	92.59	93.35	0.76	0.0172	2.59	20.31	74.44
4994.218	21.20	90.50	91.56	1.06	0.0058	1.83	27.44	67.31		
4885.490	21.20	89.54	90.93	1.39	0.0052	2.10	23.30	46.19		
4759.651	21.20	88.50	89.76	1.26	0.0140	3.08	14.86	34.33		
4665.275	21.20	87.46	88.92	1.46	0.0071	2.45	18.02	32.28		
4537.739	21.20	86.66	87.99	1.33	0.0080	2.42	18.32	34.79		
4401.638	21.20	85.42	86.74	1.32	0.0100	2.68	17.85	41.31		
4285.355	21.20	84.43	85.72	1.29	0.0084	2.44	21.12	53.72		
4112.488	25.80	82.52	83.81	1.29	0.0128	3.19	18.32	38.87		
3971.809	25.80	80.51	81.58	1.07	0.0129	2.73	21.68	53.35		
3869.342	25.80	79.51	80.48	0.97	0.0104	2.33	26.12	69.62		
3737.886	25.80	77.51	78.91	1.40	0.0118	3.06	18.39	37.15		
3623.912	25.80	75.49	77.61	2.12	0.0047	2.39	21.72	30.54		
3506.579	25.80	74.50	76.51	2.01	0.0114	3.54	12.64	17.68		
3444.505	25.80	72.53	73.84	1.31	0.0161	3.49	12.63	17.44		
3324.277	25.80	69.47	70.99	1.52	0.0125	3.12	16.47	29.48		

Sentido escoamento	Linha de água	Secção	Caudal	Cota terreno	Nível água	Altura água	Declive	Velocidade	Área secção	Largura superficial	
			(m <sup>3</sup> /s)	(m)	(m)	(m)	(m/m)	(m/s)	(m <sup>2</sup> )	(m)	
jusante		3252.784	28.60	68.27	69.87	1.60	0.0096	2.98	22.17	55.64	
		3177.174	28.60	66.32	68.36	2.04	0.0134	3.83	10.99	10.04	
		3075.805	28.60	61.14	62.89	1.75	0.0244	4.82	9.81	17.33	
		2961.456	28.60	54.17	56.17	2.00	0.0136	3.56	12.96	15.47	
		2866.407	28.60	48.42	50.72	2.30	0.0133	3.98	10.01	8.52	
		2776.081	28.60	45.46	46.98	1.52	0.0275	5.03	9.03	11.26	
		2700.340	31.00	42.51	44.56	2.05	0.0069	3.25	23.47	43.45	
		2583.109	31.00	38.06	39.07	1.01	0.0206	2.89	22.51	59.44	
		2459.872	31.00	35.51	36.84	1.33	0.0102	2.47	28.65	66.64	
		2361.865	31.00	34.50	35.63	1.13	0.0145	3.03	25.01	63.09	
		2240.382	31.00	32.51	33.69	1.18	0.0154	3.16	23.01	54.89	
		2125.222	31.00	31.32	32.53	1.21	0.0064	2.00	35.26	74.04	
		2010.314	31.00	30.24	31.44	1.20	0.0135	2.70	27.00	79.66	
		1857.406	31.00	25.51	26.92	1.41	0.0175	3.85	13.23	14.92	
		1769.375	36.90	23.36	24.84	1.48	0.0180	3.96	15.78	17.51	
		1658.338	36.90	21.50	24.44	2.94	0.0018	1.94	42.88	49.60	
		1560.488	36.90	21.51	23.80	2.29	0.0085	3.67	19.95	23.90	
		1454.930	36.90	20.04	21.38	1.34	0.0090	2.69	38.17	102.94	
		1341.045	36.90	18.45	20.02	1.57	0.0135	3.36	25.29	51.12	
		1226.449	37.10	15.37	17.45	2.08	0.0091	3.37	18.02	15.05	
		1134.911	37.10	14.49	17.00	2.51	0.0042	2.84	21.20	11.91	
		994.535	37.10	13.29	15.49	2.20	0.0167	4.44	12.25	8.73	
		863.767	39.10	11.49	14.47	2.98	0.0028	2.33	26.66	12.38	
		761.918	39.10	11.43	13.53	2.10	0.0159	4.14	15.06	14.14	
		629.860	39.10	11.12	12.98	1.86	0.0110	3.63	20.89	25.51	
		525.164	39.10	10.01	11.64	1.63	0.0170	3.48	23.64	44.85	
		406.666	39.10	8.22	10.45	2.23	0.0075	2.94	34.19	72.22	
		287.832	39.10	7.81	9.11	1.30	0.0040	1.78	46.75	72.90	
		178.087	39.10	6.47	8.19	1.72	0.0118	3.49	25.08	45.81	
		28.303	39.10	5.75	7.32	1.57	0.0020	1.41	55.28	64.81	
		ME1 afluente	1151.804	3.10	118.50	119.21	0.71	0.0070	1.54	3.81	25.55
			1044.726	3.10	118.10	118.77	0.67	0.0036	1.03	8.67	72.24
			951.730	3.10	117.52	118.21	0.69	0.0078	1.61	3.56	22.75
			825.256	3.10	115.48	116.18	0.70	0.0091	1.68	2.89	15.31
			721.974	3.10	114.50	115.16	0.66	0.0052	1.25	5.96	46.16
			569.217	3.10	113.00	113.76	0.76	0.0144	2.00	1.55	2.21
	472.518		3.10	112.52	112.86	0.34	0.0082	1.20	2.59	7.66	
	361.355		3.10	110.58	111.20	0.62	0.0240	2.39	1.30	2.25	
	243.160	3.10	108.89	109.71	0.82	0.0031	1.11	5.47	25.08		
	161.400	3.10	108.46	109.14	0.68	0.0119	1.92	2.07	8.67		
	64.701	3.10	107.51	108.14	0.63	0.0058	1.31	6.19	55.14		
	18.843	3.10	106.90	107.57	0.67	0.0057	1.32	5.92	47.90		

Na Figura 5.26 é mostrada as prováveis áreas inundadas para o período de retorno de 100 anos na ribeira de Sassoeiros.

A representação gráfica de cada secção assim como o correspondente nível de água atingido é apresentada no anexo respectivo.



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Figura 5.26 – Ribeira de Sasseiros, prováveis áreas inundadas para T=100 anos

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### 5.1.14 Bacia da ribeira da Laje

As localizações das secções transversais utilizadas na modelação encontram-se representadas na Figura 5.27, sendo a secção de montante a 1619,9142, da linha de água principal numeração esta que corresponde à distância (em metros) para a secção da bacia hidrográfica.

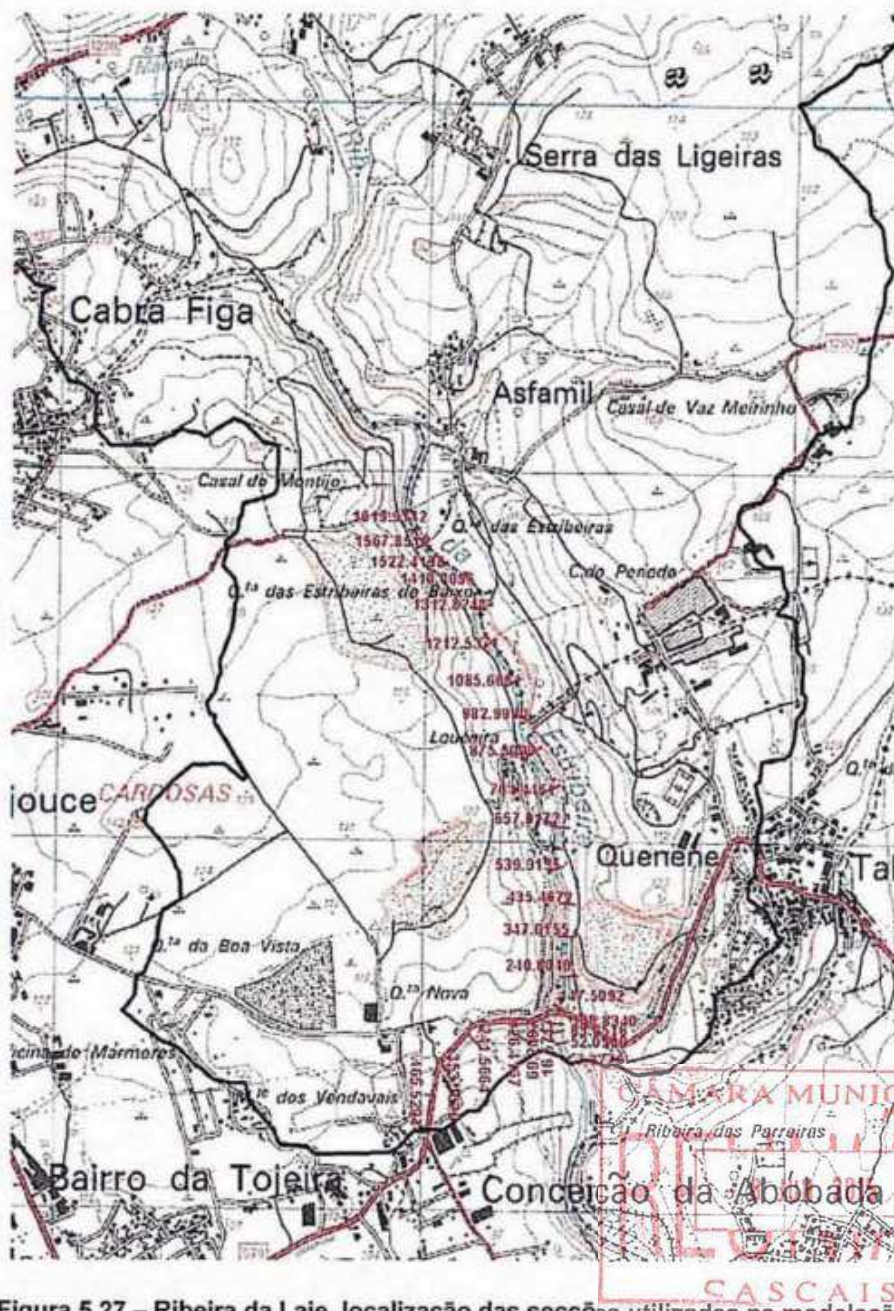


Figura 5.27 – Ribeira da Laje, localização das secções utilizadas na modelação

Na Tabela 5.14 apresenta-se o resultado da modelação da propagação dos caudais de ponta de cheia correspondentes ao período de retorno de 100 anos, nas secções de cálculo cuja localização se mostrou na Figura 5.27.

**Tabela 5.14 – Resultado da modelação para a ribeira da Laje**

Sentido escoamento	Linha de água	Secção	Caudal	Cota terreno	Nível água	Altura água	Declive	Velocidade	Área secção	Largura superficial
			(m <sup>3</sup> /s)	(m)	(m)	(m)	(m/m)	(m/s)	(m <sup>2</sup> )	(m)
montante	MD1 afluente	465.529	6.10	98.80	99.36	0.56	0.0142	1.97	5.55	20.50
		353.163	6.10	93.23	94.02	0.79	0.0136	2.30	3.46	8.15
		241.566	6.10	80.51	81.20	0.69	0.0107	1.97	5.40	19.43
		126.417	6.10	69.52	70.19	0.67	0.0165	2.43	2.62	5.31
		69.201	6.10	62.89	63.78	0.89	0.0121	2.39	3.38	8.36
		16.572	6.10	55.34	57.71	2.37	0.0000	0.30	39.31	32.55
	Laje (montante)	1619.914	156.10	69.60	73.39	3.79	0.0097	5.66	54.70	31.22
		1567.852	156.10	68.50	72.09	3.59	0.0105	5.59	55.03	32.53
		1522.414	156.10	67.50	71.51	4.01	0.0089	5.28	55.85	29.91
		1418.006	156.10	66.67	70.41	3.74	0.0104	5.66	53.79	31.42
		1312.824	156.10	65.68	70.27	4.59	0.0029	3.47	96.59	48.12
		1212.537	156.10	64.50	68.78	4.28	0.0106	6.41	42.64	17.83
		1085.666	156.10	62.55	68.12	5.57	0.0017	2.93	123.31	60.07
		982.999	156.10	62.50	67.08	4.58	0.0076	5.66	53.93	26.51
		875.510	156.10	61.68	65.51	3.83	0.0094	5.25	61.89	41.53
764.446		156.10	61.51	64.51	3.00	0.0066	4.15	87.59	69.14	
657.017		156.10	60.60	63.79	3.19	0.0065	4.07	77.39	49.48	
539.914		156.10	59.53	62.99	3.46	0.0059	4.26	70.63	37.65	
435.467		156.10	58.52	62.28	3.76	0.0065	4.48	67.74	36.45	
347.616		156.10	57.60	61.03	3.43	0.0126	6.00	46.70	24.31	
240.804	156.10	55.68	59.83	4.15	0.0057	4.41	69.13	35.51		
147.509	156.10	54.51	58.50	3.99	0.0116	6.06	44.88	21.31		
106.834	156.10	53.83	57.48	3.65	0.0041	3.67	77.09	33.37		
jusante	Laje (jusante)	83.952	159.20	53.72	57.41	3.69	0.0042	3.59	84.13	41.42
		52.030	159.20	52.62	57.39	4.77	0.0021	3.04	102.60	40.80
		7.328	159.20	51.78	57.40	5.62	0.0010	2.50	128.03	39.08

Na Figura 5.28 é mostrada as prováveis áreas inundadas para o período de retorno de 100 anos na ribeira da Laje.

A representação gráfica de cada secção assim como o correspondente nível de água atingido é apresentada no anexo respectivo.



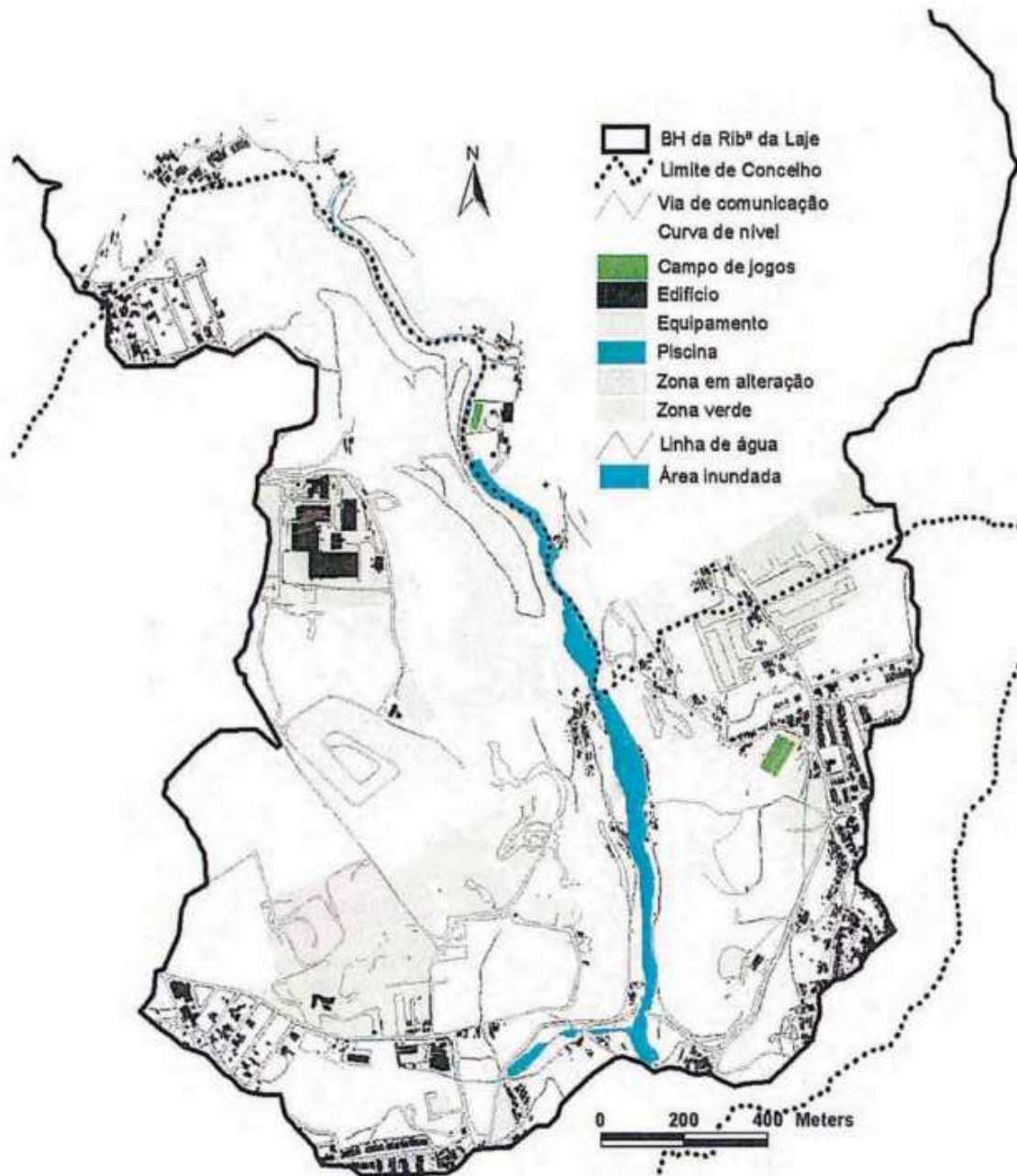


Figura 5.28 – Ribeira de Sassoeiros, prováveis áreas inundadas para T=100 anos



*[Handwritten signature]*

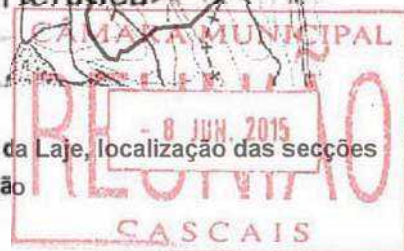


### 5.1.15 Bacia da ribeira "Polima" afluente da ribeira da Laje

As localizações das secções transversais utilizadas na modelação encontram-se representadas na Figura 5.29, sendo a secção de montante a 1619,9142, da linha de água principal numeração esta que corresponde à distância (em metros) para a secção da bacia hidrográfica.



Figura 5.29 – Ribeira da "Polima" afluente da ribeira da Laje, localização das secções utilizadas na modelação



Na Tabela 5.15 apresenta-se o resultado da modelação da propagação dos caudais de ponta de cheia correspondentes ao período de retorno de 100 anos, nas secções de cálculo cuja localização se mostrou na Figura 5.29.

**Tabela 5.15 – Resultado da modelação para a ribeira da "Polima" afluente da ribeira da Laje**

Sentido escoamento	Linha de água	Secção	Caudal (m <sup>3</sup> /s)	Cota terreno (m)	Nível água (m)	Altura água (m)	Declive (m/m)	Velocidade (m/s)	Área secção (m <sup>2</sup> )	Largura superficial (m)		
montante	"POLIMA" montante	1128.481	3.00	81.56	82.18	0.62	0.0153	2.05	1.56	4.04		
		1077.223	3.00	80.65	81.22	0.57	0.0210	2.29	1.33	2.85		
		925.157	8.30	72.50	73.63	1.13	0.0133	2.59	4.32	8.42		
		826.344	8.30	70.60	71.61	1.01	0.0104	2.38	5.97	15.01		
		749.973	9.50	66.56	67.68	1.12	0.0120	2.71	5.31	10.20		
		681.014	9.50	64.81	65.59	0.78	0.0122	2.09	9.97	39.75		
		648.014	5.30	63.71	64.53	0.82	0.0096	1.92	5.01	20.31		
		553.636	5.30	61.76	62.49	0.73	0.0109	1.96	4.88	18.90		
		447.236	5.30	59.67	60.41	0.74	0.0106	1.98	4.80	17.71		
		330.288	5.30	57.67	58.51	0.84	0.0090	1.86	5.29	22.21		
		222.715	5.30	54.54	55.42	0.88	0.0121	2.25	3.20	9.40		
		106.500	5.30	52.50	53.31	0.81	0.0108	2.05	4.29	14.75		
		13.497	5.30	50.83	51.61	0.78	0.0090	1.87	5.02	17.45		
		jusante	MD1 afluente	258.808	14.80	72.54	73.83	1.29	0.0117	2.99	8.38	14.17
				186.675	14.80	69.66	70.99	1.33	0.0127	2.97	7.94	12.86
				82.947	14.80	66.52	67.66	1.14	0.0157	3.16	8.44	17.39
				21.903	14.80	64.33	65.56	1.23	0.0130	3.10	7.59	11.18

Na Figura 5.30 é mostrada as prováveis áreas inundadas para o período de retorno de 100 anos na ribeira da "Polima" afluente da ribeira da Laje.

A representação gráfica de cada secção assim como o correspondente nível de água atingido é apresentada no anexo respectivo.



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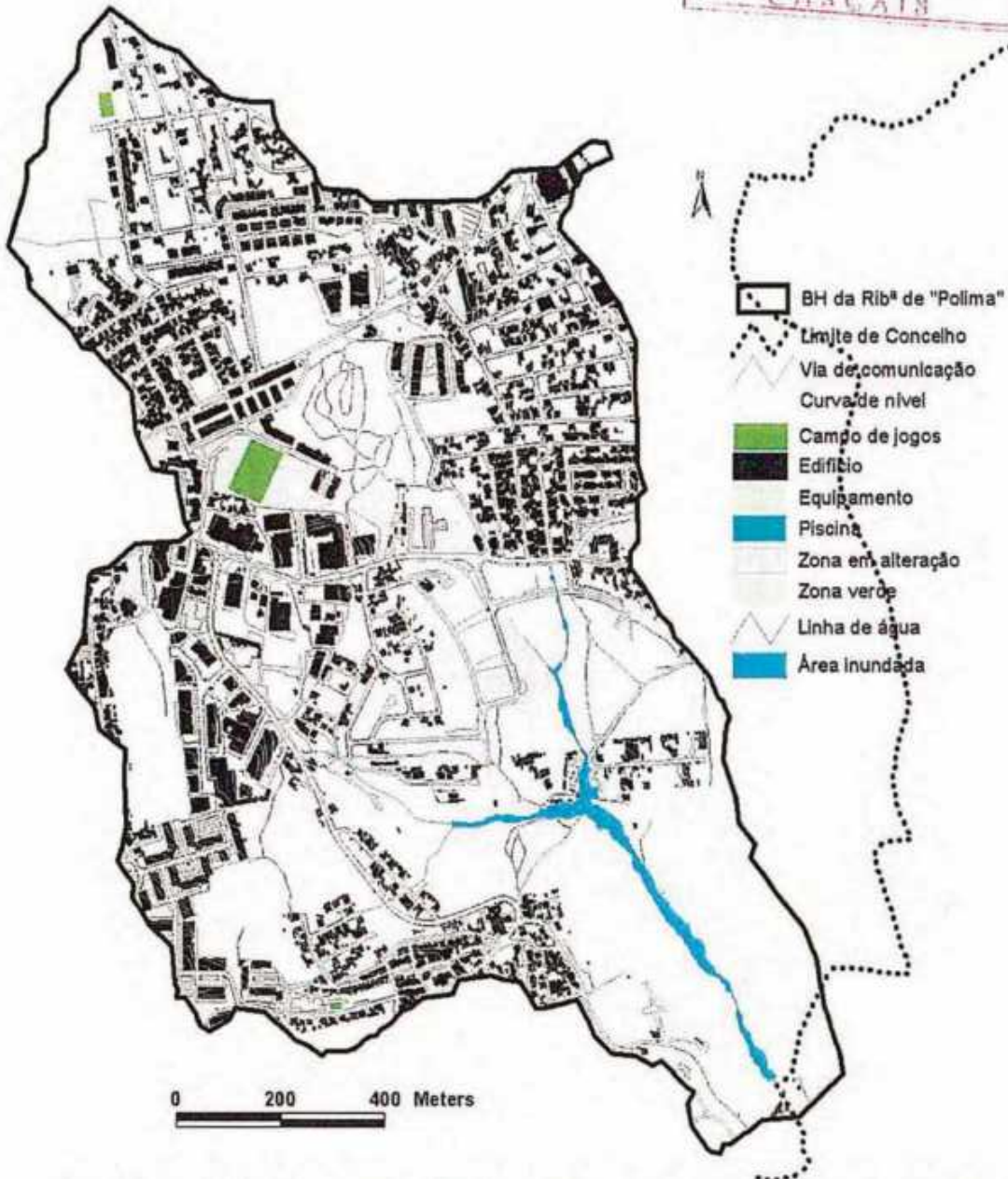


Figura 5.30 – Ribeira da "Polima", afluente da ribeira da Laje, prováveis áreas inundadas para T=100 anos



### 5.1.16 Bacia da ribeira "Arneiro" afluente da ribeira da Laje

As localizações das secções transversais utilizadas na modelação encontram-se representadas na Figura 5.31, sendo a secção de montante (574,6976), numeração esta que corresponde à distância (em metros) para a secção da bacia hidrográfica.

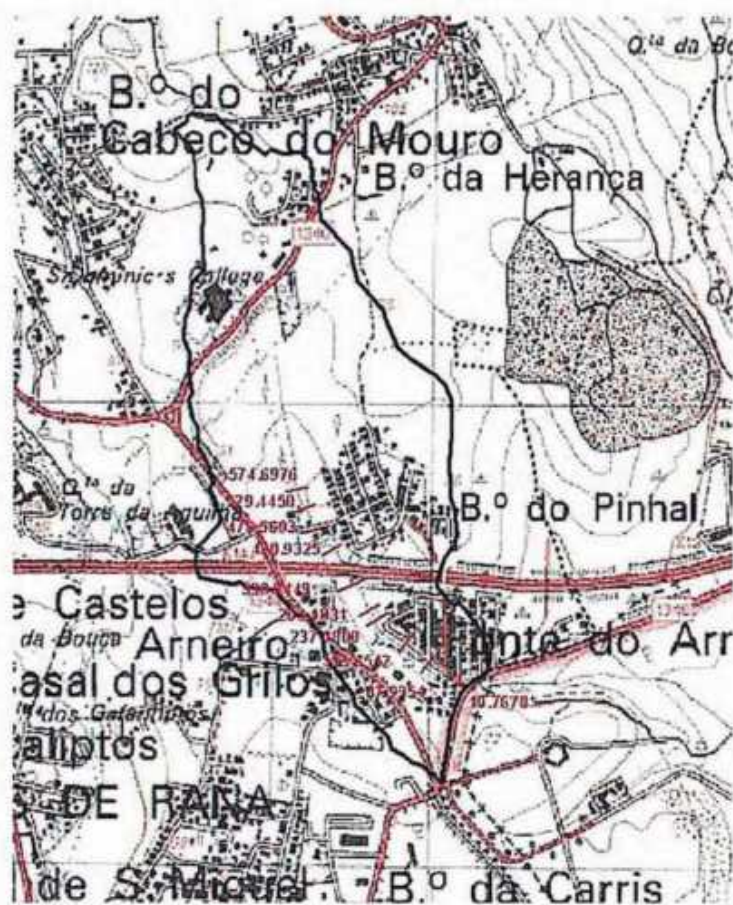


Figura 5.31 – Ribeira do "Arneiro" afluente da ribeira da Laje, localização das secções utilizadas na modelação

Na Tabela 5.16 apresenta-se o resultado da modelação da propagação dos caudais de ponta de cheia correspondentes ao período de retorno de 100 anos, nas secções de cálculo cuja localização se mostrou na Figura 5.31.

**Tabela 5.16 – Resultado da modelação para a ribeira da “Arneiro” afluente da ribeira da Laje**

Sentido escoamento	Linha de água	Secção	Caudal	Cota terreno	Nível água	Altura água	Declive	Velocidade	Área secção	largura superficial
			(m <sup>3</sup> /s)	(m)	(m)	(m)				
montante	ARNEIRO	574.698	9.50	71.52	72.75	1.23	0.0119	2.74	5.68	11.21
		529.445	9.50	69.48	70.76	1.28	0.0133	2.99	4.48	6.74
		476.569	9.50	67.56	68.84	1.28	0.0124	2.93	4.64	7.46
		420.933	9.50	66.57	67.92	1.35	0.0136	3.01	4.11	5.69
jusante	ARNEIRO	330.845	9.50	60.53	61.65	1.12	0.0112	2.70	5.65	11.06
		263.183	9.50	57.51	58.75	1.24	0.0141	3.12	4.30	6.43
		237.180	14.80	56.56	57.91	1.35	0.0117	2.82	10.17	20.80
		155.651	14.80	53.59	54.86	1.27	0.0137	3.00	8.86	15.88
		87.935	14.80	50.61	52.05	1.44	0.0127	2.93	9.29	18.21
		10.768	14.80	48.23	49.99	1.76	0.0010	1.10	30.20	40.96

Na Figura 5.32 é mostrada as prováveis áreas inundadas para o período de retorno de 100 anos na ribeira de “Arneiro” afluente da ribeira da Laje.

A representação gráfica de cada secção assim como o correspondente nível de água atingido é apresentada no anexo respectivo.



CÂMARA MUNICIPAL  
**REQUISIÇÃO**  
12 JAN. 2015  
CASCAIS

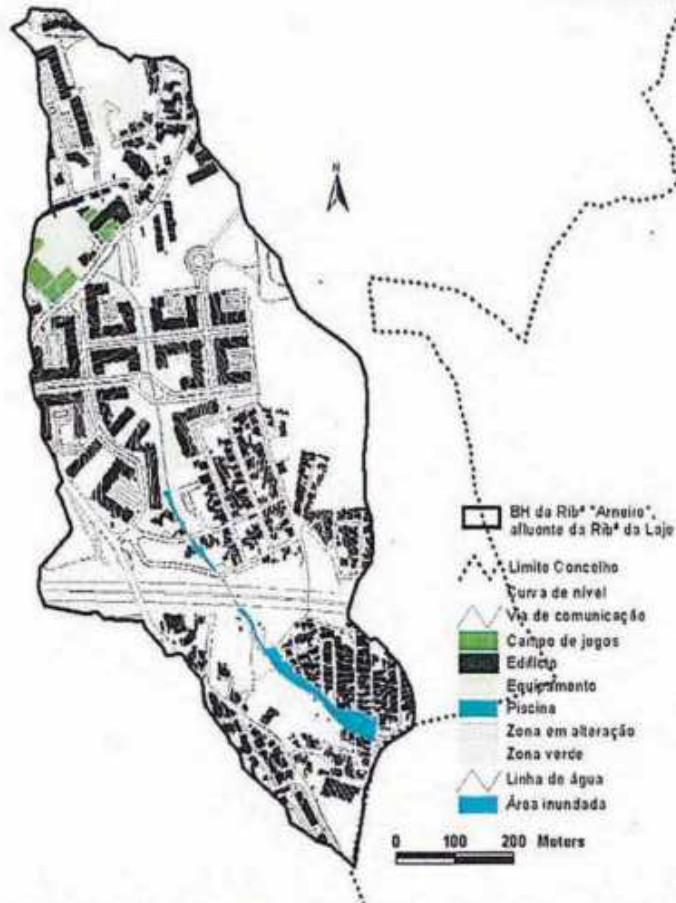


Figura 5.32 – Ribeira de "Arneiro", afluente da ribeira da Laje, prováveis áreas inundadas para T=100 anos

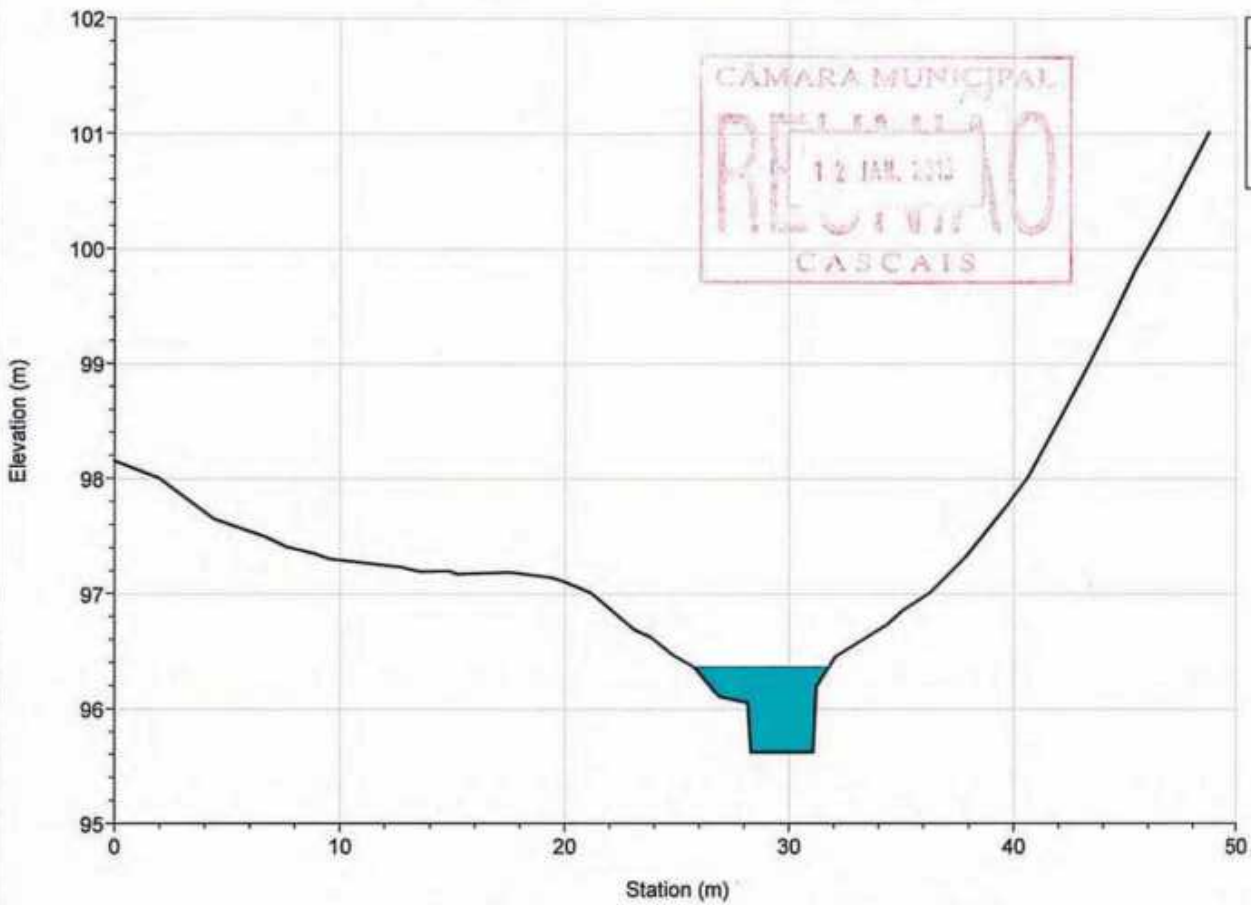
CÂMARA MUNICIPAL  
**REQUISIÇÃO**  
- 8 JUN. 2015  
CASCAIS



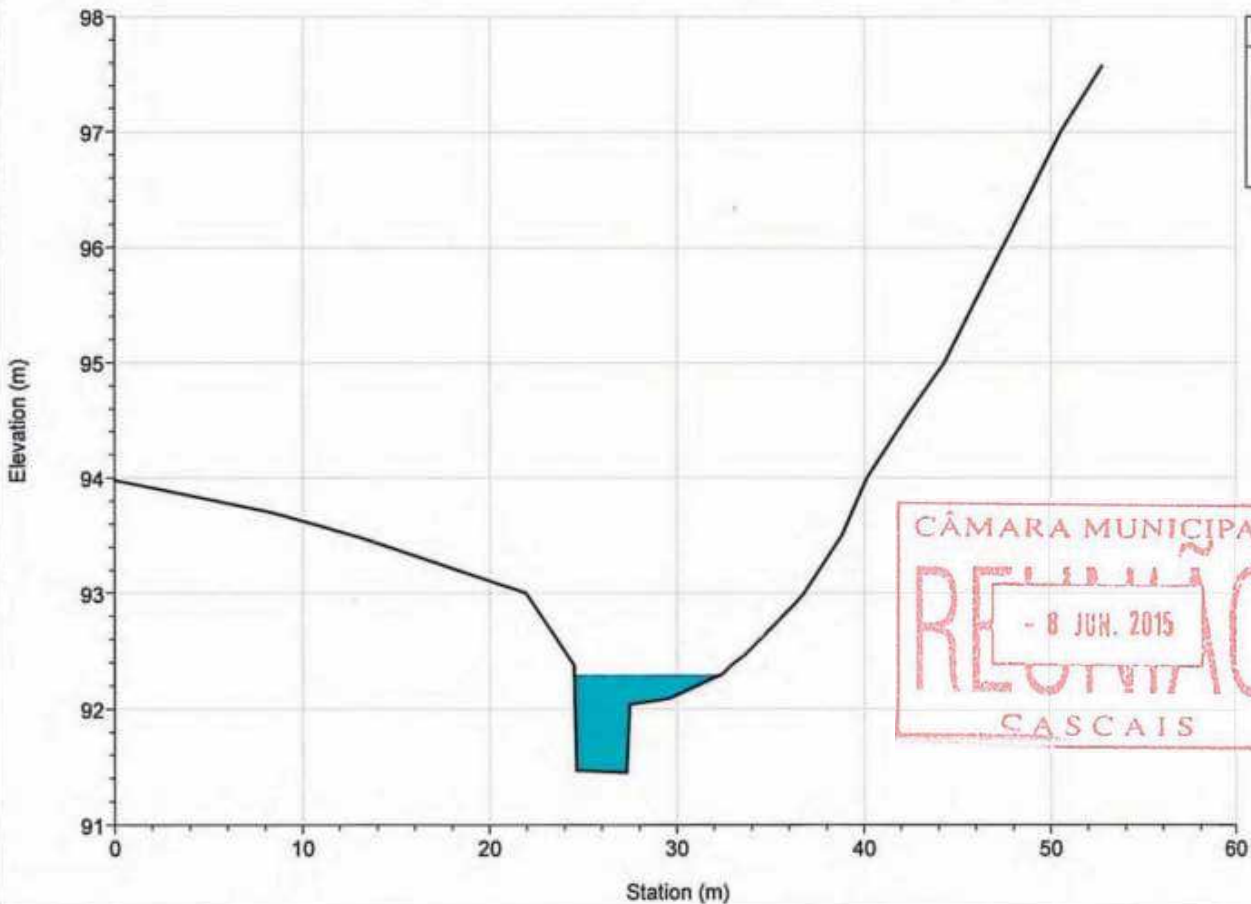


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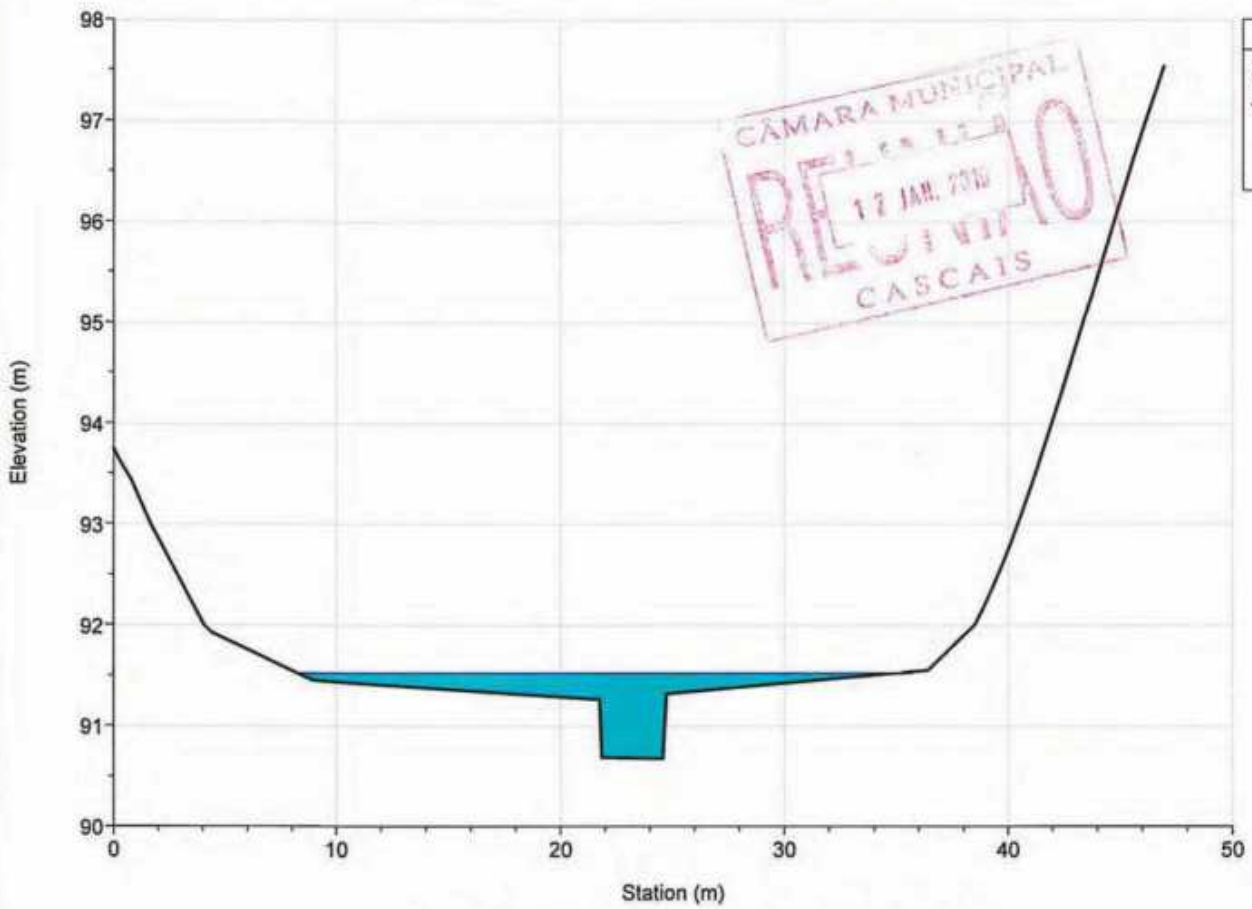
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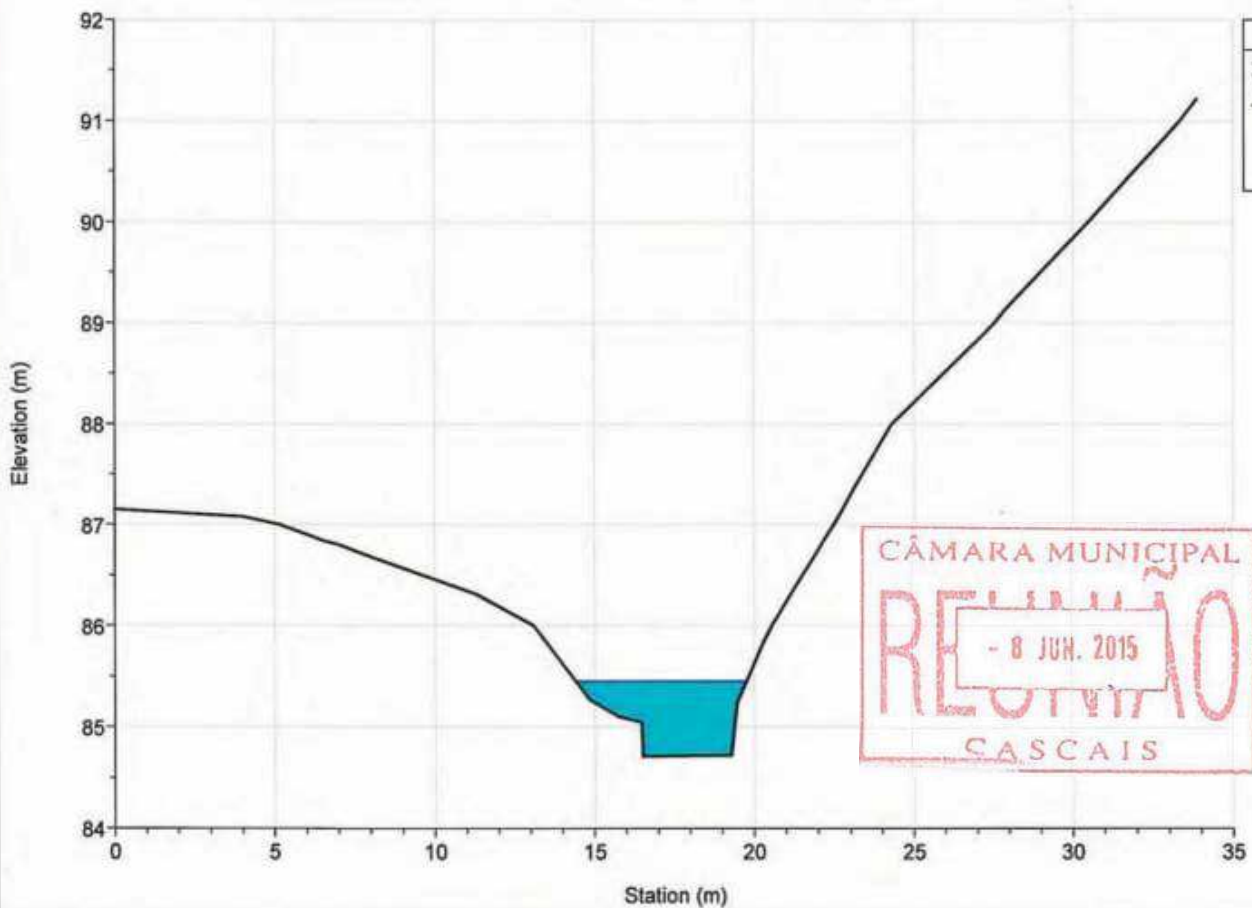
River = MD1 Reach = afluyente RS = 433.610



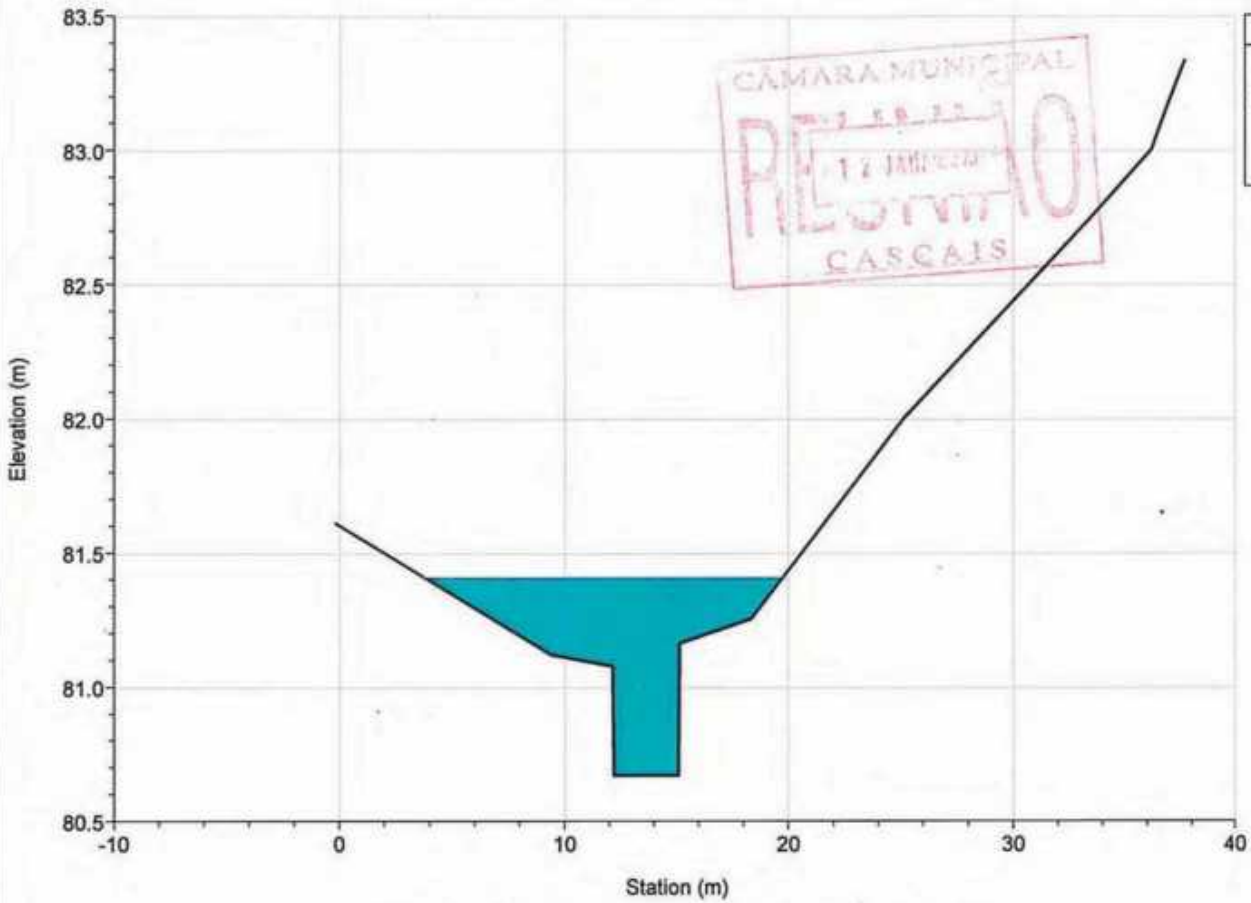
River = MD1 Reach = afluente RS = 387.233



River = MD1 Reach = afluente RS = 309.979

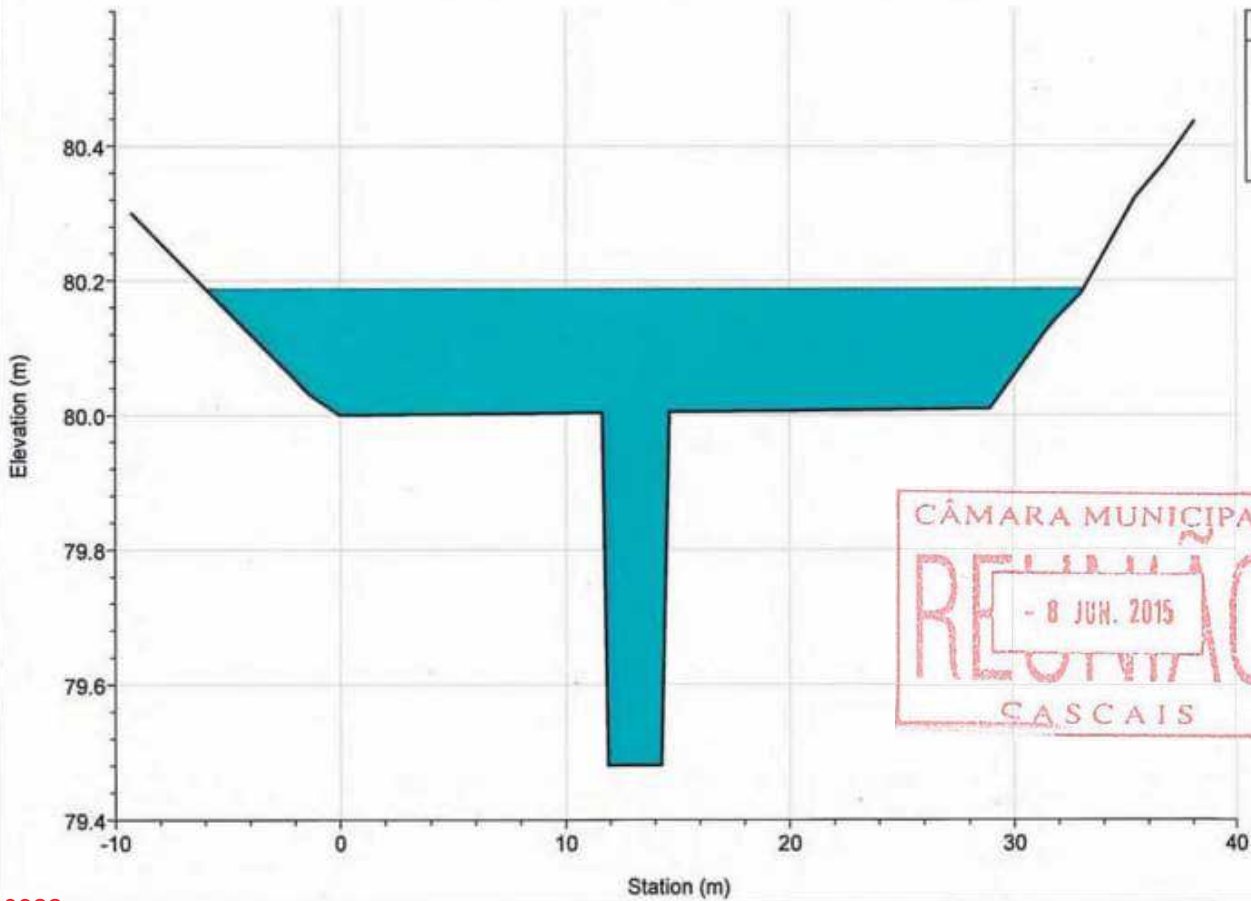


River = MD1 Reach = afluyente RS = 235.327

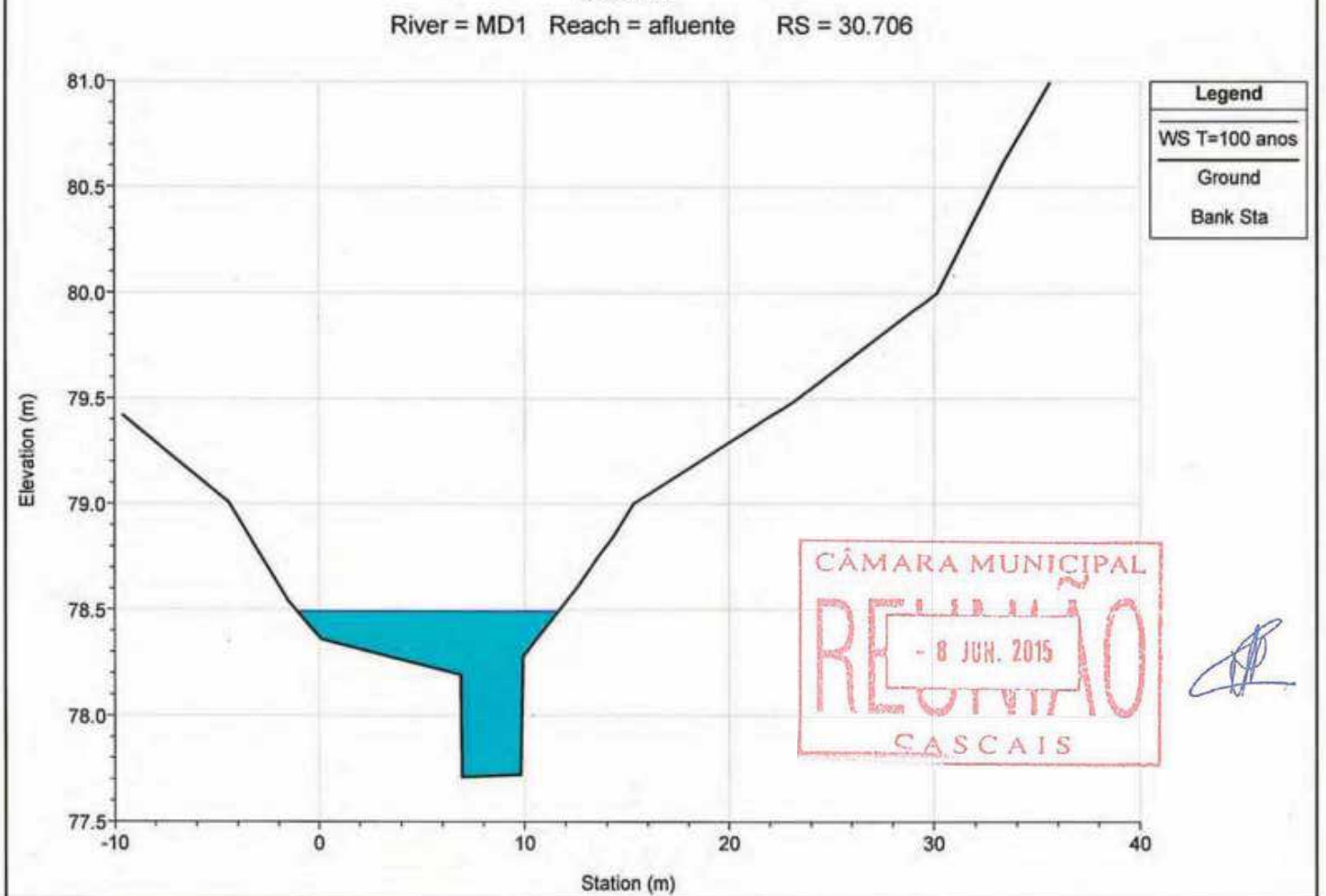
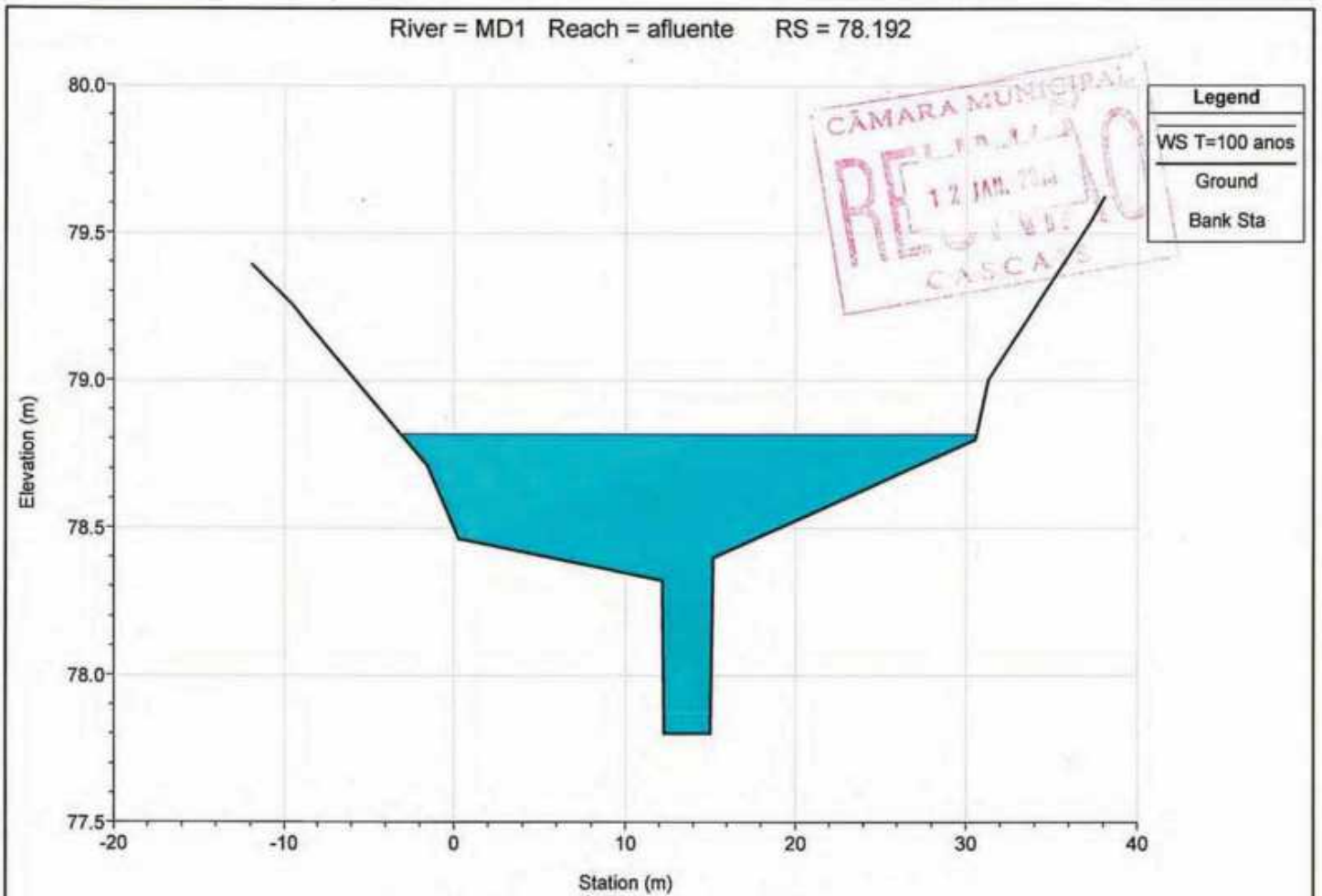


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Ground
Bank Sta

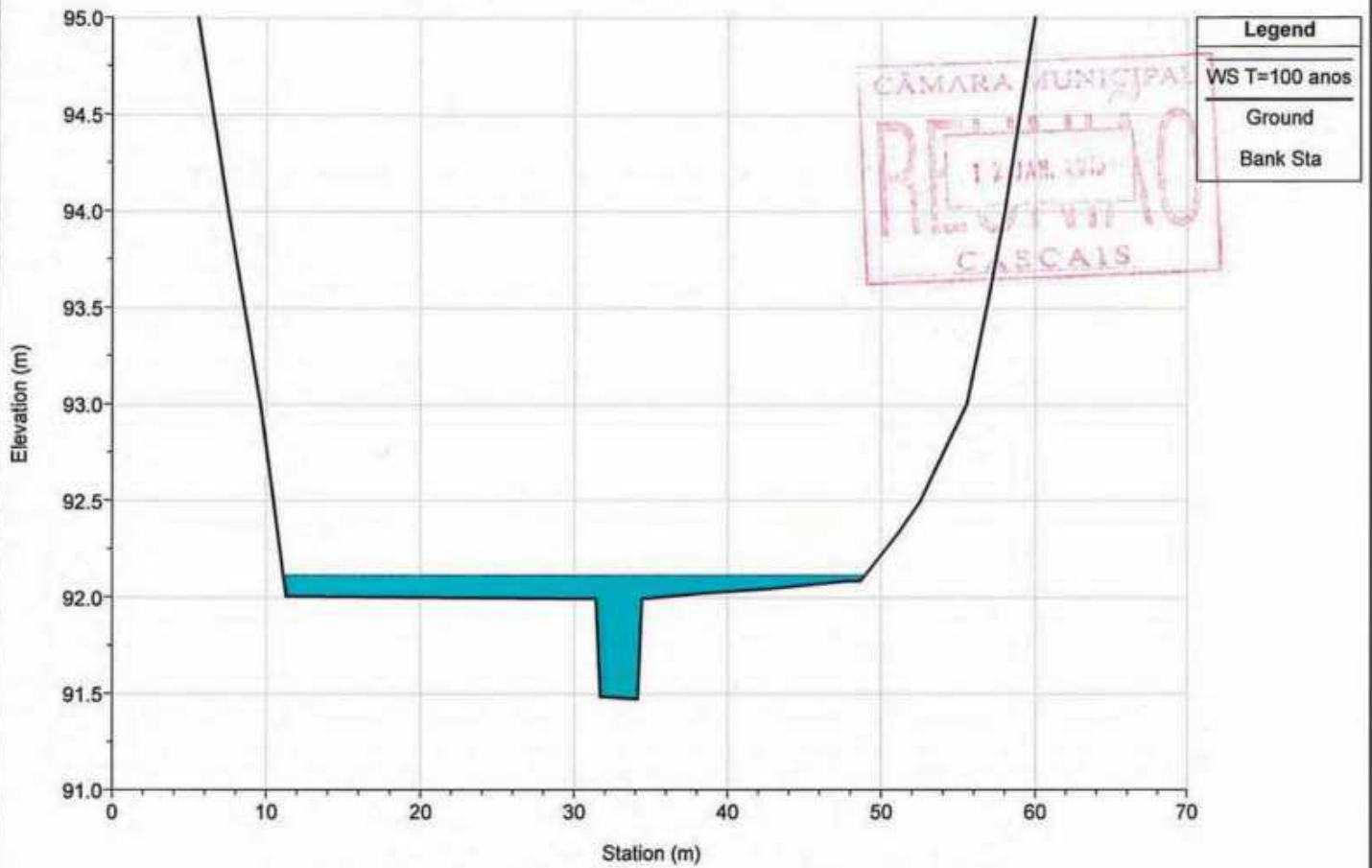
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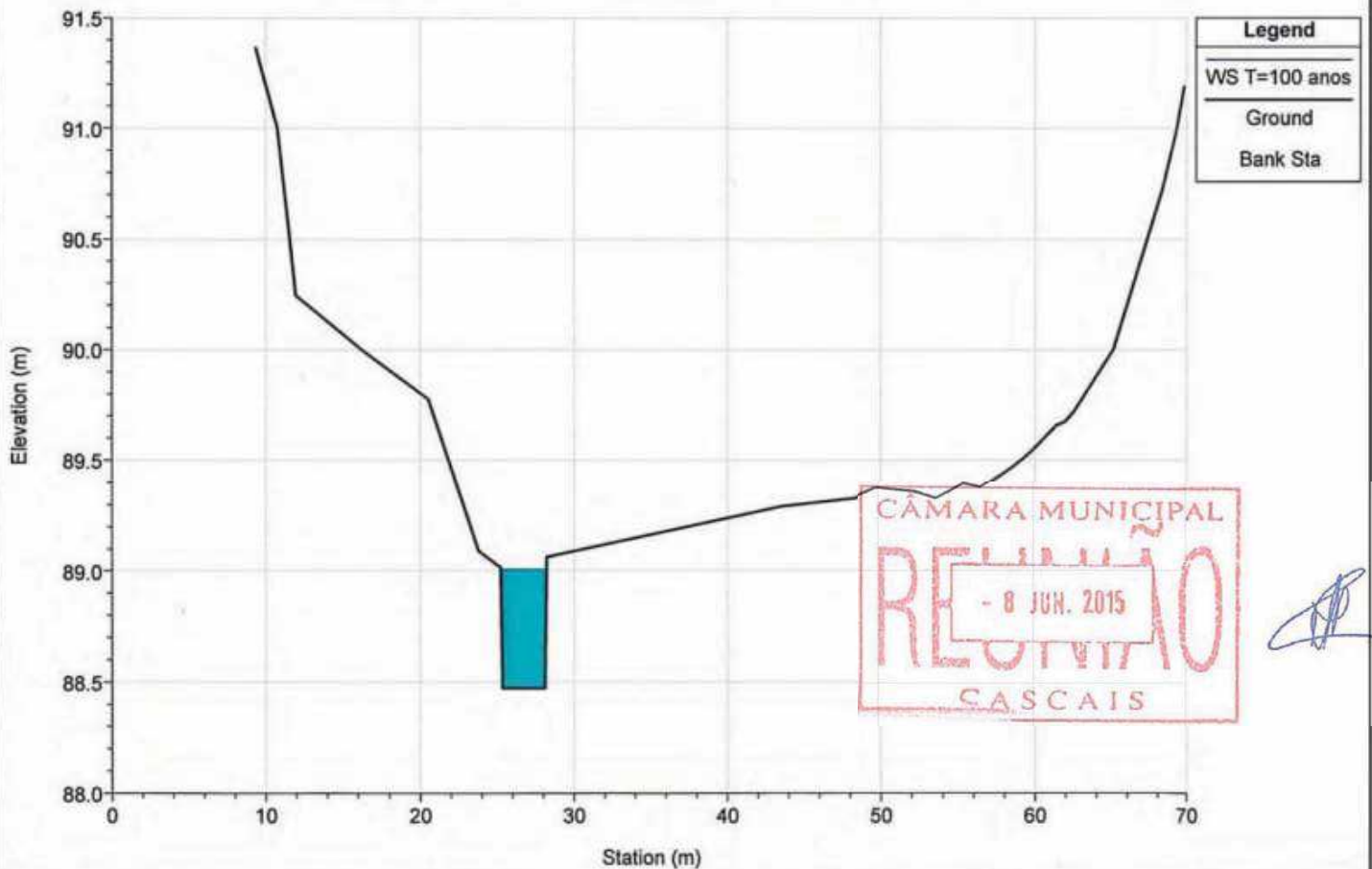
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Ground
Bank Sta



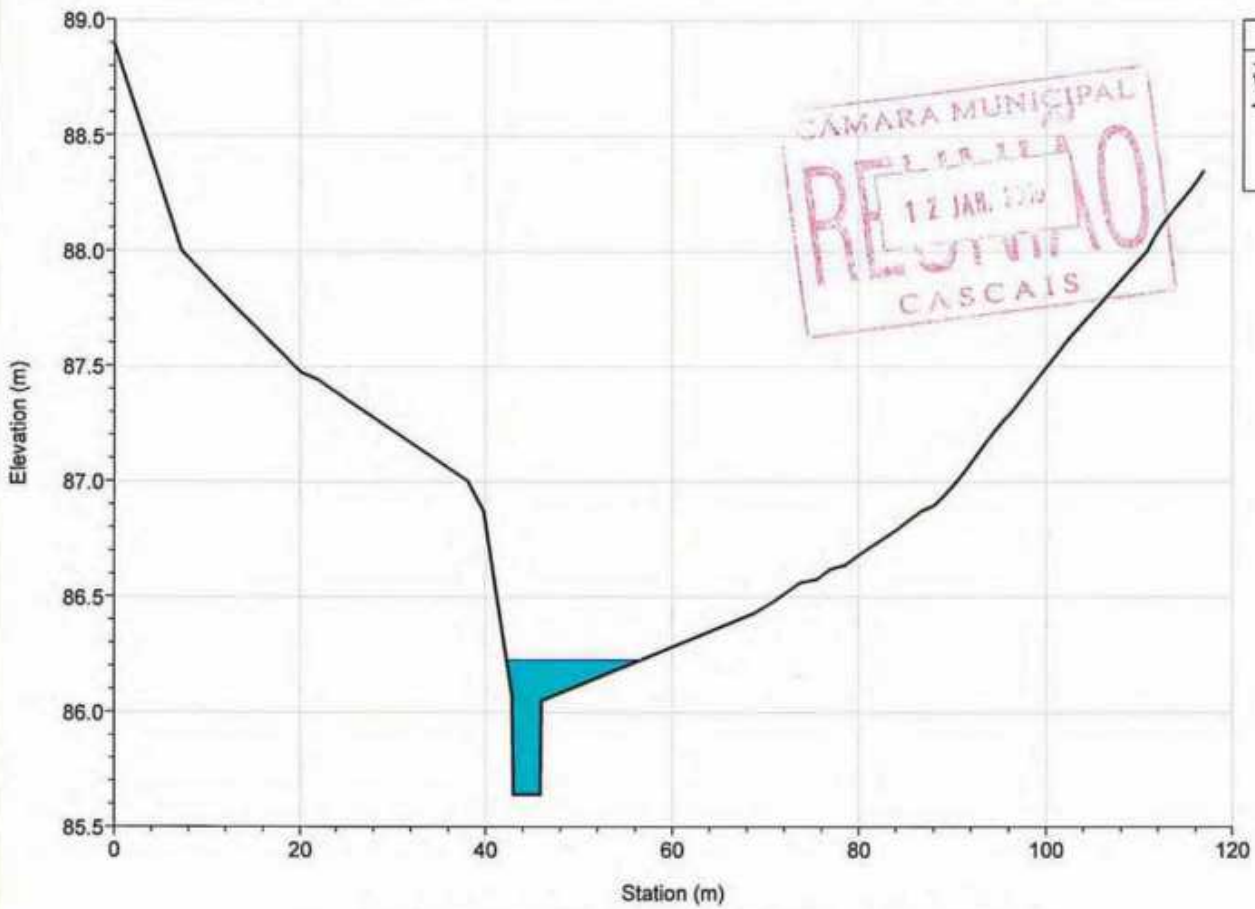
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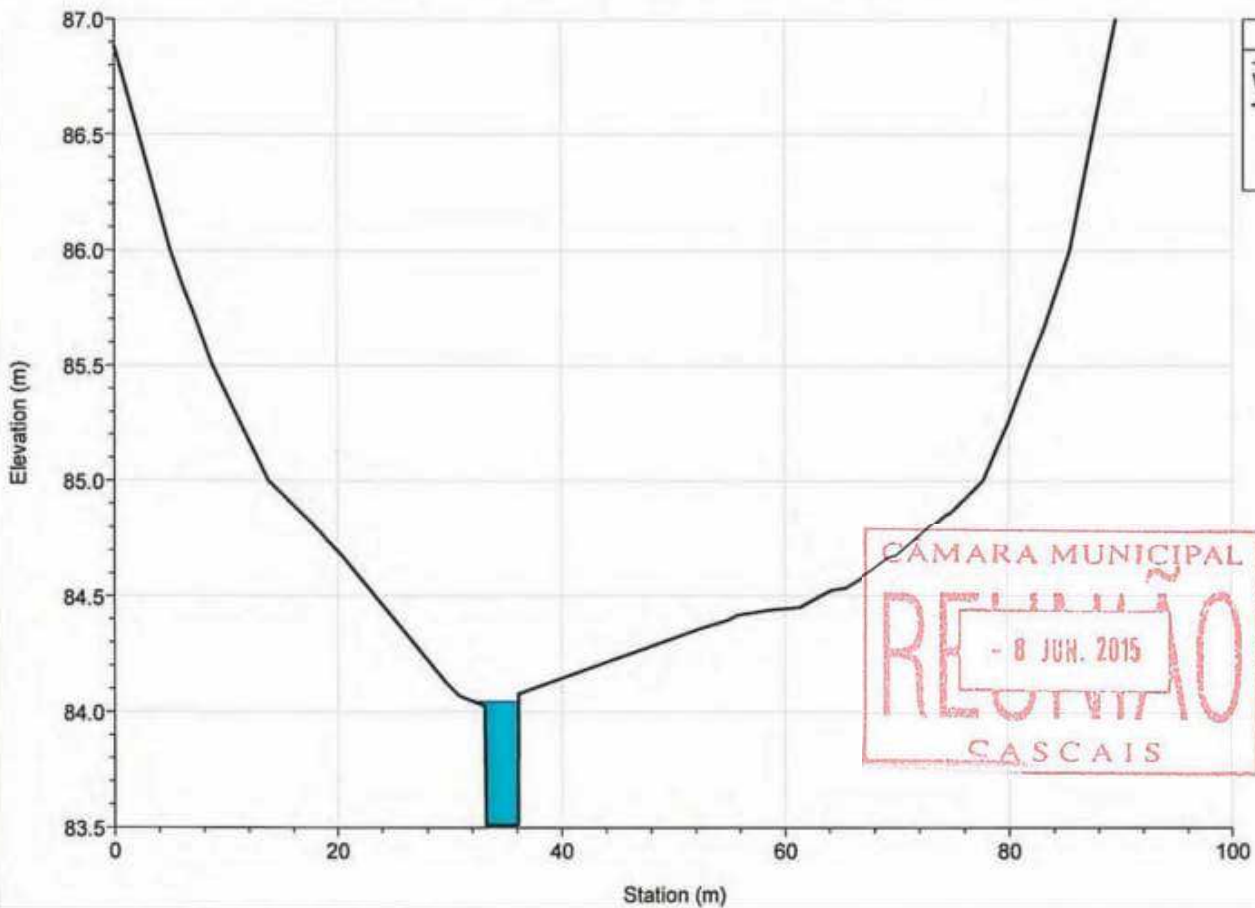
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River = CADAVEIRA Reach = montante RS = 3273.891

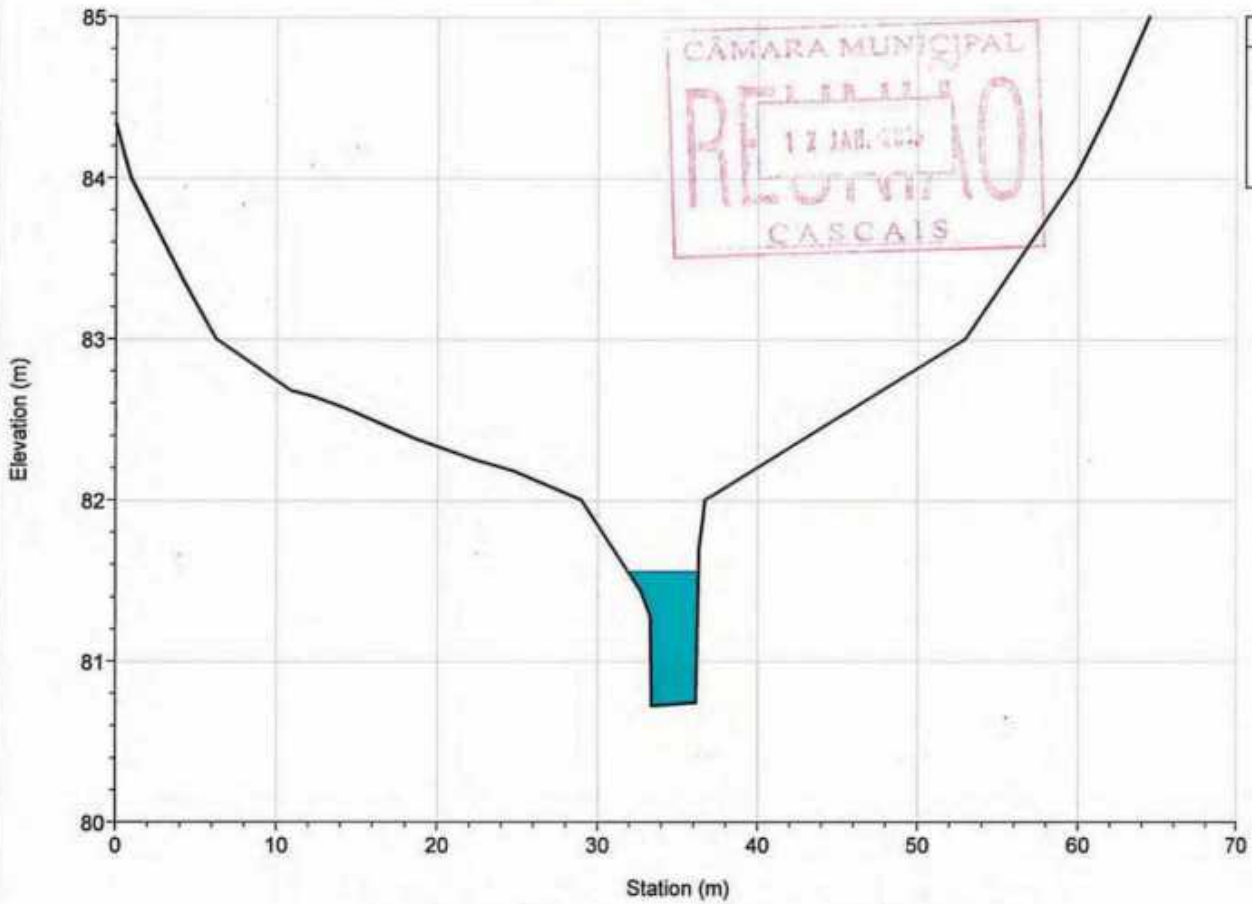


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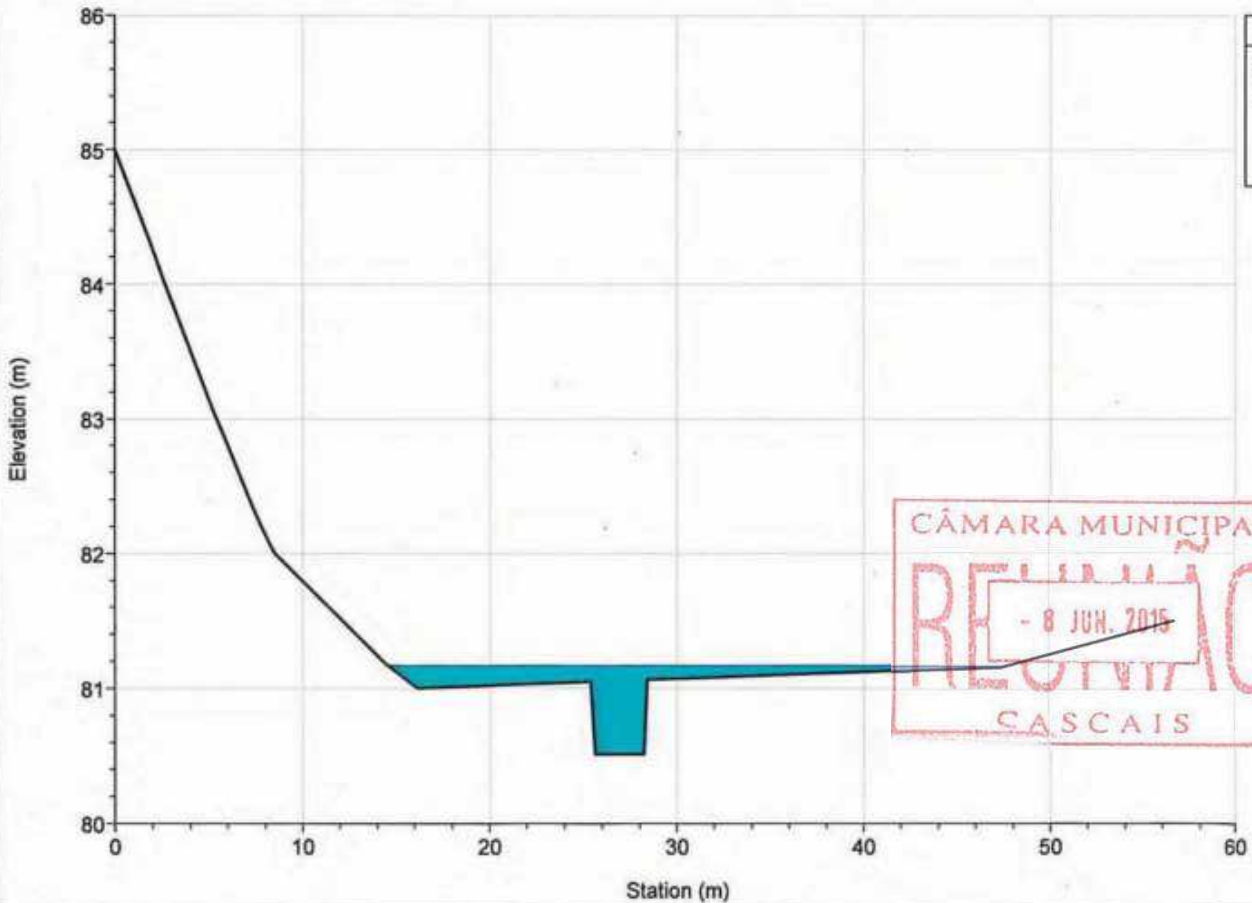


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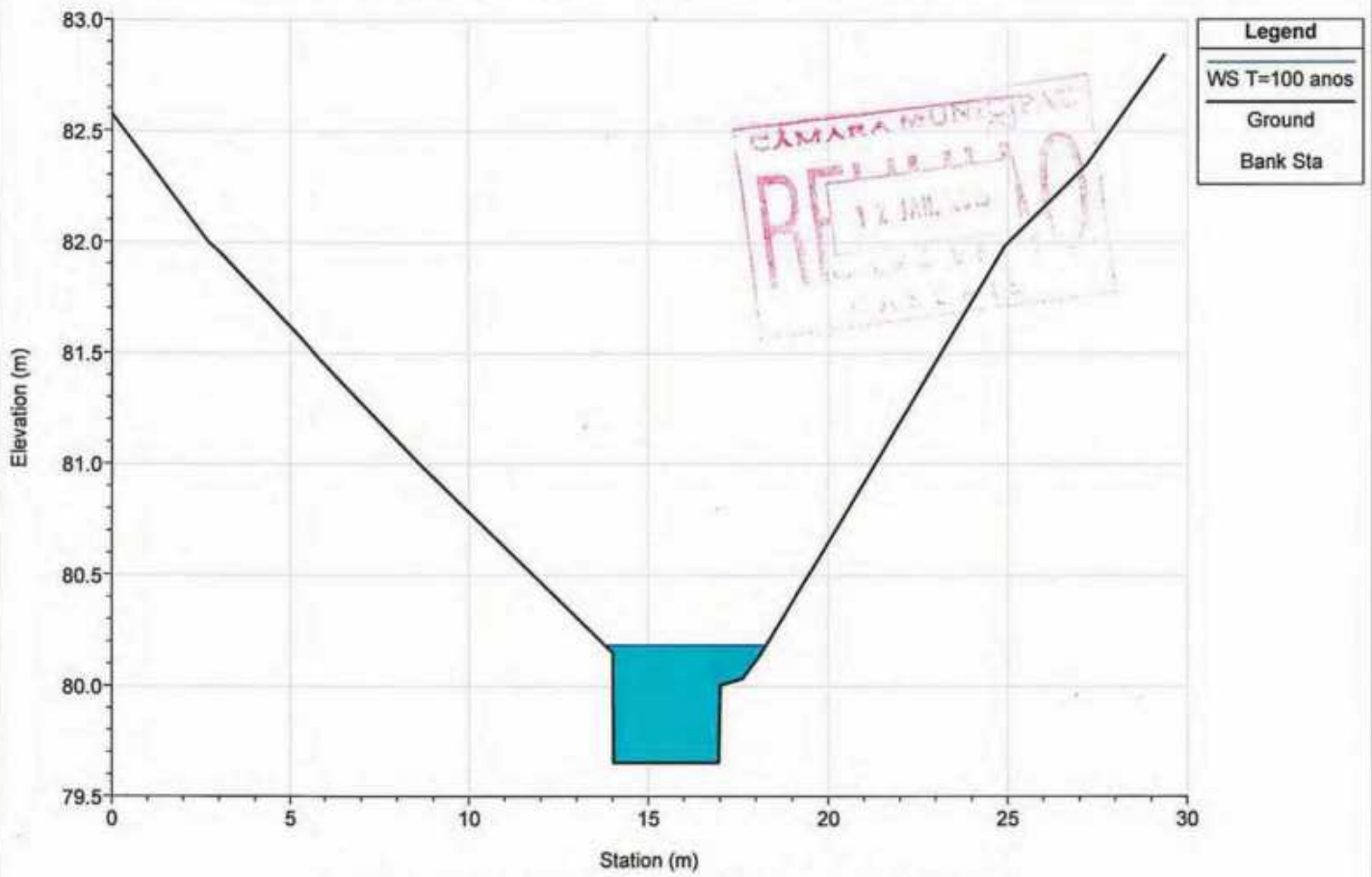
Legend
WS T=100 anos
Ground
Bank Sta

River = CADAVEIRA Reach = montante RS = 3022.145

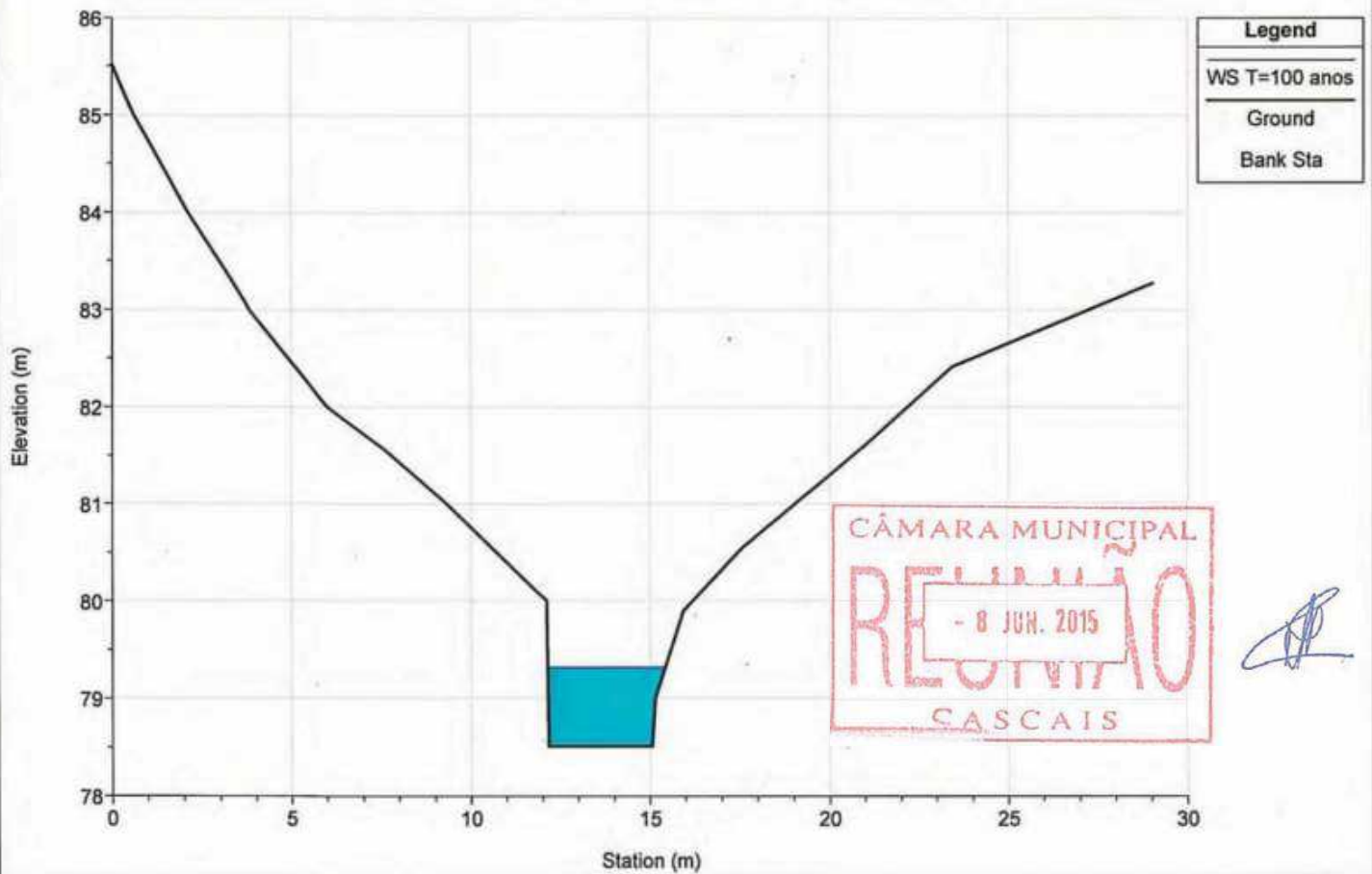


Legend
WS T=100 anos
Ground
Bank Sta

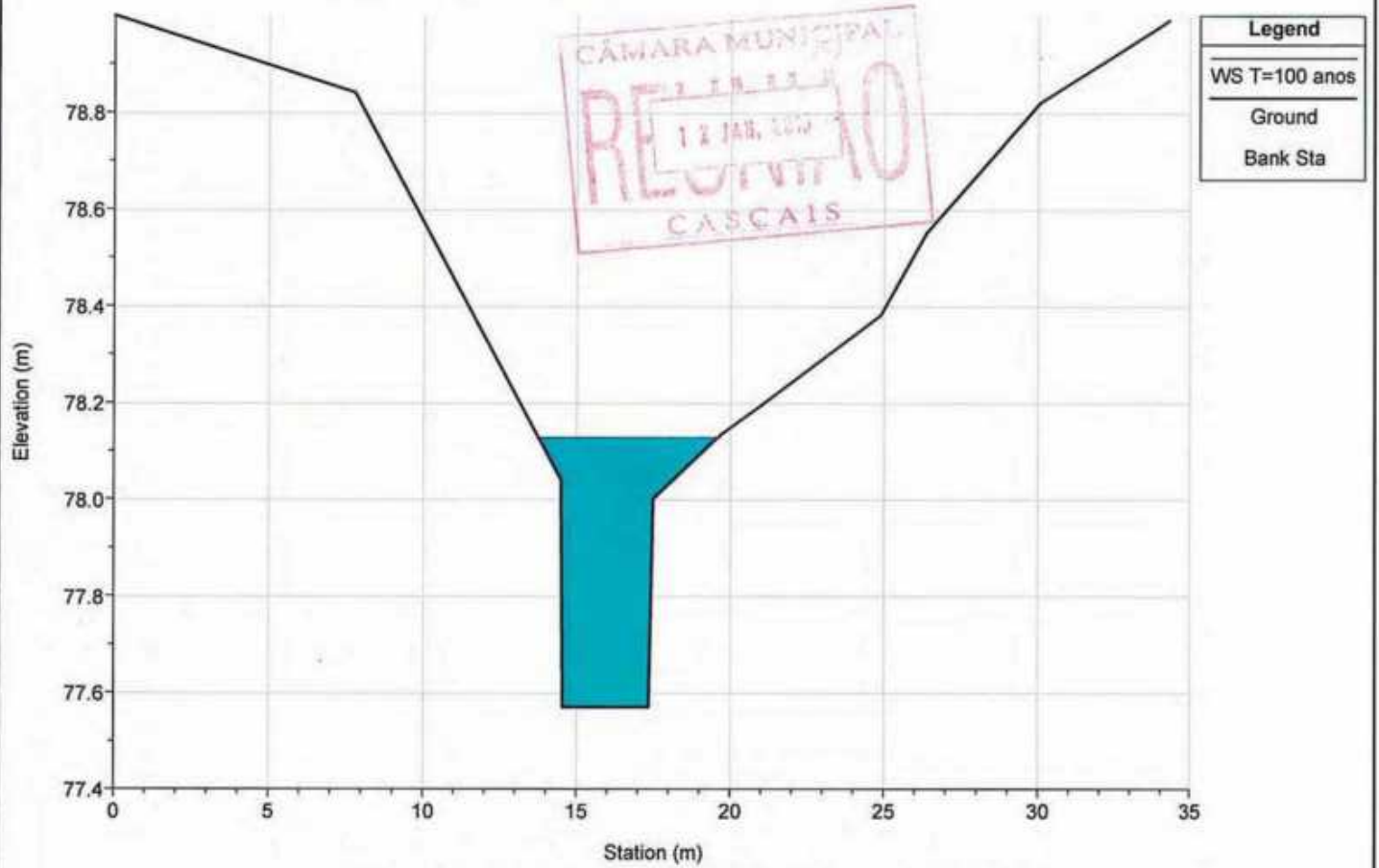
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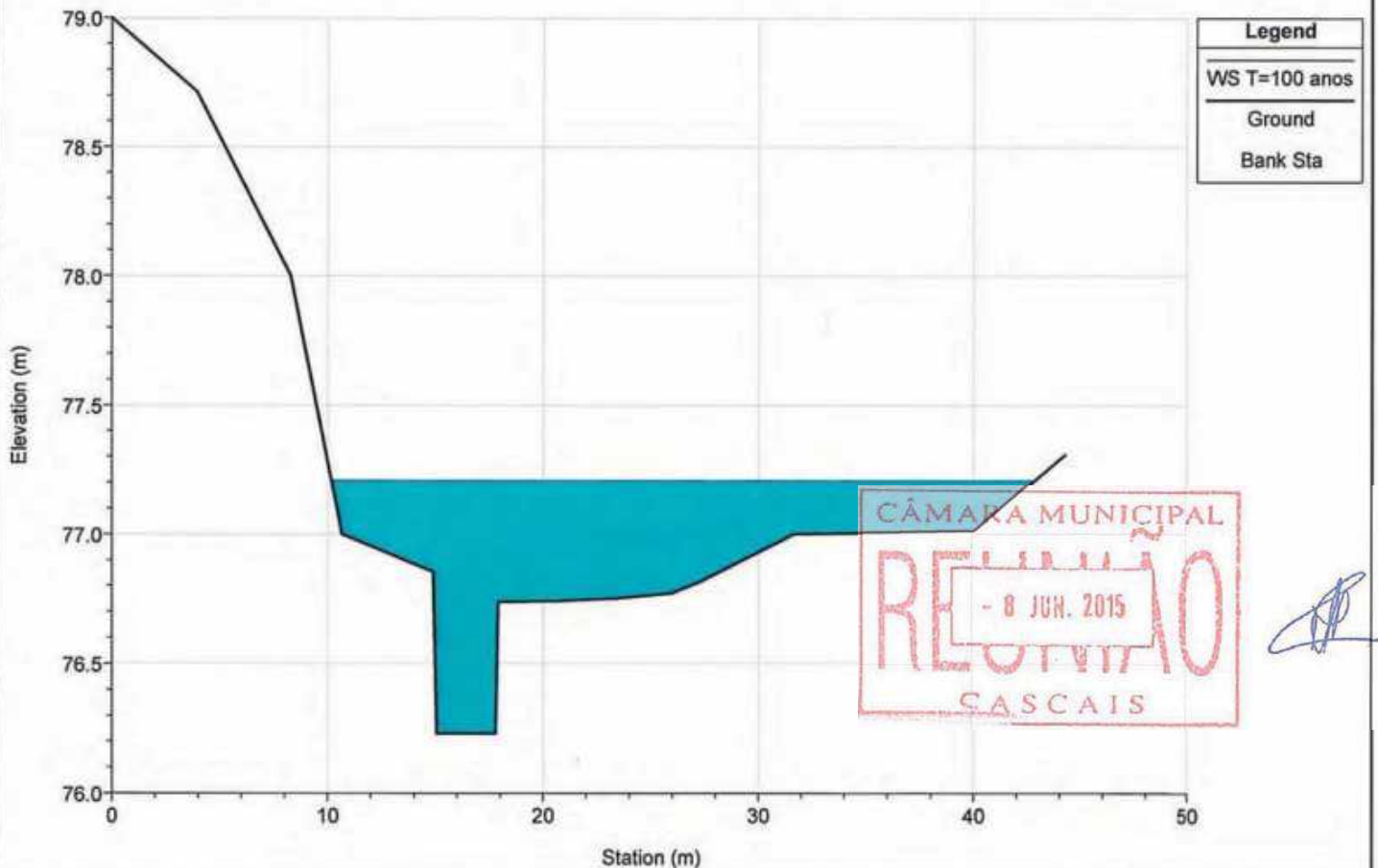
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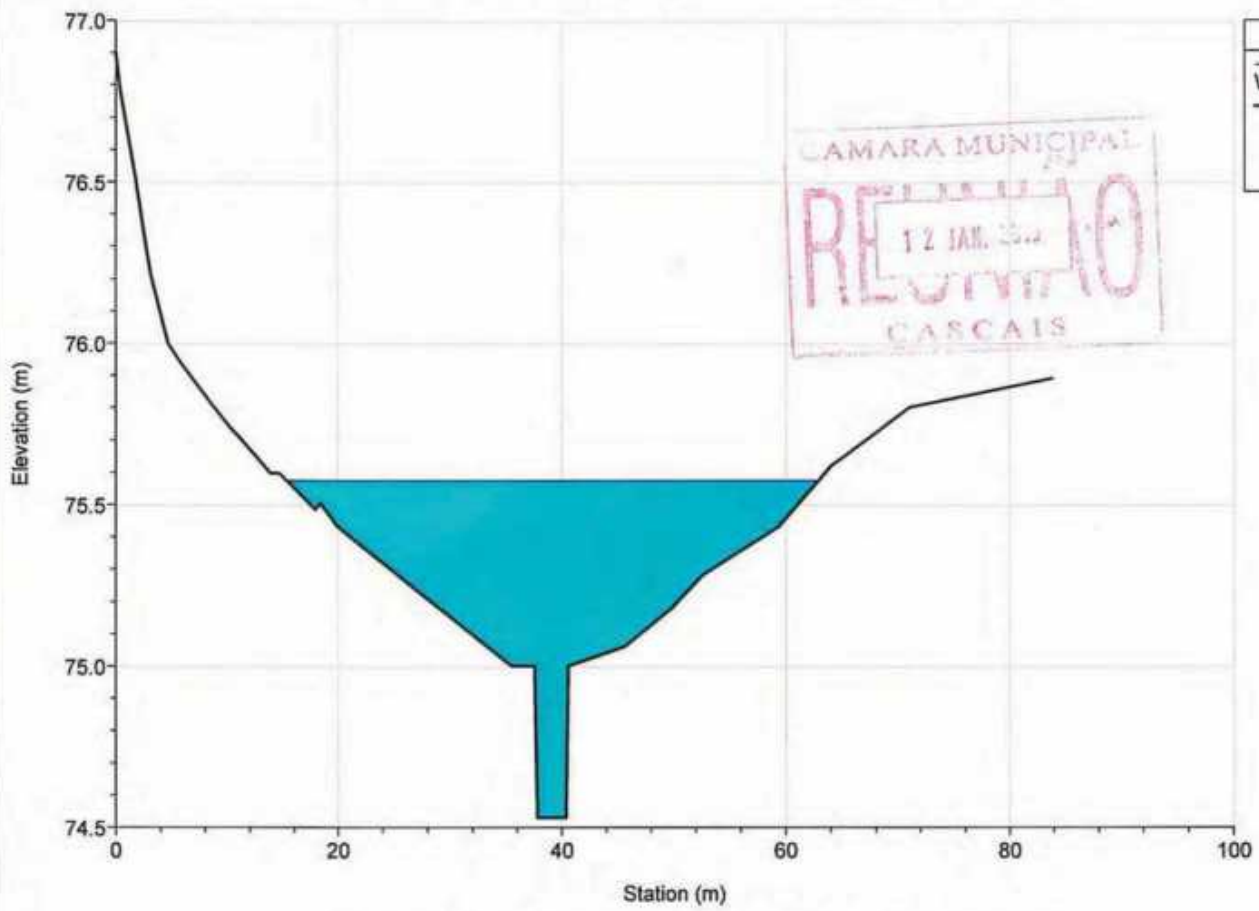
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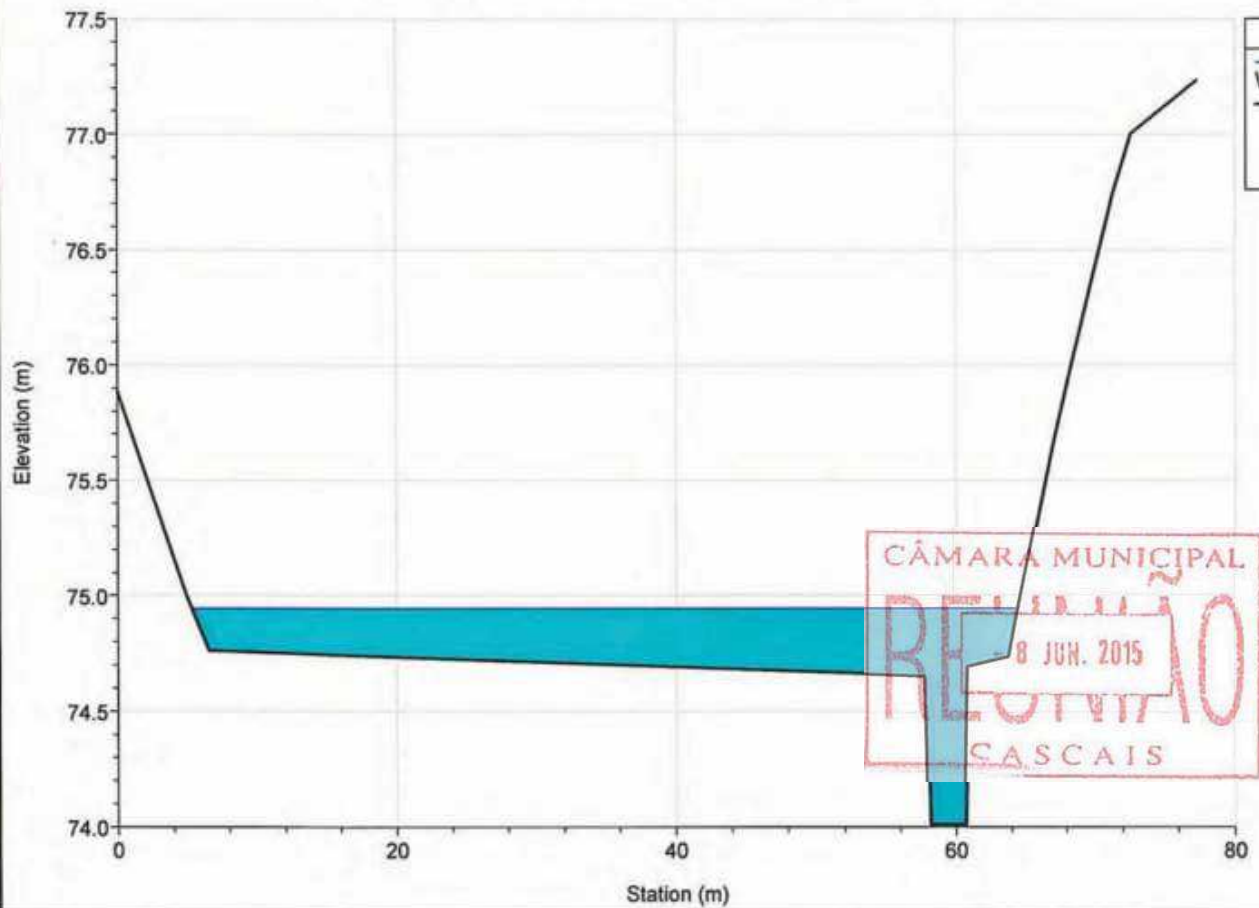
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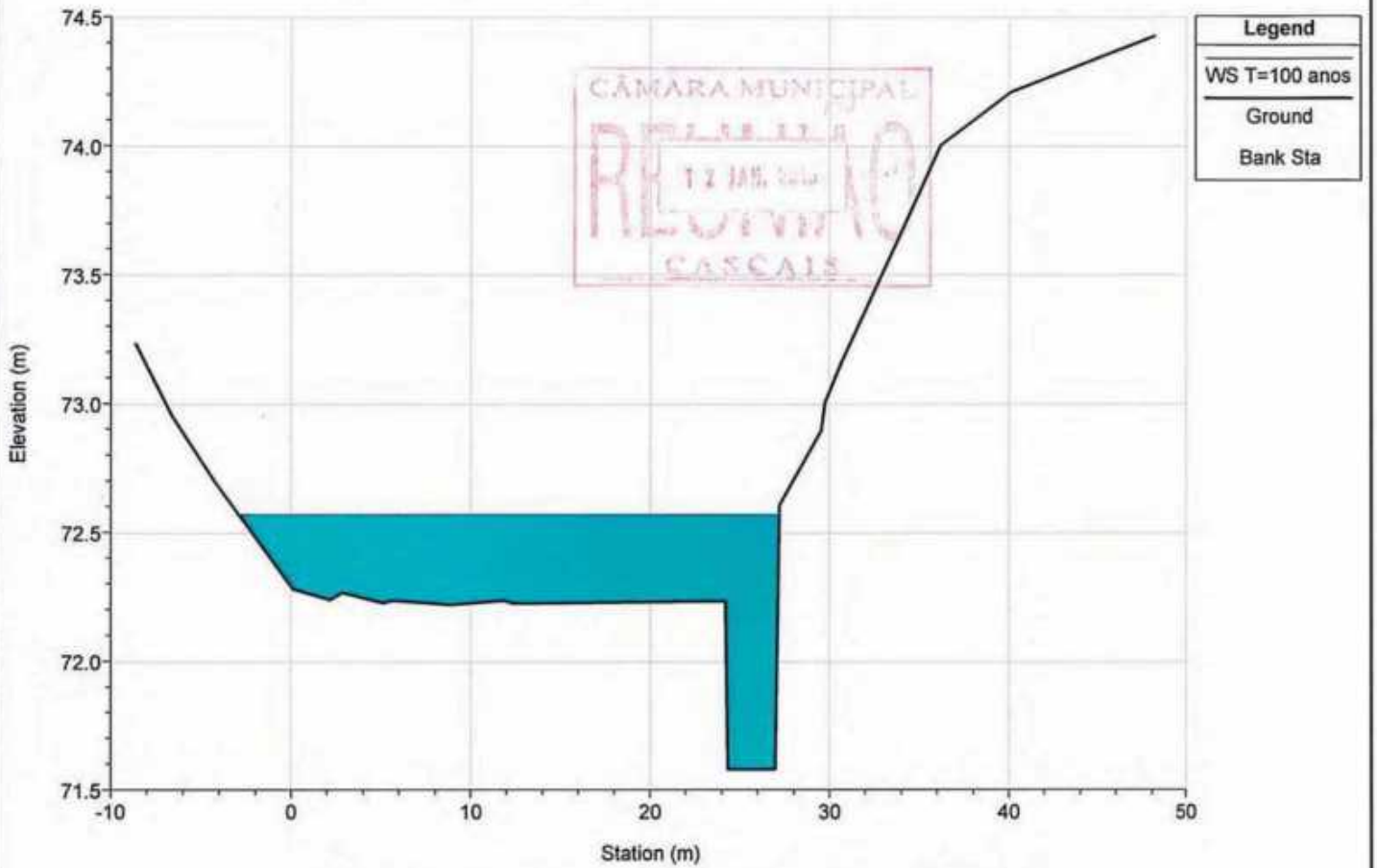
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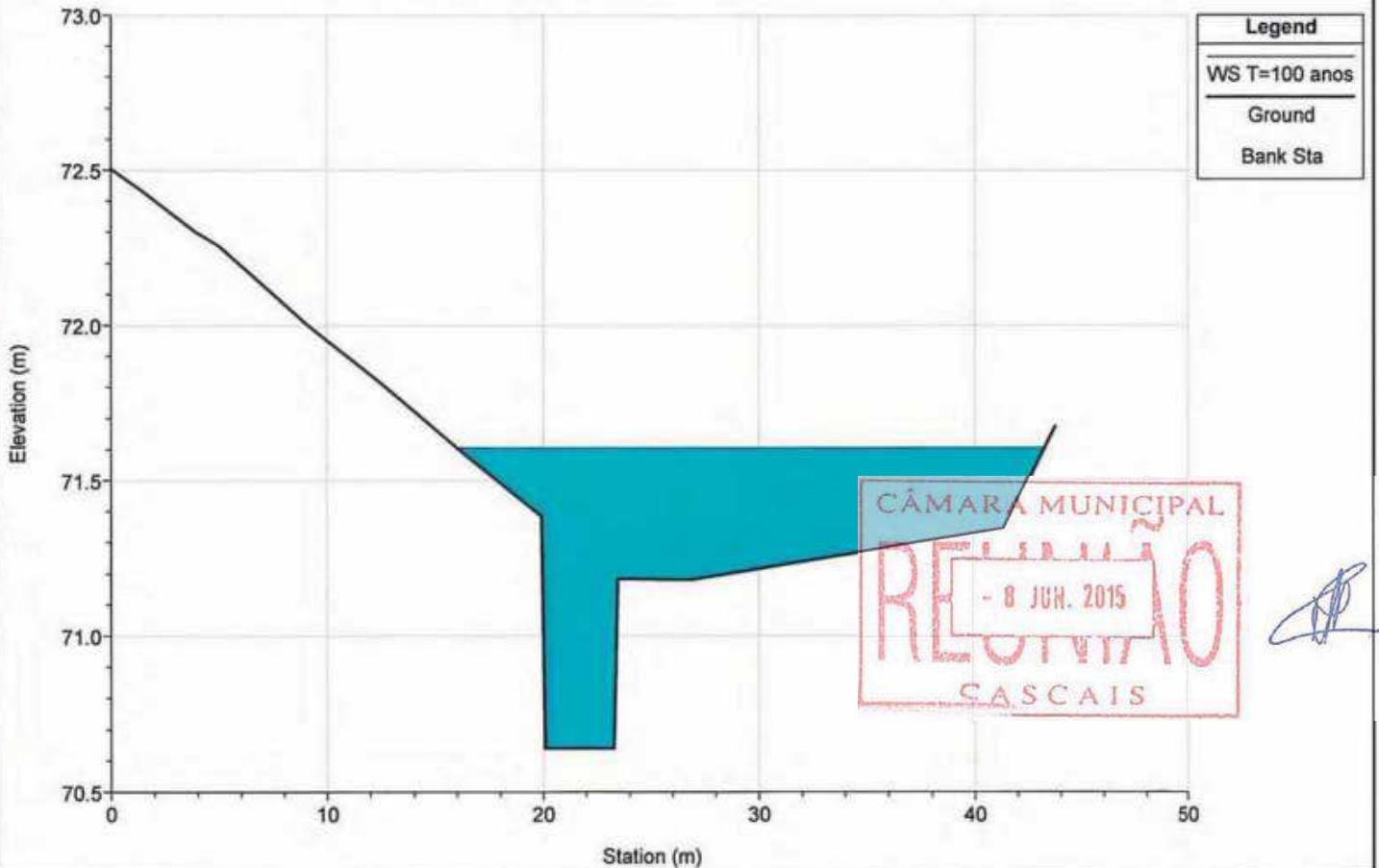
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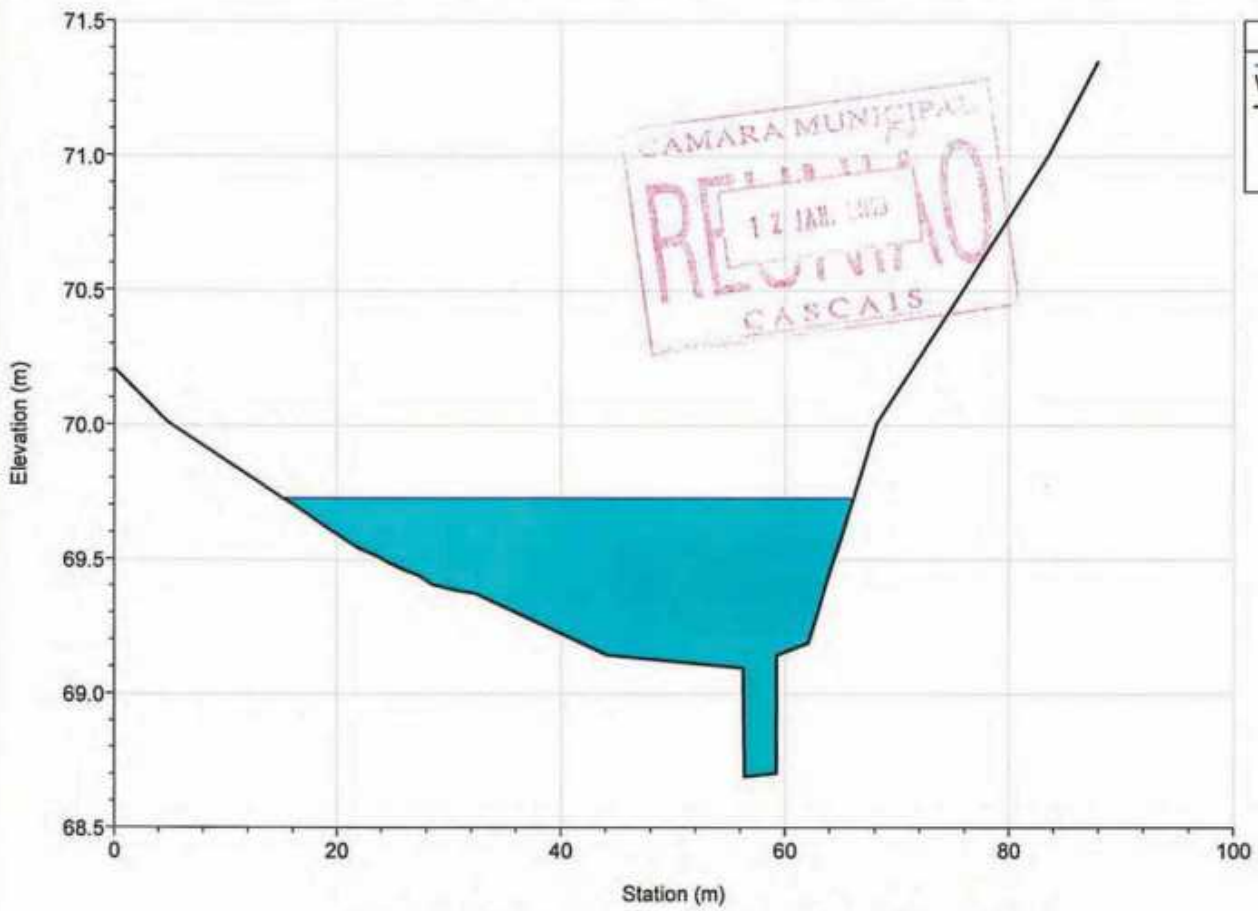
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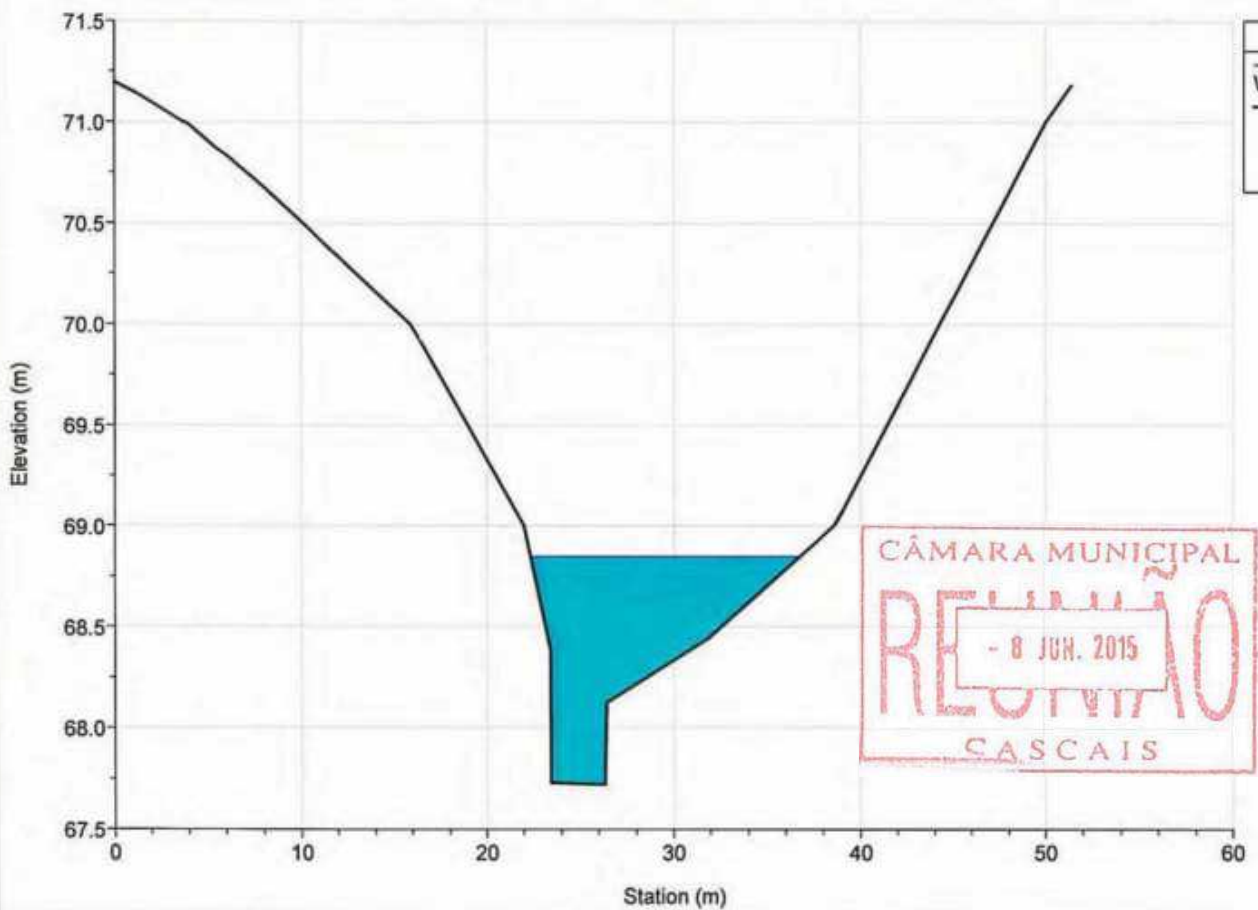
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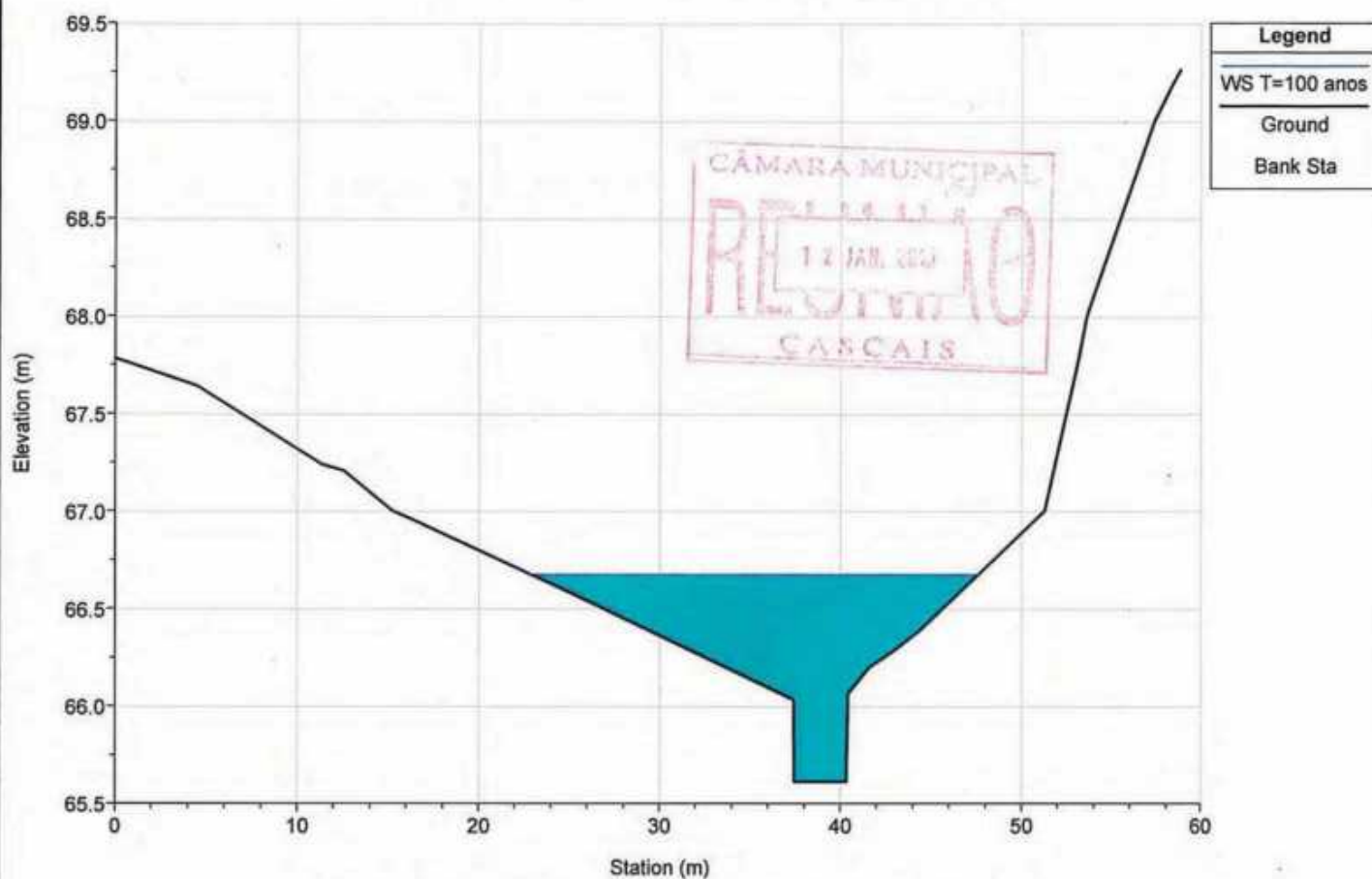
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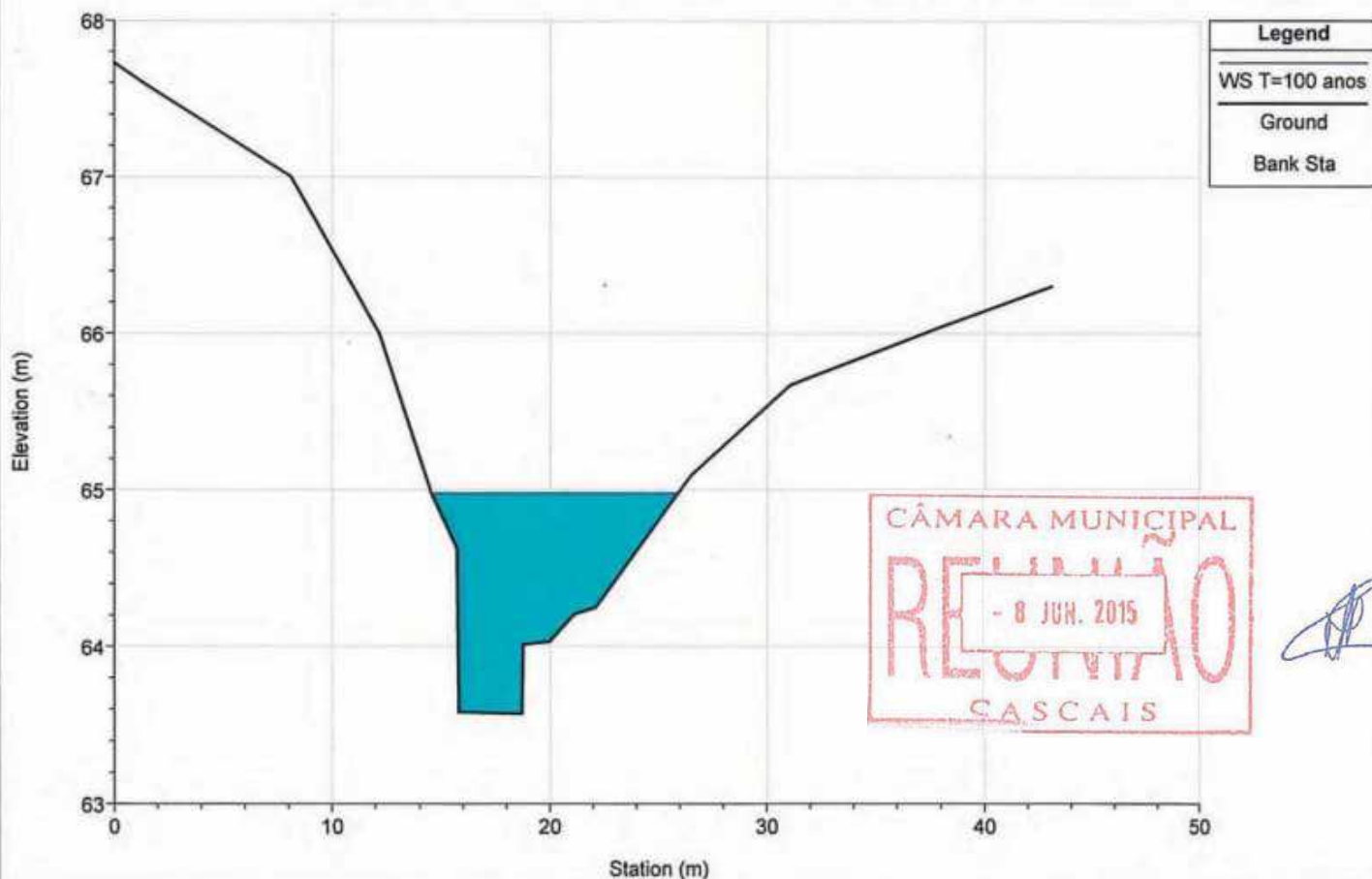
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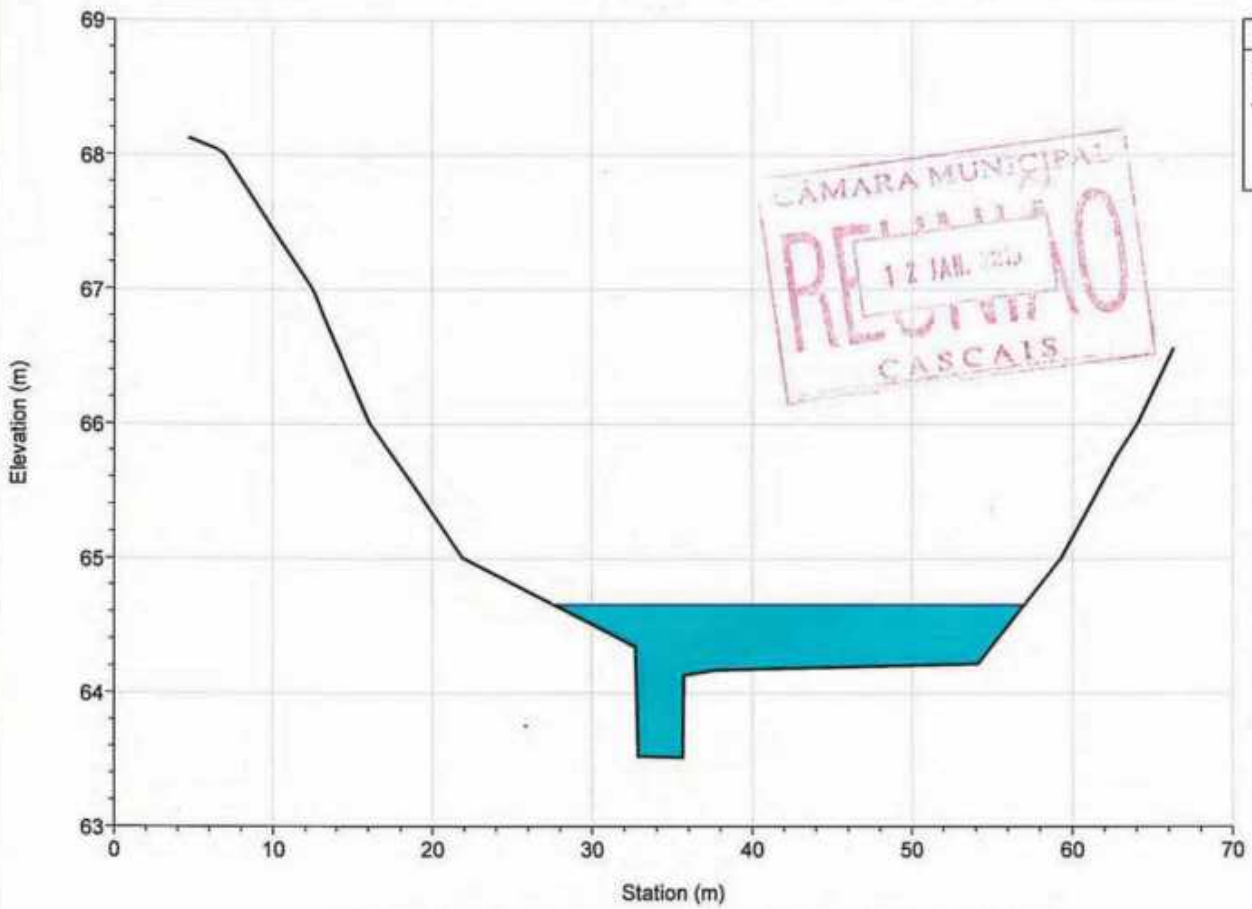
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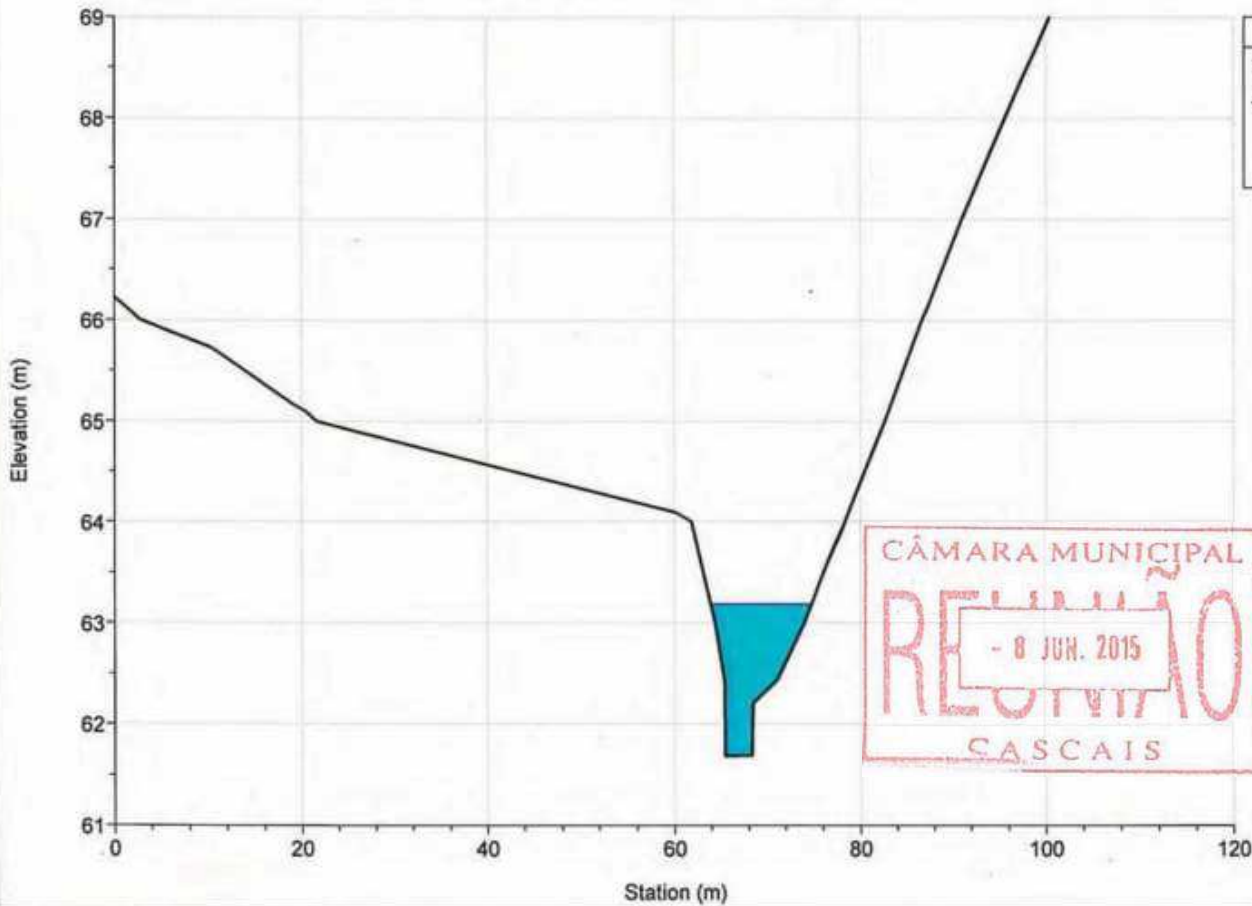
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River = CADAVEIRA Reach = jusante RS = 1952.274

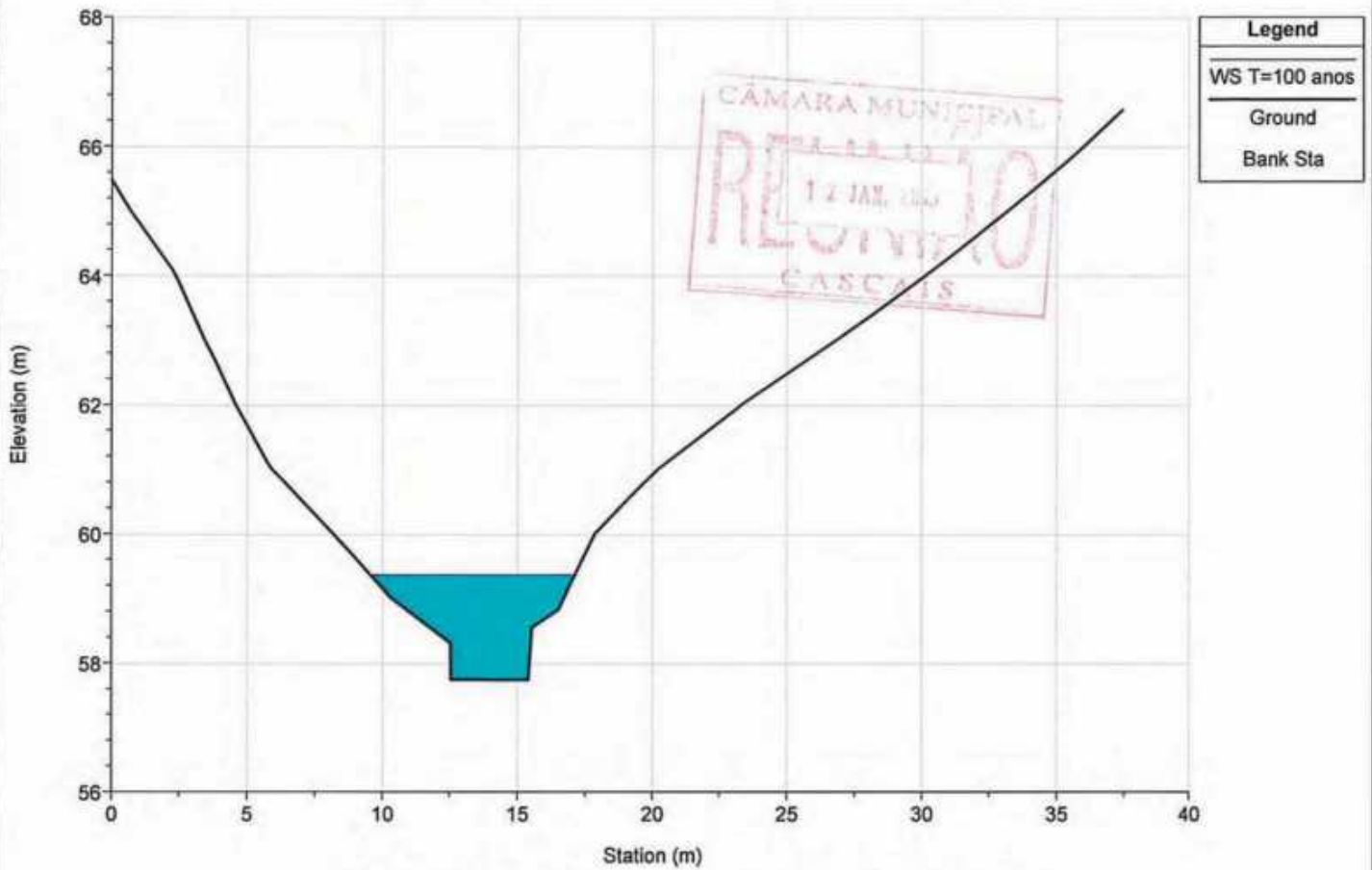


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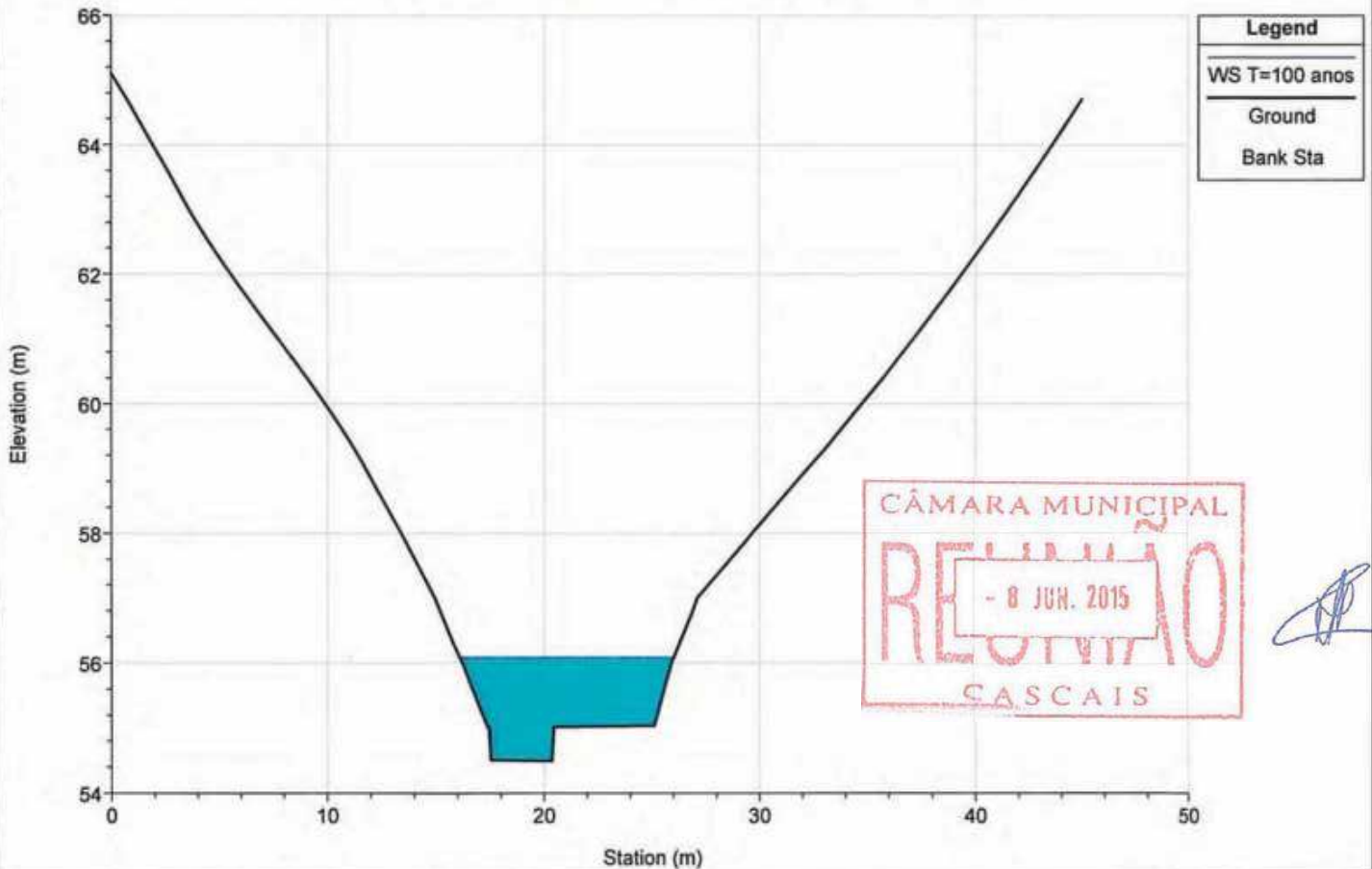




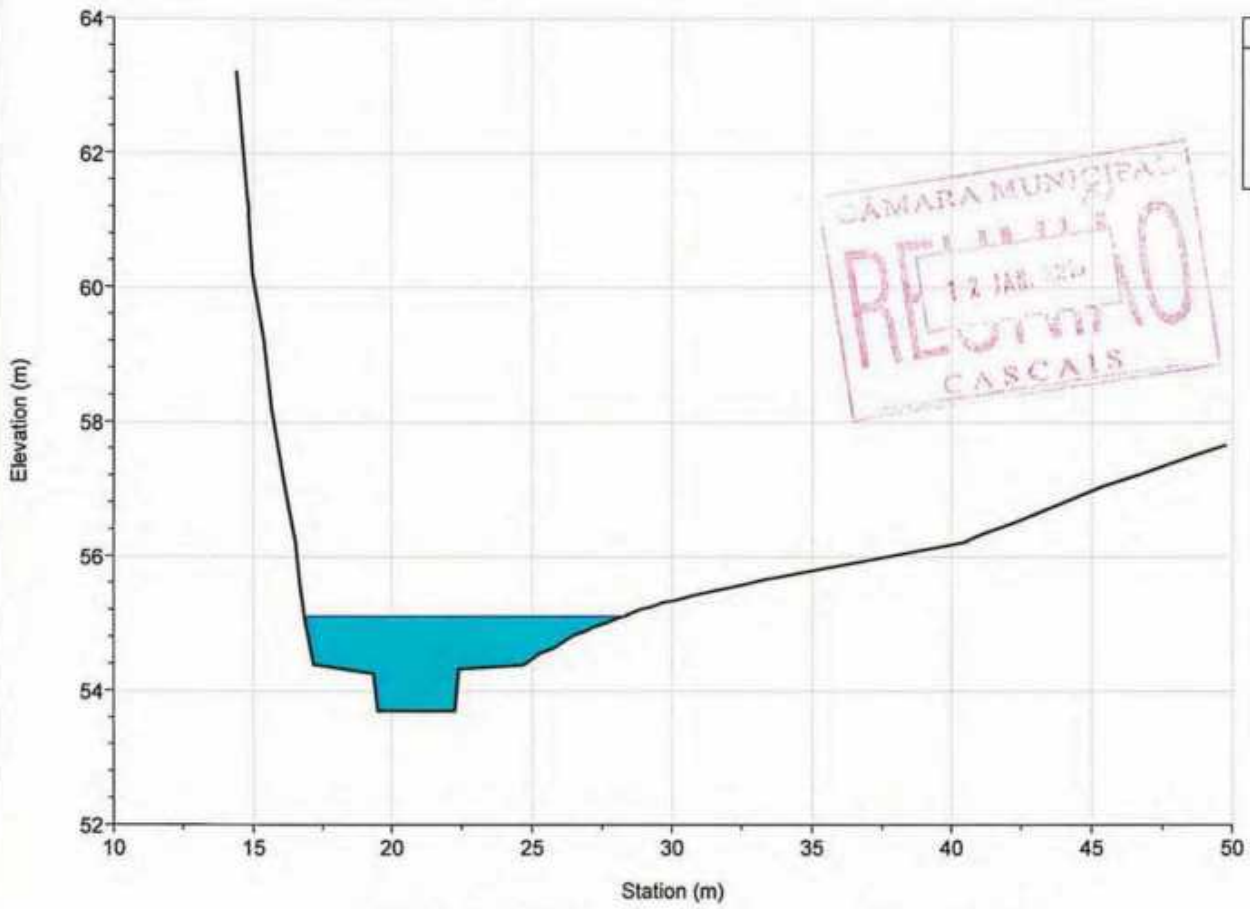
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River = CADAVEIRA Reach = jusante RS = 1639.154

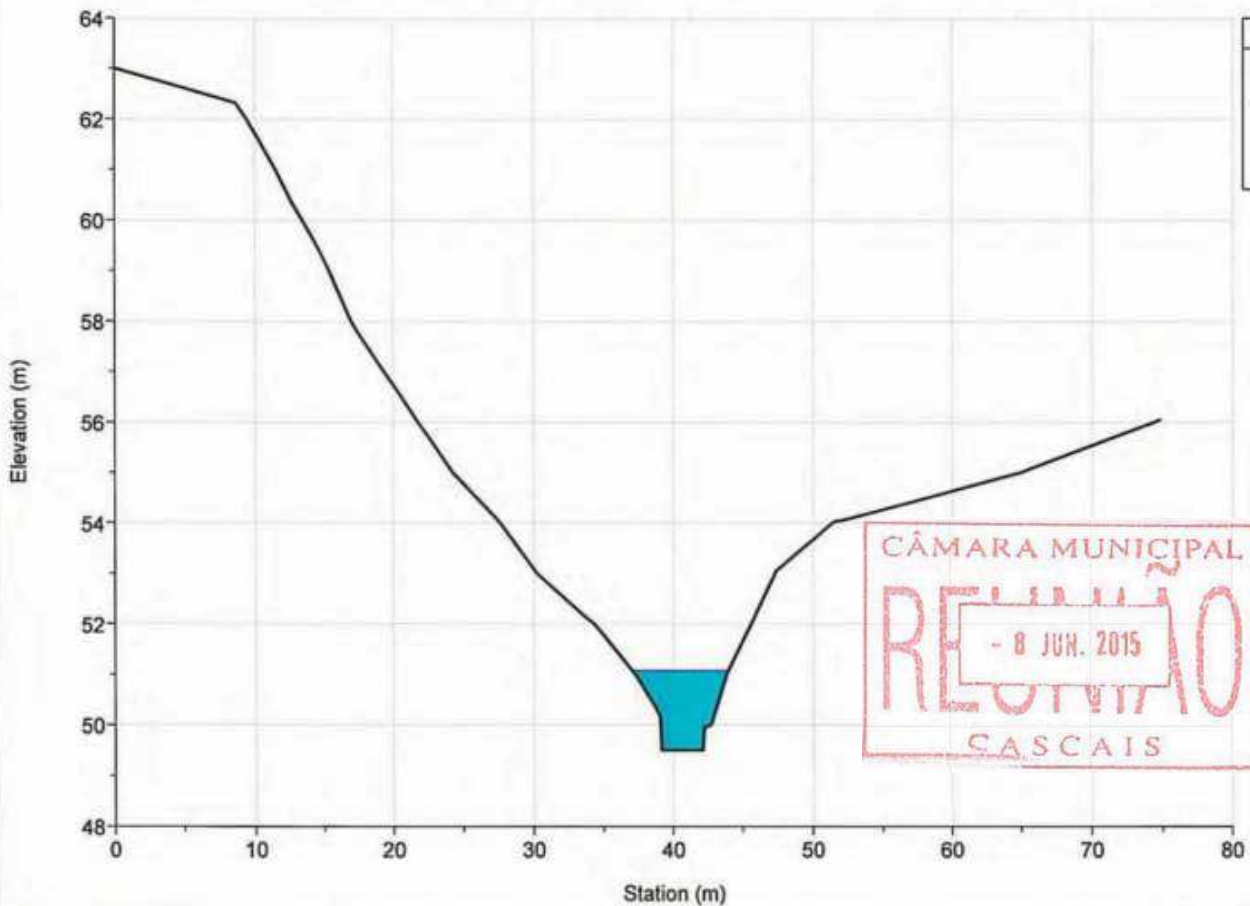


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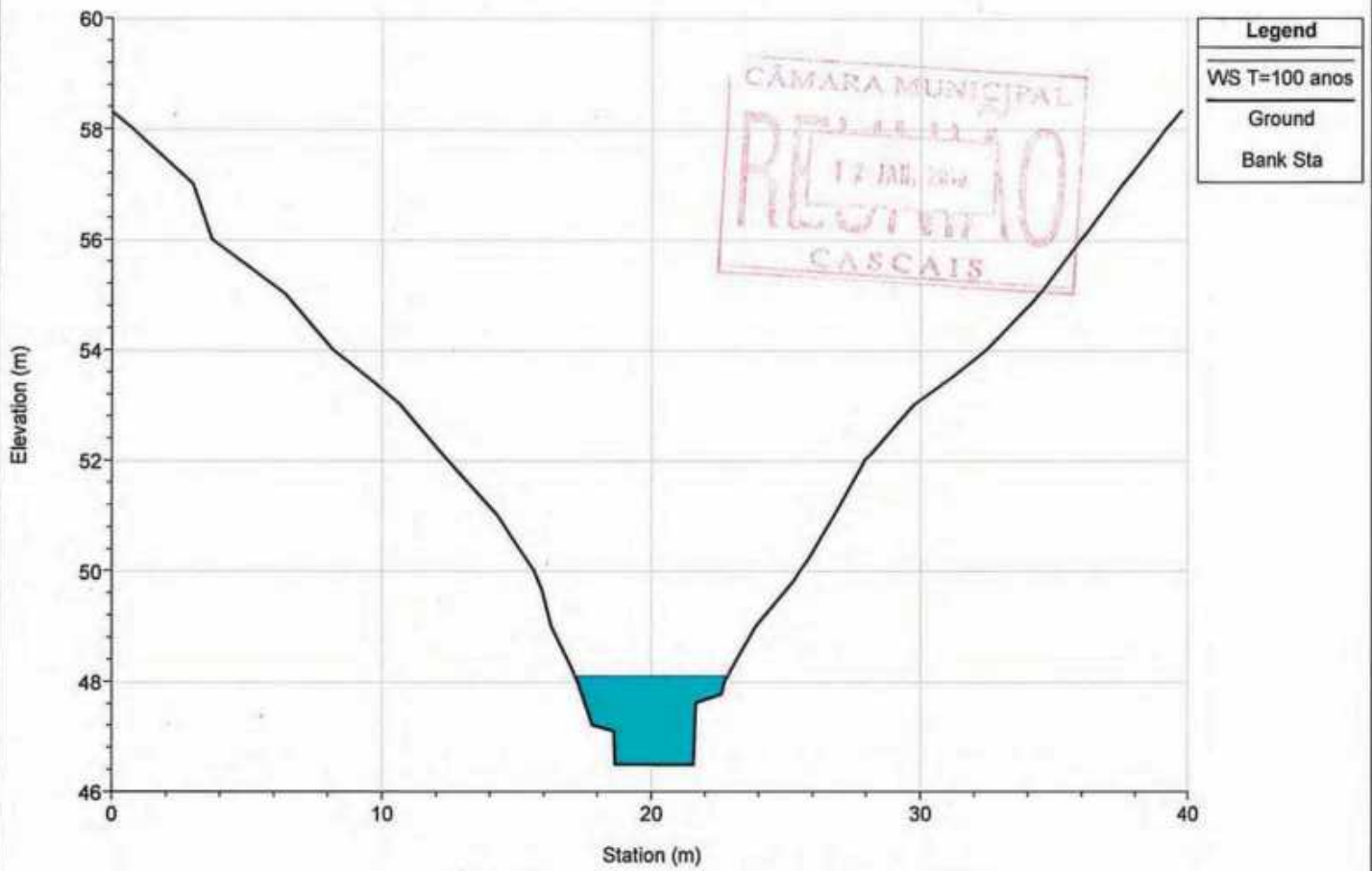
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Ground
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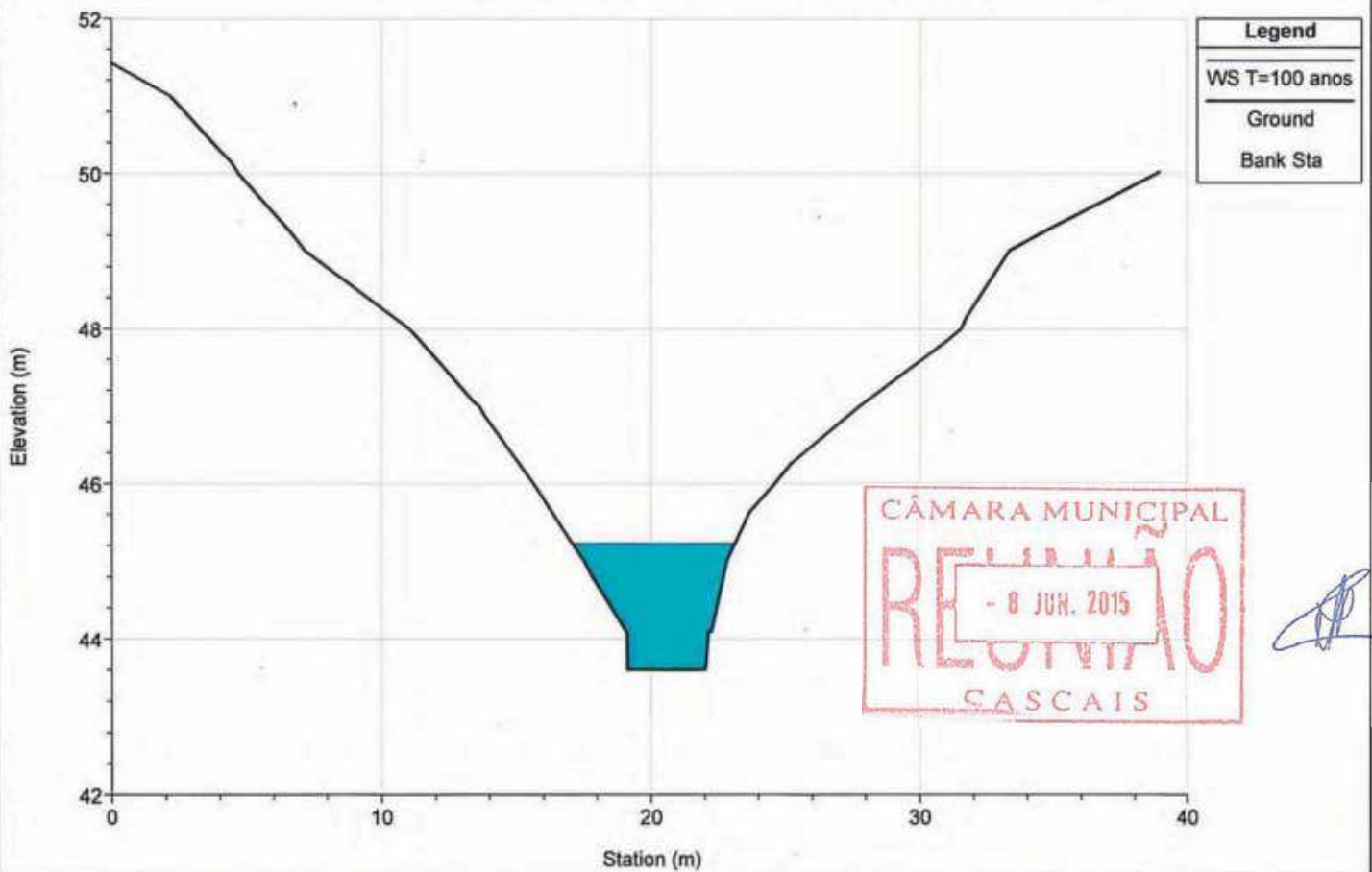


Legend
WS T=100 anos
Ground
Bank Sta

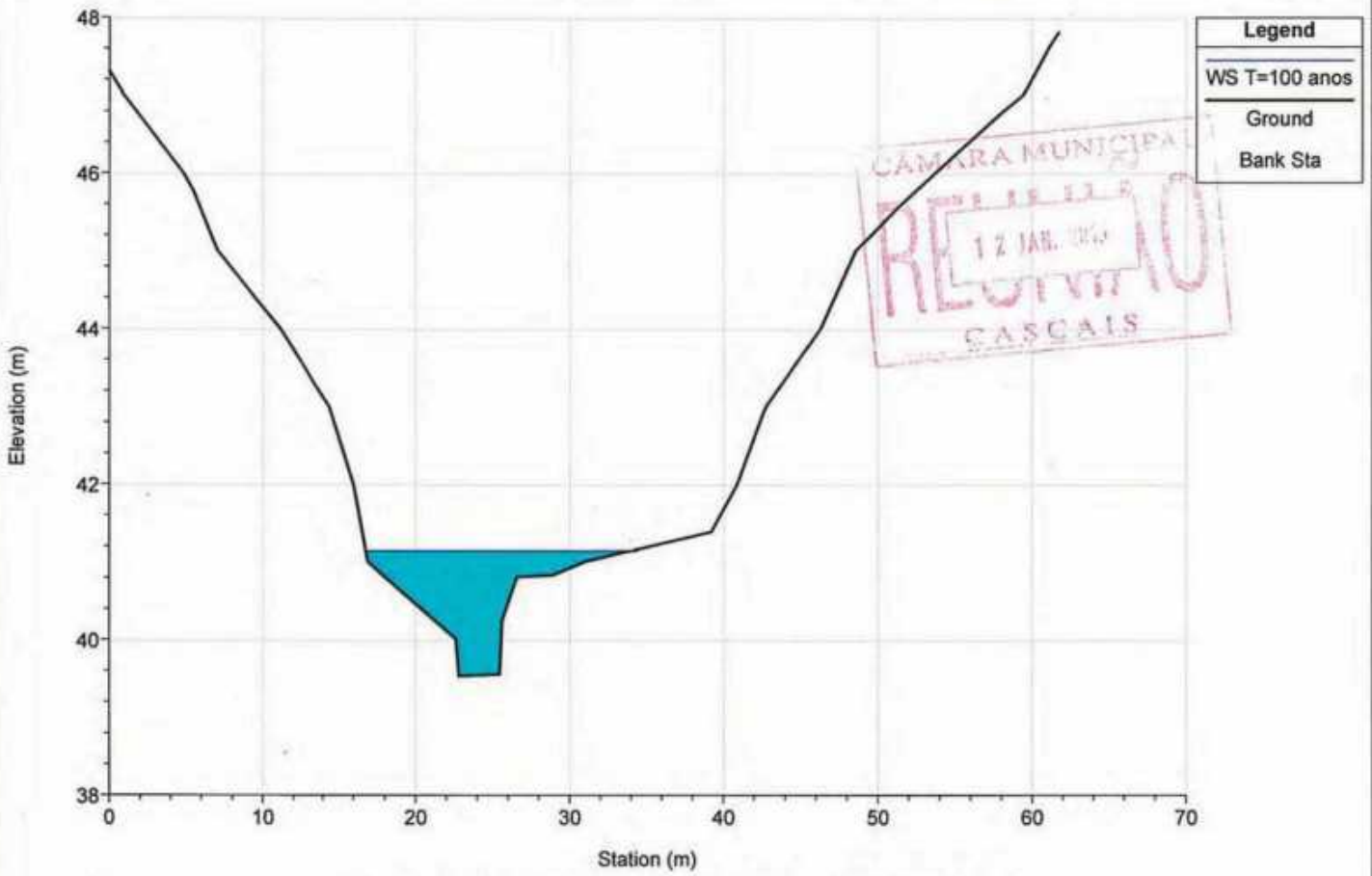
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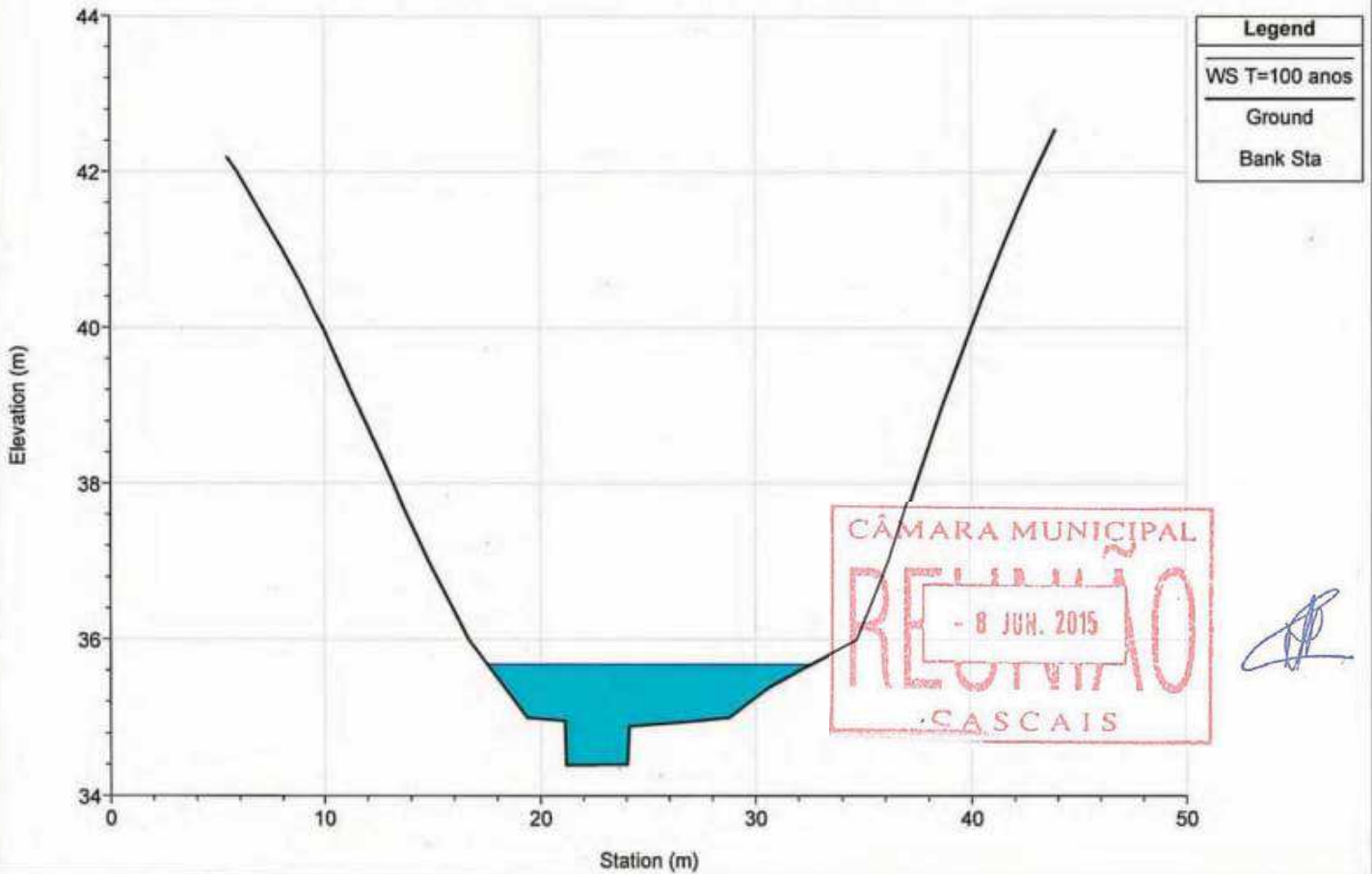
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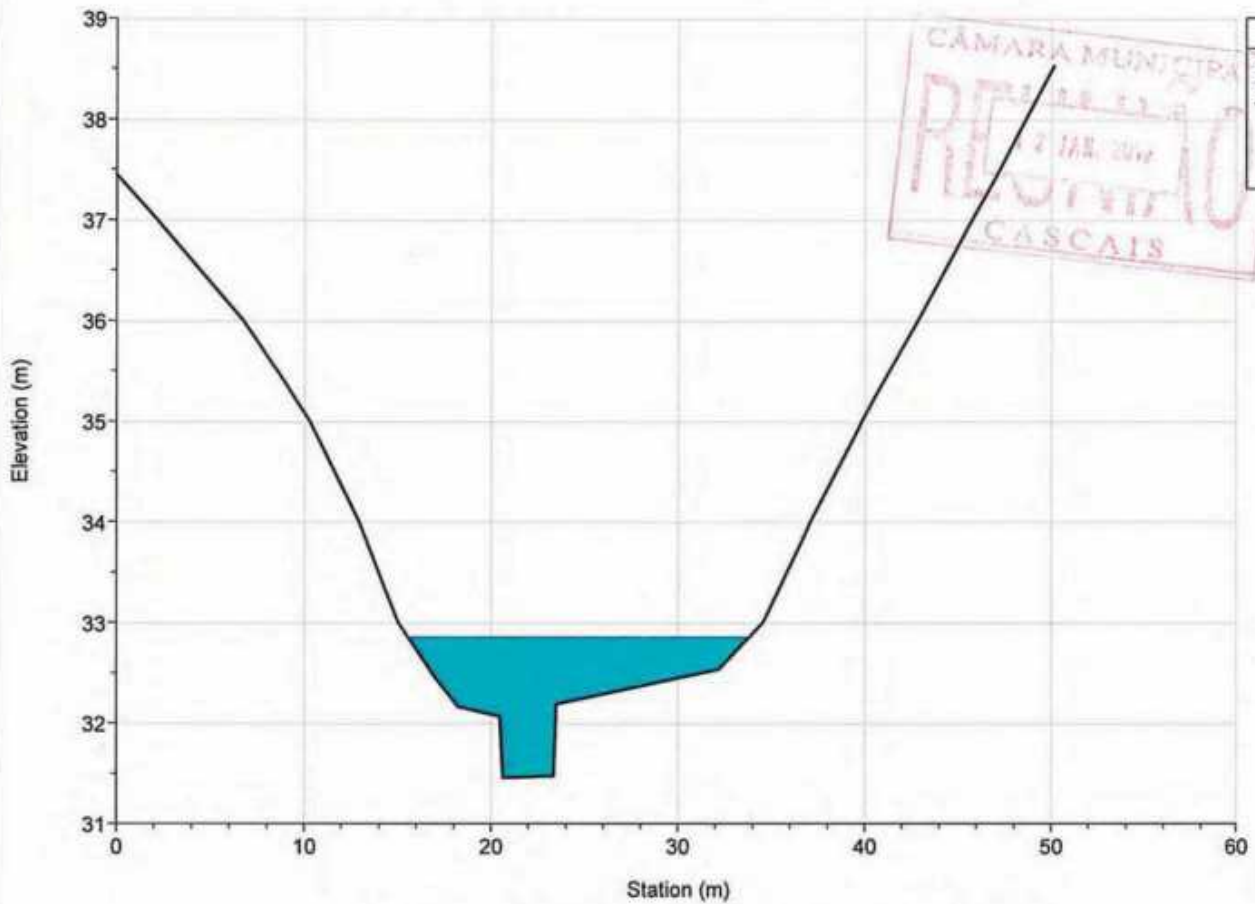
River = CADAVEIRA Reach = jusante RS = 1247.057



River = CADAVEIRA Reach = jusante RS = 1148.949

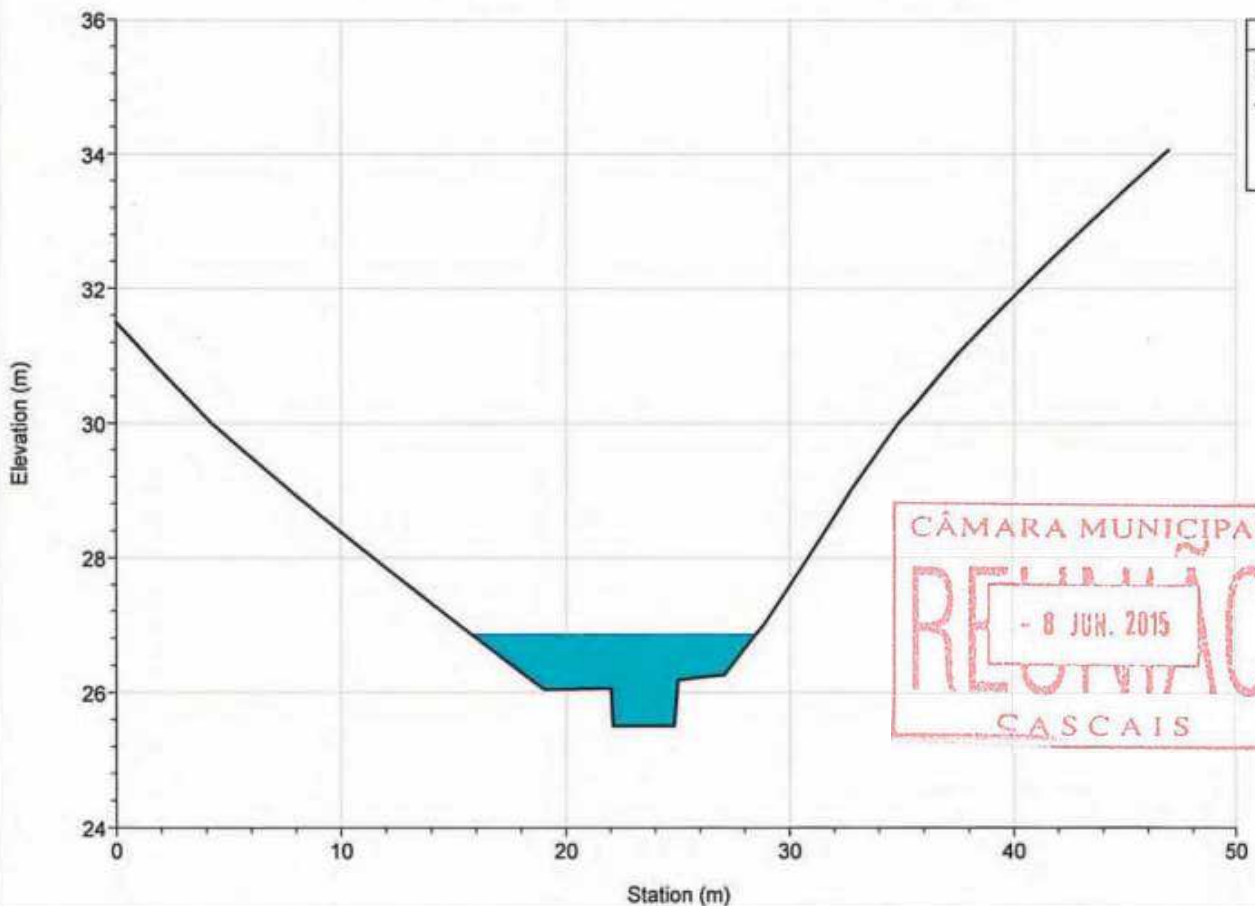


River = CADAVEIRA Reach = jusante RS = 1049.286



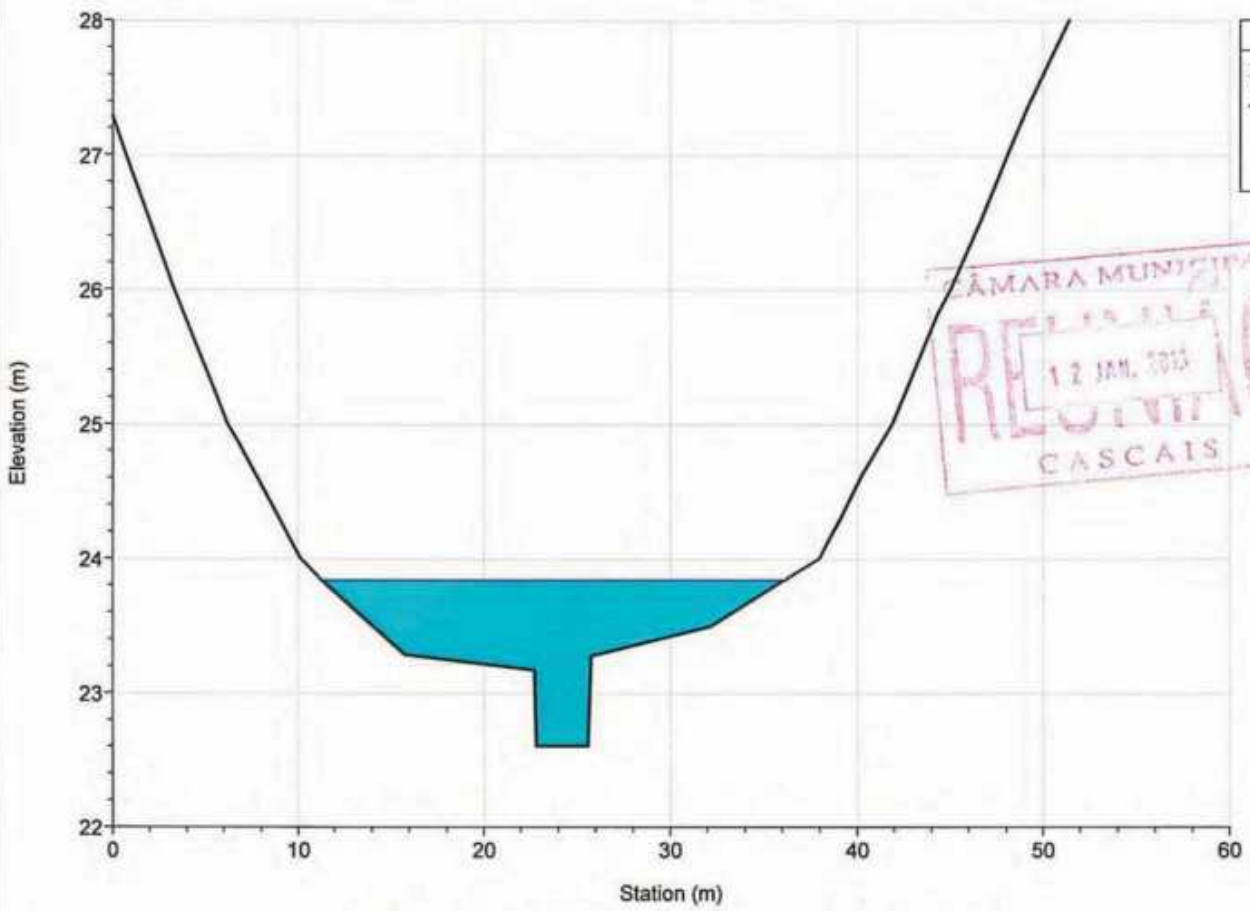
Legend
WS T=100 anos
Ground
Bank Sta

River = CADAVEIRA Reach = jusante RS = 930.792

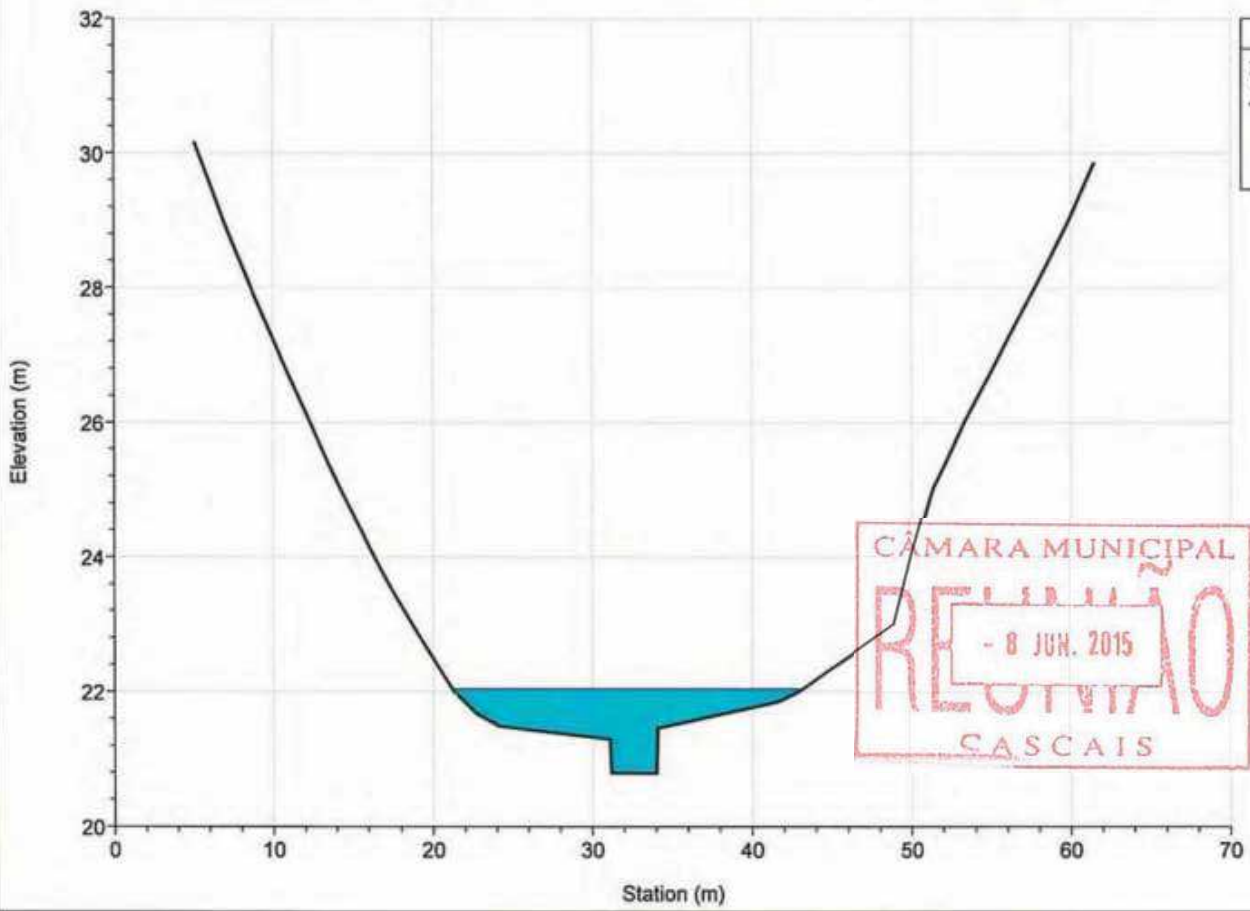


Legend
WS T=100 anos
Ground
Bank Sta

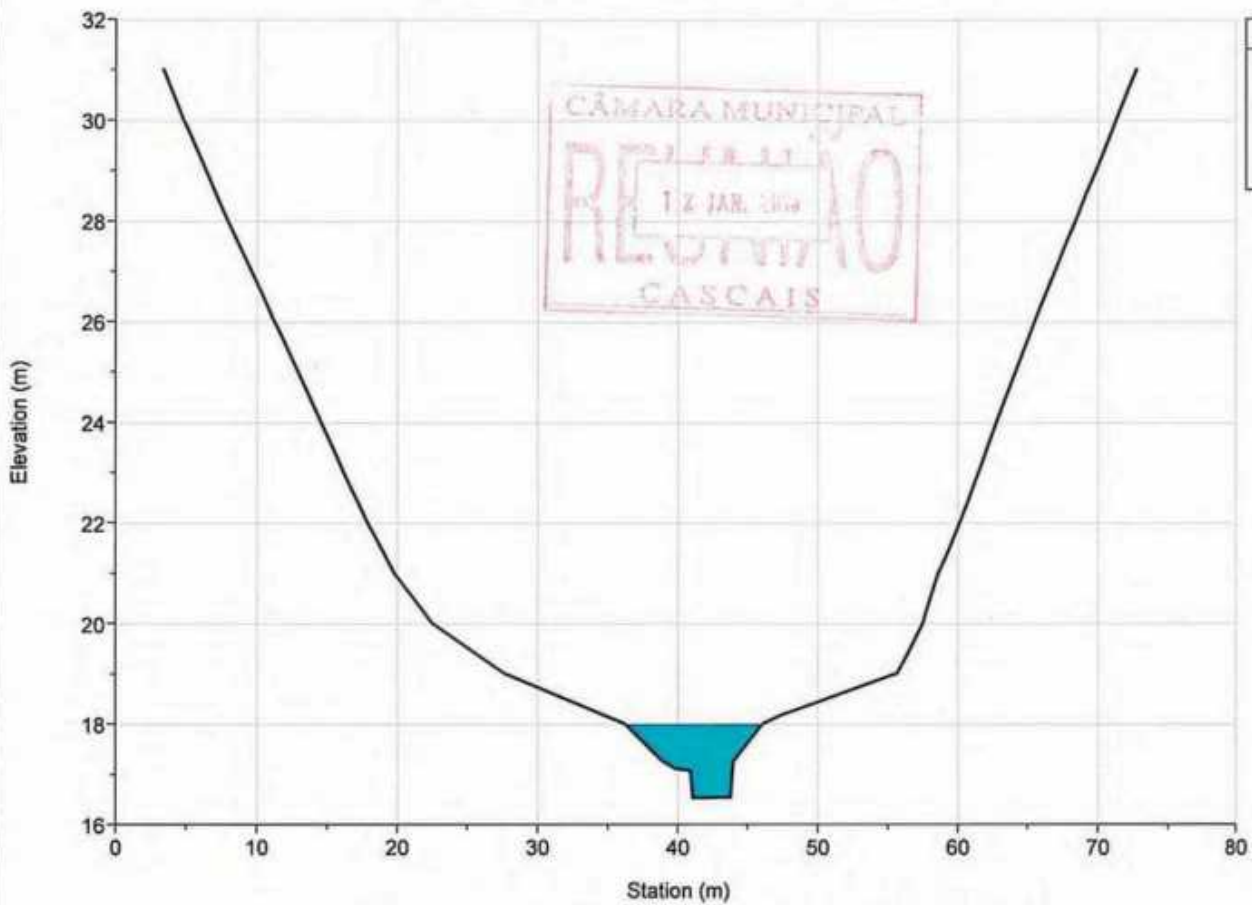
River = CADAVEIRA Reach = jusante RS = 821.585



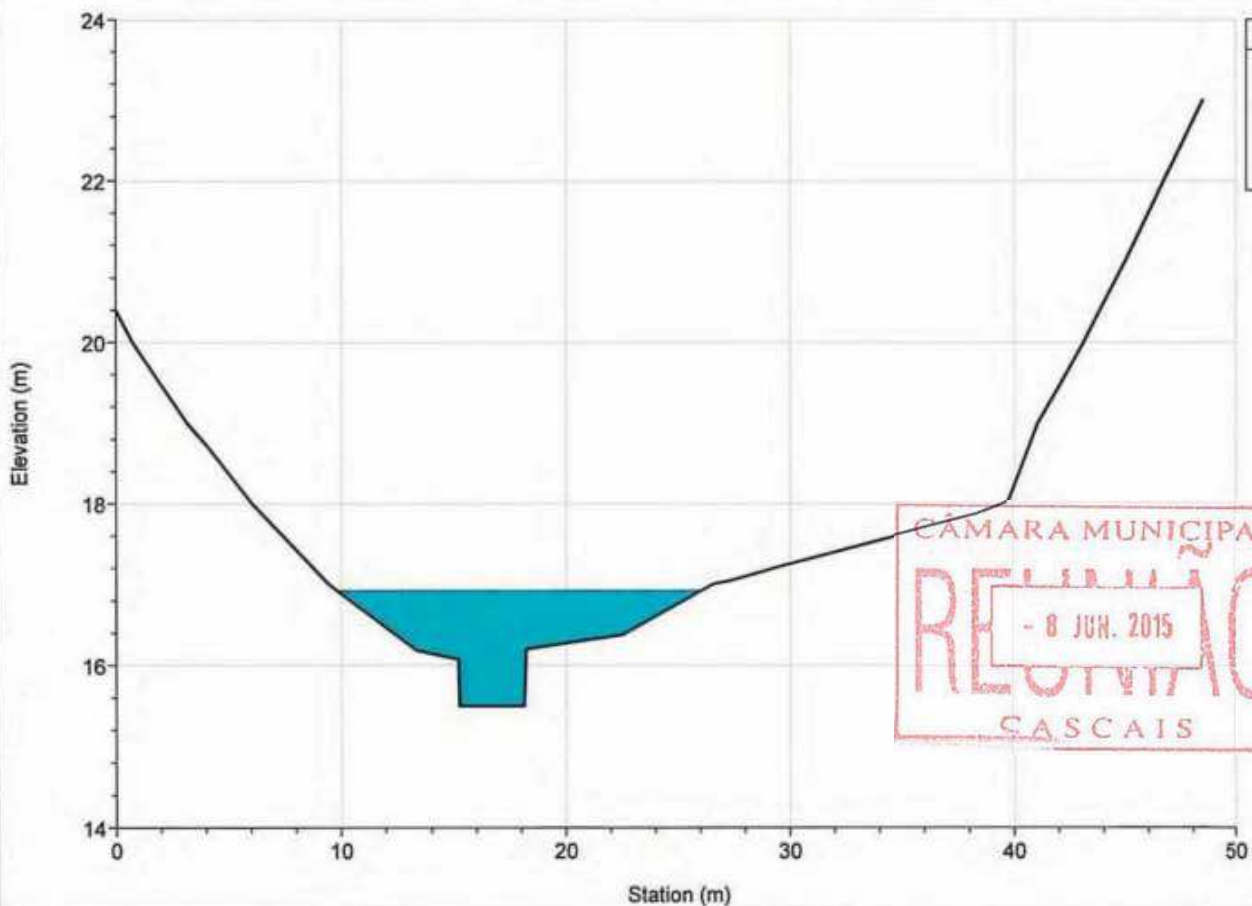
River = CADAVEIRA Reach = jusante RS = 697.618



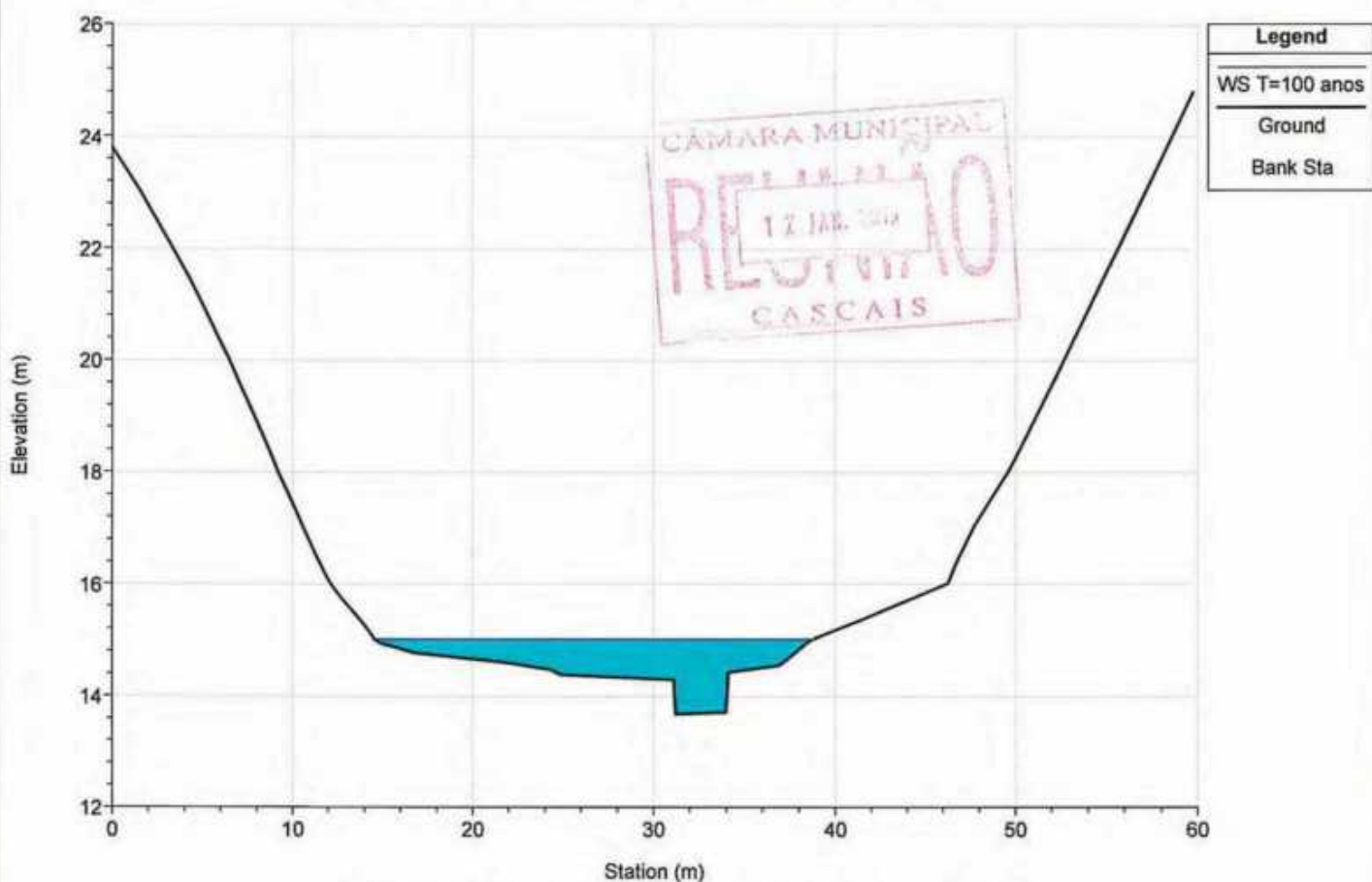
River = CADAVEIRA Reach = jusante RS = 585.684



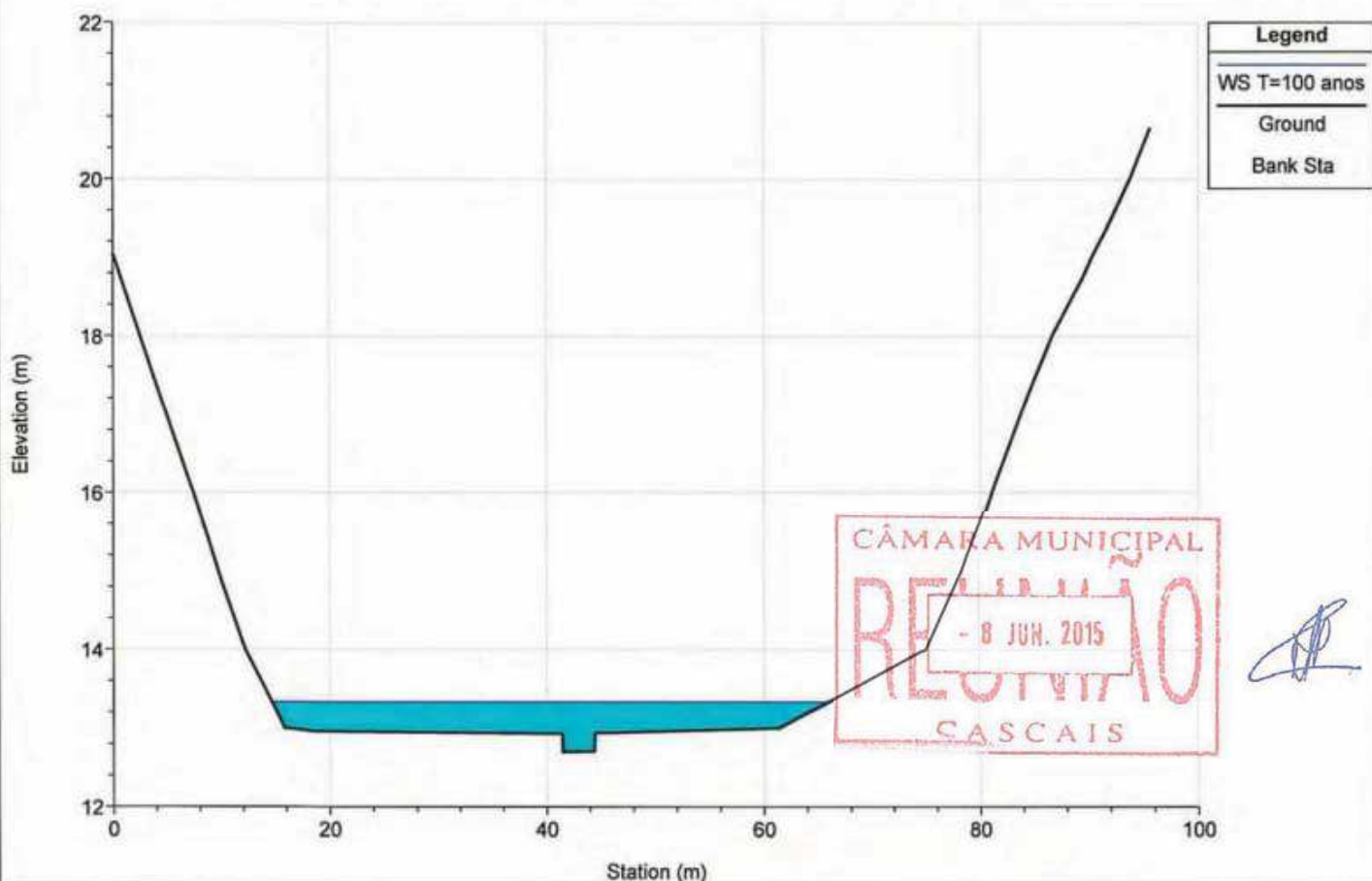
River = CADAVEIRA Reach = jusante RS = 493.057



River = CADAVEIRA Reach = jusante RS = 394.604

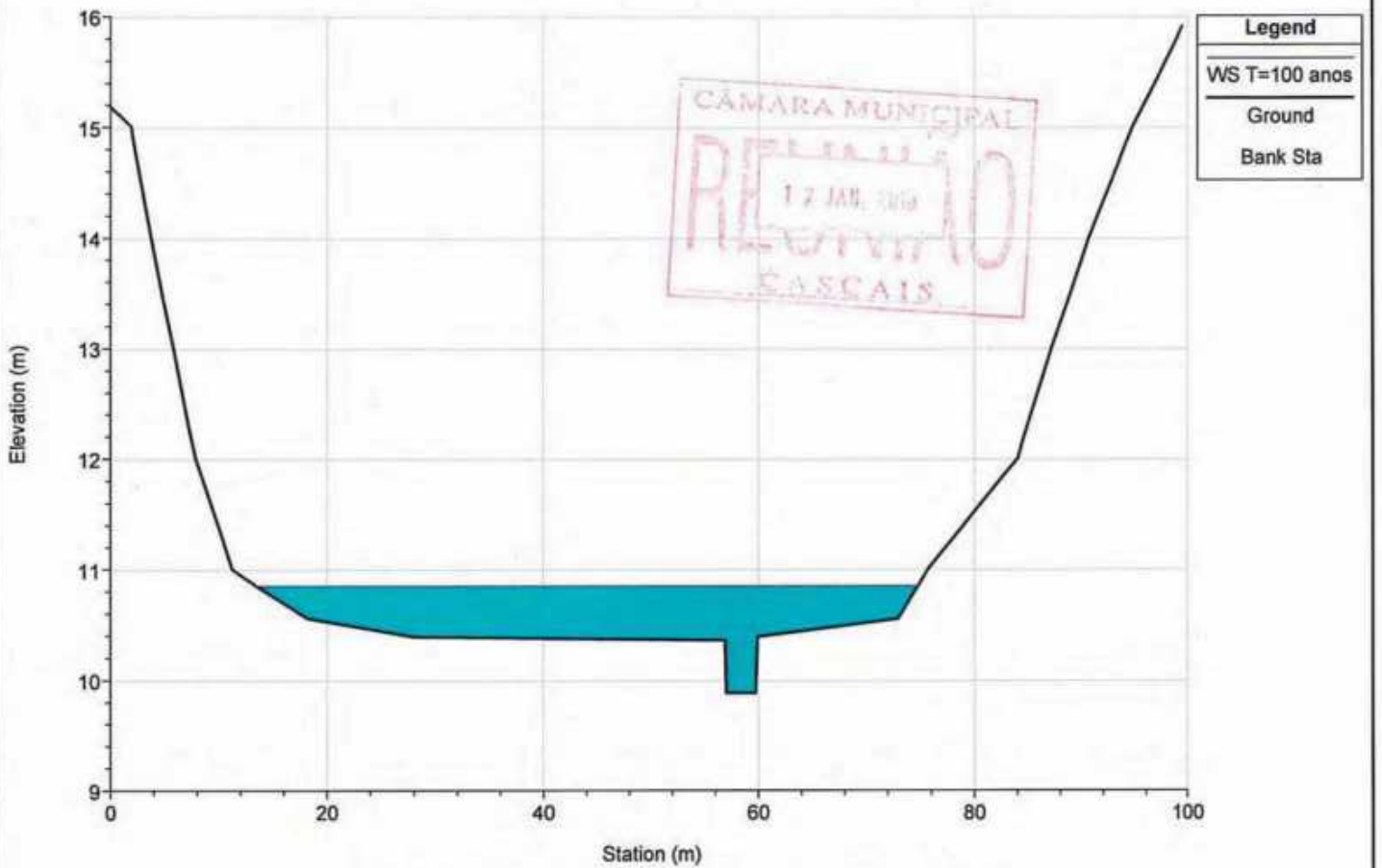


River = CADAVEIRA Reach = jusante RS = 276.613

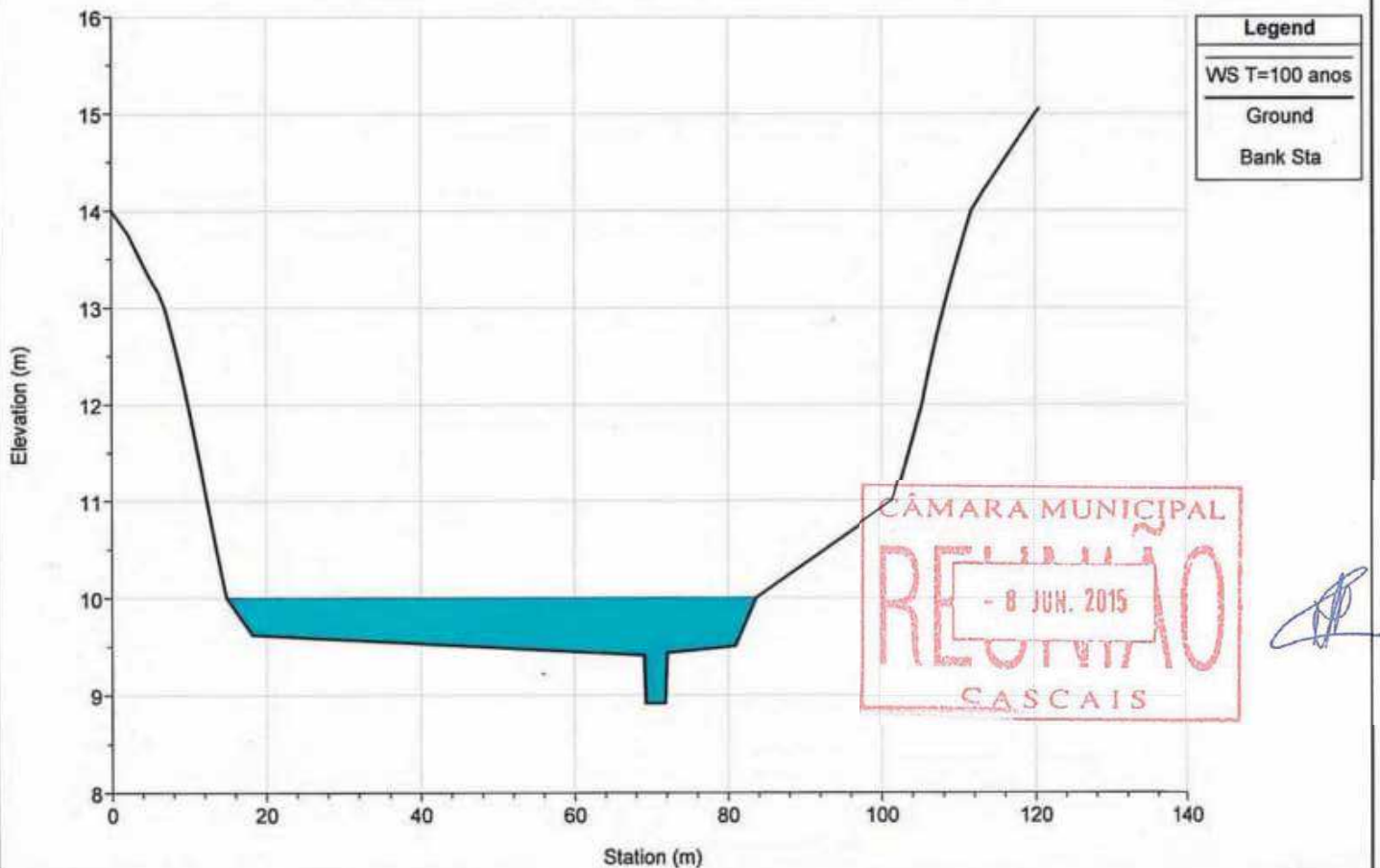




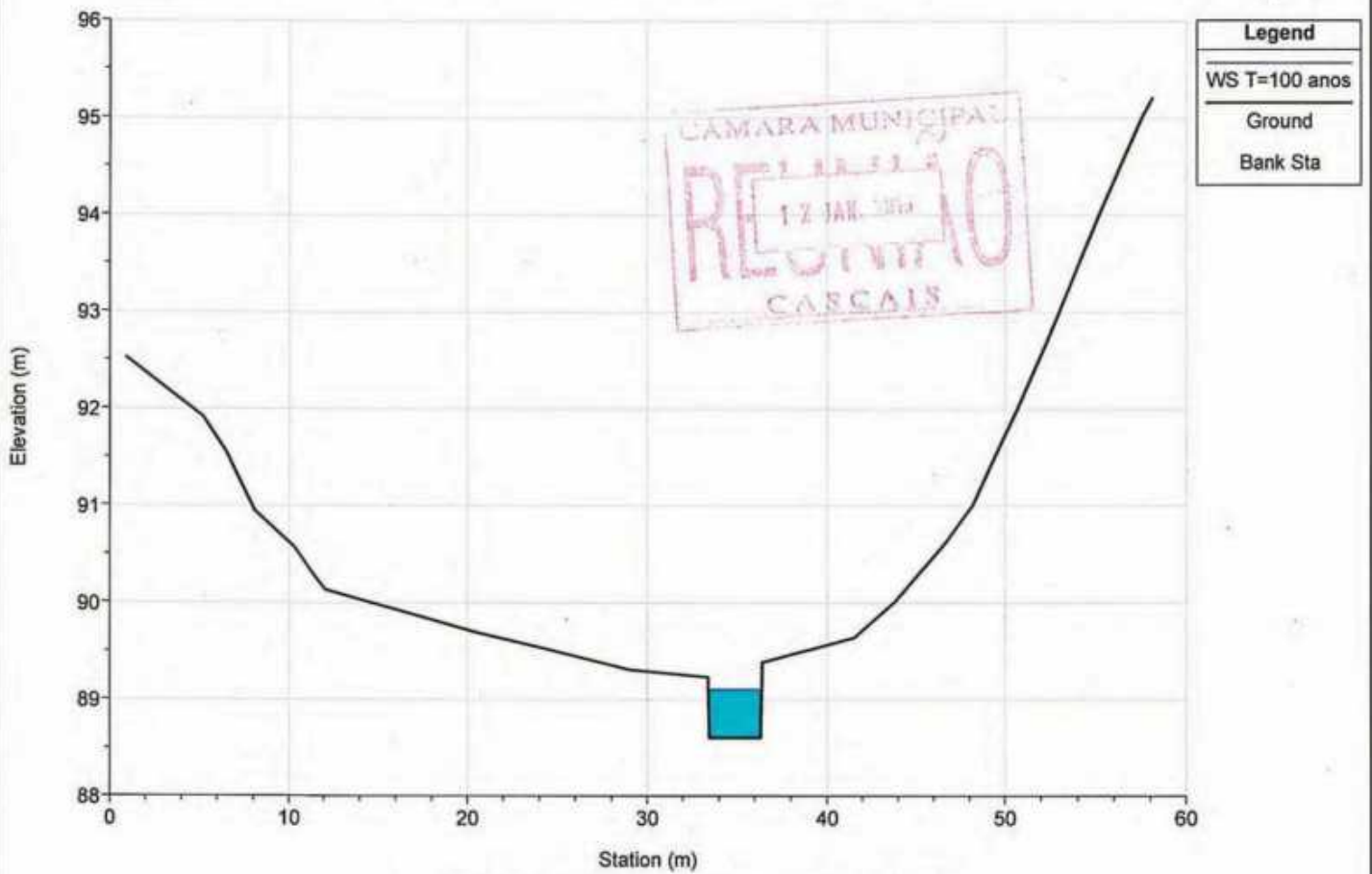
River = CADAVEIRA Reach = jusante RS = 153.051



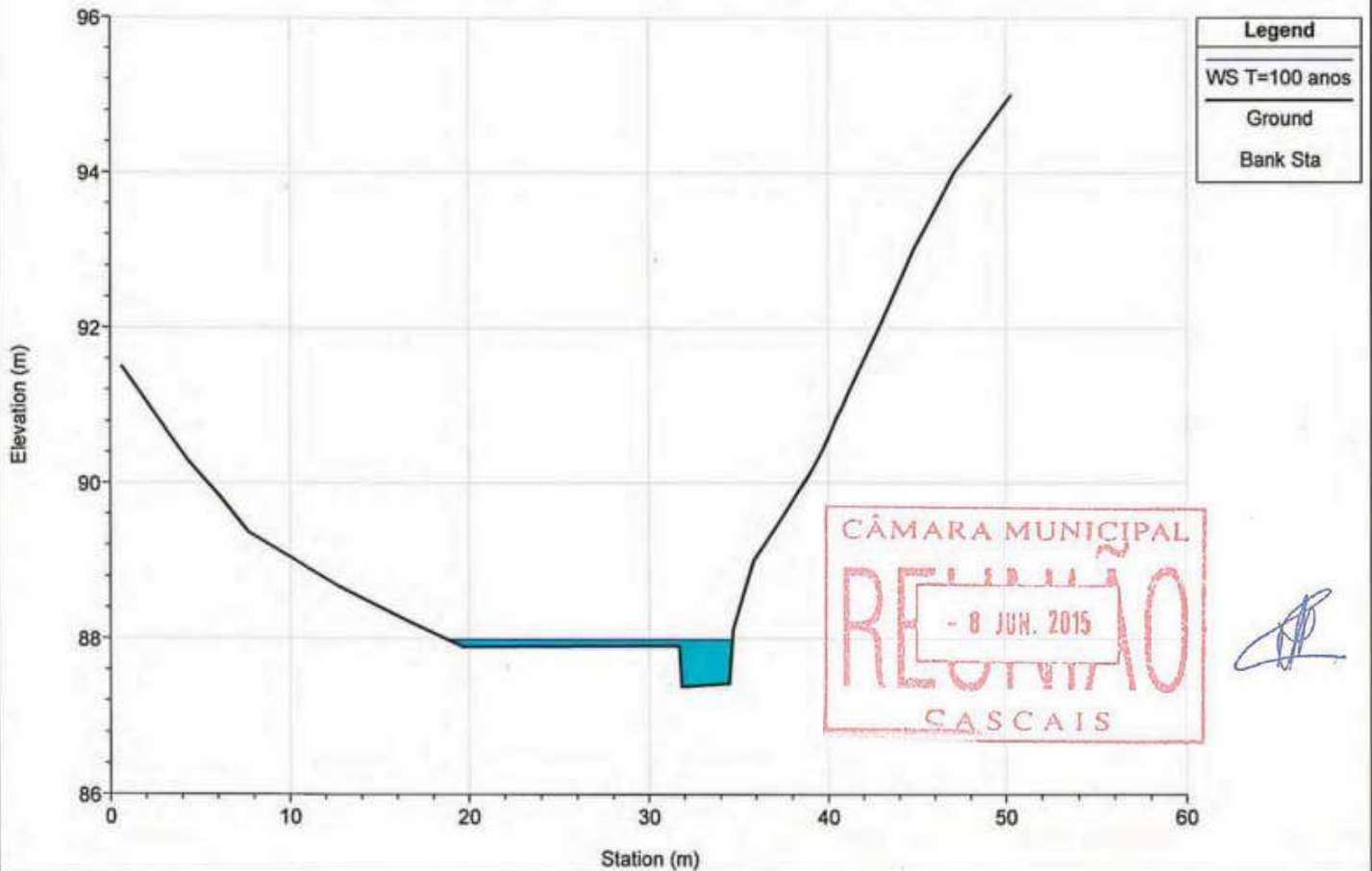
River = CADAVEIRA Reach = jusante RS = 17.559



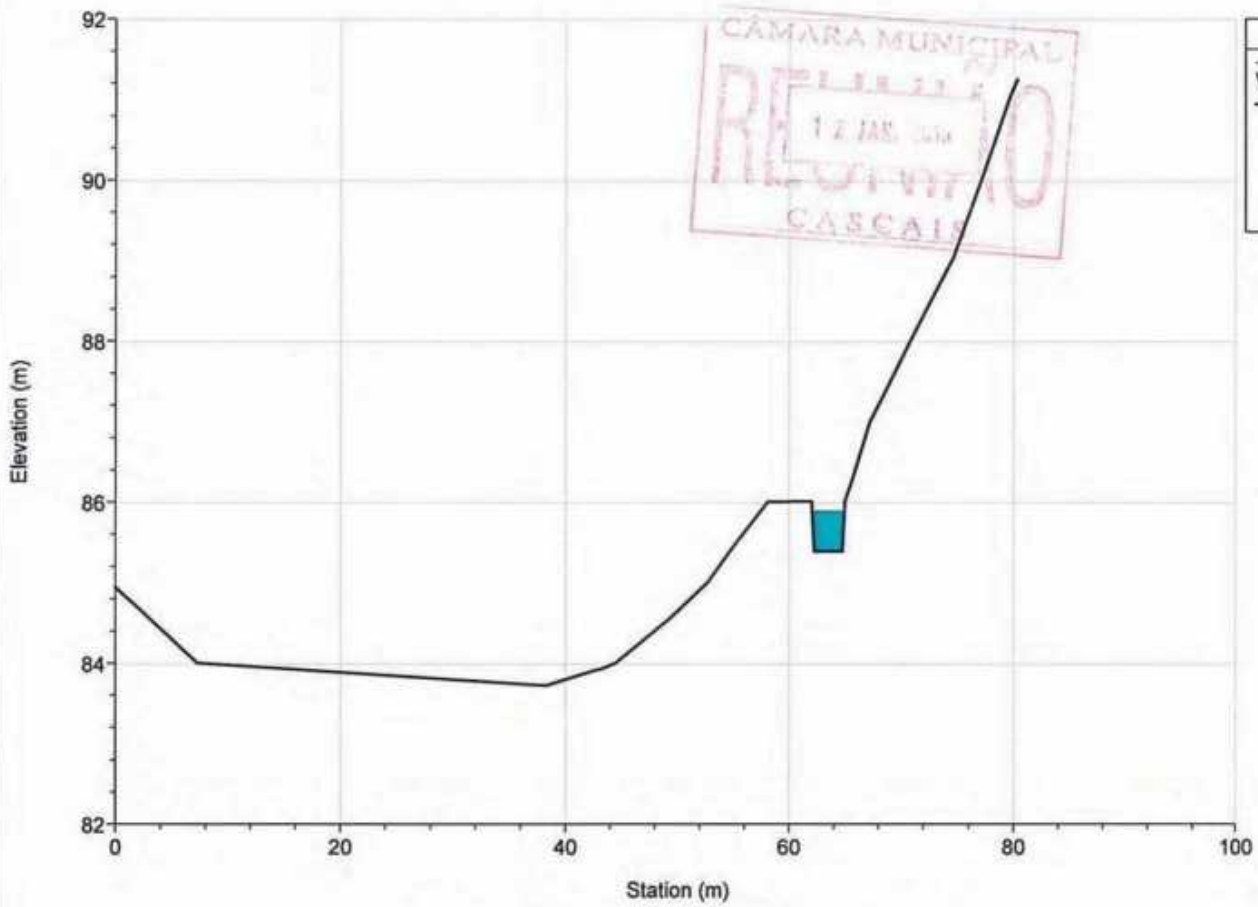
River = MD2 Reach = afluyente RS = 721.013



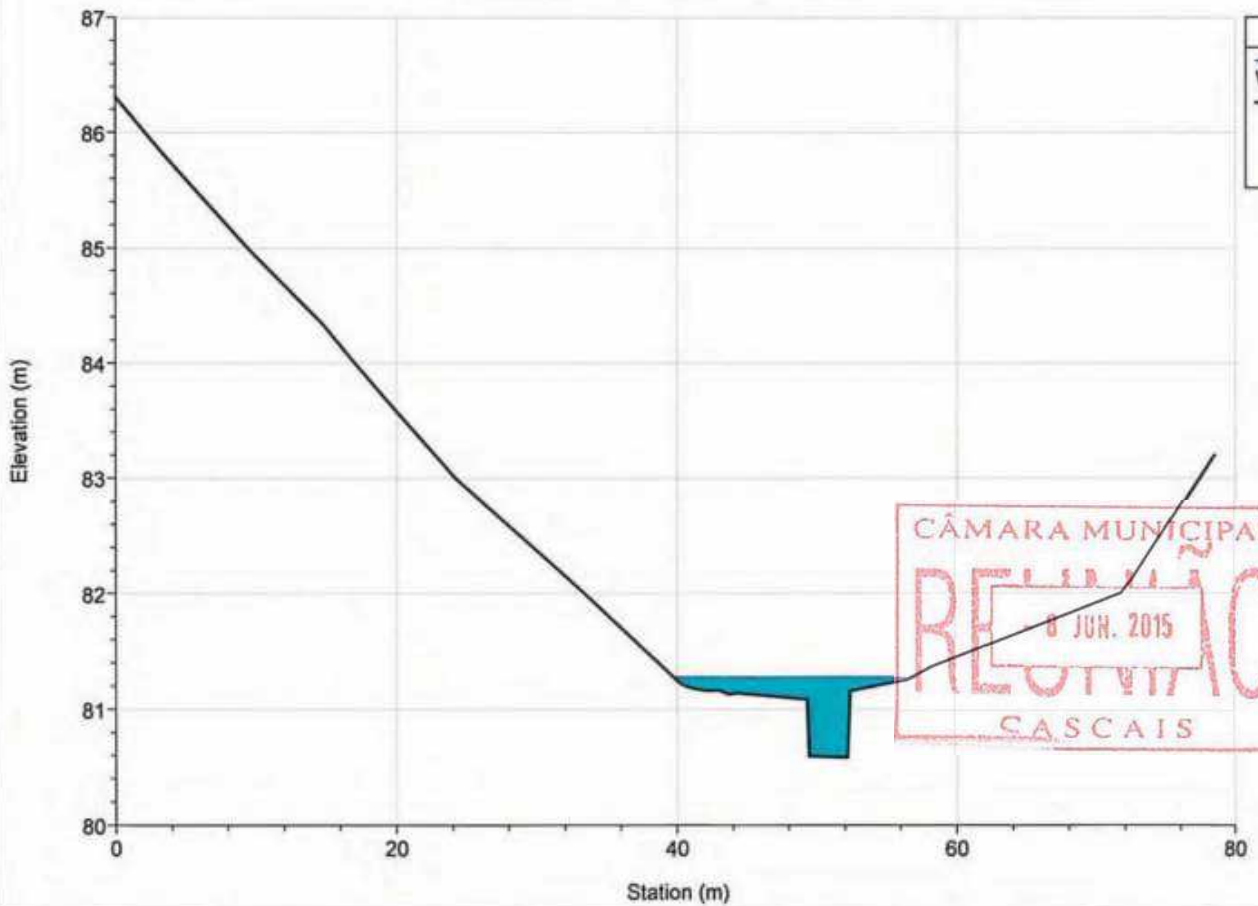
River = MD2 Reach = afluyente RS = 621.925



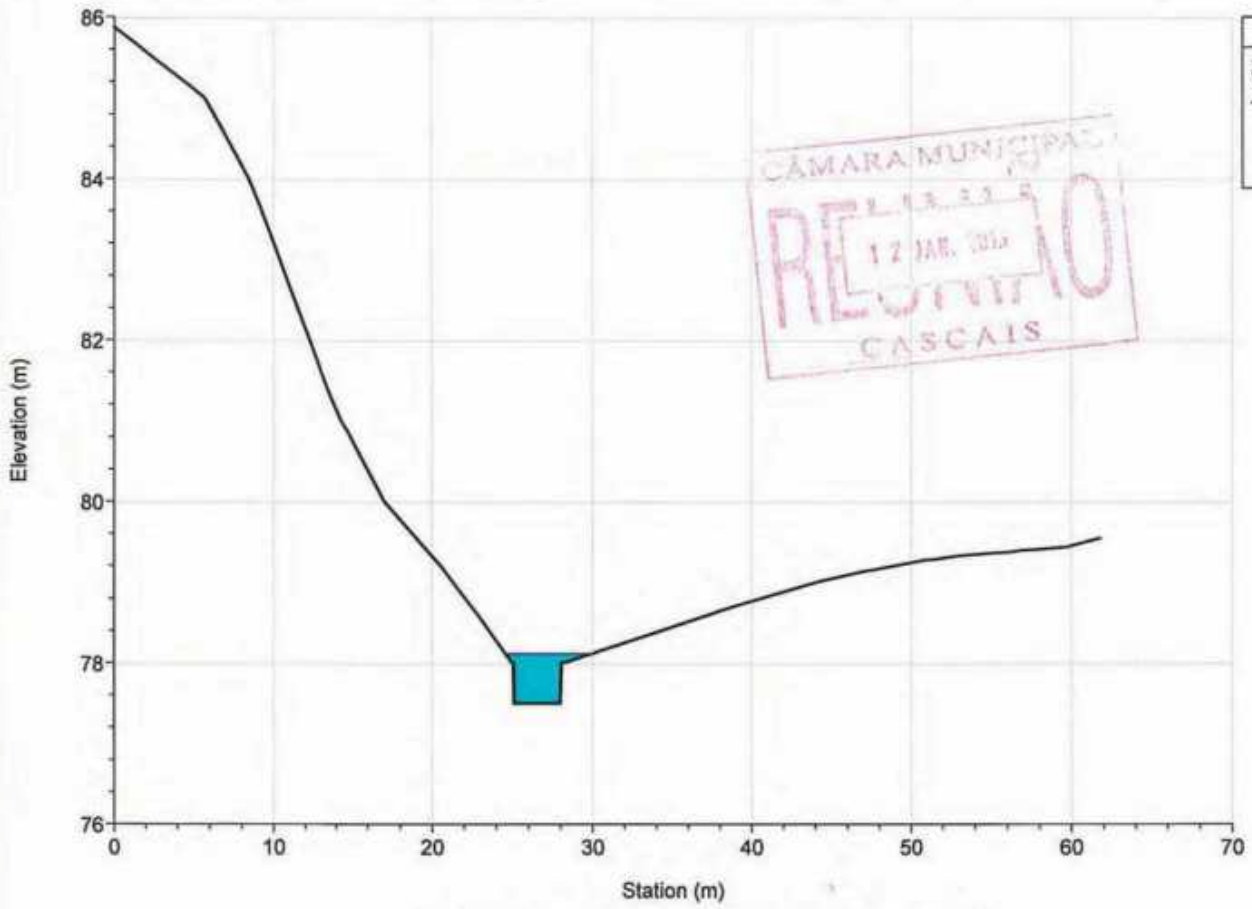
River = MD2 Reach = afluente RS = 506.328



River = MD2 Reach = afluente RS = 387.056

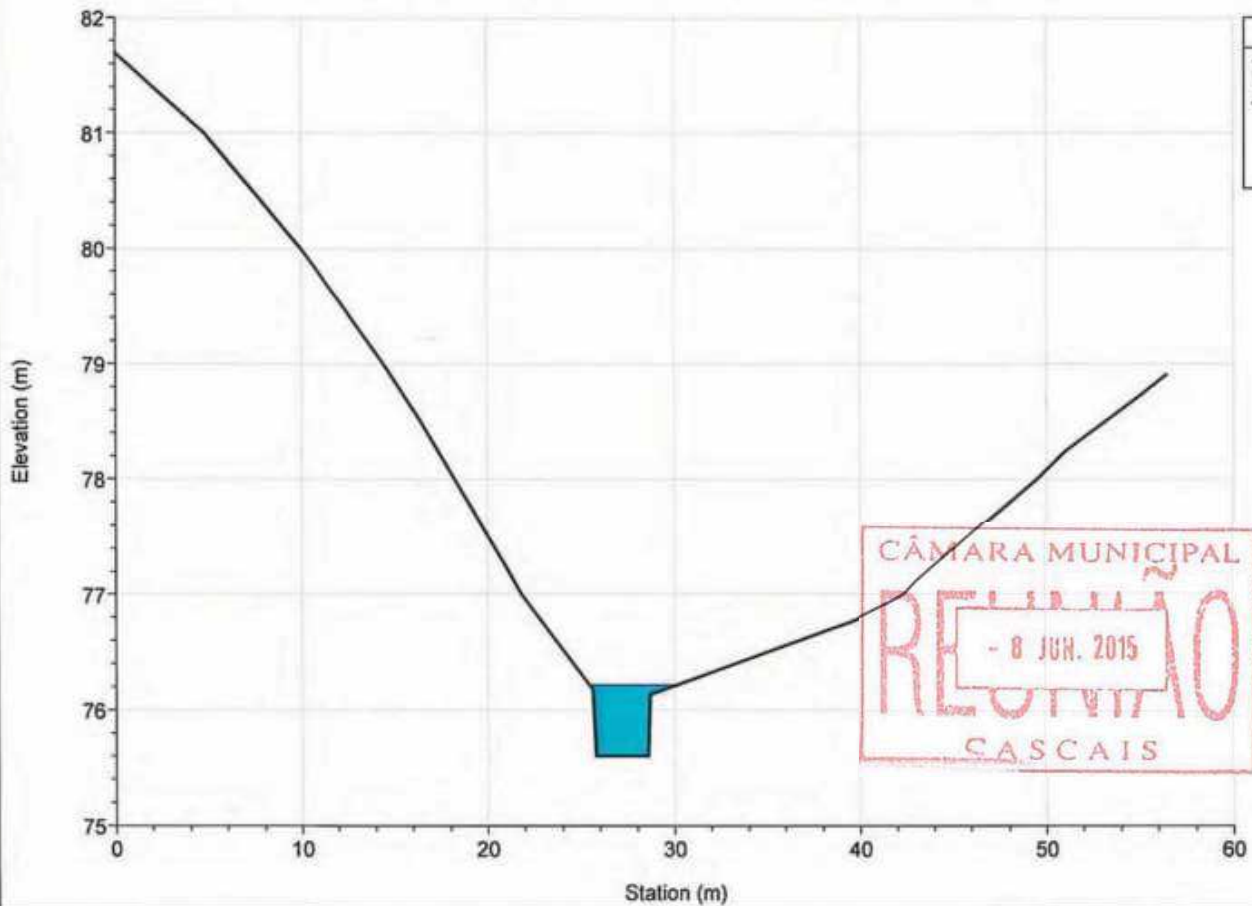


River = MD2 Reach = afluyente RS = 278.151



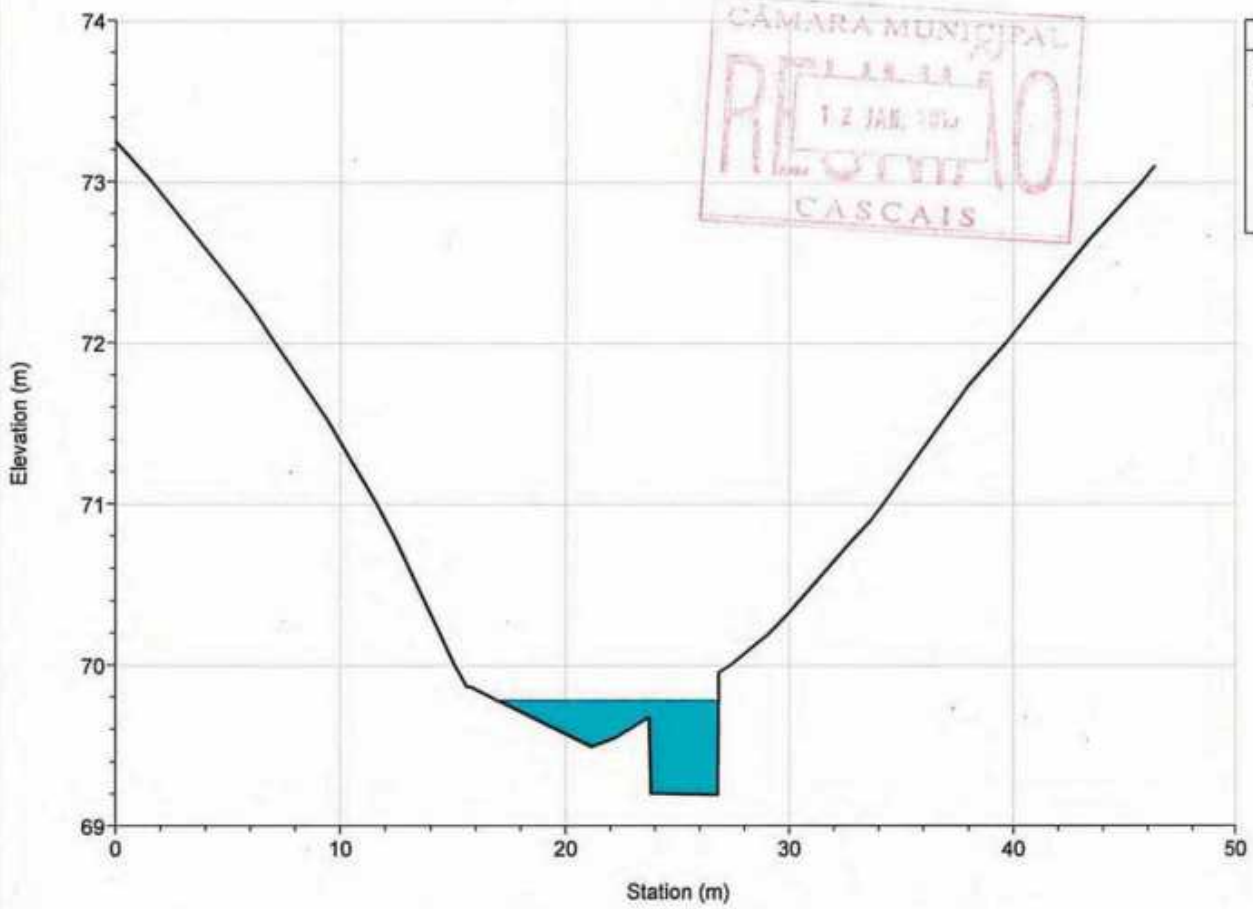
Legend
WS T=100 anos
Ground
Bank Sta

River = MD2 Reach = afluyente RS = 186.093

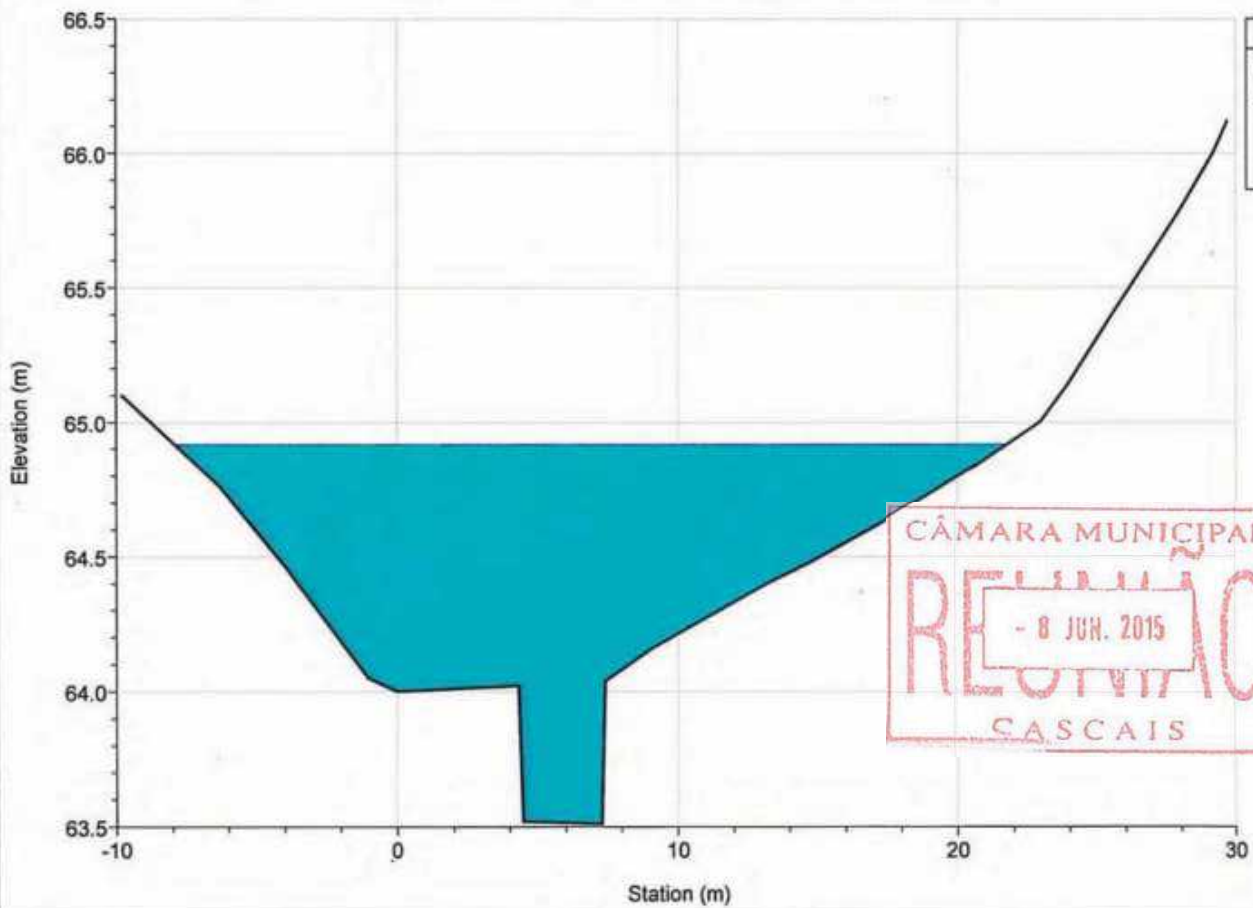


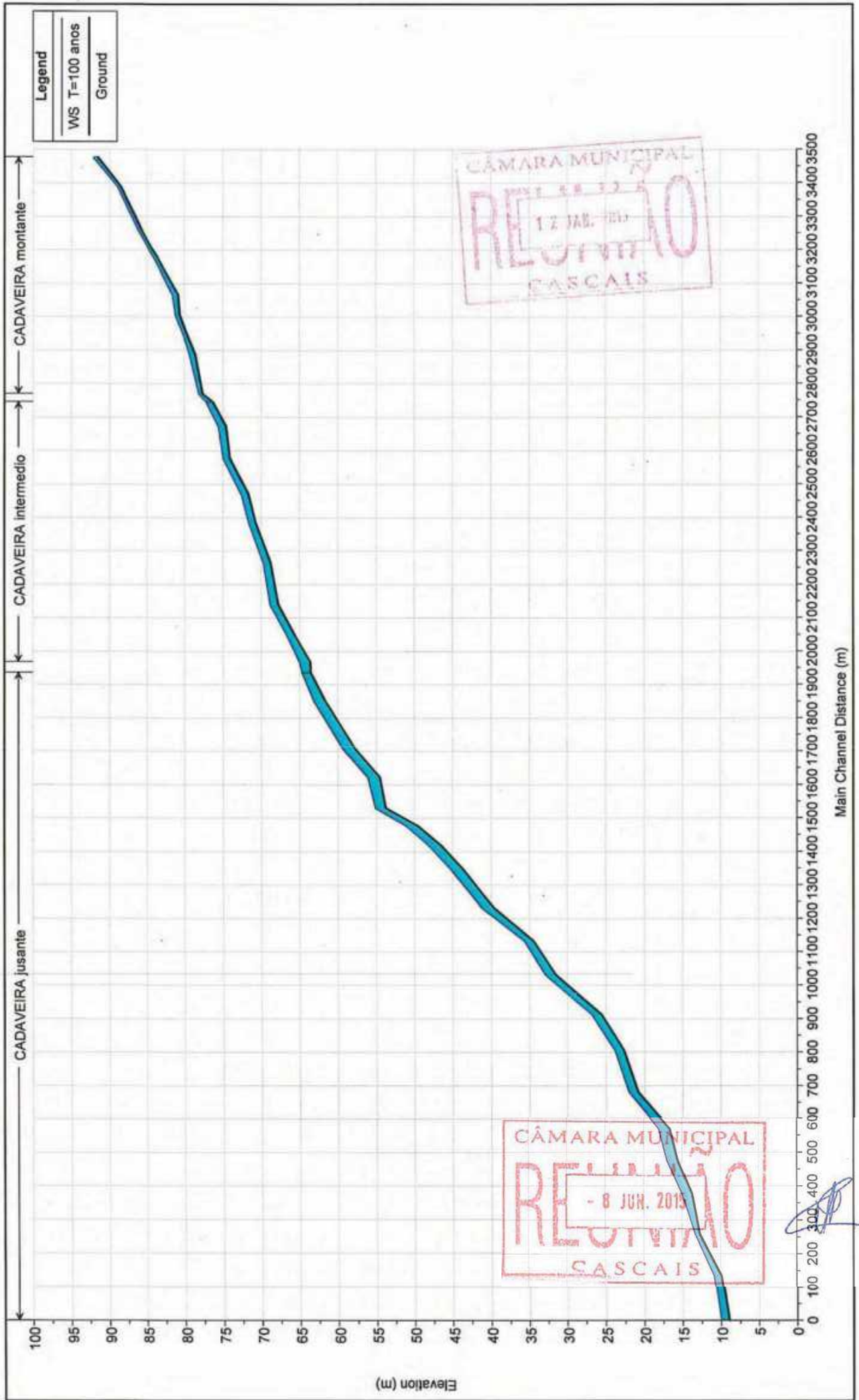
Legend
WS T=100 anos
Ground
Bank Sta

River = MD2 Reach = afluente RS = 98.037



River = MD2 Reach = afluente RS = 18.673

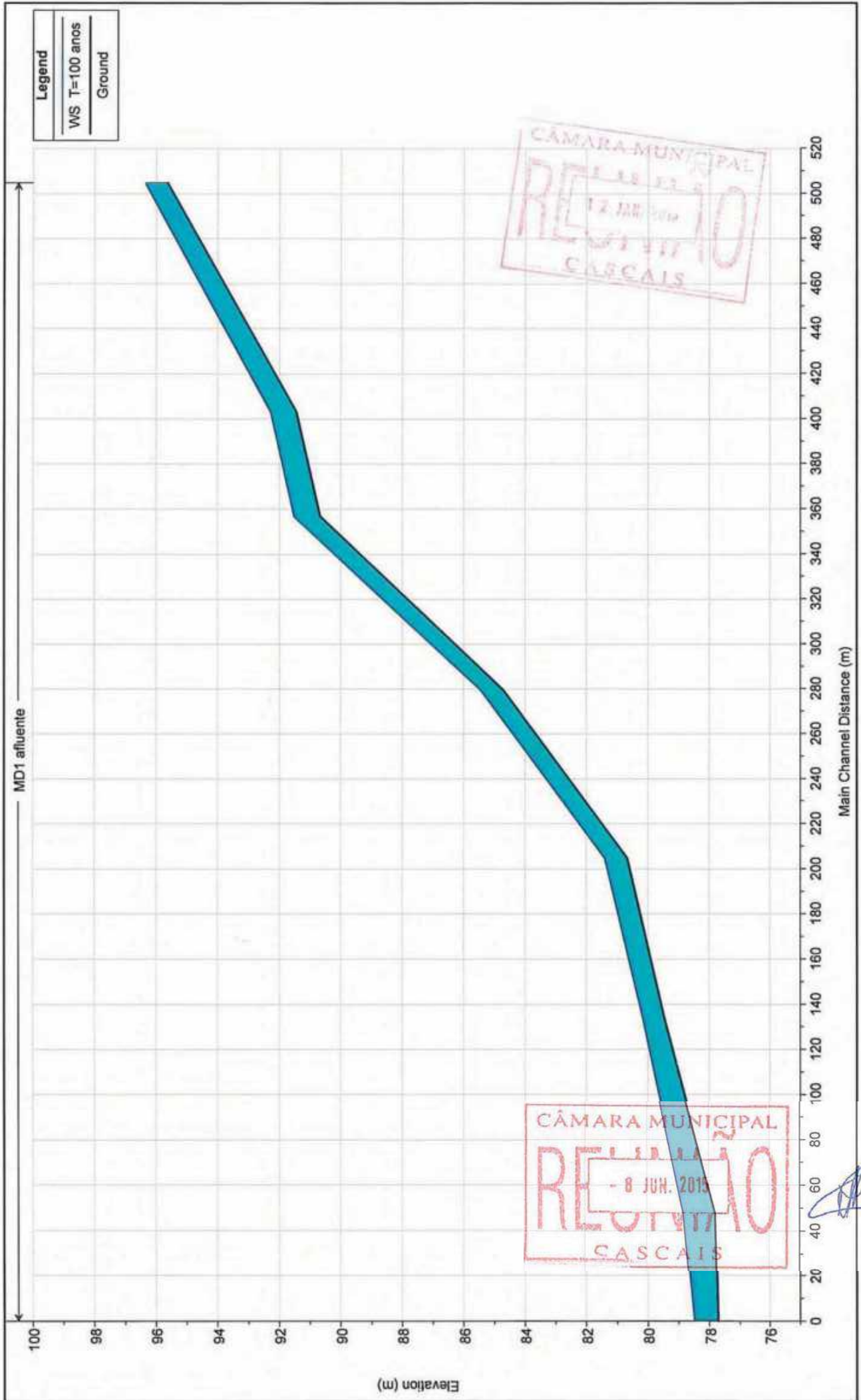


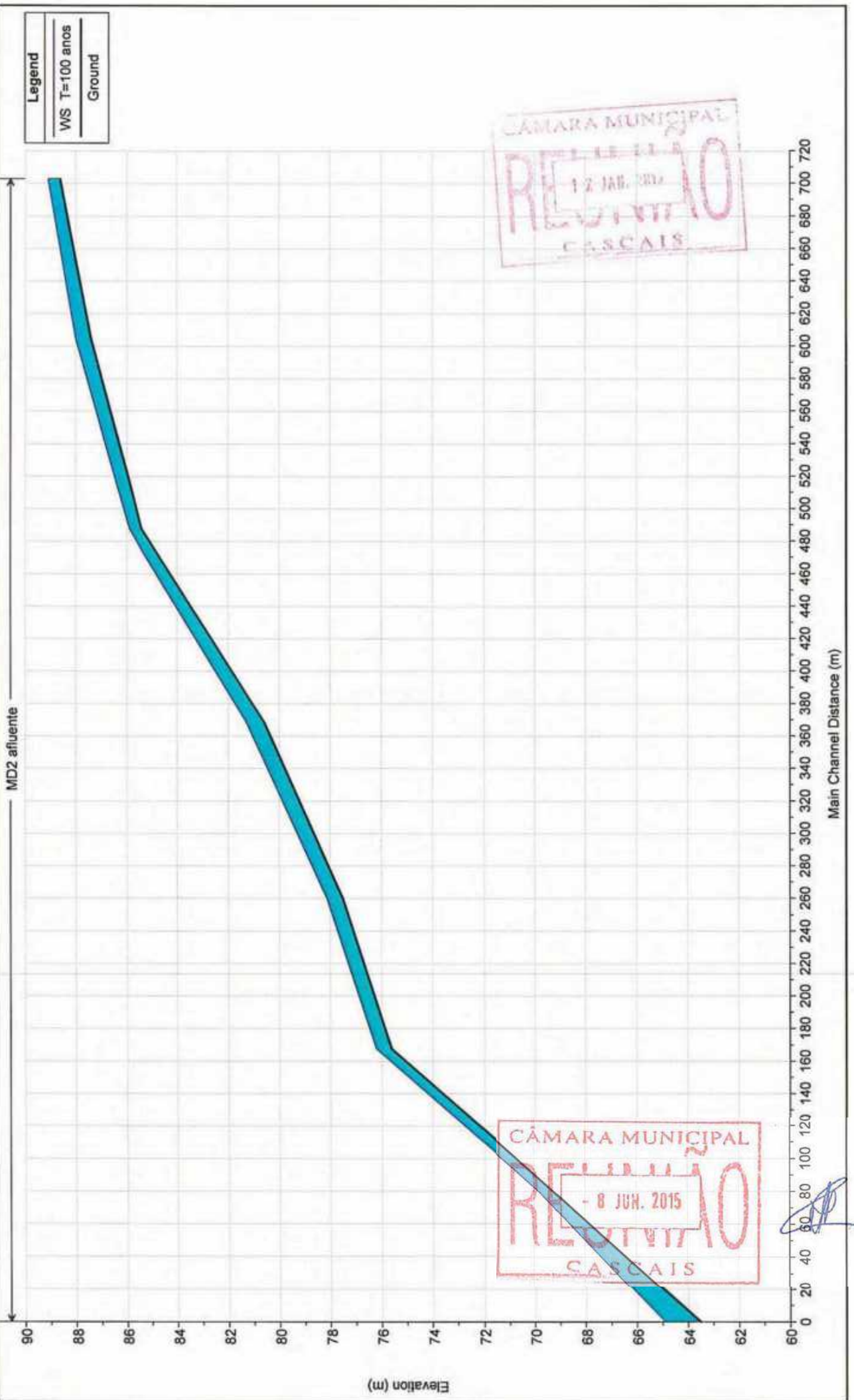


Legend	
WS T=100 anos	(Blue line)
Ground	(Black line)

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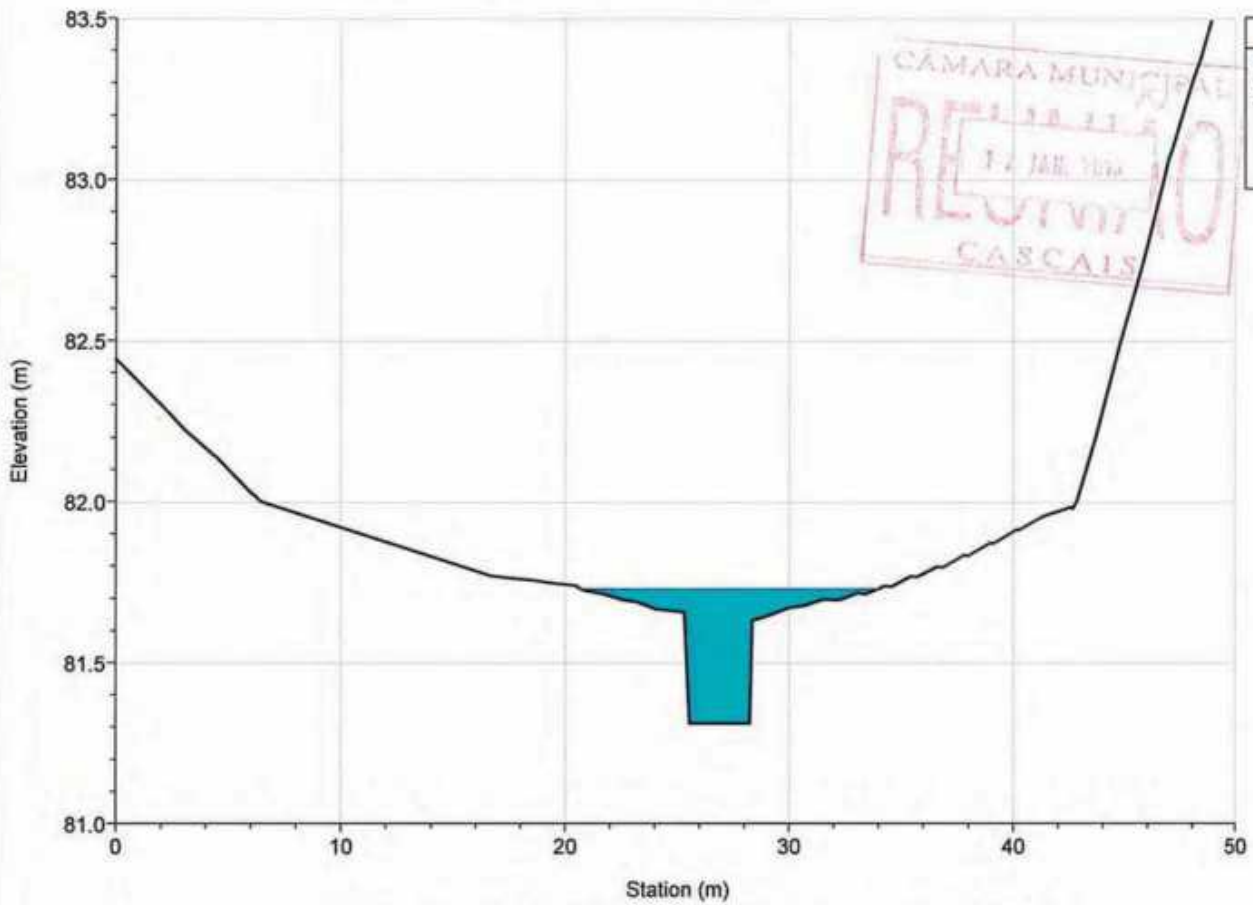
CÂMARA MUNICIPAL  
 REQUINIAO  
 - 8 JUN. 2013  
 CASCAIS



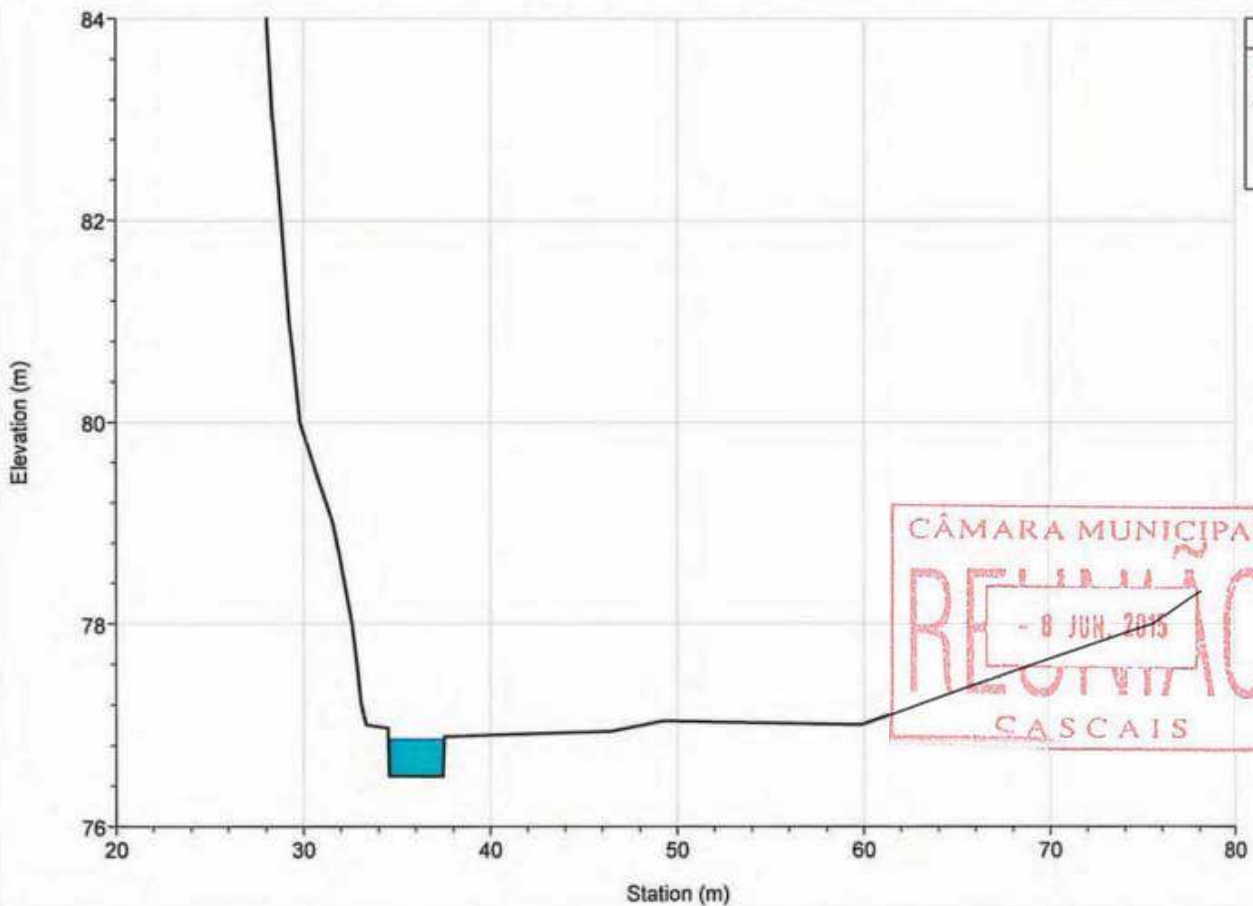




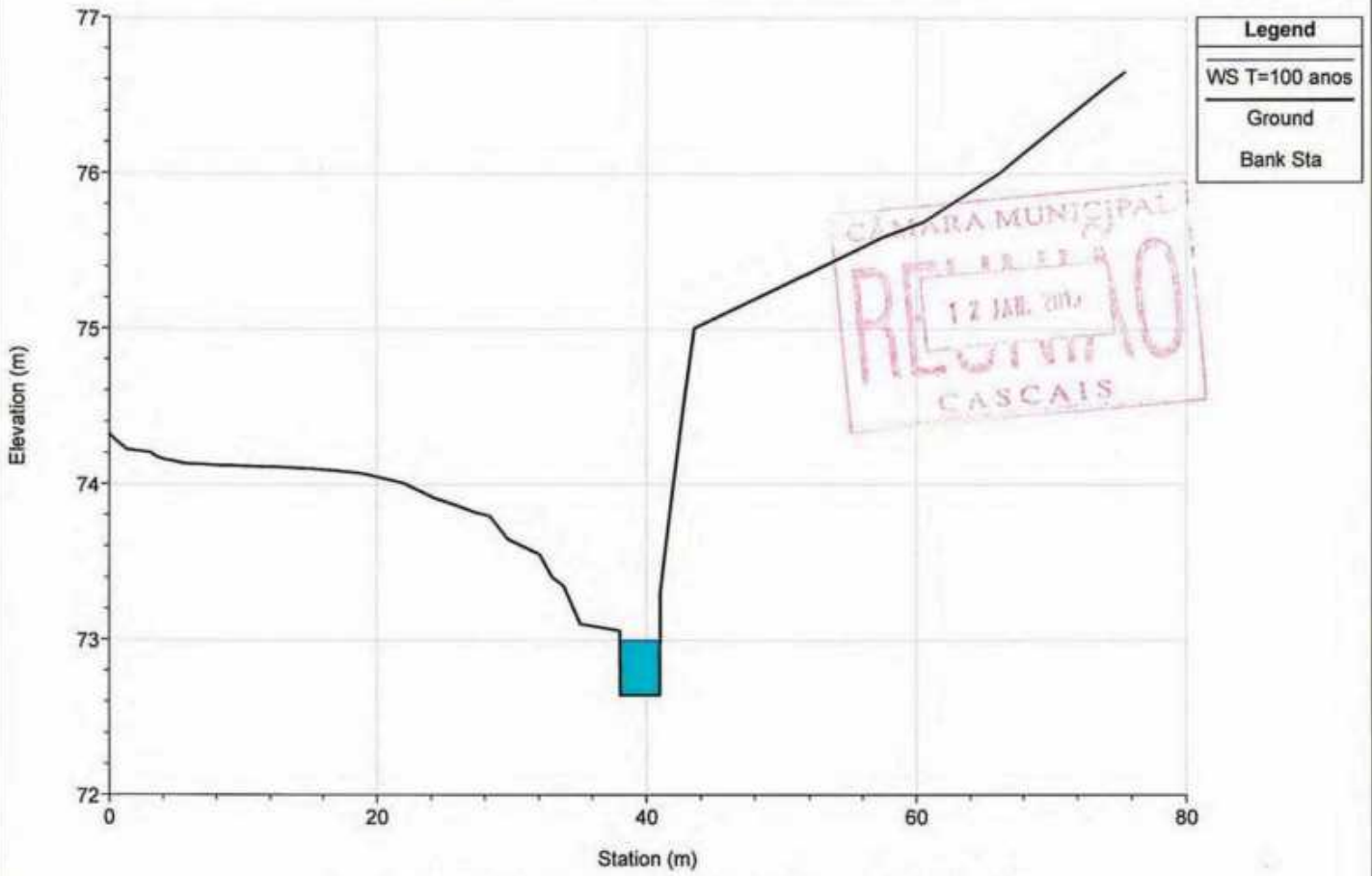
River = CASTELHANA Reach = montante RS = 2672.606



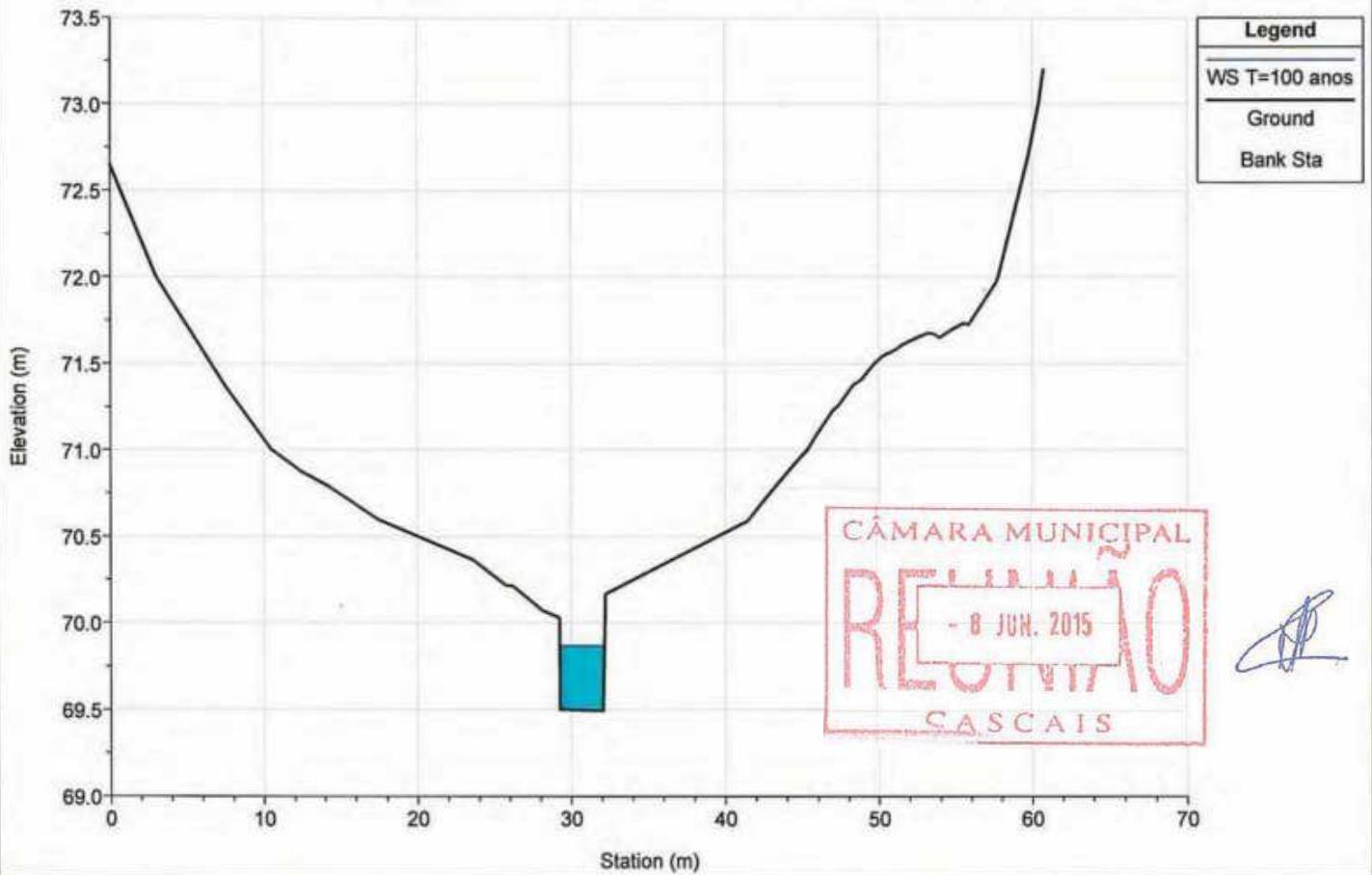
River = CASTELHANA Reach = montante RS = 2575.908



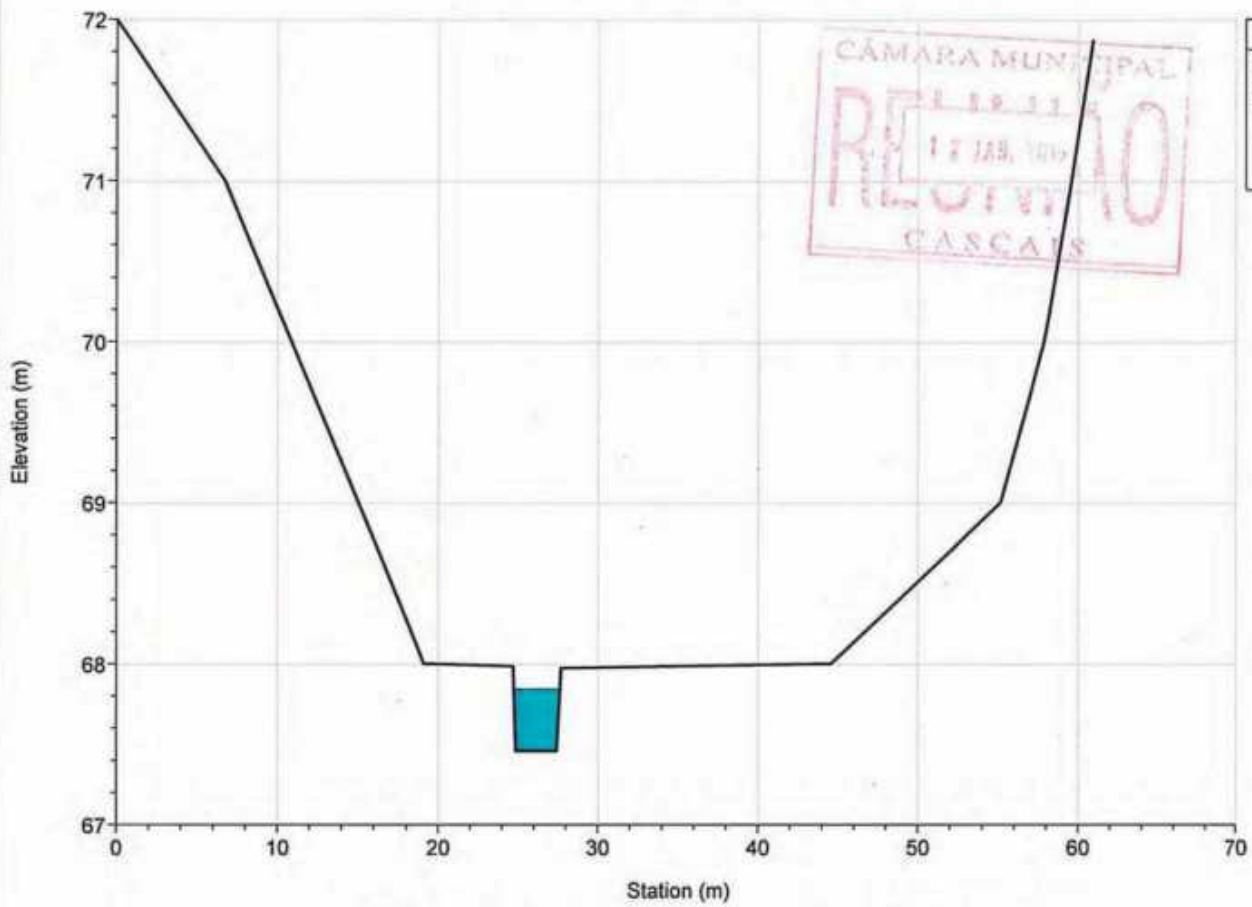
River = CASTELHANA Reach = montante RS = 2490.282



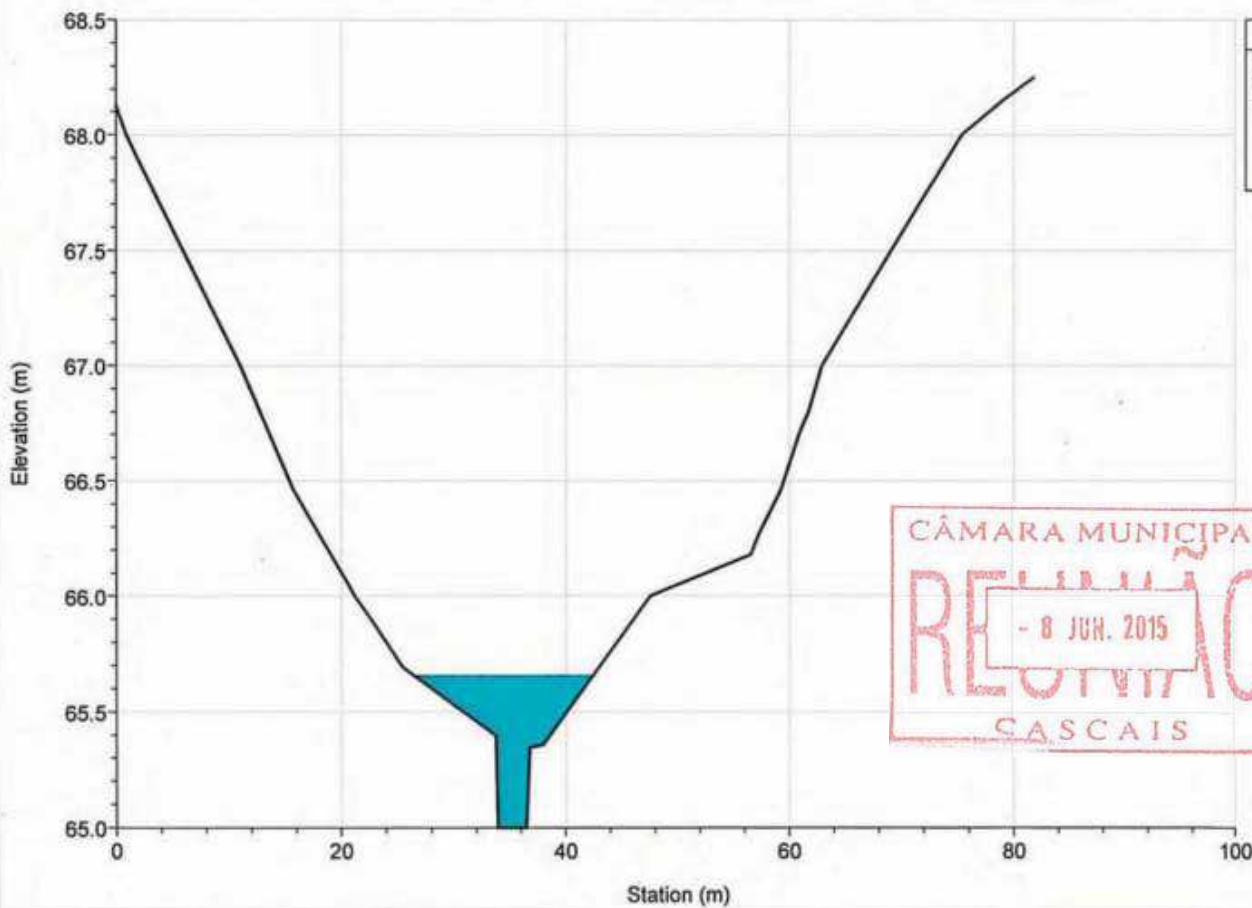
River = CASTELHANA Reach = montante RS = 2387.604



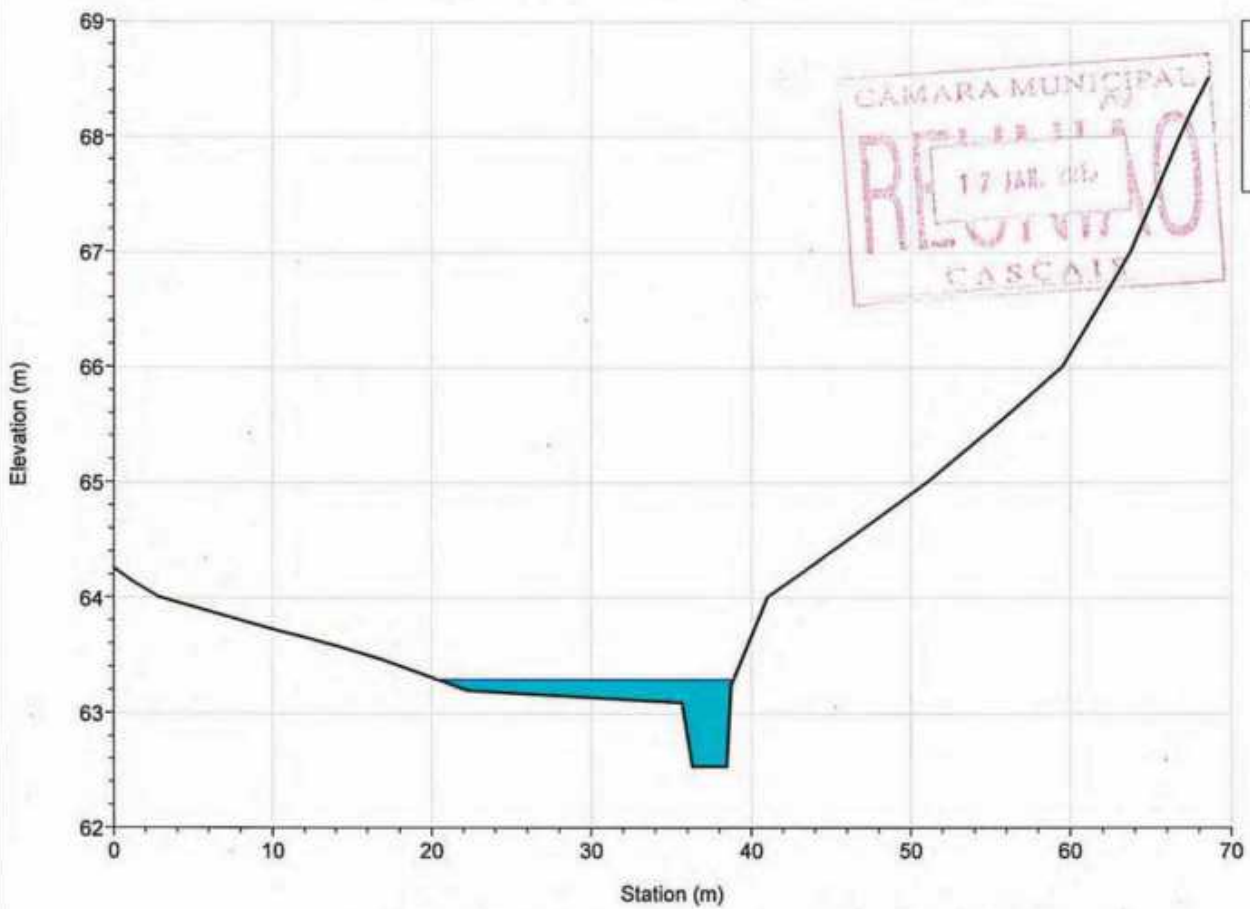
River = CASTELHANA Reach = montante RS = 2303.478



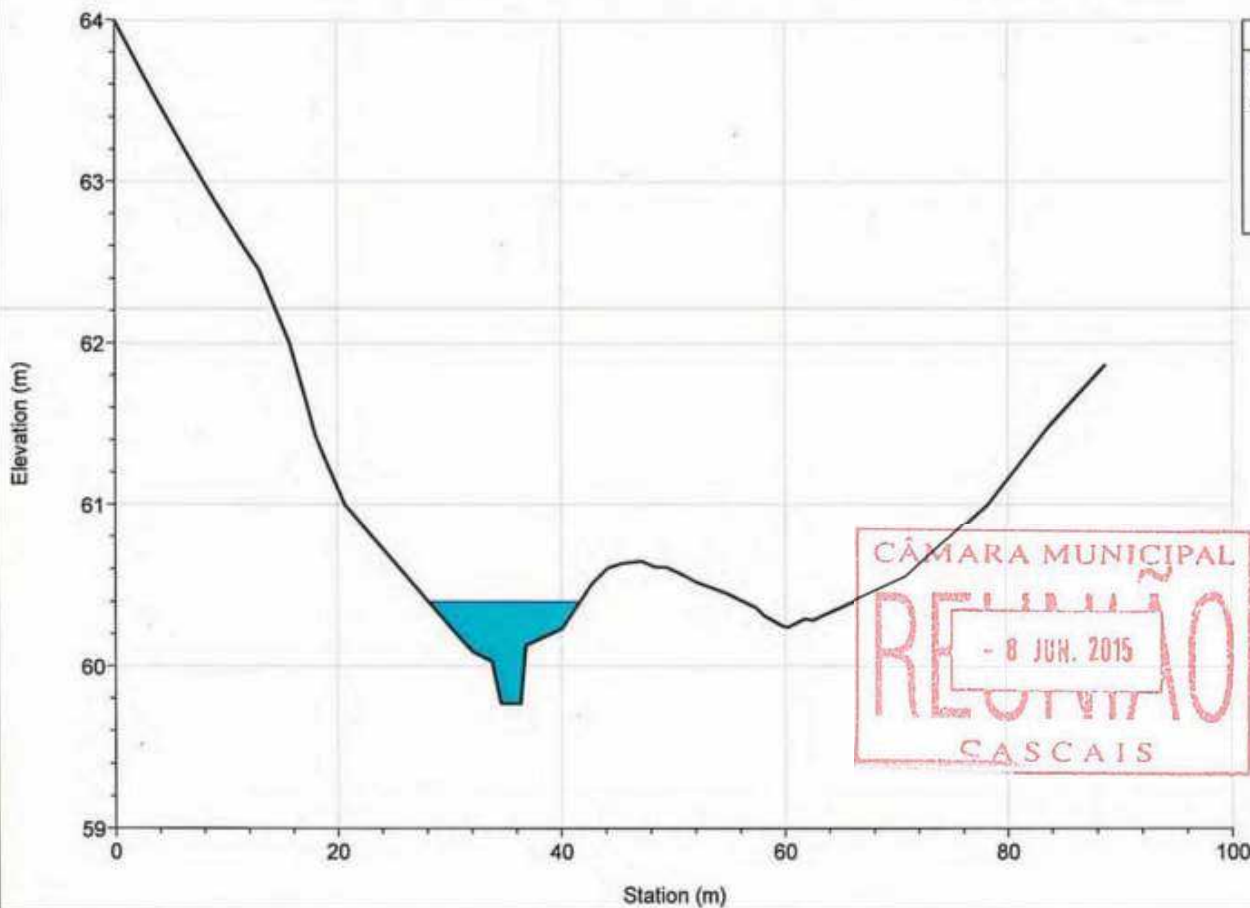
River = CASTELHANA Reach = montante RS = 2200.190



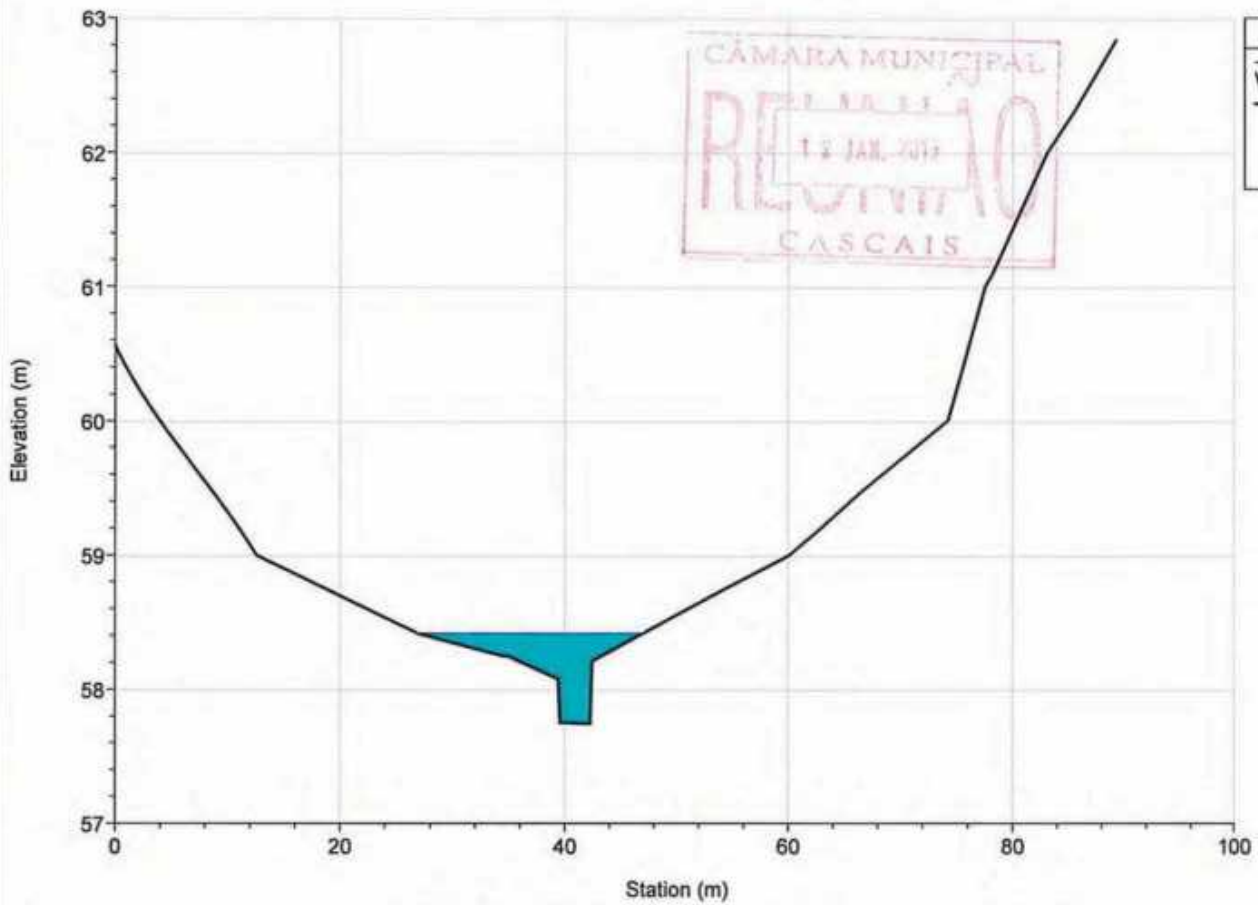
River = CASTELHANA Reach = montante RS = 2120.256



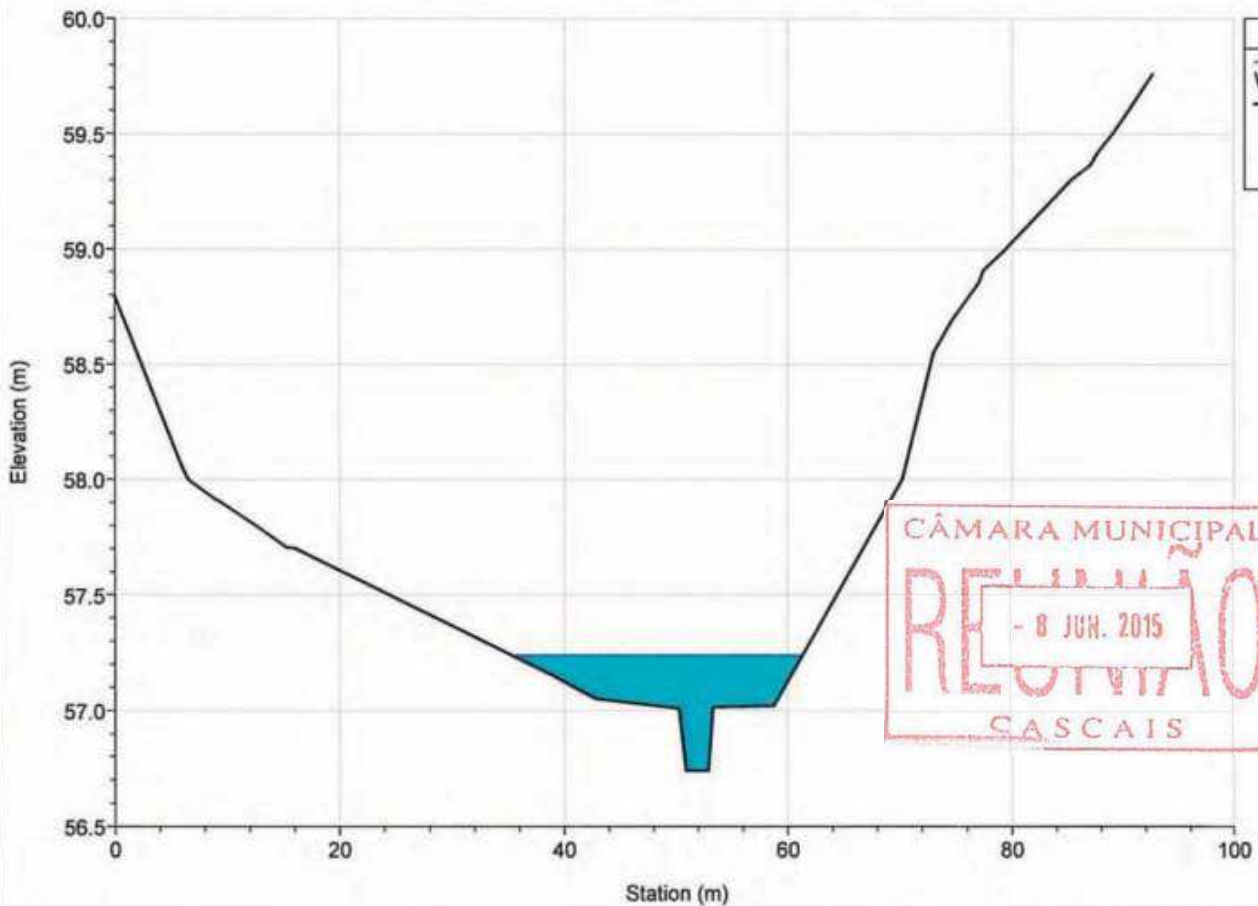
River = CASTELHANA Reach = montante RS = 1987.955



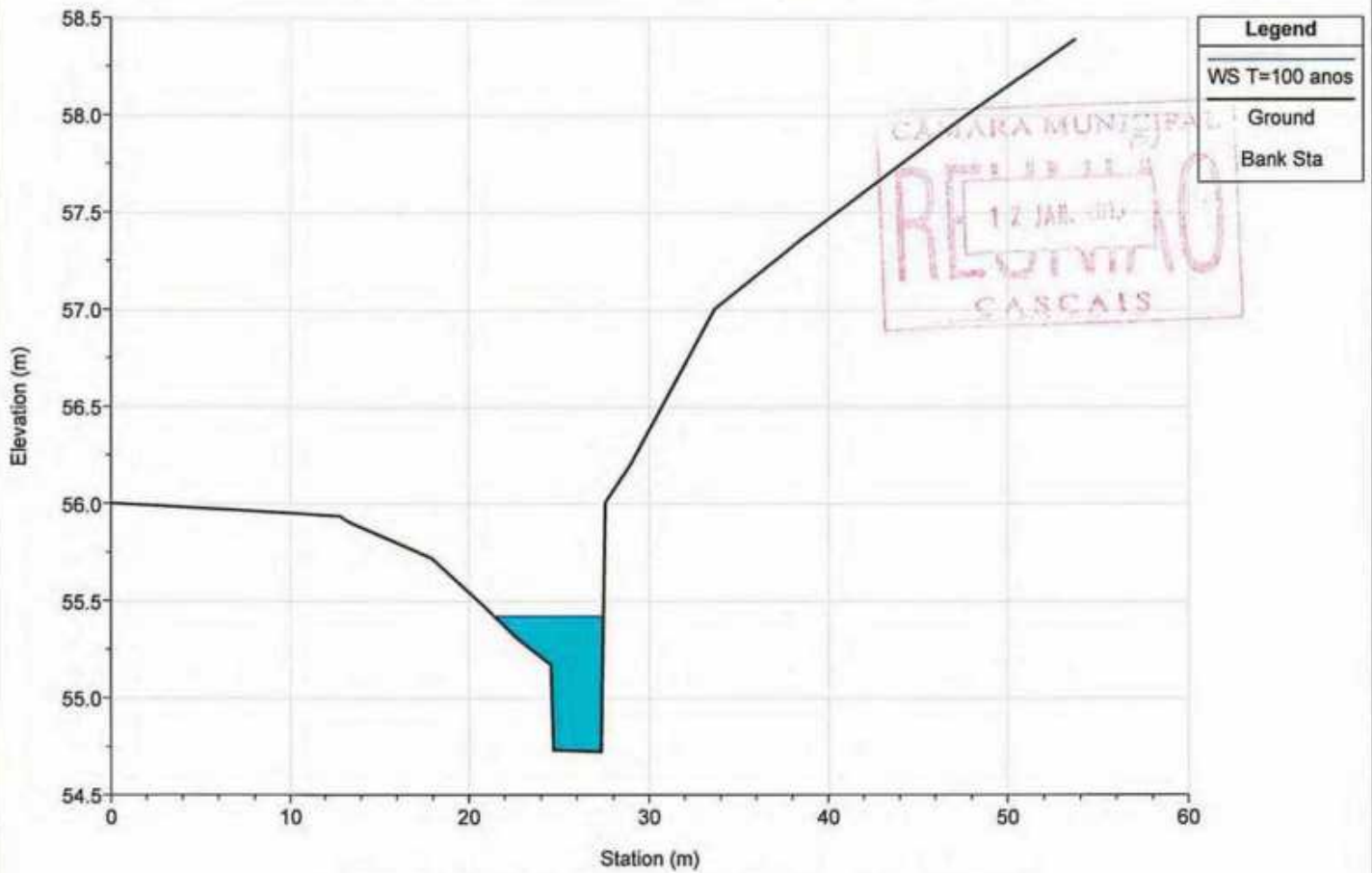
River = CASTELHANA Reach = montante RS = 1891.308



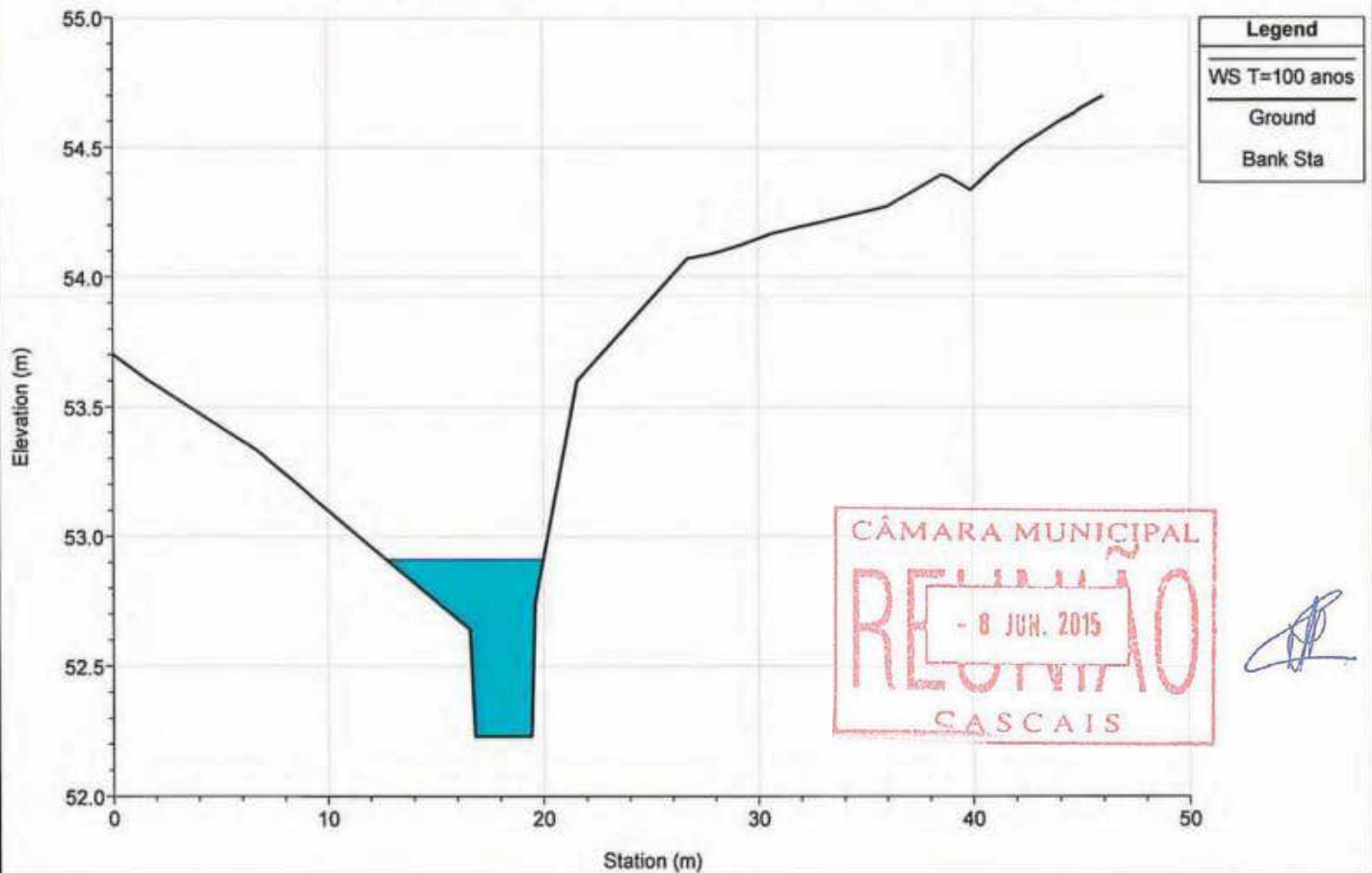
River = CASTELHANA Reach = montante RS = 1798.775



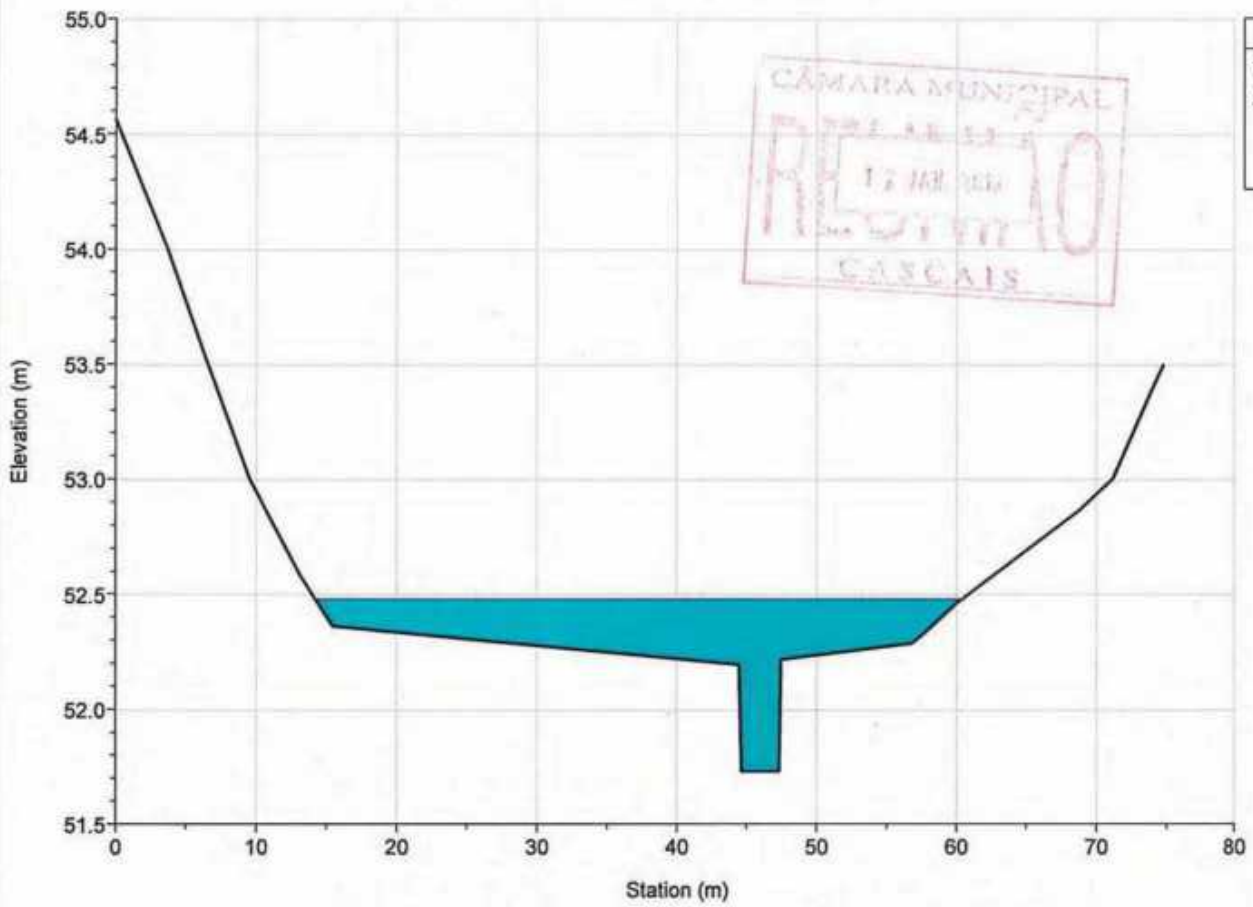
River = CASTELHANA Reach = montante RS = 1702.959



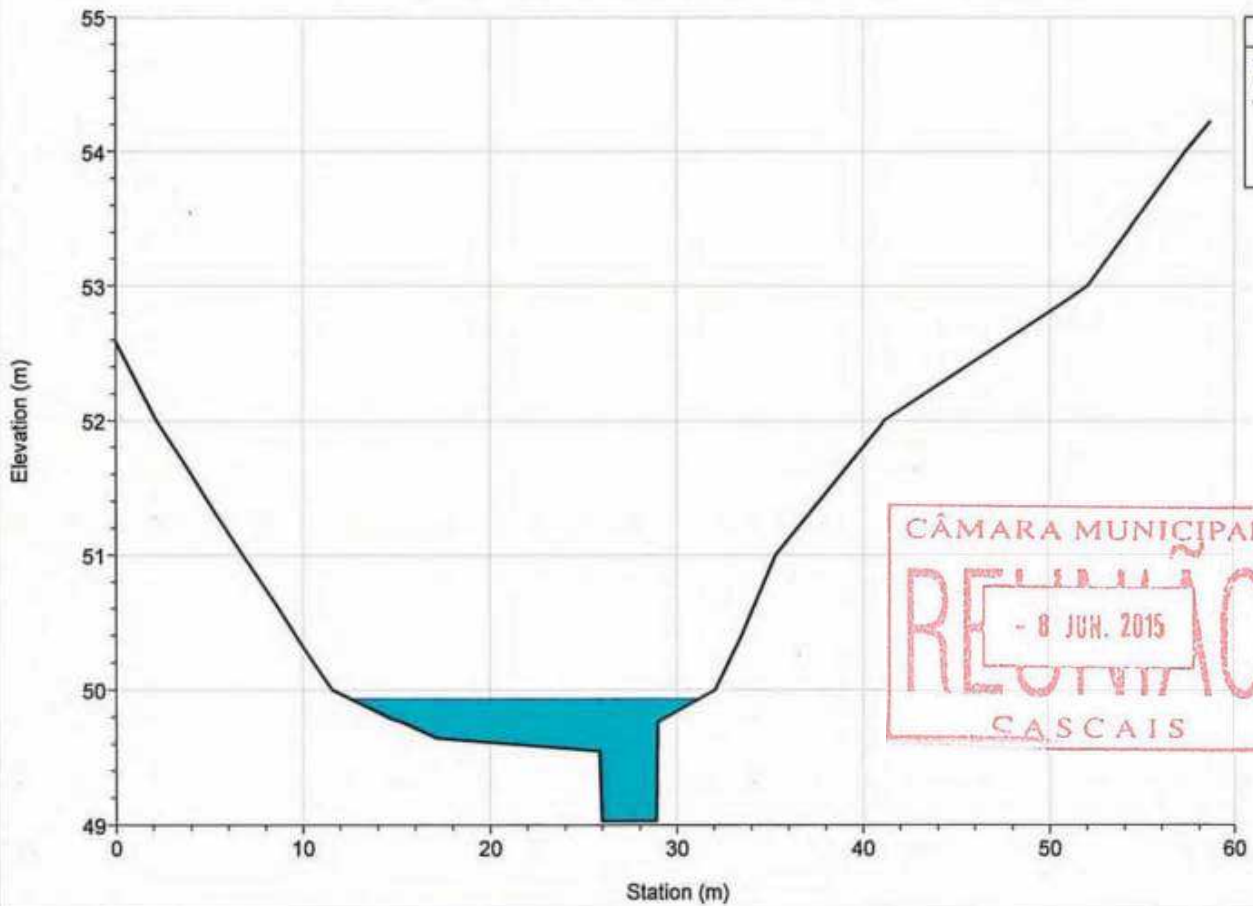
River = CASTELHANA Reach = montante RS = 1621.544



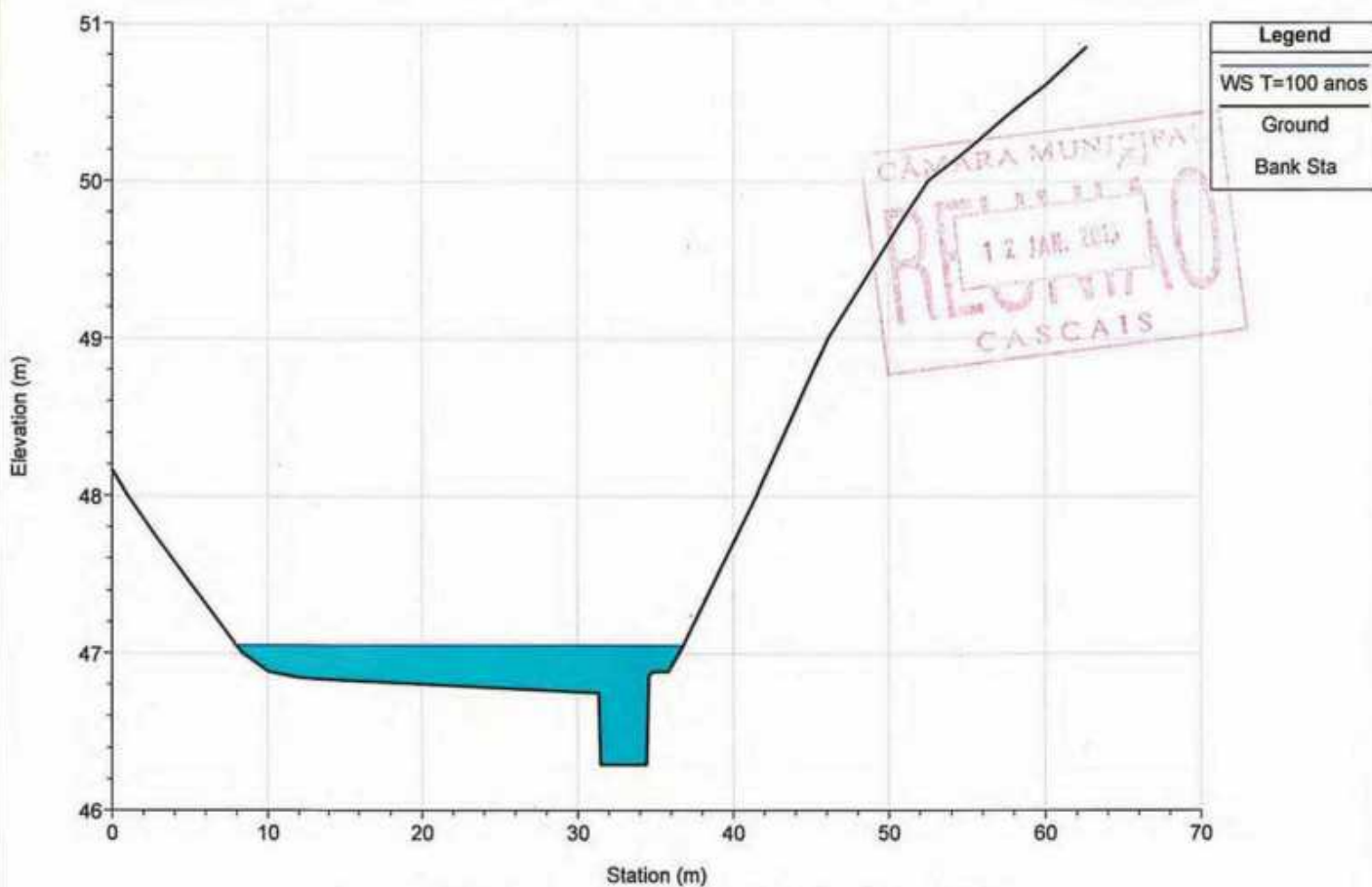
River = CASTELHANA Reach = jusante RS = 1579.754



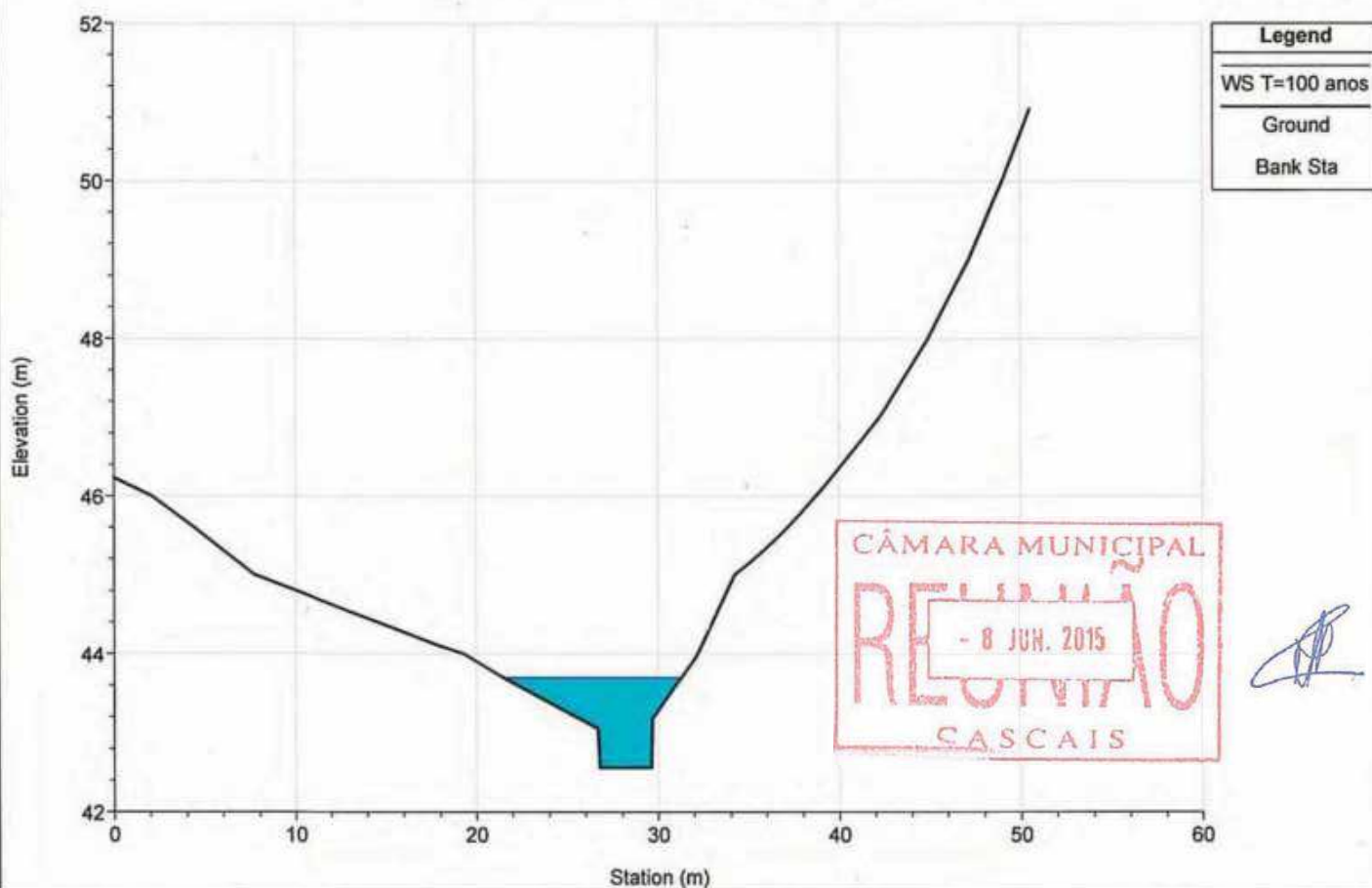
River = CASTELHANA Reach = jusante RS = 1505.965



River = CASTELHANA Reach = jusante RS = 1413.274

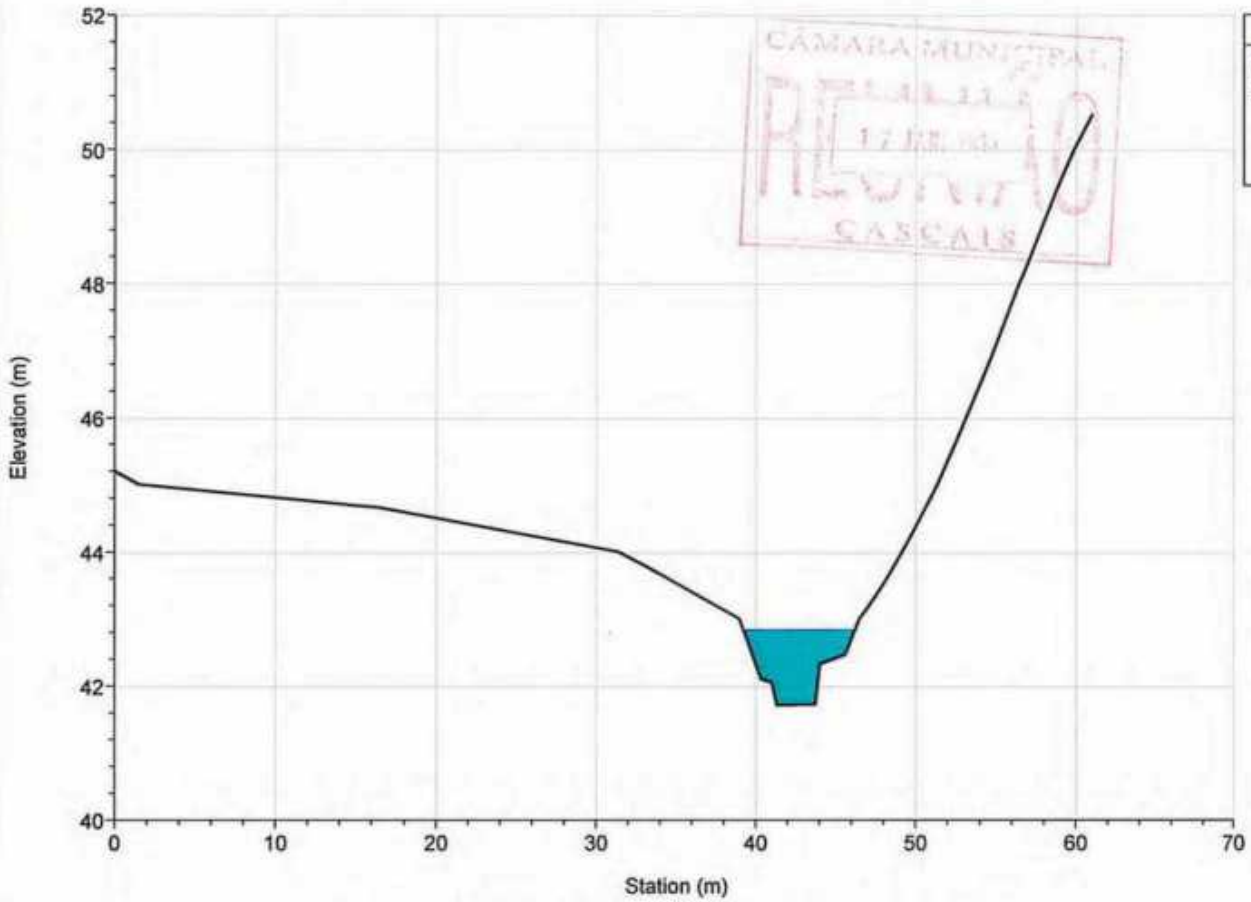


River = CASTELHANA Reach = jusante RS = 1323.475

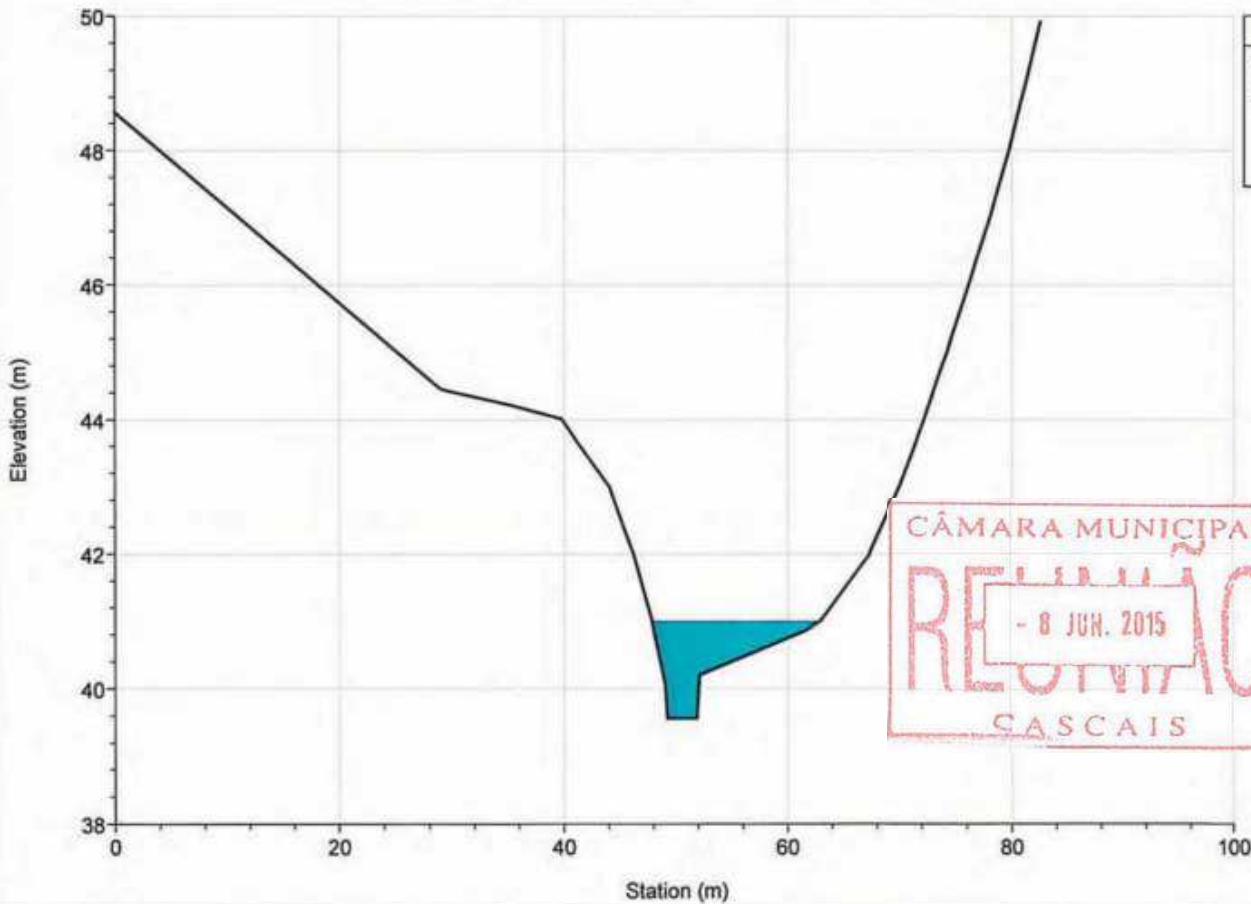




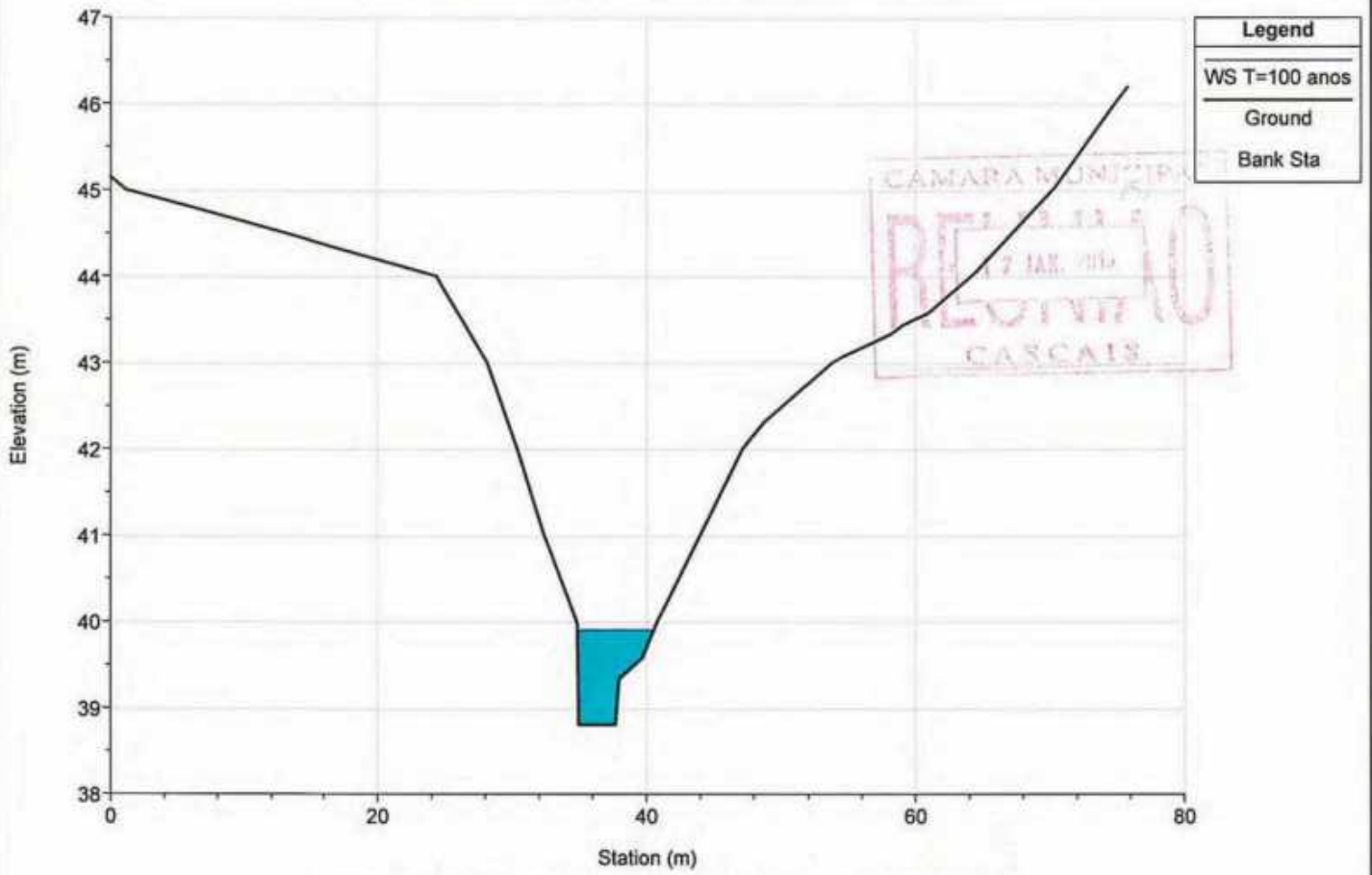
River = CASTELHANA Reach = jusante RS = 1255.036



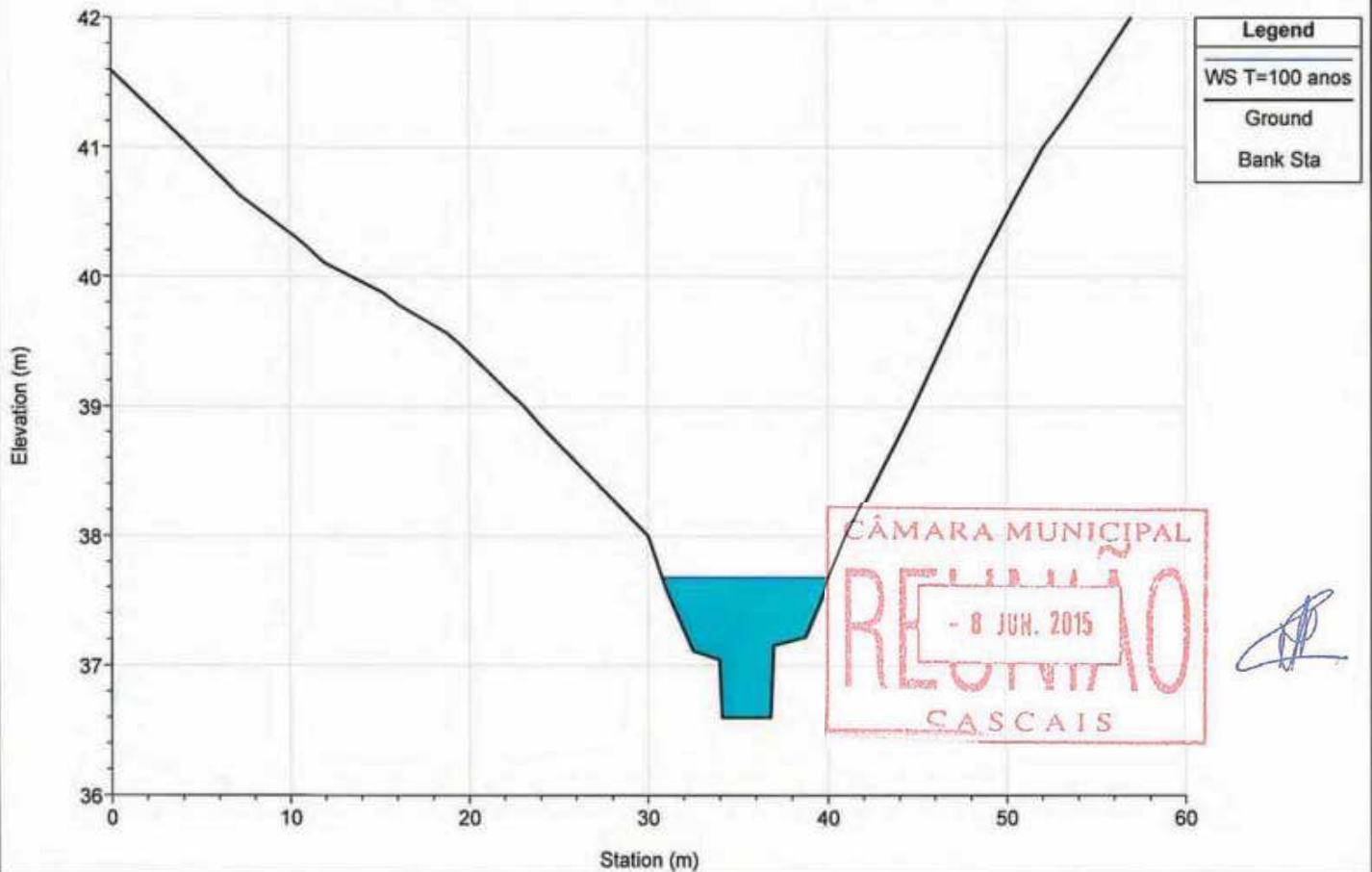
River = CASTELHANA Reach = jusante RS = 1180.527



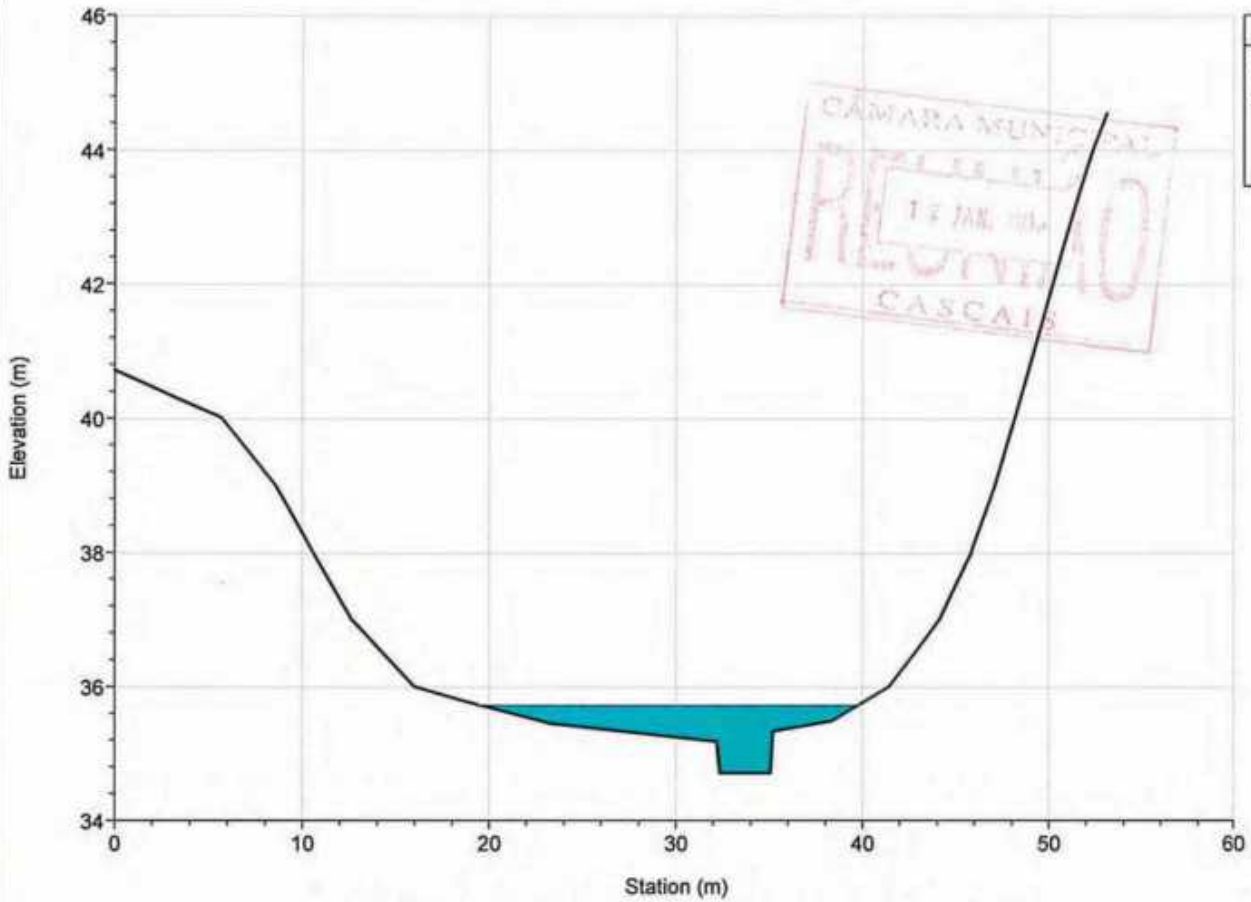
River = CASTELHANA Reach = jusante RS = 1071.628



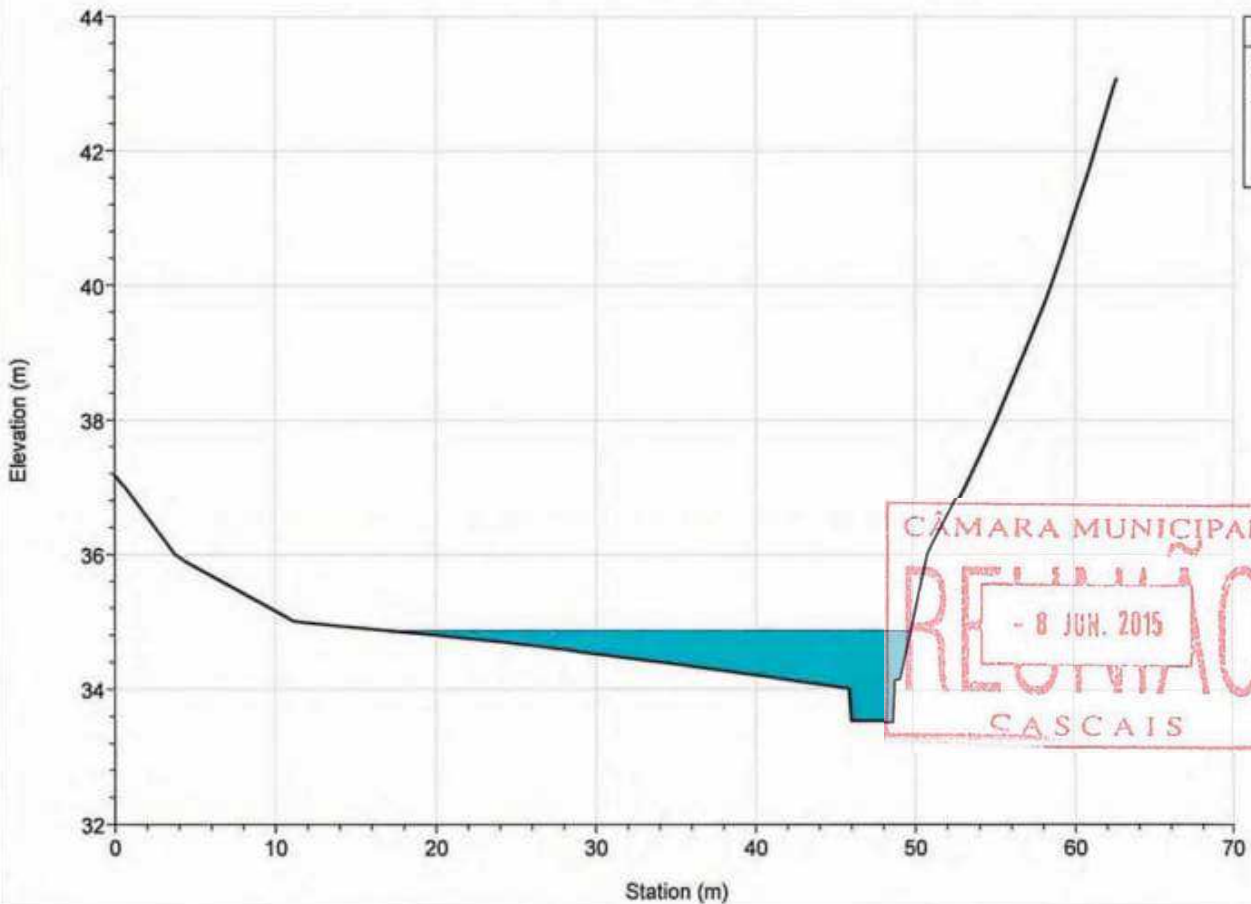
River = CASTELHANA Reach = jusante RS = 949.590



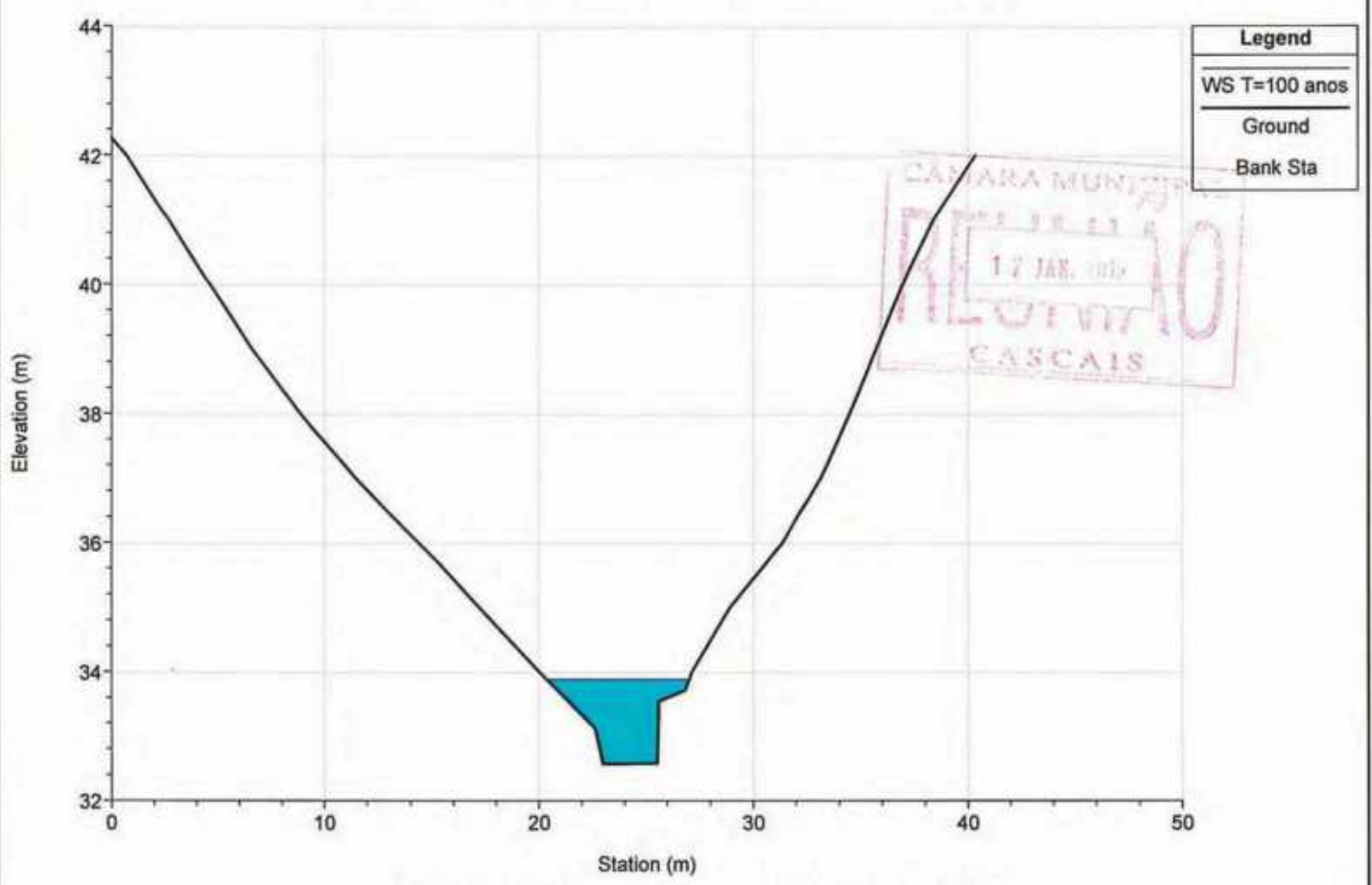
River = CASTELHANA Reach = jusante RS = 852.939



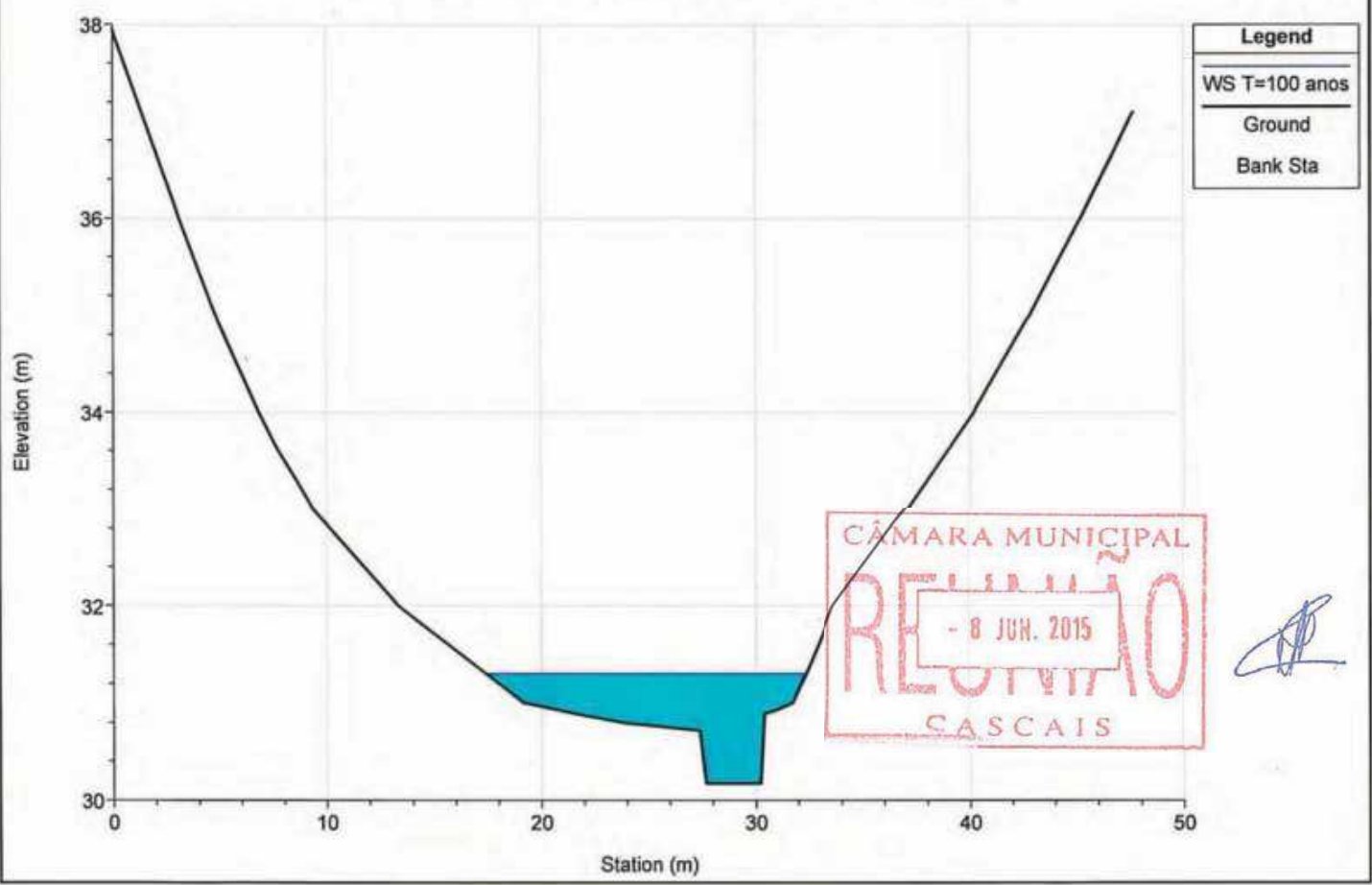
River = CASTELHANA Reach = jusante RS = 770.105



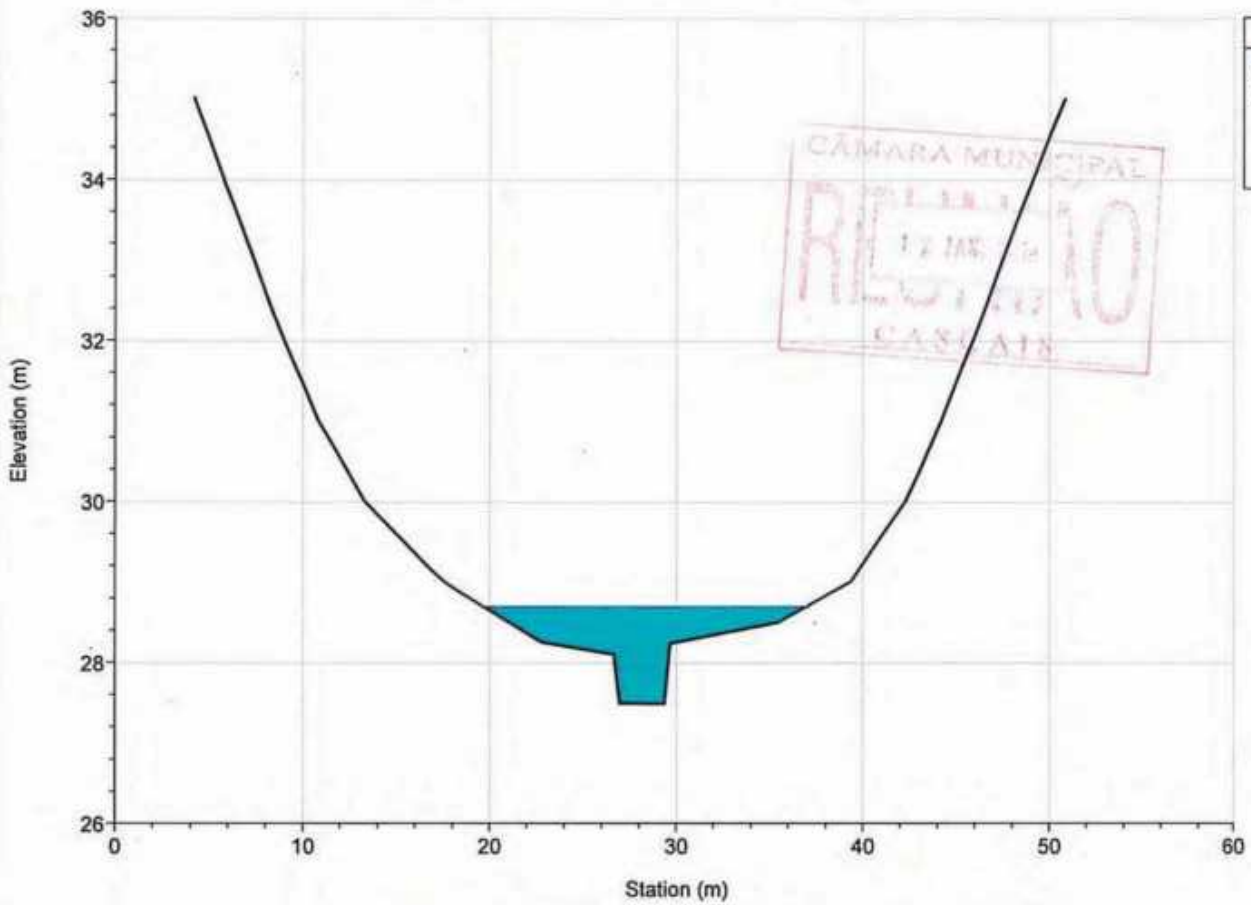
River = CASTELHANA Reach = jusante RS = 659.818



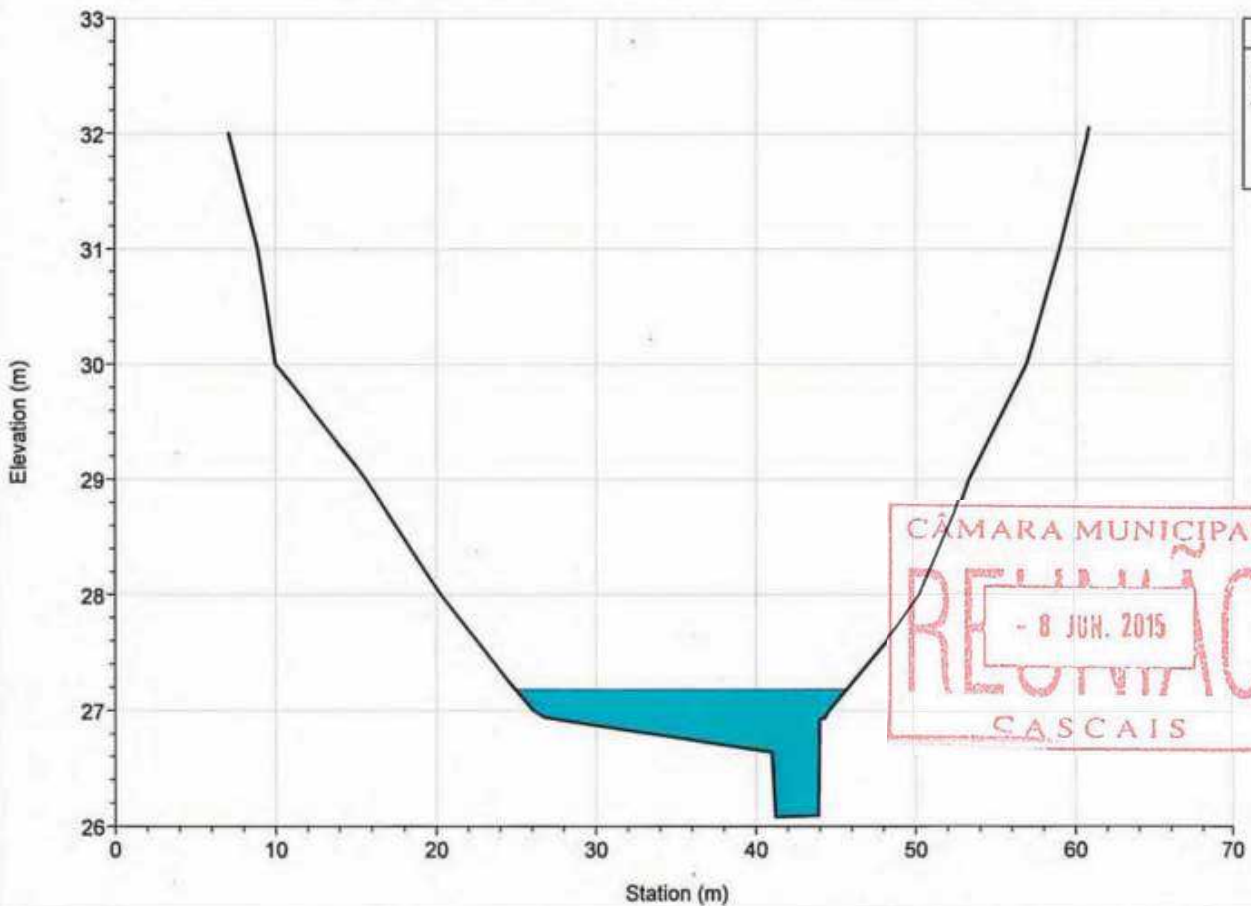
River = CASTELHANA Reach = jusante RS = 559.081



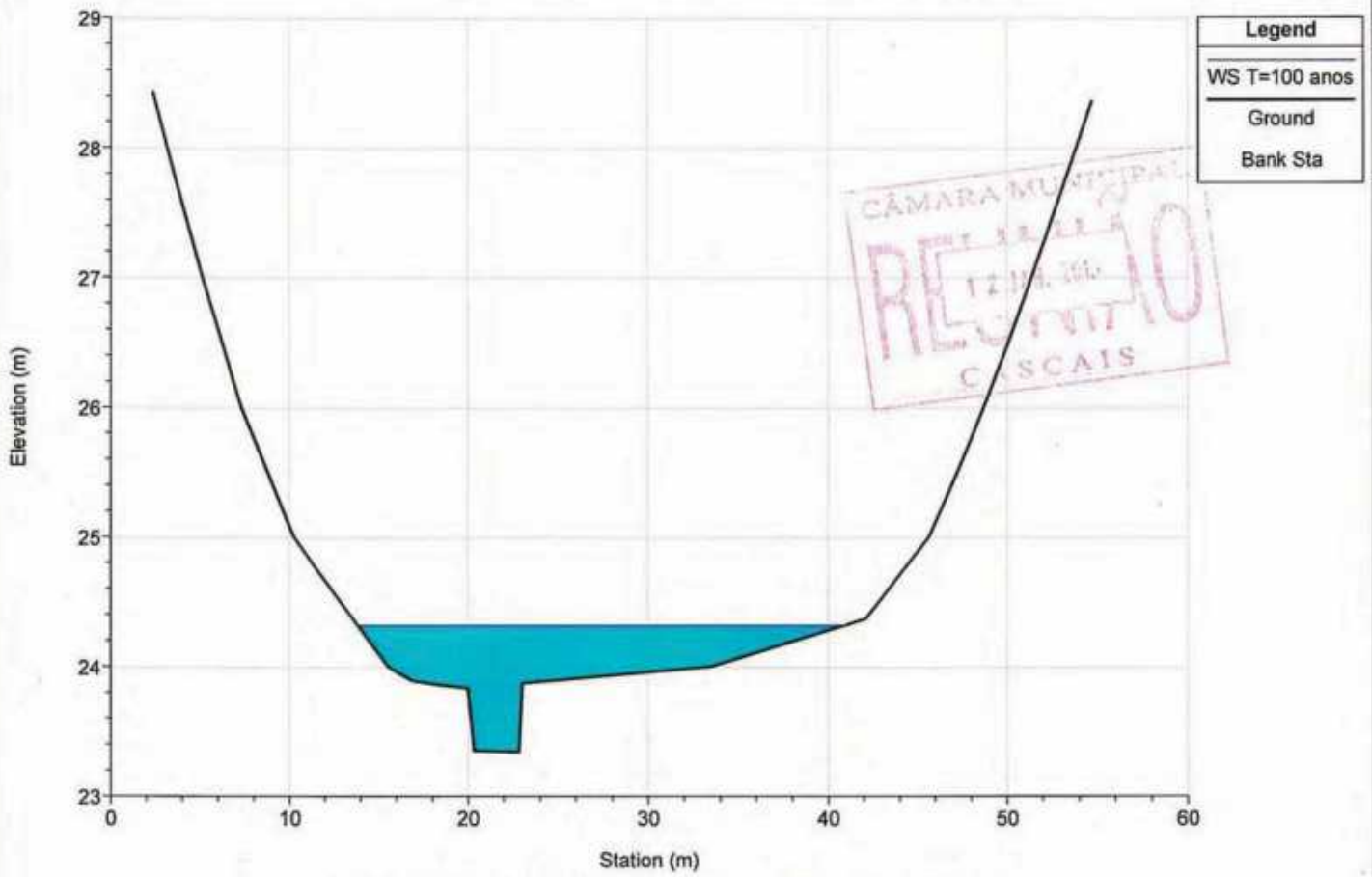
River = CASTELHANA Reach = jusante RS = 444.124



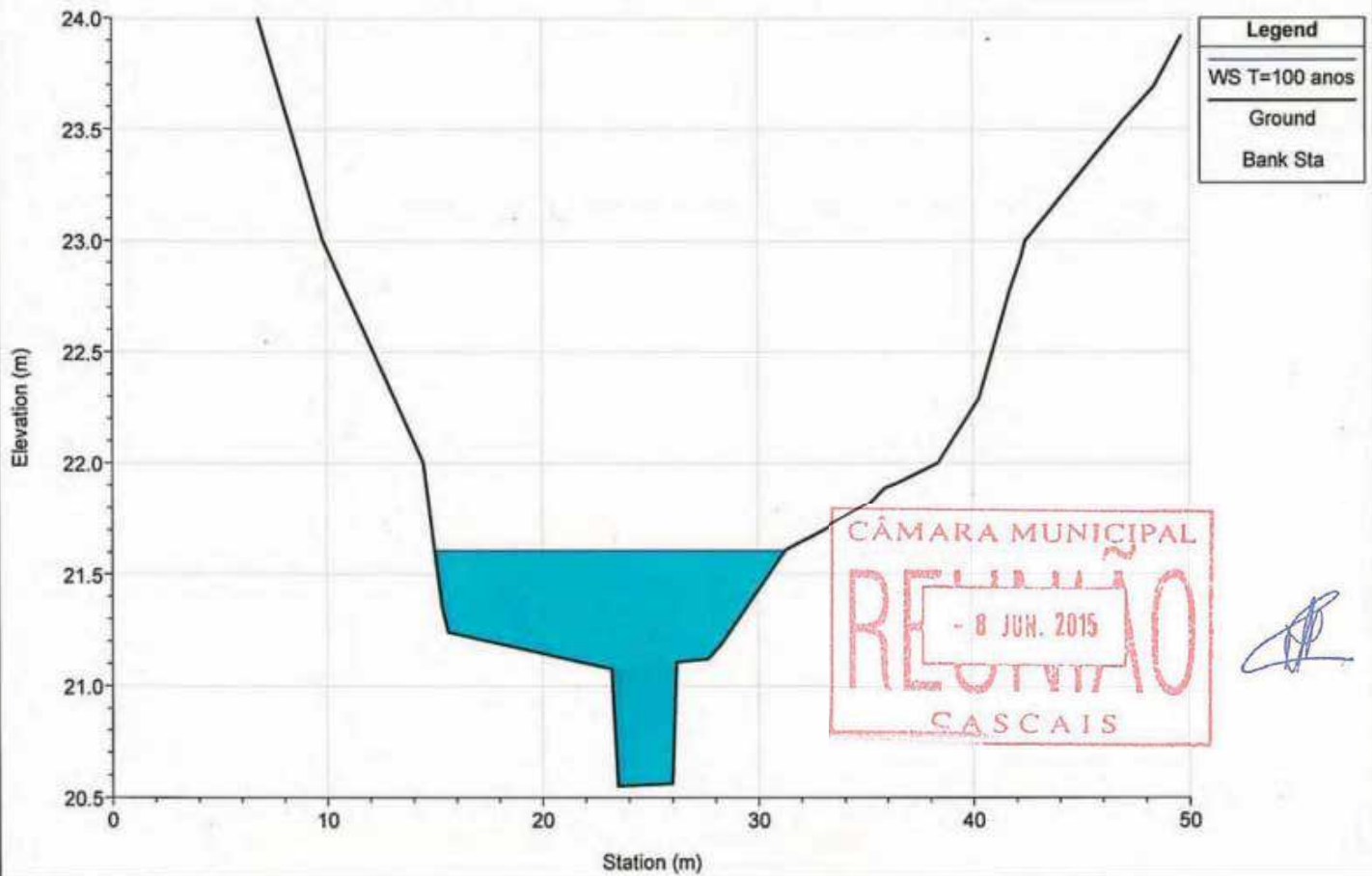
River = CASTELHANA Reach = jusante RS = 362.172



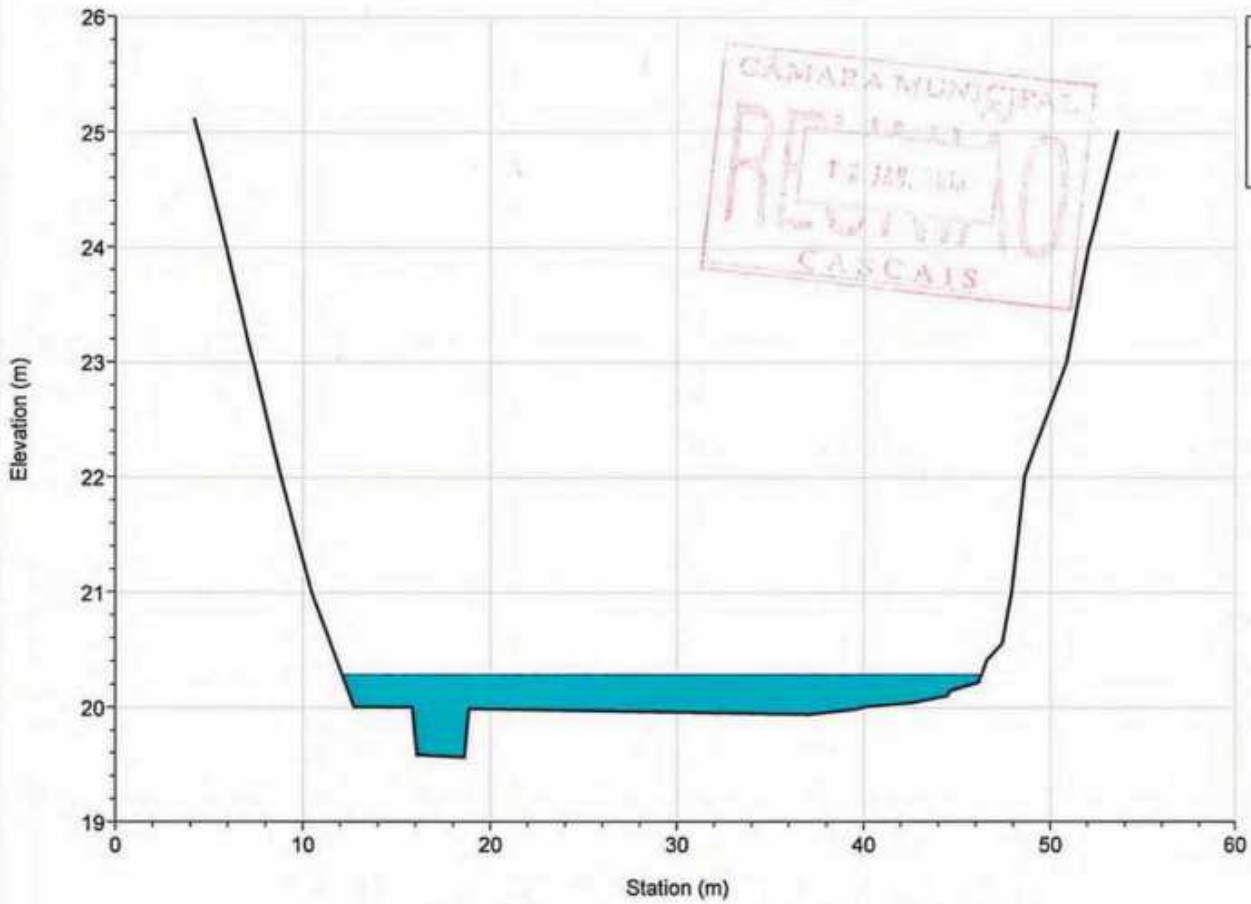
River = CASTELHANA Reach = jusante RS = 258.519



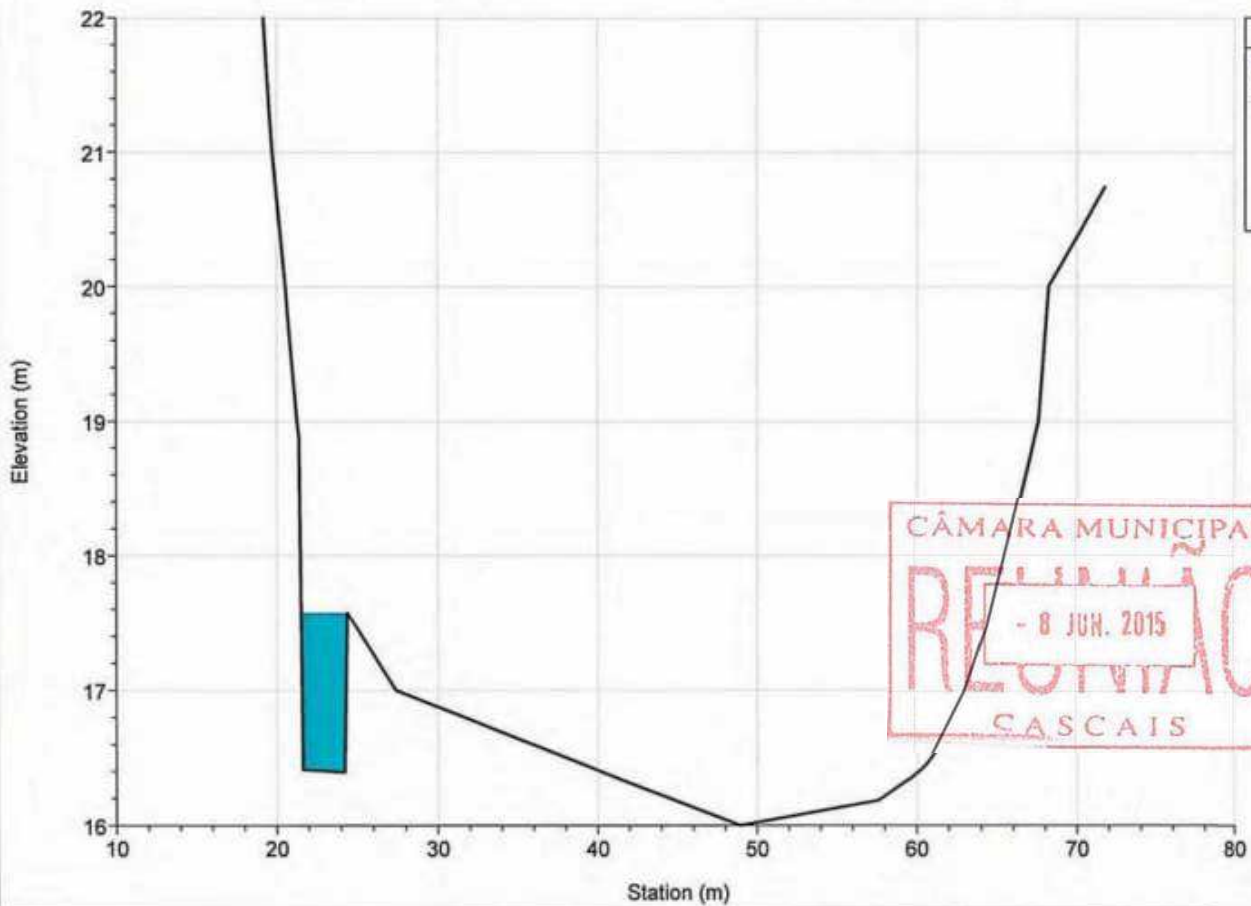
River = CASTELHANA Reach = jusante RS = 161.011



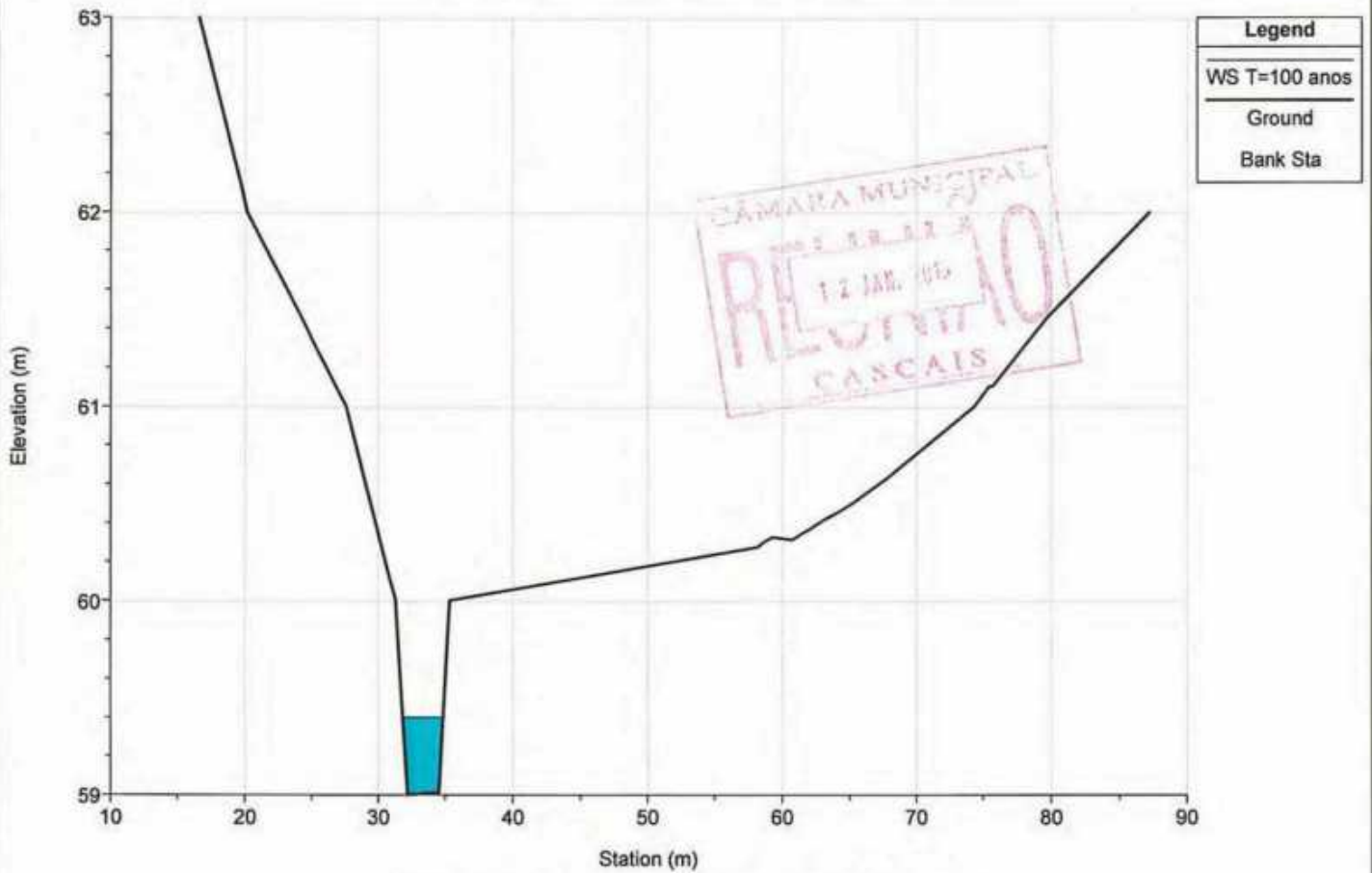
River = CASTELHANA Reach = jusante RS = 83.750



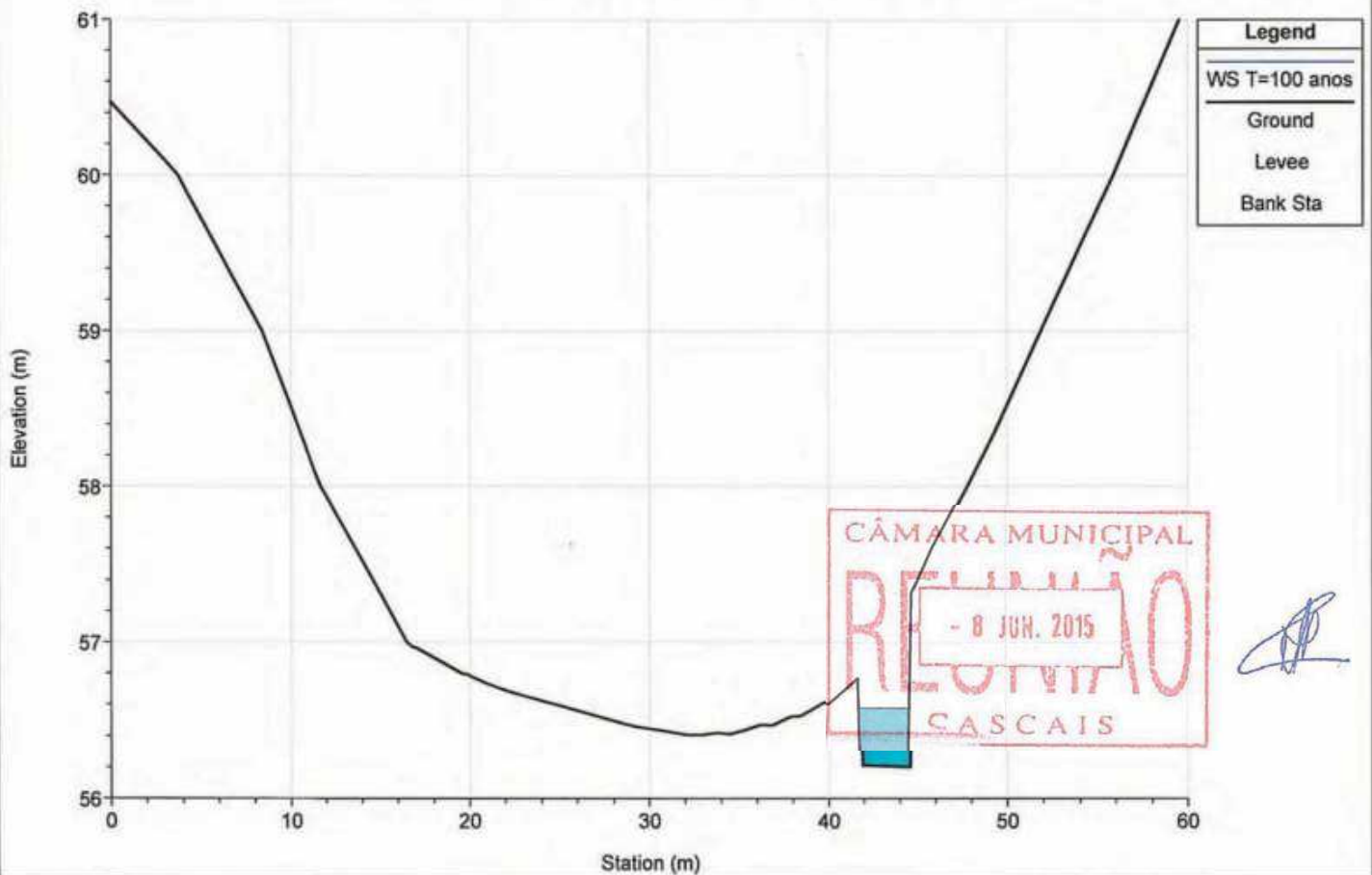
River = CASTELHANA Reach = jusante RS = 13.490



River = ME Reach = afluente RS = 342.445

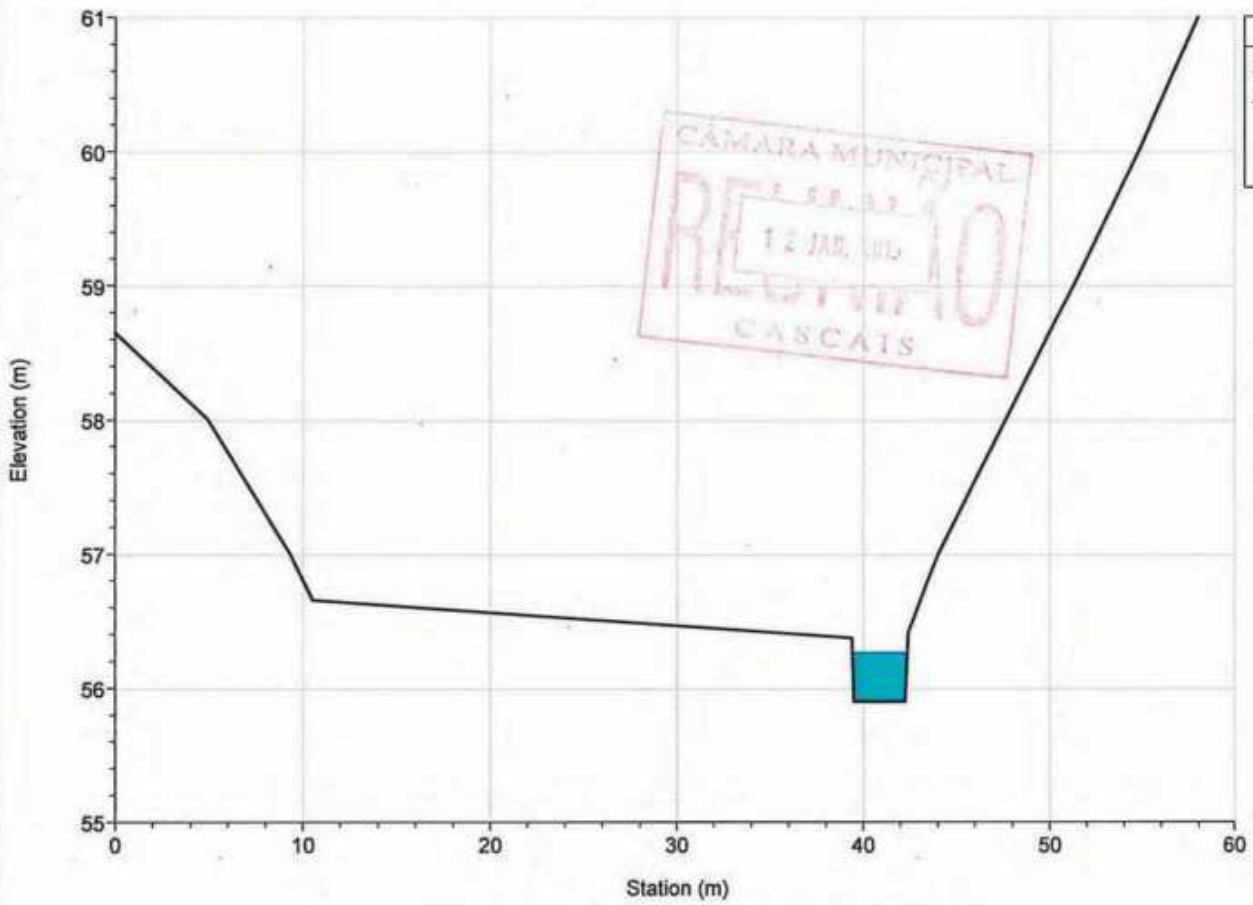


River = ME Reach = afluente RS = 228.168

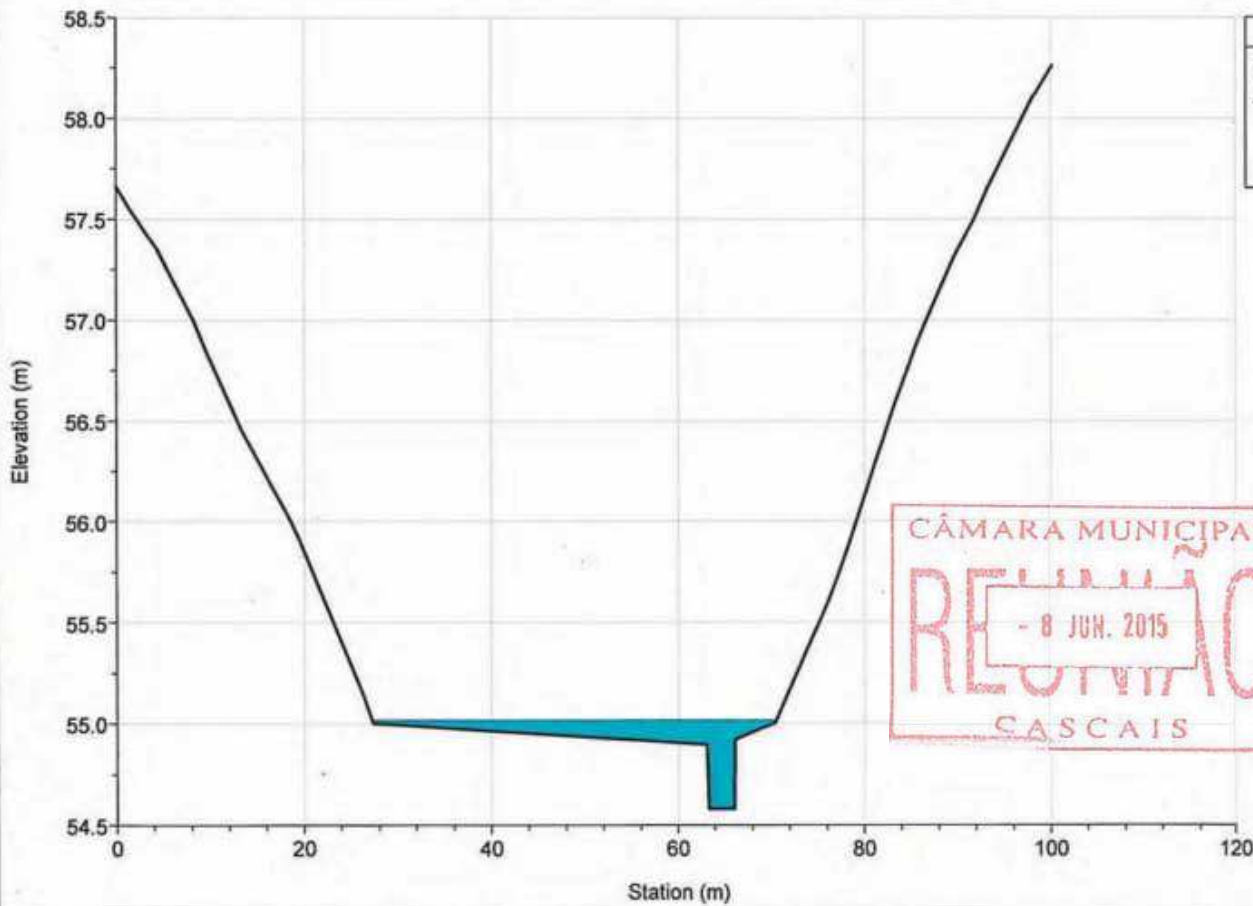




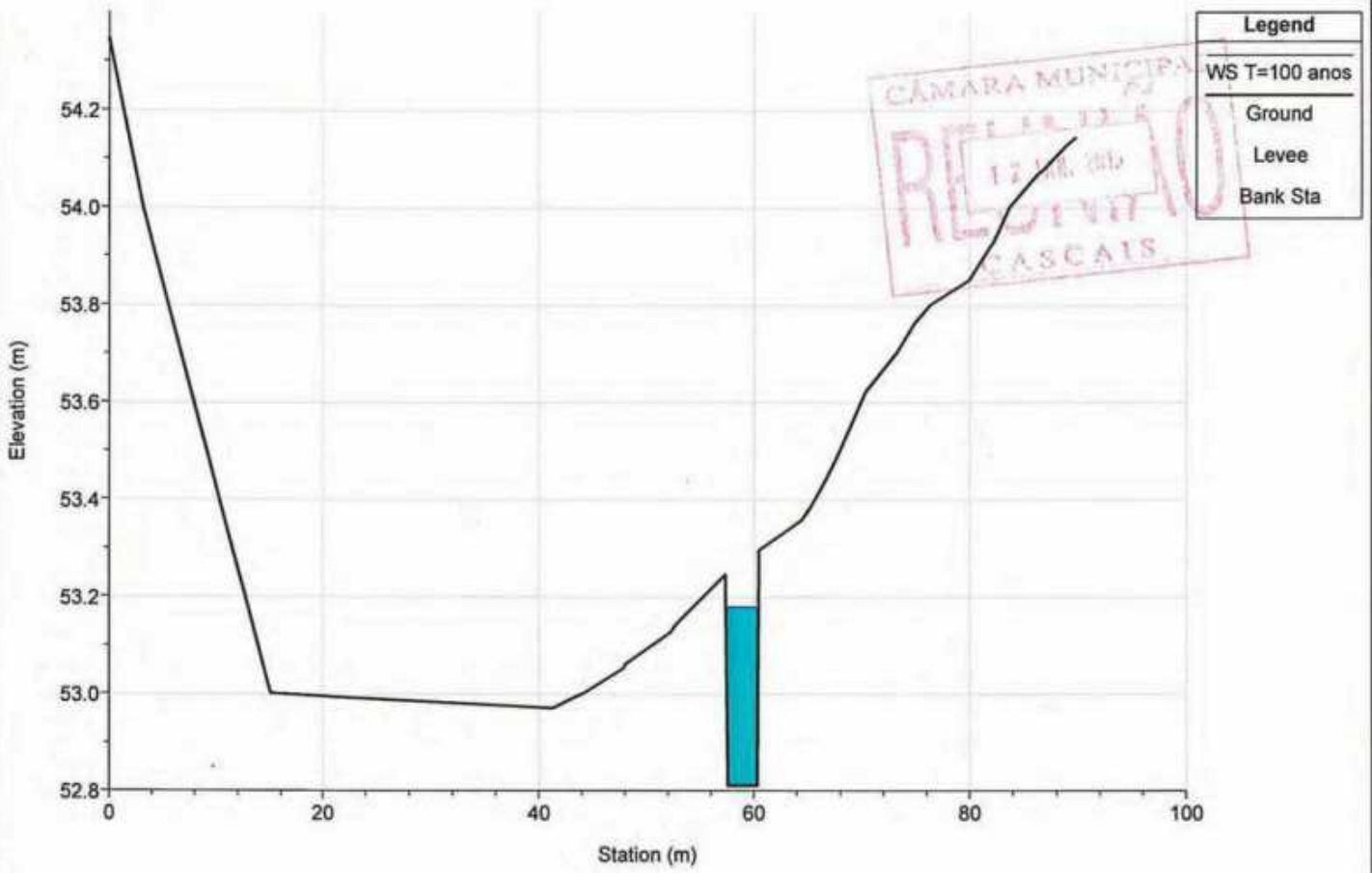
River = ME Reach = afluyente RS = 162.219



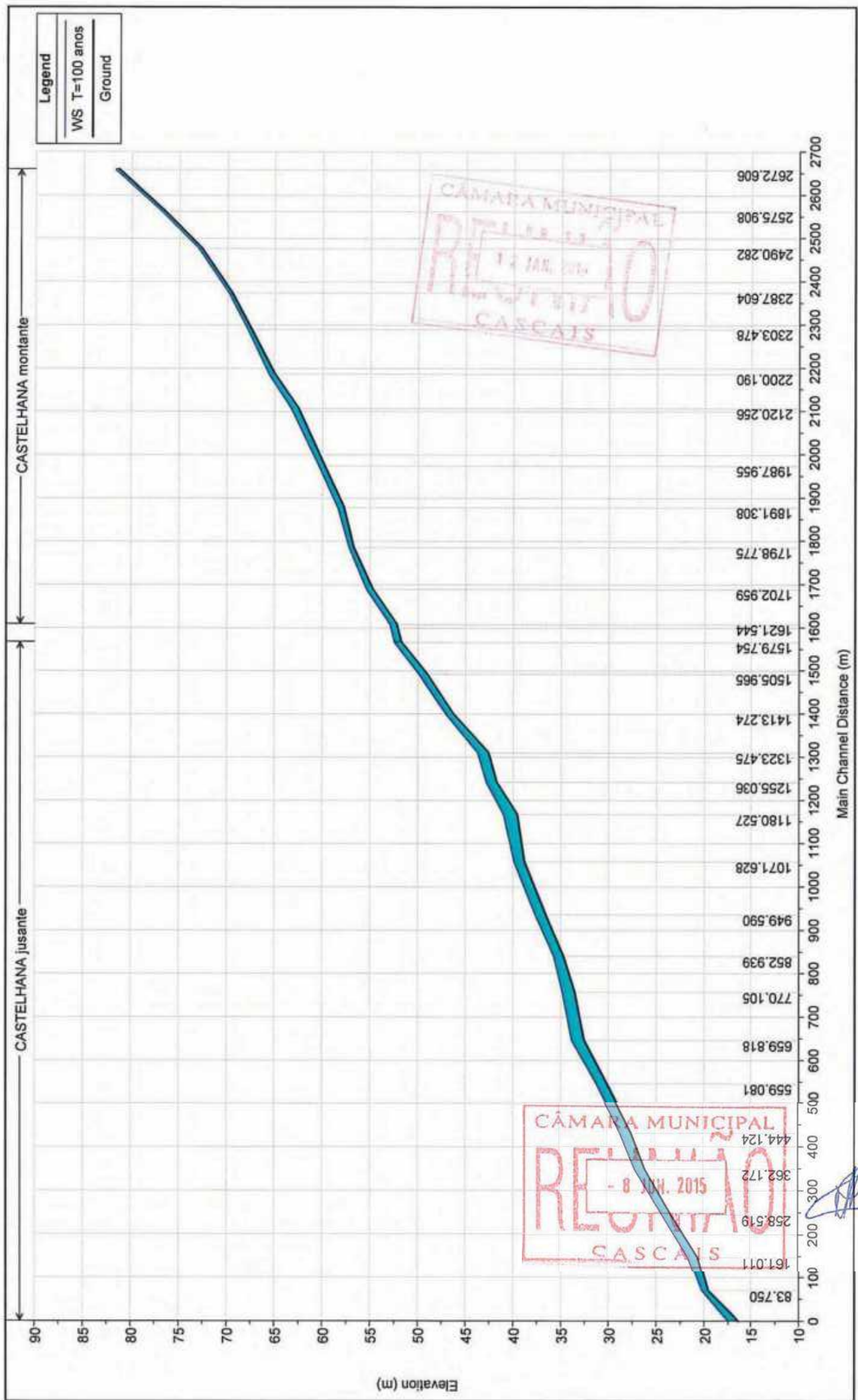
River = ME Reach = afluyente RS = 89.919

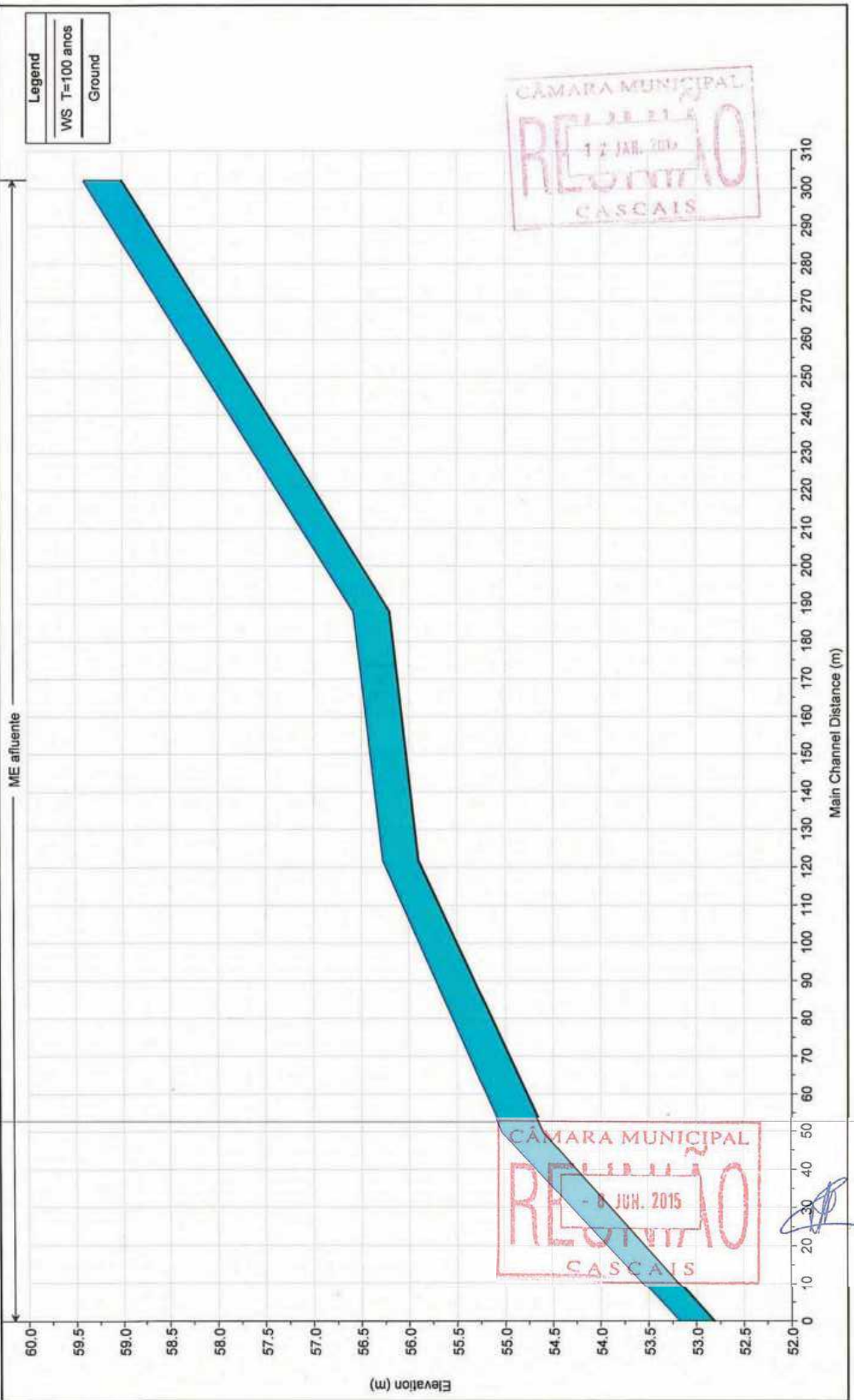


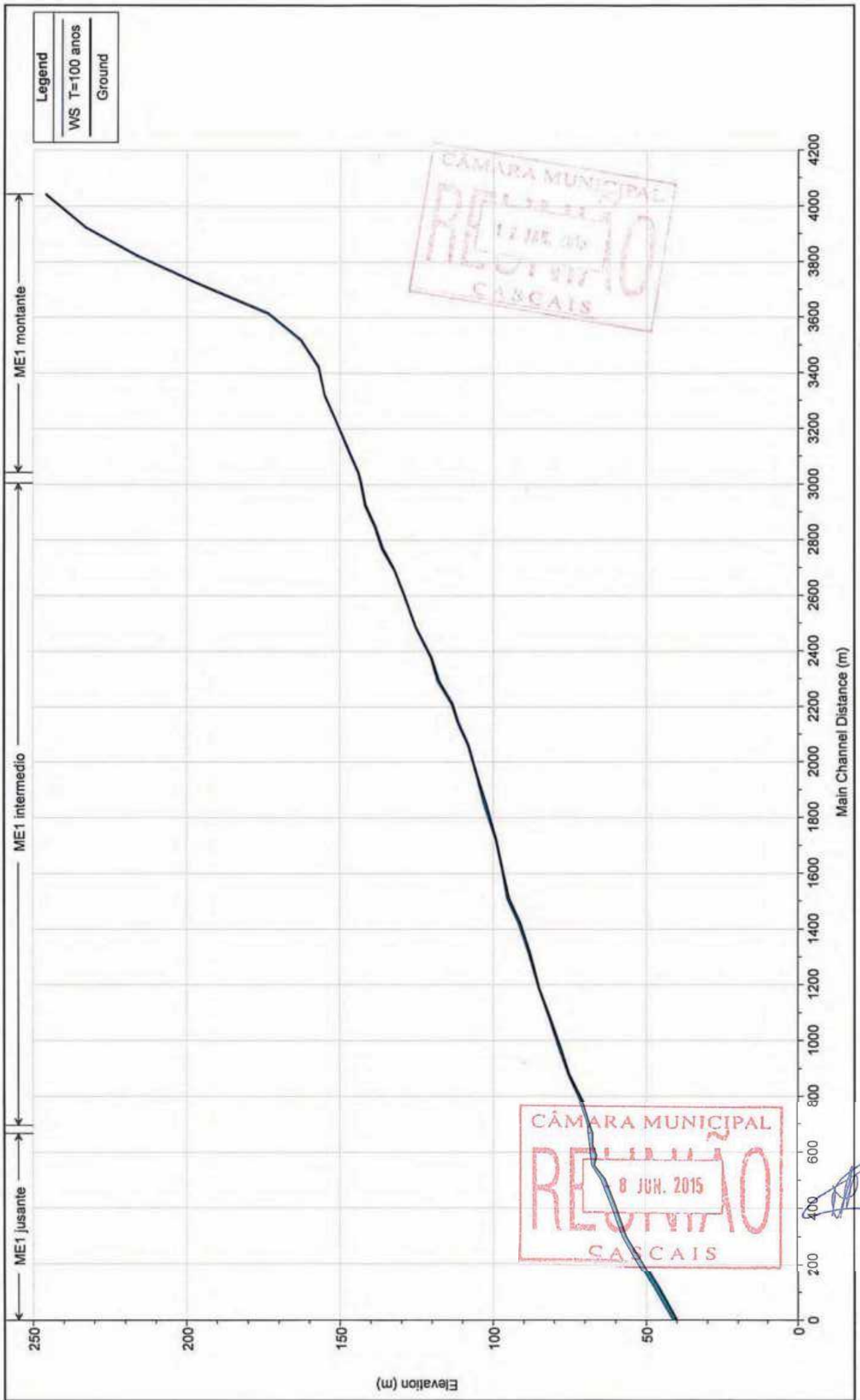
River = ME Reach = afluyente RS = 40.352

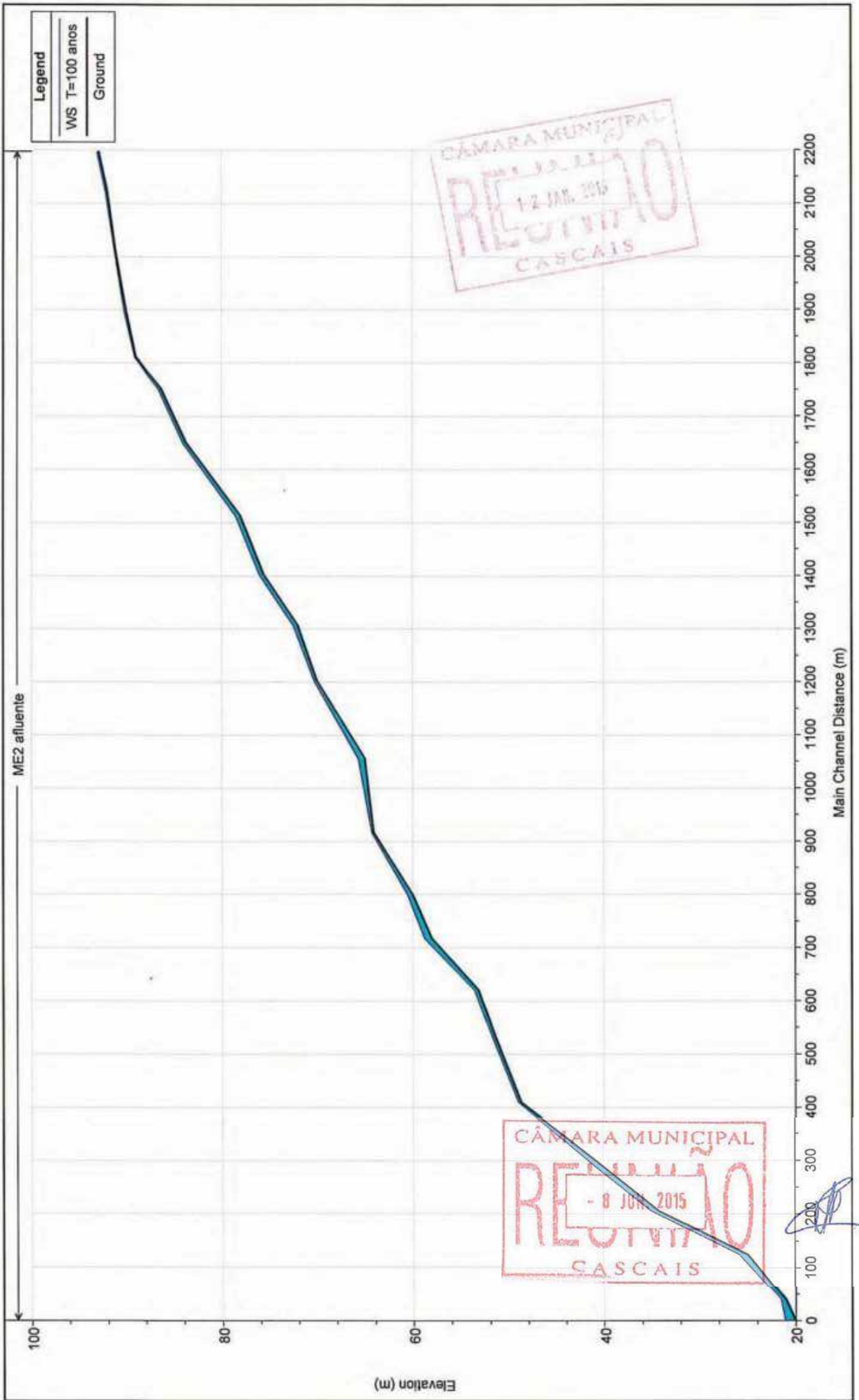


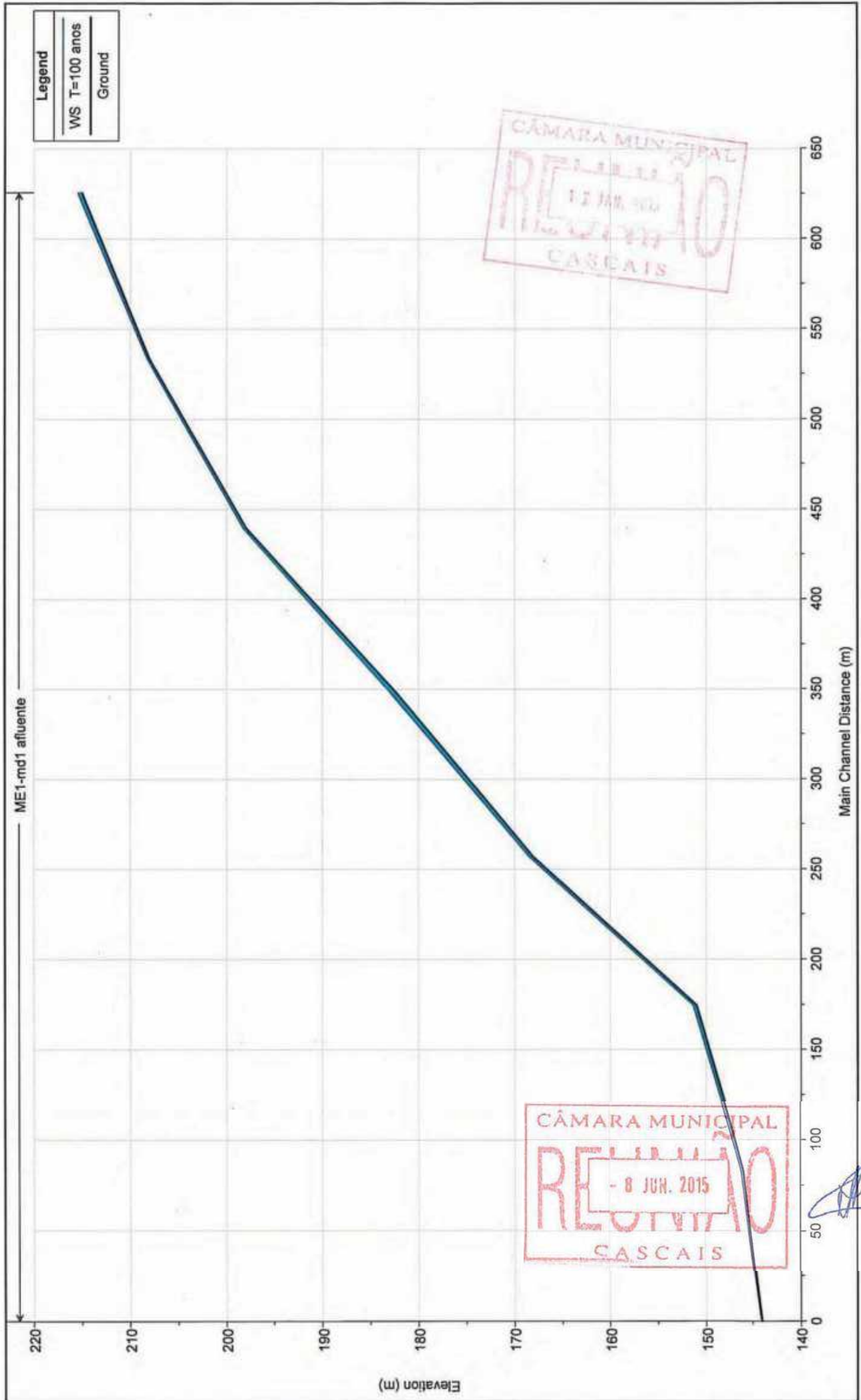
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- 8 JUN. 2015  
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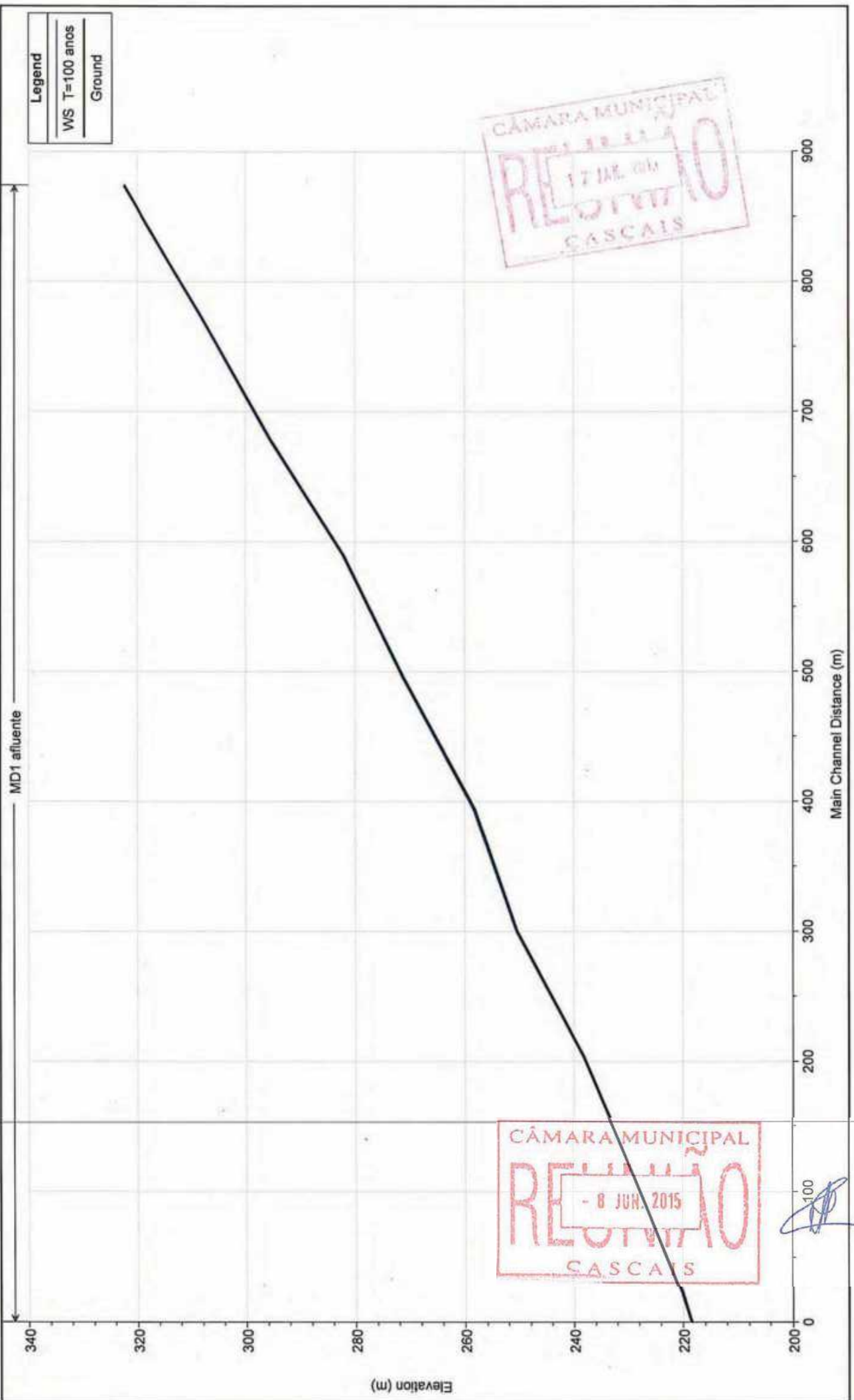




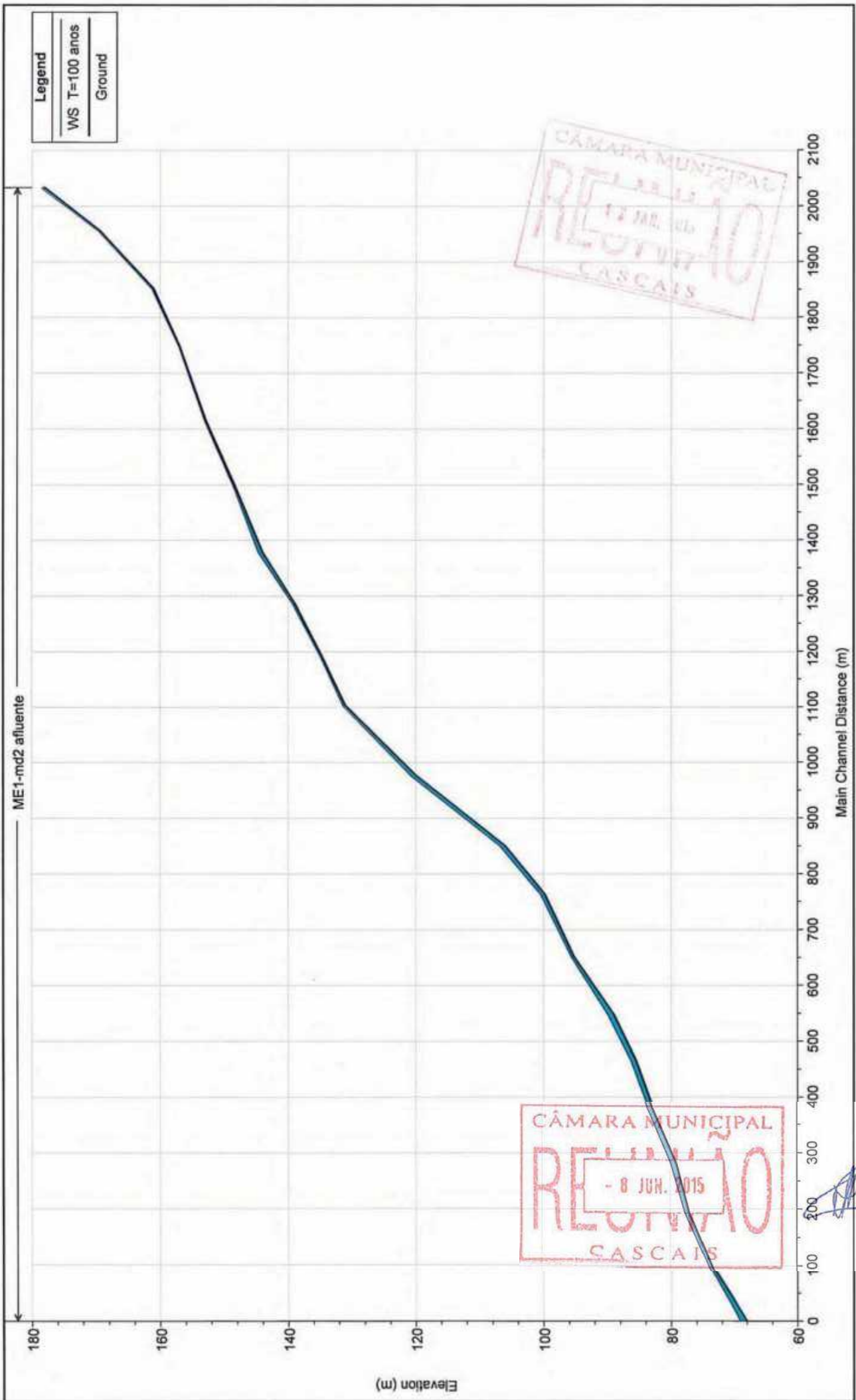


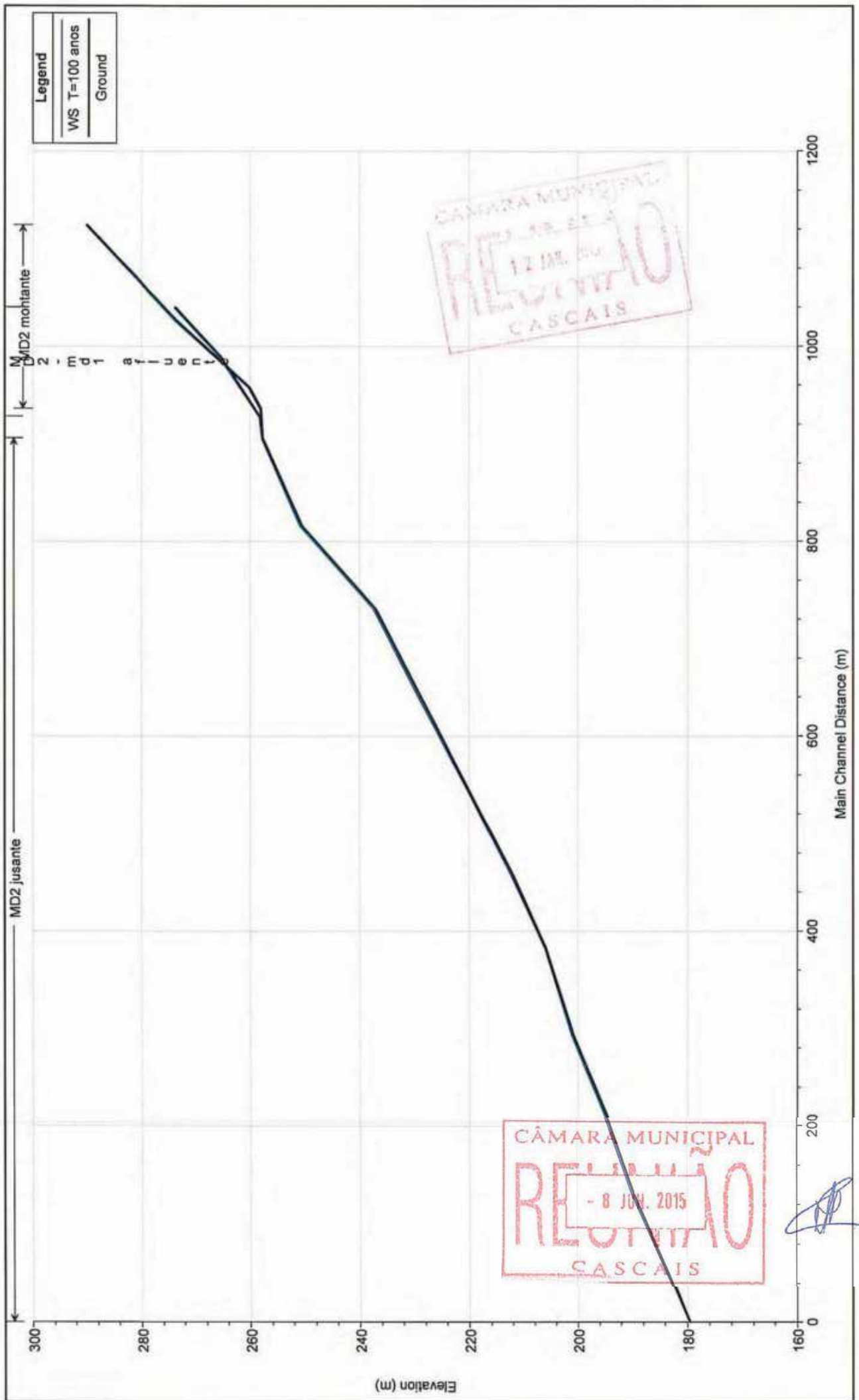


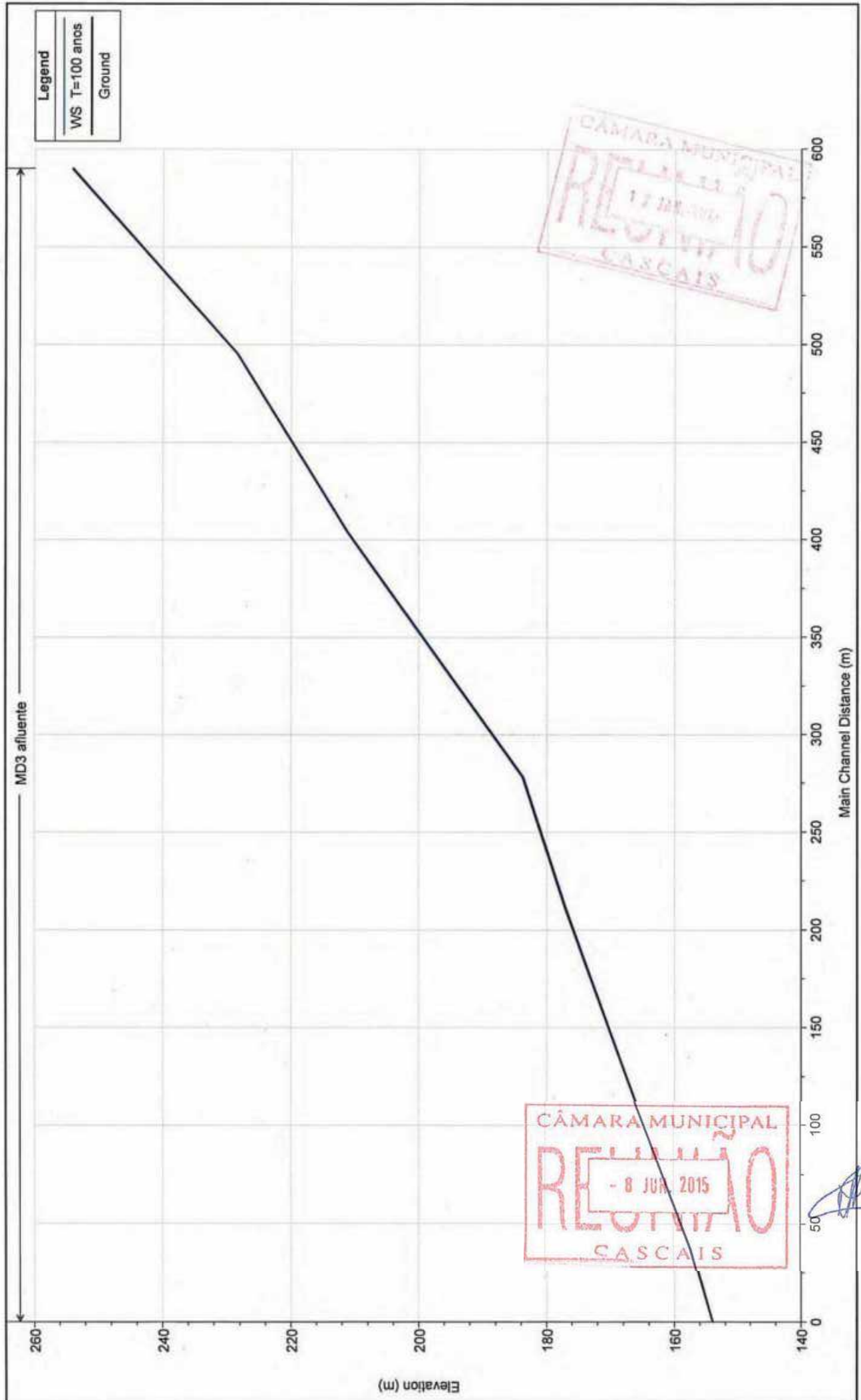




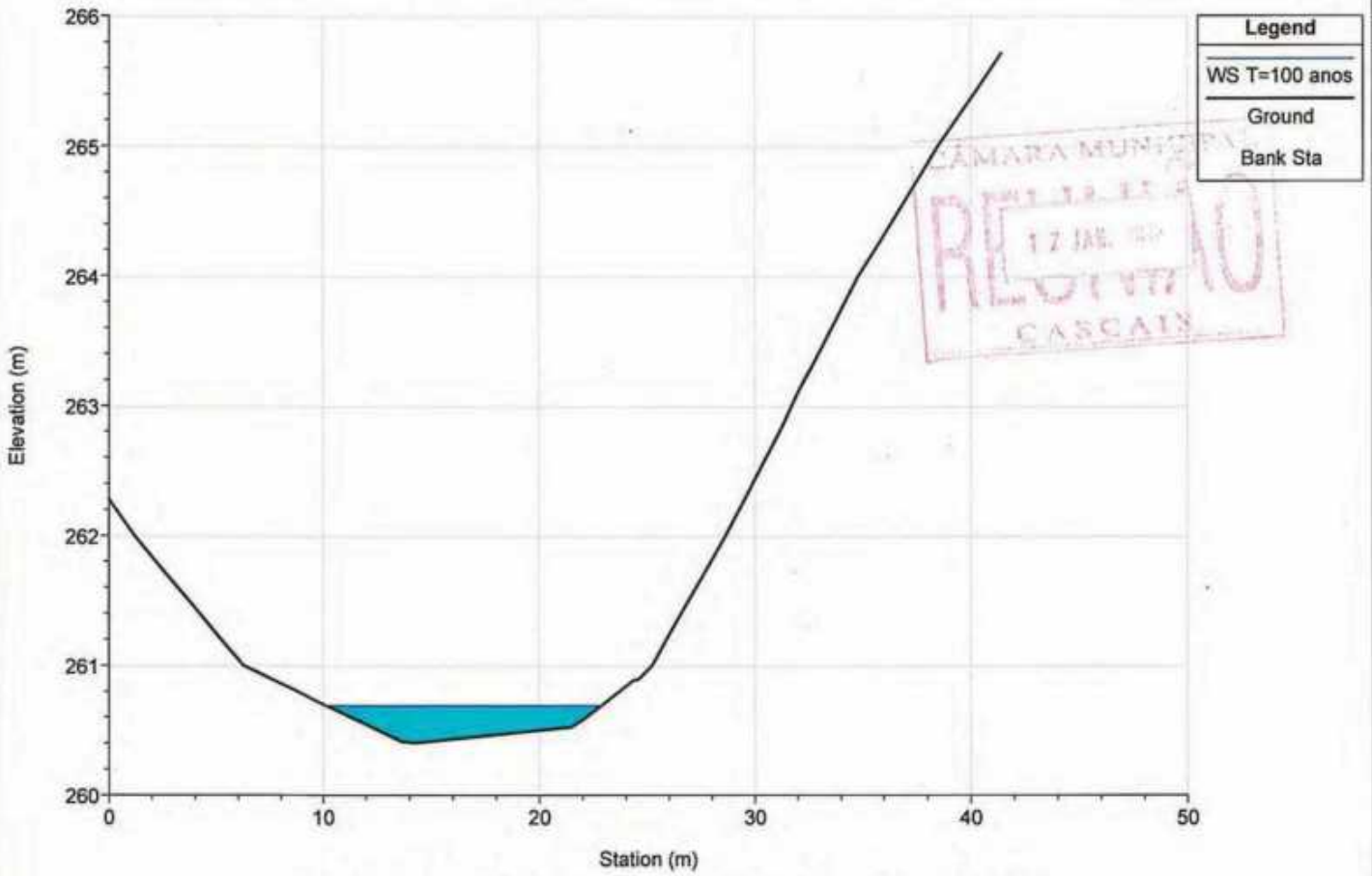




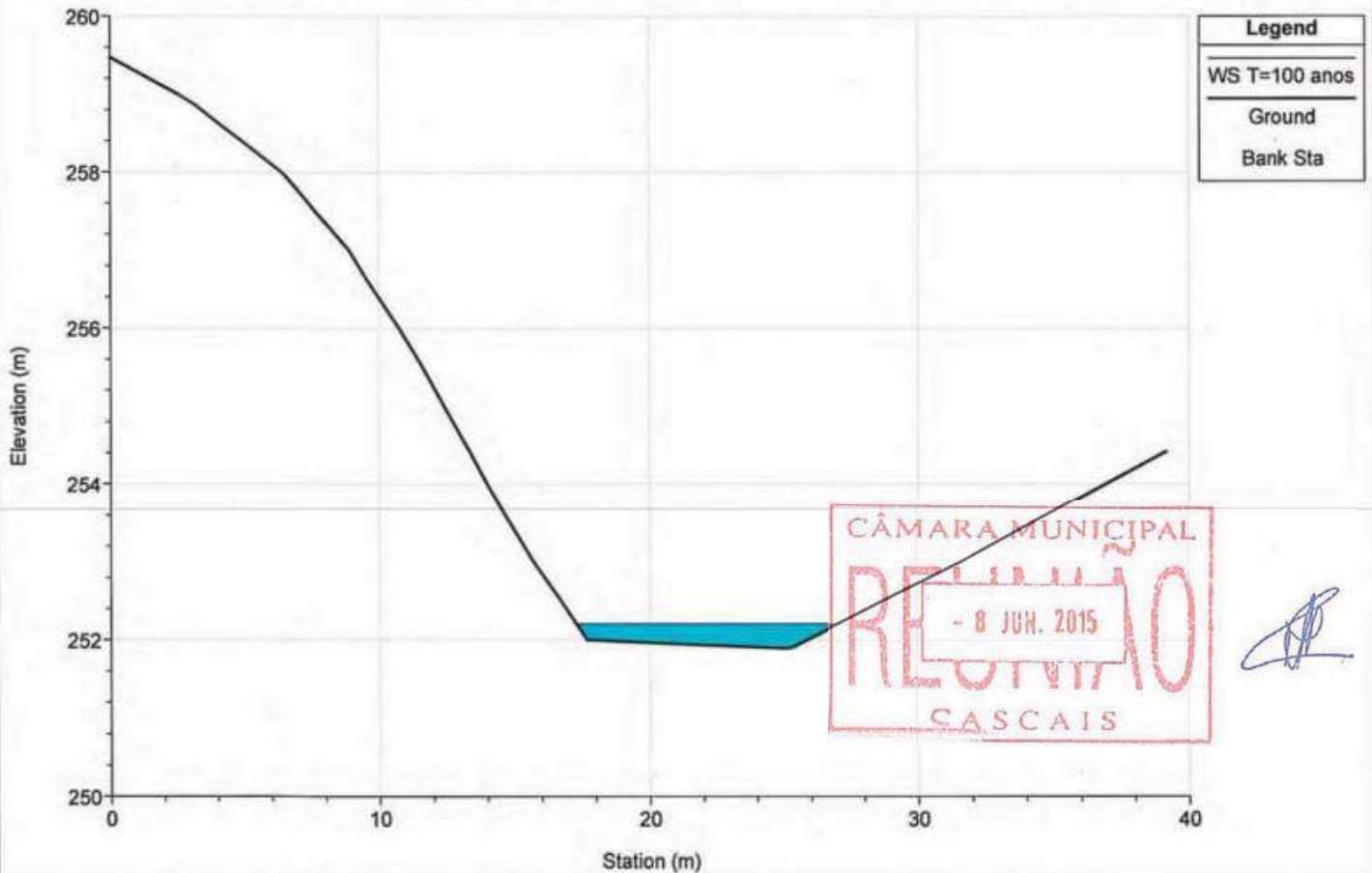




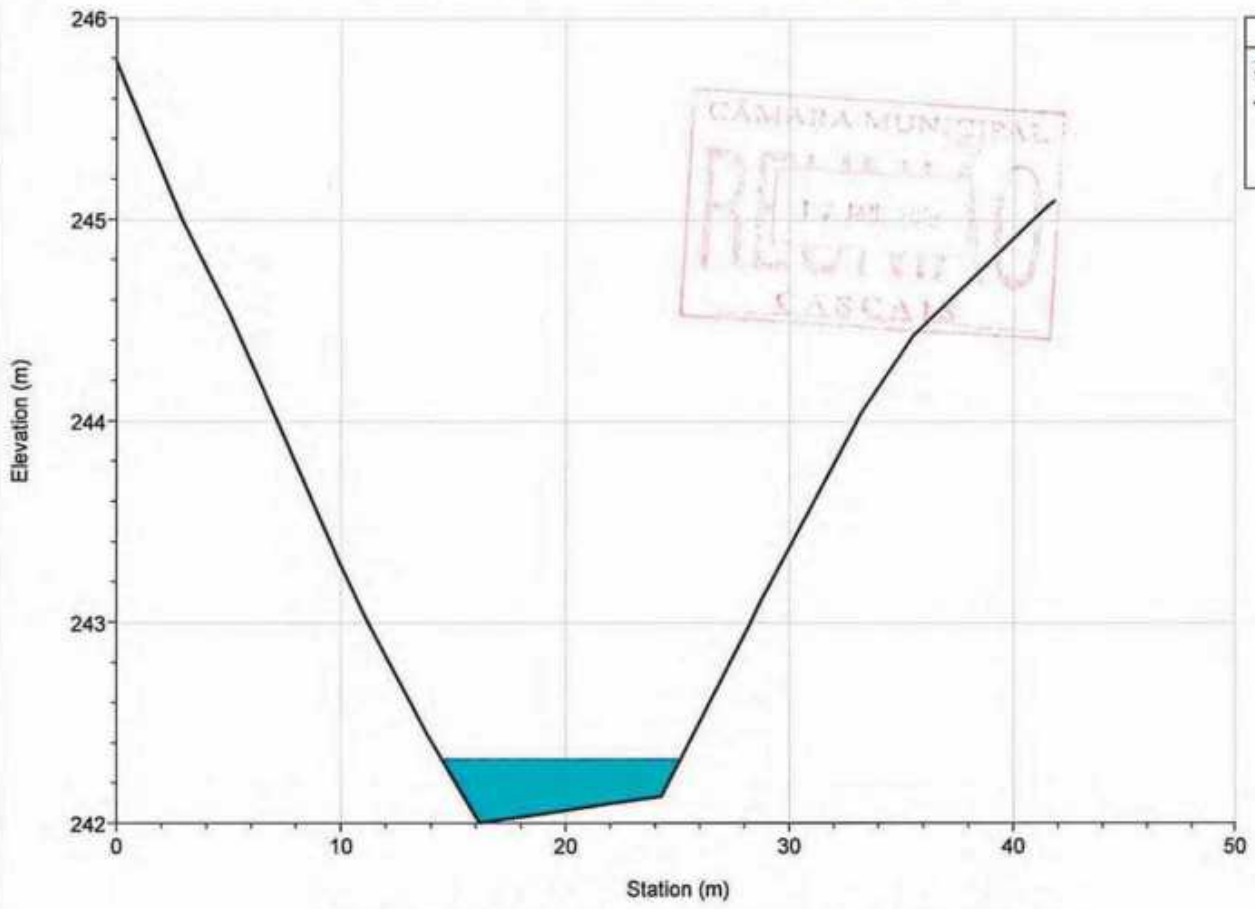
River = FOZ\_GUINCHO Reach = montante RS = 5123.181



River = FOZ\_GUINCHO Reach = montante RS = 5016.575



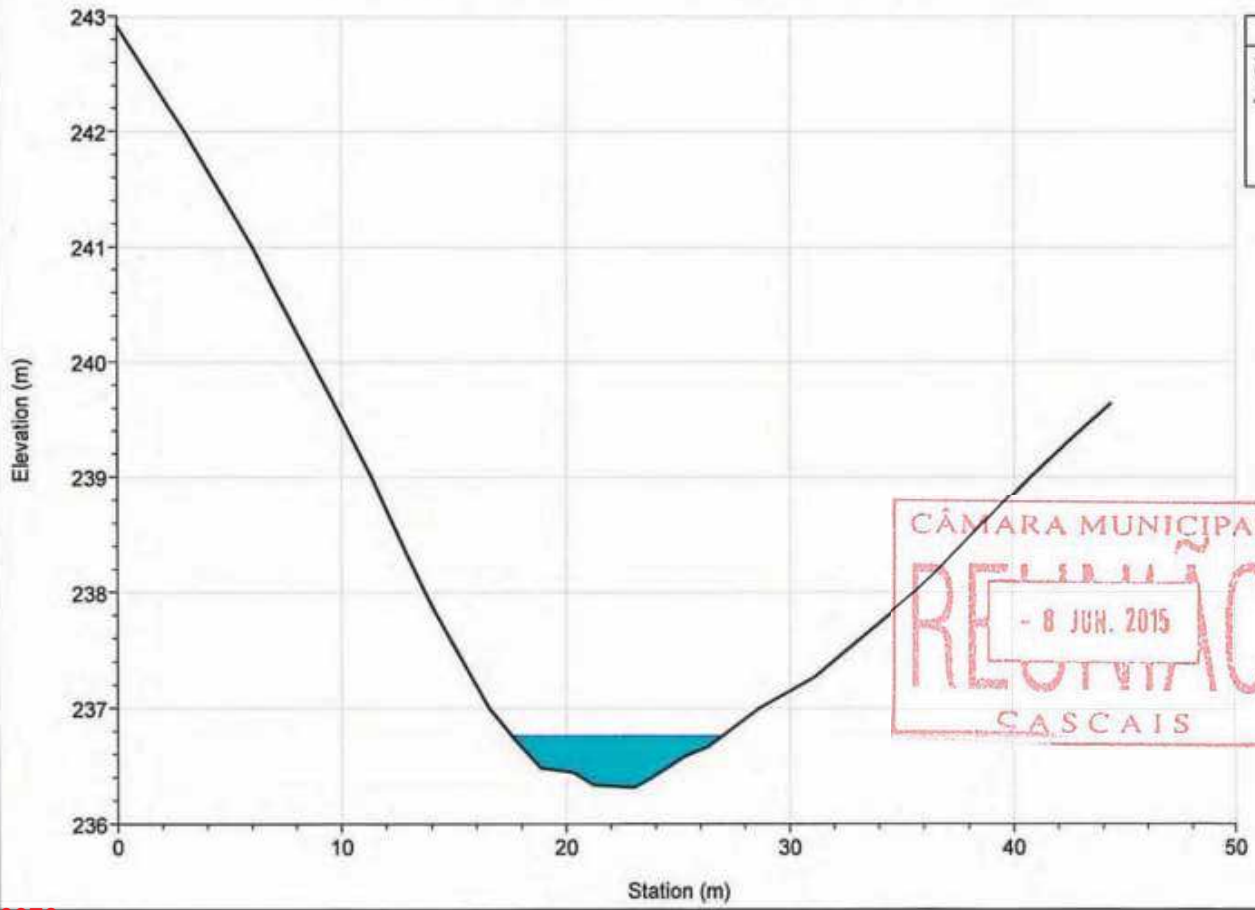
River = FOZ\_GUINCHO Reach = montante RS = 4922.738



Legend
WS T=100 anos
Ground
Bank Sta



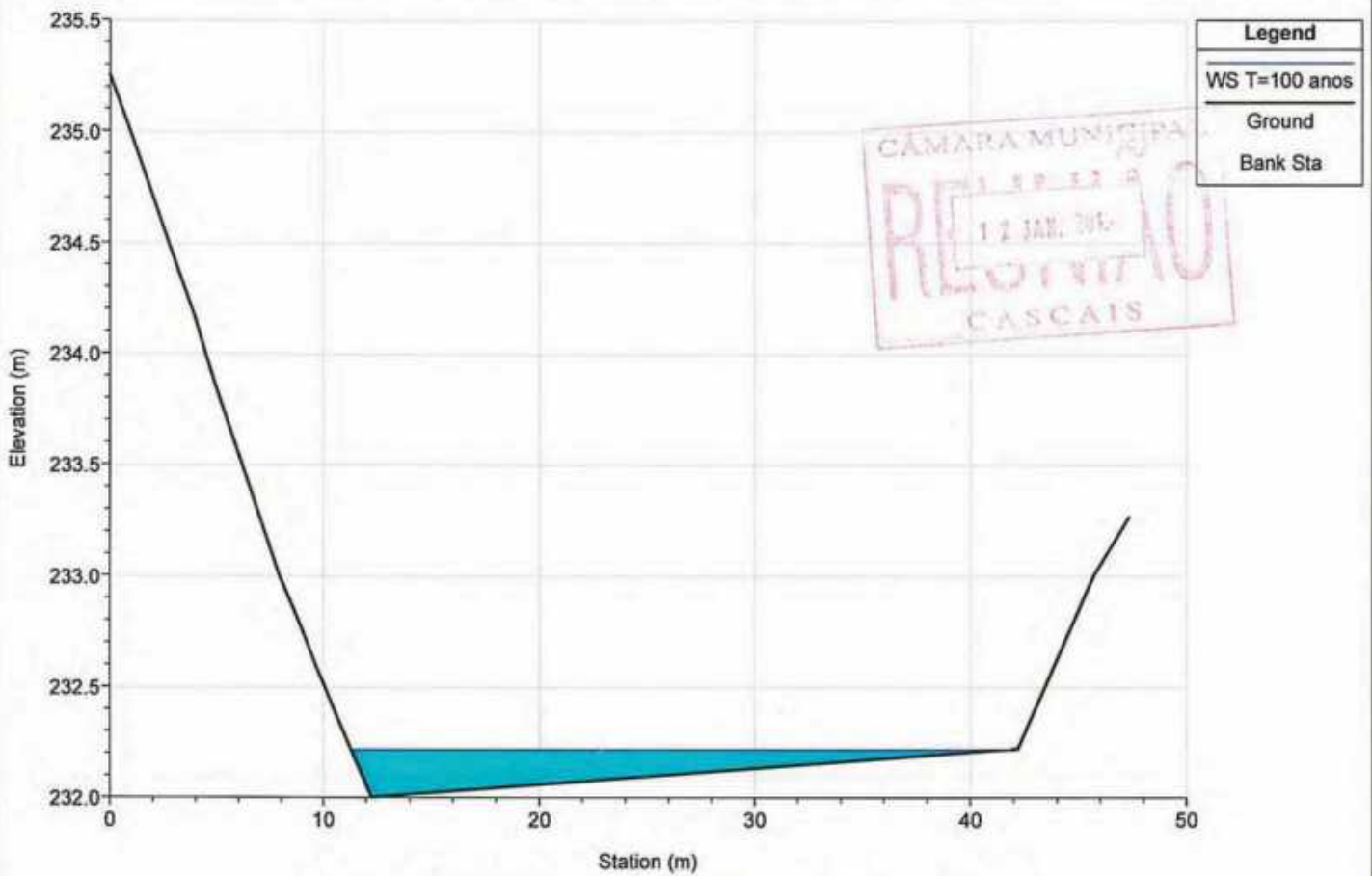
River = FOZ\_GUINCHO Reach = montante RS = 4823.514



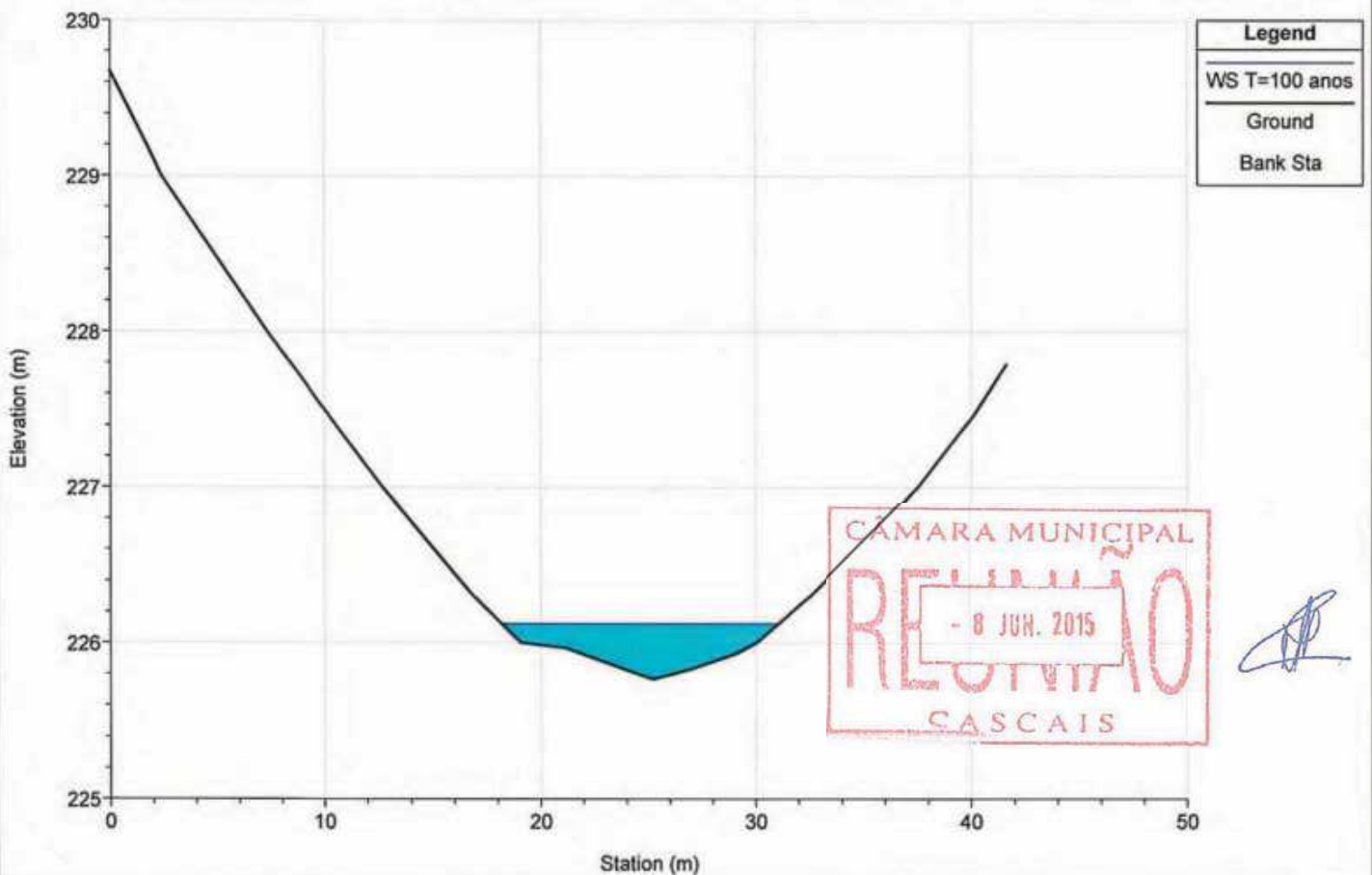
Legend
WS T=100 anos
Ground
Bank Sta



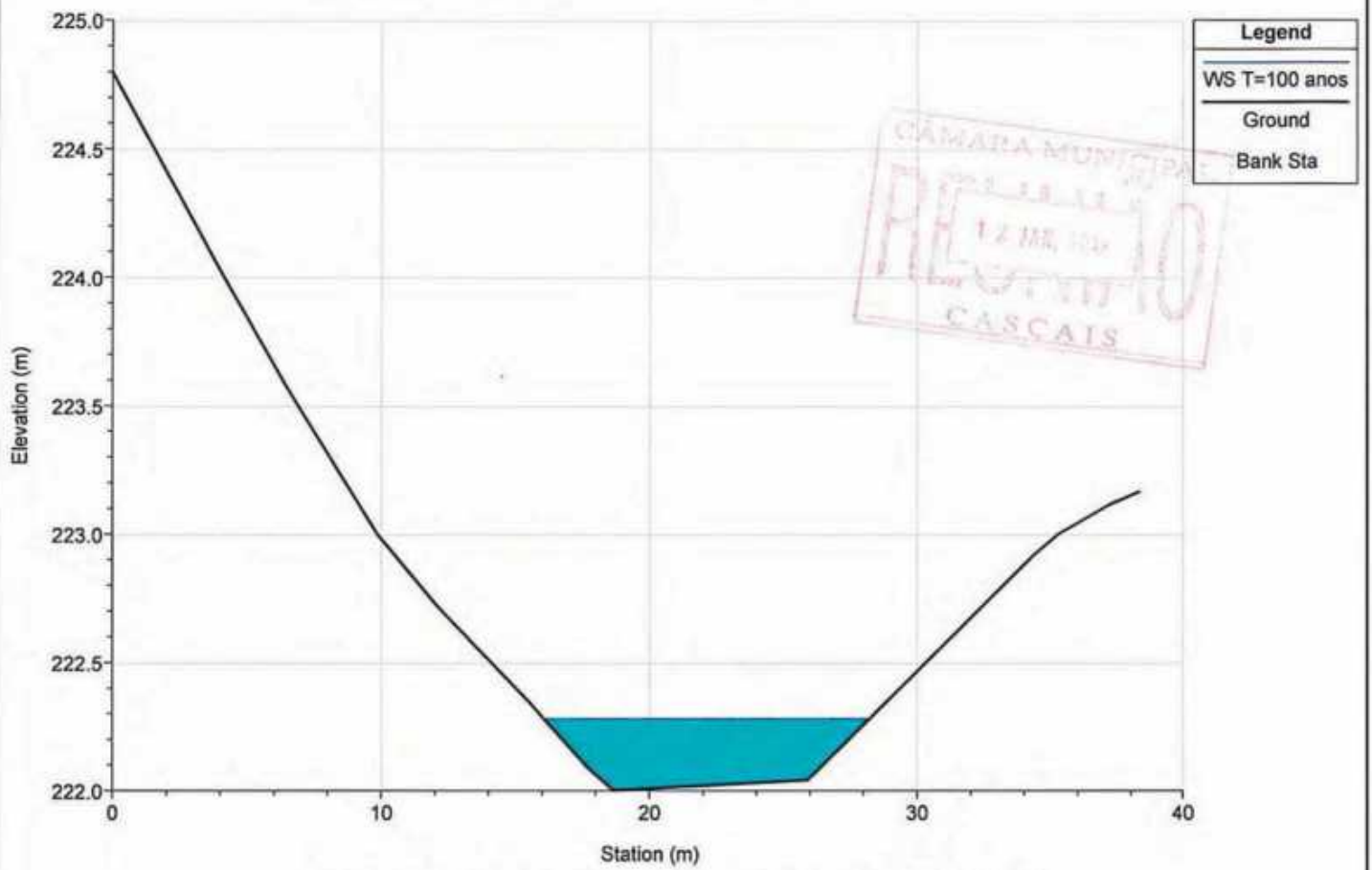
River = FOZ\_GUINCHO Reach = montante RS = 4737.256



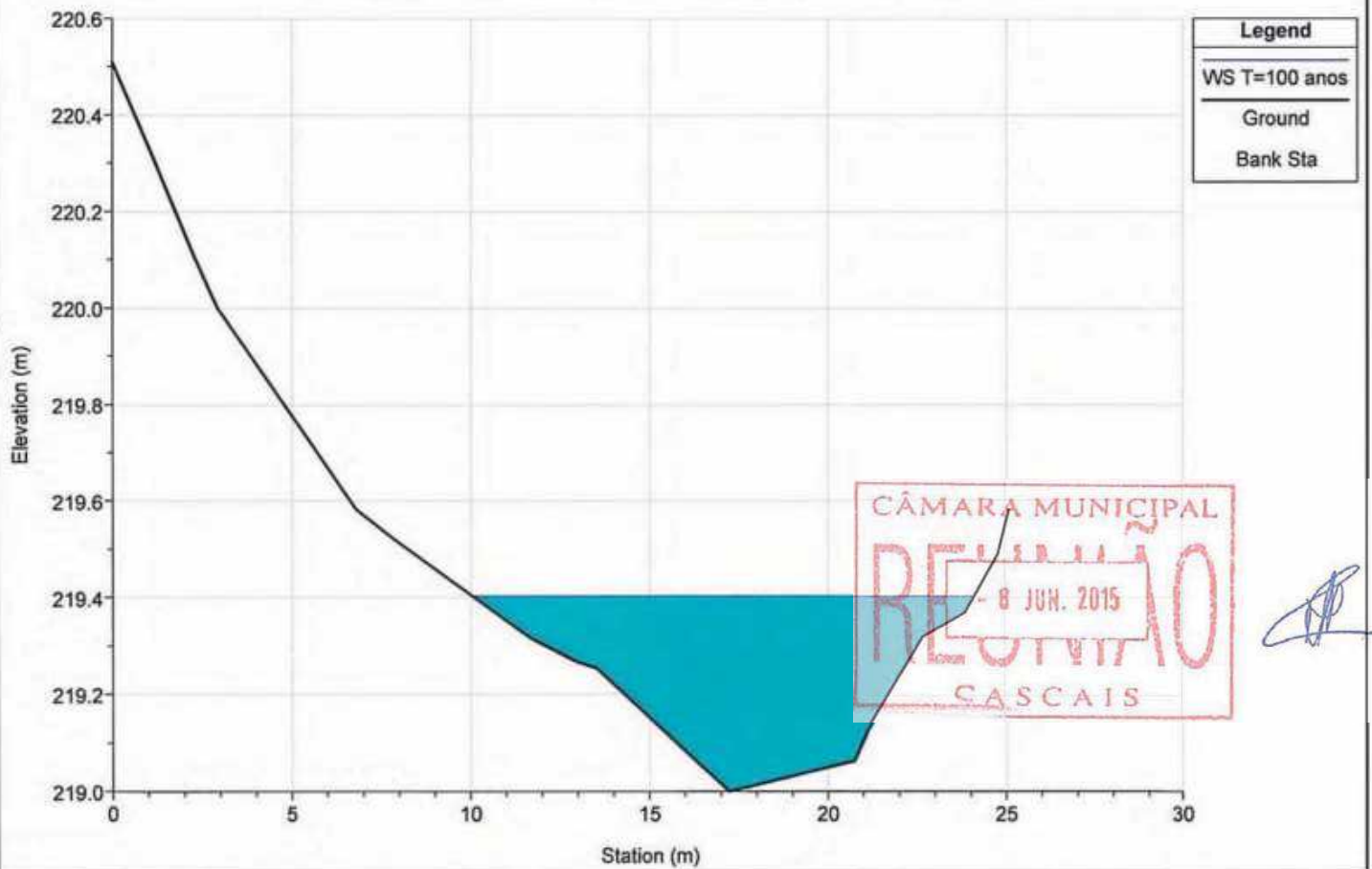
River = FOZ\_GUINCHO Reach = montante RS = 4645.073



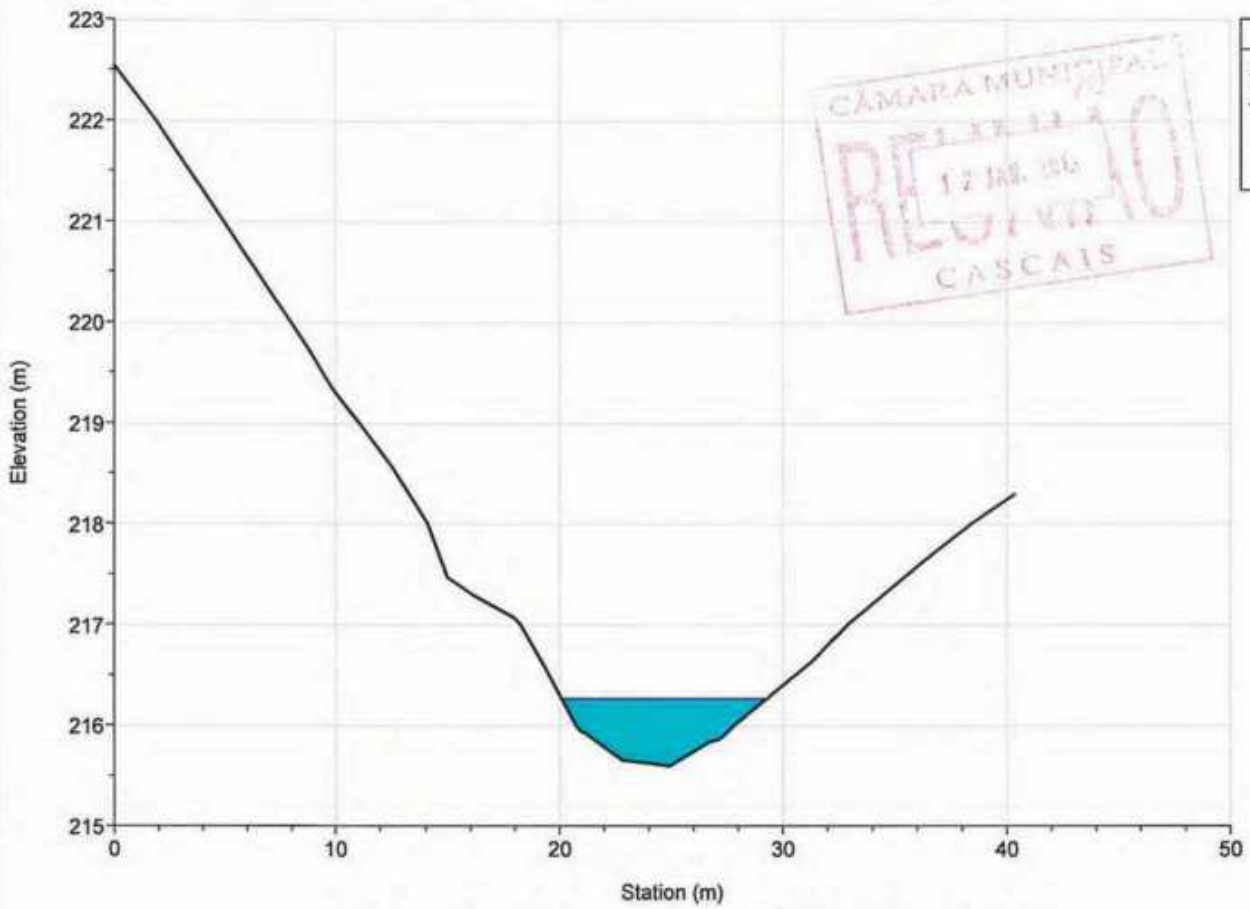
River = FOZ\_GUINCHO Reach = montante RS = 4583.240



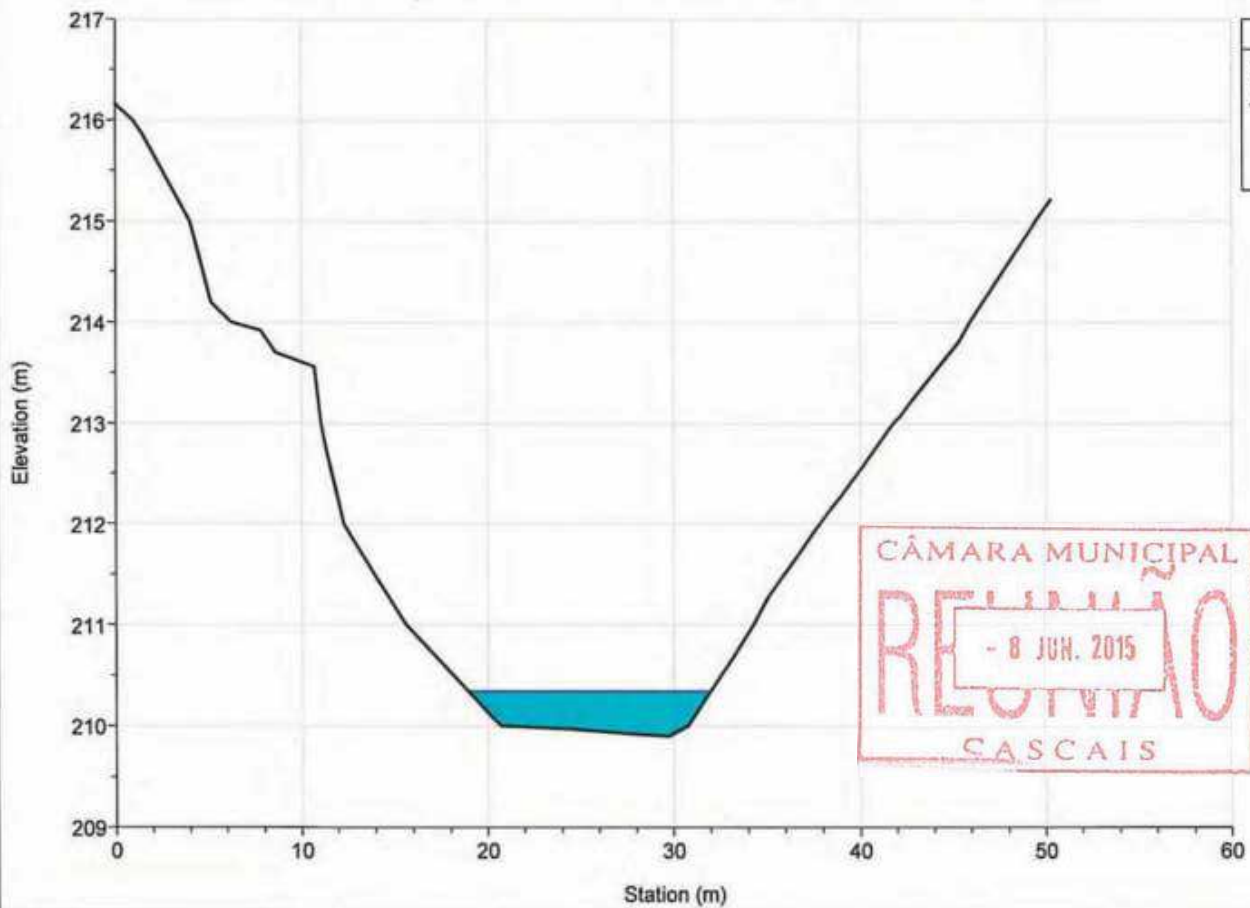
River = FOZ\_GUINCHO Reach = montante RS = 4561.372



River = FOZ\_GUINCHO Reach = inter 1 RS = 4533.399

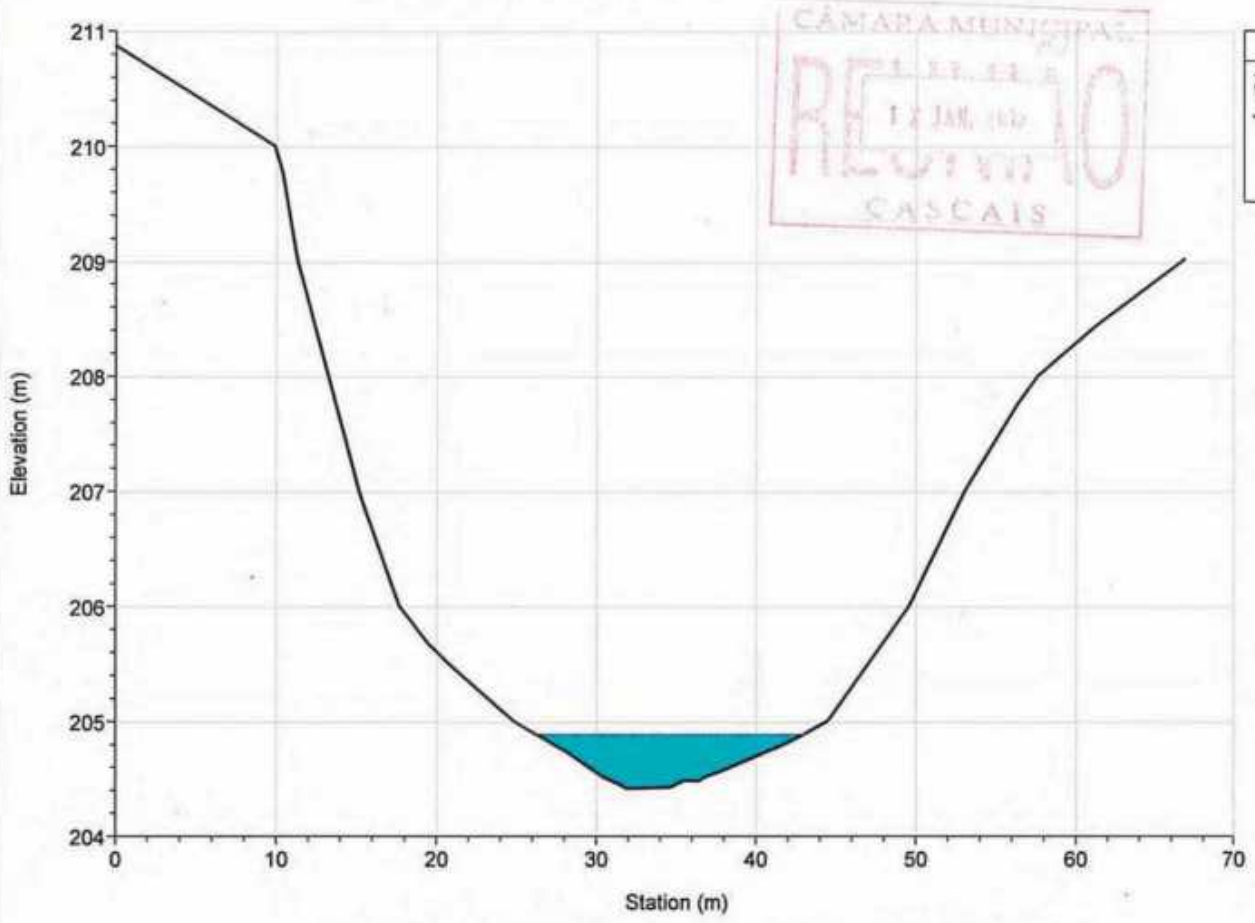


River = FOZ\_GUINCHO Reach = inter 1 RS = 4453.160



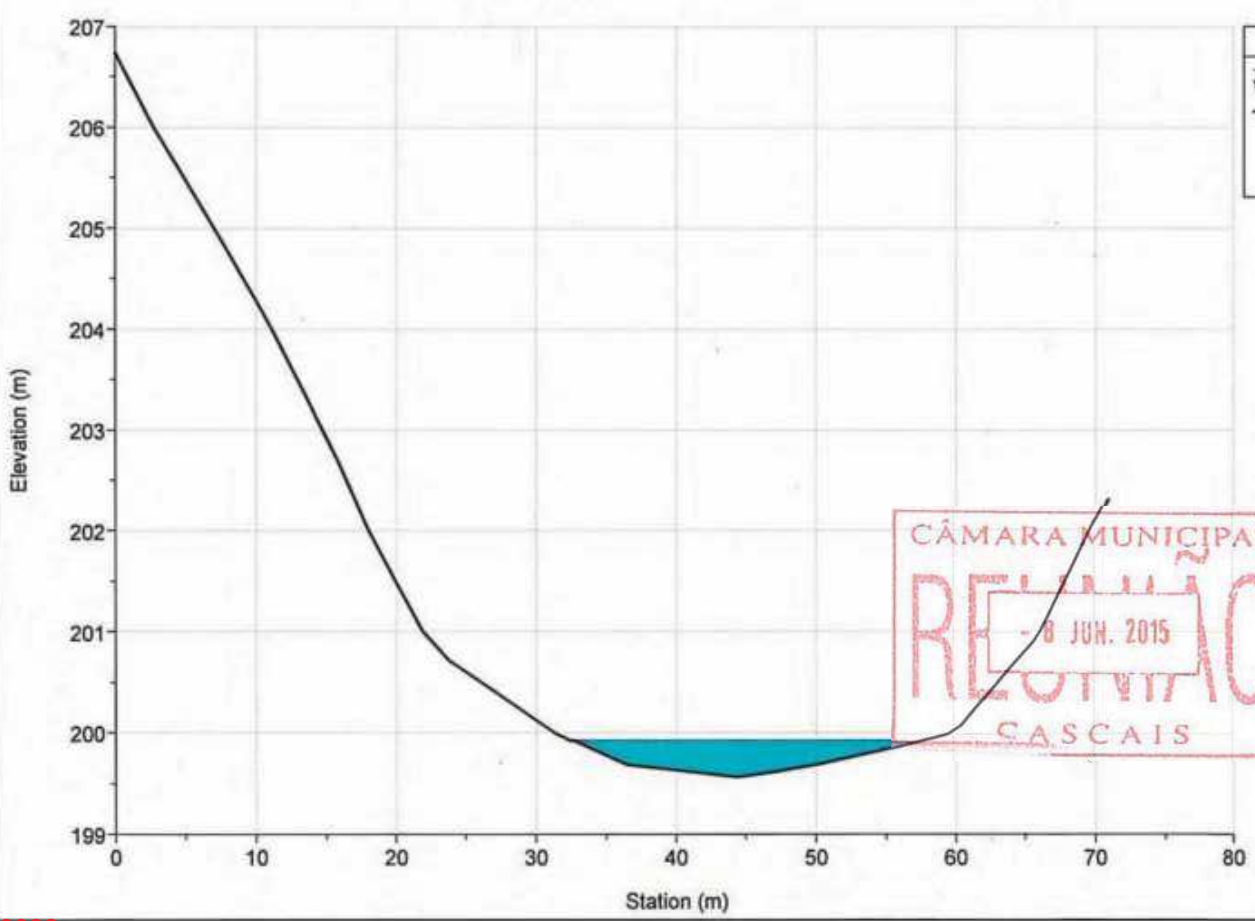


River = FOZ\_GUINCHO Reach = inter 1 RS = 4352.772



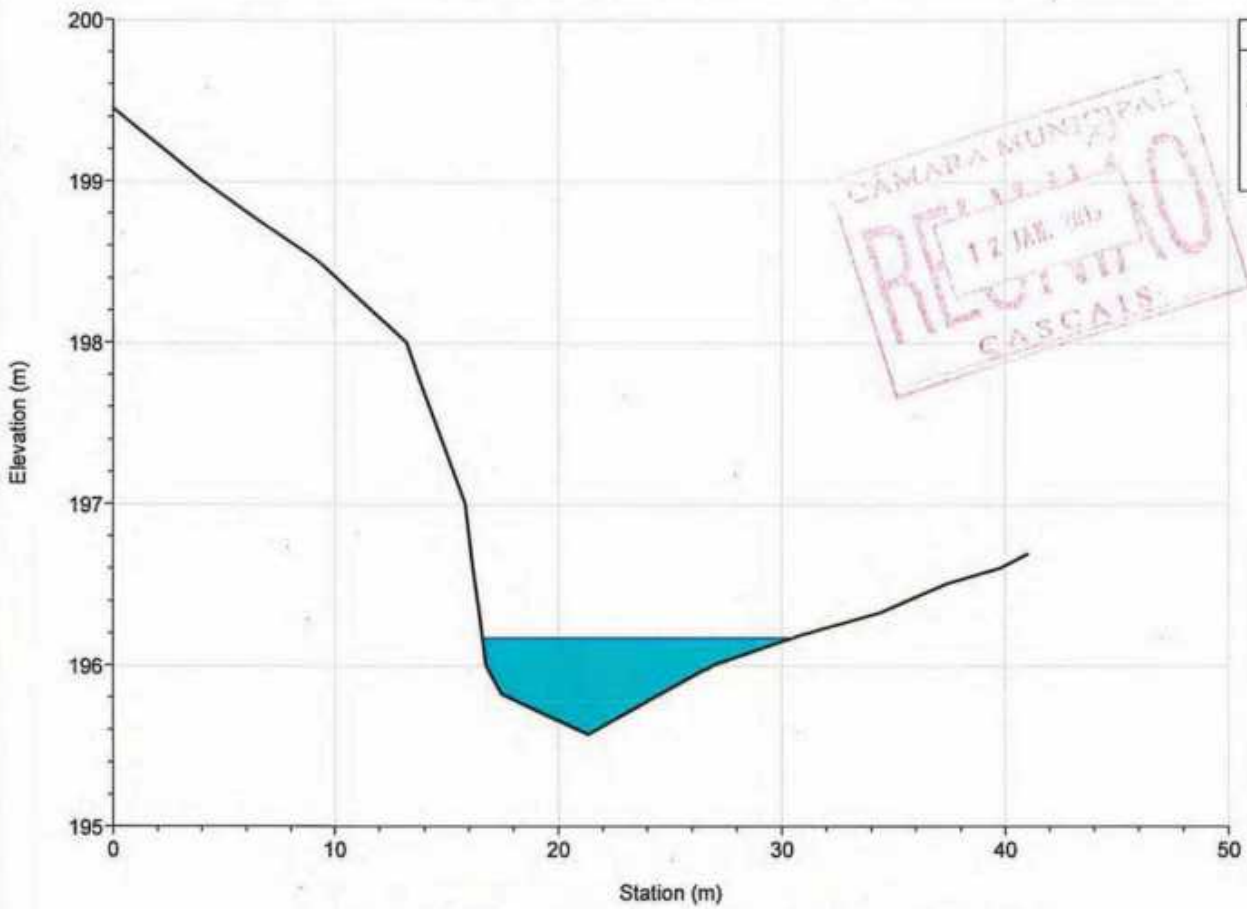
Legend	
WS T=100 anos	
Ground	
Bank Sta	

River = FOZ\_GUINCHO Reach = inter 1 RS = 4260.206

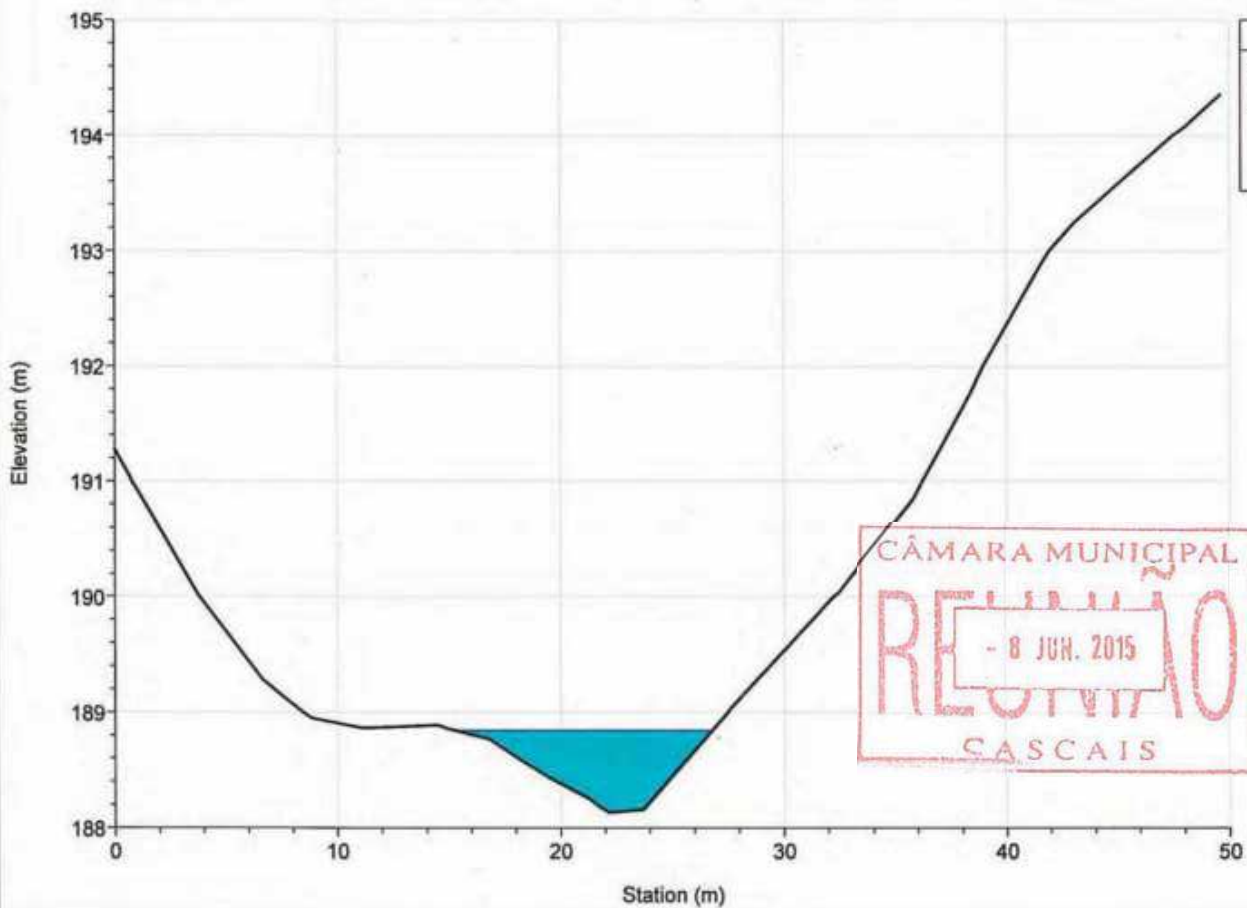


Legend	
WS T=100 anos	
Ground	
Bank Sta	

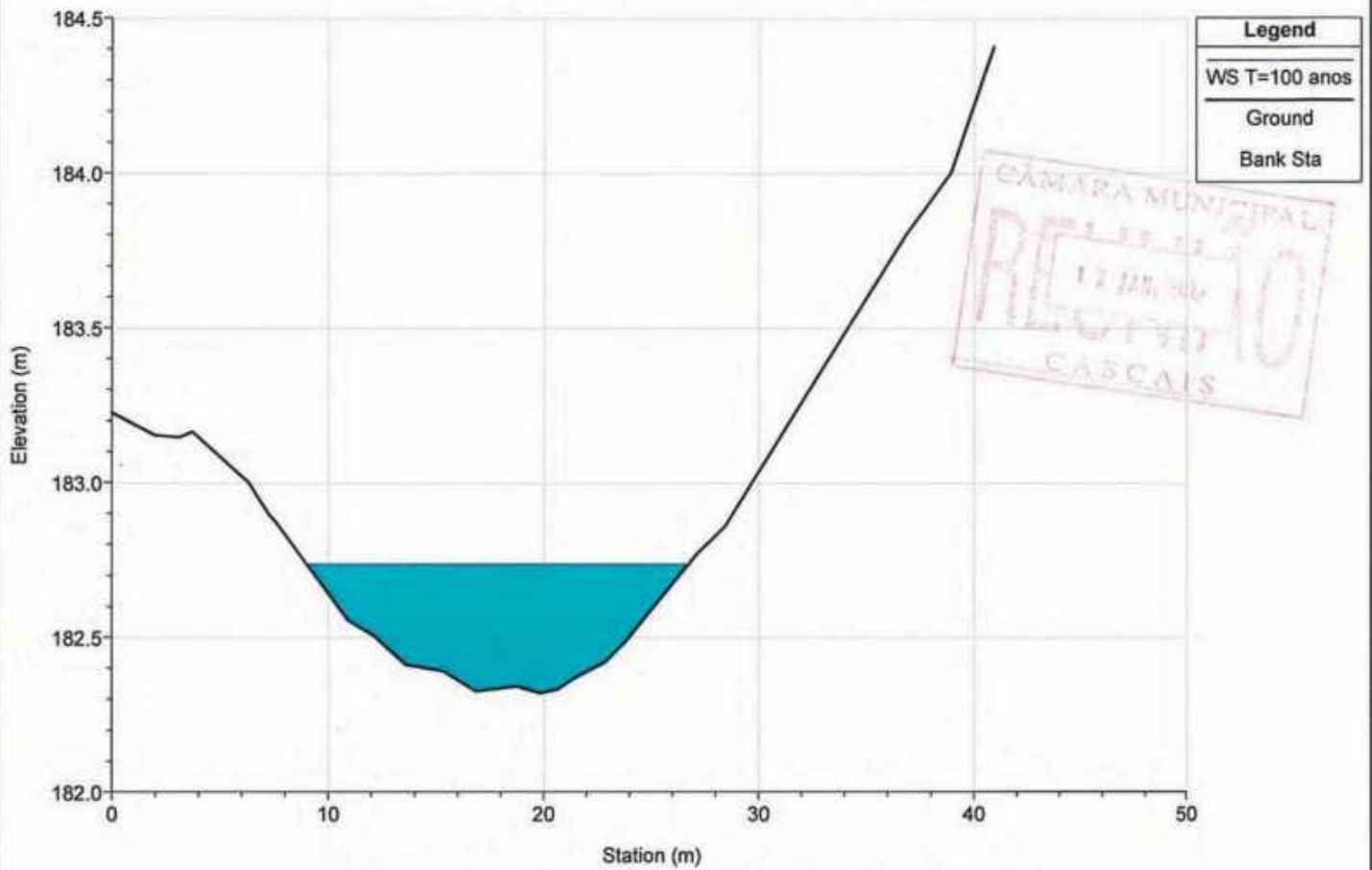
River = FOZ\_GUINCHO Reach = inter 1 RS = 4186.473



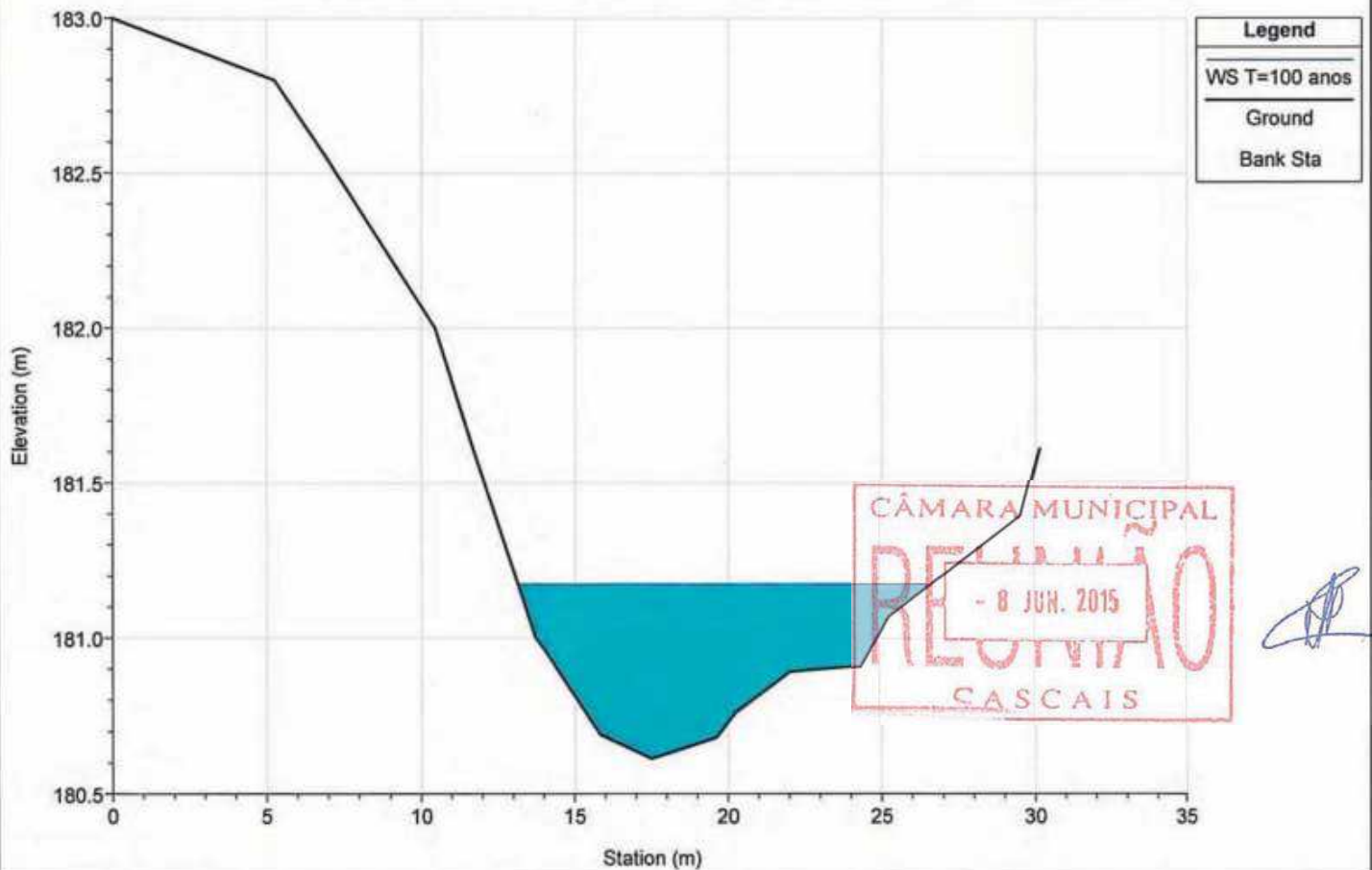
River = FOZ\_GUINCHO Reach = inter 1 RS = 4106.951



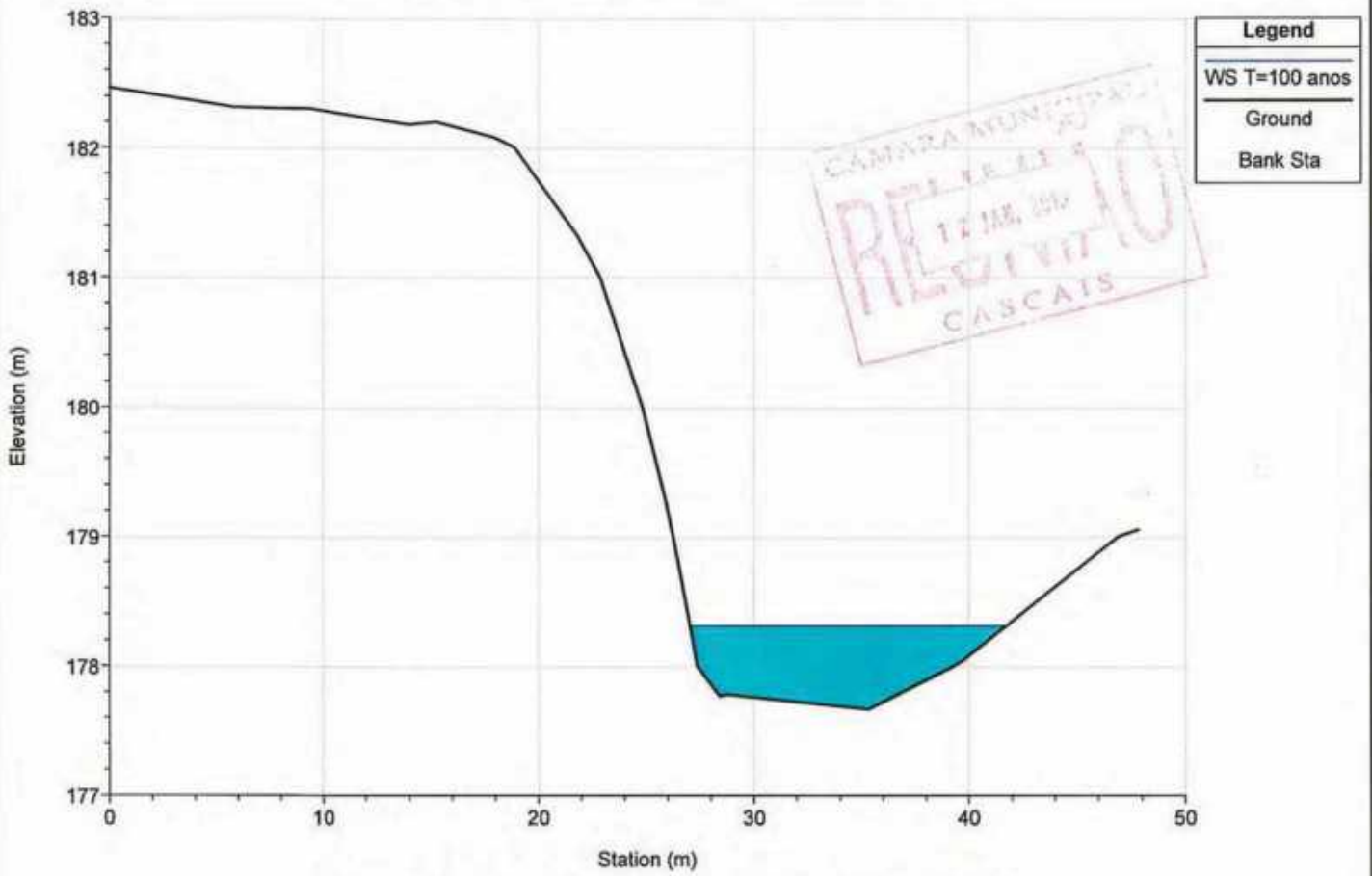
River = FOZ\_GUINCHO Reach = inter 1 RS = 4057.394



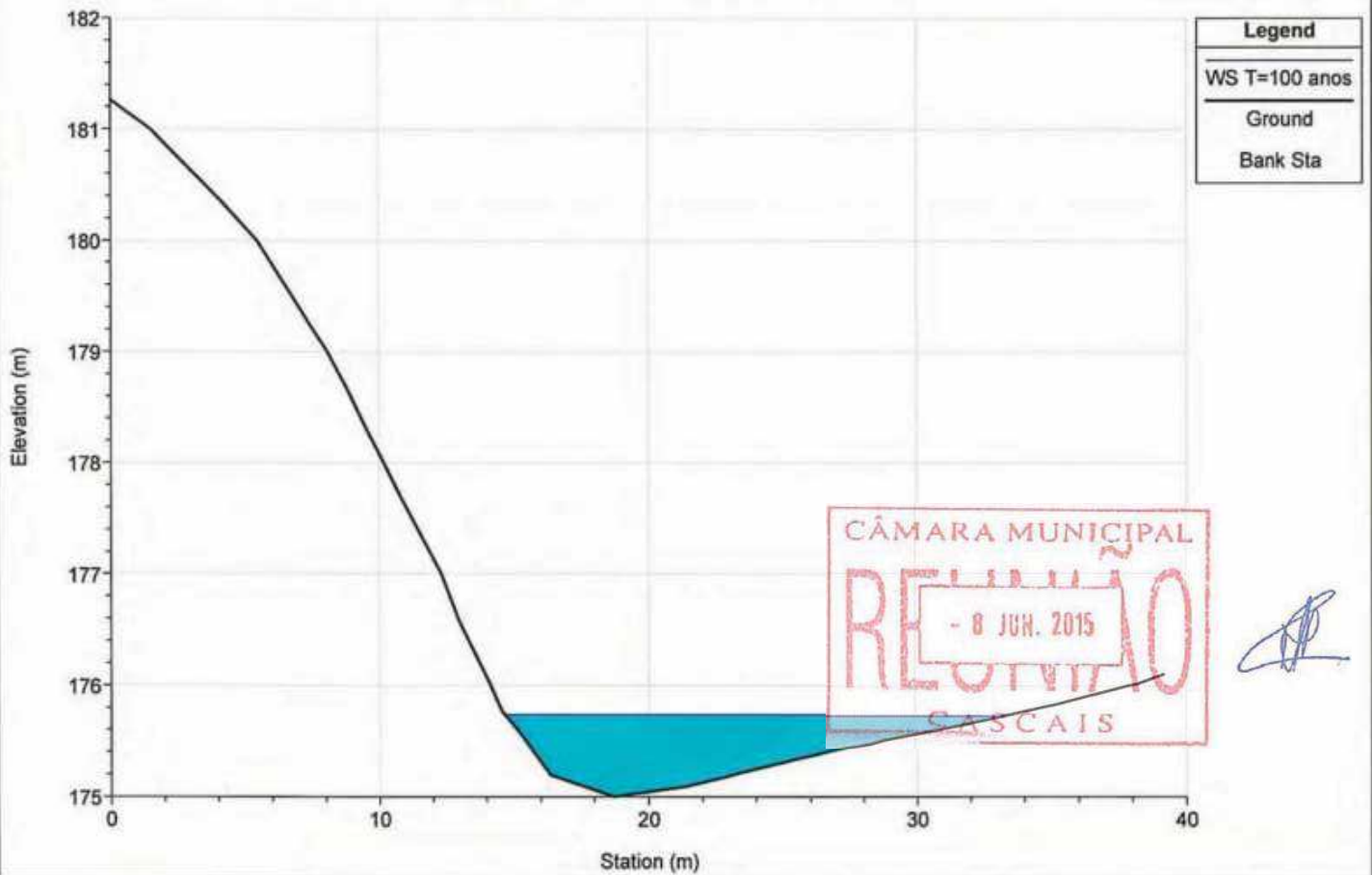
River = FOZ\_GUINCHO Reach = inter 1 RS = 4025.923



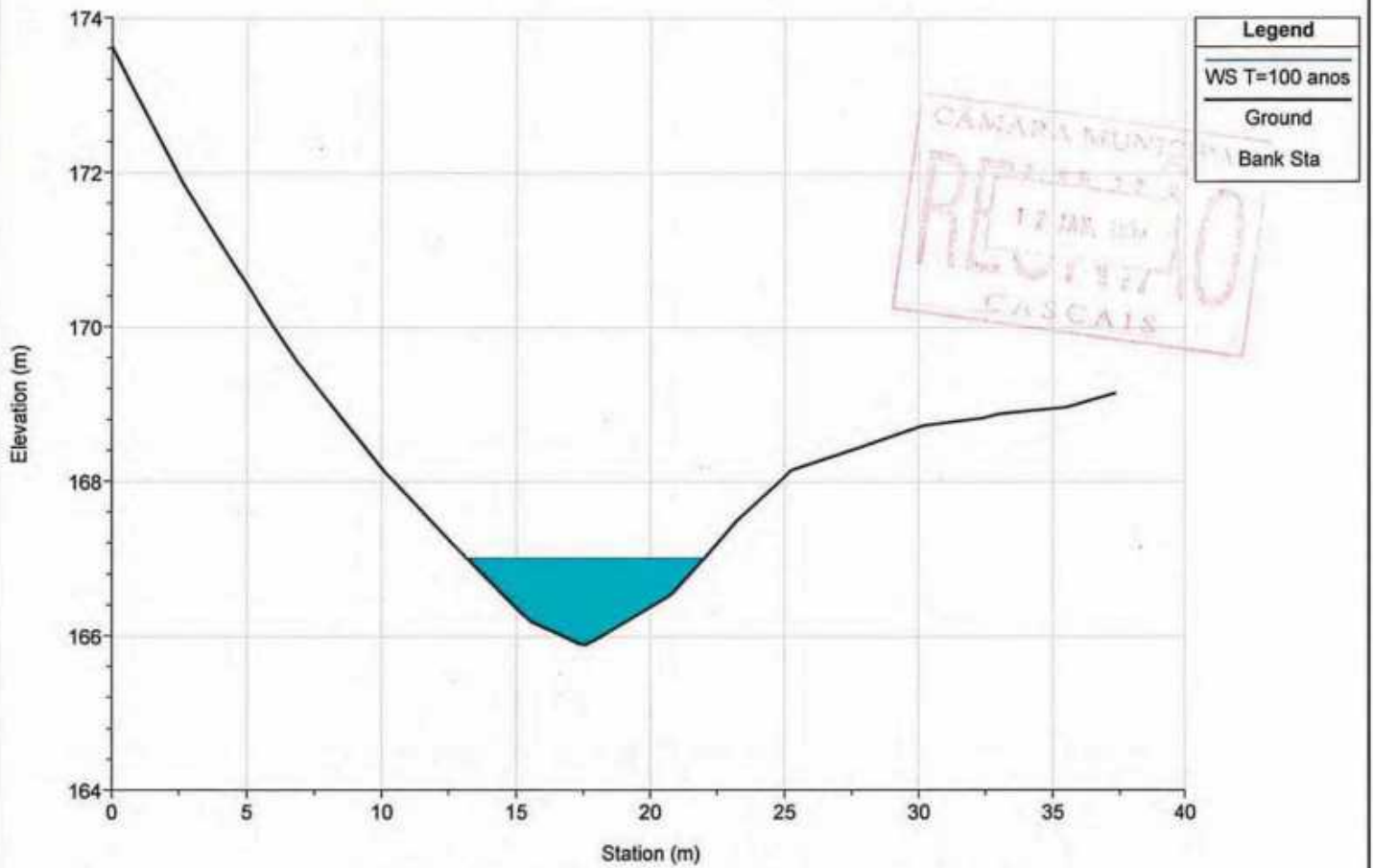
River = FOZ\_GUINCHO Reach = inter2 RS = 3998.569



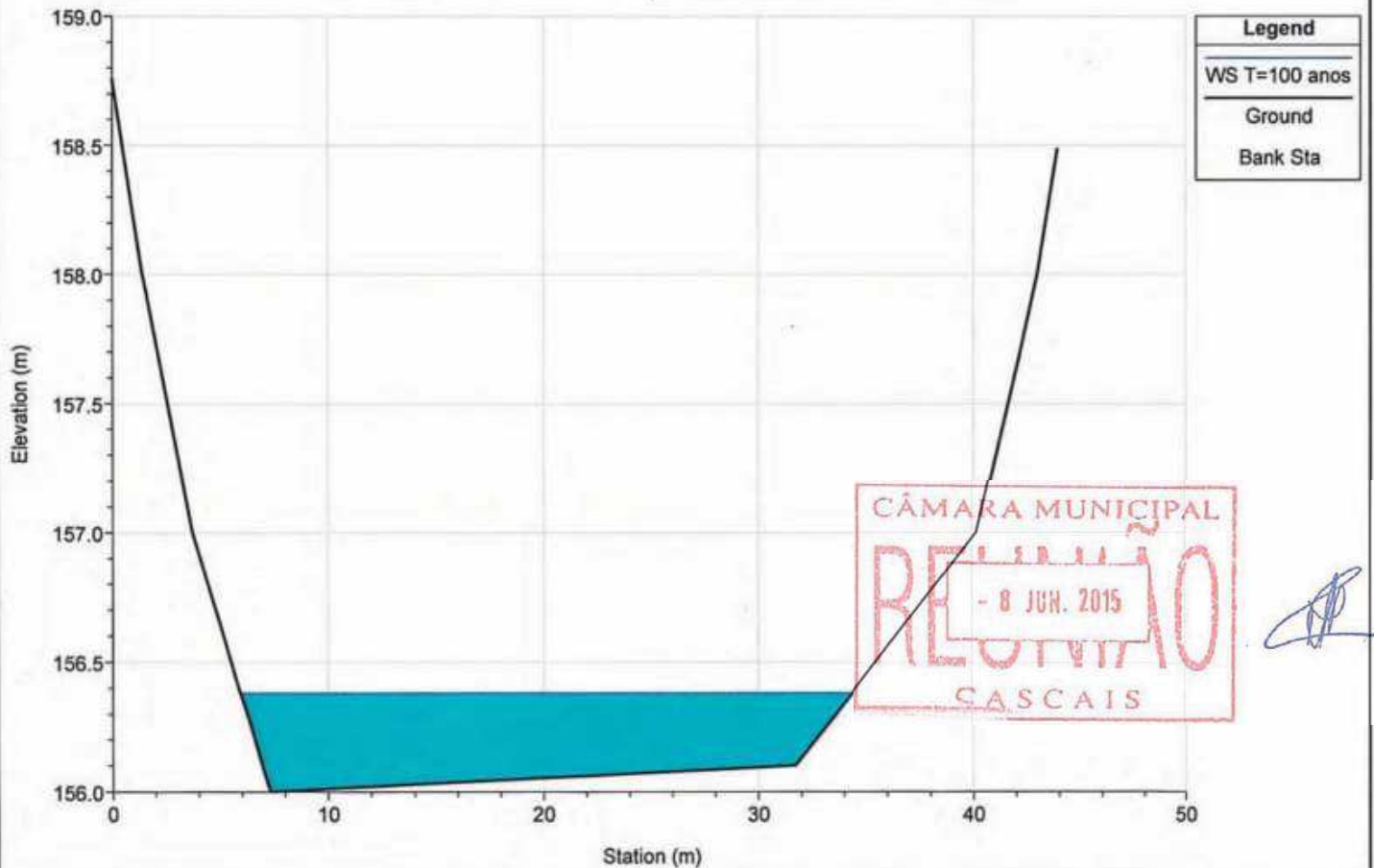
River = FOZ\_GUINCHO Reach = inter2 RS = 3929.554



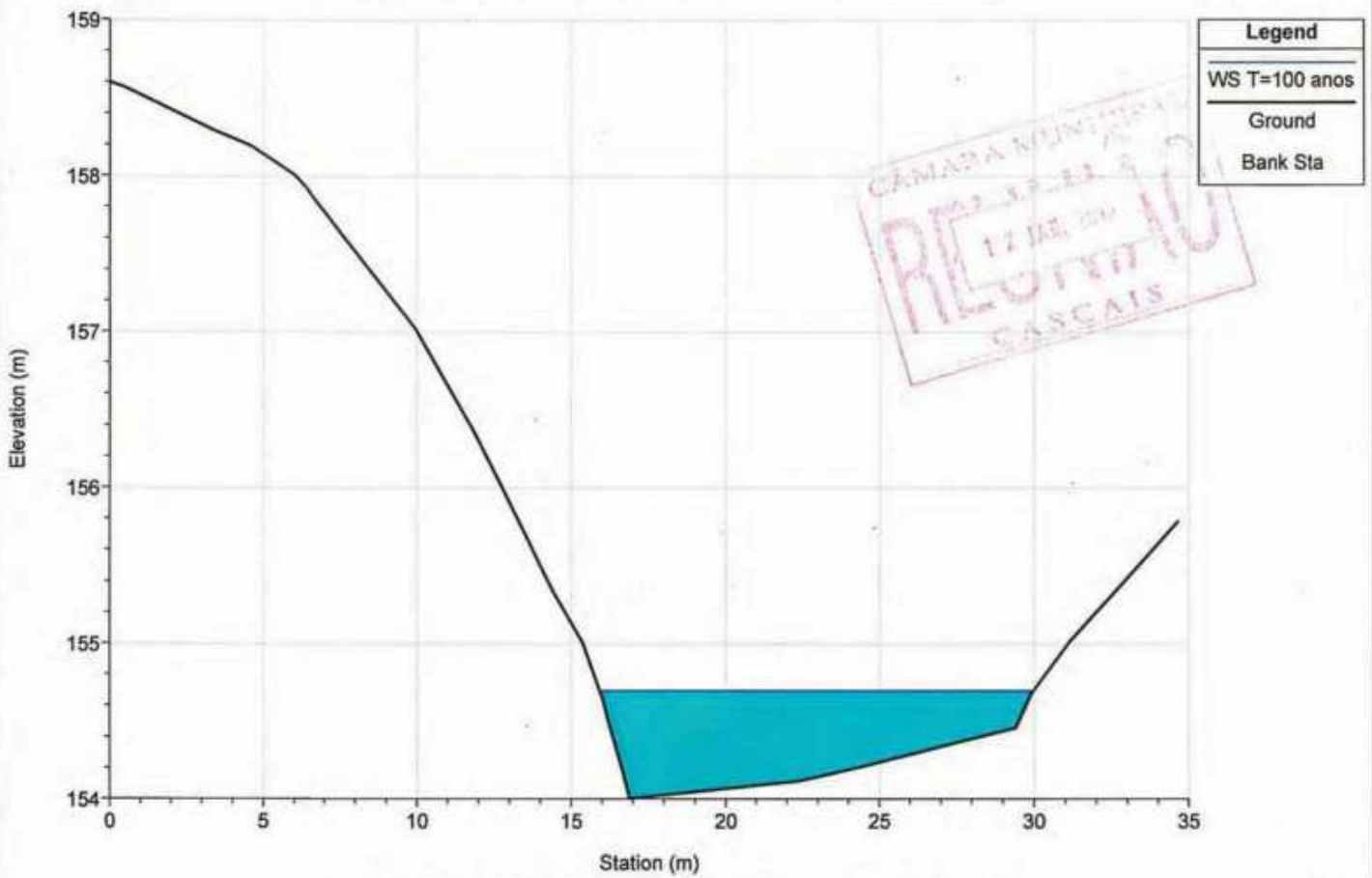
River = FOZ\_GUINCHO Reach = inter2 RS = 3856.793



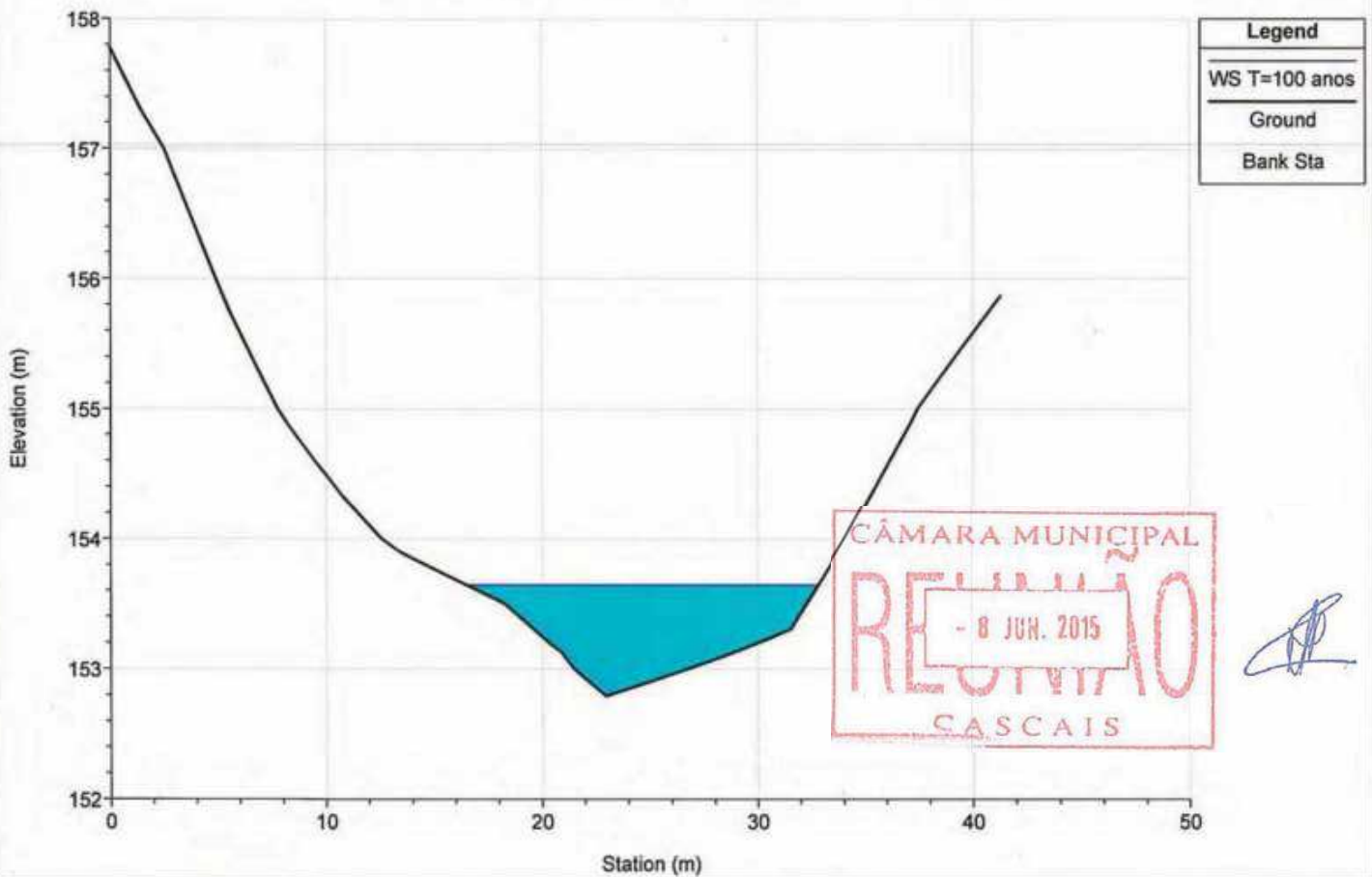
River = FOZ\_GUINCHO Reach = inter2 RS = 3787.381



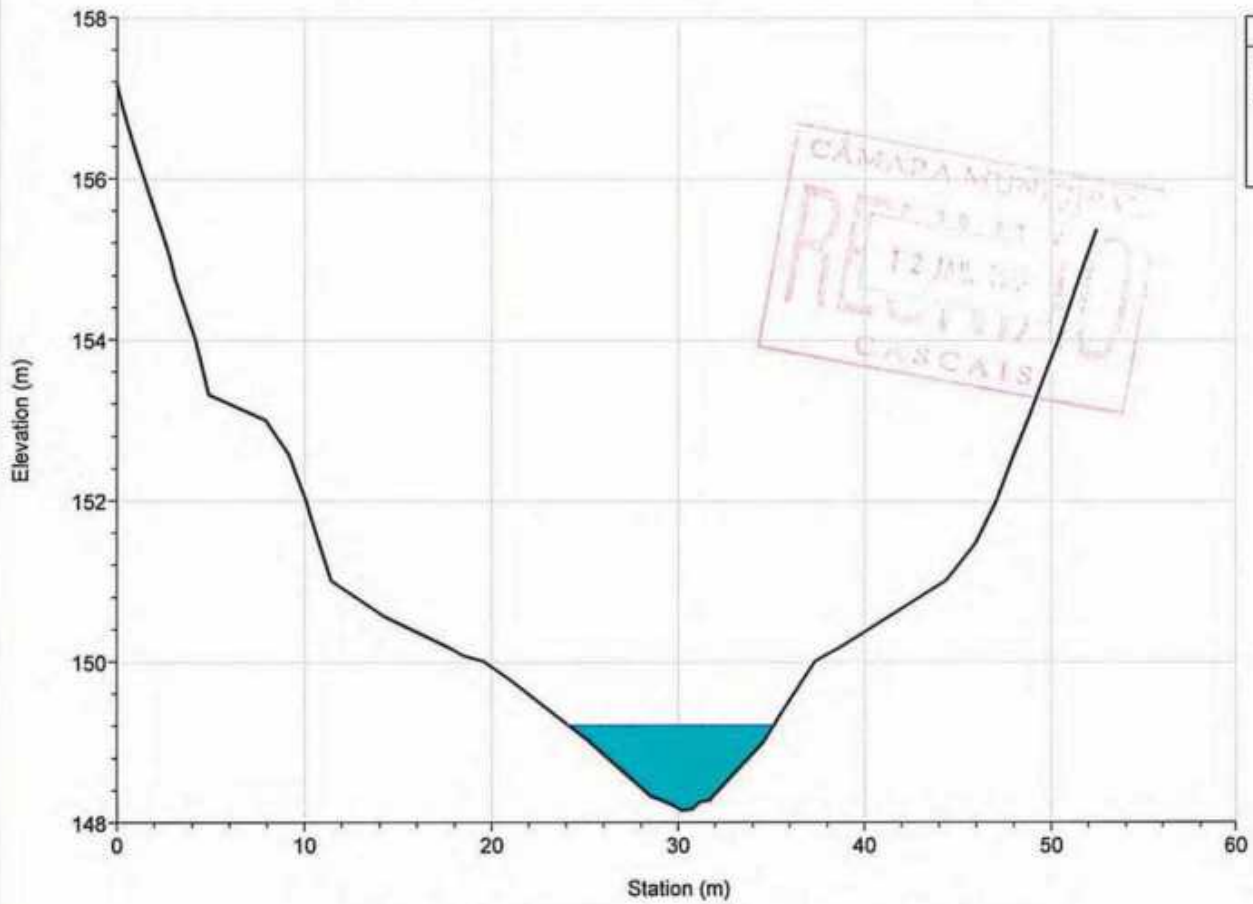
River = FOZ\_GUINCHO Reach = inter2 RS = 3741.769



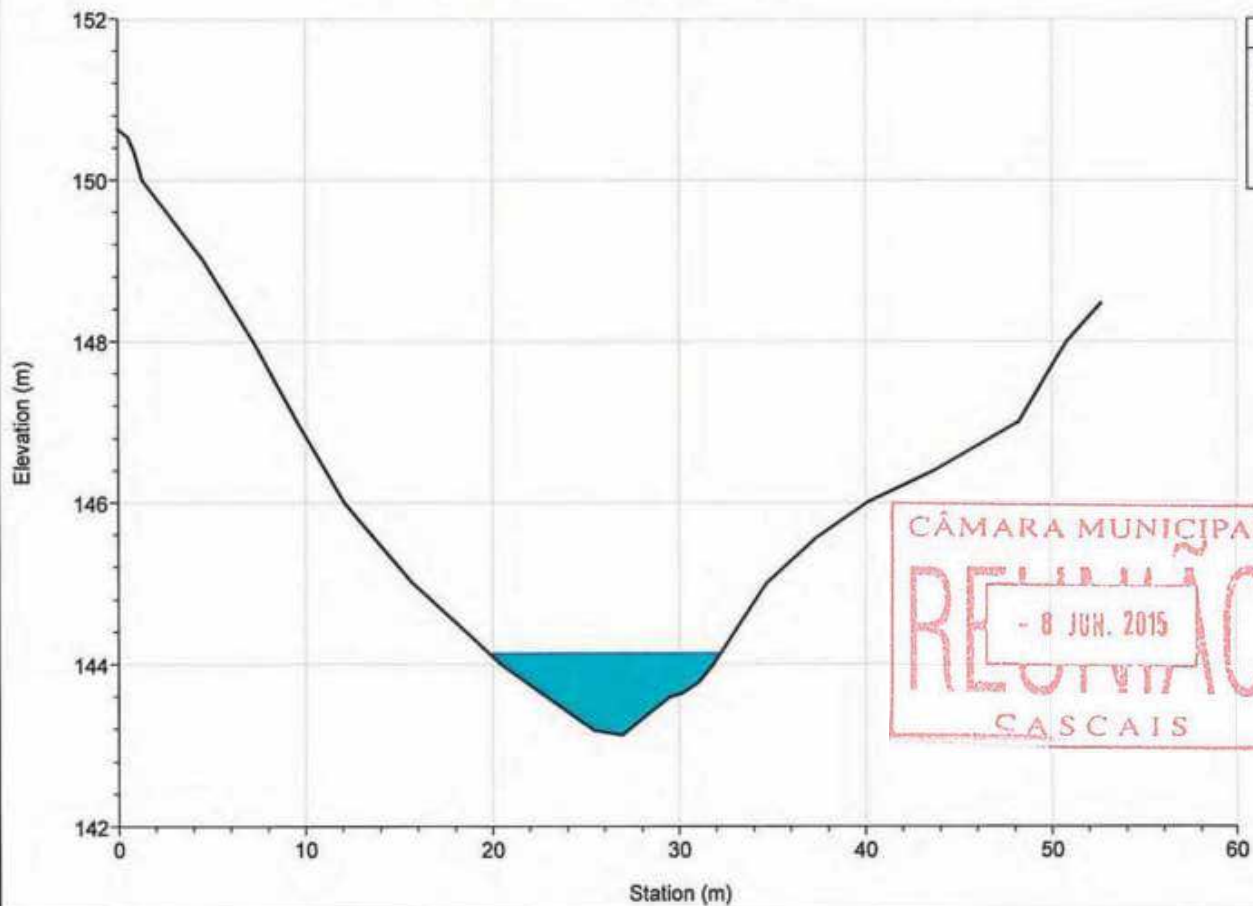
River = FOZ\_GUINCHO Reach = inter3 RS = 3714.551



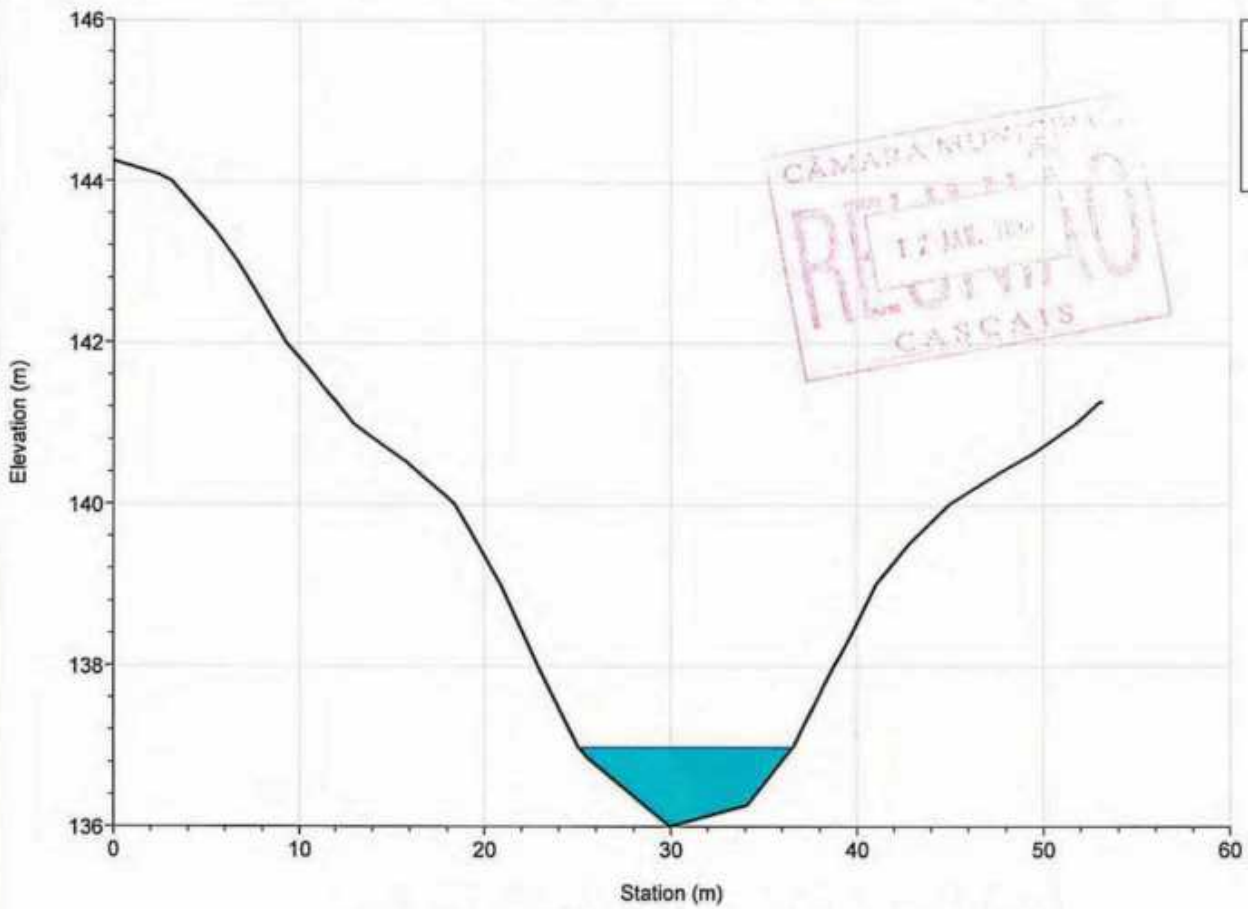
River = FOZ\_GUINCHO Reach = inter3 RS = 3641.971



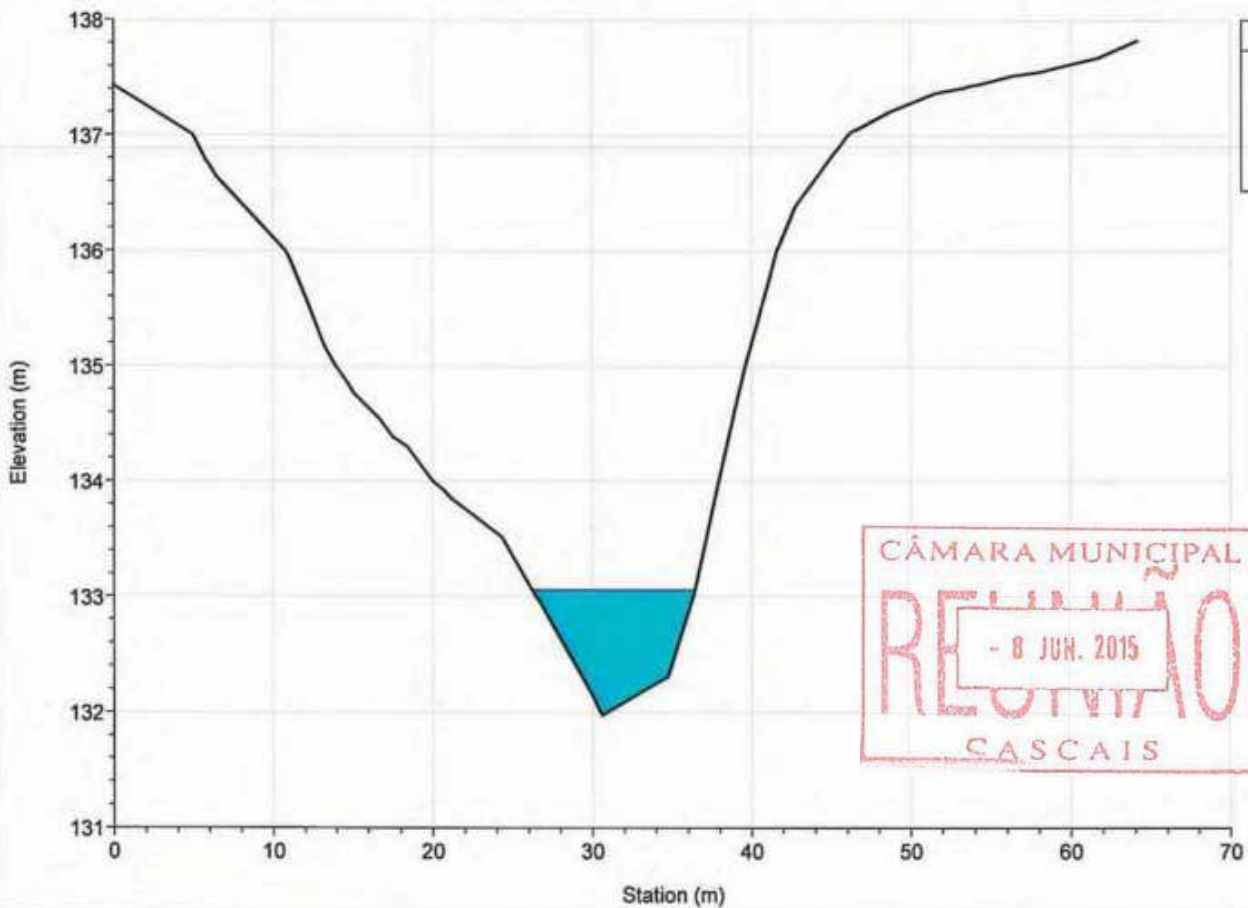
River = FOZ\_GUINCHO Reach = inter3 RS = 3557.873



River = FOZ\_GUINCHO Reach = inter3 RS = 3467.567

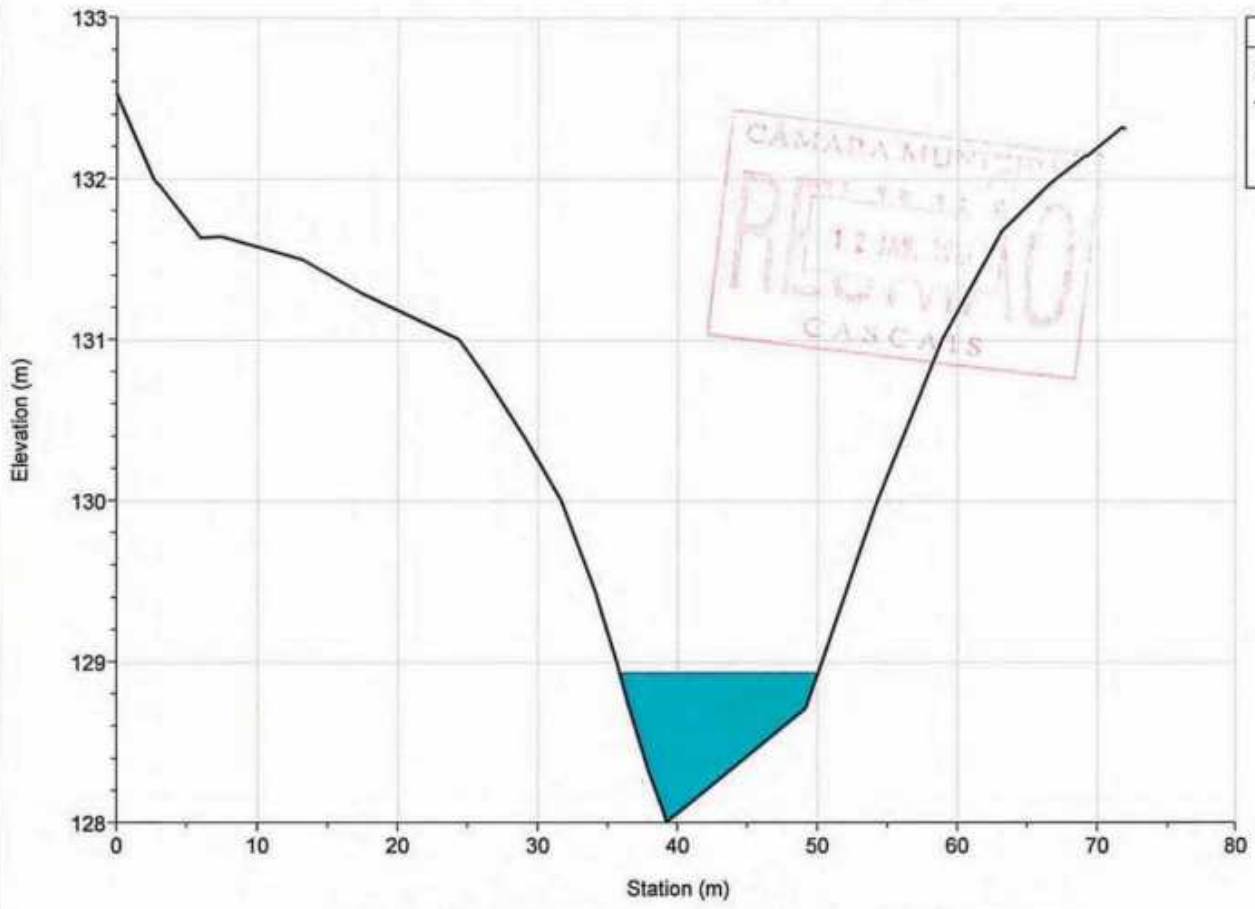


River = FOZ\_GUINCHO Reach = inter3 RS = 3419.835

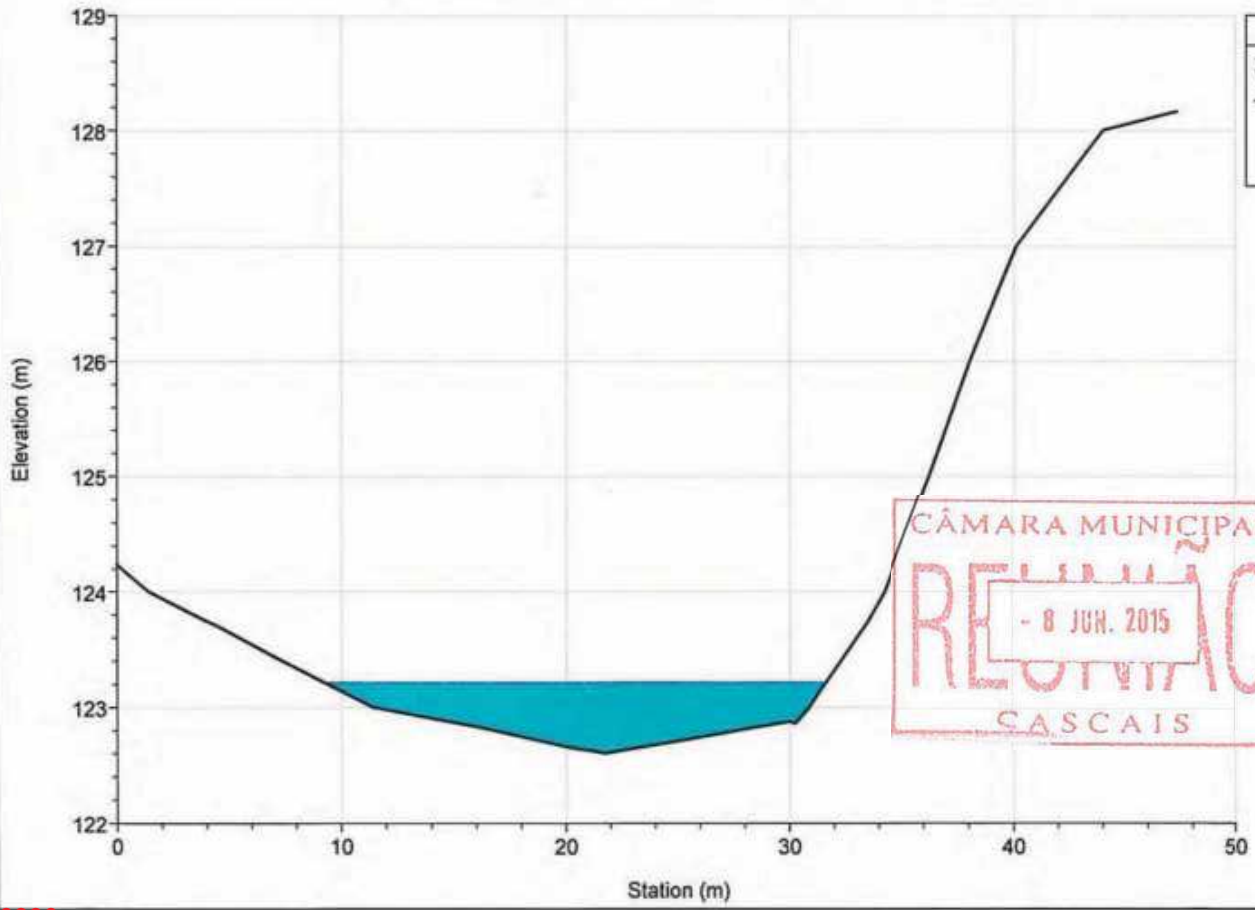




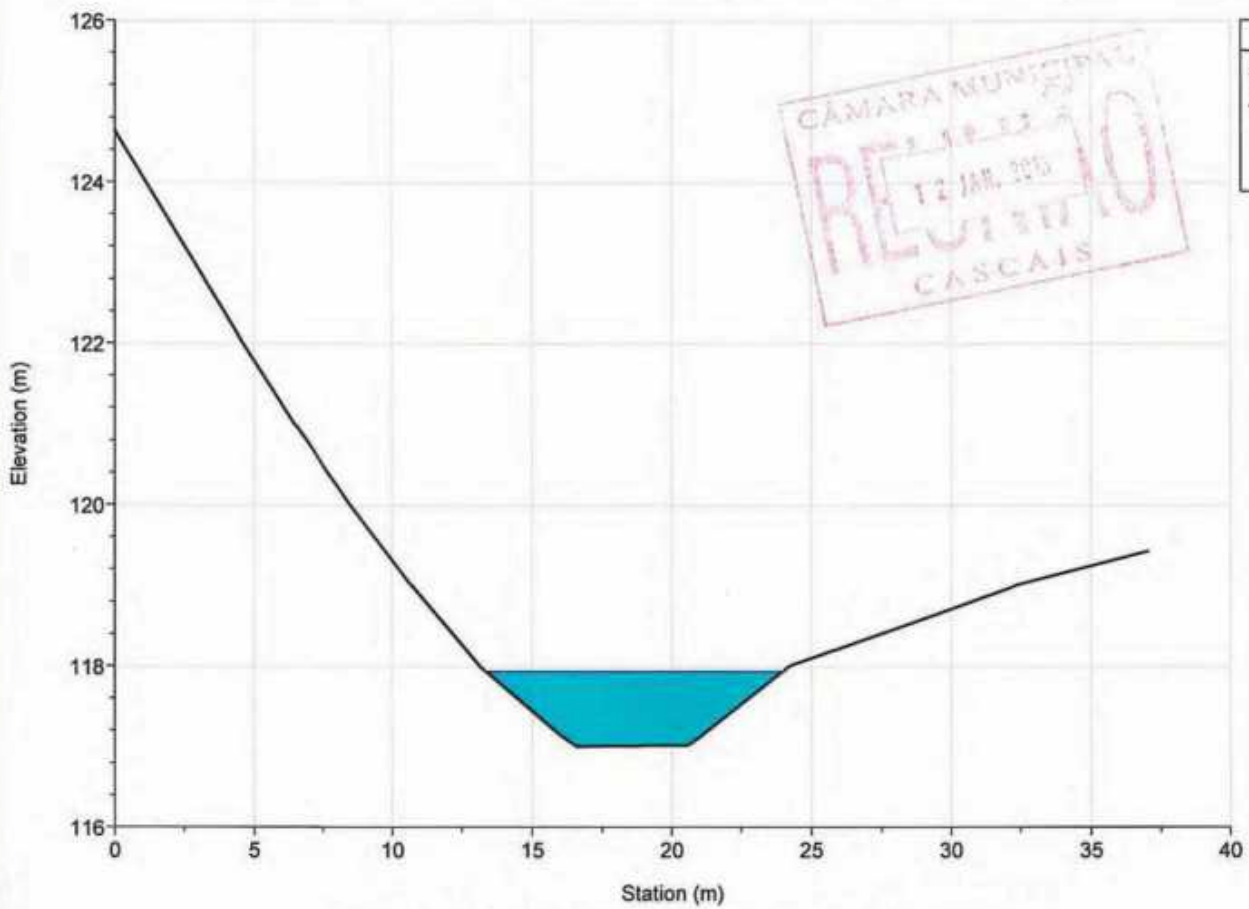
River = FOZ\_GUINCHO Reach = inter3 RS = 3348.724



River = FOZ\_GUINCHO Reach = inter3 RS = 3255.269



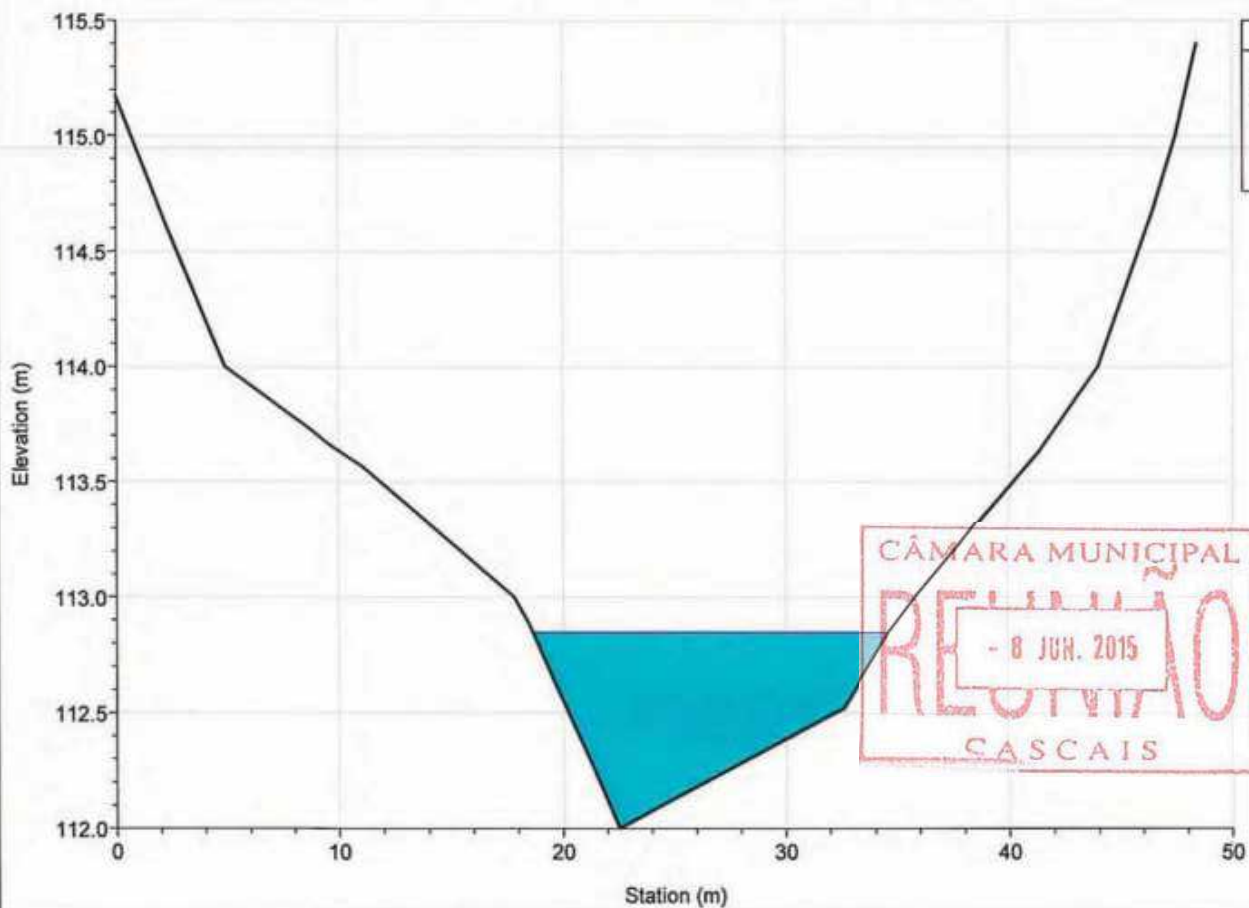
River = FOZ\_GUINCHO Reach = inter3 RS = 3167.493



Legend
WS T=100 anos
Ground
Bank Sta

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12 JUN. 2015  
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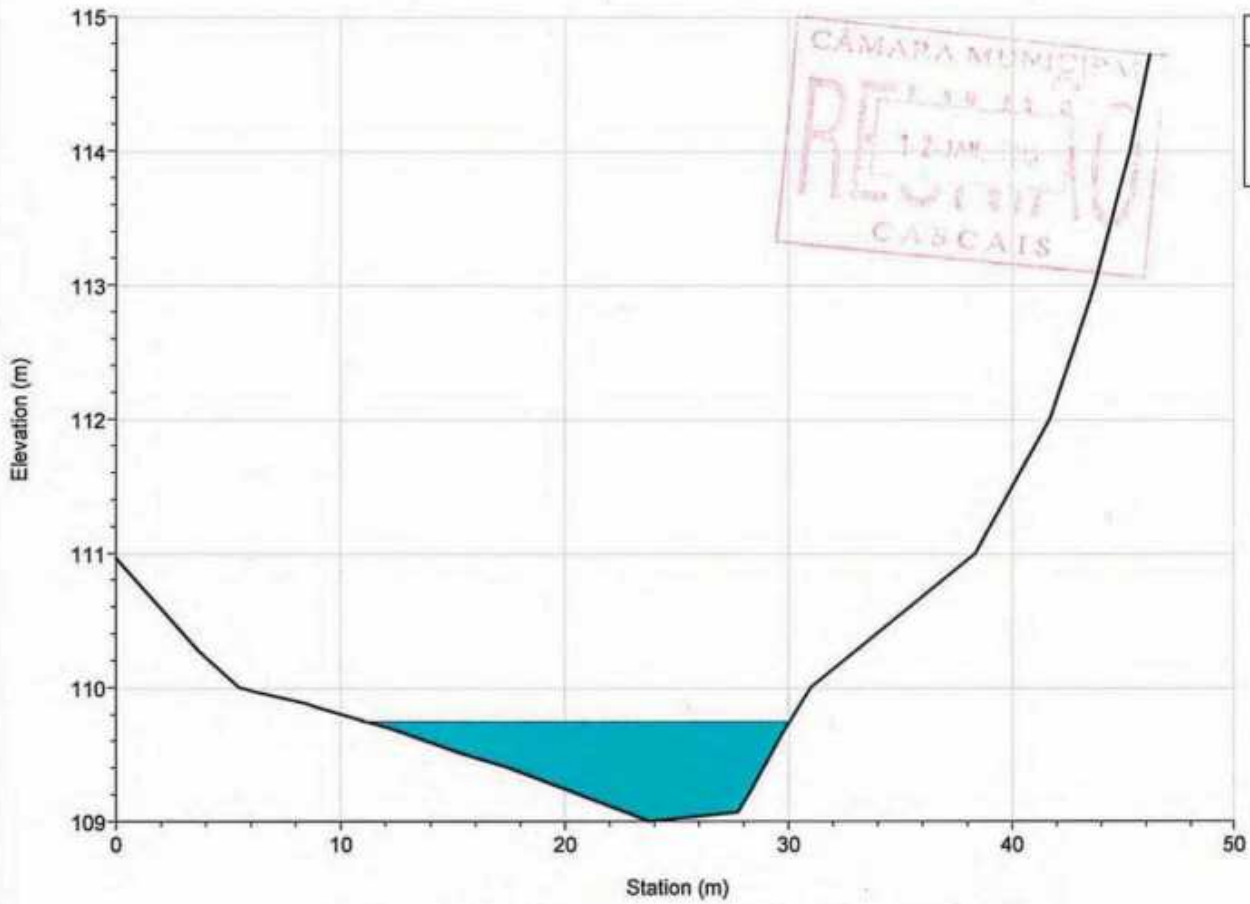
River = FOZ\_GUINCHO Reach = inter3 RS = 3075.866



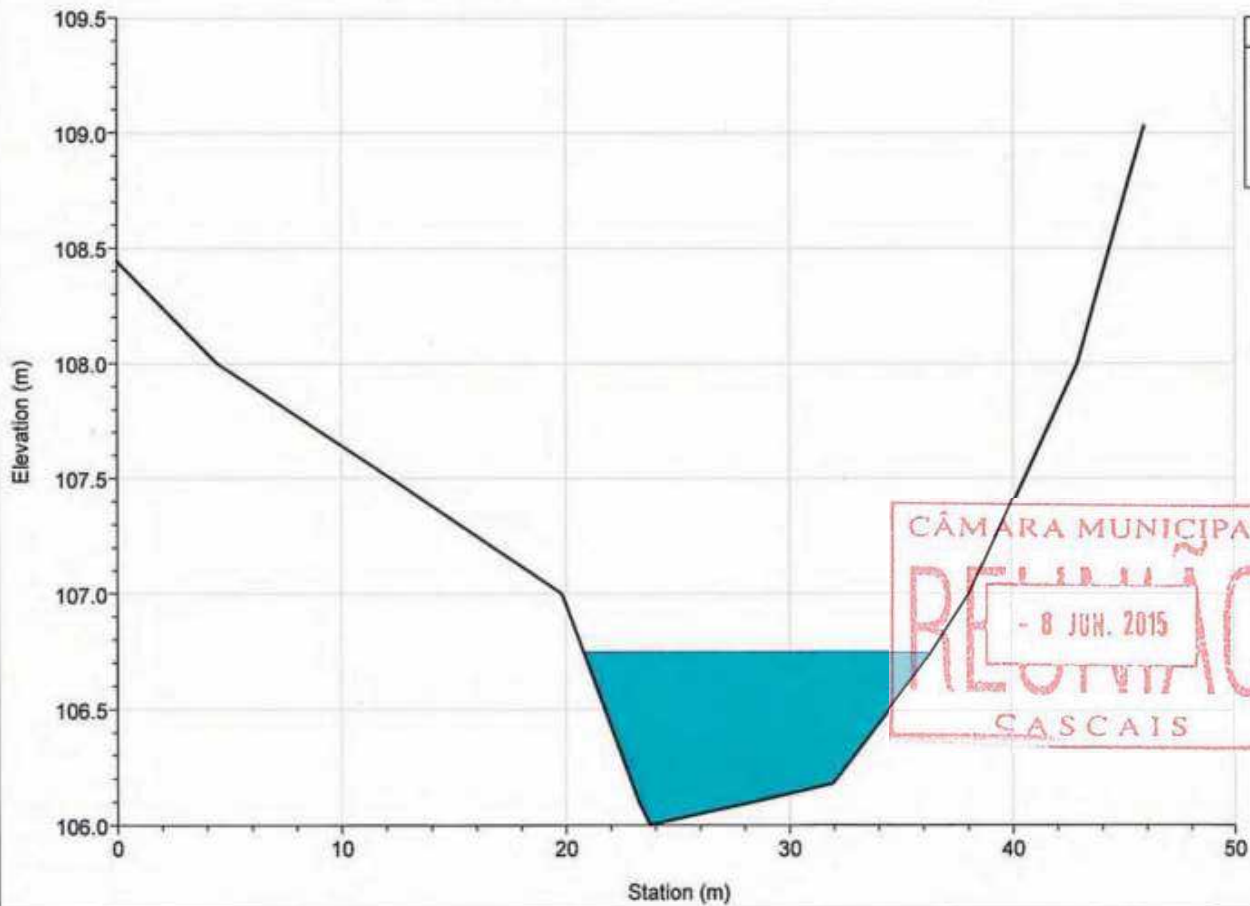
Legend
WS T=100 anos
Ground
Bank Sta

CÂMARA MUNICIPAL  
RECONSTRUÇÃO  
- 8 JUN. 2015  
CASCAIS

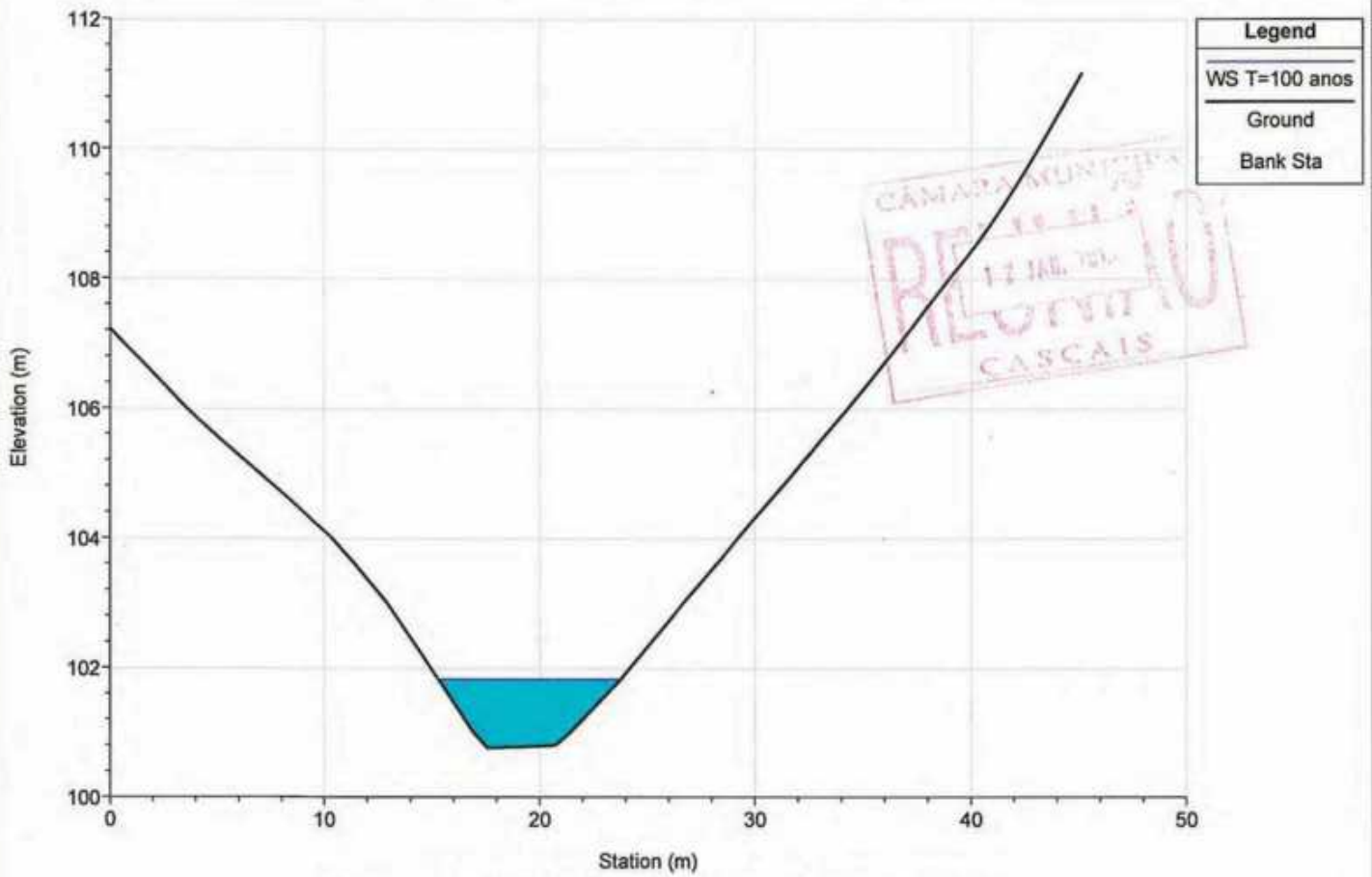
River = FOZ\_GUINCHO Reach = inter3 RS = 2998.184



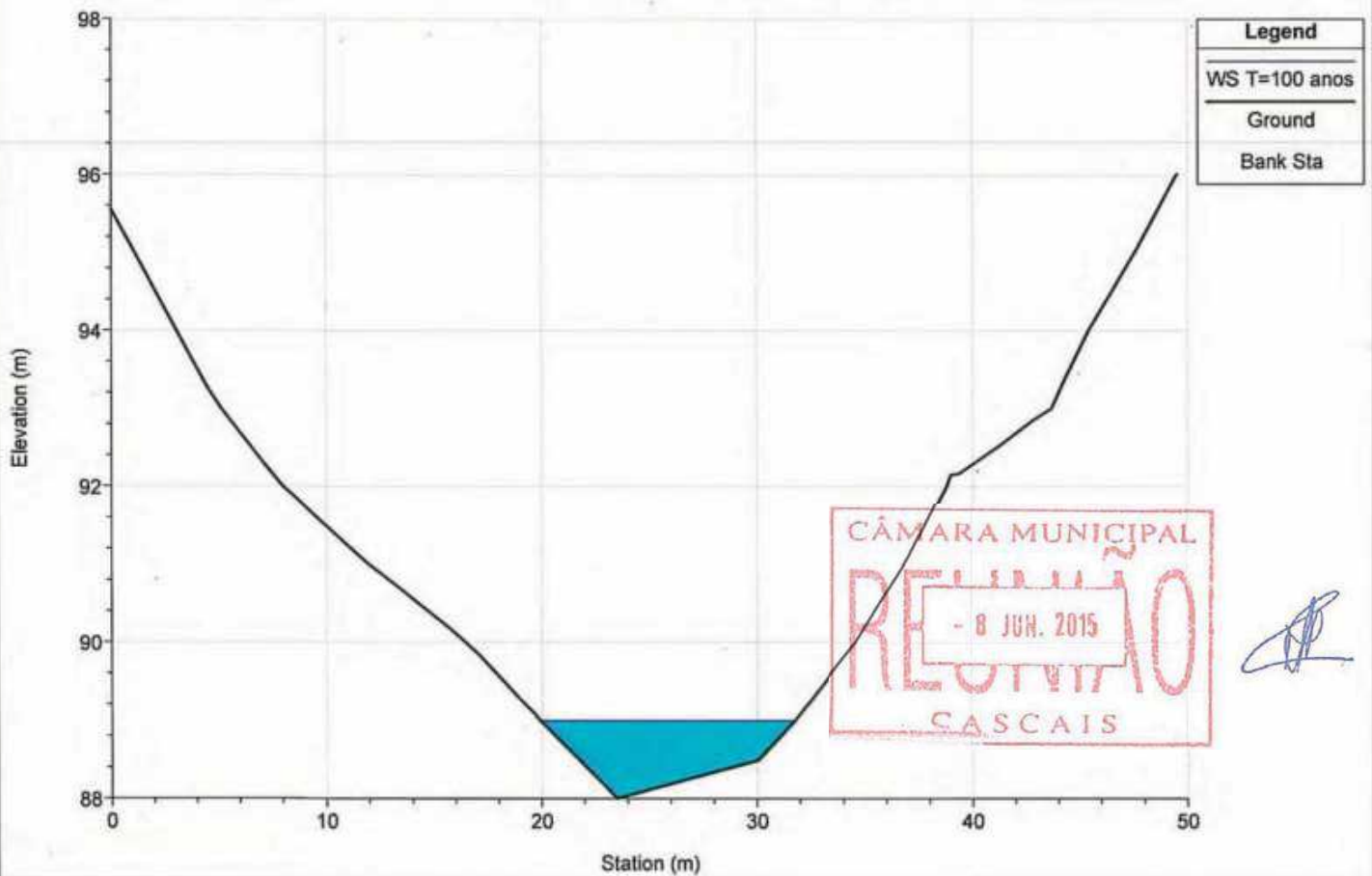
River = FOZ\_GUINCHO Reach = inter3 RS = 2912.659



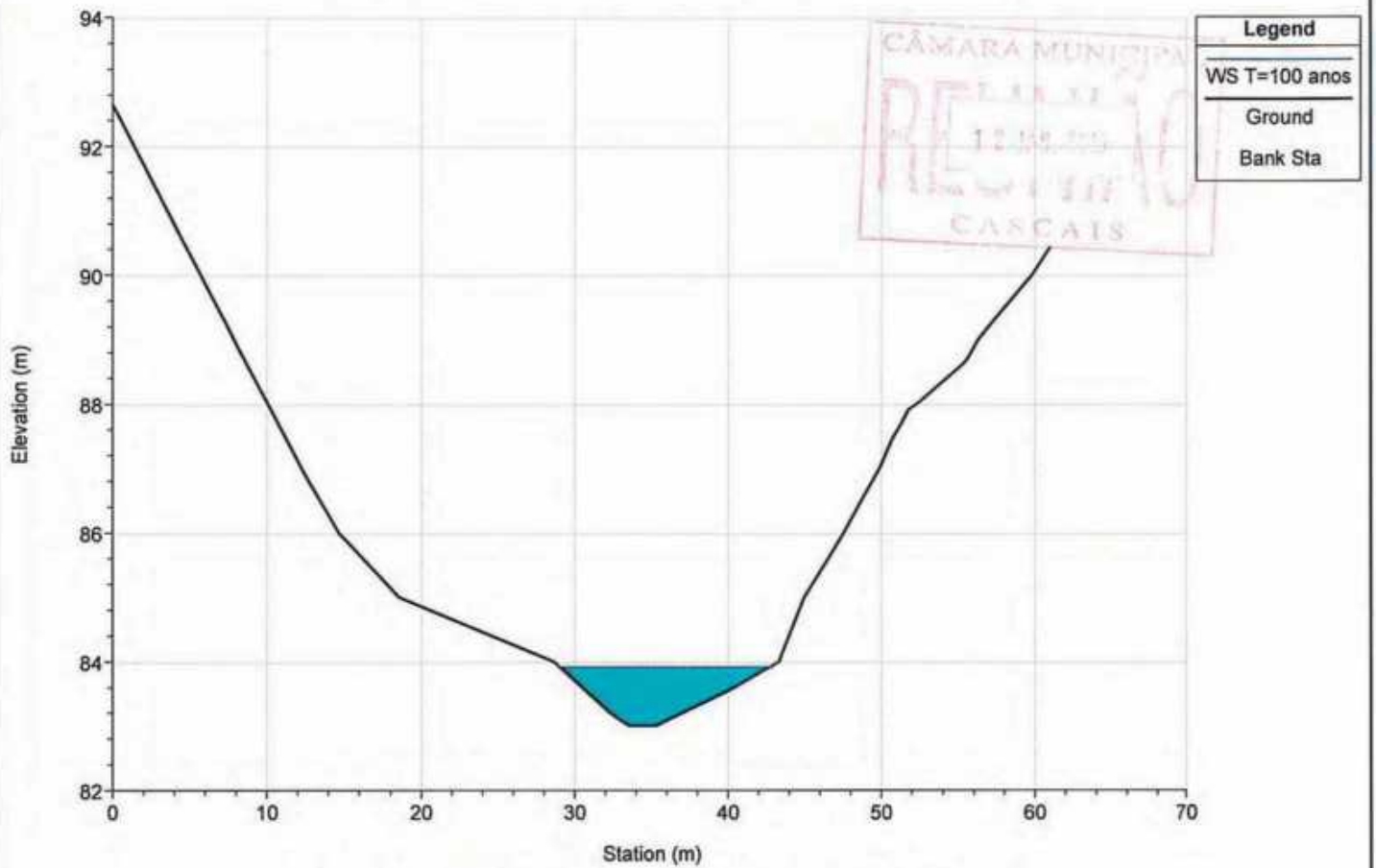
River = FOZ\_GUINCHO Reach = inter3 RS = 2843.237



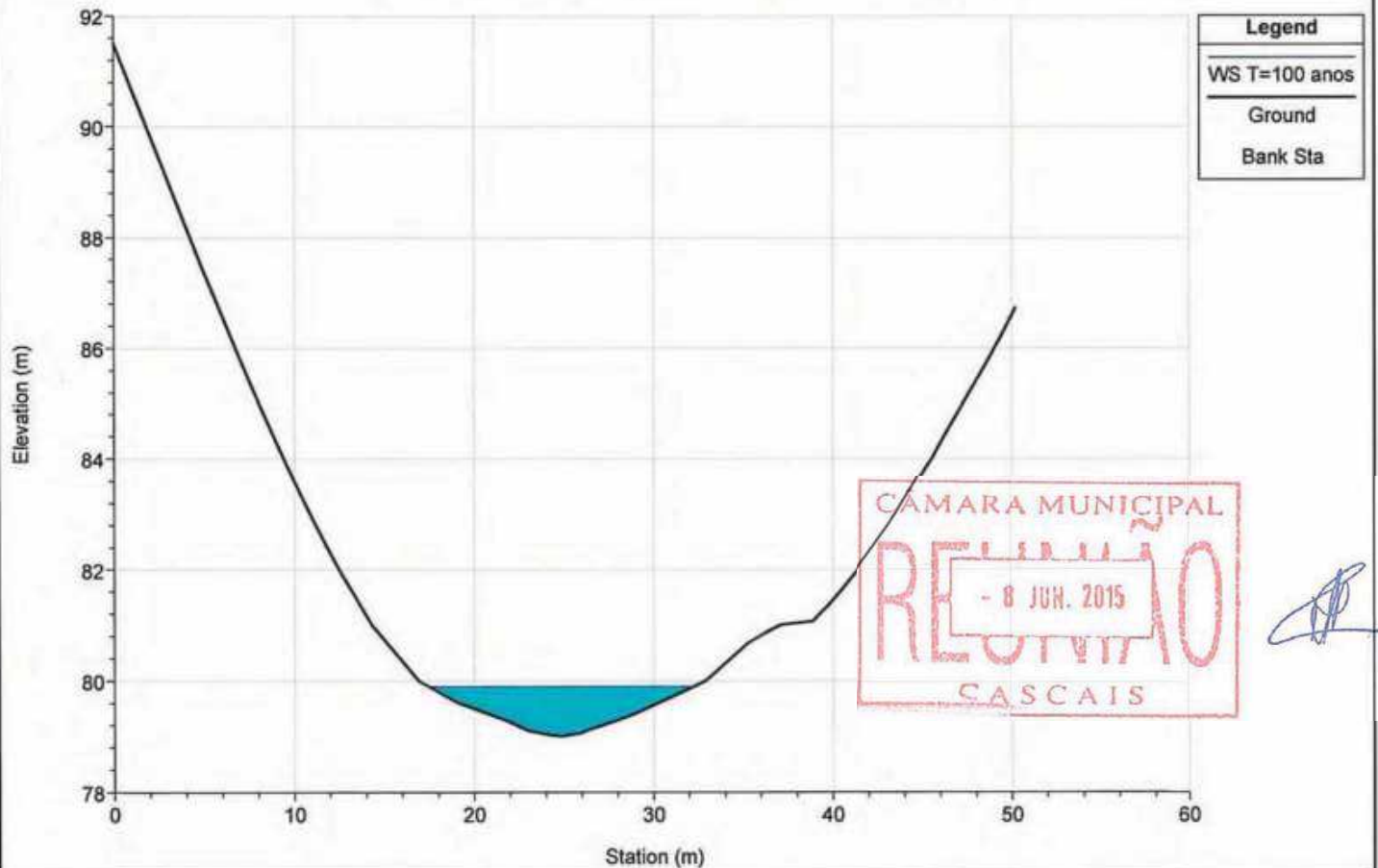
River = FOZ\_GUINCHO Reach = inter3 RS = 2757.176



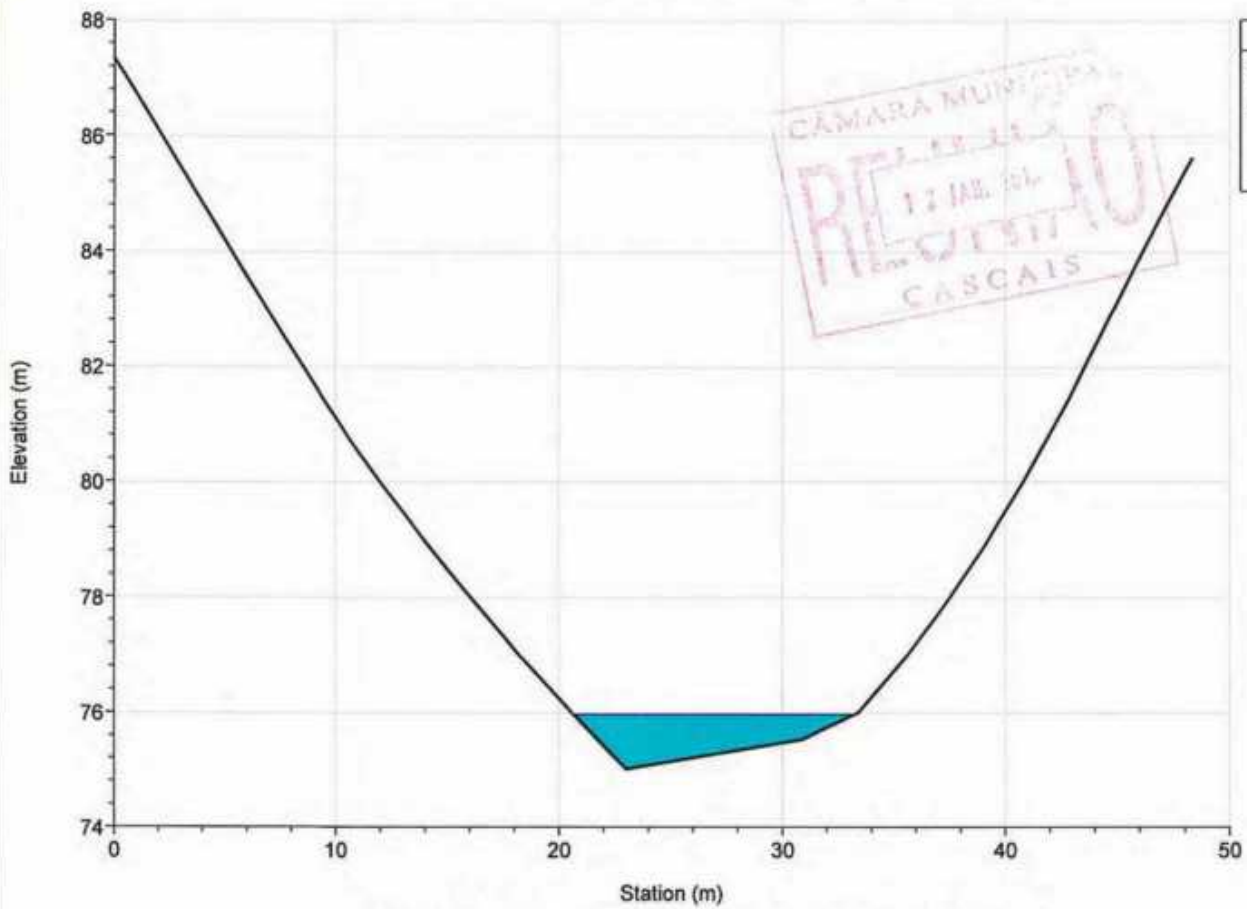
River = FOZ\_GUINCHO Reach = inter3 RS = 2670.166



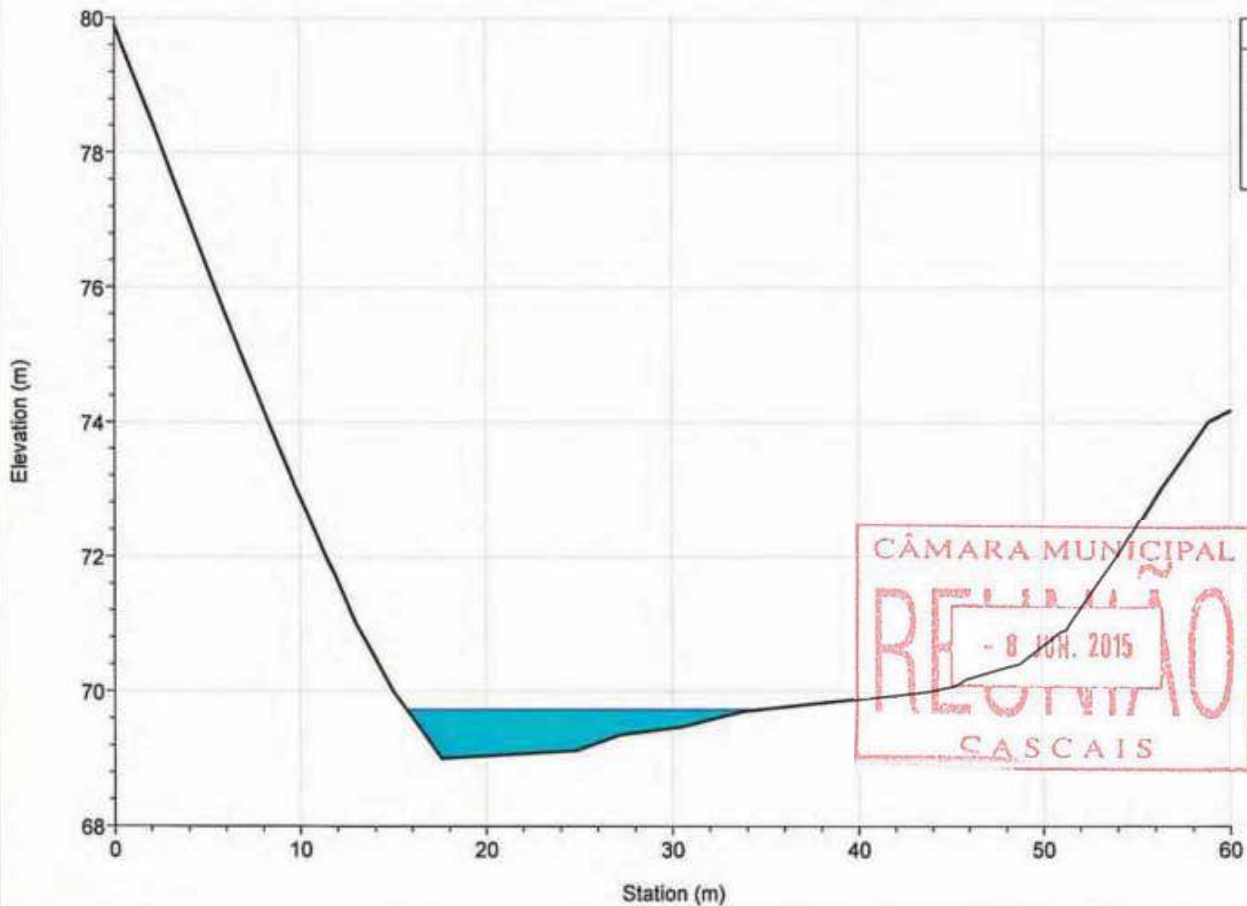
River = FOZ\_GUINCHO Reach = inter3 RS = 2572.145



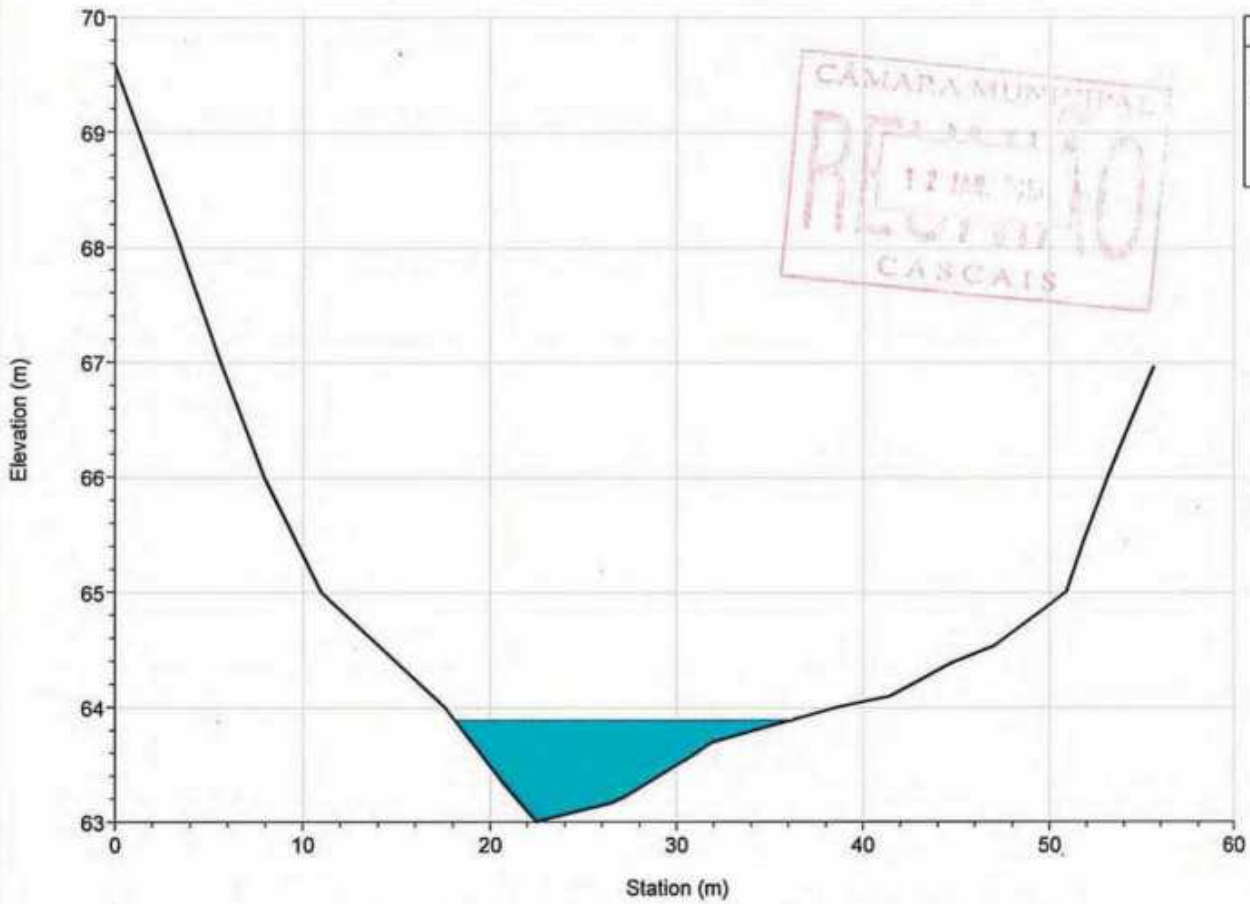
River = FOZ\_GUINCHO Reach = inter3 RS = 2484.223



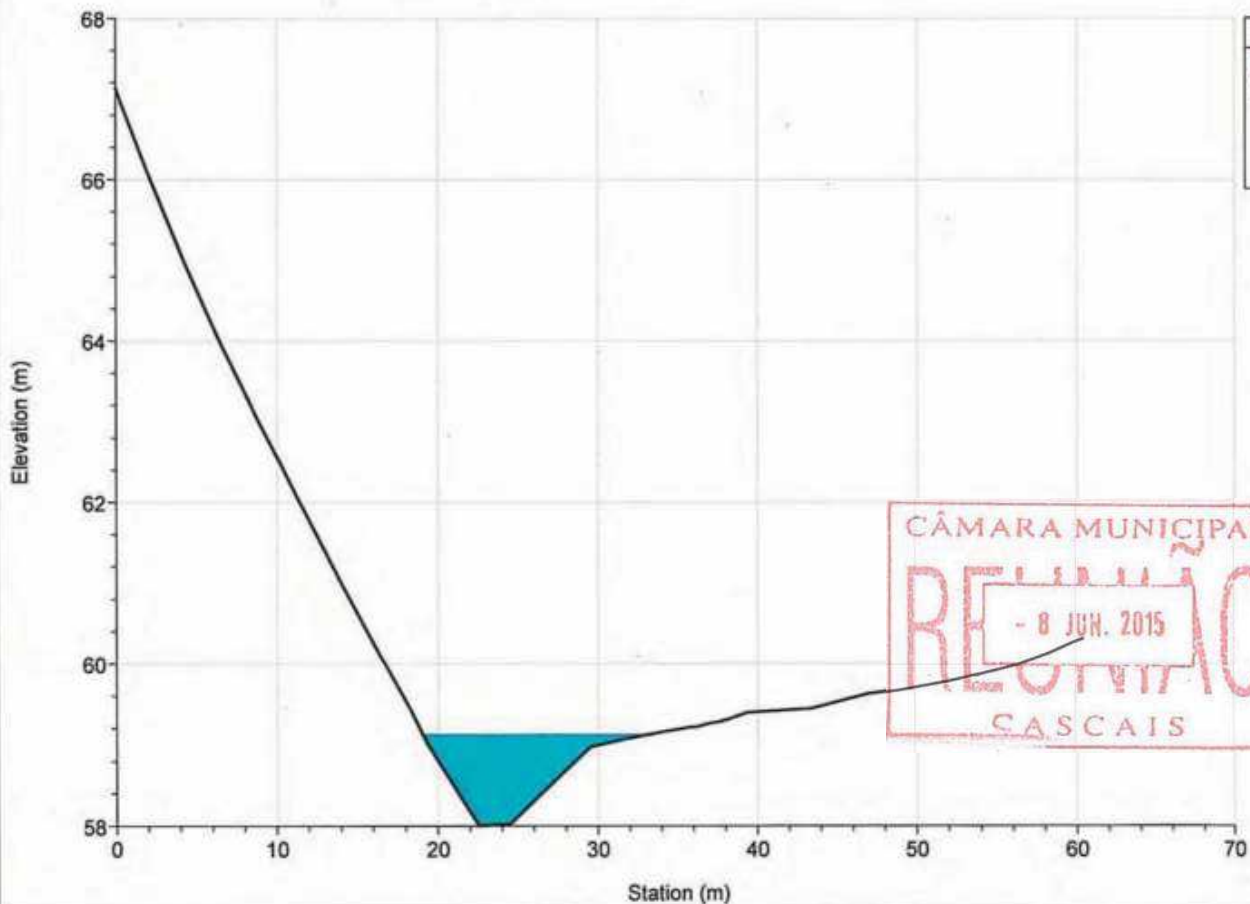
River = FOZ\_GUINCHO Reach = inter3 RS = 2357.051



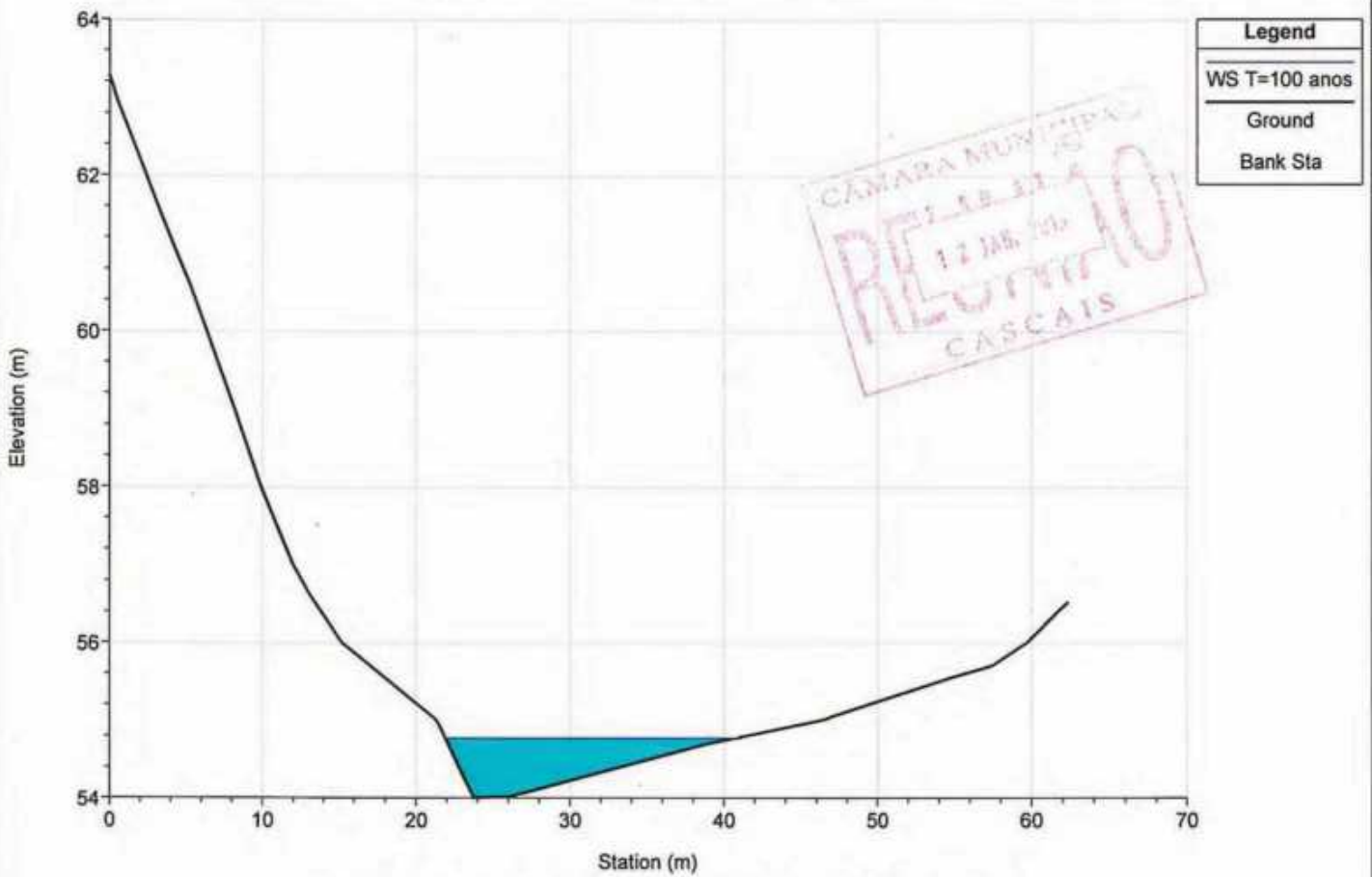
River = FOZ\_GUINCHO Reach = inter3 RS = 2228.776



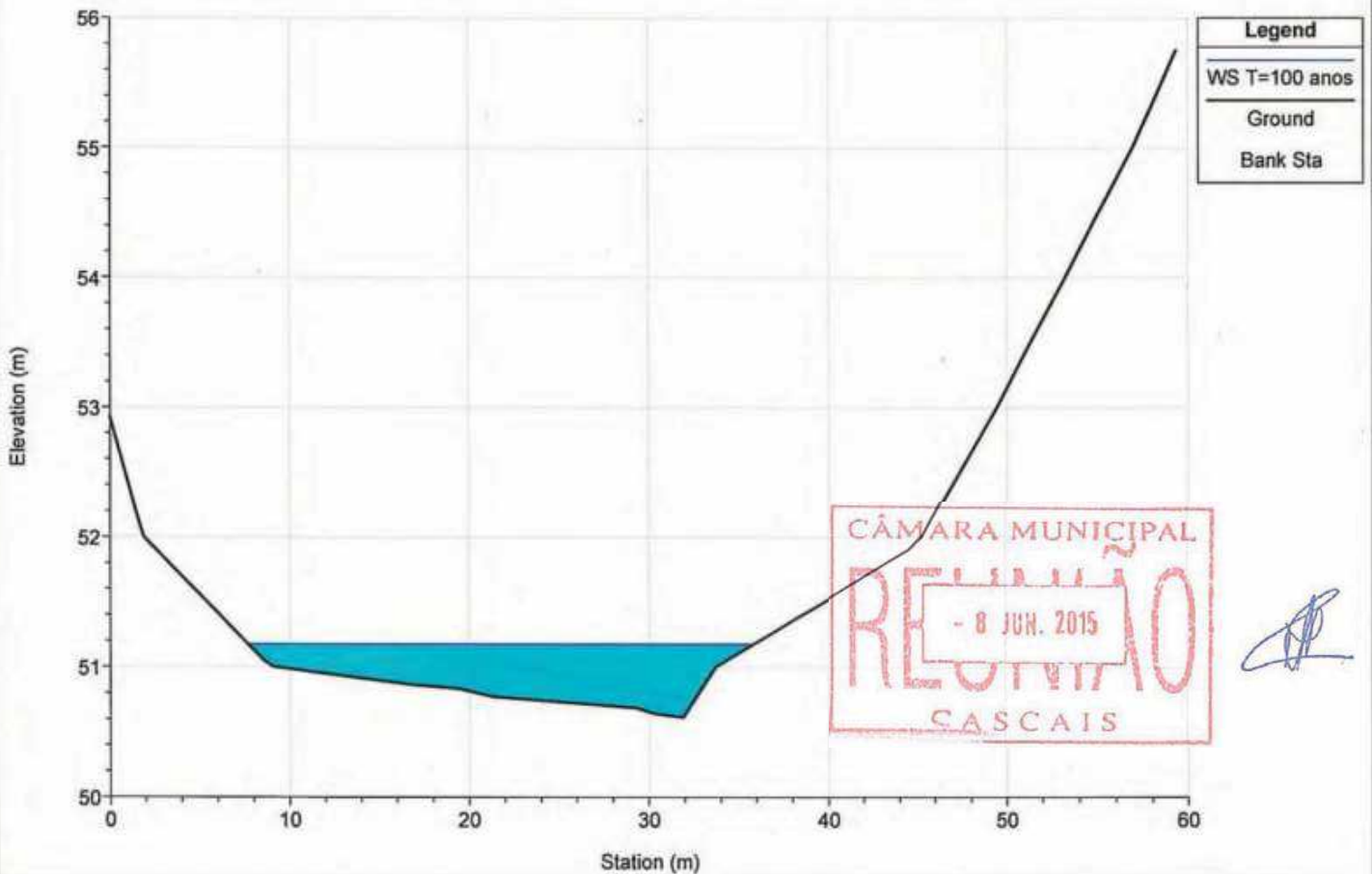
River = FOZ\_GUINCHO Reach = inter3 RS = 2117.043



River = FOZ\_GUINCHO Reach = inter3 RS = 2010.847

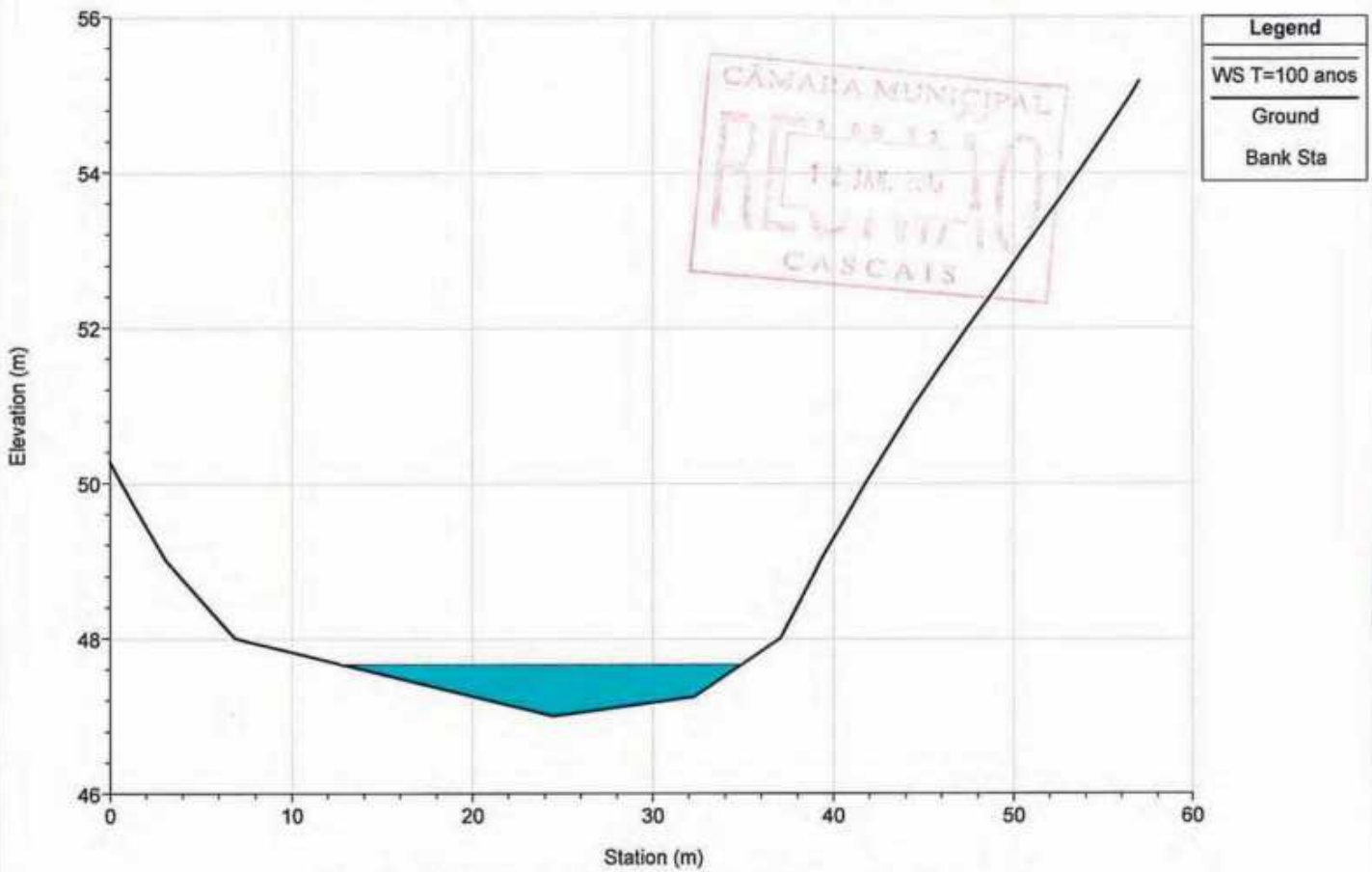


River = FOZ\_GUINCHO Reach = inter3 RS = 1892.185

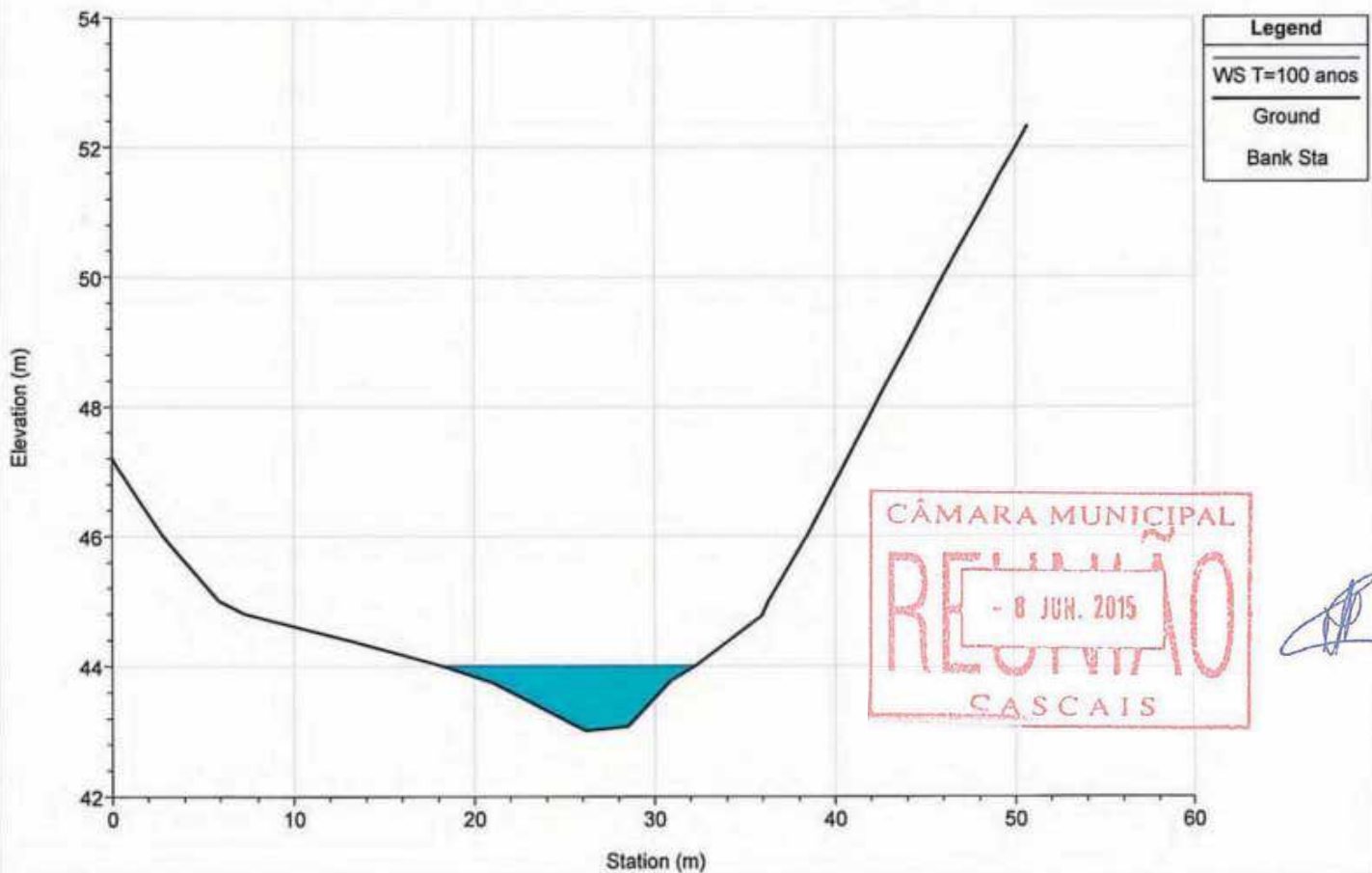




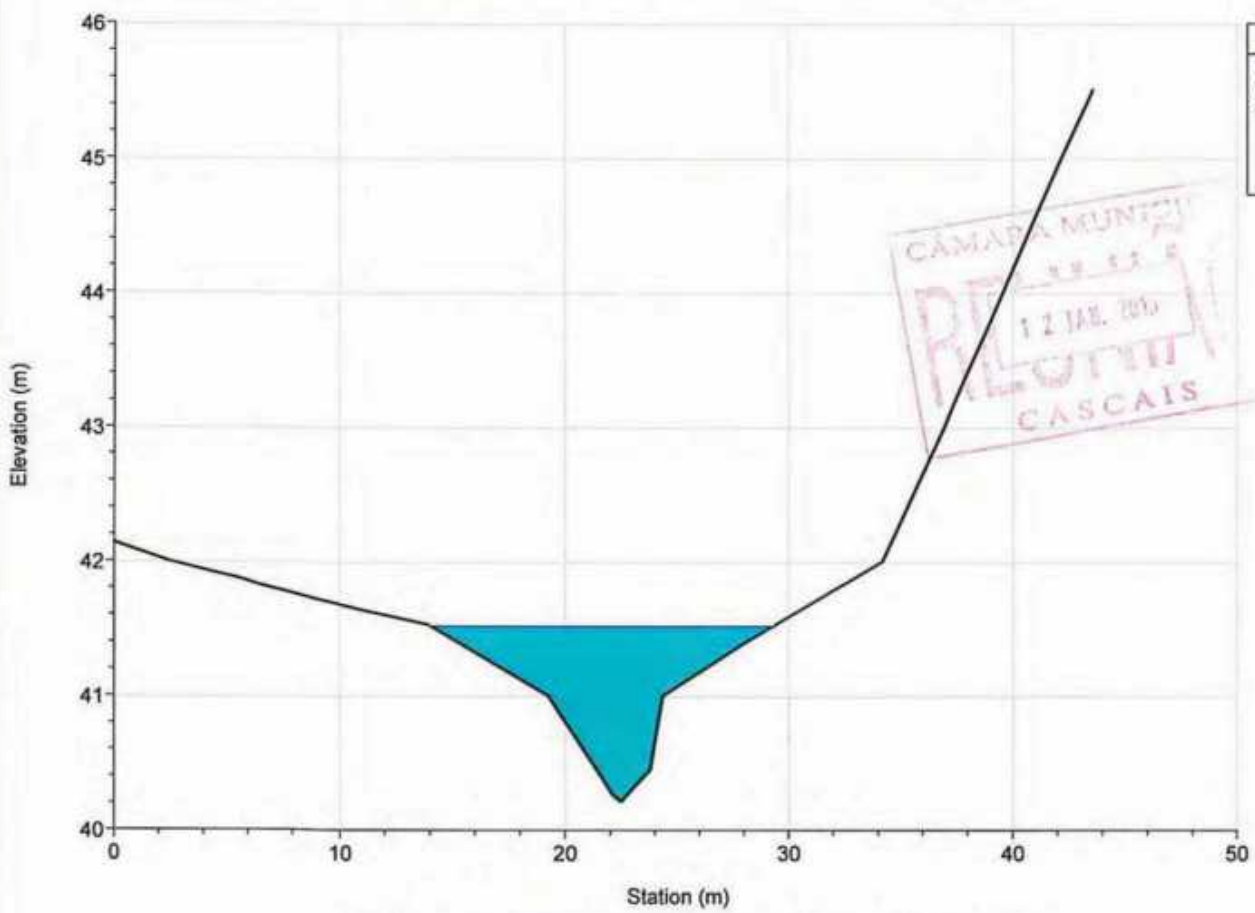
River = FOZ\_GUINCHO Reach = inter3 RS = 1790.503



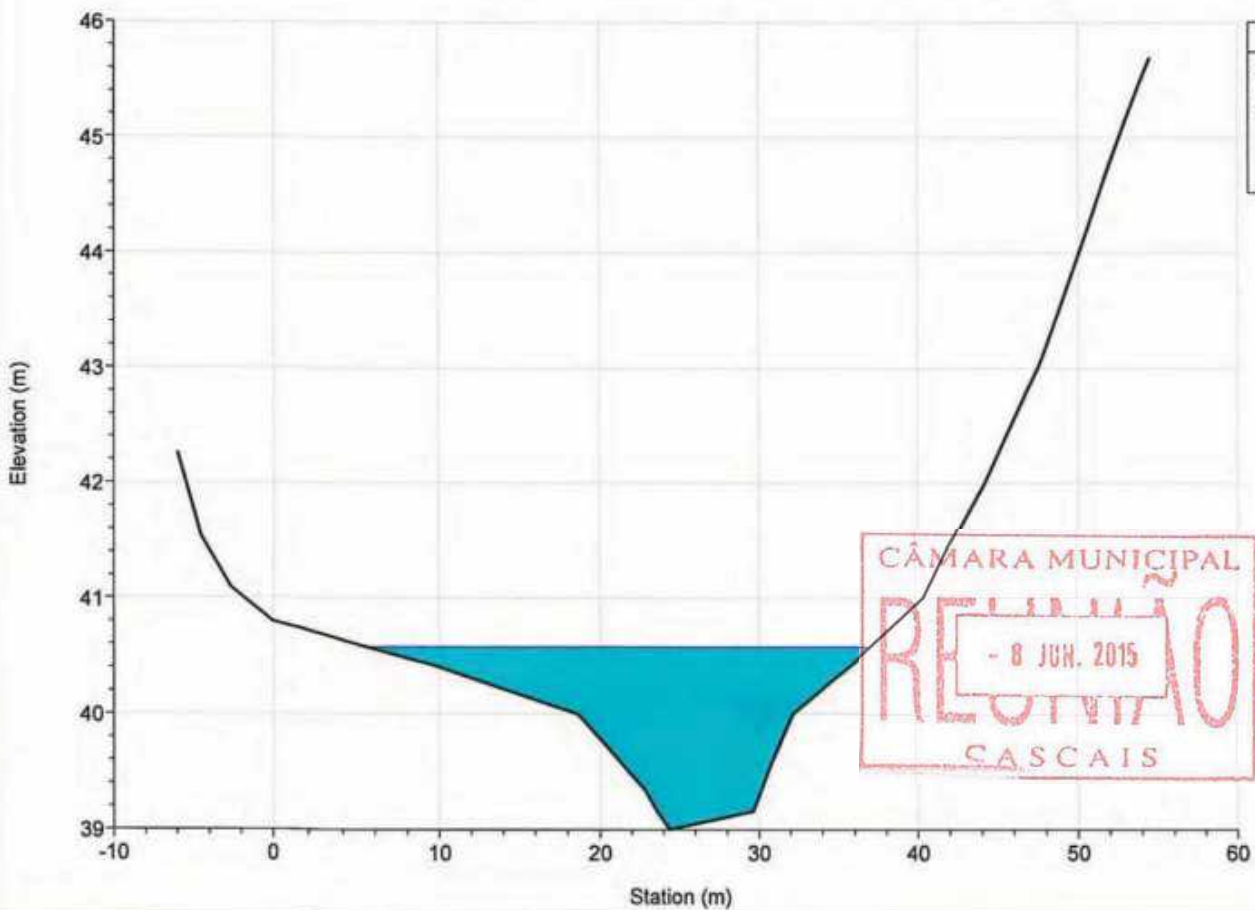
River = FOZ\_GUINCHO Reach = inter3 RS = 1694.344



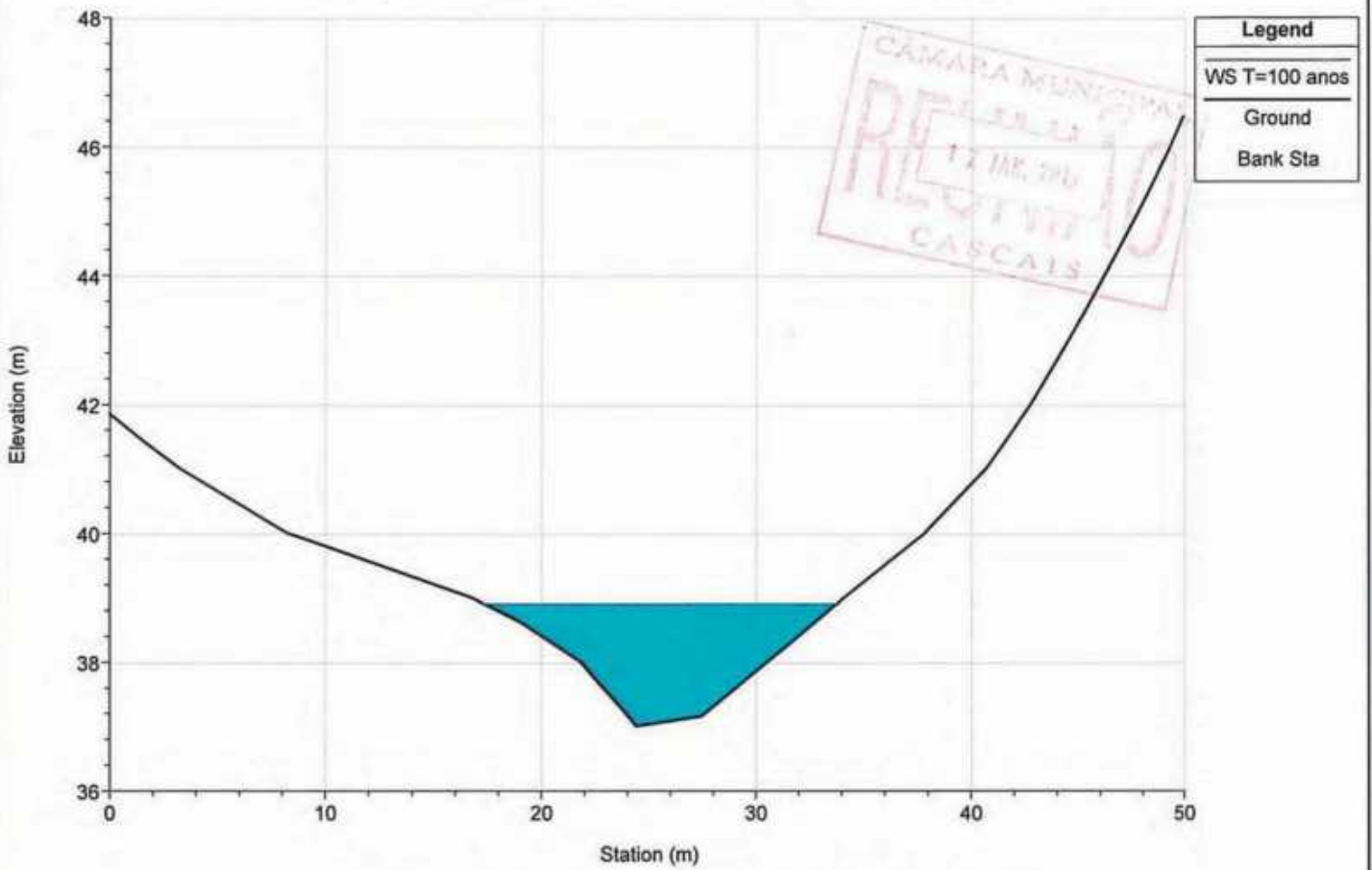
River = FOZ\_GUINCHO Reach = inter3 RS = 1632.411



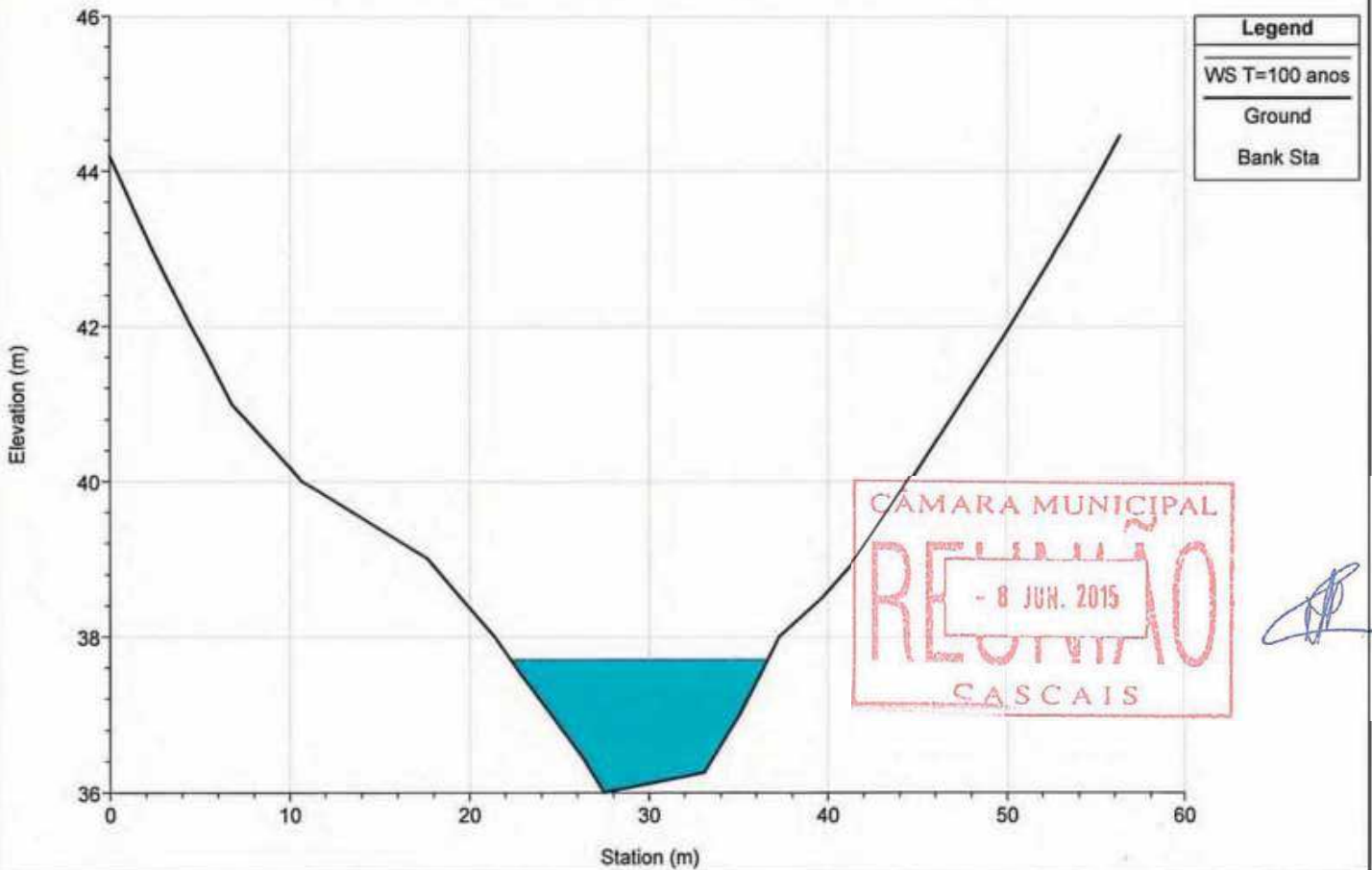
River = FOZ\_GUINCHO Reach = inter4 RS = 1599.263



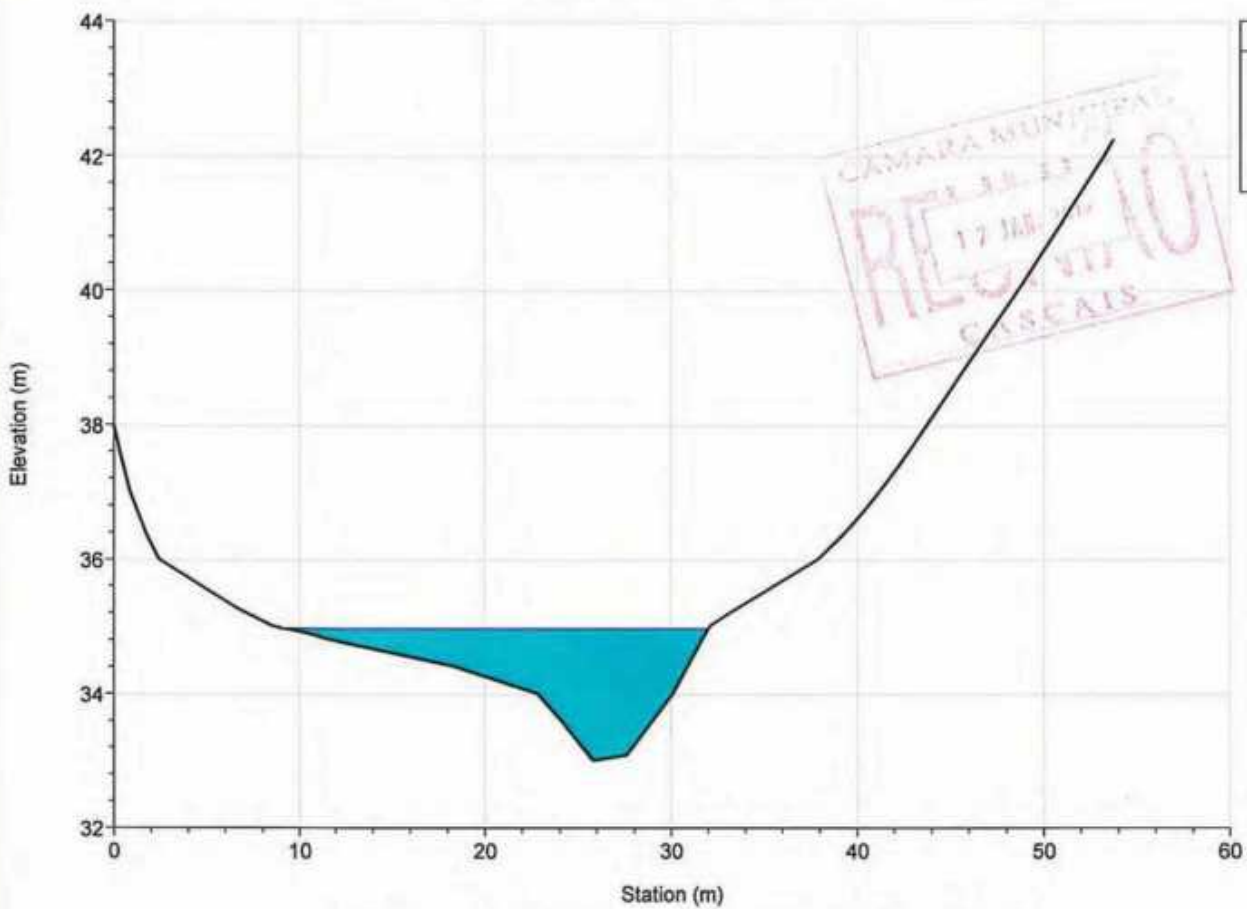
River = FOZ\_GUINCHO Reach = inter4 RS = 1532.361



River = FOZ\_GUINCHO Reach = inter4 RS = 1450.568

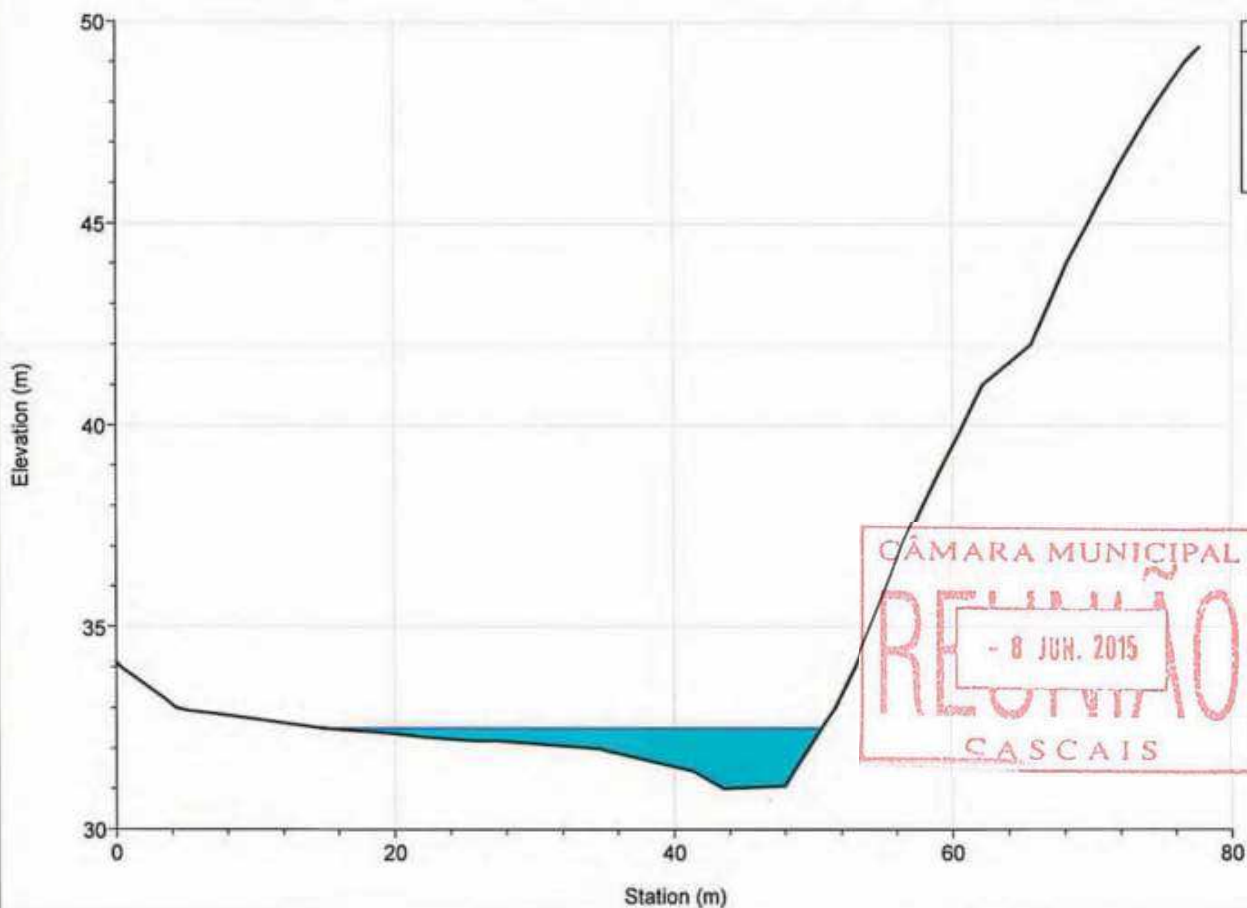


River = FOZ\_GUINCHO Reach = inter4 RS = 1344.735



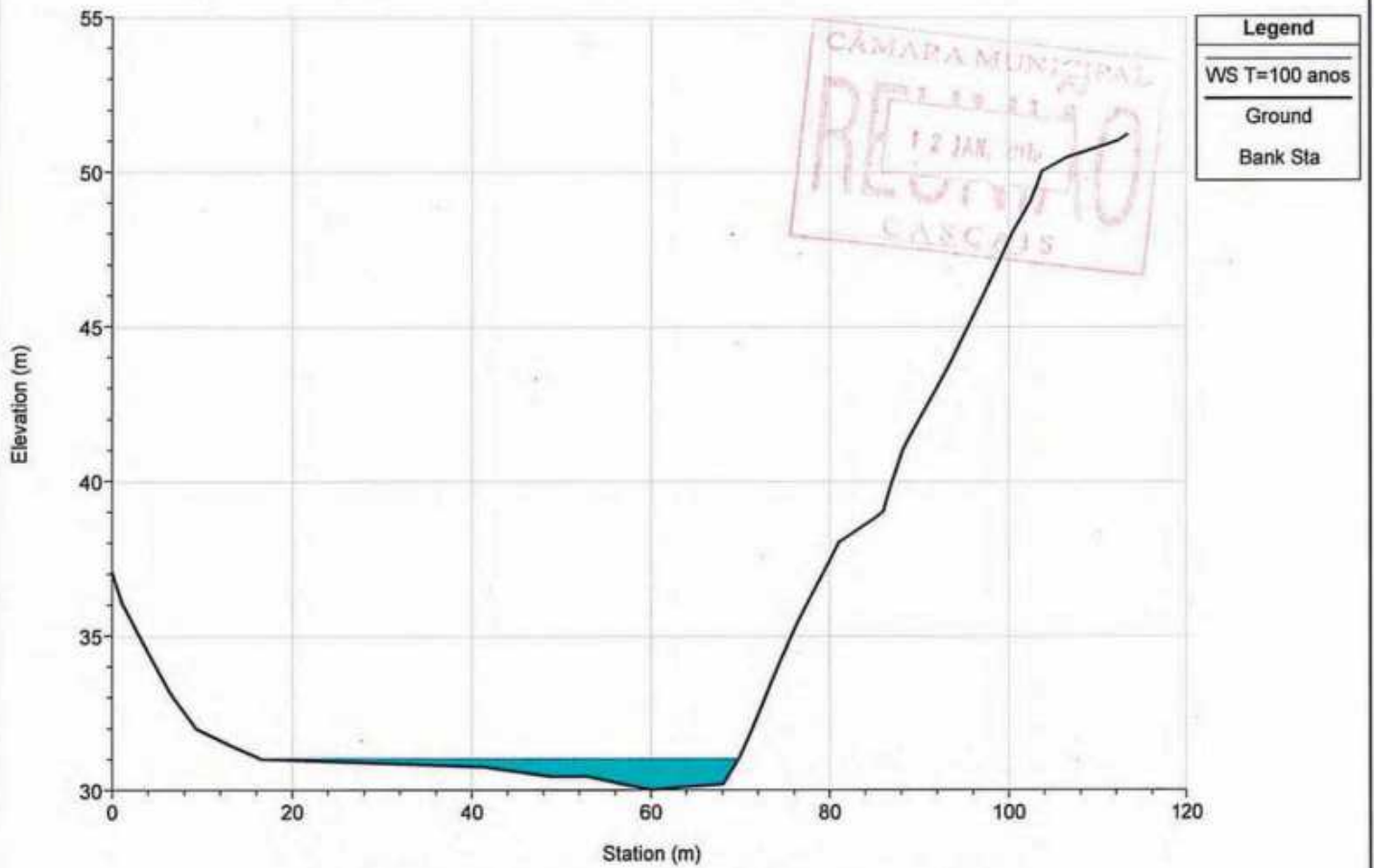
Legend
WS T=100 anos
Ground
Bank Sta

River = FOZ\_GUINCHO Reach = inter4 RS = 1260.993

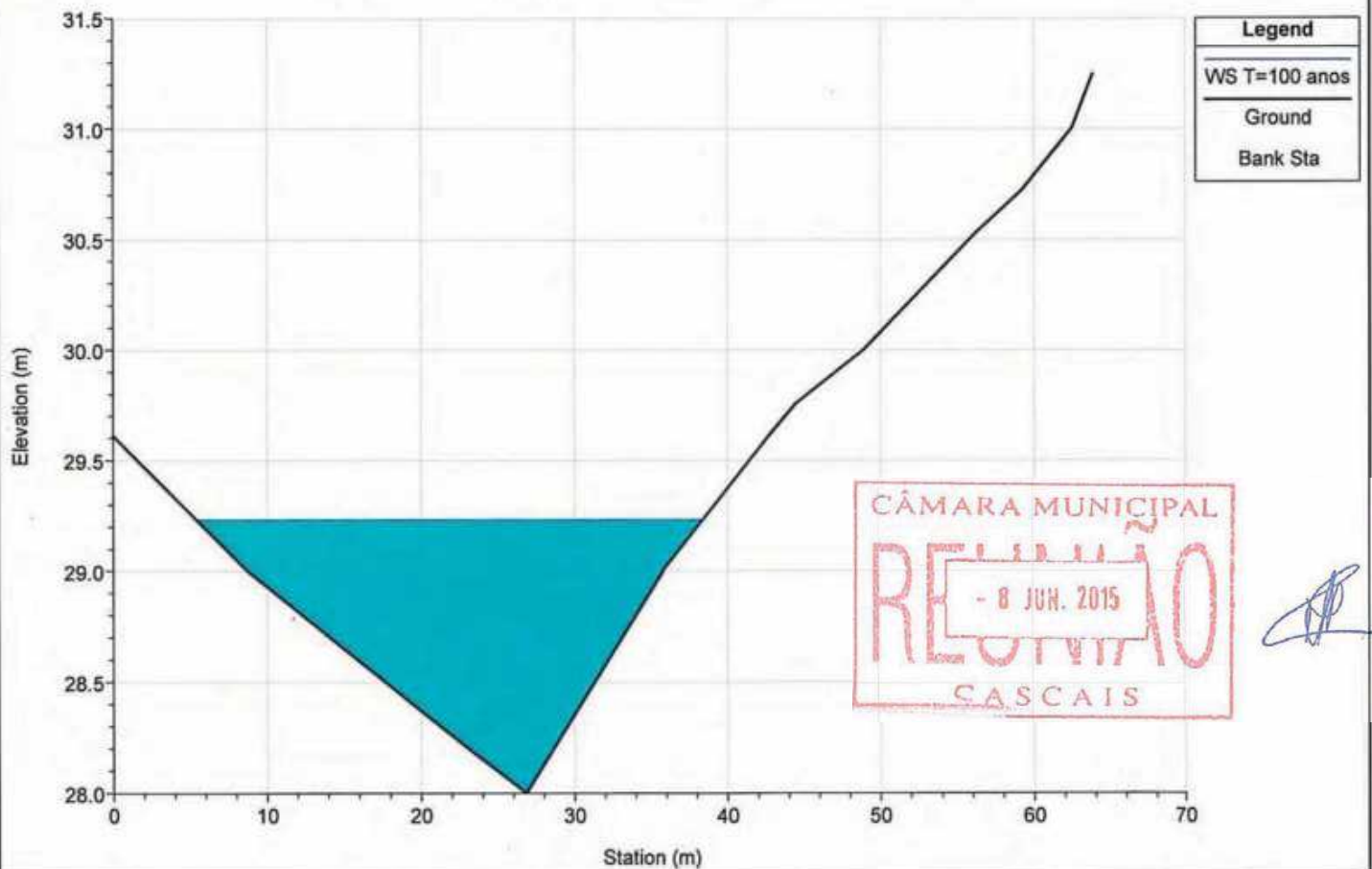


Legend
WS T=100 anos
Ground
Bank Sta

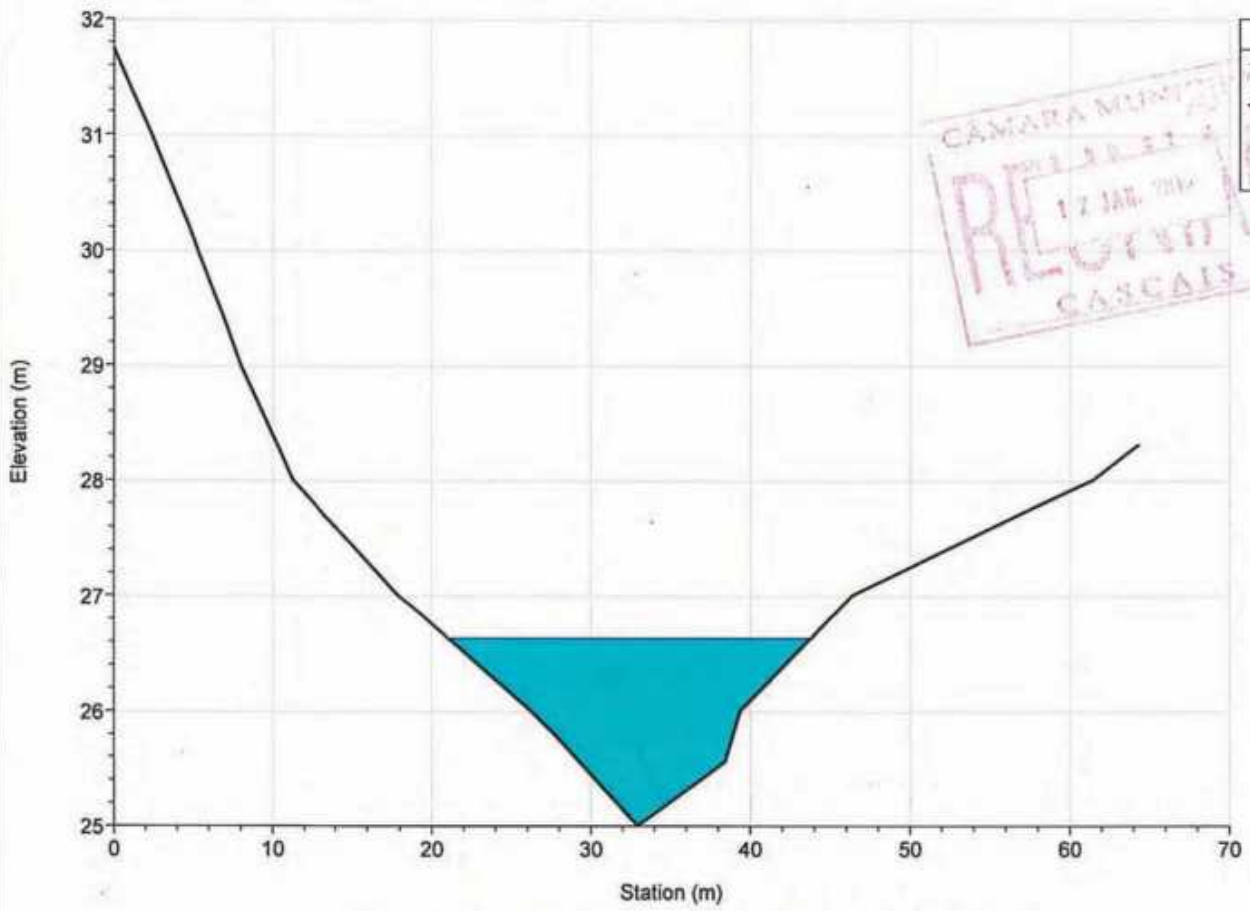
River = FOZ\_GUINCHO Reach = inter4 RS = 1191.948



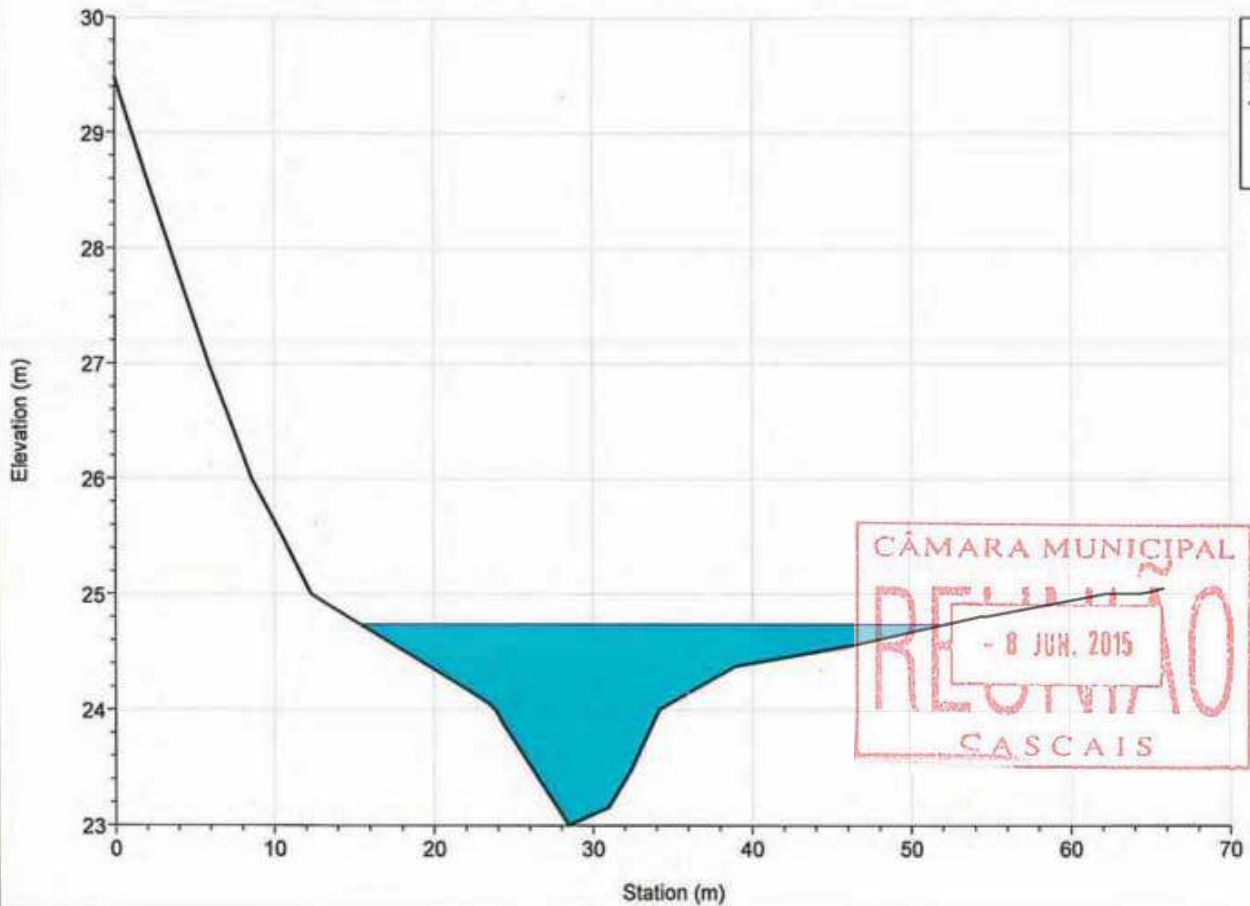
River = FOZ\_GUINCHO Reach = inter4 RS = 1096.515



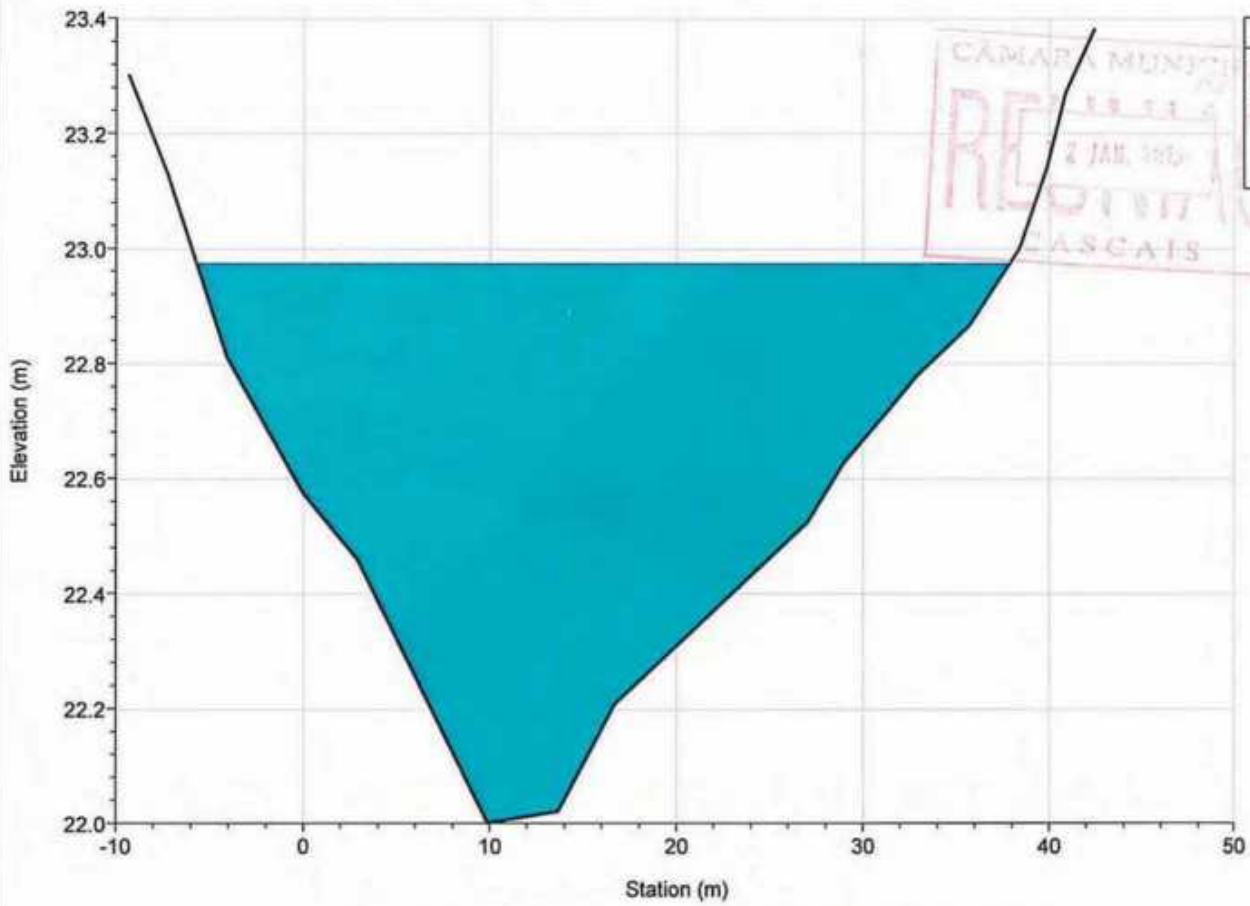
River = FOZ\_GUINCHO Reach = inter4 RS = 1004.926



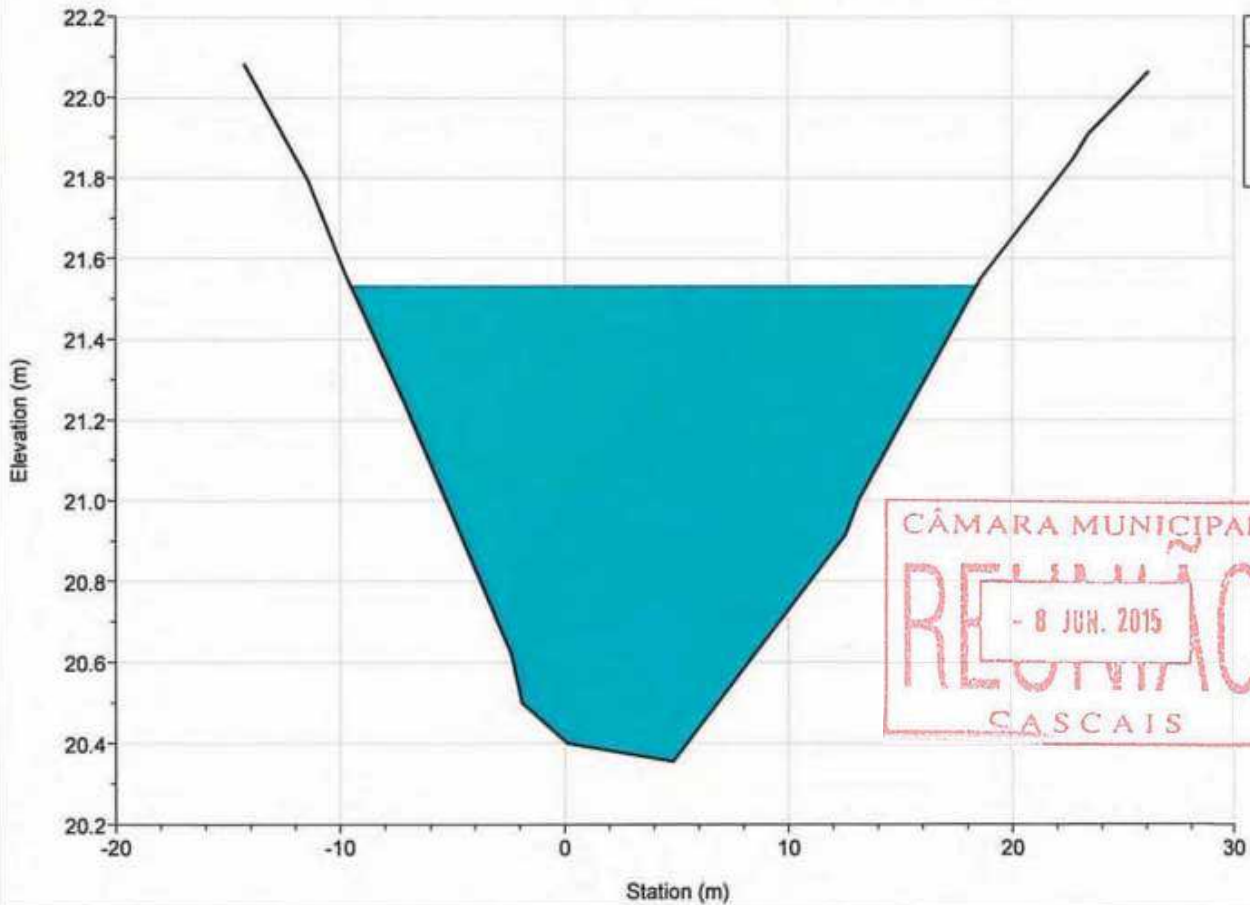
River = FOZ\_GUINCHO Reach = inter4 RS = 883.207



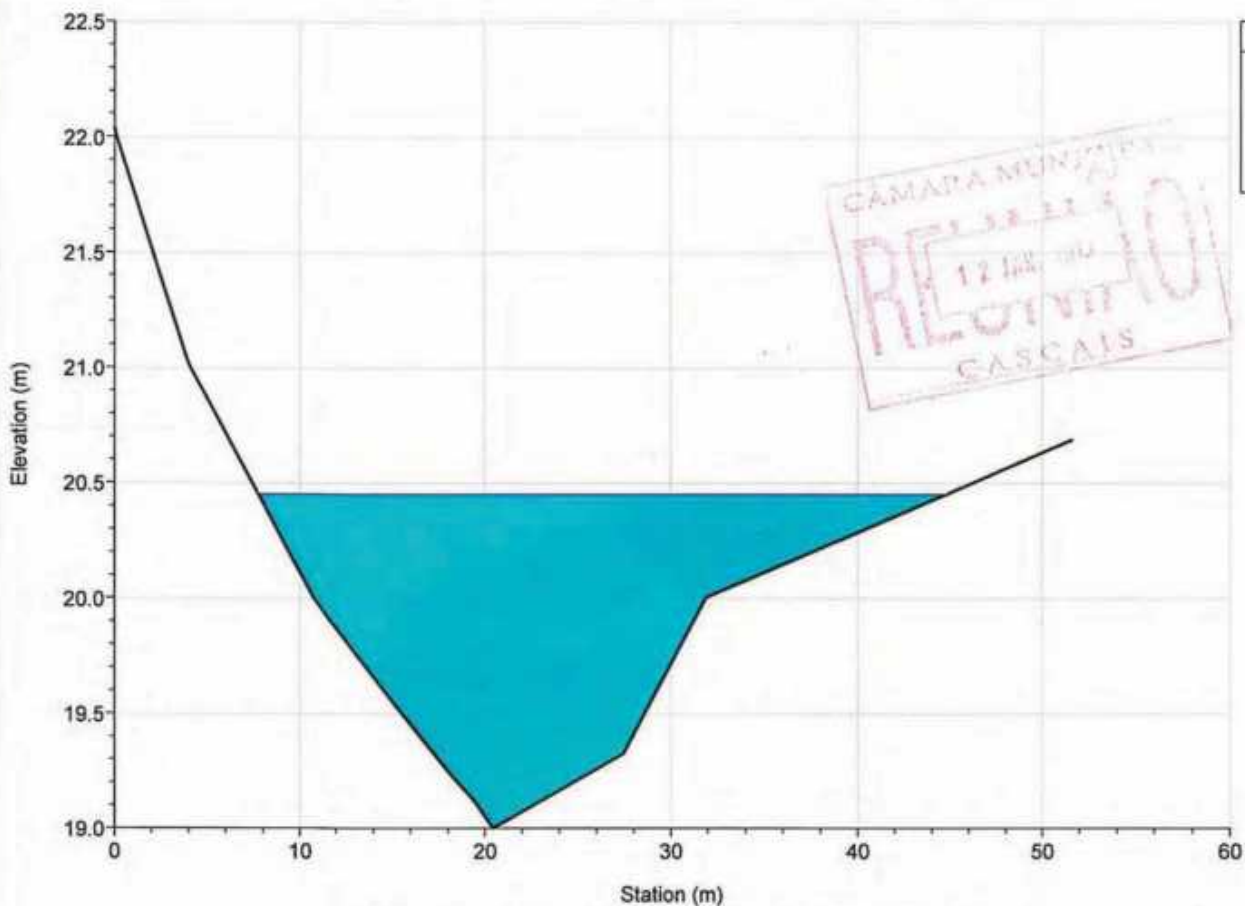
River = FOZ\_GUINCHO Reach = inter4 RS = 809.020



River = FOZ\_GUINCHO Reach = inter4 RS = 730.285



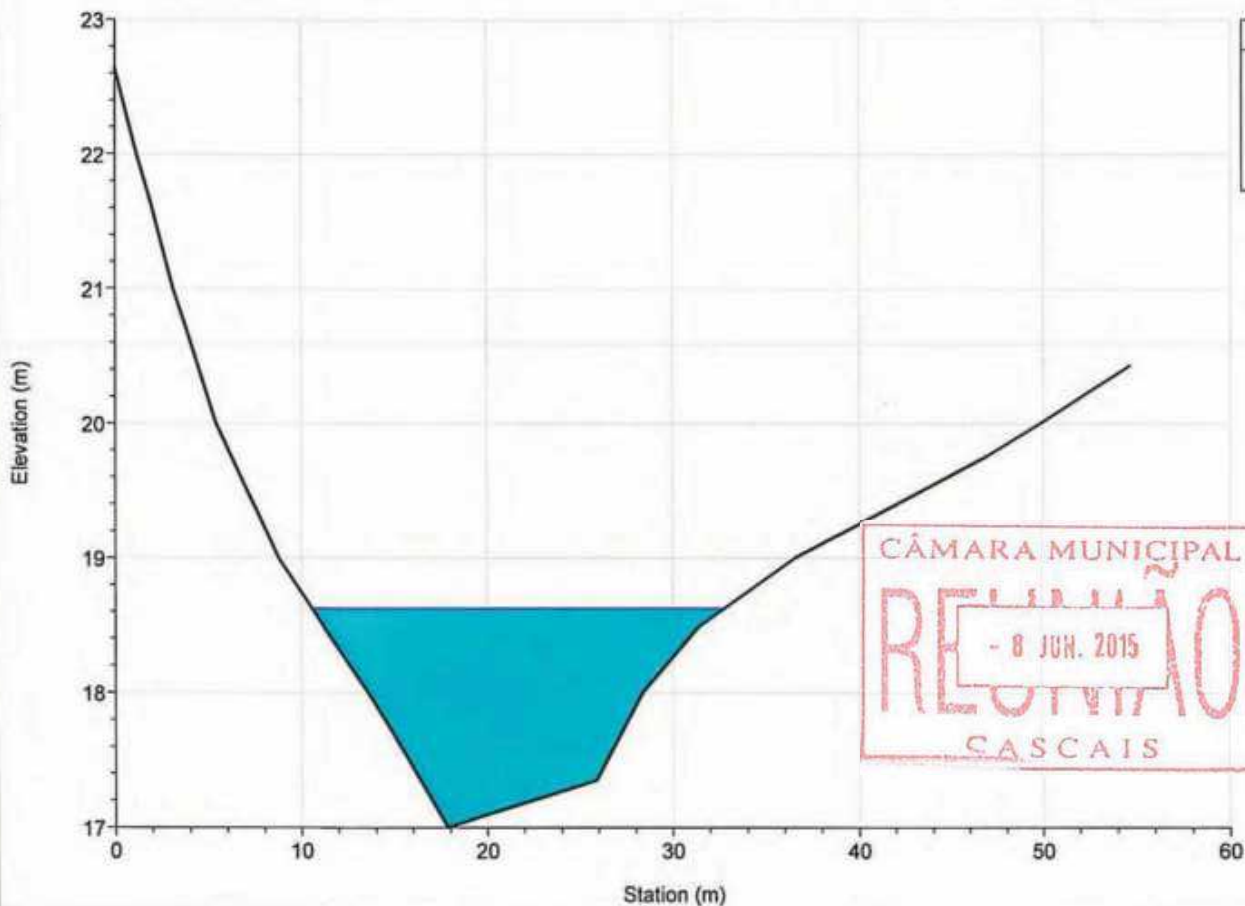
River = FOZ\_GUINCHO Reach = jusante RS = 670.597



Legend
WS T=100 anos
Ground
Bank Sta



River = FOZ\_GUINCHO Reach = jusante RS = 562.117

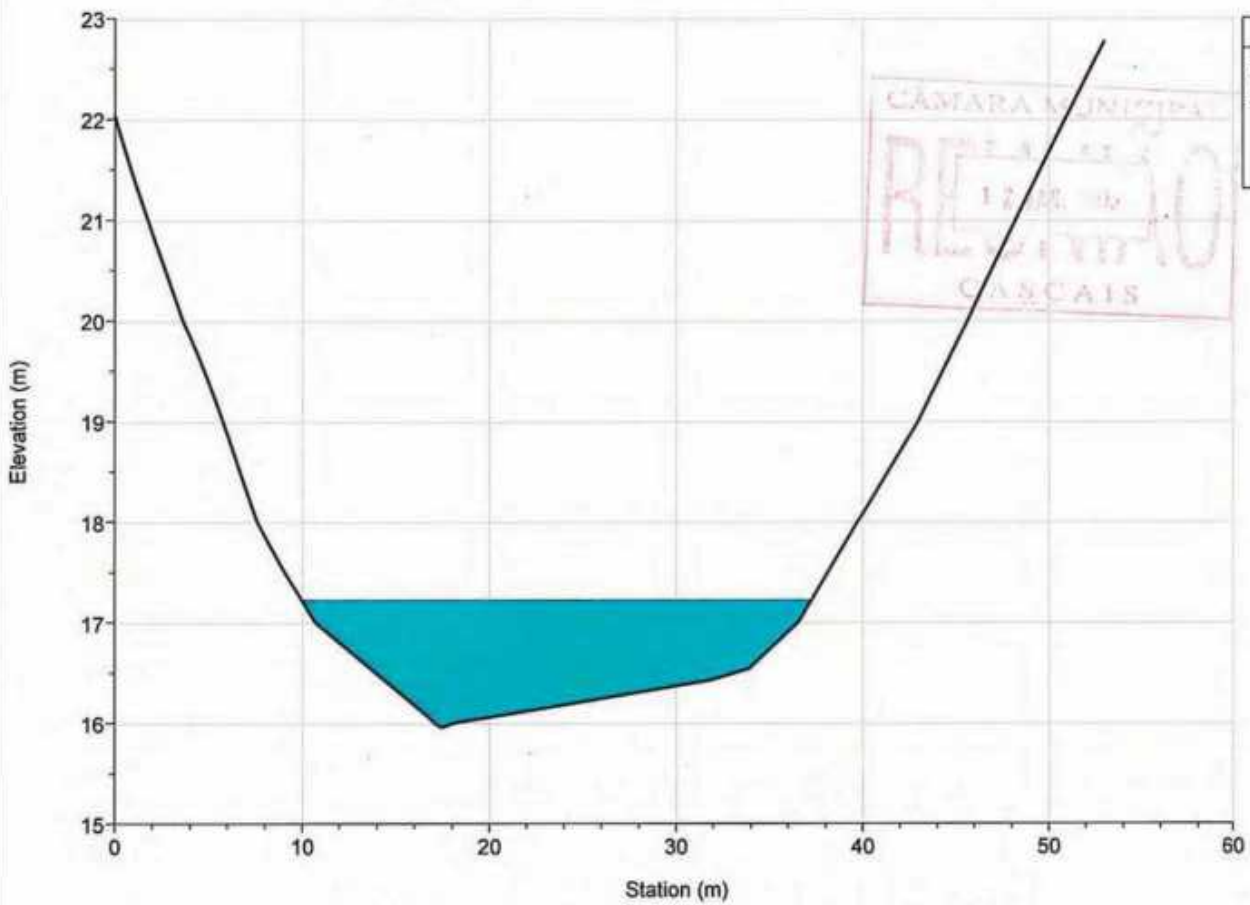


Legend
WS T=100 anos
Ground
Bank Sta



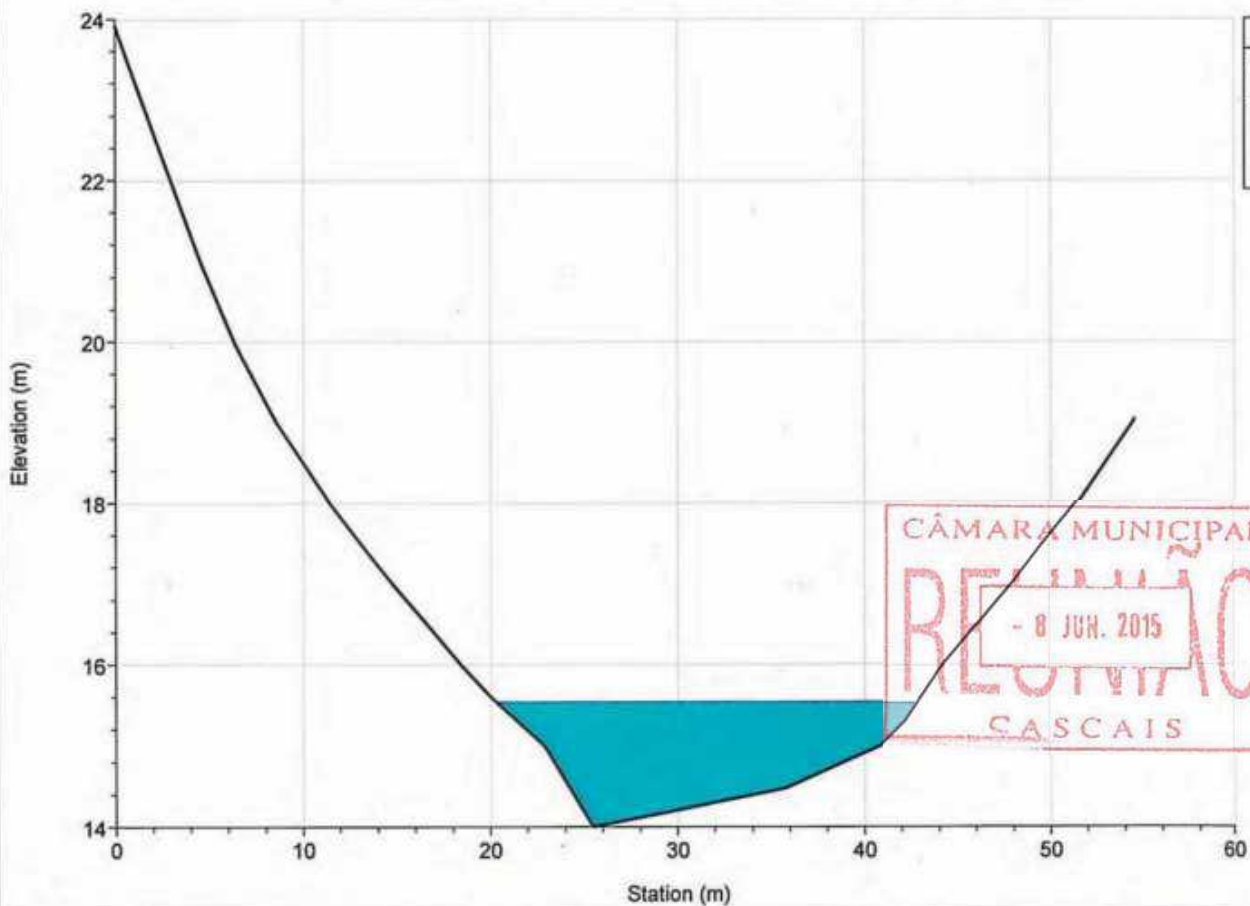


River = FOZ\_GUINCHO Reach = jusante RS = 451.787



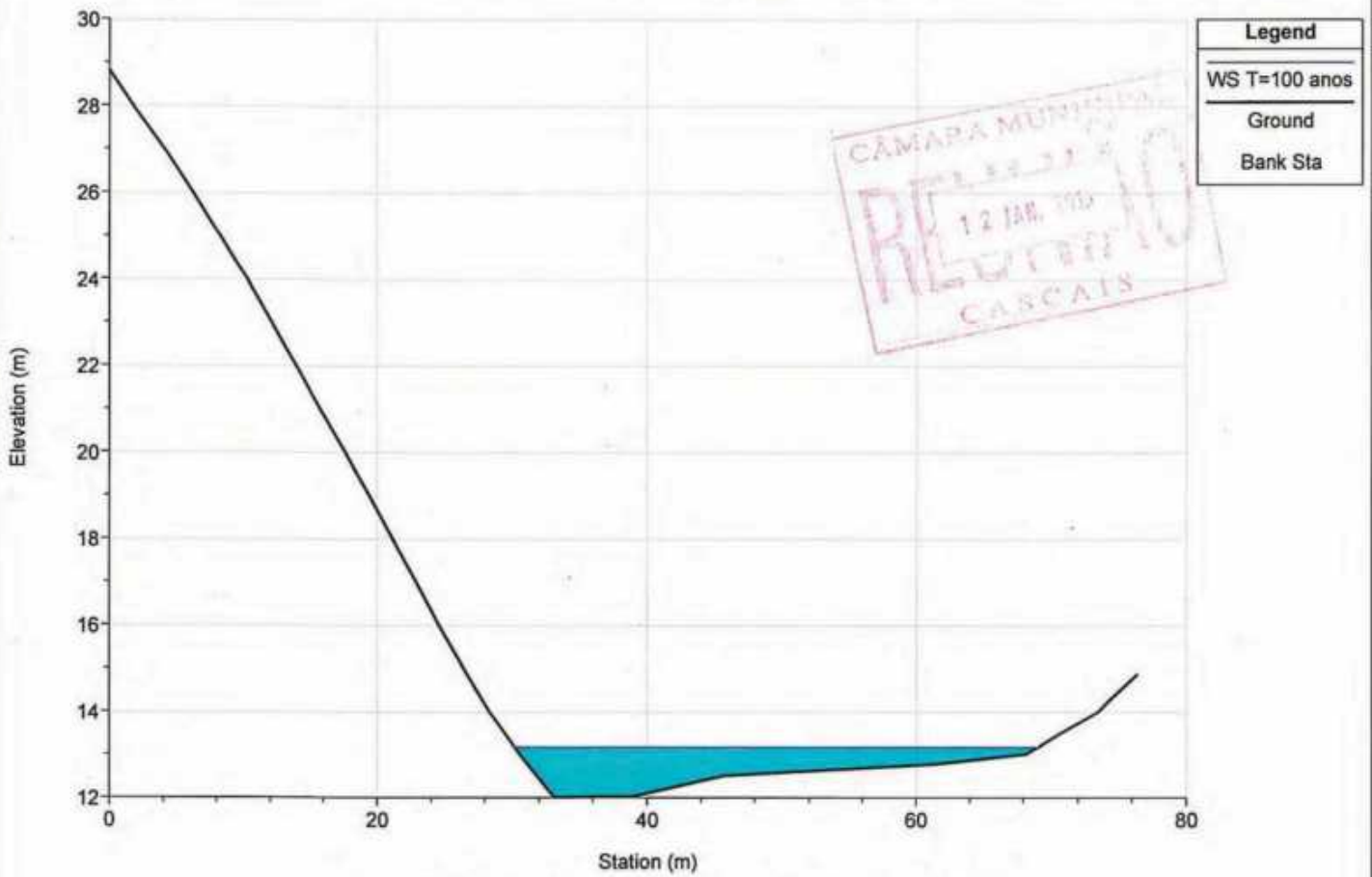
Legend	
WS T=100 anos	Ground
	Bank Sta

River = FOZ\_GUINCHO Reach = jusante RS = 365.034

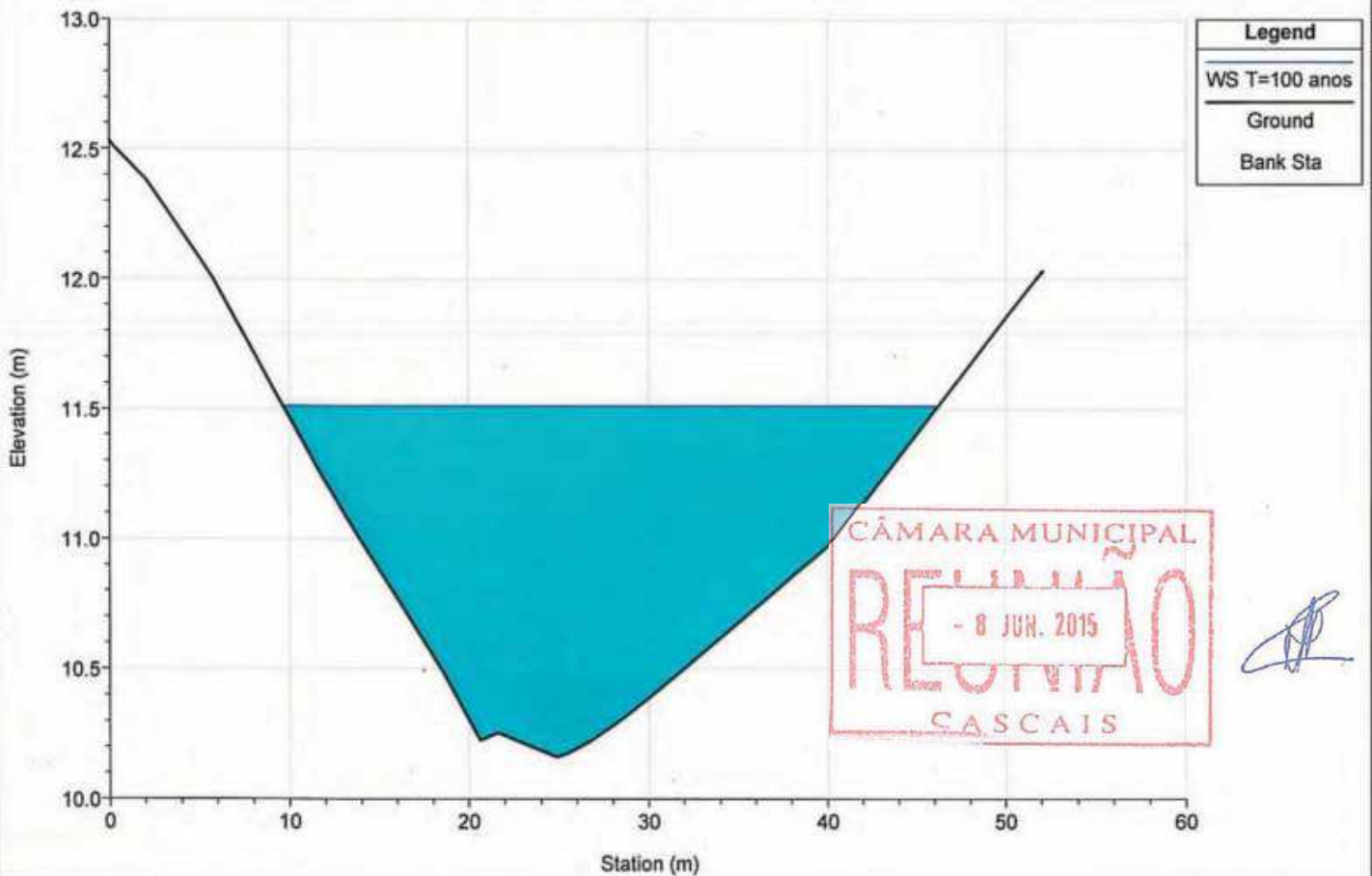


Legend	
WS T=100 anos	Ground
	Bank Sta

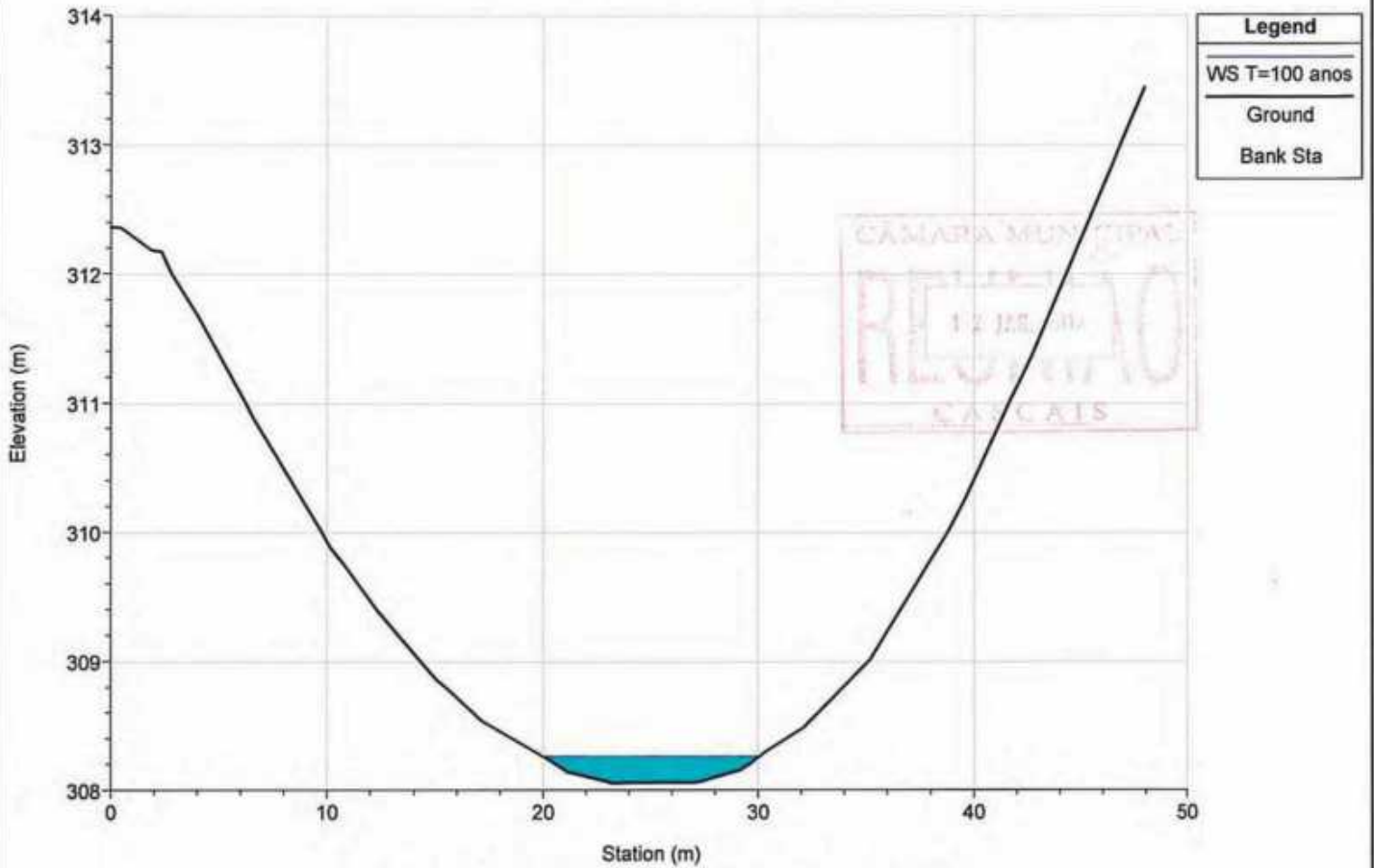
River = FOZ\_GUINCHO Reach = jusante RS = 268.731



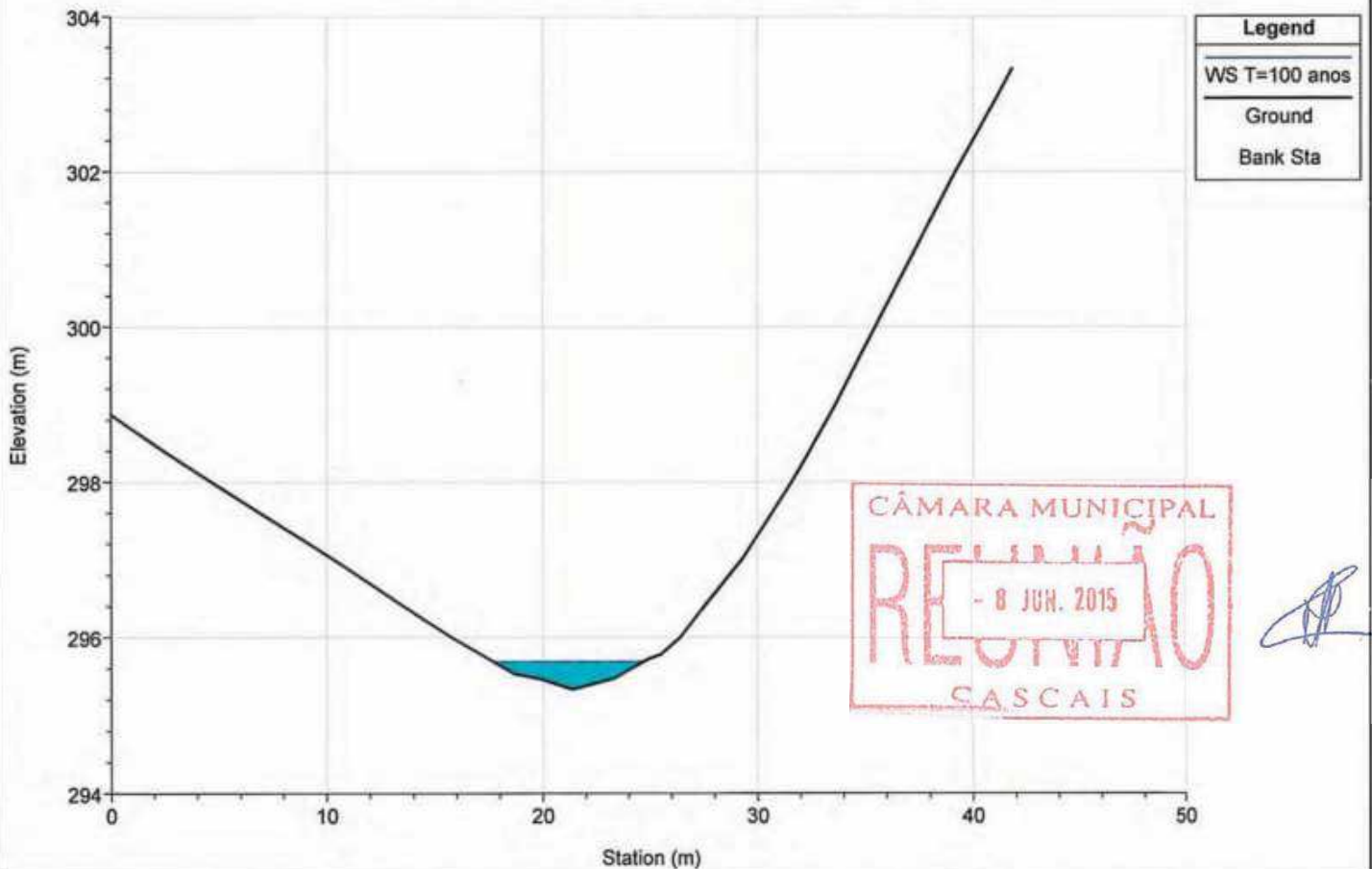
River = FOZ\_GUINCHO Reach = jusante RS = 144.786



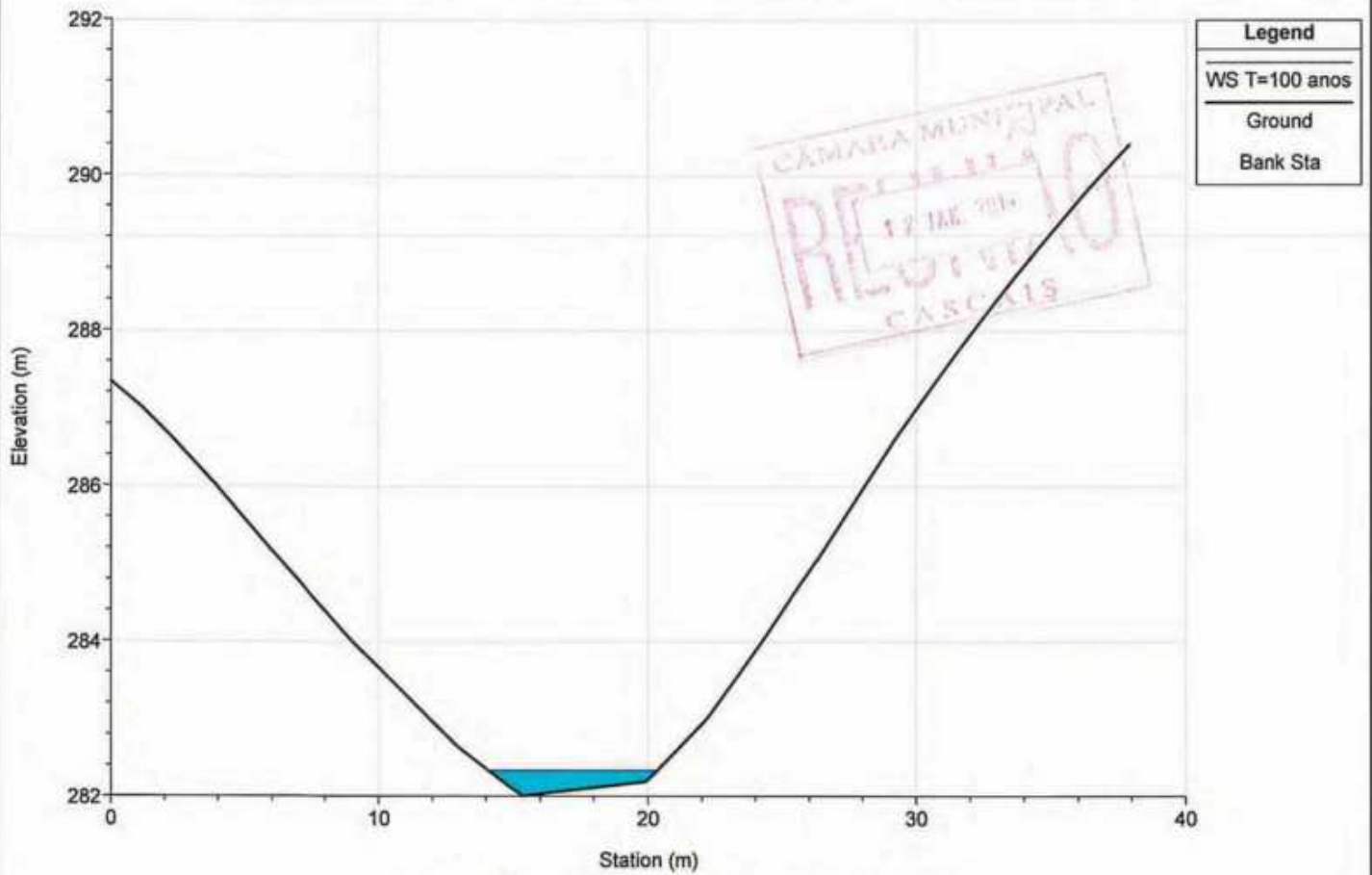
River = MD1 Reach = afluyente RS = 793.886



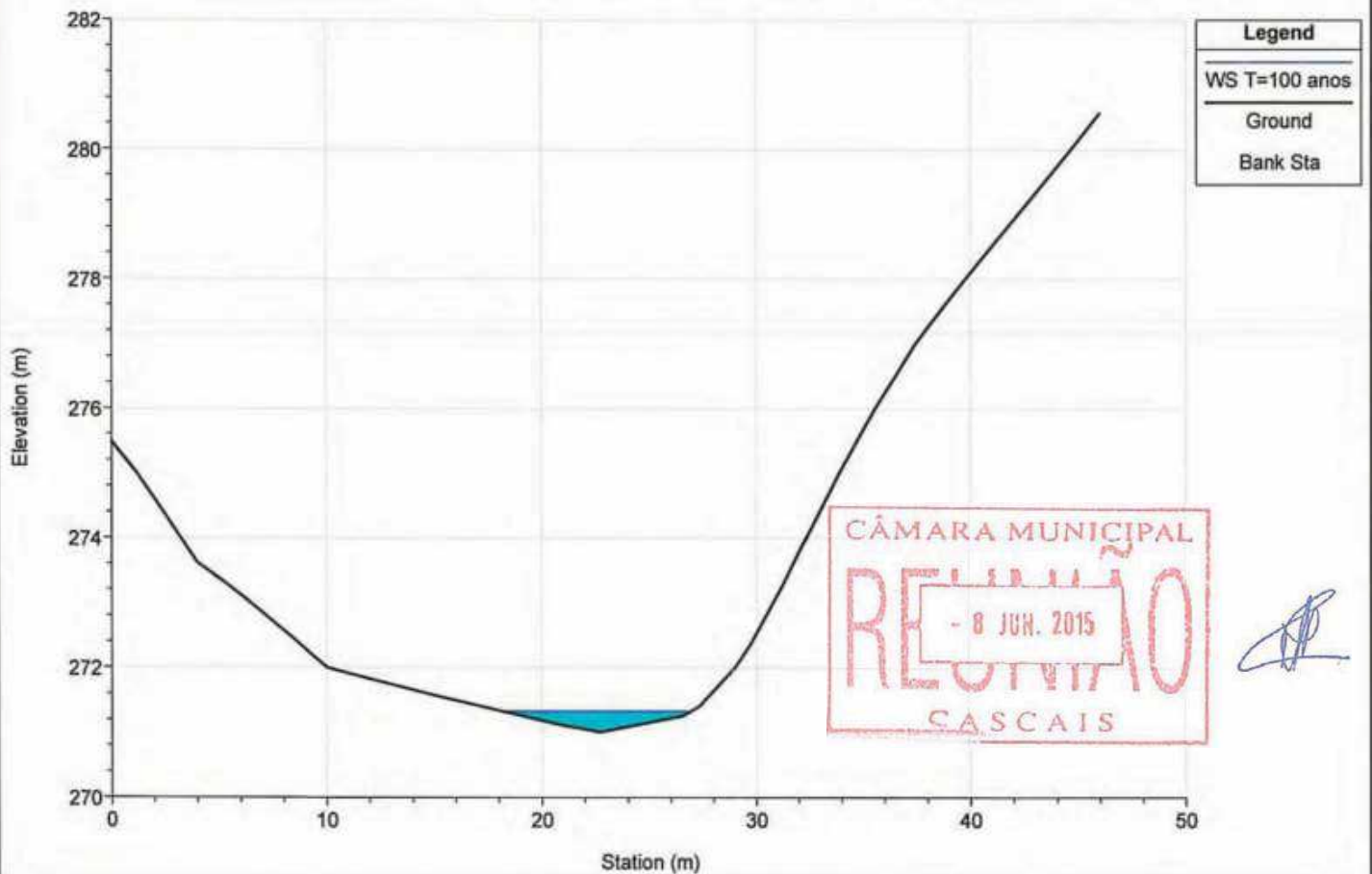
River = MD1 Reach = afluyente RS = 699.058



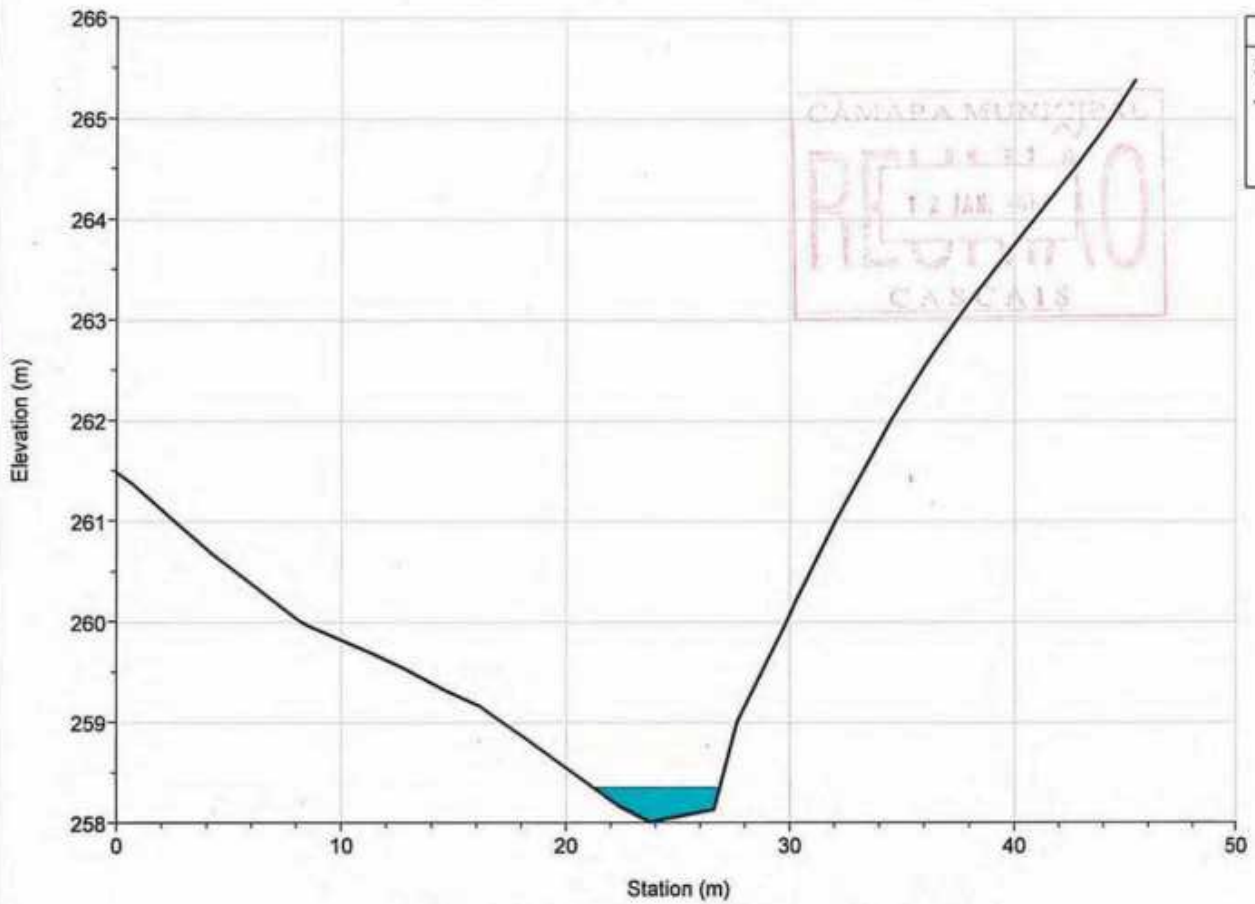
River = MD1 Reach = afluyente RS = 610.474



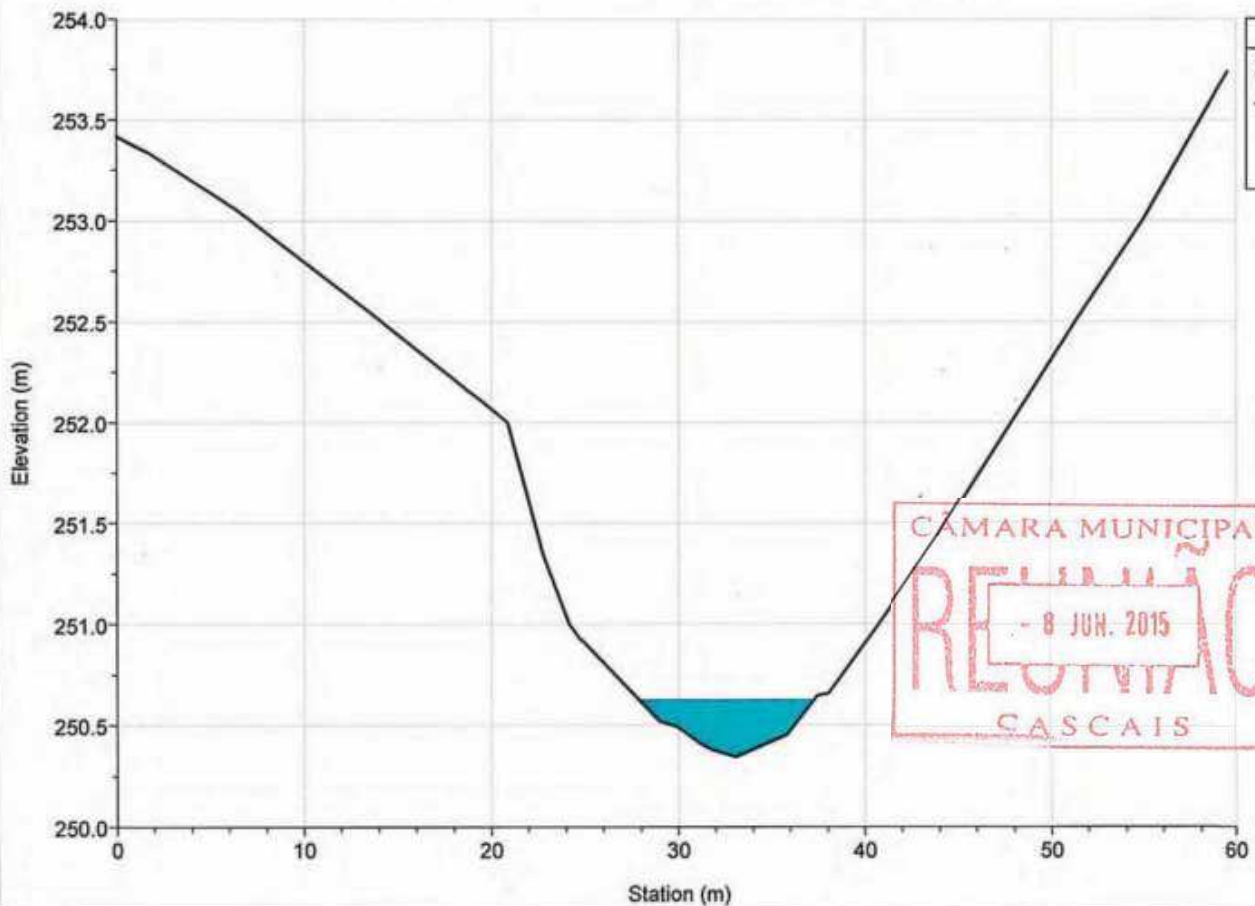
River = MD1 Reach = afluyente RS = 515.576



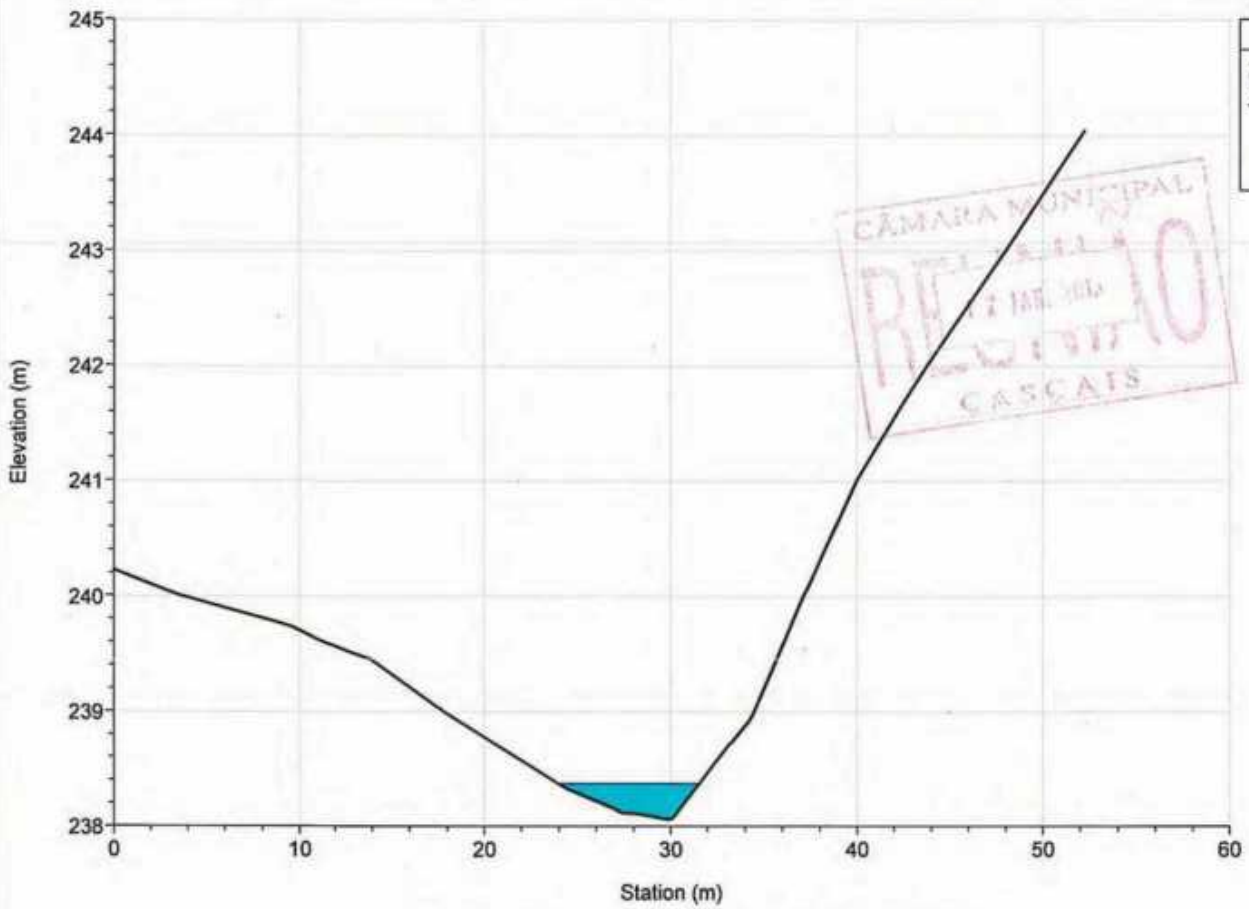
River = MD1 Reach = afluente RS = 413.862



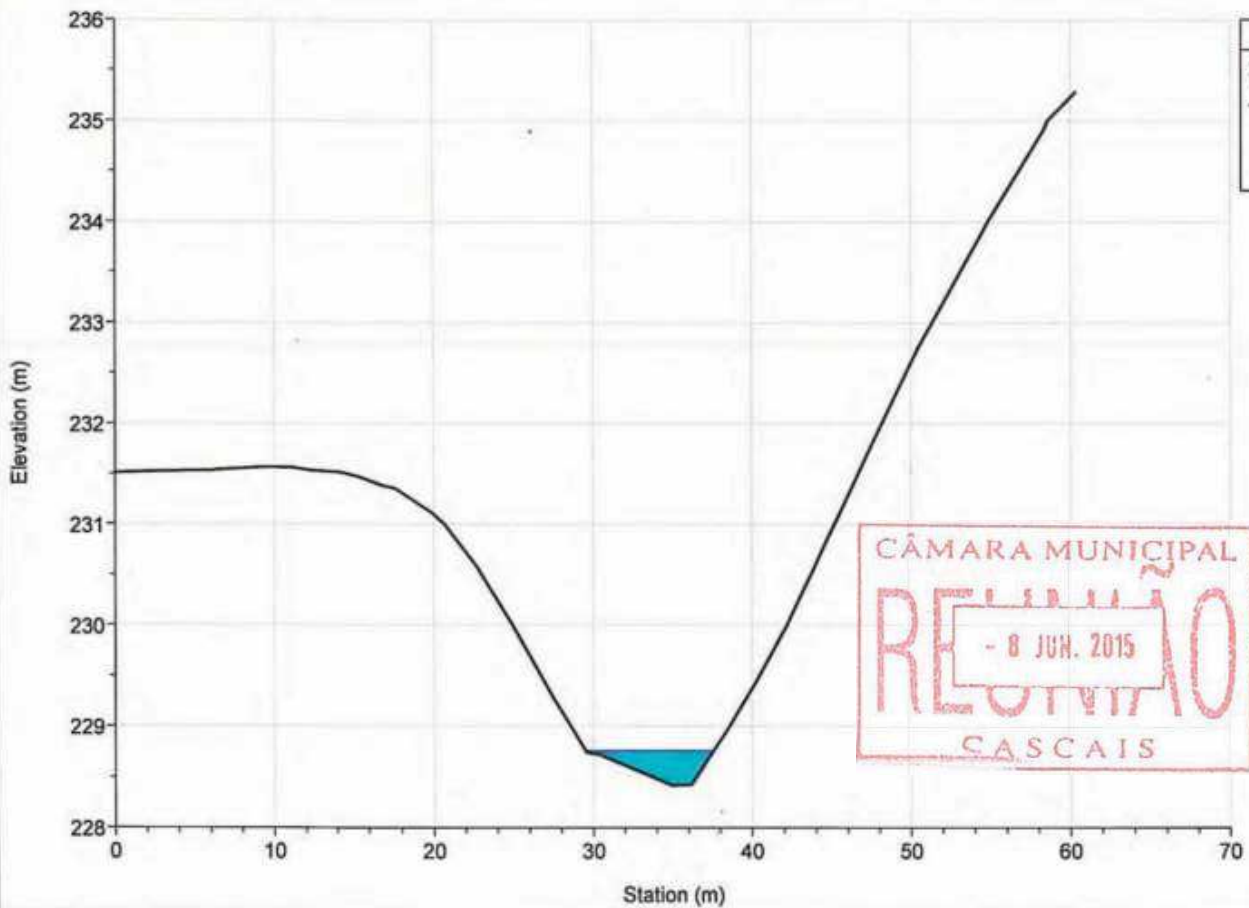
River = MD1 Reach = afluente RS = 320.636



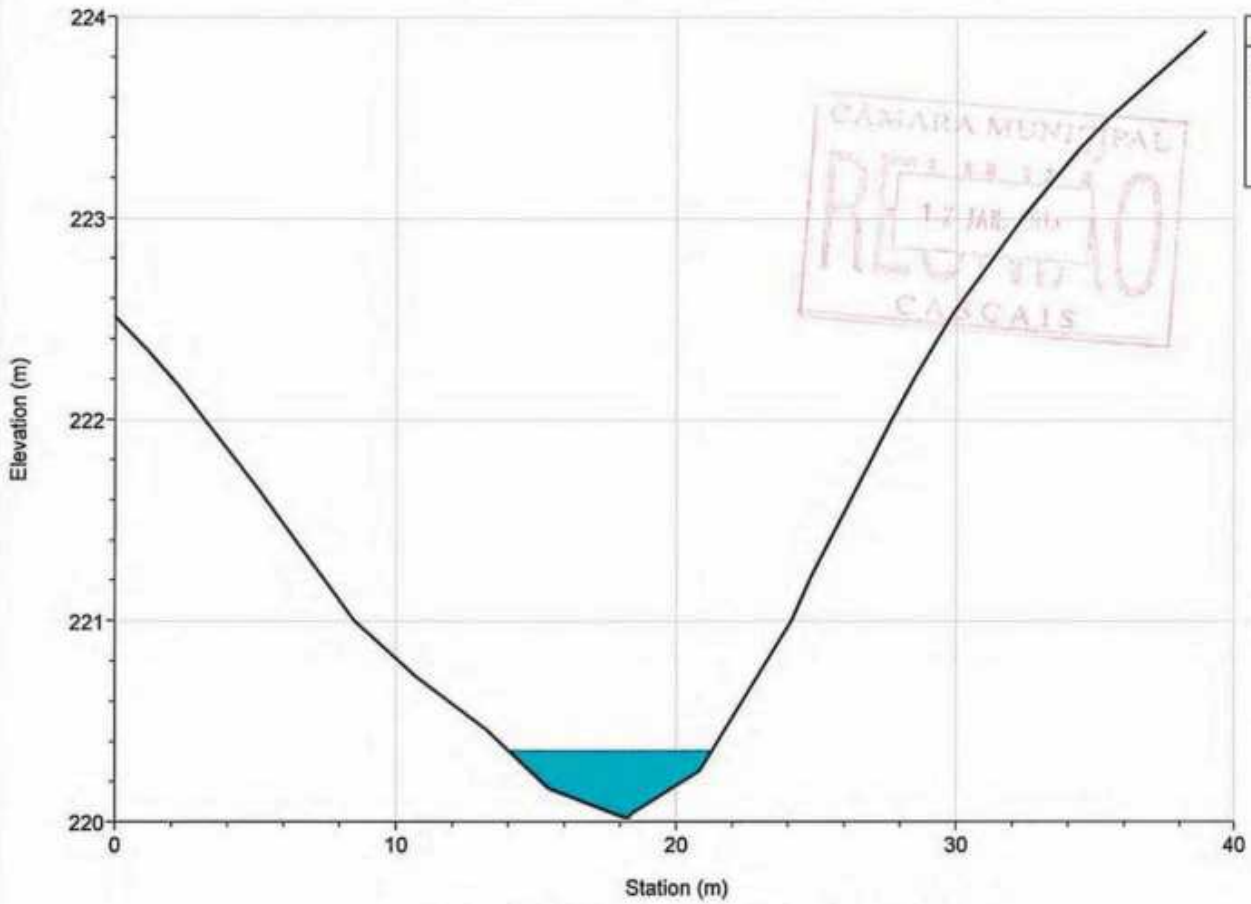
River = MD1 Reach = afluente RS = 224.301



River = MD1 Reach = afluente RS = 129.950



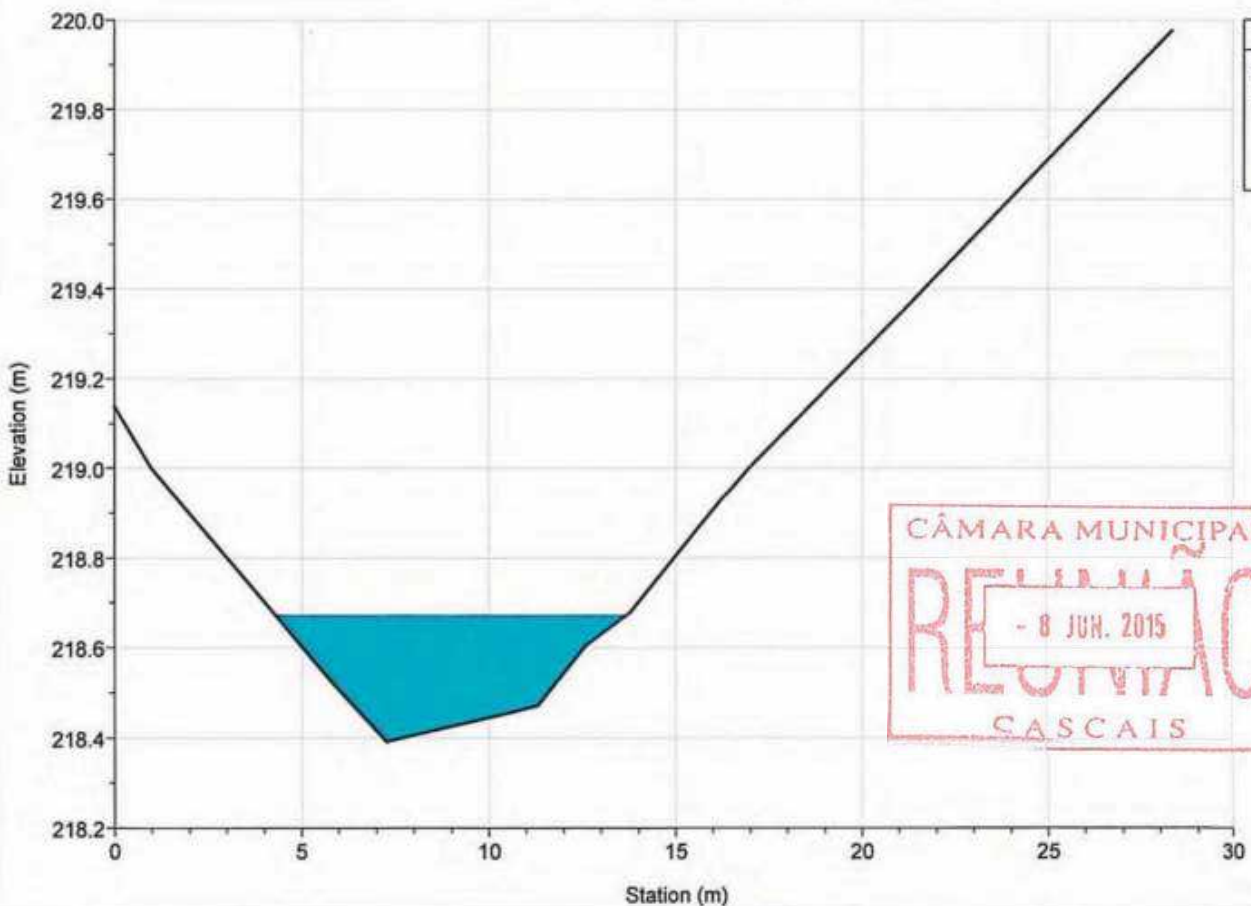
River = MD1 Reach = afluyente RS = 43.424



Legend	
WS T=100 anos	
Ground	
Bank Sta	

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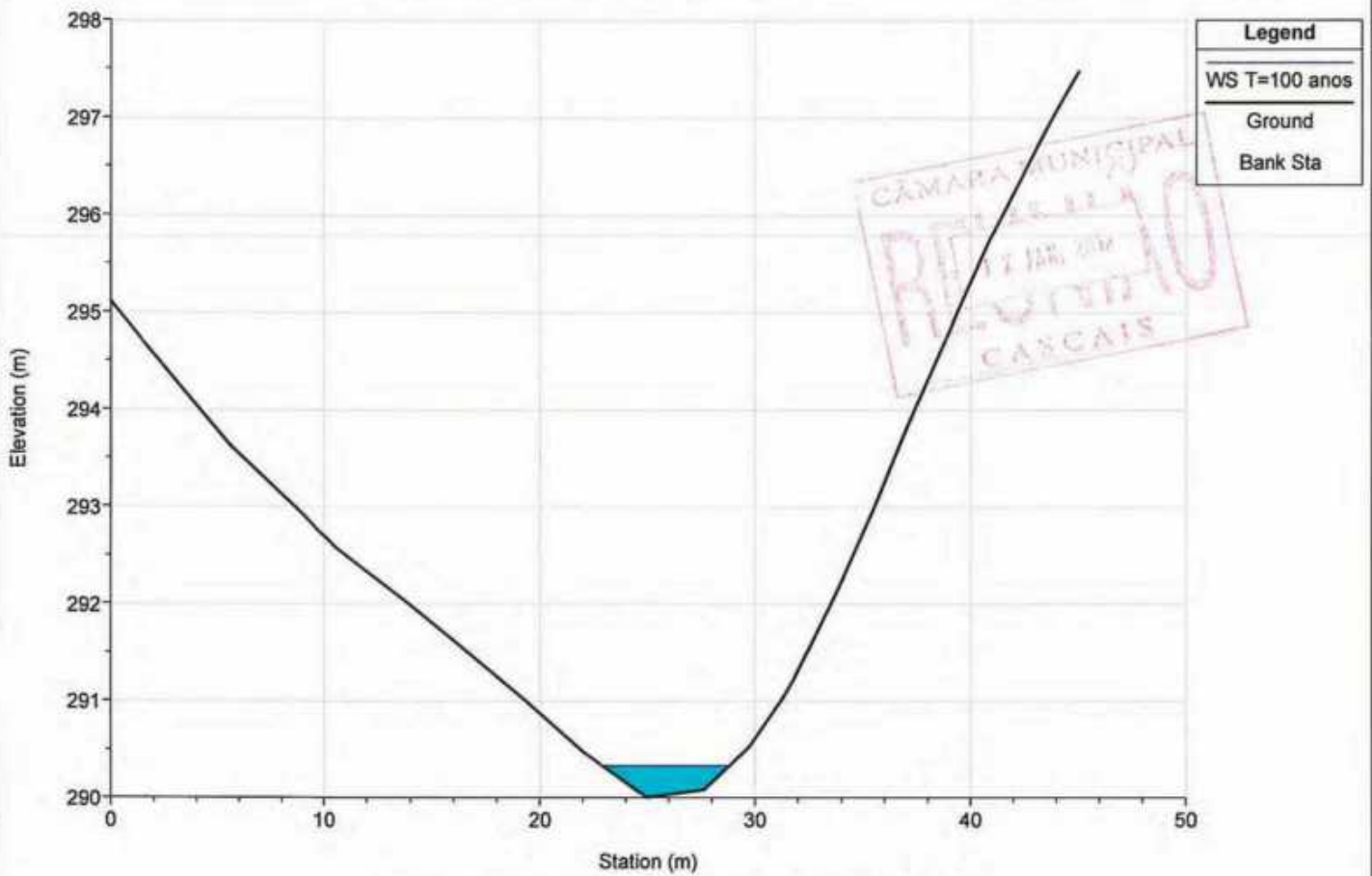
River = MD1 Reach = afluyente RS = 20.614



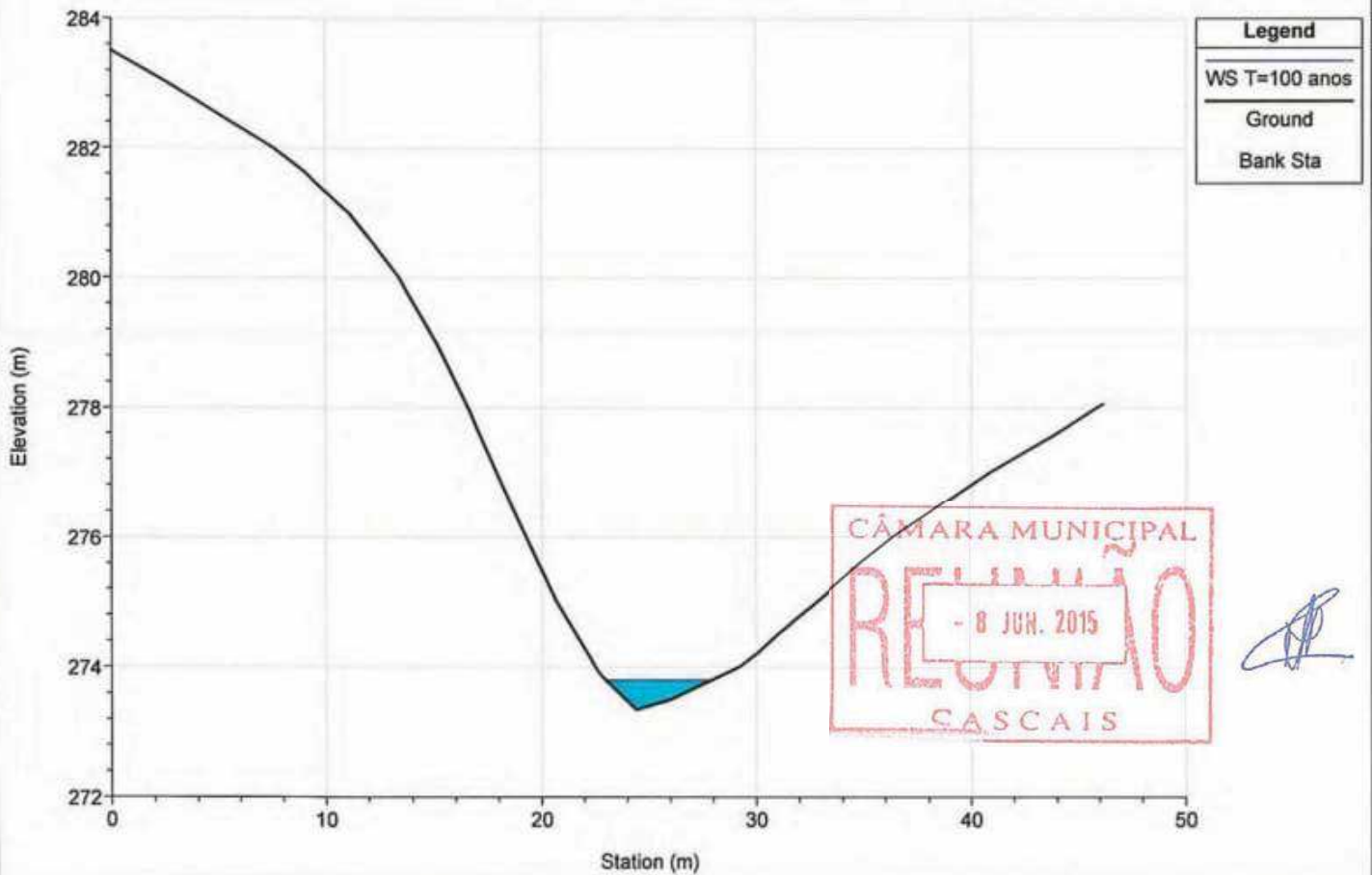
Legend	
WS T=100 anos	
Ground	
Bank Sta	

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- 8 JUN. 2015  
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River = MD2 Reach = montante RS = 1143.563

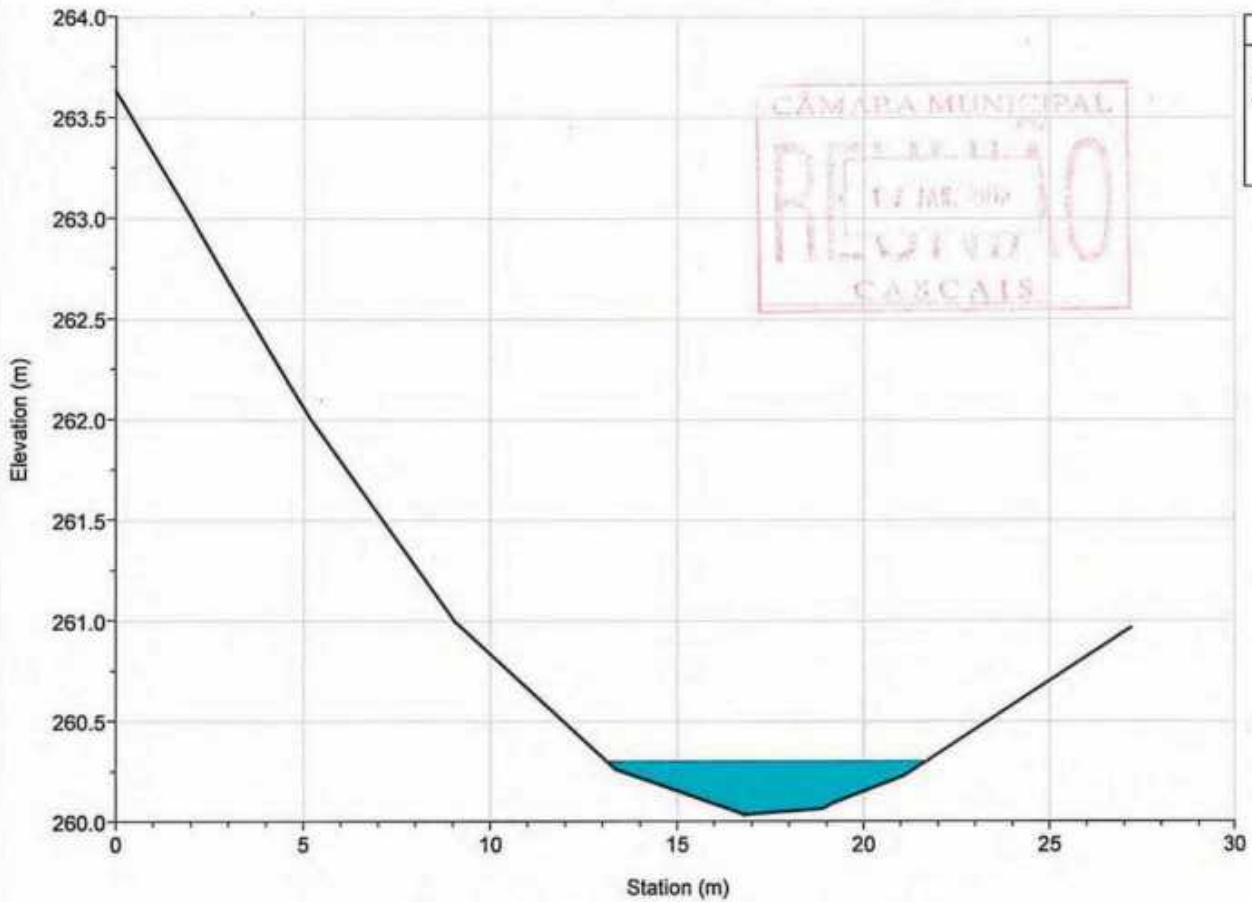


River = MD2 Reach = montante RS = 1045.834





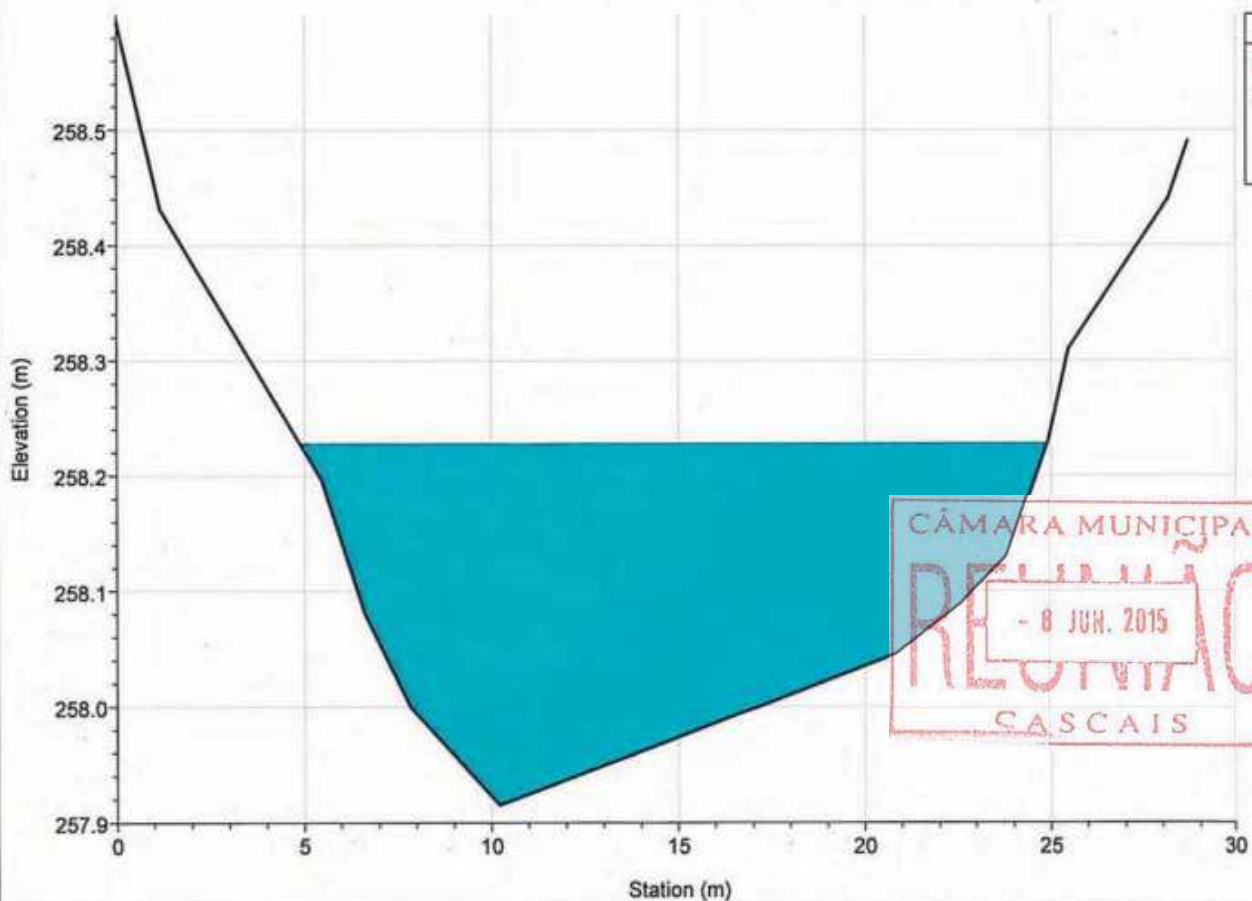
River = MD2 Reach = montante RS = 977.415



Legend
WS T=100 anos
Ground
Bank Sta

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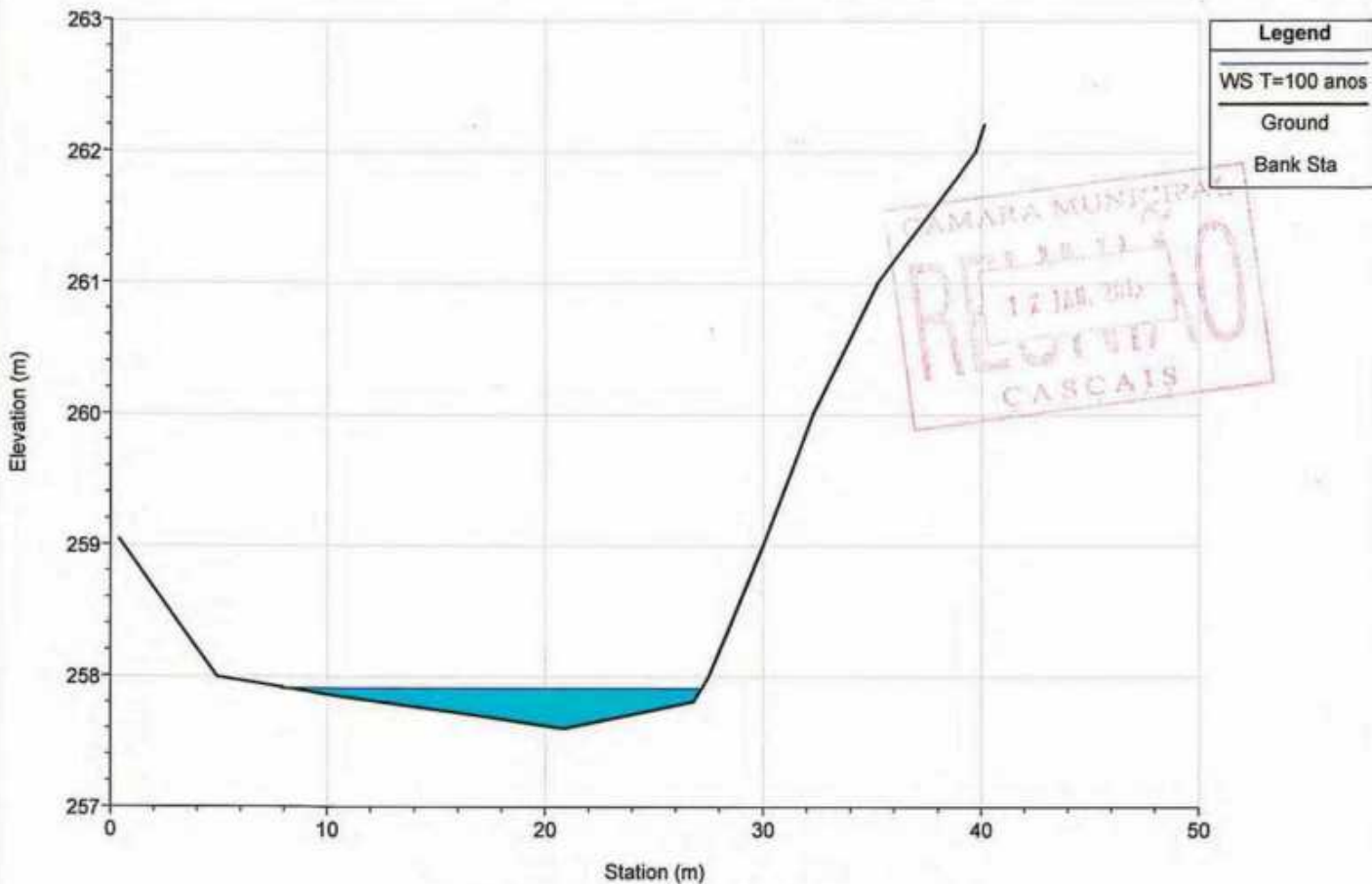
River = MD2 Reach = montante RS = 955.287



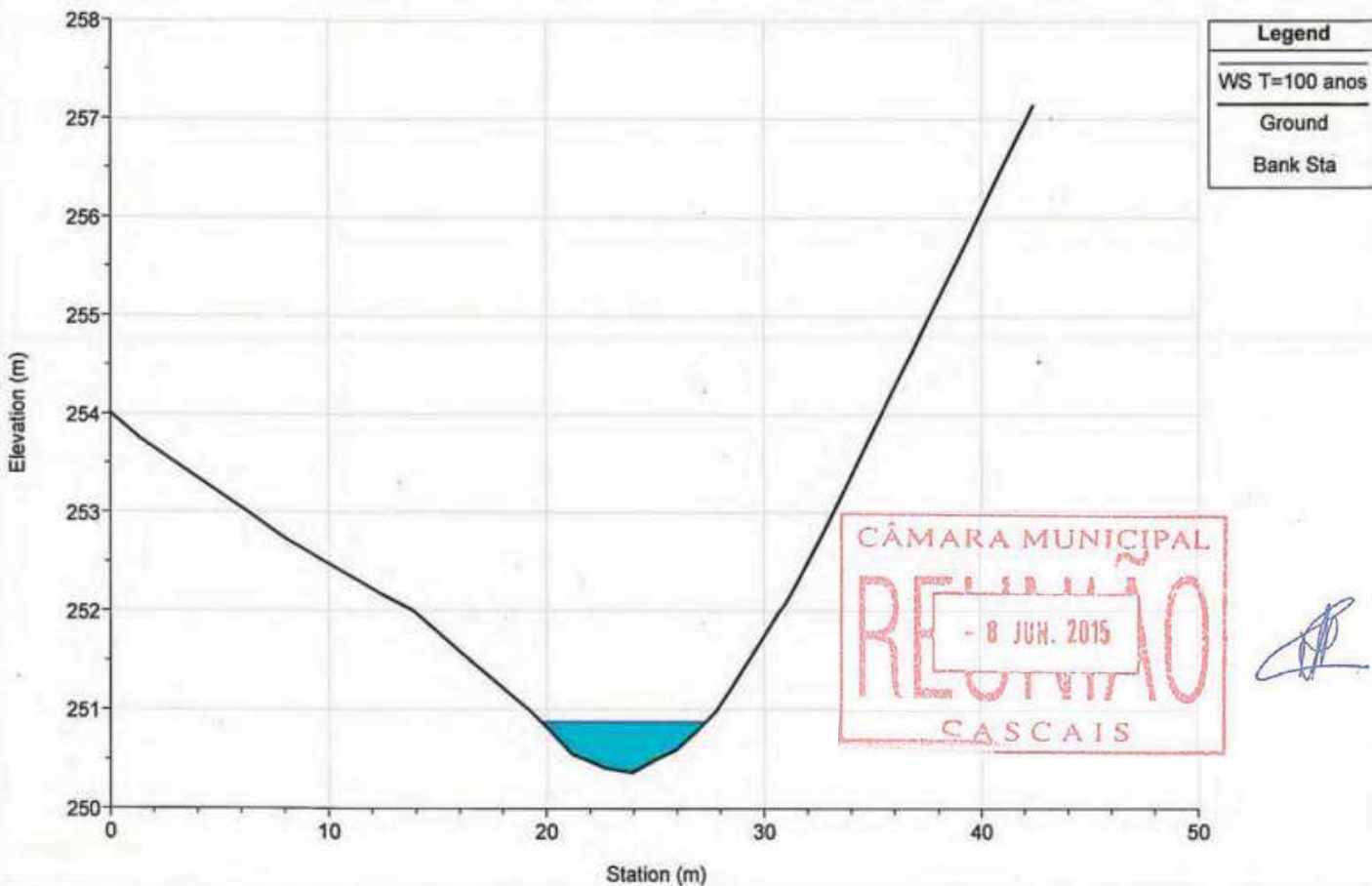
Legend
WS T=100 anos
Ground
Bank Sta

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- 8 JUN. 2015  
CASCAIS

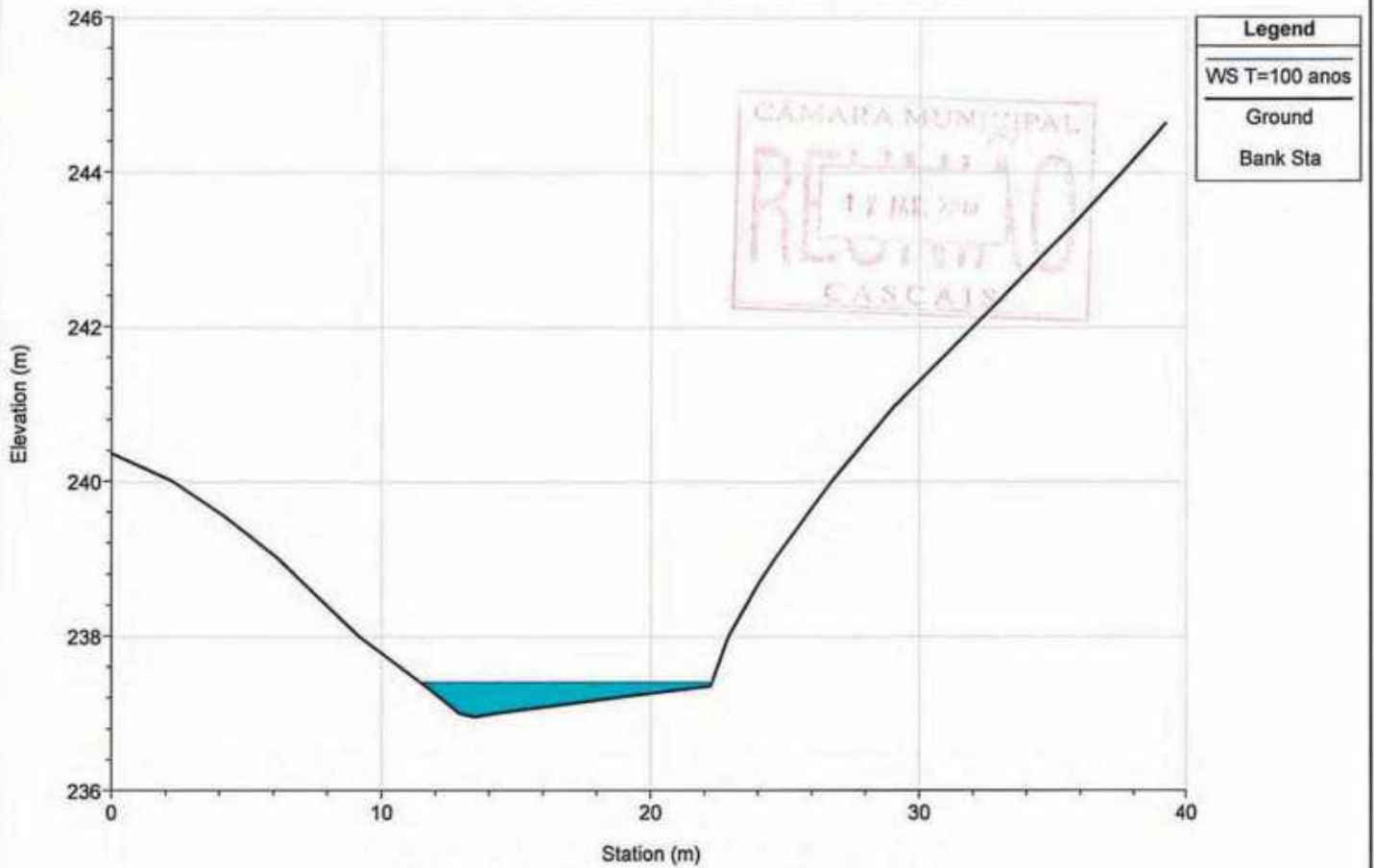
River = MD2 Reach = jusante RS = 925.180



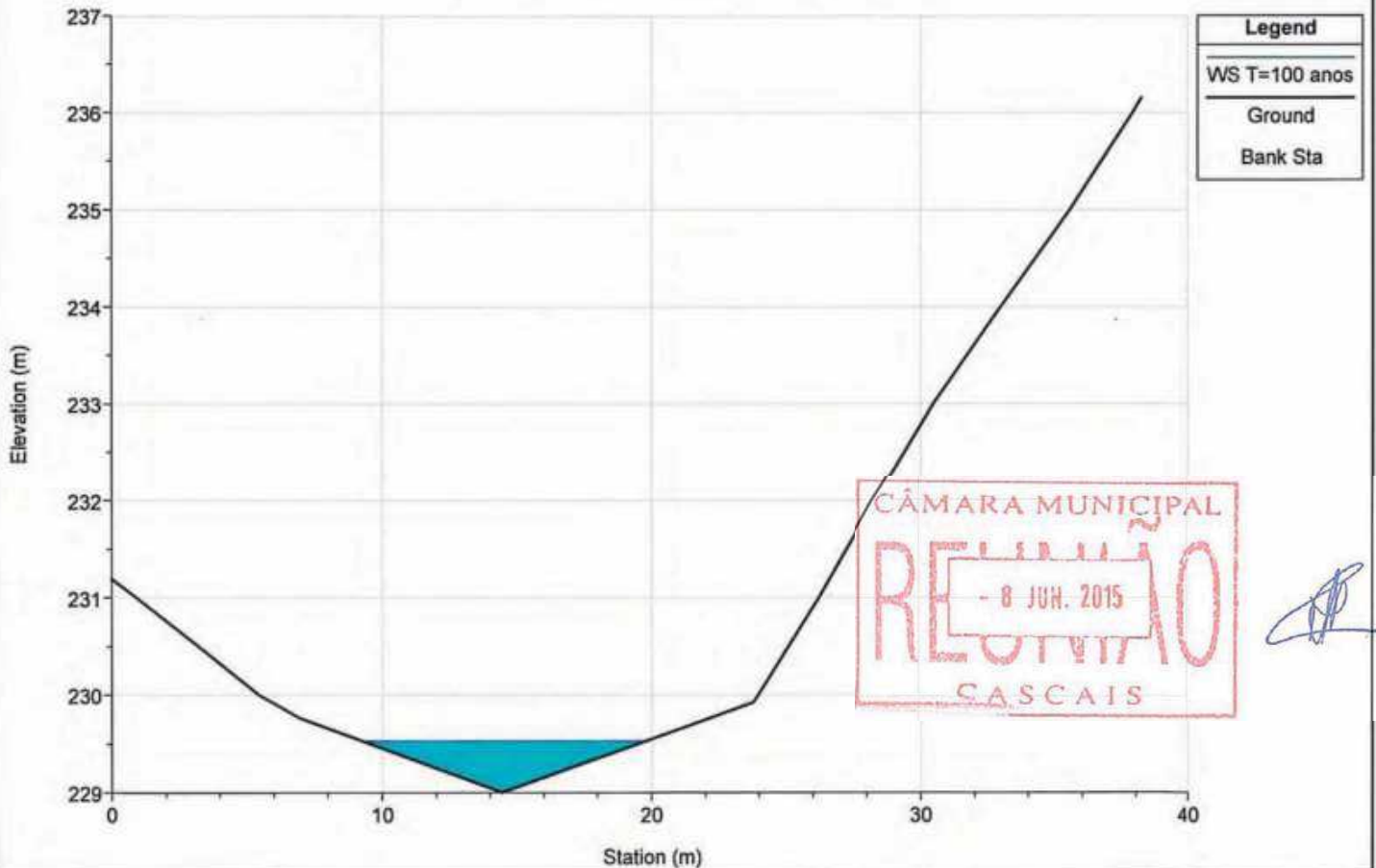
River = MD2 Reach = jusante RS = 835.344



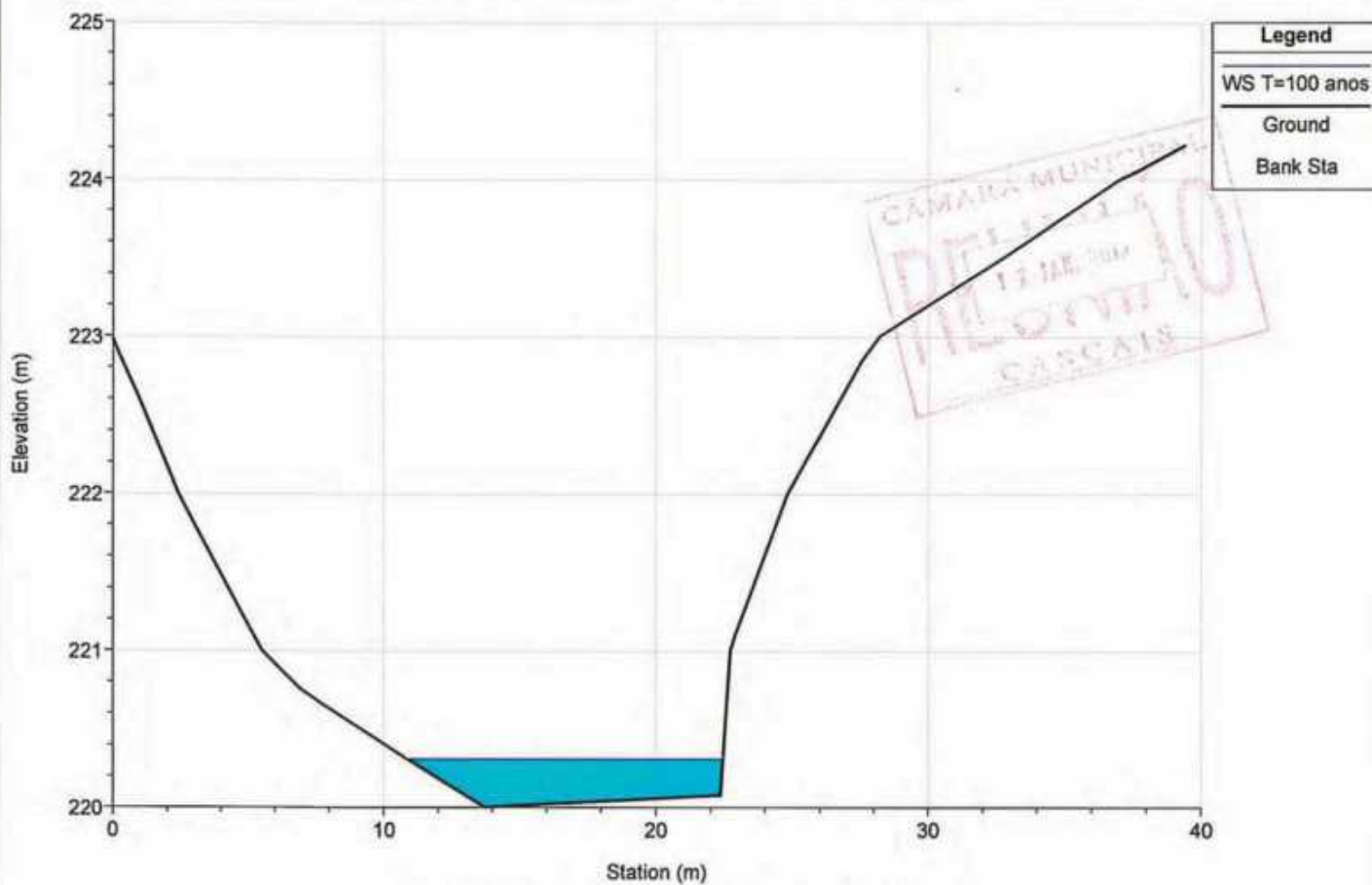
River = MD2 Reach = jusante RS = 750.310



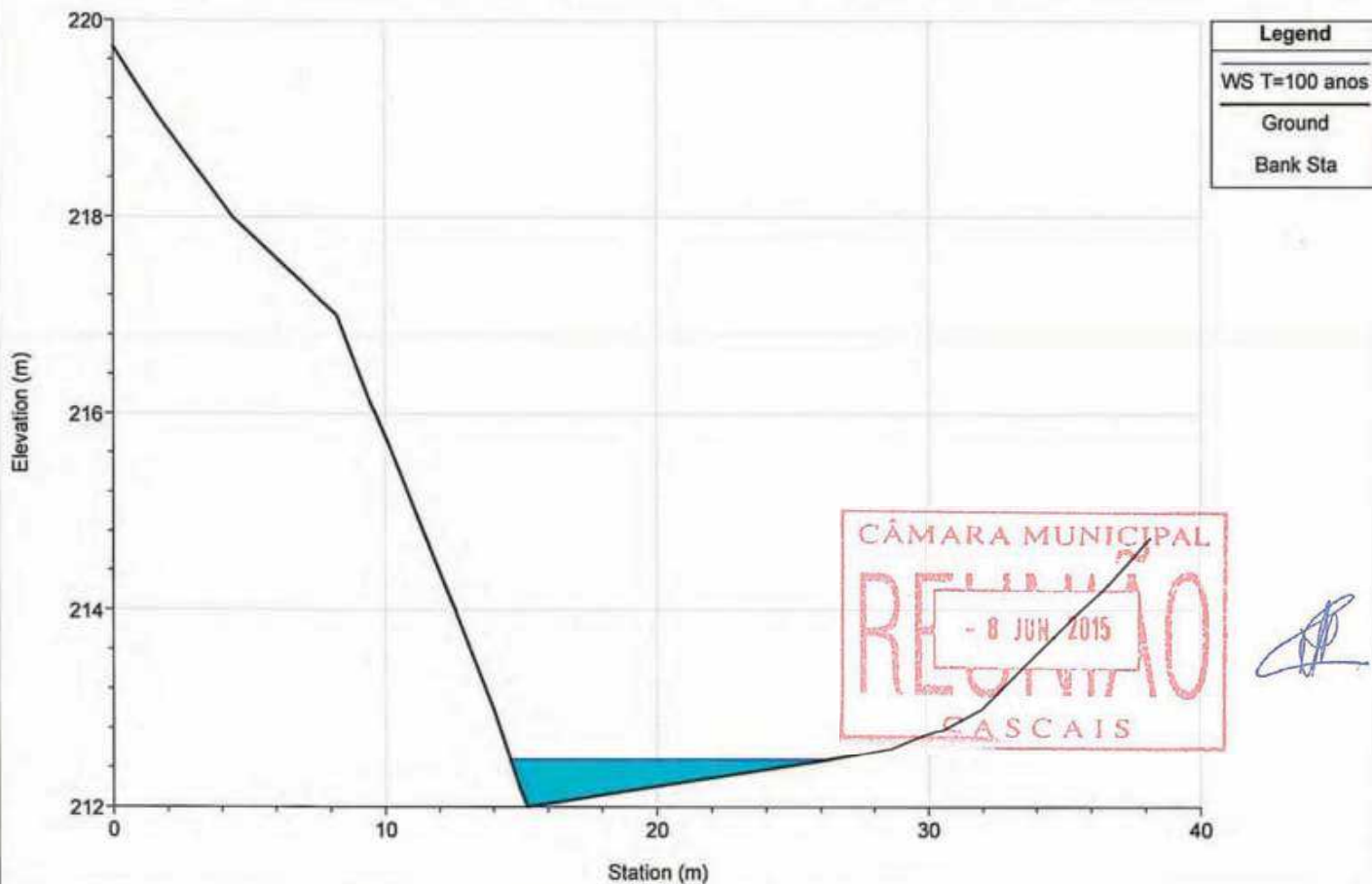
River = MD2 Reach = jusante RS = 662.458



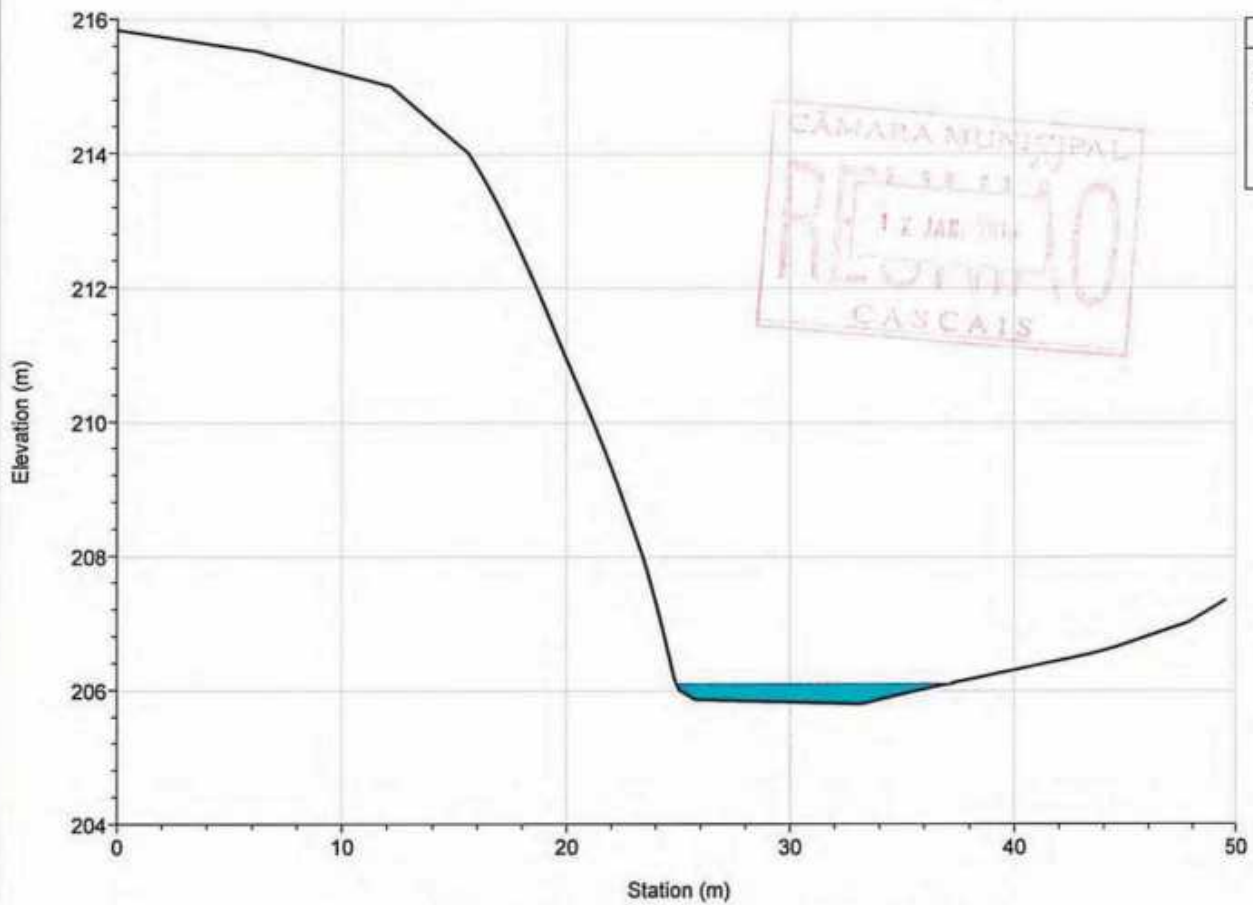
River = MD2 Reach = jusante RS = 564.368



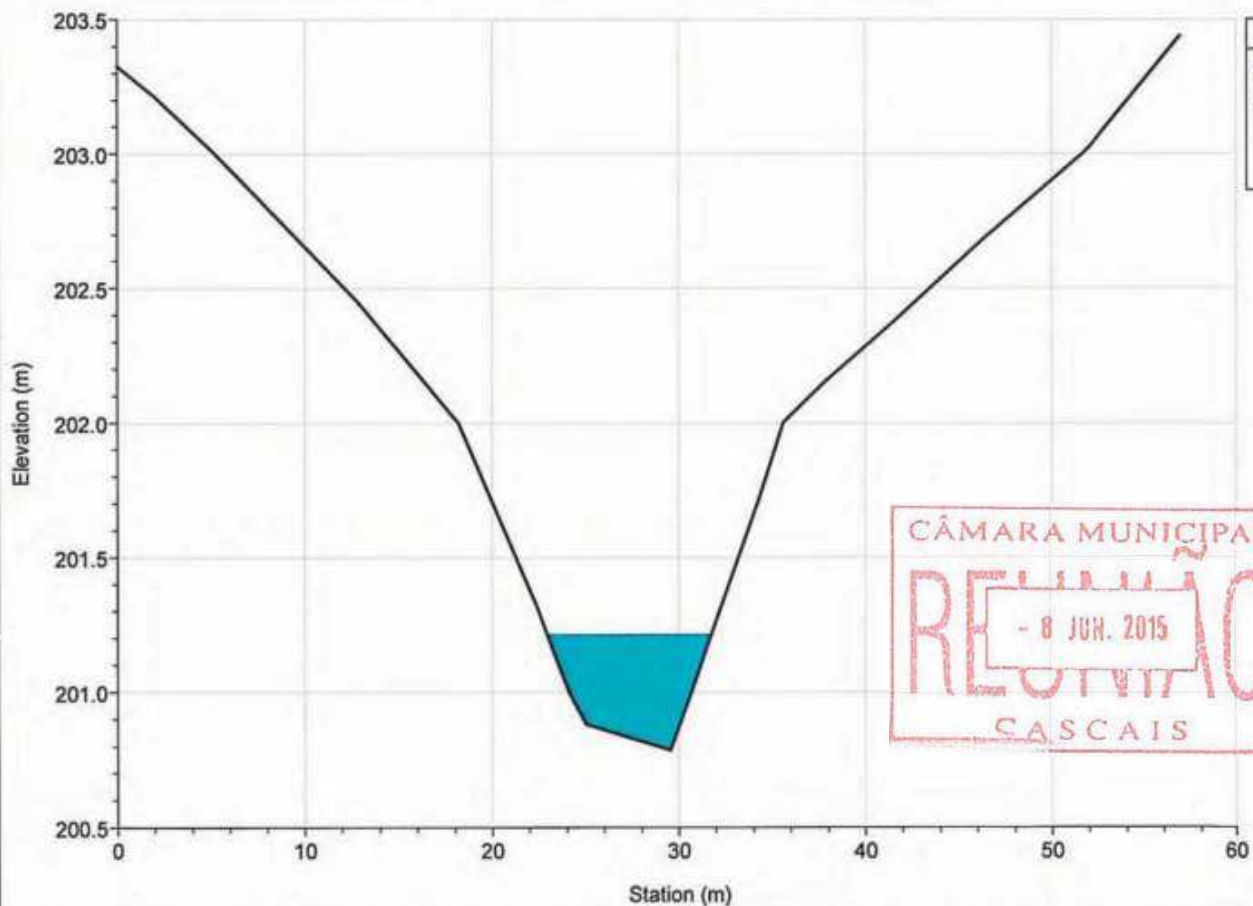
River = MD2 Reach = jusante RS = 478.408



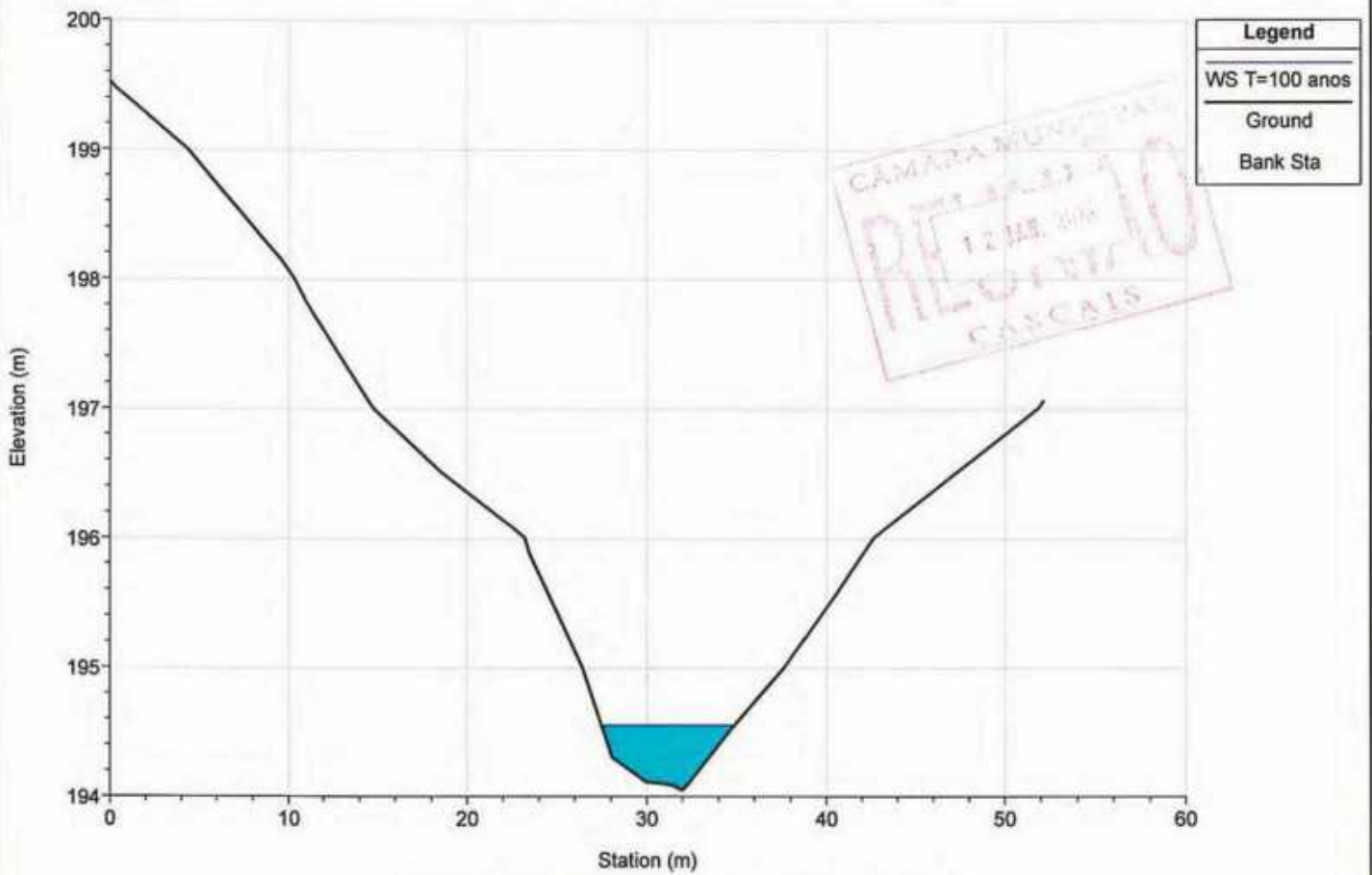
River = MD2 Reach = jusante RS = 402.147



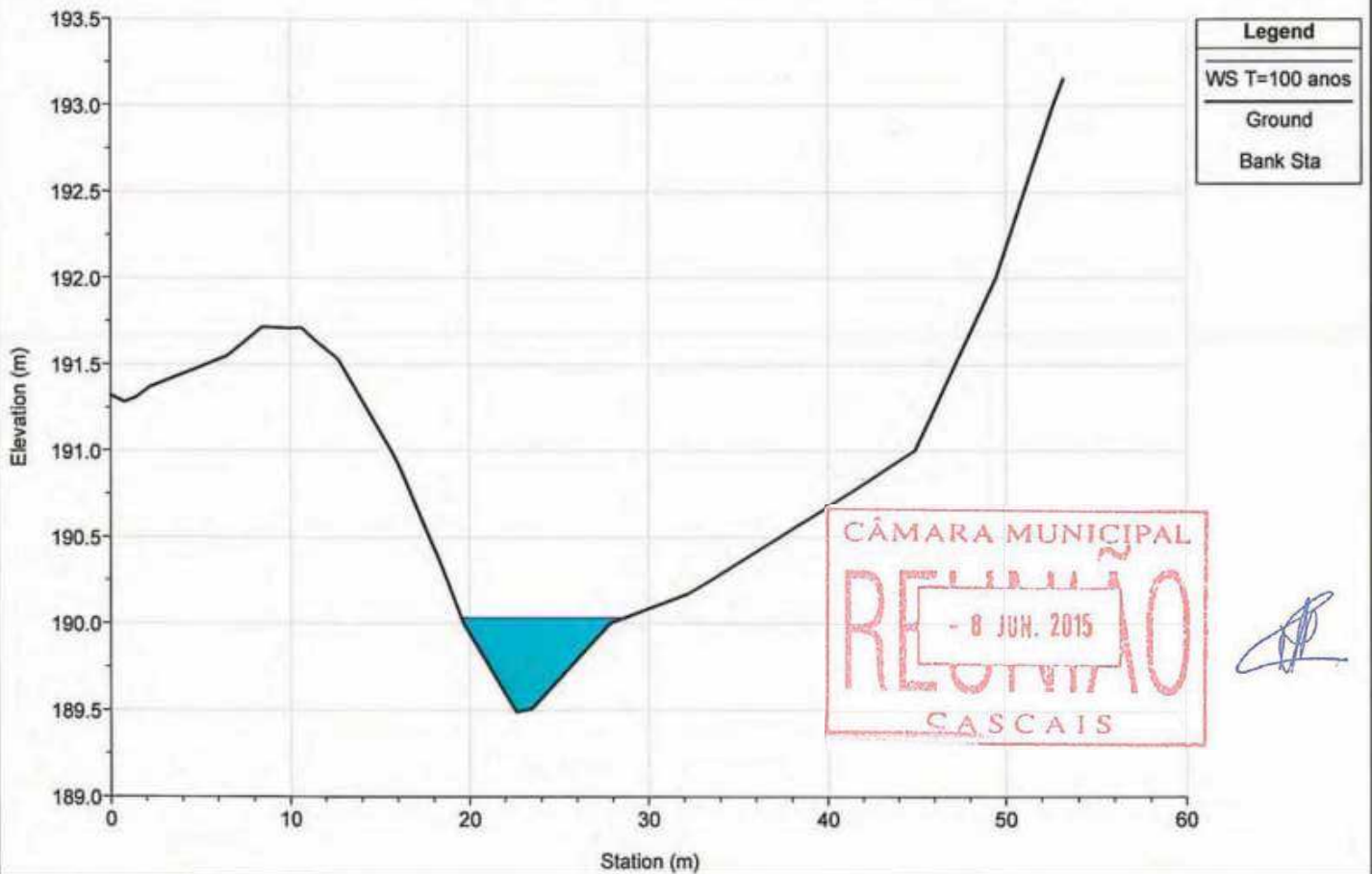
River = MD2 Reach = jusante RS = 313.606



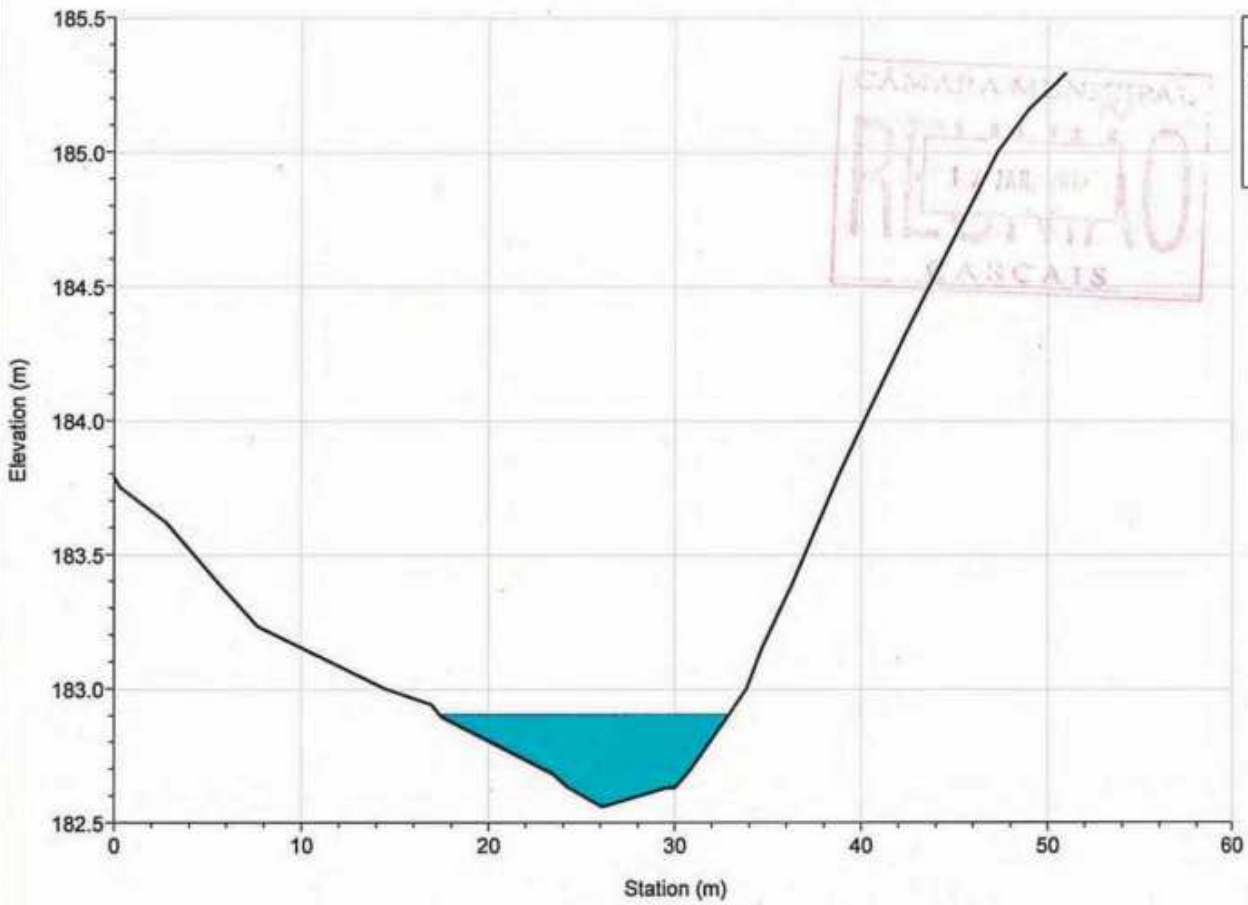
River = MD2 Reach = jusante RS = 224.008



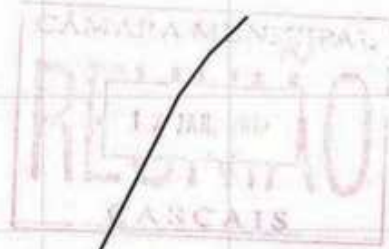
River = MD2 Reach = jusante RS = 150.692



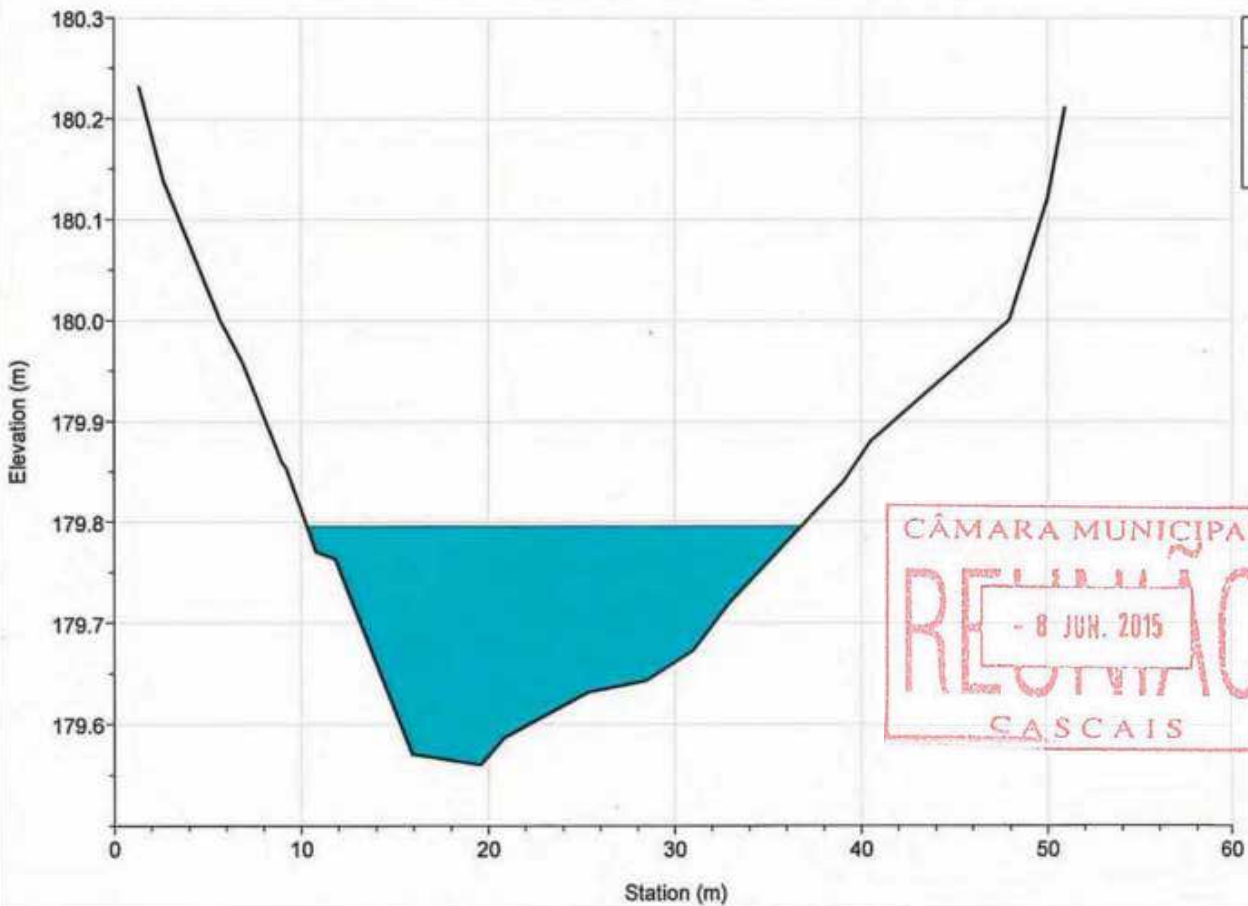
River = MD2 Reach = jusante RS = 62.569



Legend	
WS T=100 anos	Ground
Bank Sta	



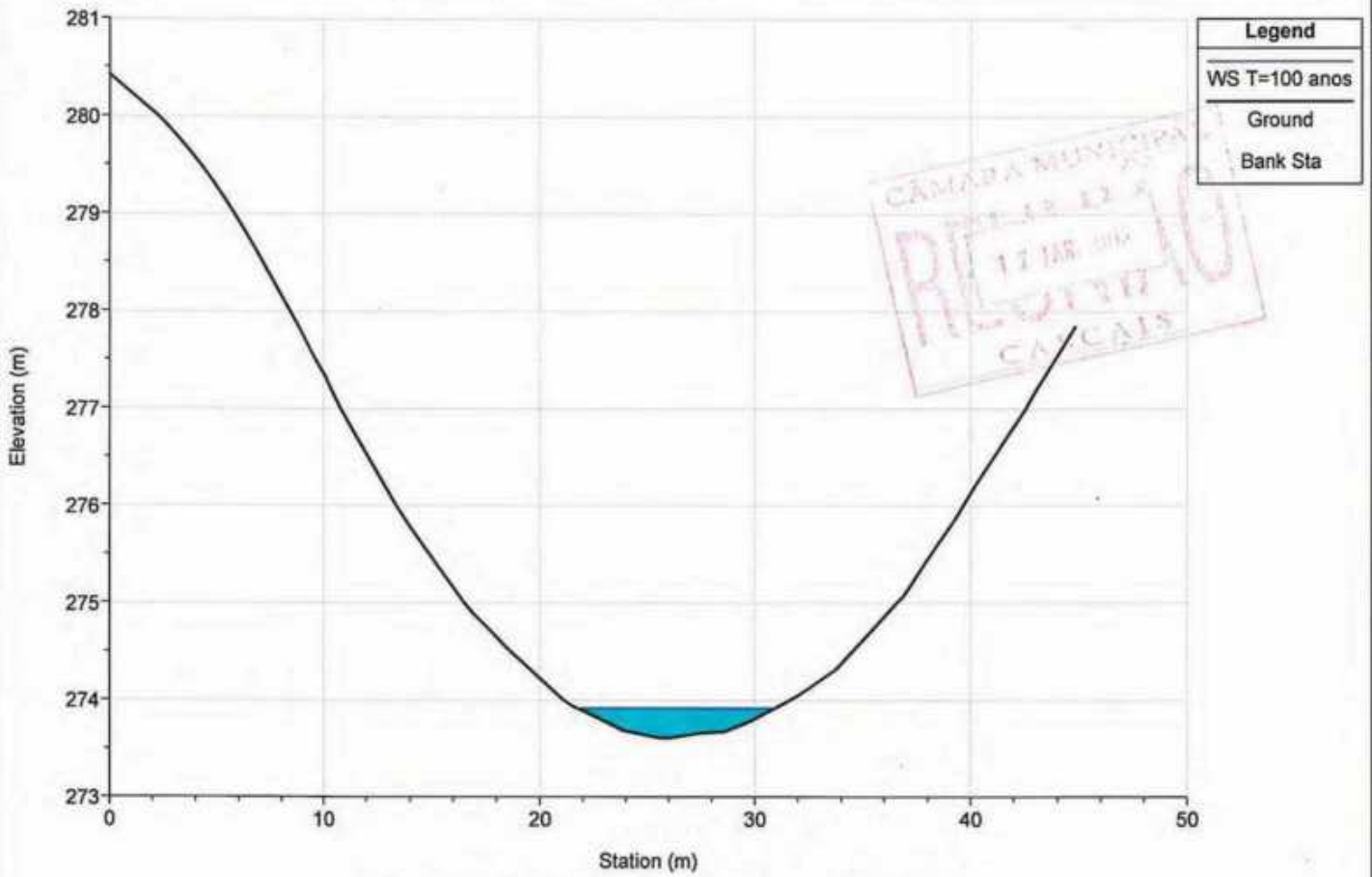
River = MD2 Reach = jusante RS = 19.750



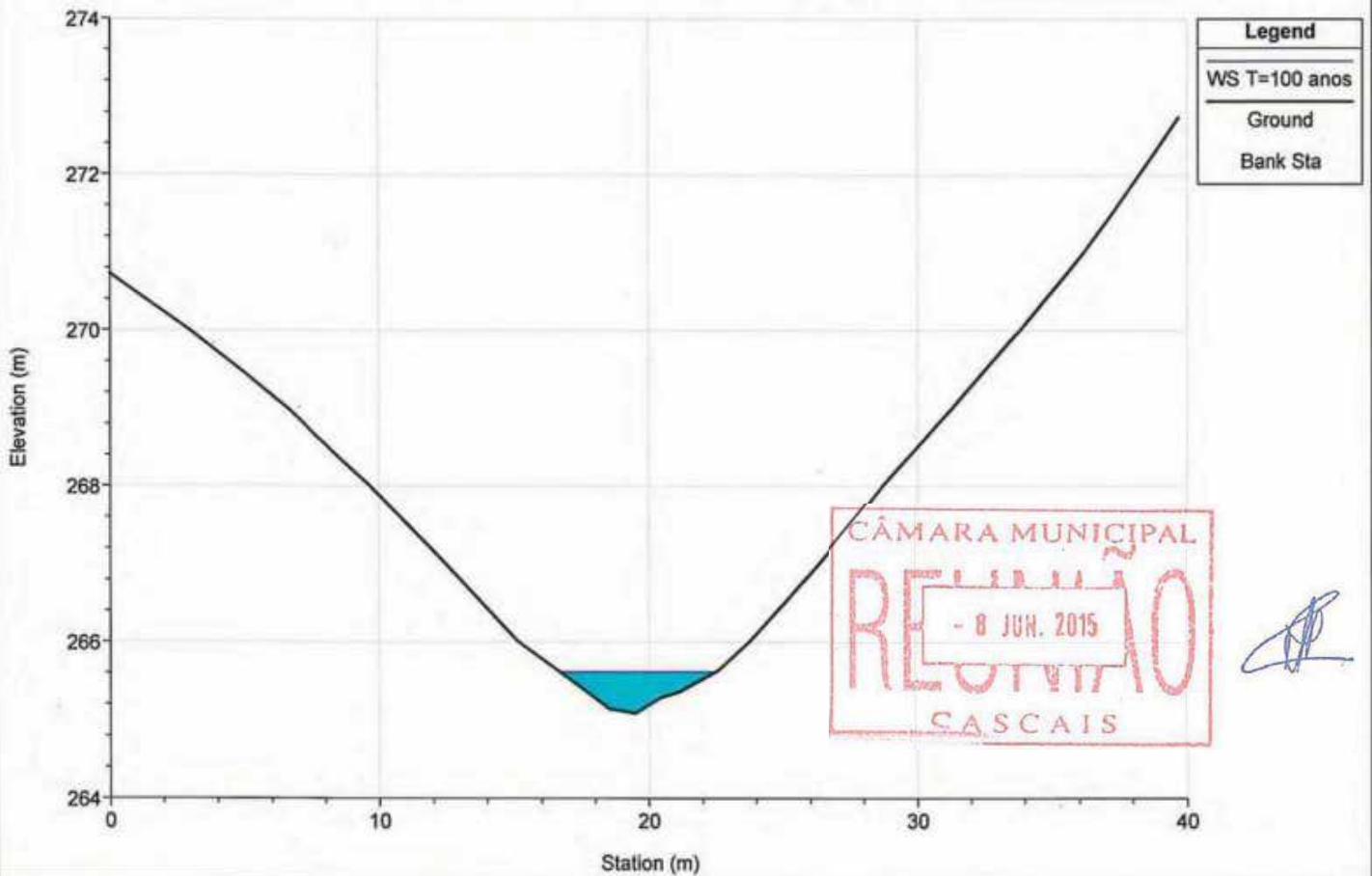
Legend	
WS T=100 anos	Ground
Bank Sta	



River = MD2-md1 Reach = afluyente RS = 134.226

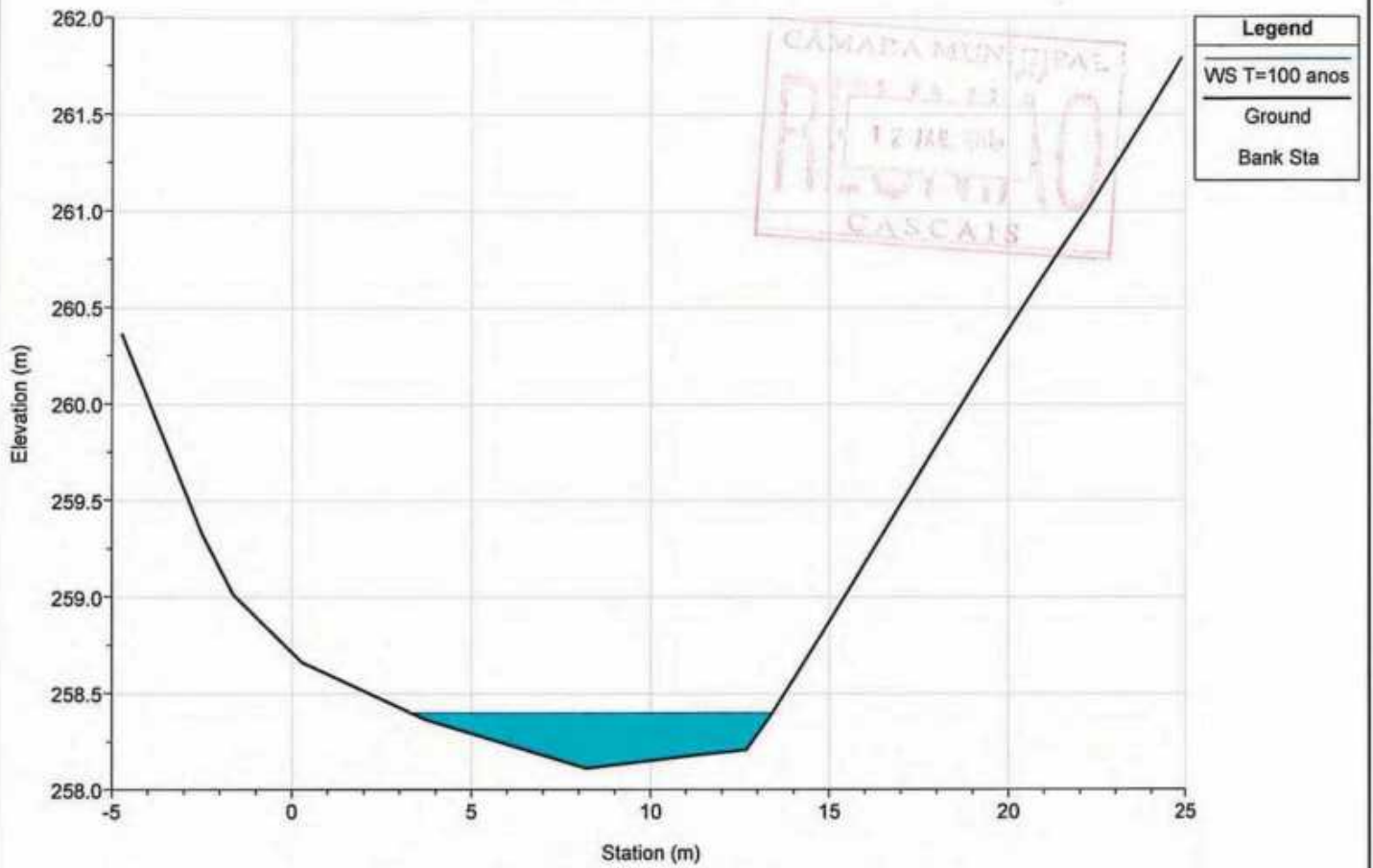


River = MD2-md1 Reach = afluyente RS = 82.611

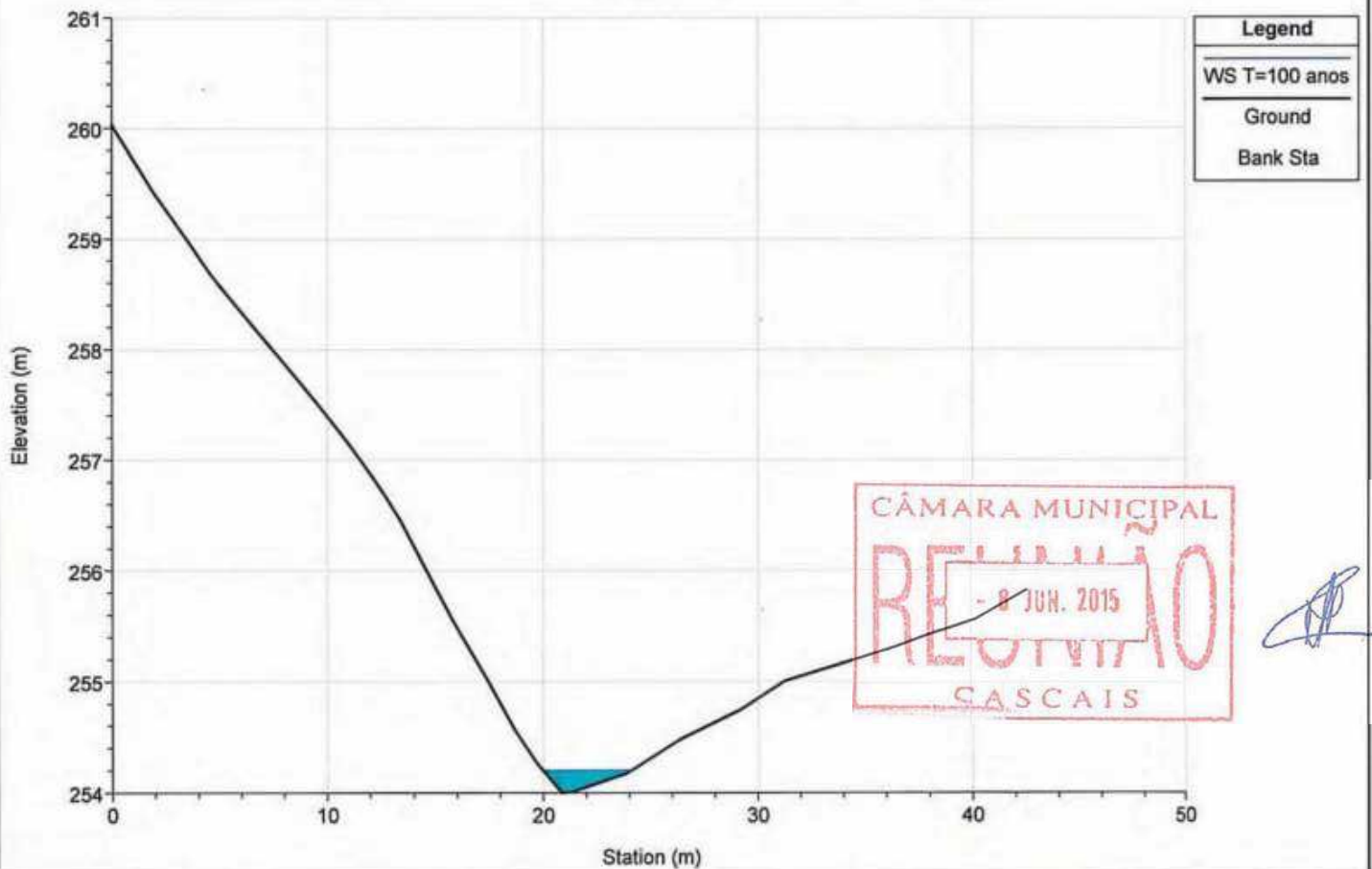




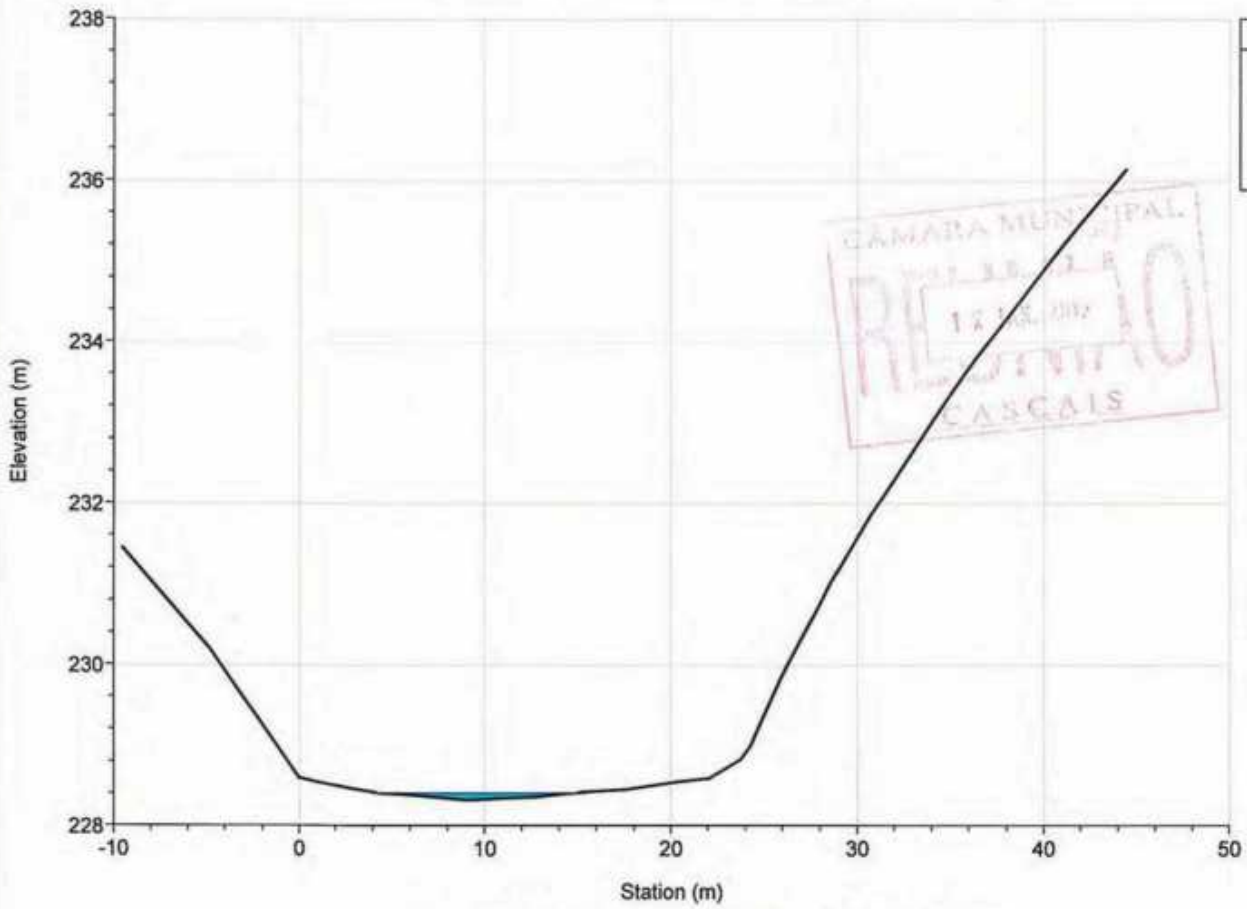
River = MD2-md1 Reach = afluyente RS = 22.209



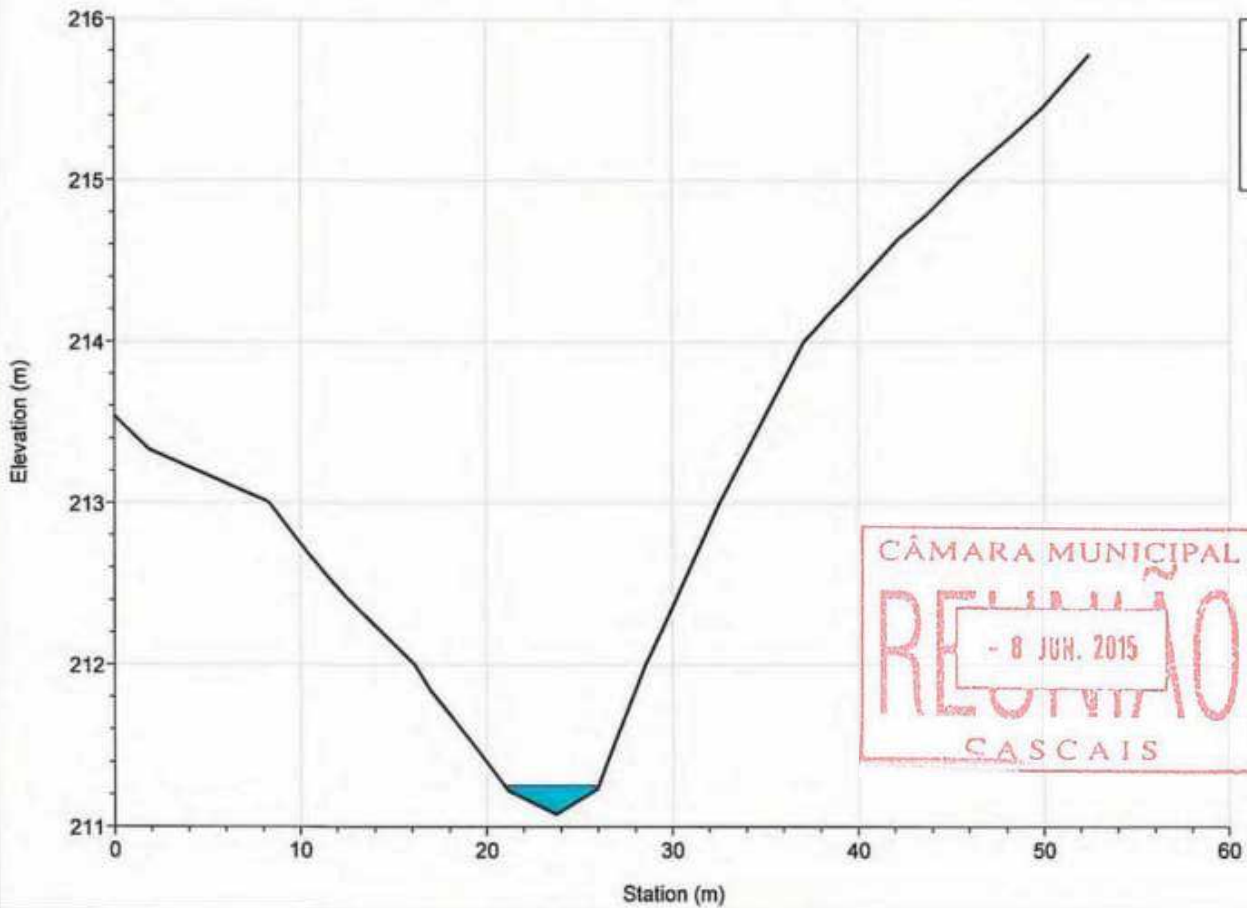
River = MD3 Reach = afluyente RS = 603.031



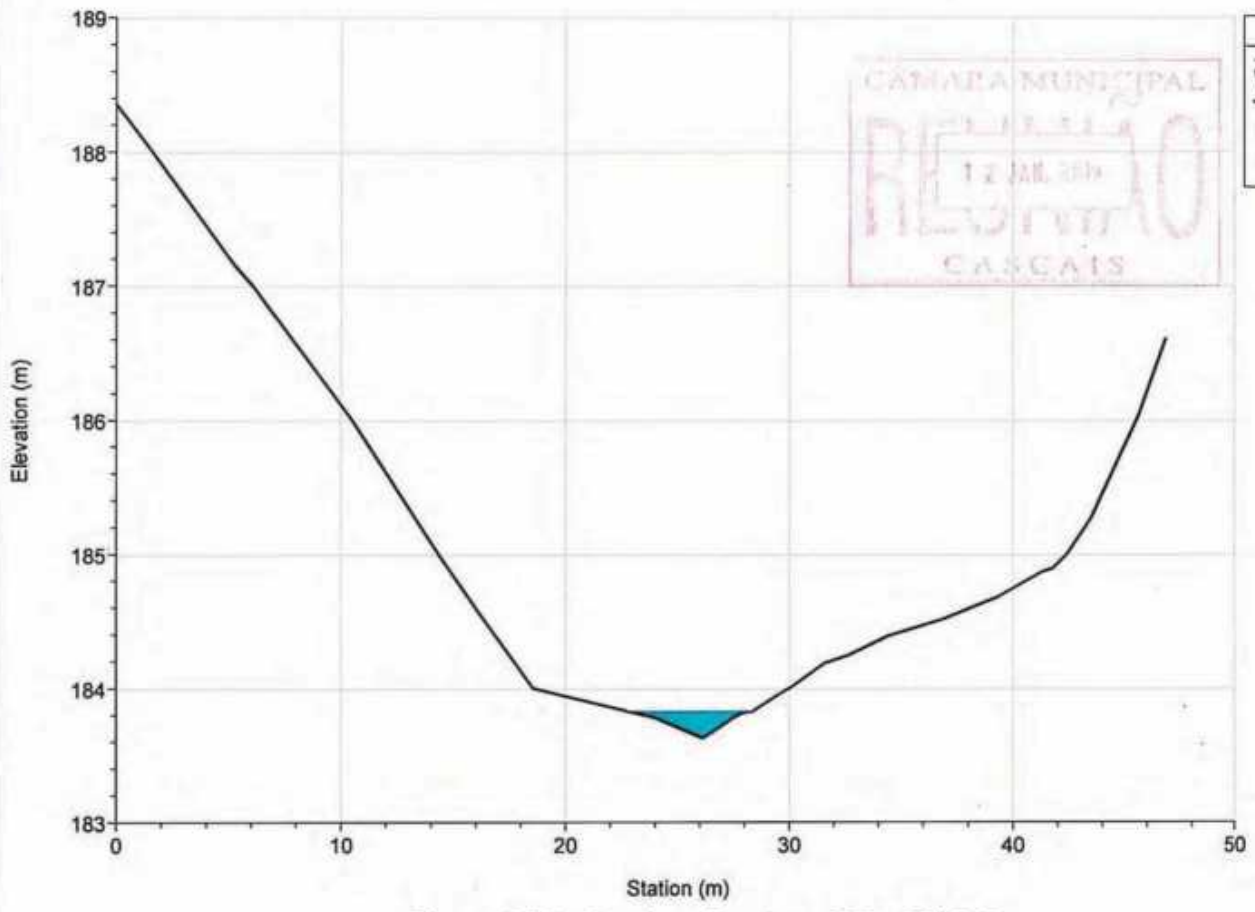
River = MD3 Reach = afluyente RS = 508.257



River = MD3 Reach = afluyente RS = 417.144



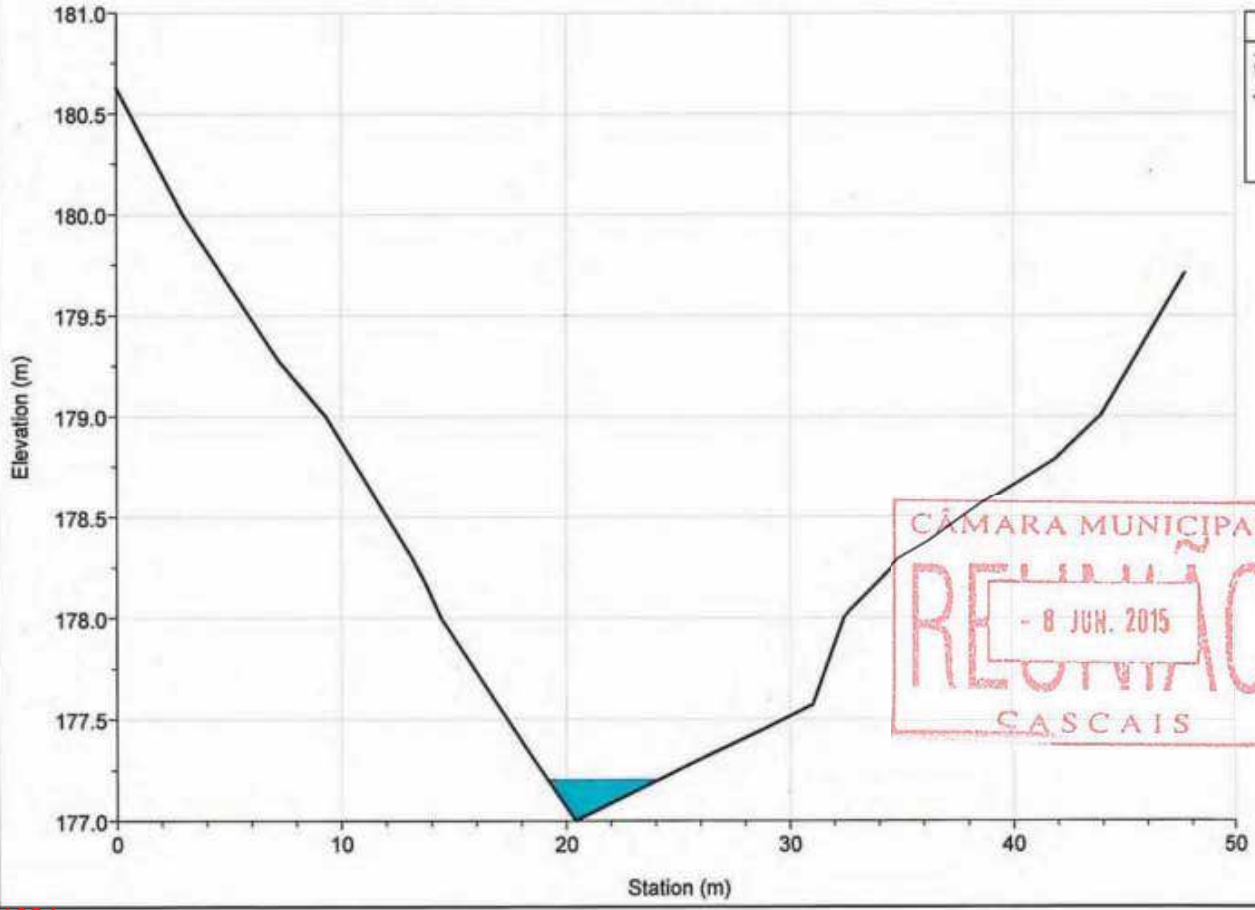
River = MD3 Reach = afluente RS = 291.506



Legend
WS T=100 anos
Ground
Bank Sta

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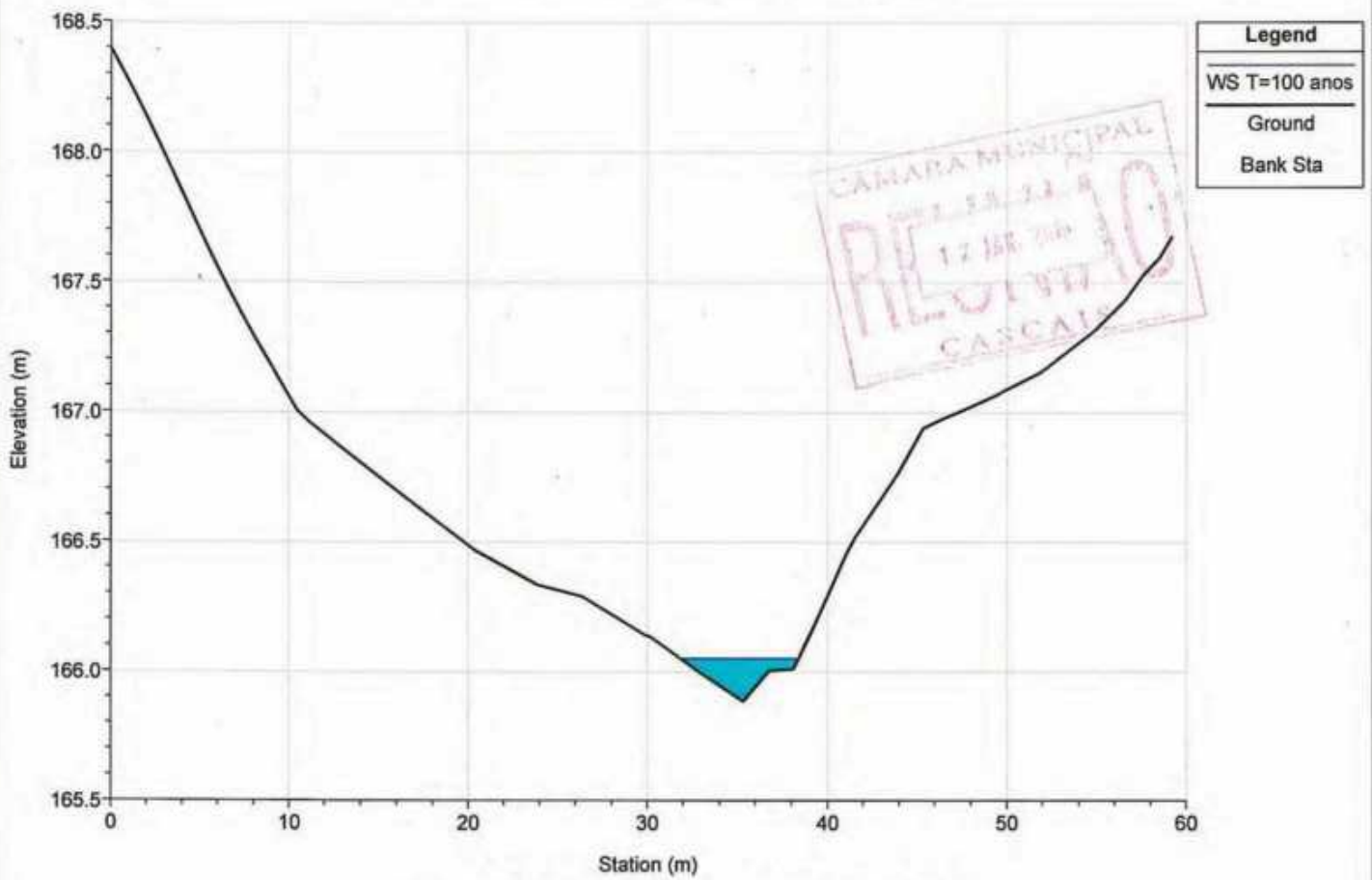
River = MD3 Reach = afluente RS = 224.613



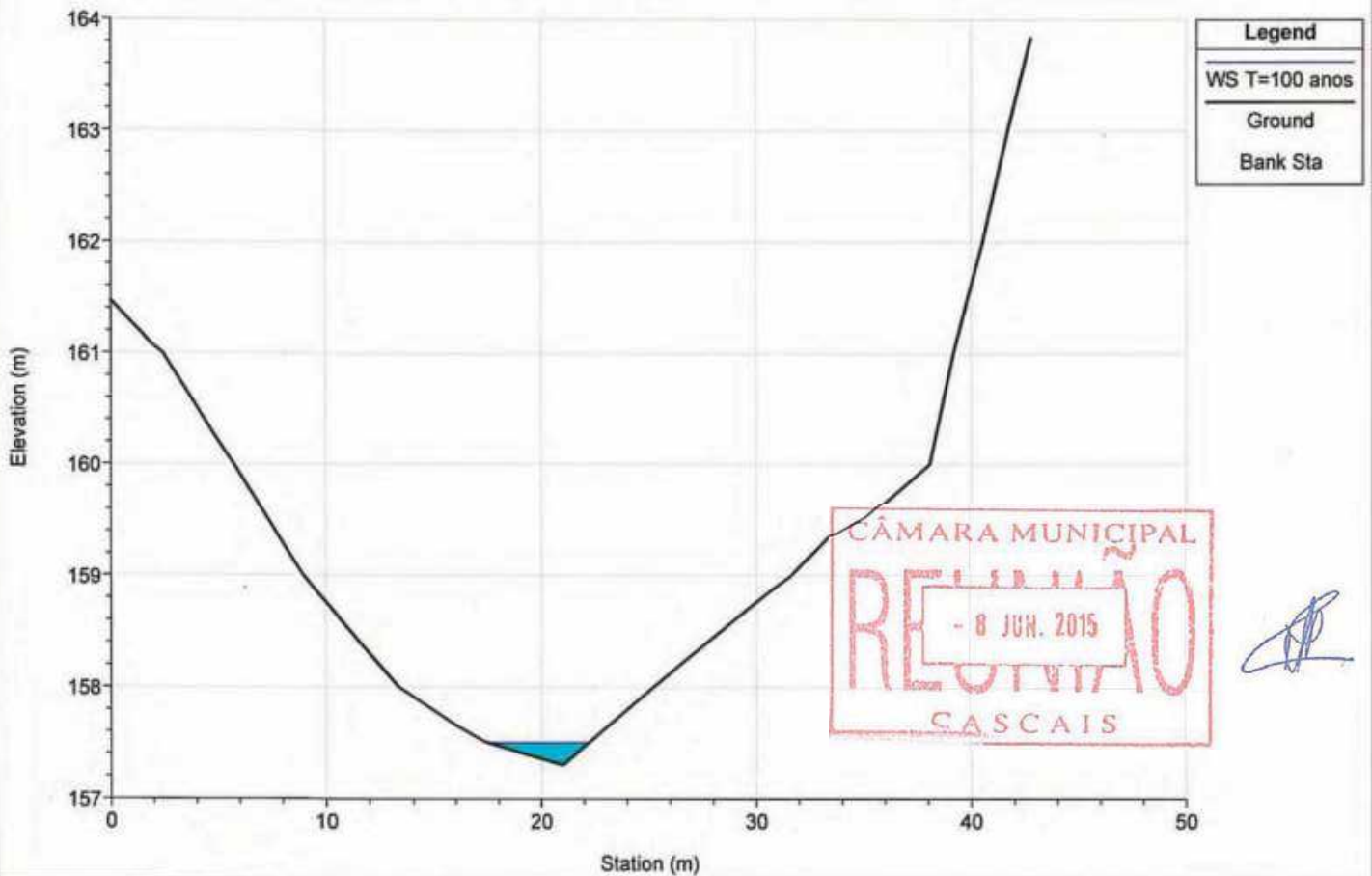
Legend
WS T=100 anos
Ground
Bank Sta

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REQUISIÇÃO  
- 8 JUN. 2015  
CASCAIS

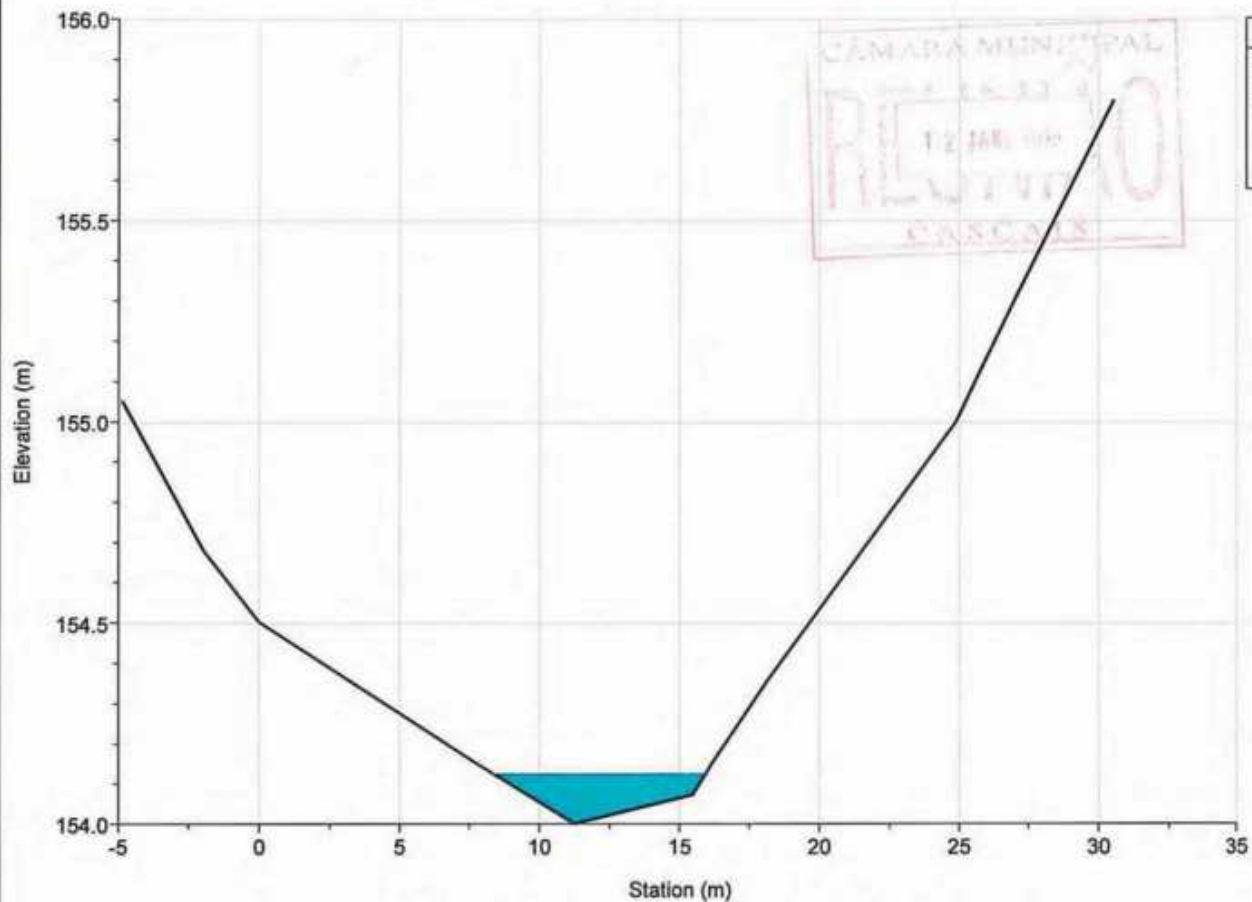
River = MD3 Reach = afluente RS = 123.964



River = MD3 Reach = afluente RS = 50.610



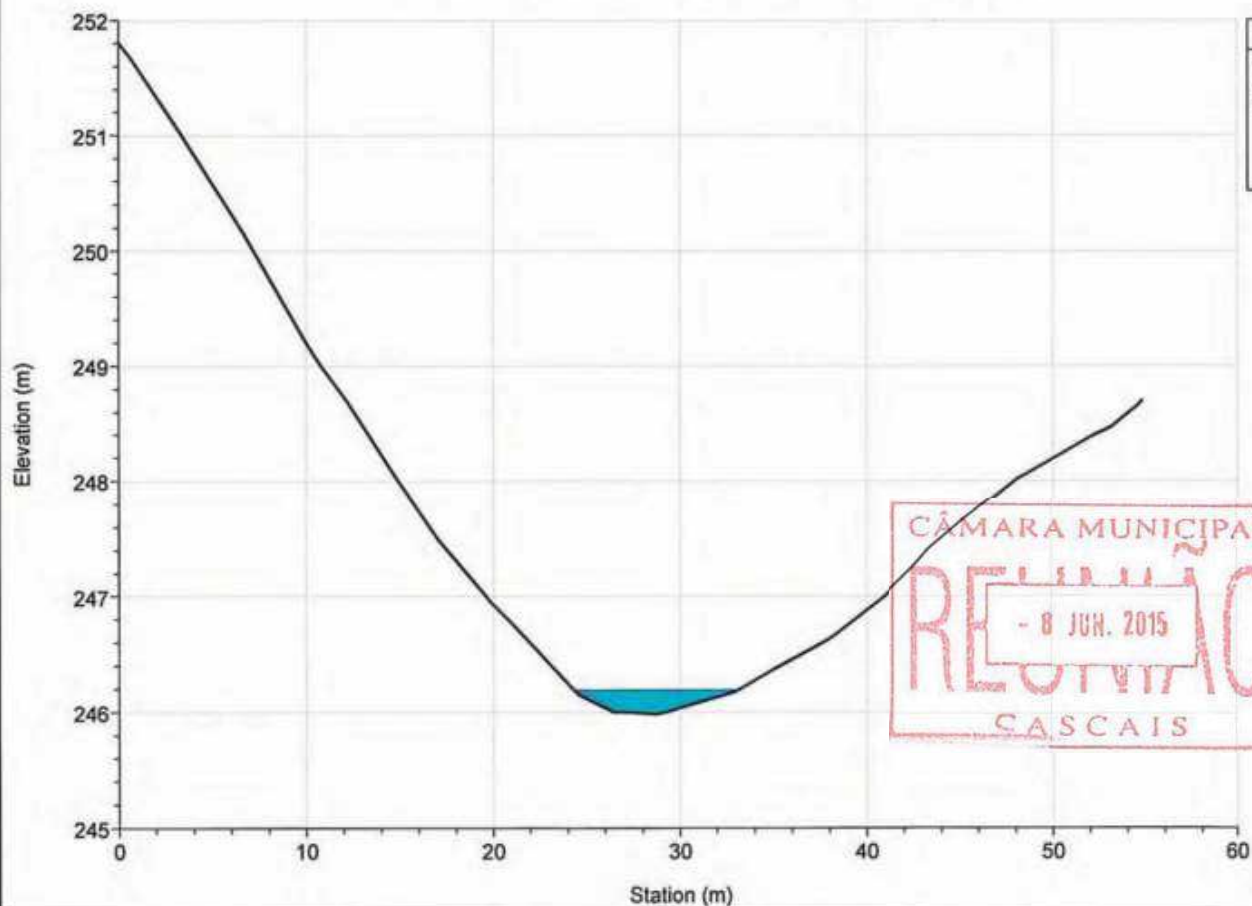
River = MD3 Reach = afluente RS = 13.342



Legend
WS T=100 anos
Ground
Bank Sta

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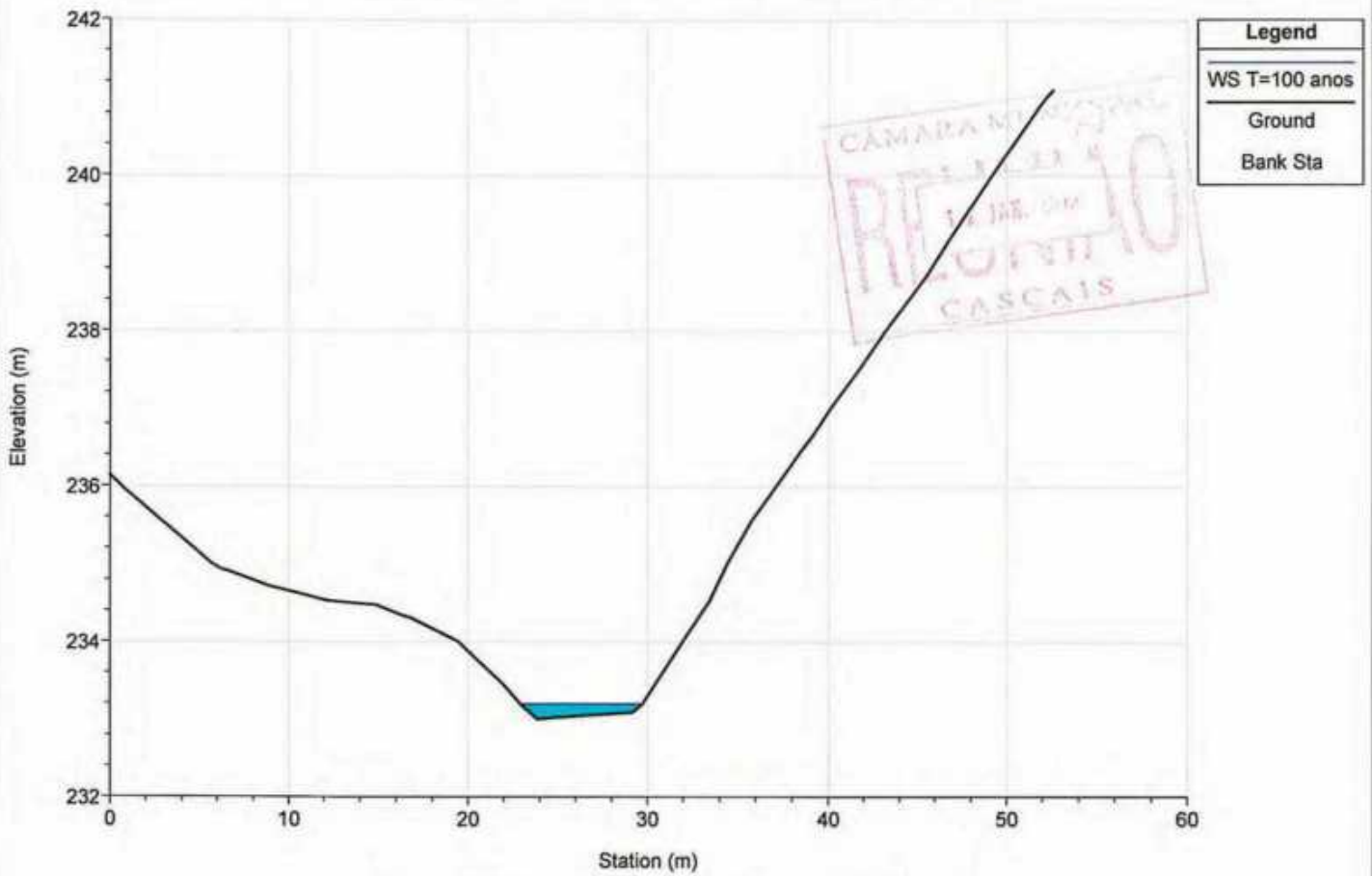
River = ME1 Reach = montante RS = 4061.138



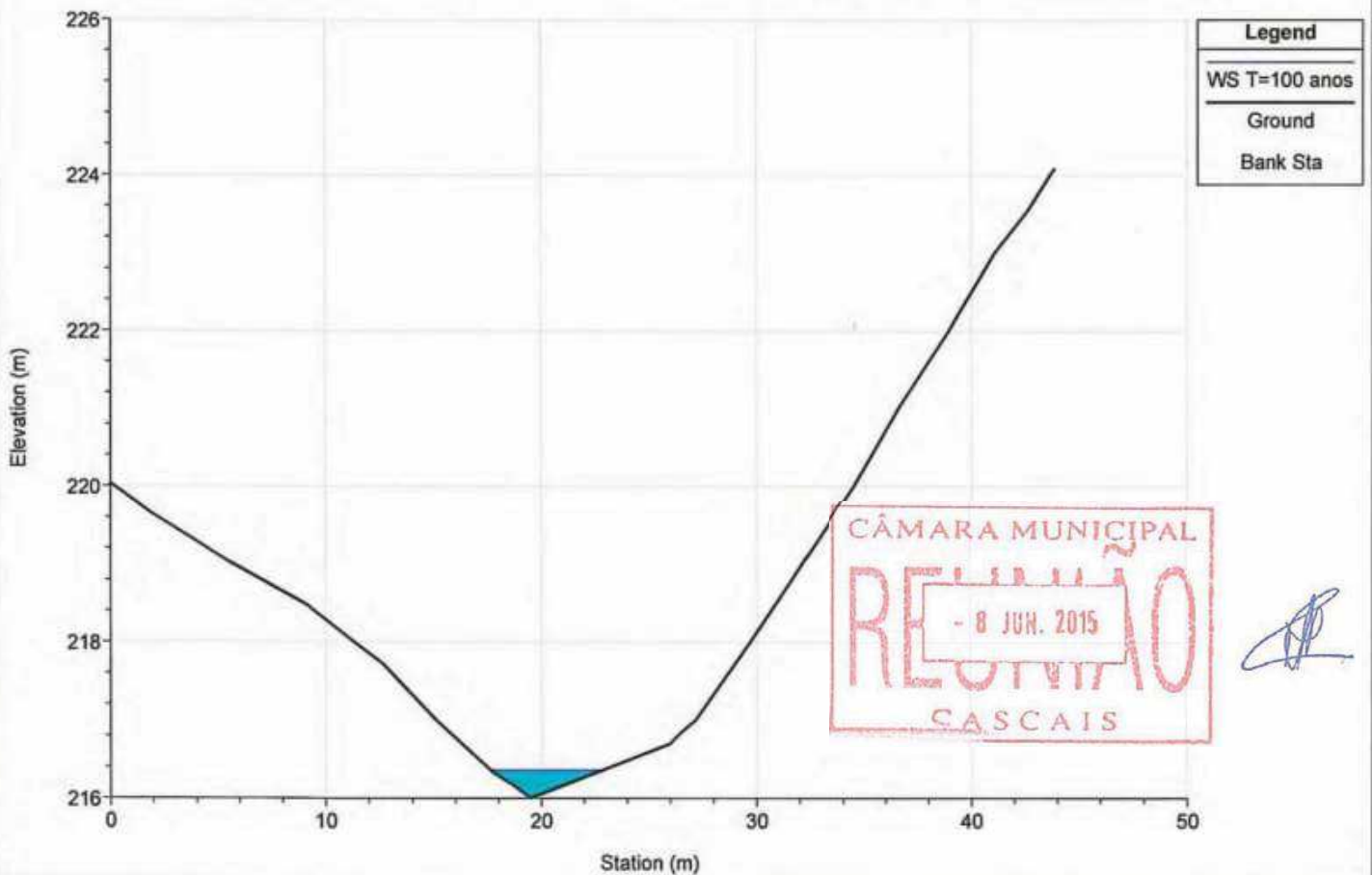
Legend
WS T=100 anos
Ground
Bank Sta

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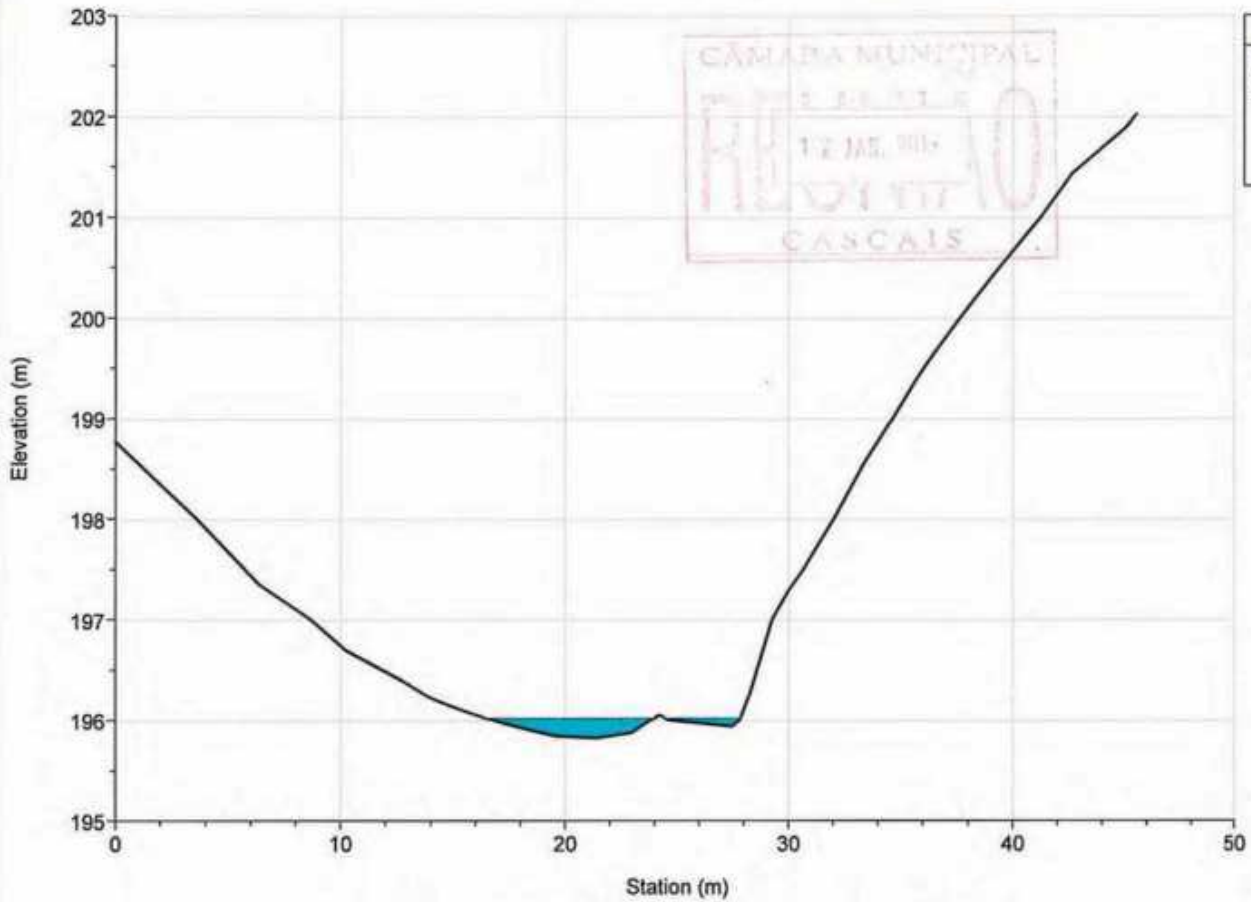
River = ME1 Reach = montante RS = 3940.880



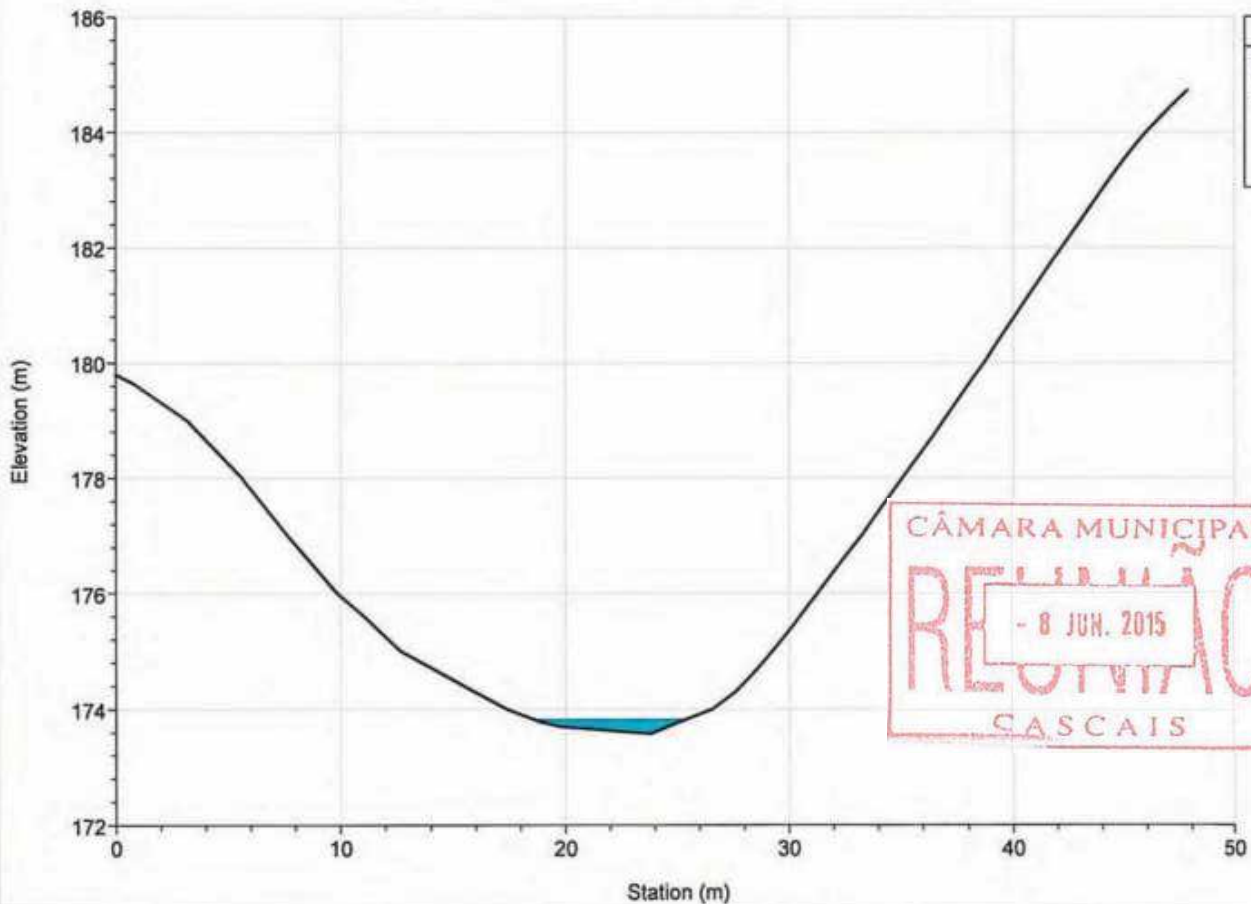
River = ME1 Reach = montante RS = 3839.595



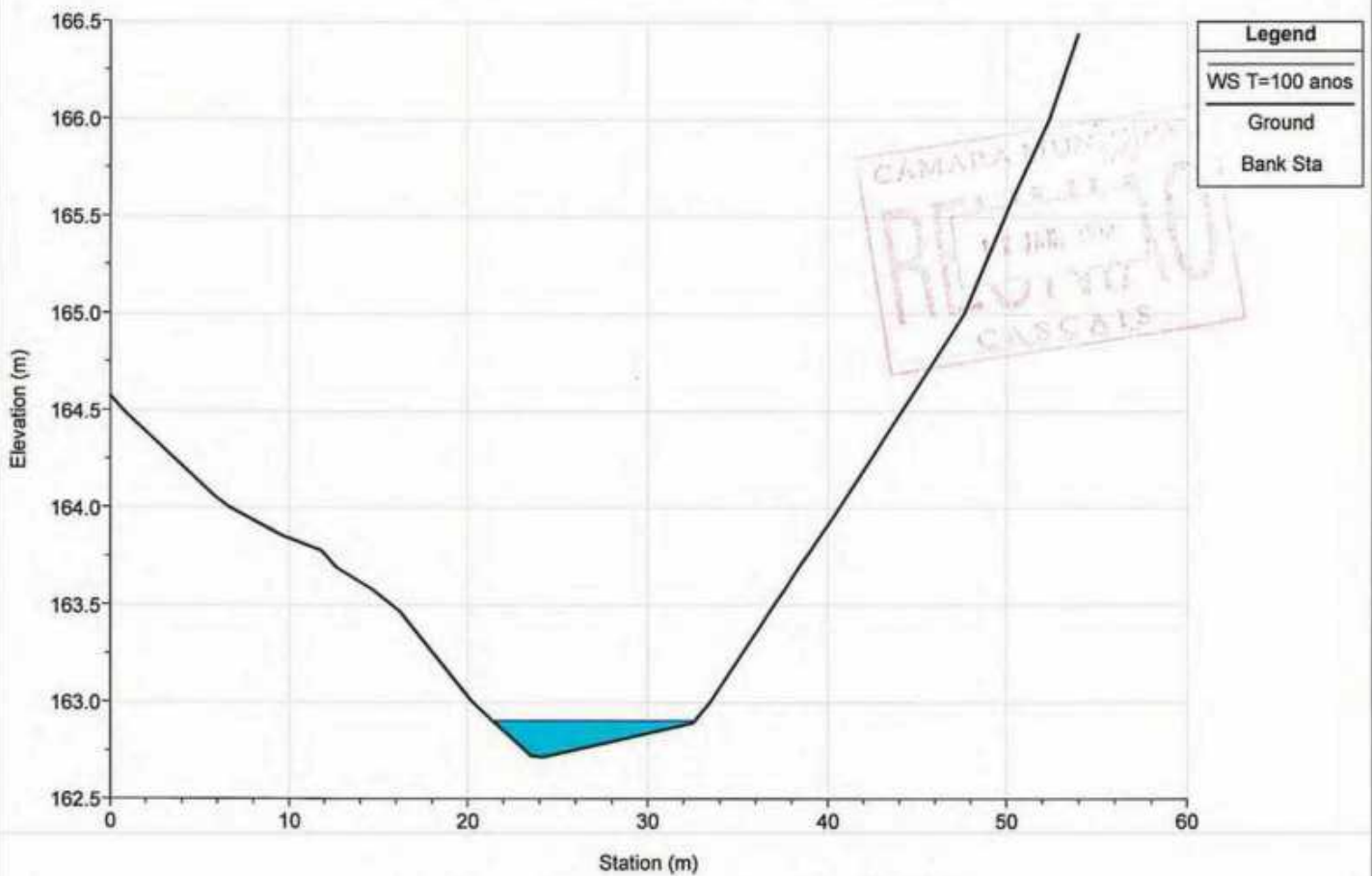
River = ME1 Reach = montante RS = 3738.647



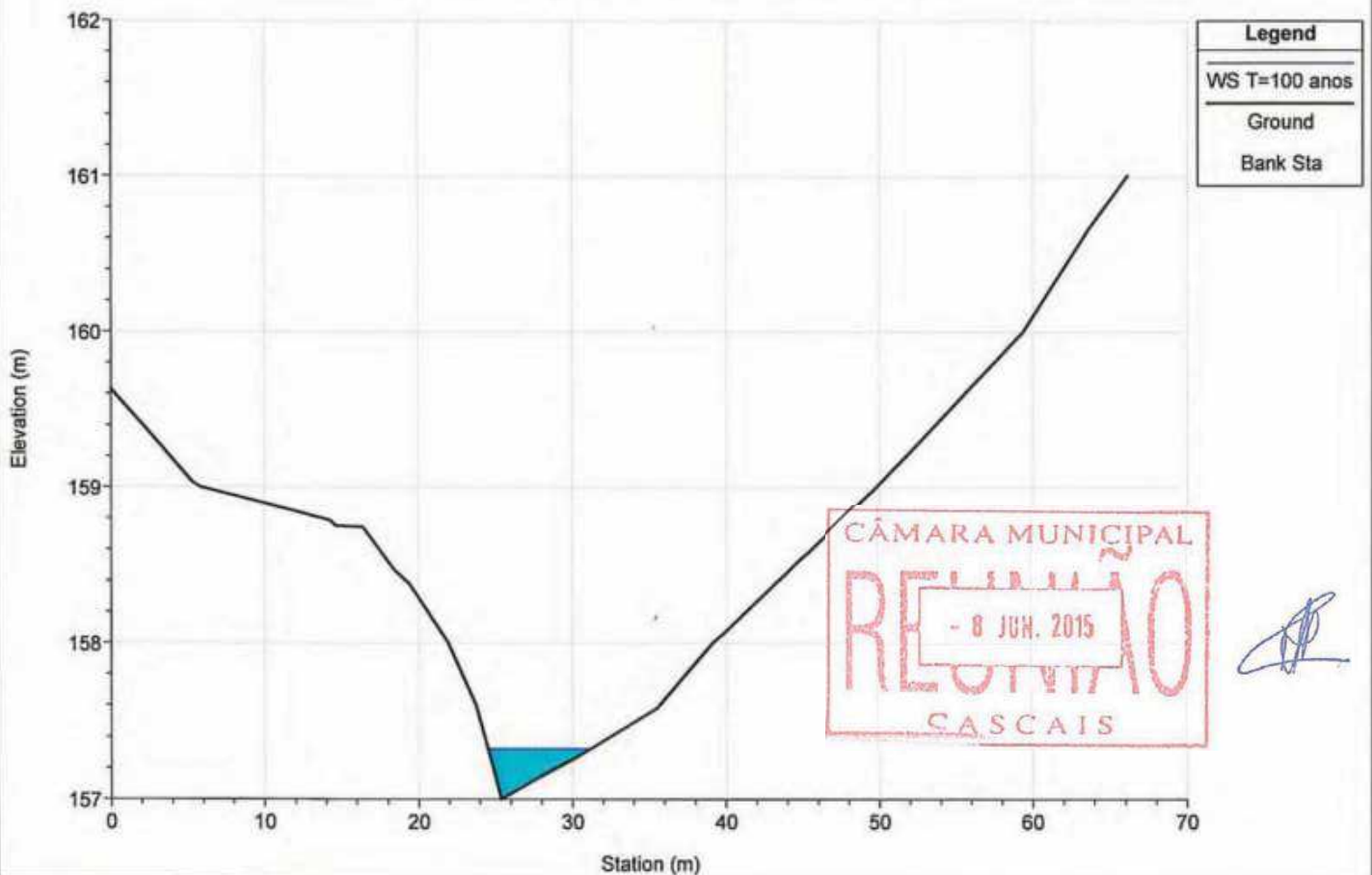
River = ME1 Reach = montante RS = 3634.780



River = ME1 Reach = montante RS = 3535.903



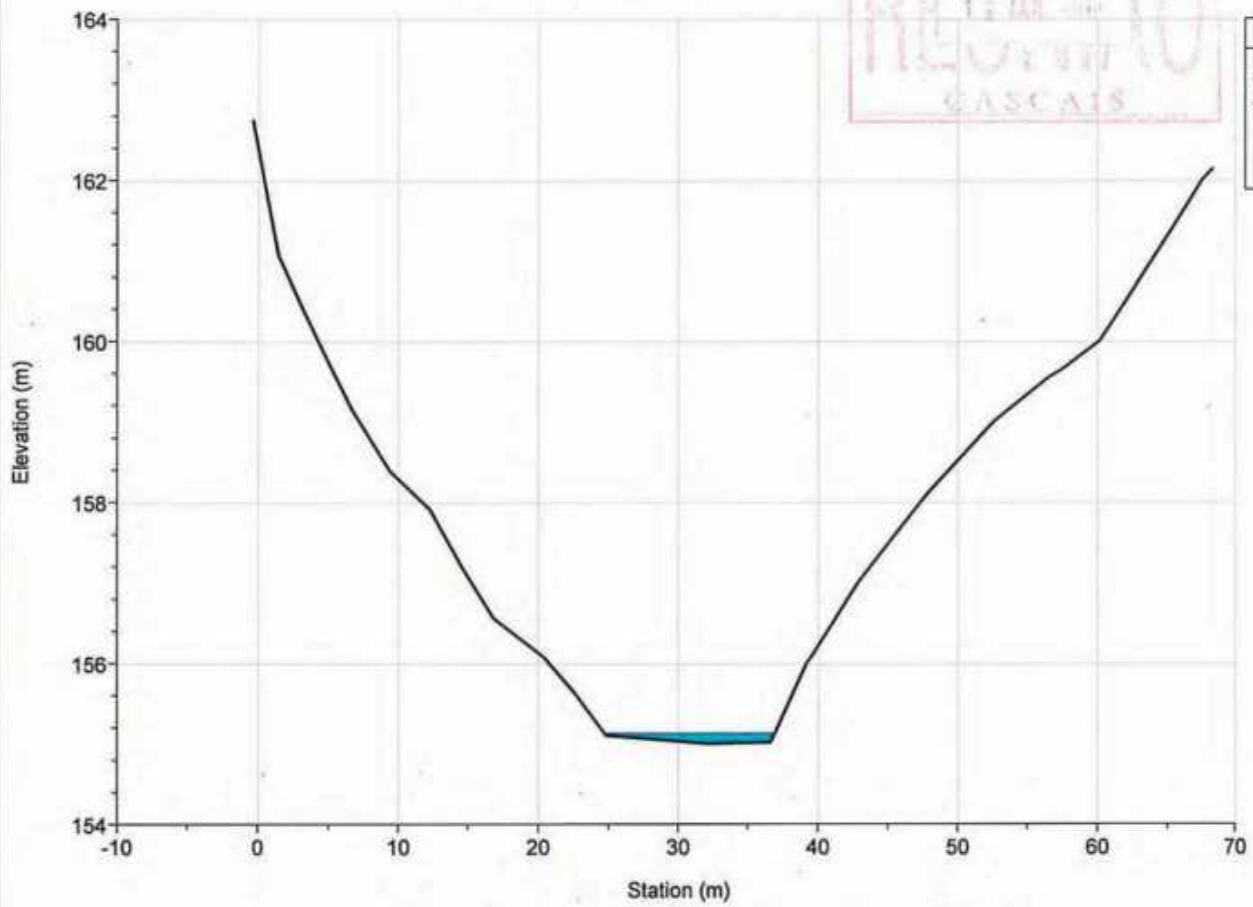
River = ME1 Reach = montante RS = 3441.846





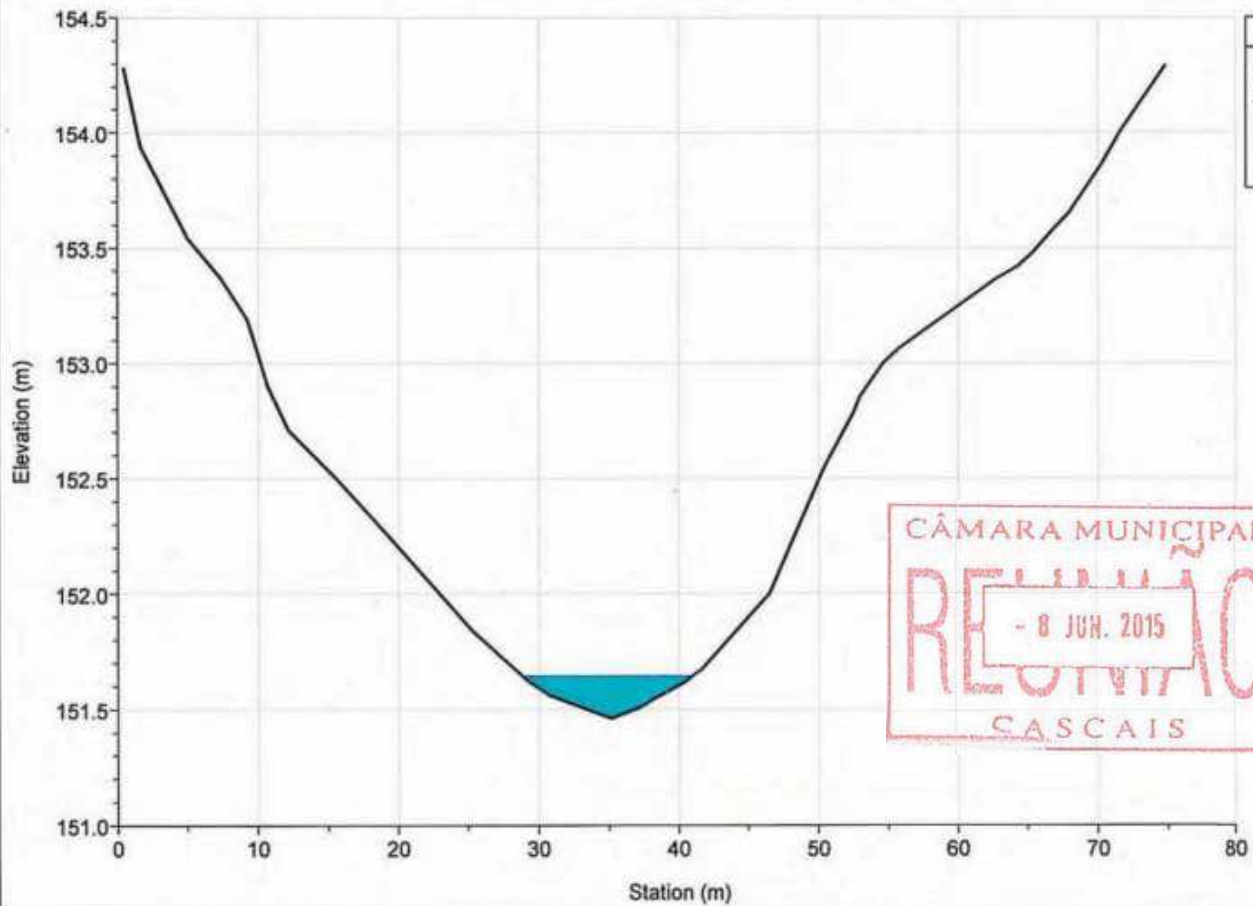
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River = ME1 Reach = montante RS = 3339.636



Legend	
WS T=100 anos	
Ground	
Bank Sta	

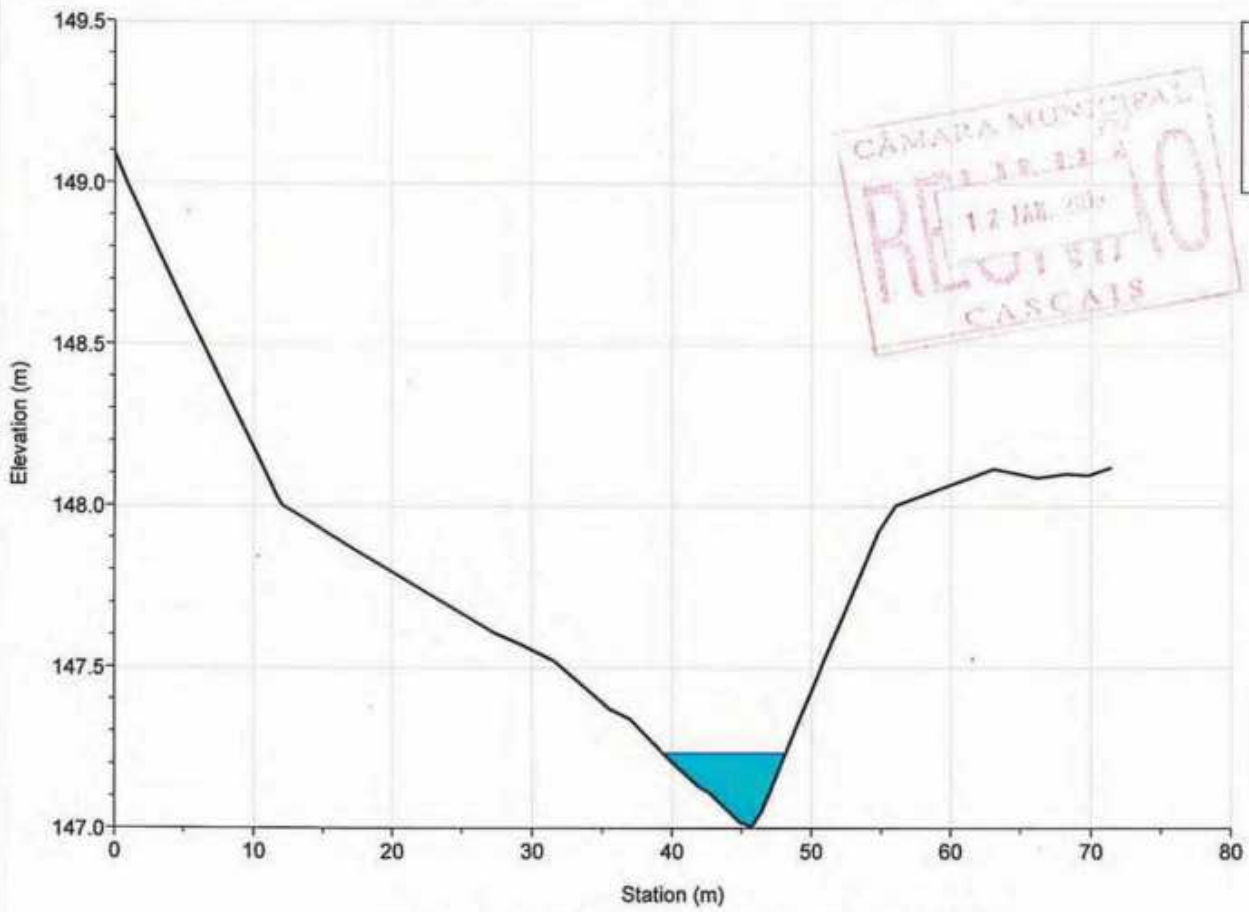
River = ME1 Reach = montante RS = 3250.754



Legend	
WS T=100 anos	
Ground	
Bank Sta	

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 - 8 JUN. 2015  
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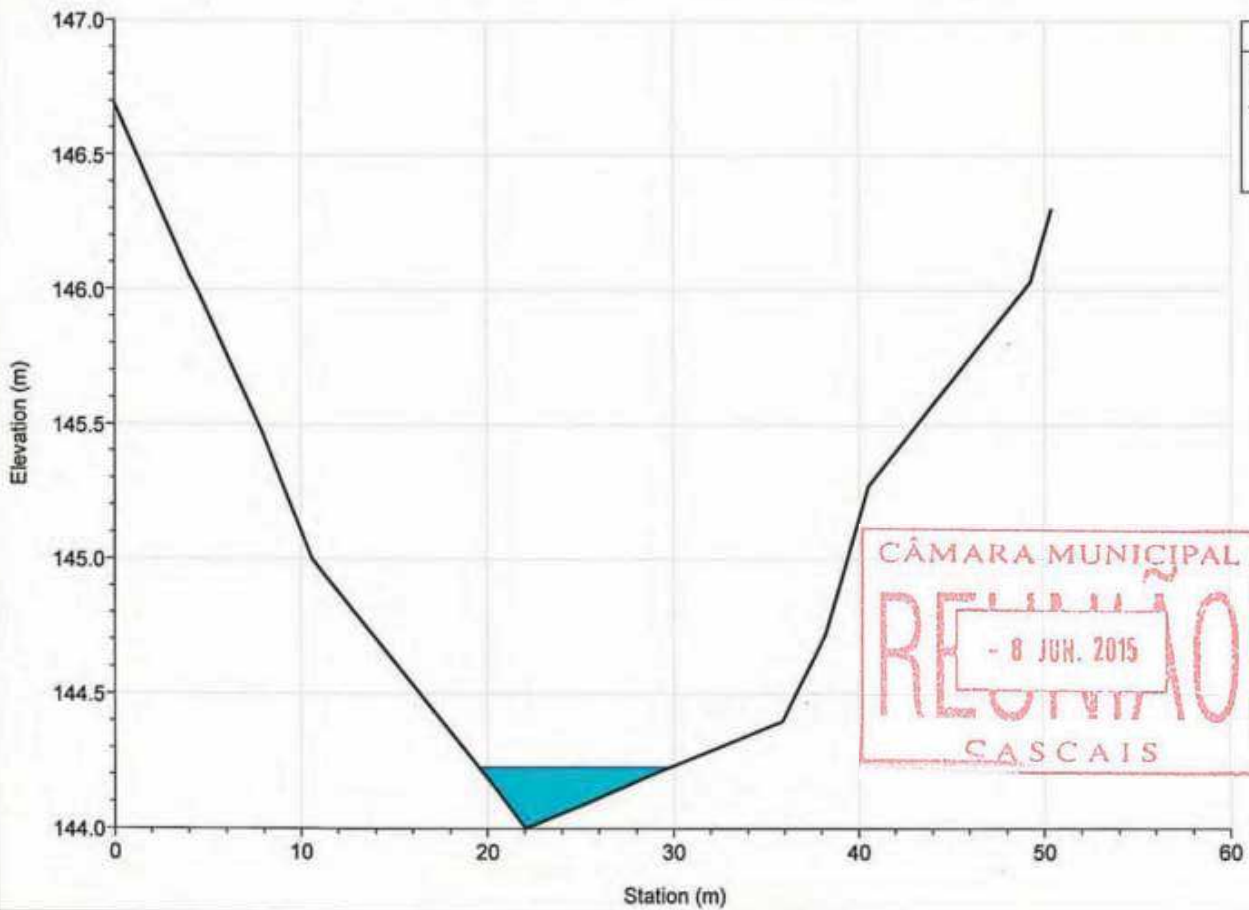
River = ME1 Reach = montante RS = 3137.580



Legend
WS T=100 anos
Ground
Bank Sta

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17 MAR. 2015  
CASCAIS

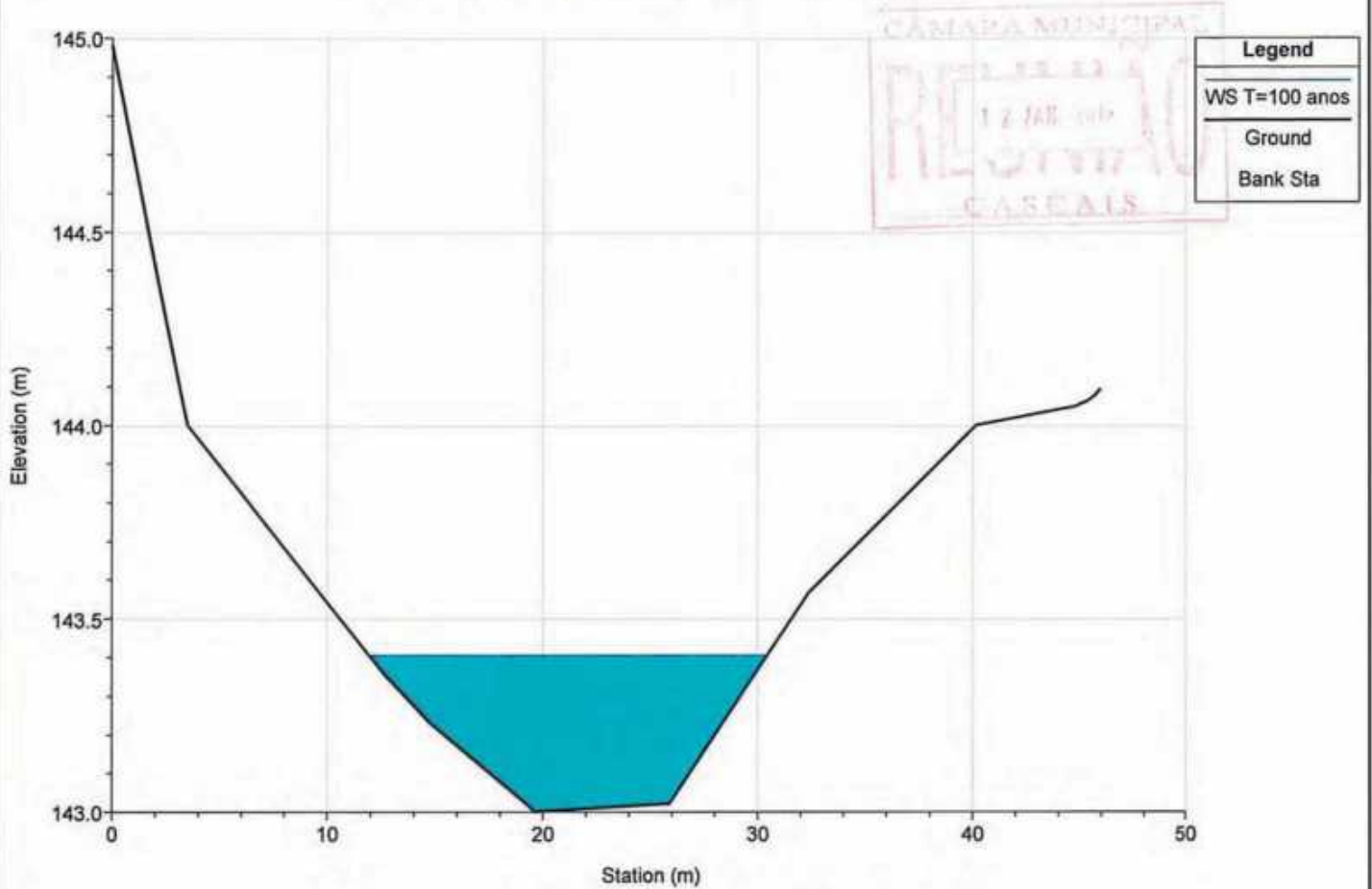
River = ME1 Reach = montante RS = 3059.937



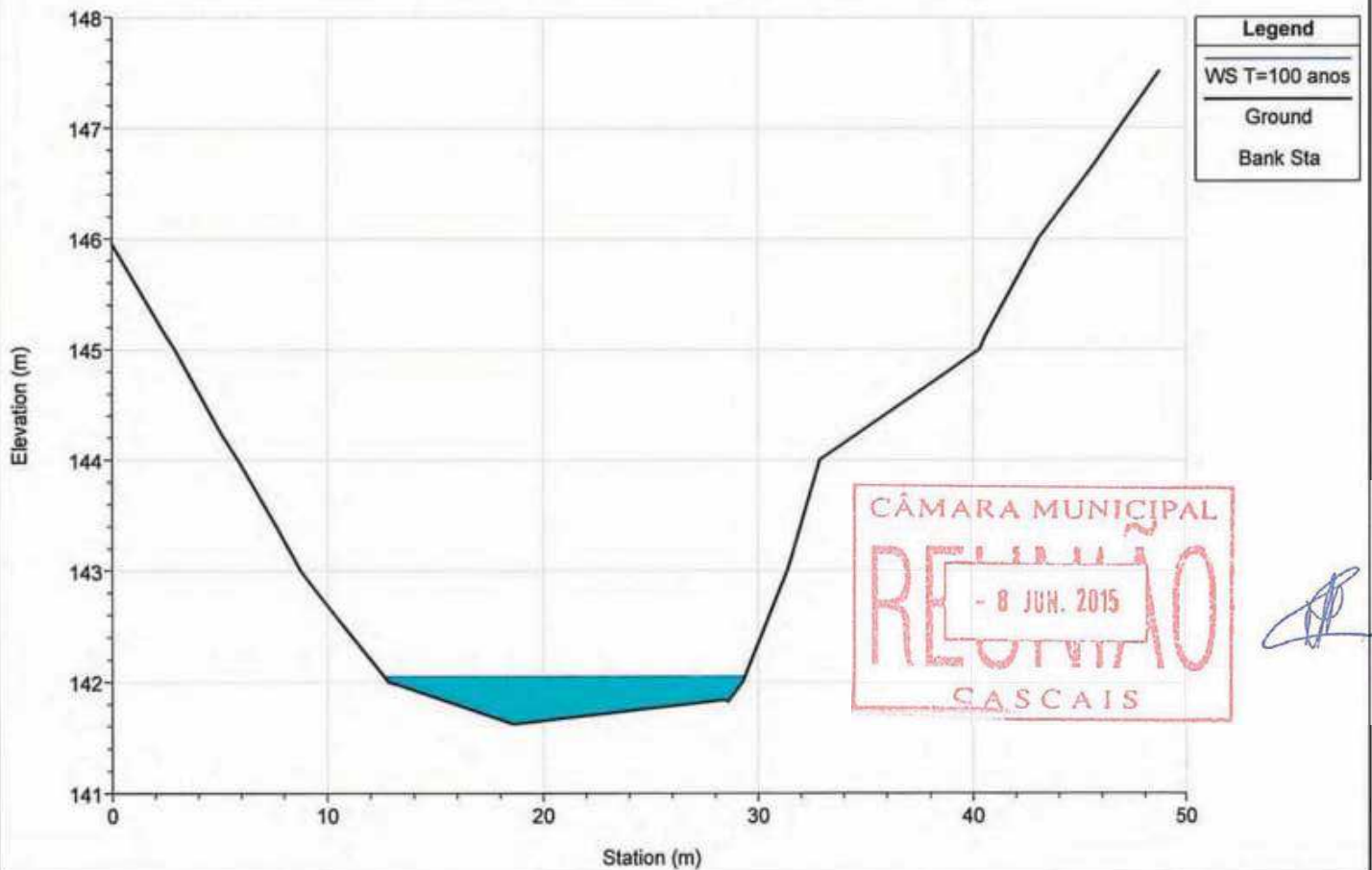
Legend
WS T=100 anos
Ground
Bank Sta

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- 8 JUN. 2015  
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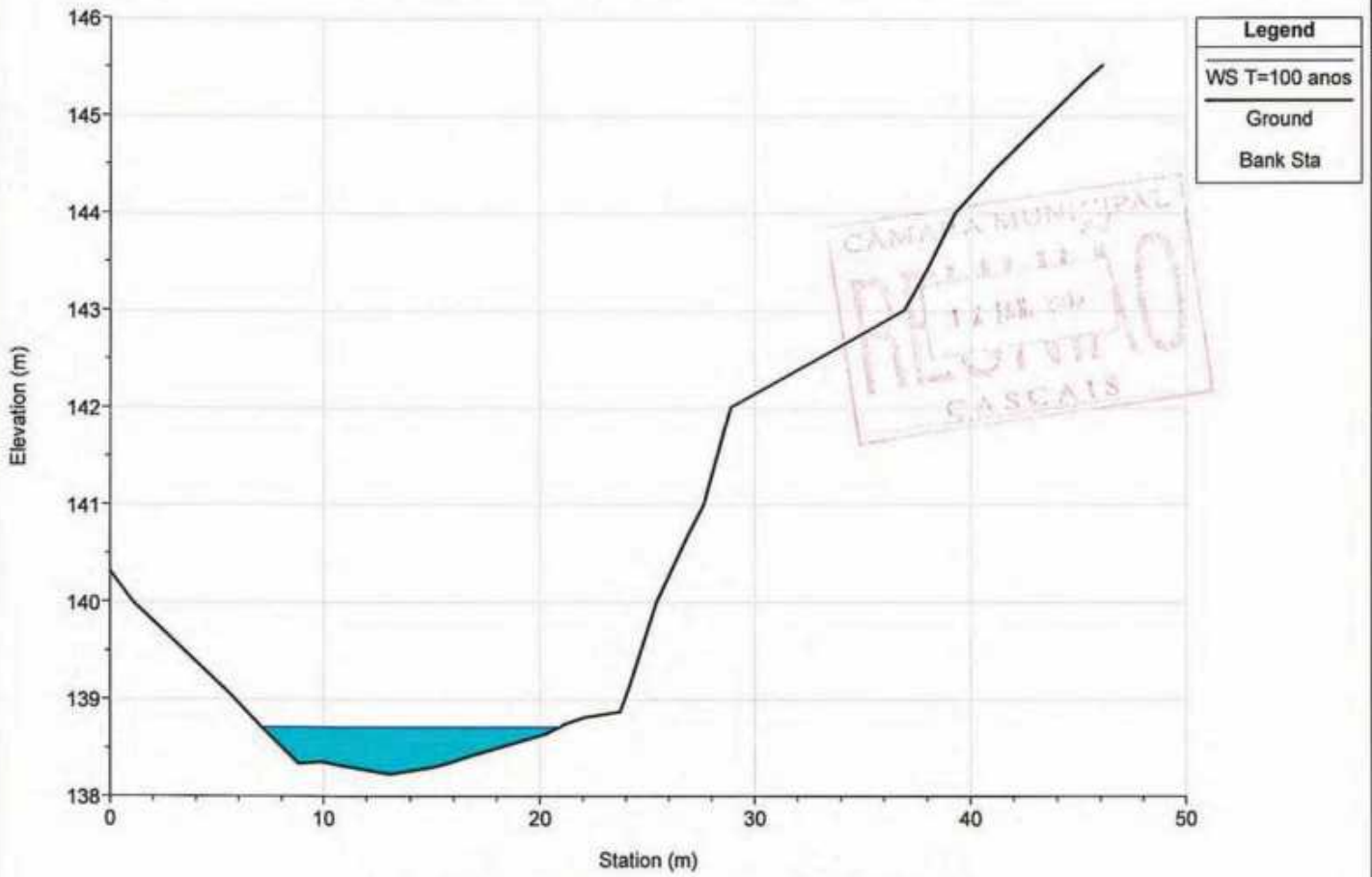
River = ME1 Reach = intermedio RS = 3022.381



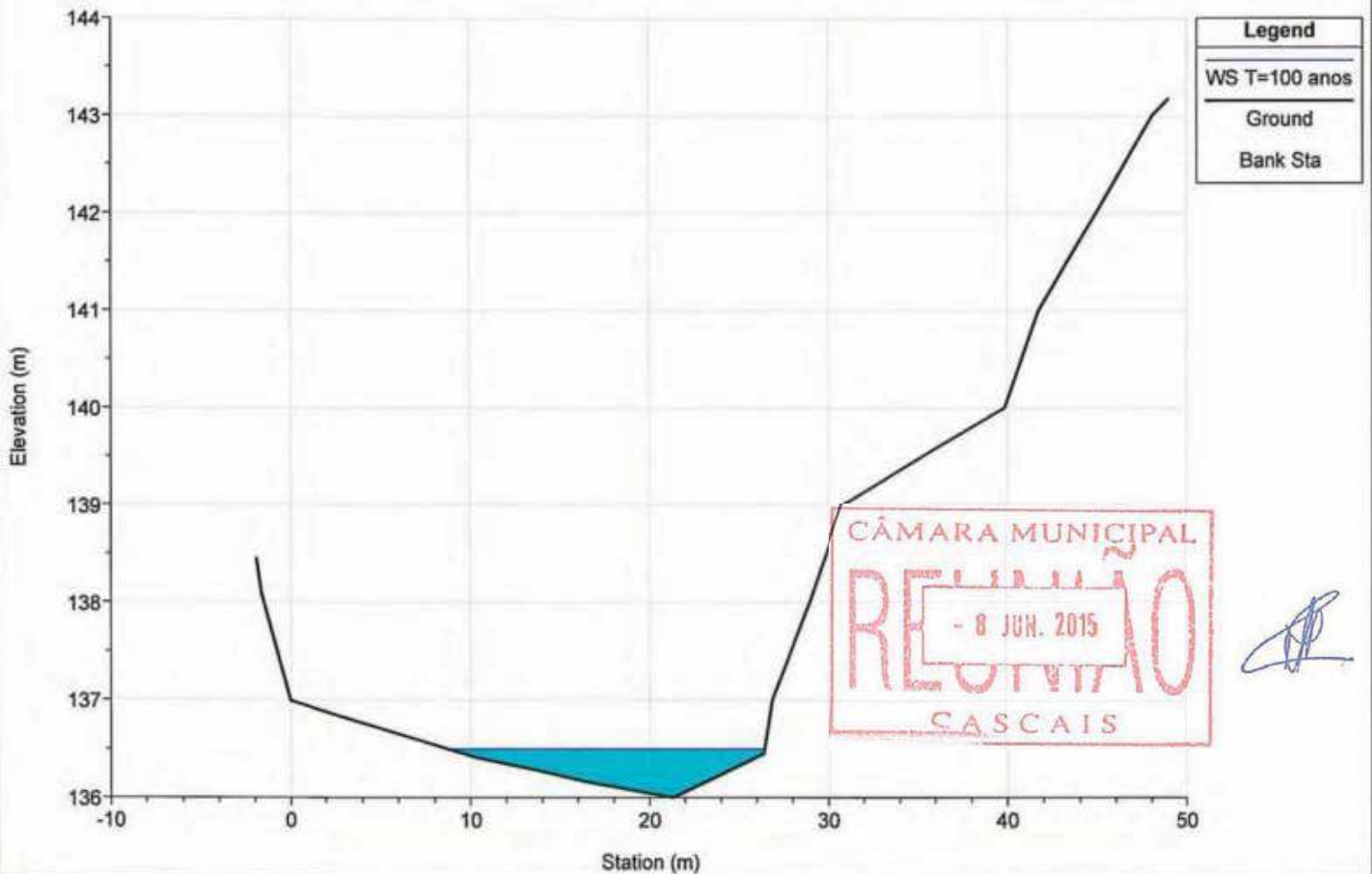
River = ME1 Reach = intermedio RS = 2944.292



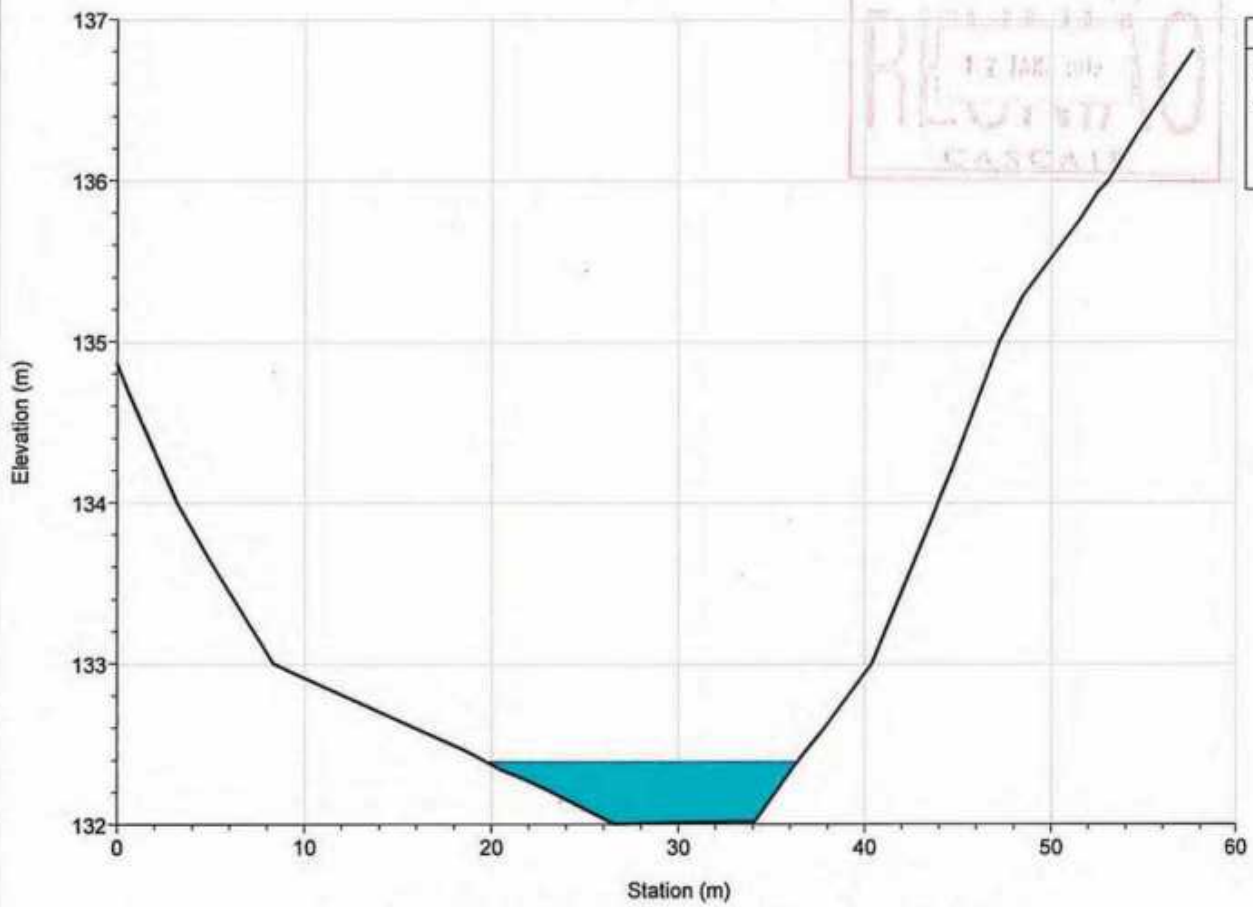
River = ME1 Reach = intermedio RS = 2862.628



River = ME1 Reach = intermedio RS = 2788.491

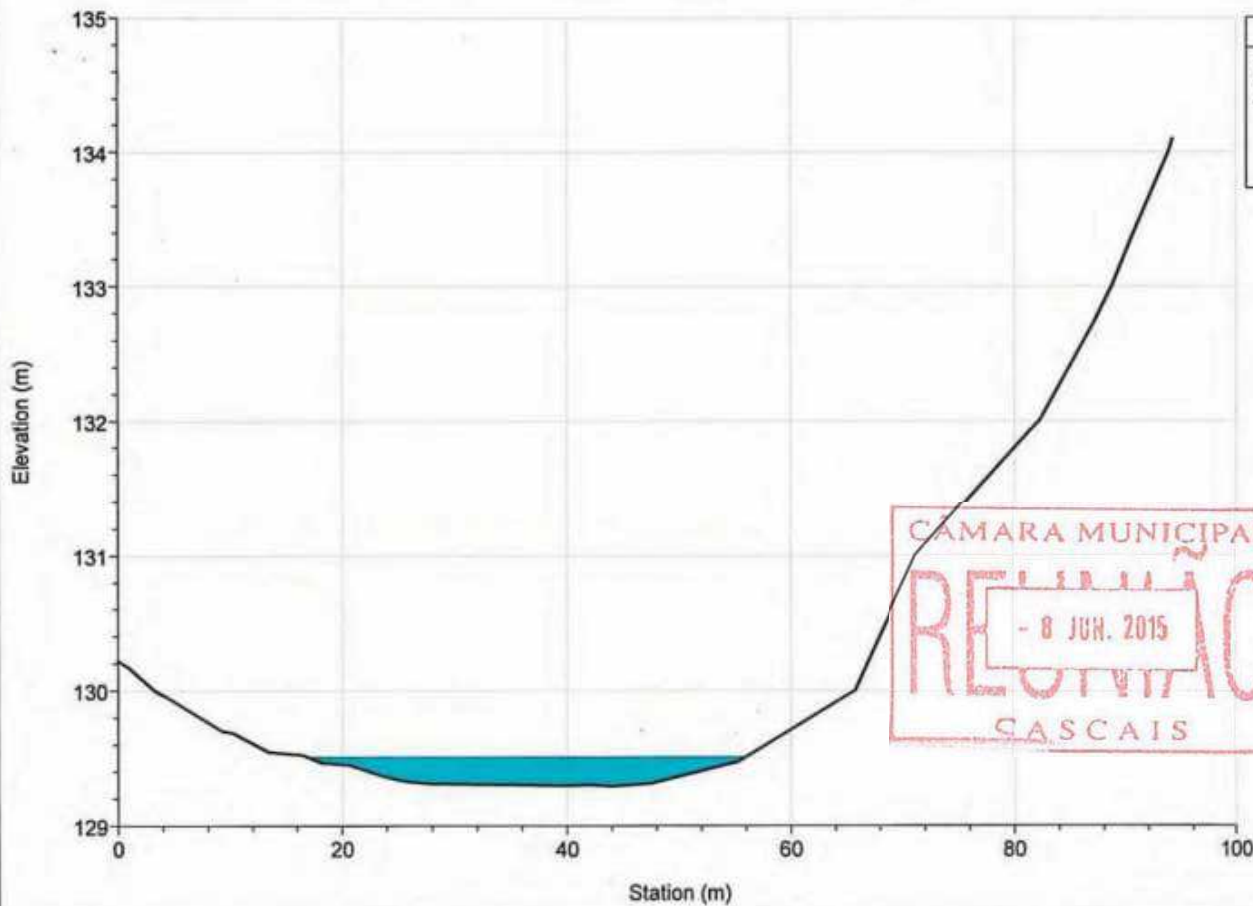


River = ME1 Reach = intermedio RS = 2709.249



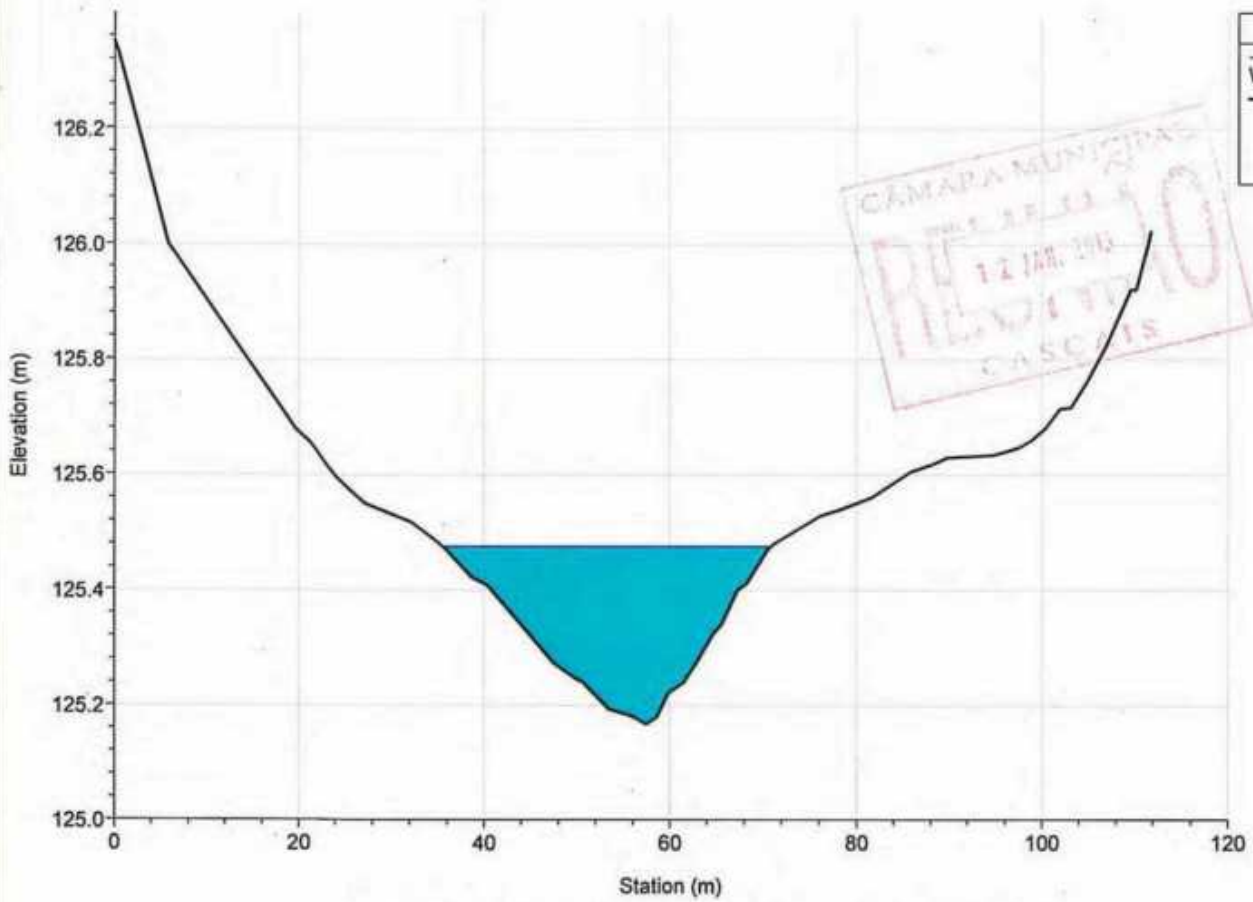
Legend	
WS T=100 anos	
Ground	
Bank Sta	

River = ME1 Reach = intermedio RS = 2630.484



Legend	
WS T=100 anos	
Ground	
Bank Sta	

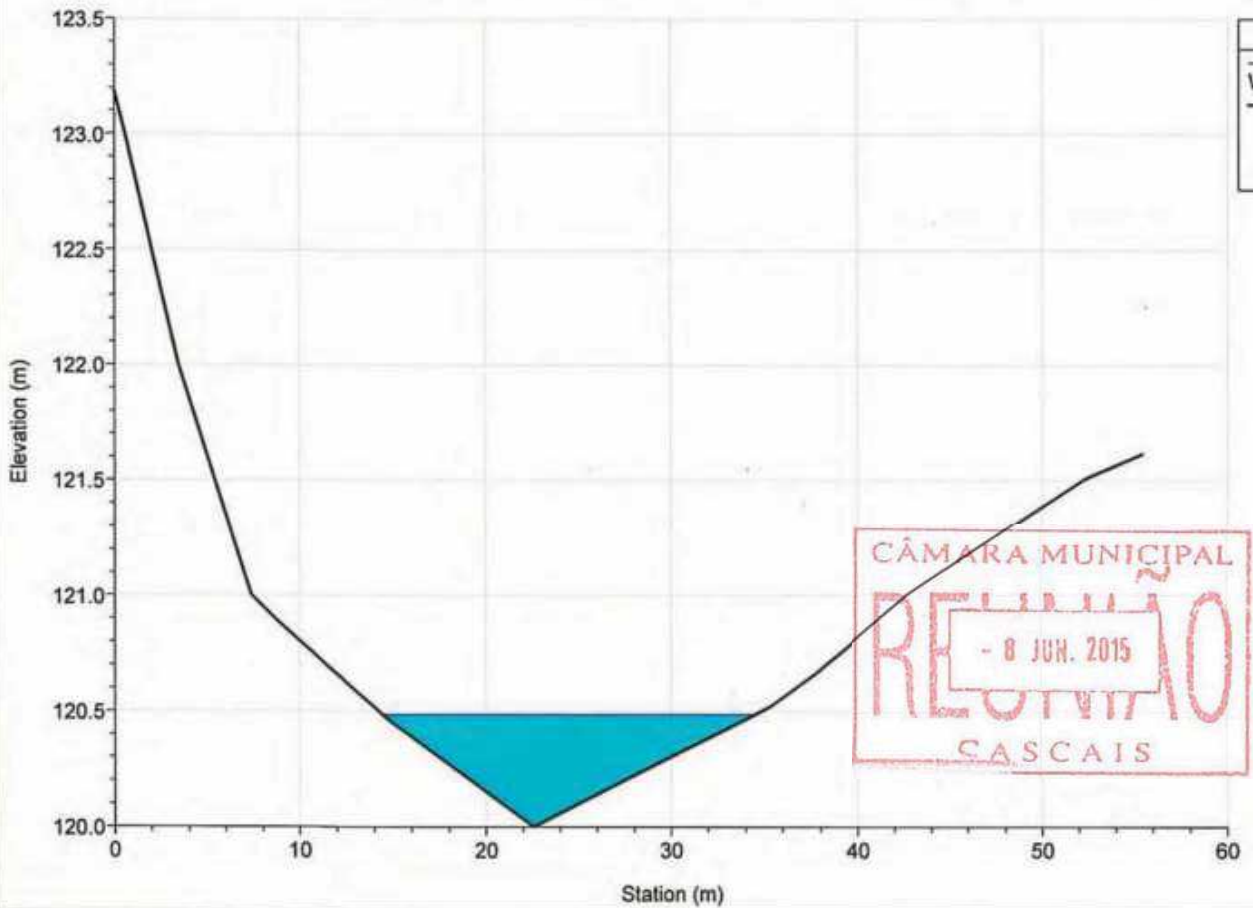
River = ME1 Reach = intermedio RS = 2504.088



Legend
WS T=100 anos
Ground
Bank Sta

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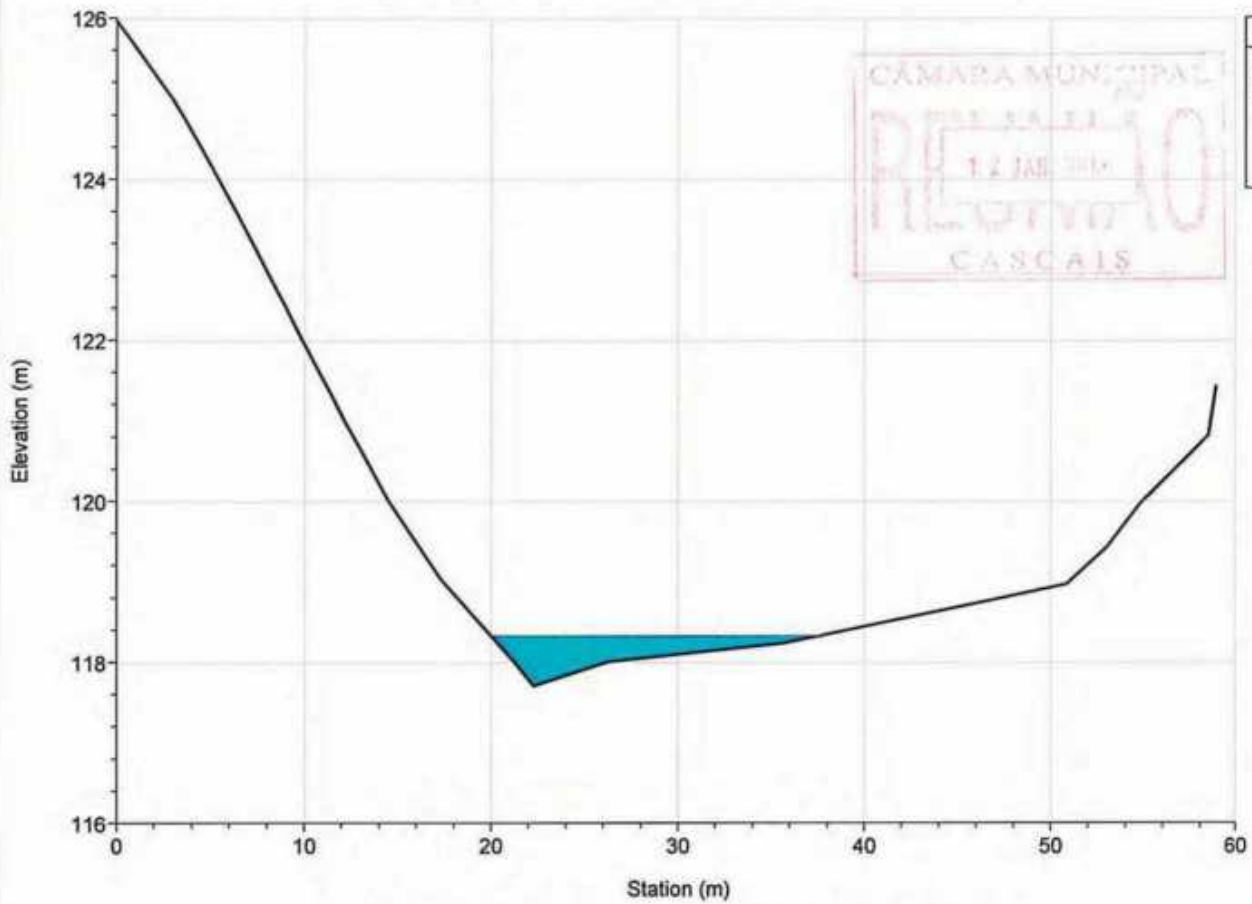
River = ME1 Reach = intermedio RS = 2393.563



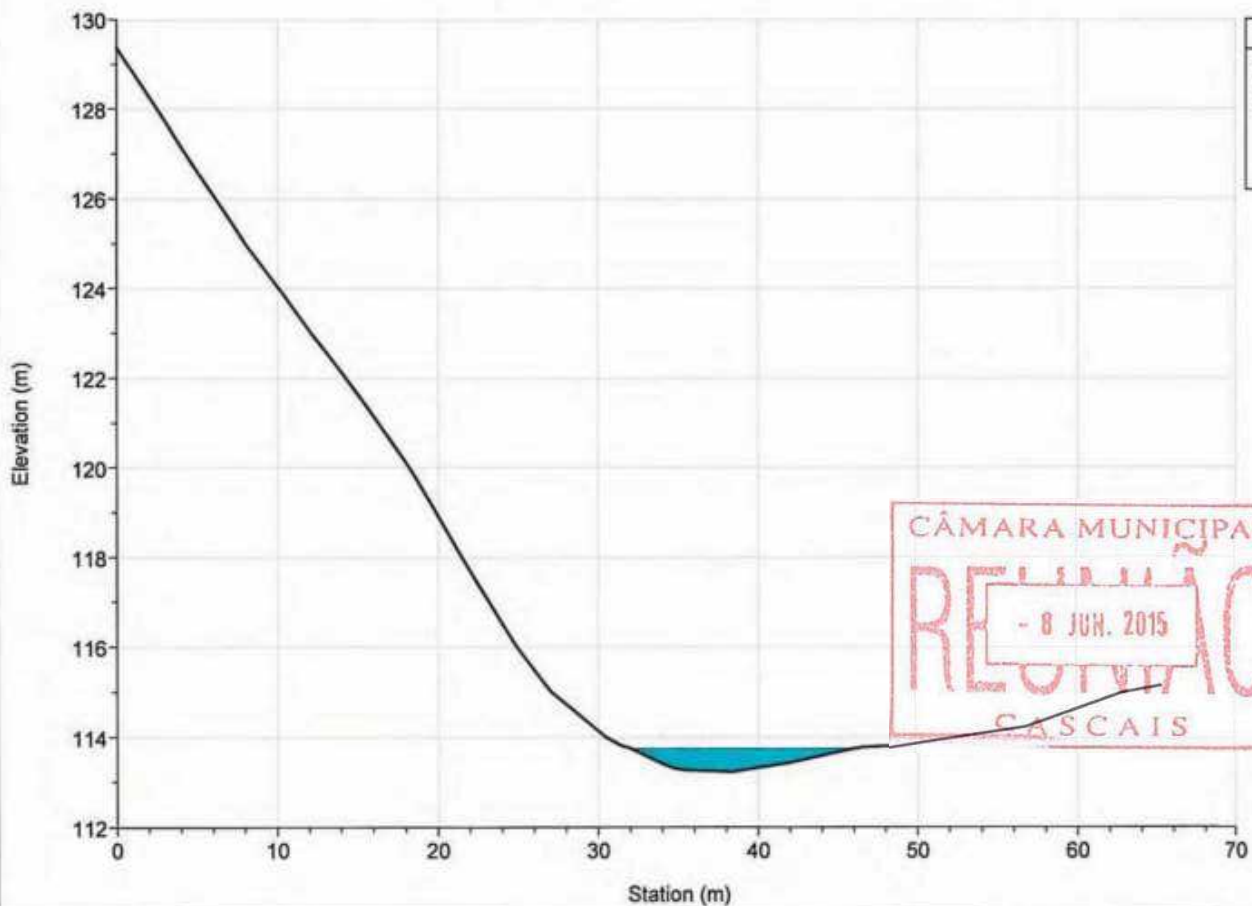
Legend
WS T=100 anos
Ground
Bank Sta

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- 8 JUN. 2015  
CASCAIS

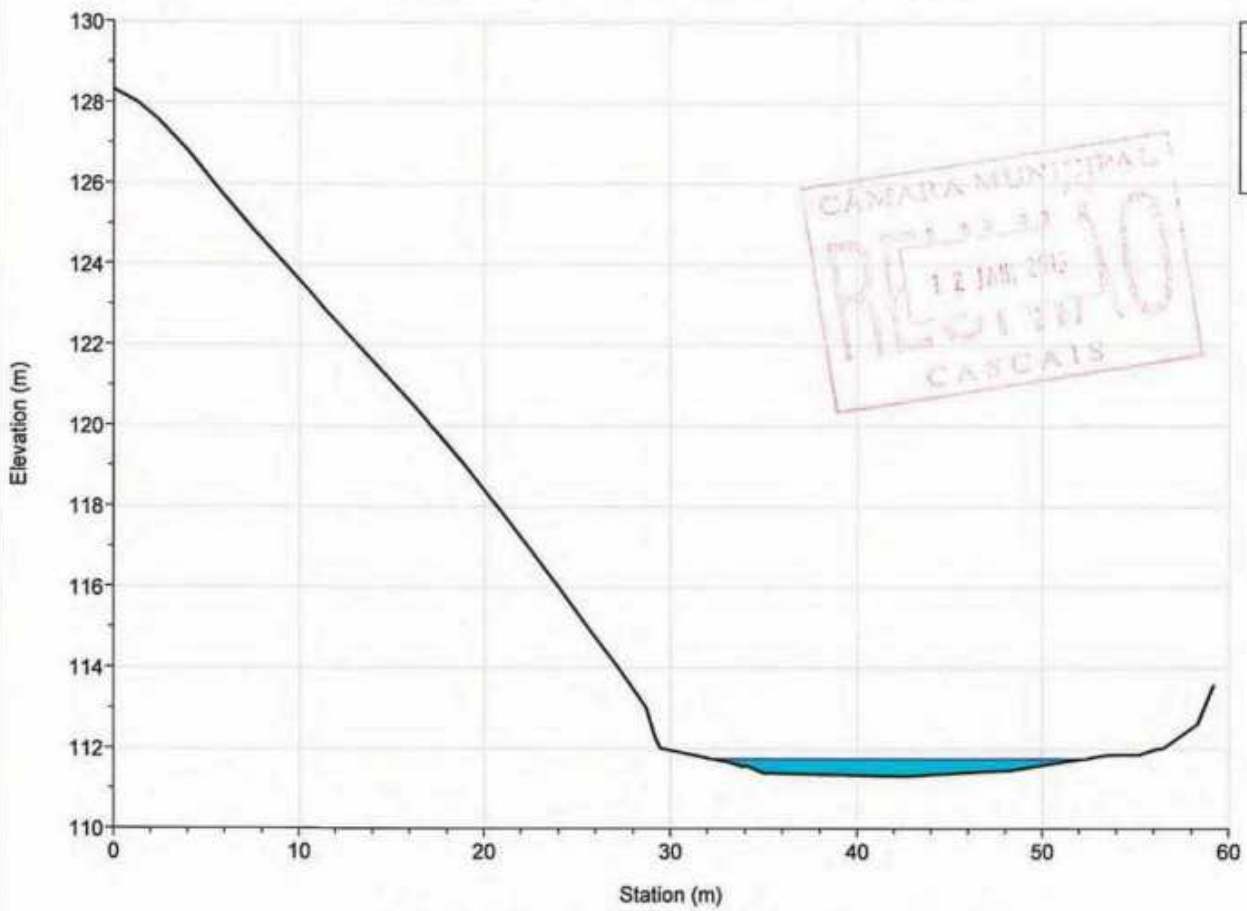
River = ME1 Reach = intermedio RS = 2312.587



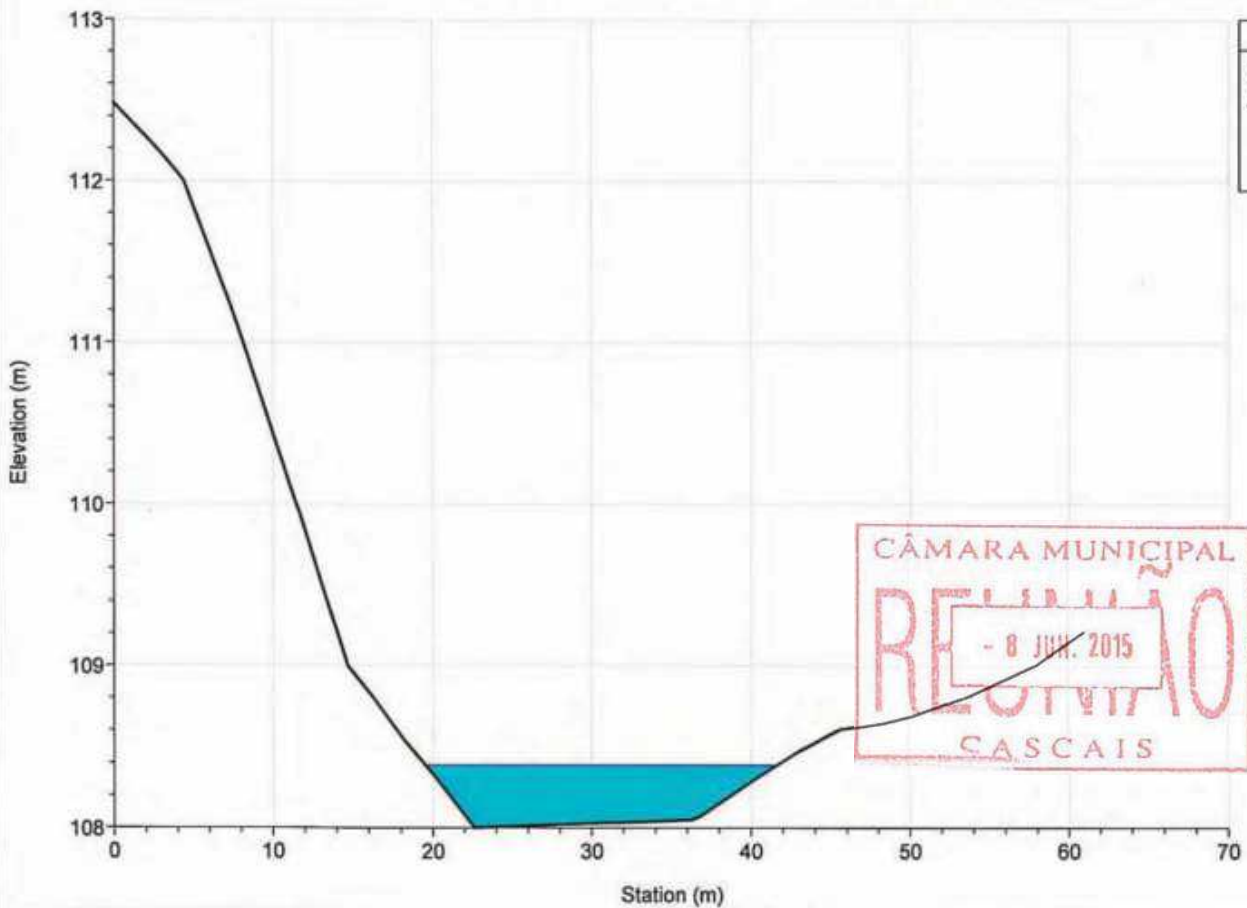
River = ME1 Reach = intermedio RS = 2230.145



River = ME1 Reach = intermedio RS = 2160.497

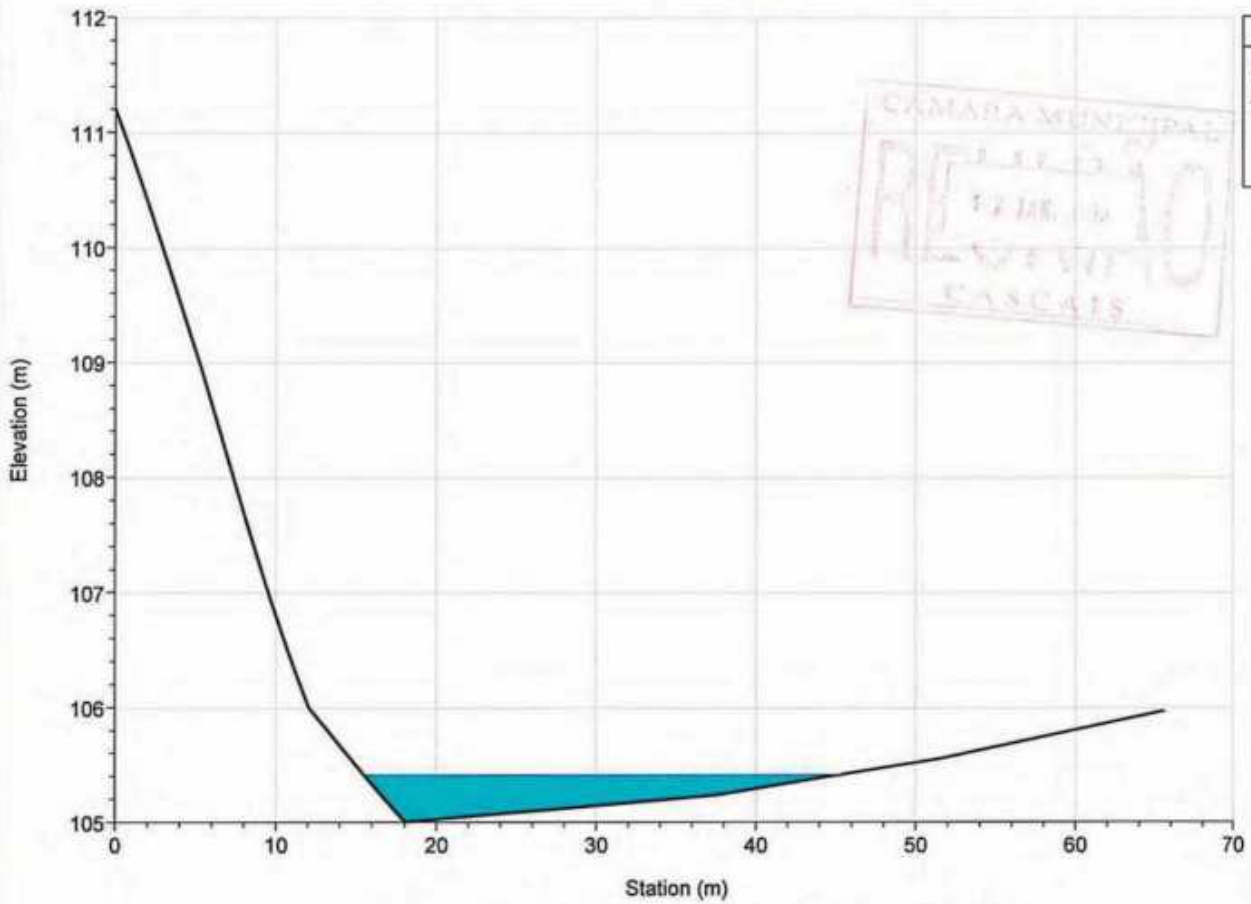


River = ME1 Reach = intermedio RS = 2080.357

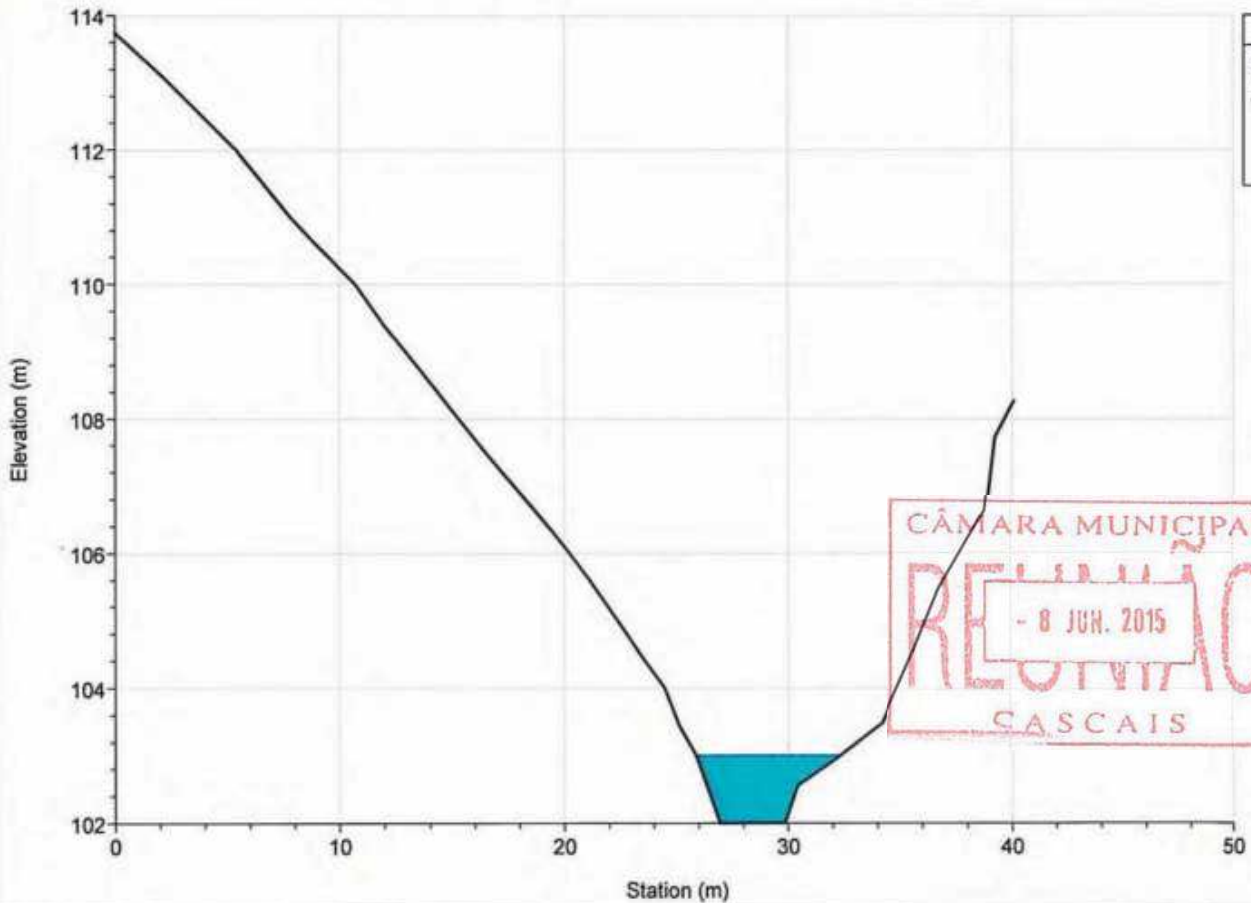




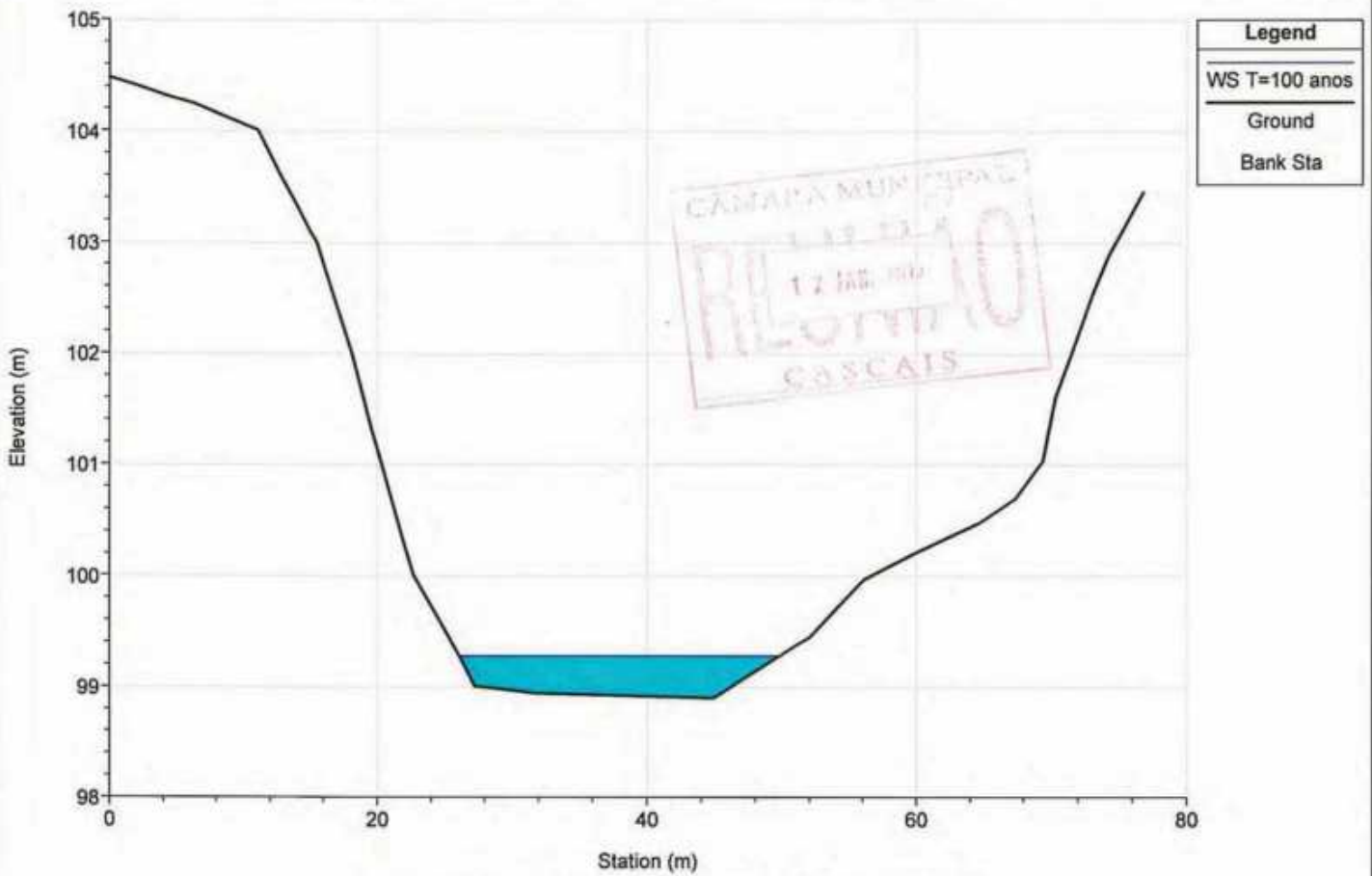
River = ME1 Reach = intermedio RS = 1967.792



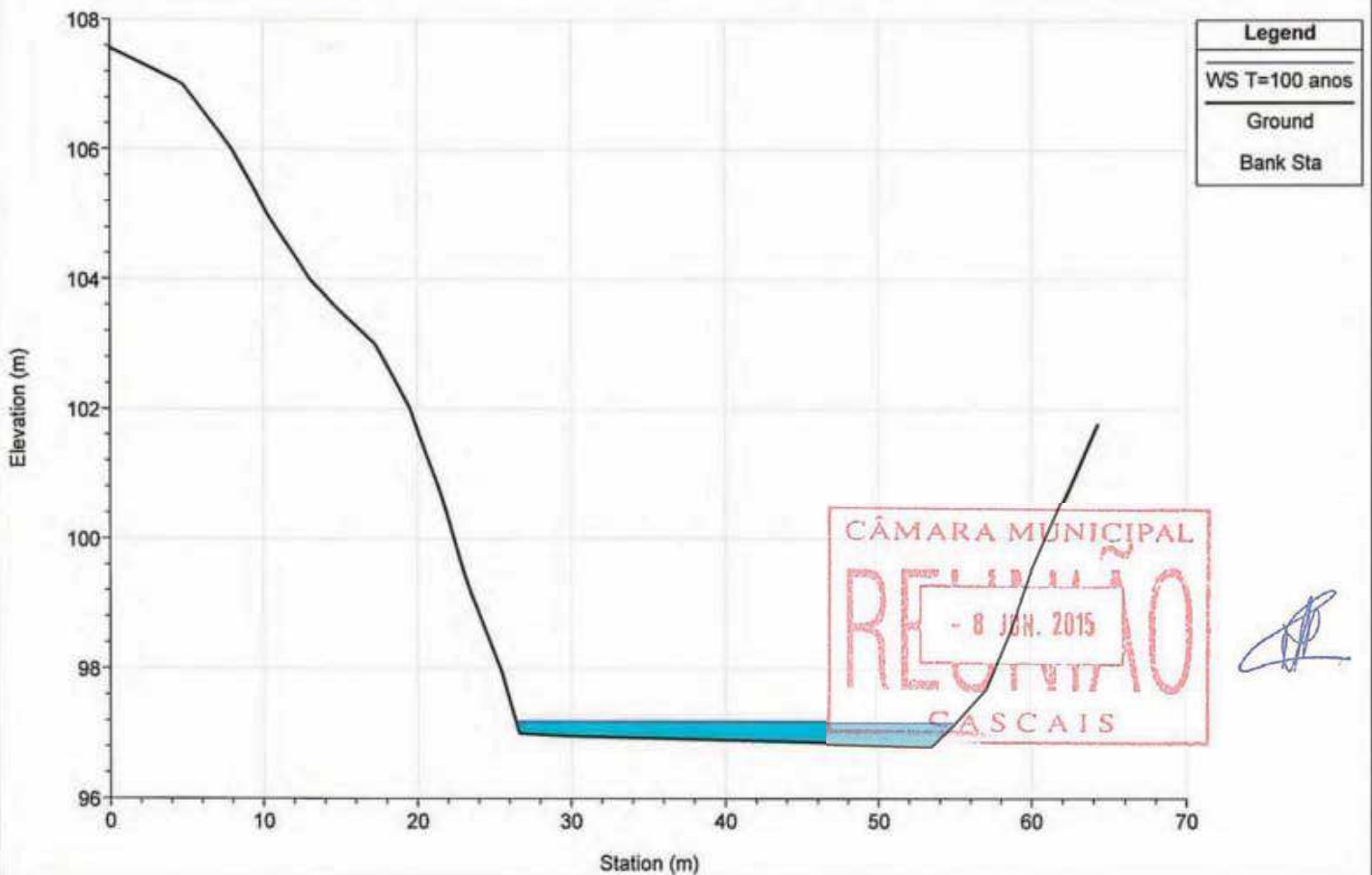
River = ME1 Reach = intermedio RS = 1863.582



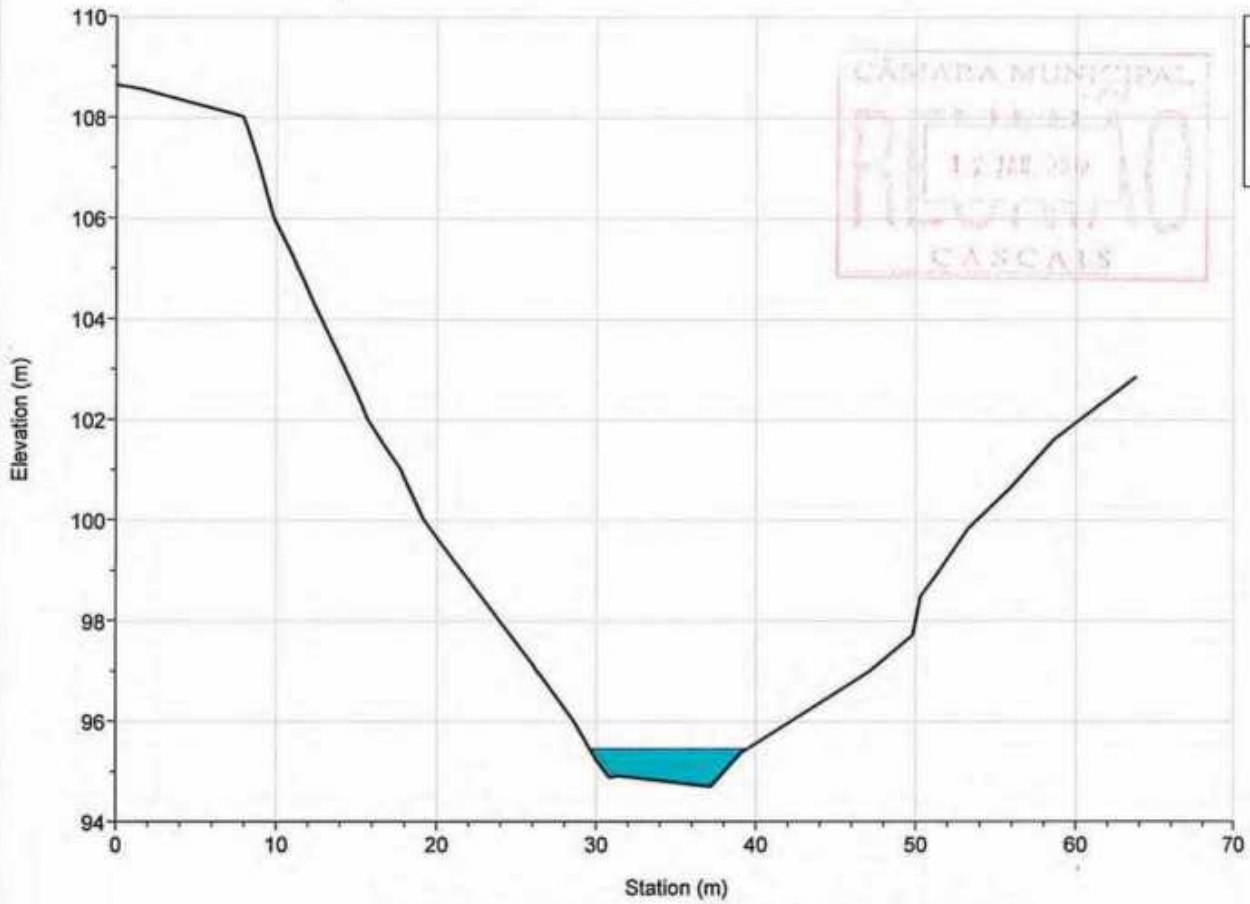
River = ME1 Reach = intermedio RS = 1739.775



River = ME1 Reach = intermedio RS = 1631.022



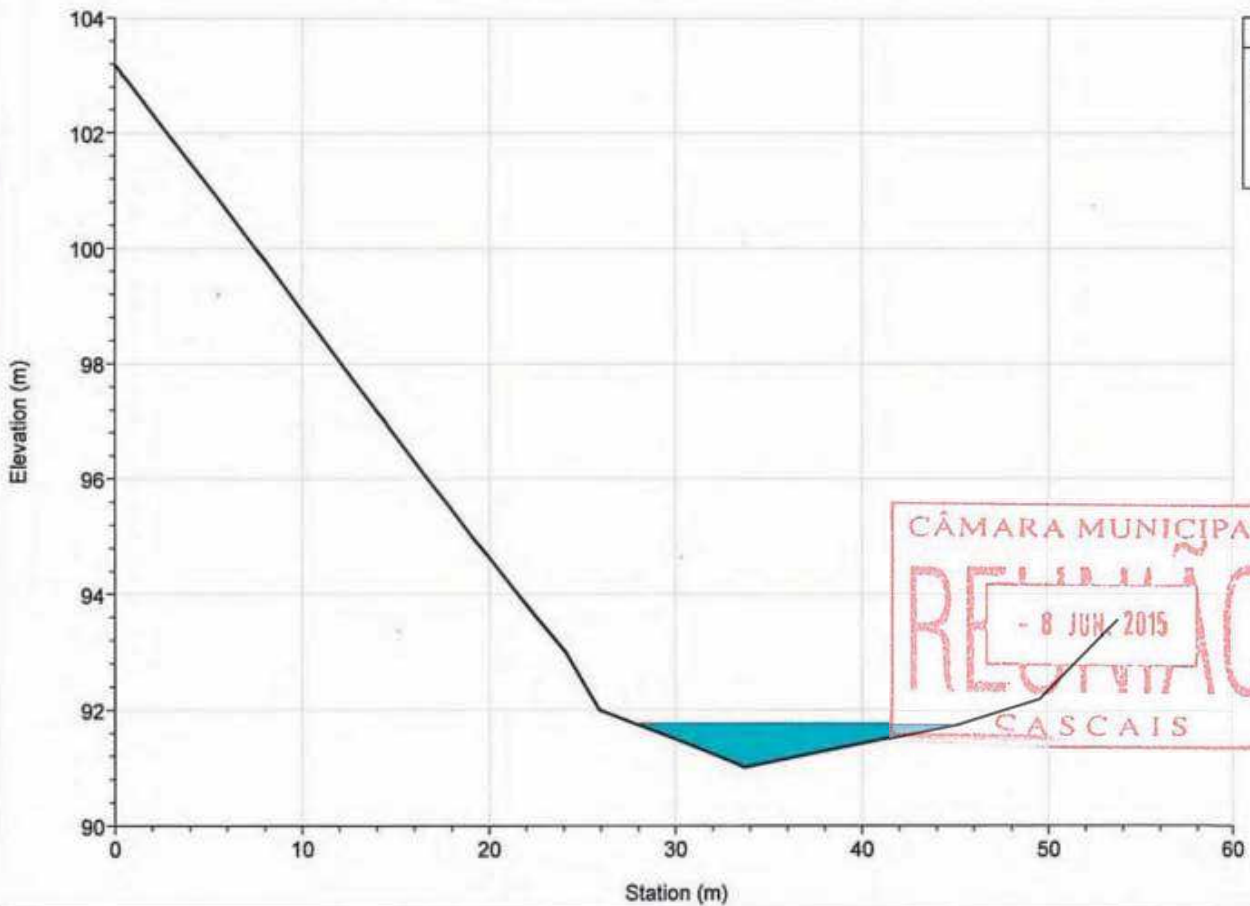
River = ME1 Reach = intermedio RS = 1530.203



Legend
WS T=100 anos
Ground
Bank Sta



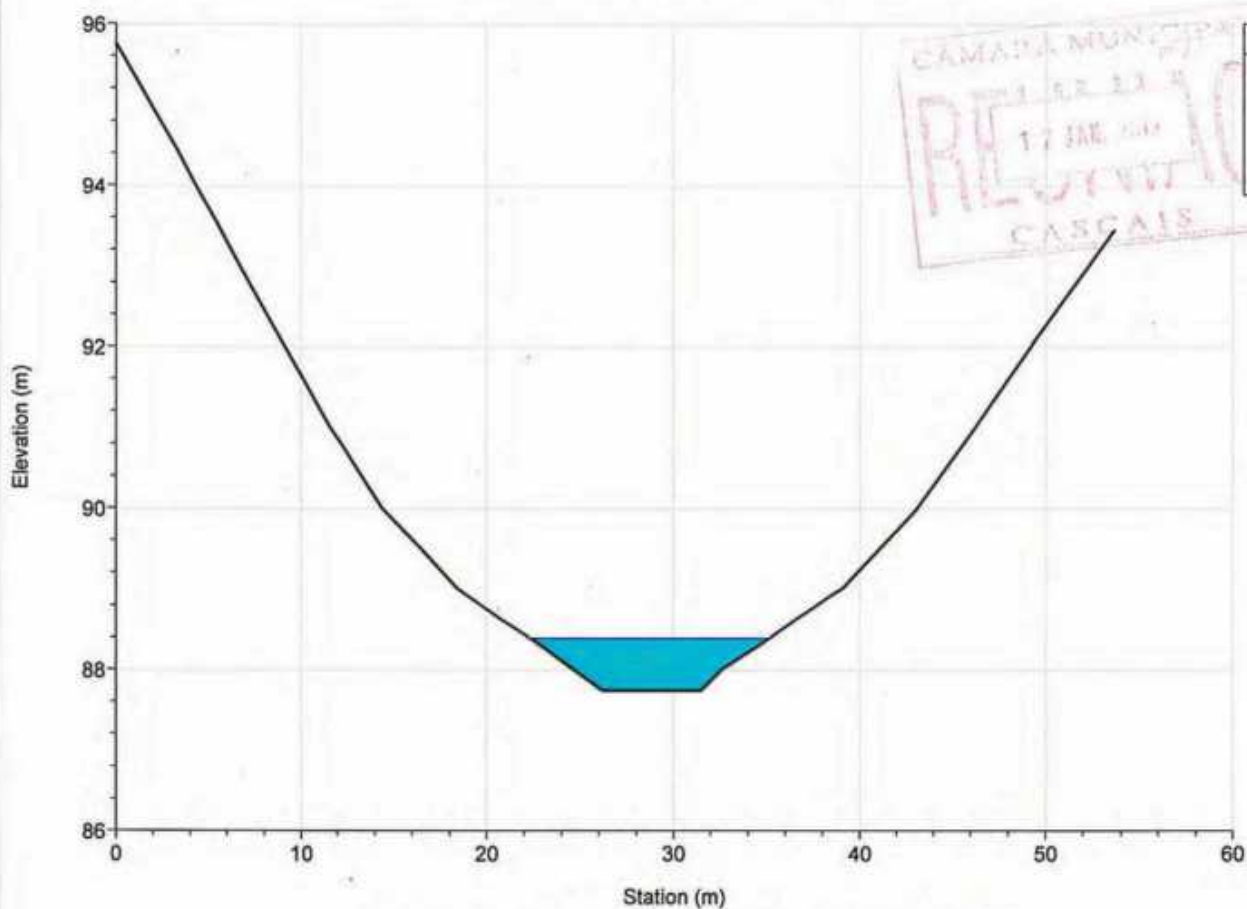
River = ME1 Reach = intermedio RS = 1439.491



Legend
WS T=100 anos
Ground
Bank Sta



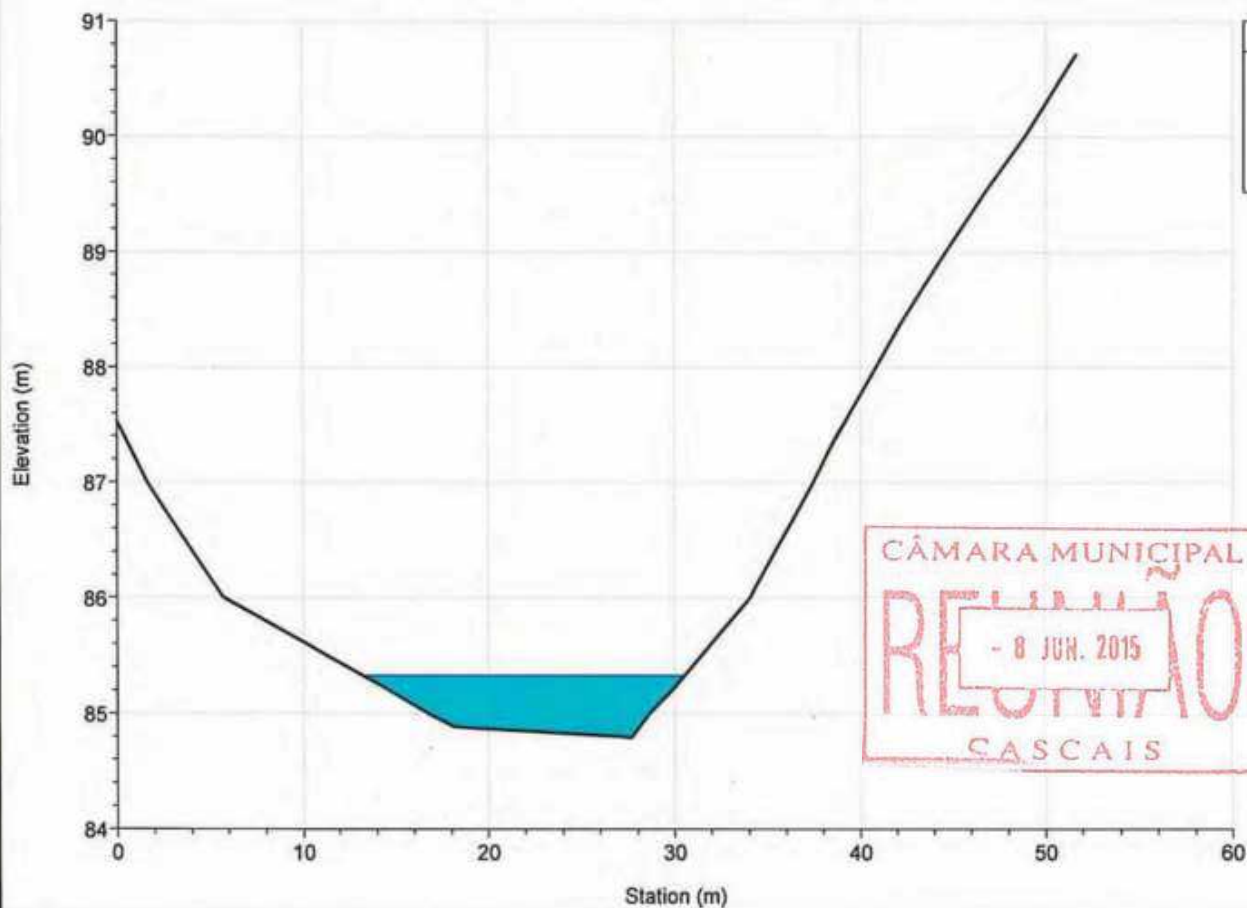
River = ME1 Reach = intermedio RS = 1331.283



Legend	
WS T=100 anos	
Ground	
Bank Sta	

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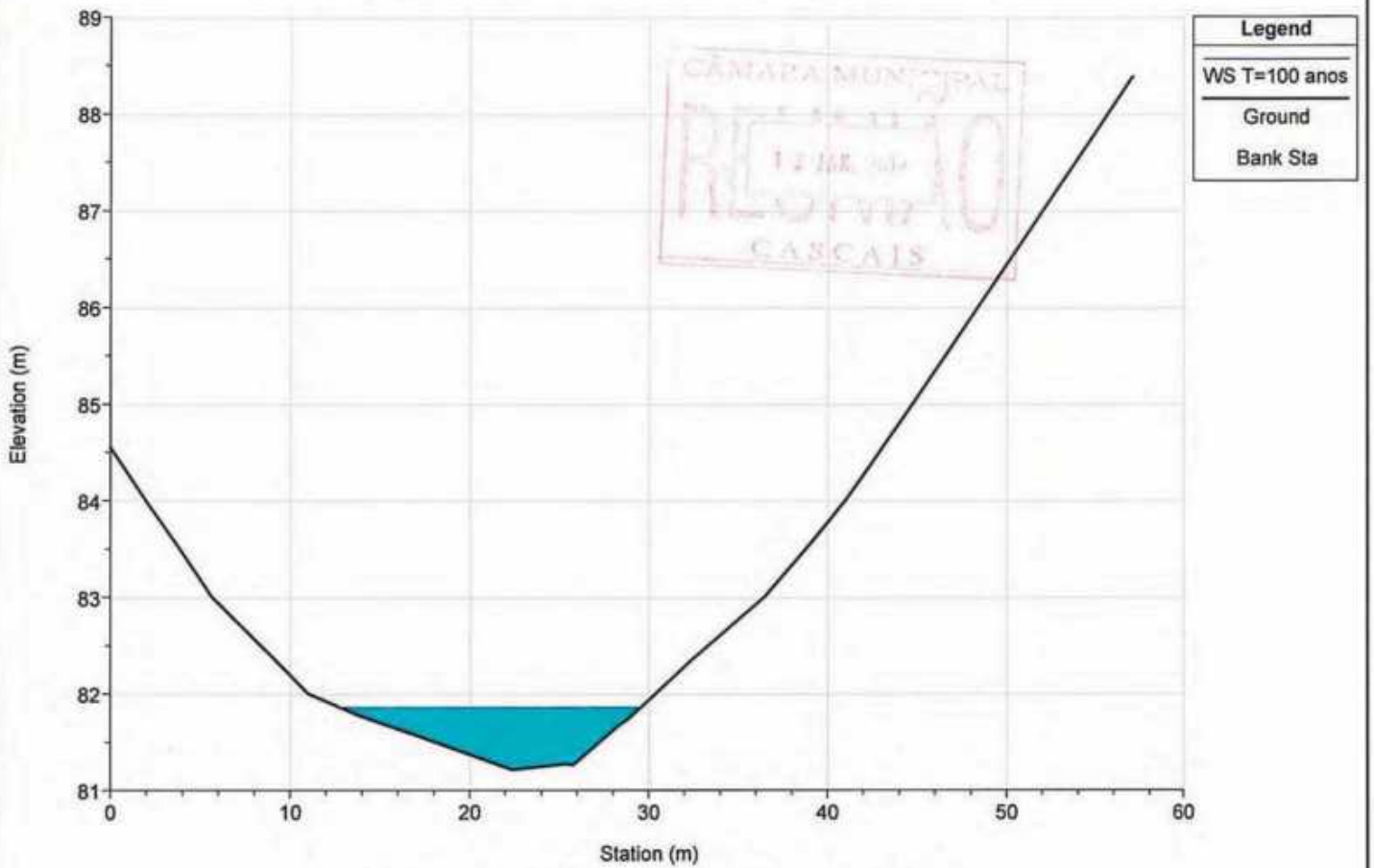
River = ME1 Reach = intermedio RS = 1206.514



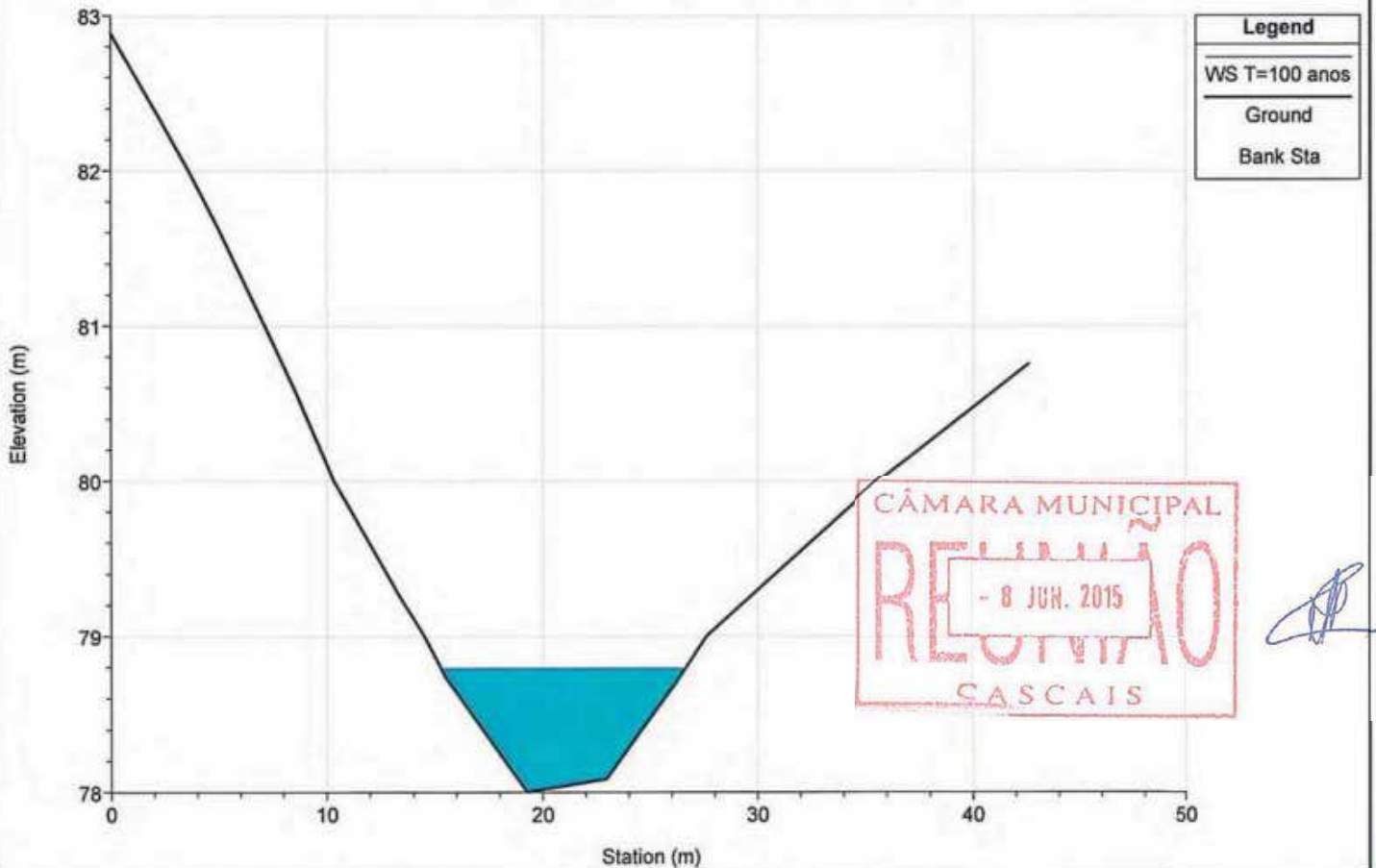
Legend	
WS T=100 anos	
Ground	
Bank Sta	

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- 8 JUN. 2015  
CASCAIS

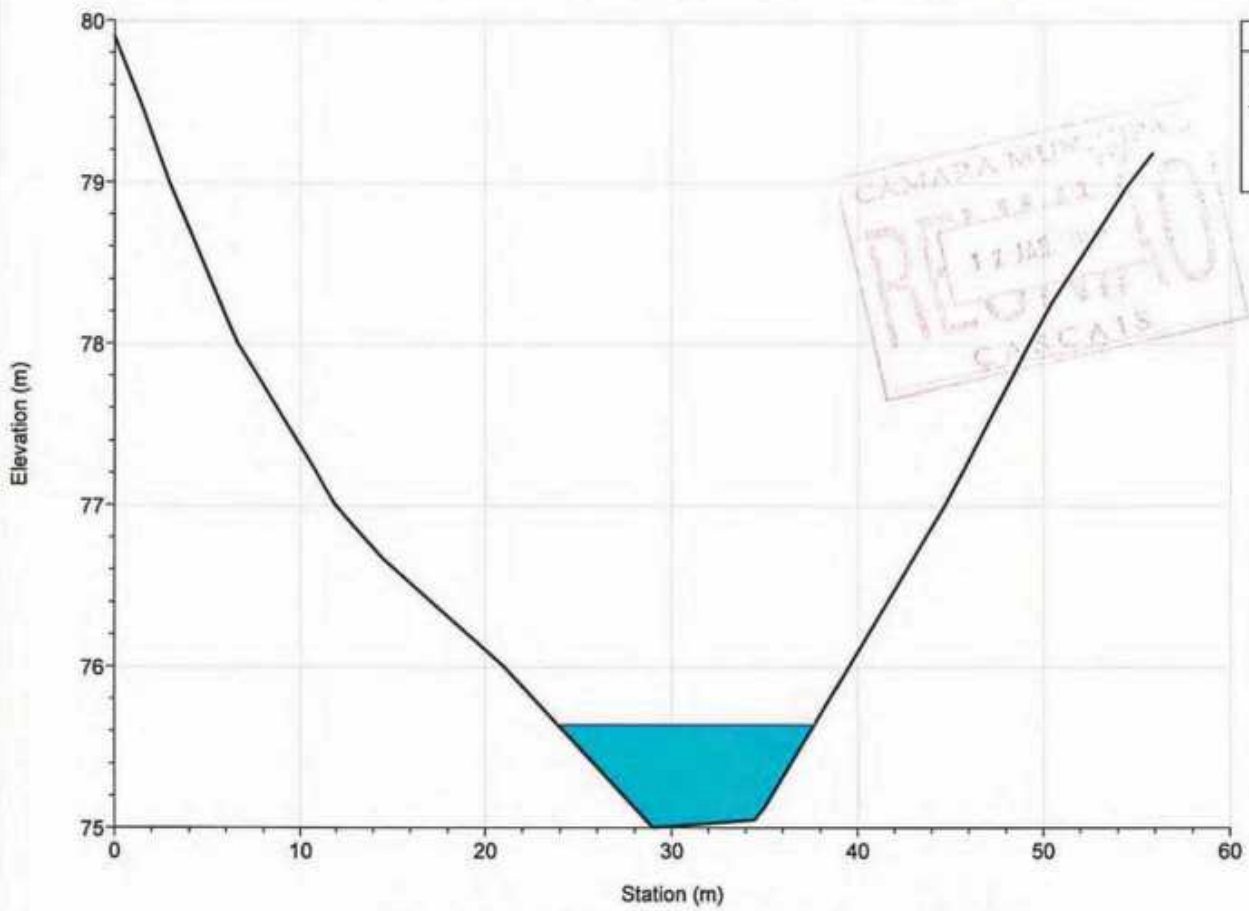
River = ME1 Reach = intermedio RS = 1100.978



River = ME1 Reach = intermedio RS = 996.926



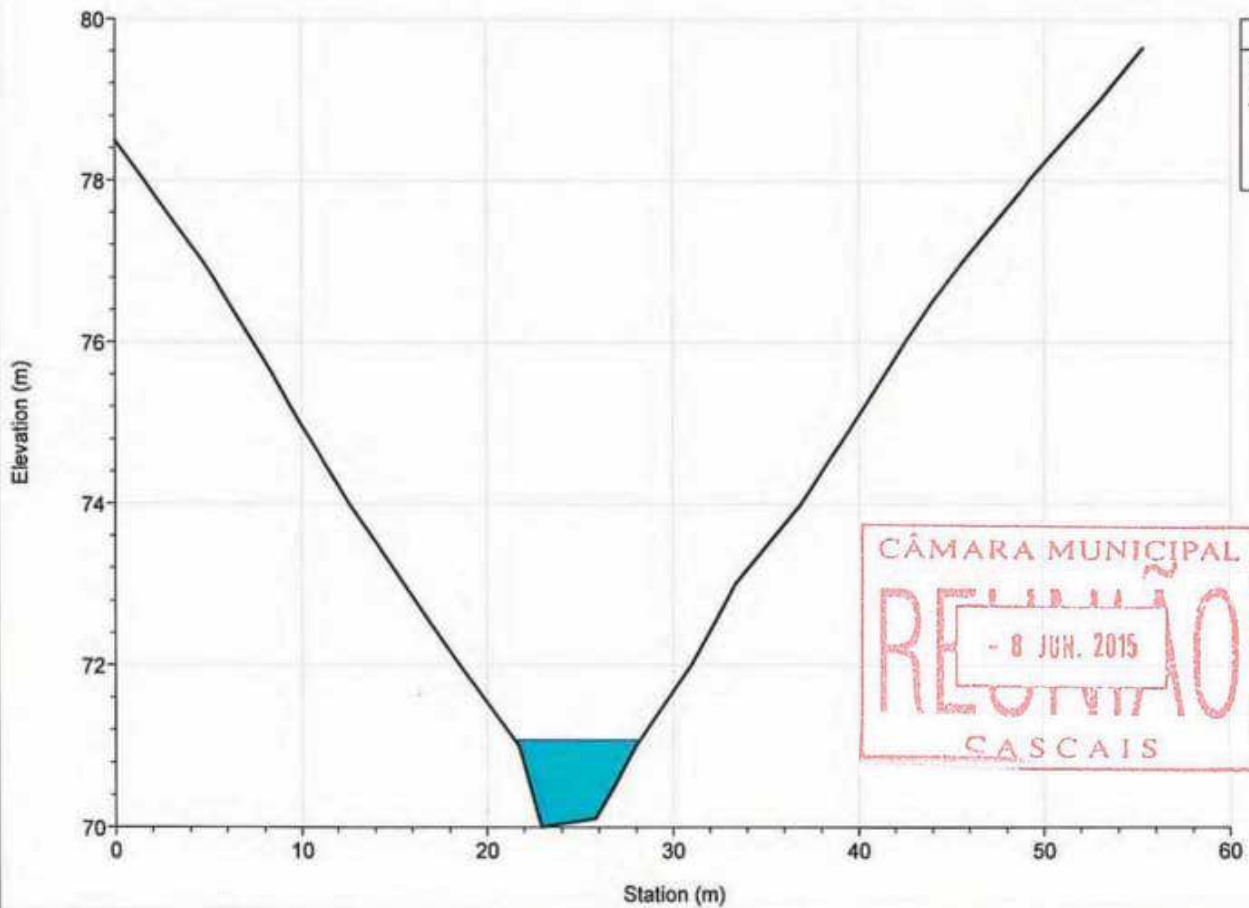
River = ME1 Reach = intermedio RS = 897.489



Legend
WS T=100 anos
Ground
Bank Sta

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17 DE JUNHO  
2015  
CASCAIS

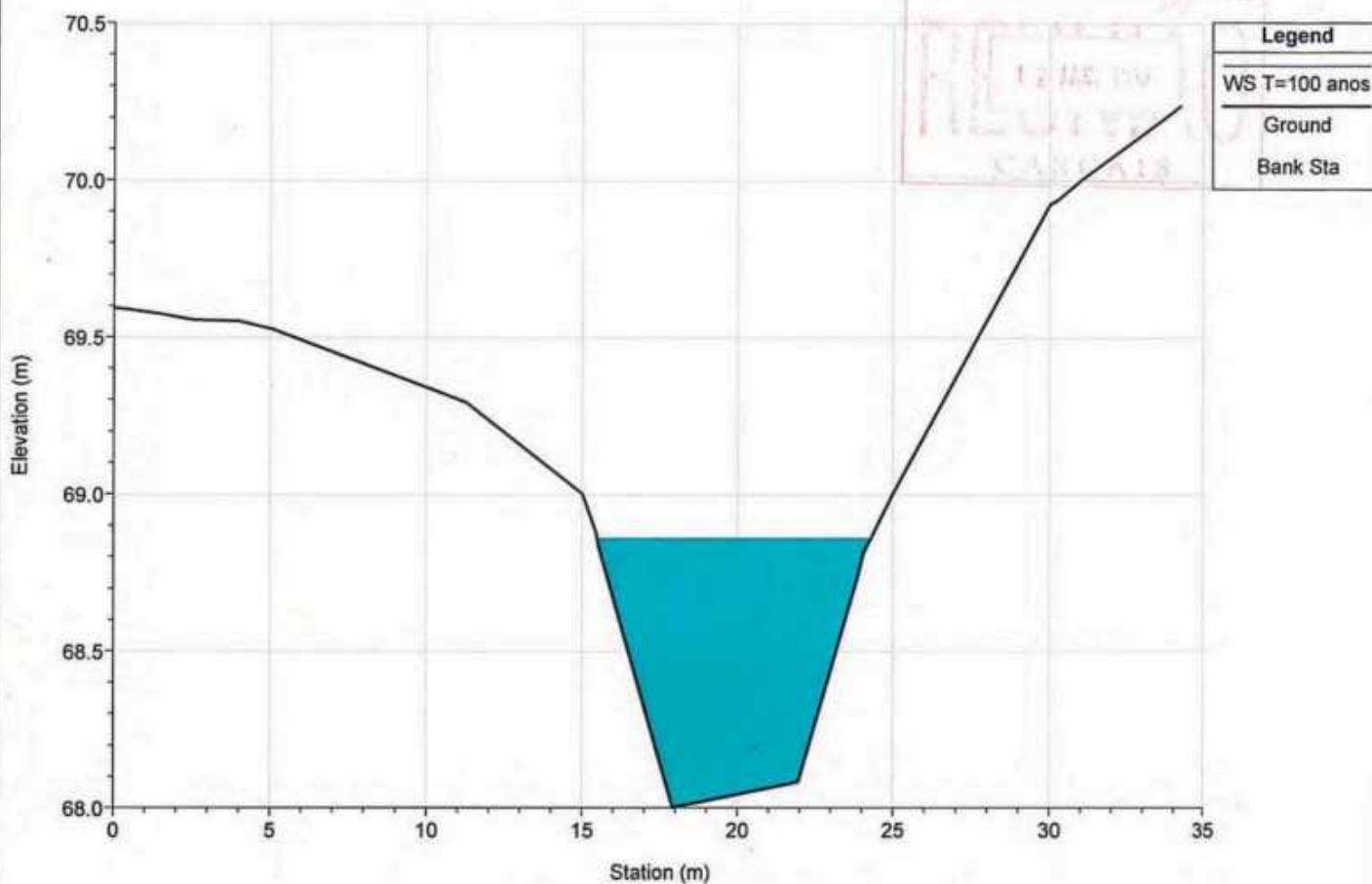
River = ME1 Reach = intermedio RS = 789.813



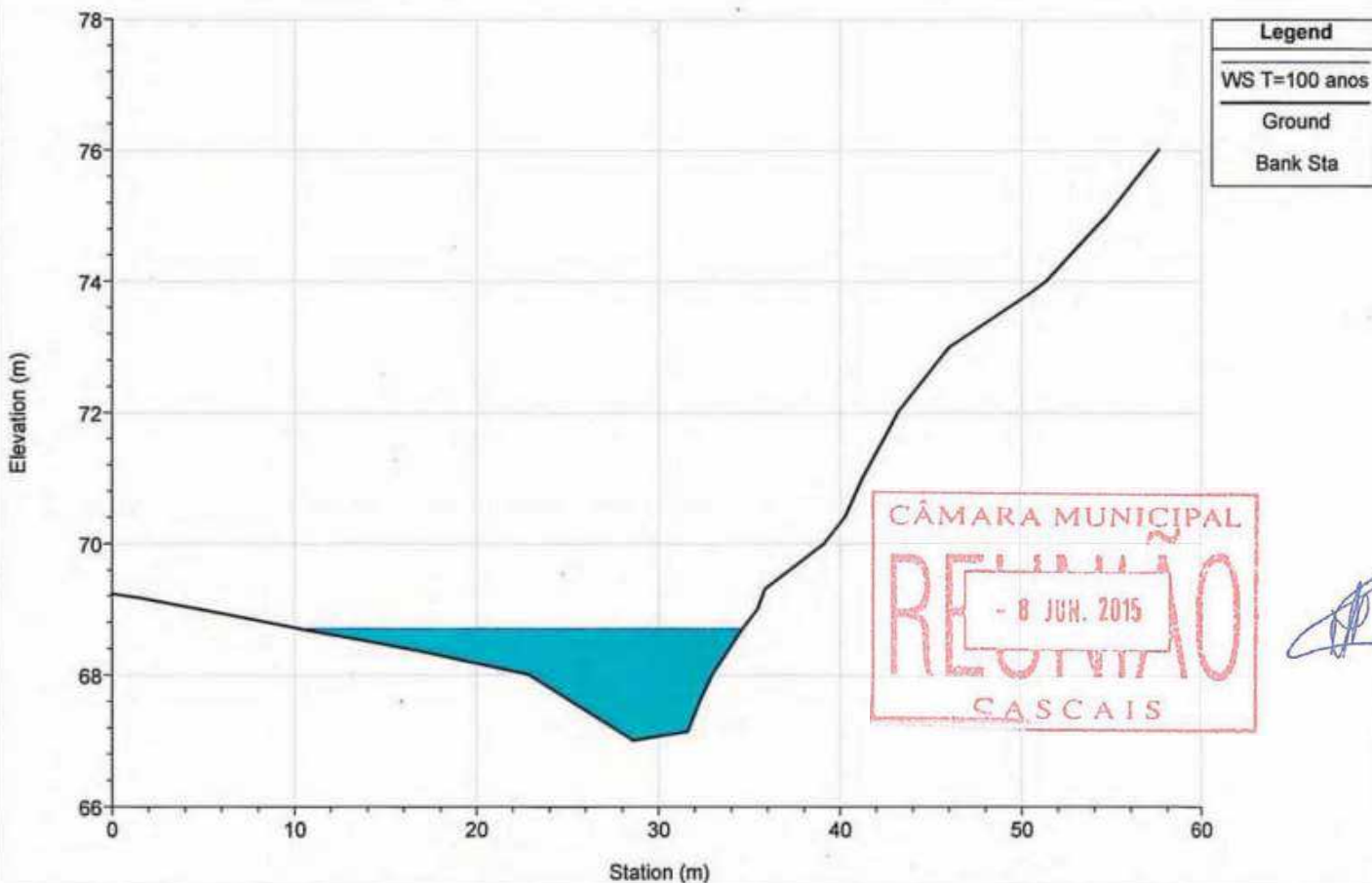
Legend
WS T=100 anos
Ground
Bank Sta

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- 8 JUN. 2015  
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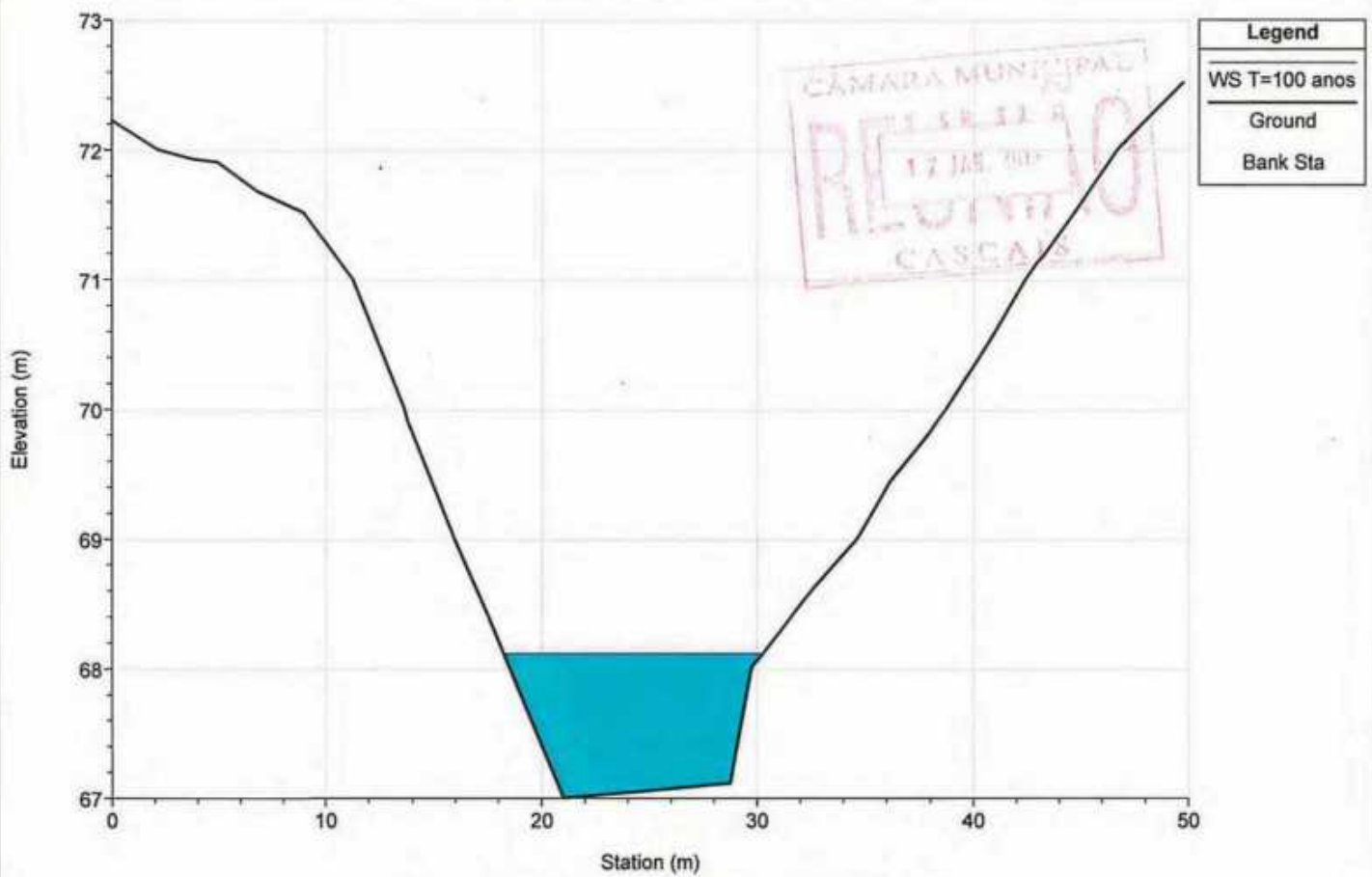
River = ME1 Reach = intermedio RS = 716.600



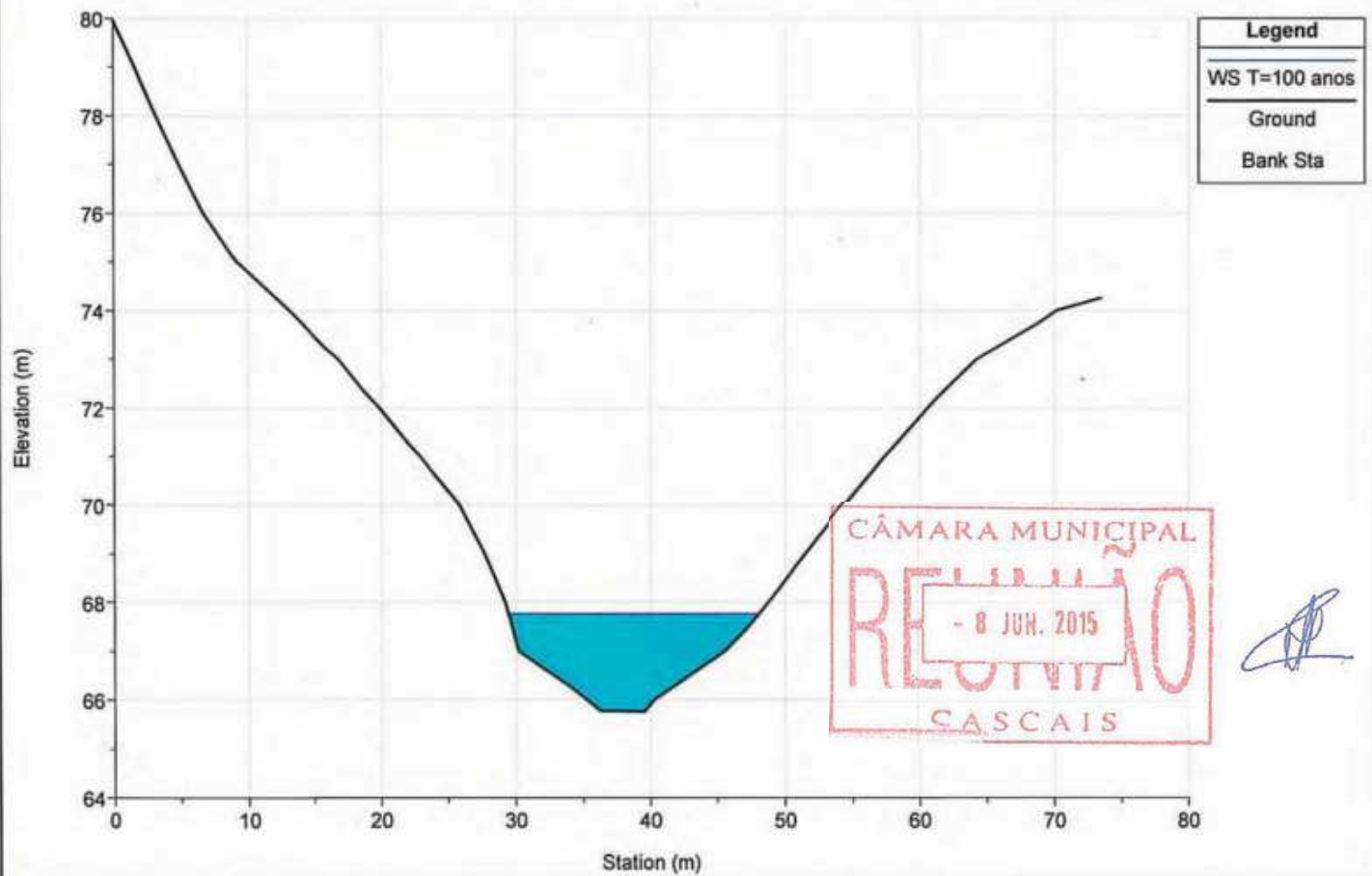
River = ME1 Reach = jusante RS = 687.401



River = ME1 Reach = jusante RS = 644.727

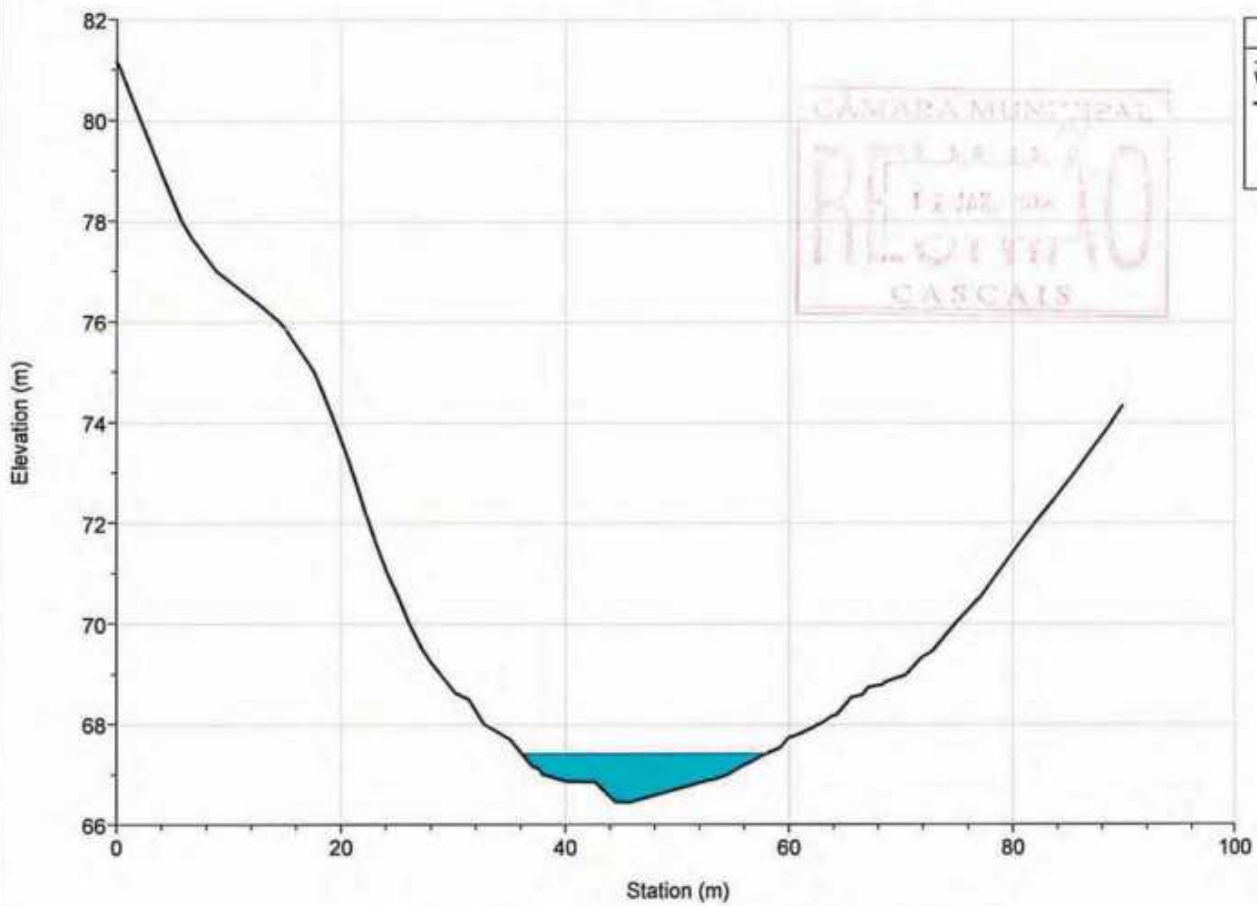


River = ME1 Reach = jusante RS = 606.543



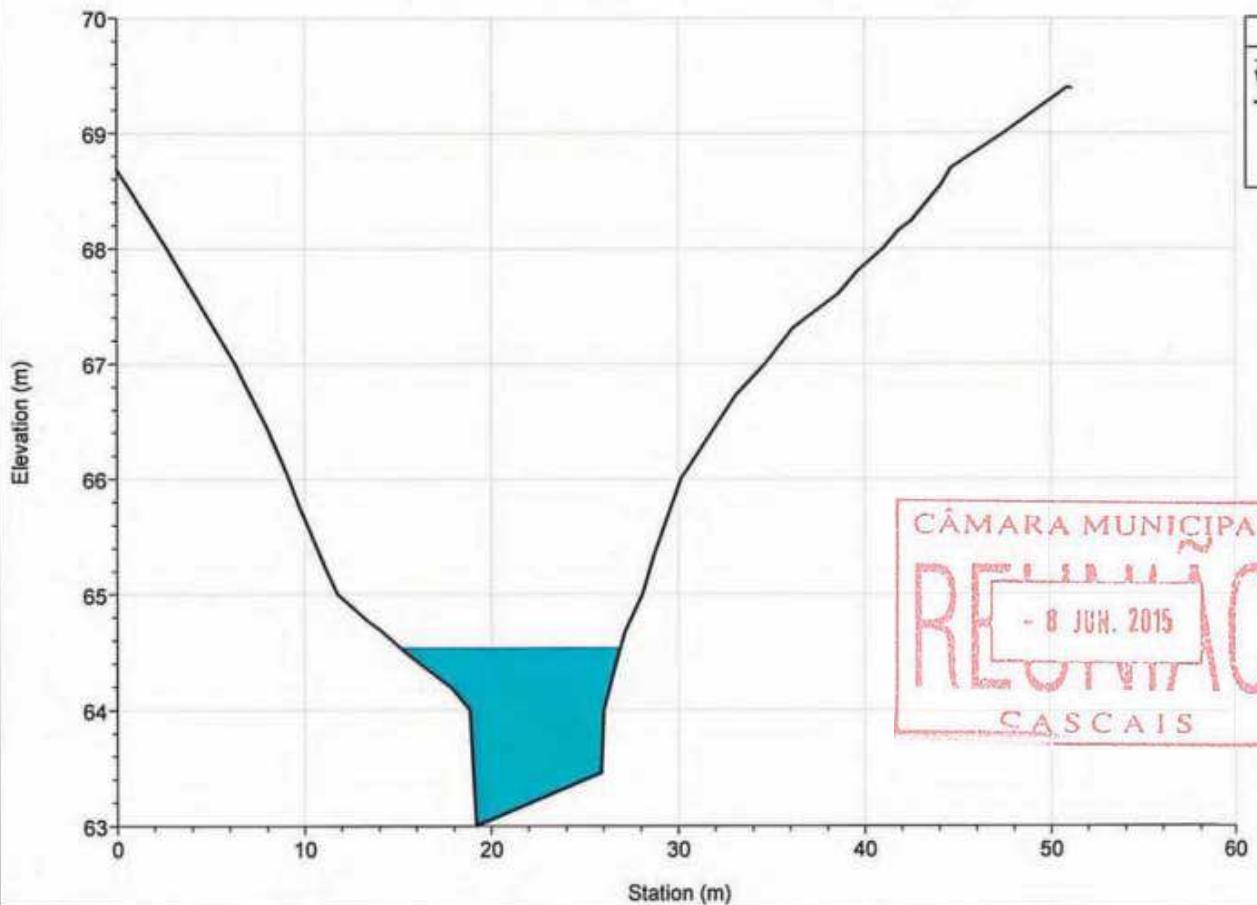


River = ME1 Reach = jusante RS = 572.809



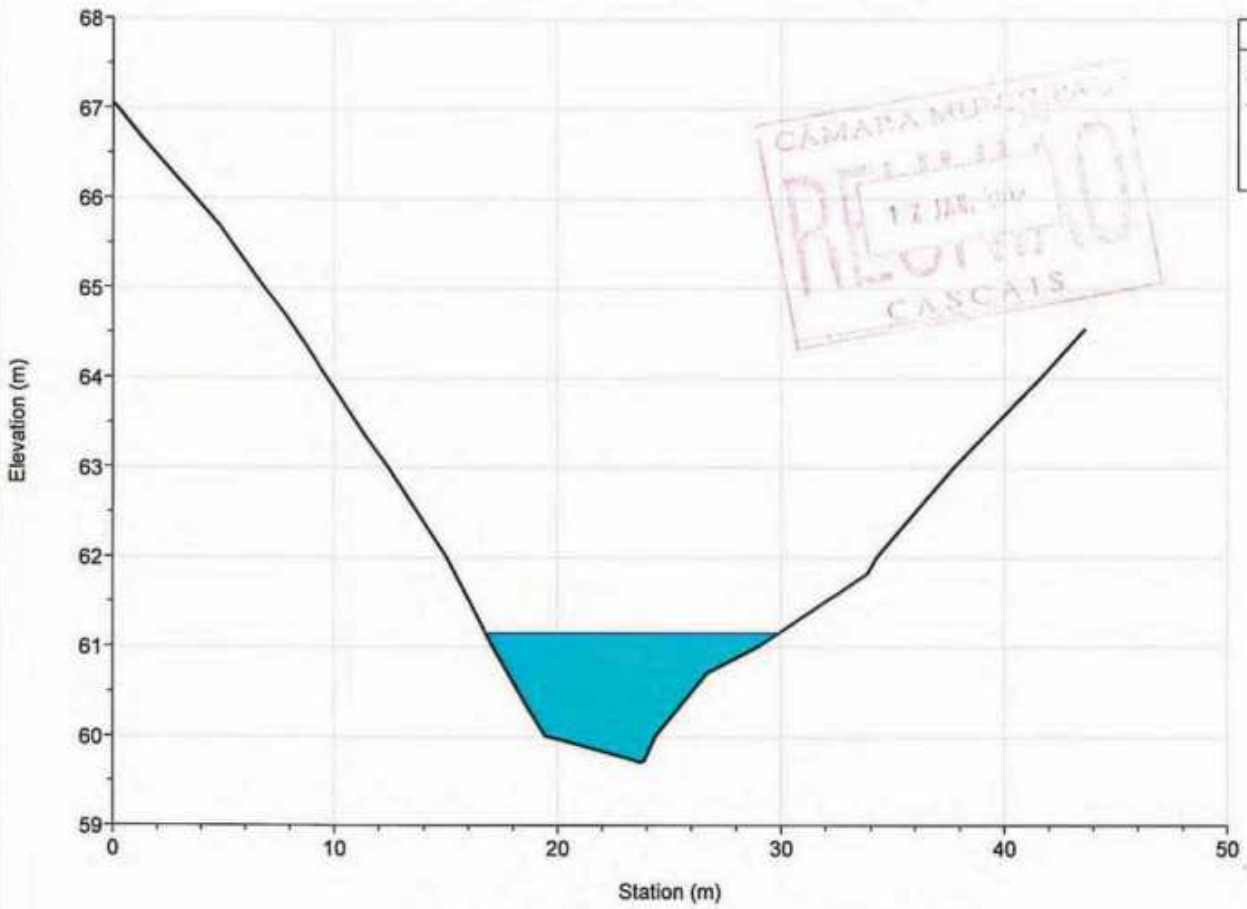
Legend	
WS T=100 anos	
Ground	
Bank Sta	

River = ME1 Reach = jusante RS = 522.946



Legend	
WS T=100 anos	
Ground	
Bank Sta	

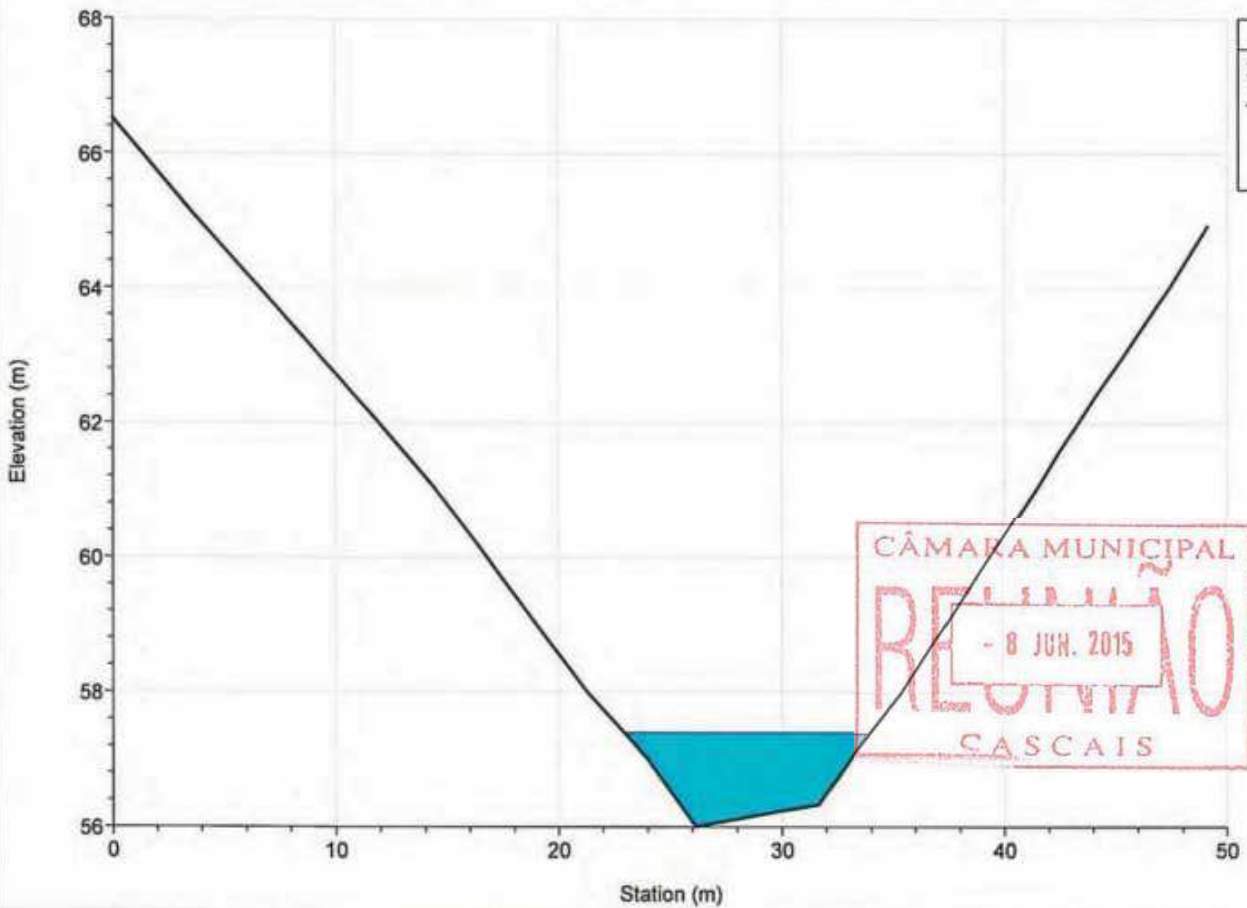
River = ME1 Reach = jusante RS = 431.175



Legend
WS T=100 anos
Ground
Bank Sta

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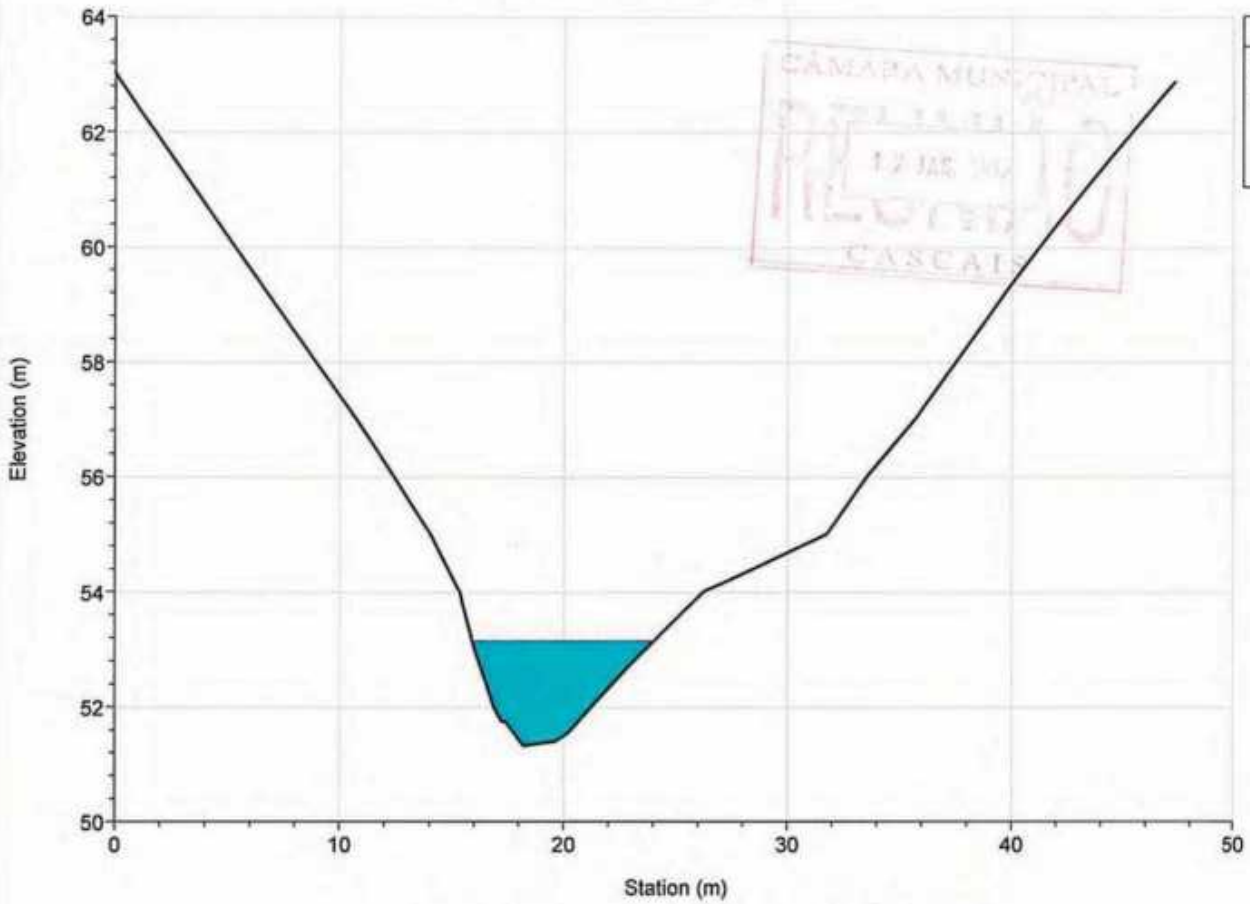
River = ME1 Reach = jusante RS = 318.979



Legend
WS T=100 anos
Ground
Bank Sta

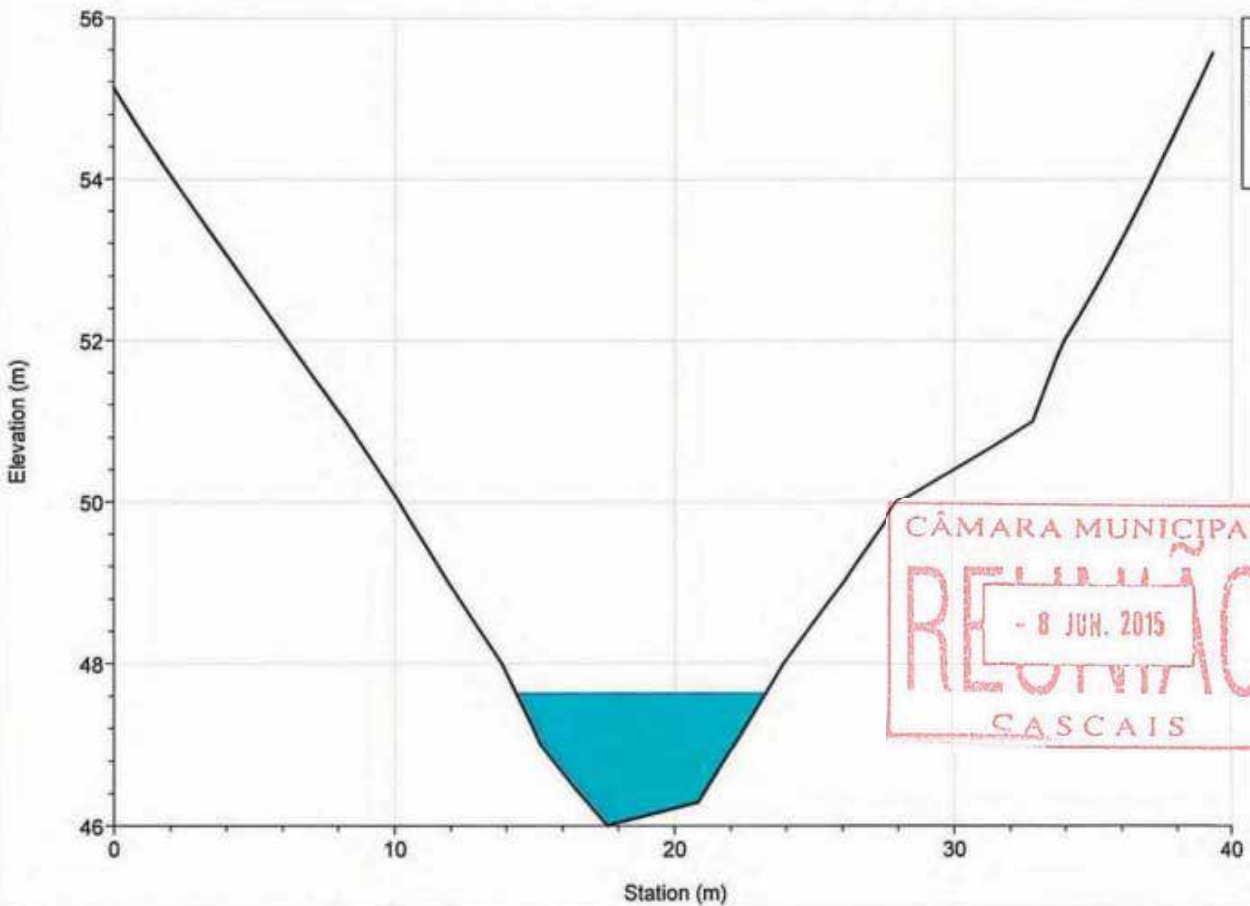
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River = ME1 Reach = jusante RS = 236.403



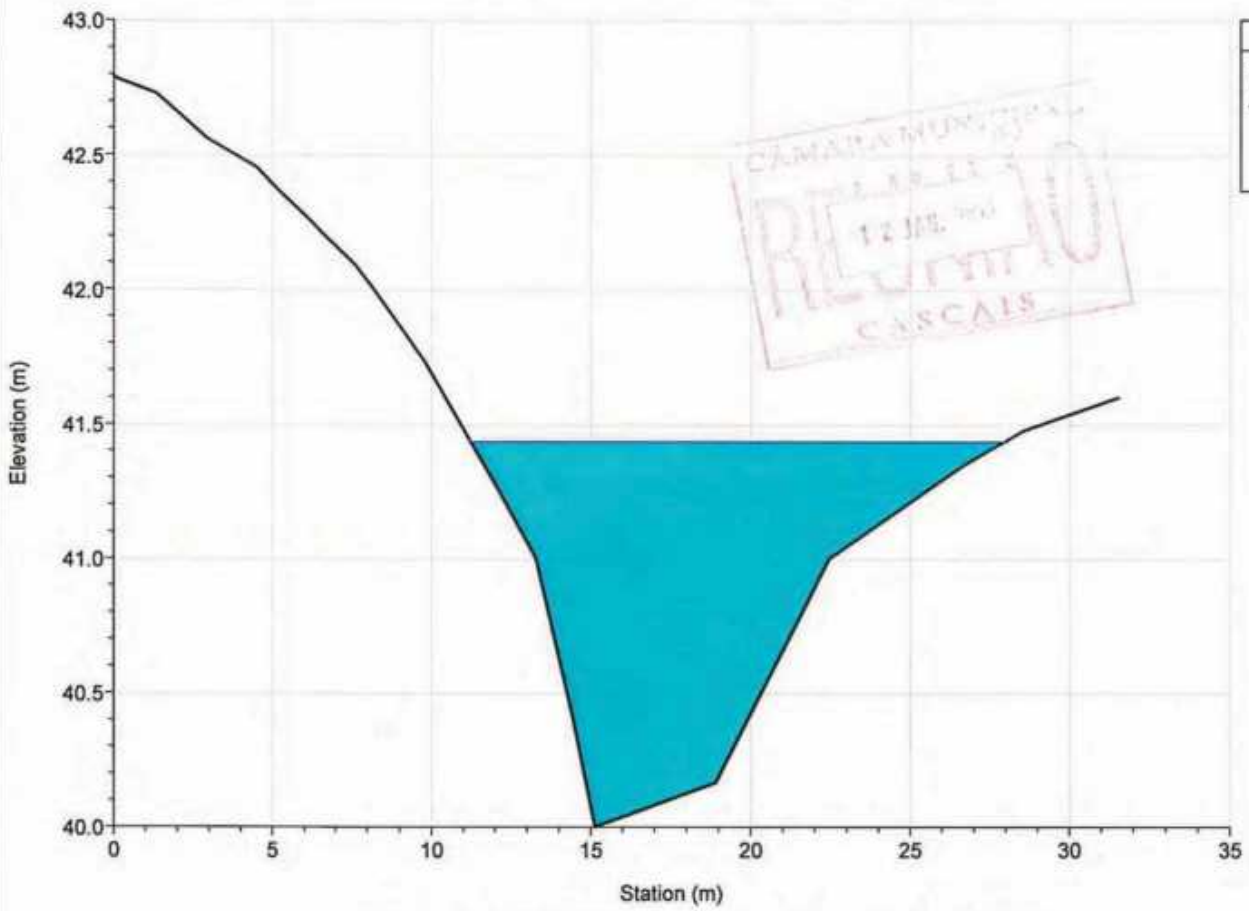
Legend
WS T=100 anos
Ground
Bank Sta

River = ME1 Reach = jusante RS = 139.761



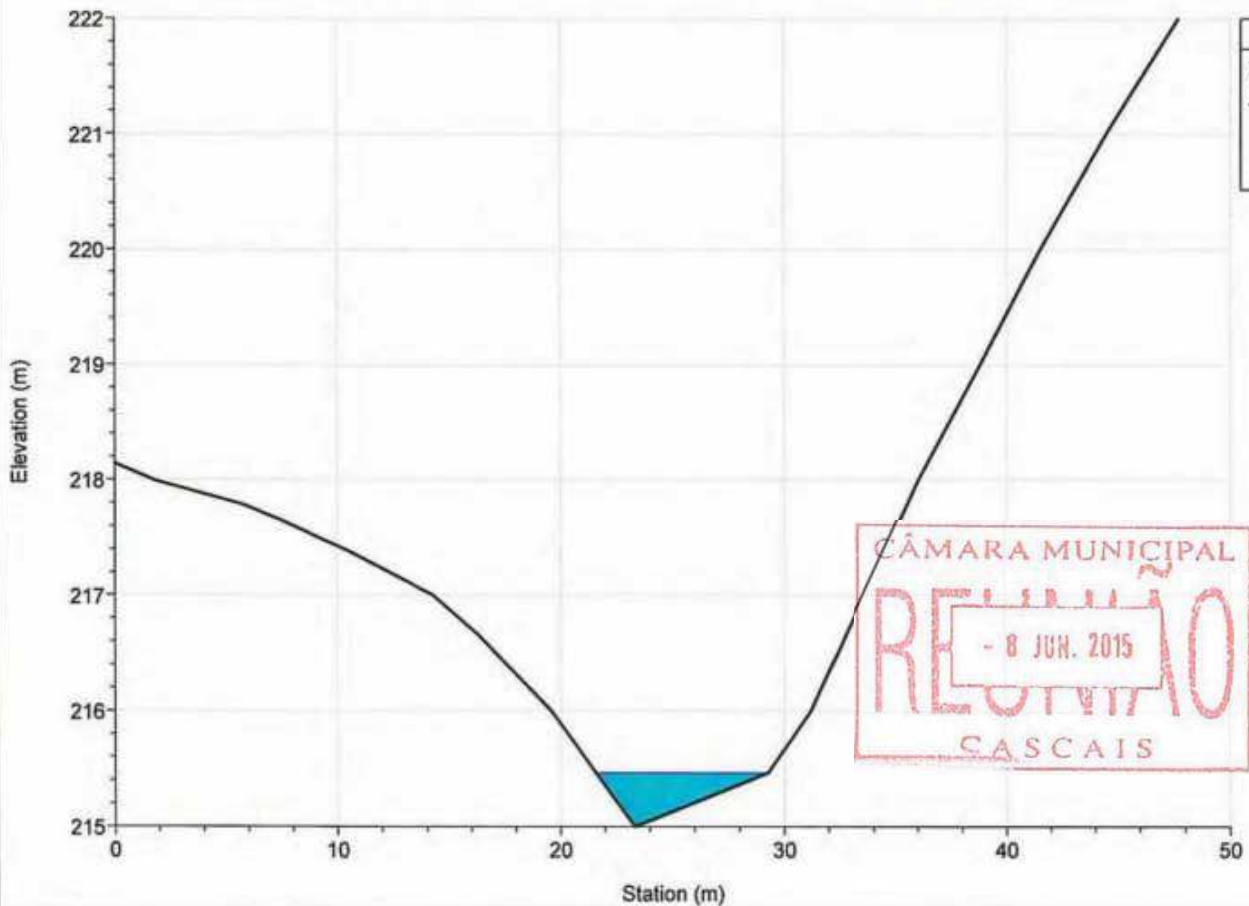
Legend
WS T=100 anos
Ground
Bank Sta

River = ME1 Reach = jusante RS = 19.955



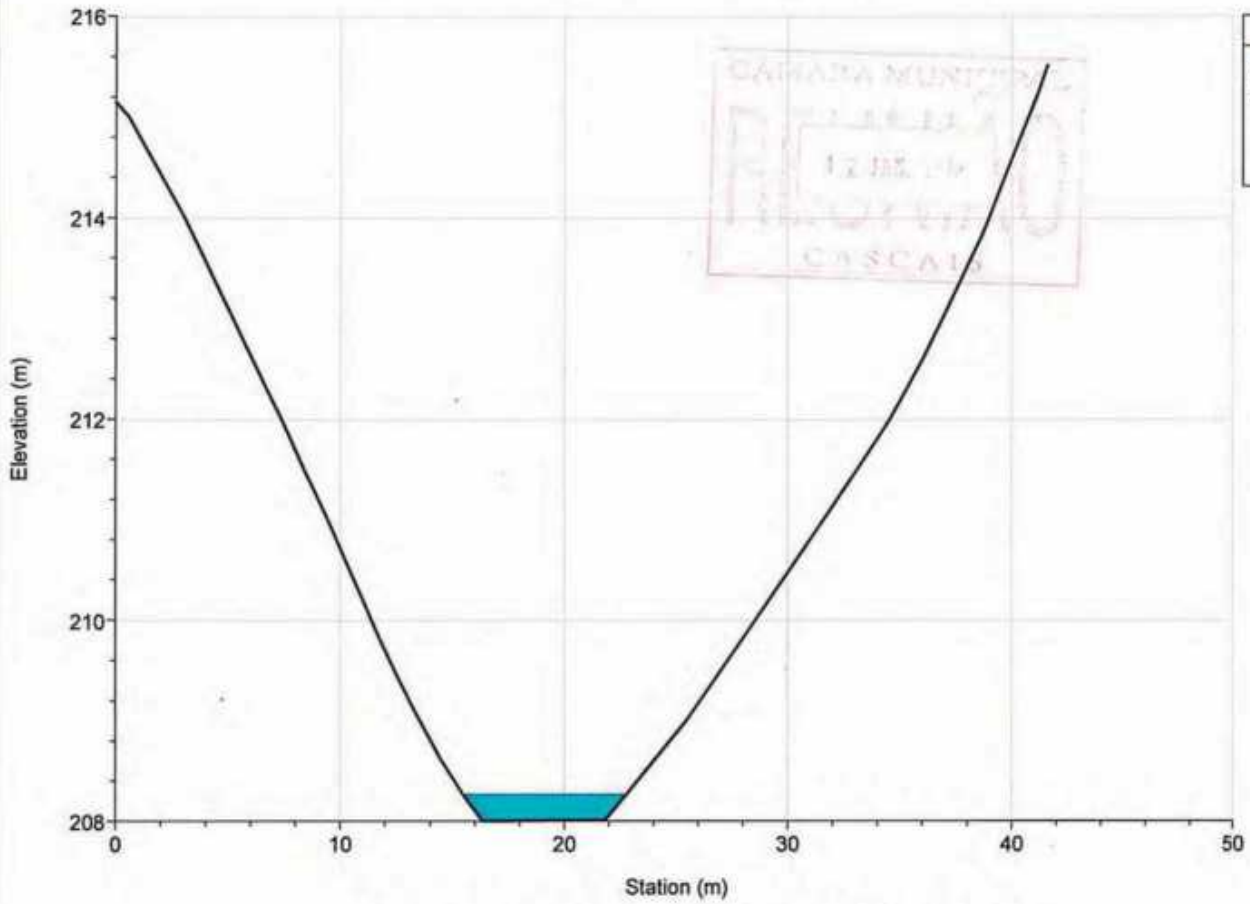
Legend
WS T=100 anos
Ground
Bank Sta

River = ME1-md1 Reach = afluente RS = 643.160



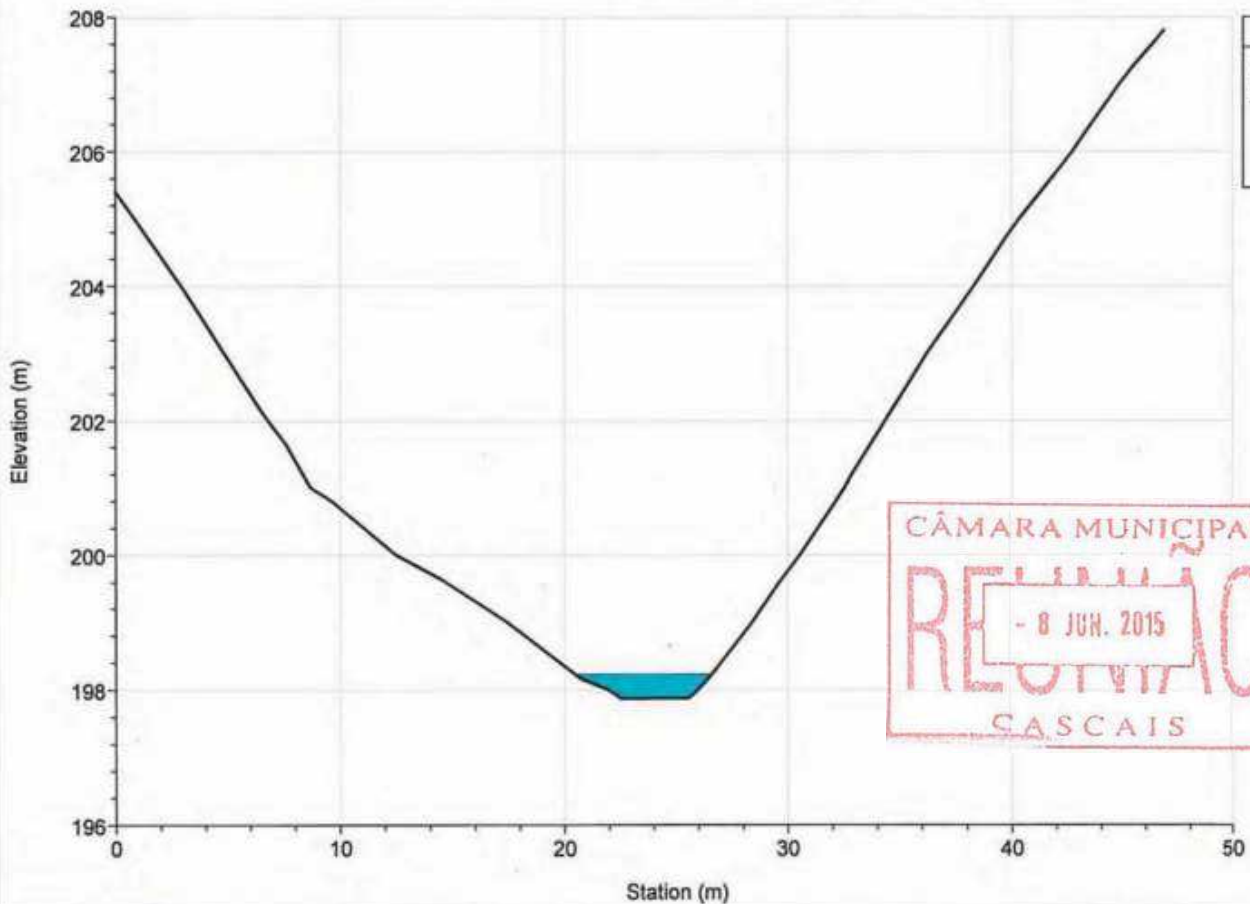
Legend
WS T=100 anos
Ground
Bank Sta

River = ME1-md1 Reach = afluyente RS = 551.345



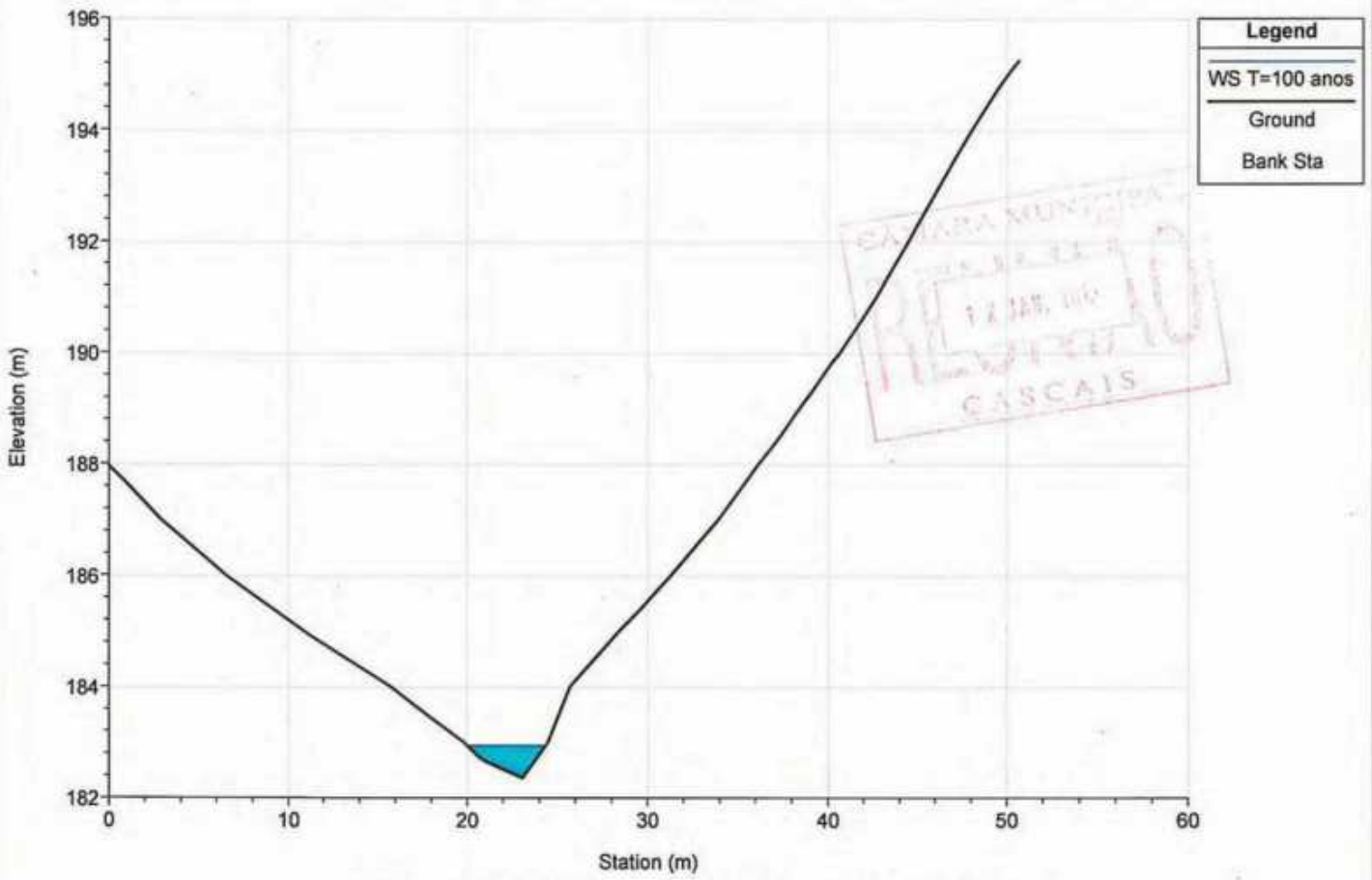
Legend
WS T=100 anos
Ground
Bank Sta

River = ME1-md1 Reach = afluyente RS = 456.953

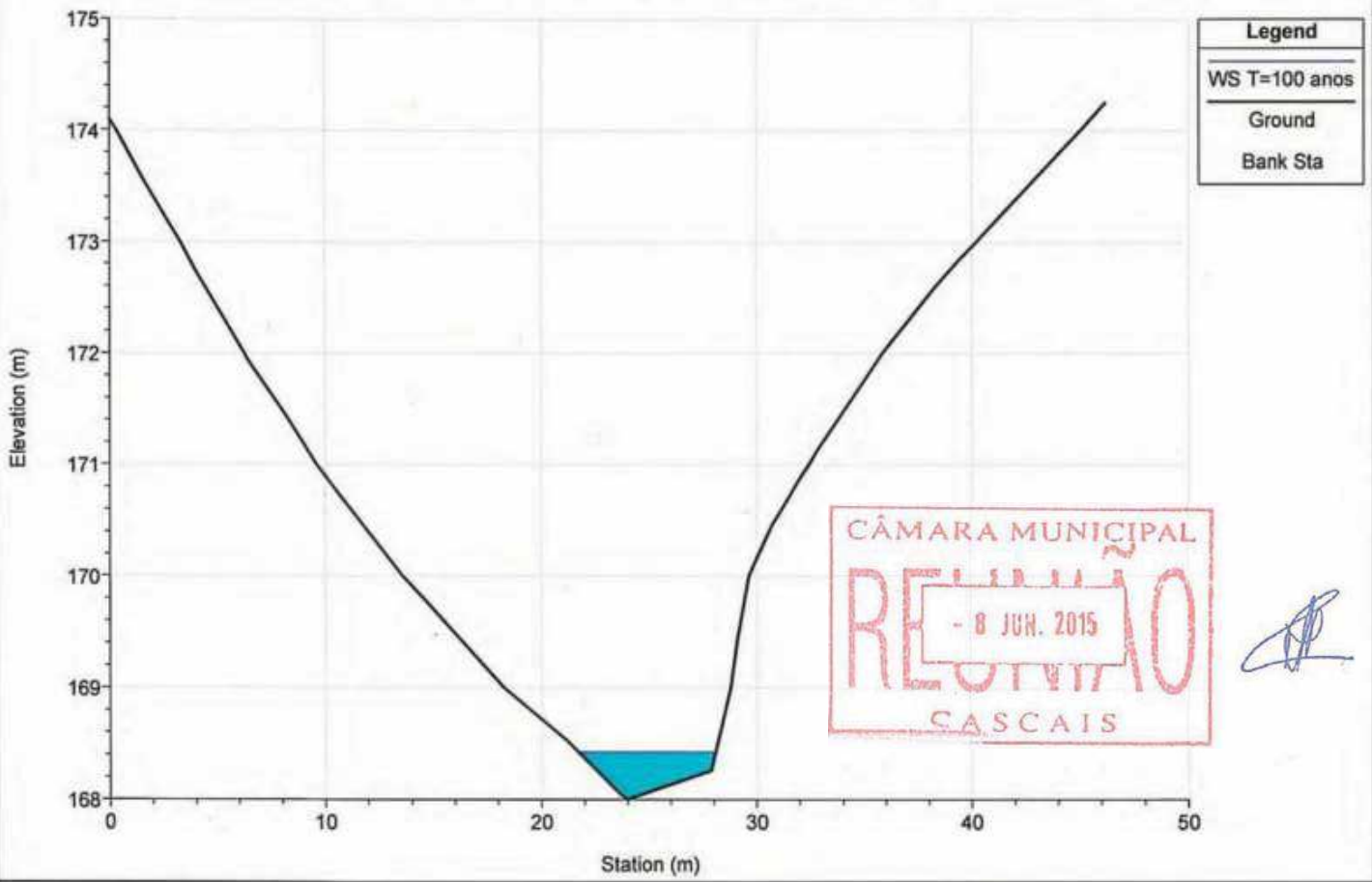


Legend
WS T=100 anos
Ground
Bank Sta

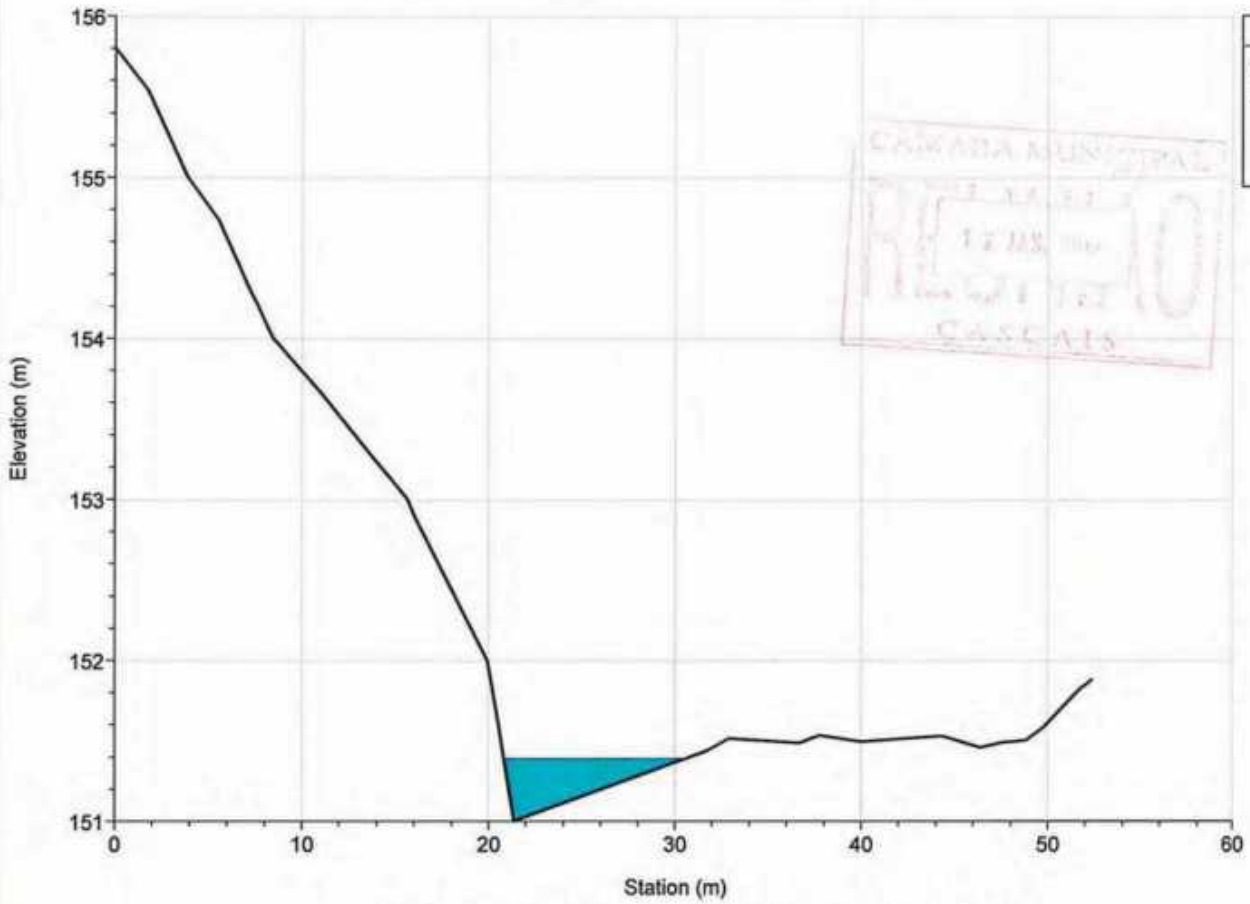
River = ME1-md1 Reach = afluyente RS = 366.076



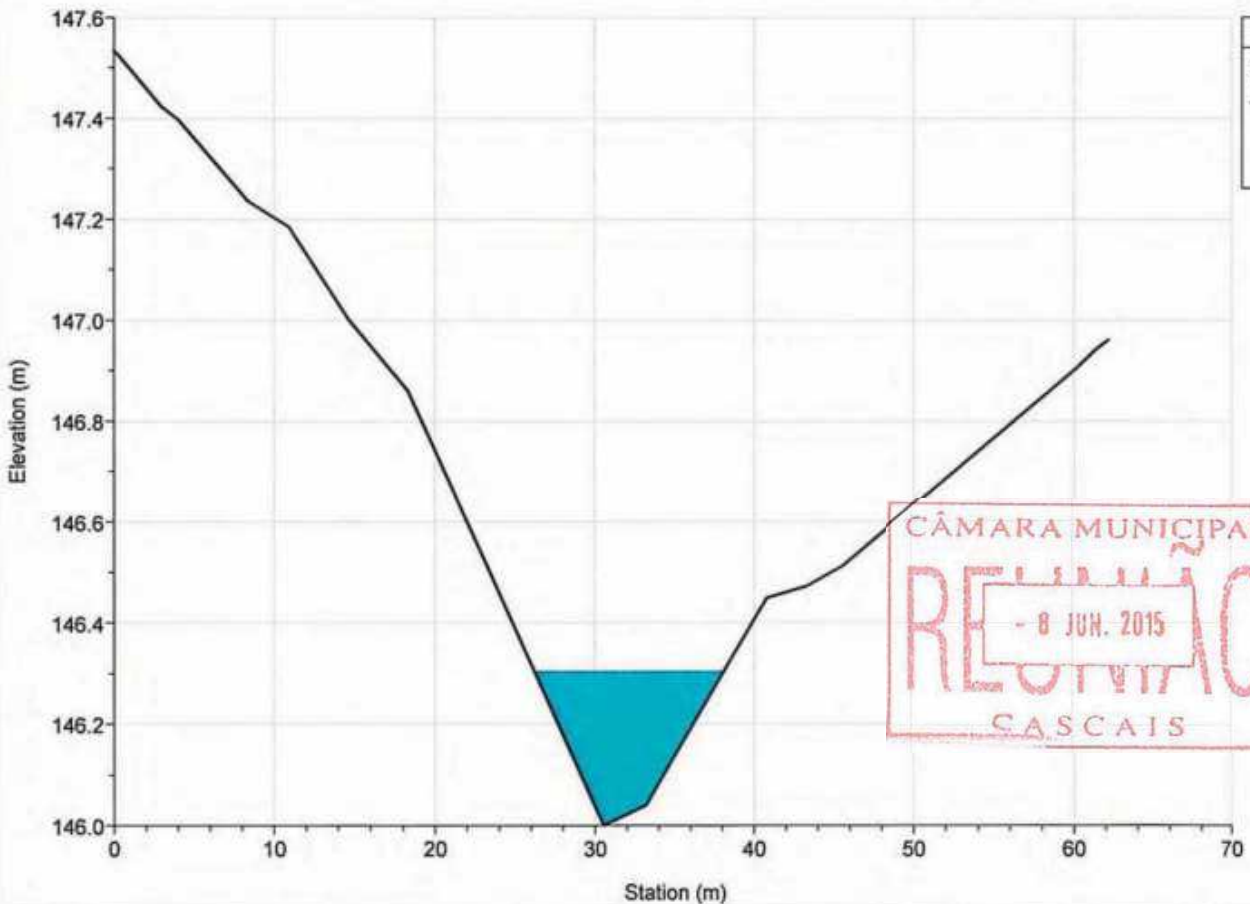
River = ME1-md1 Reach = afluyente RS = 274.297



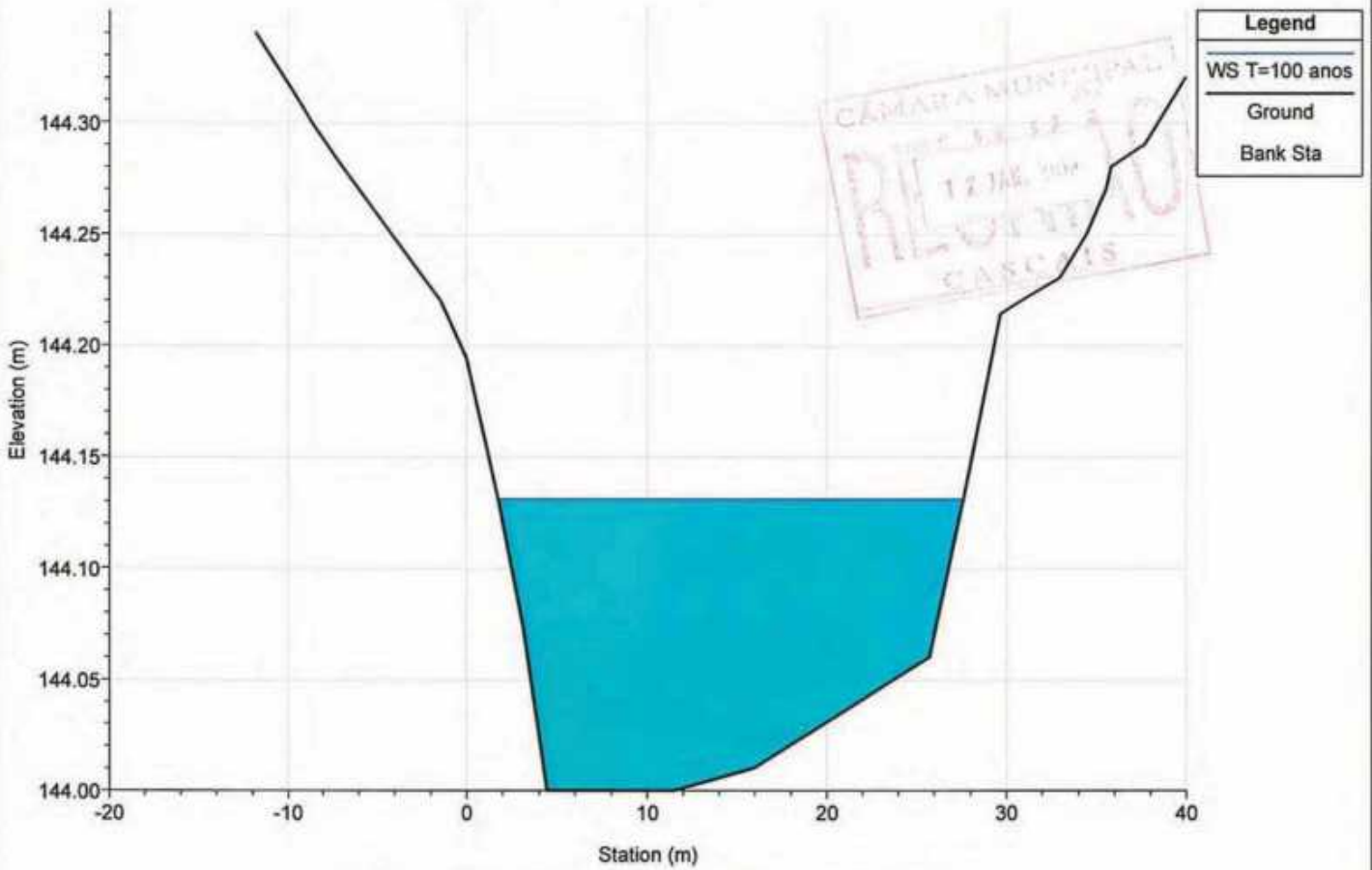
River = ME1-md1 Reach = afluyente RS = 192.238



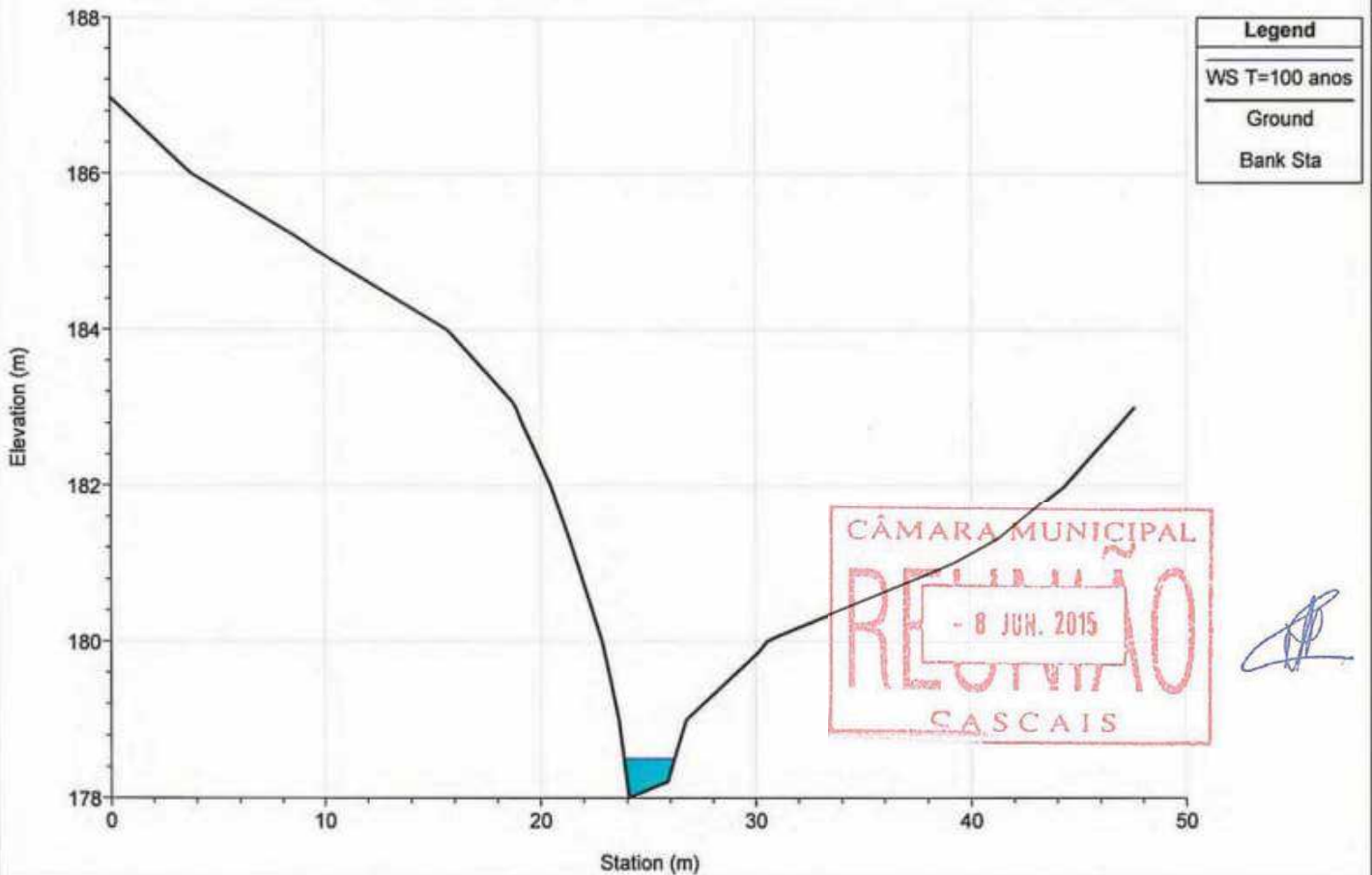
River = ME1-md1 Reach = afluyente RS = 100.487



River = ME1-md1 Reach = afluyente RS = 17.761

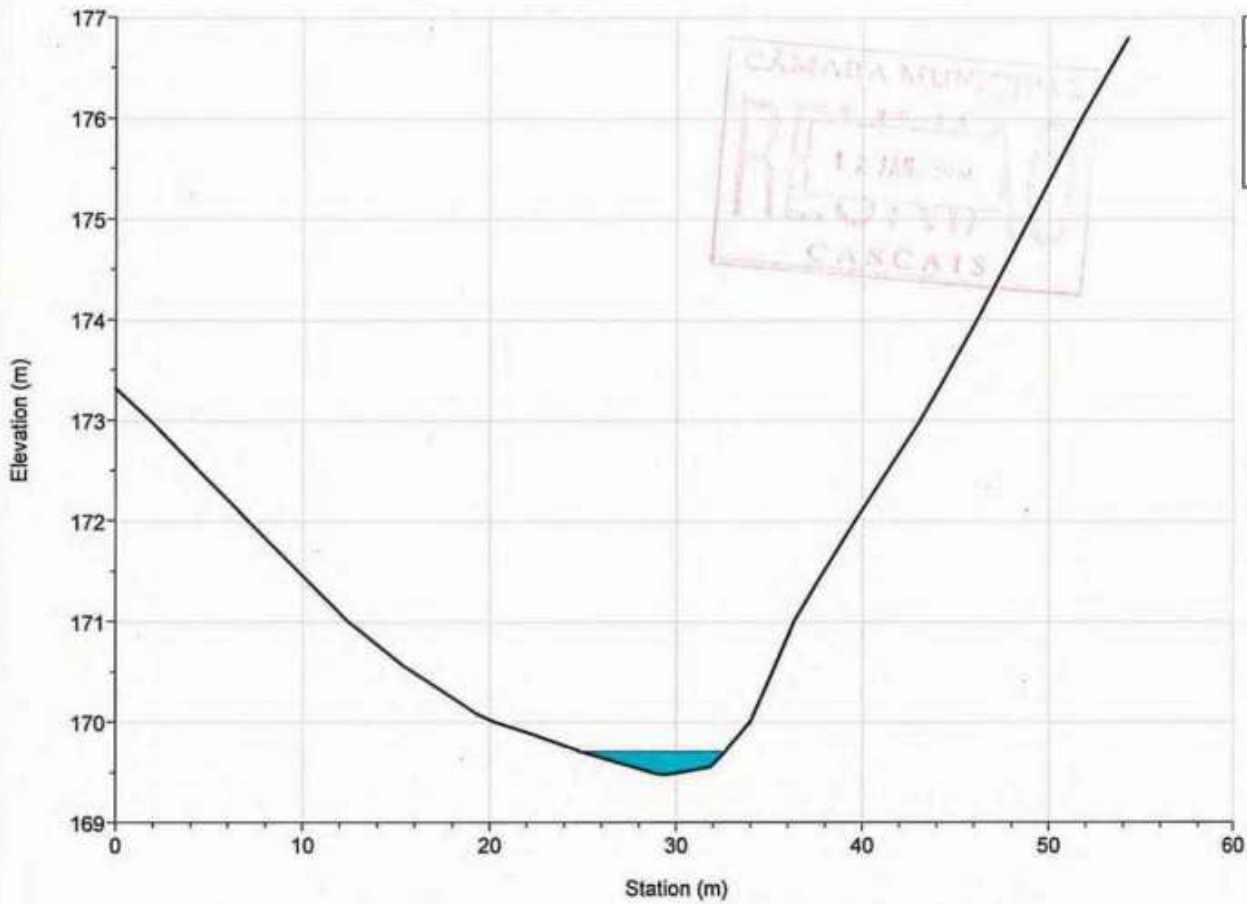


River = ME1-md2 Reach = afluyente RS = 2049.378



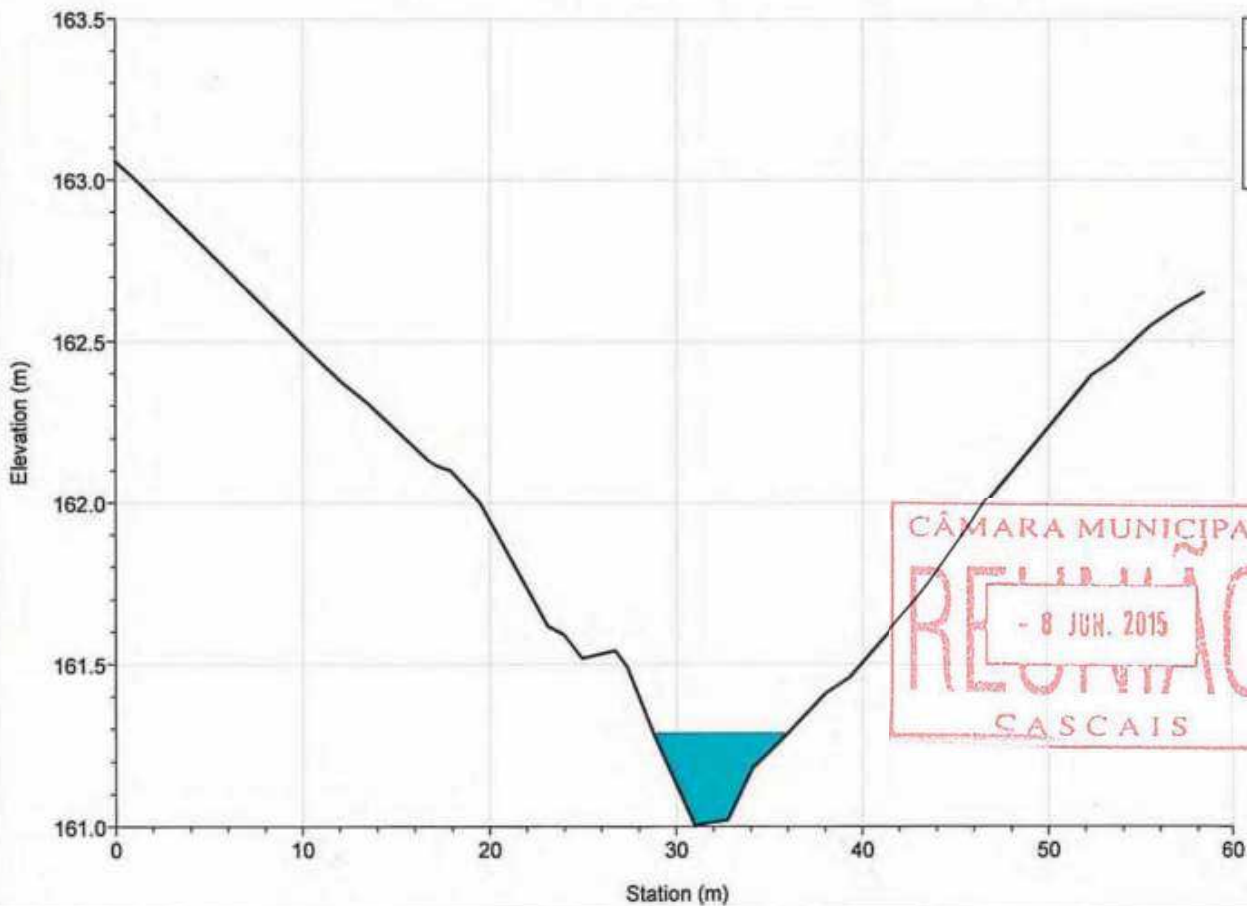


River = ME1-md2 Reach = afluente RS = 1972.742



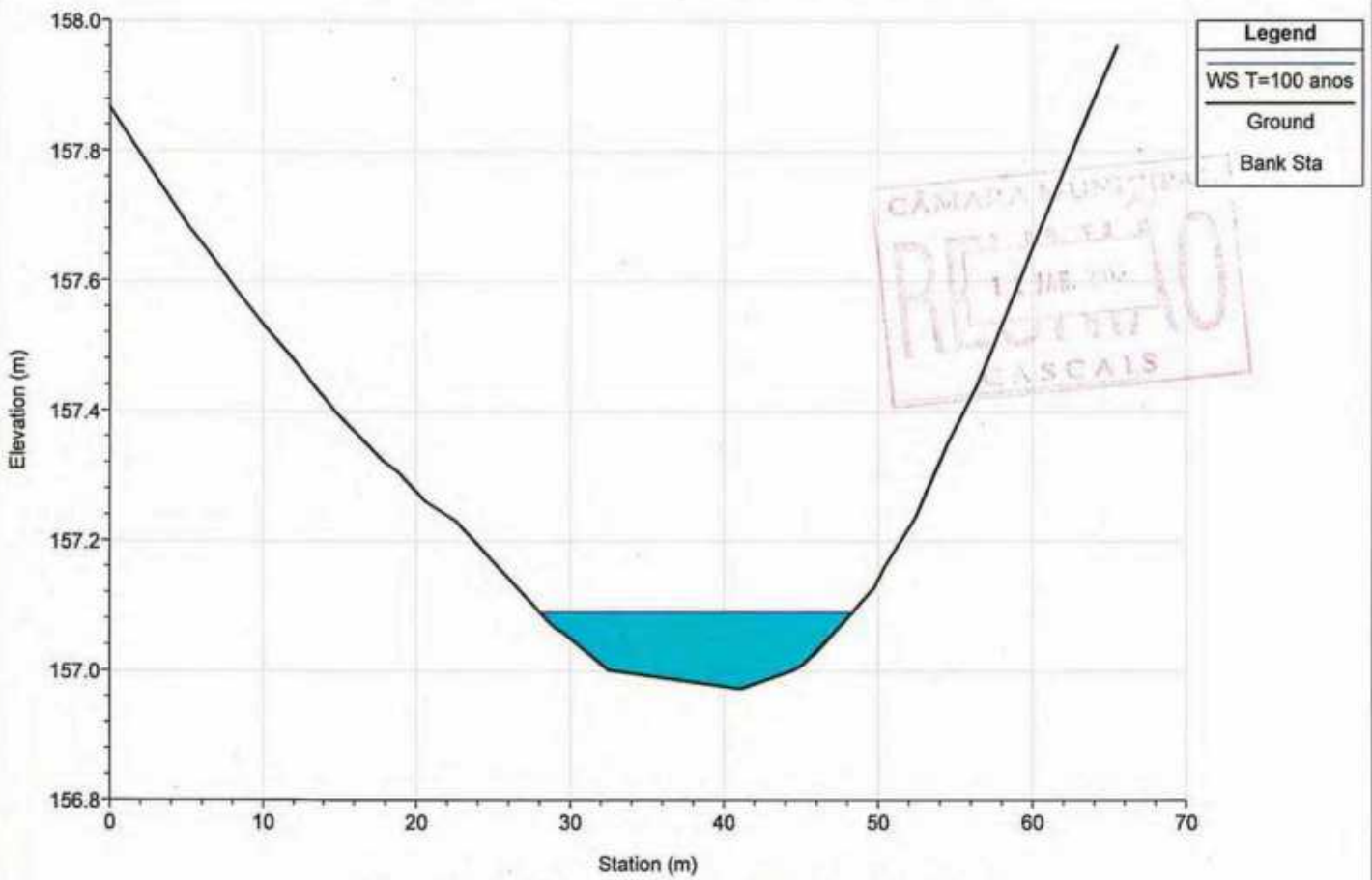
Legend
WS T=100 anos
Ground
Bank Sta

River = ME1-md2 Reach = afluente RS = 1867.583

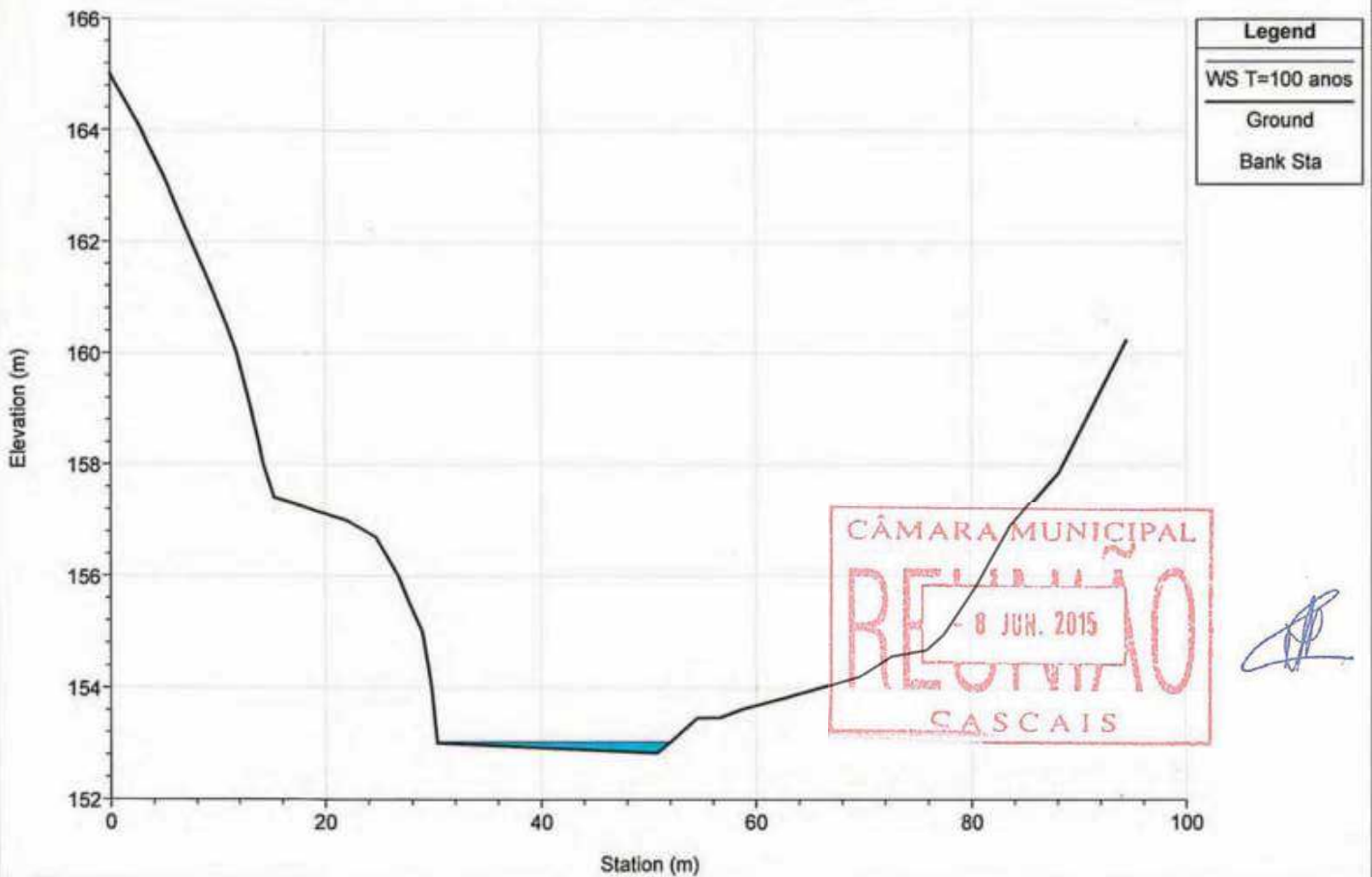


Legend
WS T=100 anos
Ground
Bank Sta

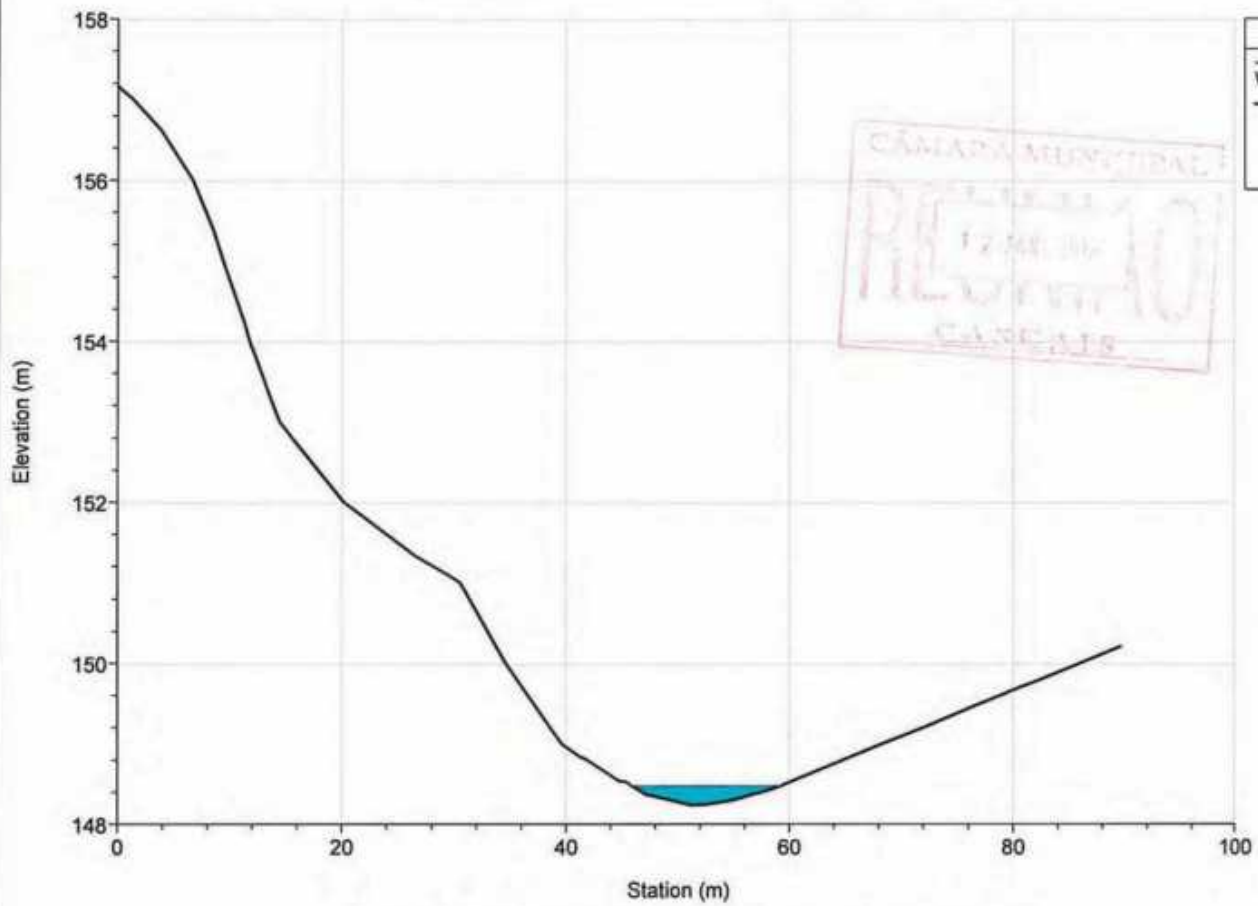
River = ME1-md2 Reach = afluente RS = 1764.276



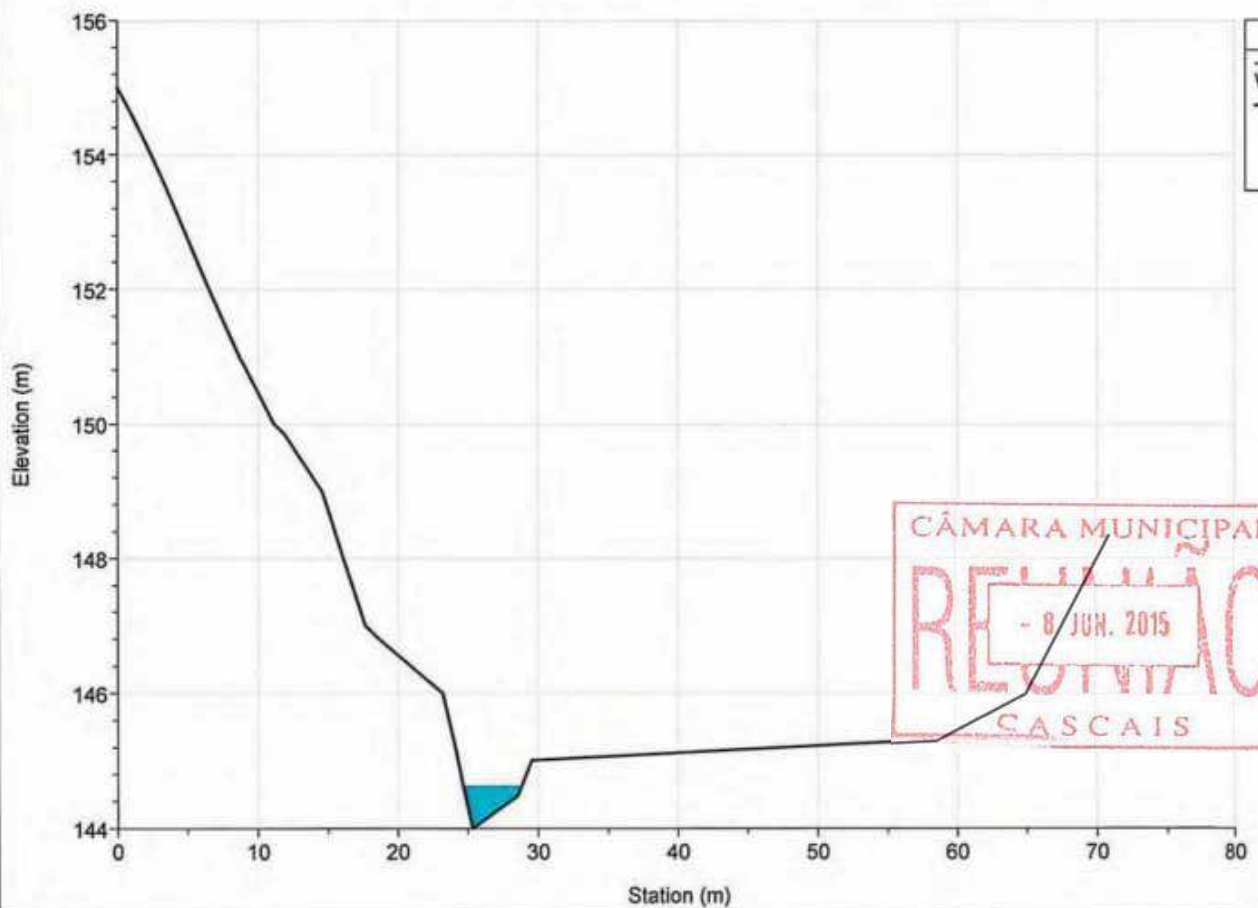
River = ME1-md2 Reach = afluente RS = 1630.640



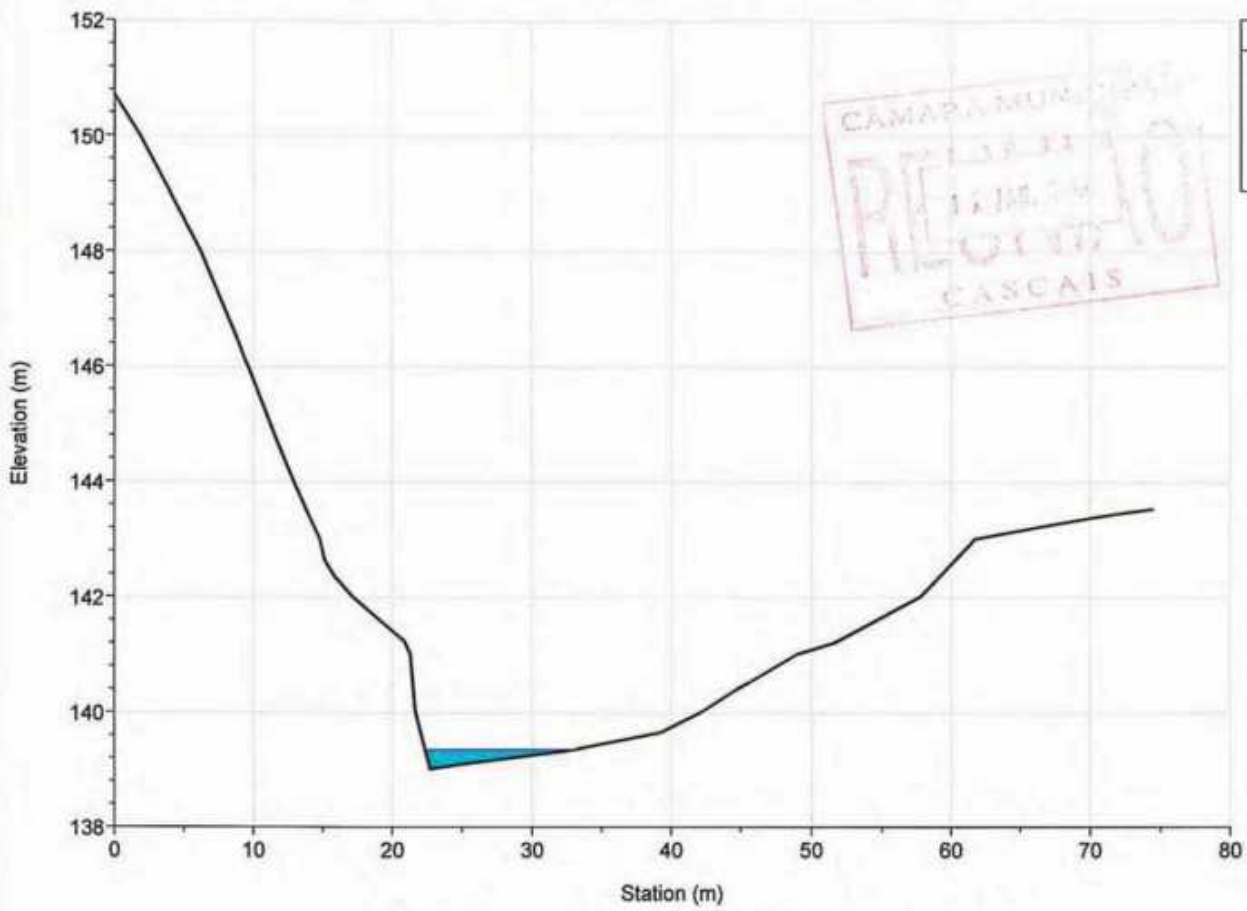
River = ME1-md2 Reach = afluente RS = 1512.732



River = ME1-md2 Reach = afluente RS = 1395.286



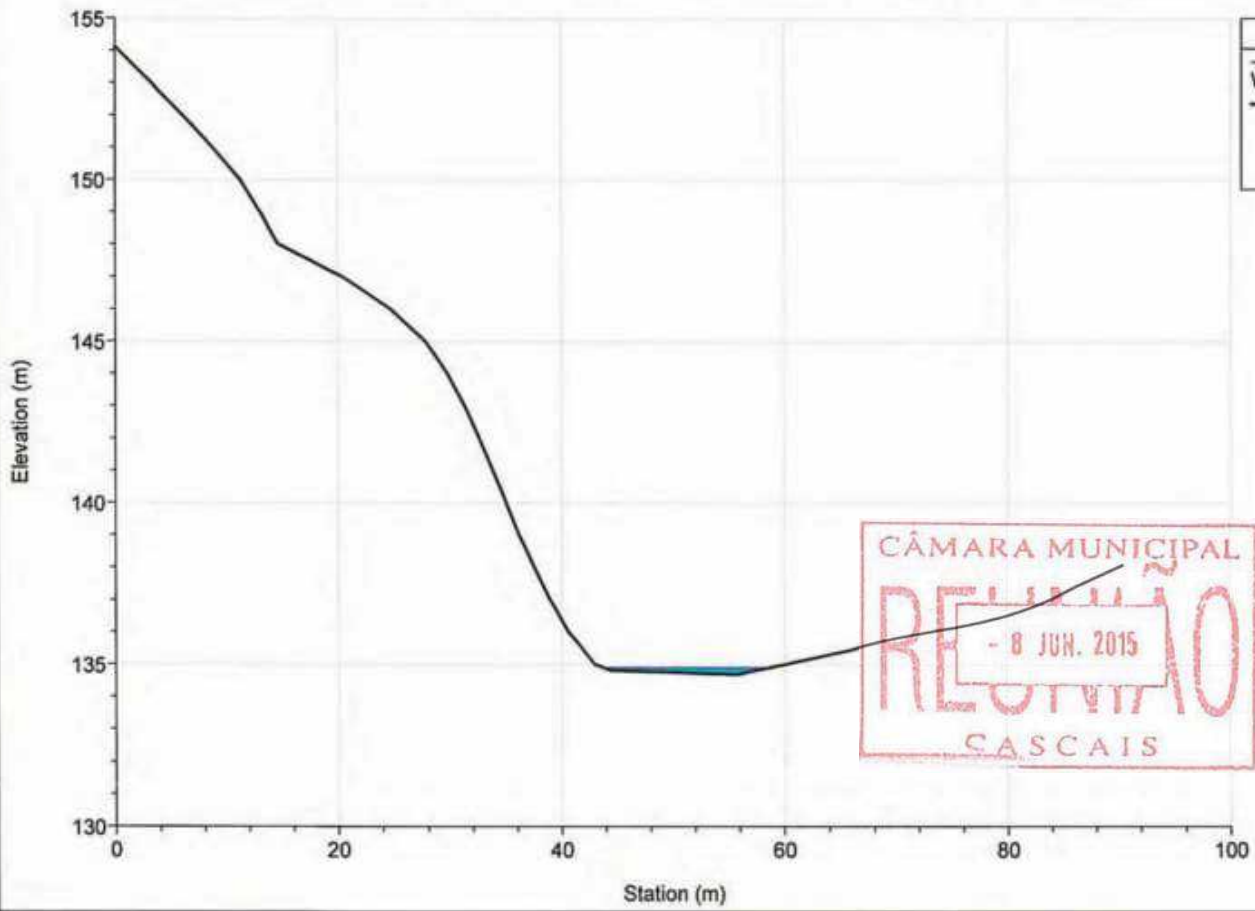
River = ME1-md2 Reach = afluente RS = 1304.443



Legend	
WS T=100 anos	
Ground	
Bank Sta	

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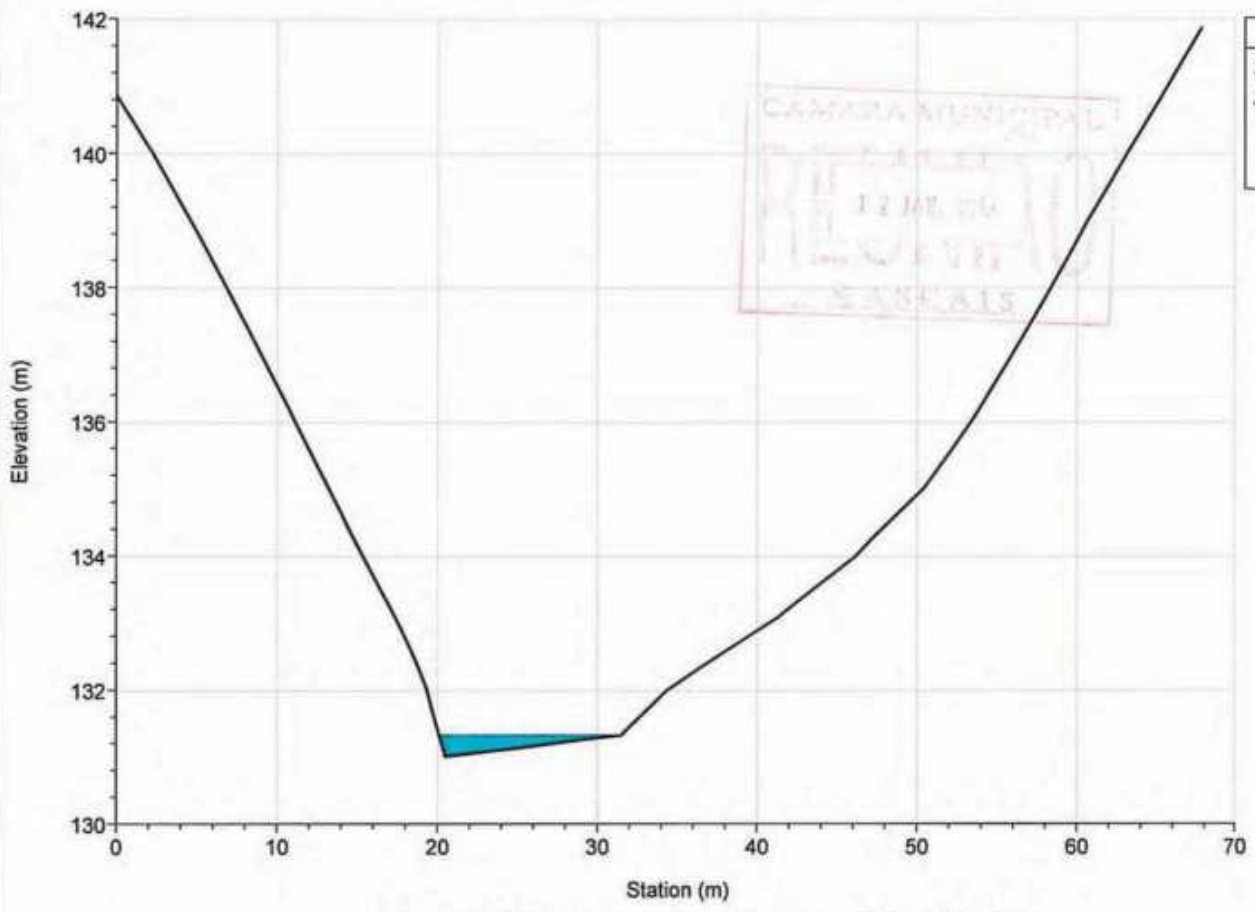
River = ME1-md2 Reach = afluente RS = 1206.708



Legend	
WS T=100 anos	
Ground	
Bank Sta	

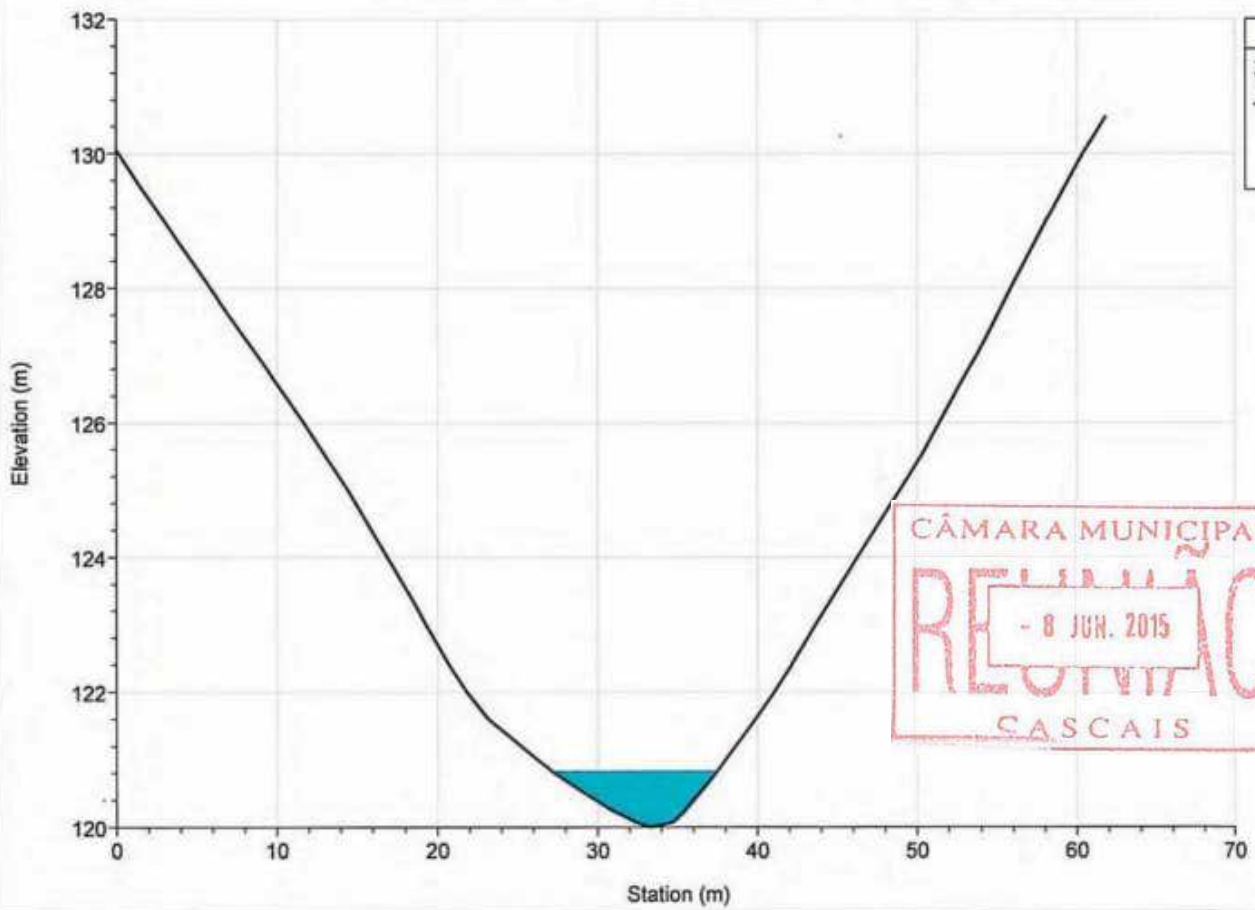
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River = ME1-md2 Reach = afluente RS = 1119.151



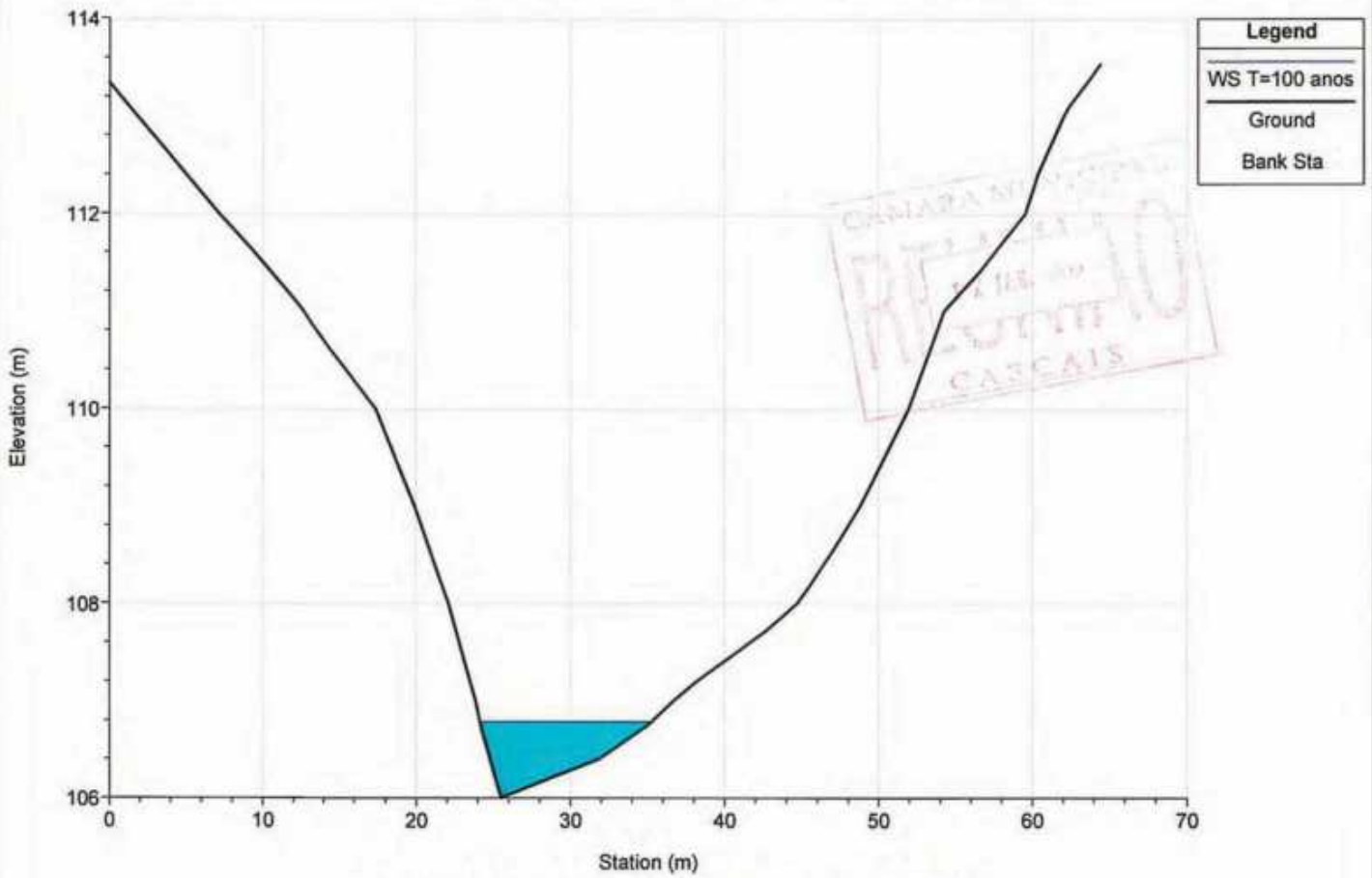
Legend
WS T=100 anos
Ground
Bank Sta

River = ME1-md2 Reach = afluente RS = 993.836

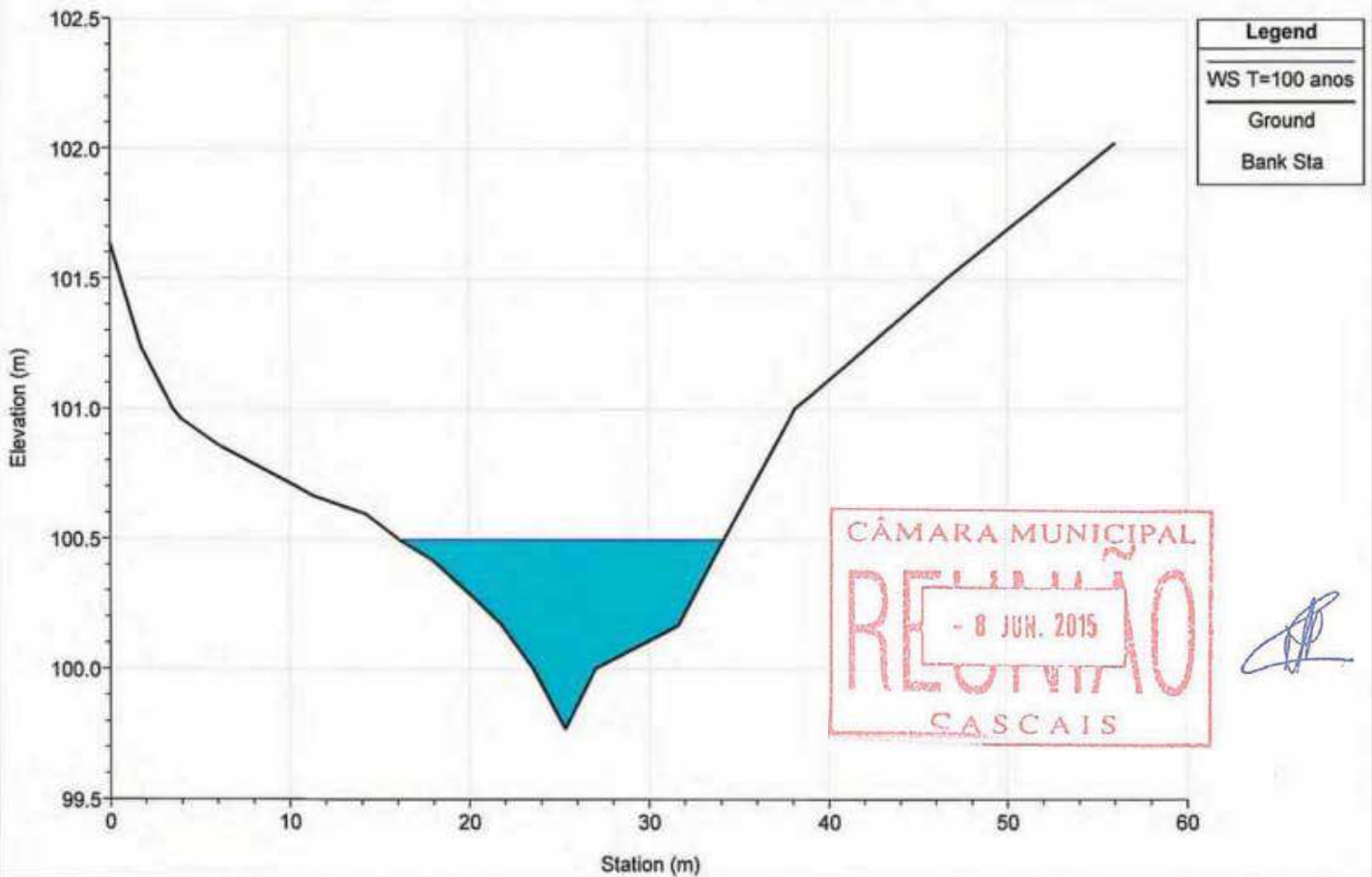


Legend
WS T=100 anos
Ground
Bank Sta

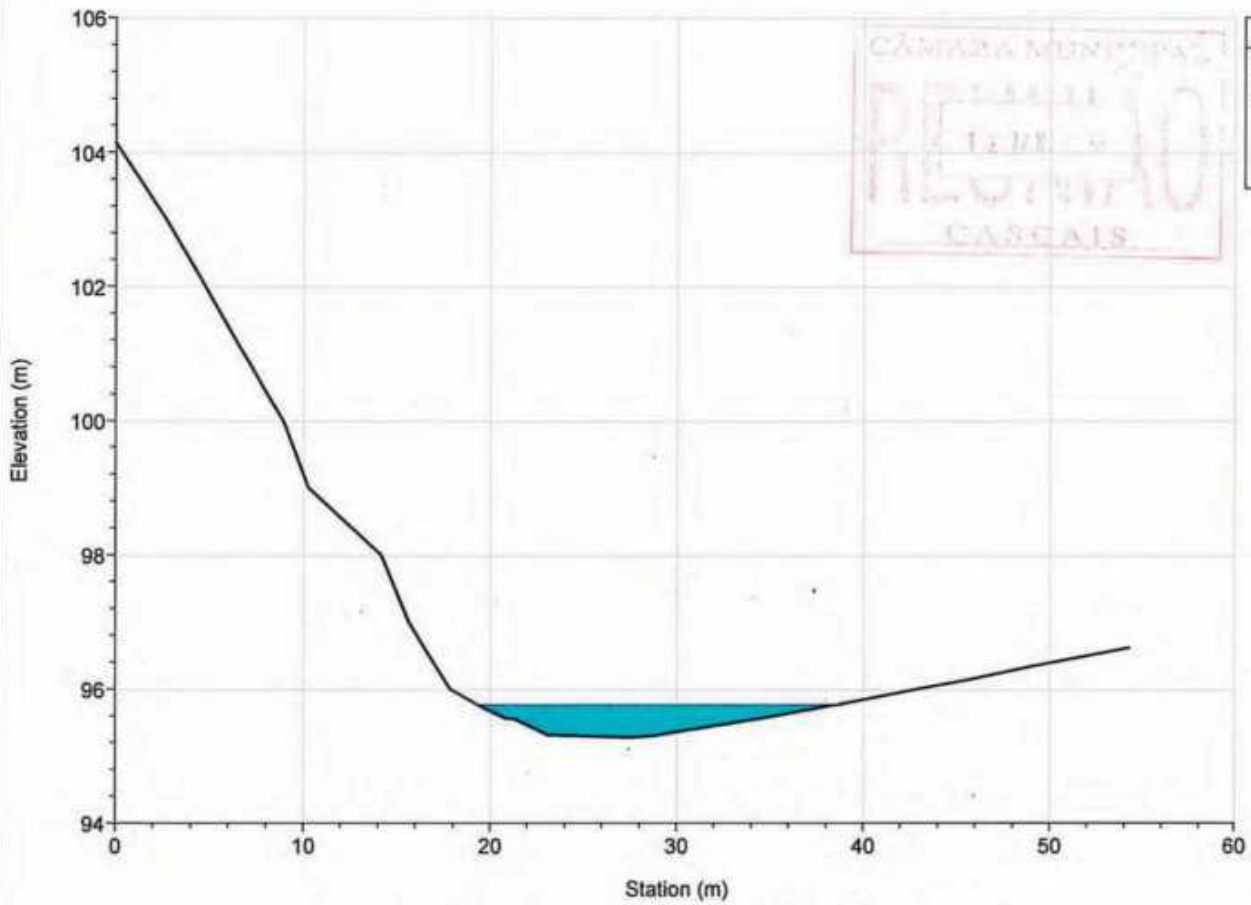
River = ME1-md2 Reach = afluente RS = 866.461



River = ME1-md2 Reach = afluente RS = 780.081



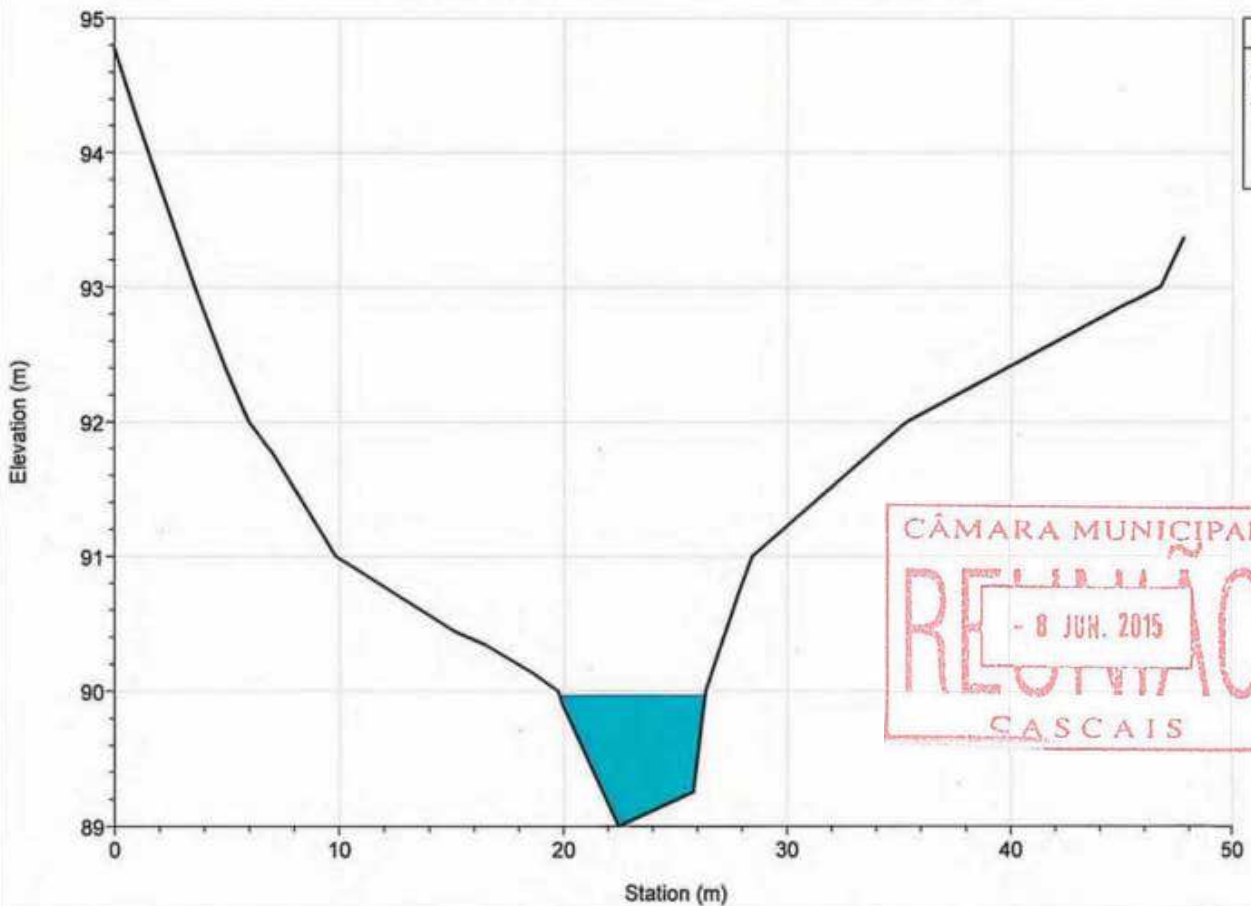
River = ME1-md2 Reach = afluente RS = 669.071



Legend	
WS T=100 anos	
Ground	
Bank Sta	

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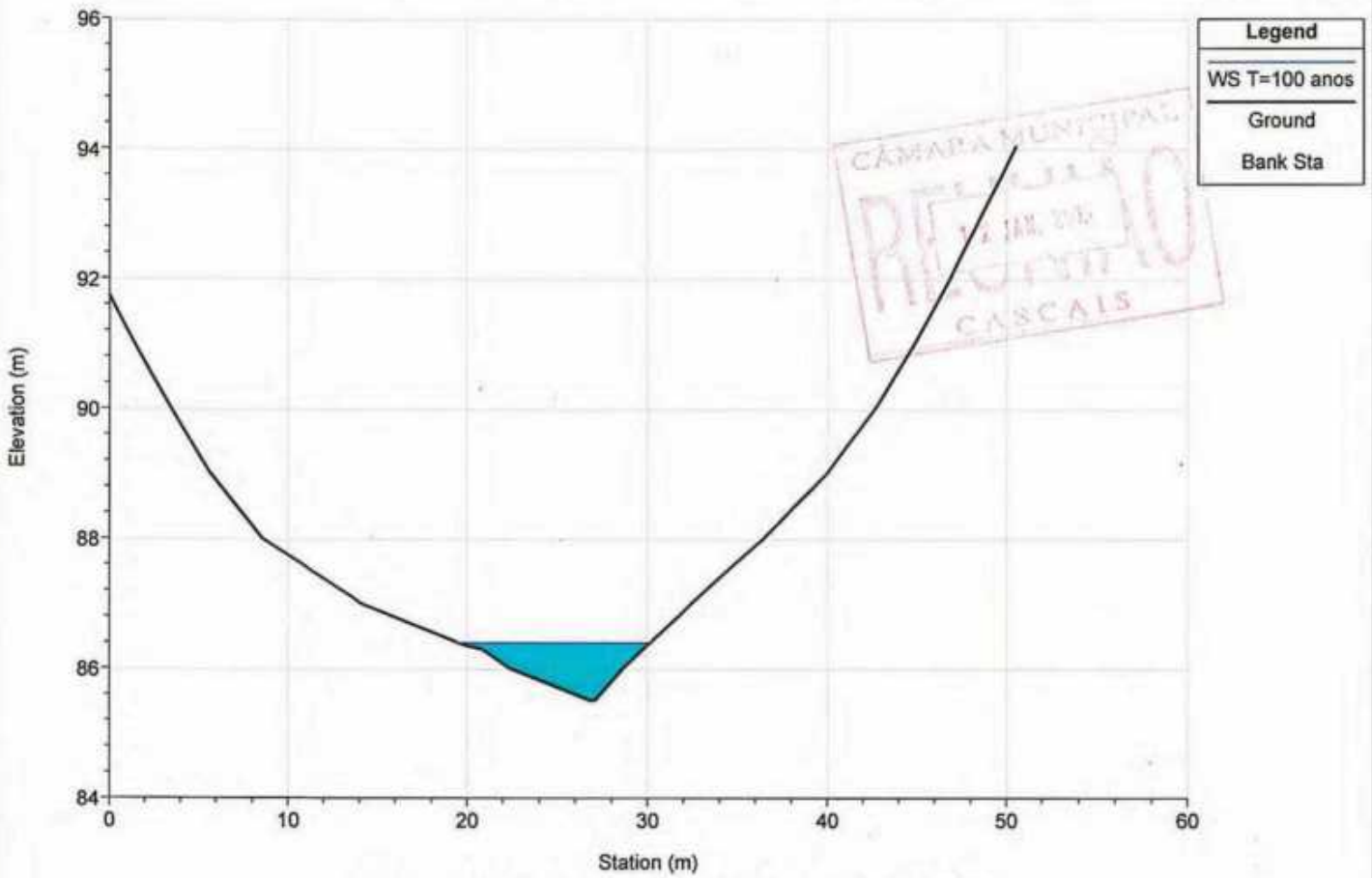
River = ME1-md2 Reach = afluente RS = 564.335



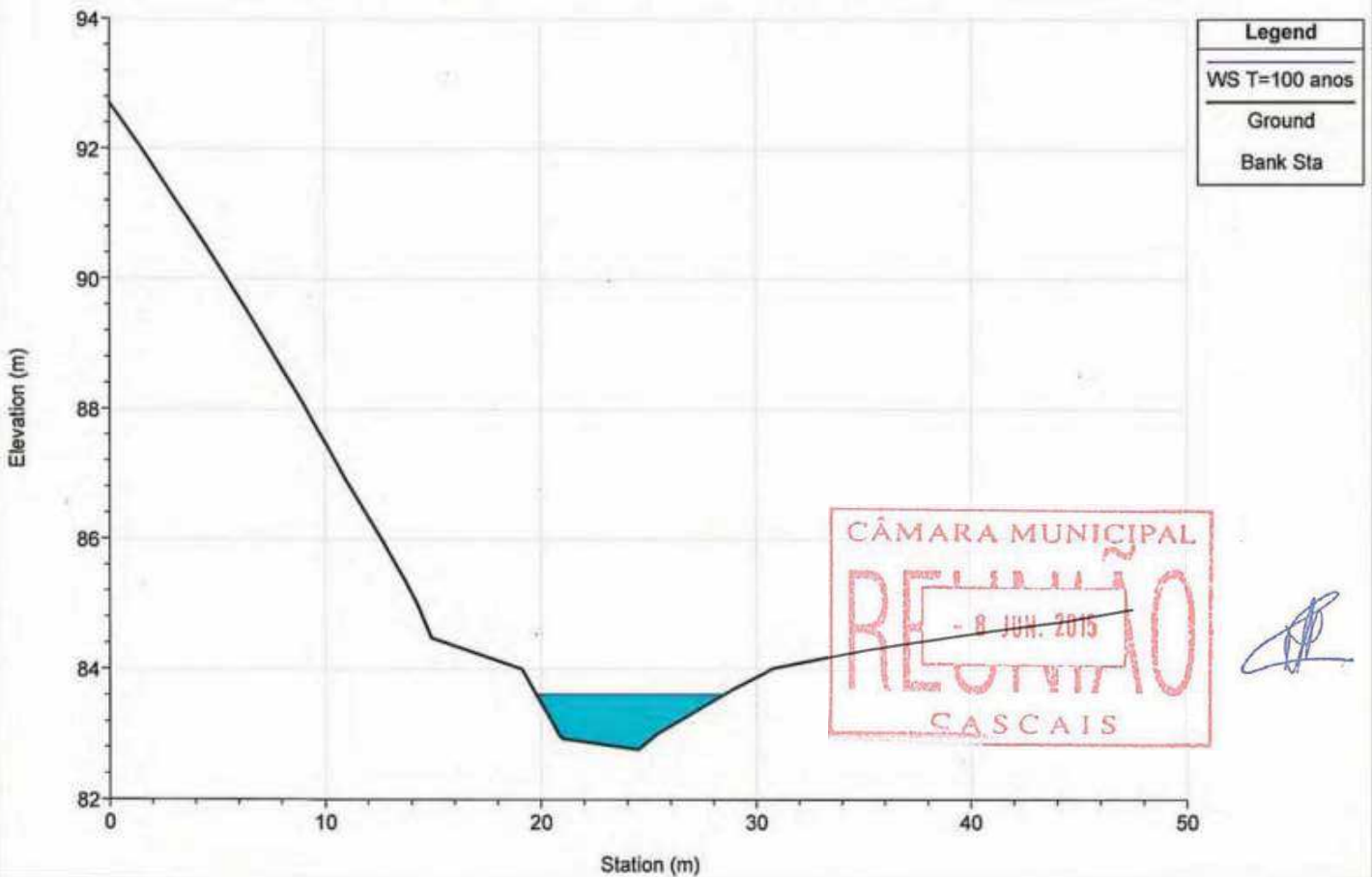
Legend	
WS T=100 anos	
Ground	
Bank Sta	

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River = ME1-md2 Reach = afluente RS = 482.728

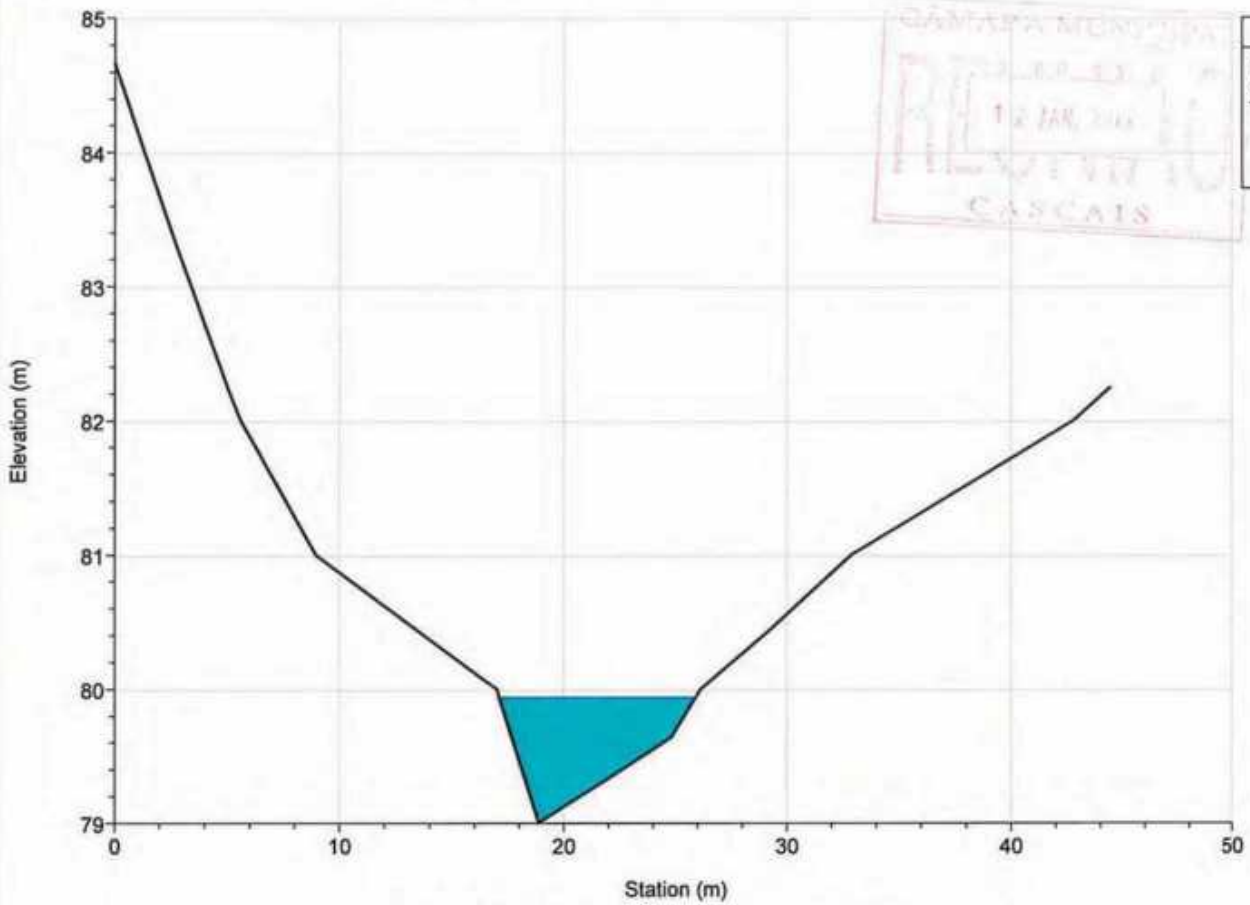


River = ME1-md2 Reach = afluente RS = 396.143



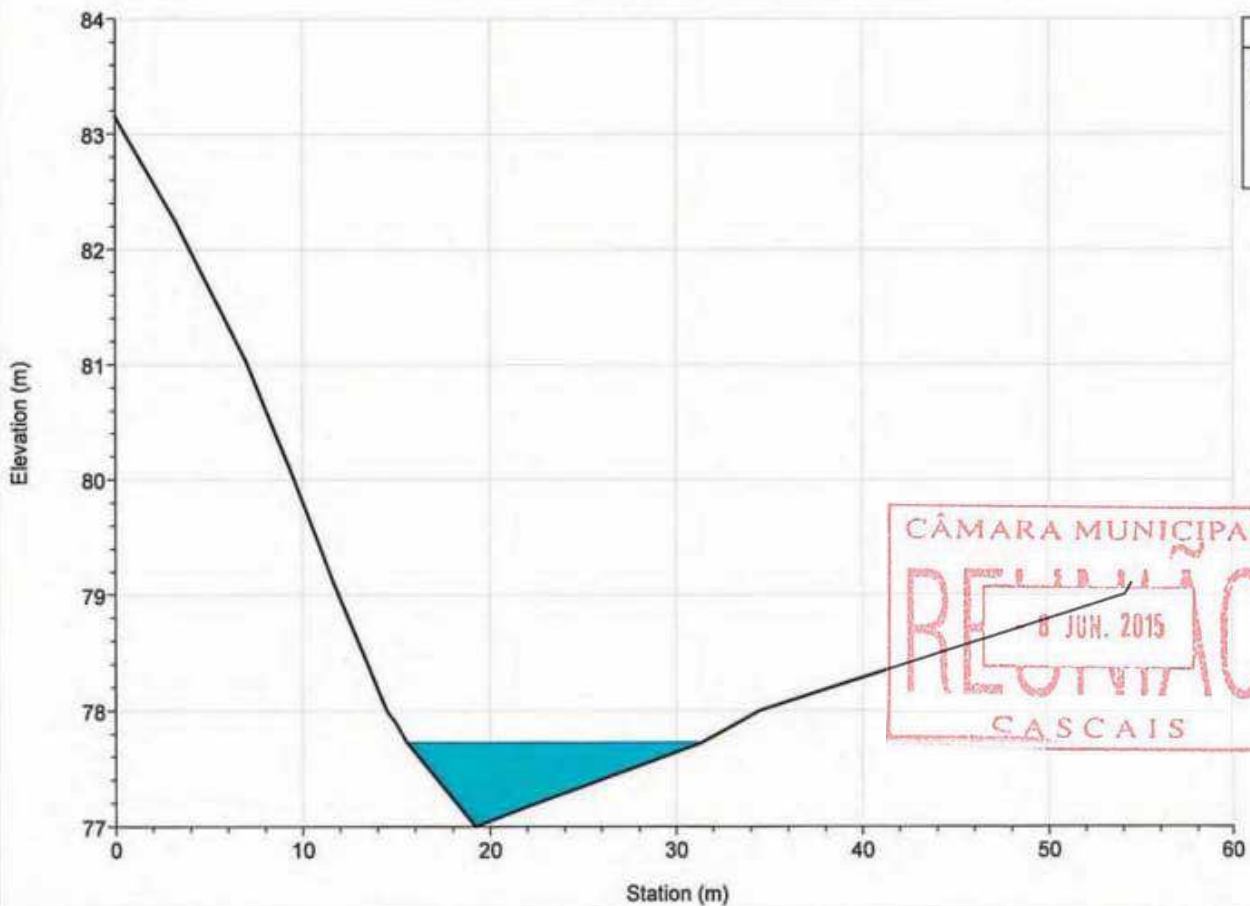


River = ME1-md2 Reach = afluente RS = 297.875



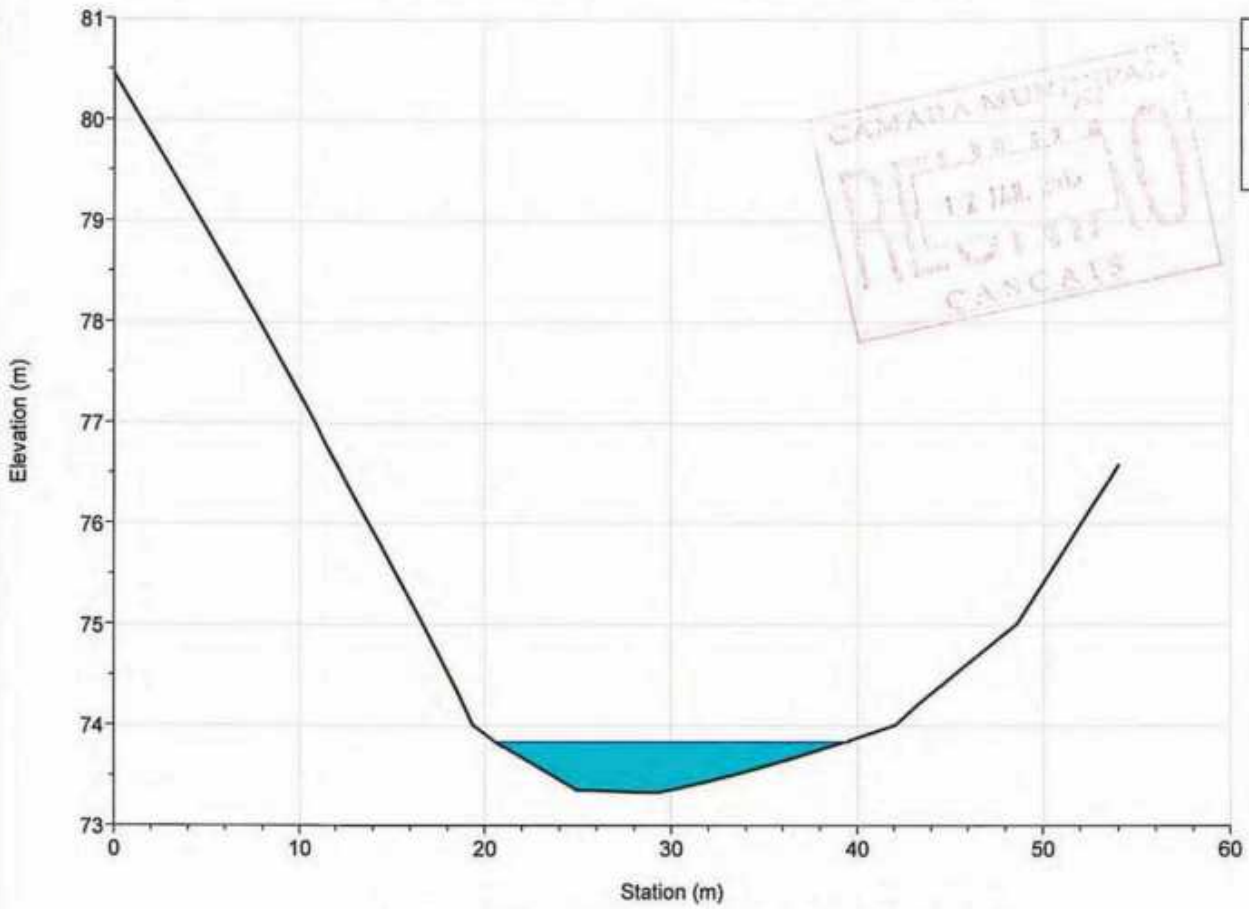
Legend	
WS T=100 anos	
Ground	
Bank Sta	

River = ME1-md2 Reach = afluente RS = 211.432

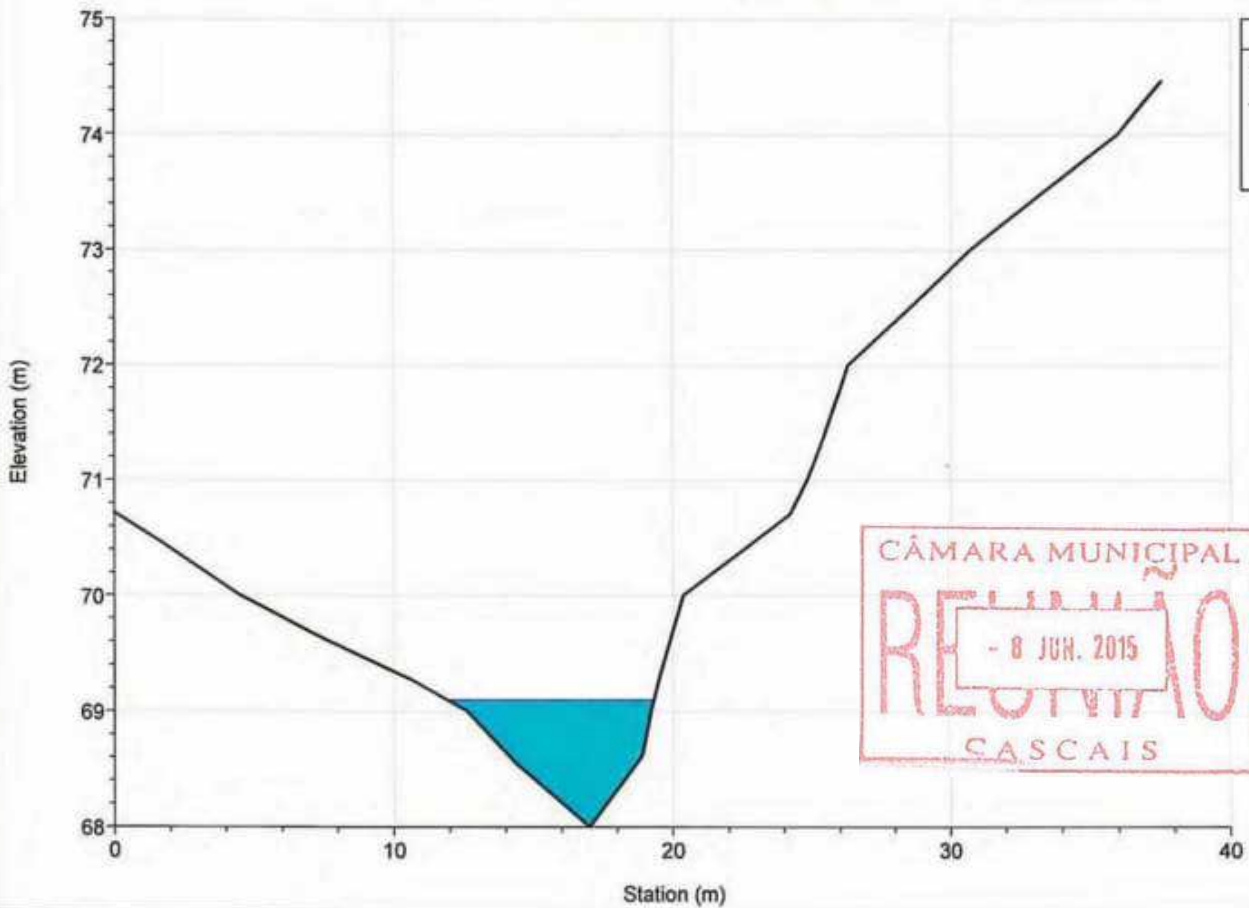


Legend	
WS T=100 anos	
Ground	
Bank Sta	

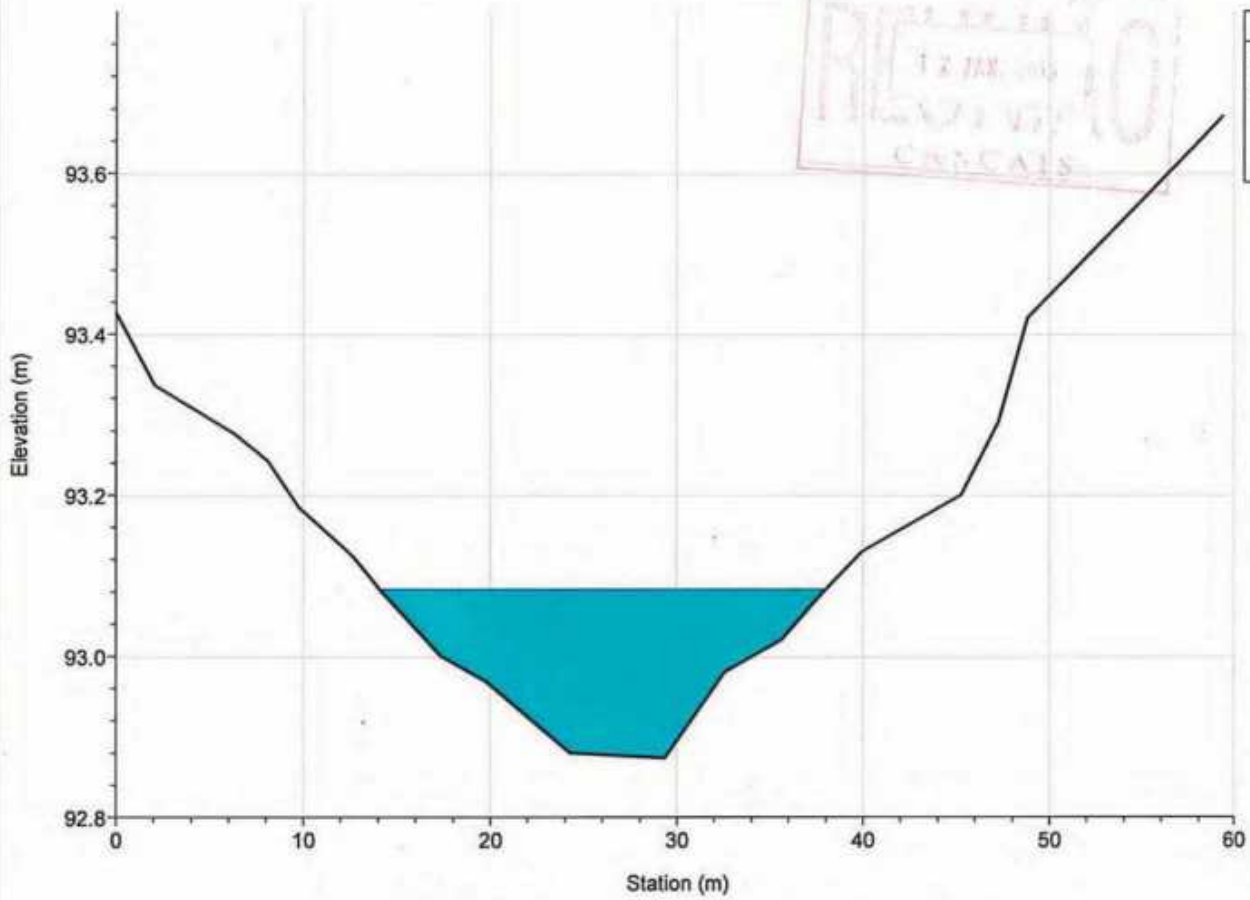
River = ME1-md2 Reach = afluyente RS = 112.011



River = ME1-md2 Reach = afluyente RS = 17.063

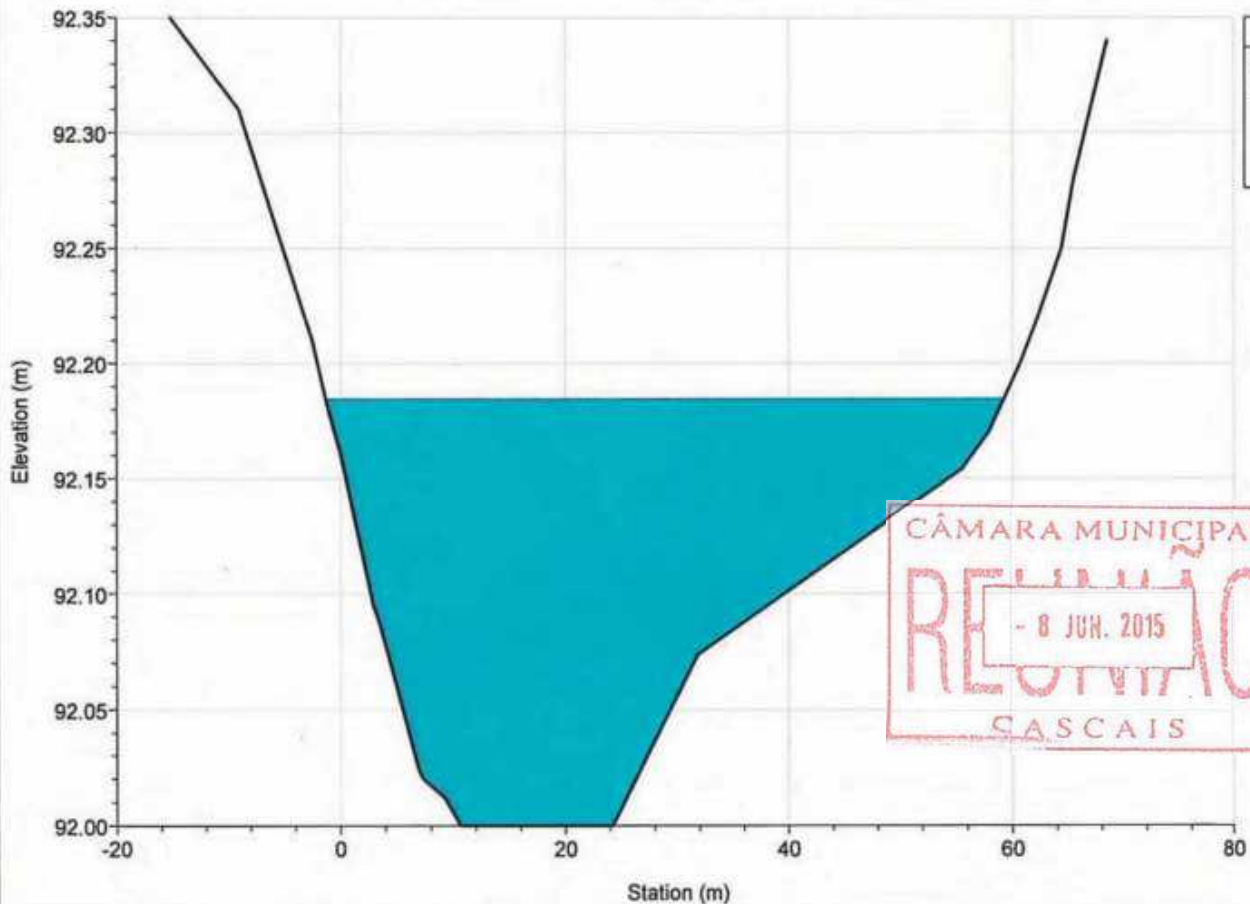


River = ME2 Reach = afluente RS = 2235.112



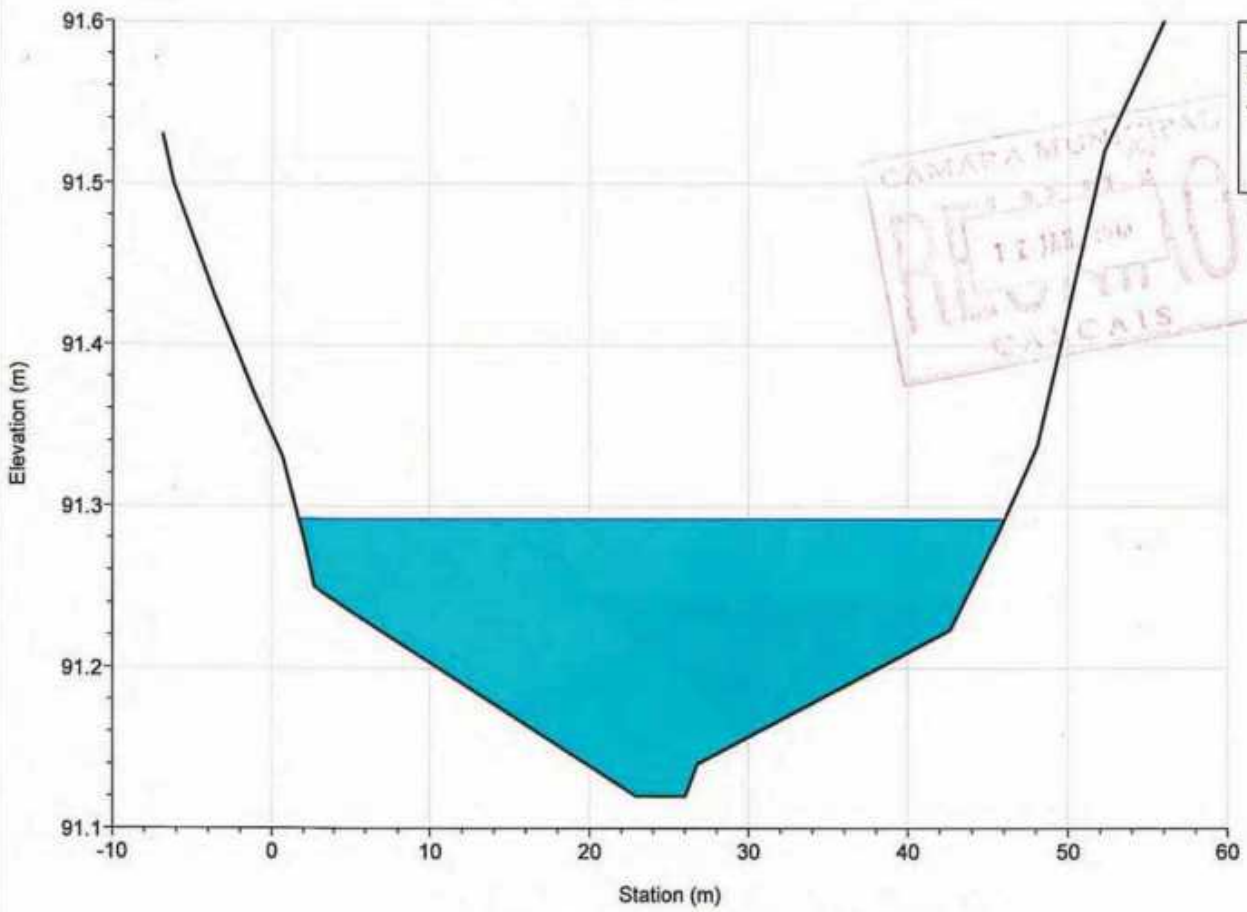
Legend	
WS T=100 anos	
Ground	
Bank Sta	

River = ME2 Reach = afluente RS = 2159.483



Legend	
WS T=100 anos	
Ground	
Bank Sta	

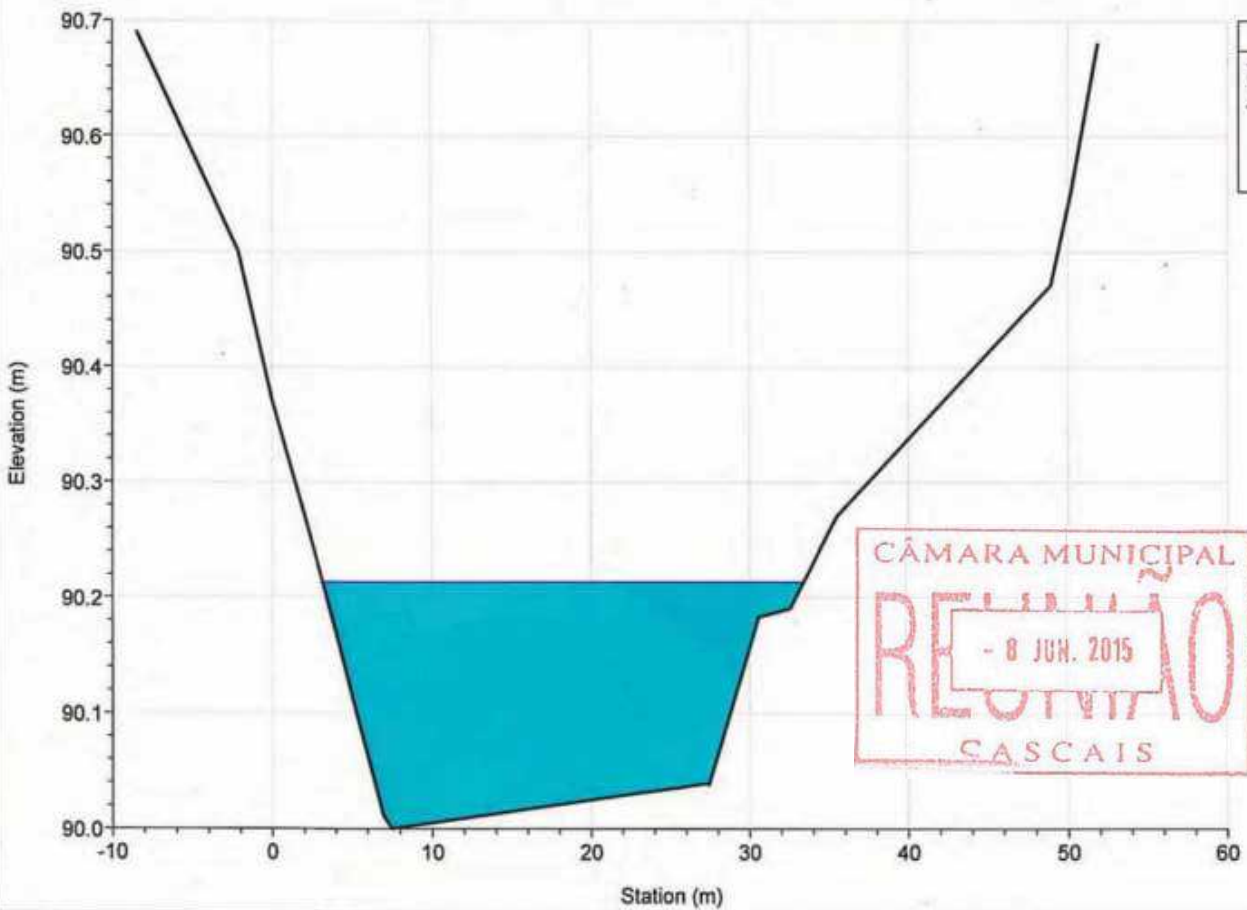
River = ME2 Reach = afluente RS = 2051.609



Legend
WS T=100 anos
Ground
Bank Sta

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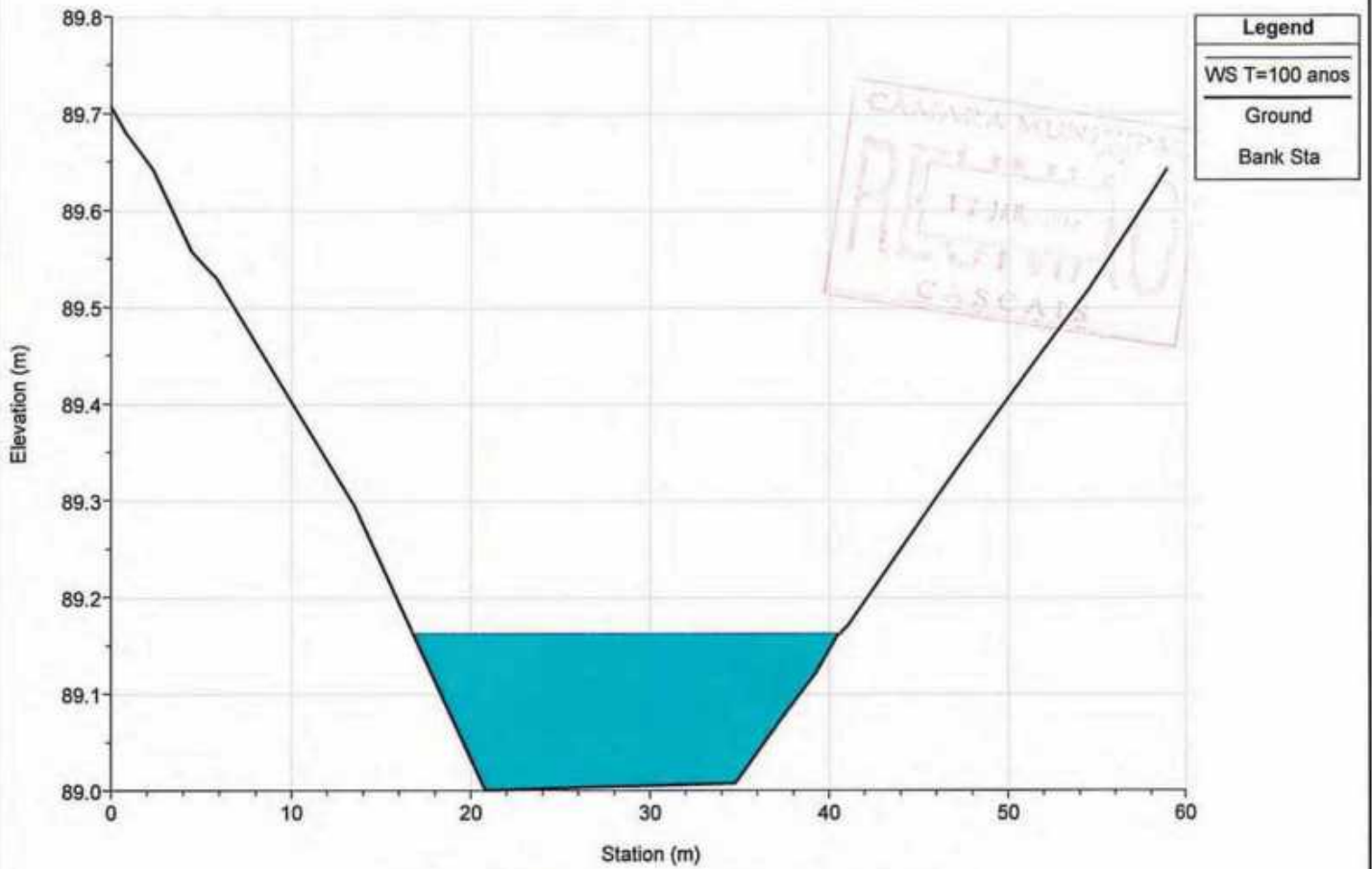
River = ME2 Reach = afluente RS = 1934.692



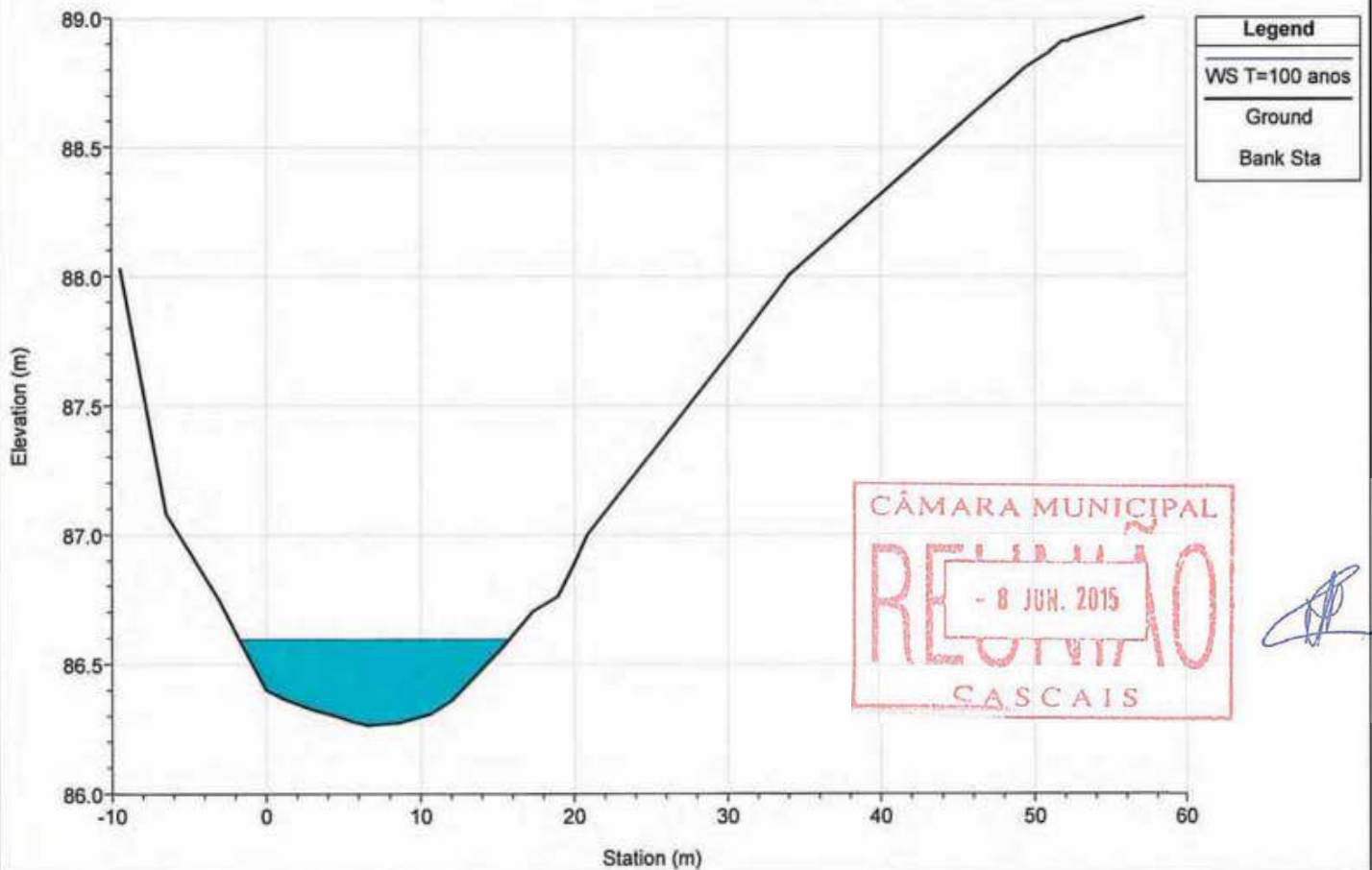
Legend
WS T=100 anos
Ground
Bank Sta

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RECEBIMOS  
- 8 JUN. 2015  
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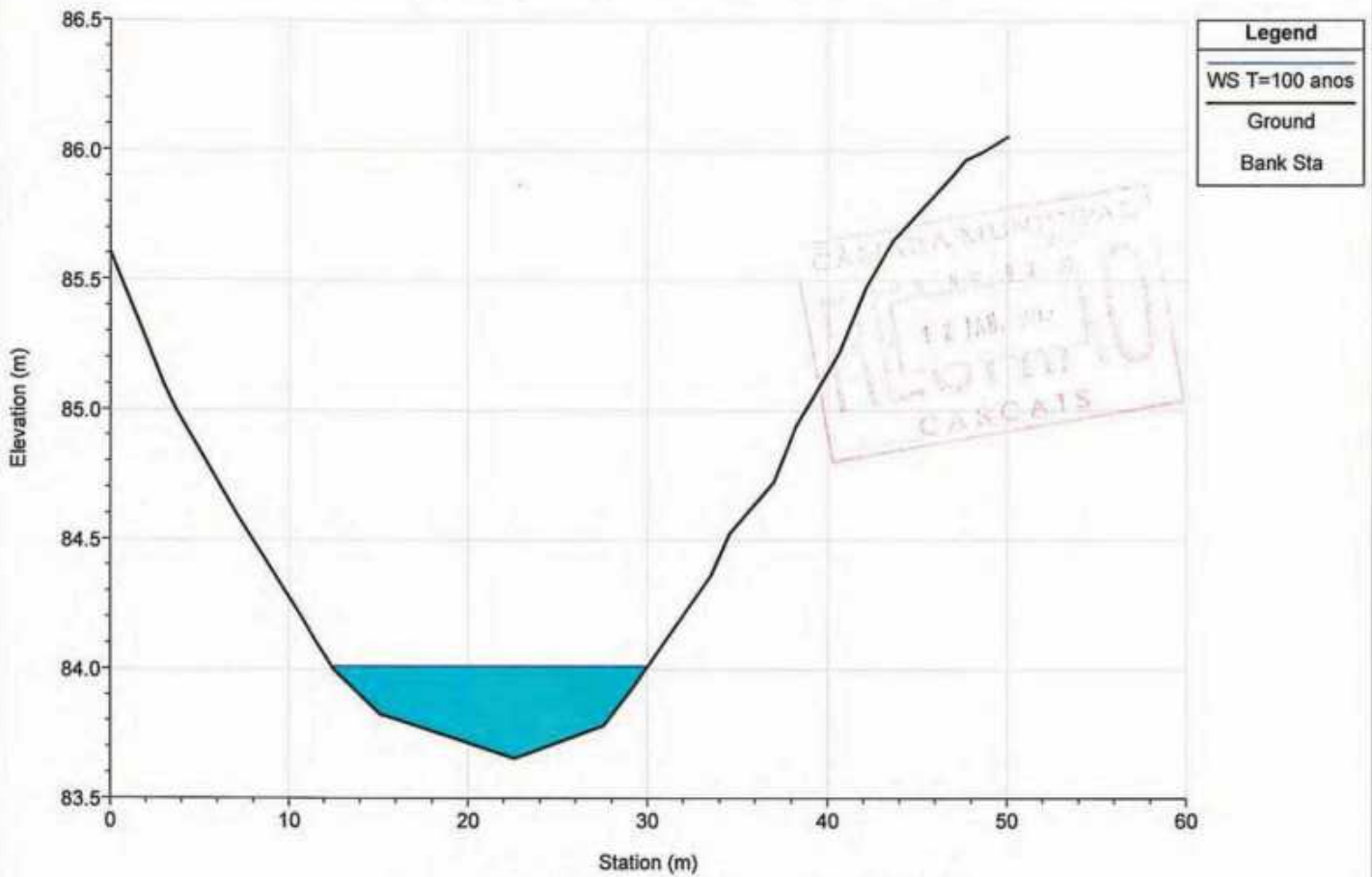
River = ME2 Reach = afluyente RS = 1850.067



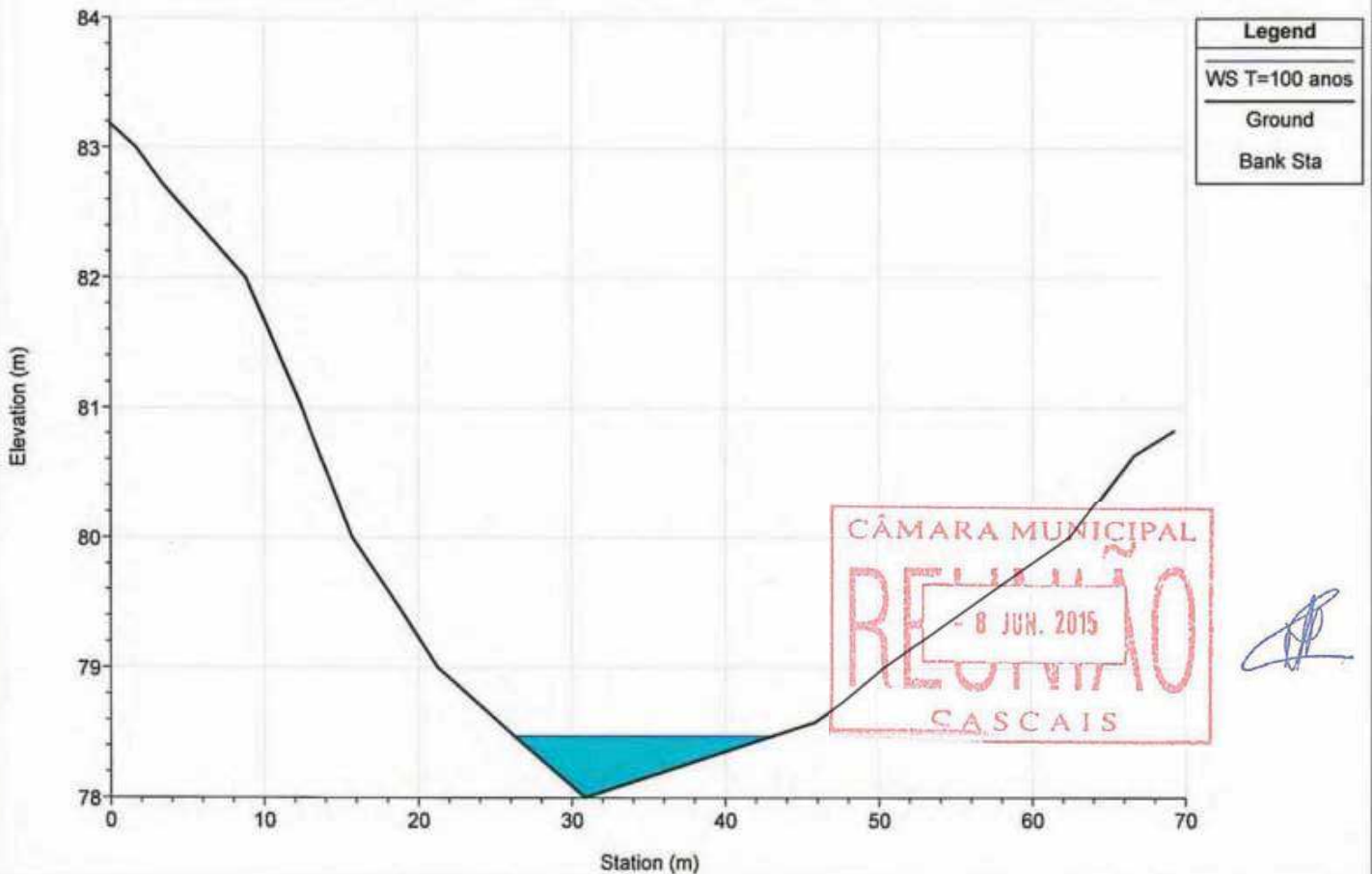
River = ME2 Reach = afluyente RS = 1790.884



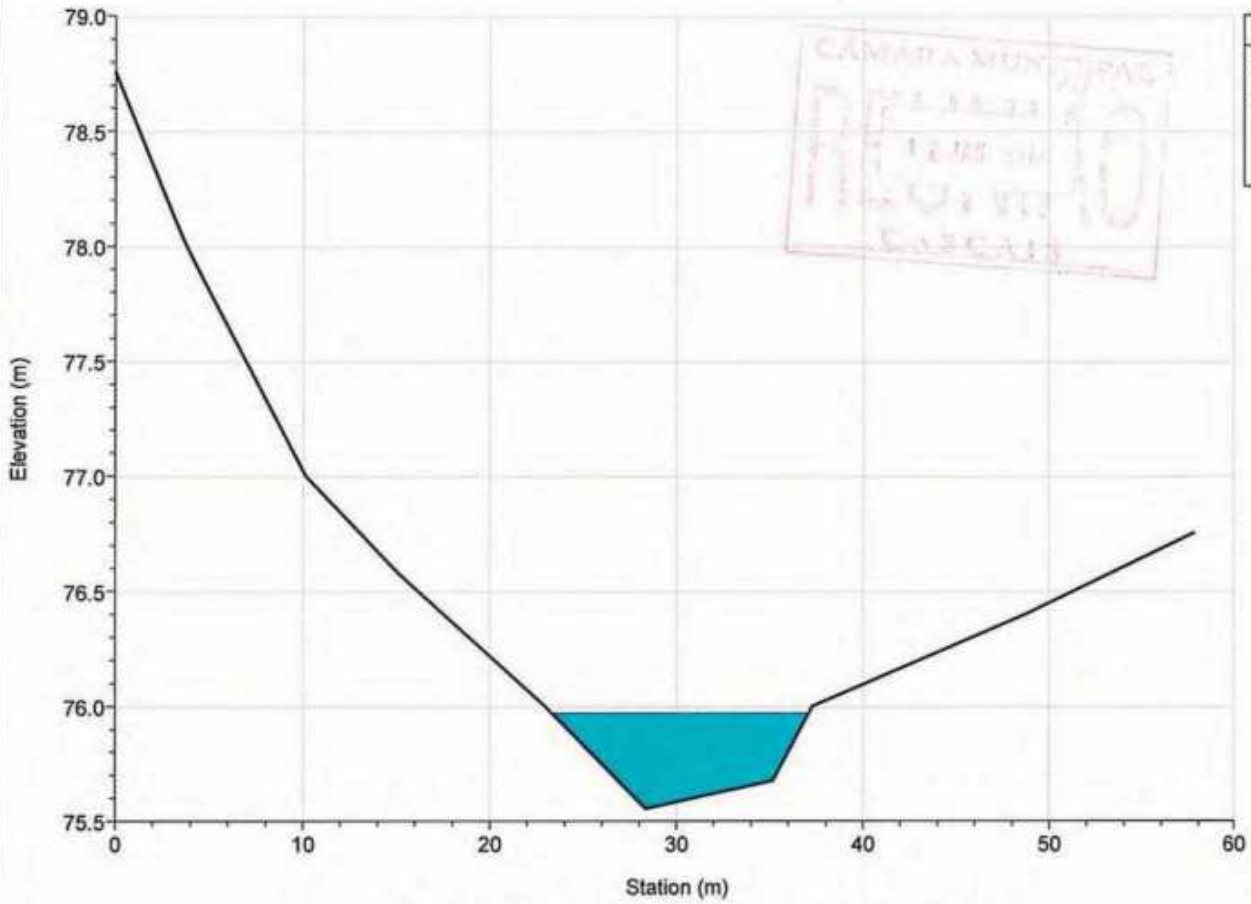
River = ME2 Reach = afluente RS = 1688.612



River = ME2 Reach = afluente RS = 1551.560

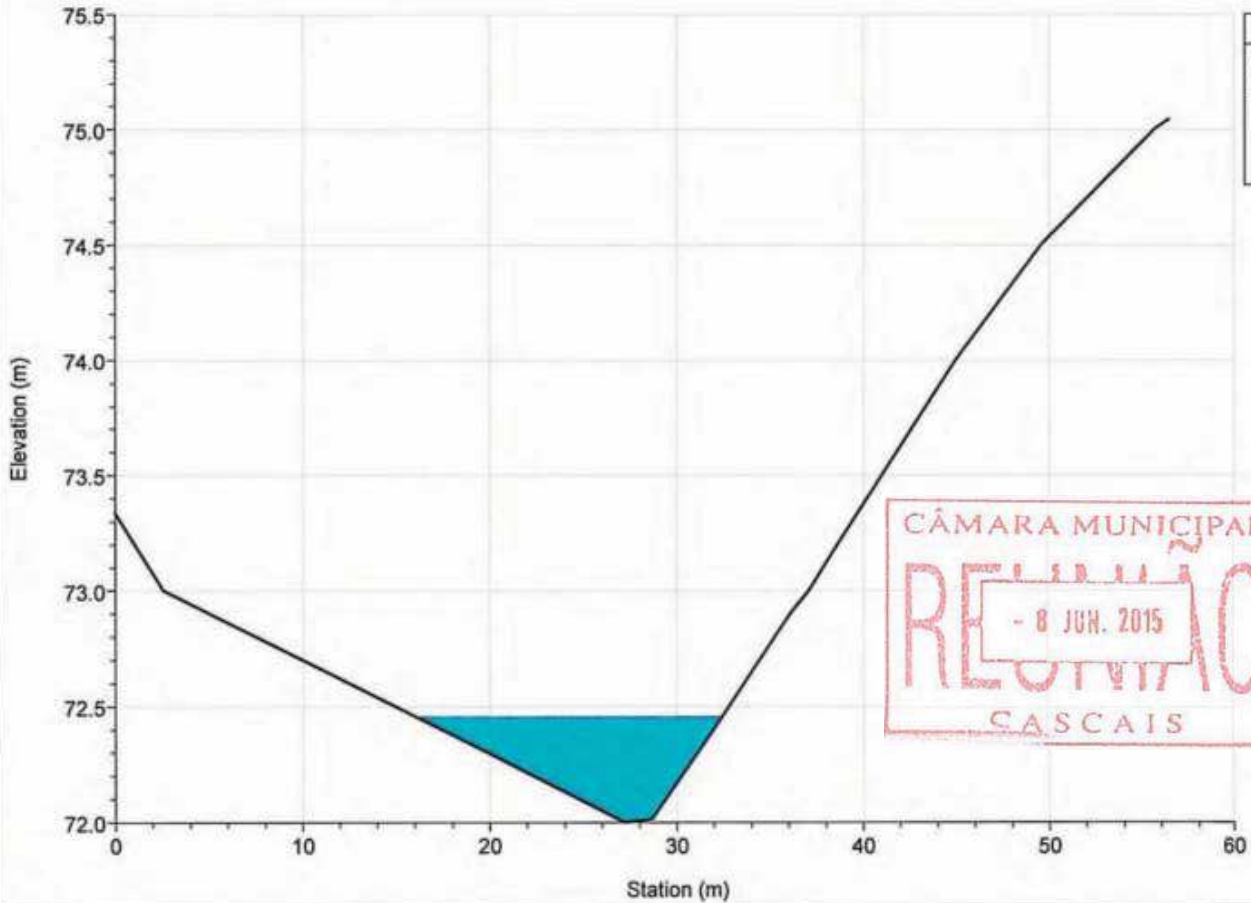


River = ME2 Reach = afluente RS = 1440.933



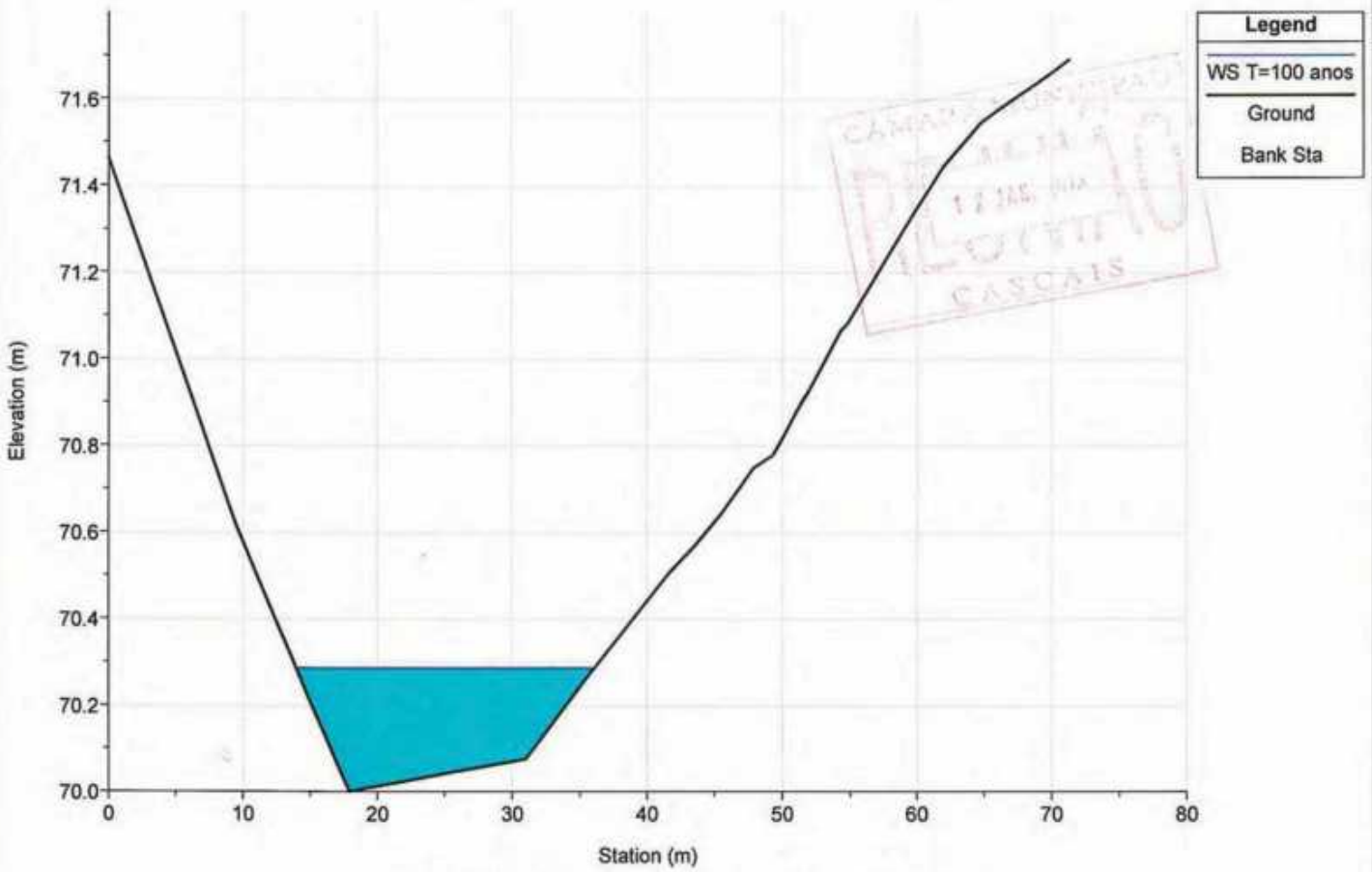
Legend
WS T=100 anos
Ground
Bank Sta

River = ME2 Reach = afluente RS = 1345.794

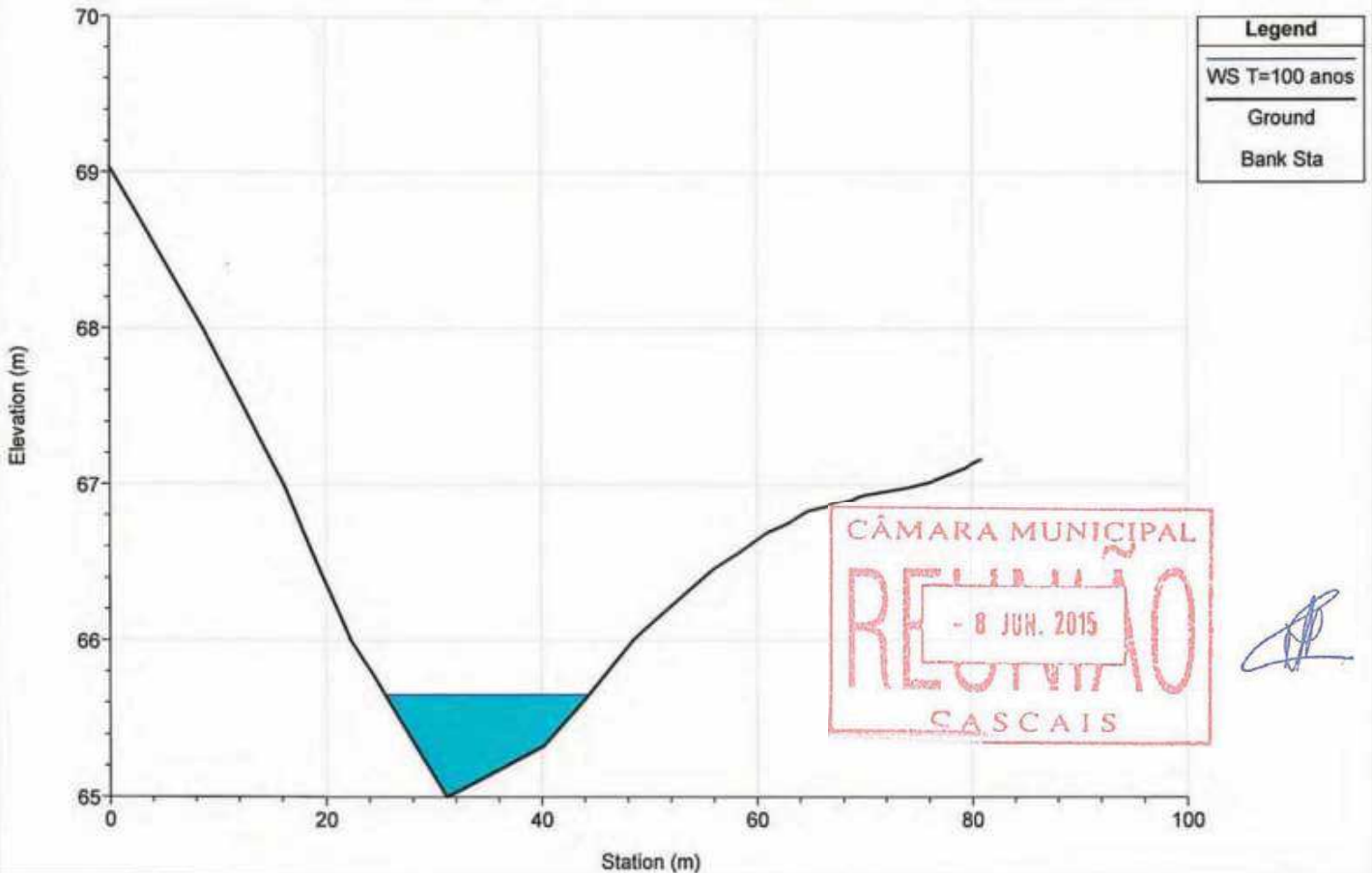


Legend
WS T=100 anos
Ground
Bank Sta

River = ME2 Reach = afluente RS = 1242.073

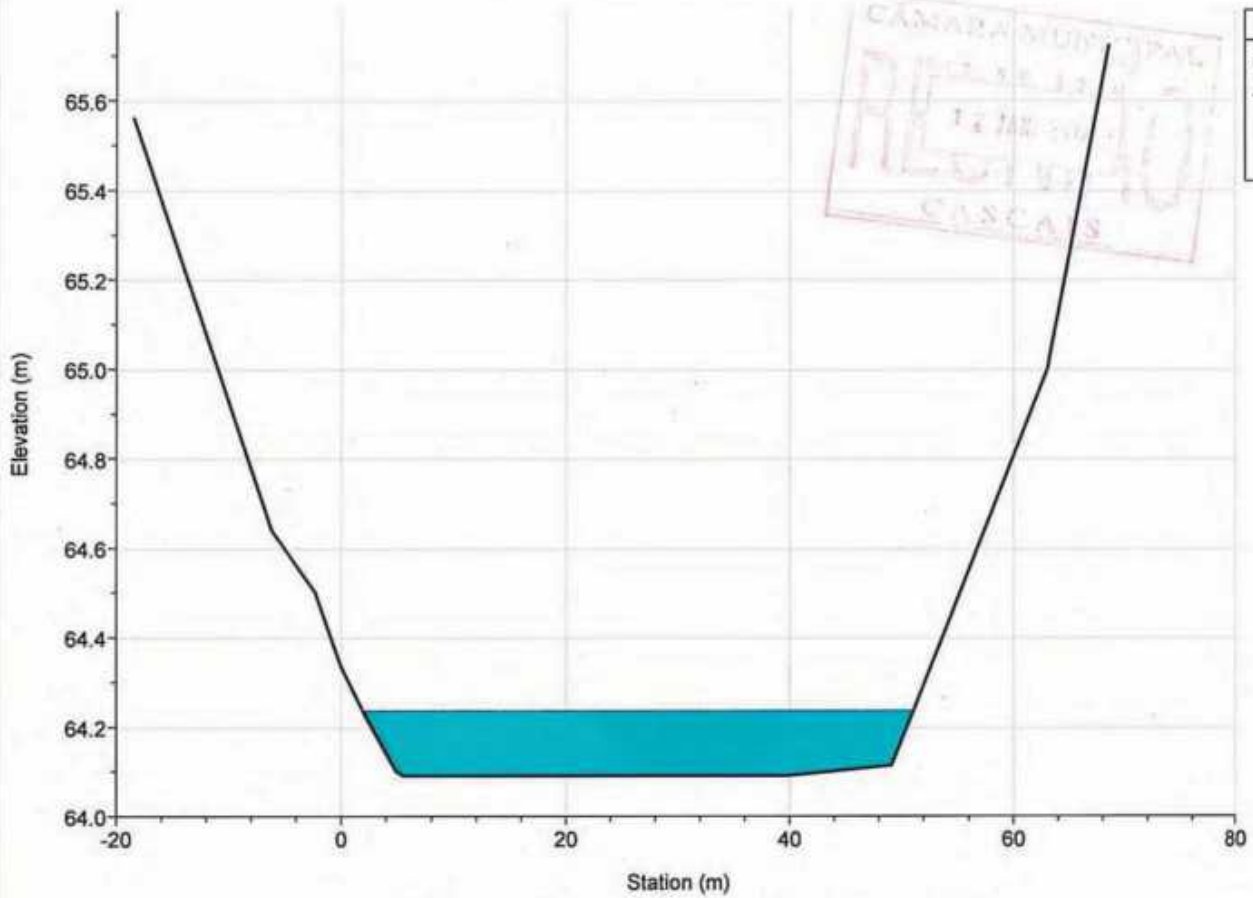


River = ME2 Reach = afluente RS = 1095.437



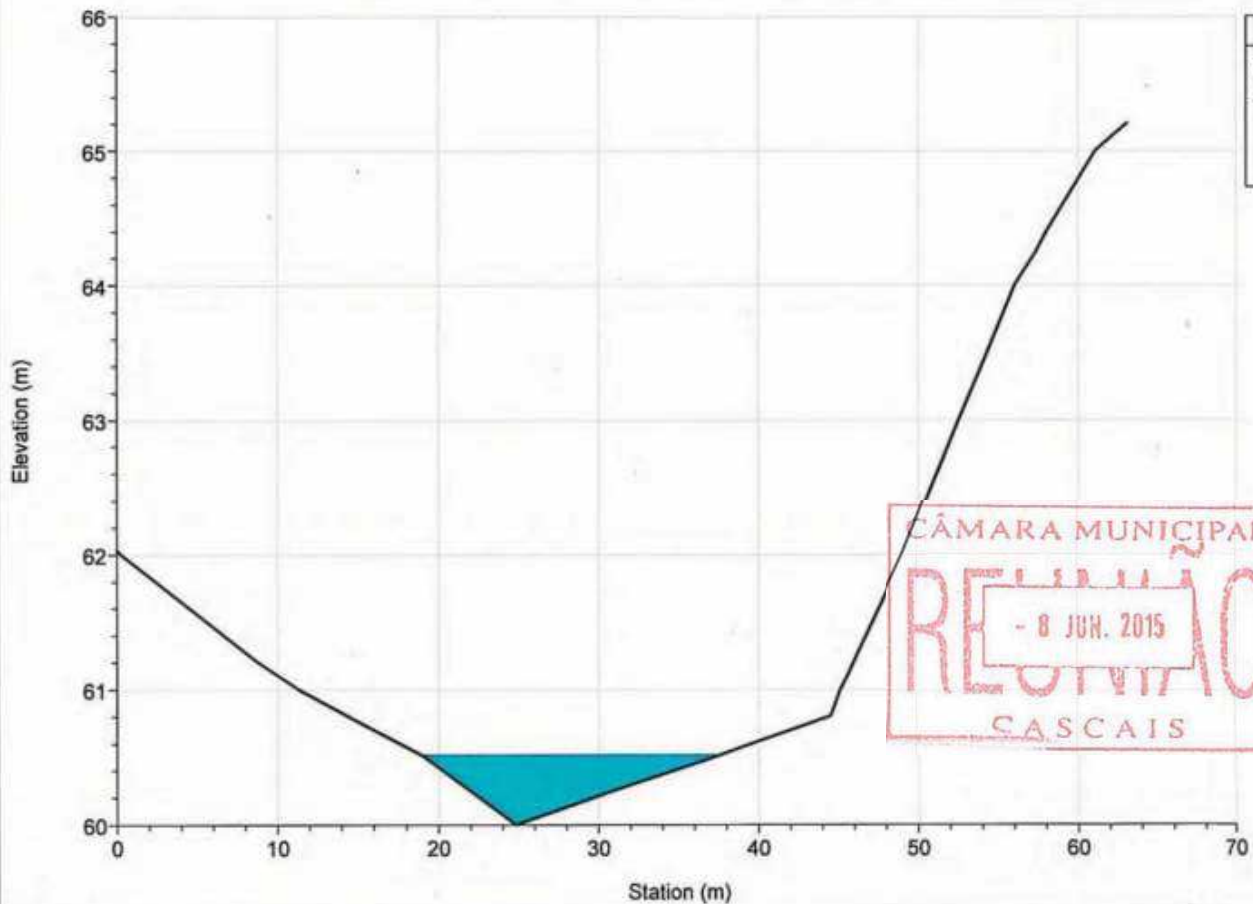


River = ME2 Reach = afluente RS = 955.551



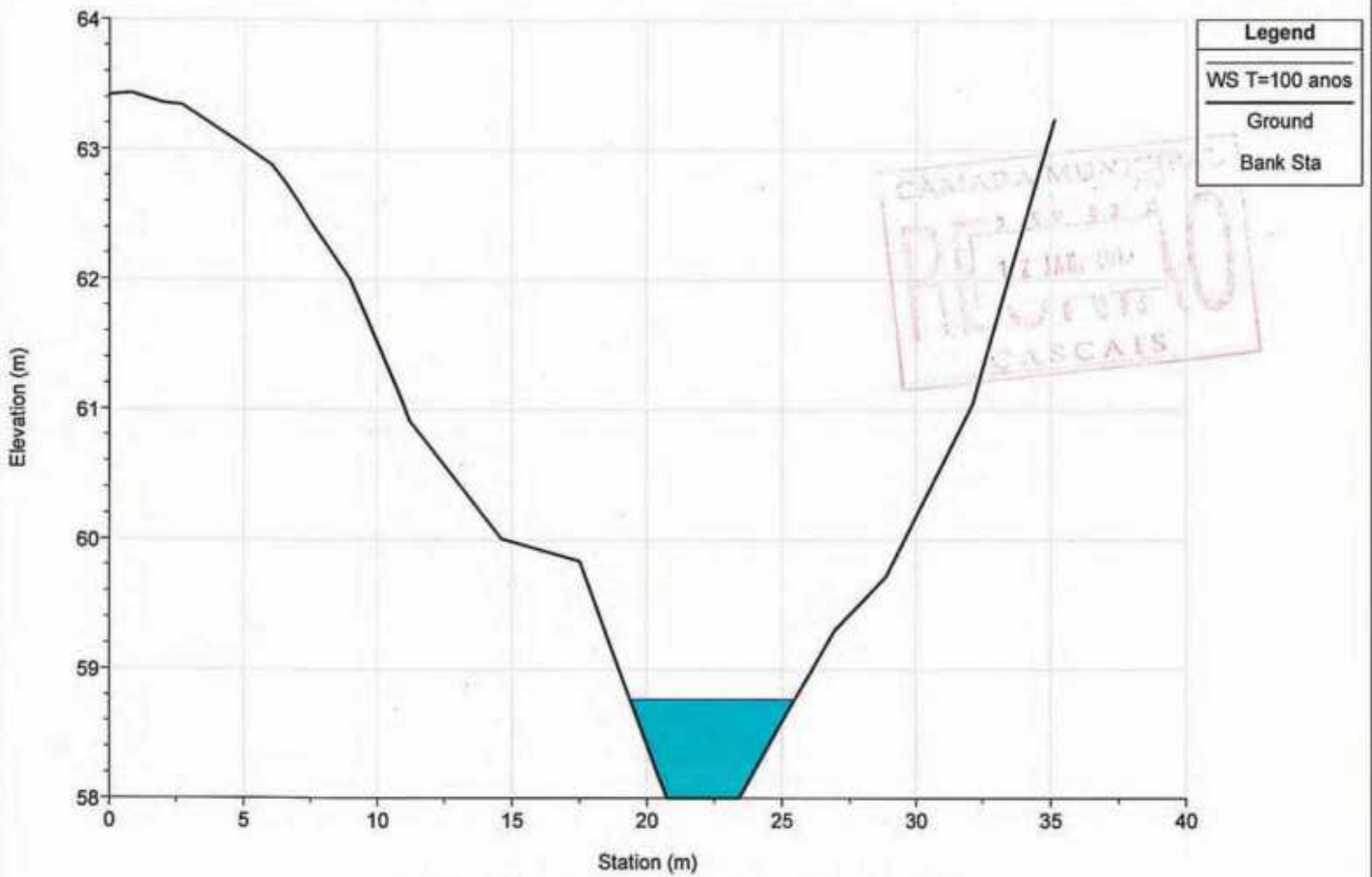
Legend
WS T=100 anos
Ground
Bank Sta

River = ME2 Reach = afluente RS = 838.944

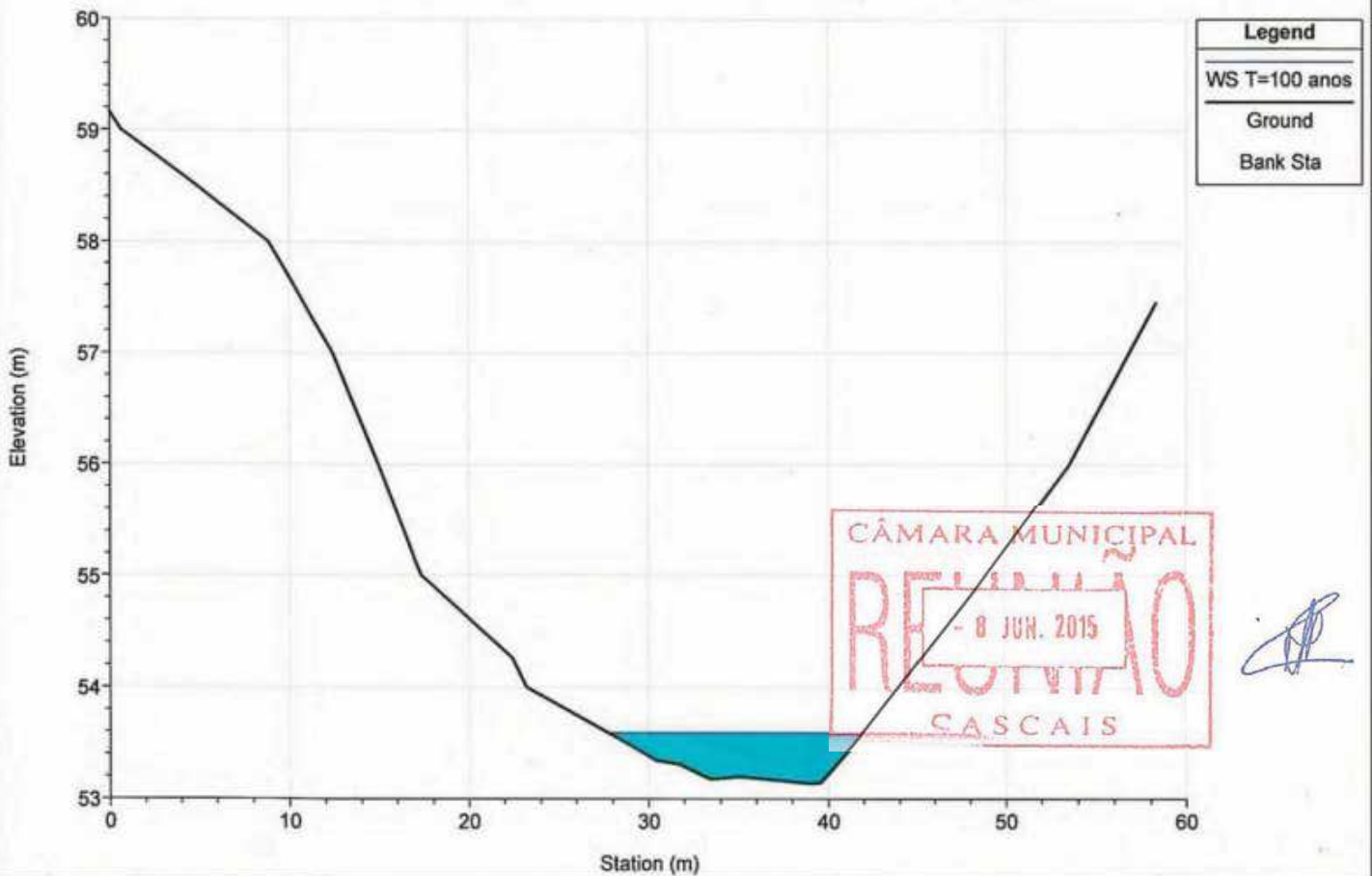


Legend
WS T=100 anos
Ground
Bank Sta

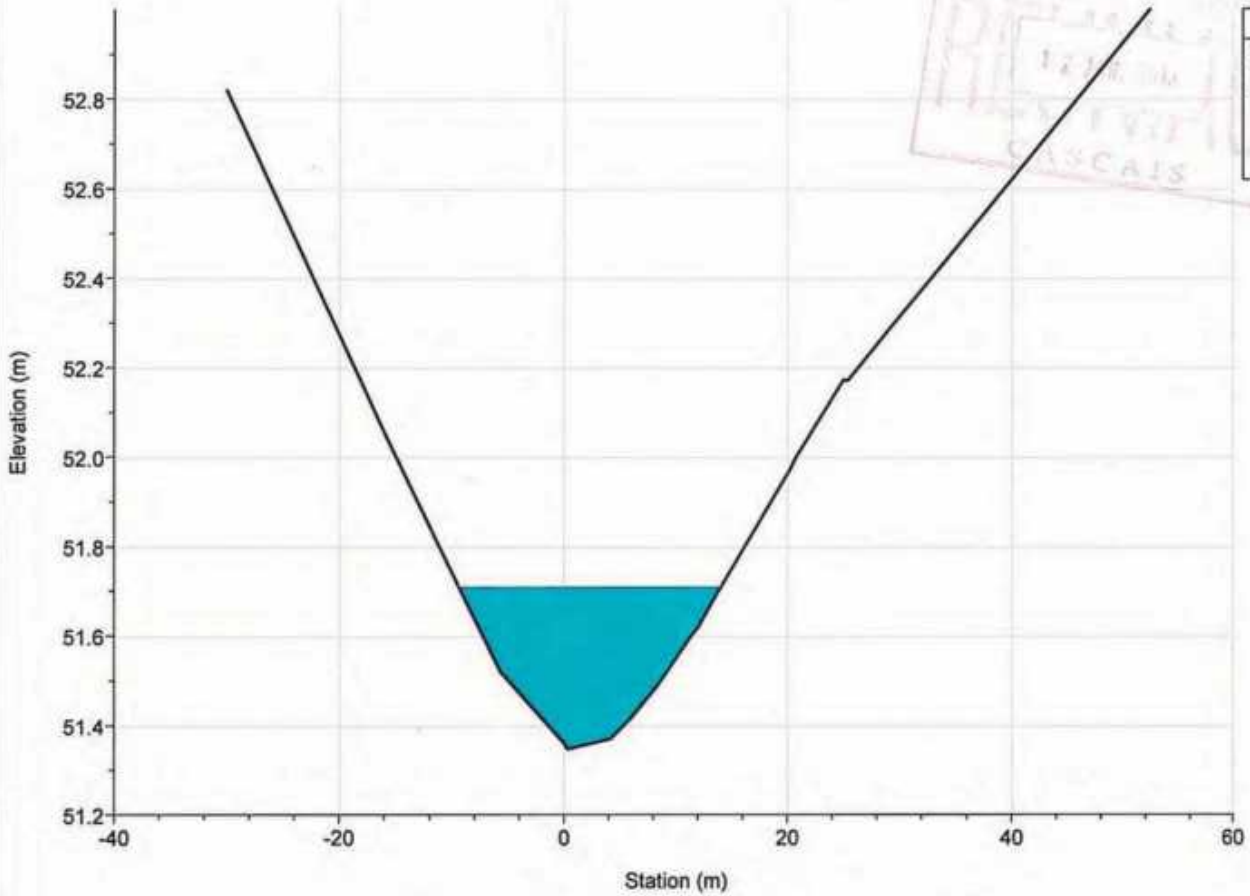
River = ME2 Reach = affluente RS = 756.409



River = ME2 Reach = affluente RS = 659.134

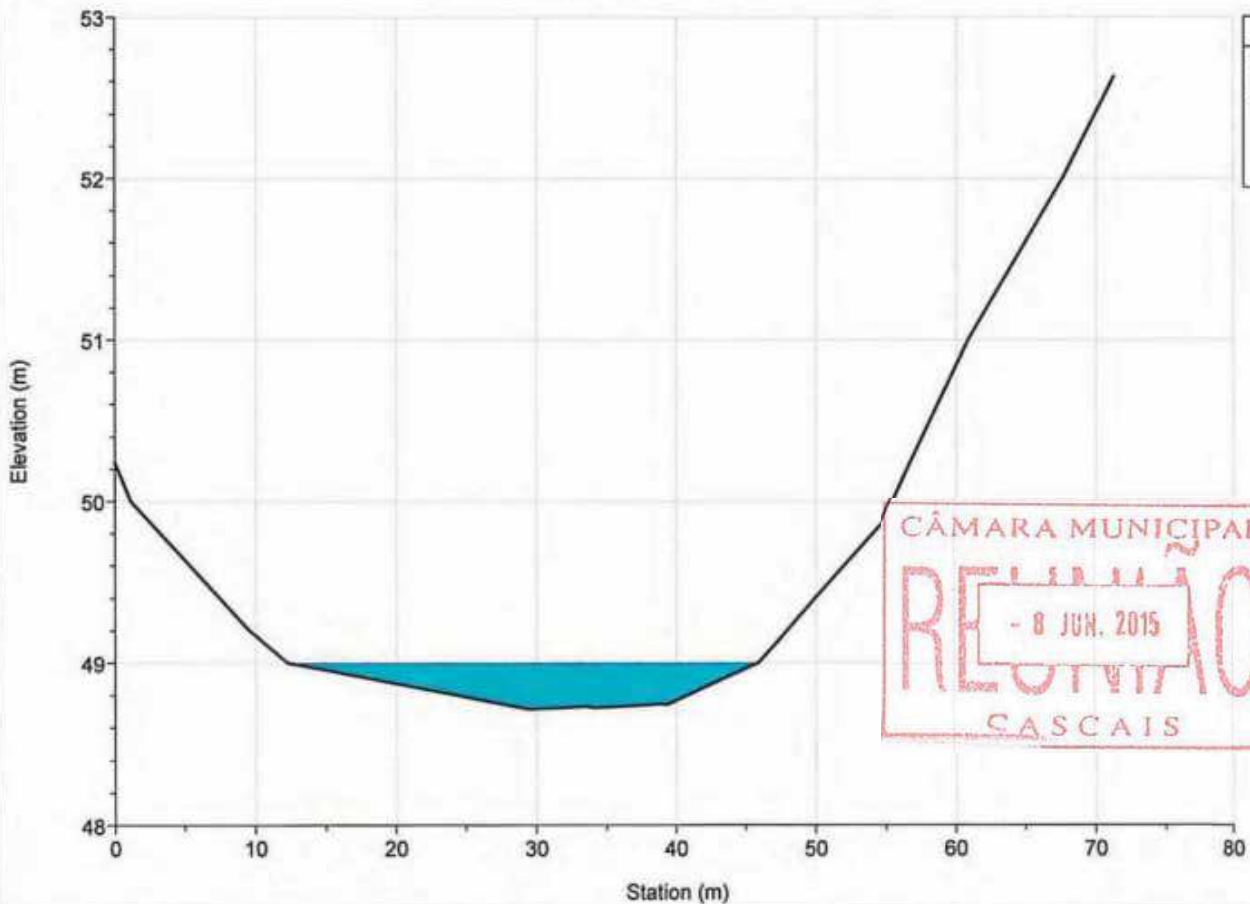


River = ME2 Reach = afluente RS = 570.263



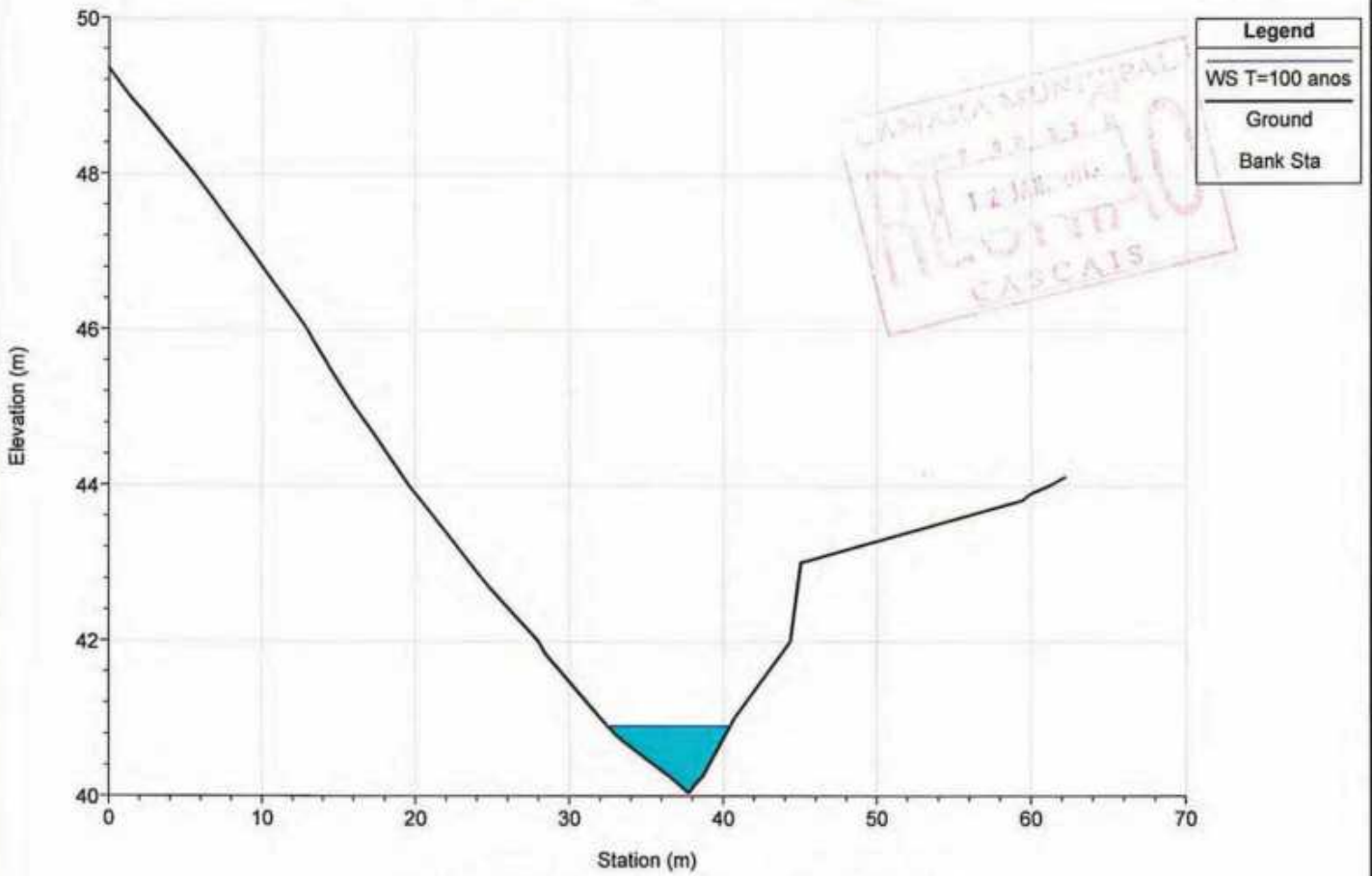
Legend	
WS T=100 anos	
Ground	
Bank Sta	

River = ME2 Reach = afluente RS = 448.388

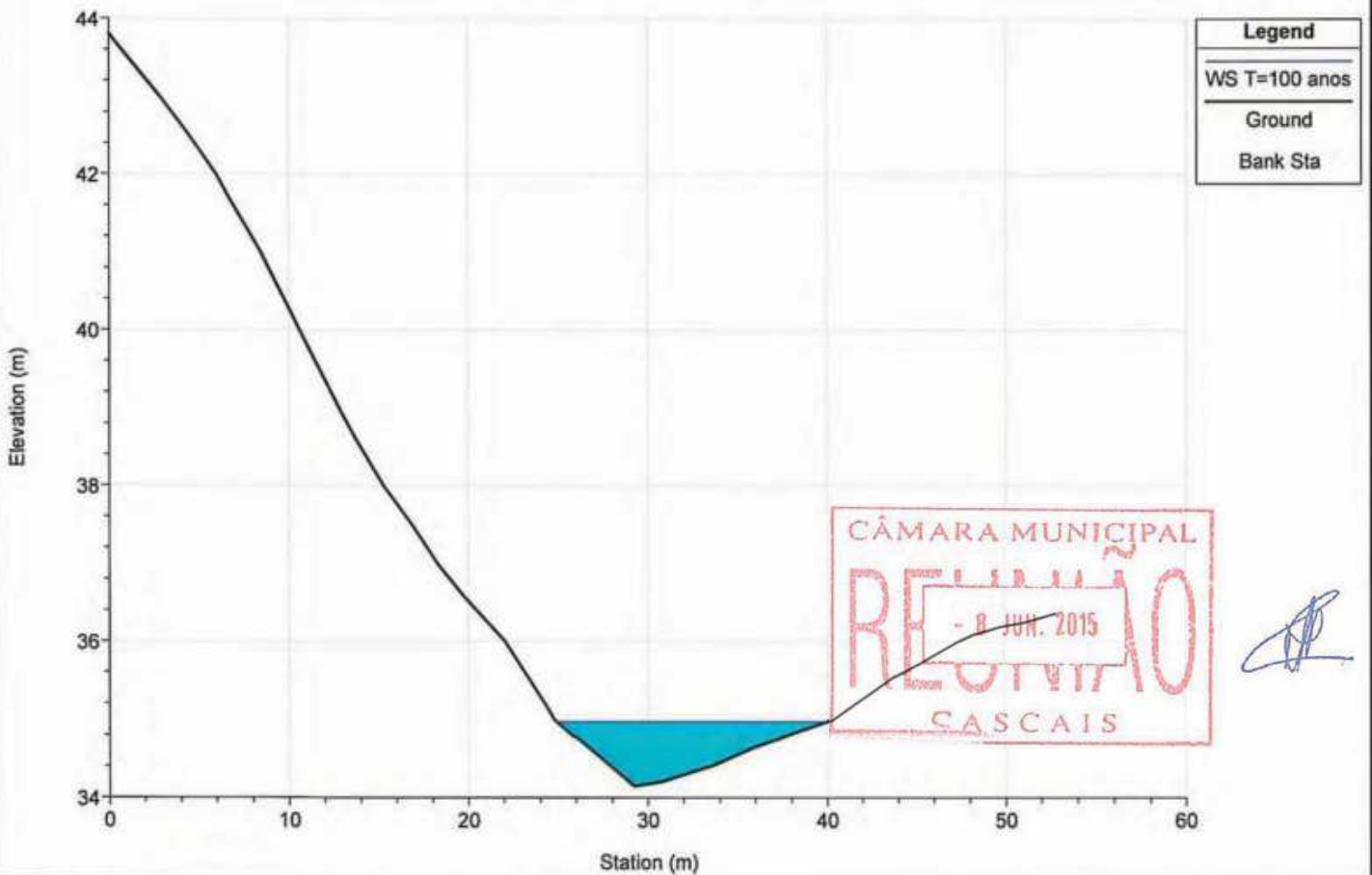


Legend	
WS T=100 anos	
Ground	
Bank Sta	

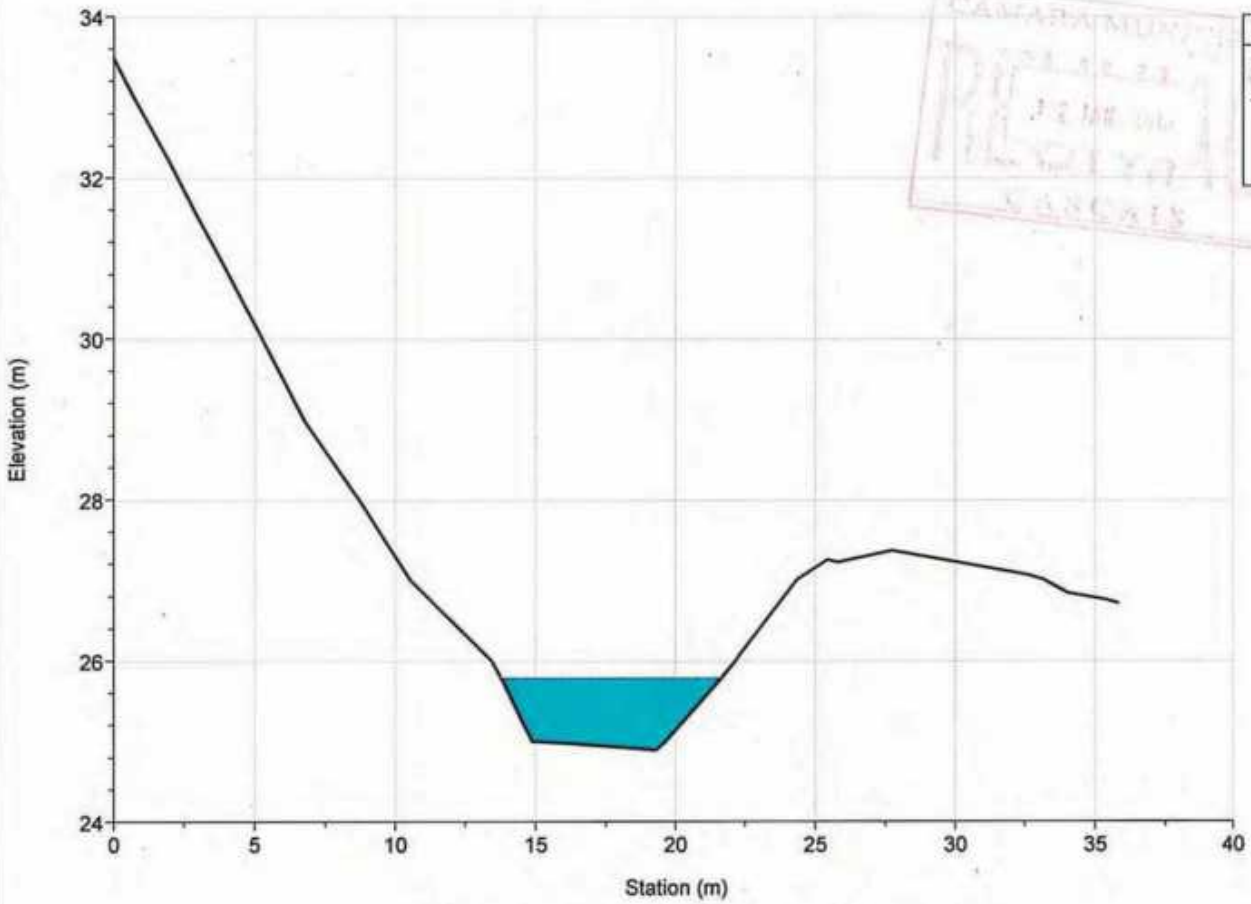
River = ME2 Reach = afluente RS = 328.619



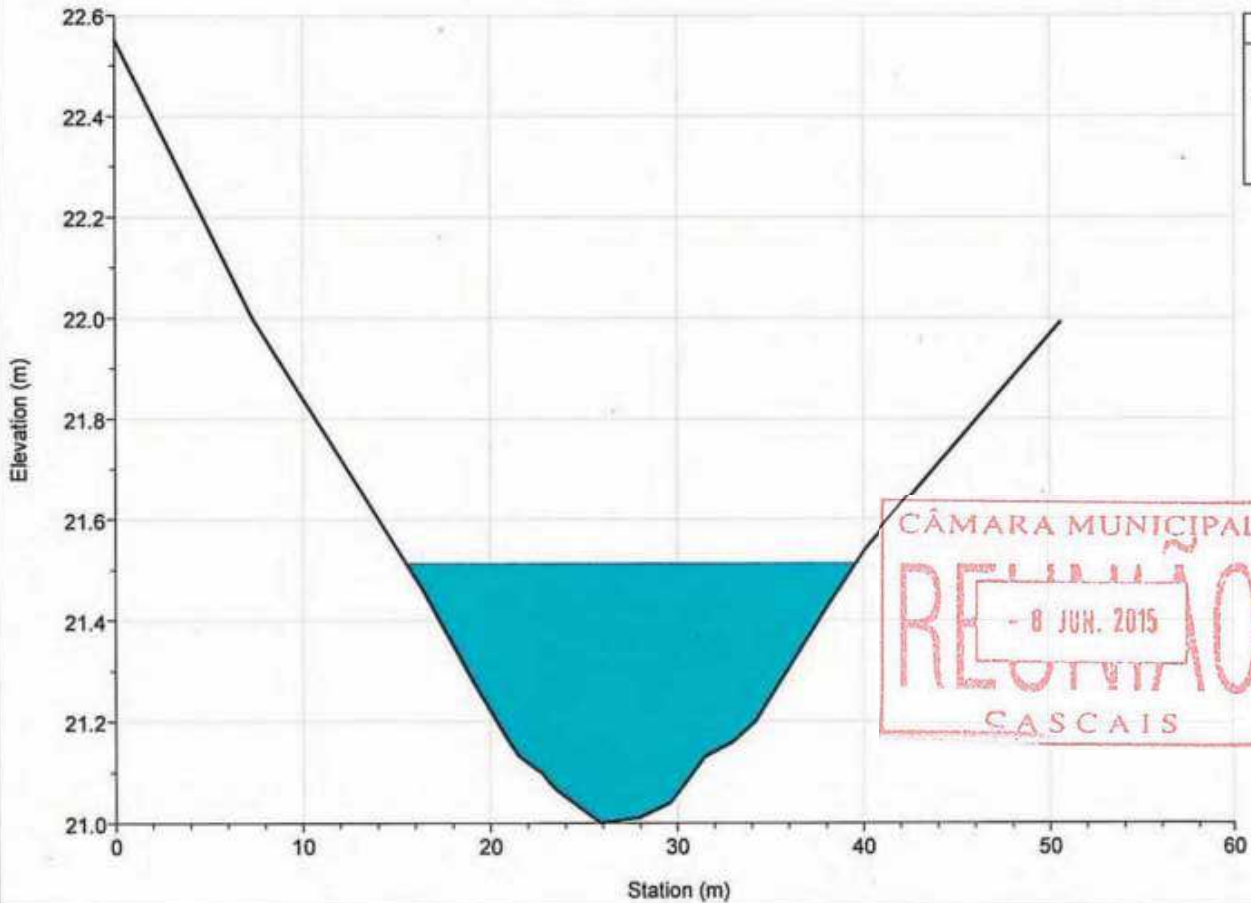
River = ME2 Reach = afluente RS = 245.105



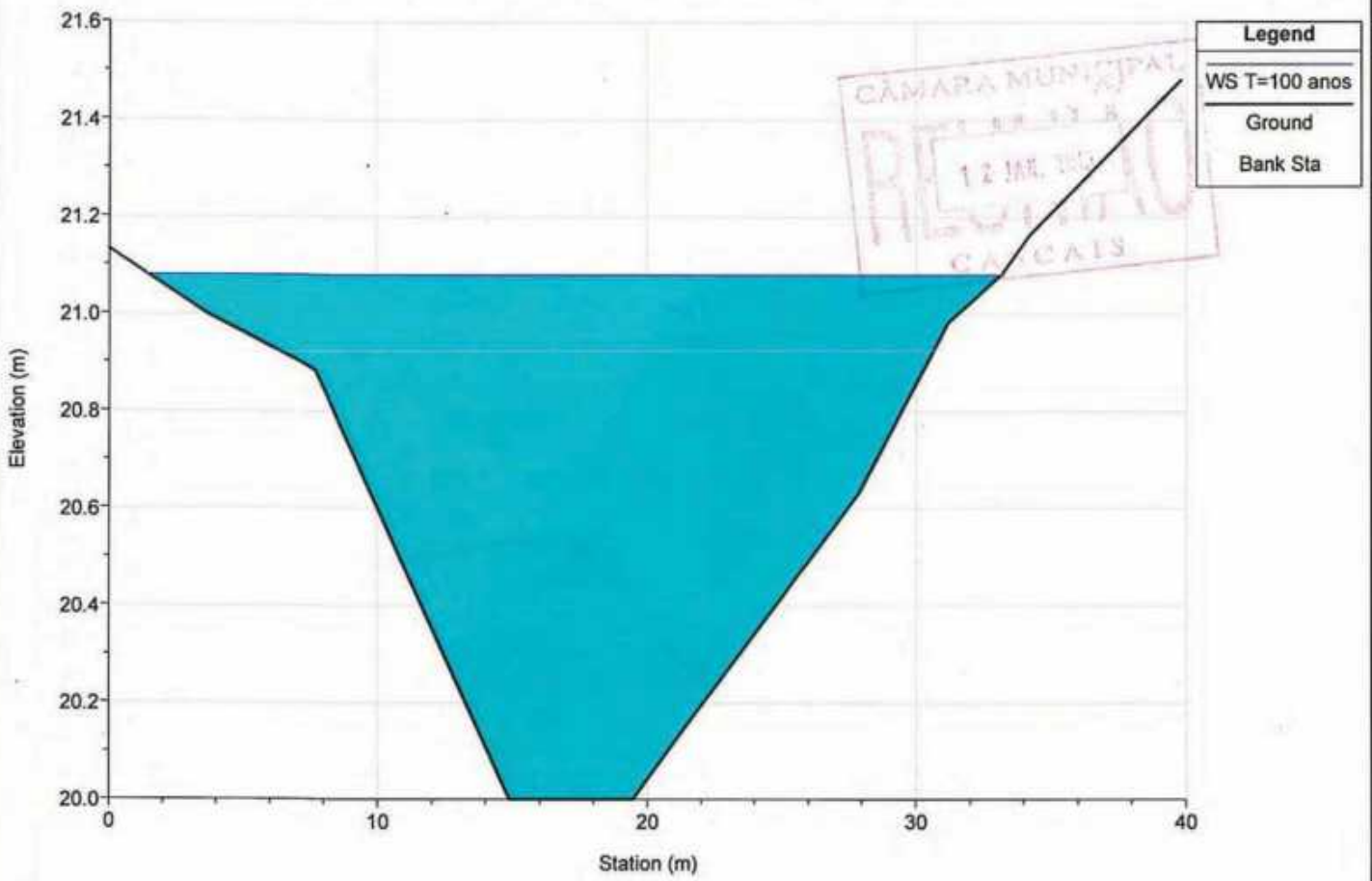
River = ME2 Reach = afluyente RS = 164.257



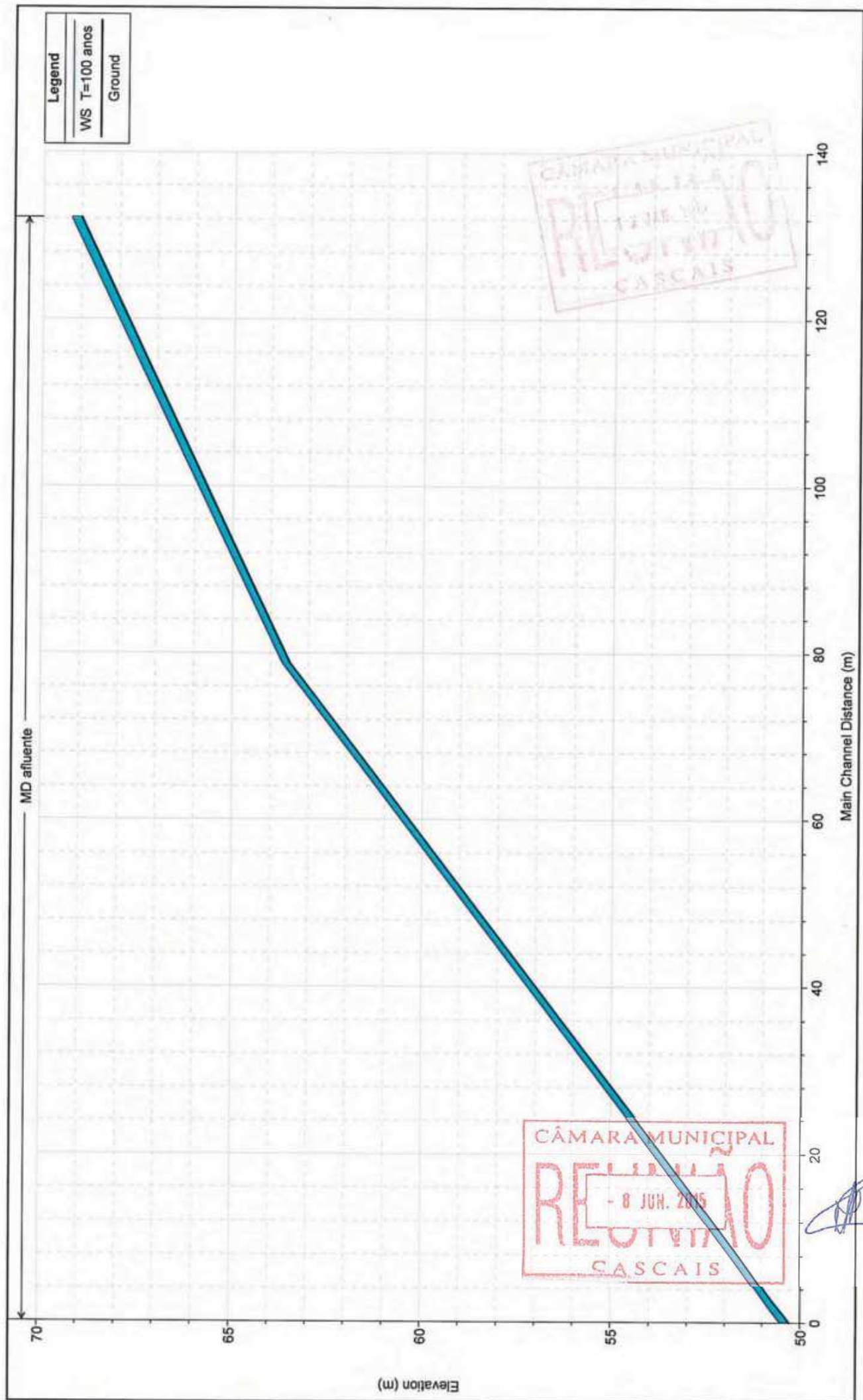
River = ME2 Reach = afluyente RS = 79.912



River = ME2 Reach = afluente RS = 39.144



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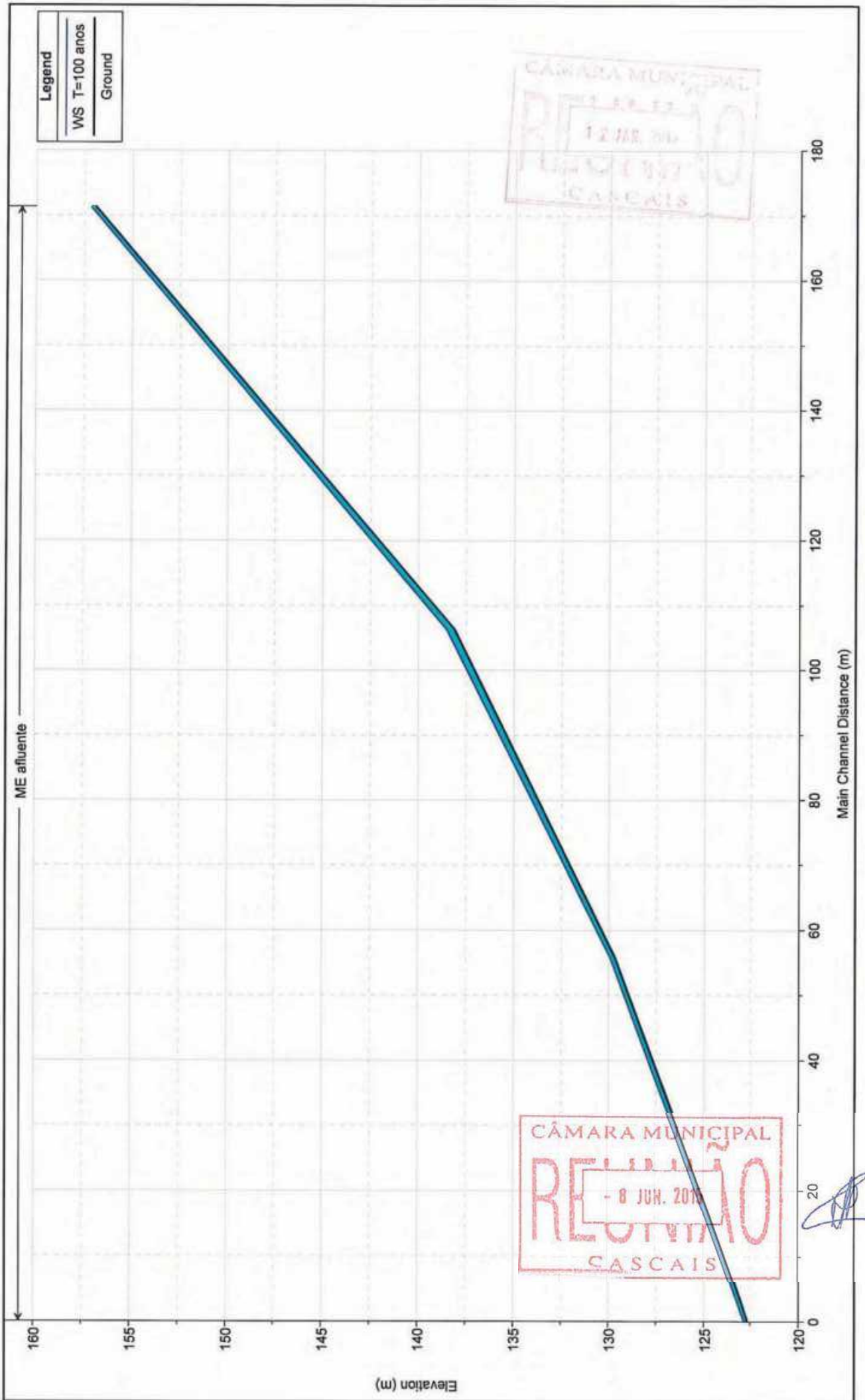


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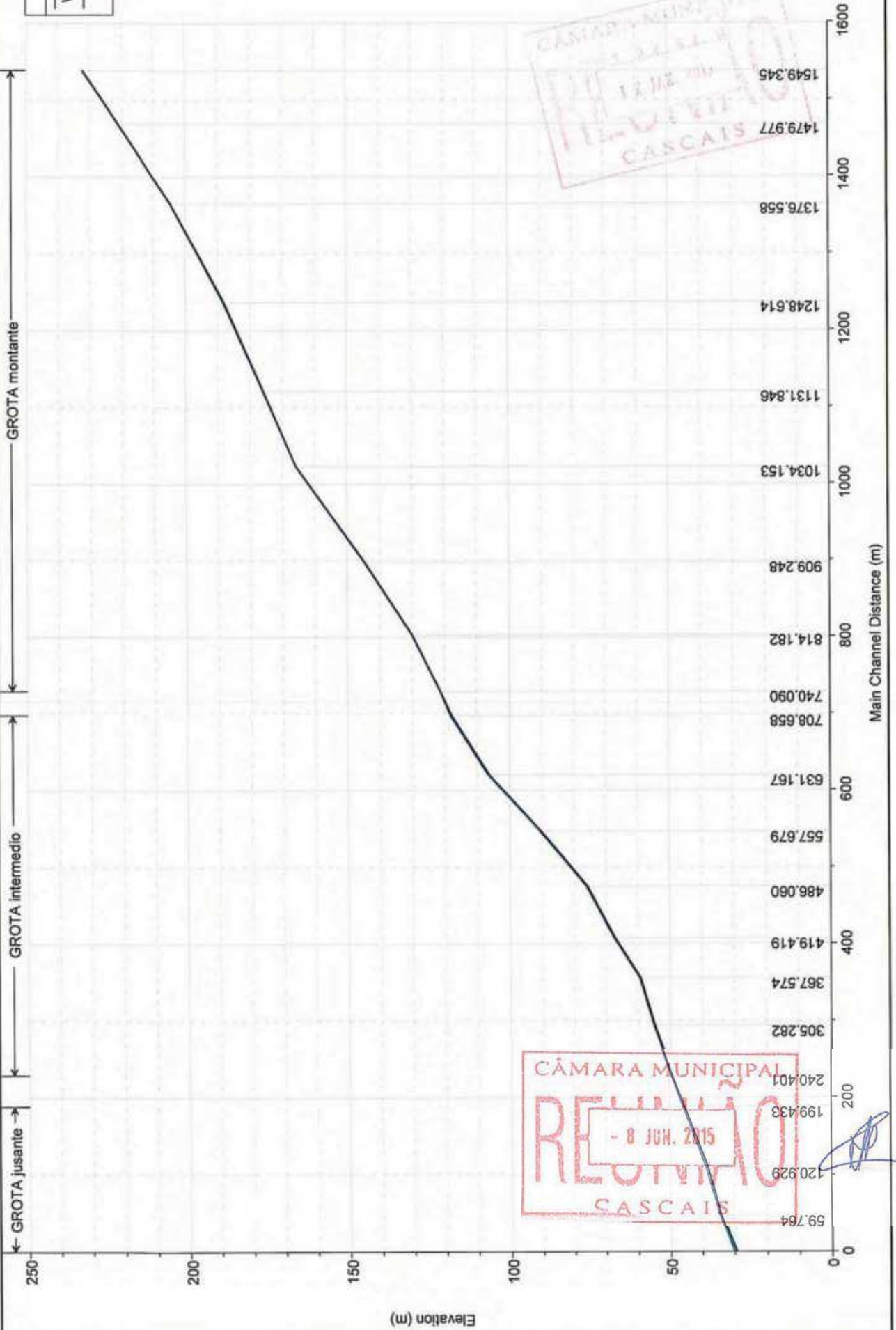
CÂMARA MUNICIPAL  
REUNIÃO  
- 8 JUN. 2015  
CASCAIS



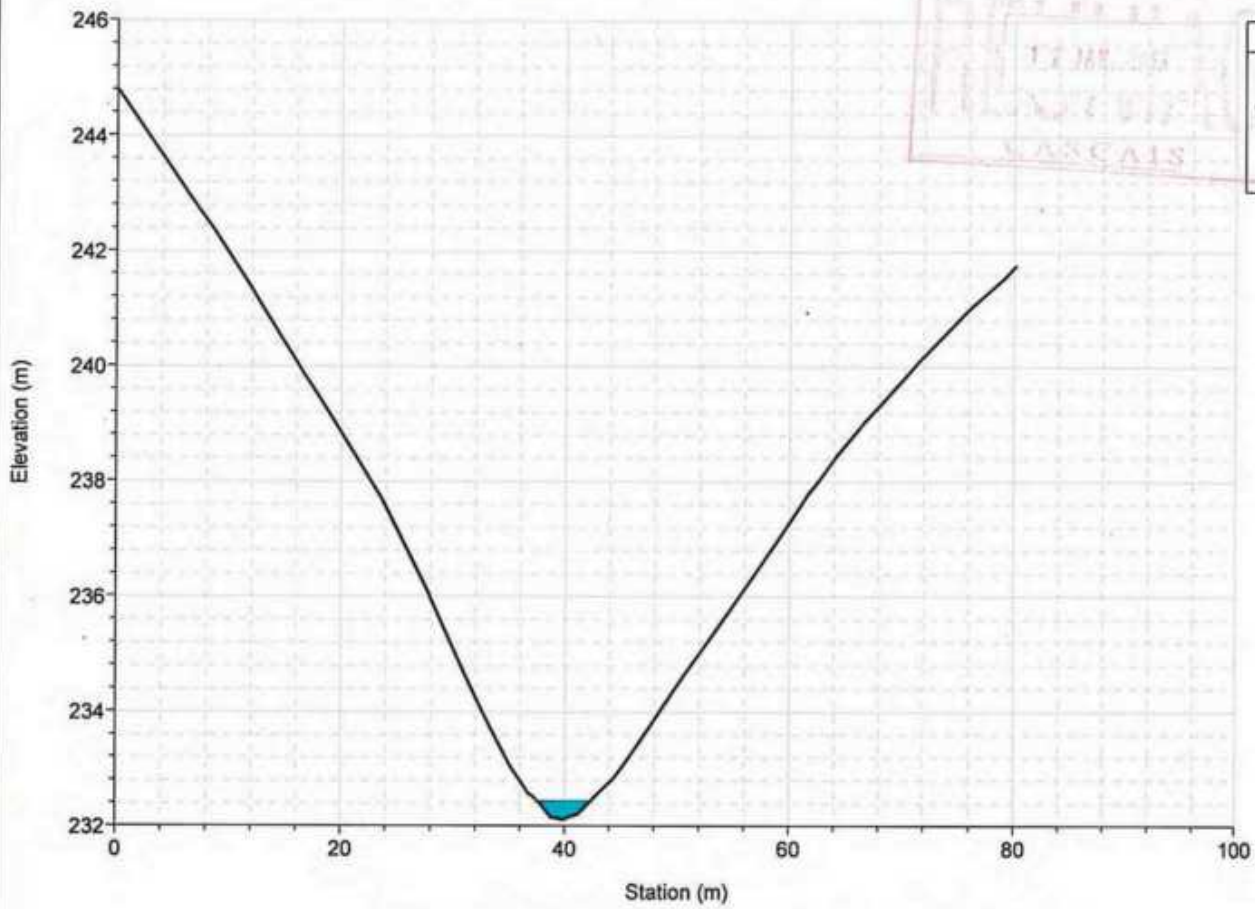




Legend	
WS T=100 anos	Ground

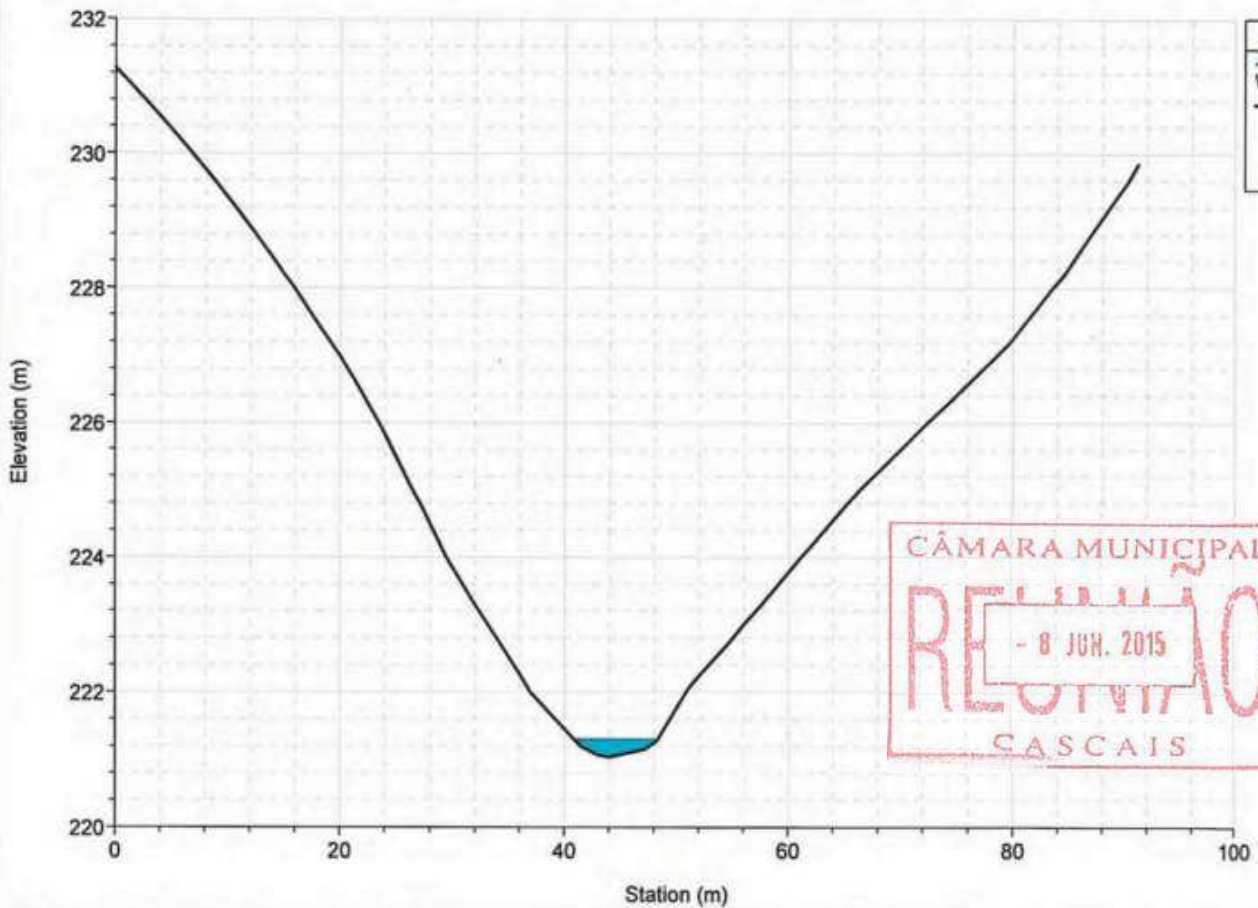


River = GROTA Reach = montante RS = 1549.345



Legend	
WS T=100 anos	Ground
	Bank Sta

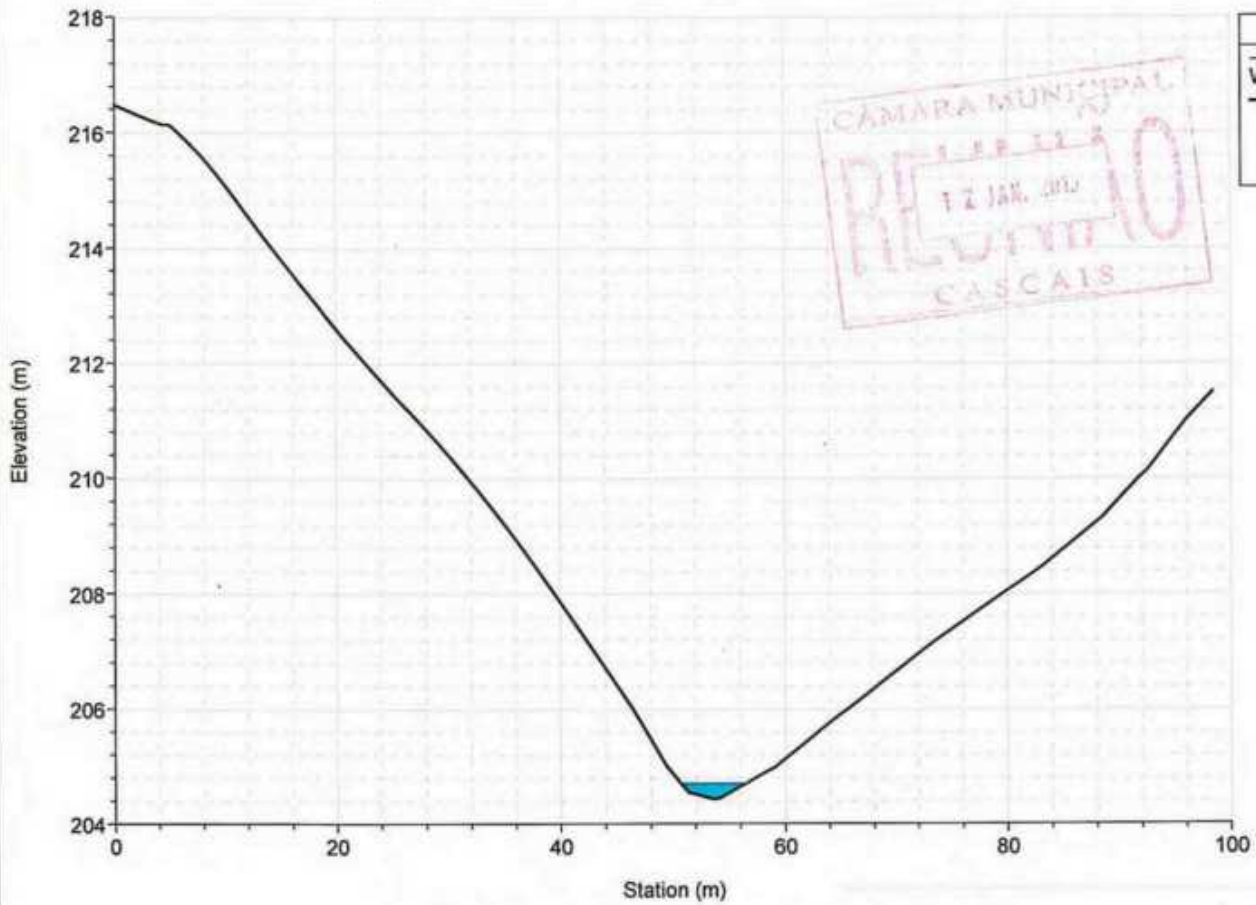
River = GROTA Reach = montante RS = 1479.977



Legend	
WS T=100 anos	Ground
	Bank Sta

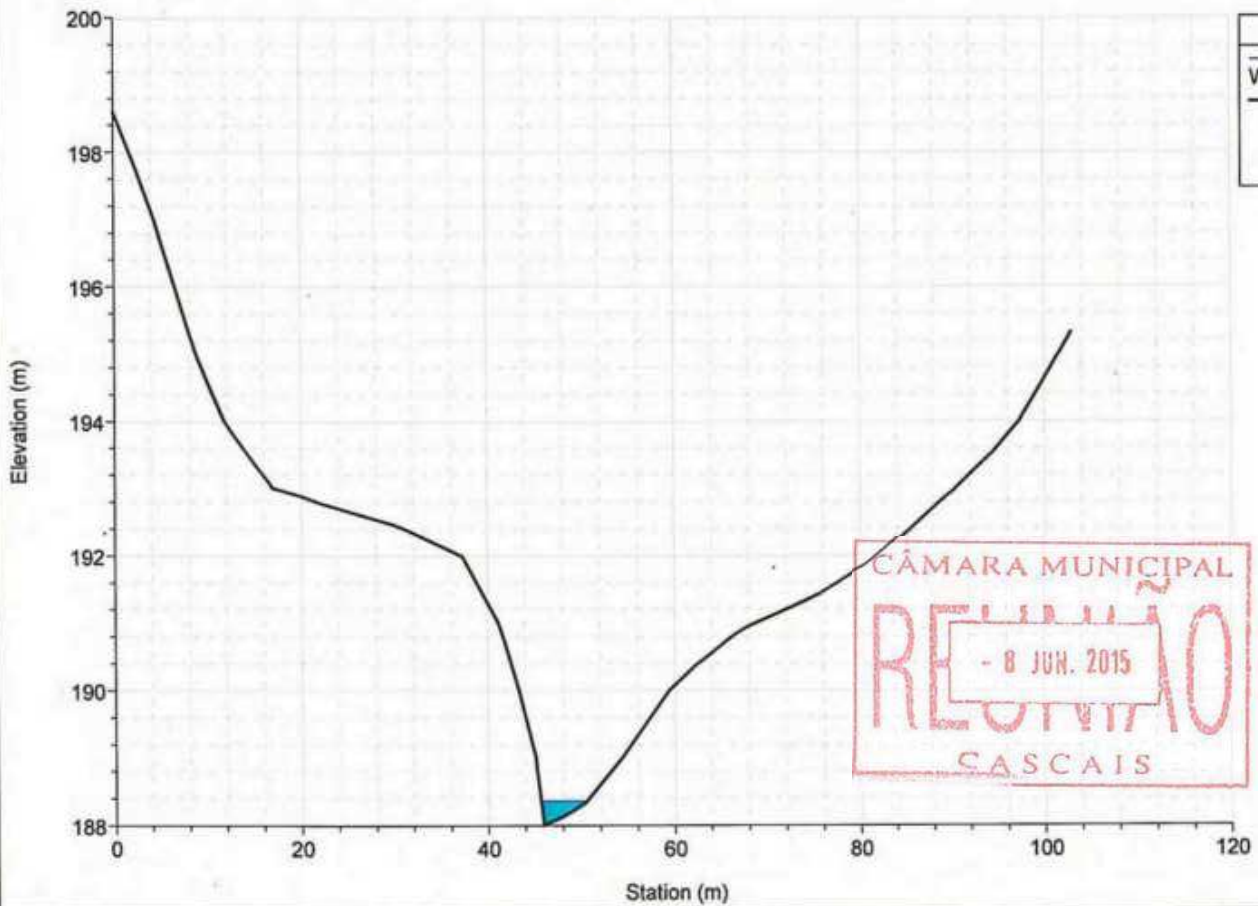
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River = GROTA Reach = montante RS = 1376.558

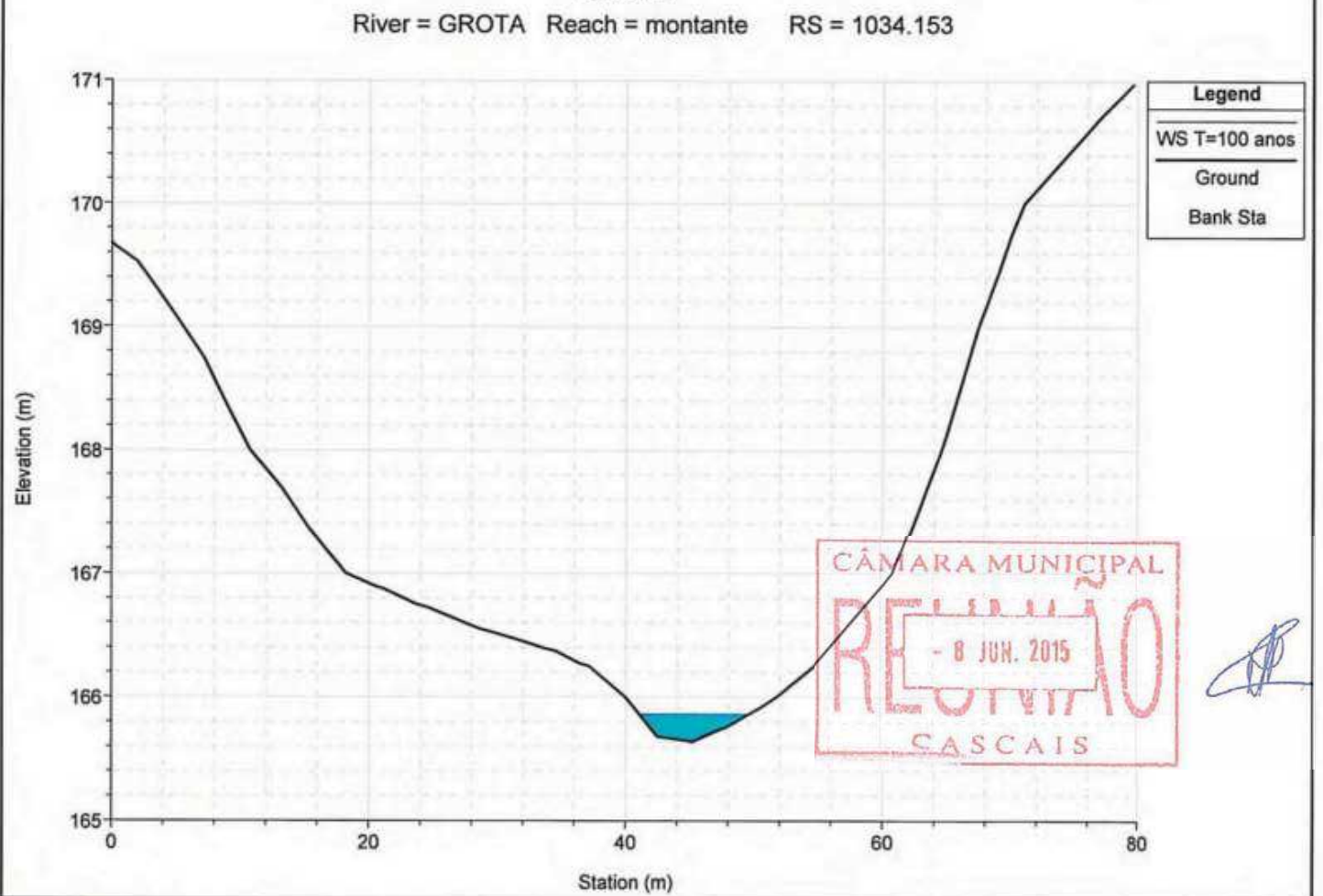
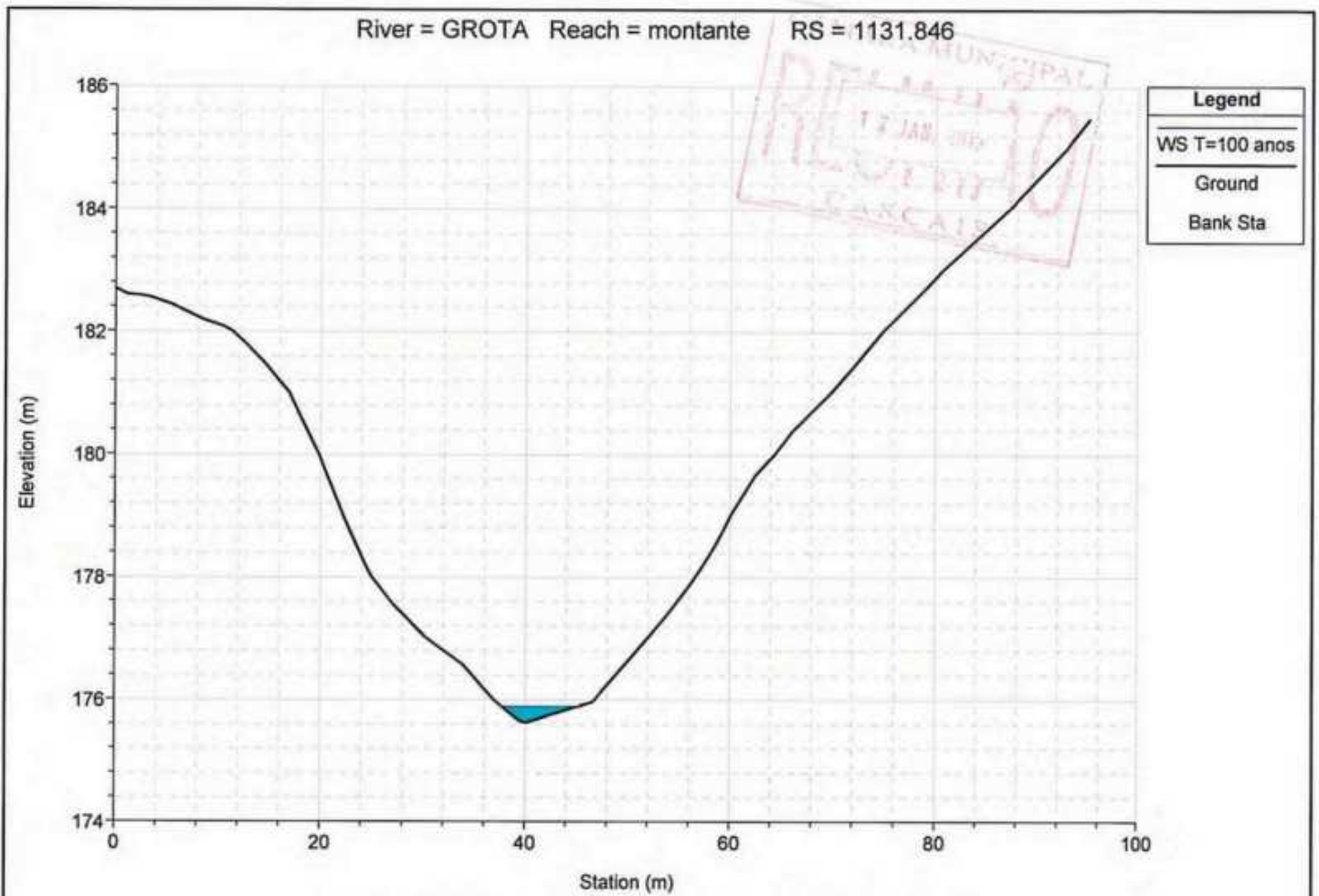


Legend
WS T=100 anos
Ground
Bank Sta

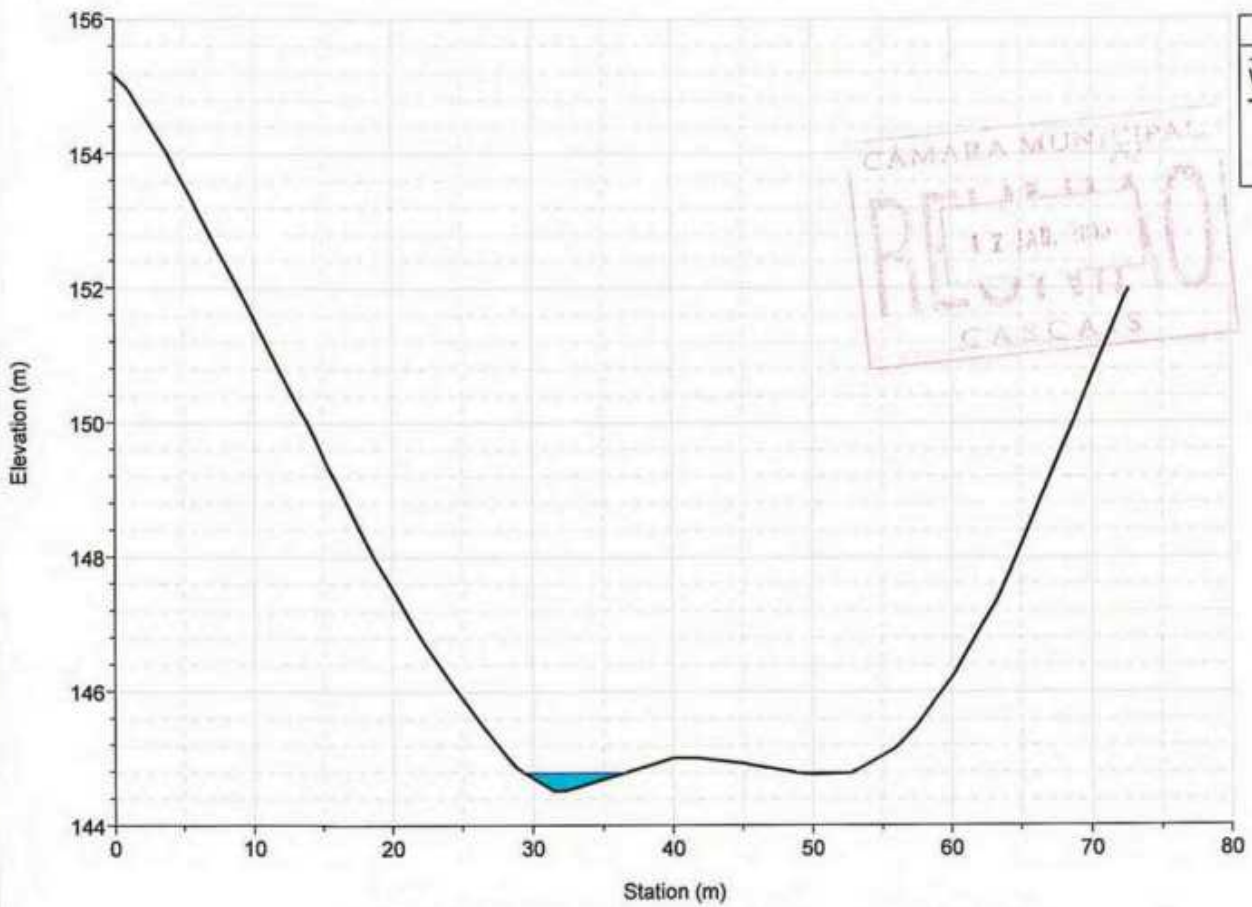
River = GROTA Reach = montante RS = 1248.614



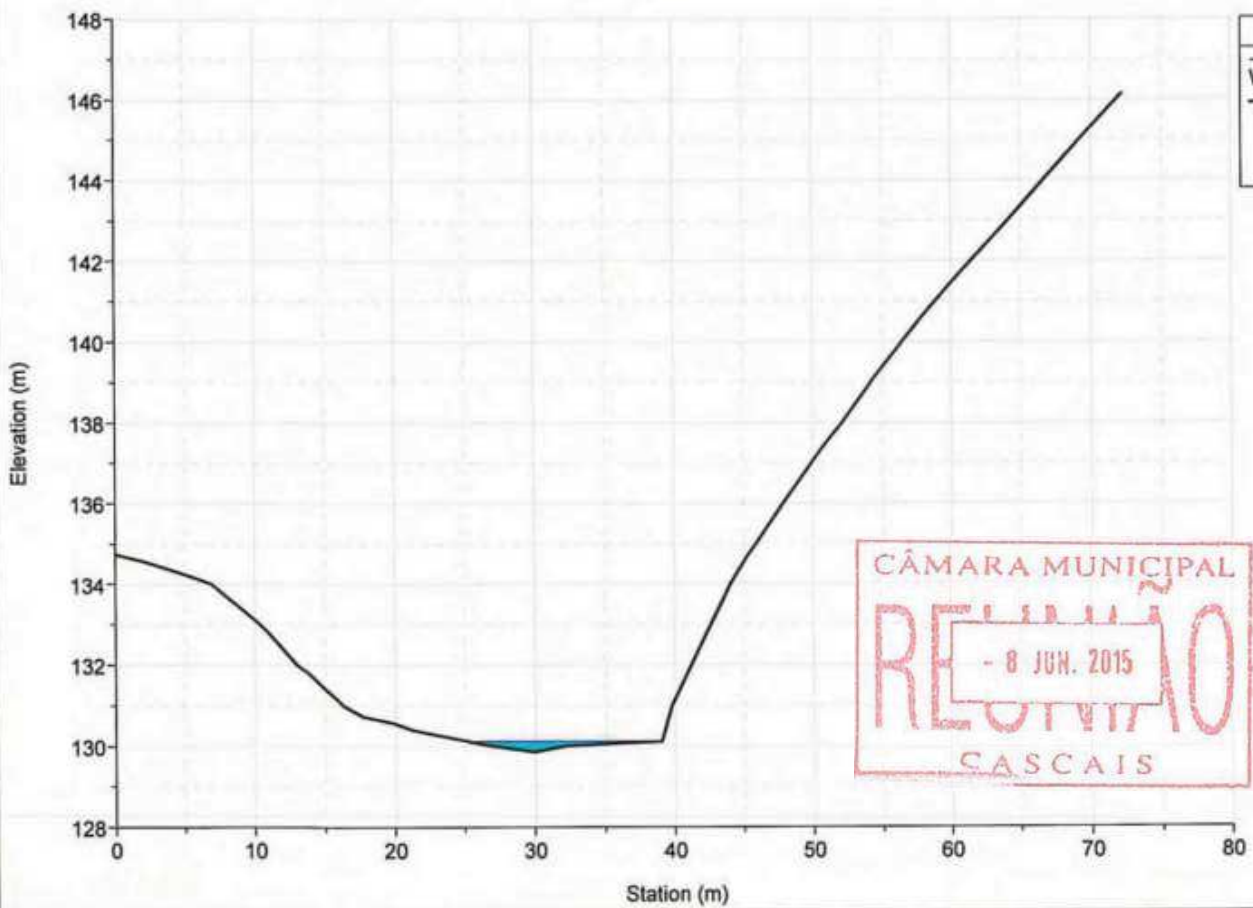
Legend
WS T=100 anos
Ground
Bank Sta



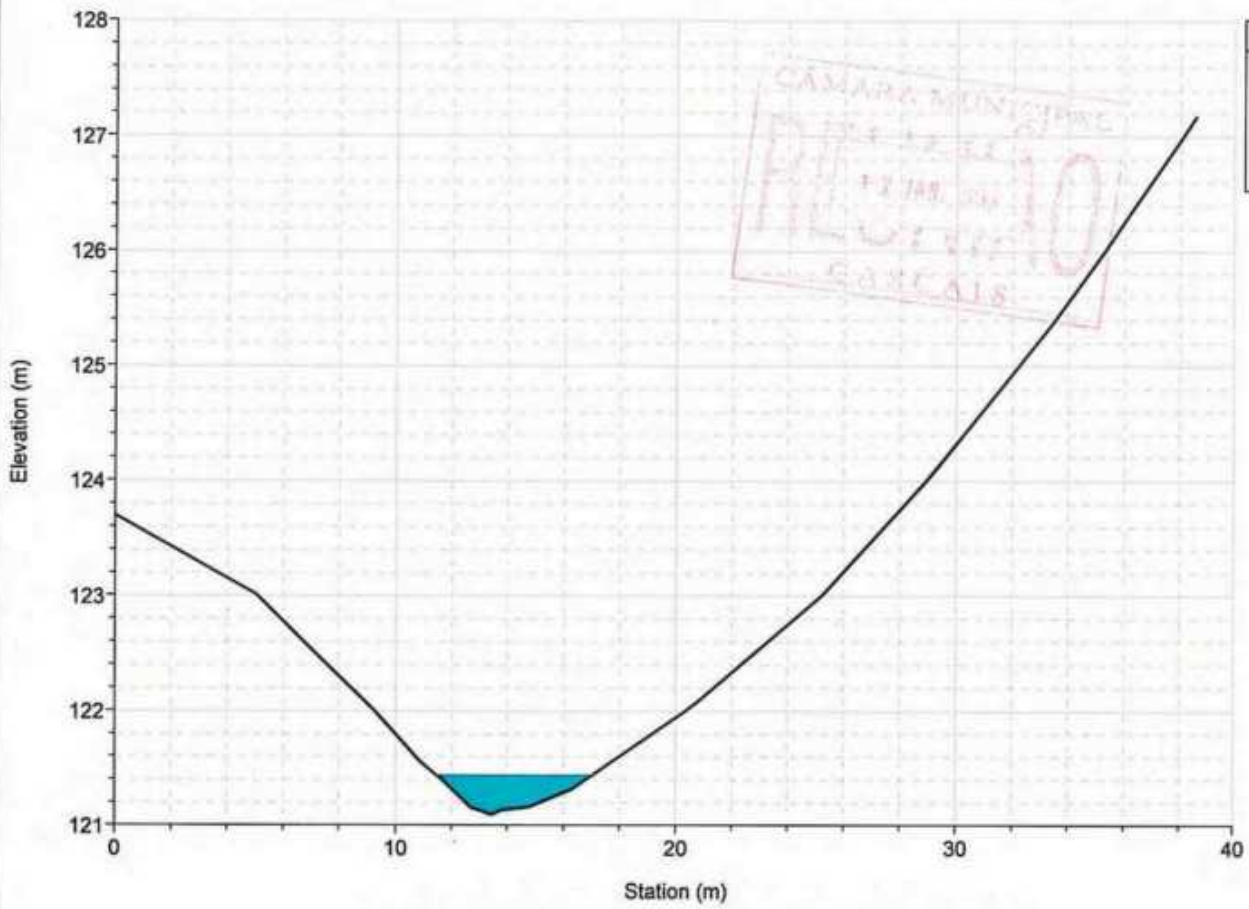
River = GROTA Reach = montante RS = 909.248



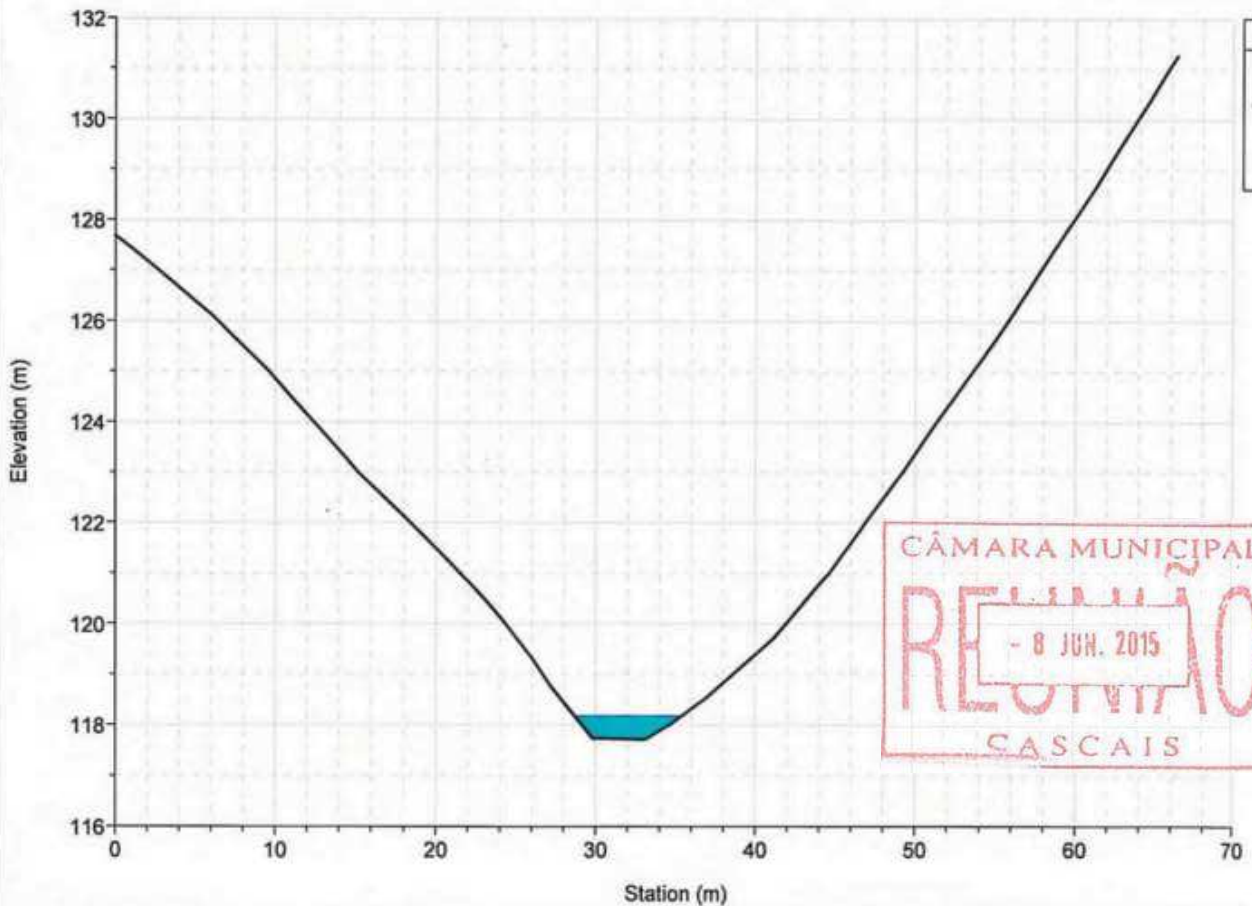
River = GROTA Reach = montante RS = 814.182



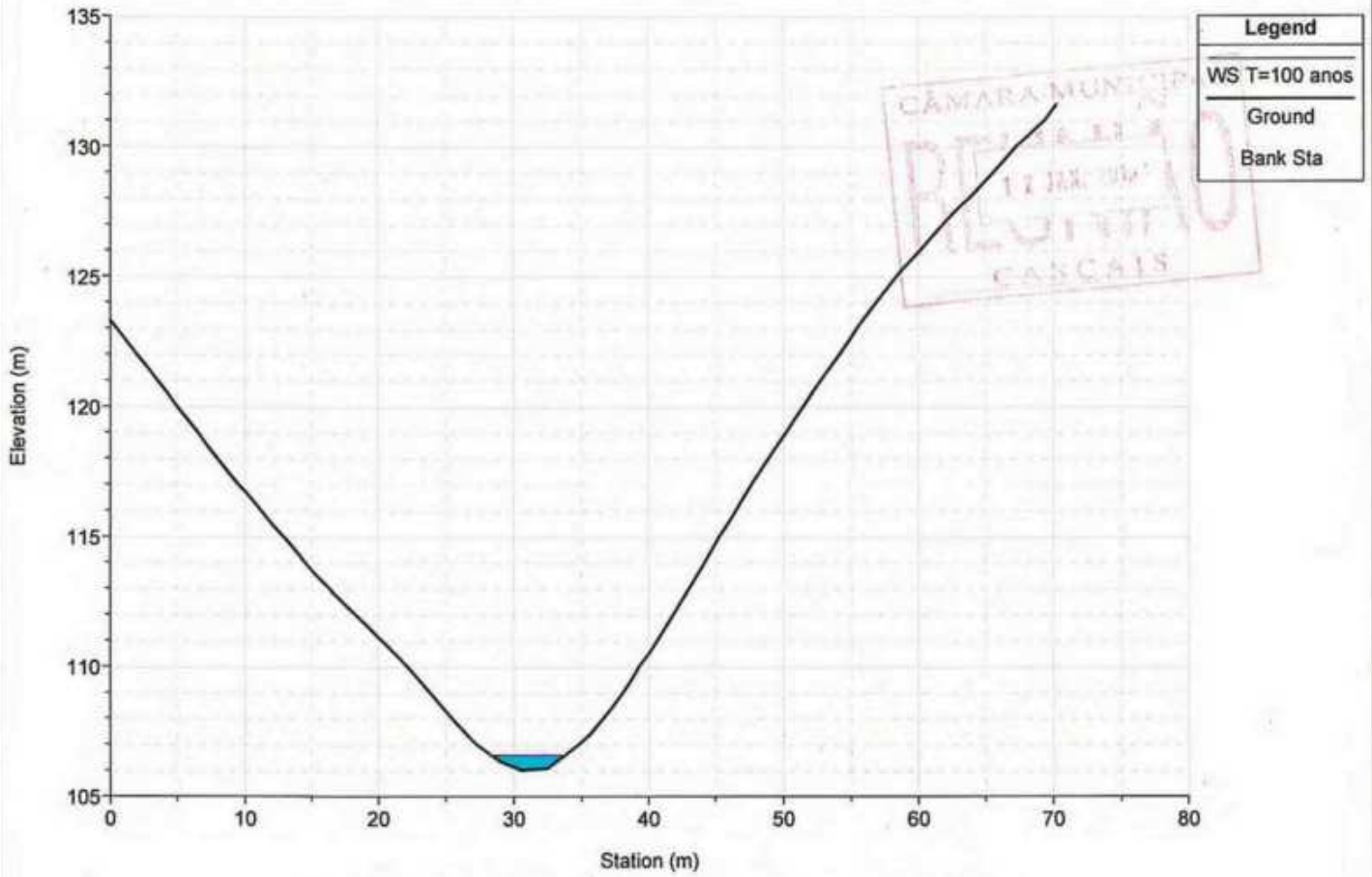
River = GROTA Reach = montante RS = 740.090



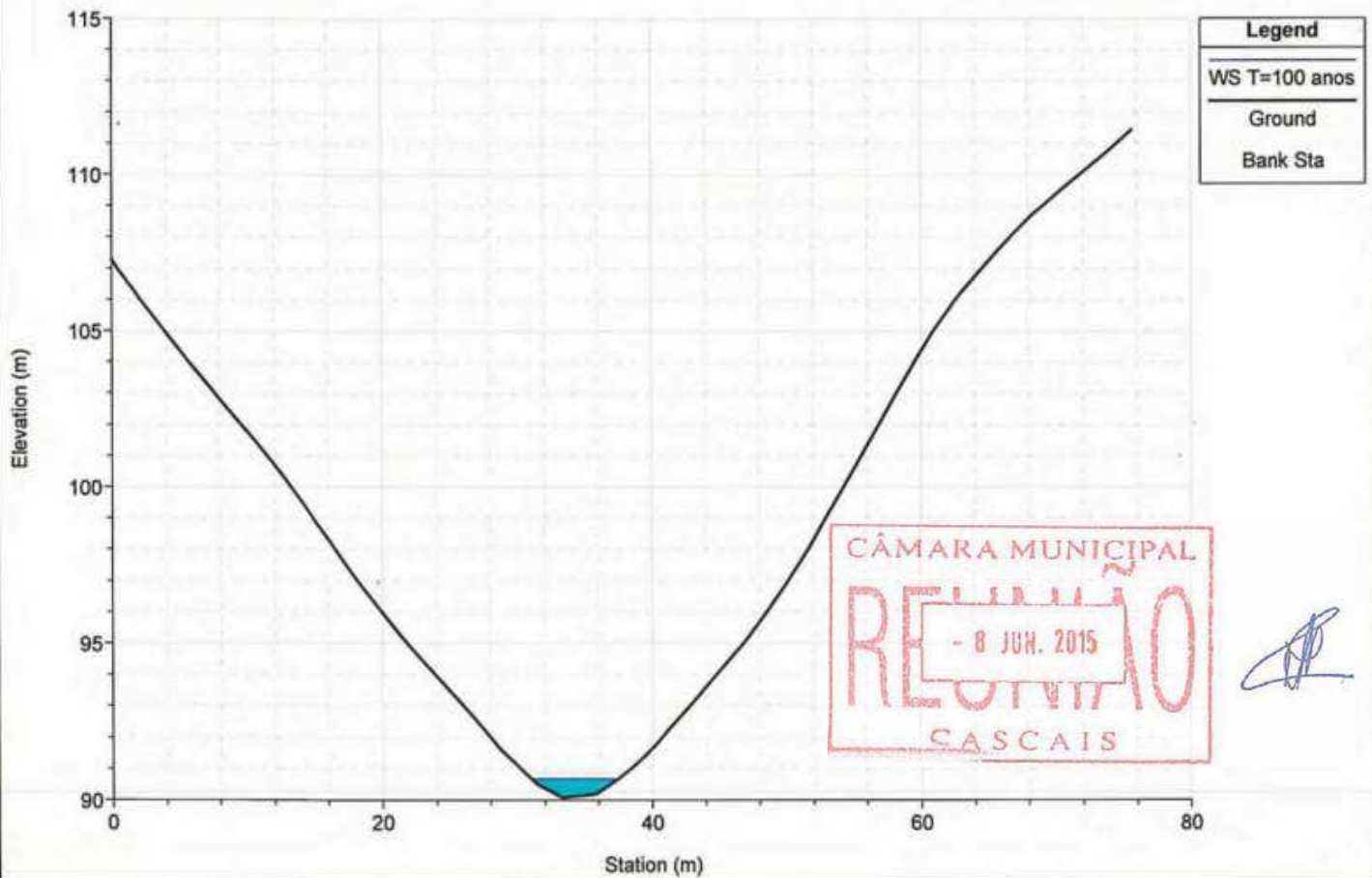
River = GROTA Reach = intermedio RS = 708.658



River = GROTA Reach = intermedio RS = 631.167

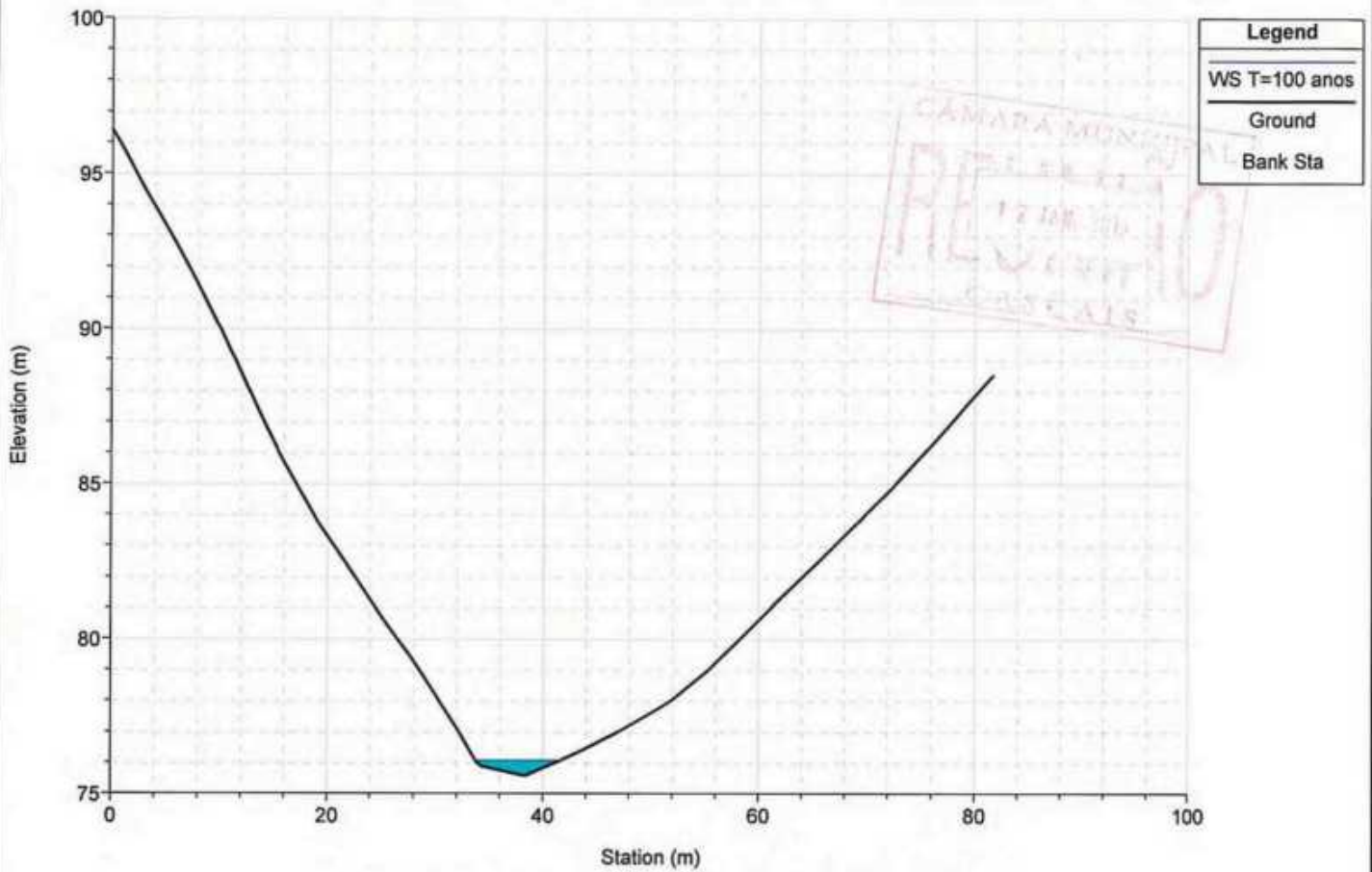


River = GROTA Reach = intermedio RS = 557.679

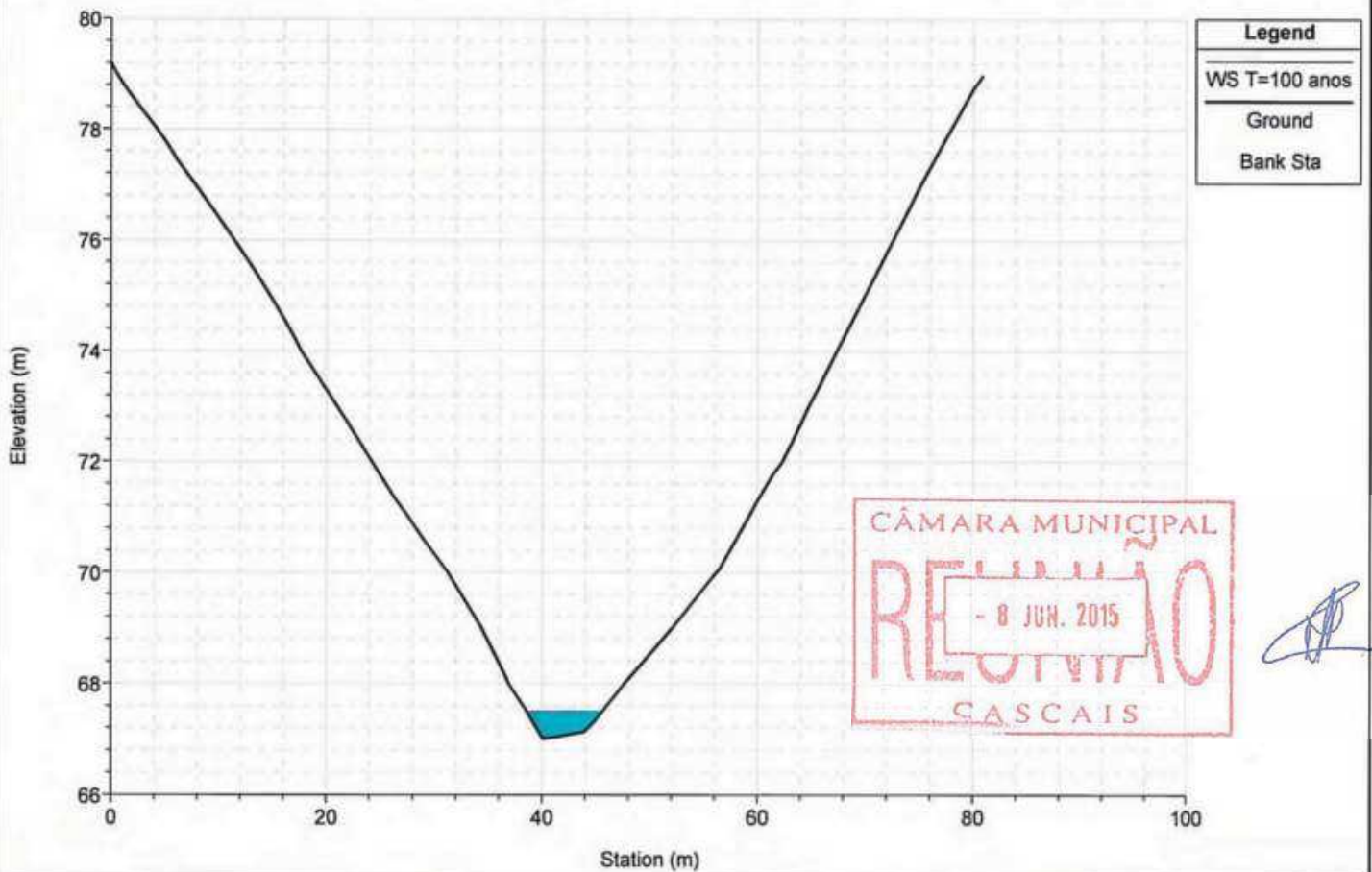




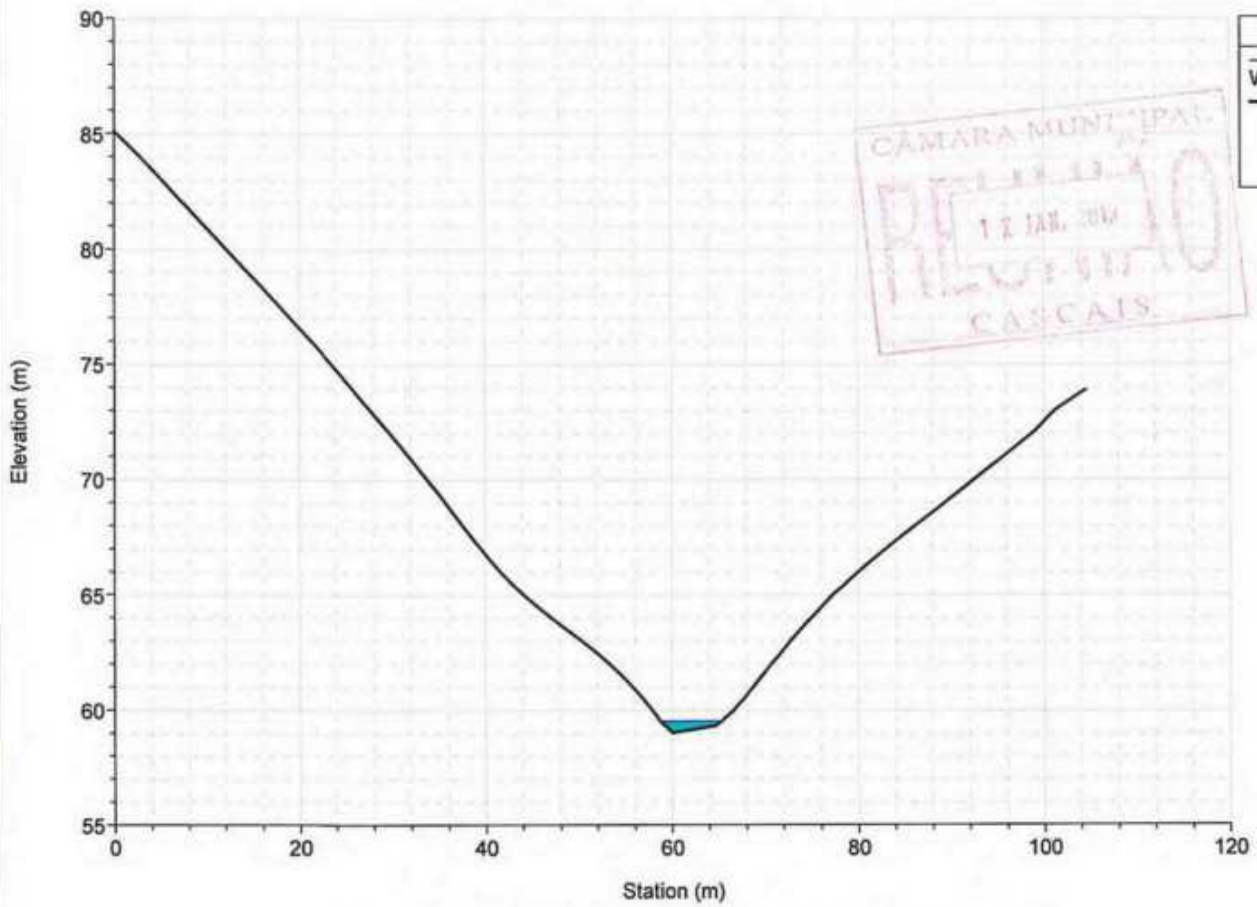
River = GROTA Reach = intermedio RS = 486.060



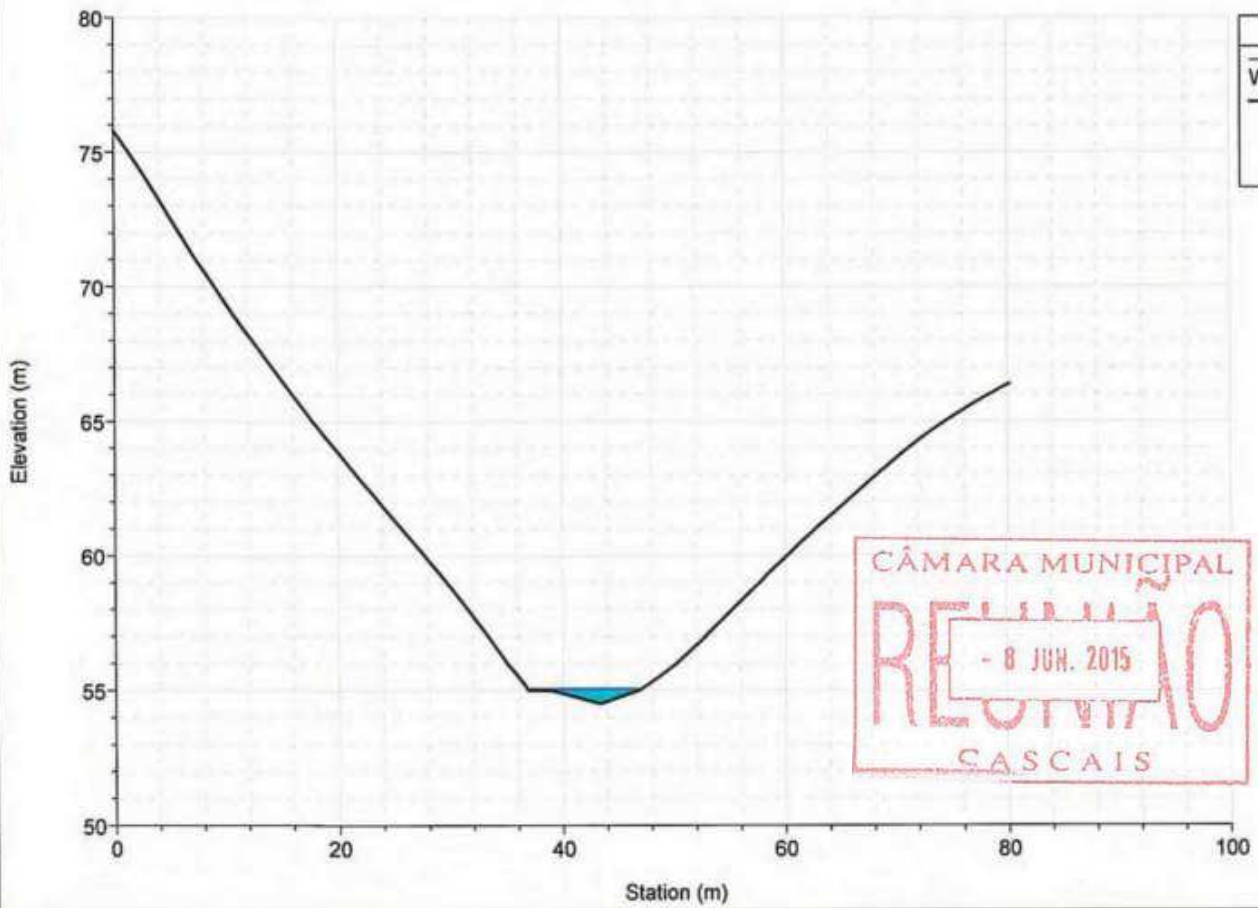
River = GROTA Reach = intermedio RS = 419.419



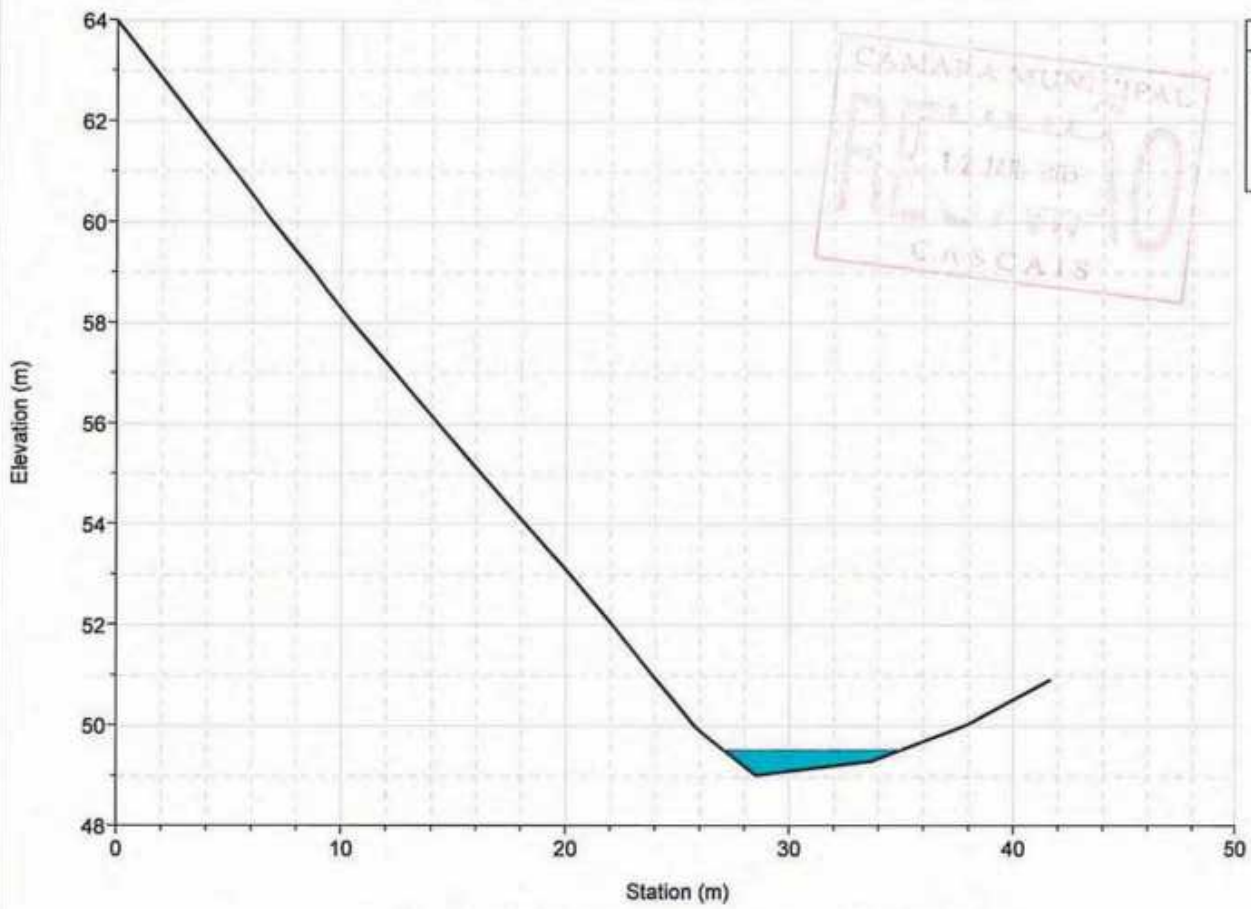
River = GROTA Reach = intermedio RS = 367.574



River = GROTA Reach = intermedio RS = 305.282

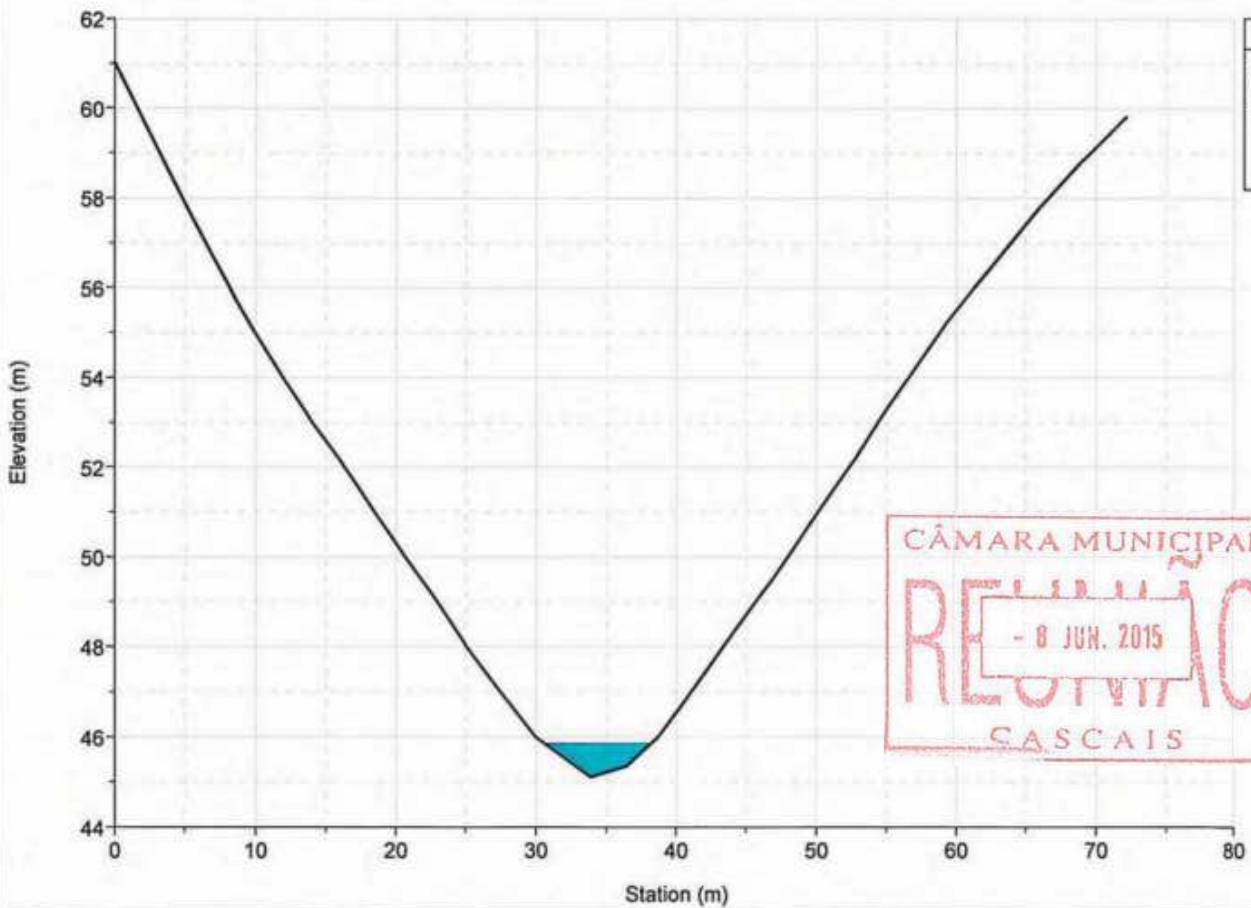


River = GROTA Reach = intermedio RS = 240.401

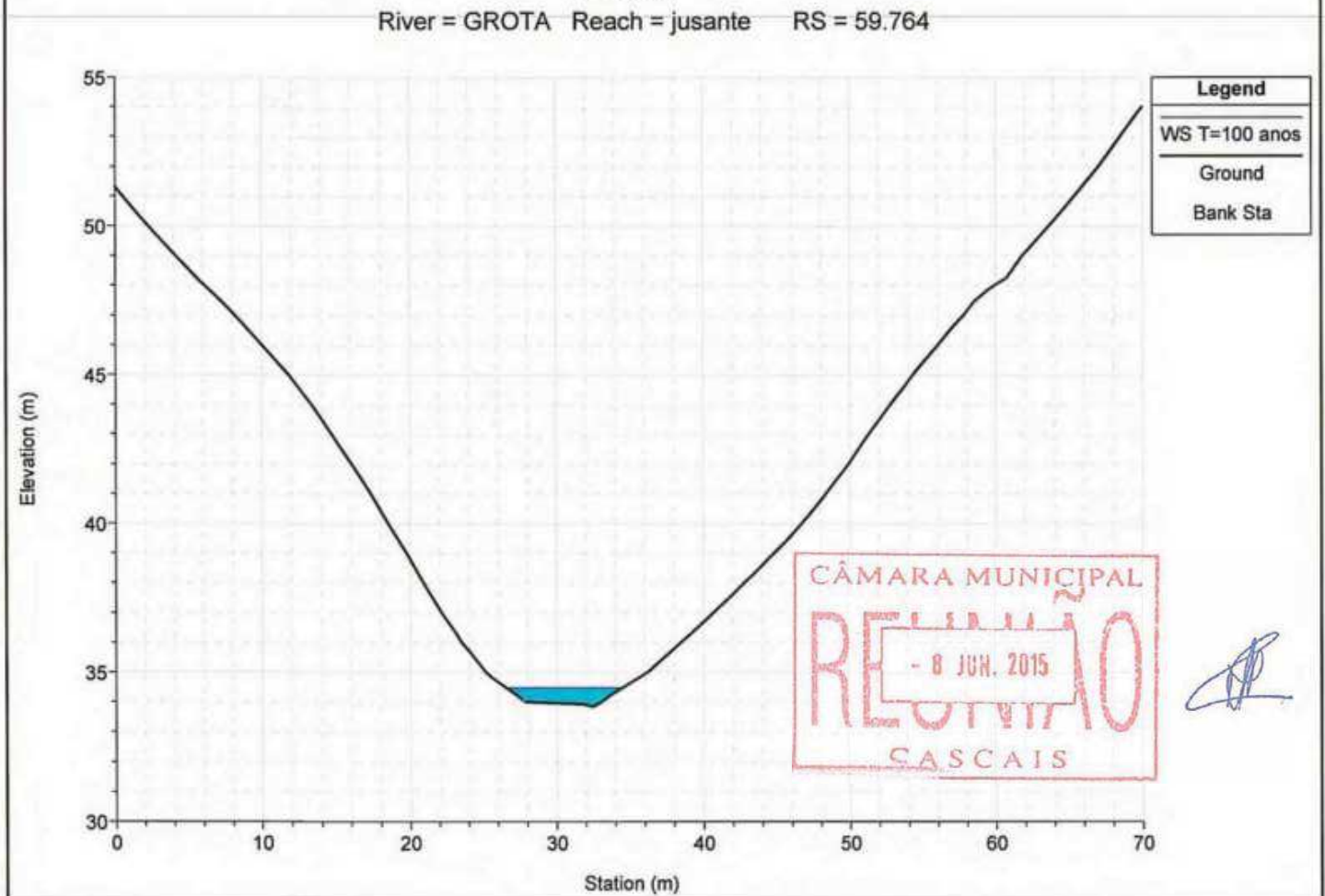
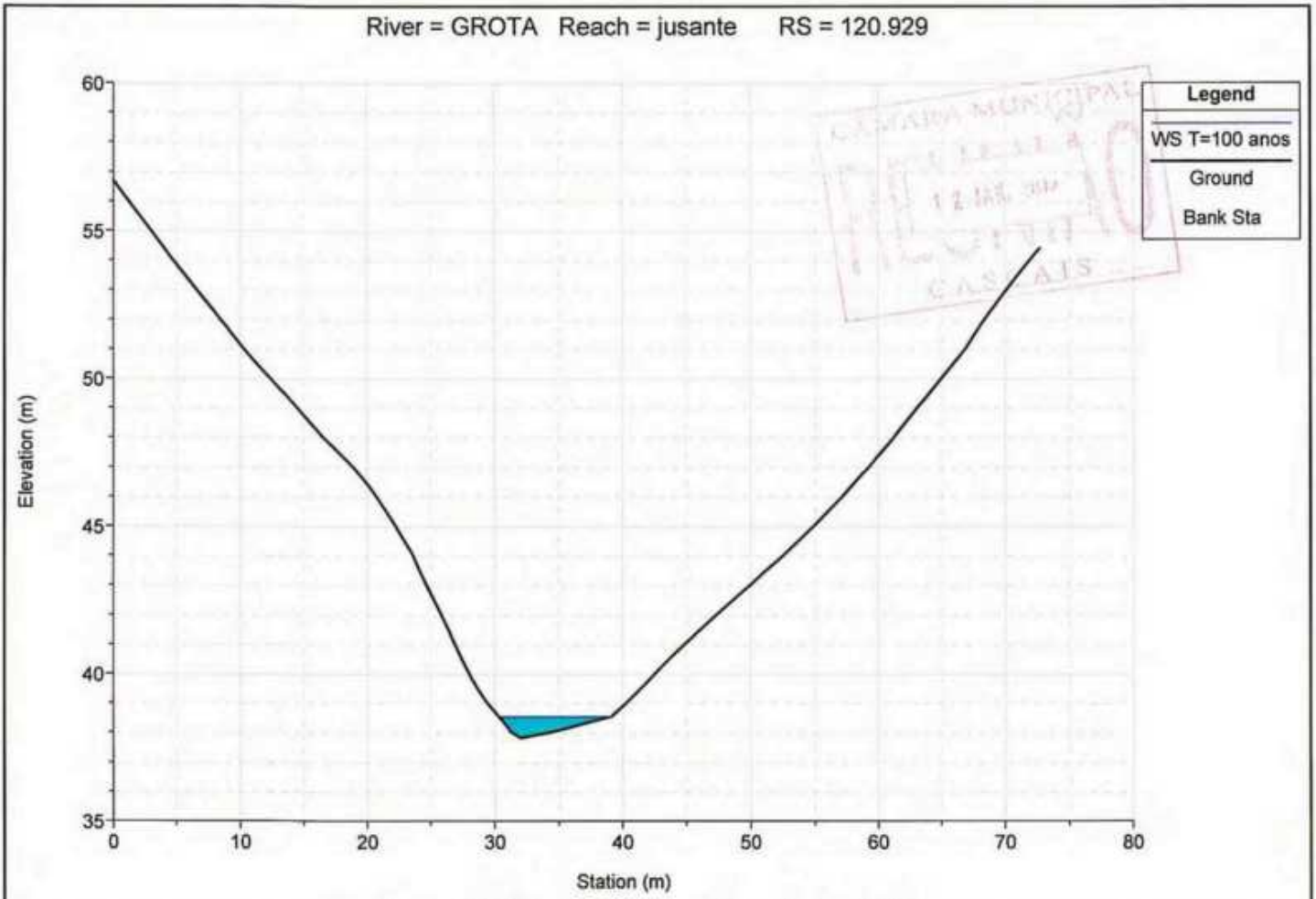


Legend
WS T=100 anos
Ground
Bank Sta

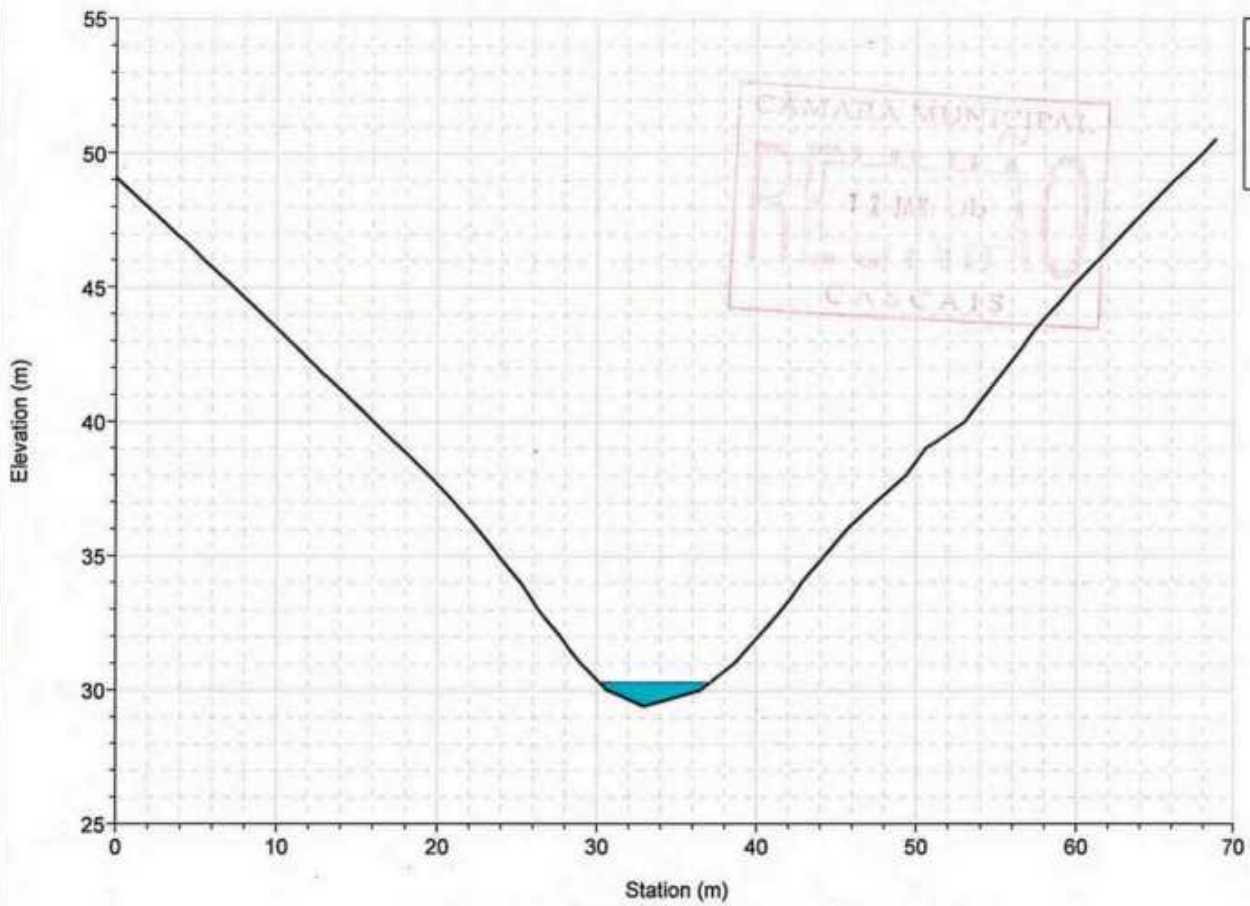
River = GROTA Reach = jusante RS = 199.433



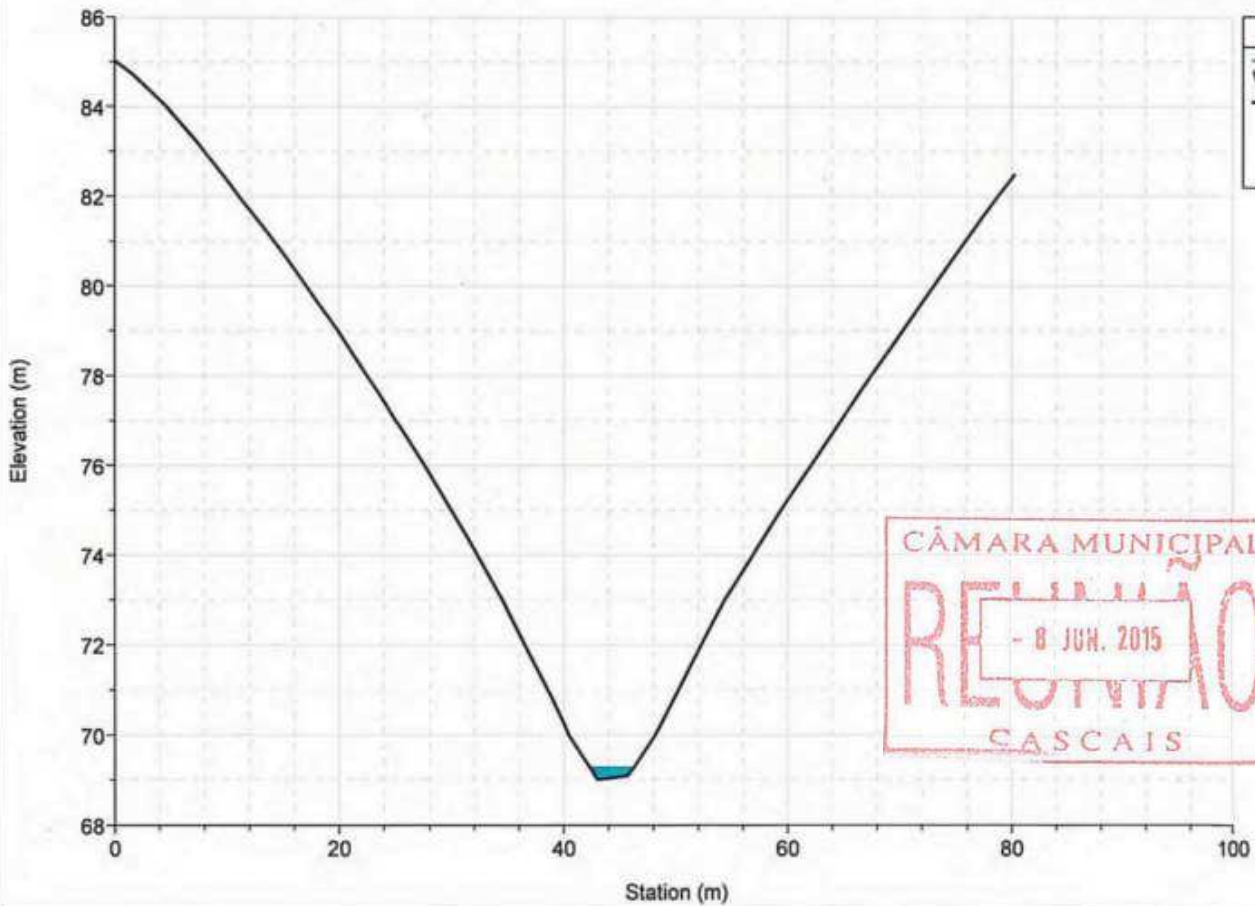
Legend
WS T=100 anos
Ground
Bank Sta



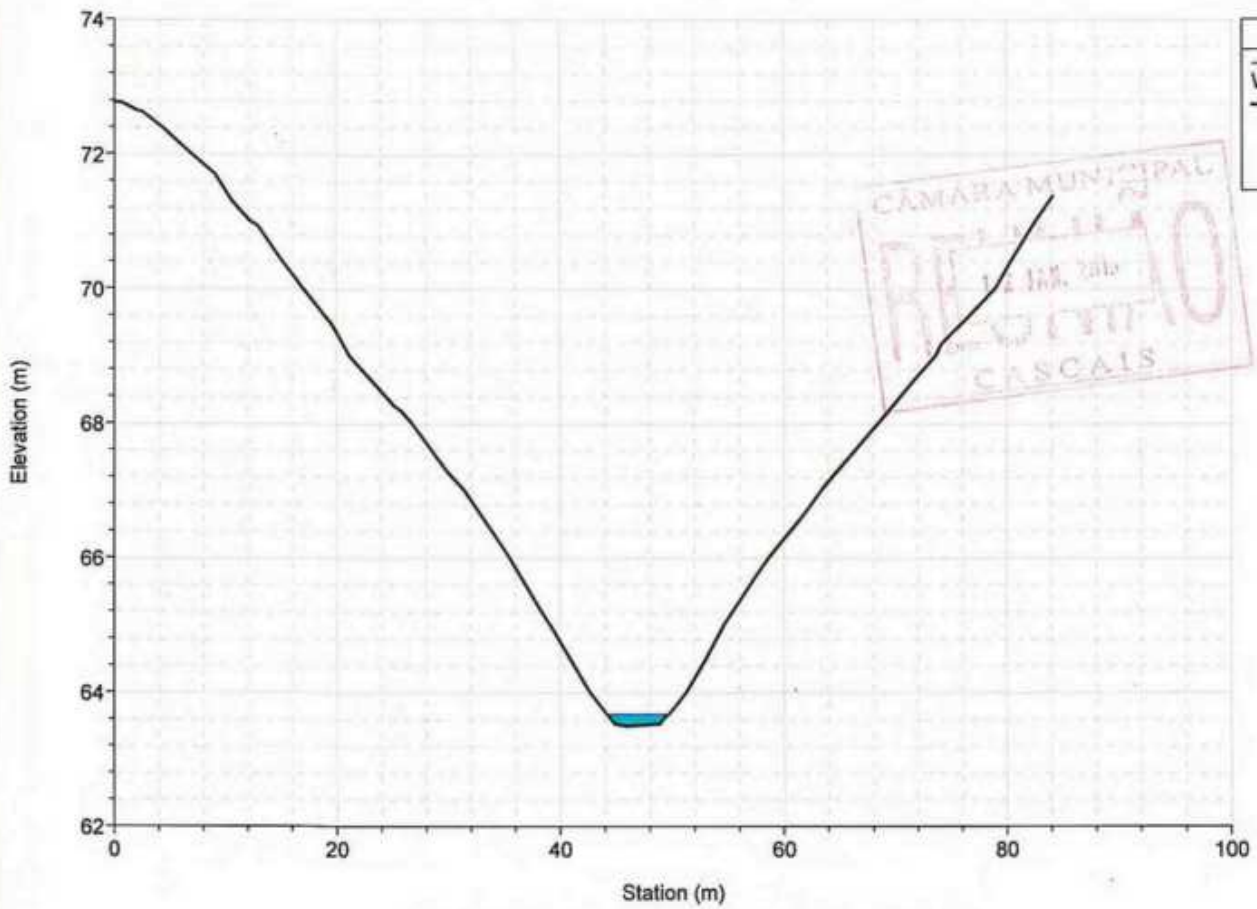
River = GROTA Reach = jusante RS = 11.335



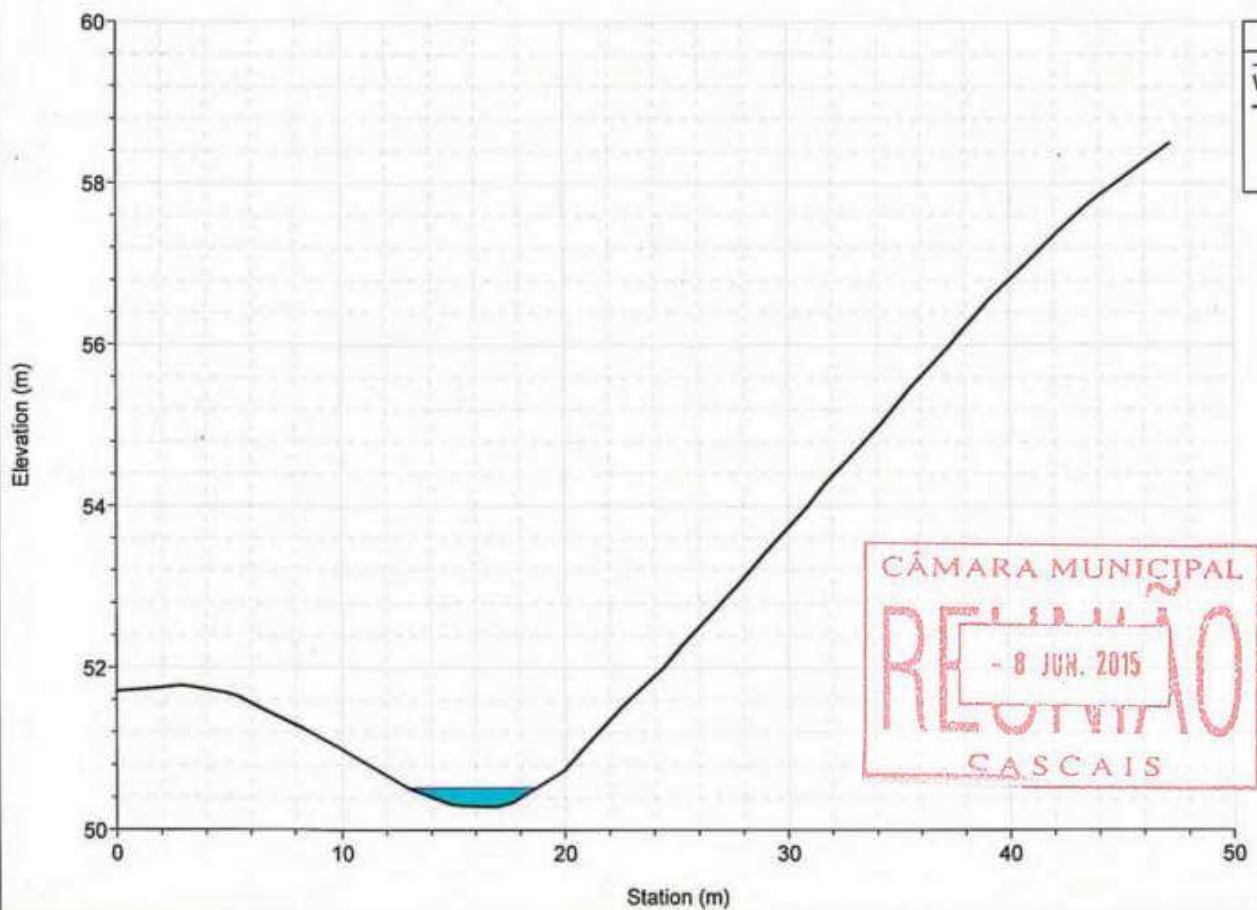
River = MD Reach = afluente RS = 151.390



River = MD Reach = afluente RS = 98.043

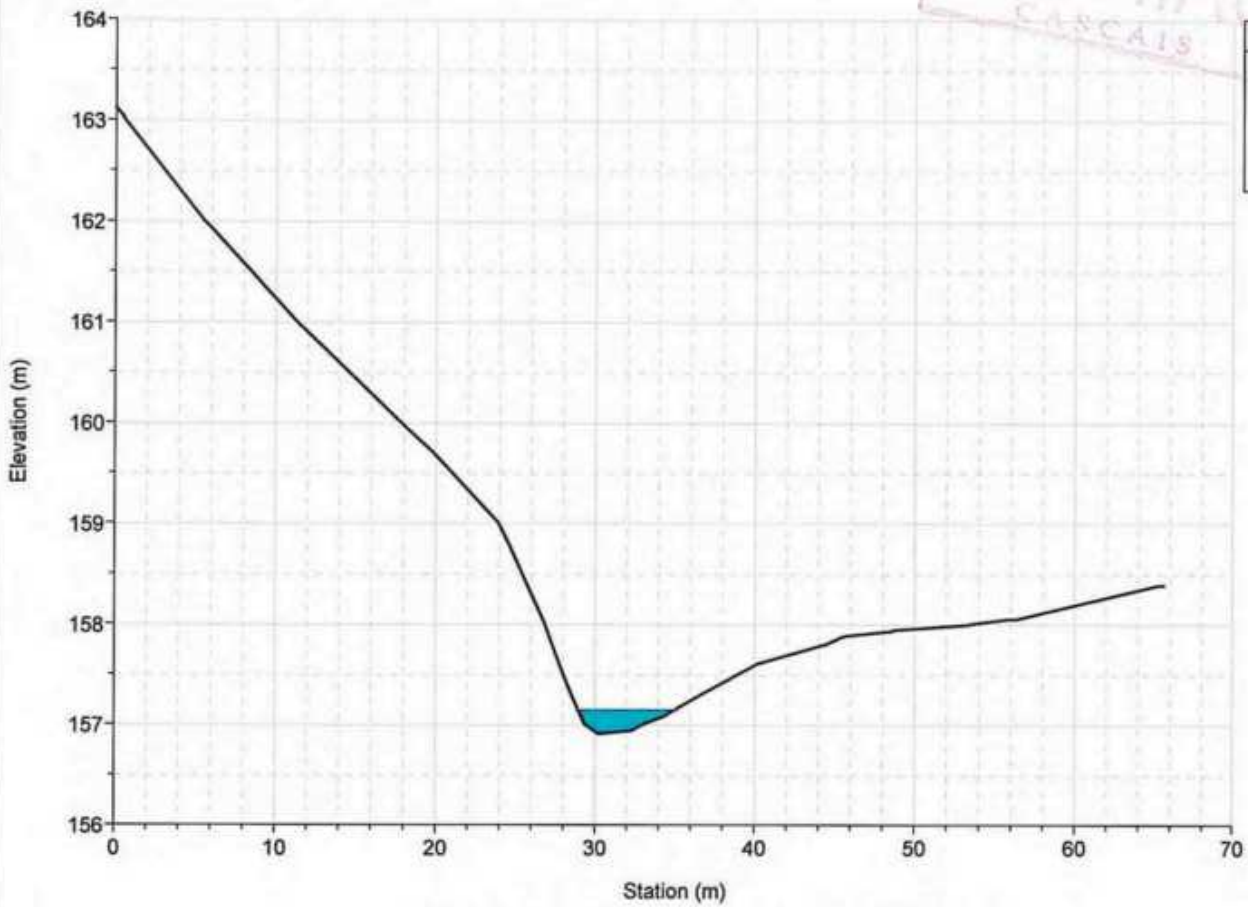


River = MD Reach = afluente RS = 19.308

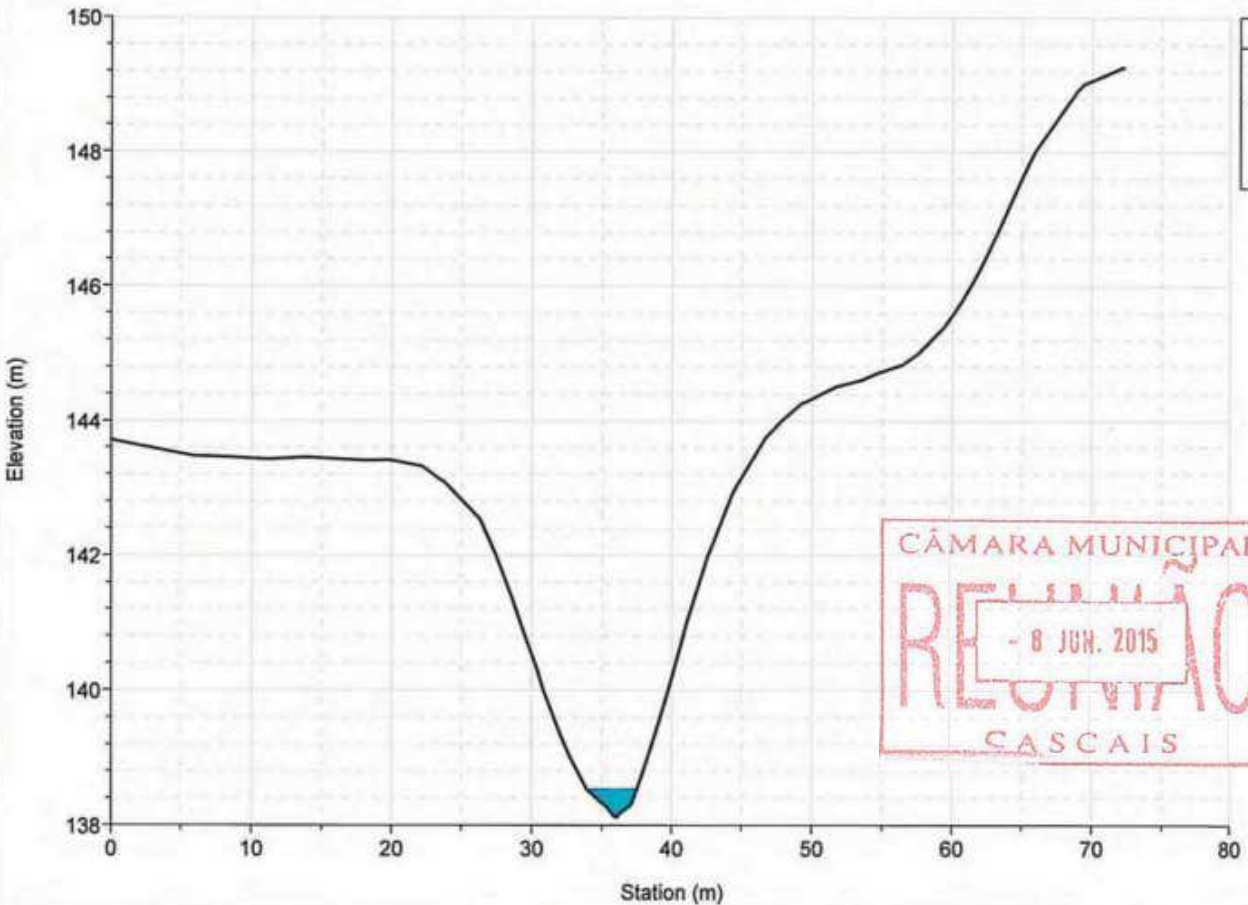


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River = ME Reach = afluyente RS = 195.290



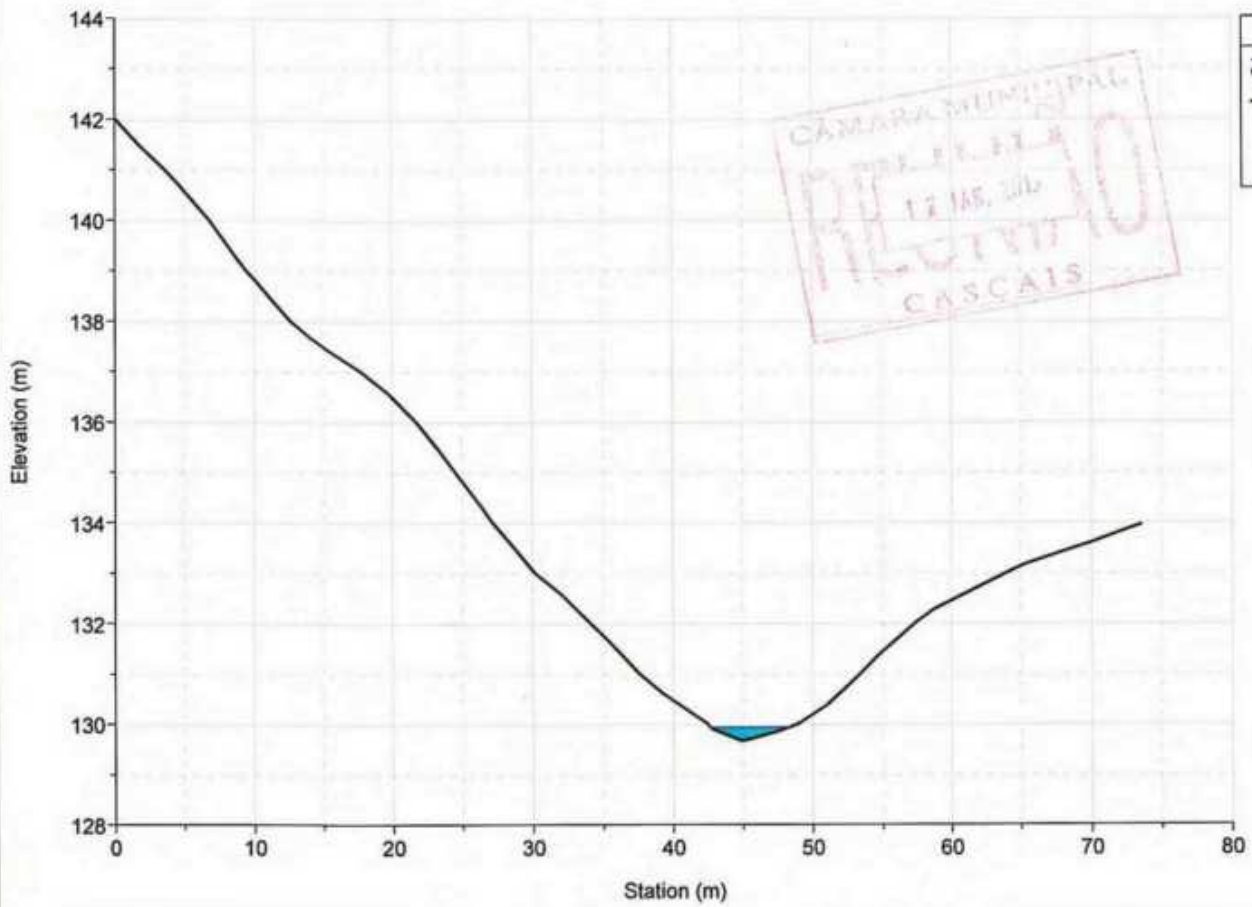
River = ME Reach = afluyente RS = 130.362



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*[Handwritten signature]*

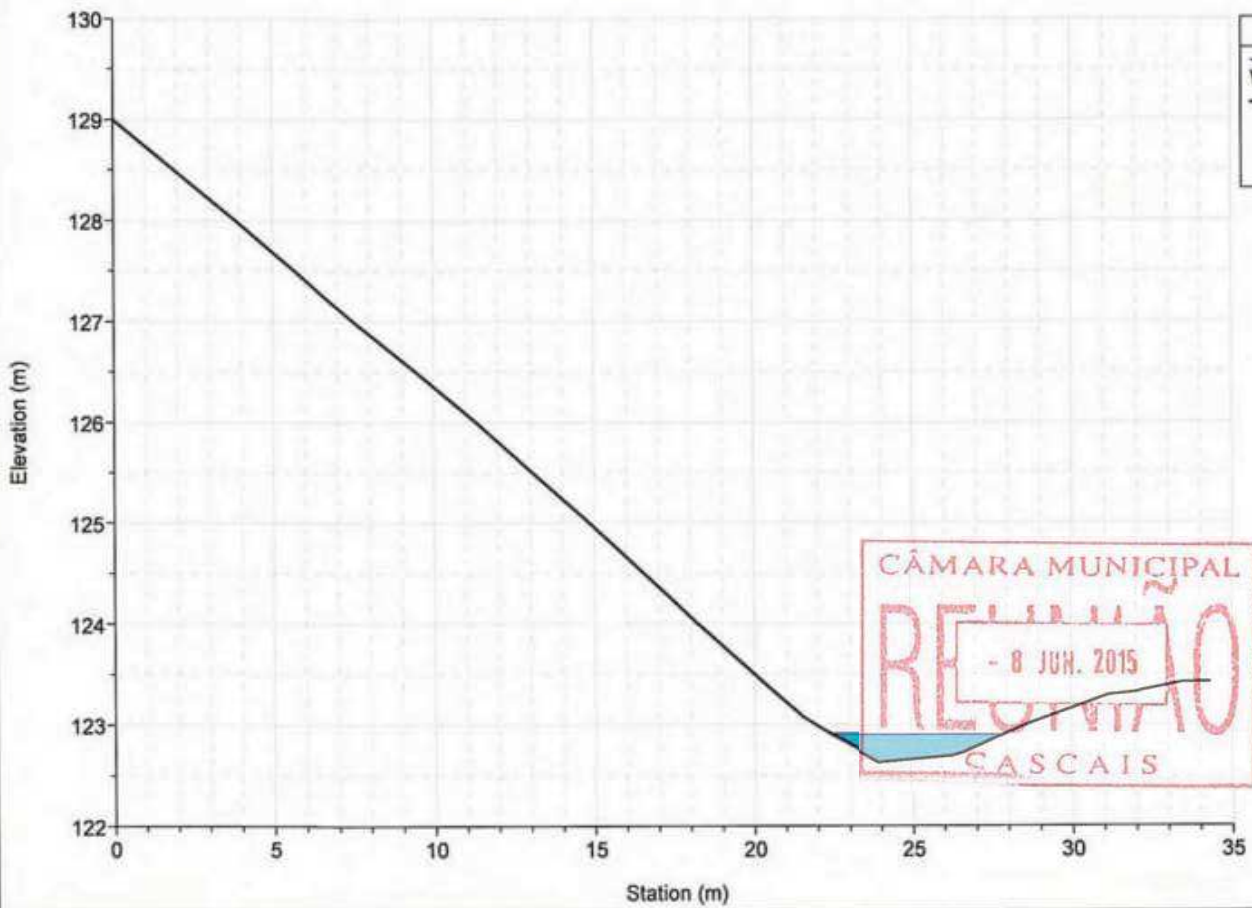
River = ME Reach = afluyente RS = 79.775



Legend
WS T=100 anos
Ground
Bank Sta

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River = ME Reach = afluyente RS = 24.067



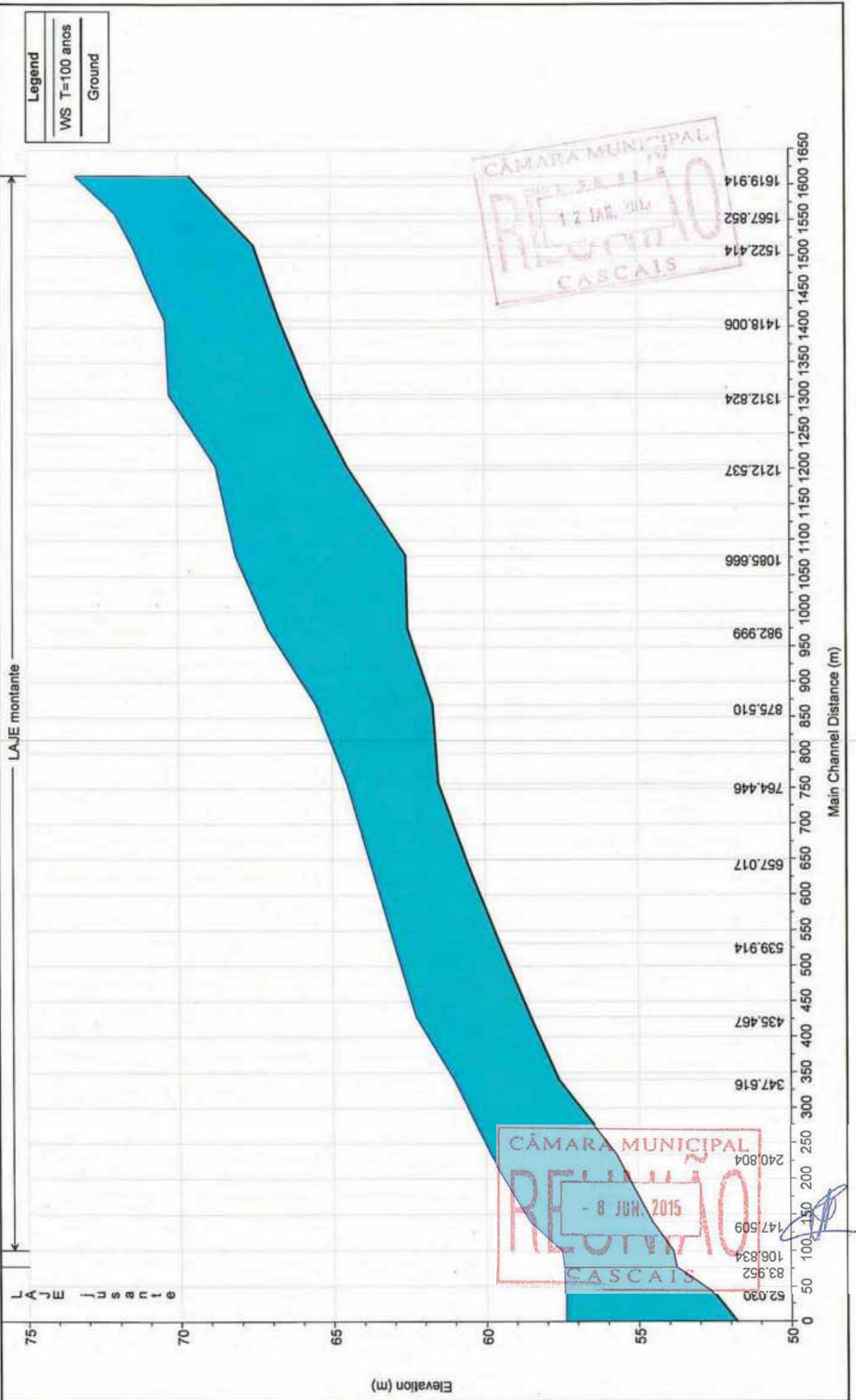
Legend
WS T=100 anos
Ground
Bank Sta

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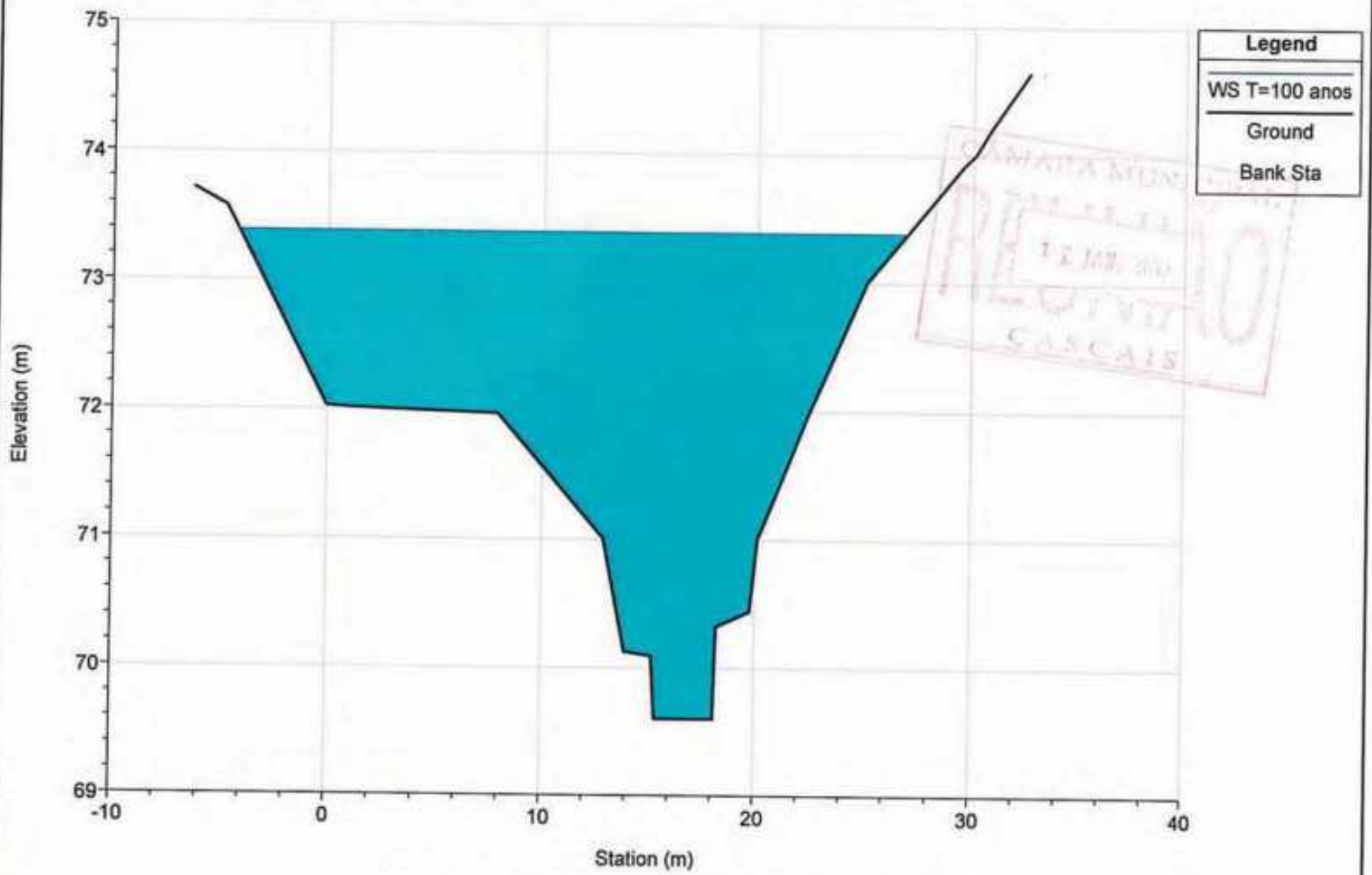




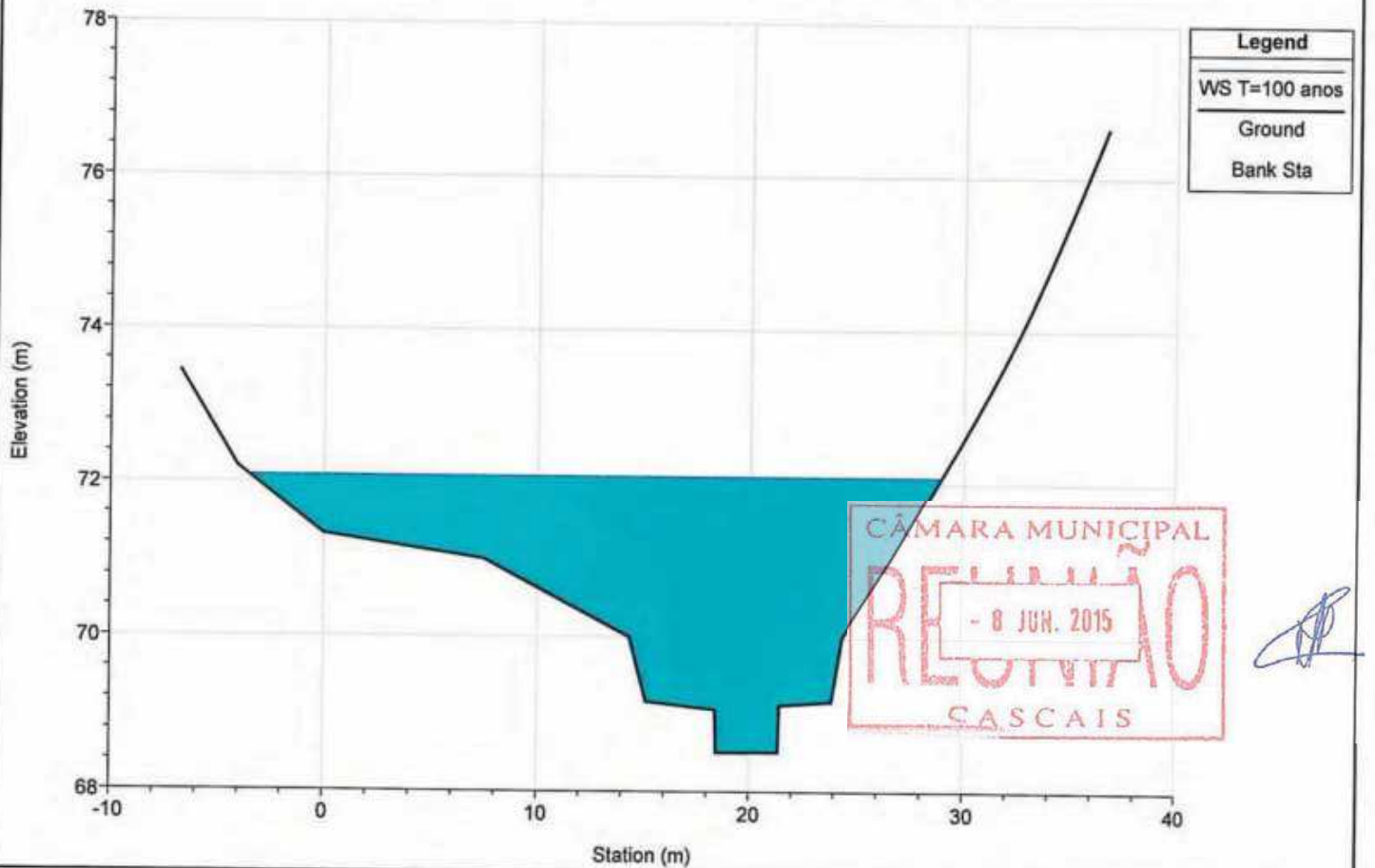
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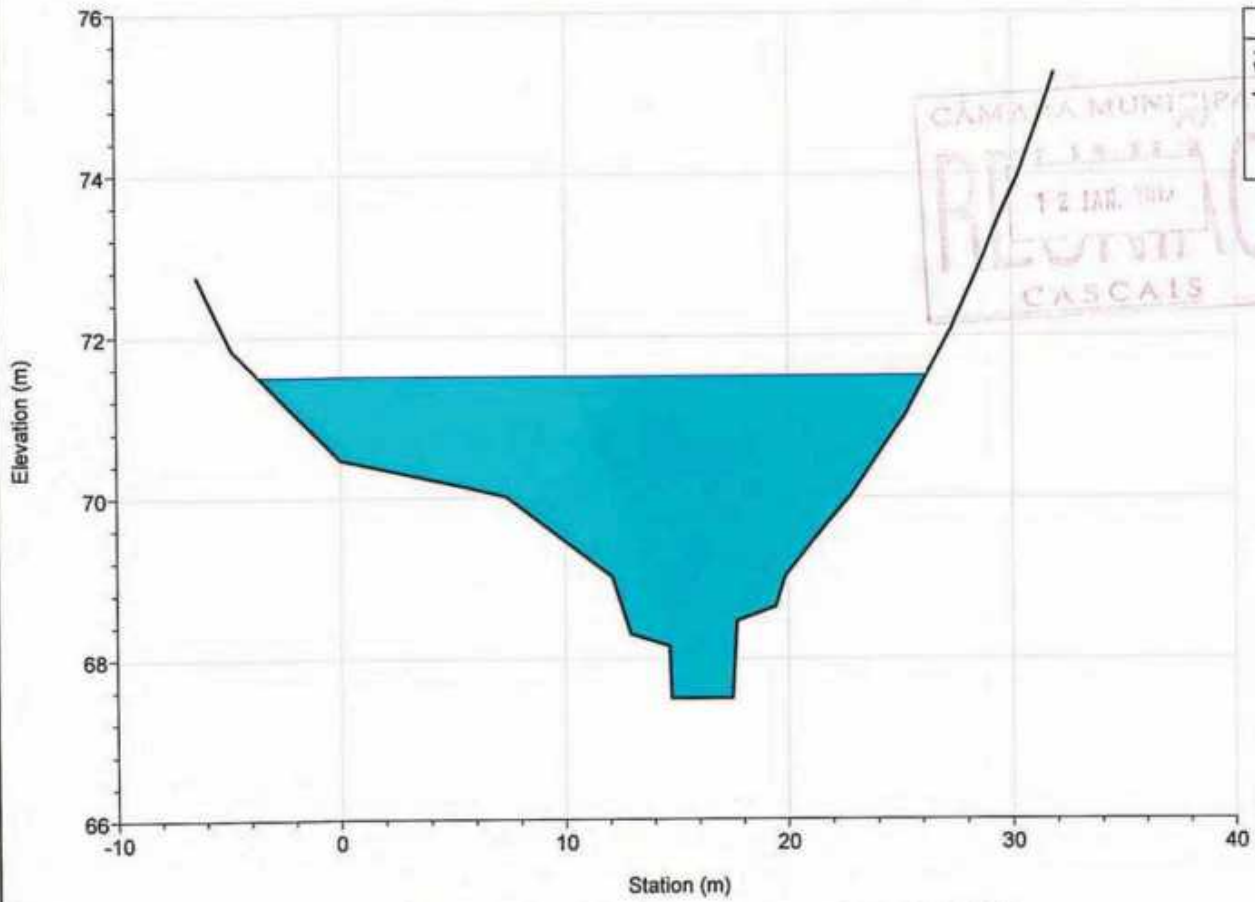
River = LAJE Reach = montante RS = 1619.914



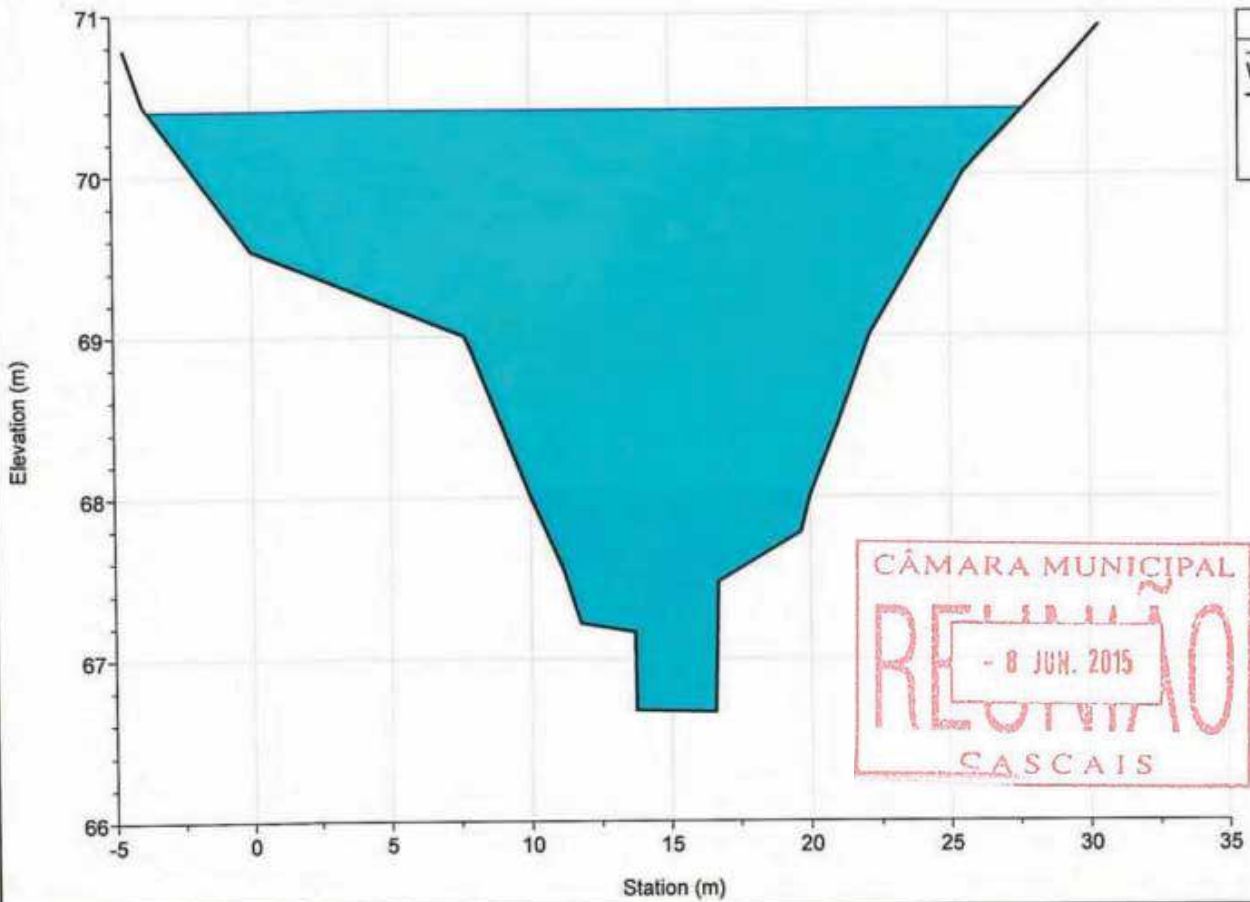
River = LAJE Reach = montante RS = 1567.852



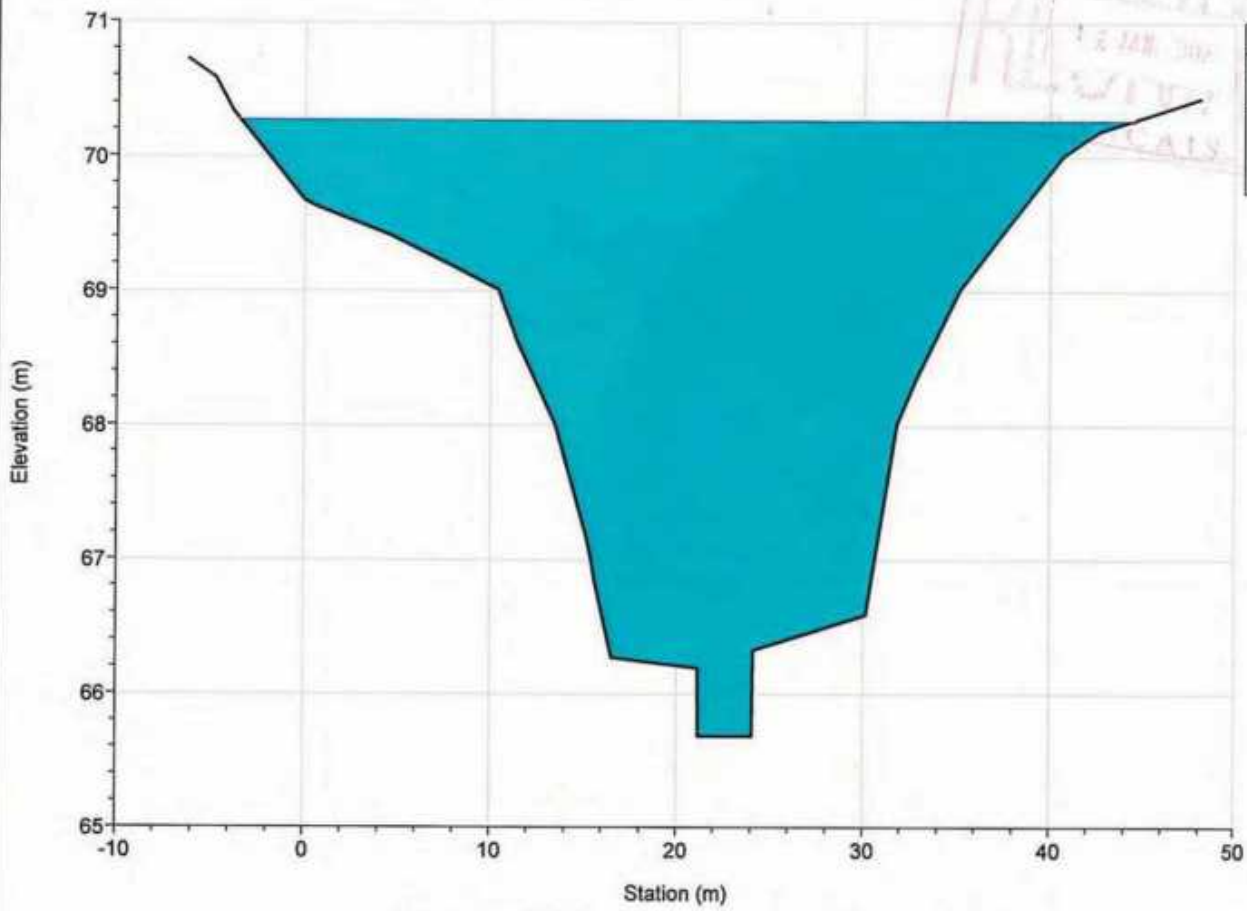
River = LAJE Reach = montante RS = 1522.414



River = LAJE Reach = montante RS = 1418.006

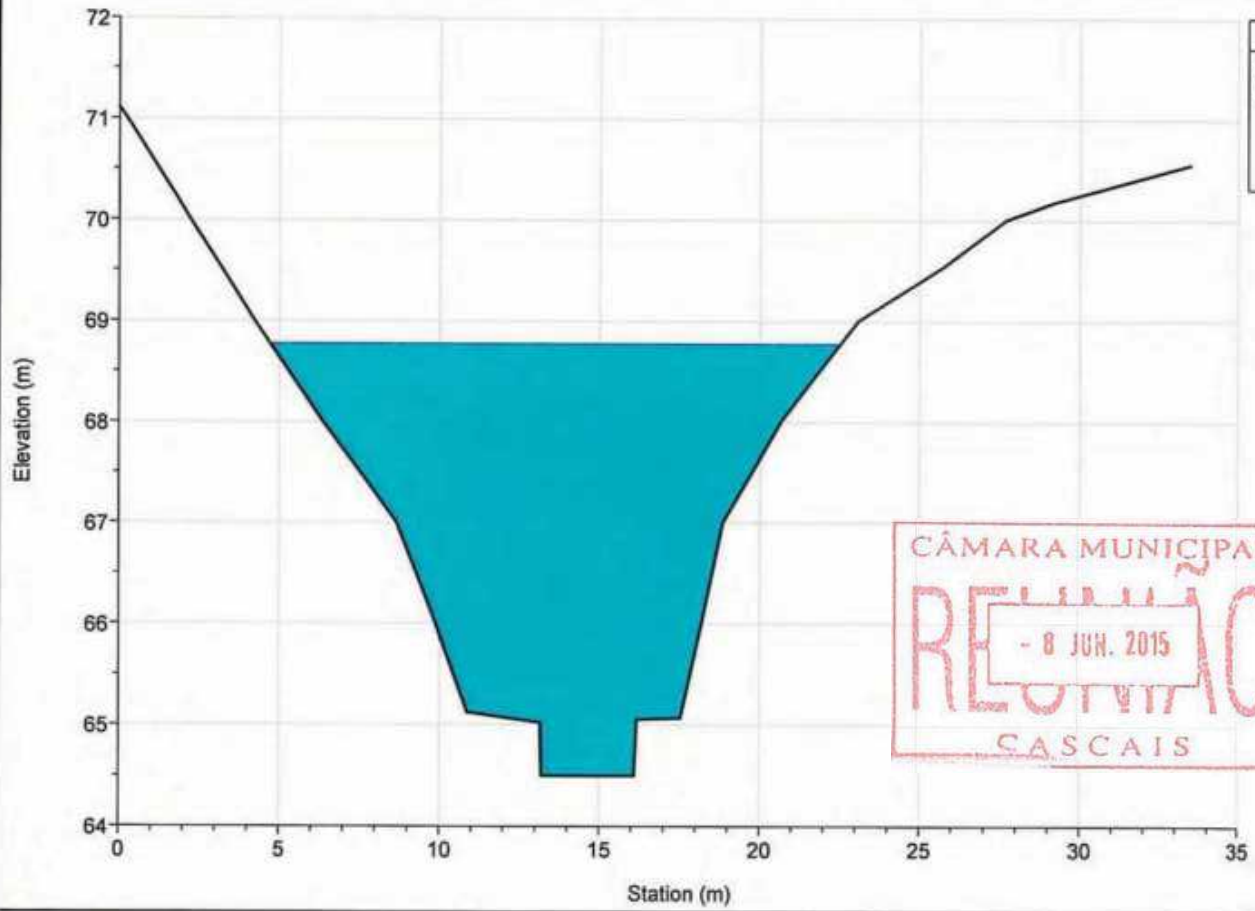


River = LAJE Reach = montante RS = 1312.824



Legend	
WS T=100 anos	Ground
Ground	Bank Sta

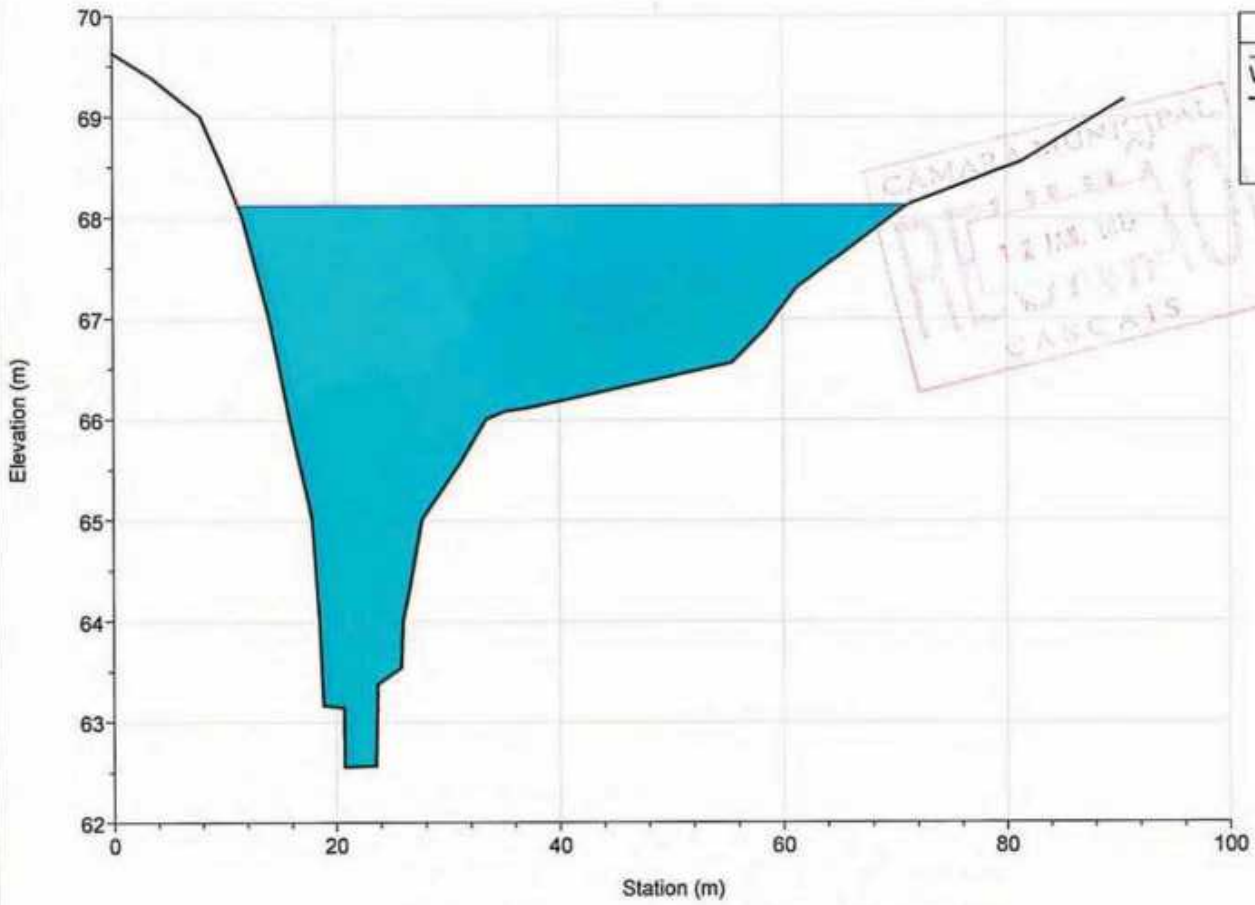
River = LAJE Reach = montante RS = 1212.537



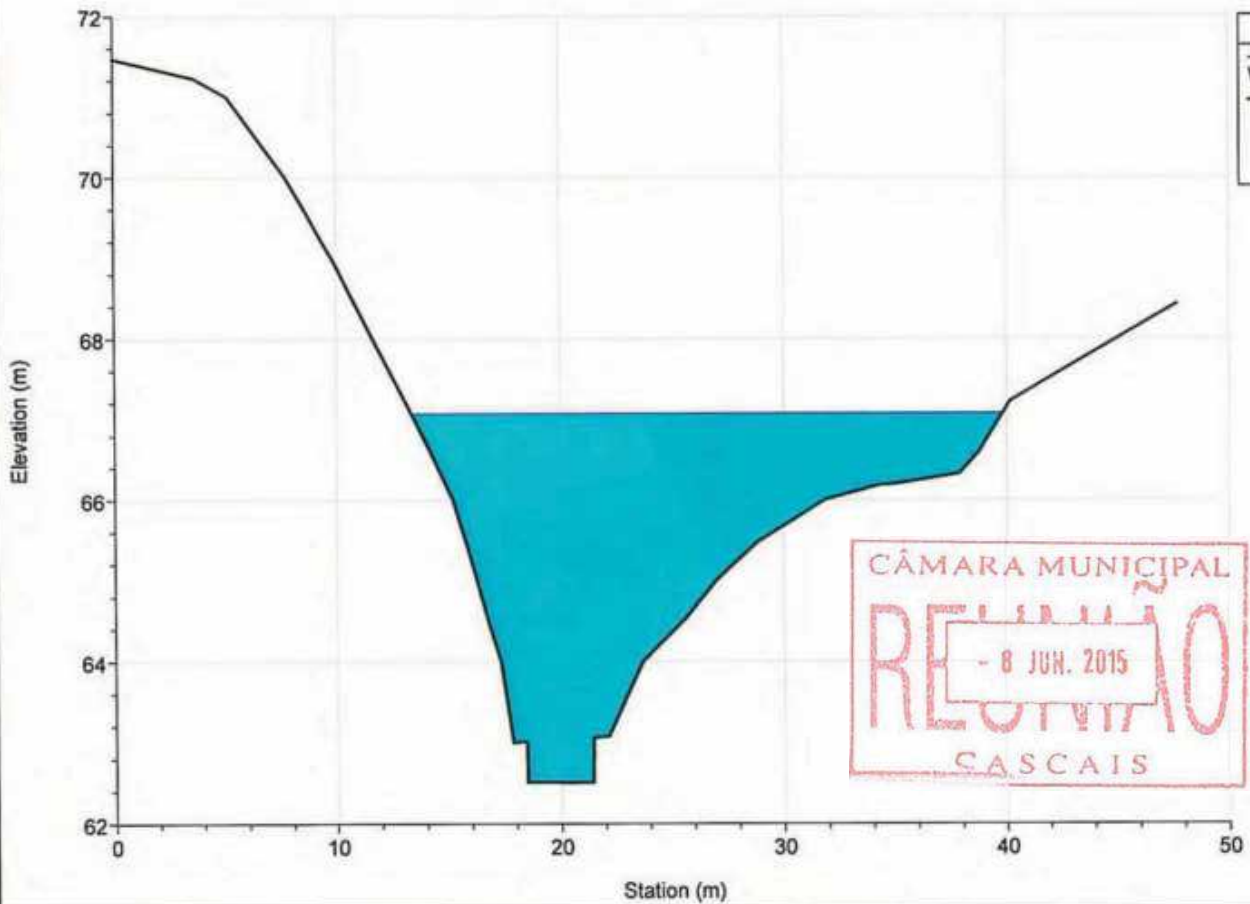
Legend	
WS T=100 anos	Ground
Ground	Bank Sta

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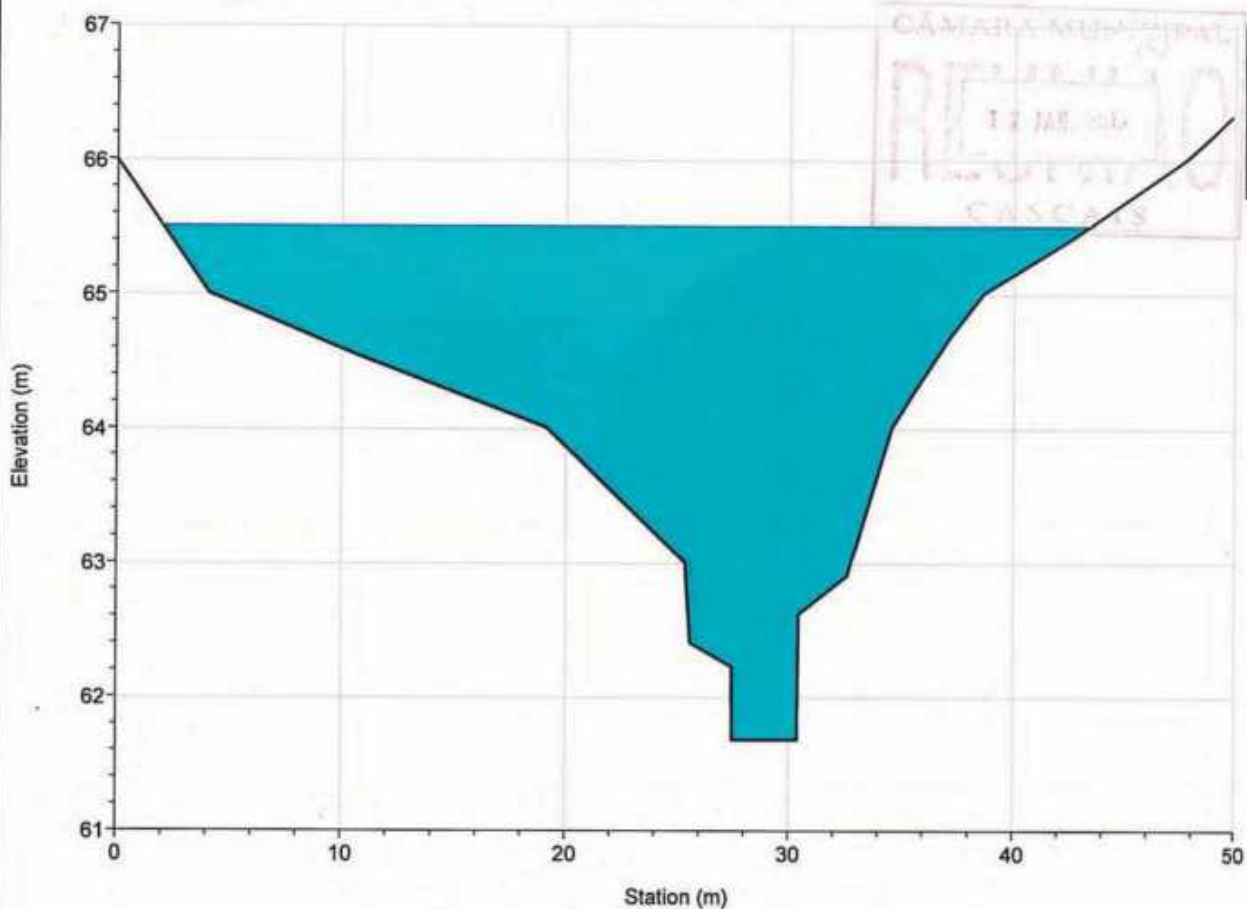
River = LAJE Reach = montante RS = 1085.666



River = LAJE Reach = montante RS = 982.999

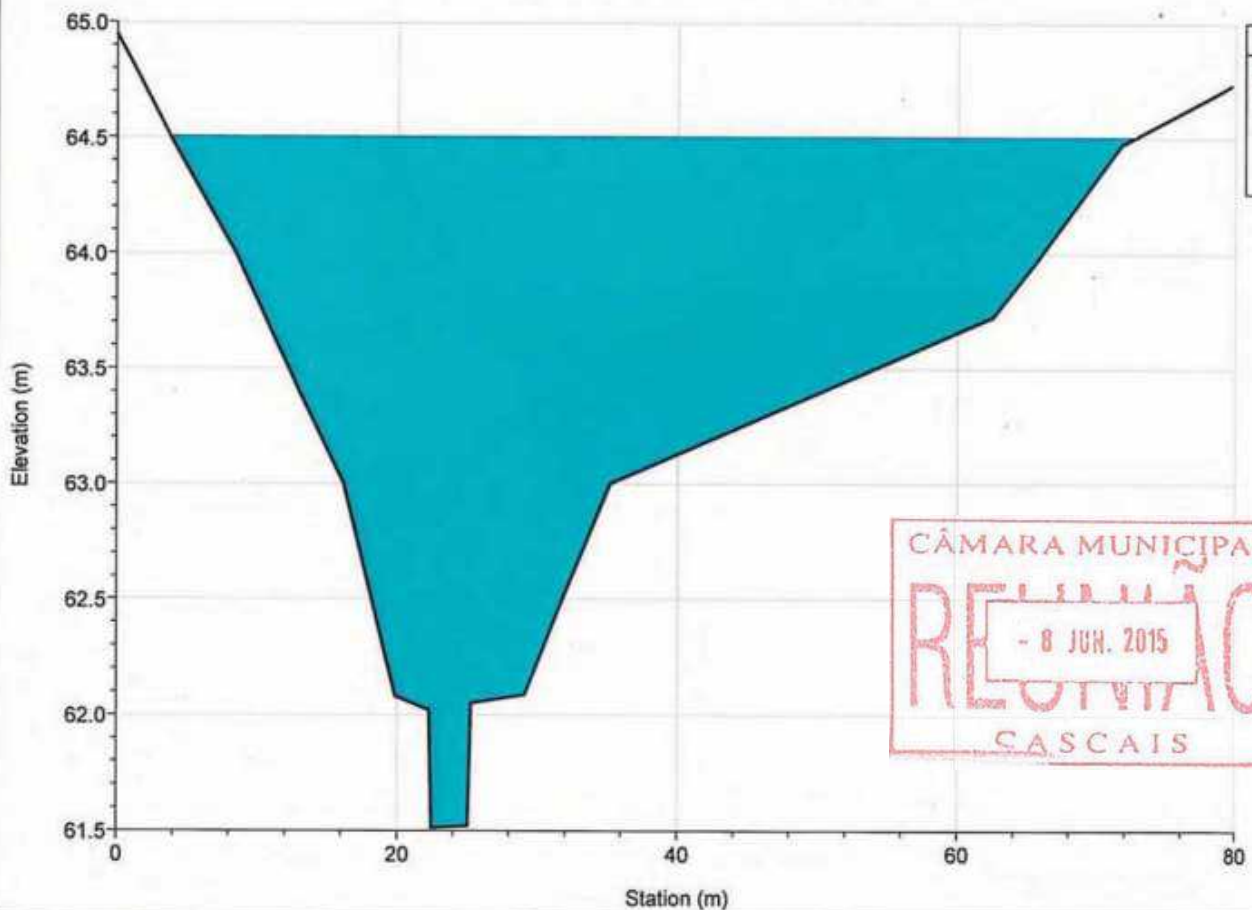


River = LAJE Reach = montante RS = 875.510



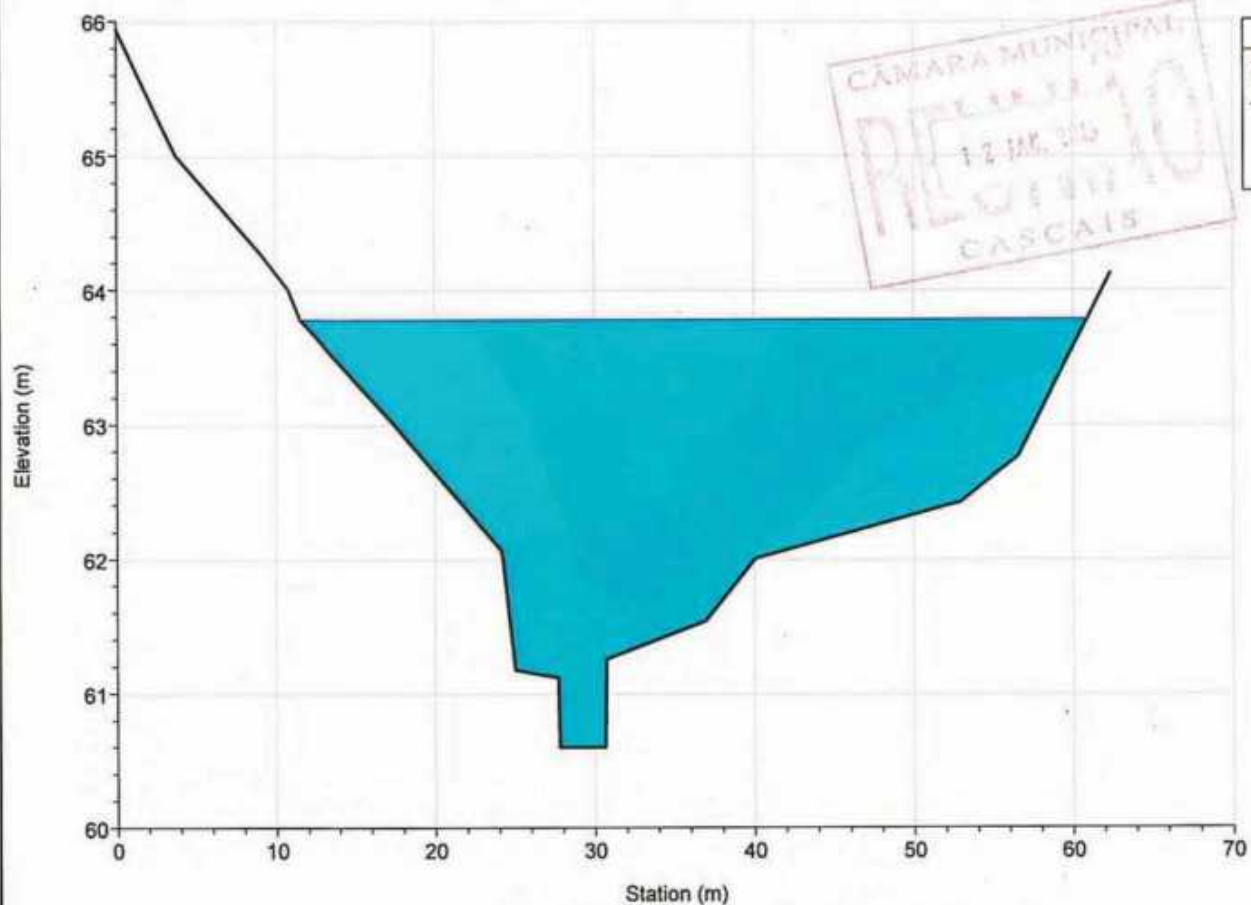
Legend
WS T=100 anos
Ground
Bank Sta

River = LAJE Reach = montante RS = 764.446



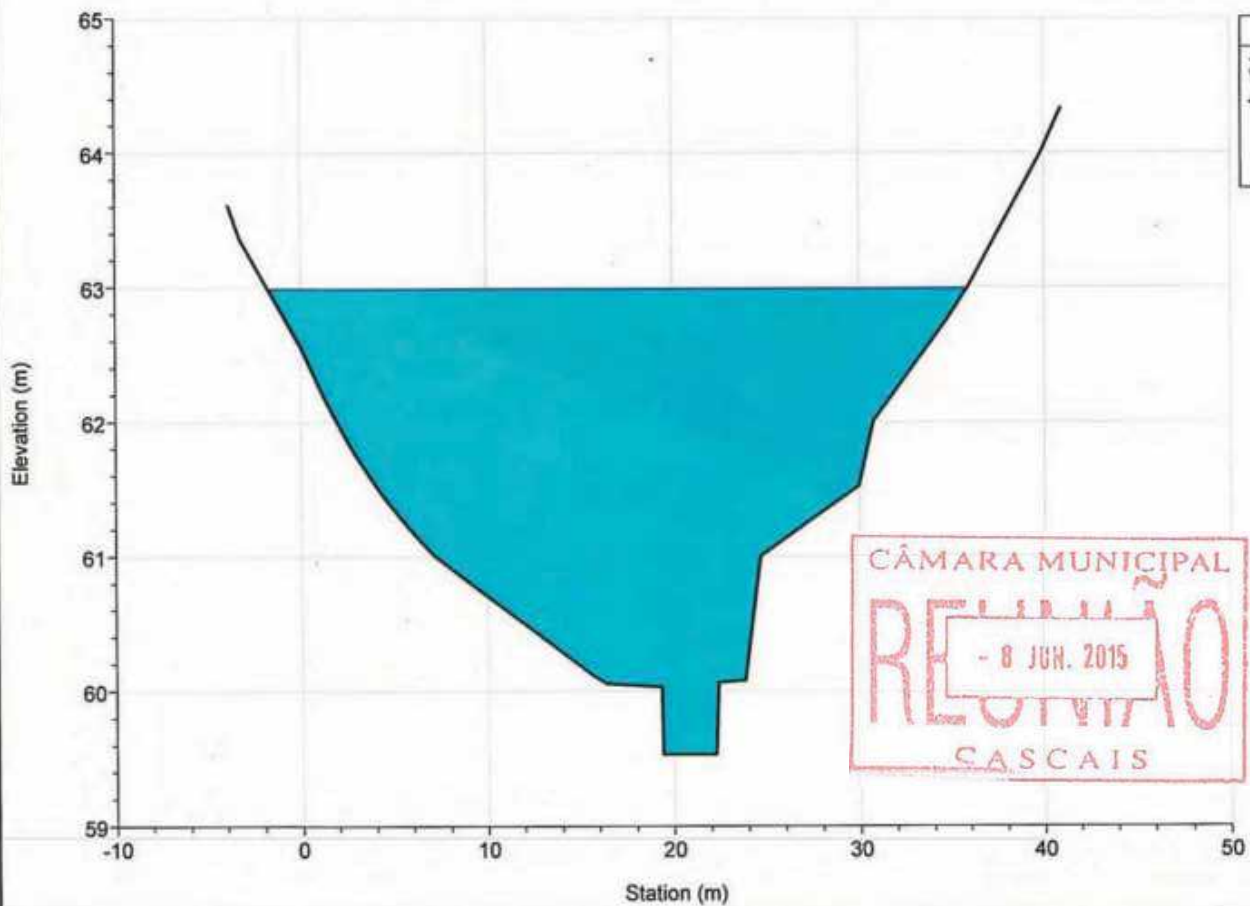
Legend
WS T=100 anos
Ground
Bank Sta

River = LAJE Reach = montante RS = 657.017



Legend
WS T=100 anos
Ground
Bank Sta

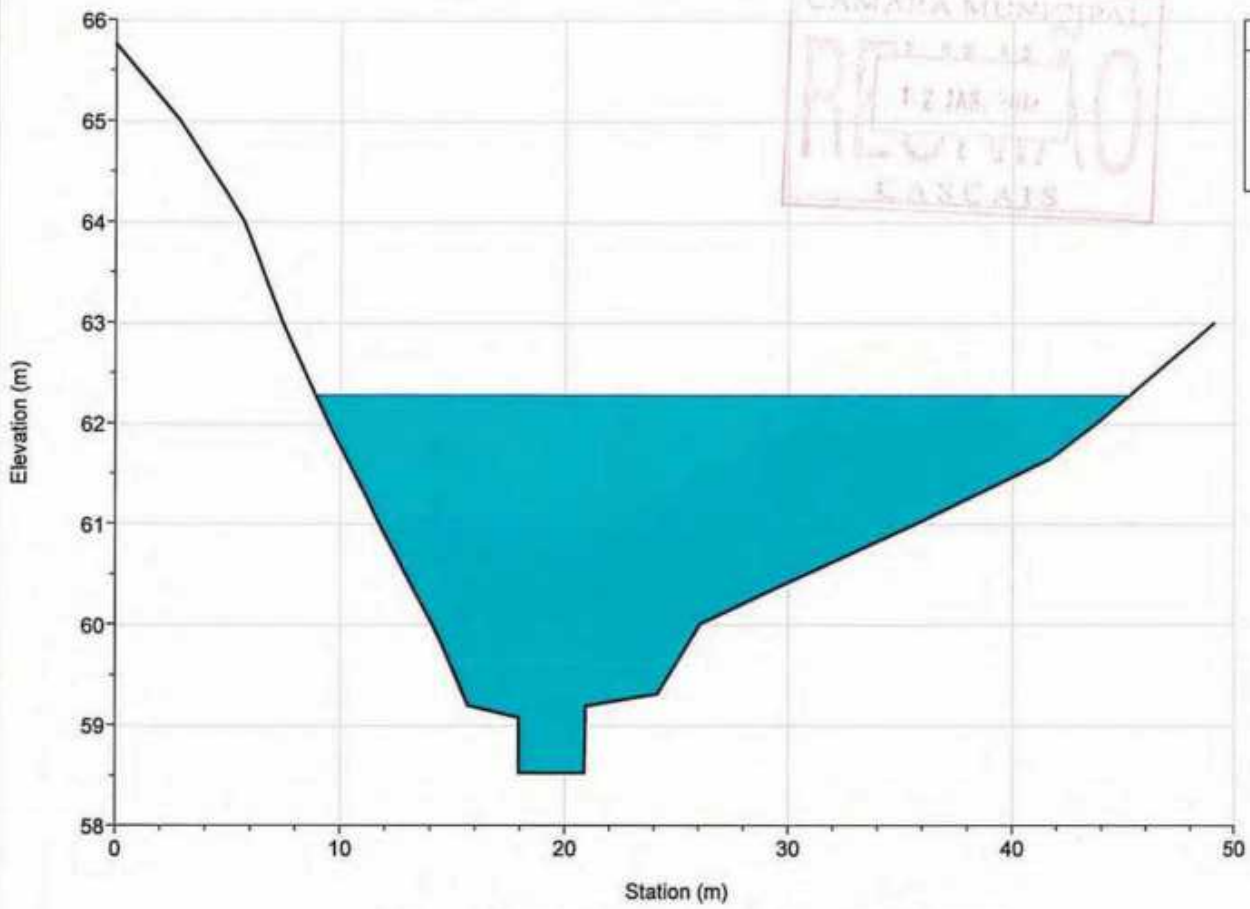
River = LAJE Reach = montante RS = 539.914



Legend
WS T=100 anos
Ground
Bank Sta



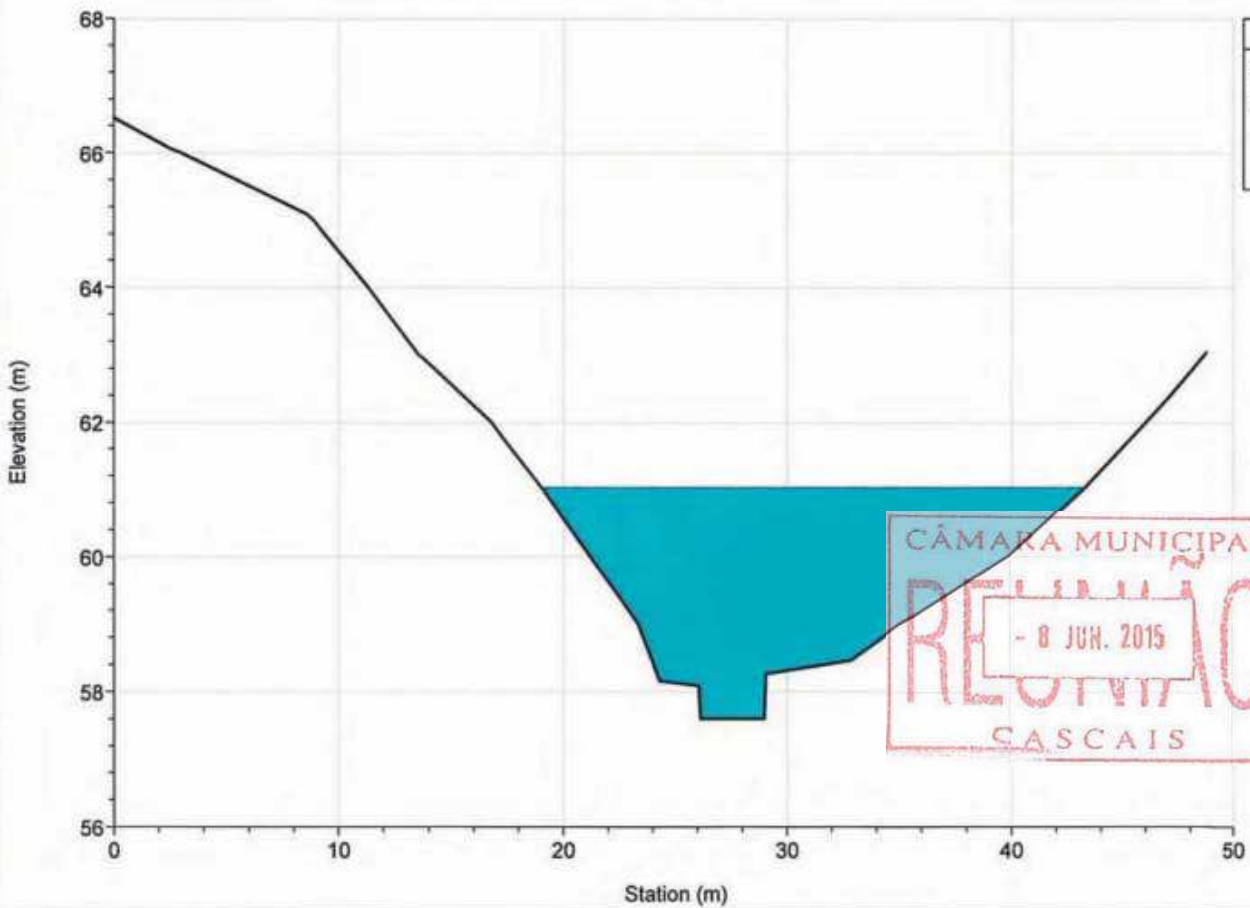
River = LAJE Reach = montante RS = 435.467



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Legend	
WS T=100 anos	
Ground	
Bank Sta	

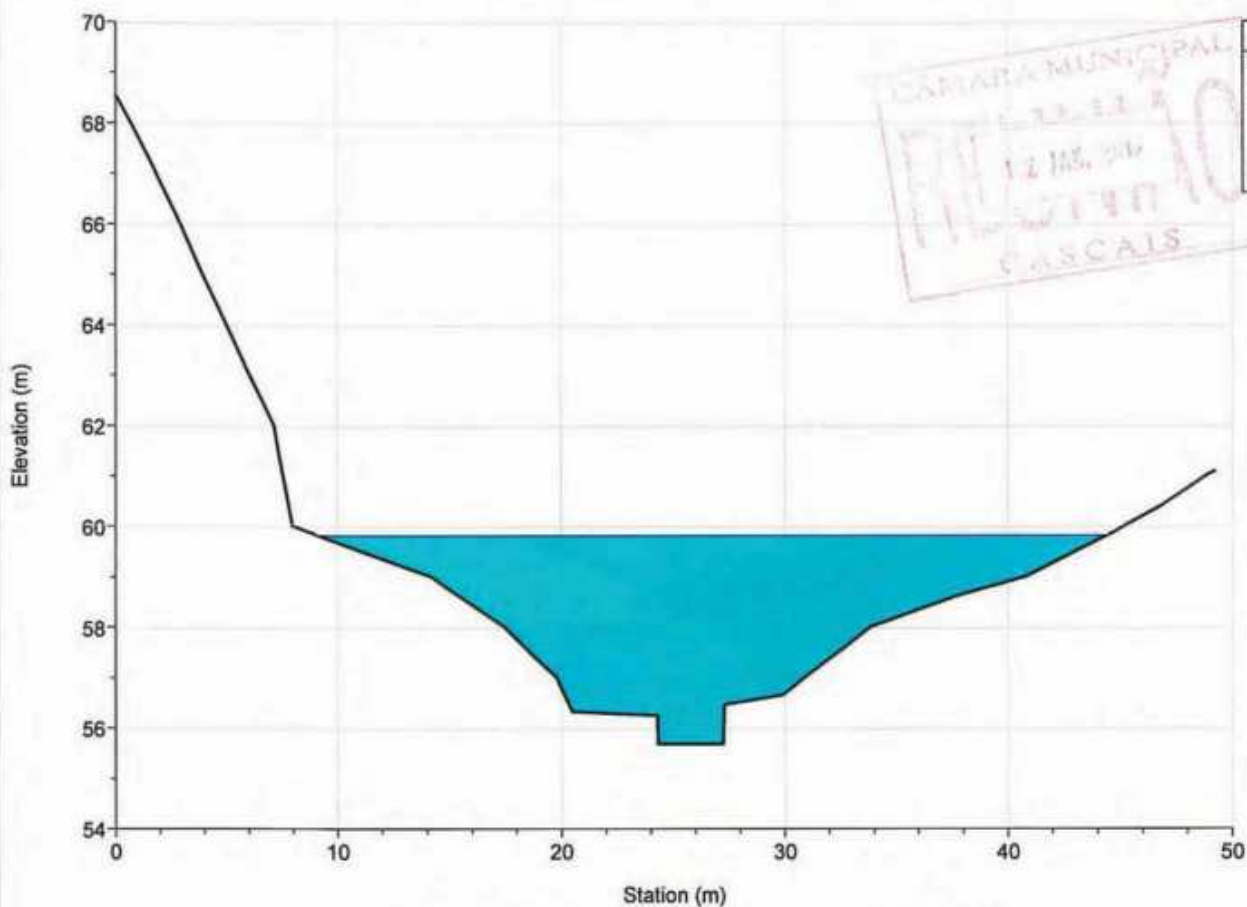
River = LAJE Reach = montante RS = 347.616



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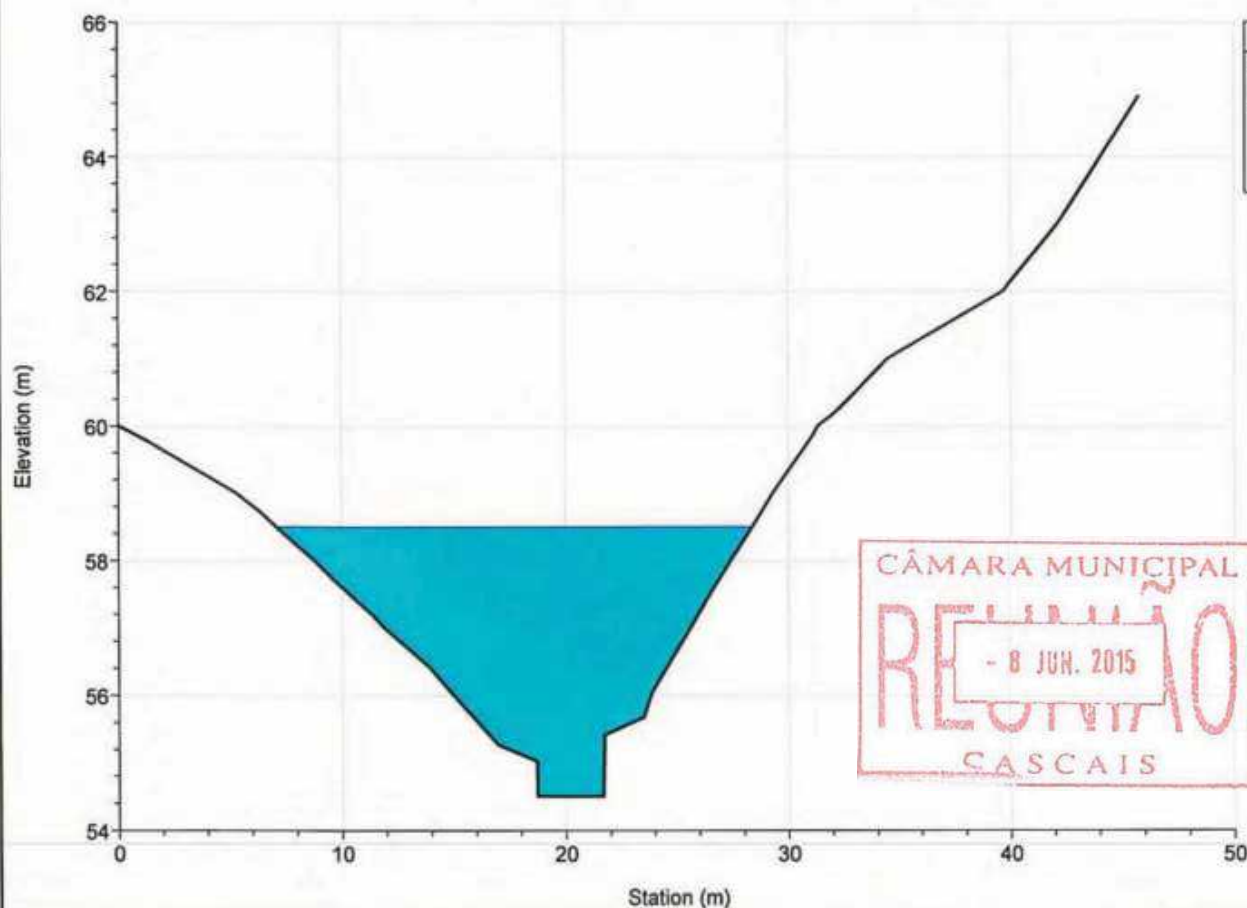
Legend	
WS T=100 anos	
Ground	
Bank Sta	

River = LAJE Reach = montante RS = 240.804



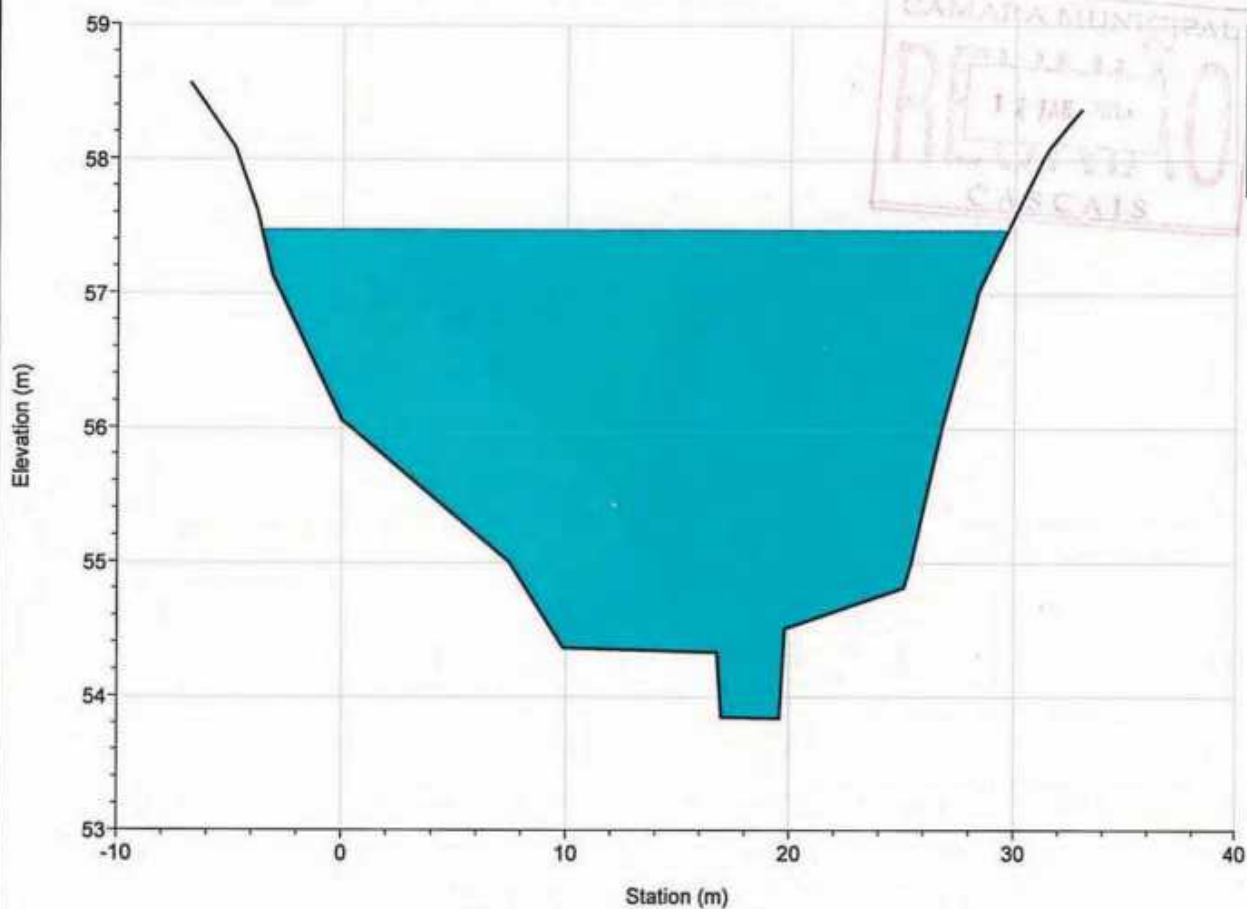
Legend
WS T=100 anos
Ground
Bank Sta

River = LAJE Reach = montante RS = 147.509



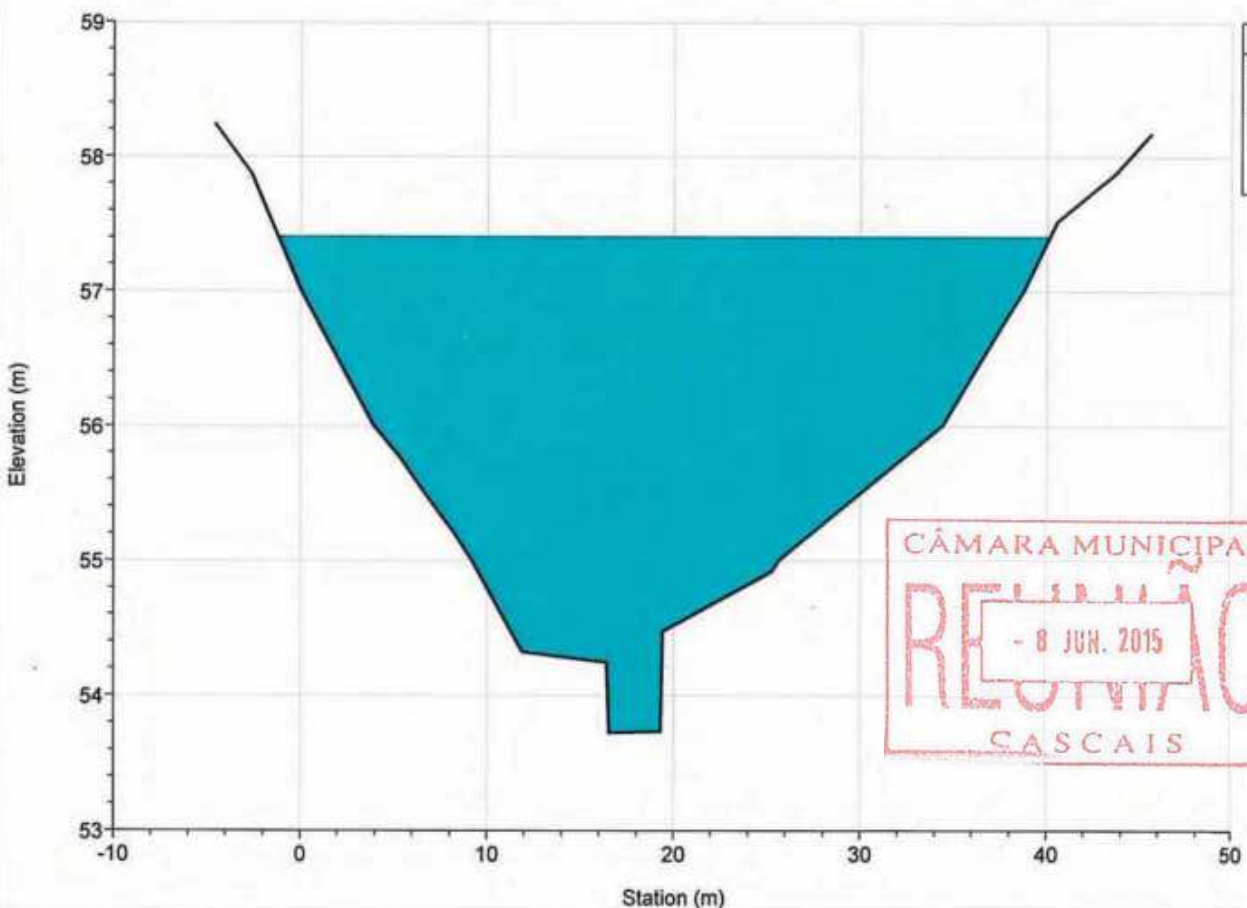
Legend
WS T=100 anos
Ground
Bank Sta

River = LAJE Reach = montante RS = 106.834



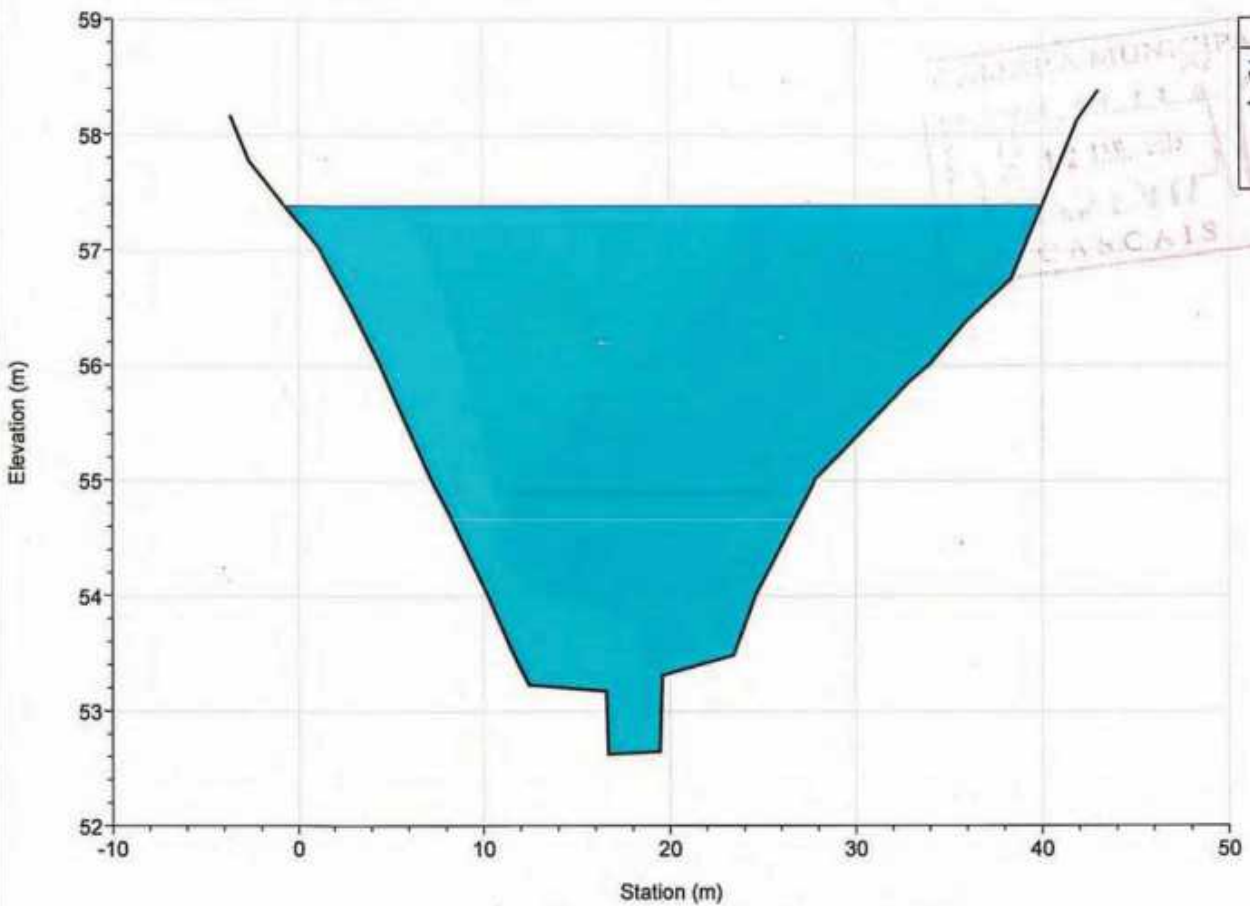
Legend
WS T=100 anos
Ground
Bank Sta

River = LAJE Reach = jusante RS = 83.952

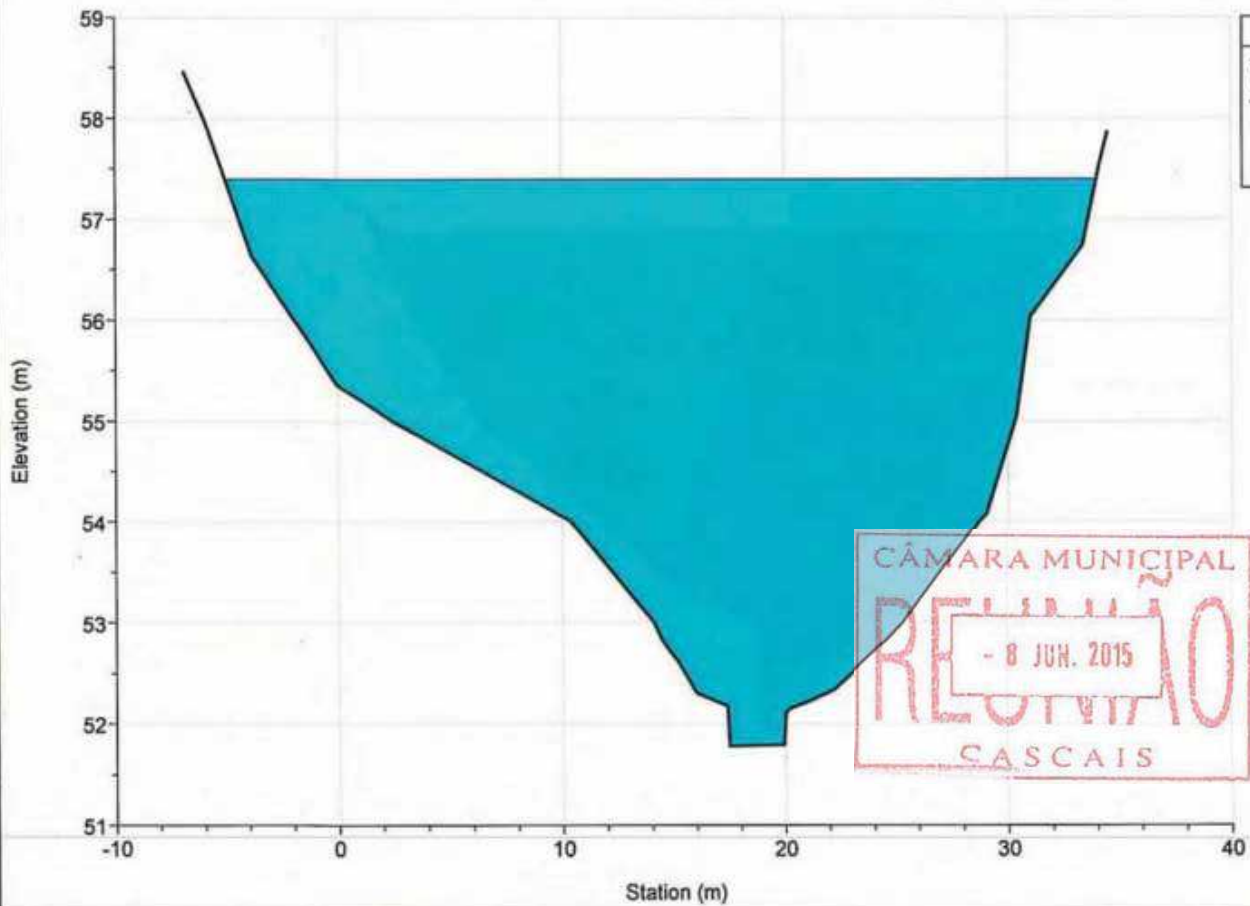


Legend
WS T=100 anos
Ground
Bank Sta

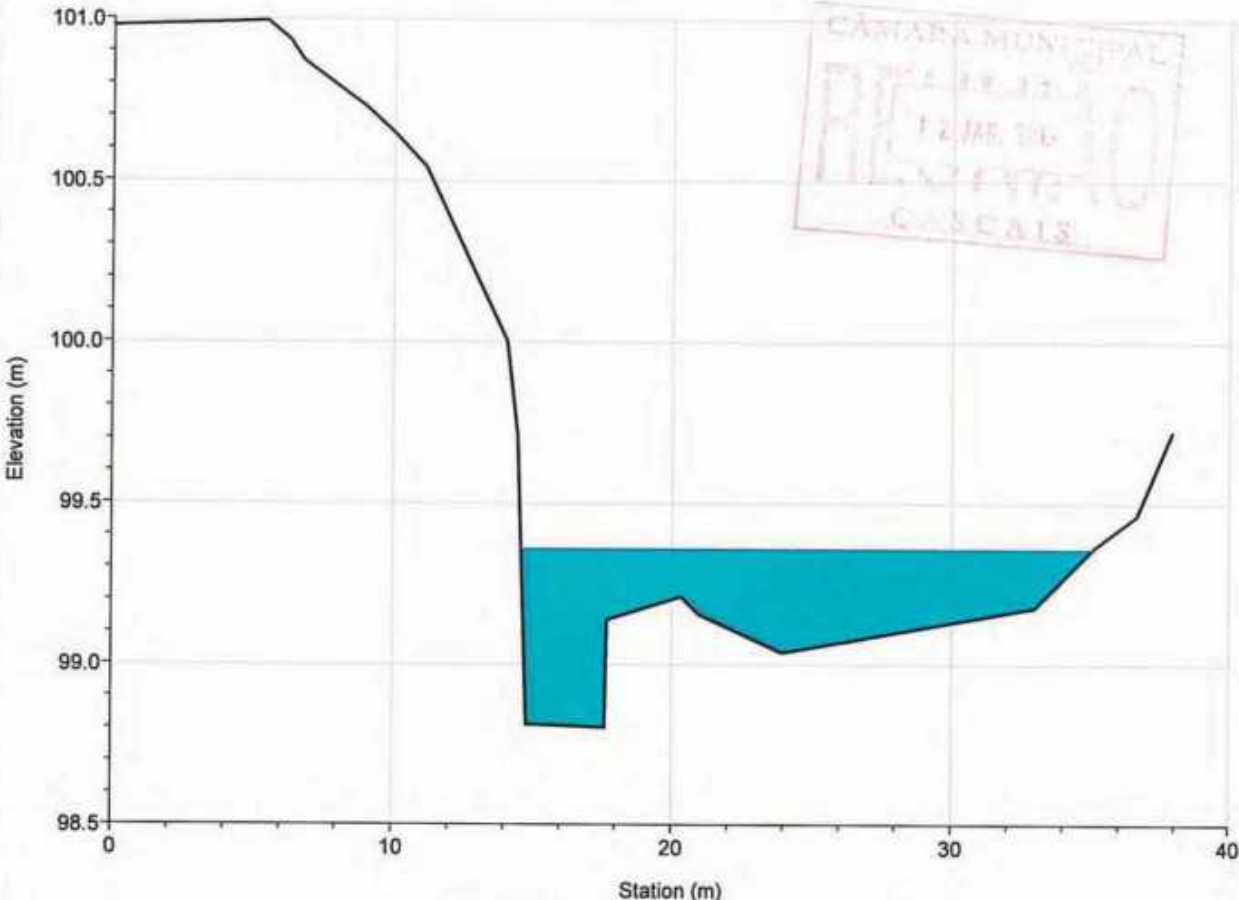
River = LAJE Reach = jusante RS = 52.030



River = LAJE Reach = jusante RS = 7.328

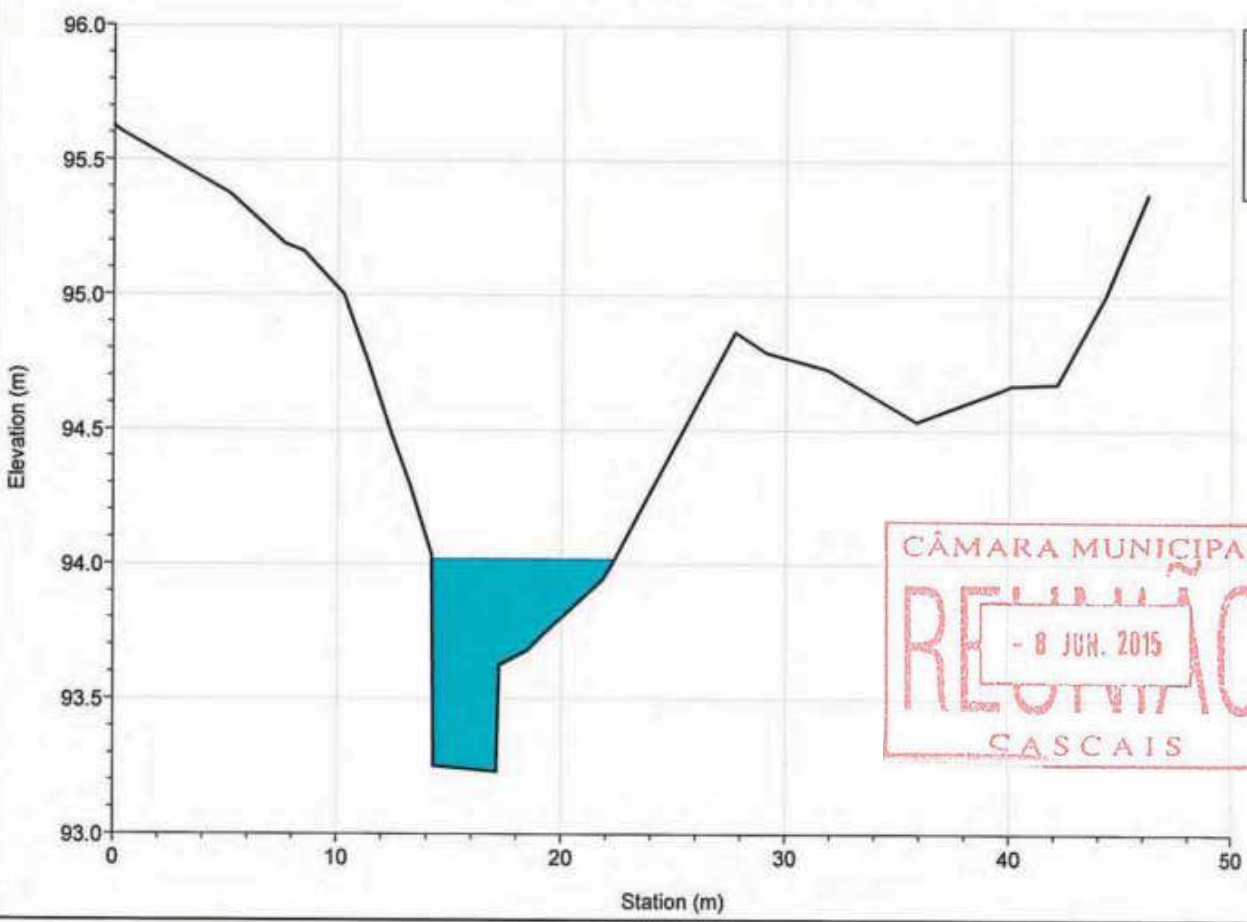


River = MD1 Reach = afluyente RS = 465.529



Legend	
WS T=100 anos	
Ground	
Bank Sta	

River = MD1 Reach = afluyente RS = 353.163

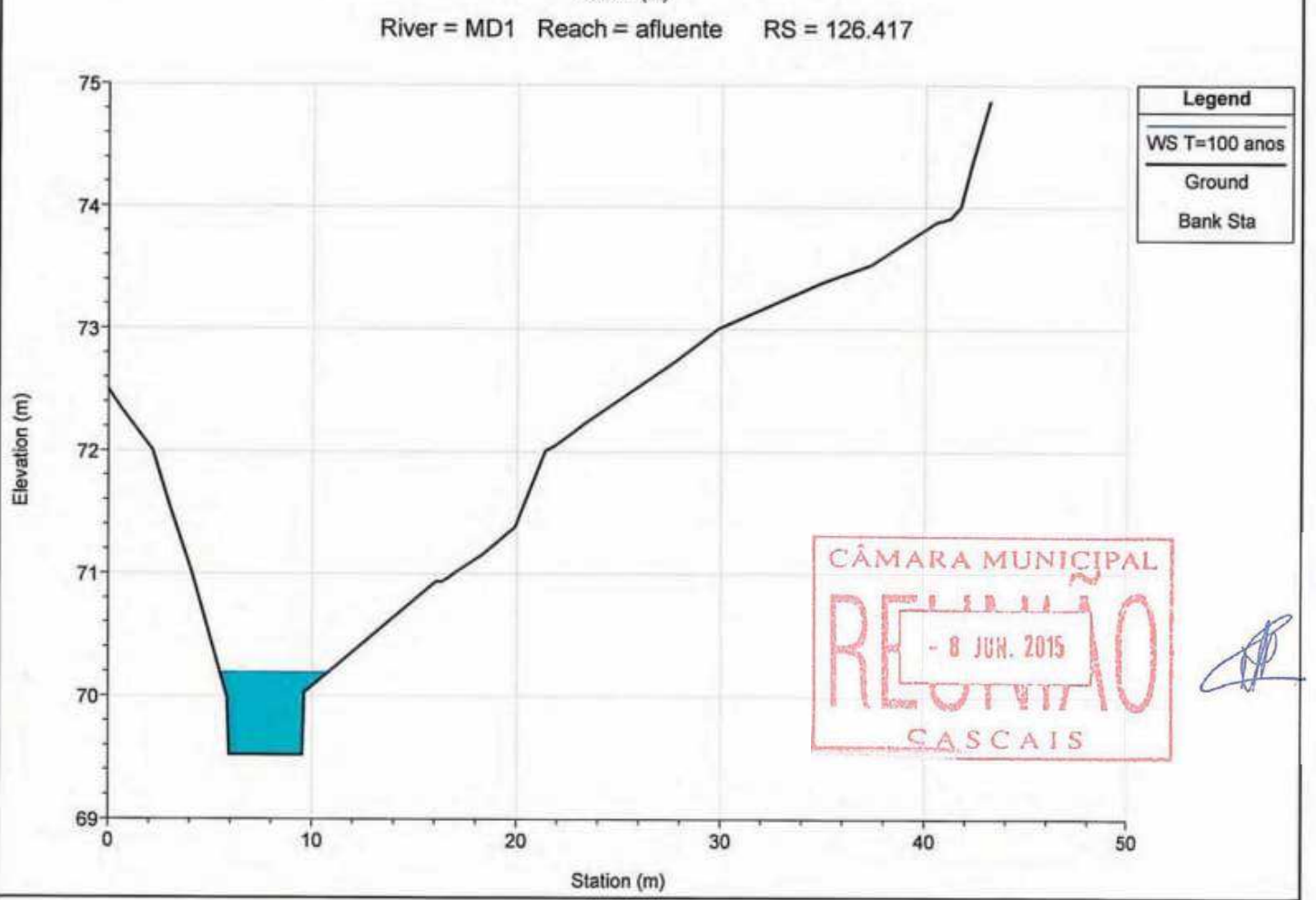
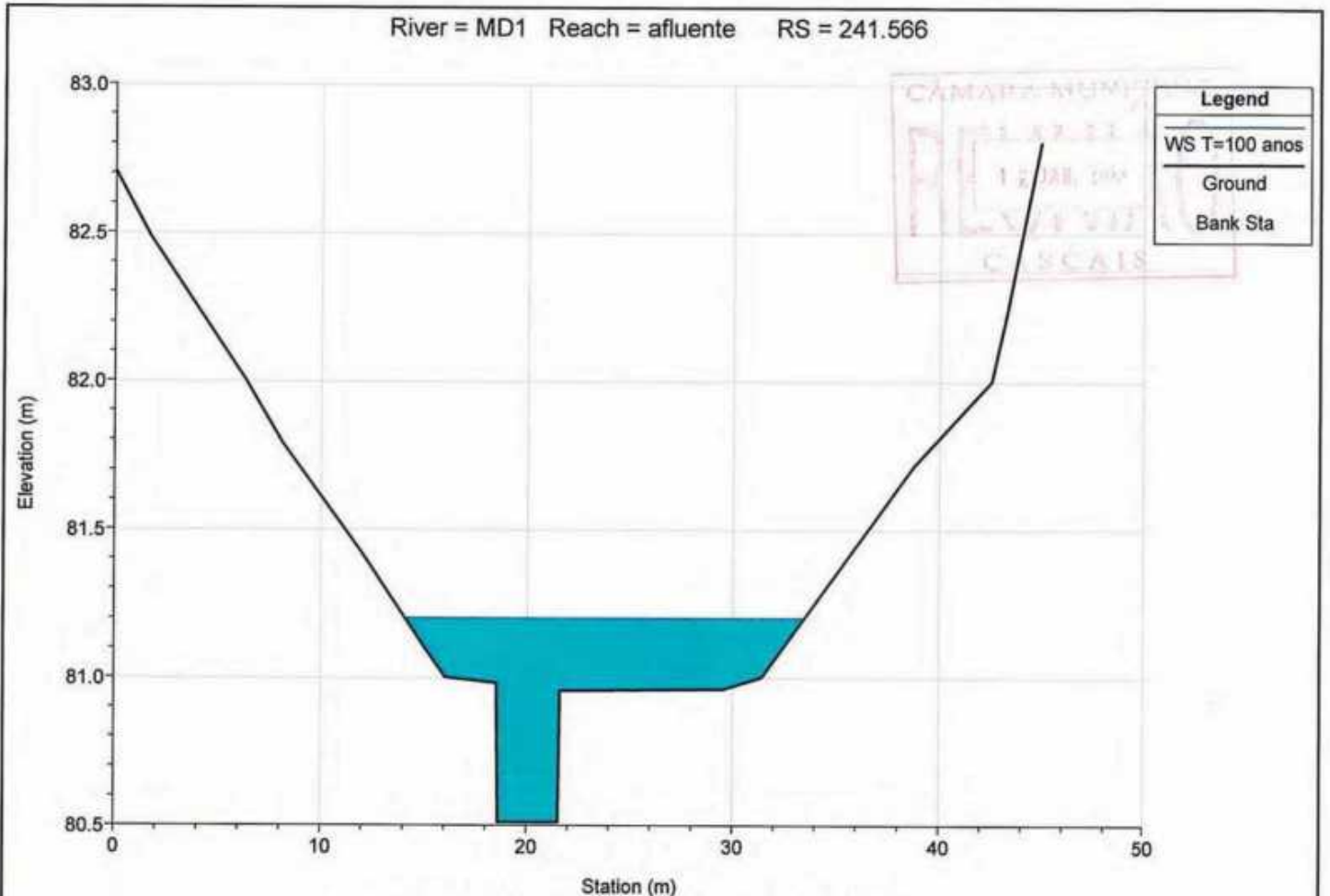


Legend	
WS T=100 anos	
Ground	
Bank Sta	

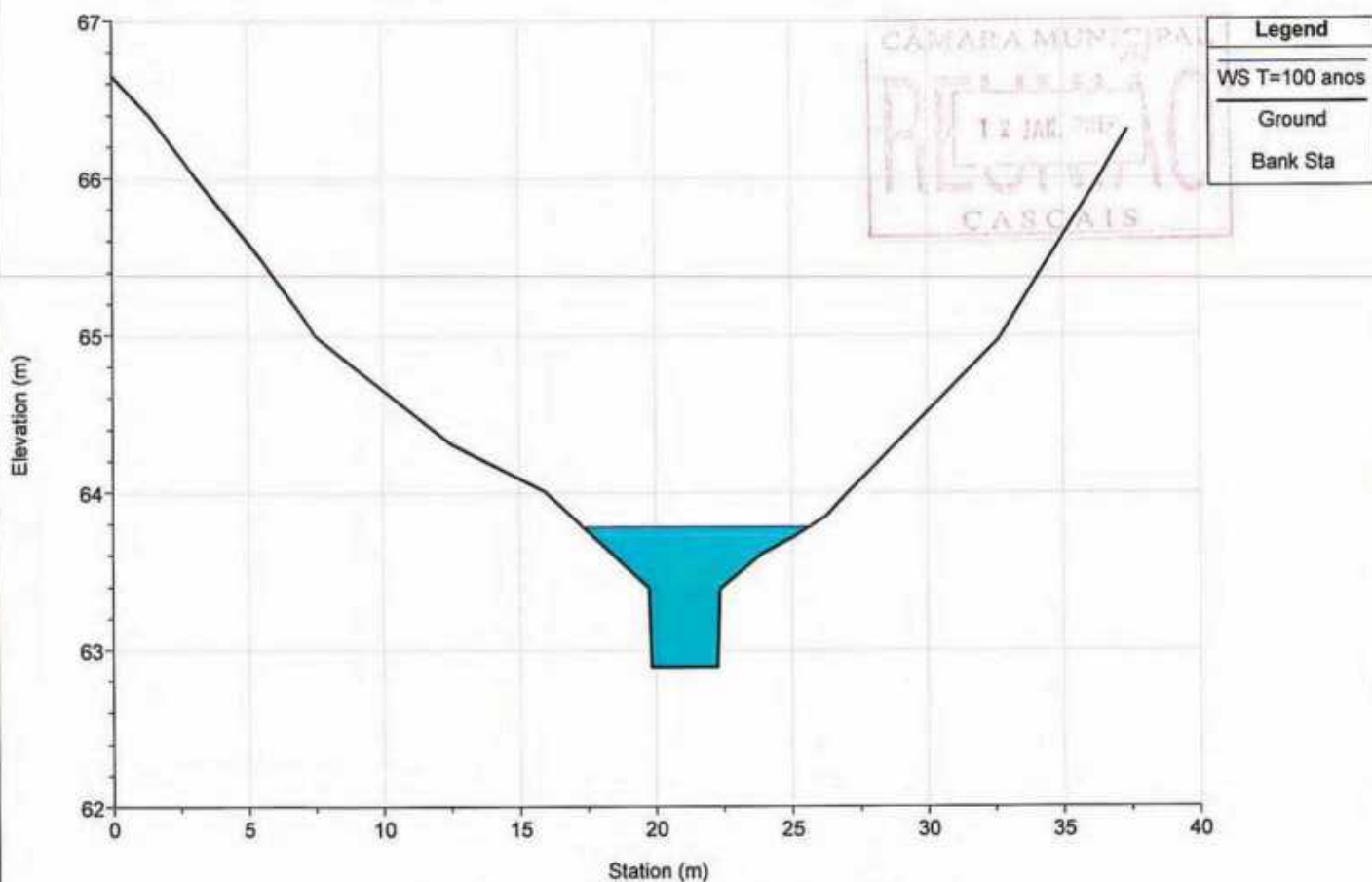
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- 8 JUN. 2015  
CASCAIS

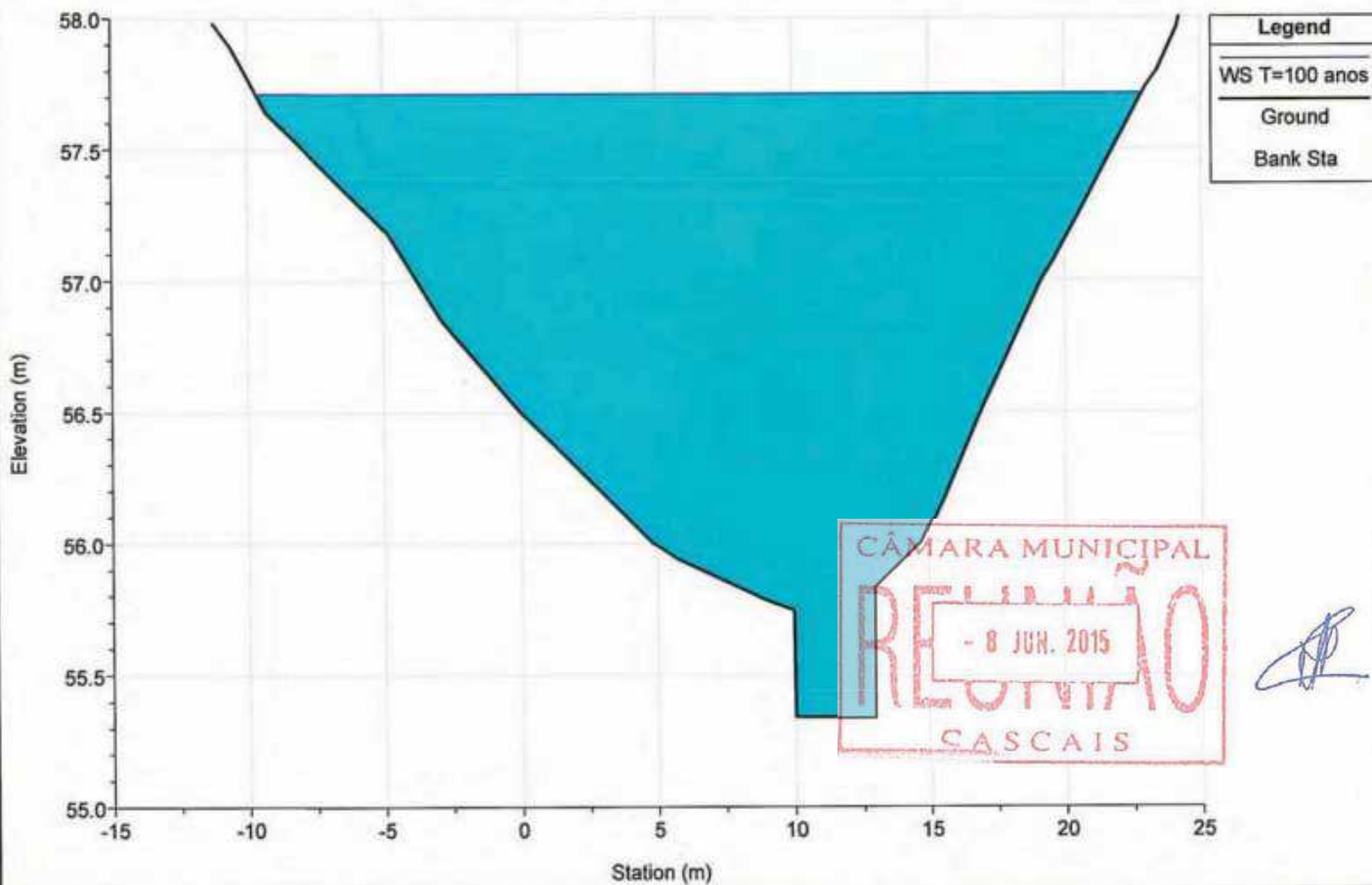




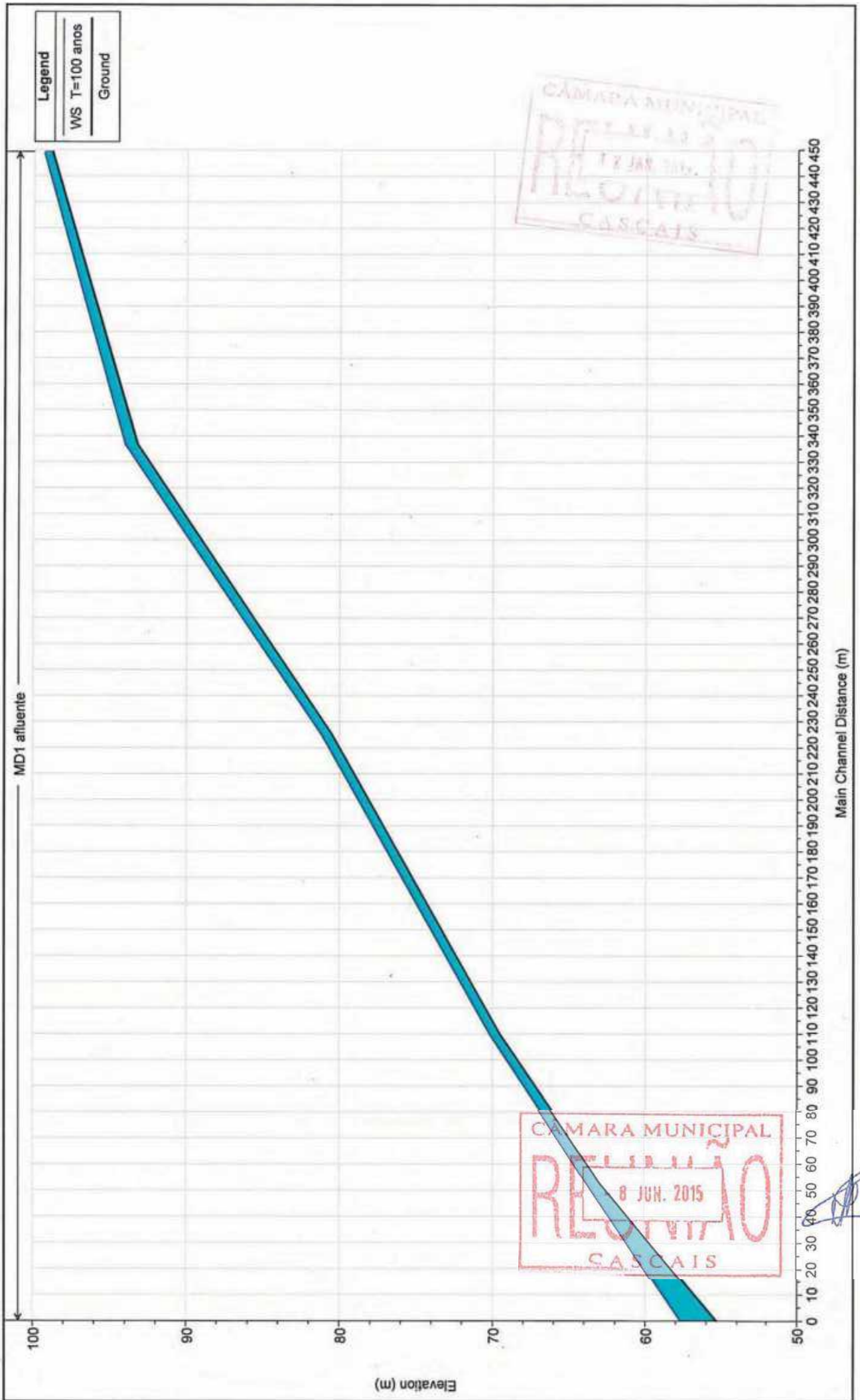
River = MD1 Reach = afluente RS = 69.201



River = MD1 Reach = afluente RS = 16.572

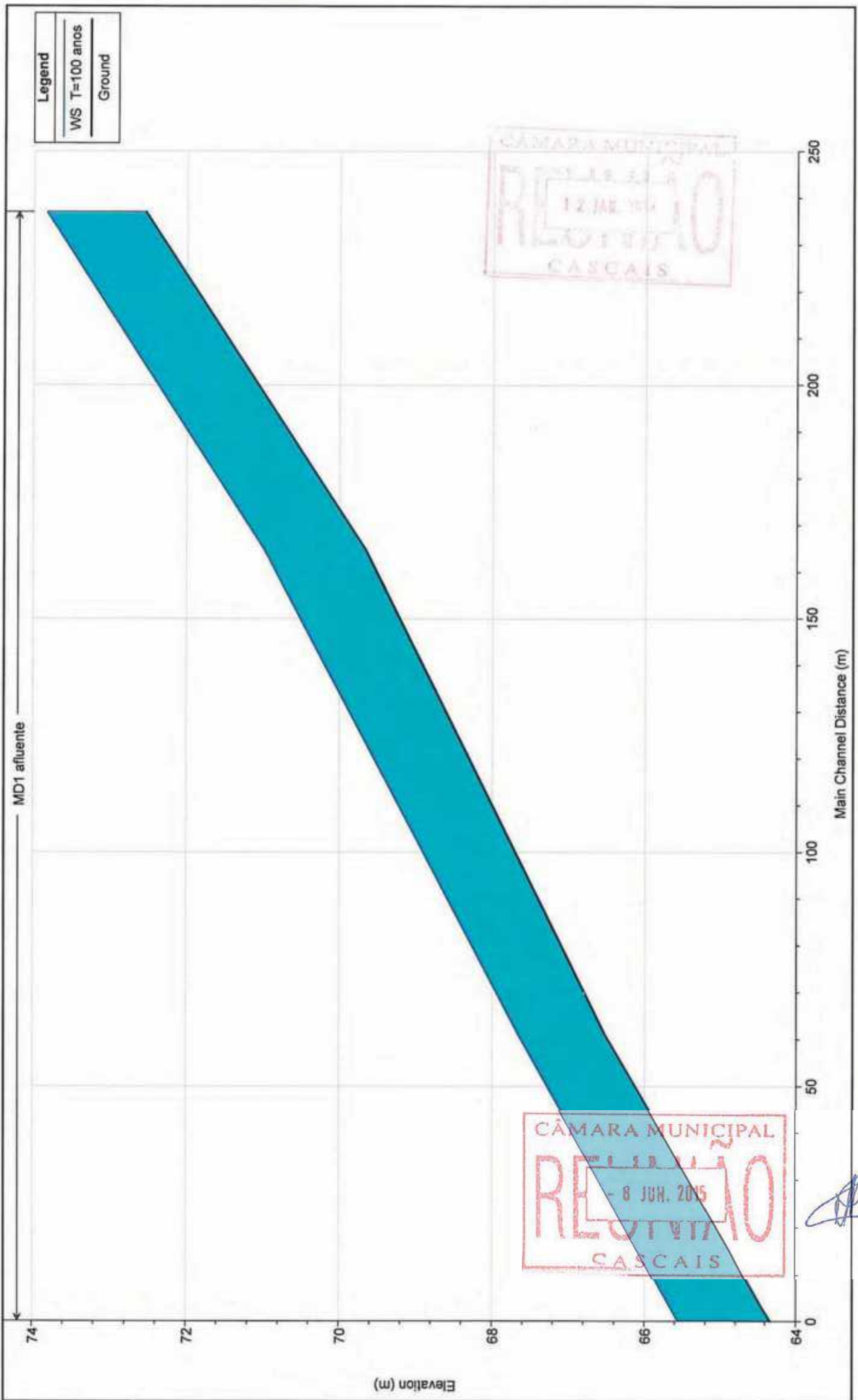


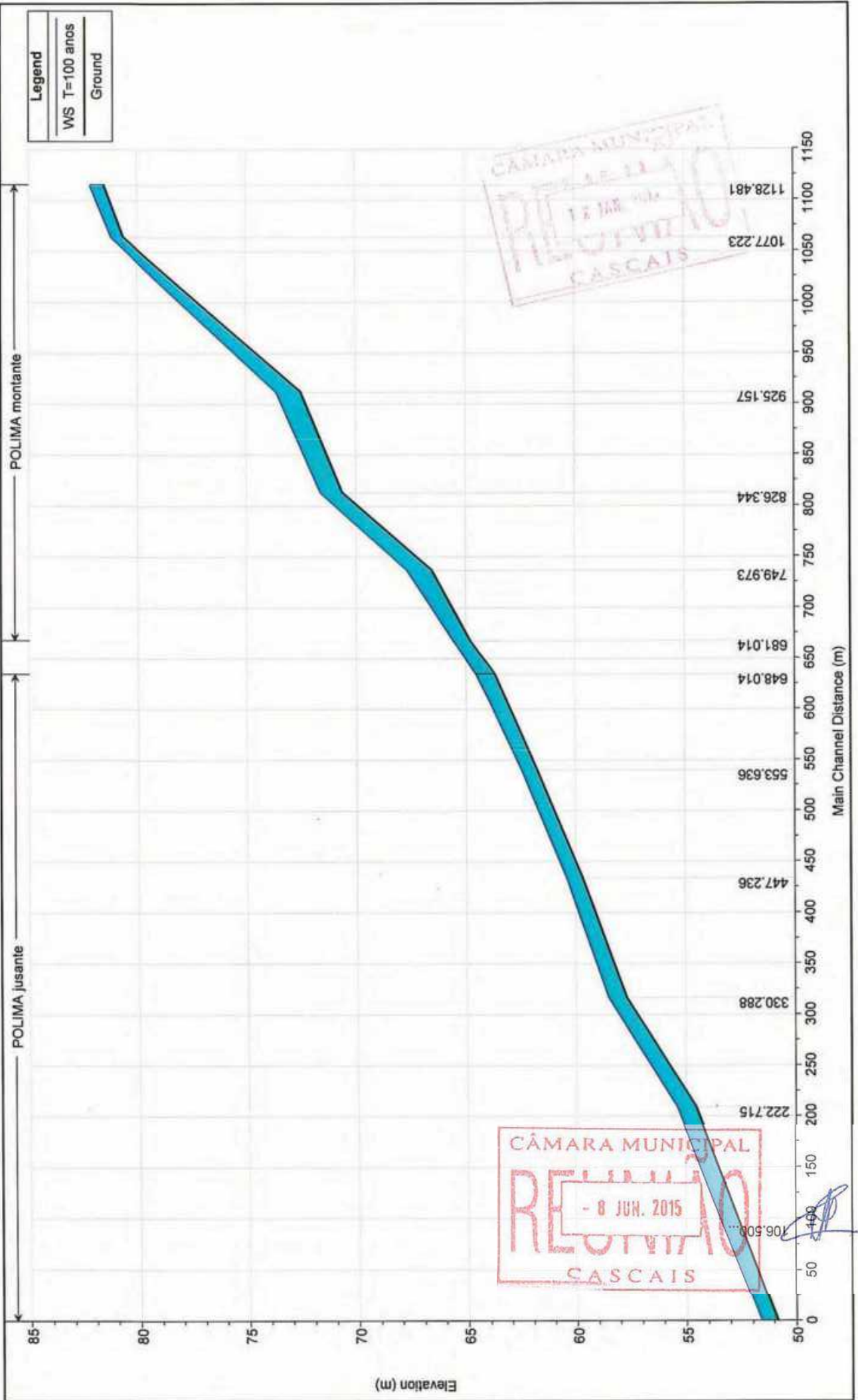




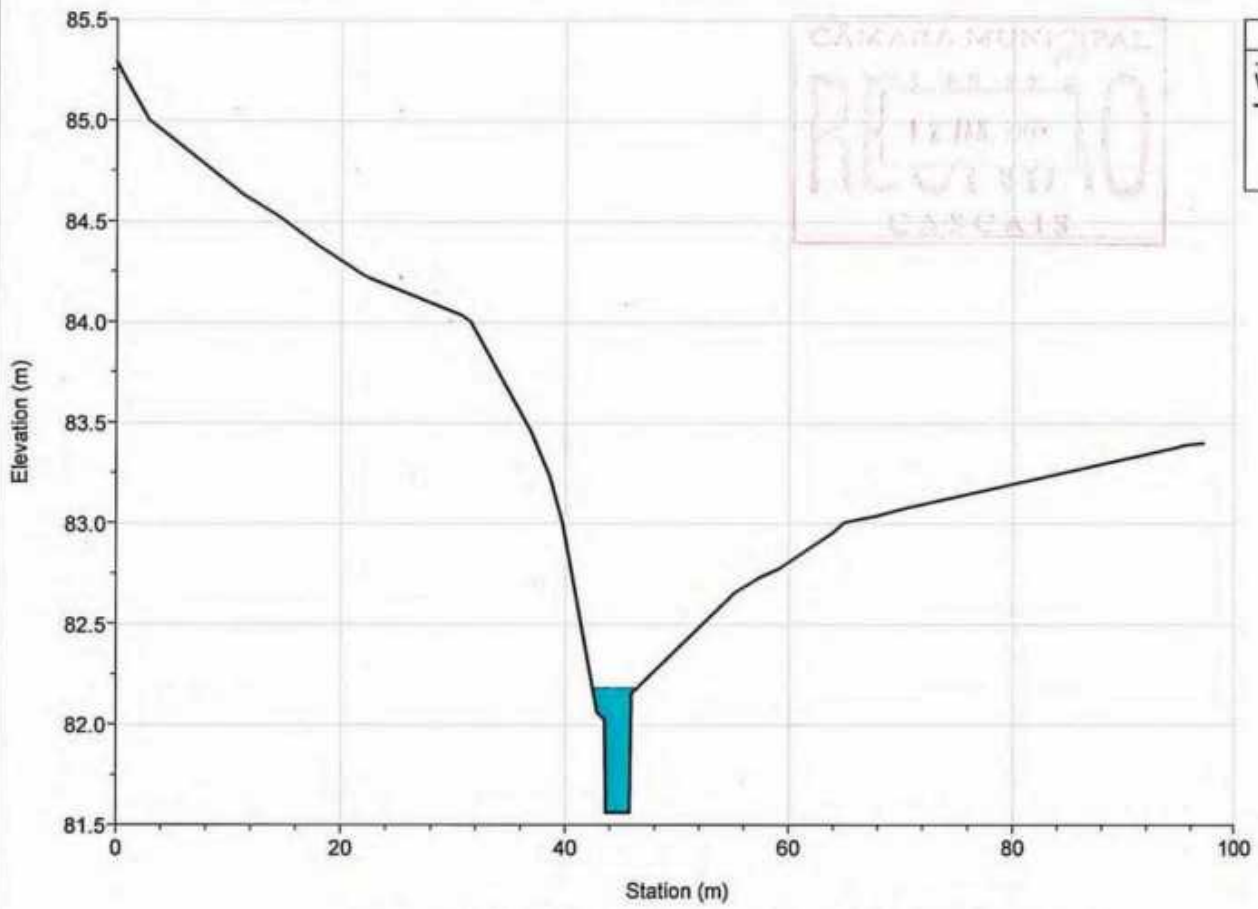


A handwritten signature in blue ink, located to the right of the red stamp.



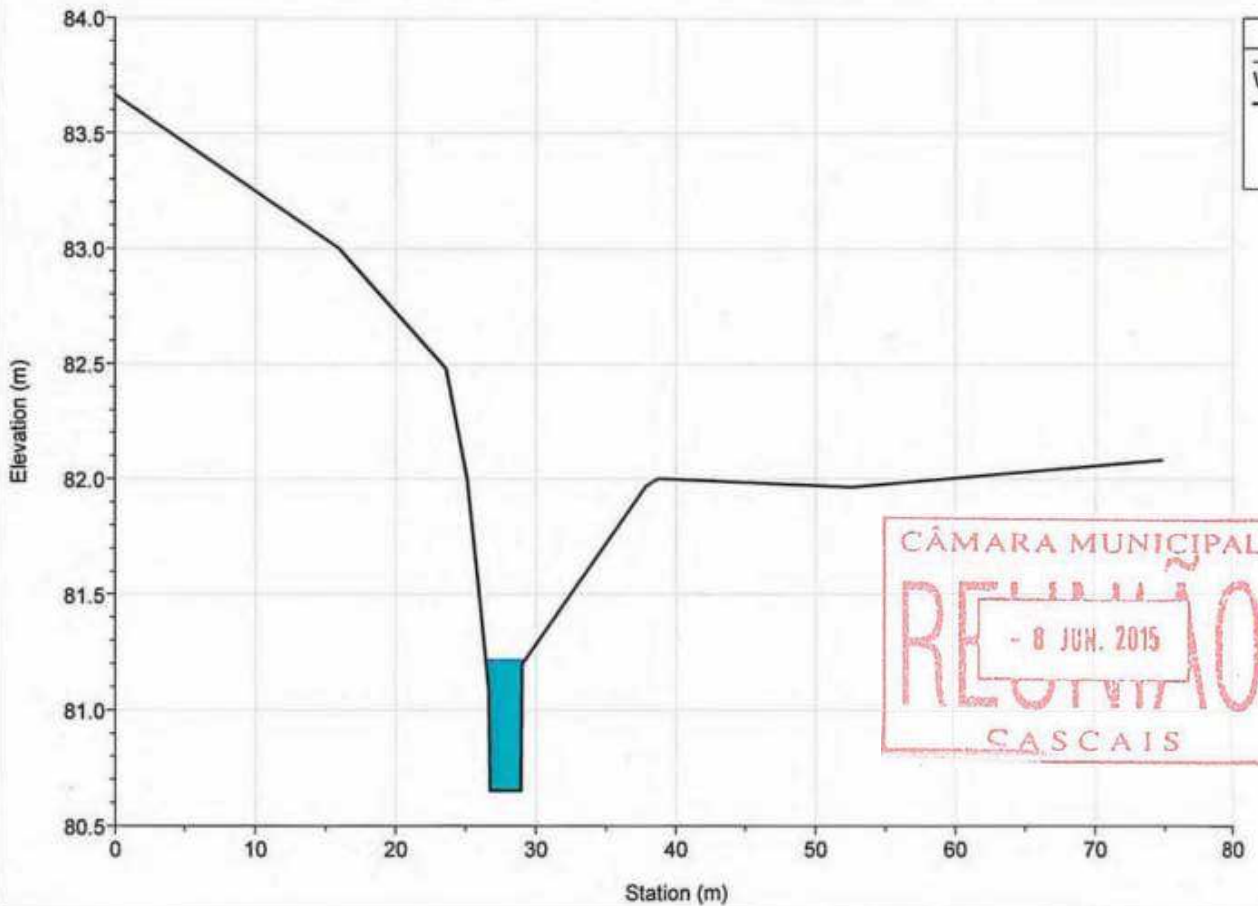


River = POLIMA Reach = montante RS = 1128.481



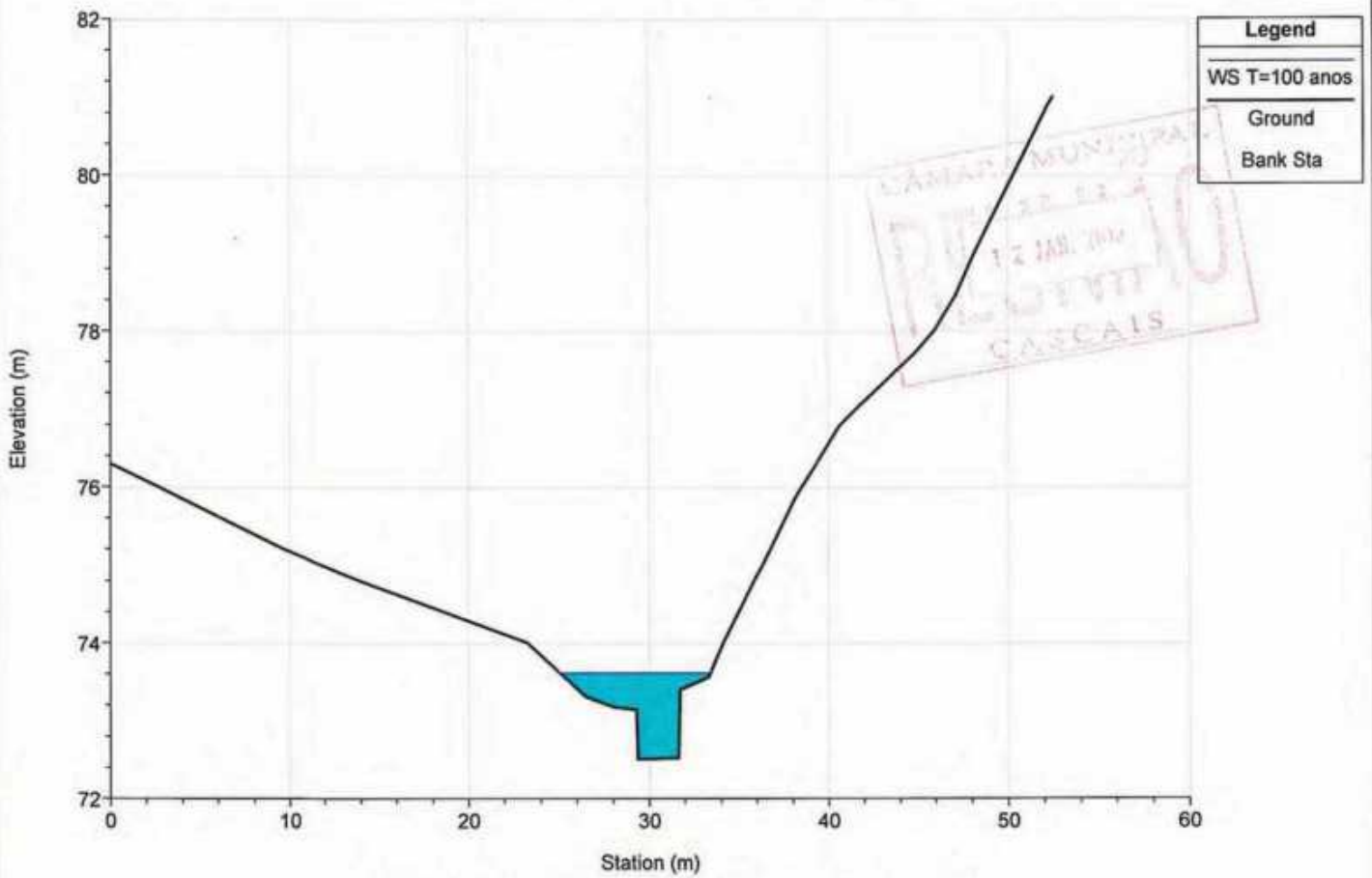
Legend	
WS T=100 anos	
Ground	
Bank Sta	

River = POLIMA Reach = montante RS = 1077.223

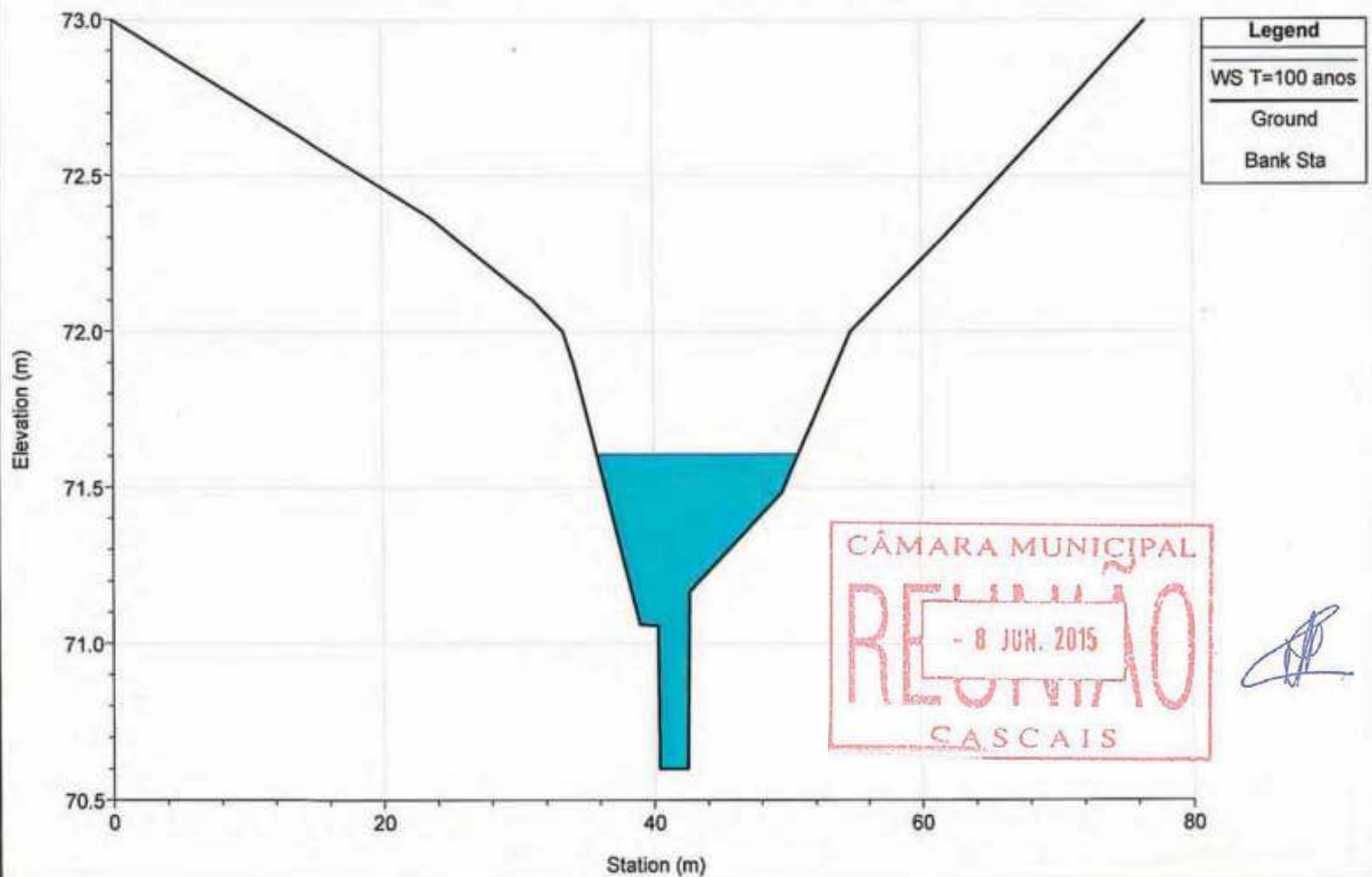


Legend	
WS T=100 anos	
Ground	
Bank Sta	

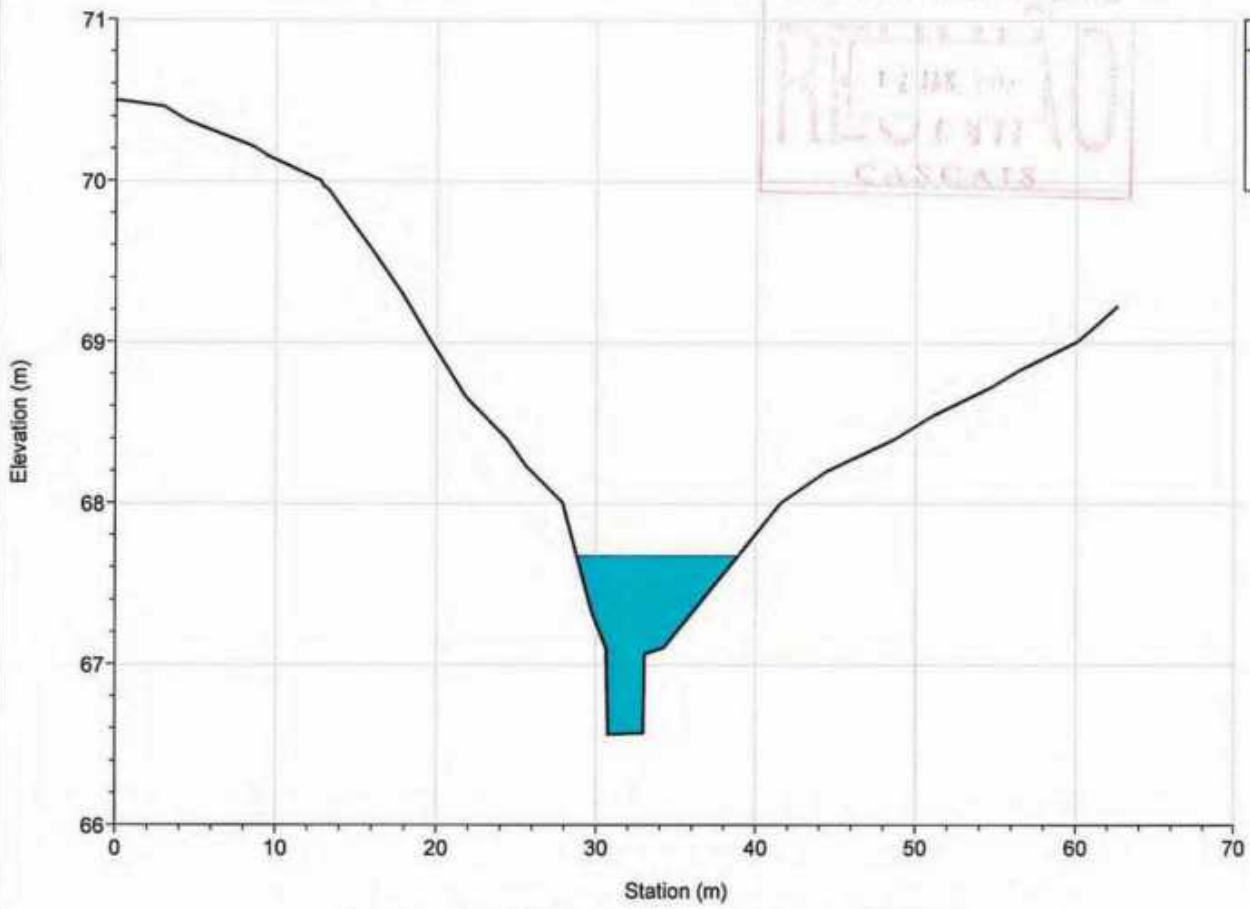
River = POLIMA Reach = montante RS = 925.157



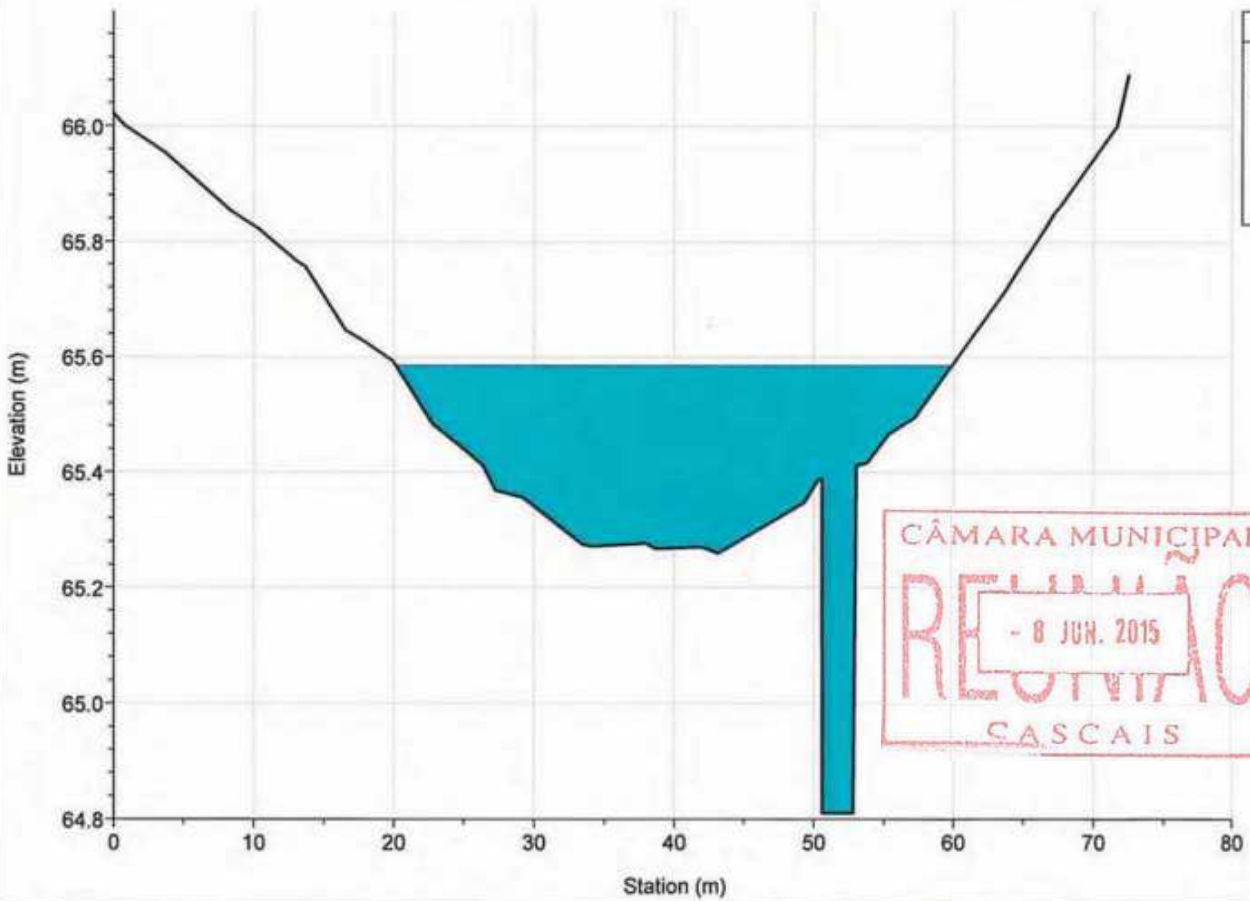
River = POLIMA Reach = montante RS = 826.344



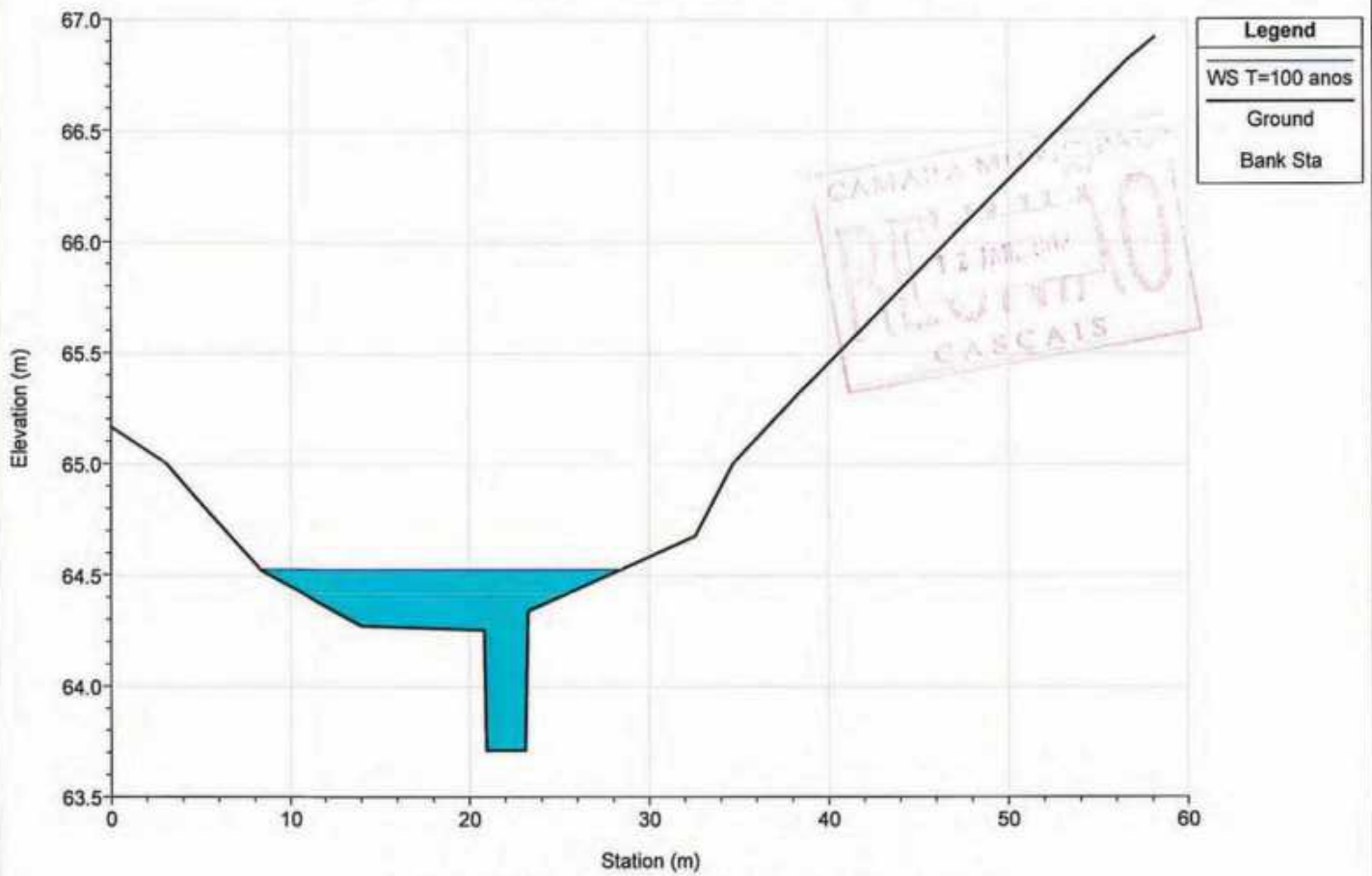
River = POLIMA Reach = montante RS = 749.973



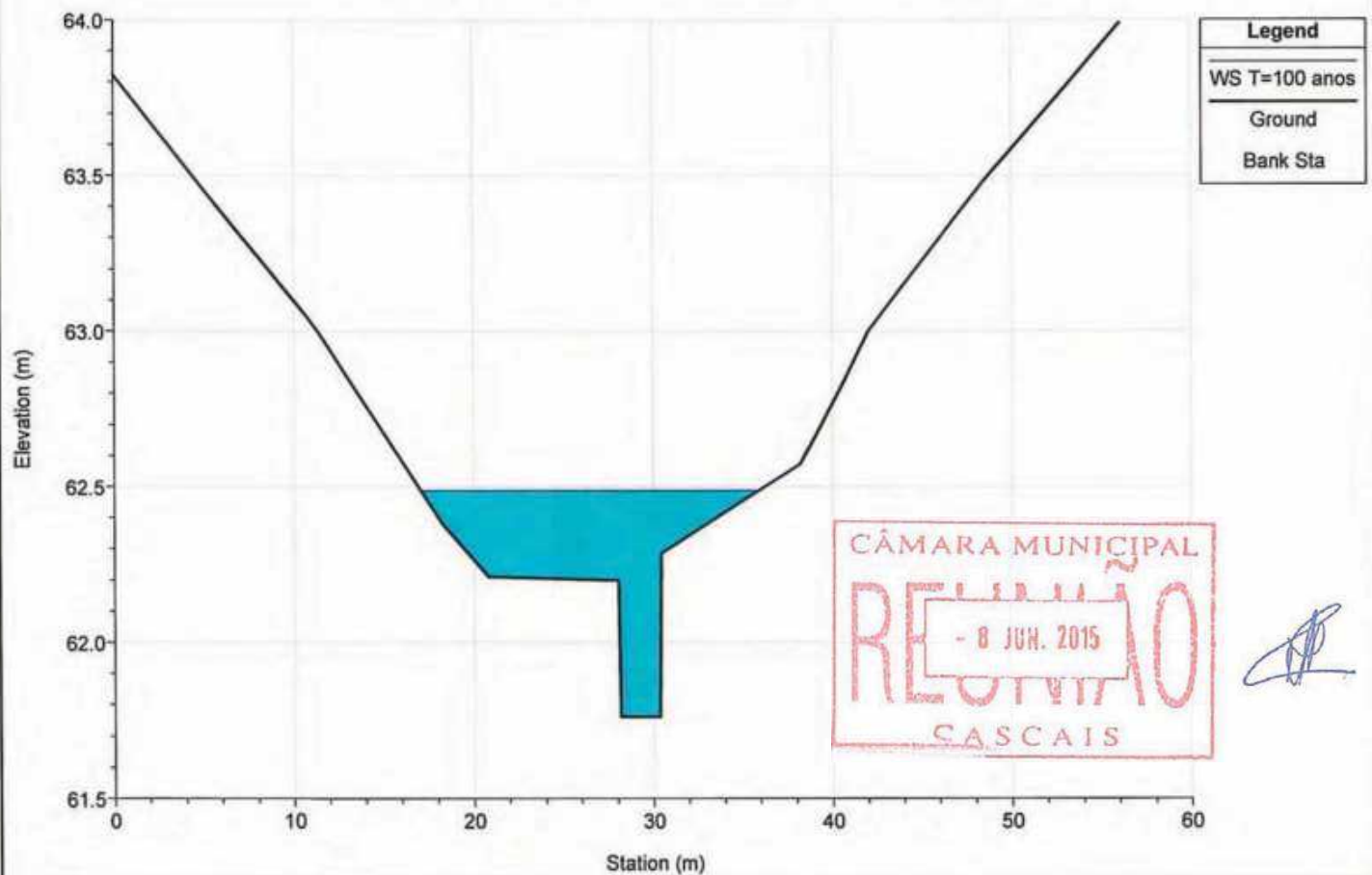
River = POLIMA Reach = montante RS = 681.014



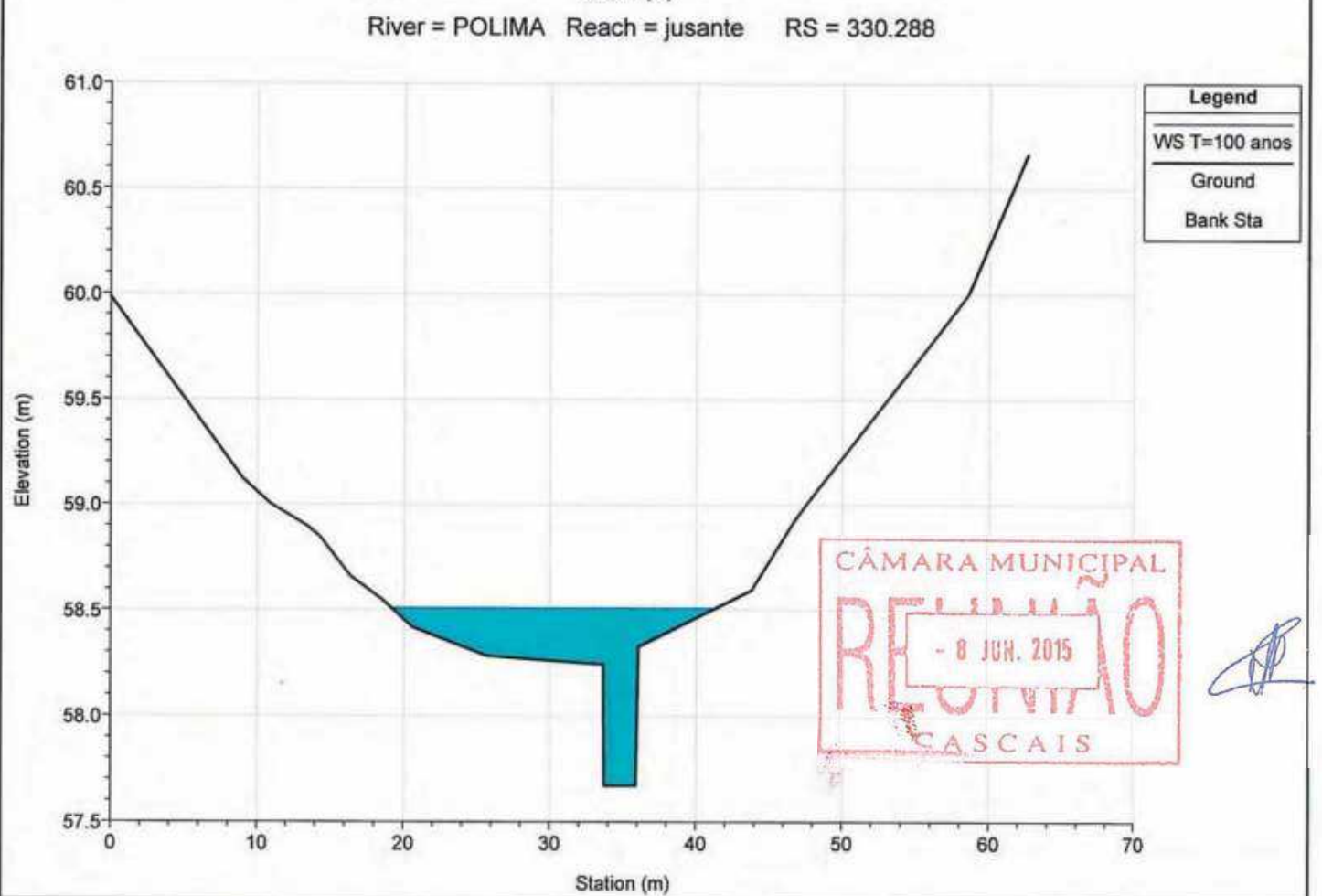
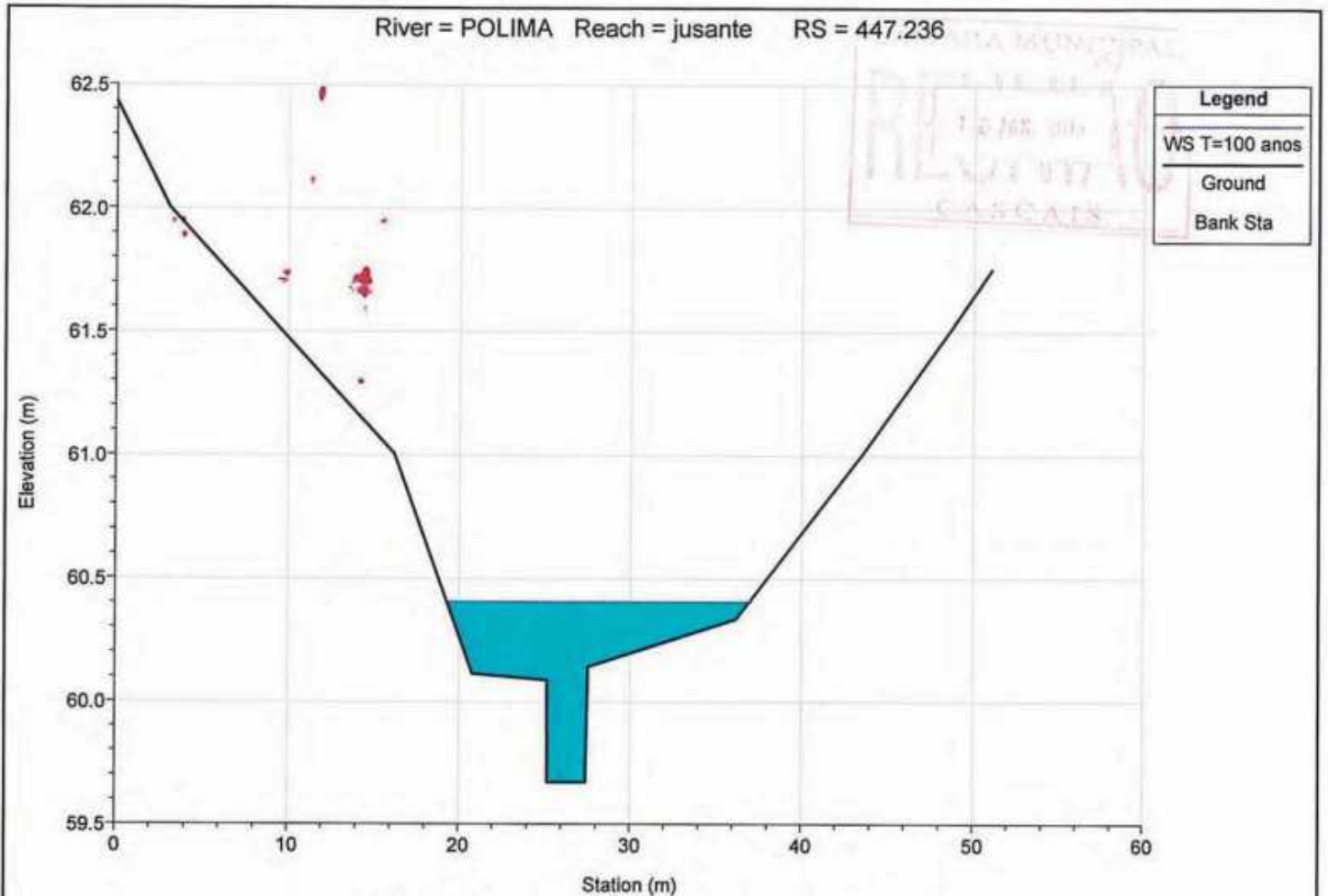
River = POLIMA Reach = jusante RS = 648.014



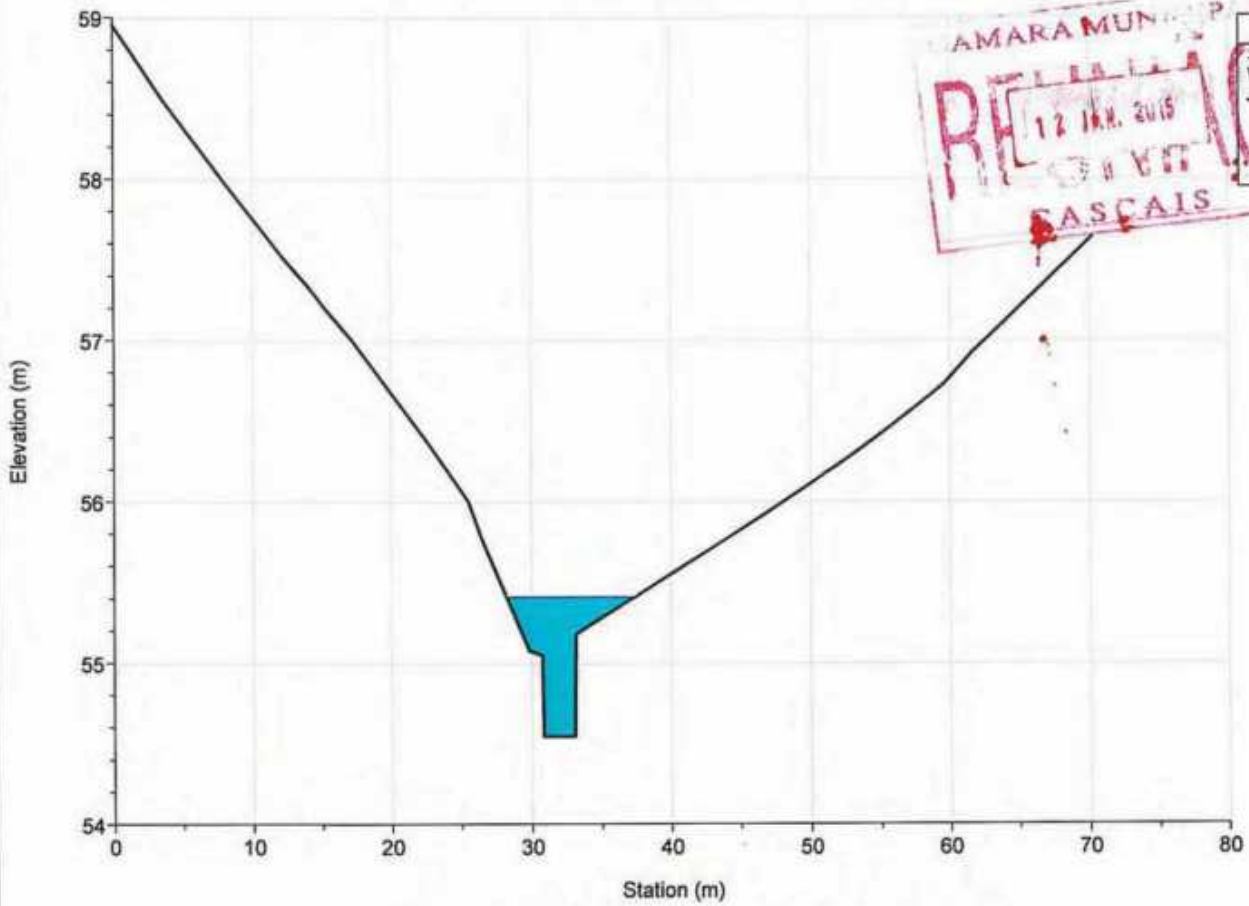
River = POLIMA Reach = jusante RS = 553.636



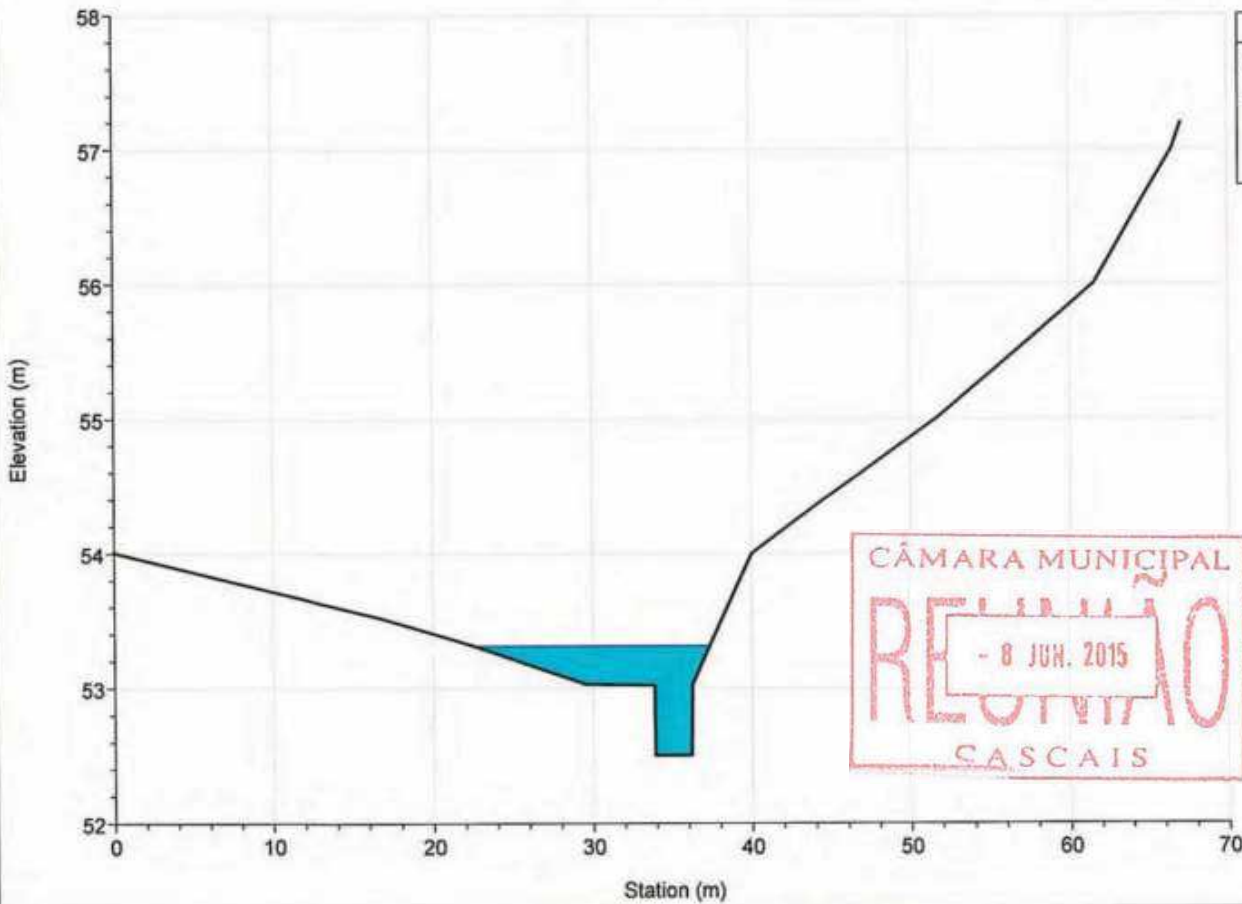




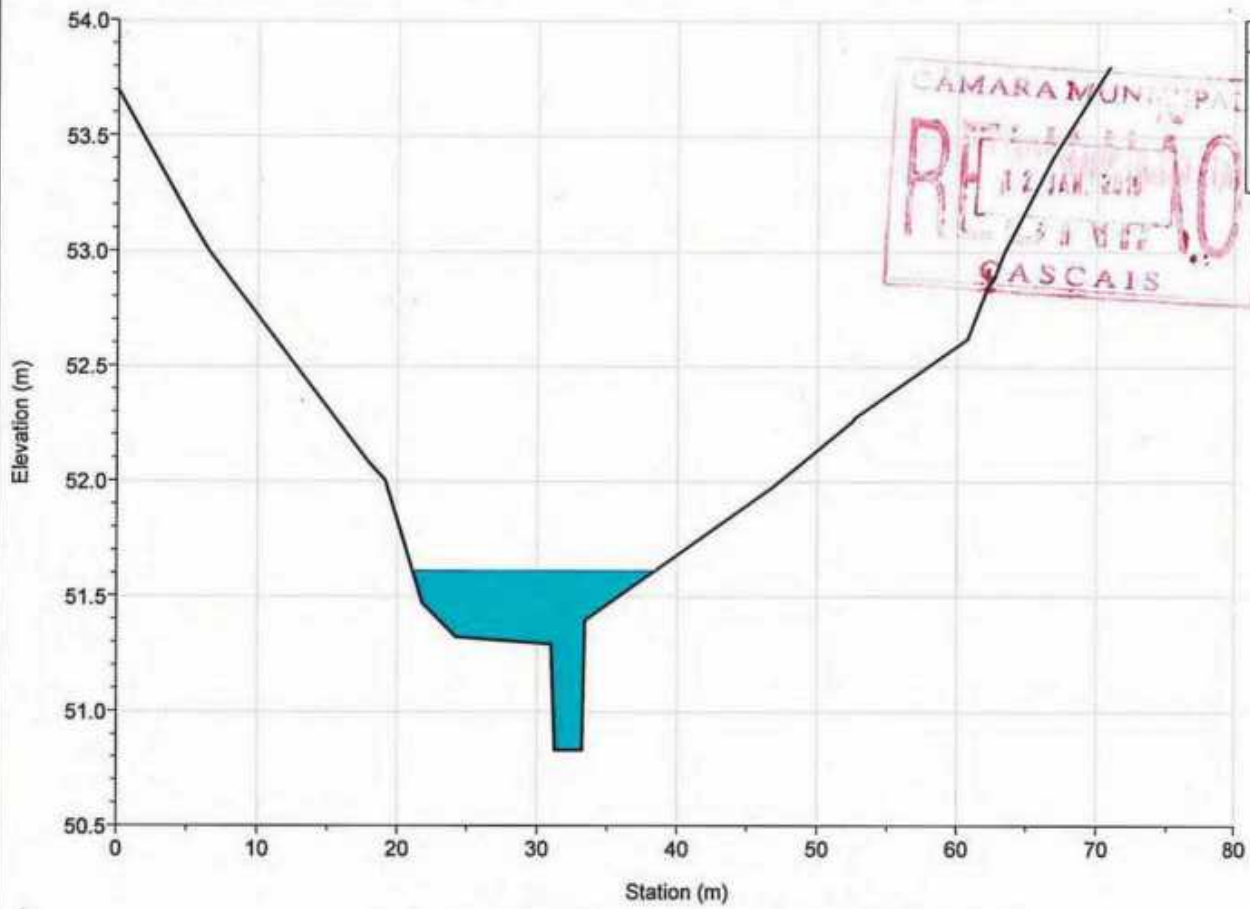
River = POLIMA Reach = jusante RS = 222.715



River = POLIMA Reach = jusante RS = 106.500

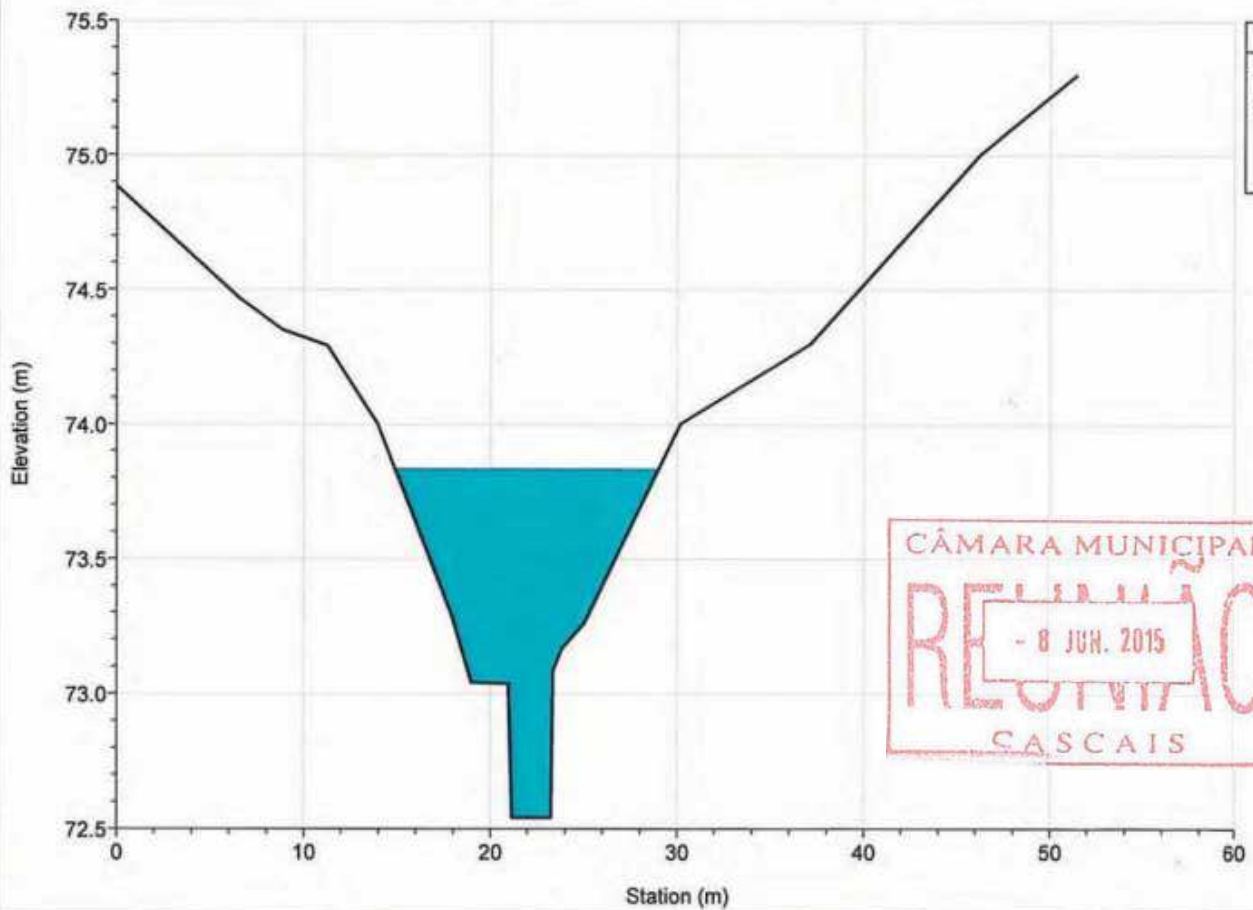


River = POLIMA Reach = jusante RS = 13.497

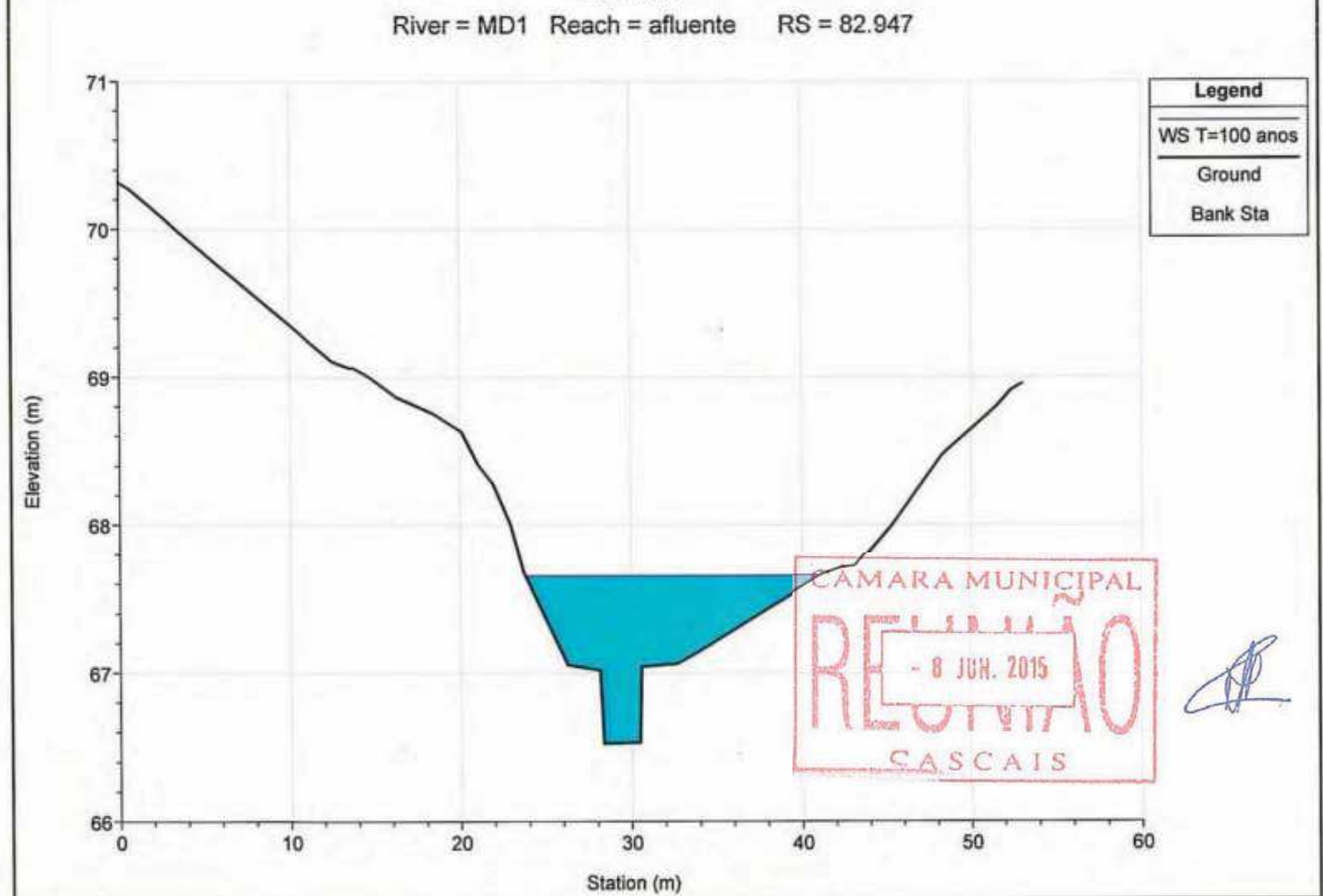
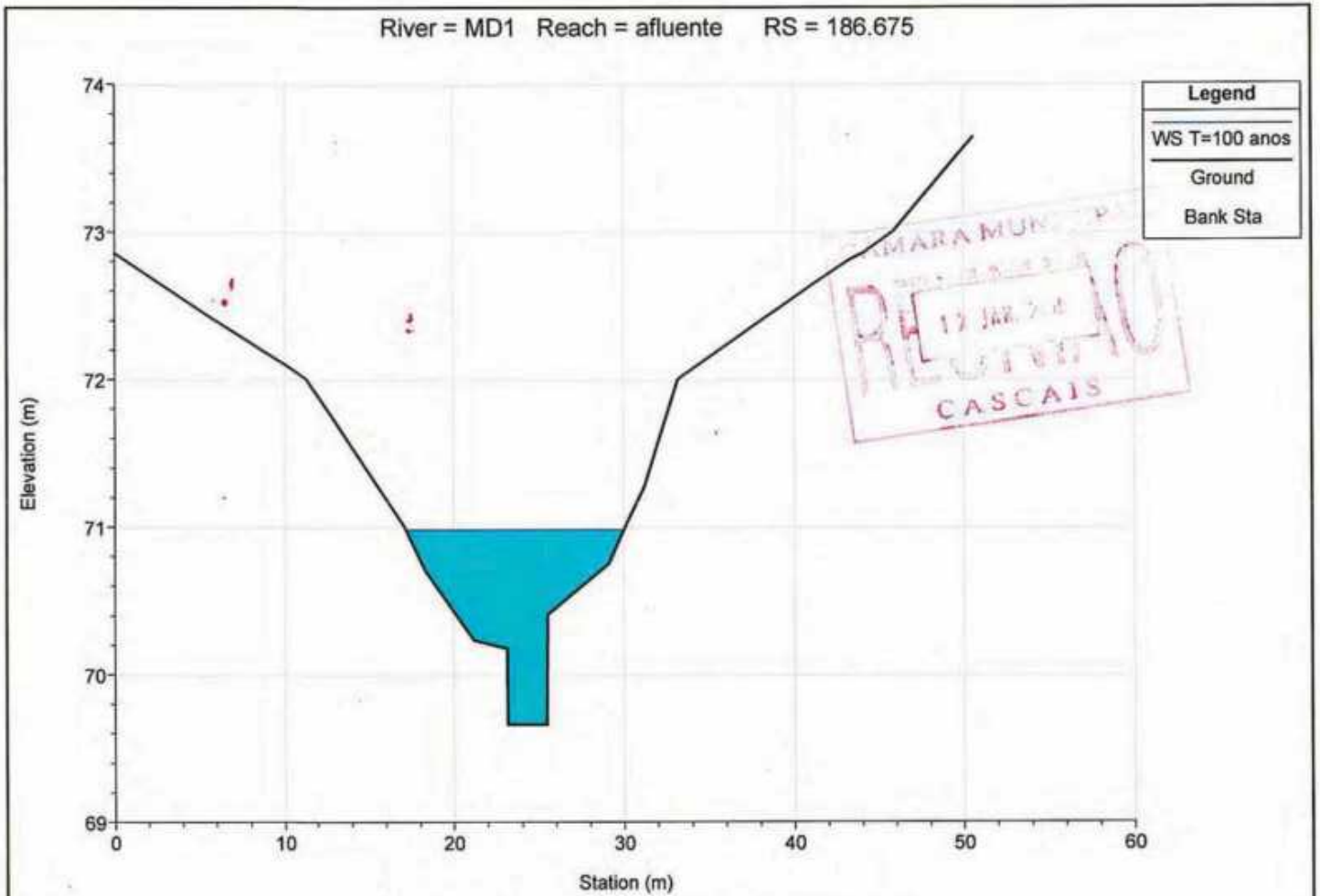


Legend
WS T=100 anos
Ground
Bank Sta

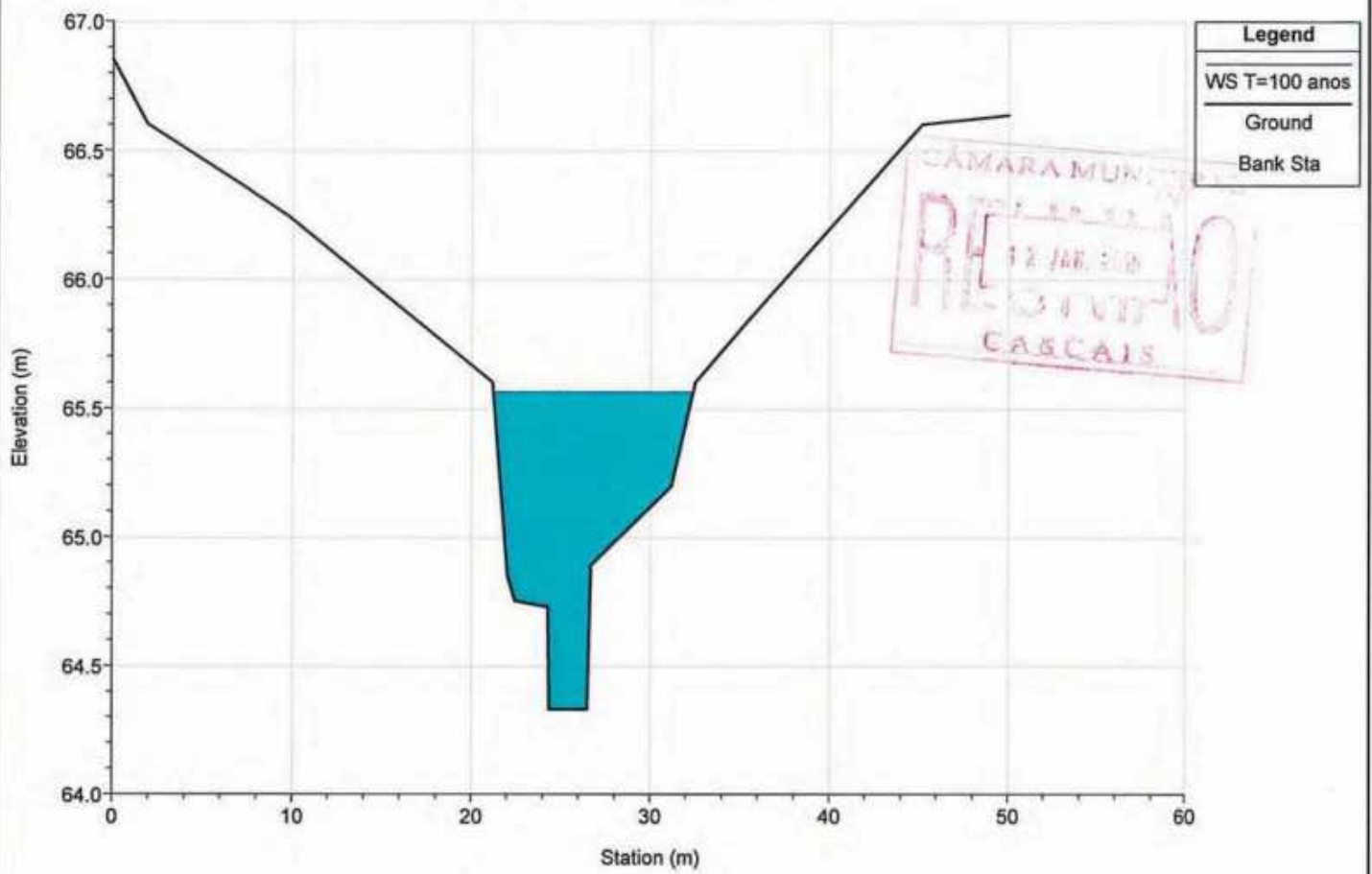
River = MD1 Reach = afluyente RS = 258.808



Legend
WS T=100 anos
Ground
Bank Sta



River = MD1 Reach = afluente RS = 21.903

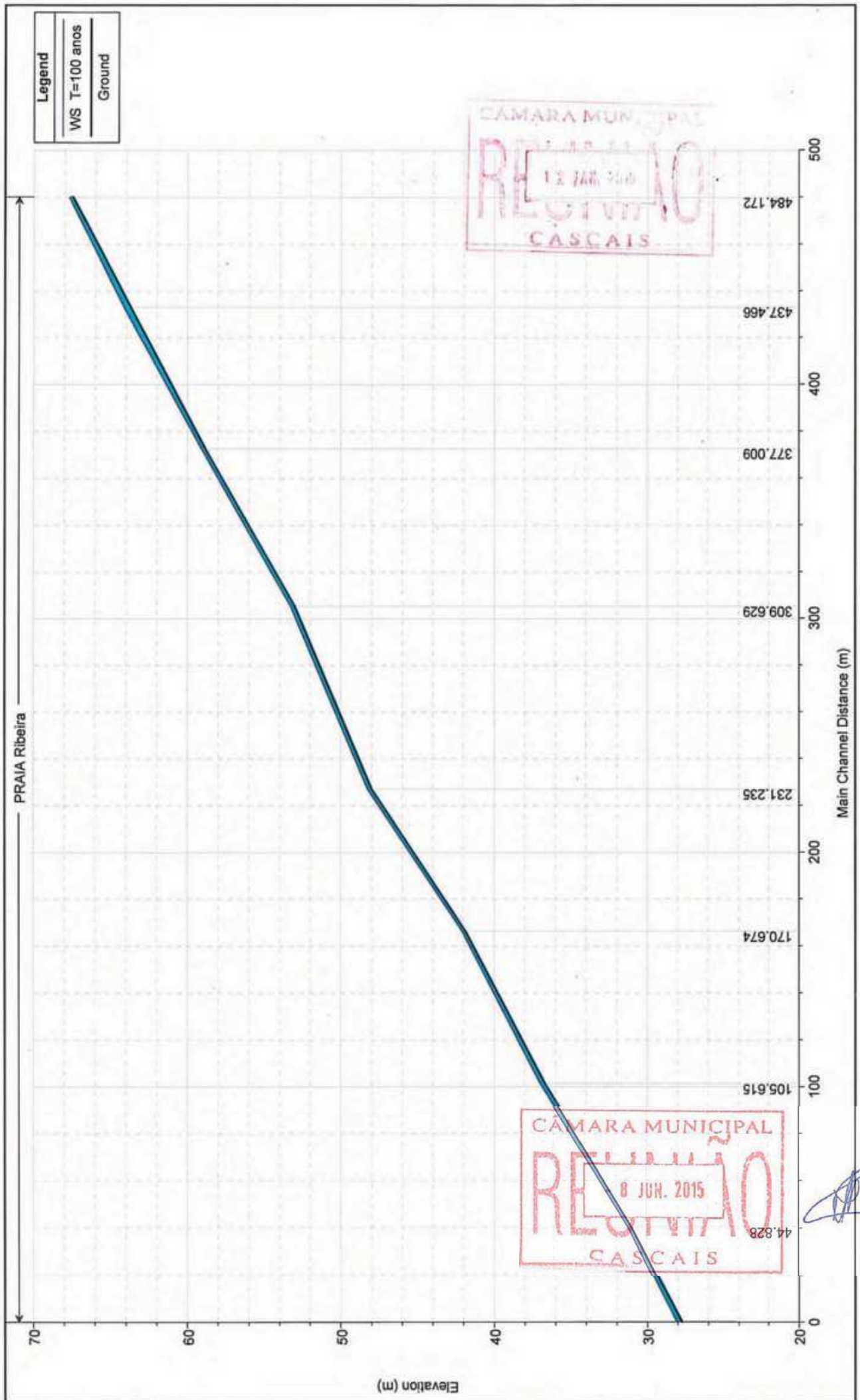


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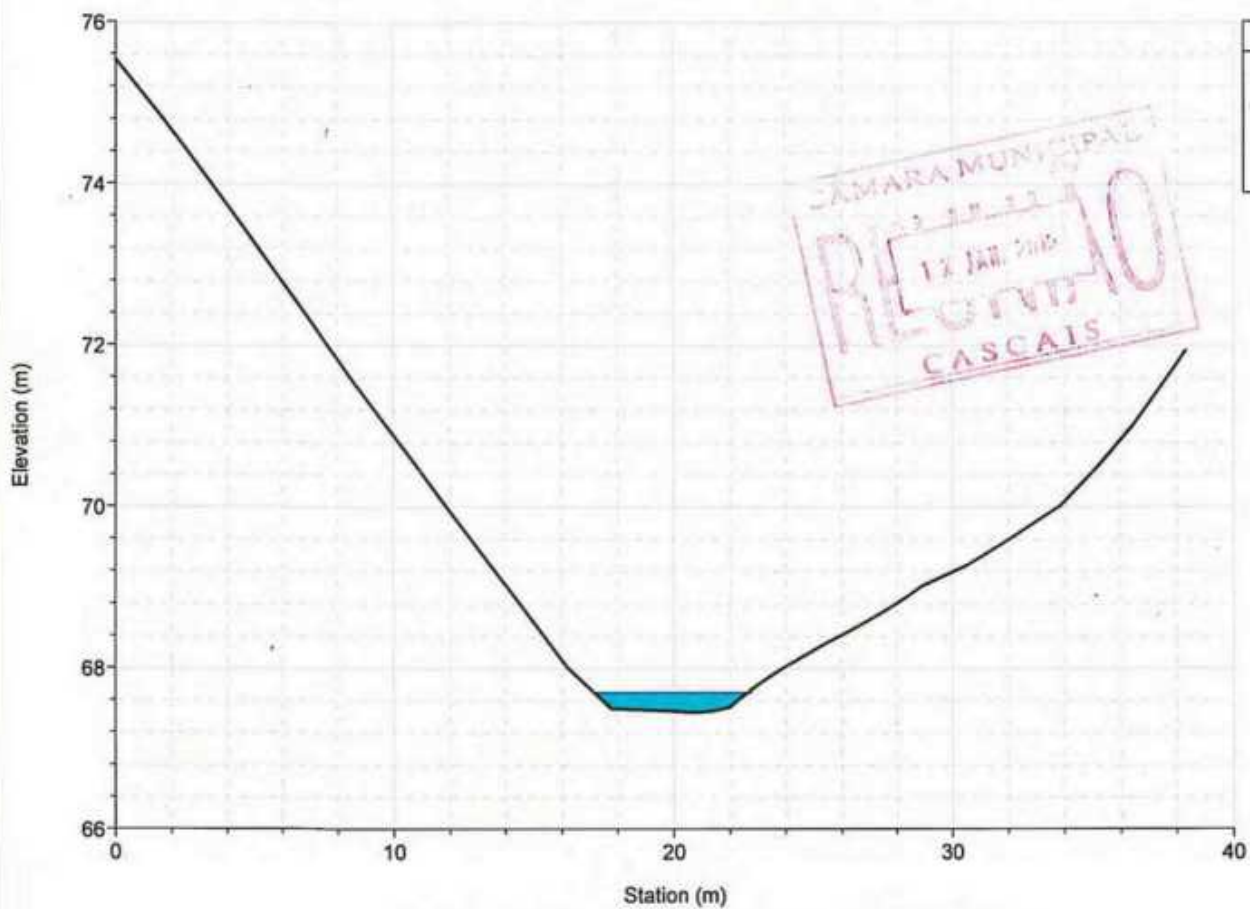
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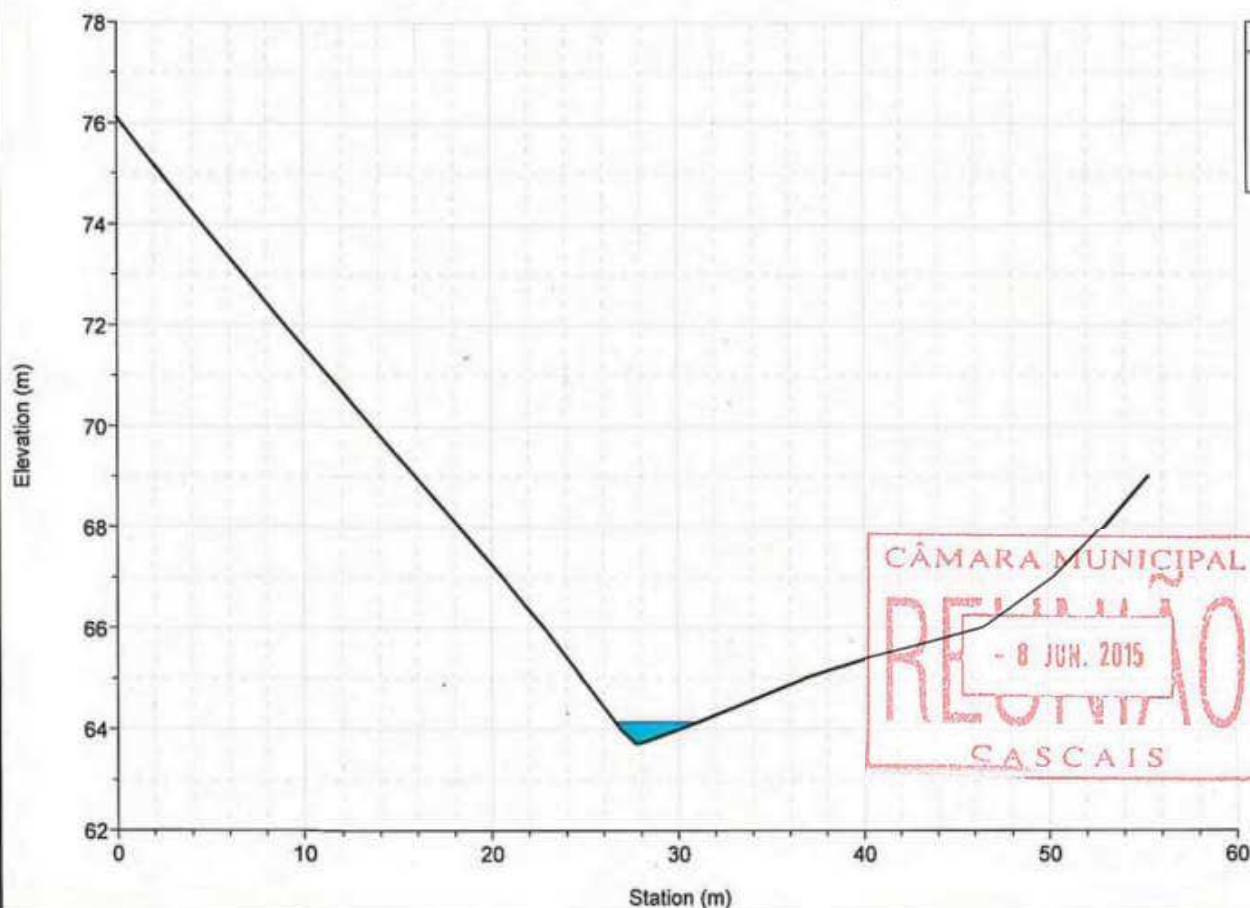




River = PRAIA Reach = Ribeira RS = 484.172

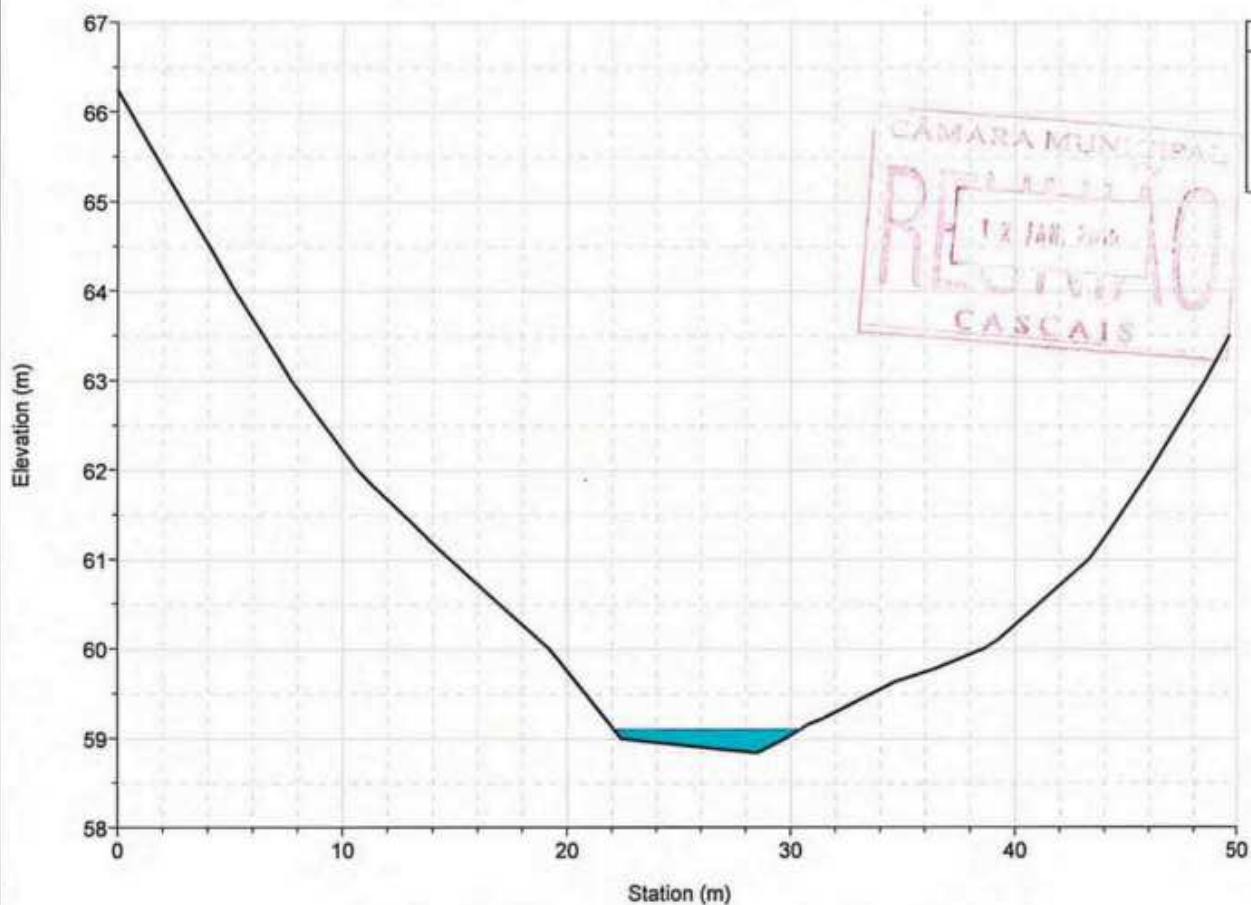


River = PRAIA Reach = Ribeira RS = 437.466



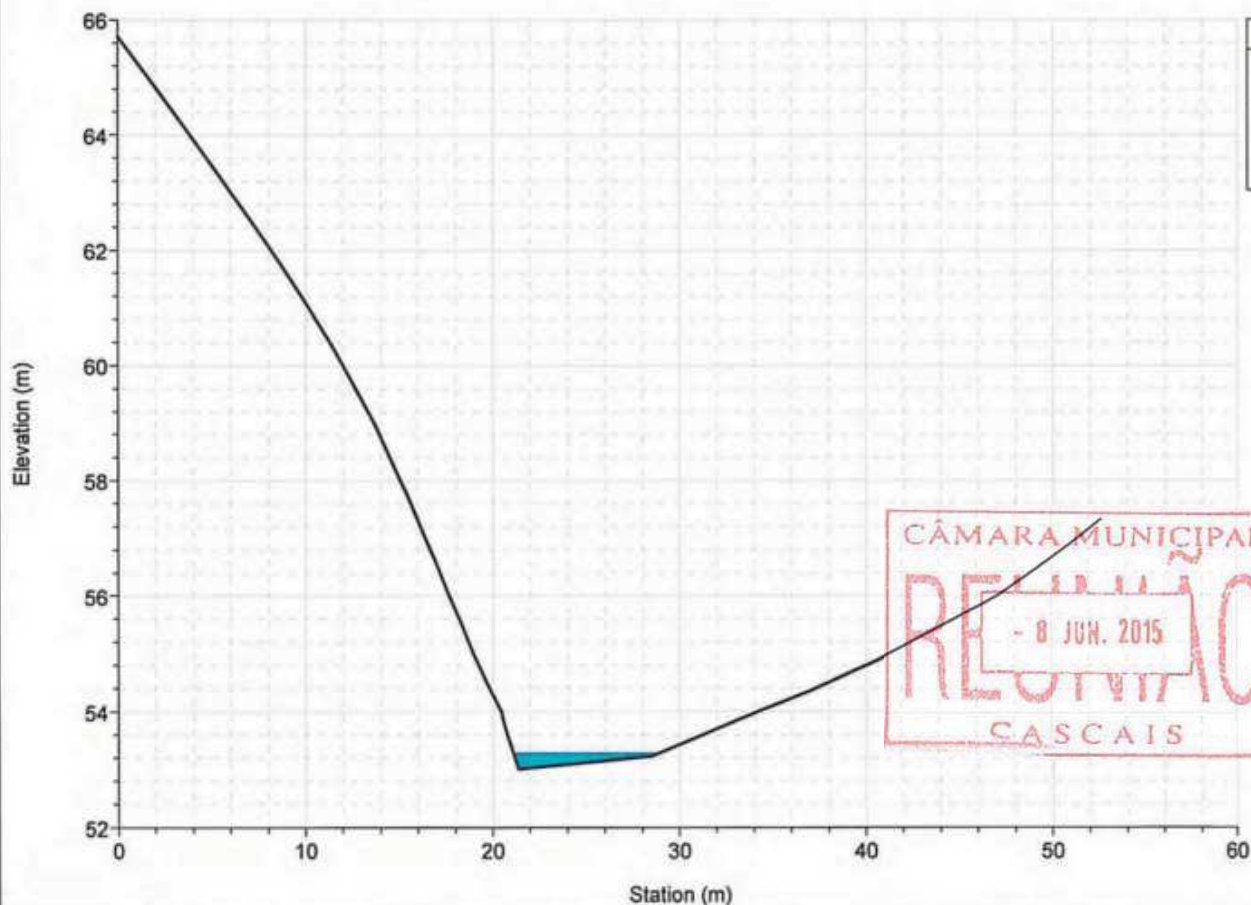


River = PRAIA Reach = Ribeira RS = 377.009



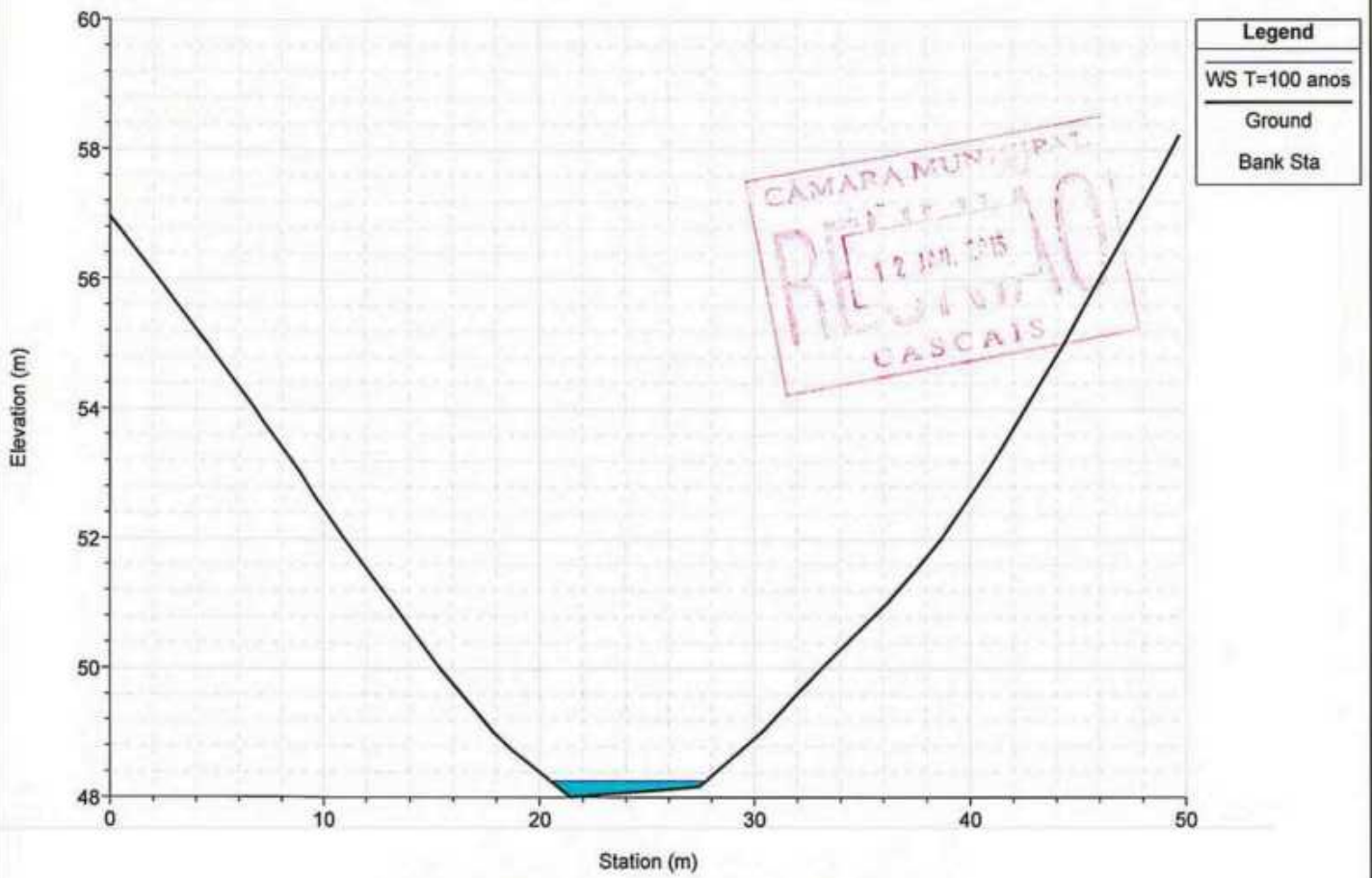
Legend
WS T=100 anos
Ground
Bank Sta

River = PRAIA Reach = Ribeira RS = 309.629

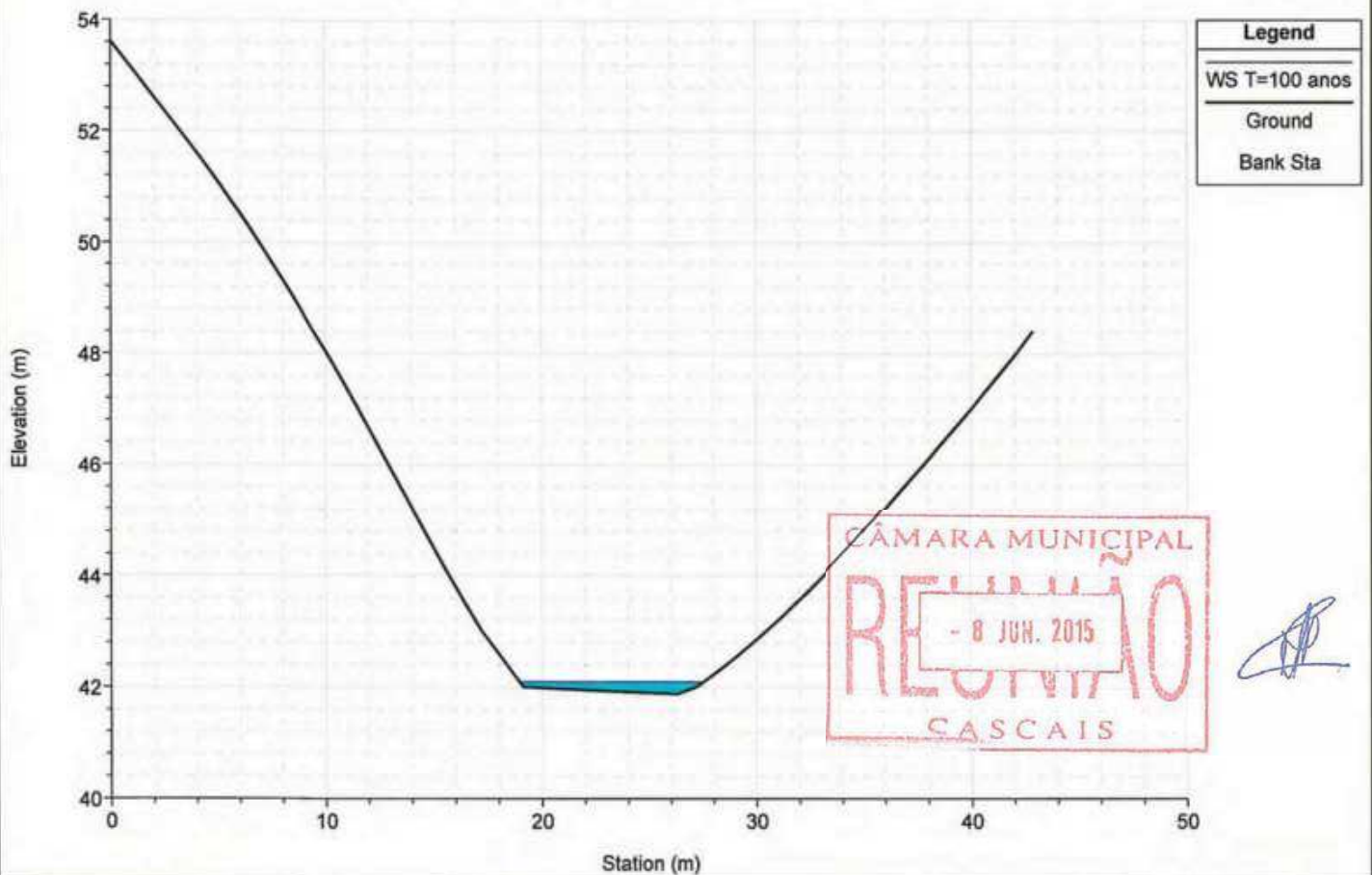


Legend
WS T=100 anos
Ground
Bank Sta

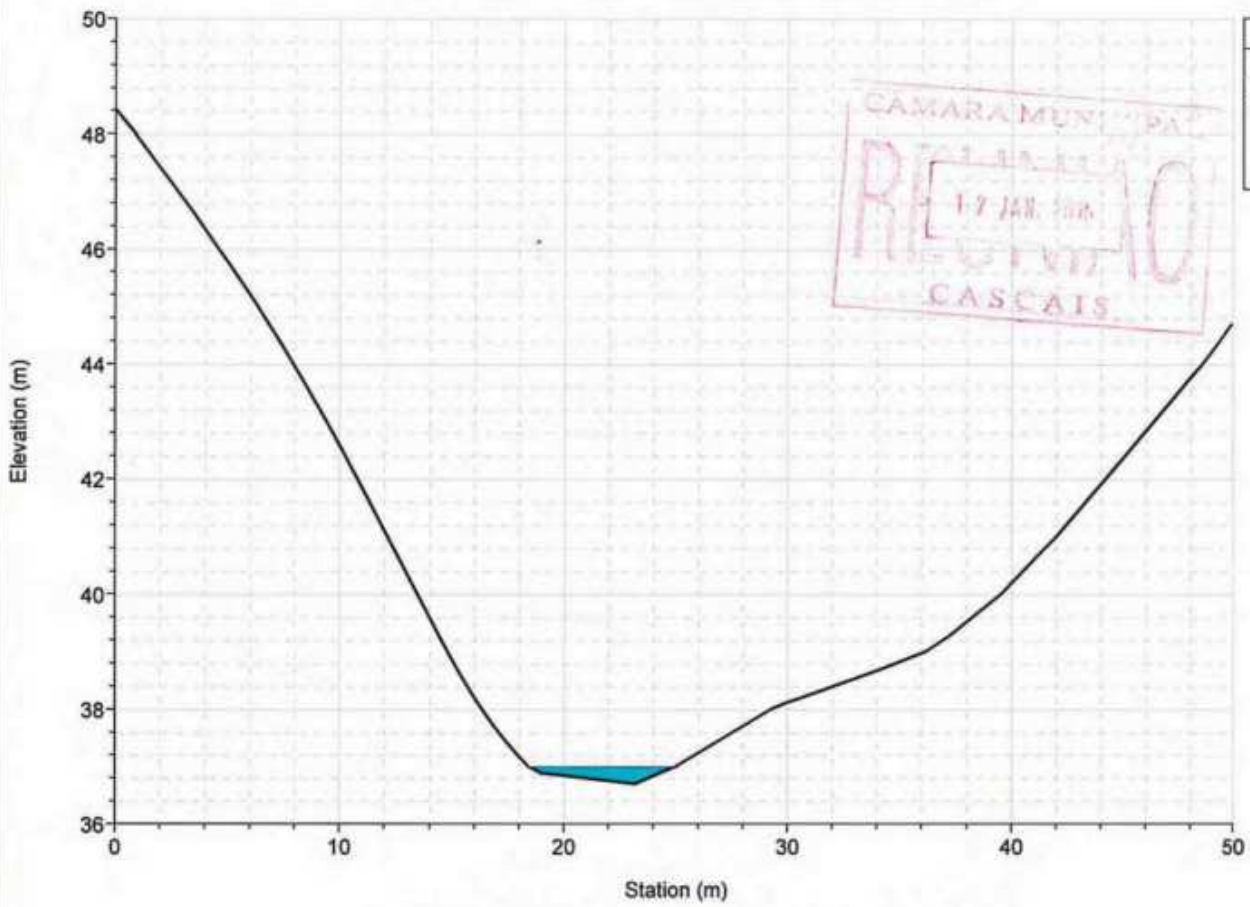
River = PRAIA Reach = Ribeira RS = 231.235



River = PRAIA Reach = Ribeira RS = 170.674

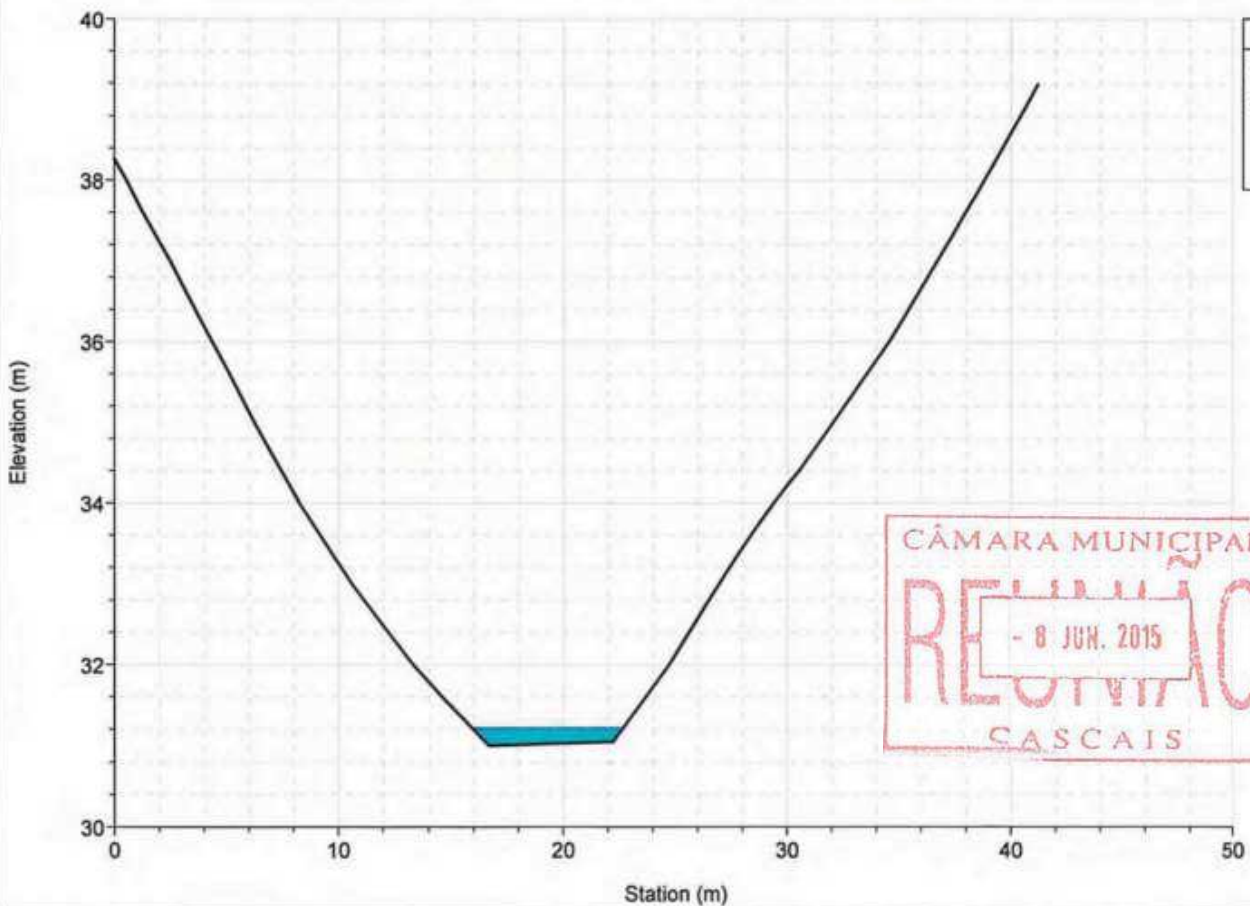


River = PRAIA Reach = Ribeira RS = 105.615



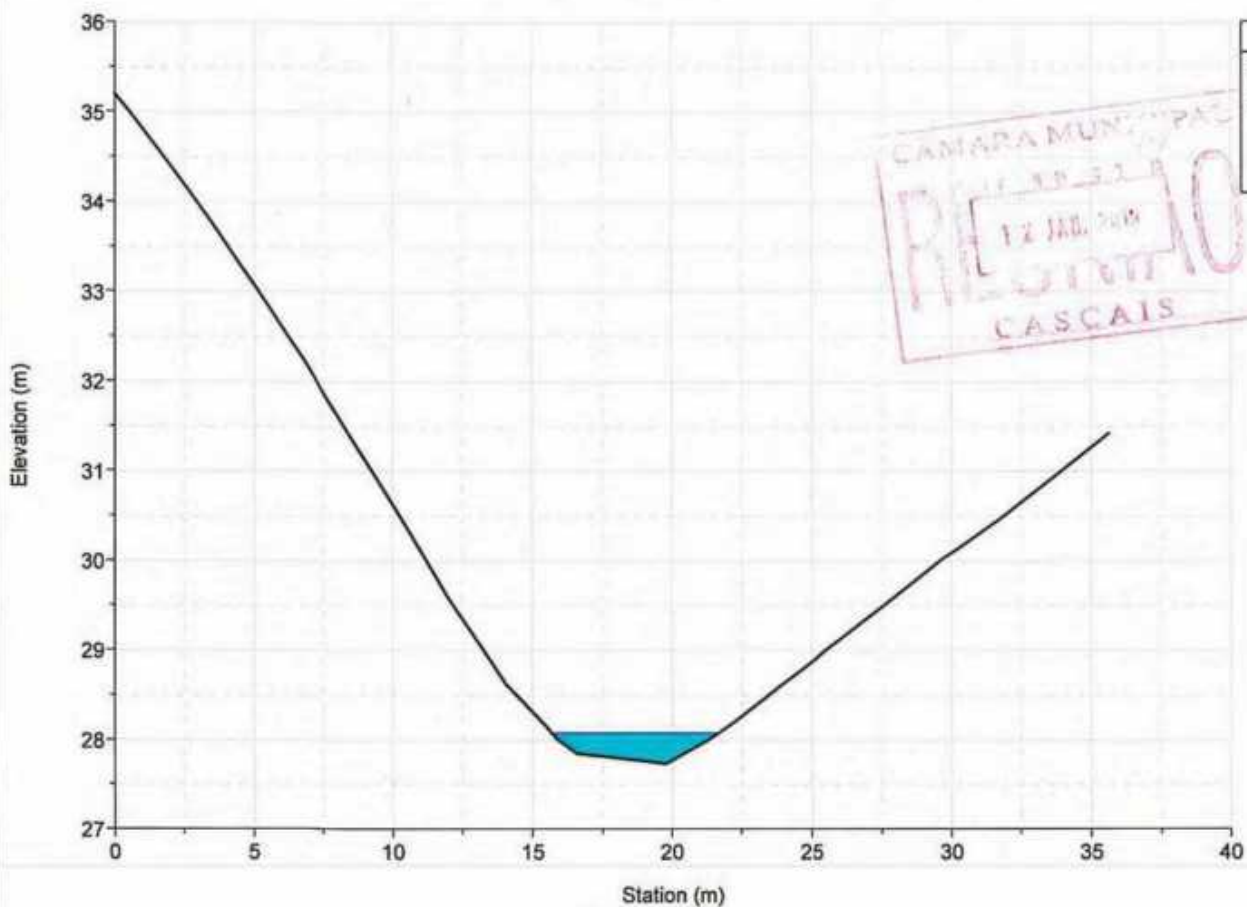
Legend
WS T=100 anos
Ground
Bank Sta

River = PRAIA Reach = Ribeira RS = 44.828



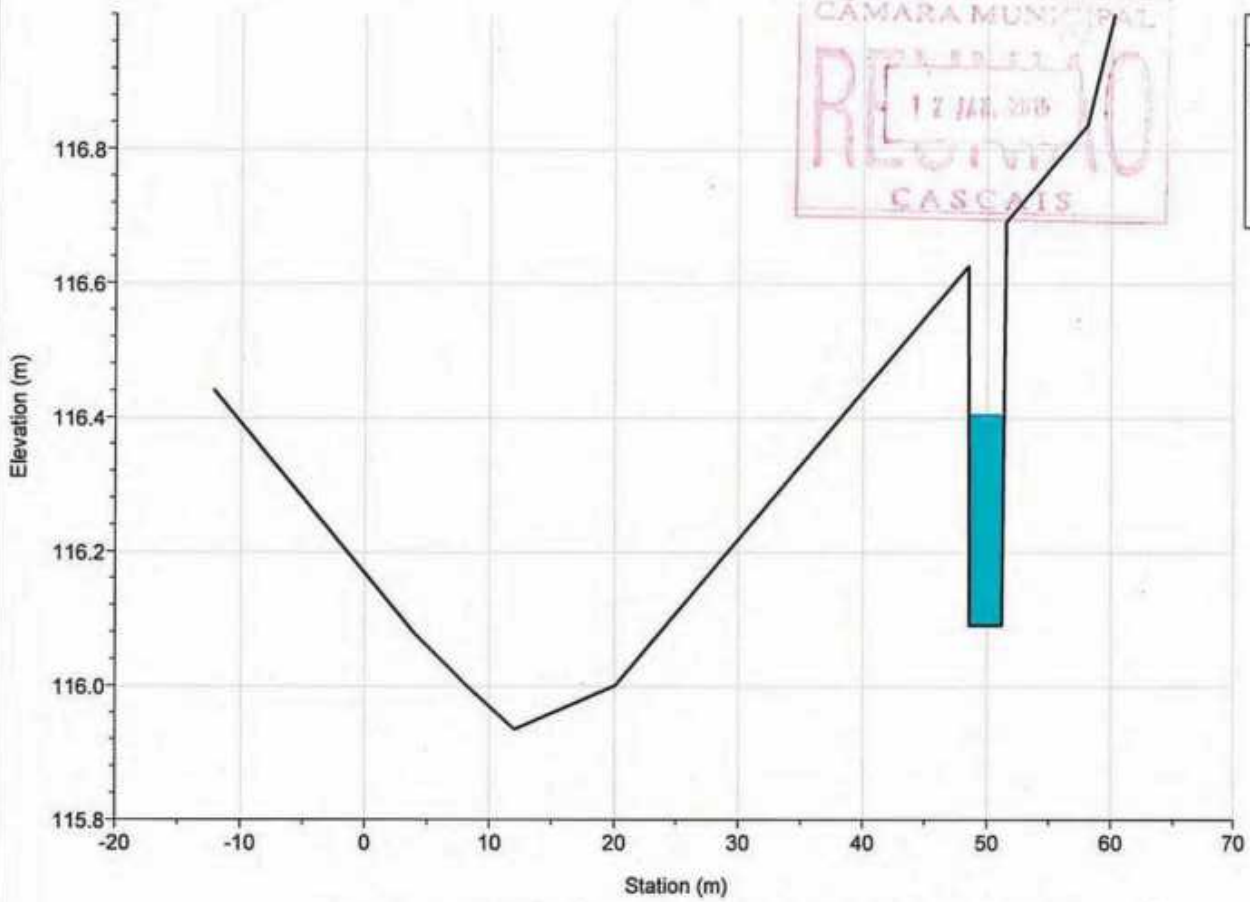
Legend
WS T=100 anos
Ground
Bank Sta

River = PRAIA Reach = Ribeira RS = 4.221



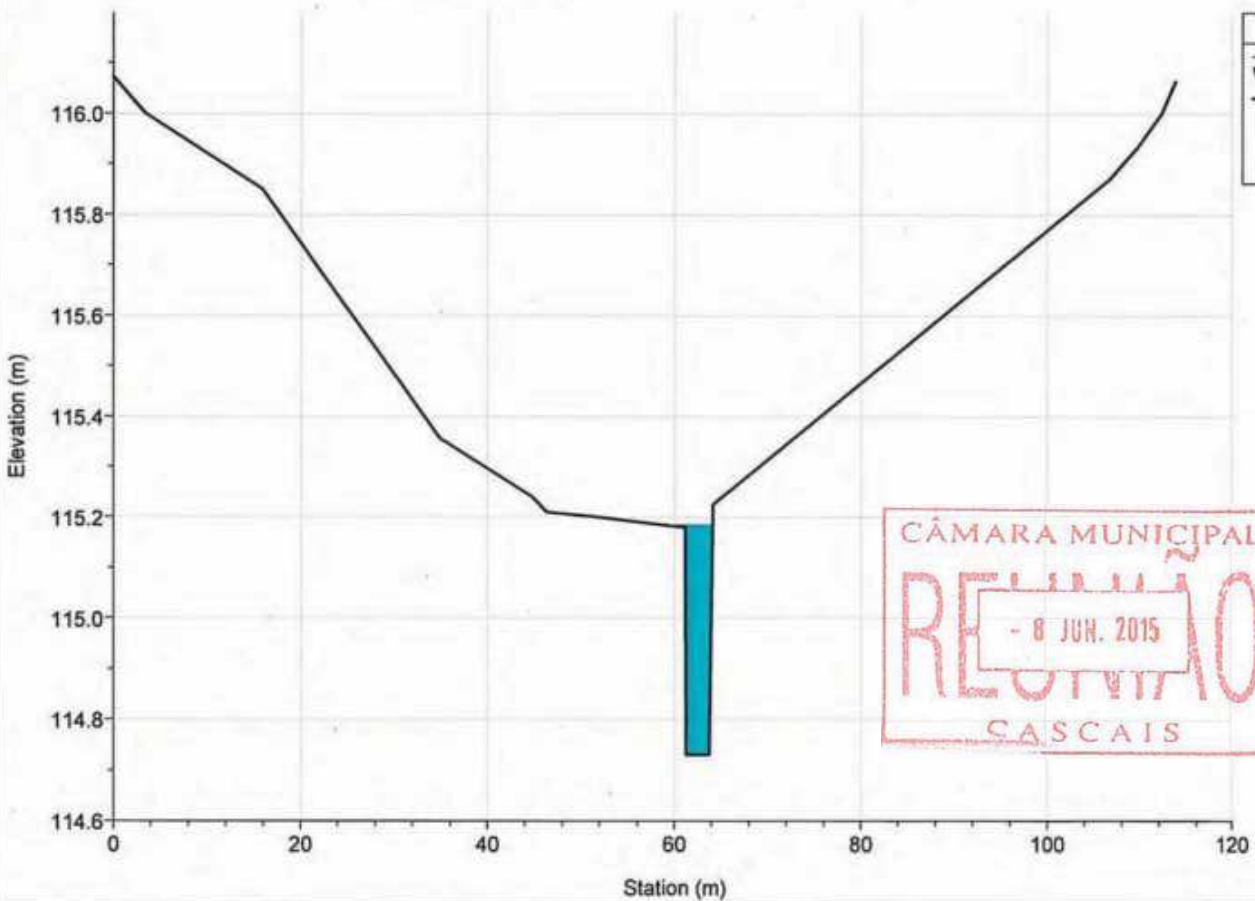
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River = MARIANAS Reach = montante RS = 7914.526



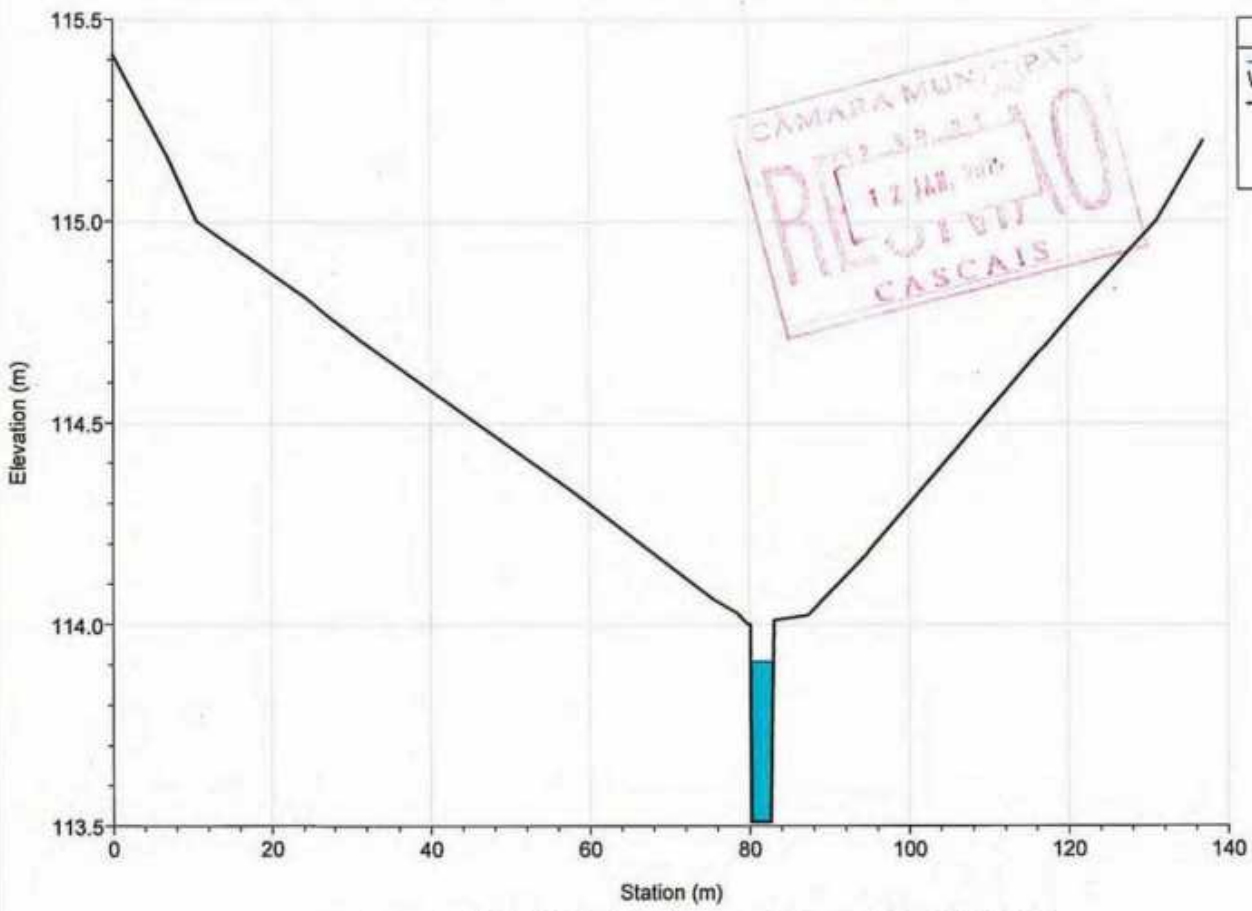
Legend	
WS T=100 anos	
Ground	
Levee	
Bank Sta	

River = MARIANAS Reach = montante RS = 7838.377

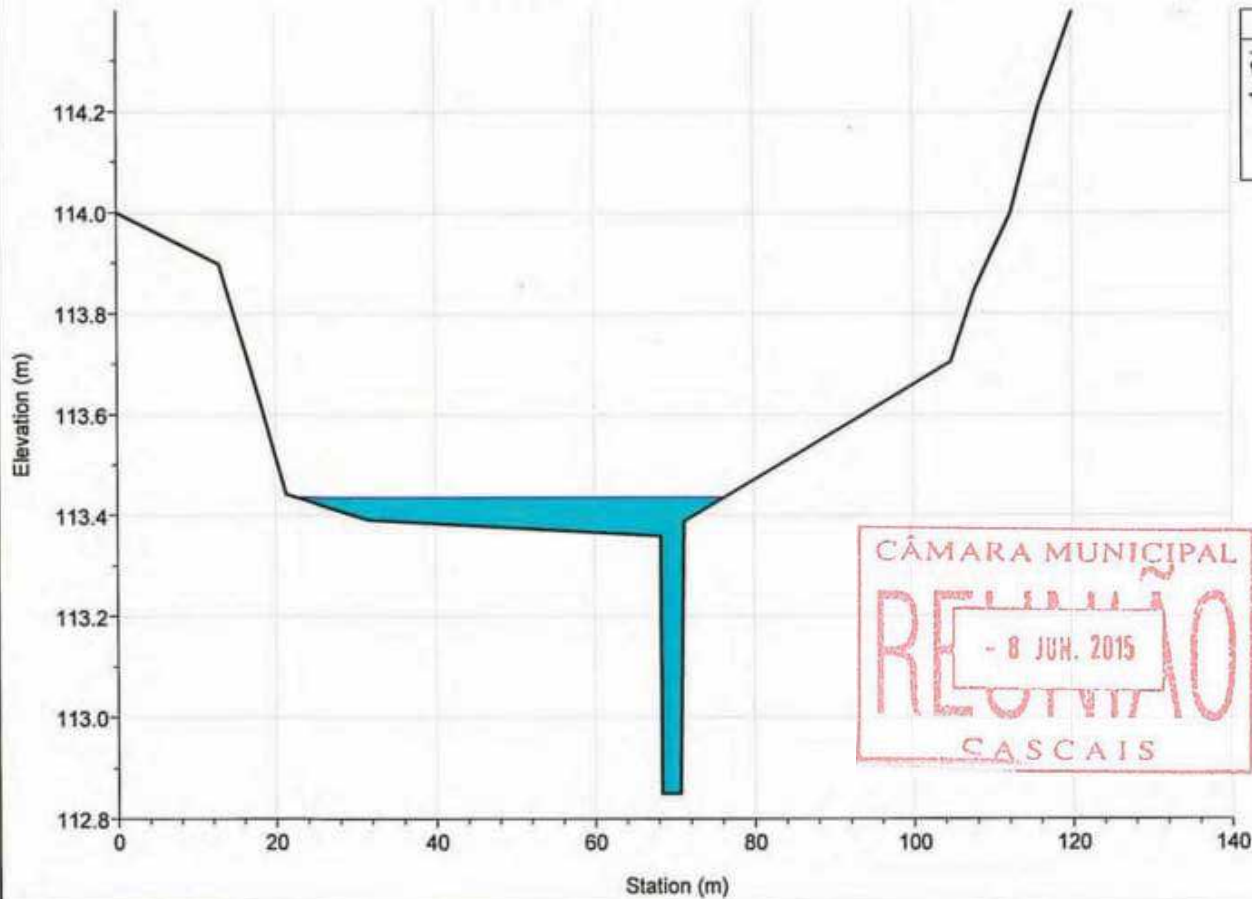


Legend	
WS T=100 anos	
Ground	
Bank Sta	

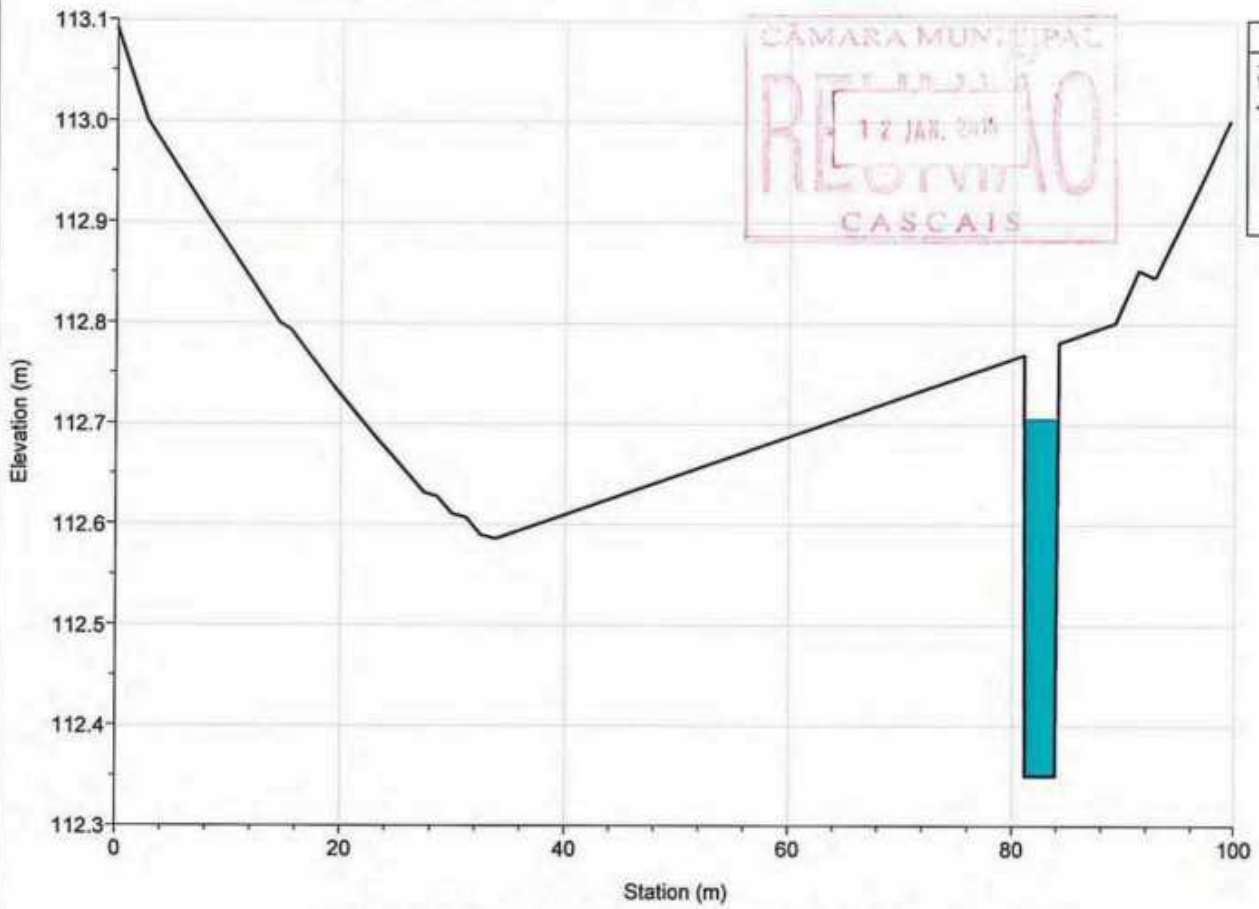
River = MARIANAS Reach = montante RS = 7700.441



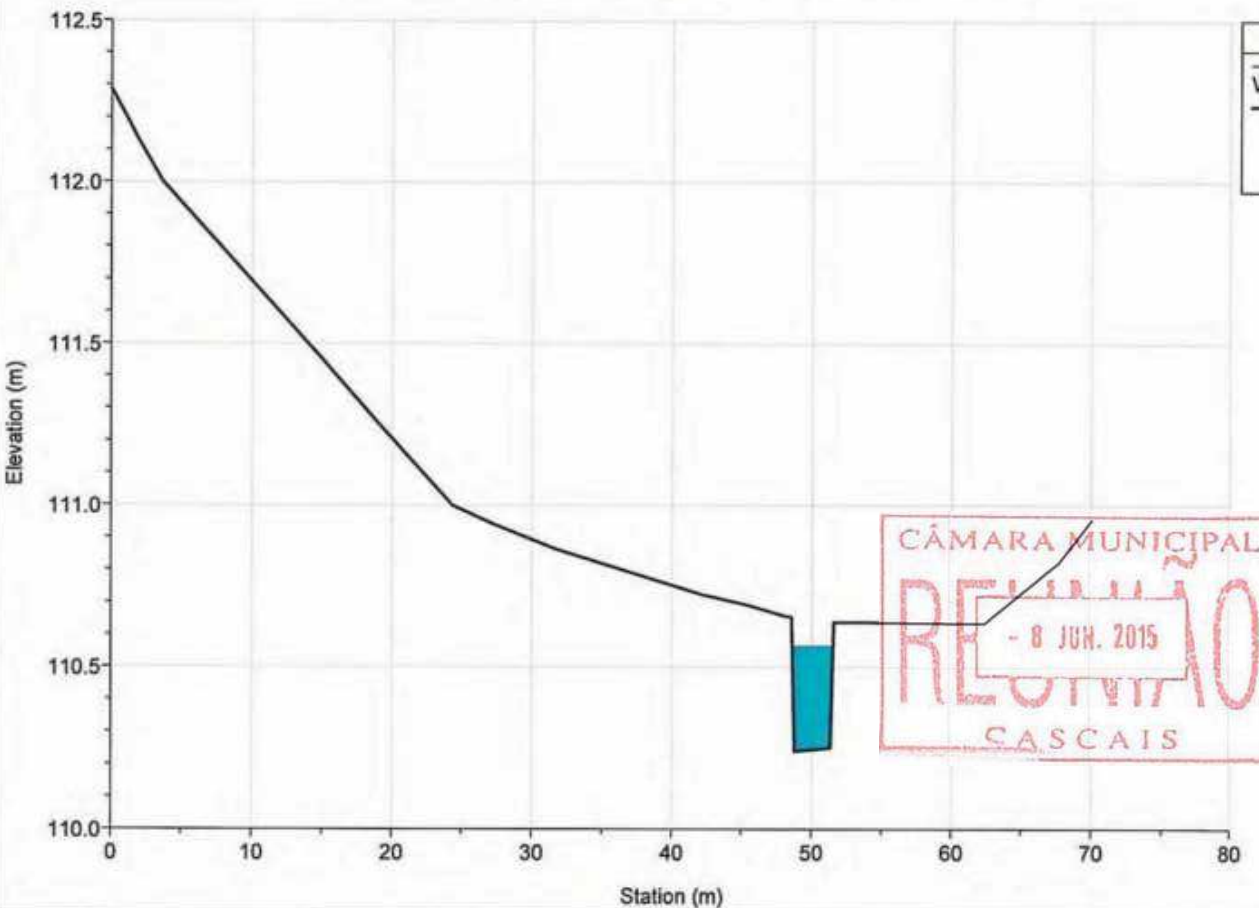
River = MARIANAS Reach = montante RS = 7571.767



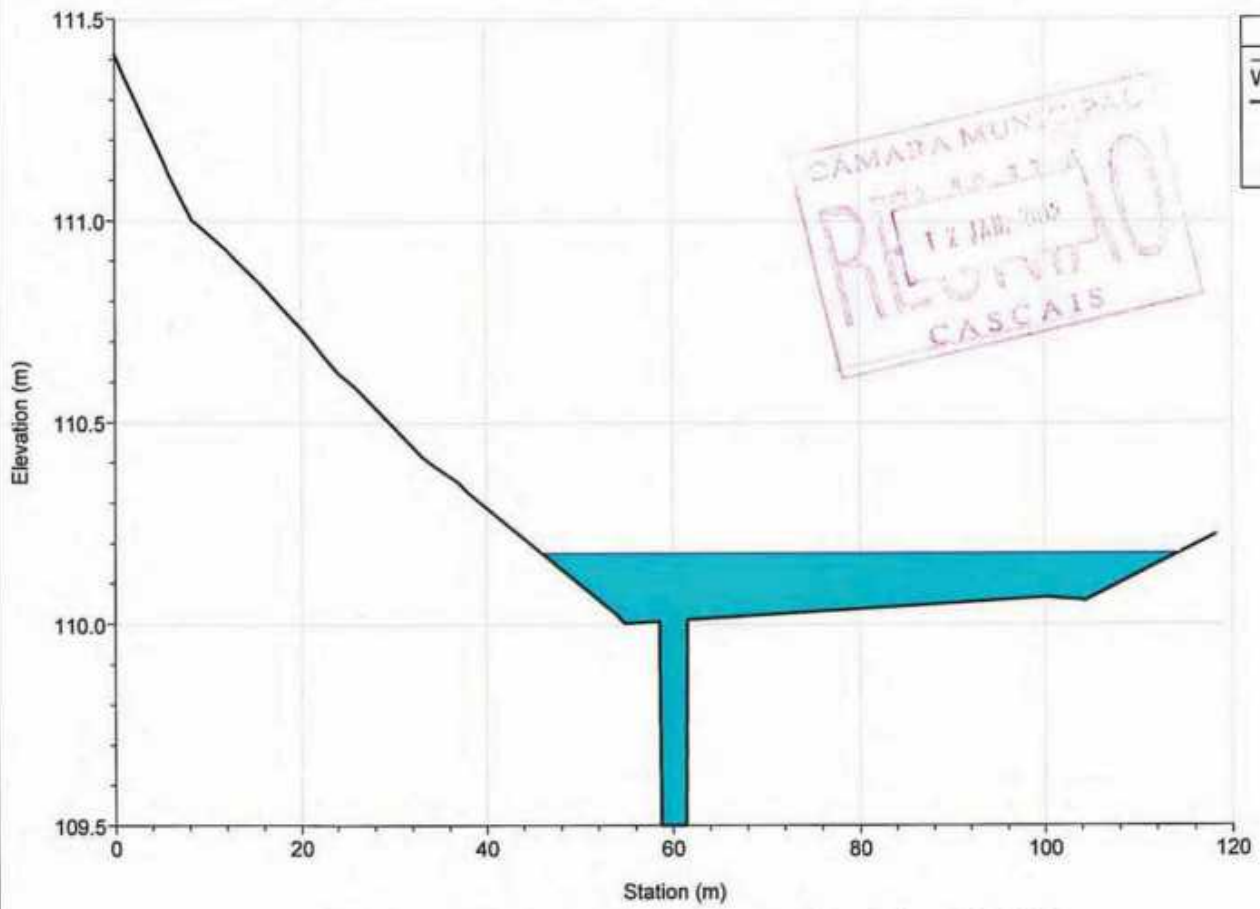
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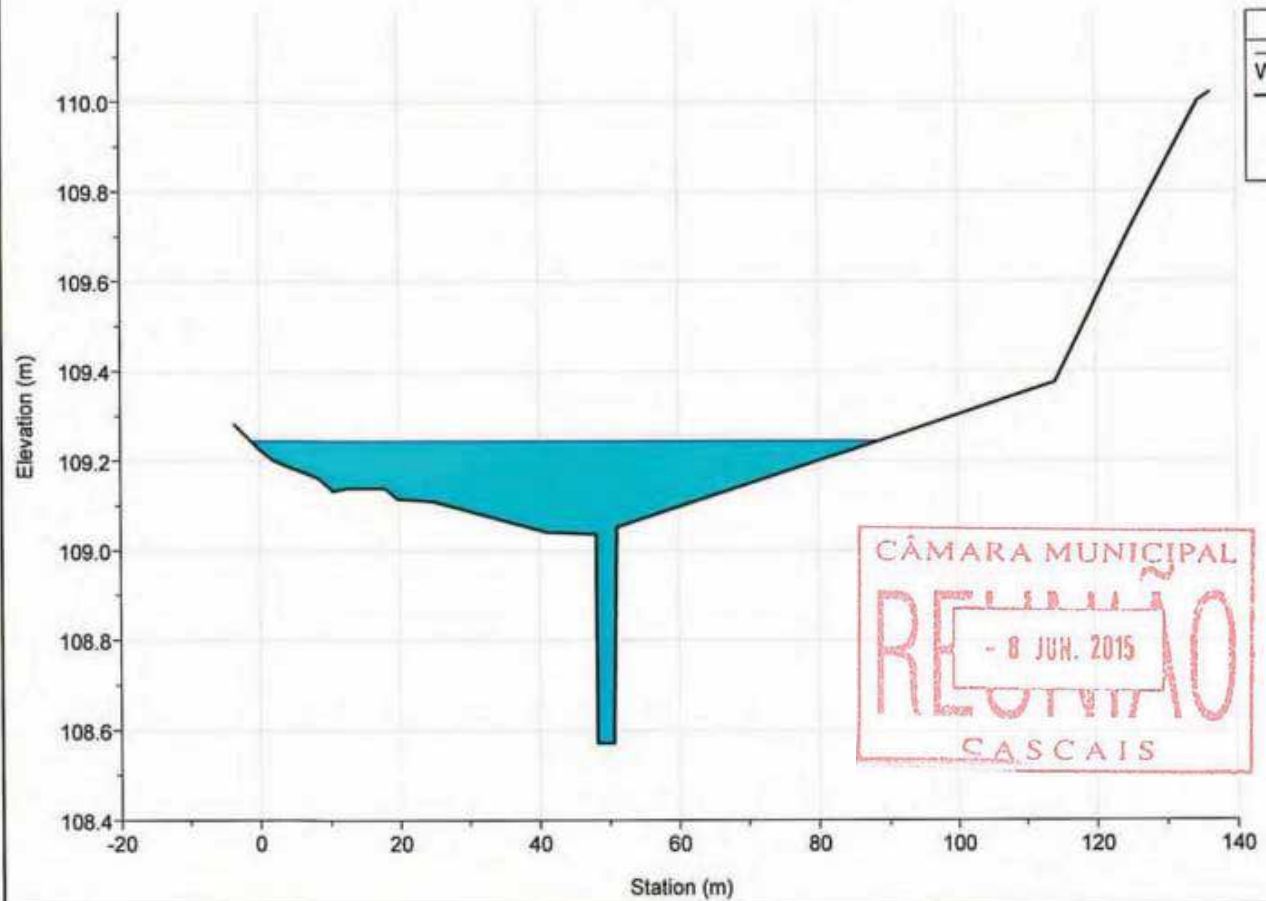
River = MARIANAS Reach = montante RS = 7307.076



River = MARIANAS Reach = intermedio RS = 7263.476

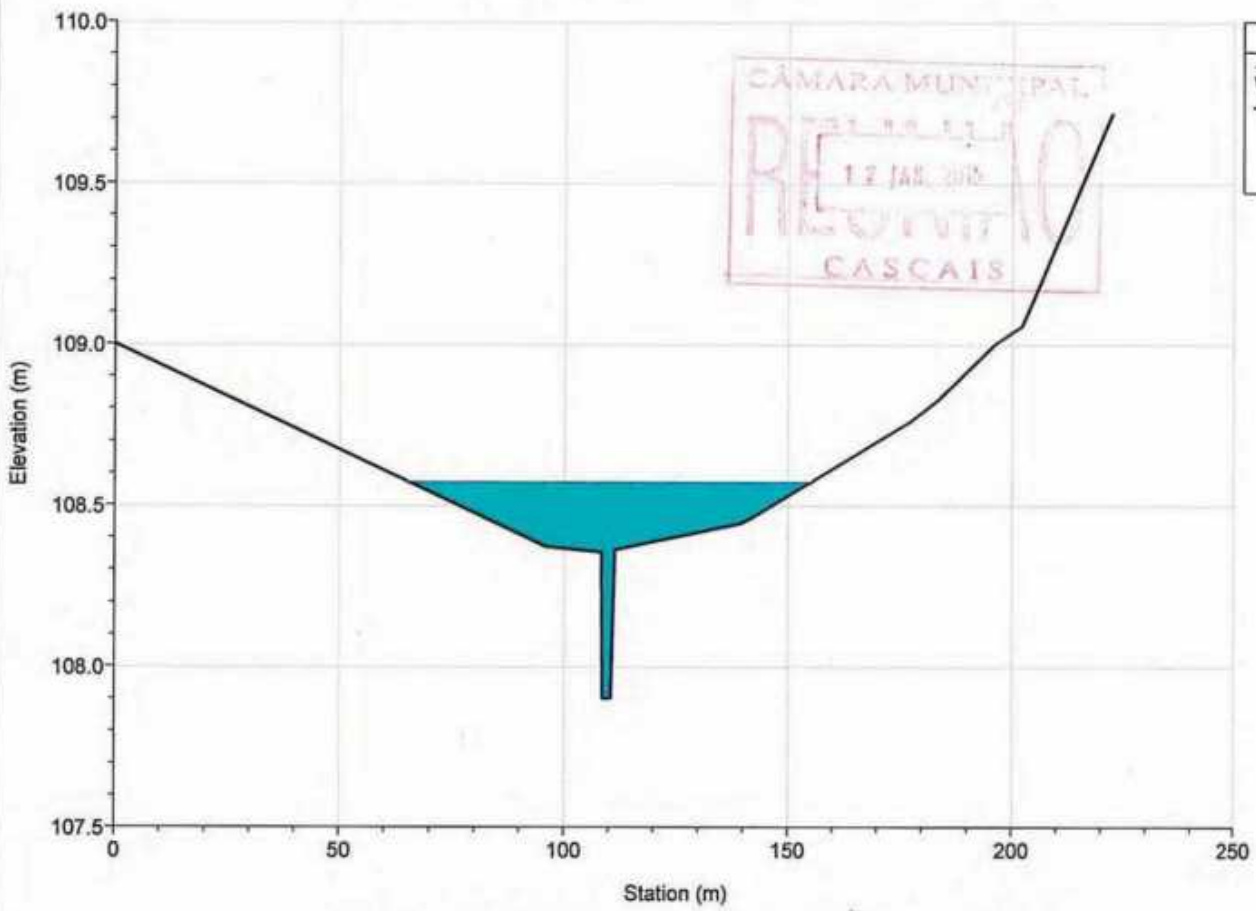


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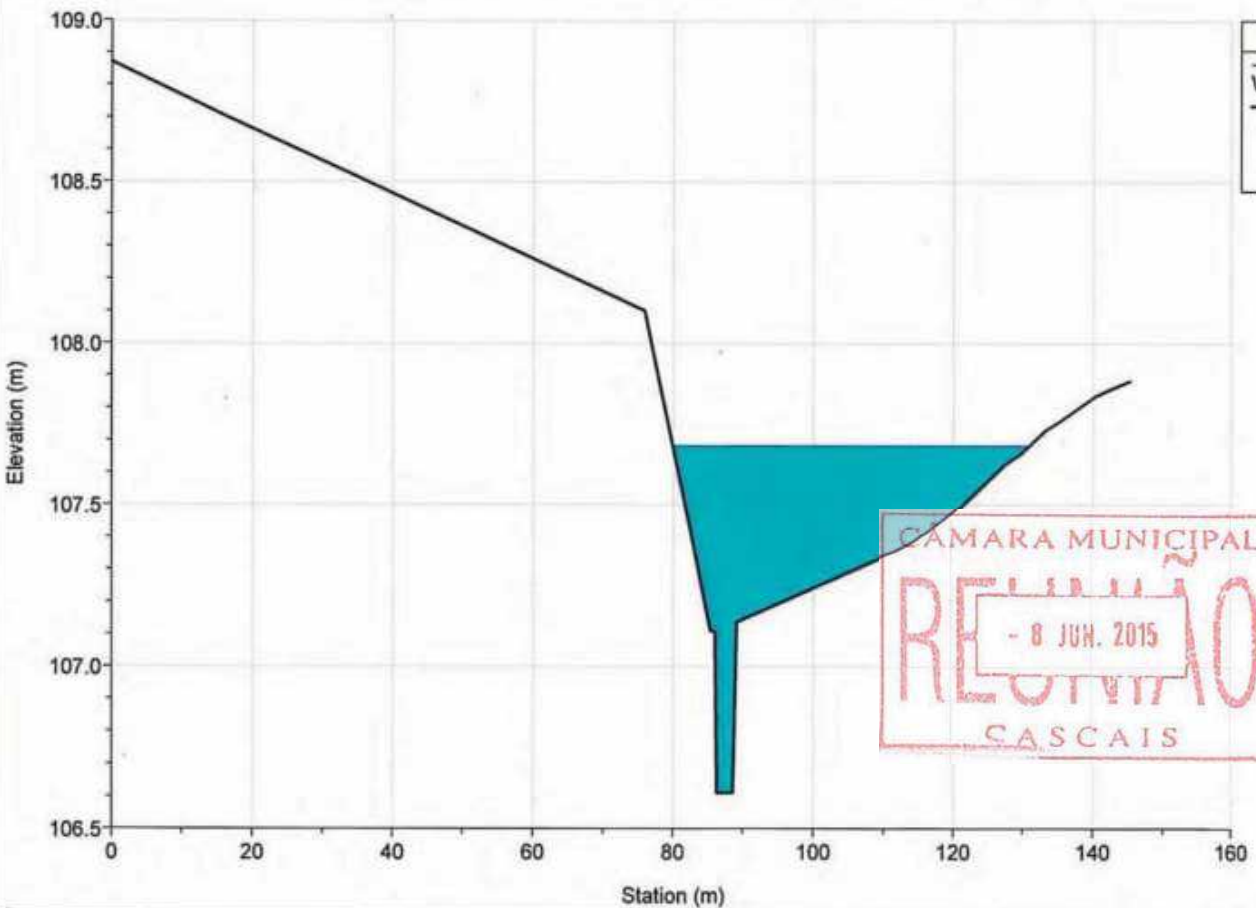




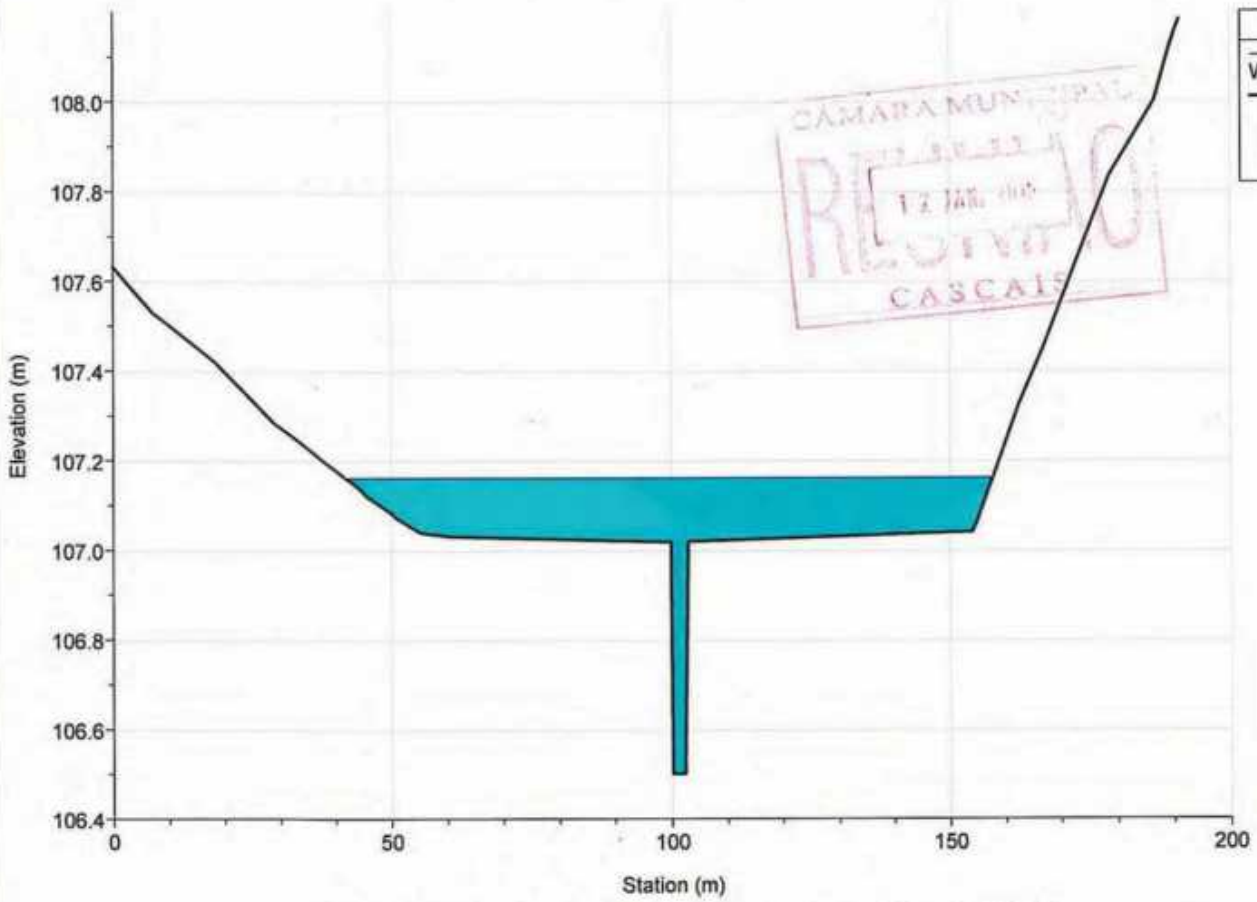
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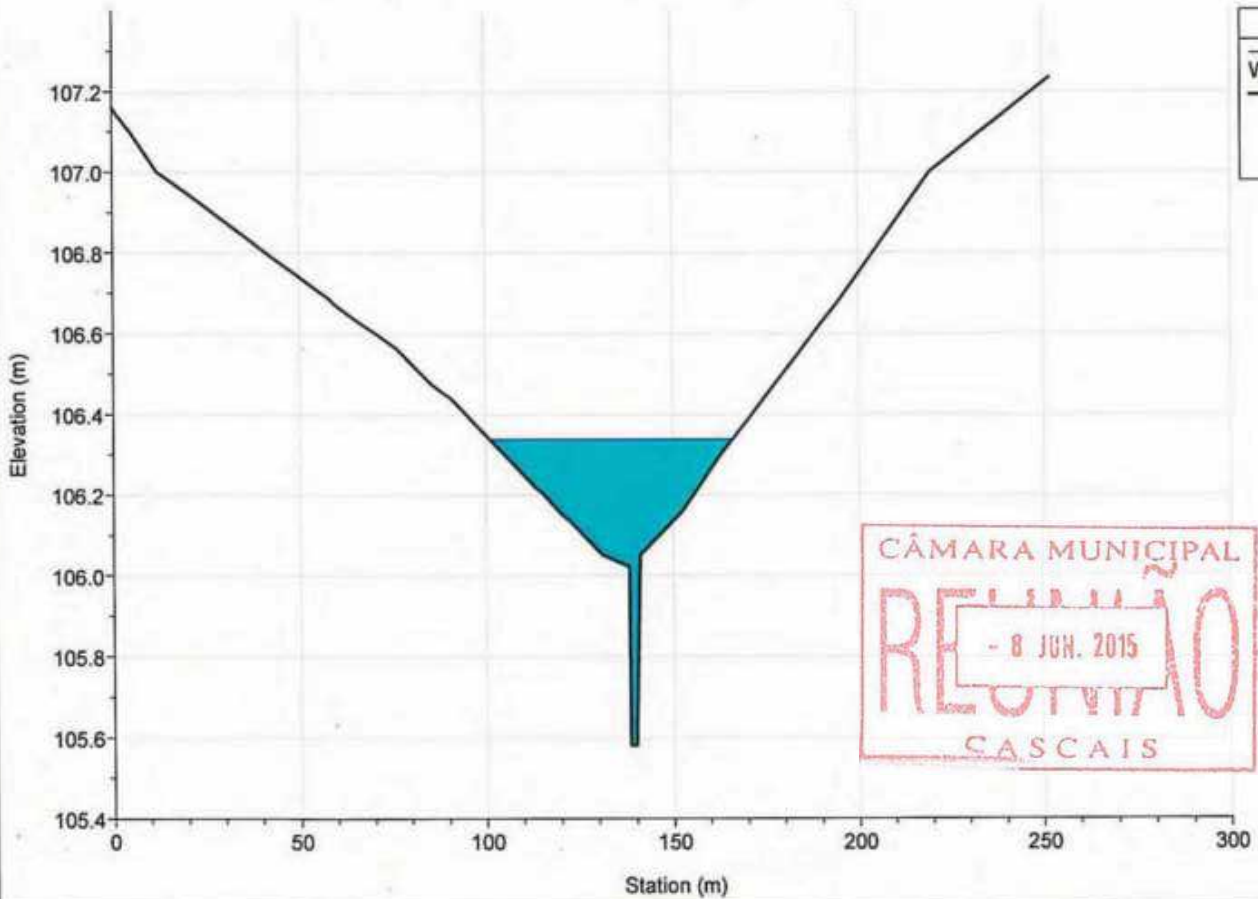
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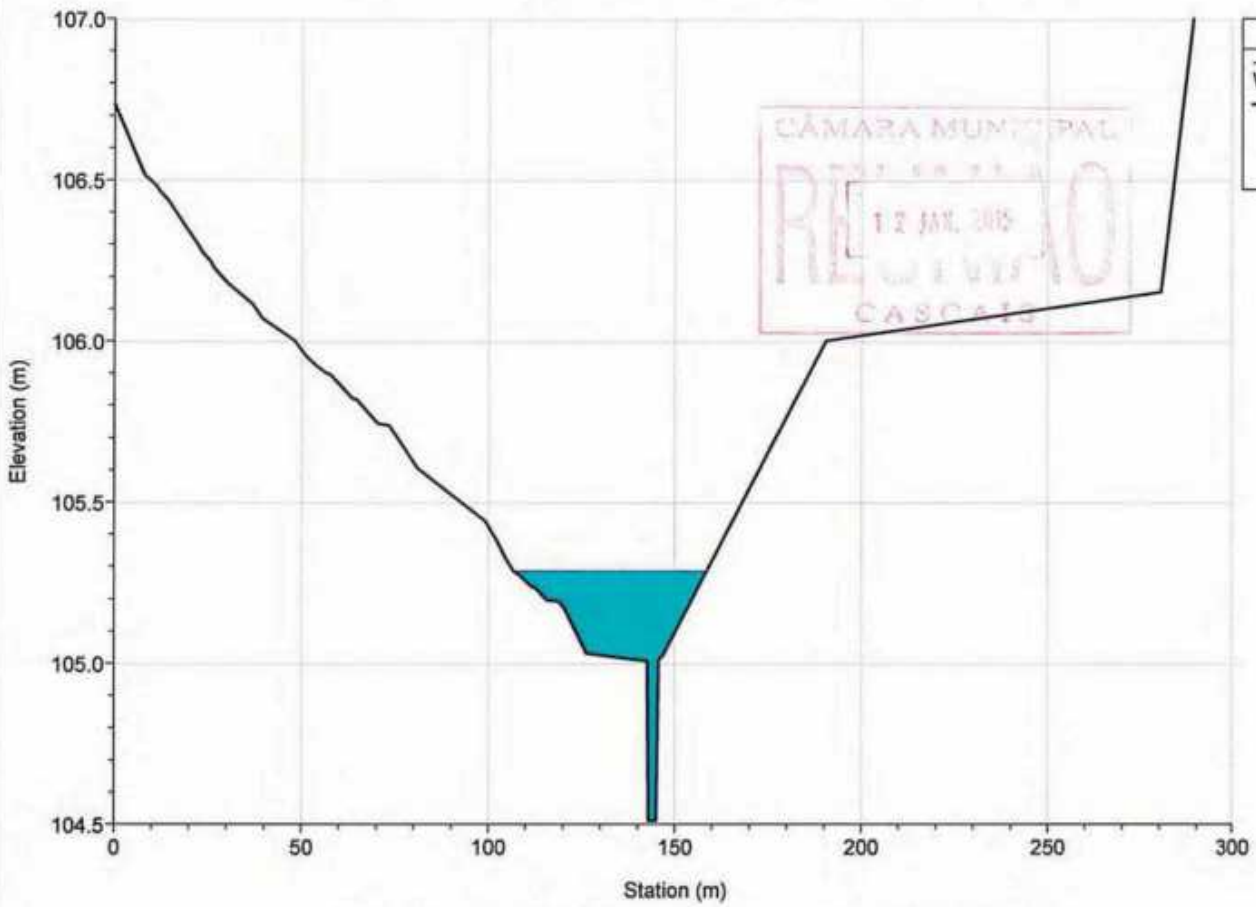
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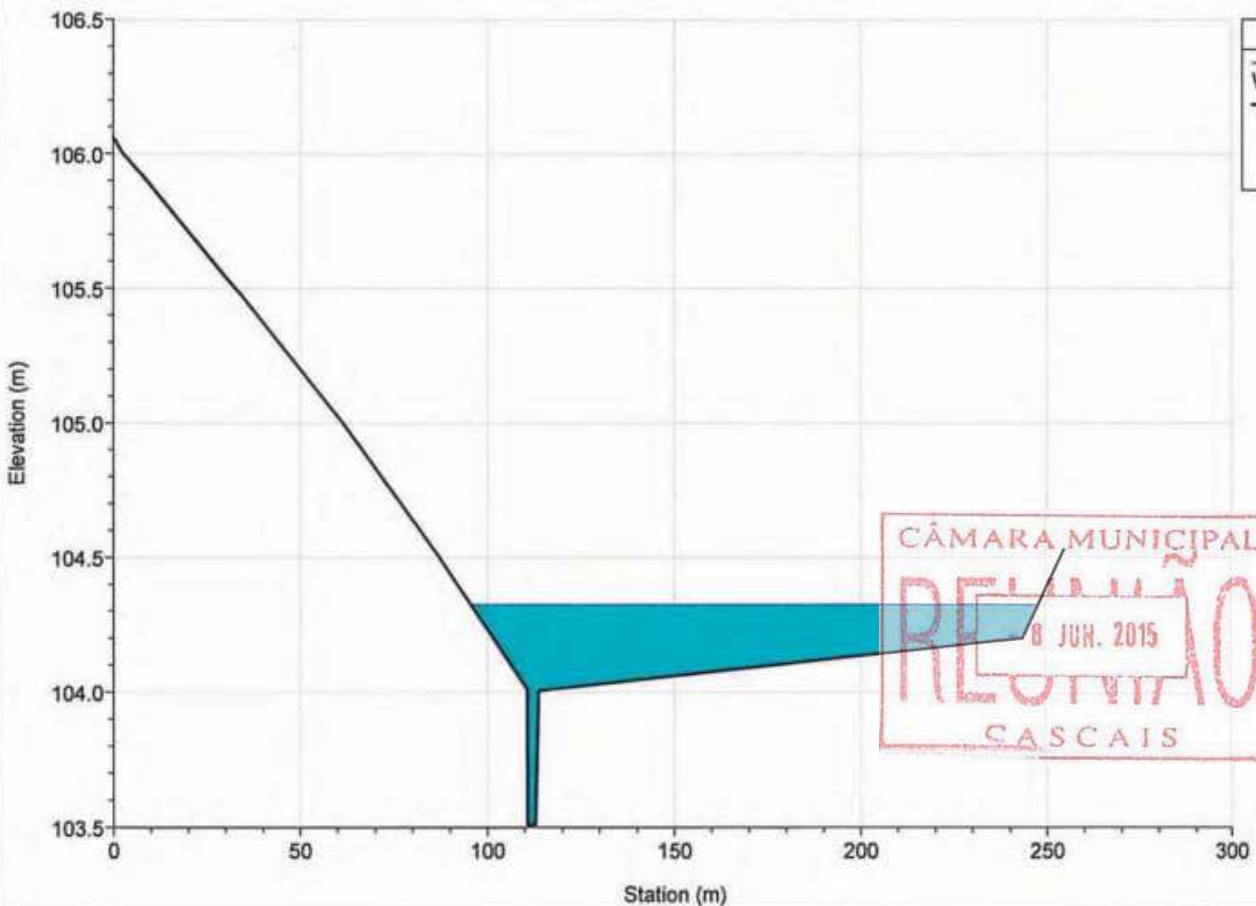
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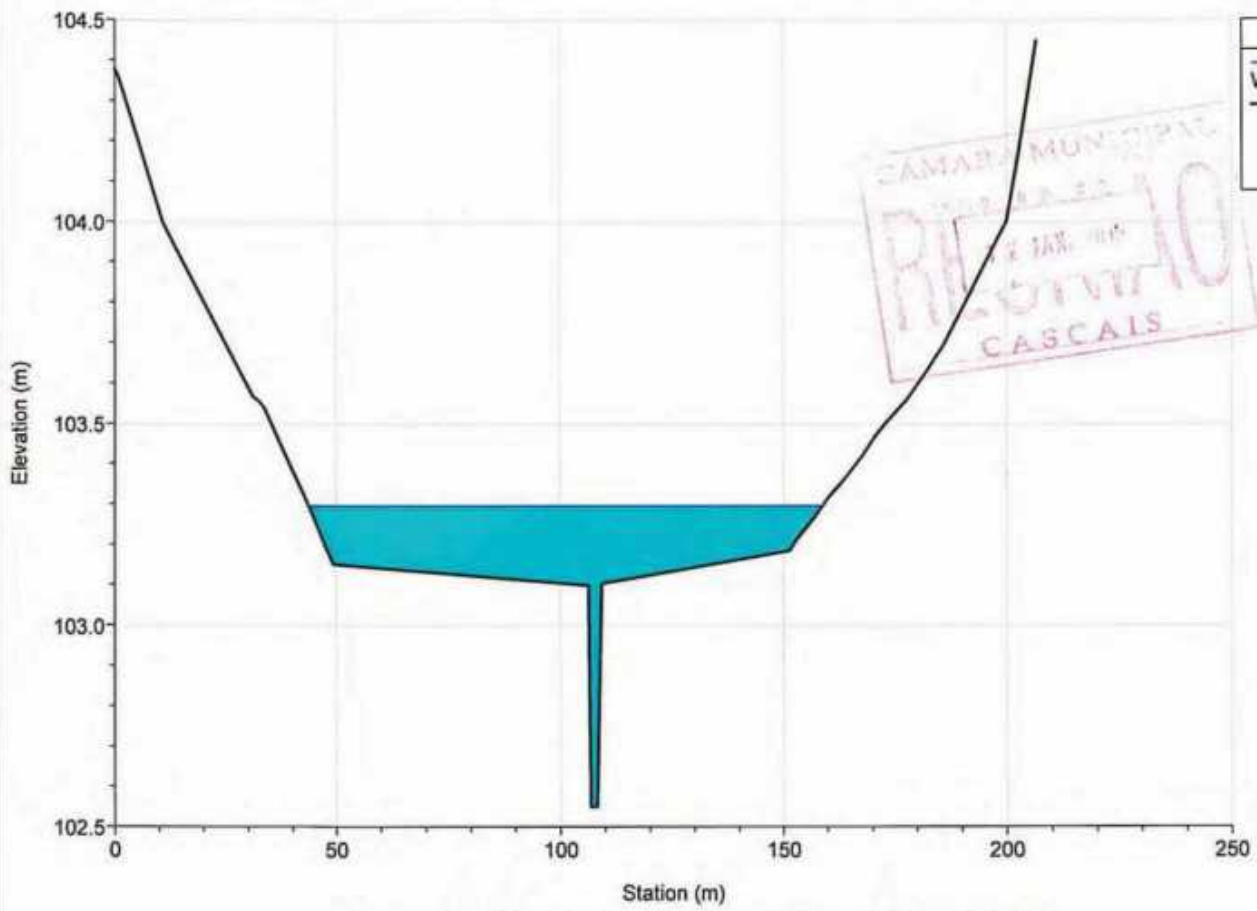
River = MARIANAS Reach = intermedio RS = 6535.410



River = MARIANAS Reach = intermedio RS = 6398.270



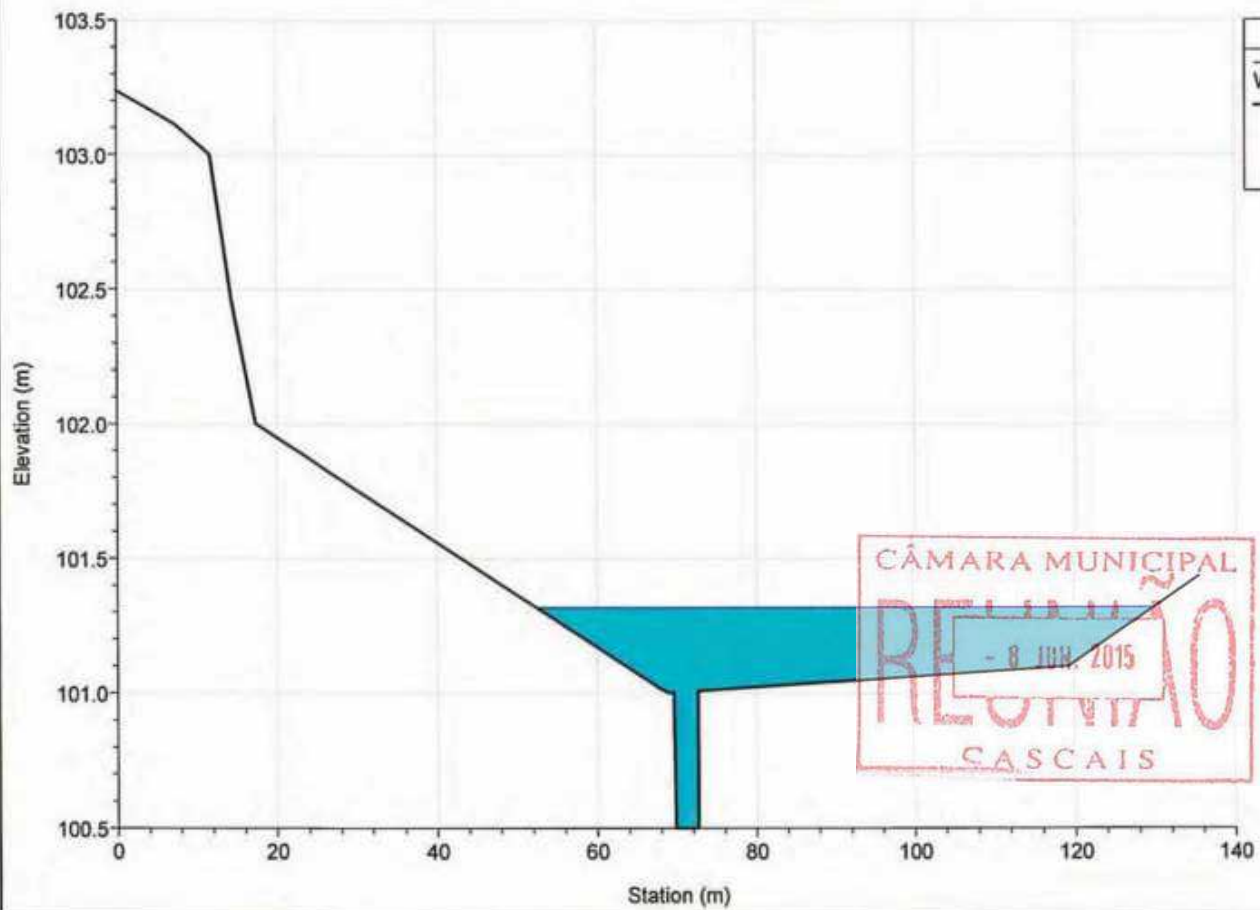
River = MARIANAS Reach = intermedio RS = 6192.111



Legend
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Ground
Bank Sta

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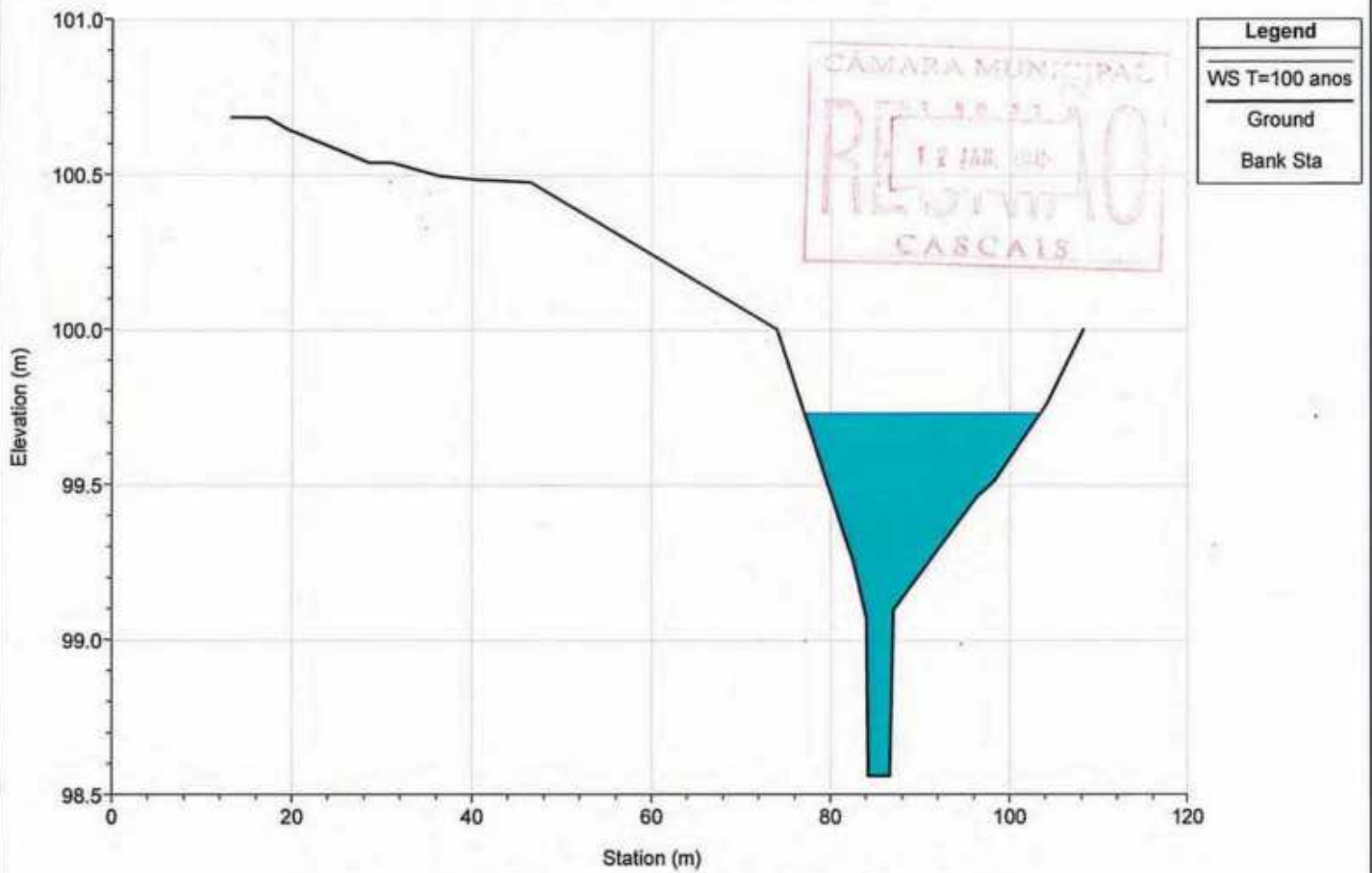
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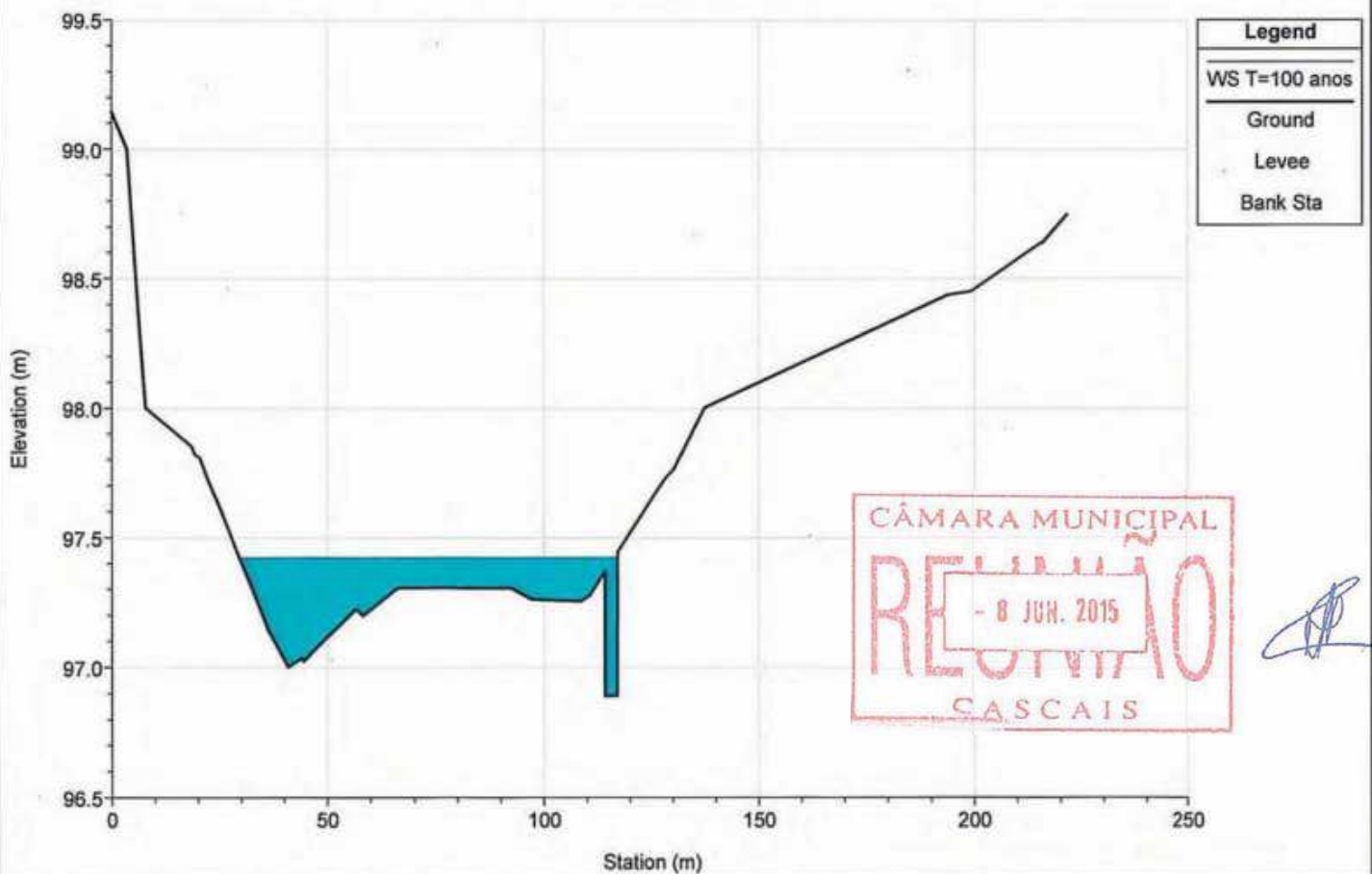
Legend
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Ground
Bank Sta

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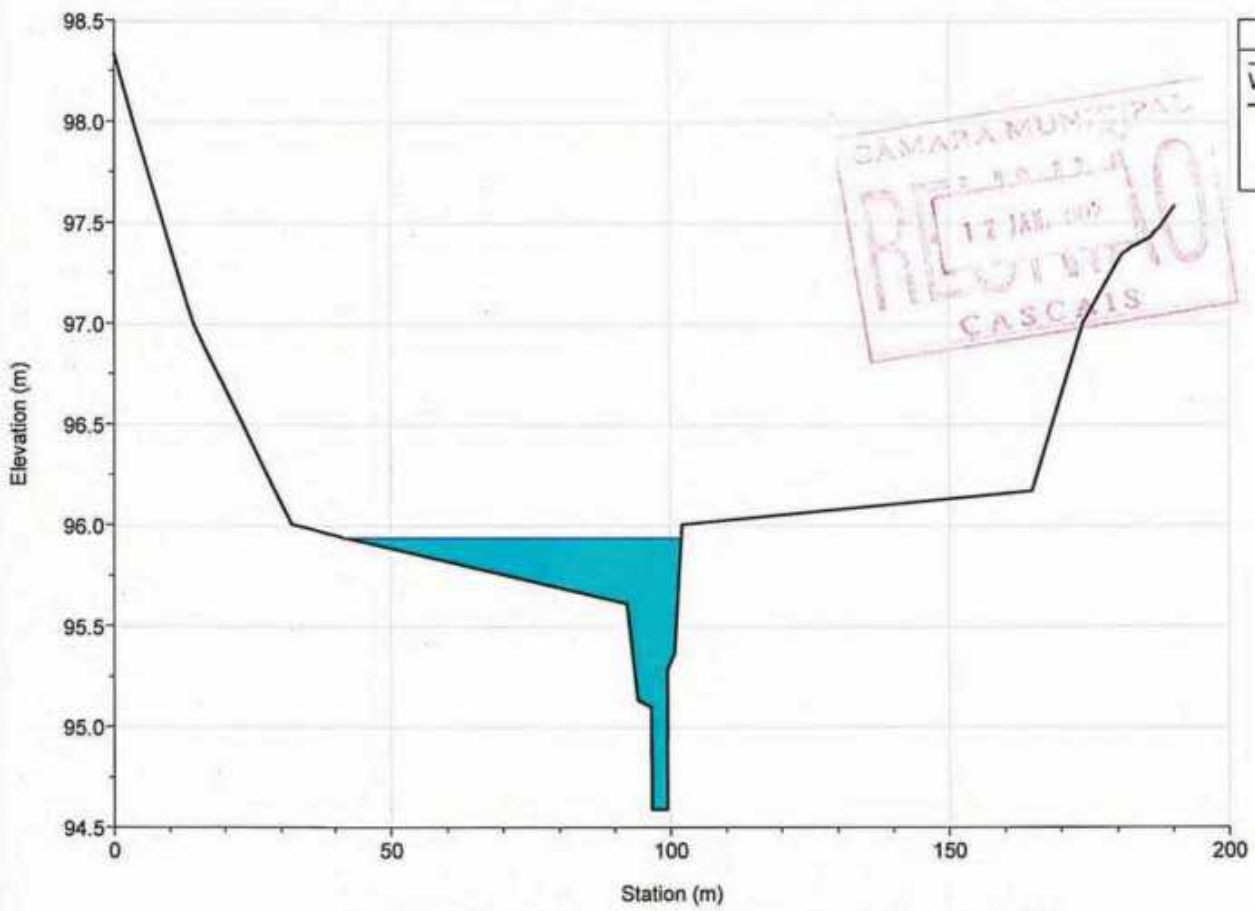
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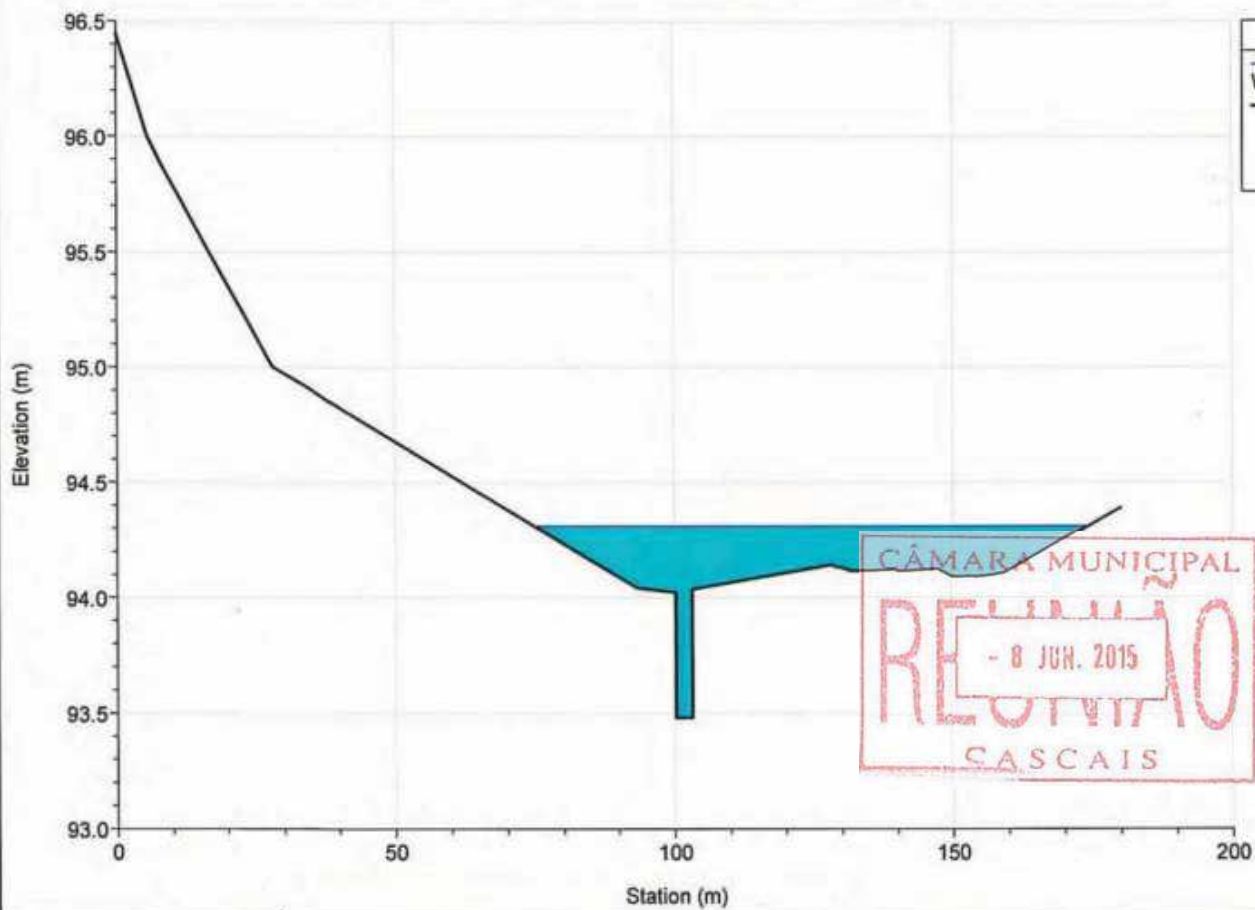
River = MARIANAS Reach = intermedio RS = 5635.252



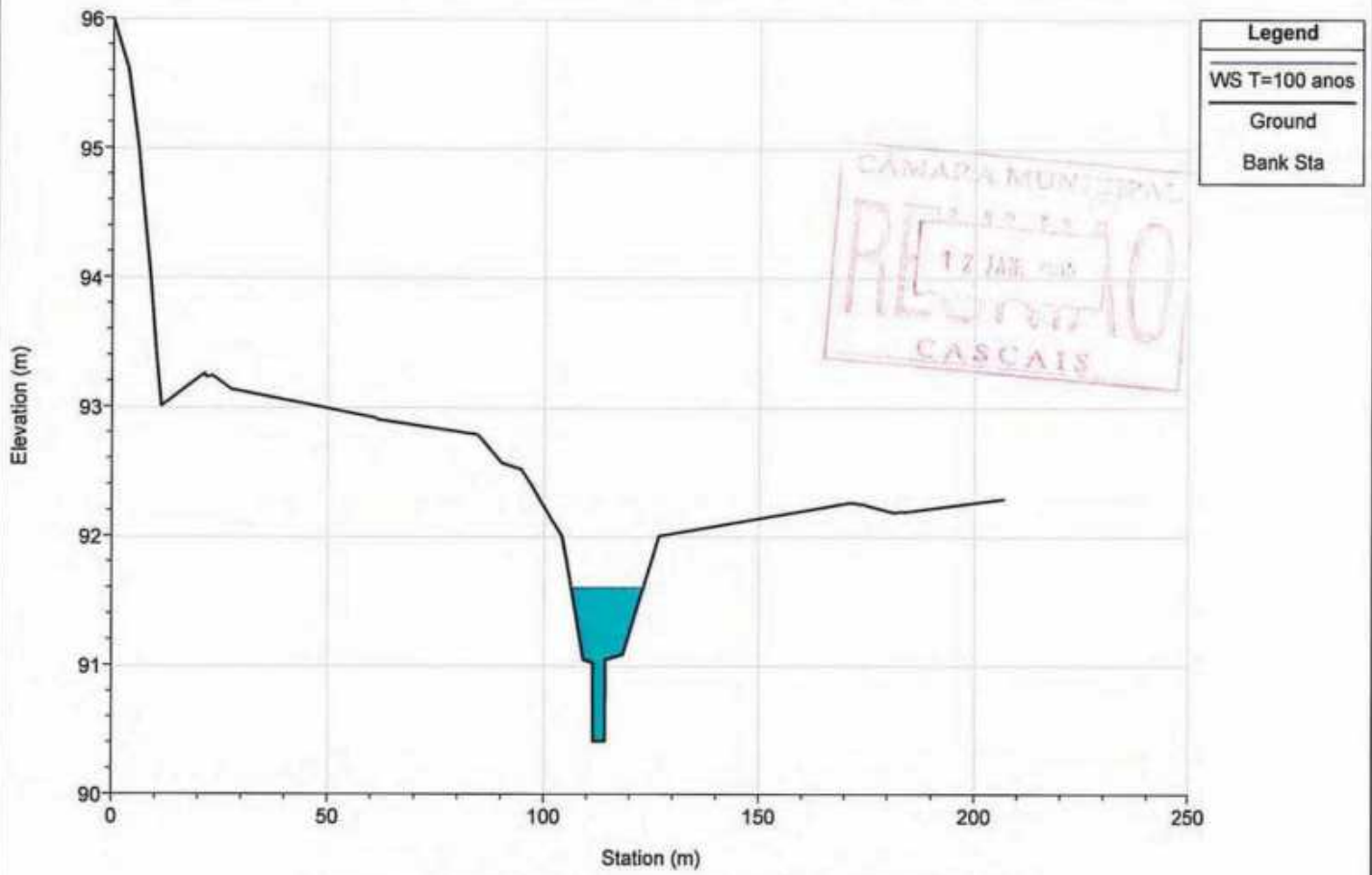
River = MARIANAS Reach = intermedio RS = 5510.749



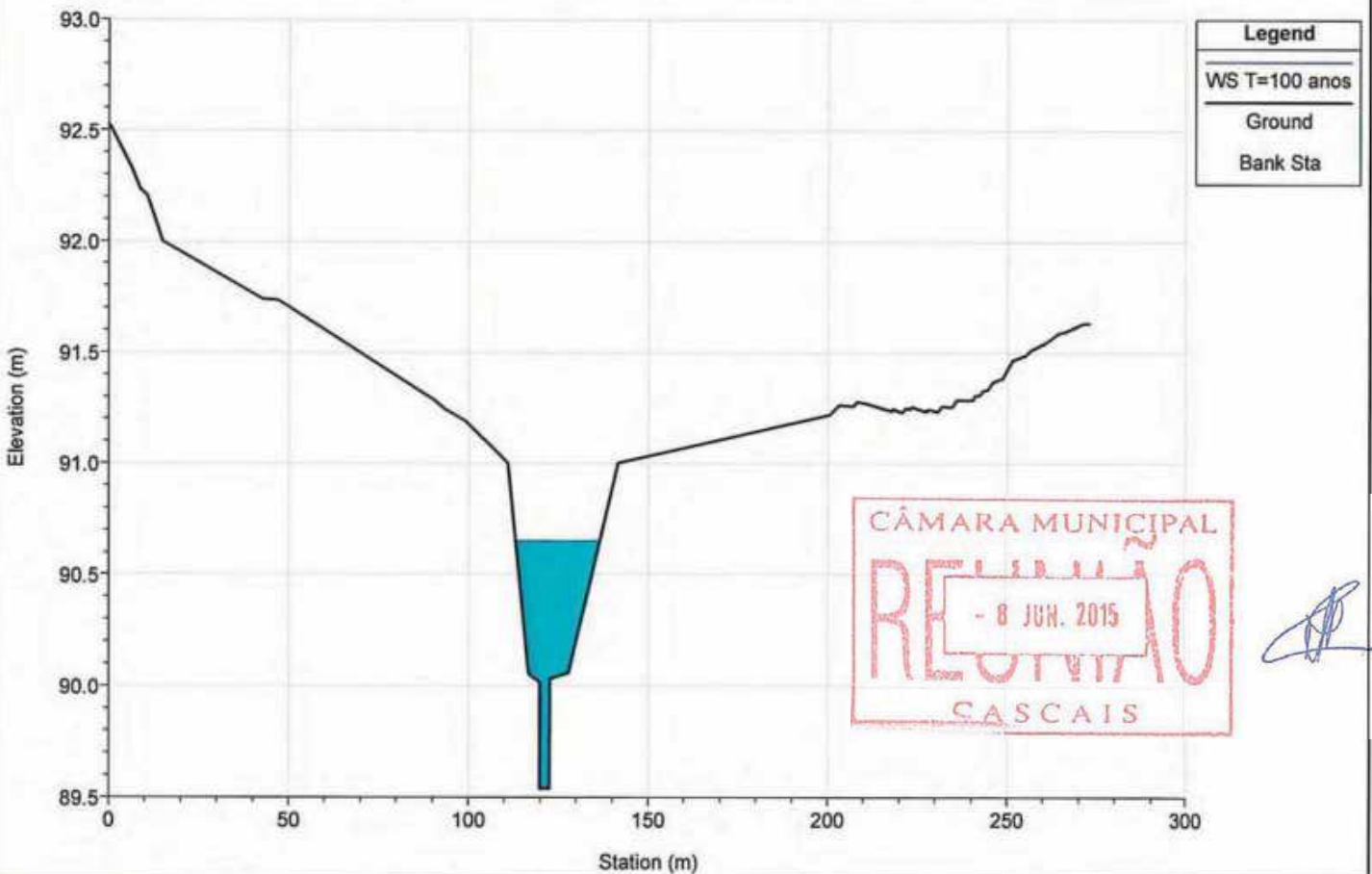
River = MARIANAS Reach = intermedio RS = 5400.328



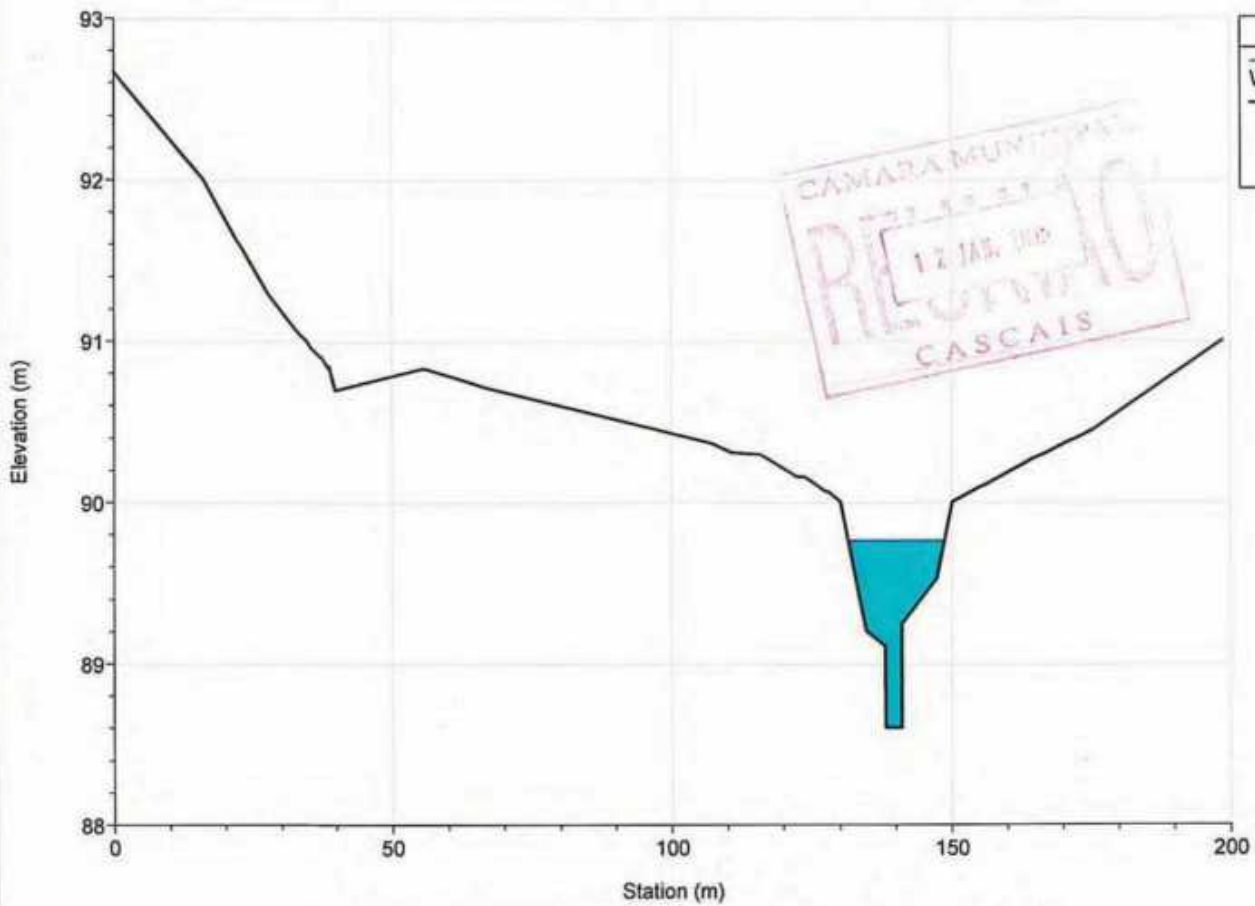
River = MARIANAS Reach = intermedio RS = 5222.089



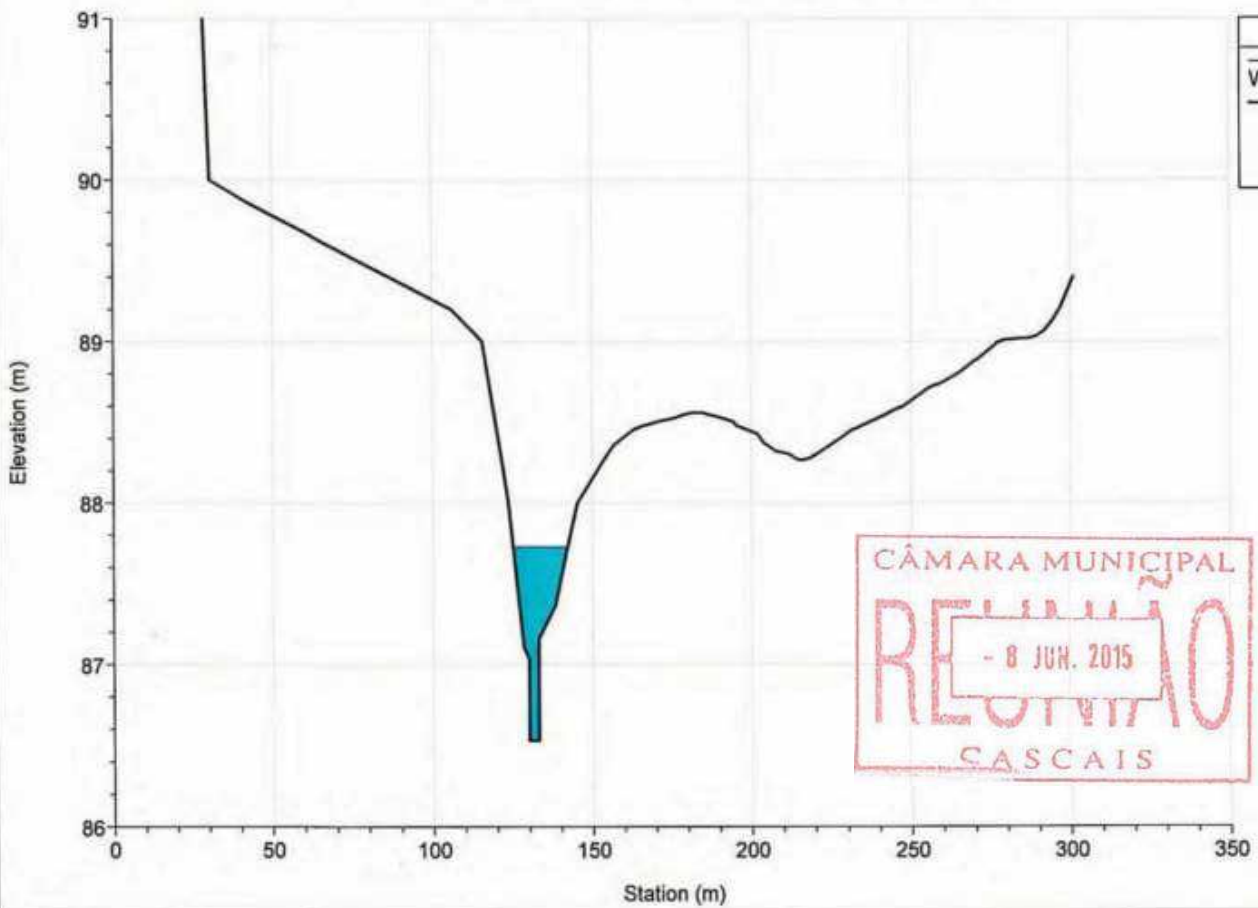
River = MARIANAS Reach = intermedio RS = 5104.043



River = MARIANAS Reach = intermedio RS = 5016.874

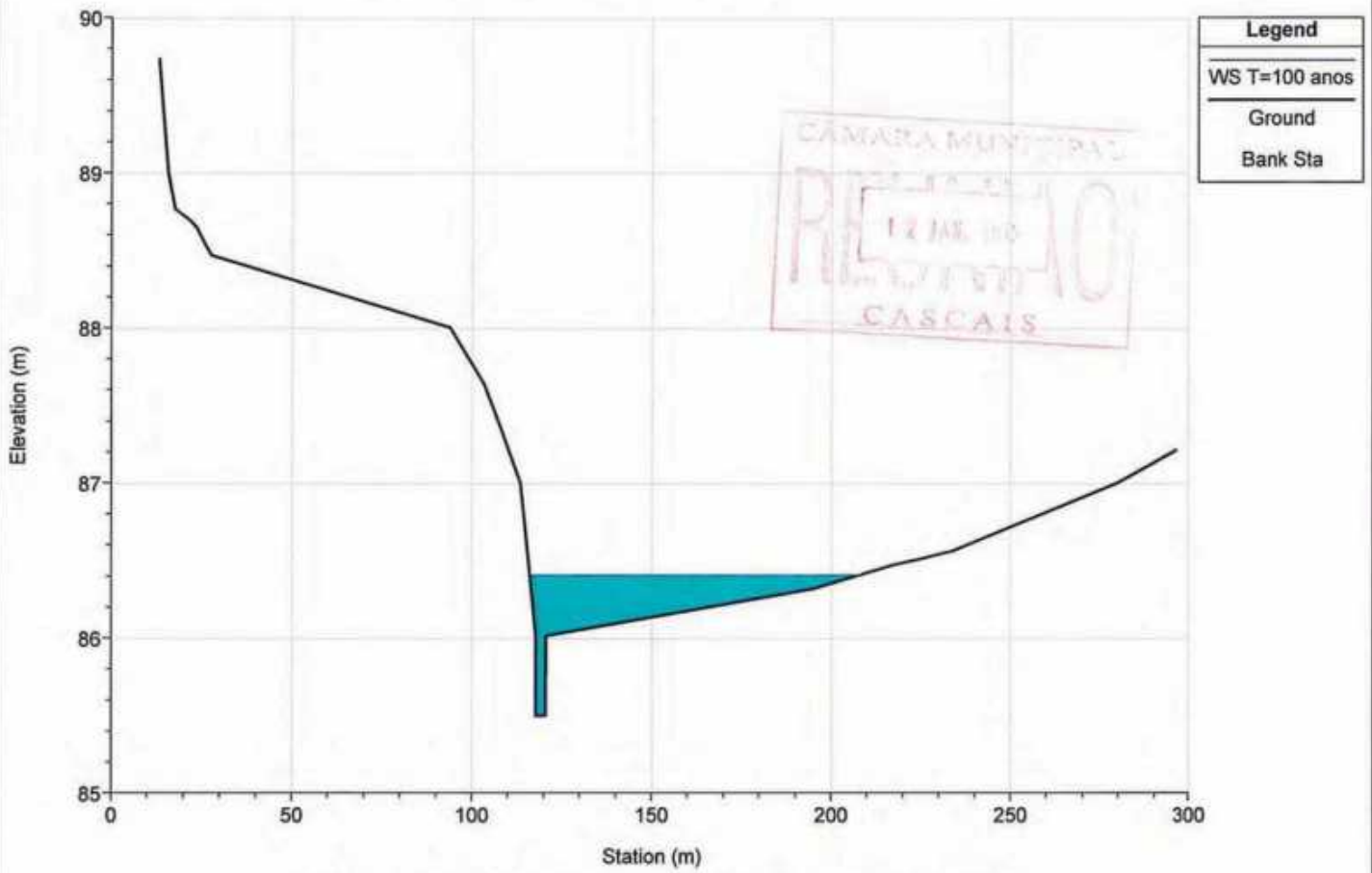


River = MARIANAS Reach = intermedio RS = 4869.717

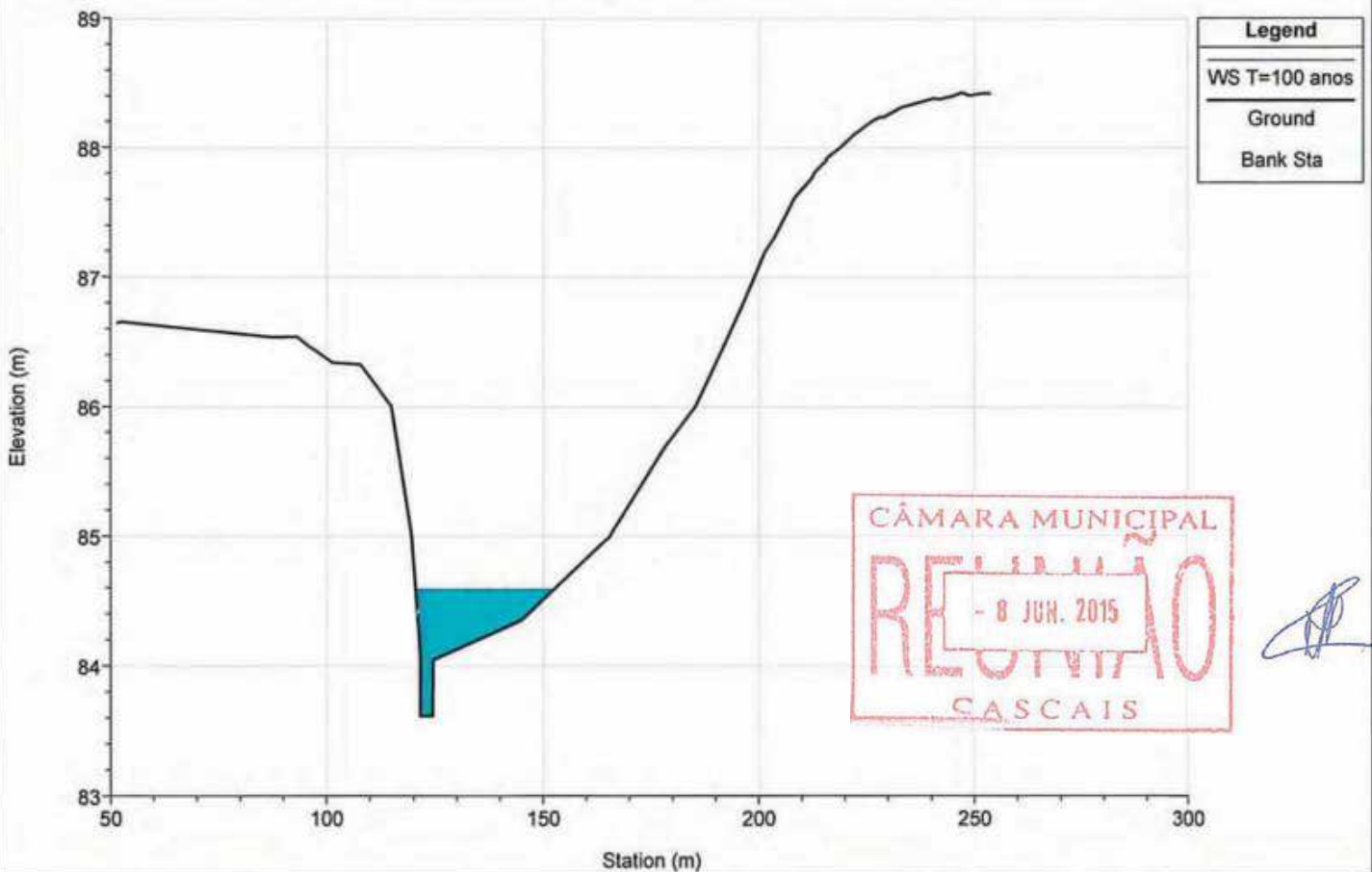




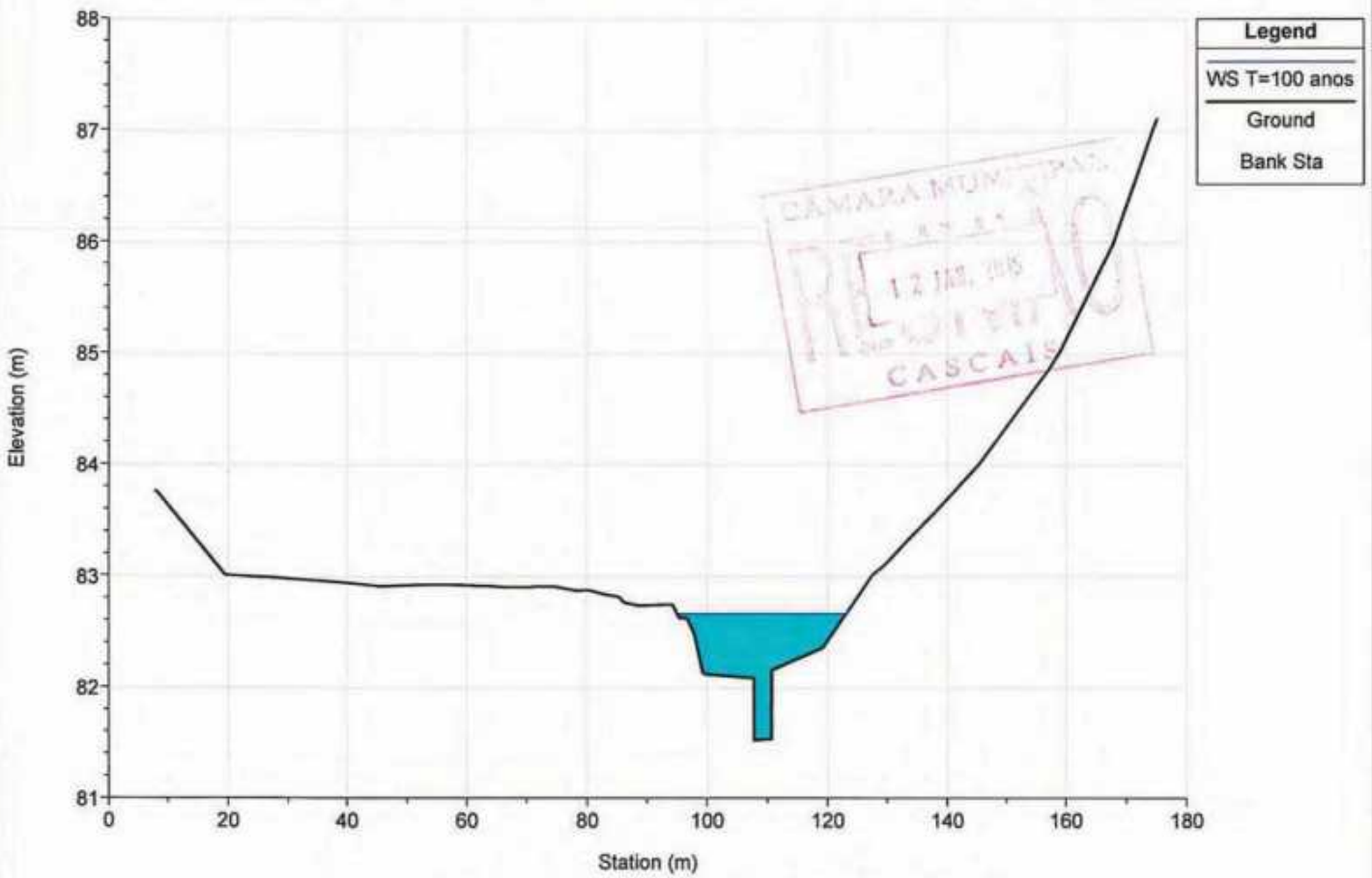
River = MARIANAS Reach = intermedio RS = 4713.714



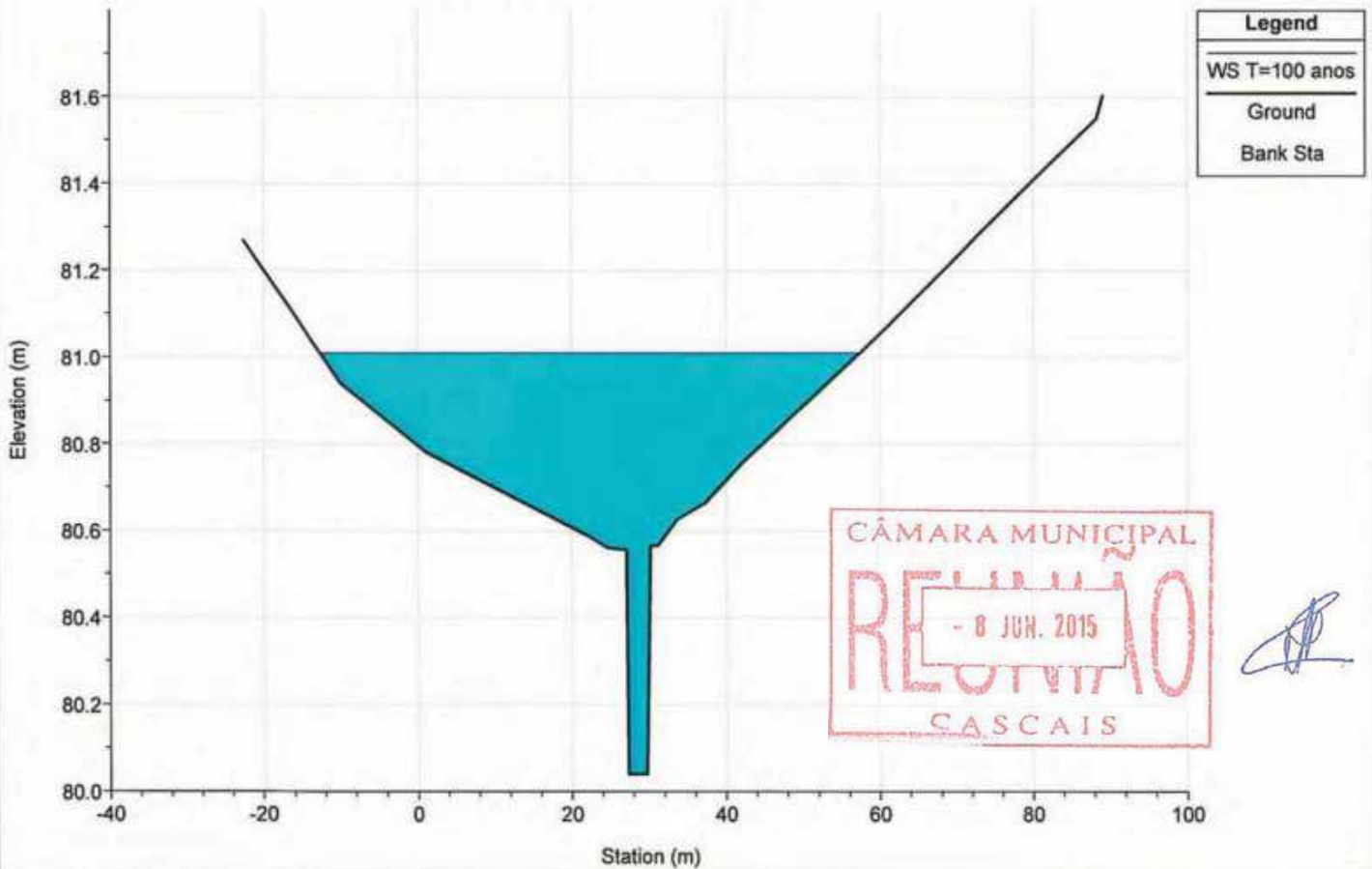
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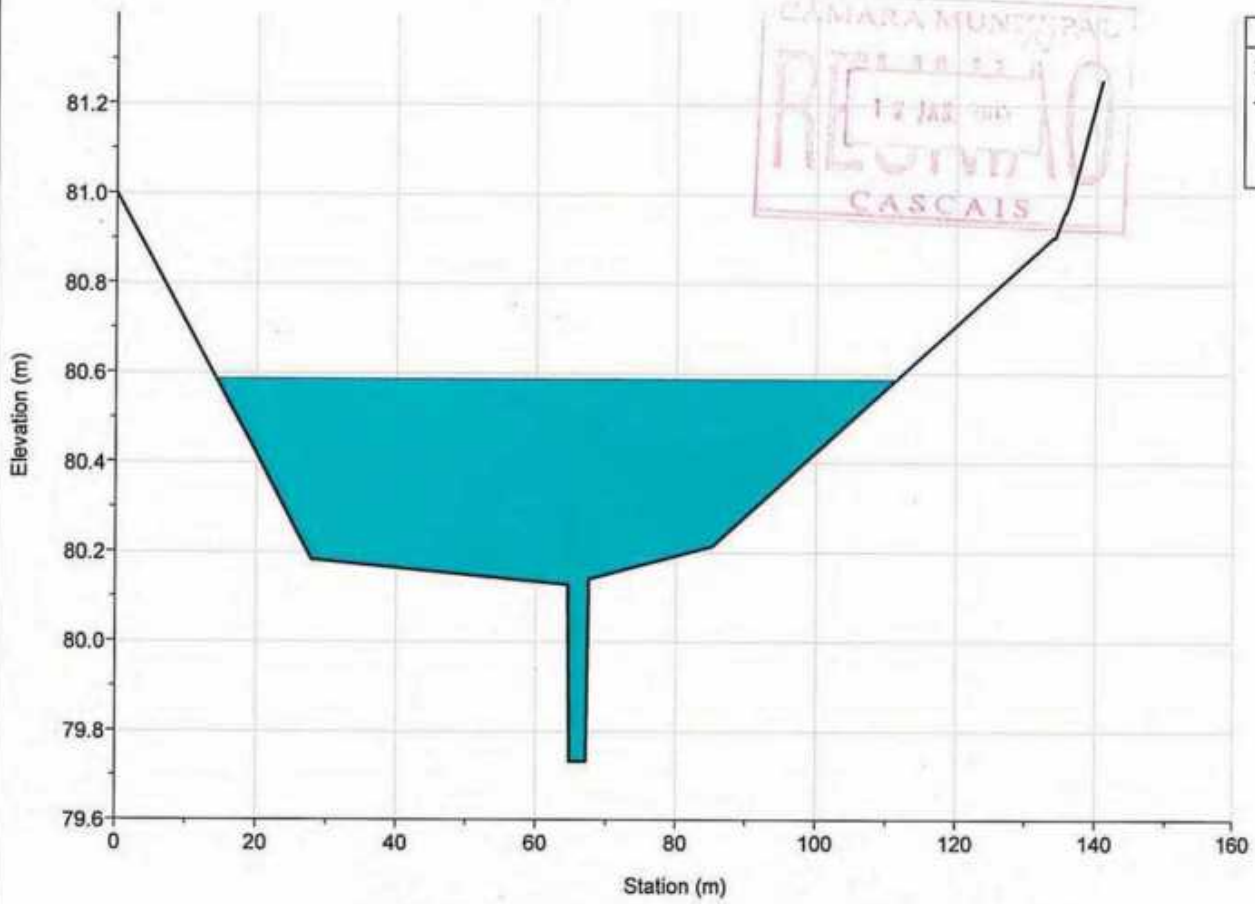
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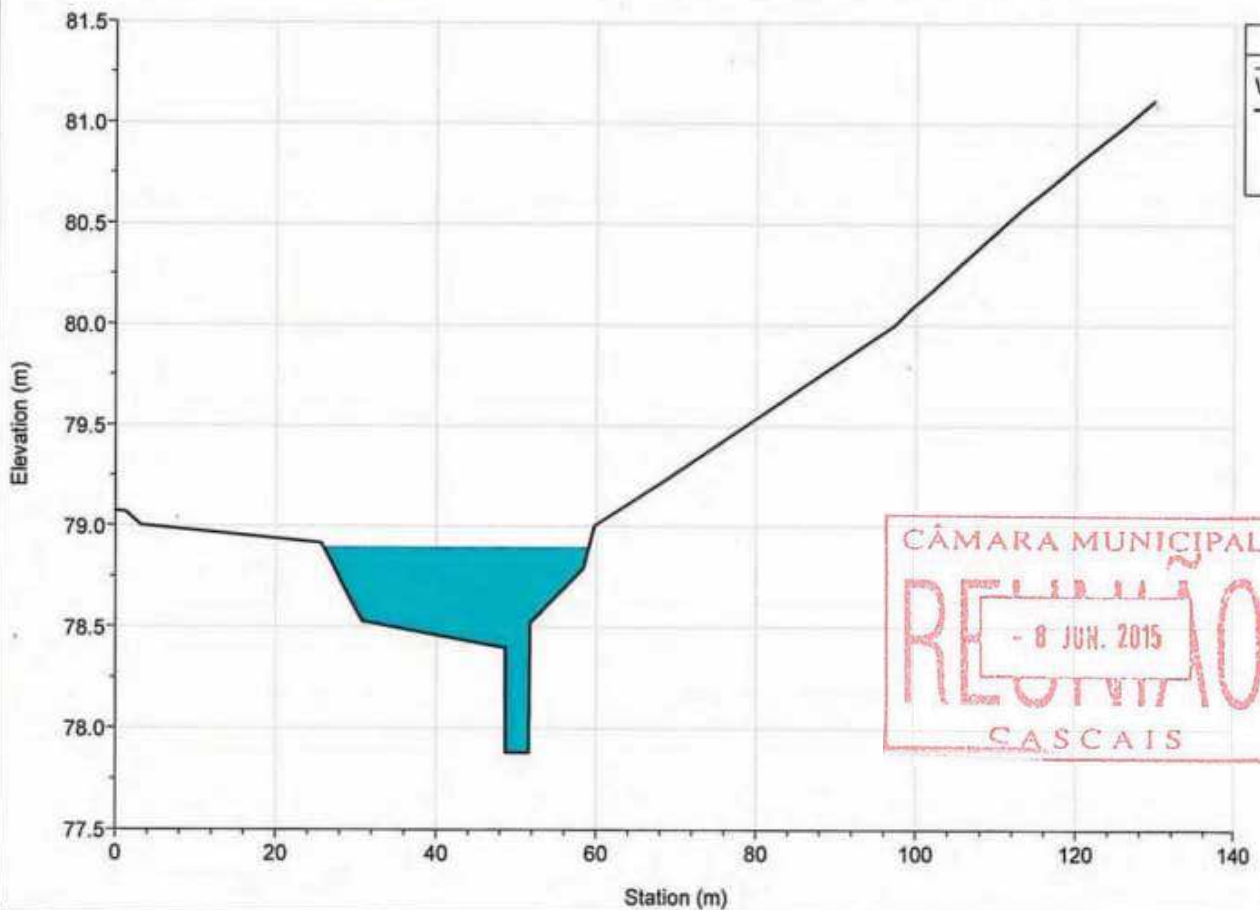
River = MARIANAS Reach = intermedio RS = 4235.262



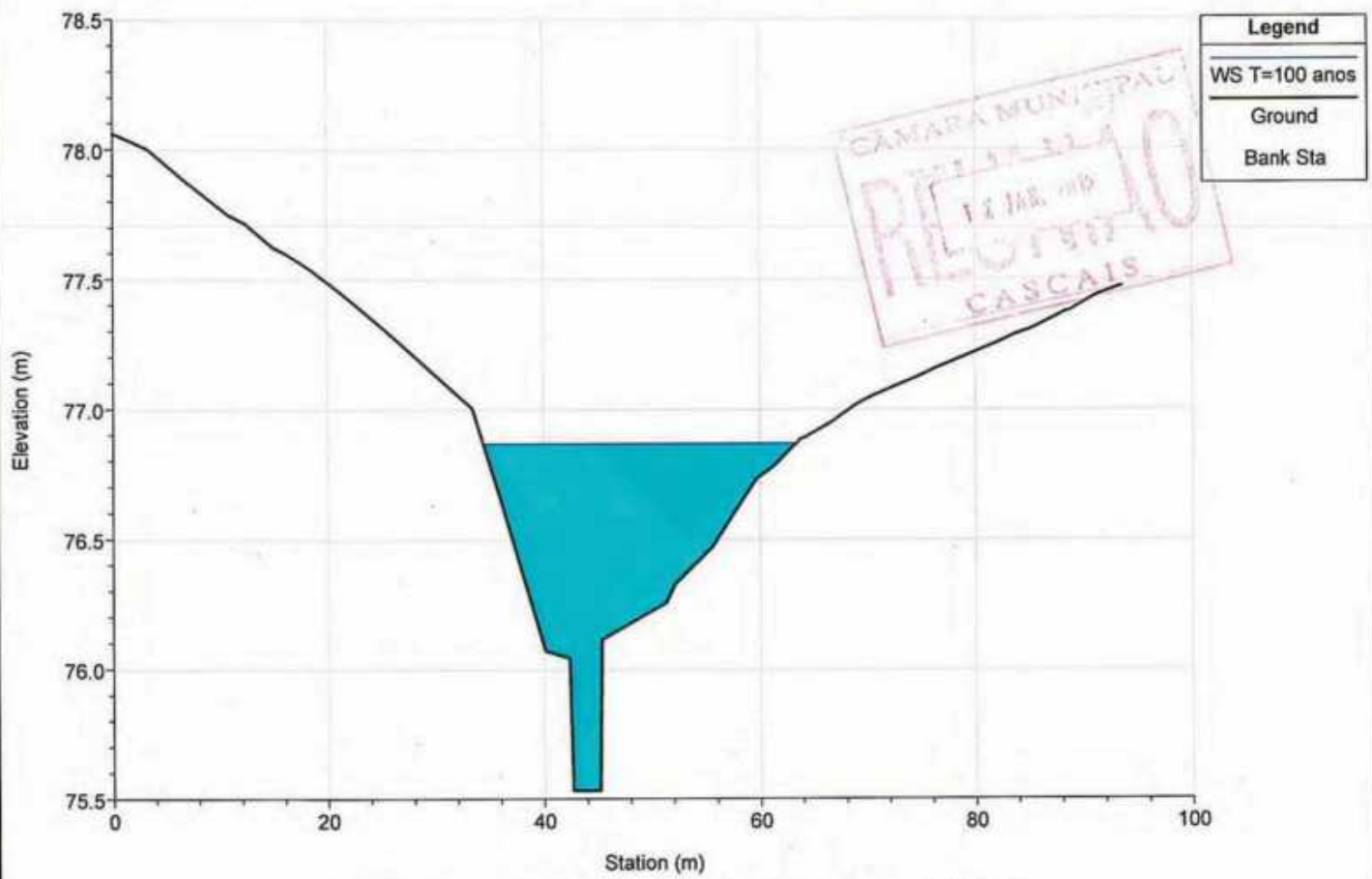
River = MARIANAS Reach = jusante RS = 4195.636



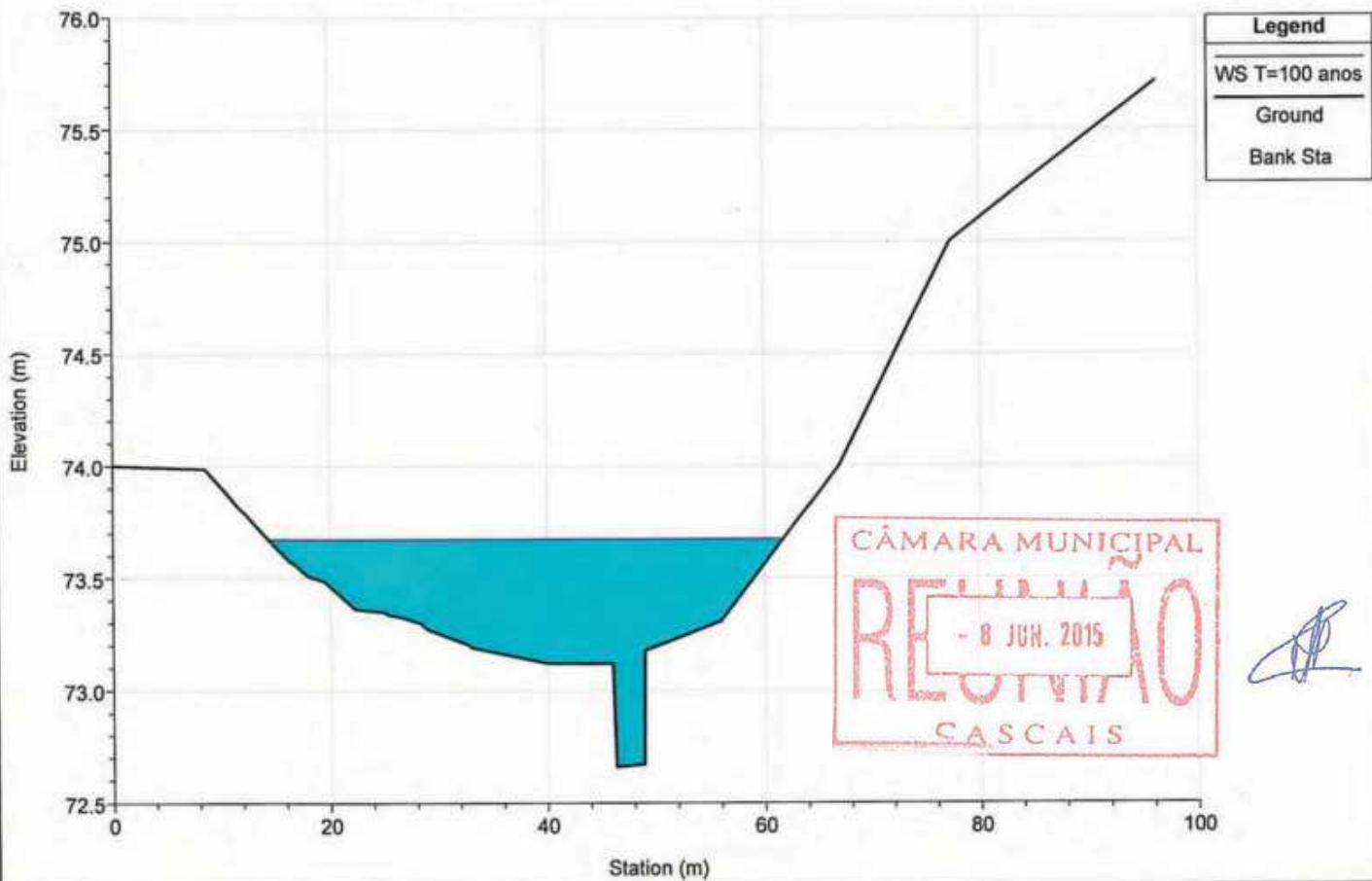
River = MARIANAS Reach = jusante RS = 4074.329



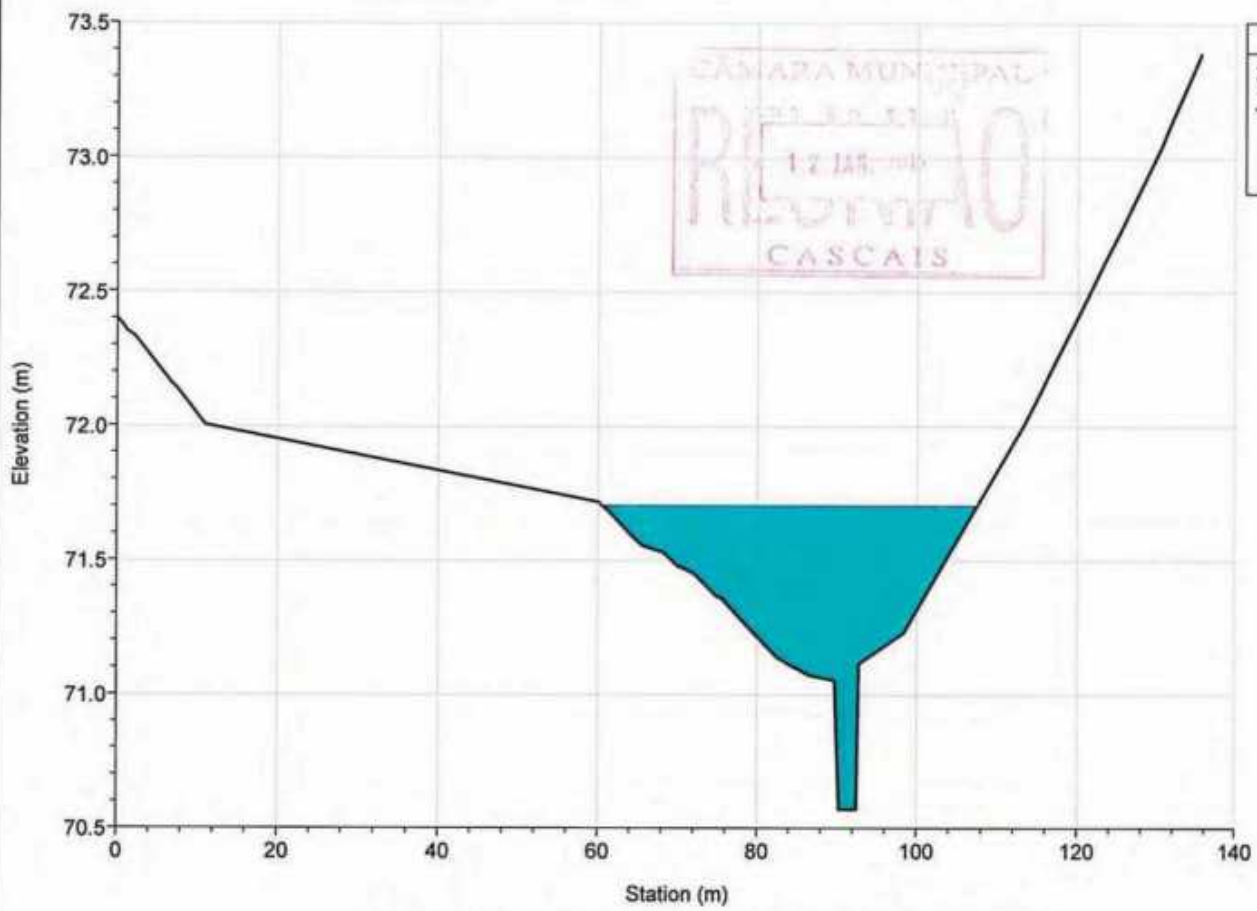
River = MARIANAS Reach = jusante RS = 3967.167



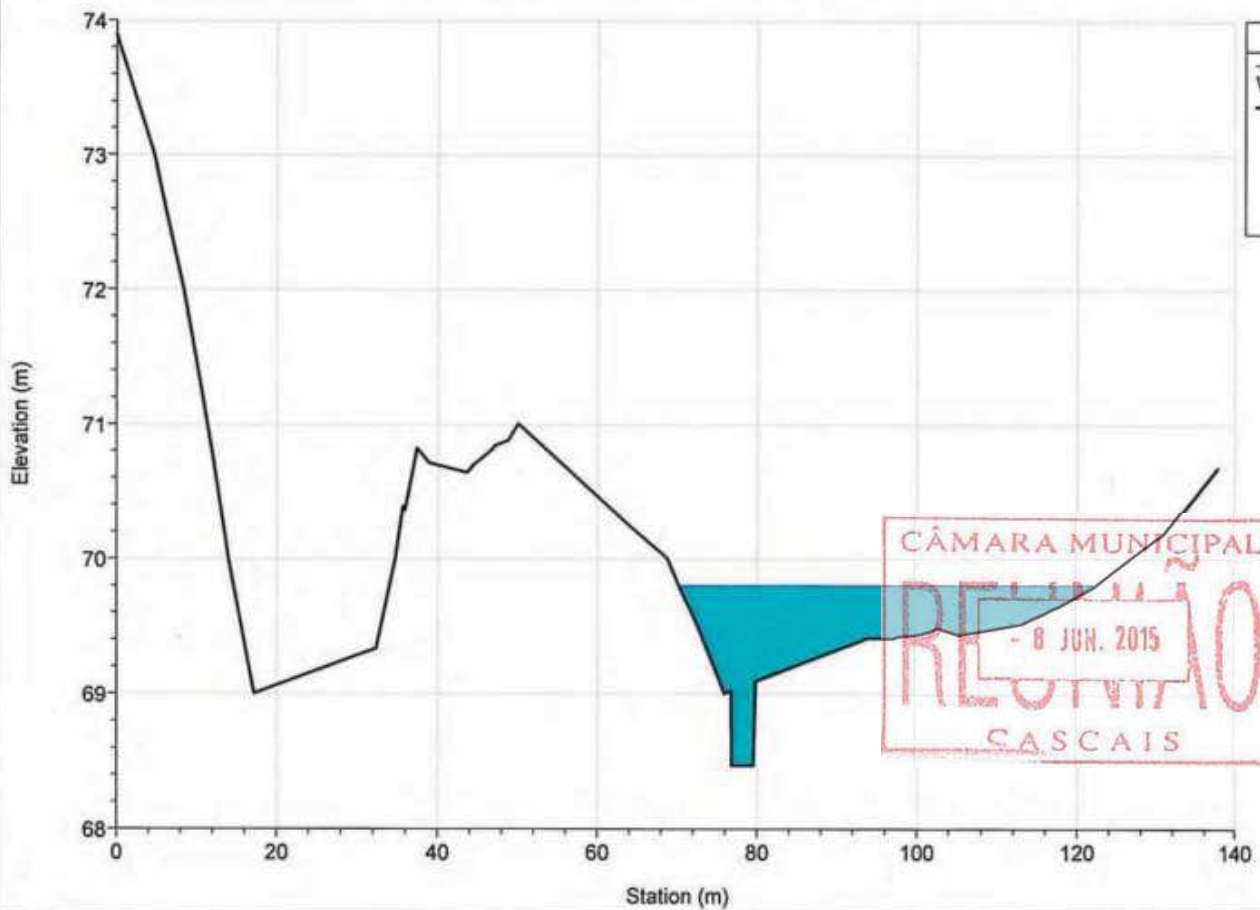
River = MARIANAS Reach = jusante RS = 3851.647



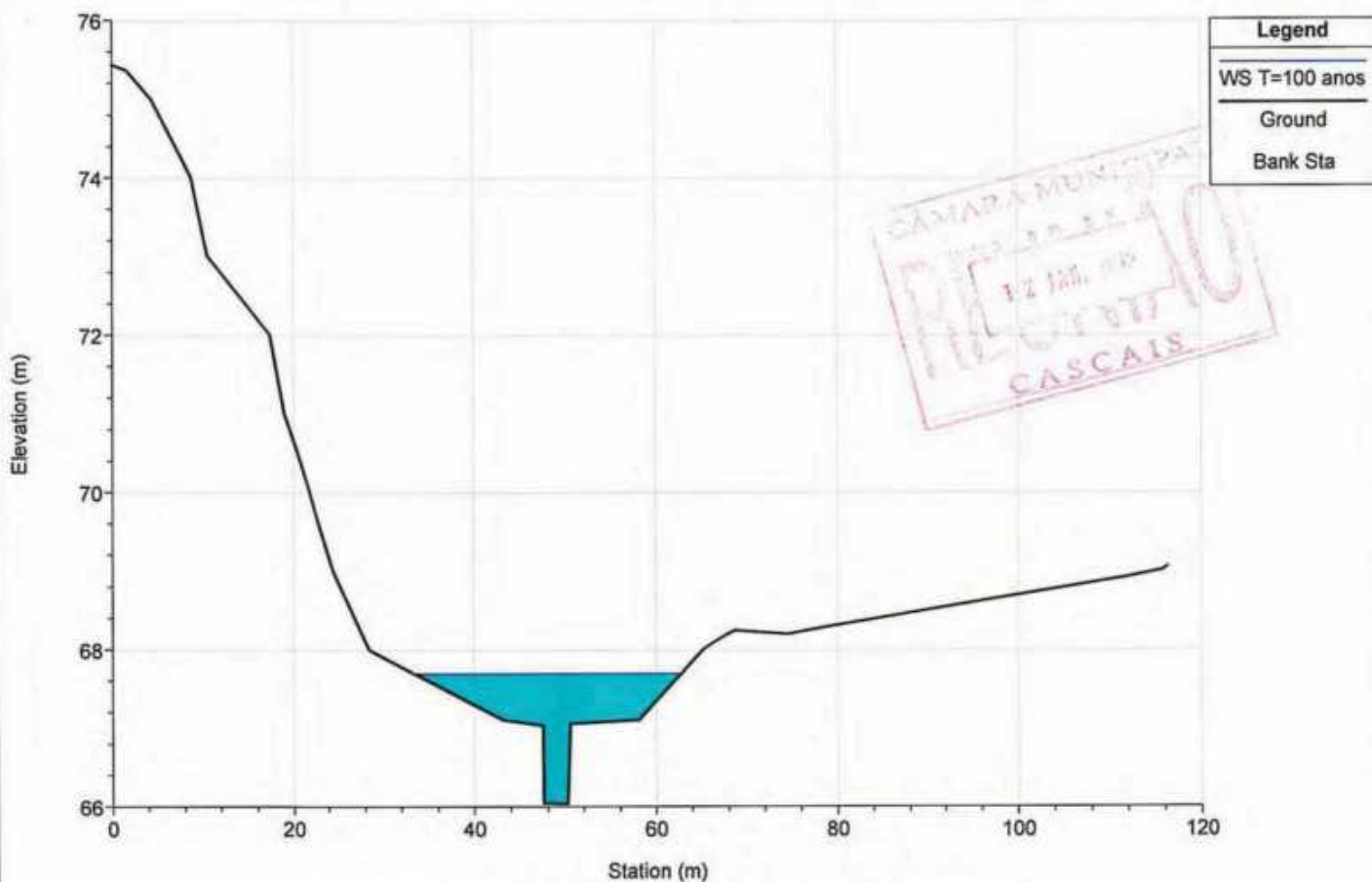
River = MARIANAS Reach = jusante RS = 3705.192



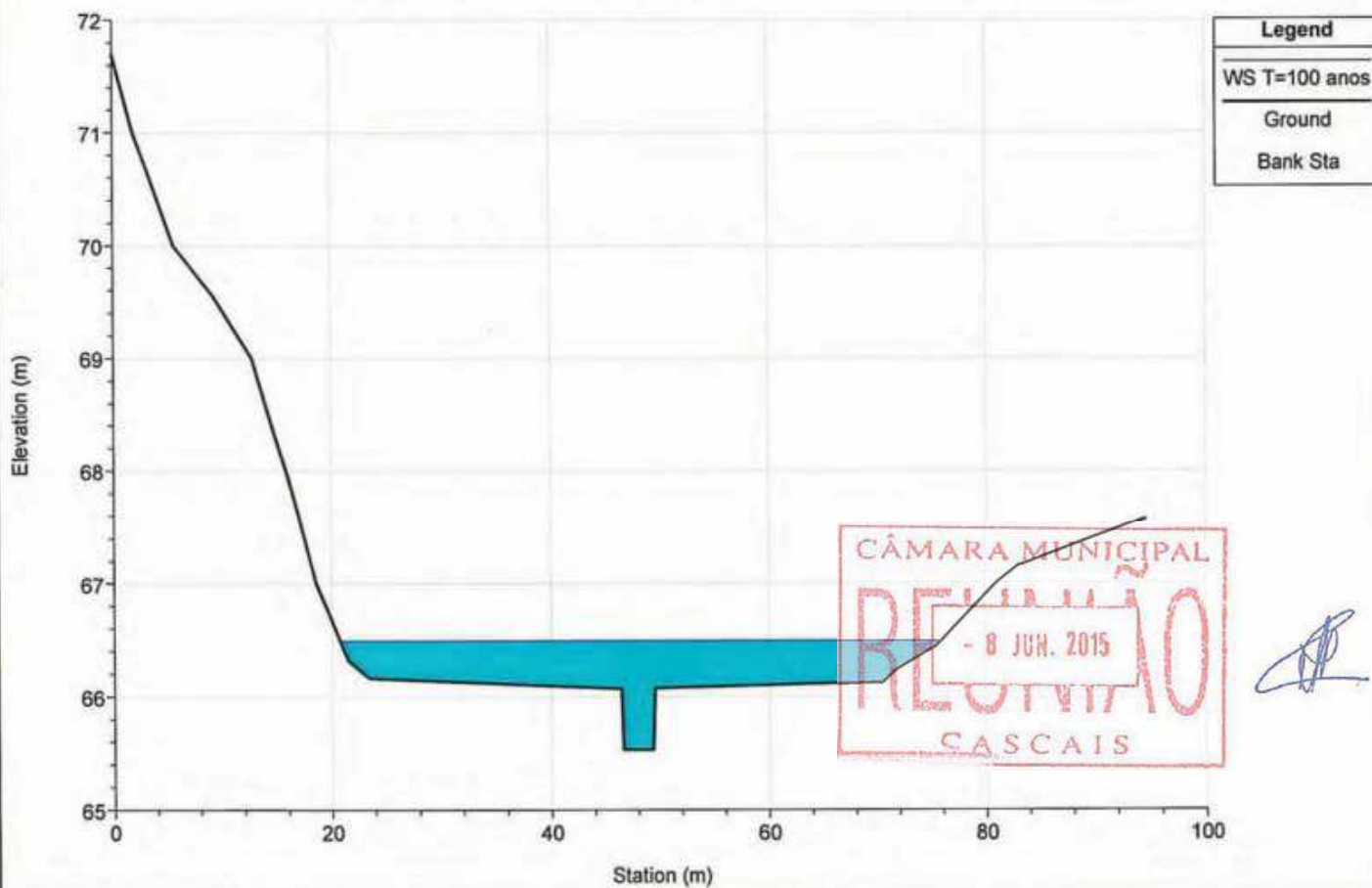
River = MARIANAS Reach = jusante RS = 3578.552



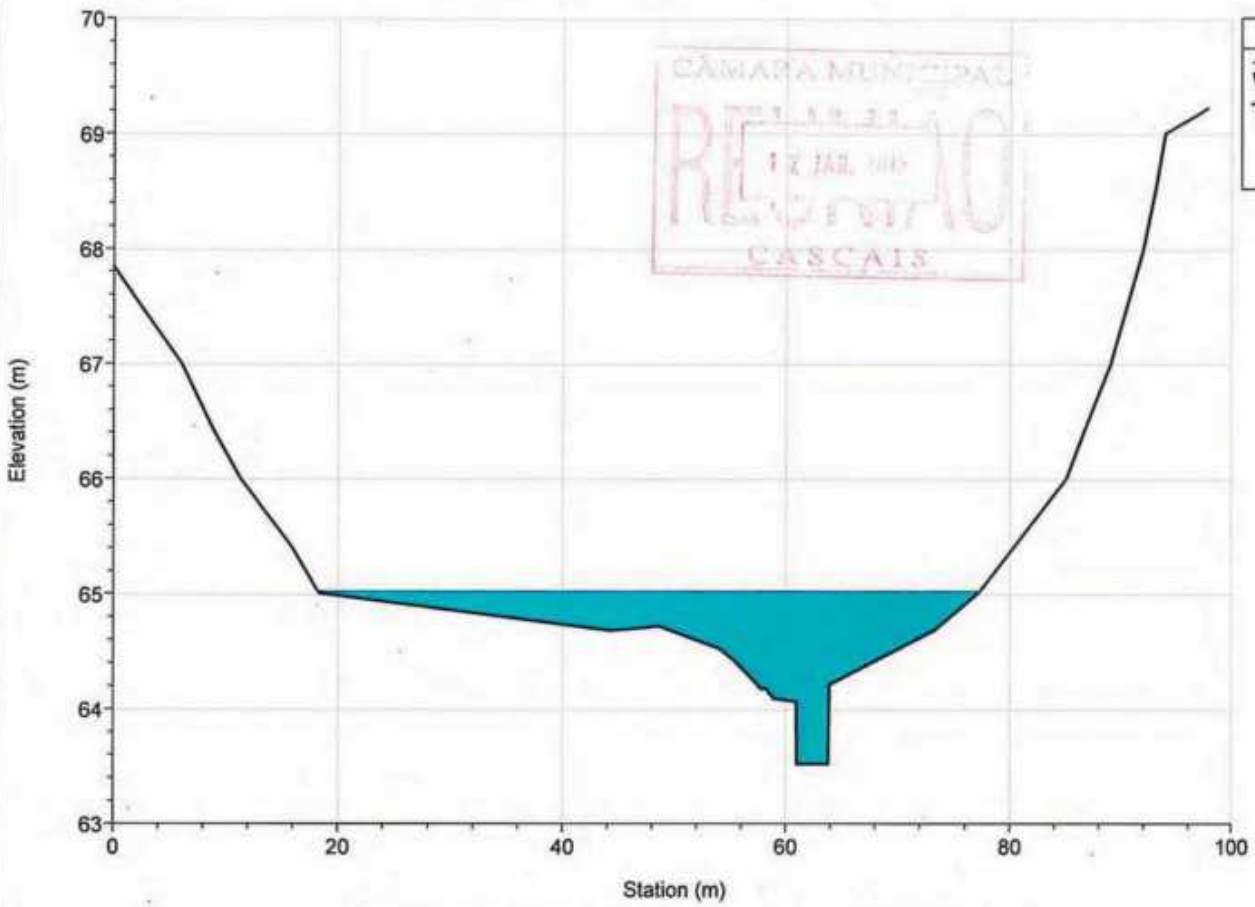
River = MARIANAS Reach = jusante RS = 3452.699



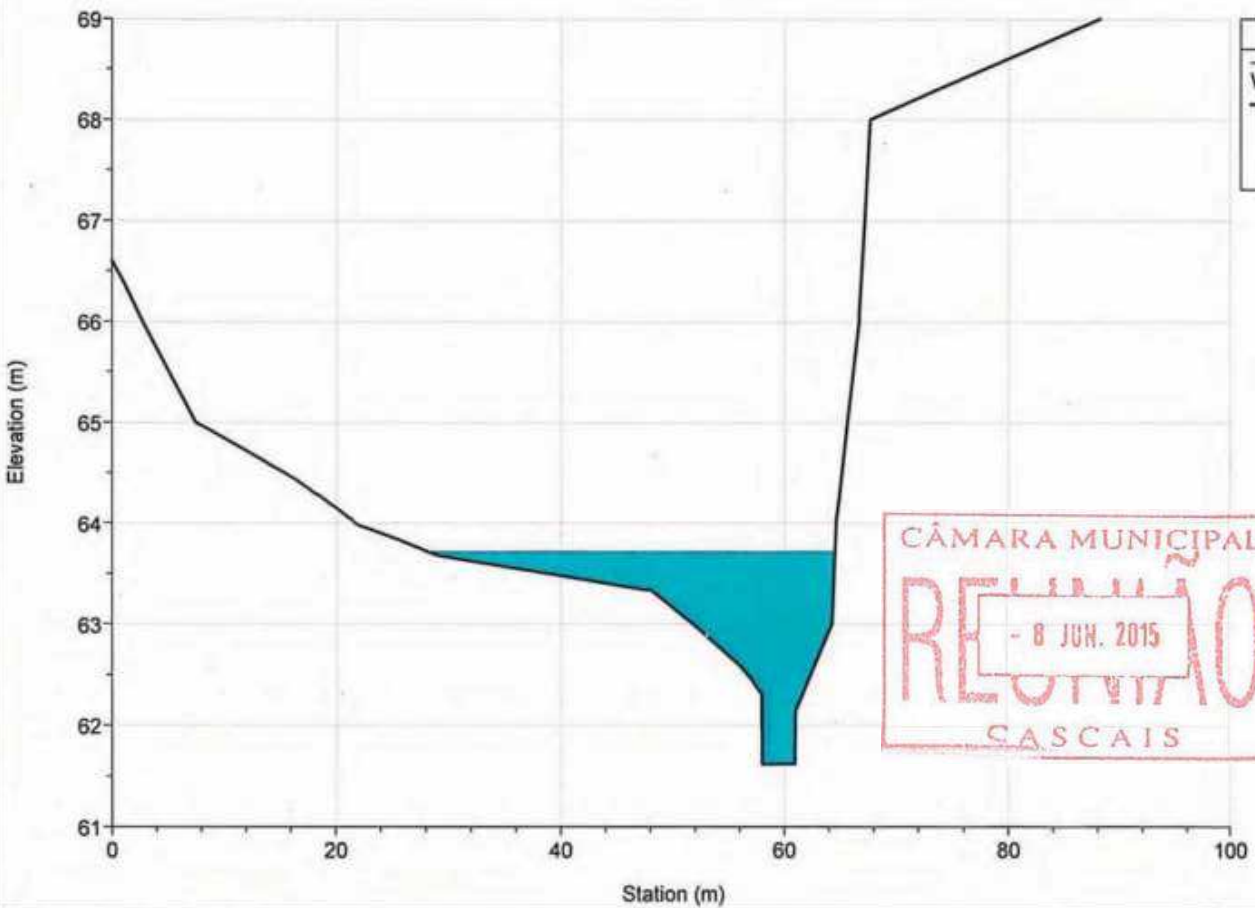
River = MARIANAS Reach = jusante RS = 3343.691



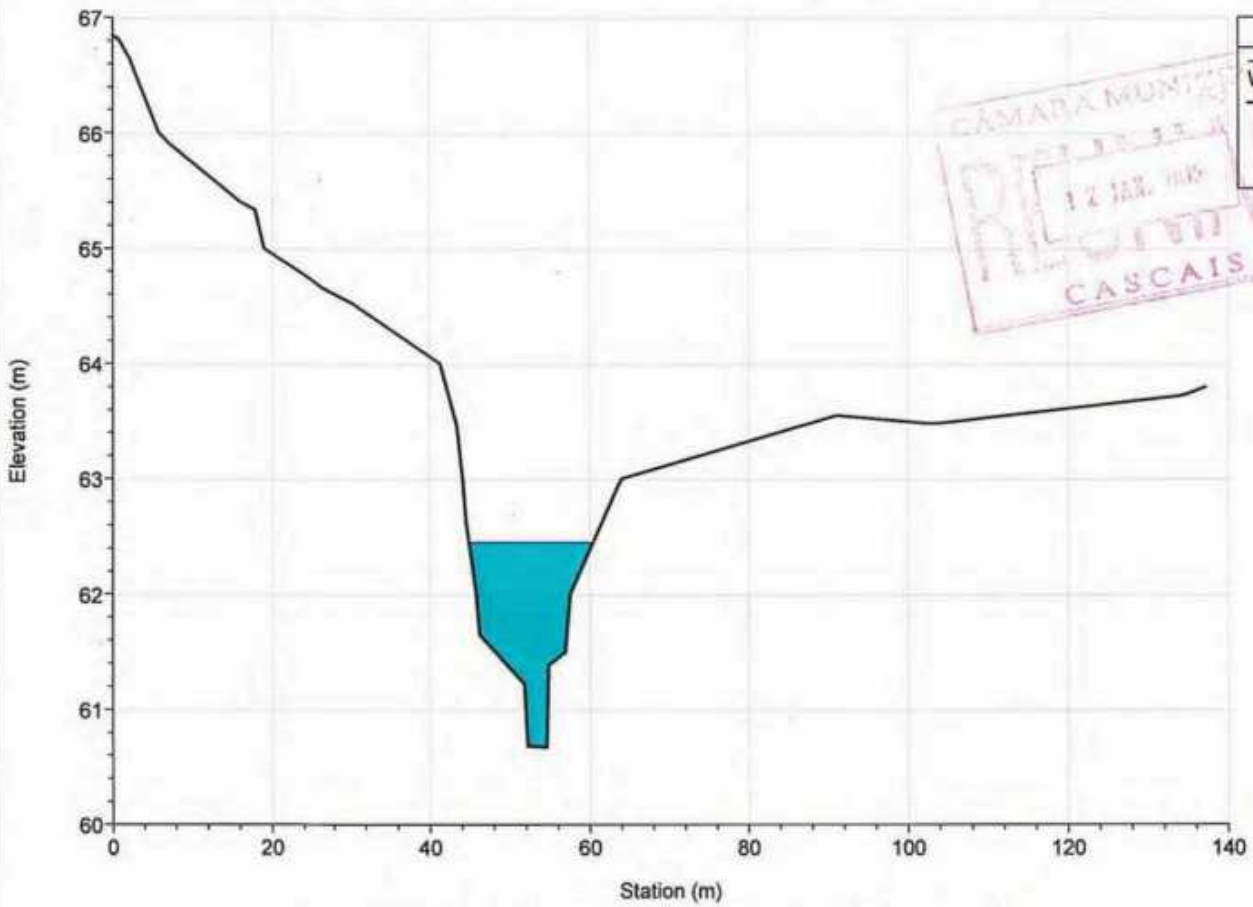
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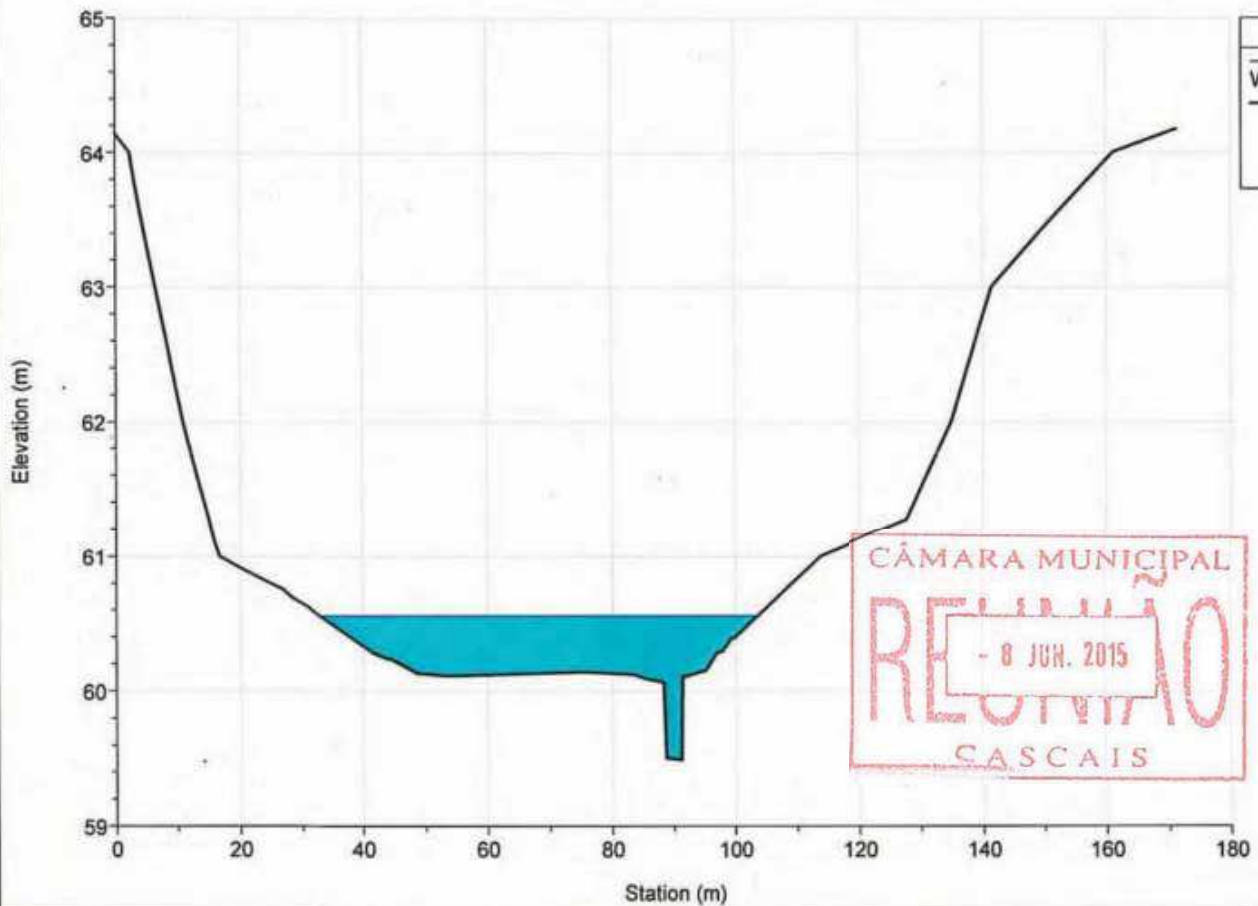
River = MARIANAS Reach = jusante RS = 3118.249



River = MARIANAS Reach = jusante RS = 2994.240

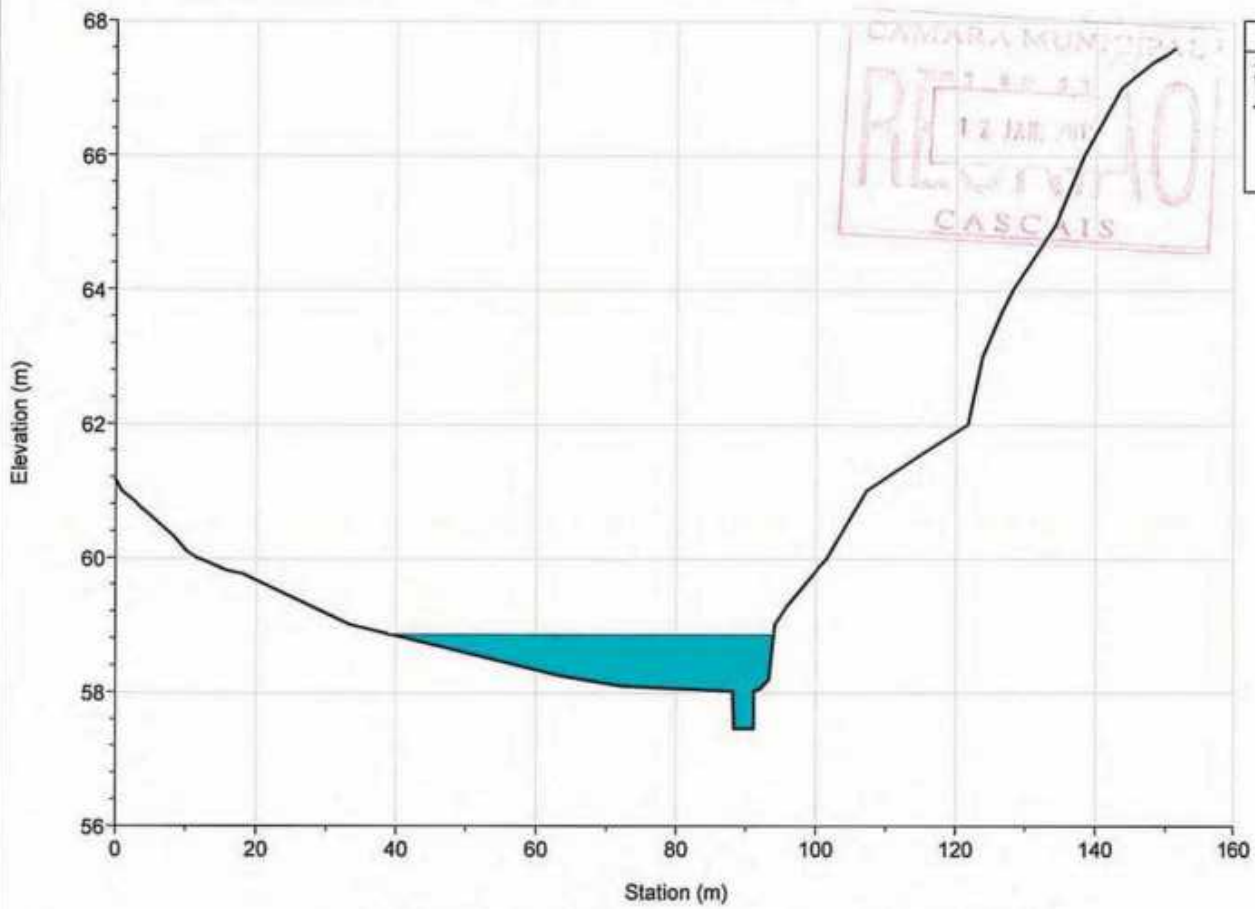


River = MARIANAS Reach = jusante RS = 2929.425

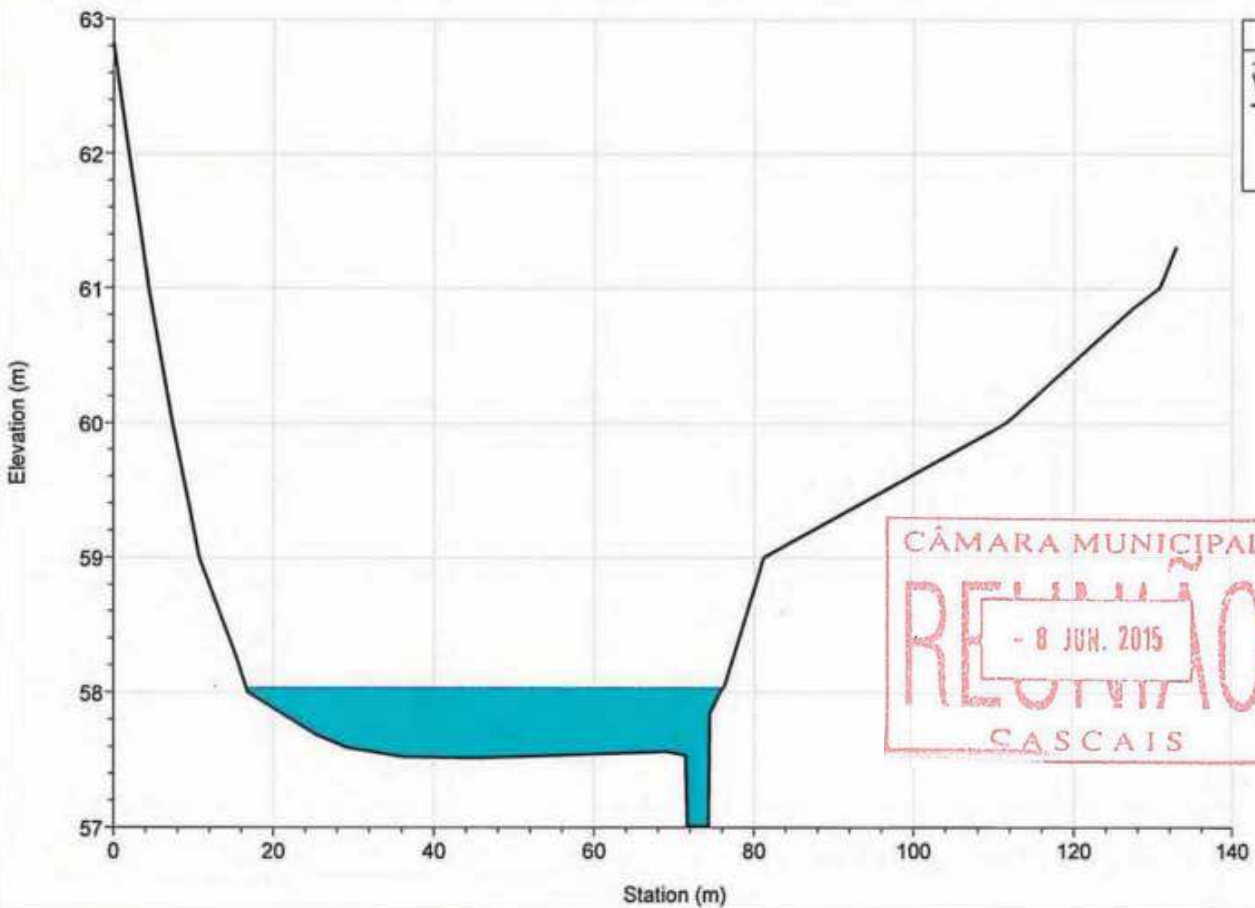




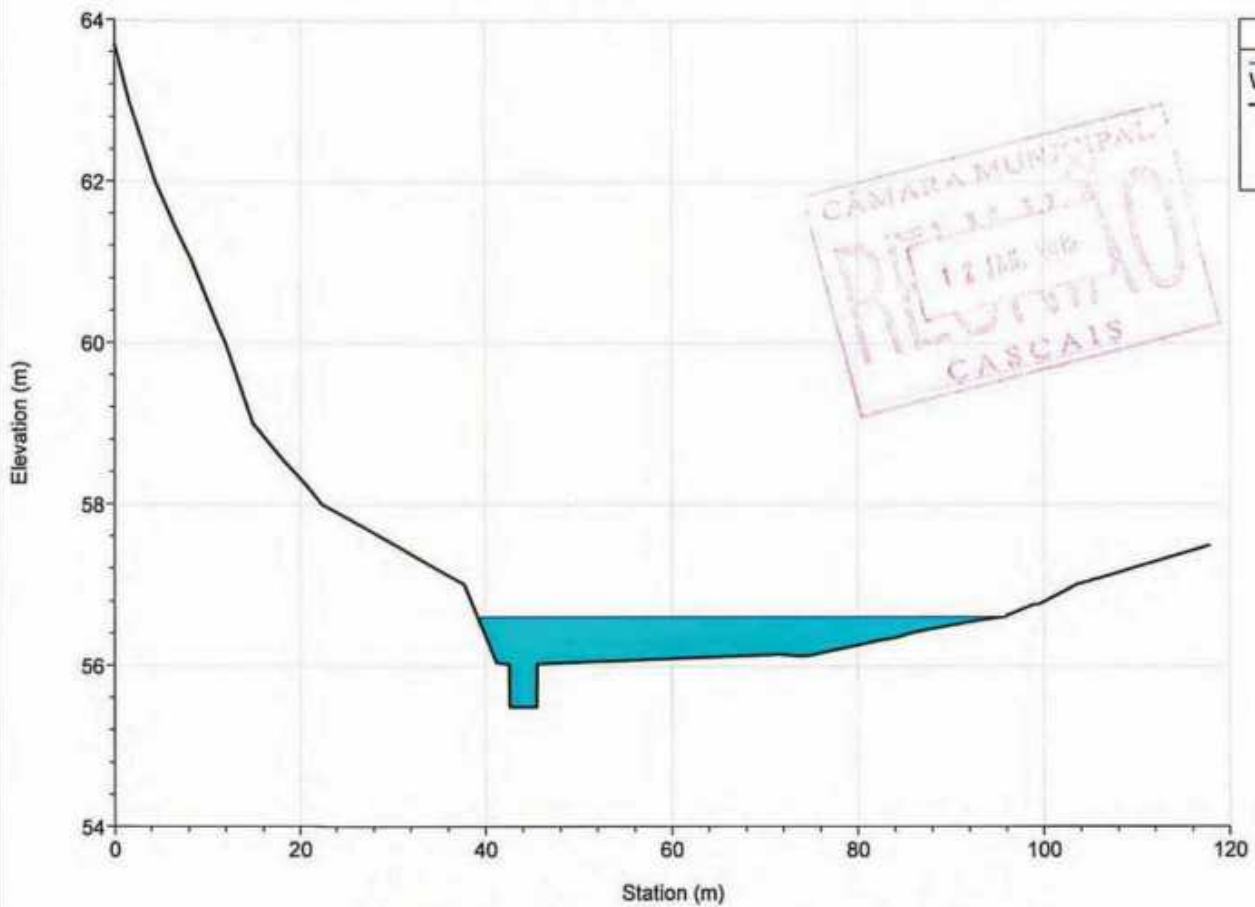
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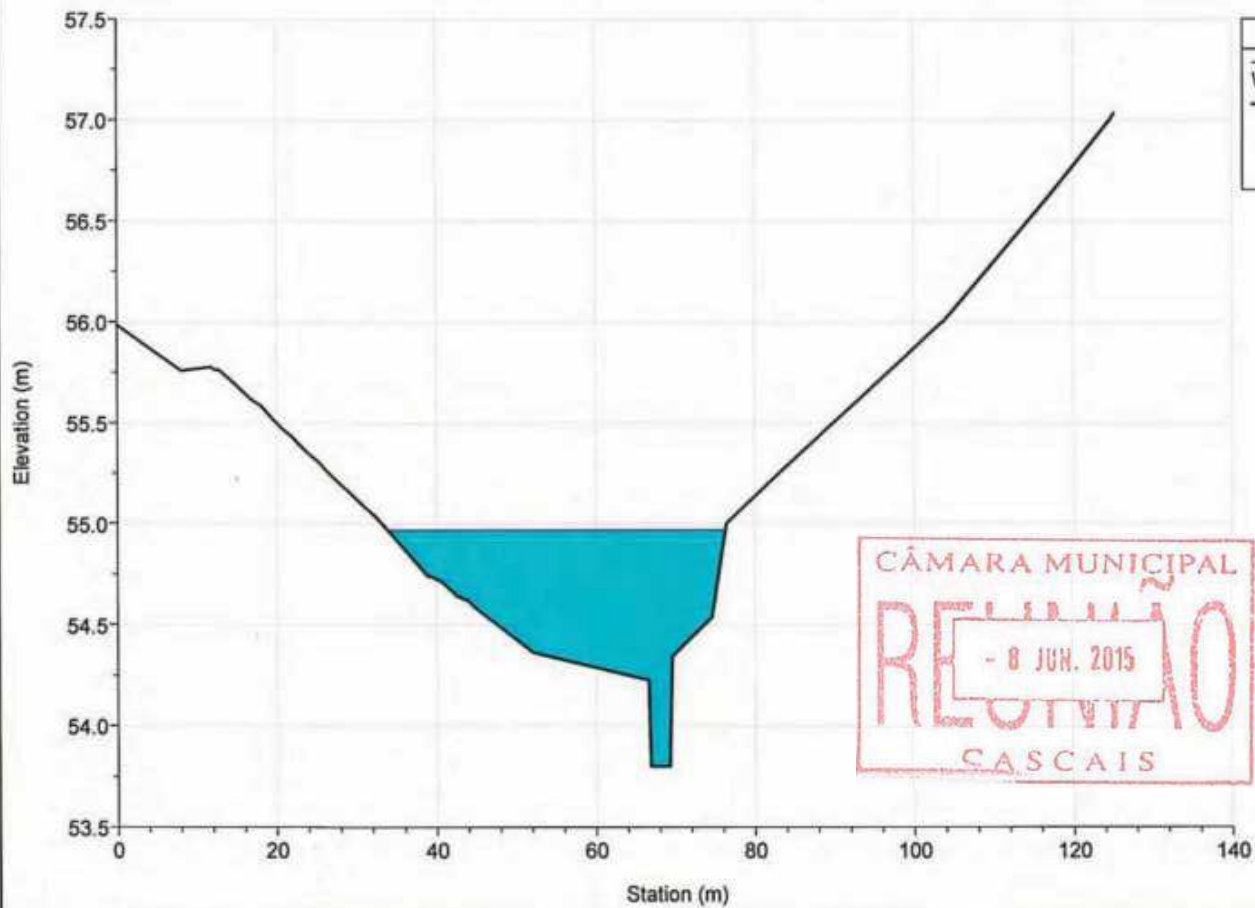
River = MARIANAS Reach = jusante RS = 2717.070



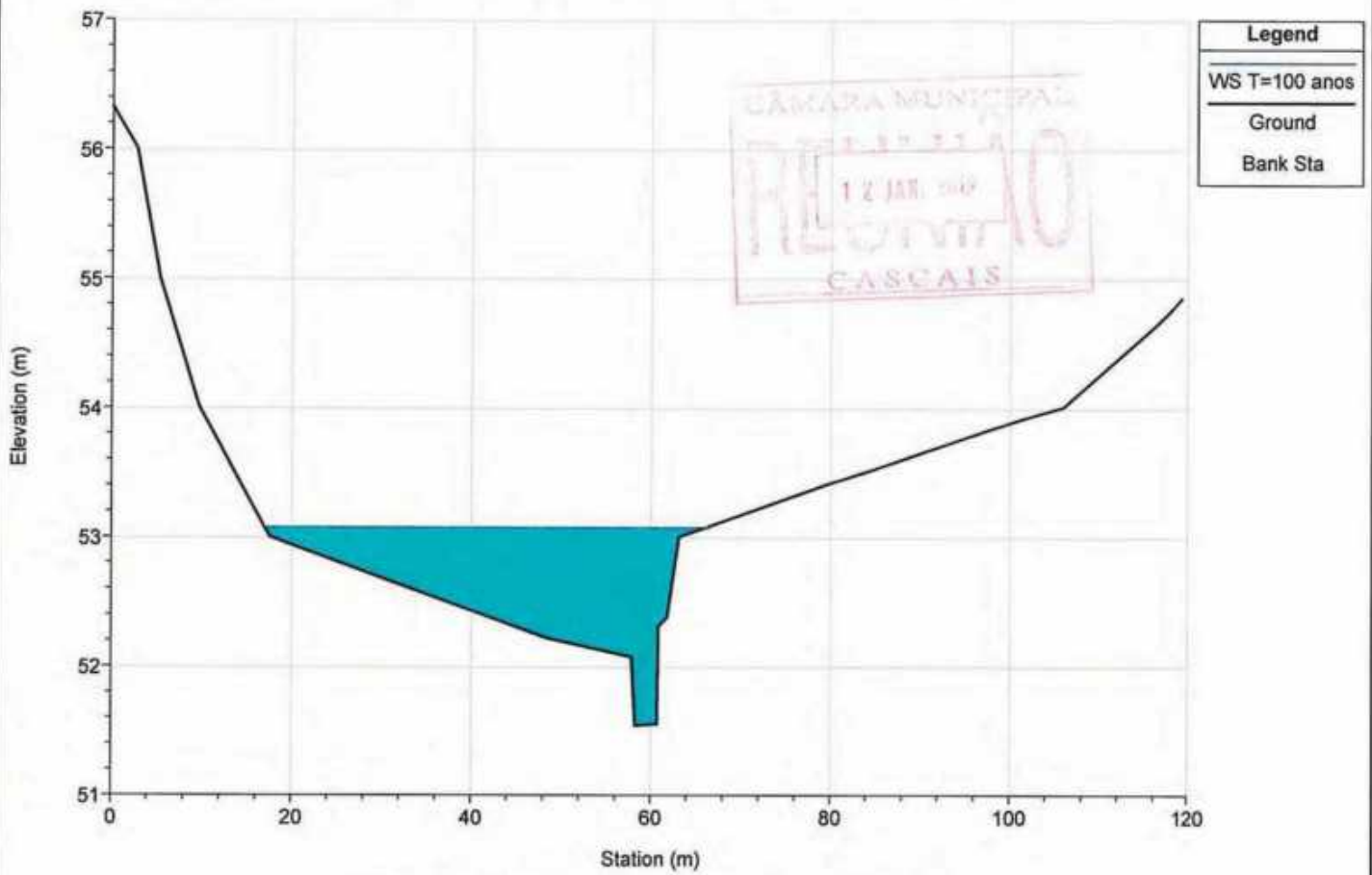
River = MARIANAS Reach = jusante RS = 2613.332



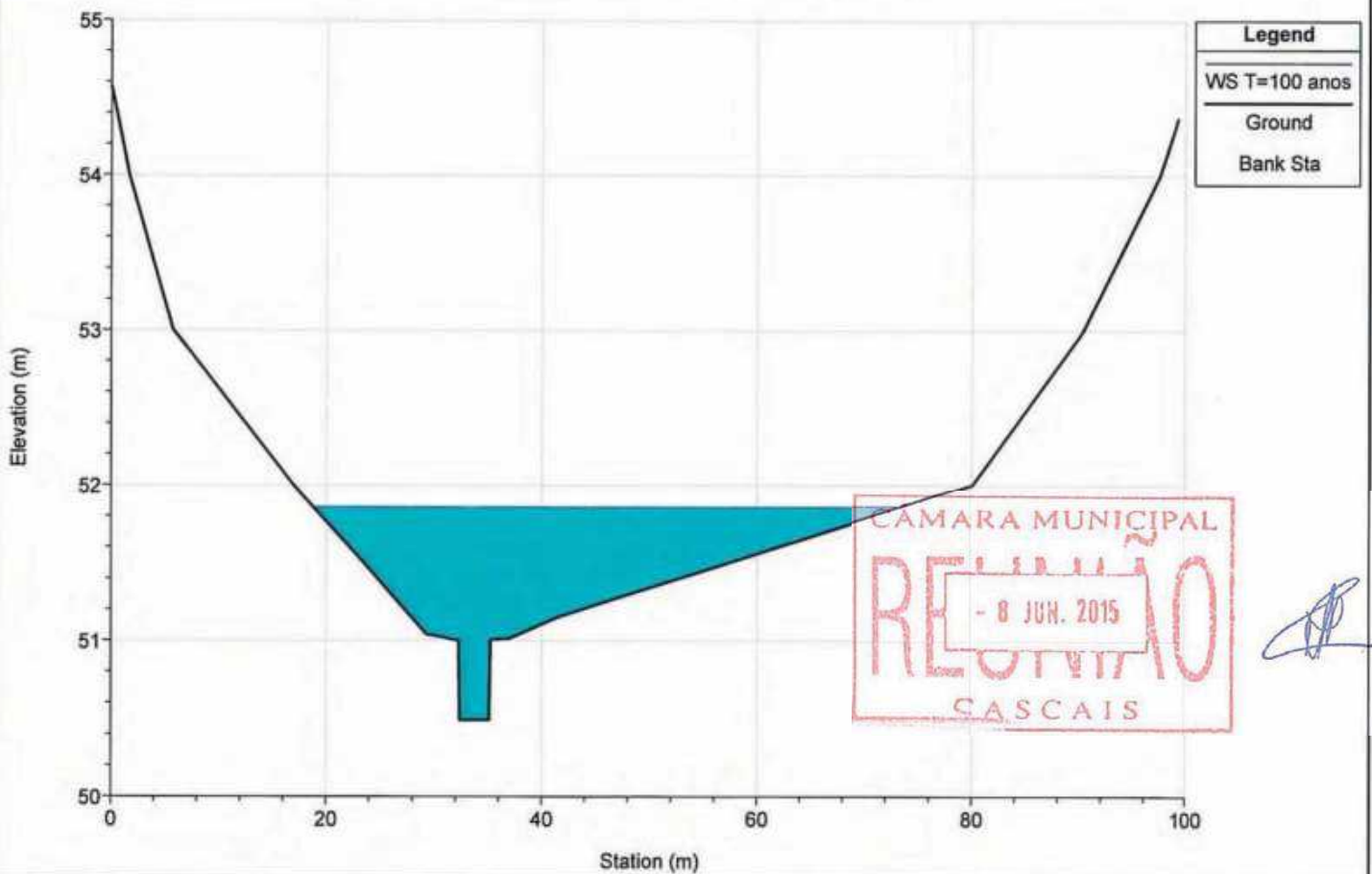
River = MARIANAS Reach = jusante RS = 2508.552



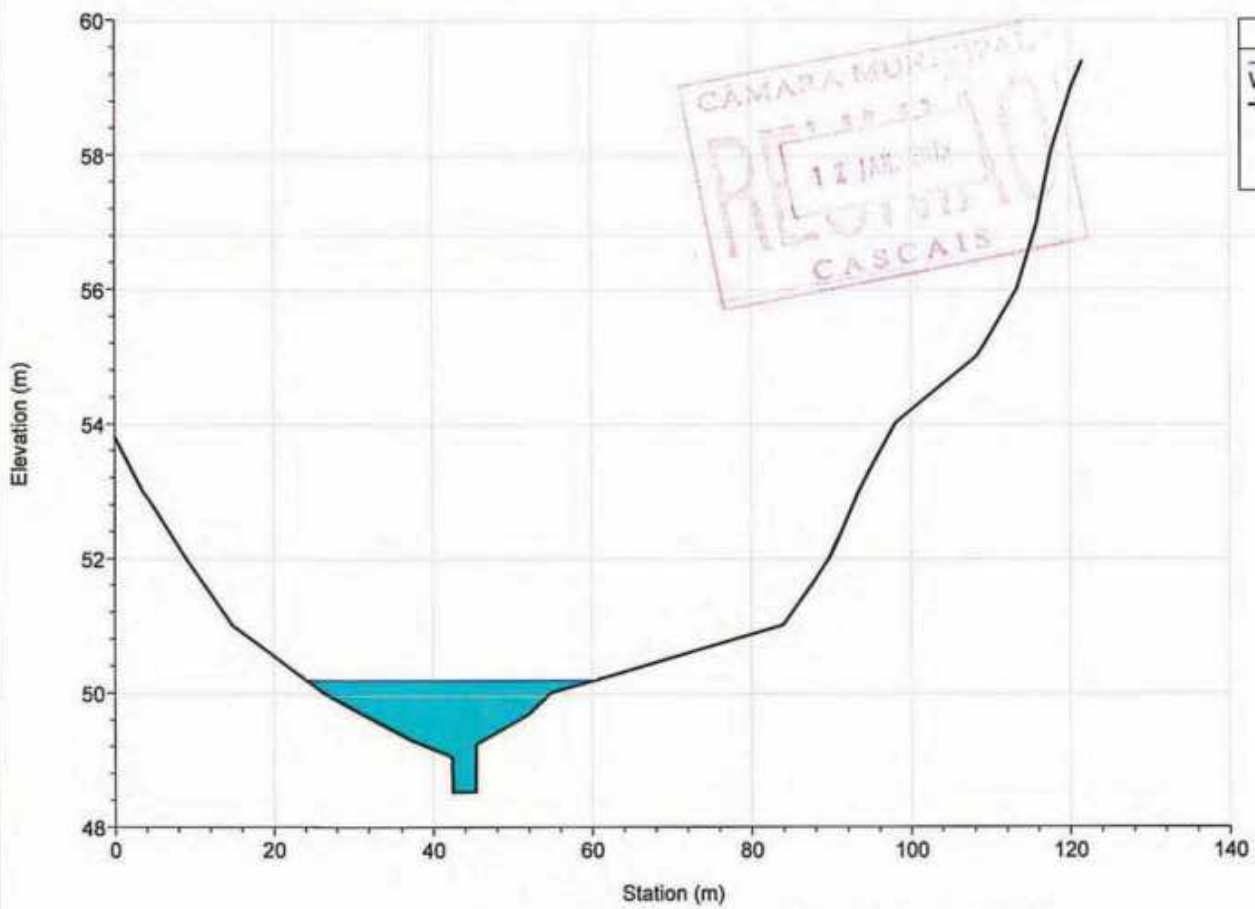
River = MARIANAS Reach = jusante RS = 2405.897



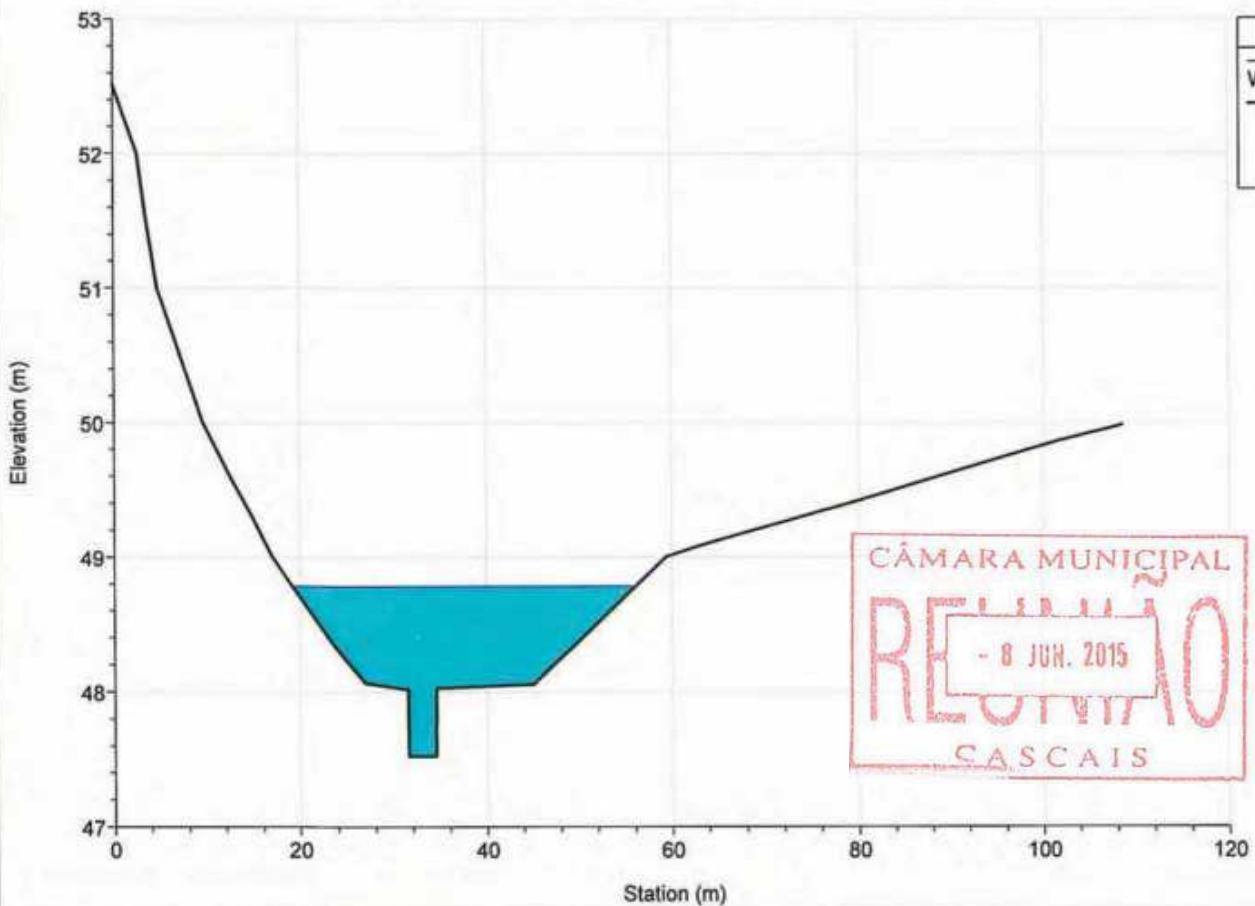
River = MARIANAS Reach = jusante RS = 2286.912



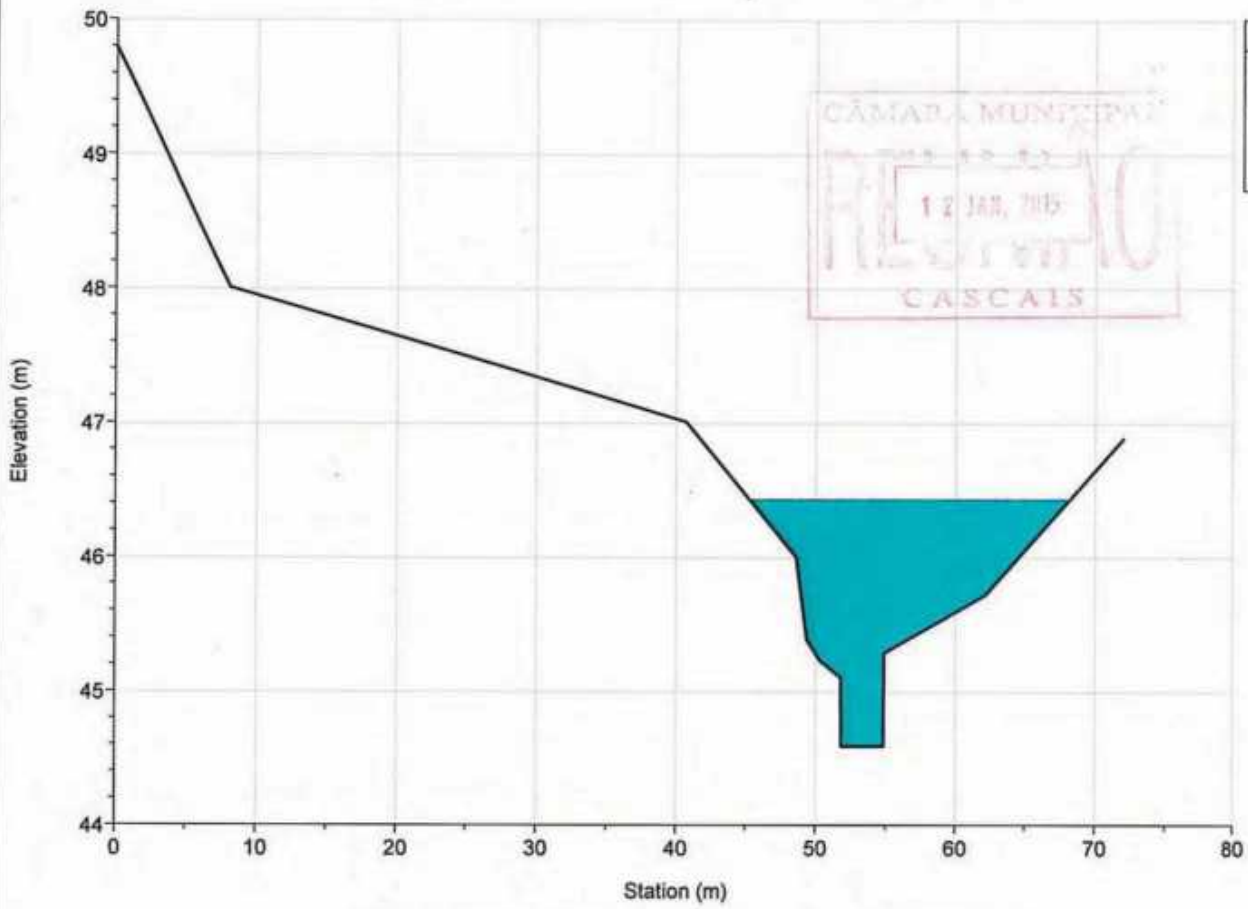
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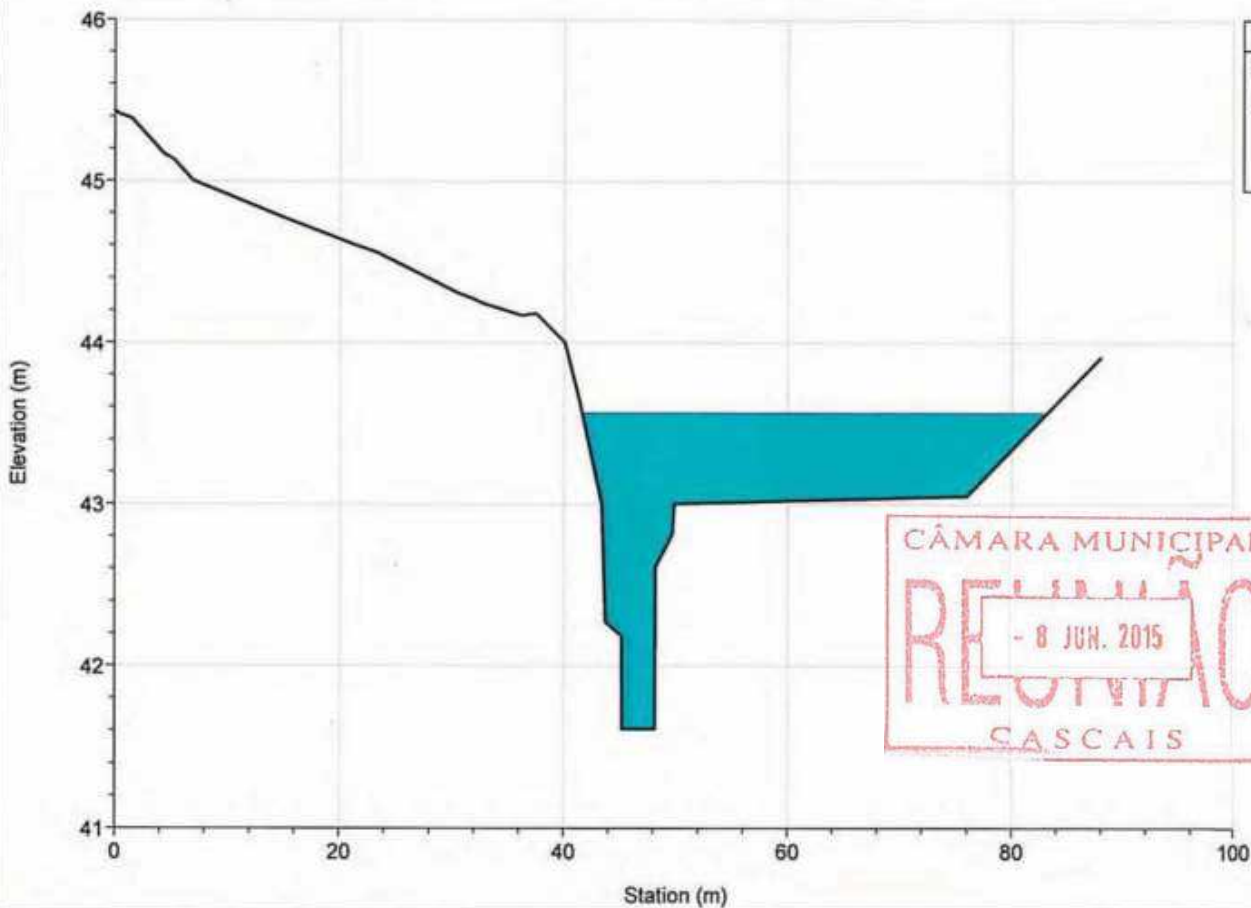
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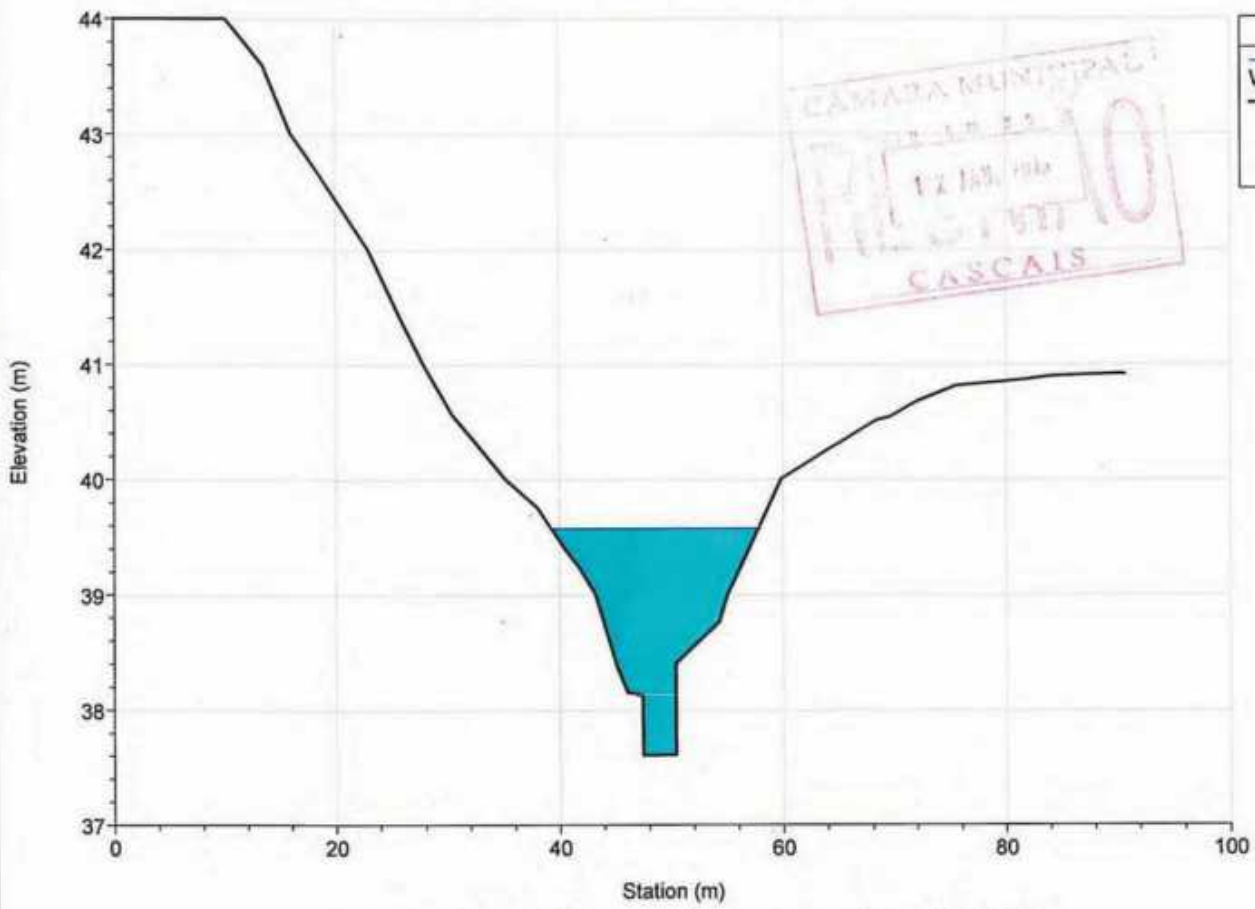
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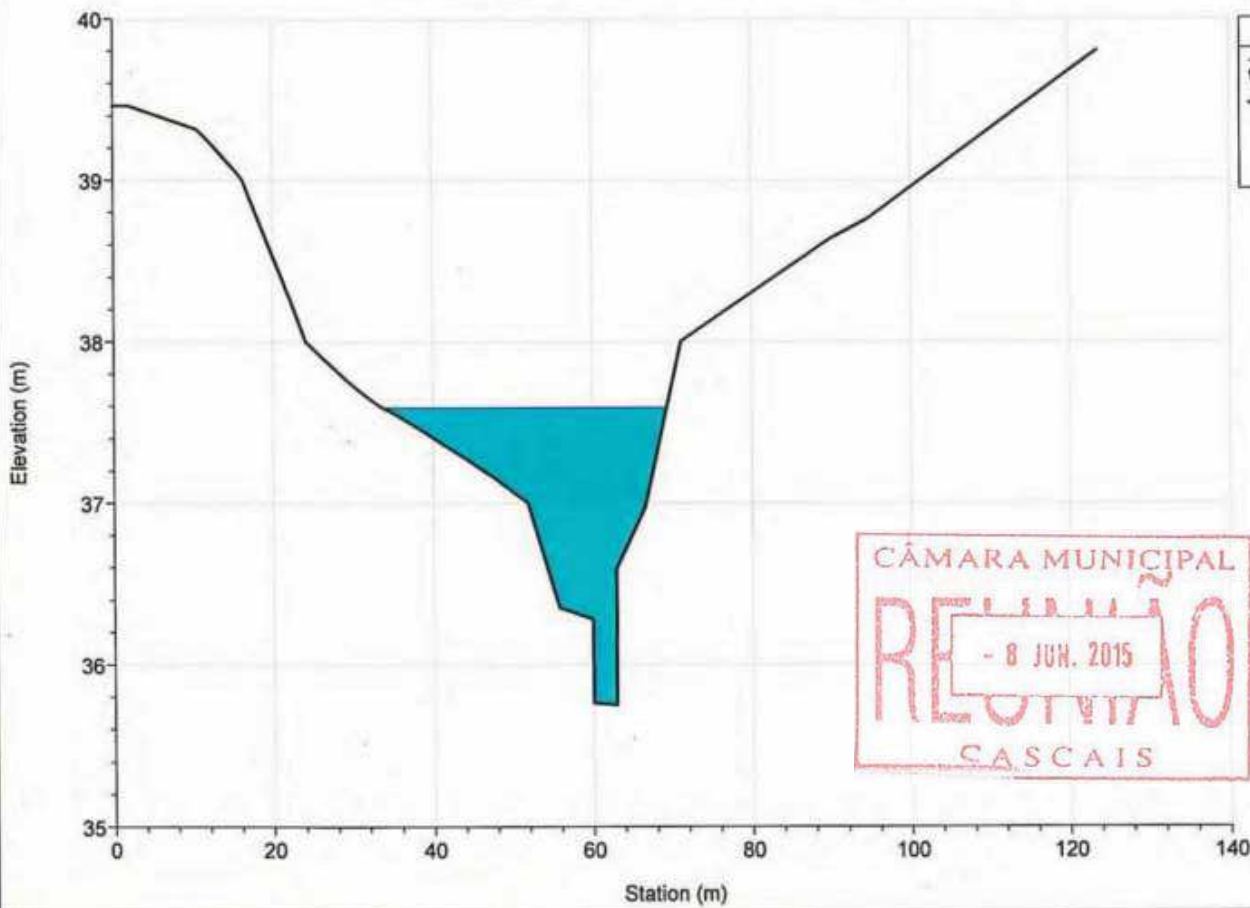
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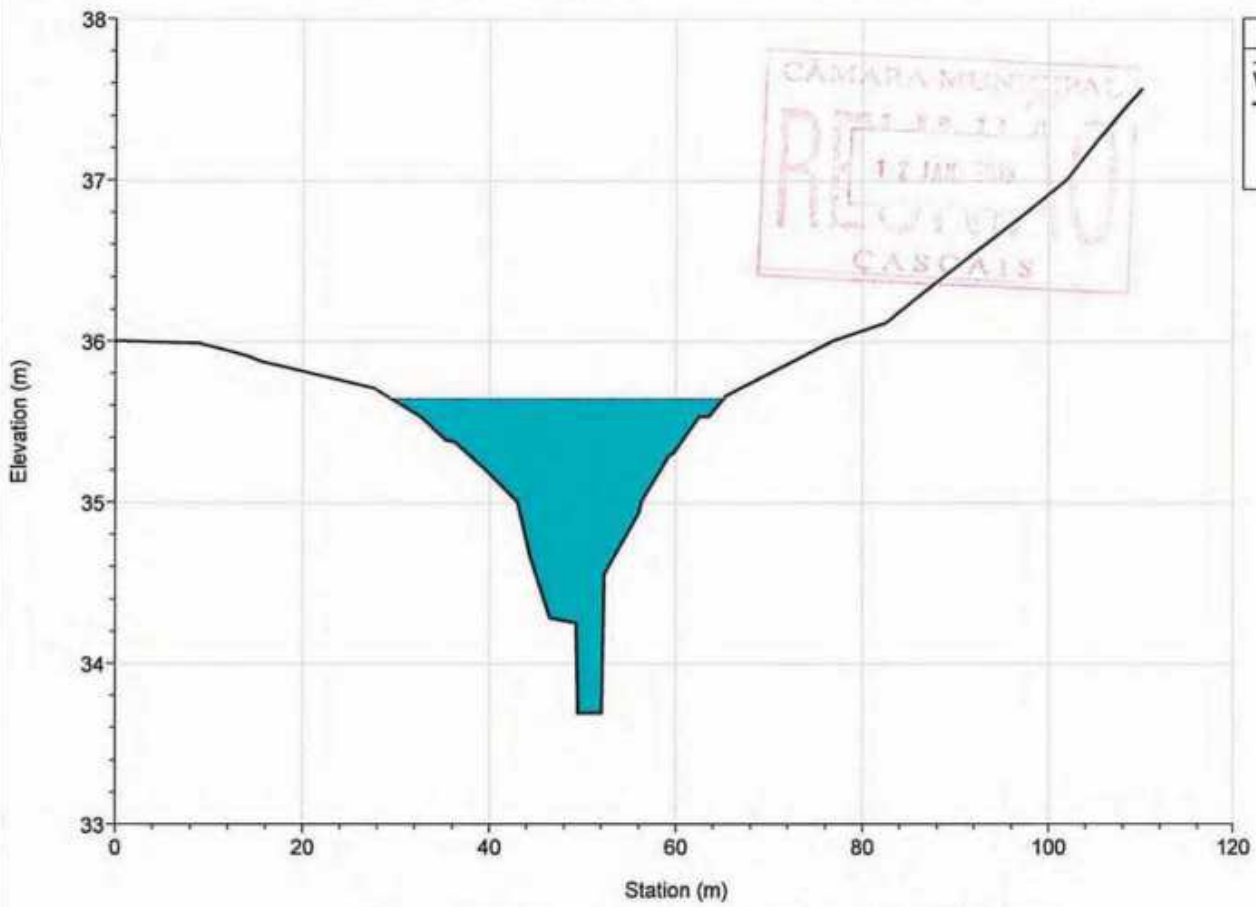
River = MARIANAS Reach = jusante RS = 1700.898



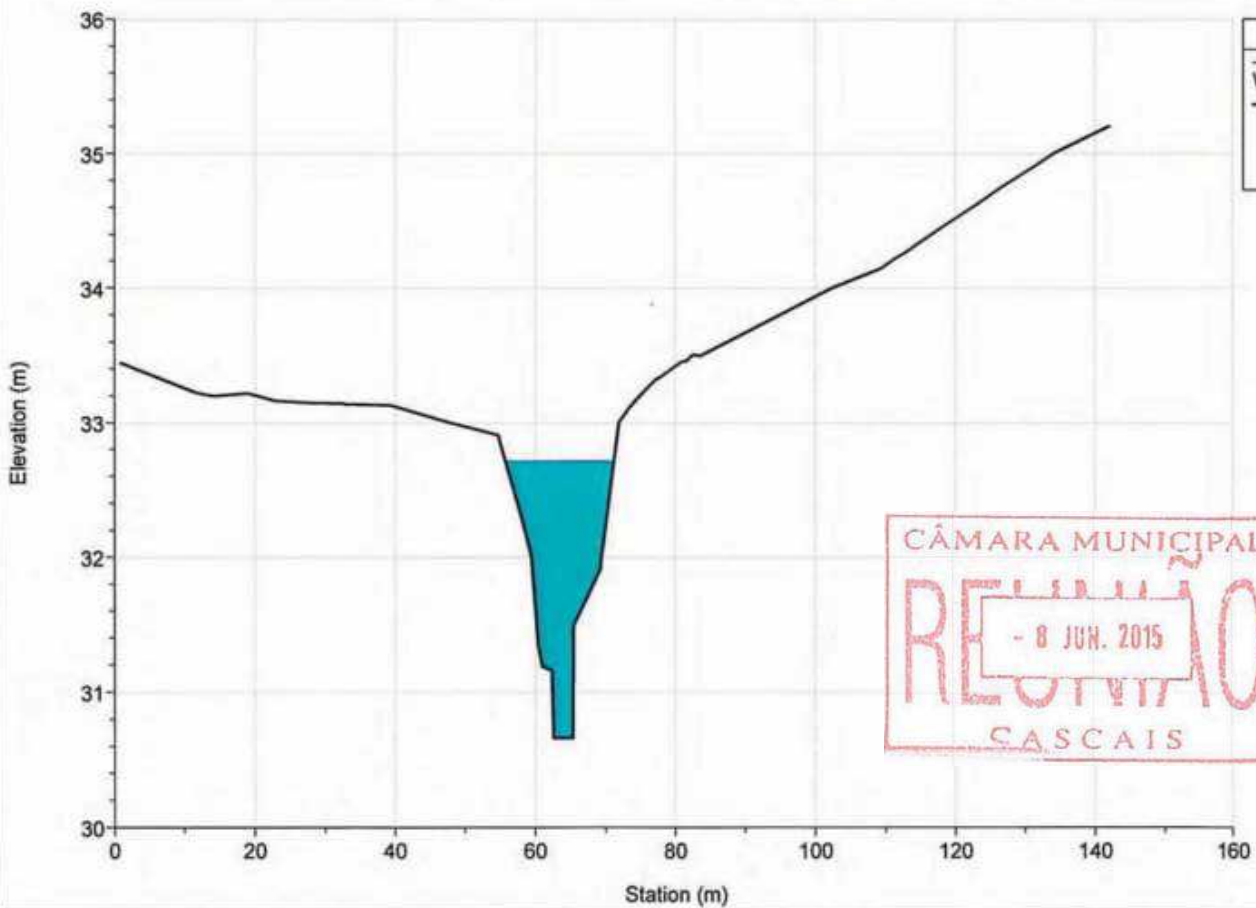
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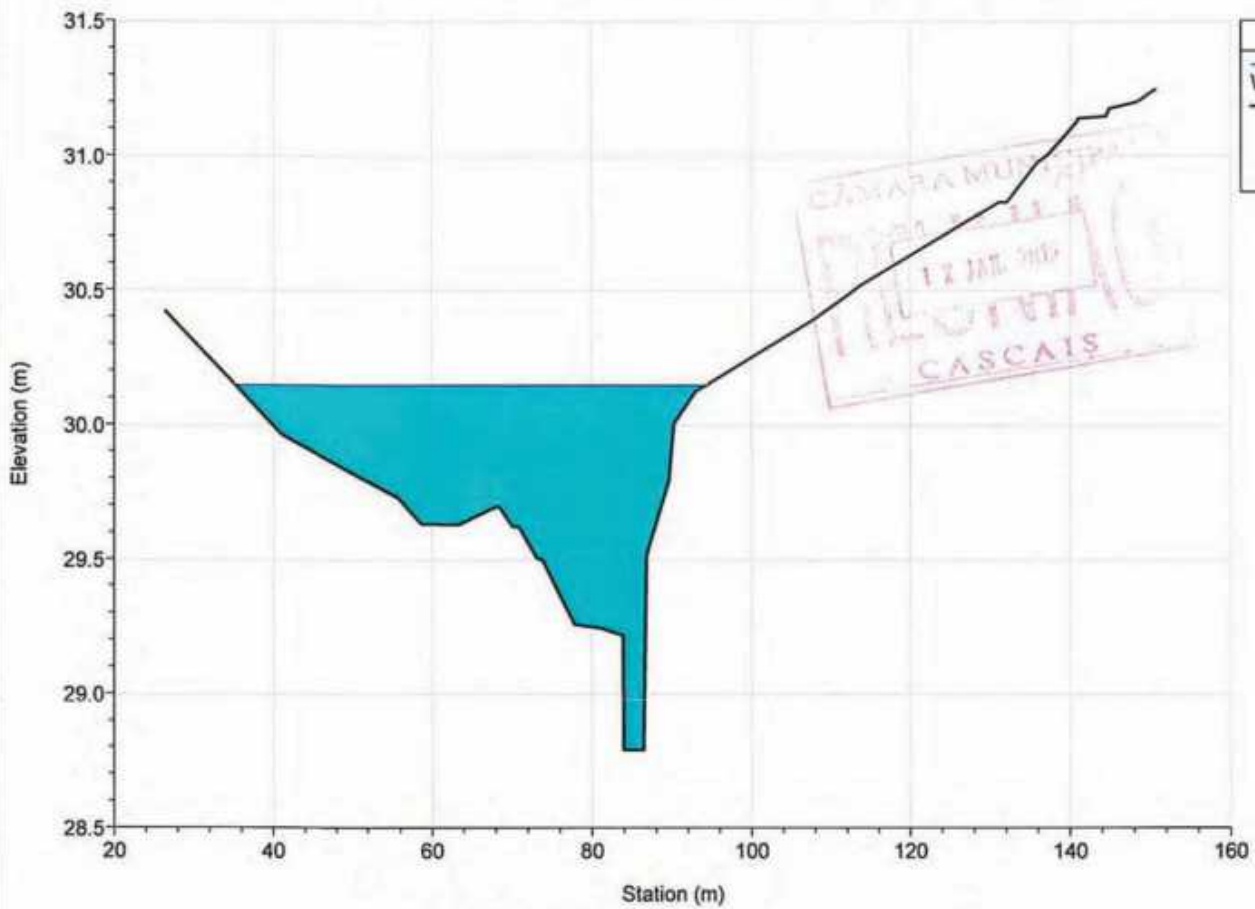
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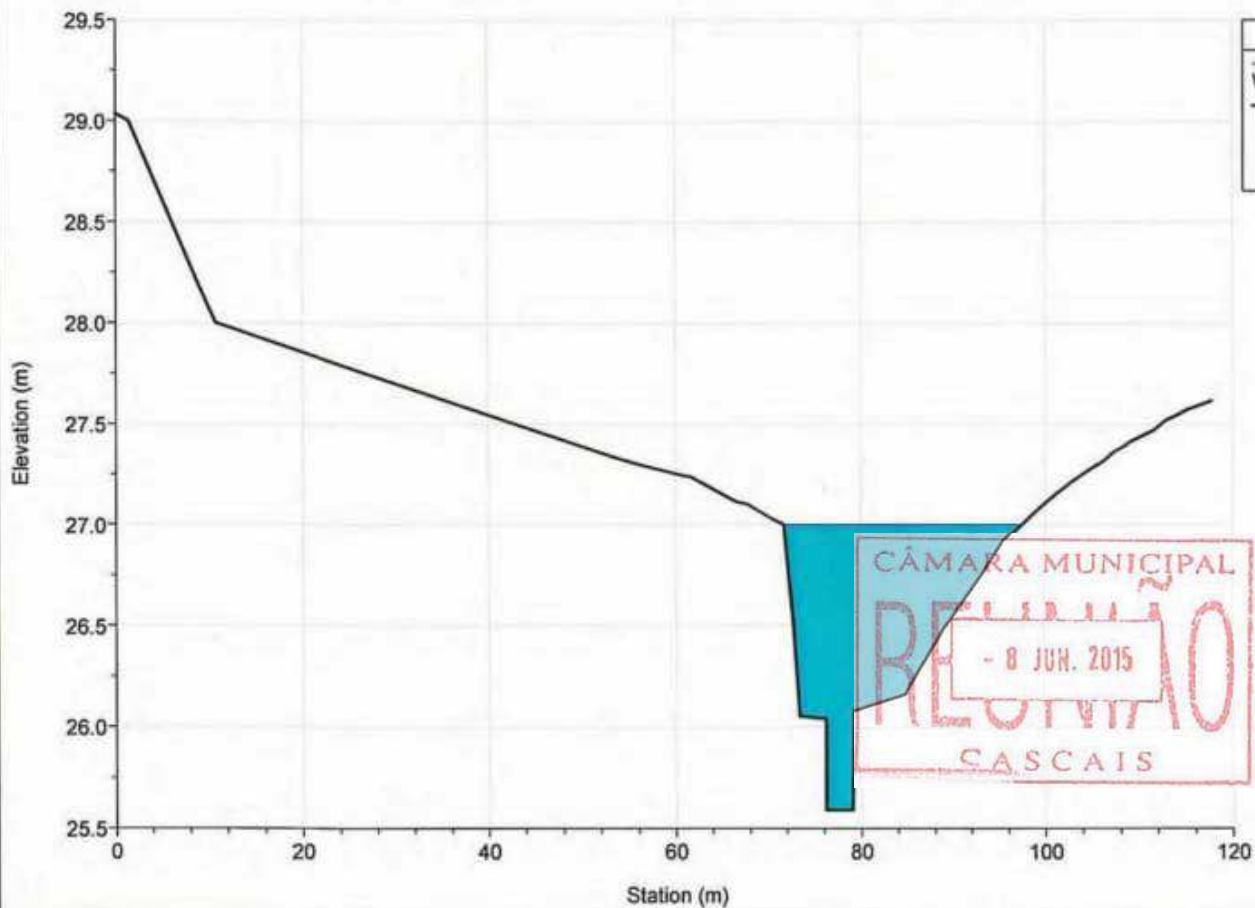
River = MARIANAS Reach = jusante RS = 1373.354



River = MARIANAS Reach = jusante RS = 1219.866

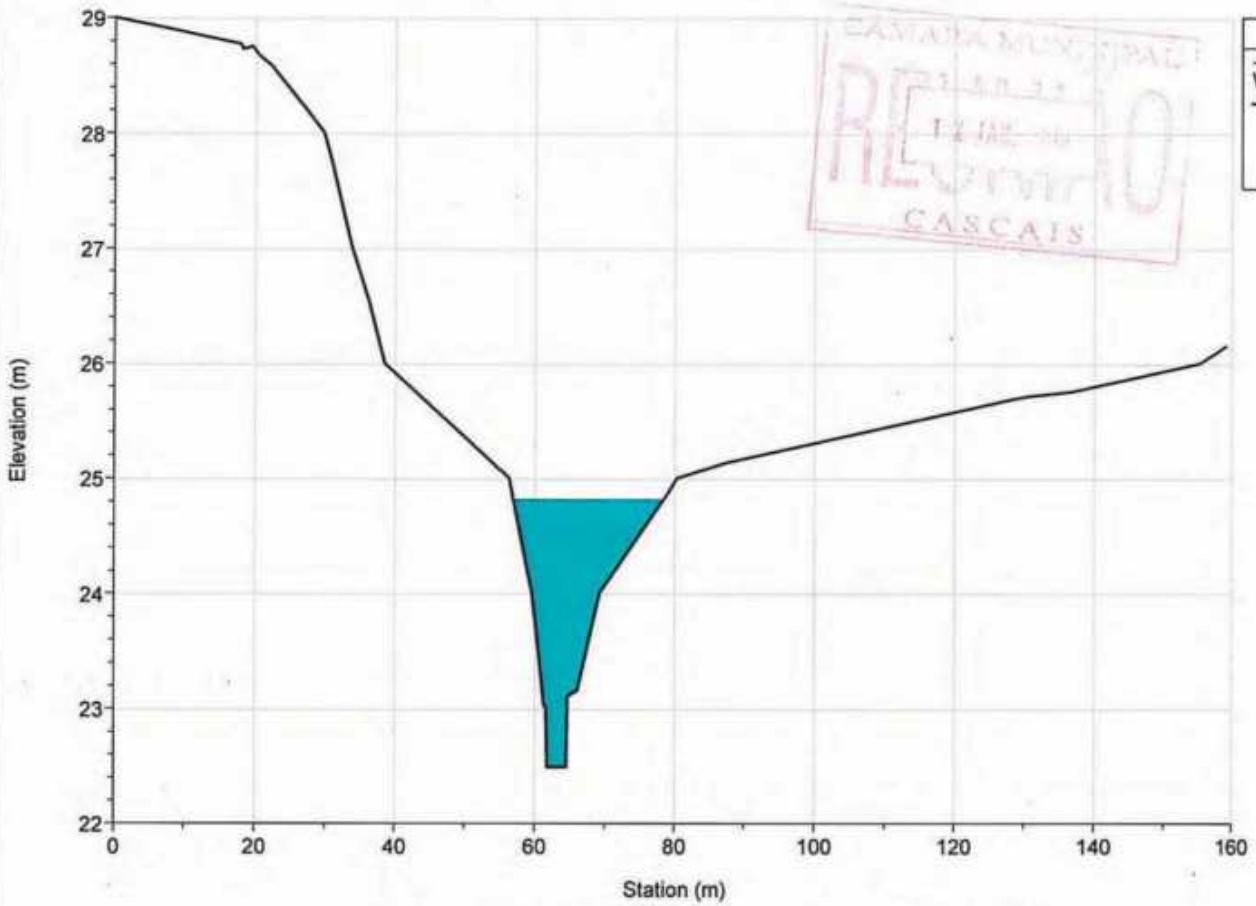


River = MARIANAS Reach = jusante RS = 1066.811

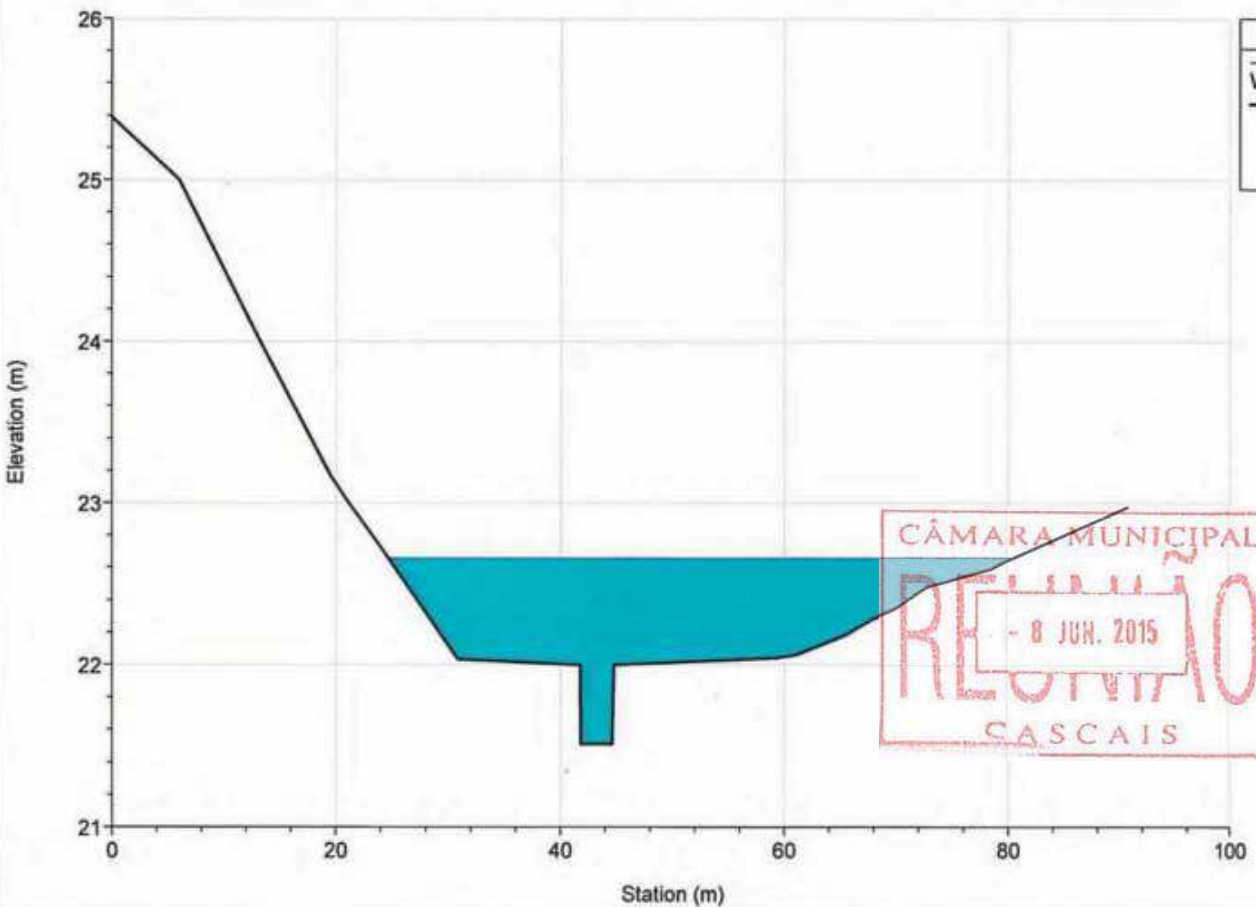




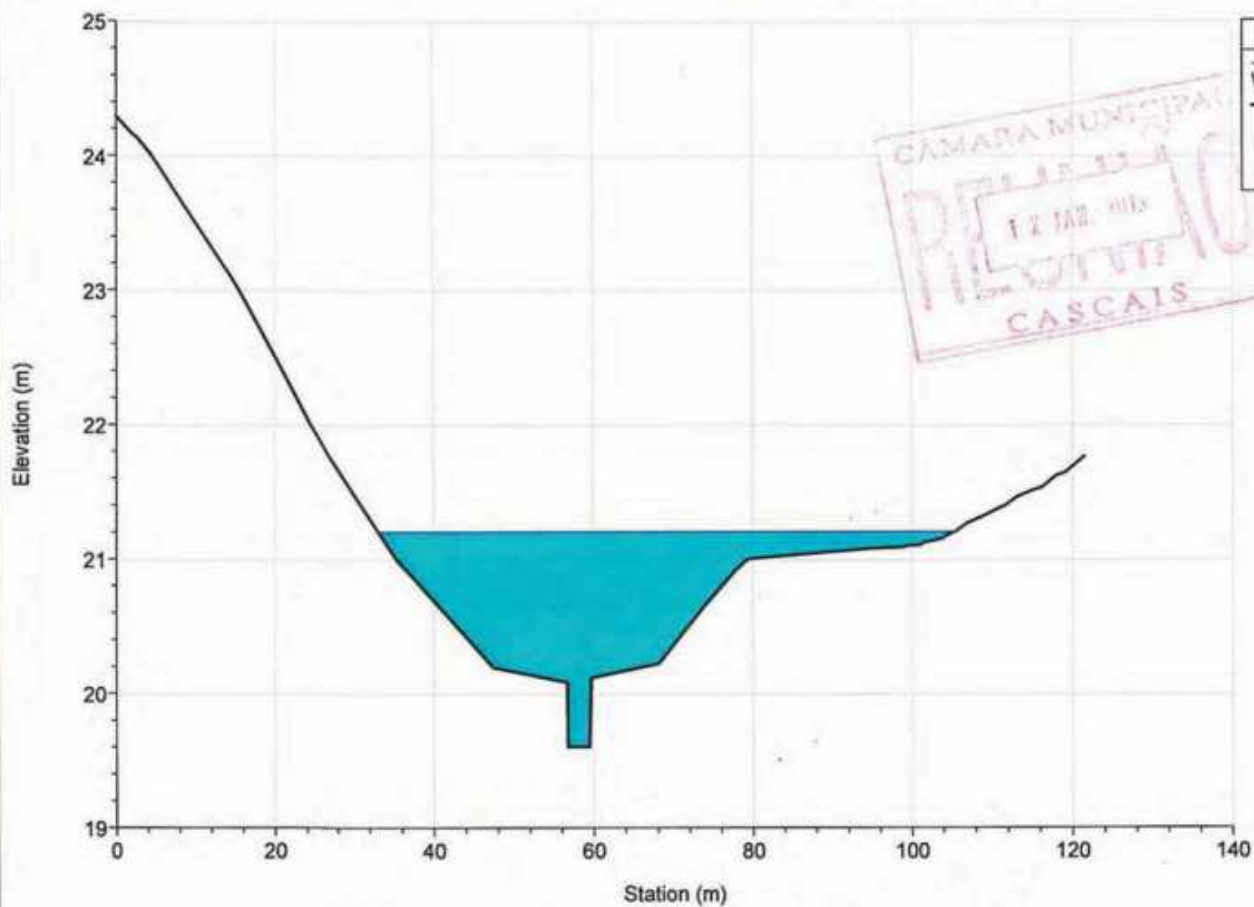
River = MARIANAS Reach = jusante RS = 953.332



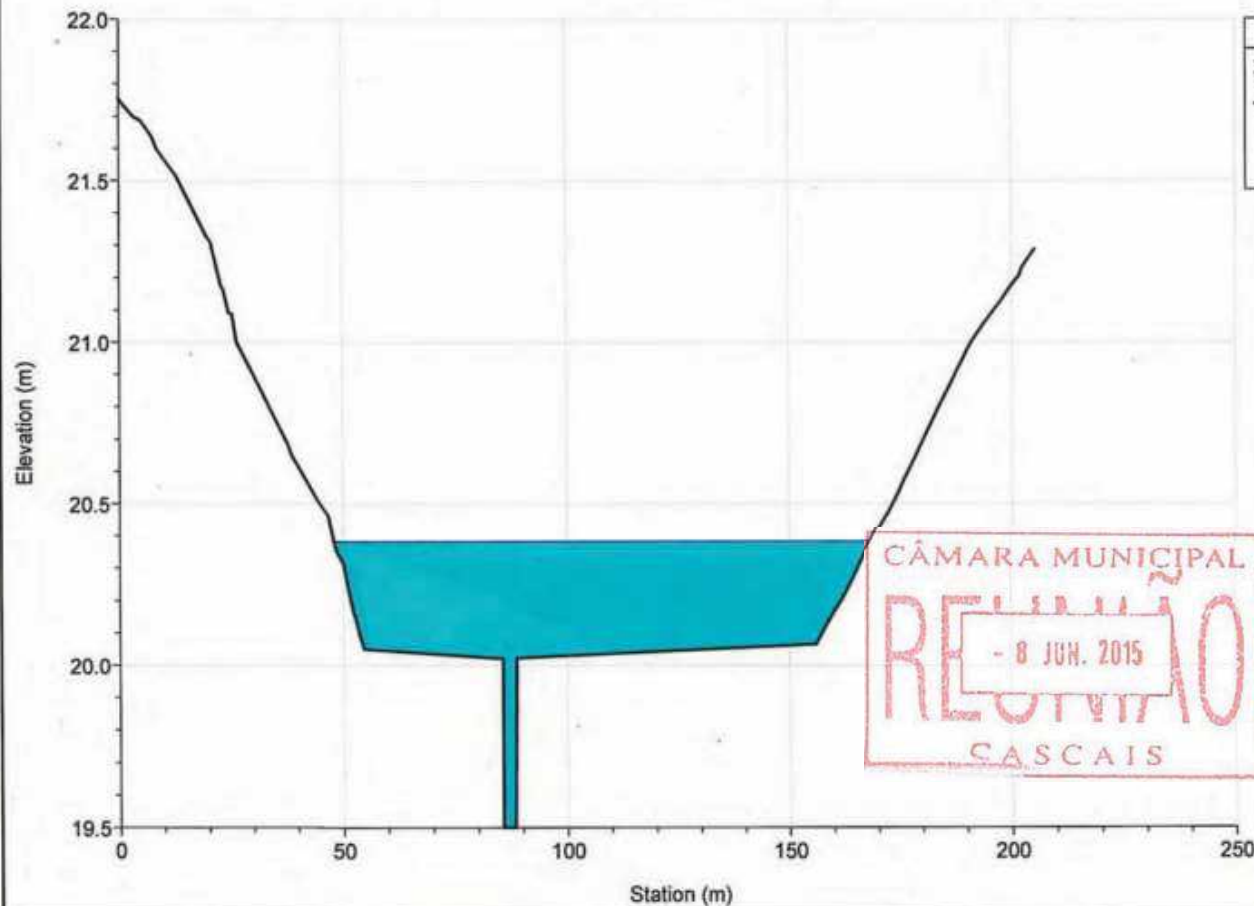
River = MARIANAS Reach = jusante RS = 856.889



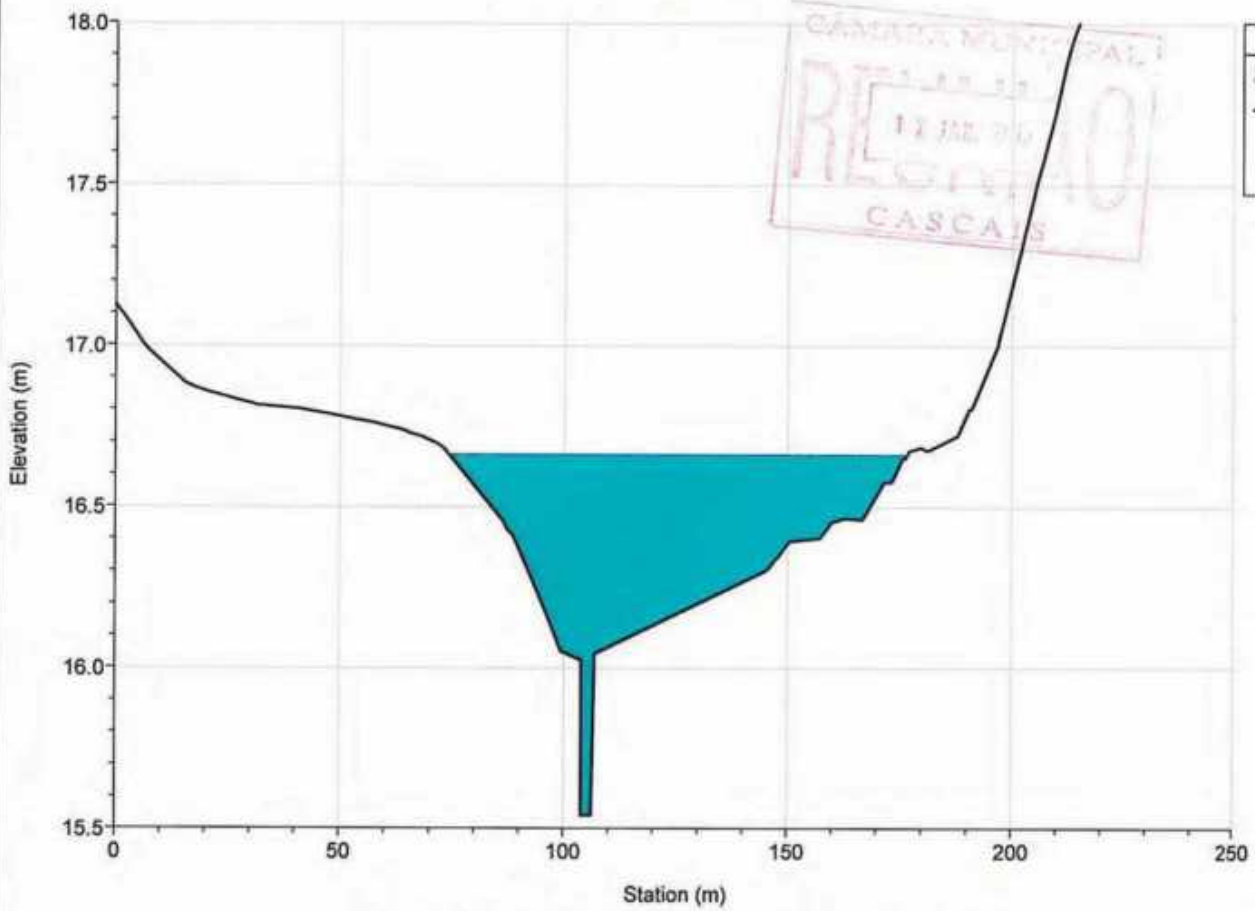
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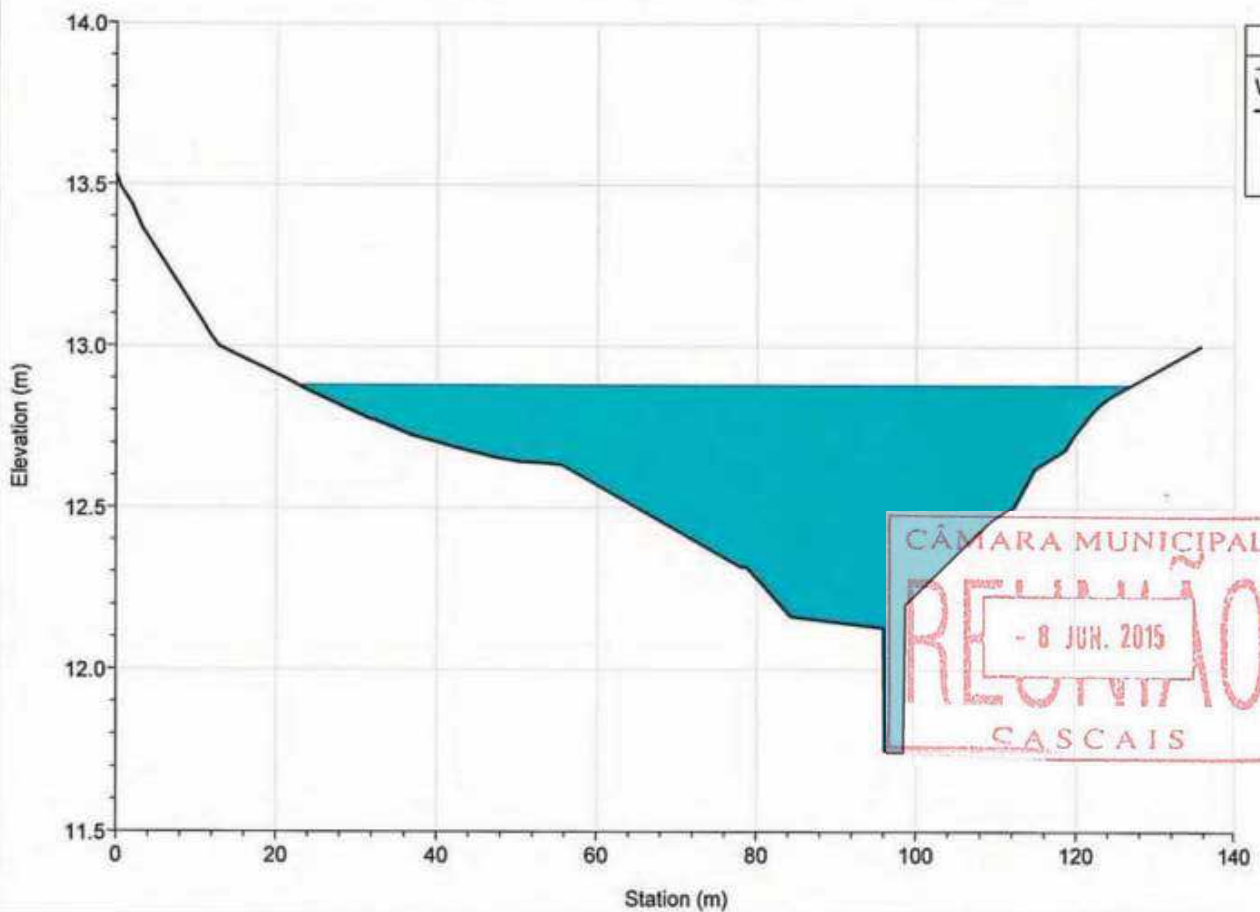
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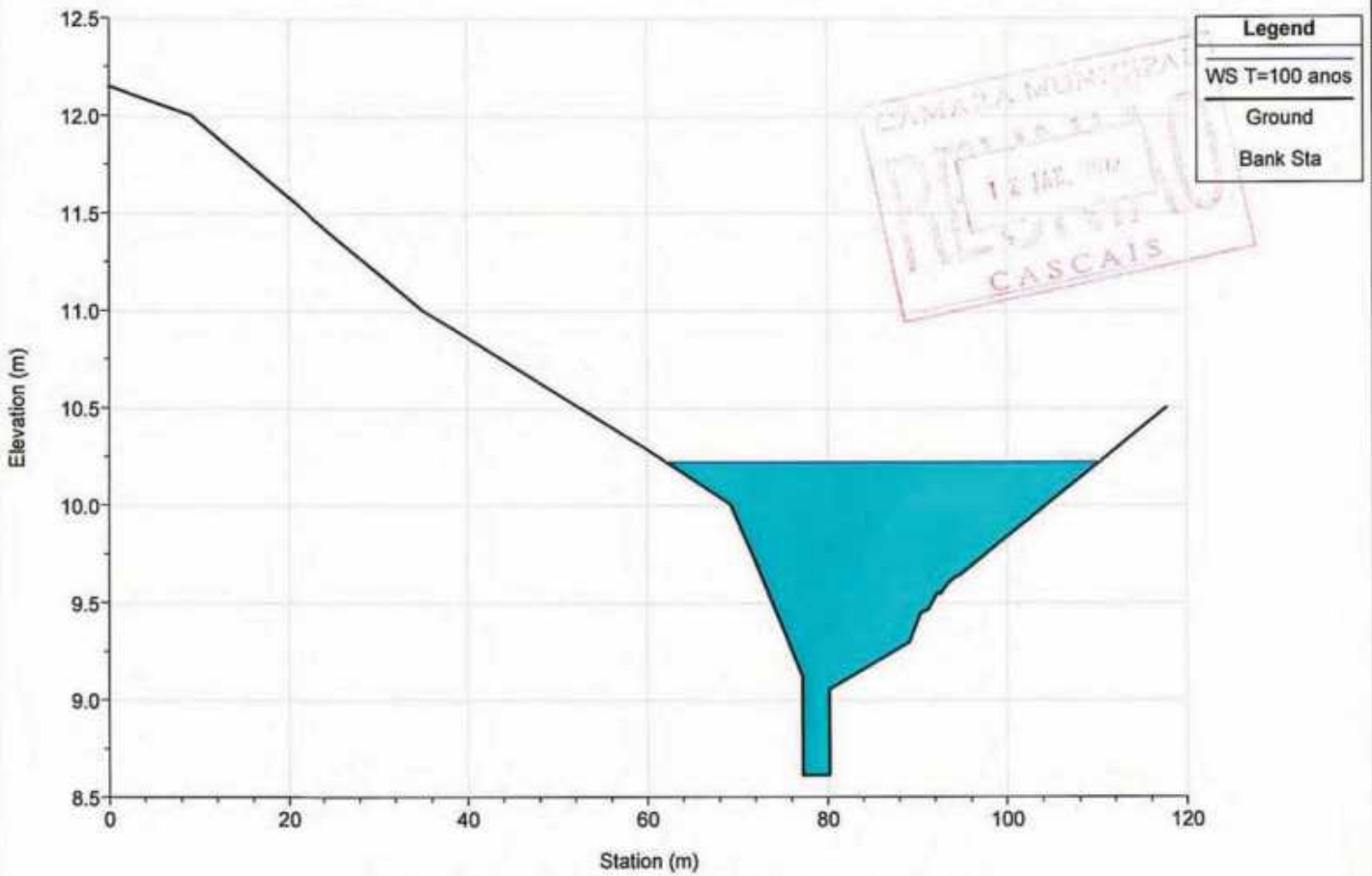
River = MARIANAS Reach = jusante RS = 511.630



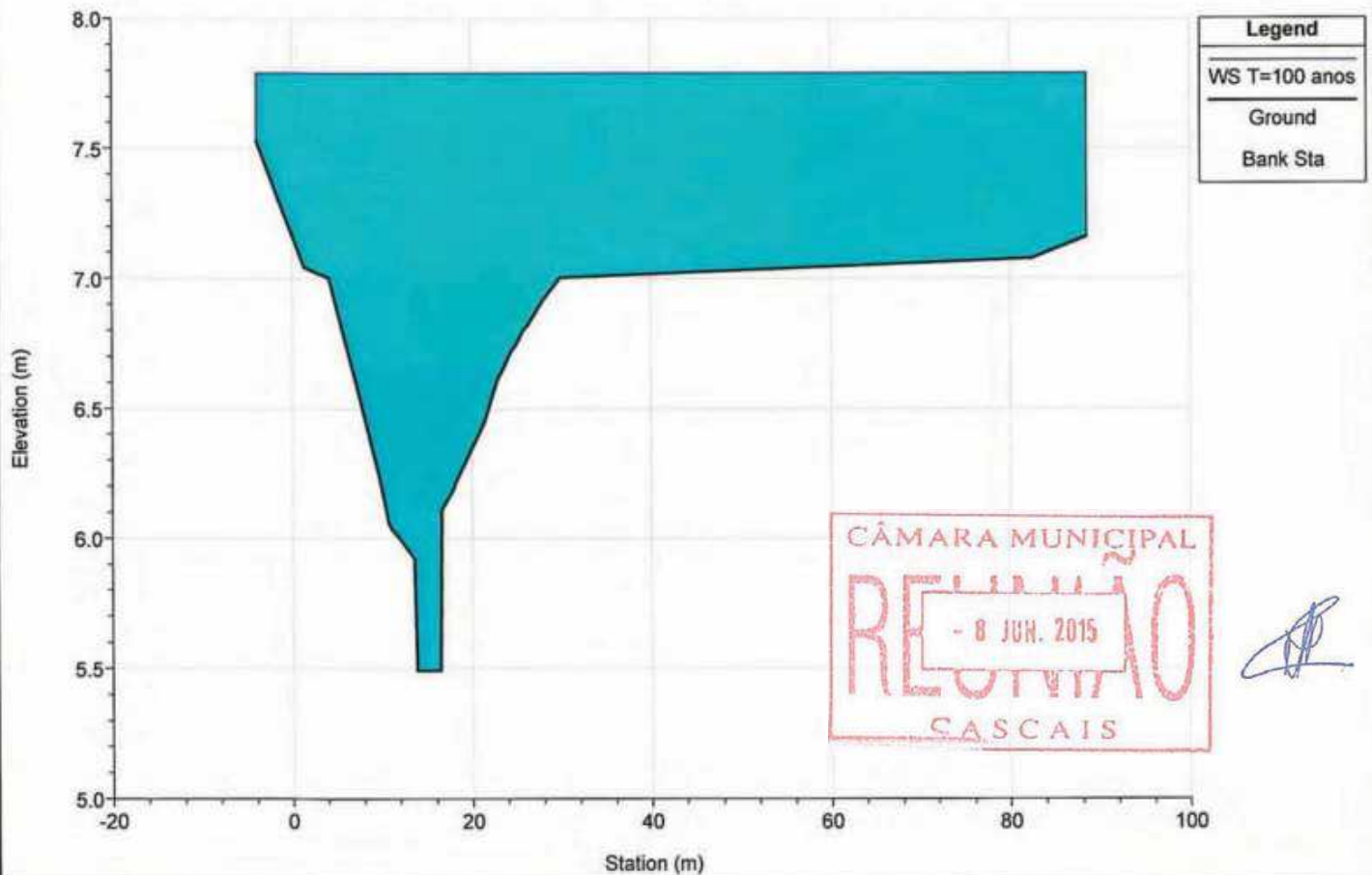
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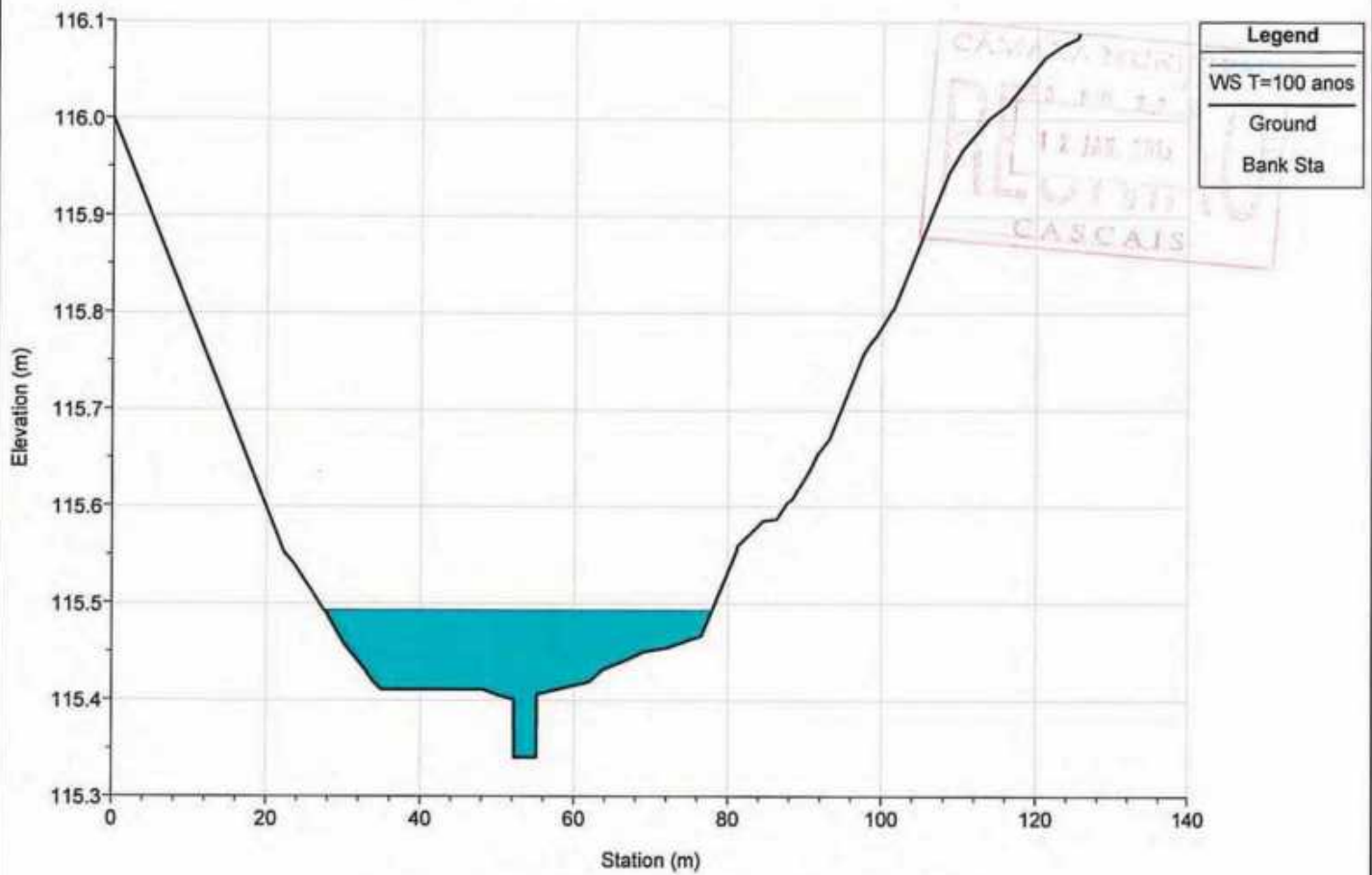
River = MARIANAS Reach = jusante RS = 195.807



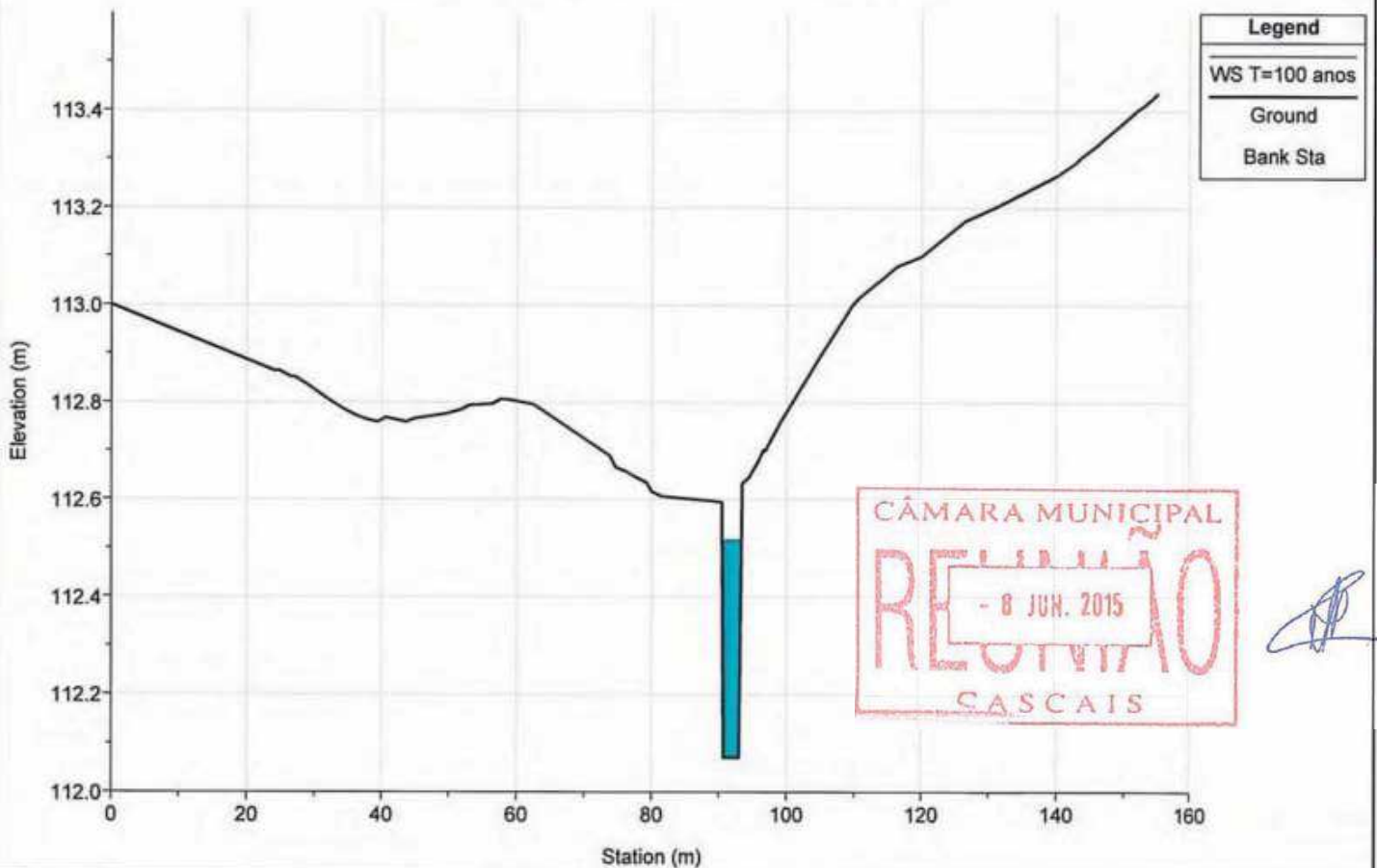
River = MARIANAS Reach = jusante RS = 13.996



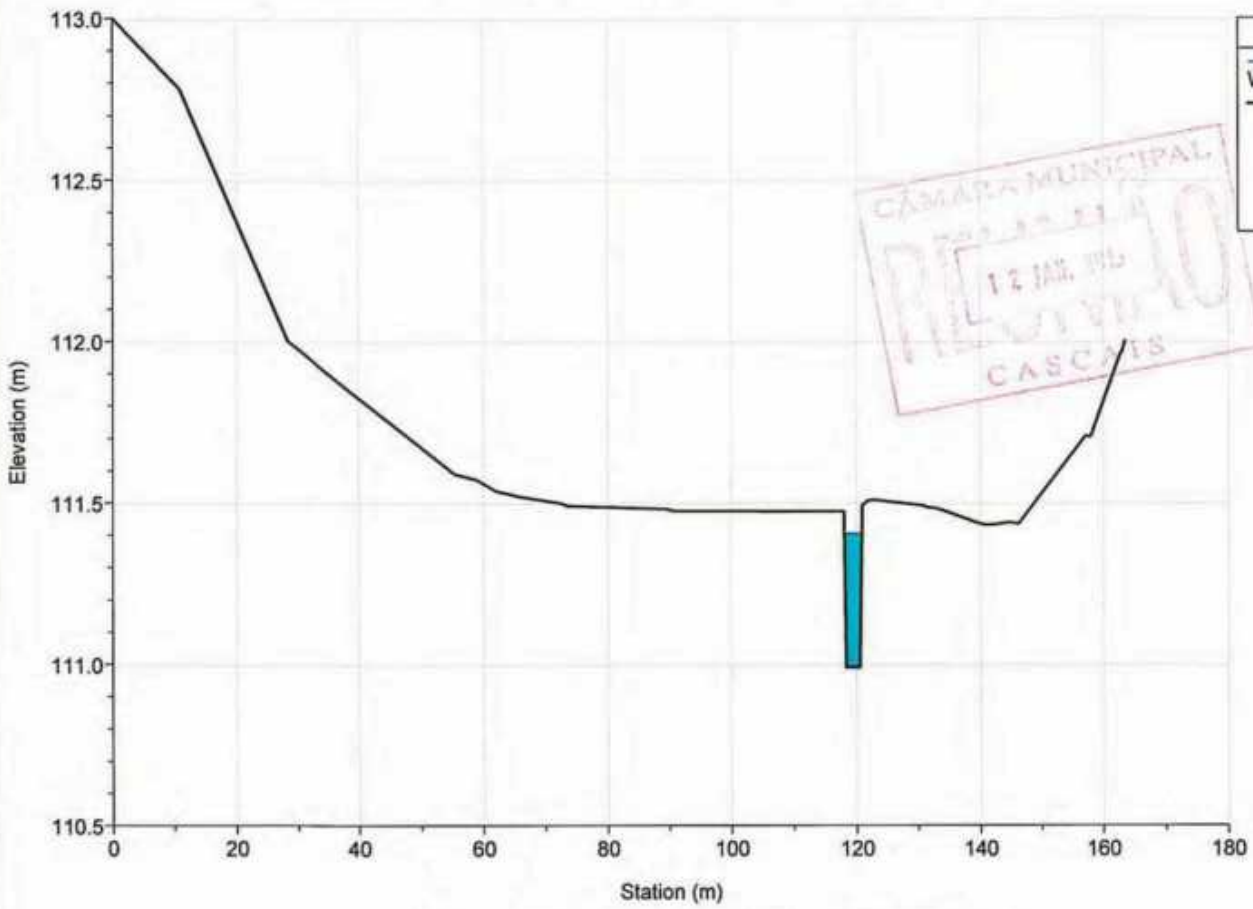
River = MD1 Reach = afluente RS = 341.983



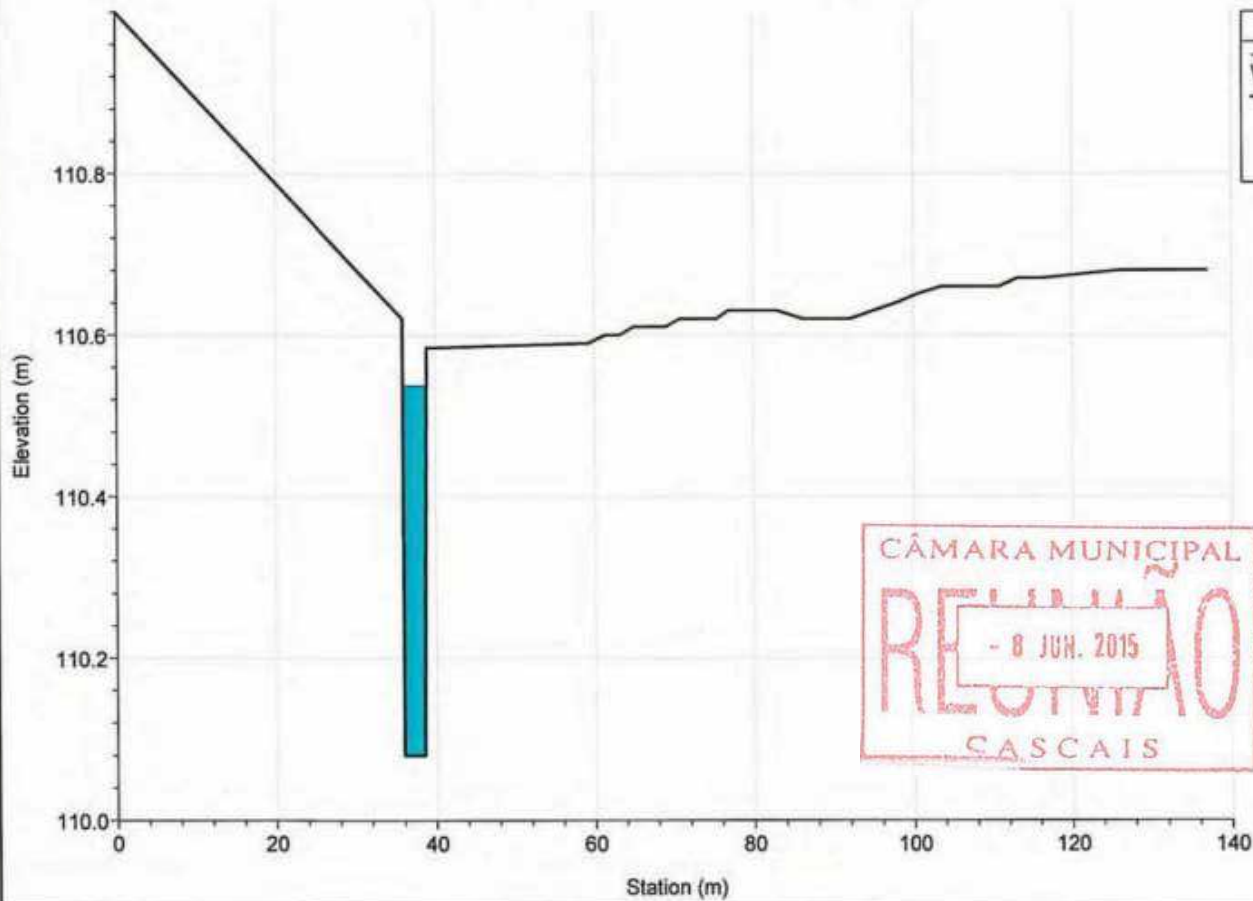
River = MD1 Reach = afluente RS = 228.455



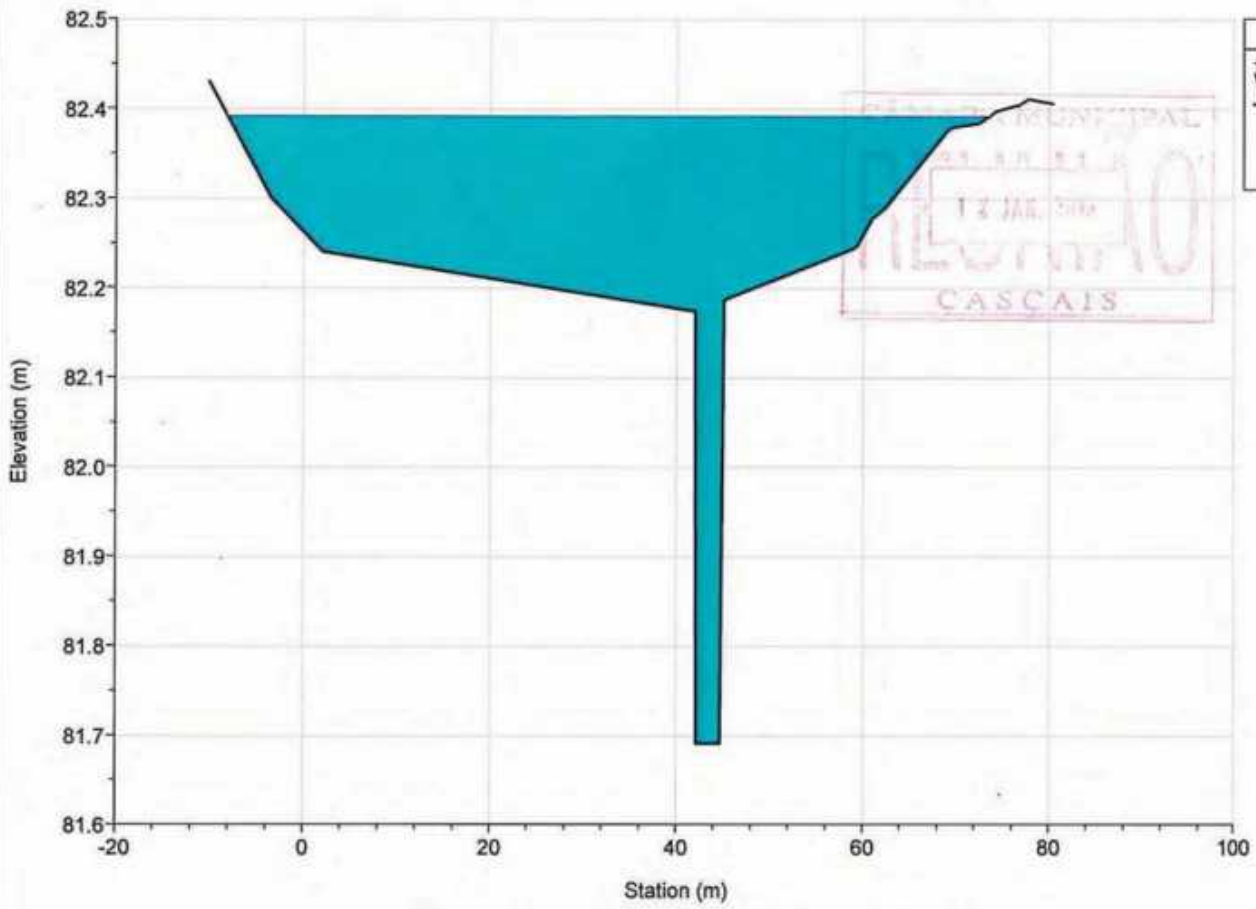
River = MD1 Reach = afluyente RS = 137.222



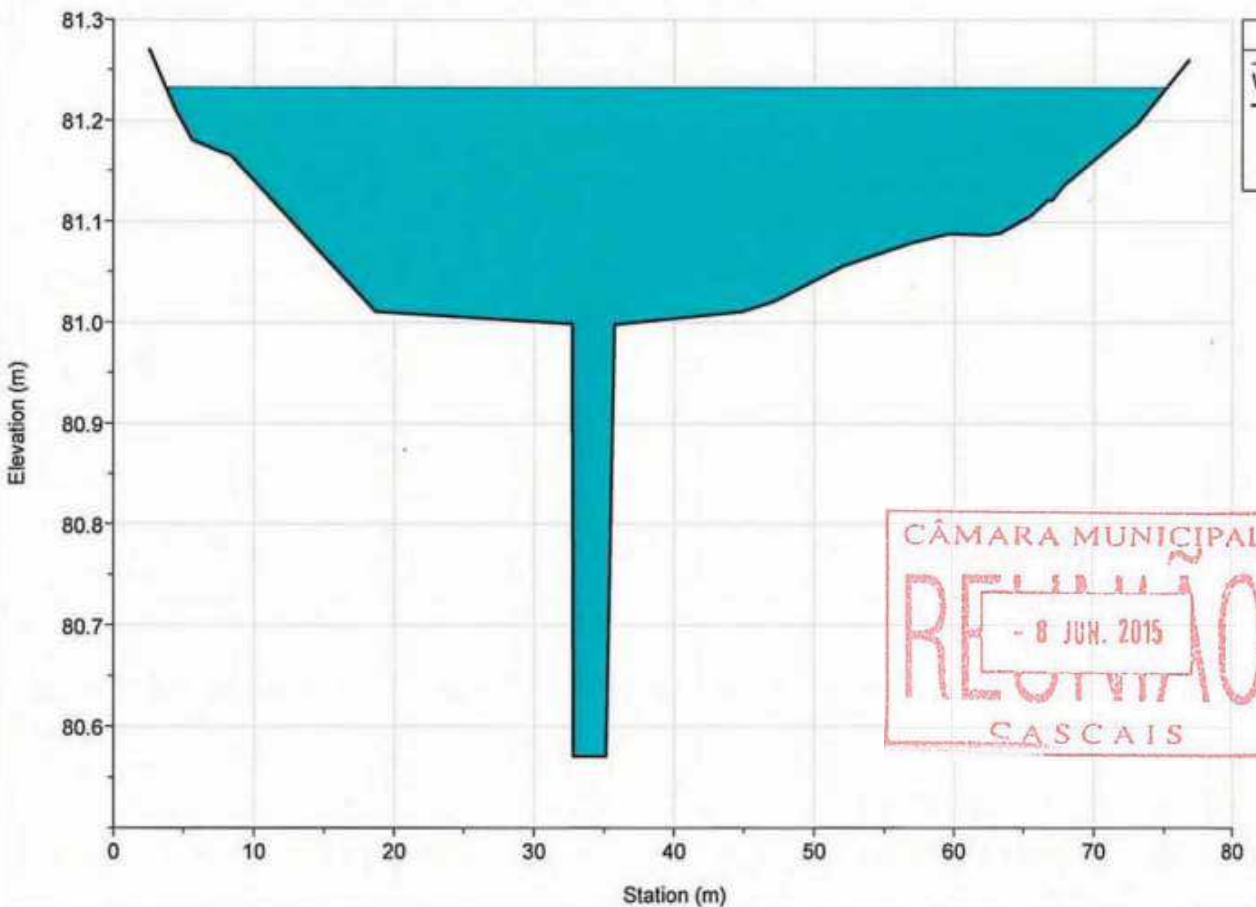
River = MD1 Reach = afluyente RS = 54.524



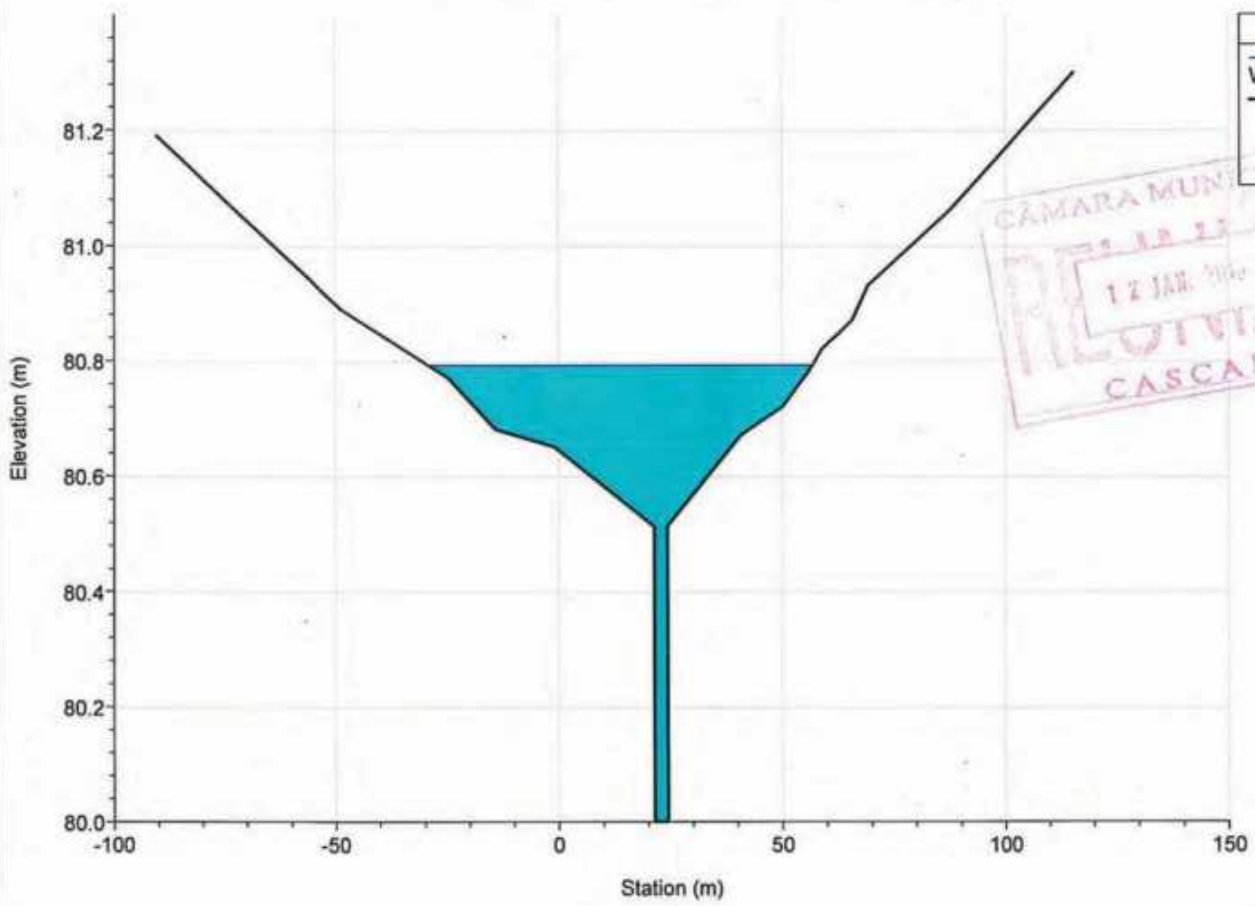
River = ME1 Reach = afluyente RS = 110.644



River = ME1 Reach = afluyente RS = 68.252

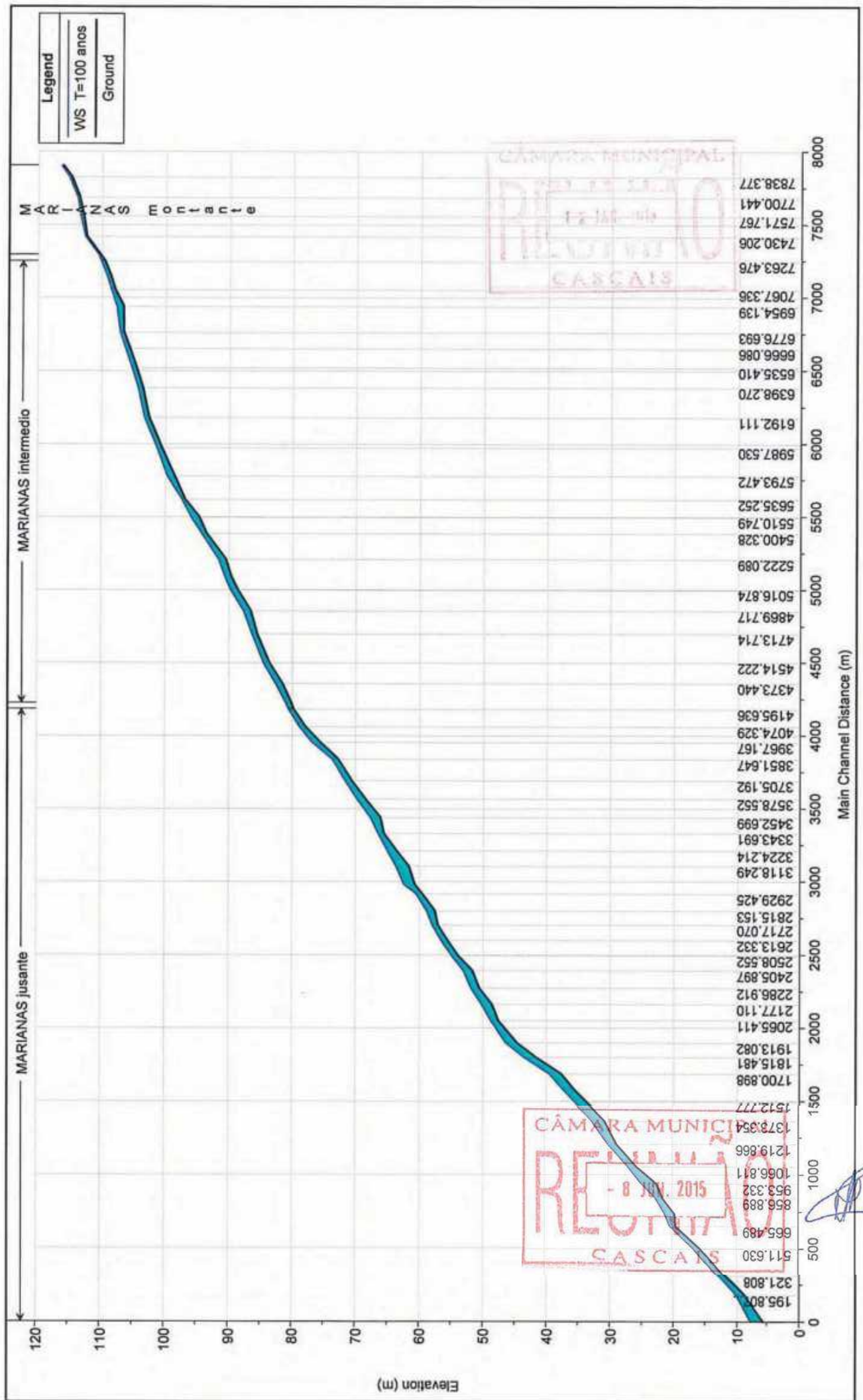


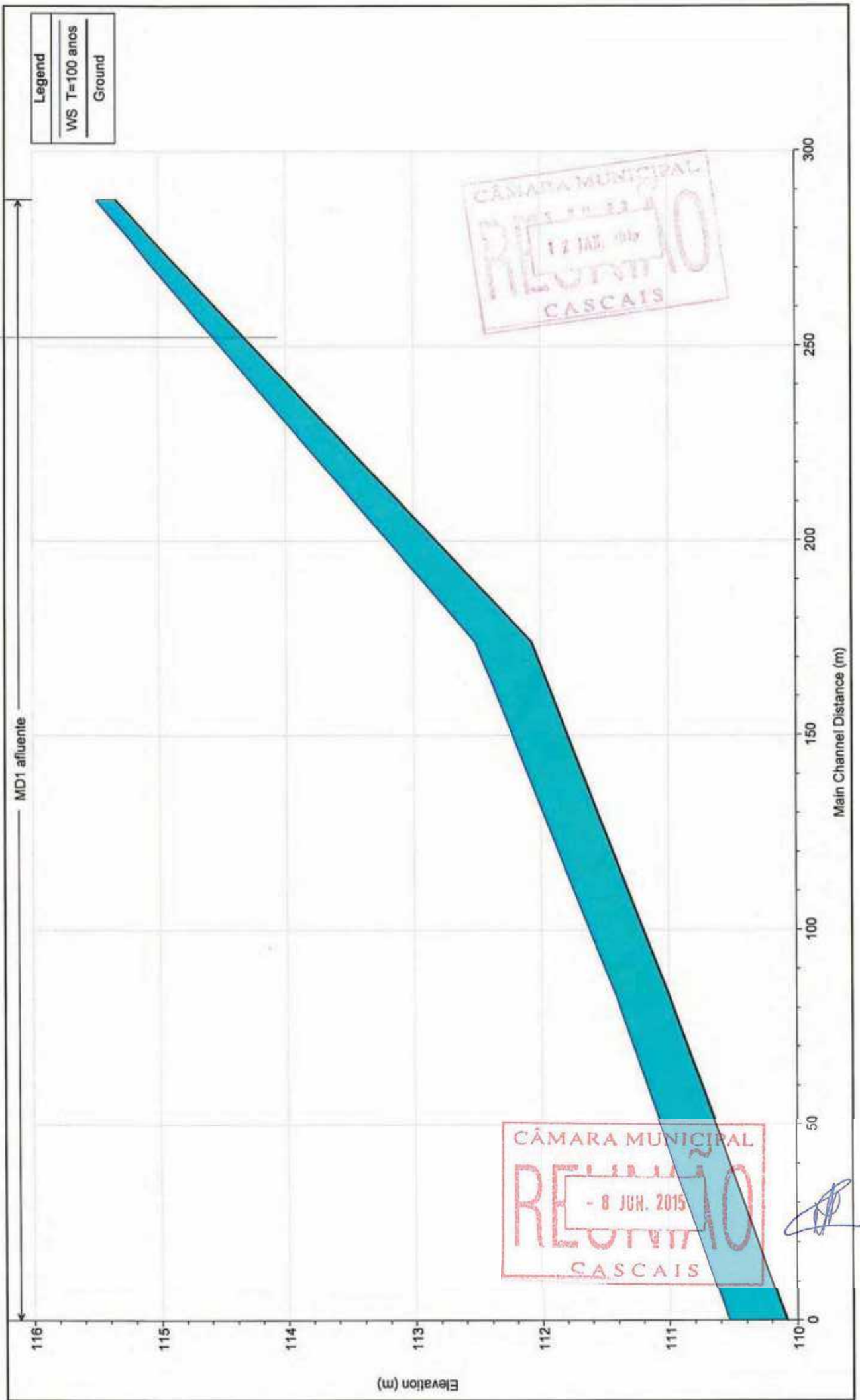
River = ME1 Reach = afluente RS = 13.880



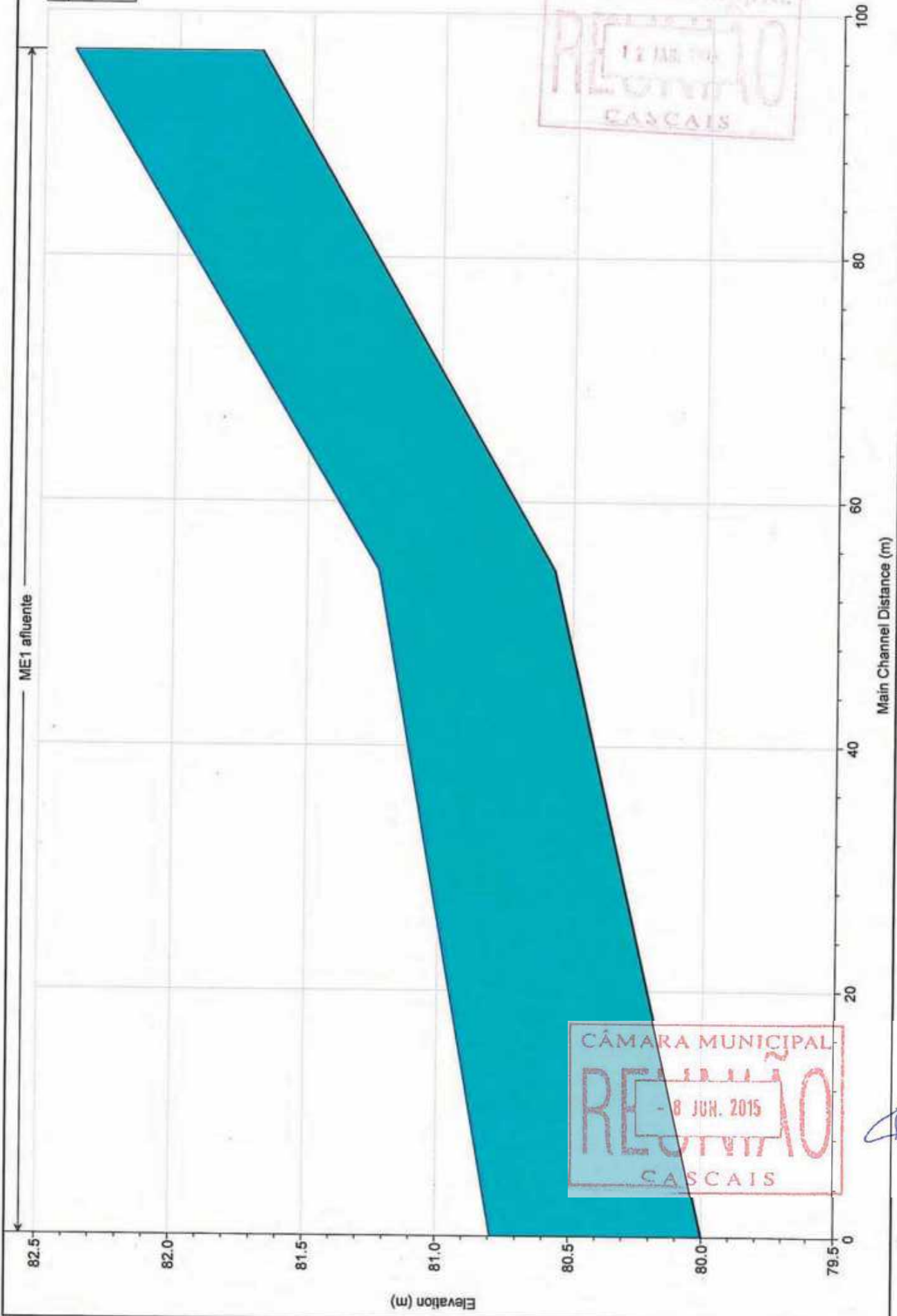
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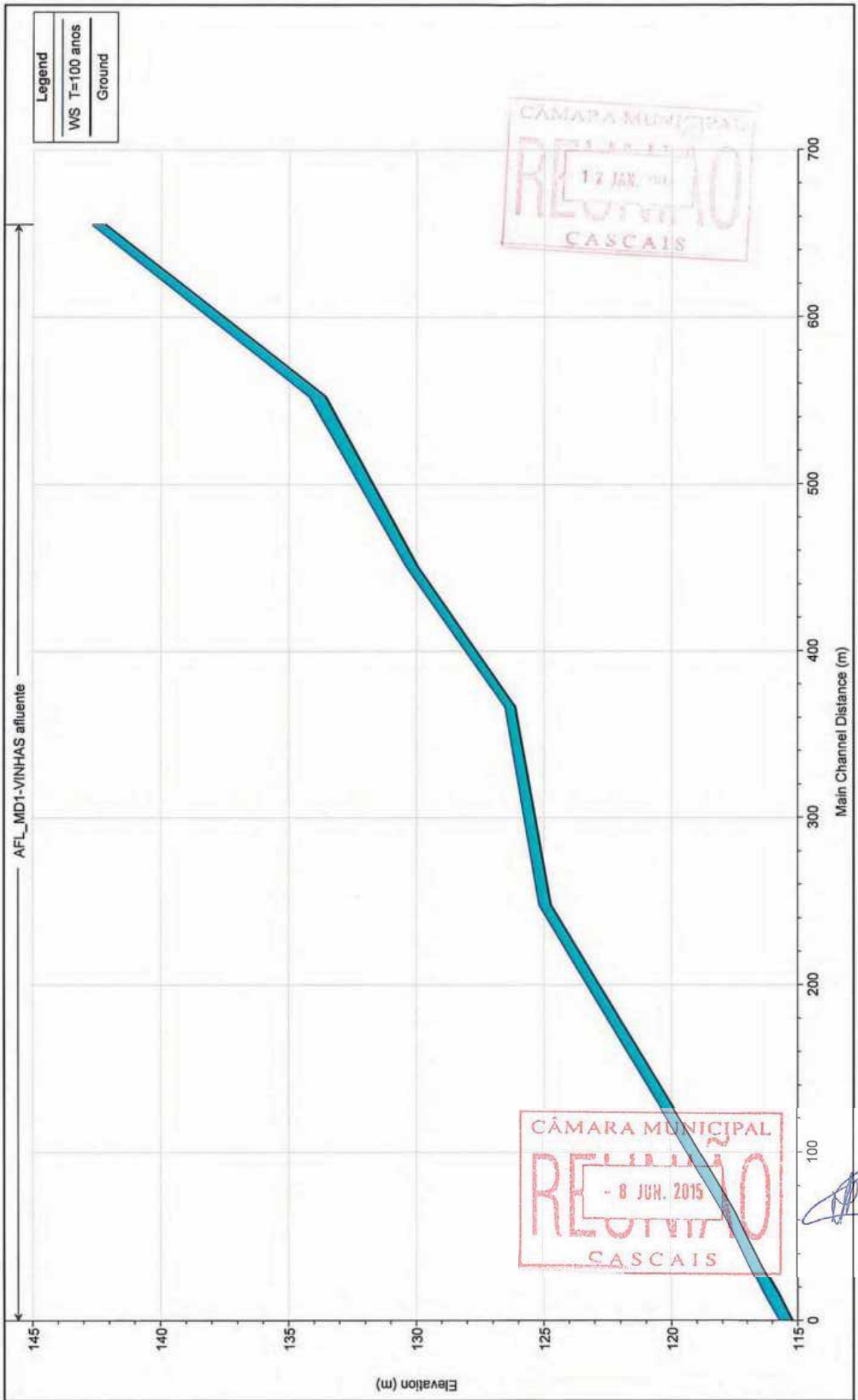


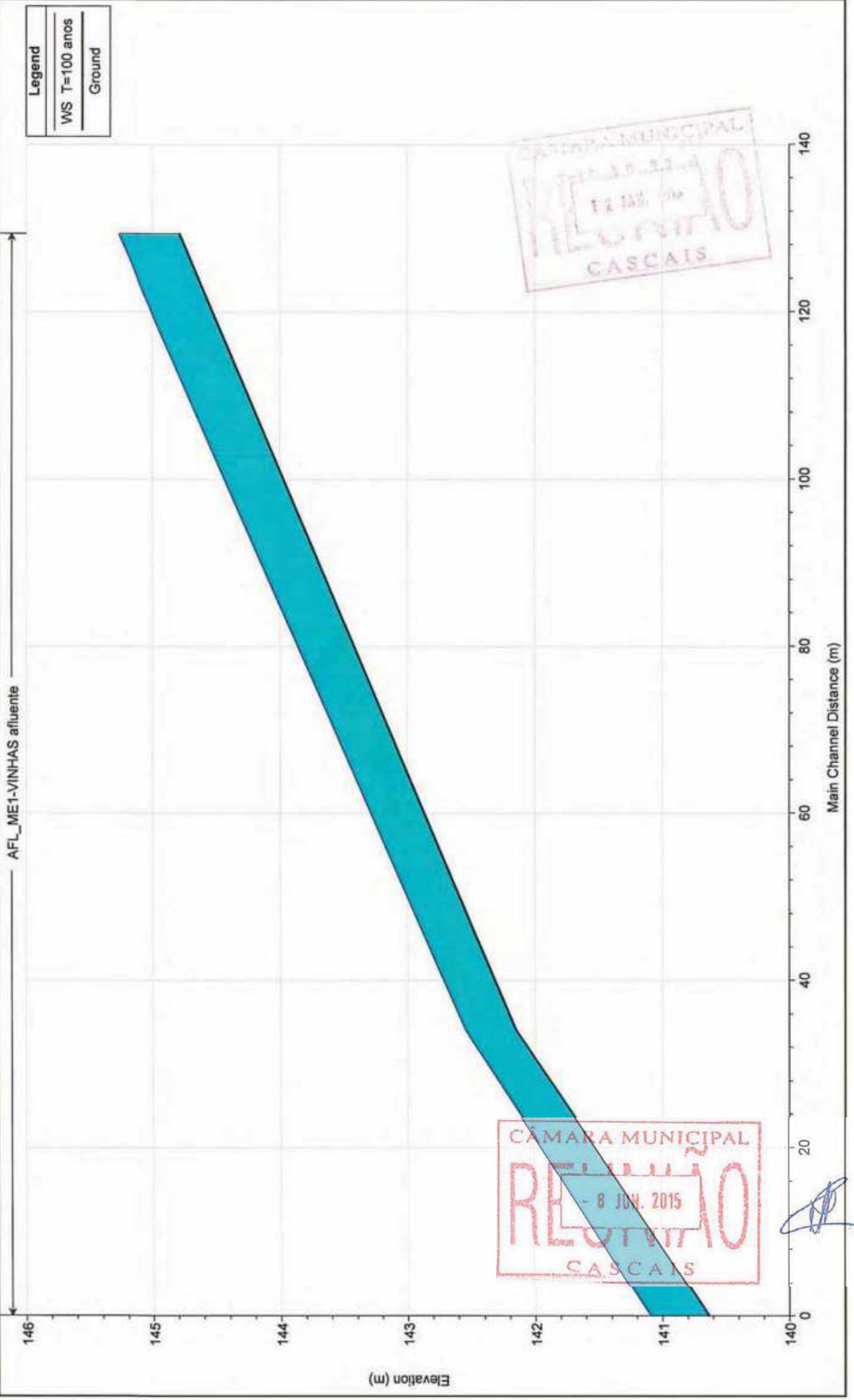
Legend	
WS T=100 anos	—
Ground	—

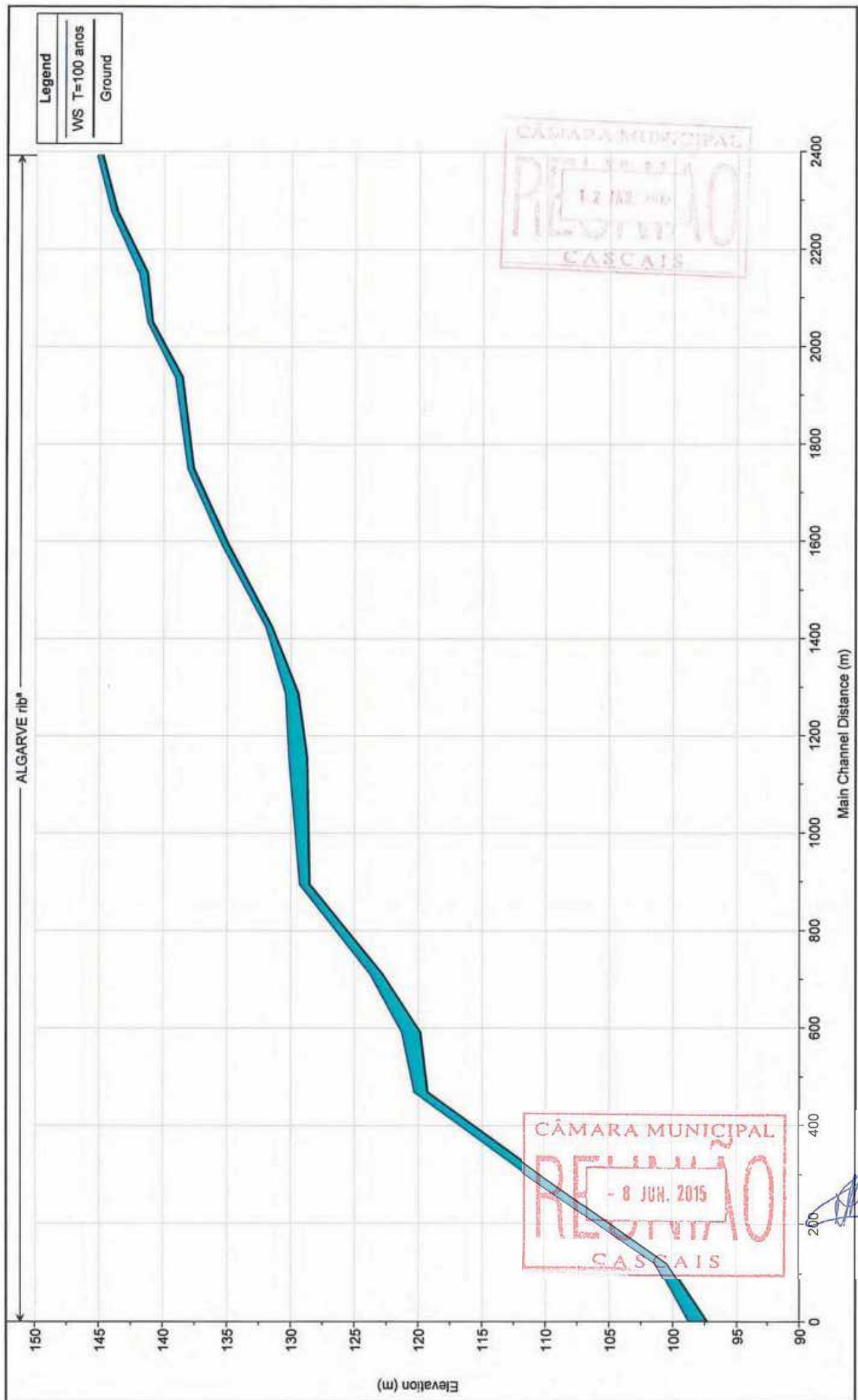


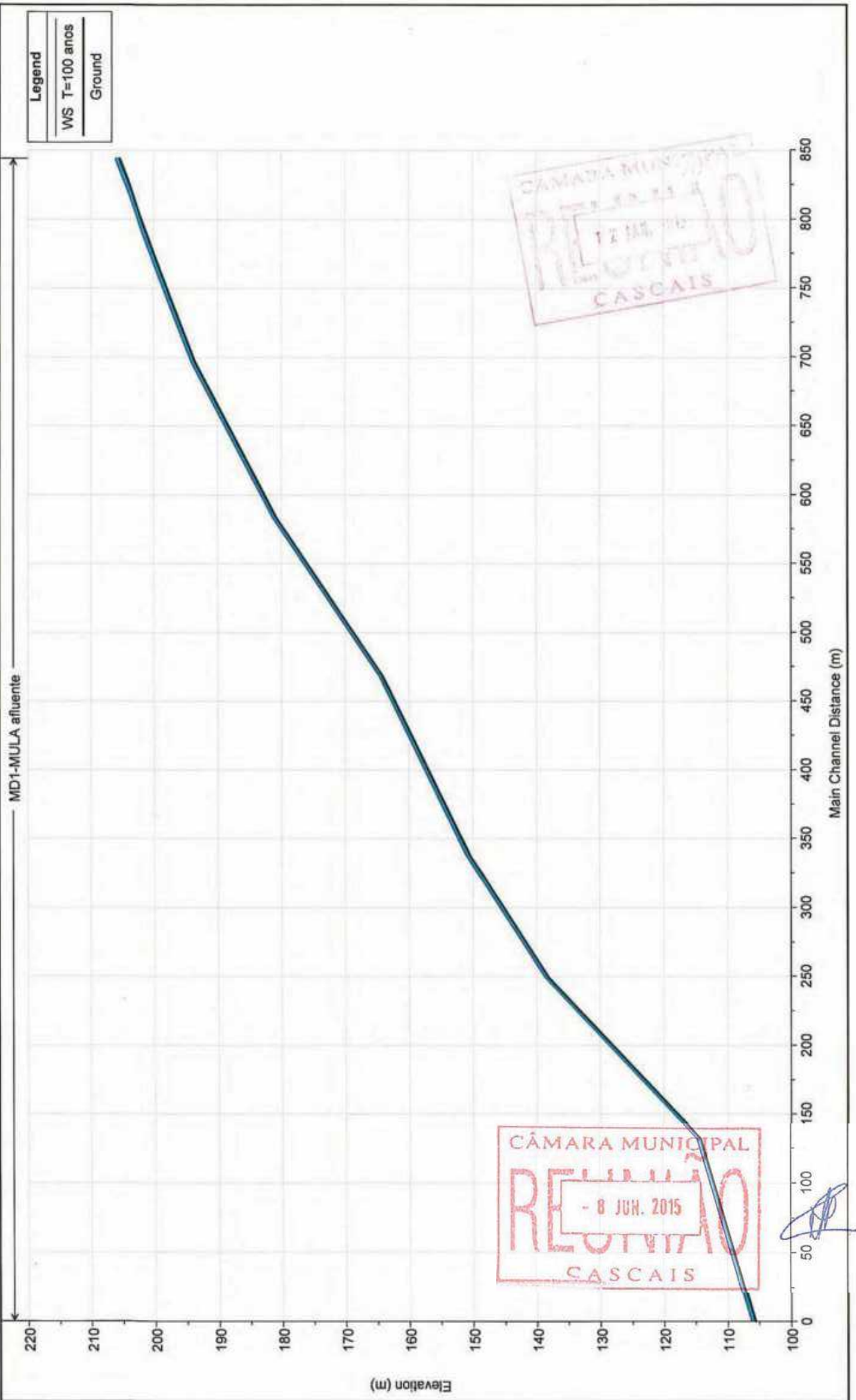
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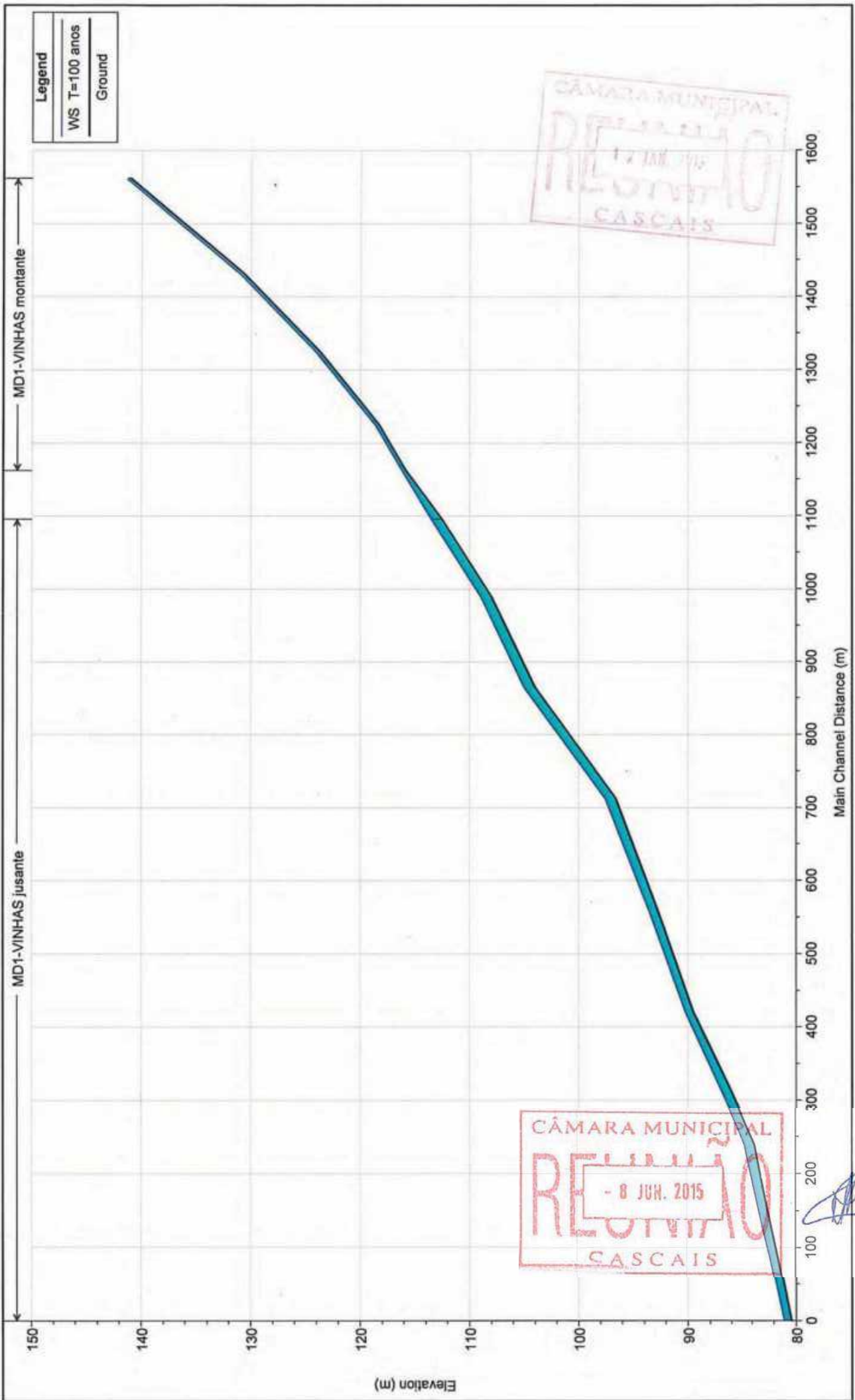


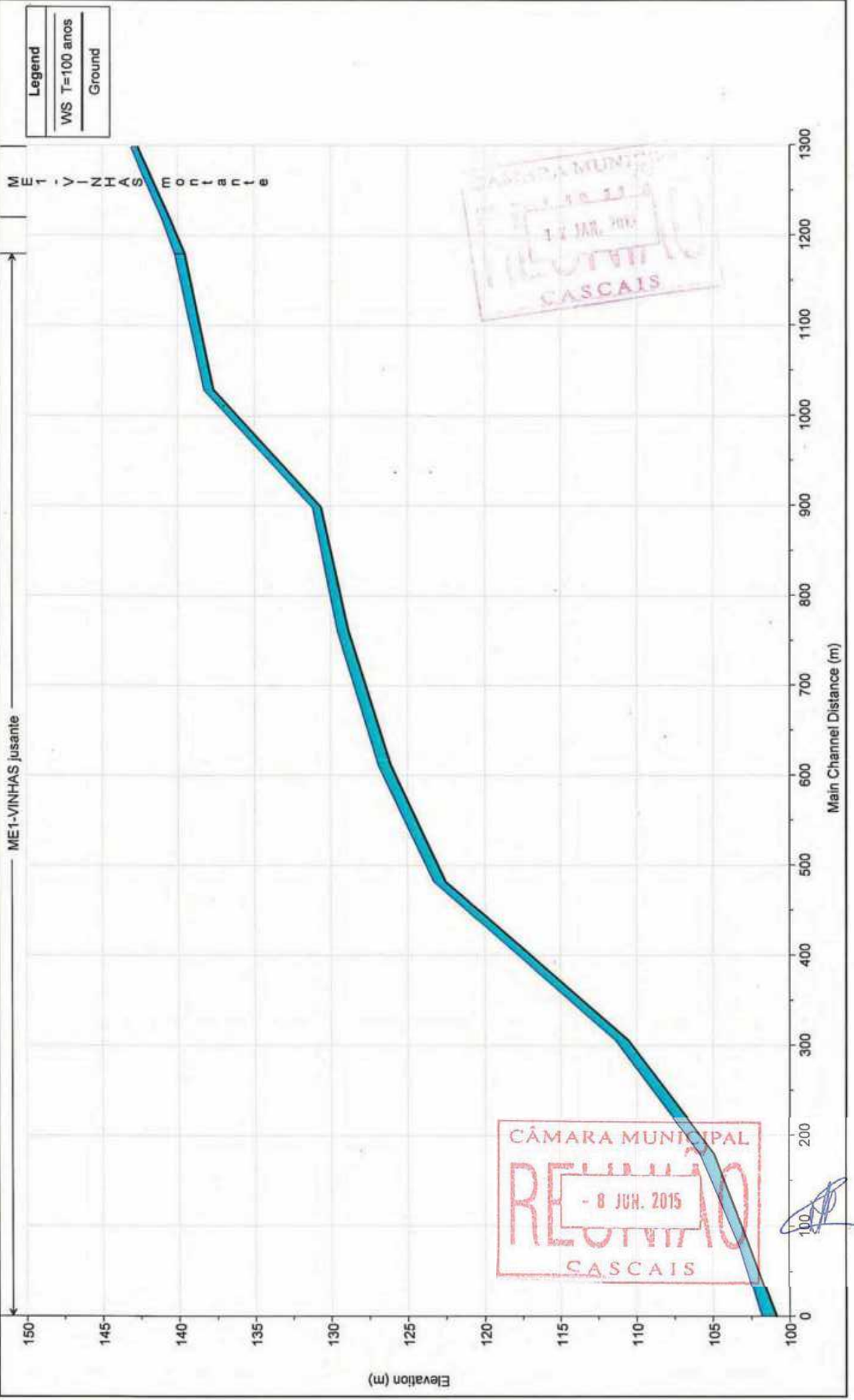


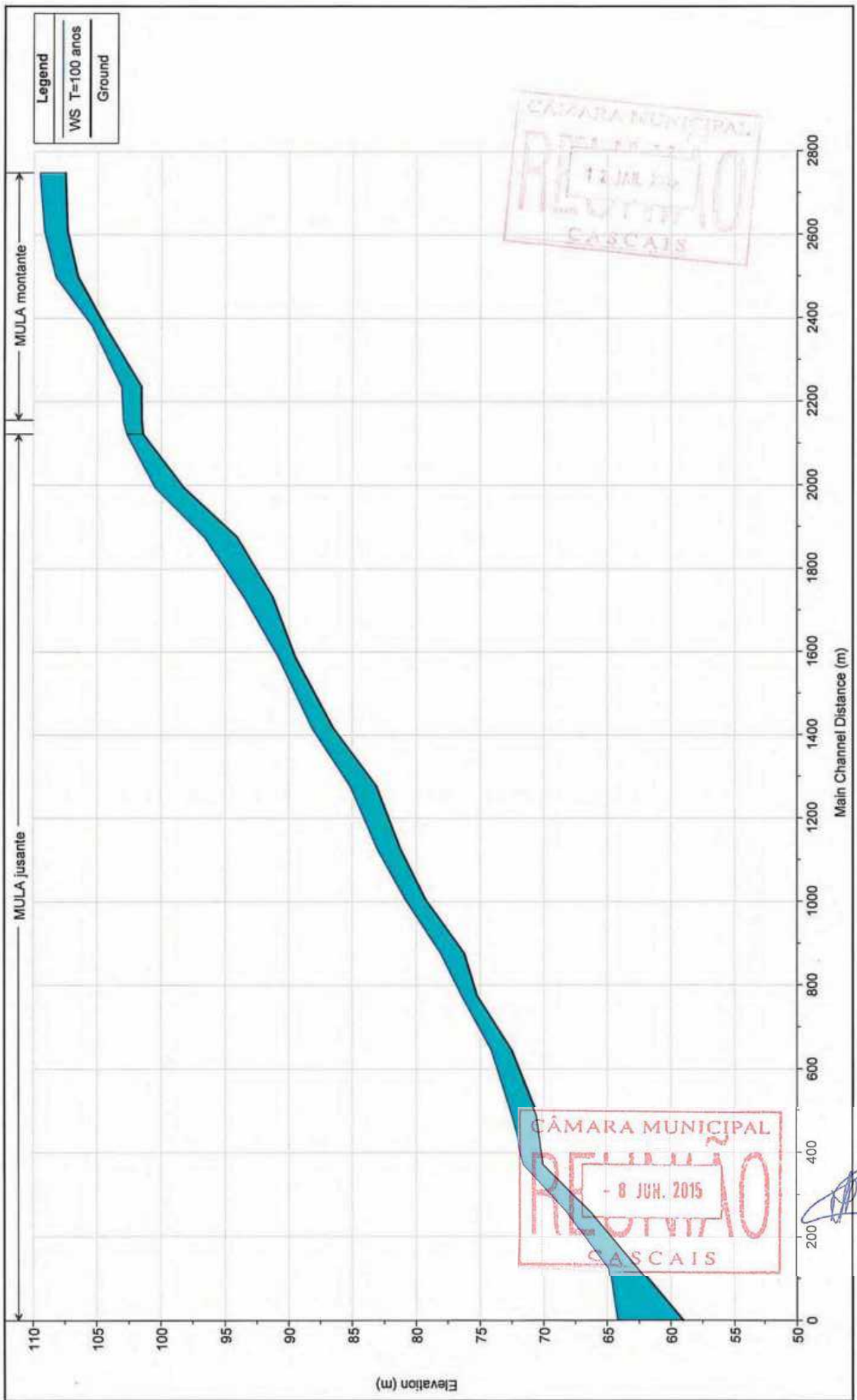


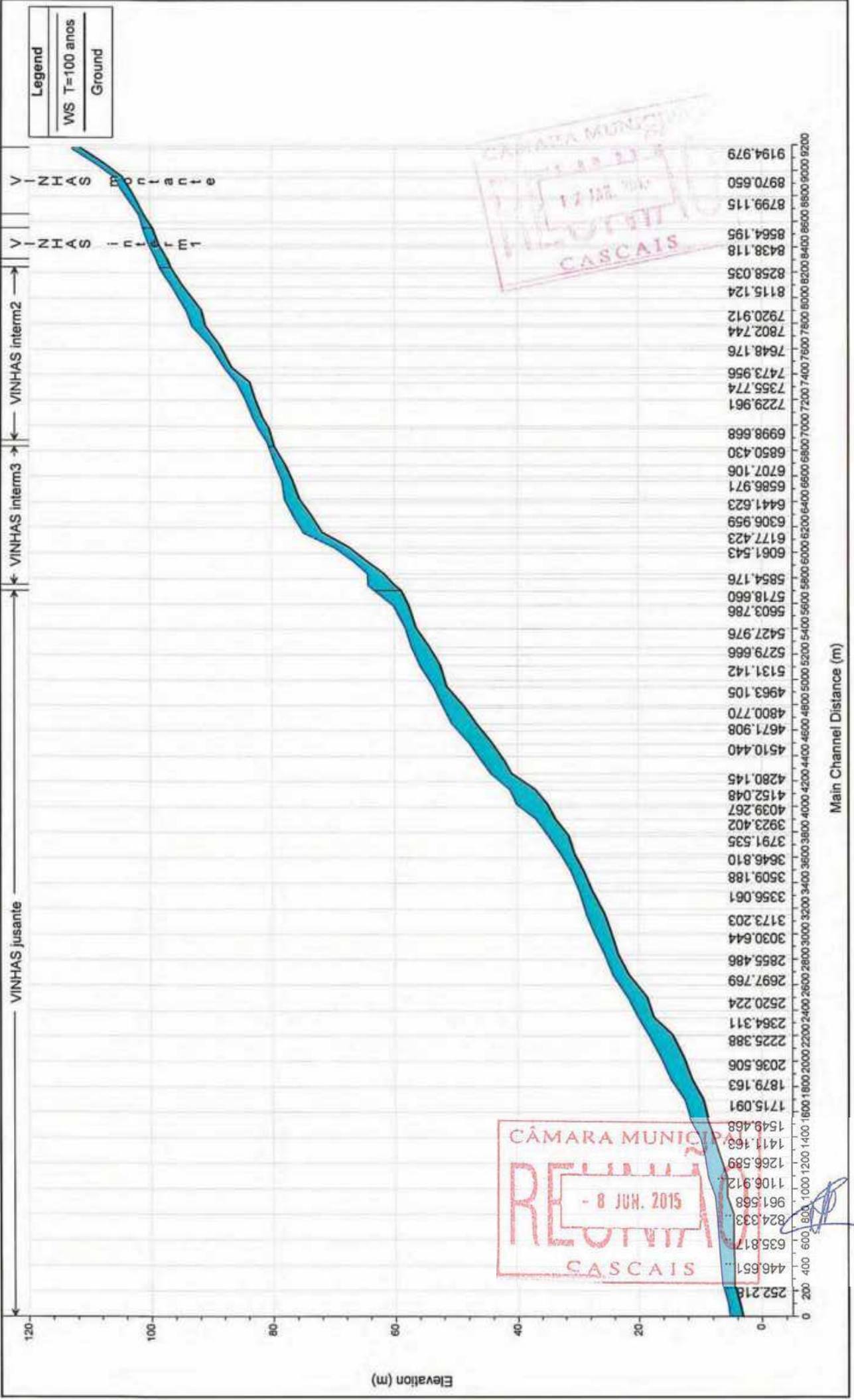




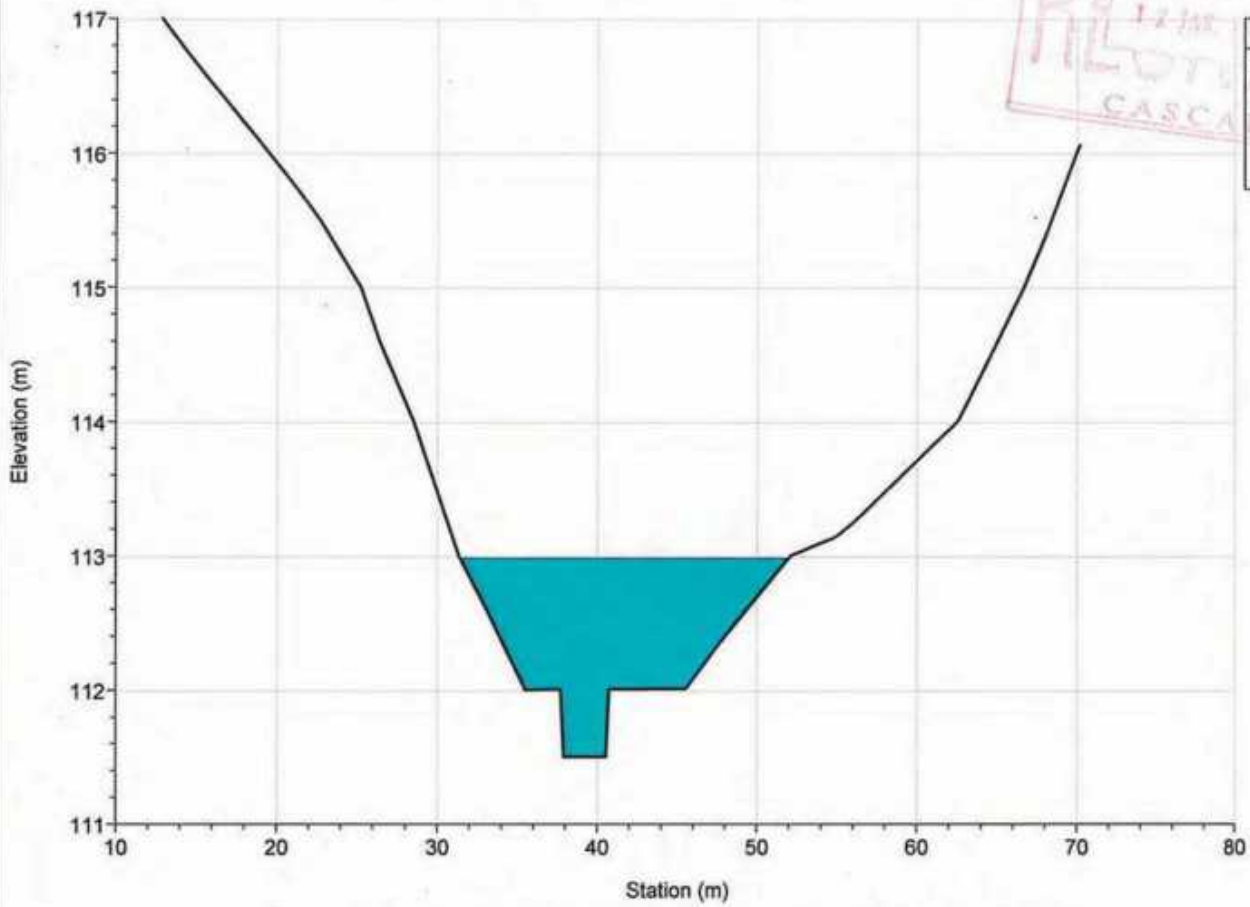




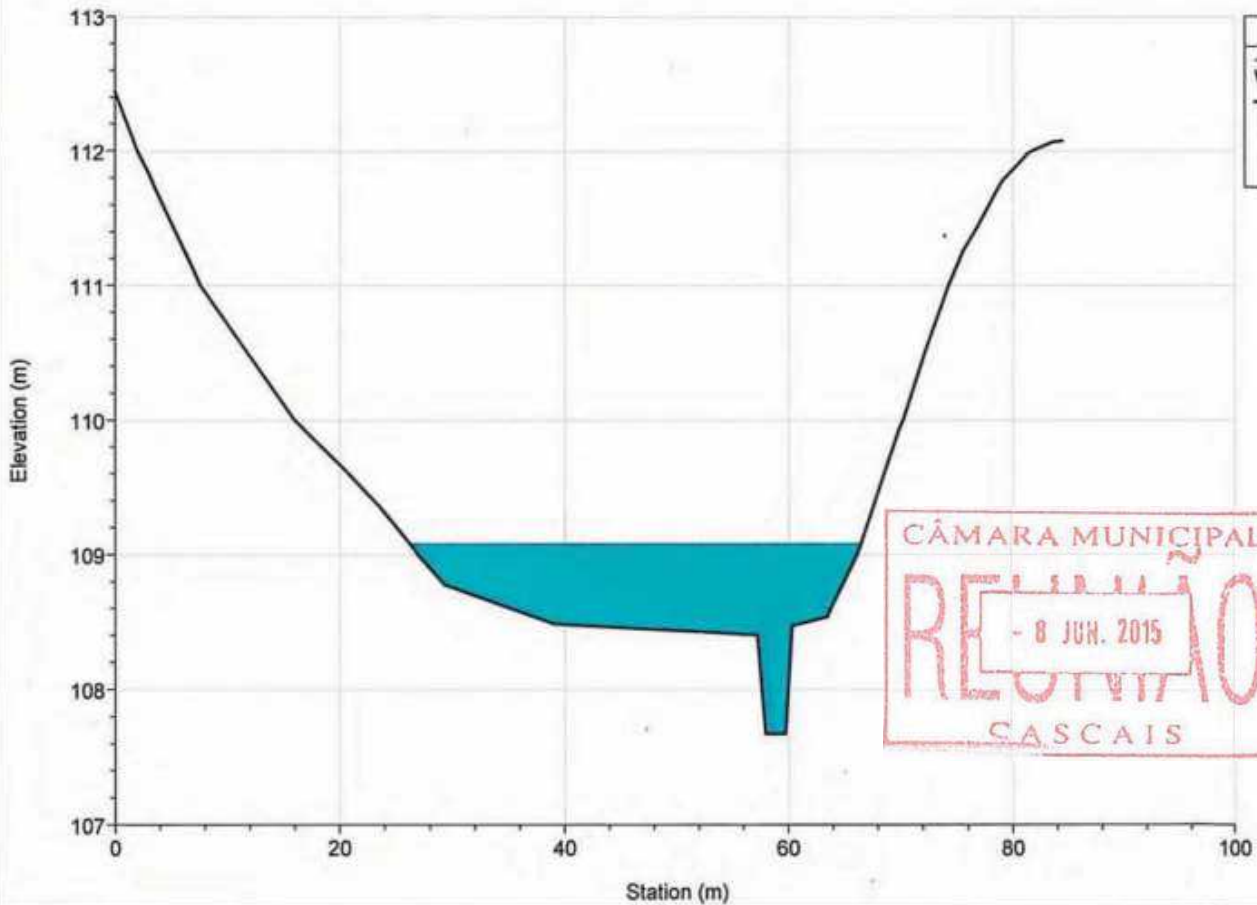




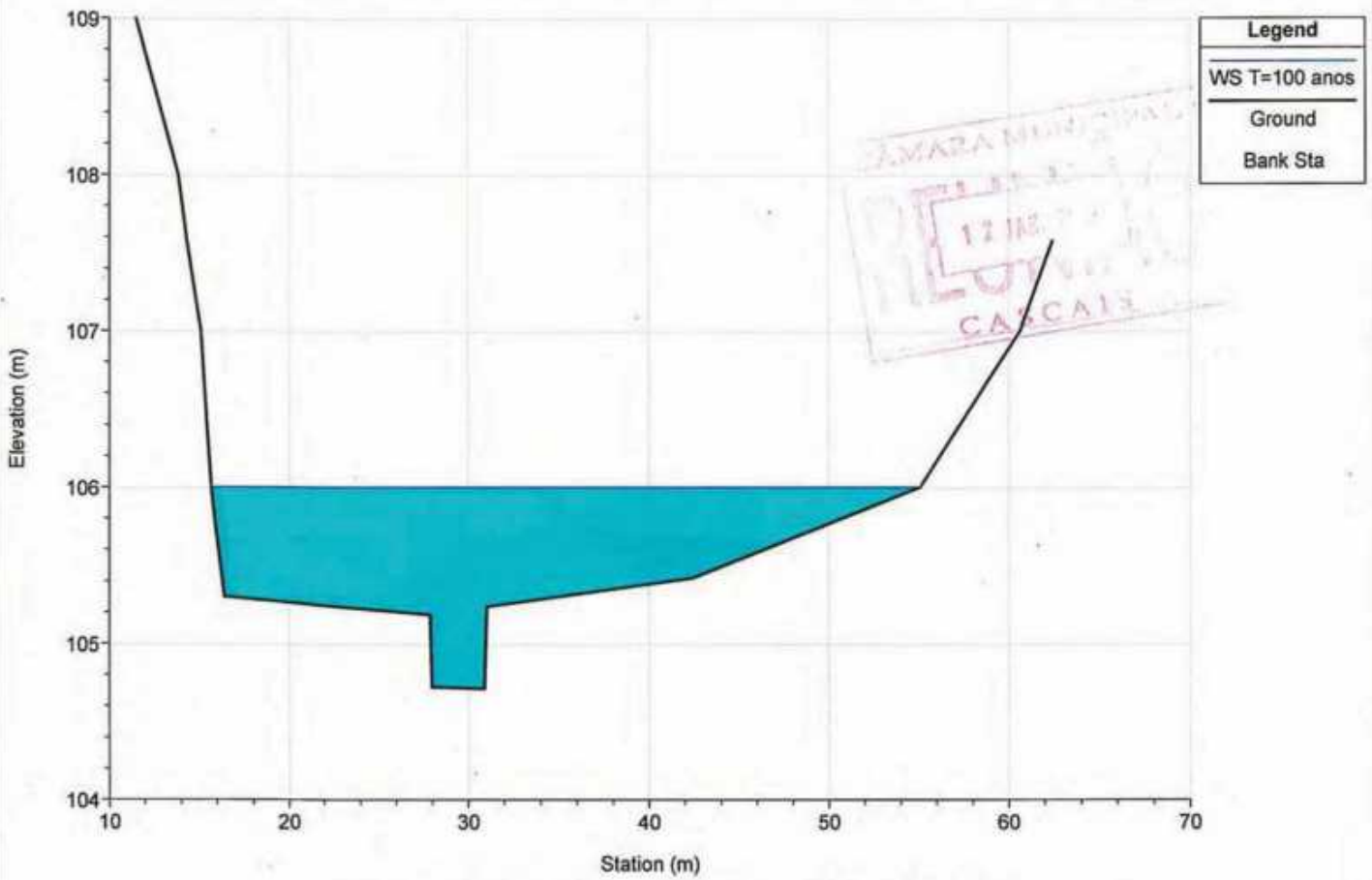
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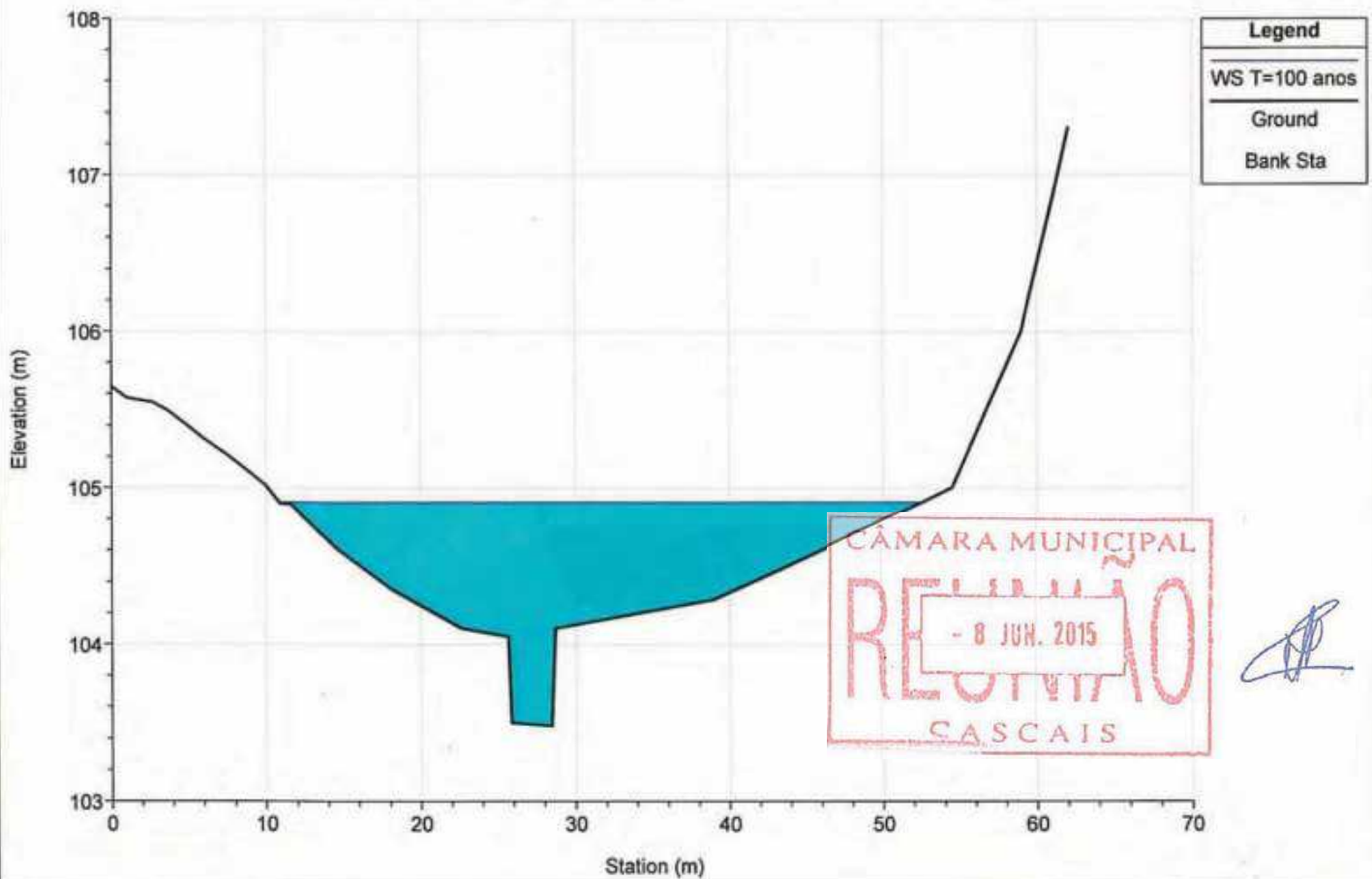
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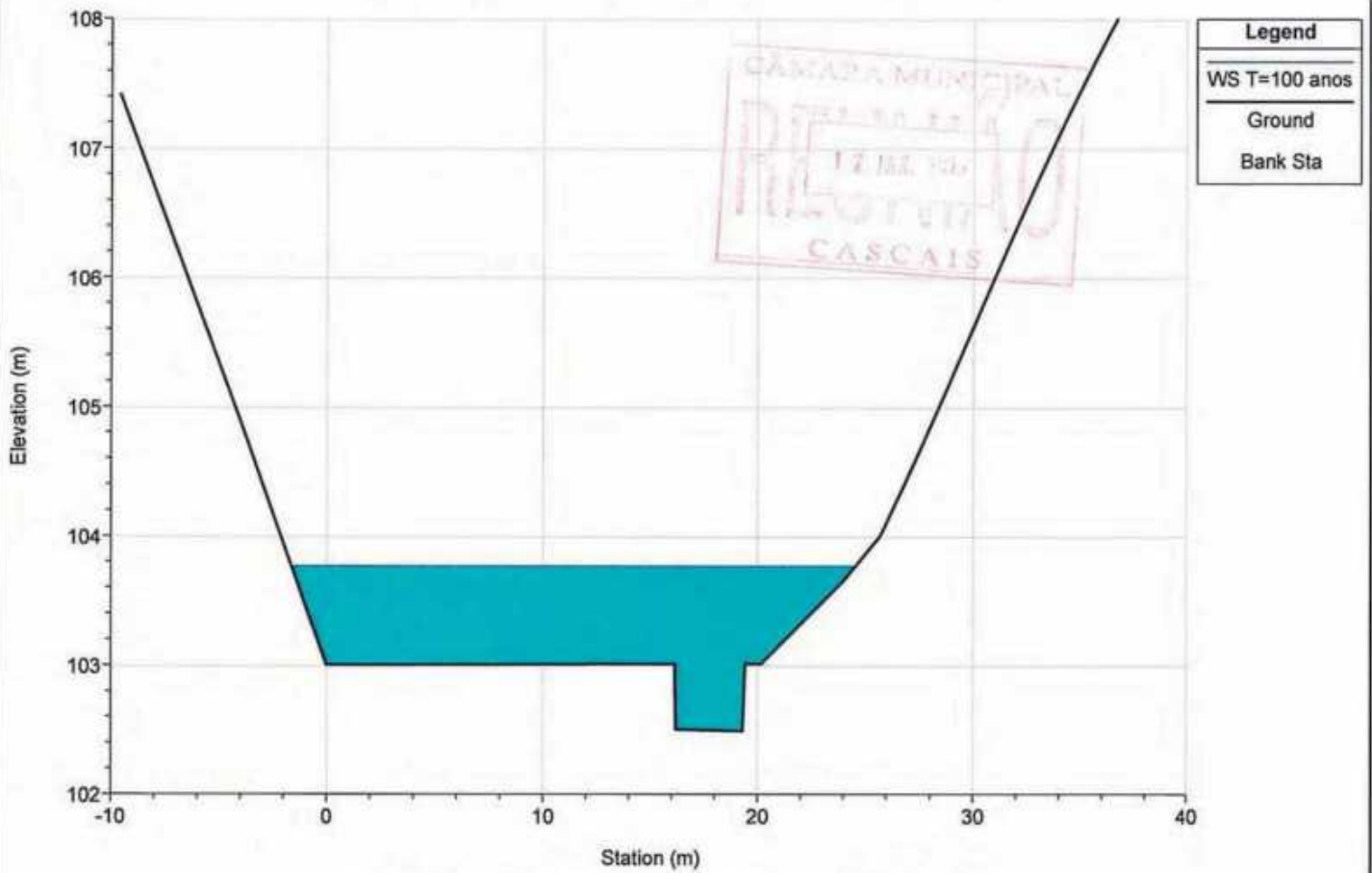
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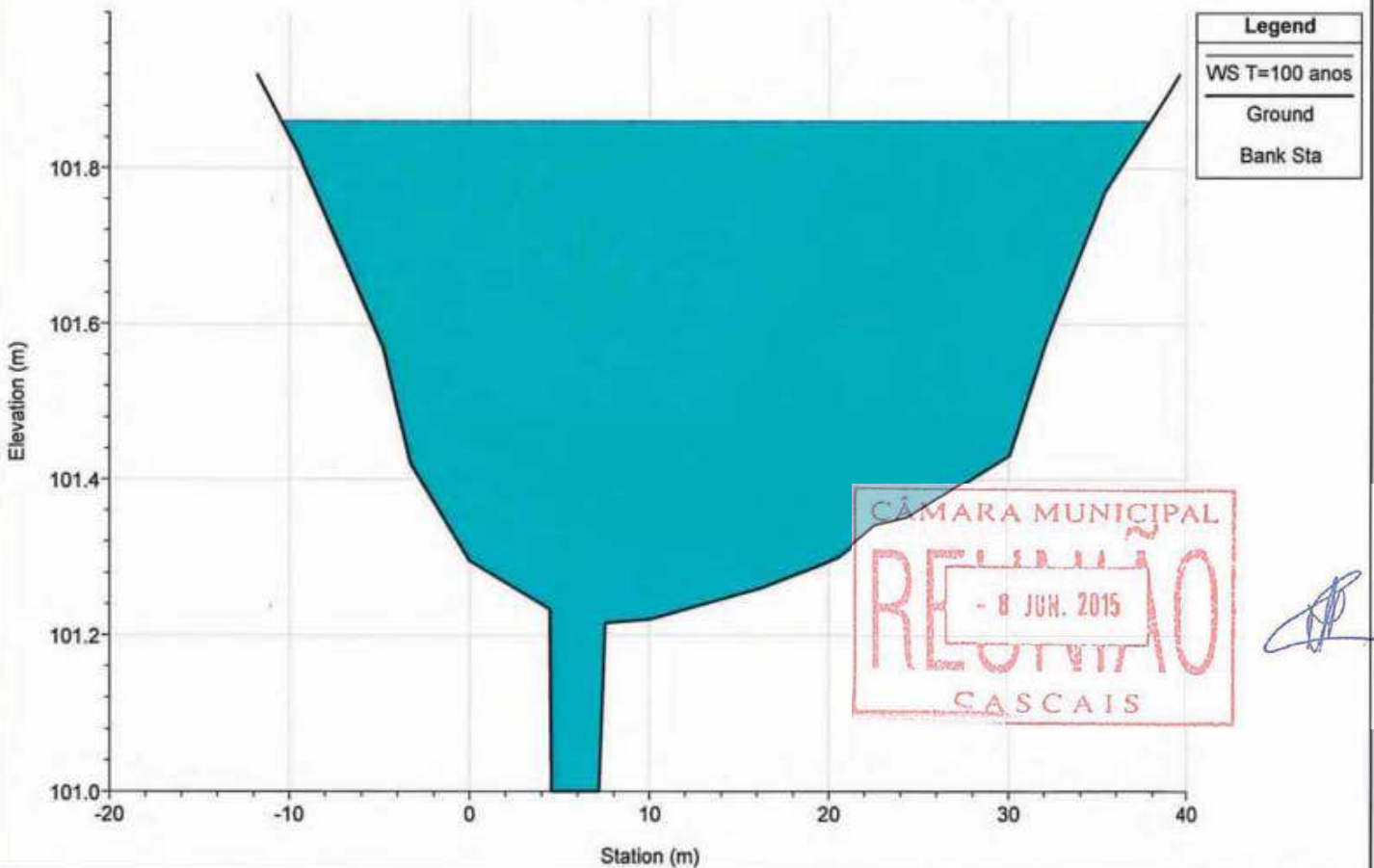
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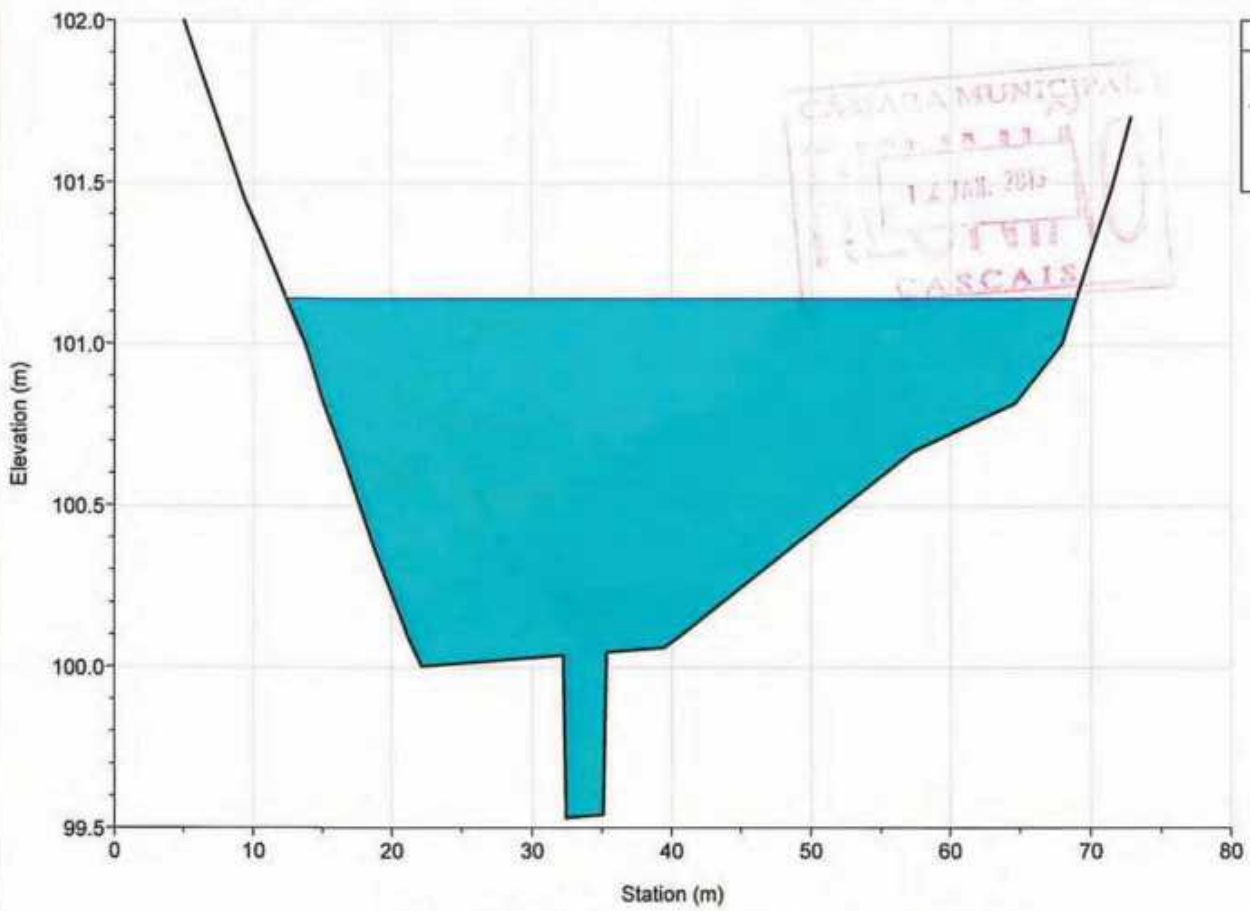
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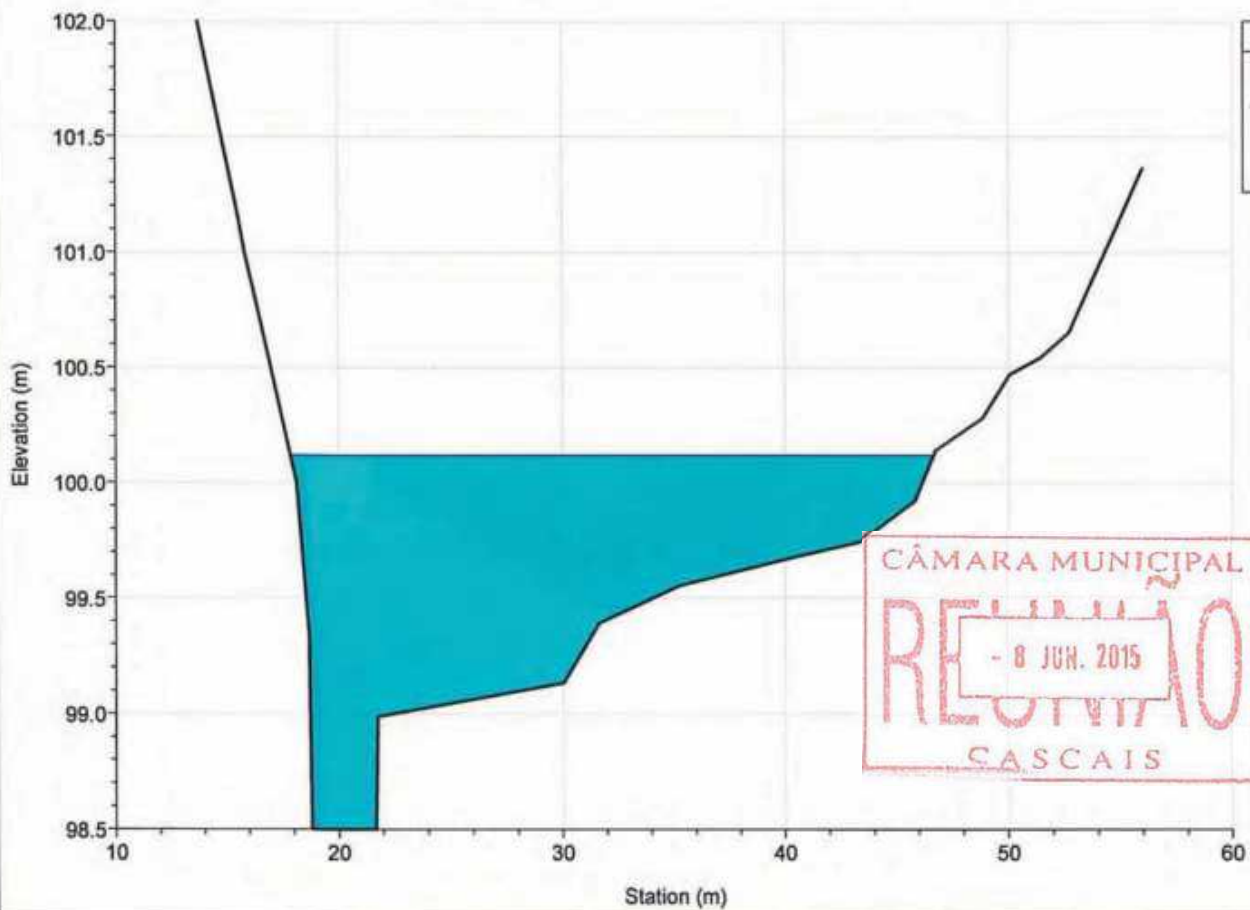
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River = VINHAS Reach = interm1 RS = 8564.195

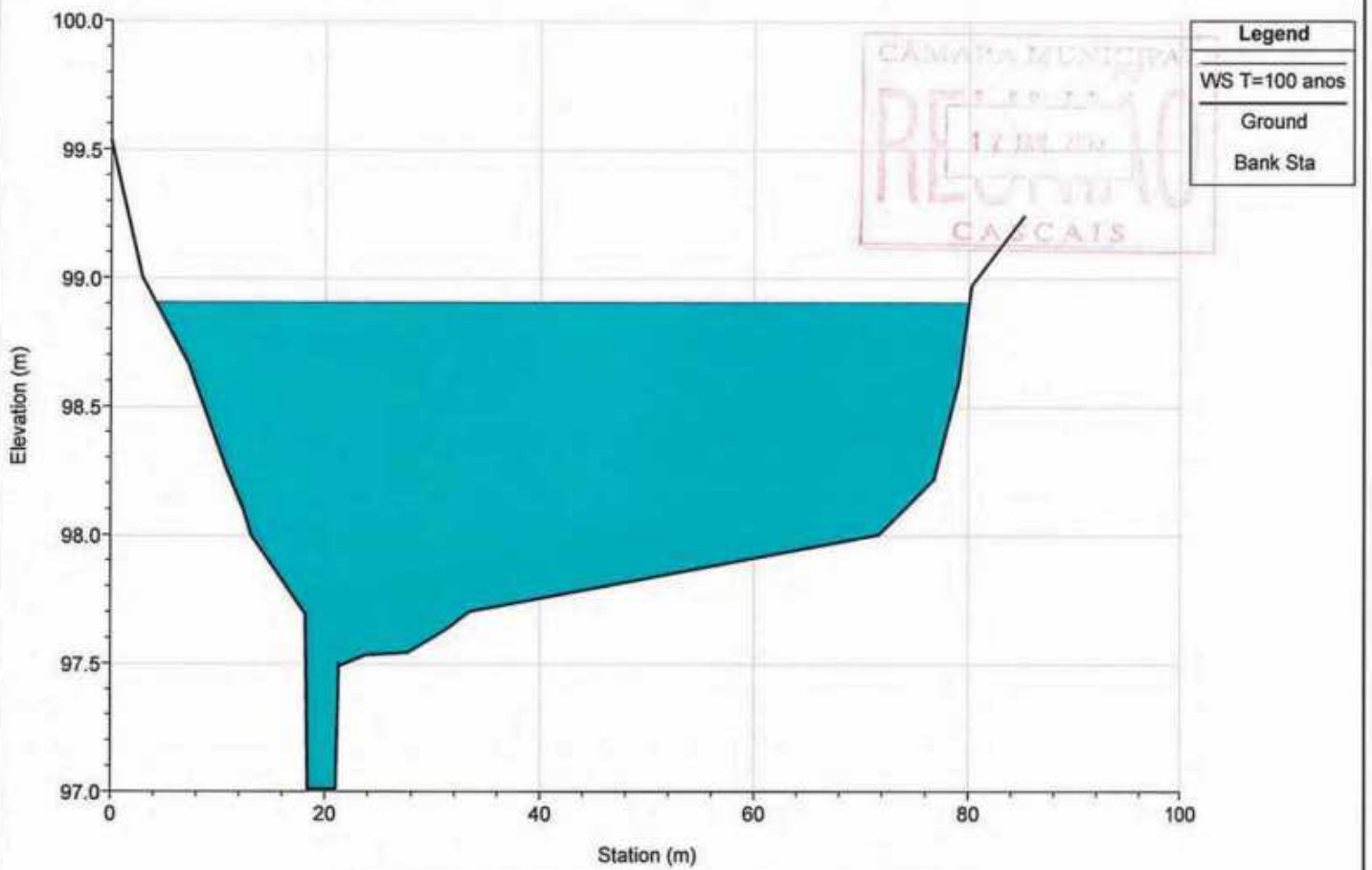


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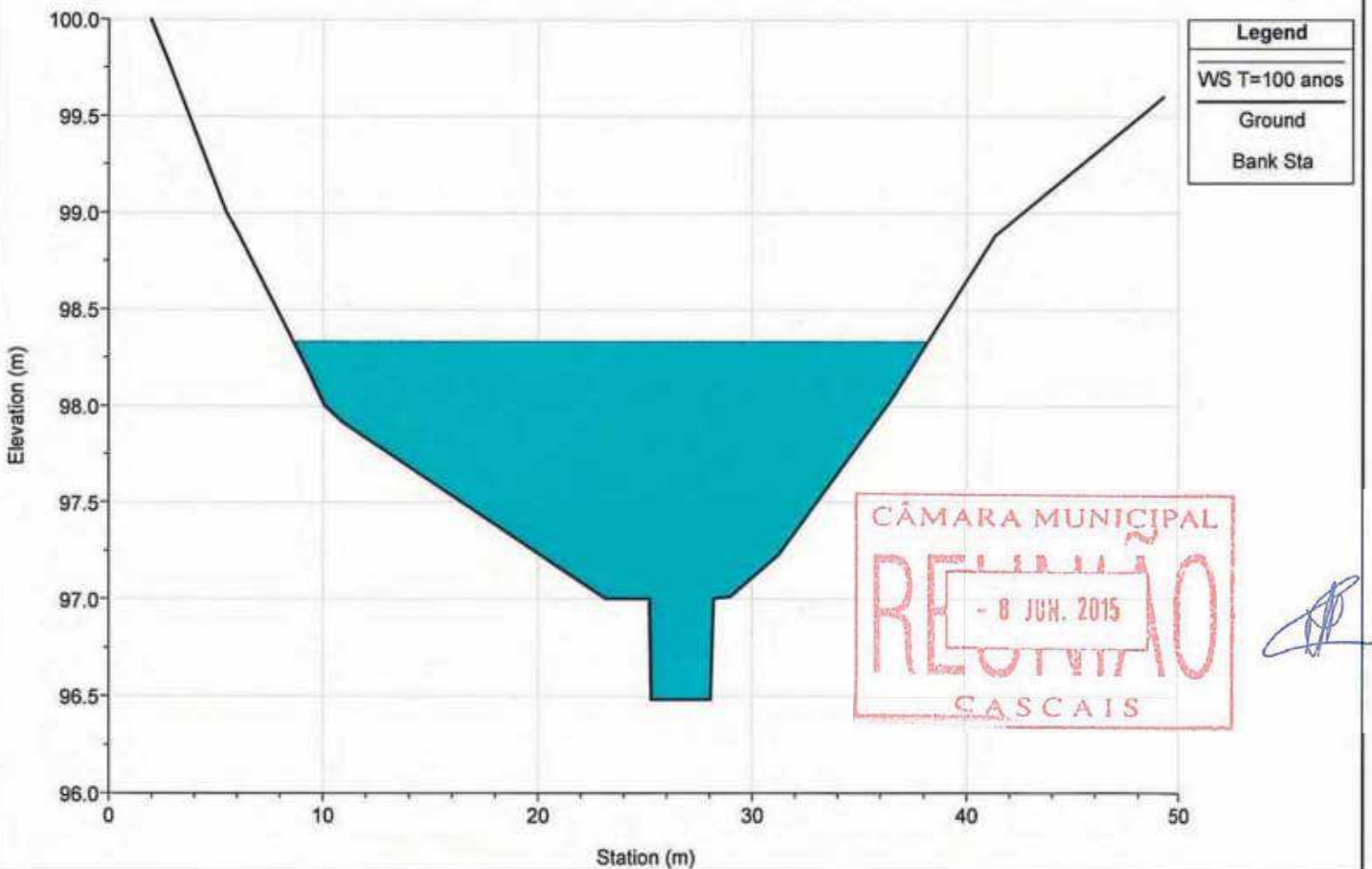




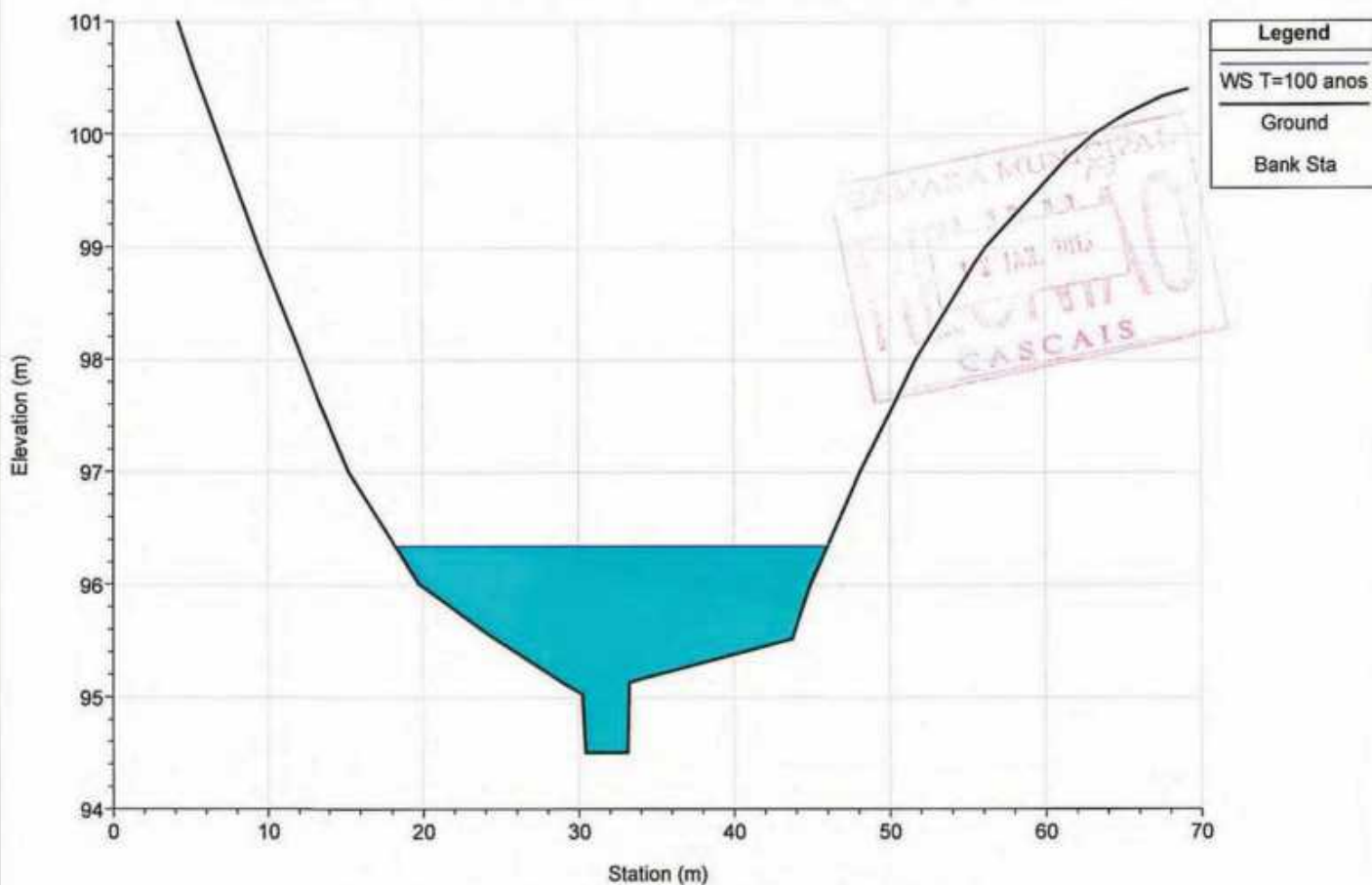
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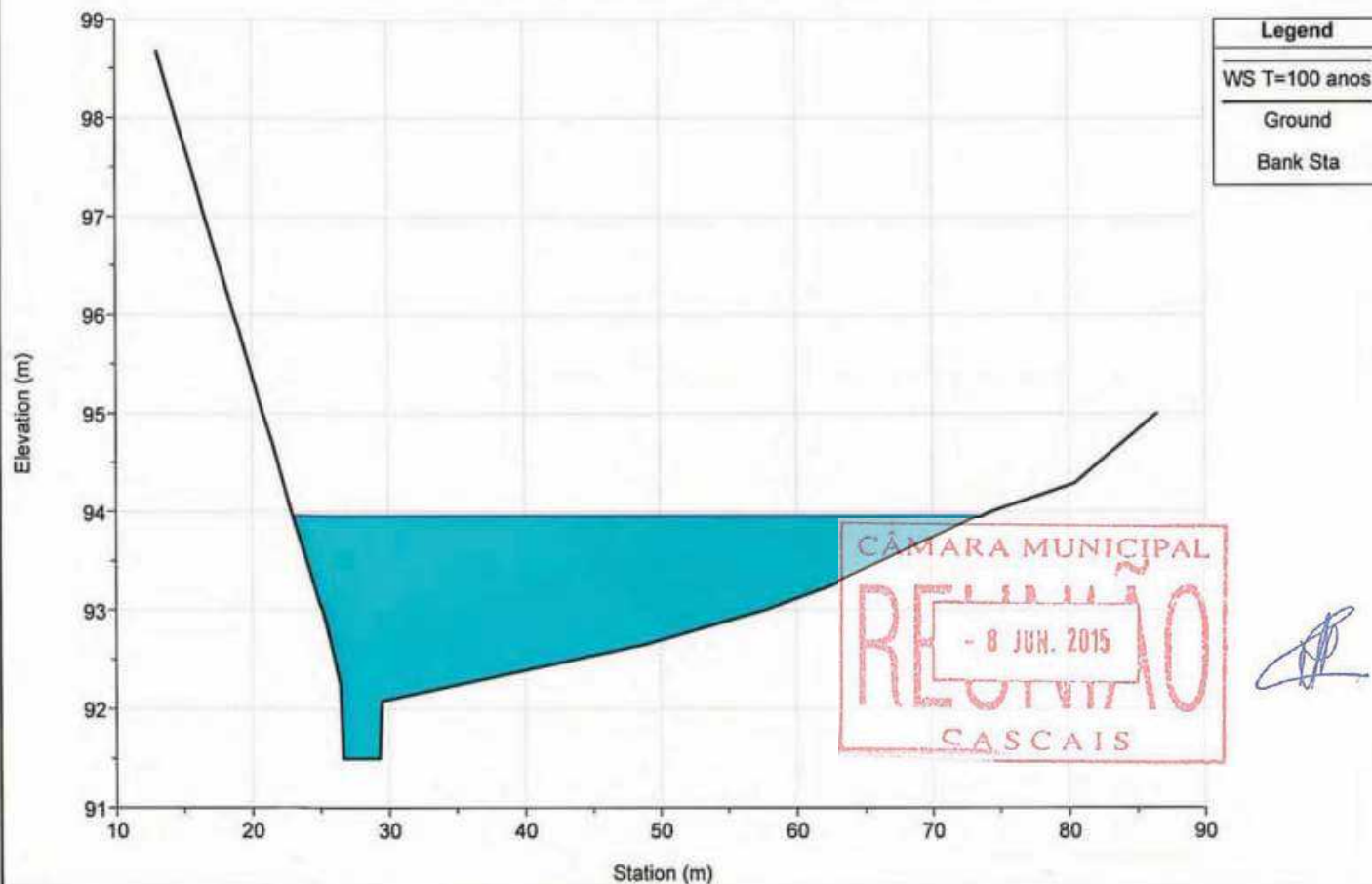
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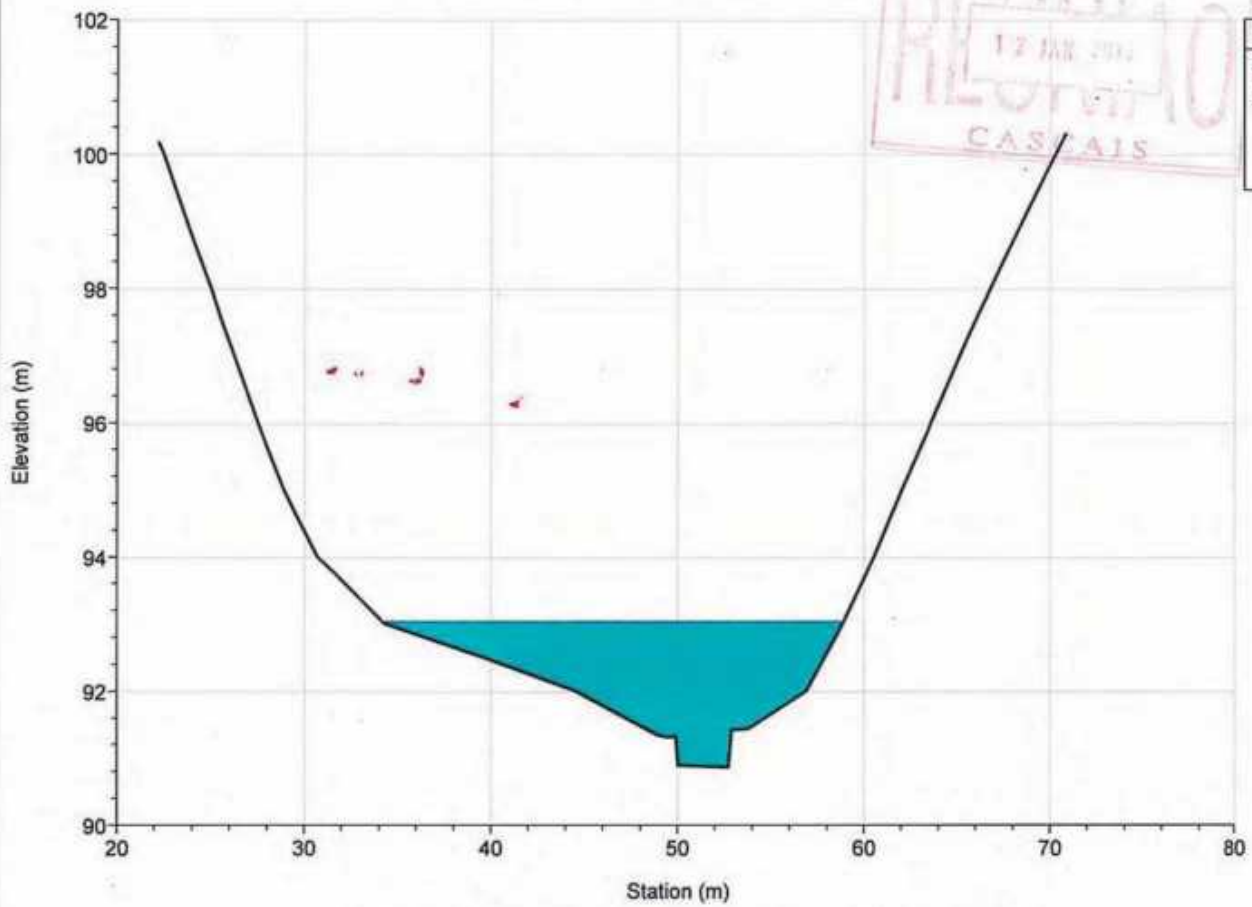
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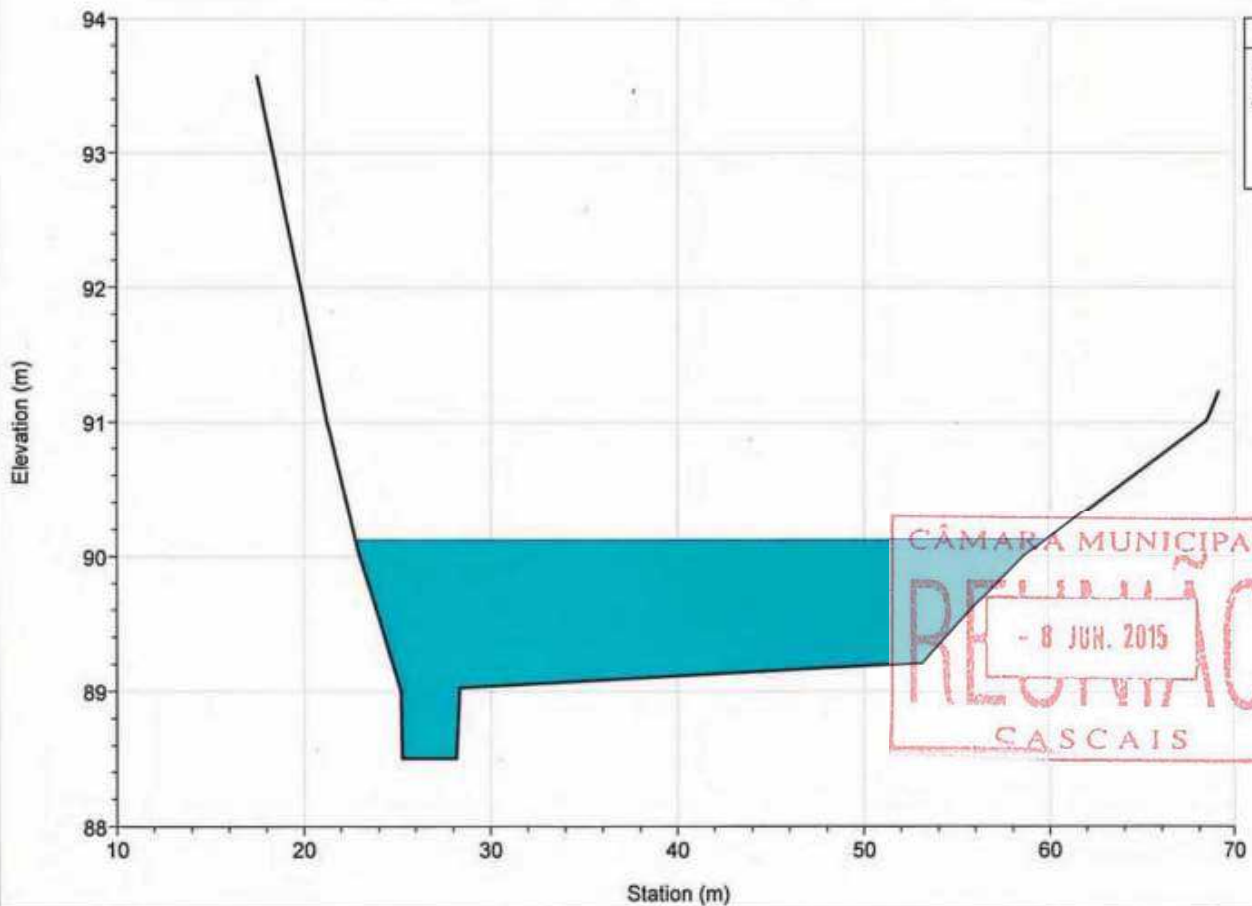
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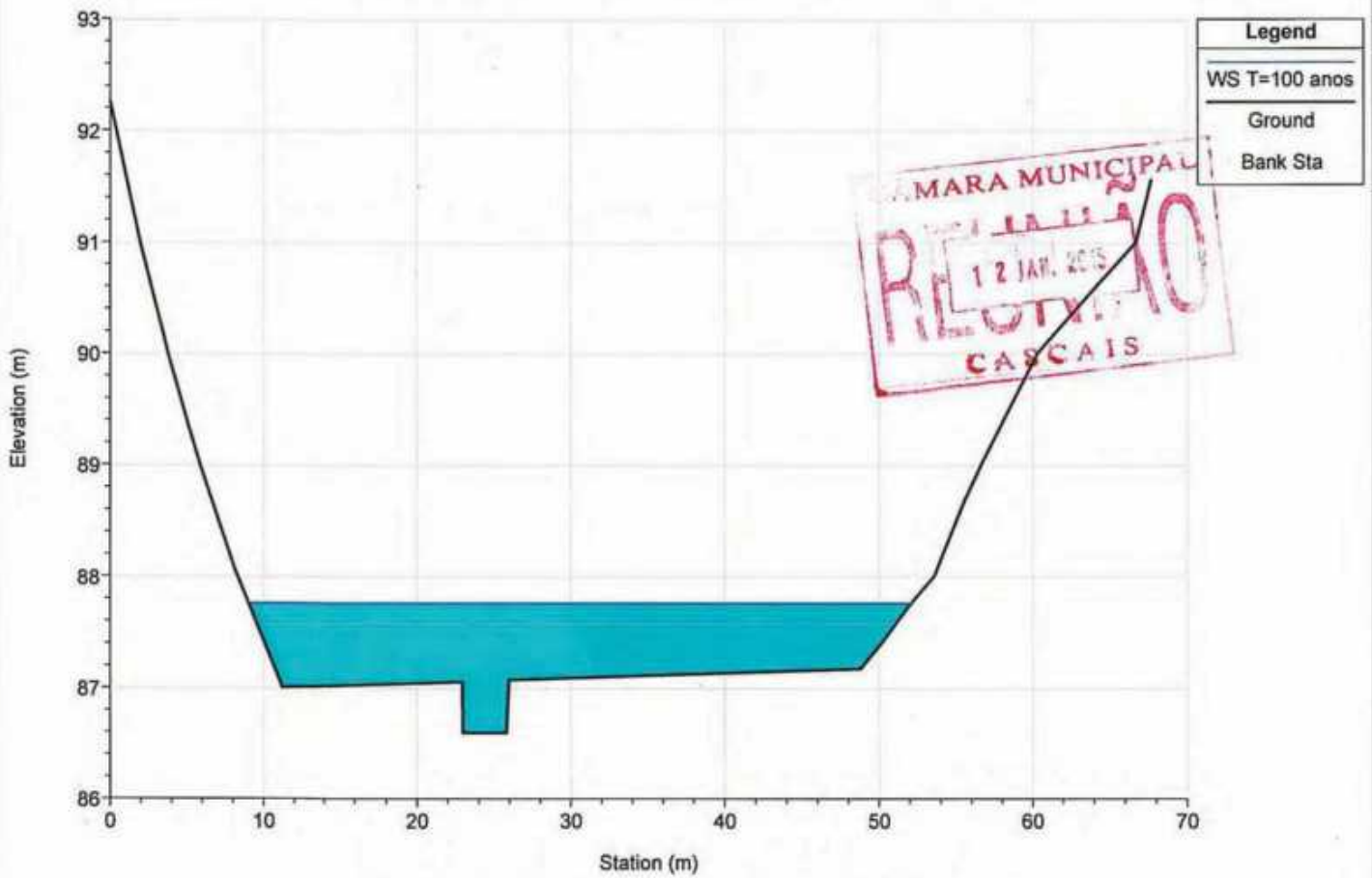
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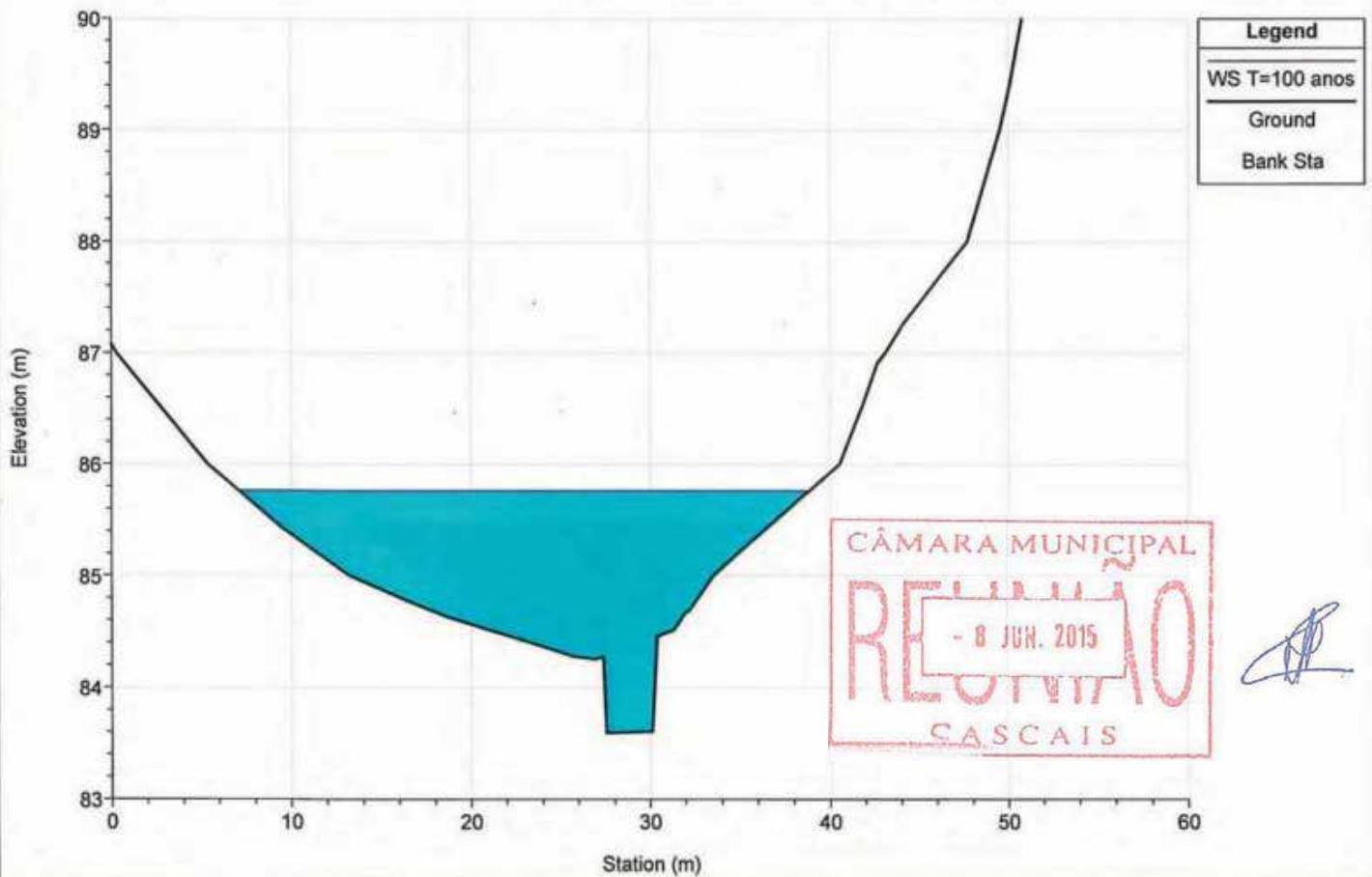
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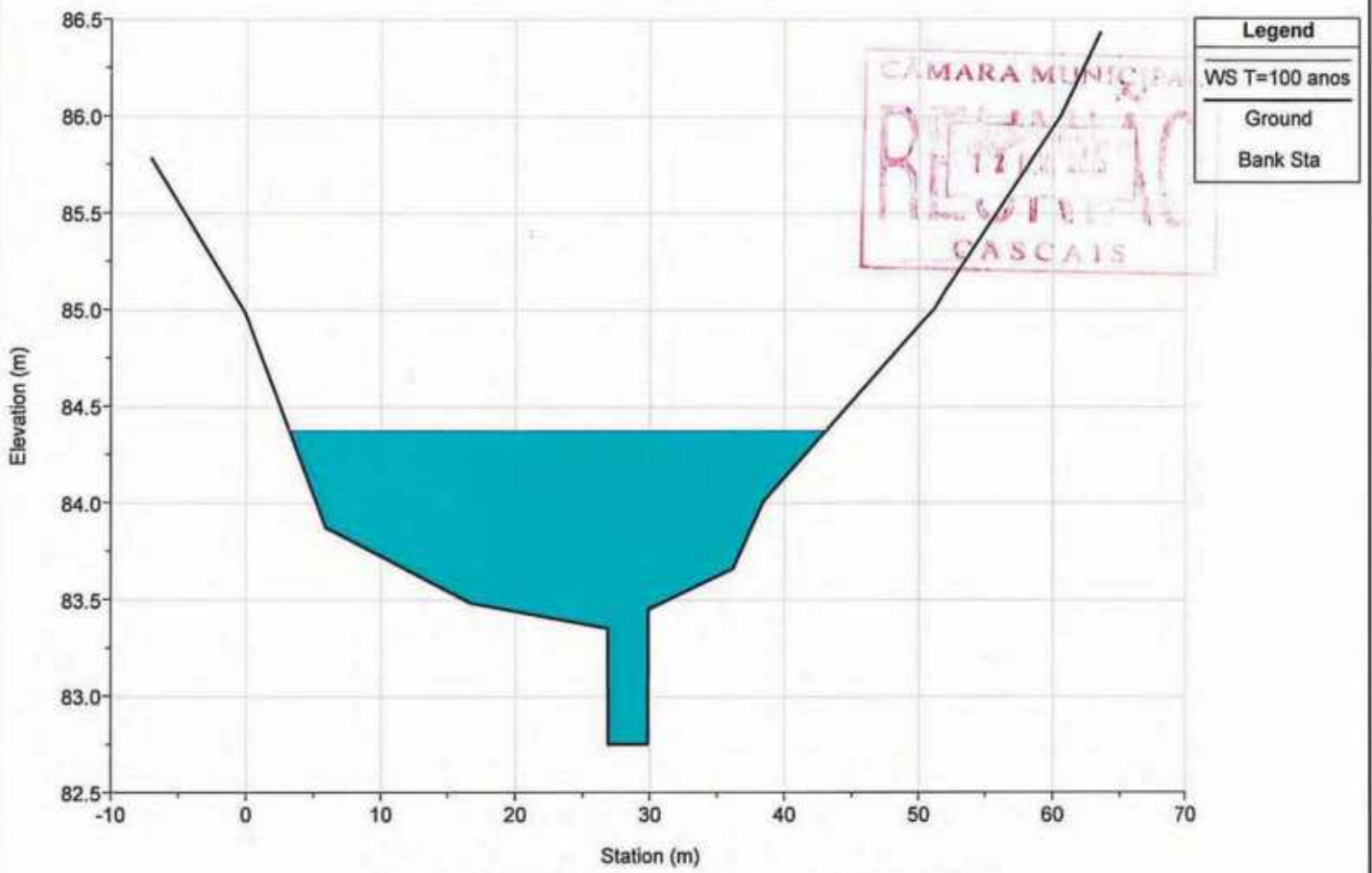
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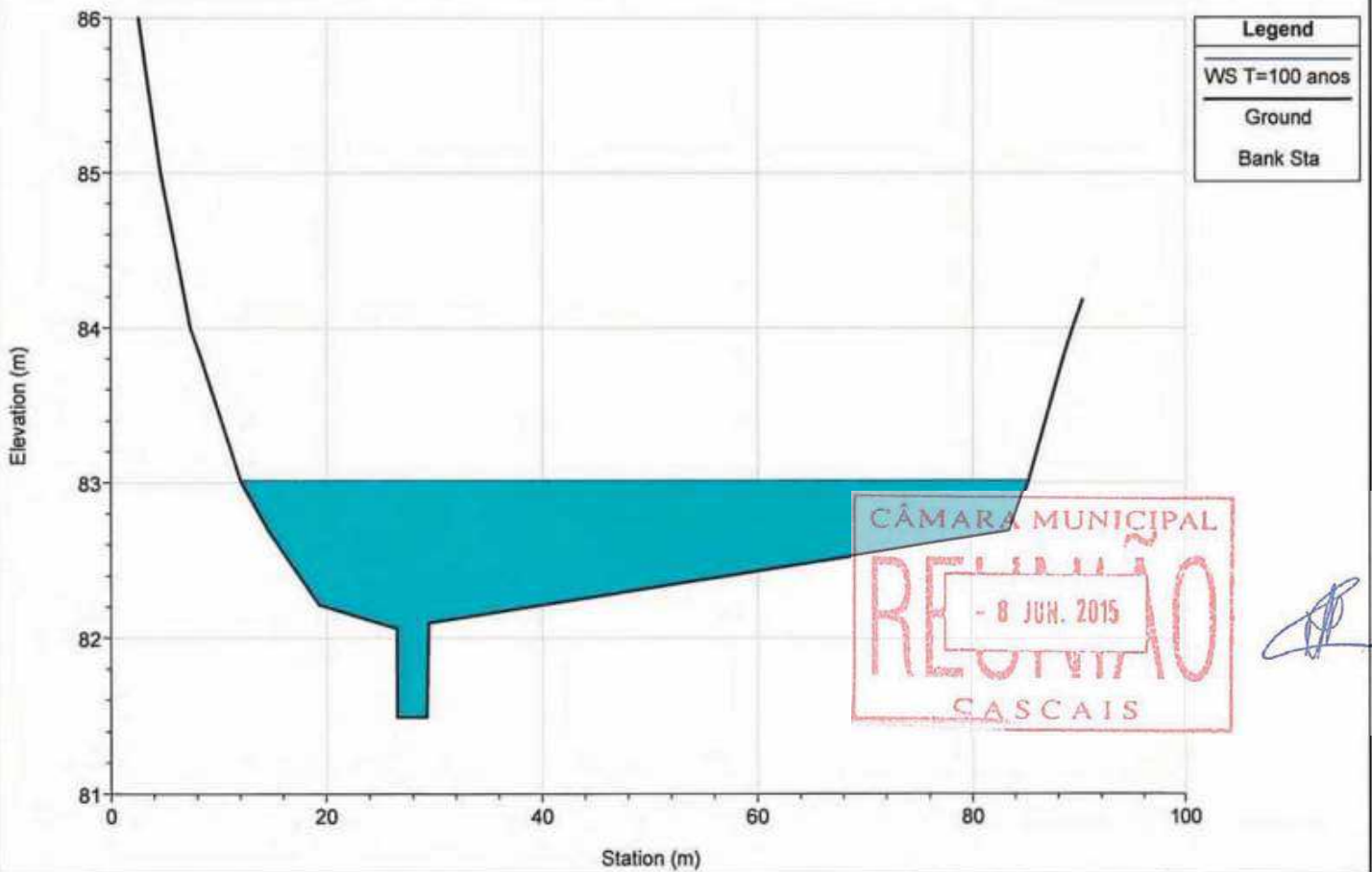
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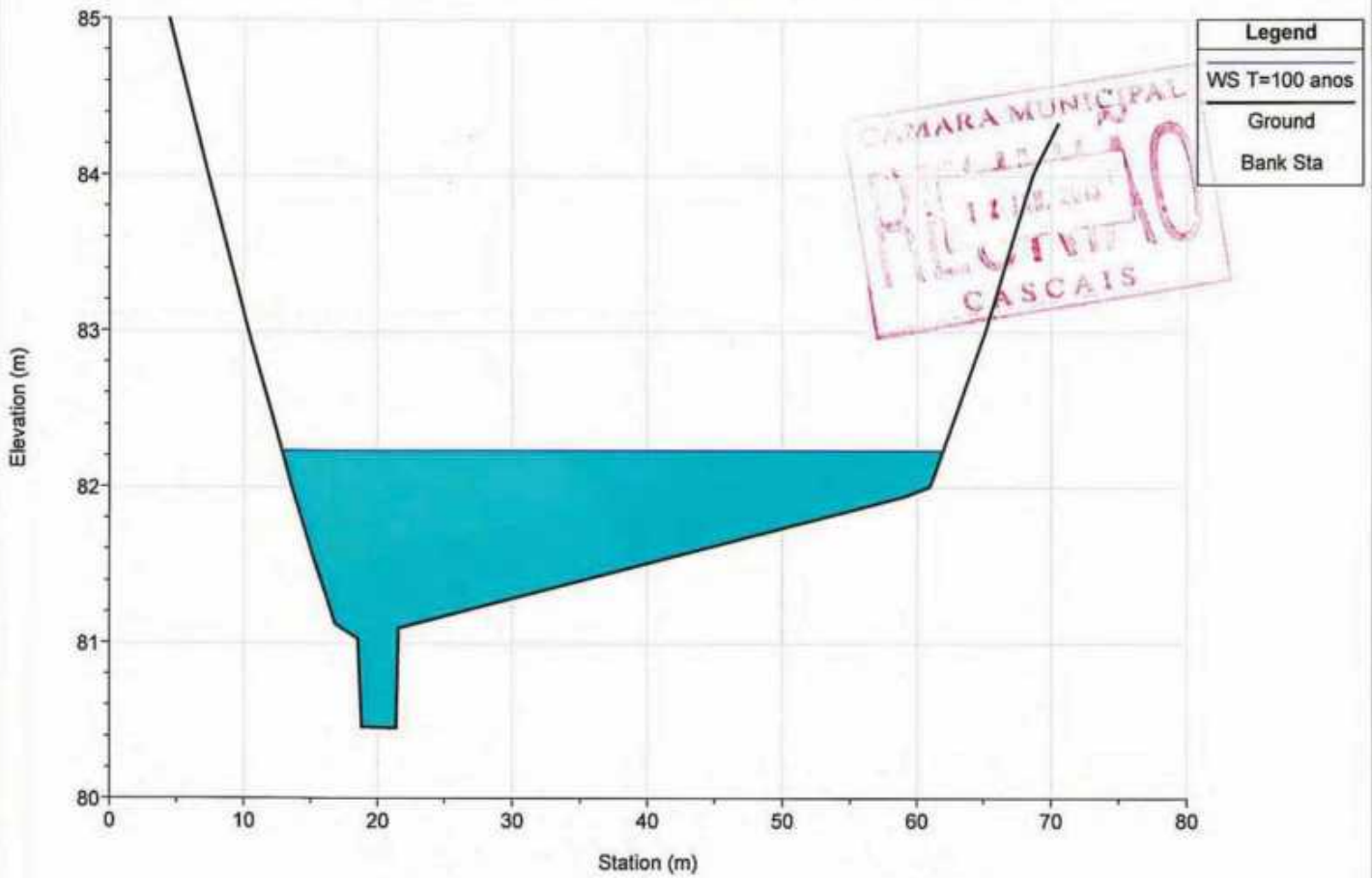
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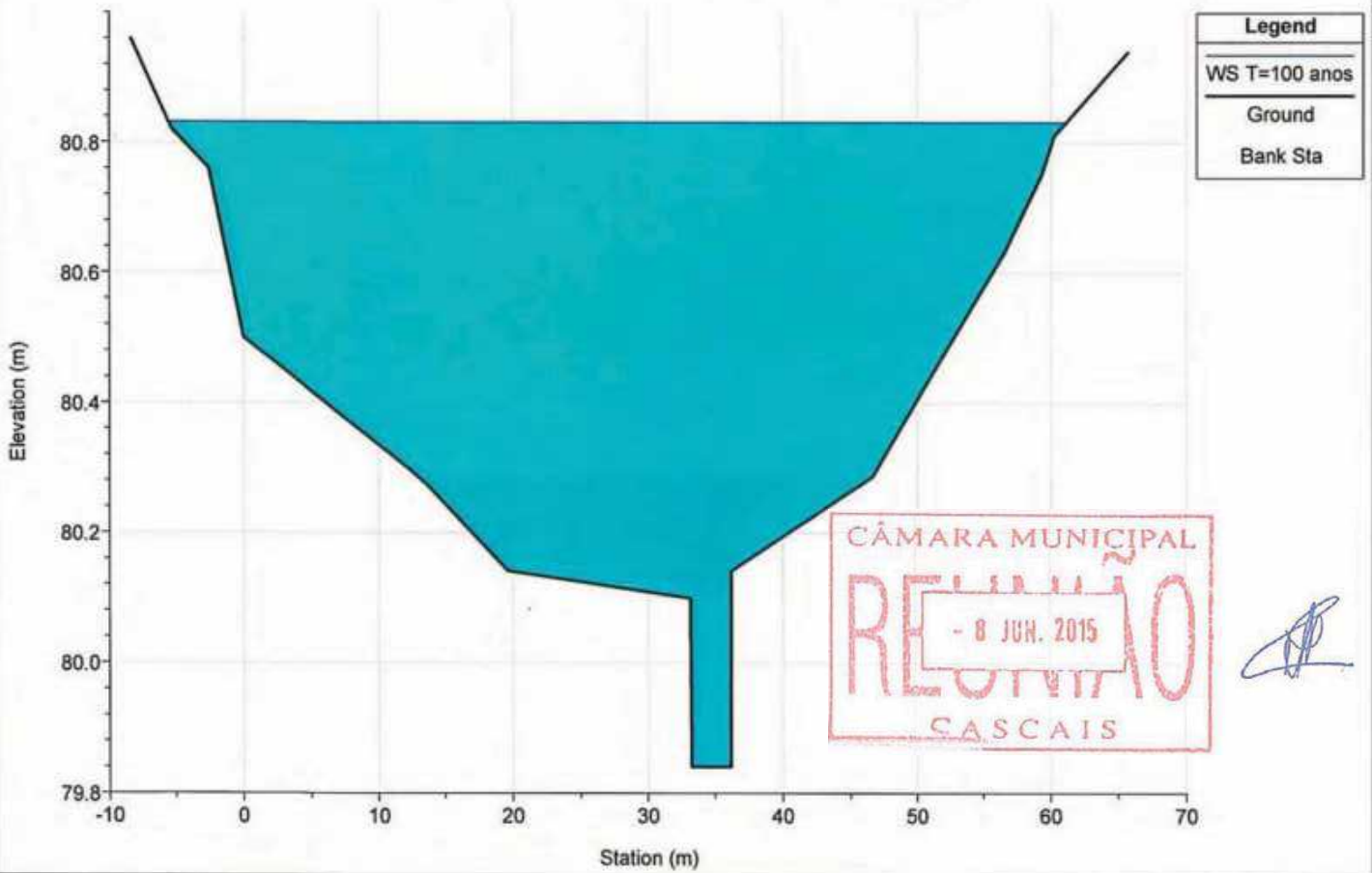
River = VINHAS Reach = interm2 RS = 7078.120



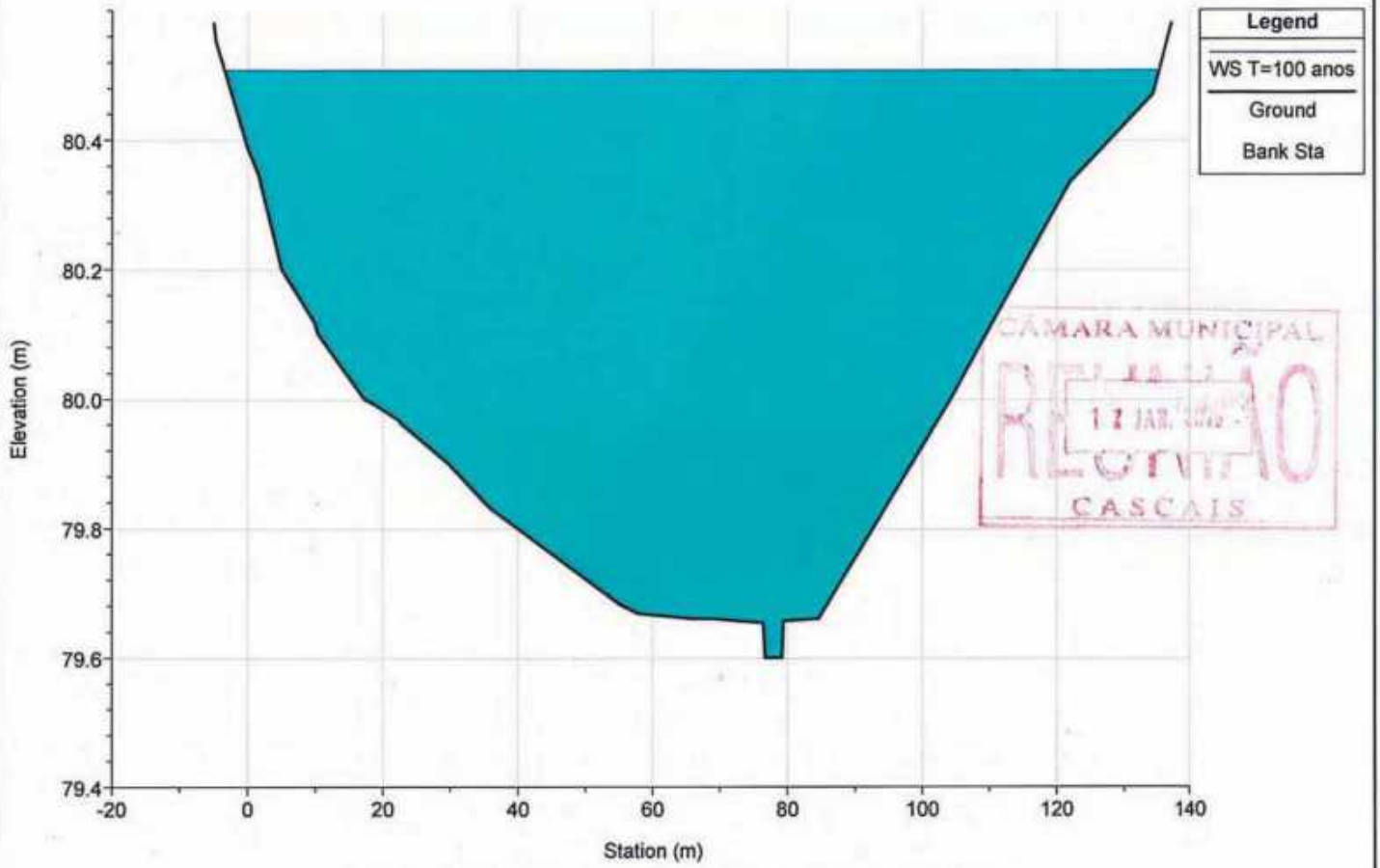
River = VINHAS Reach = interm2 RS = 6998.668



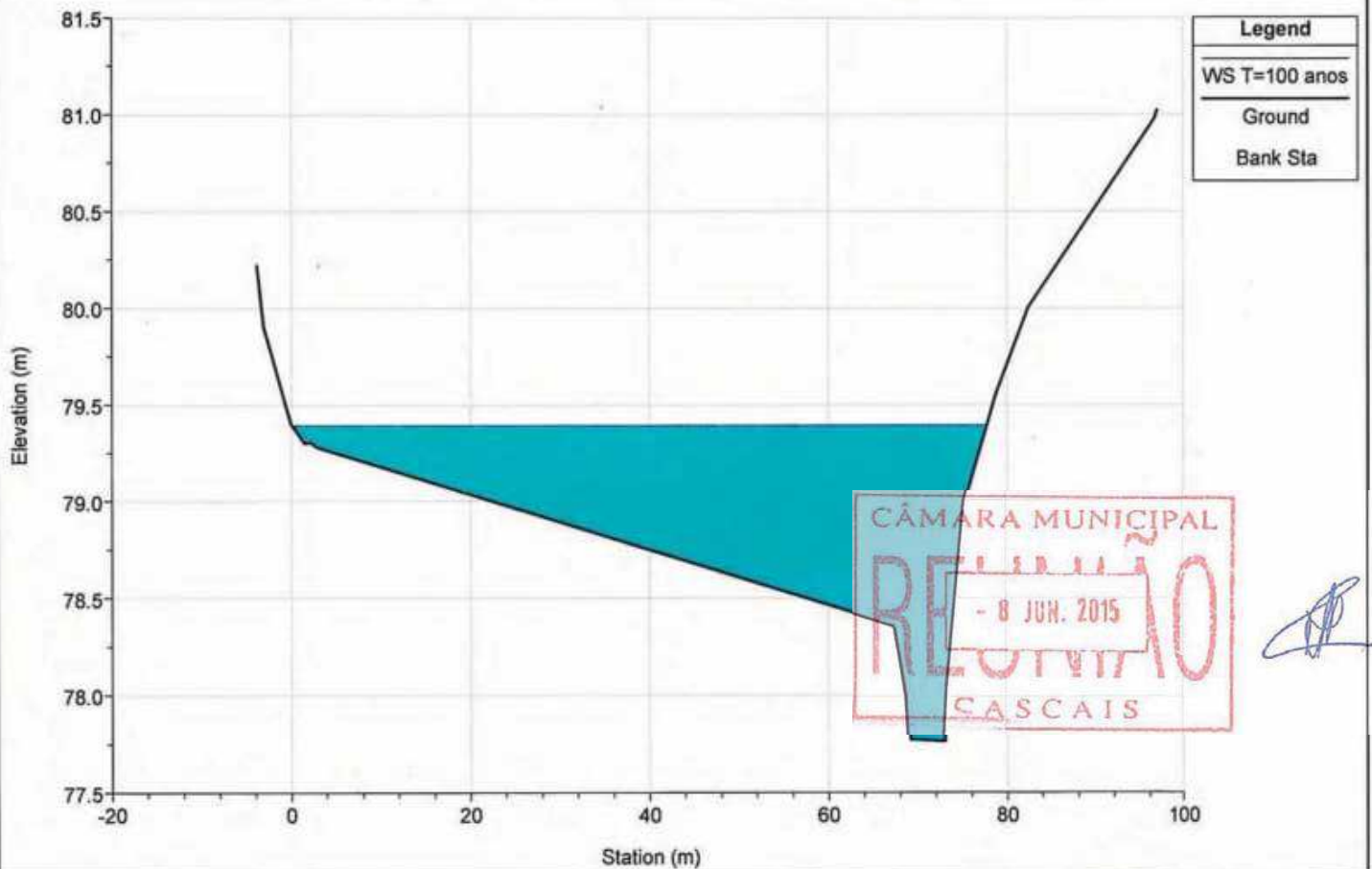
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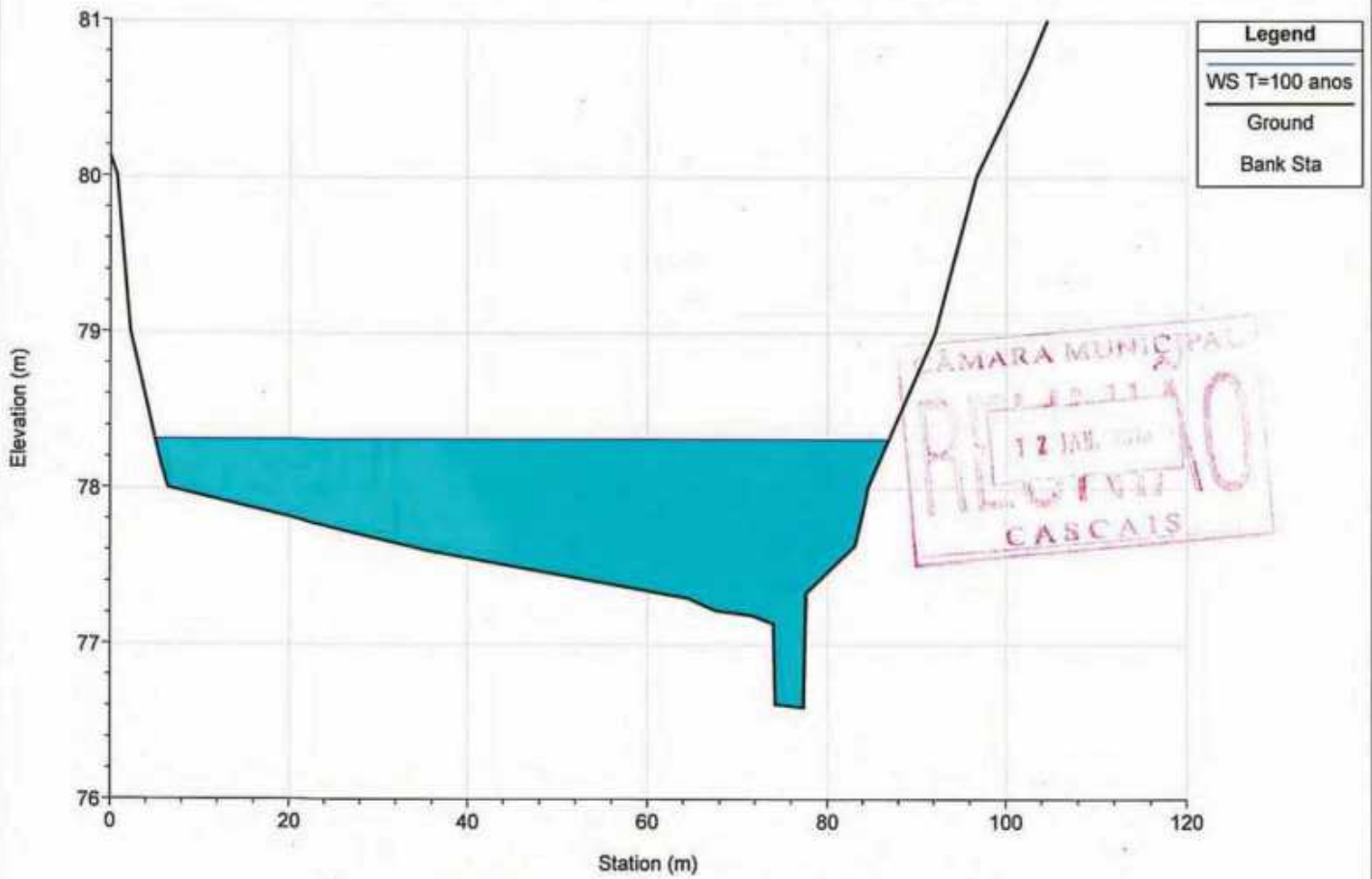
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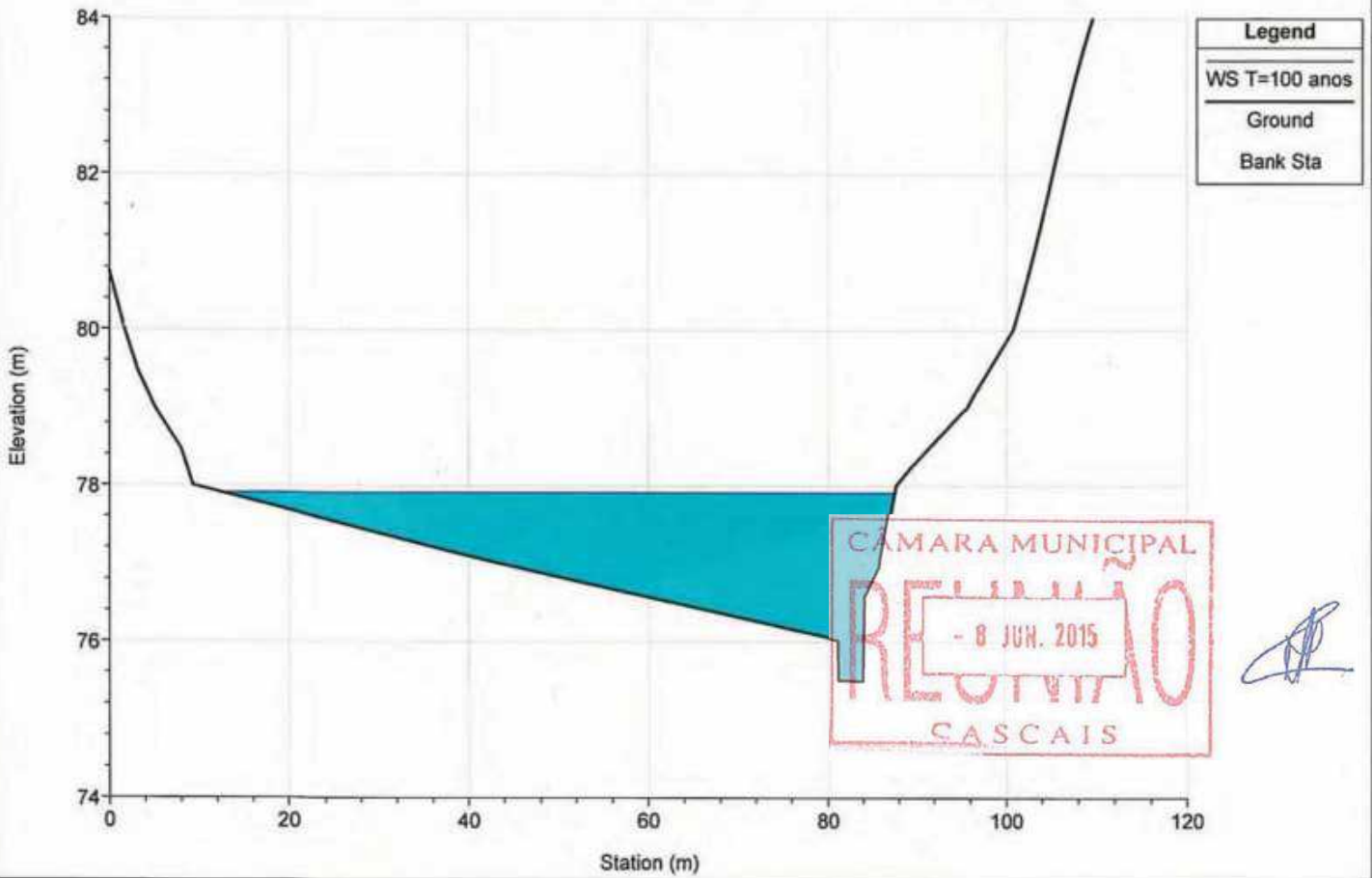
River = VINHAS Reach = interm3 RS = 6707.106



River = VINHAS Reach = interm3 RS = 6586.971

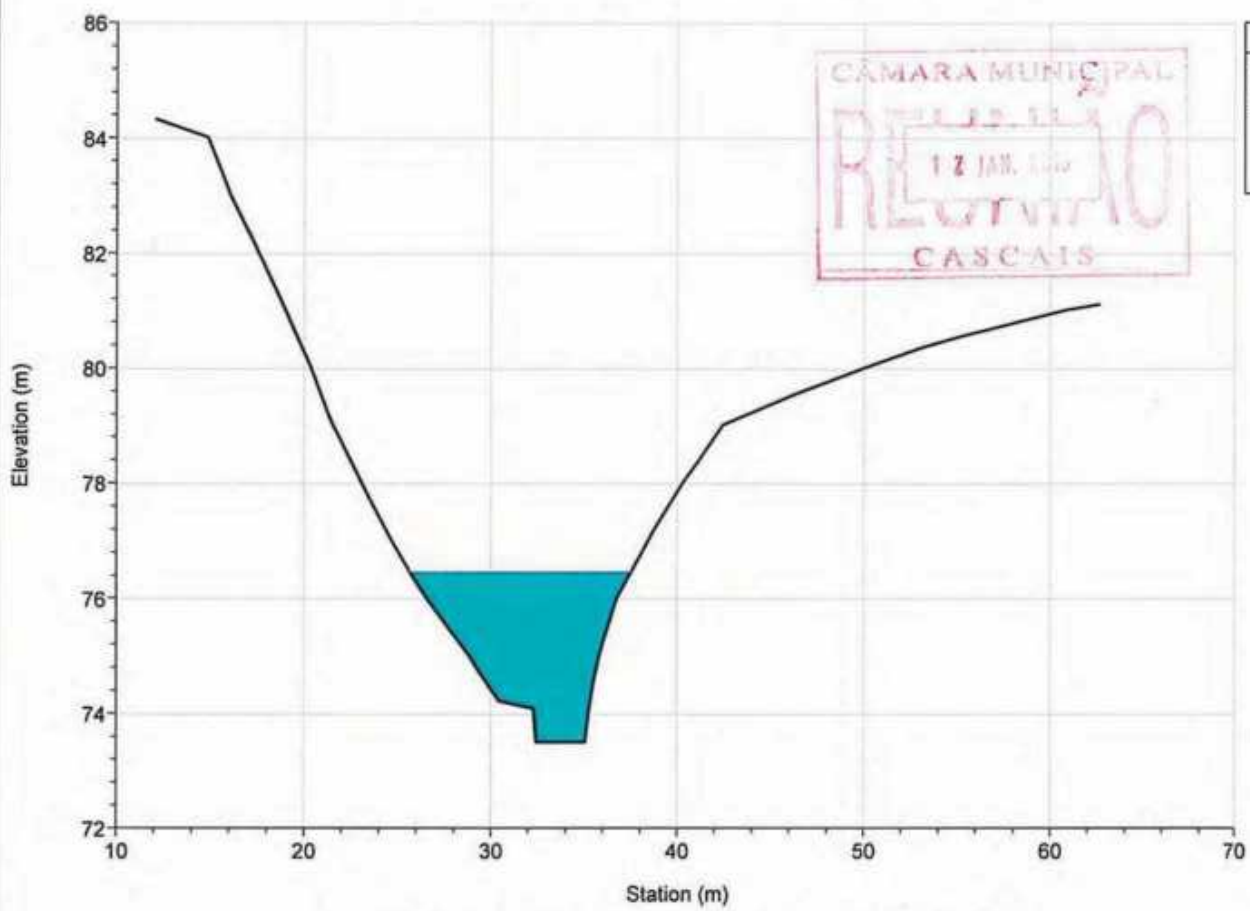


River = VINHAS Reach = interm3 RS = 6441.623

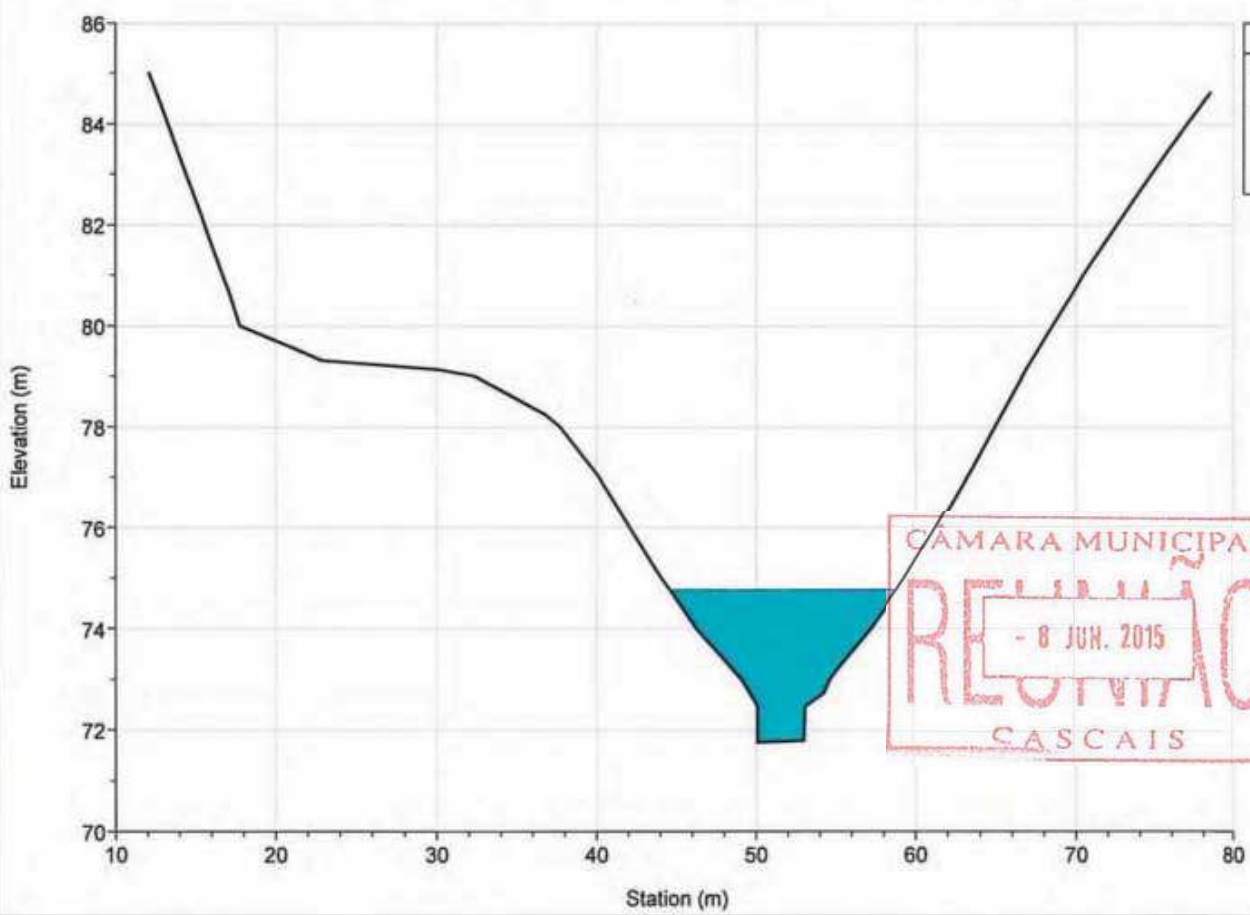




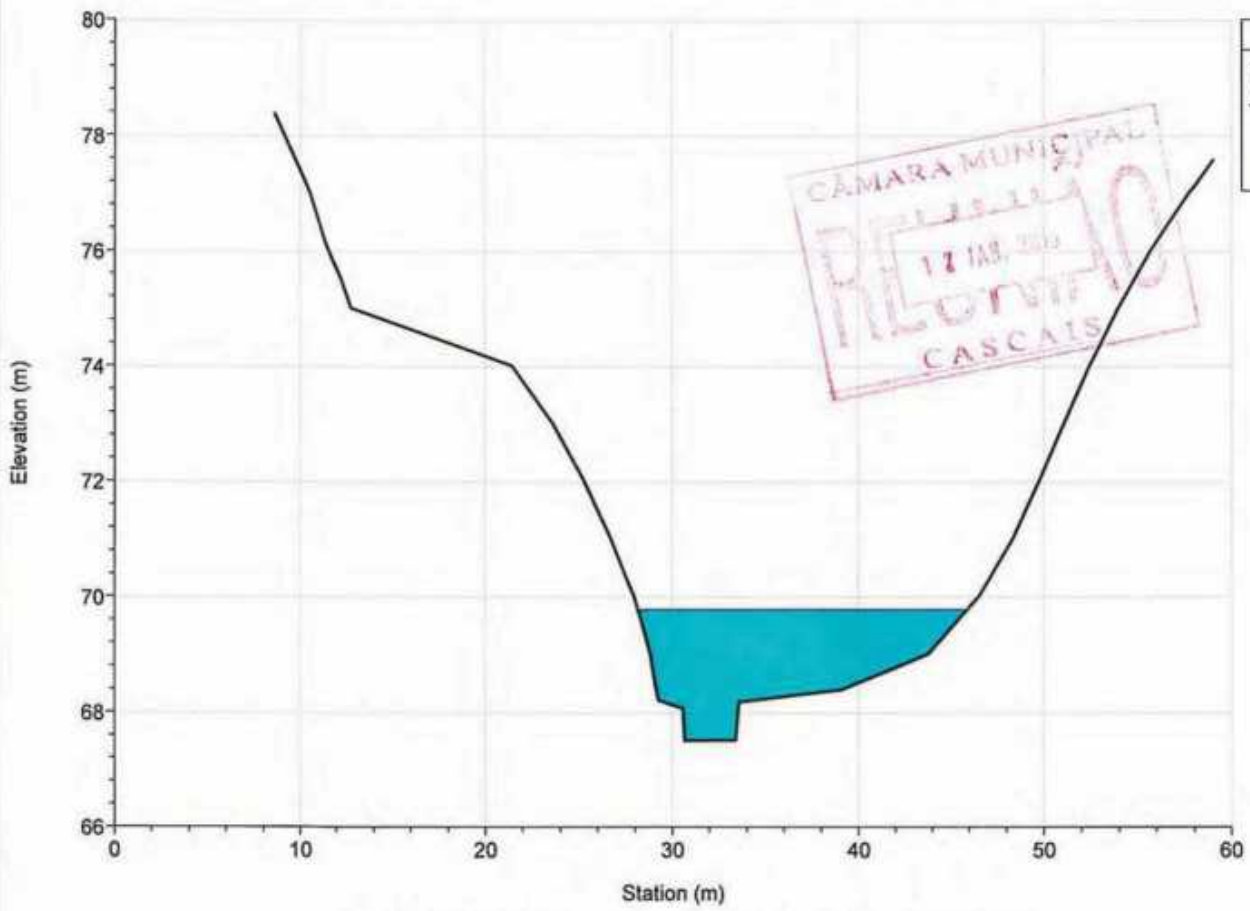
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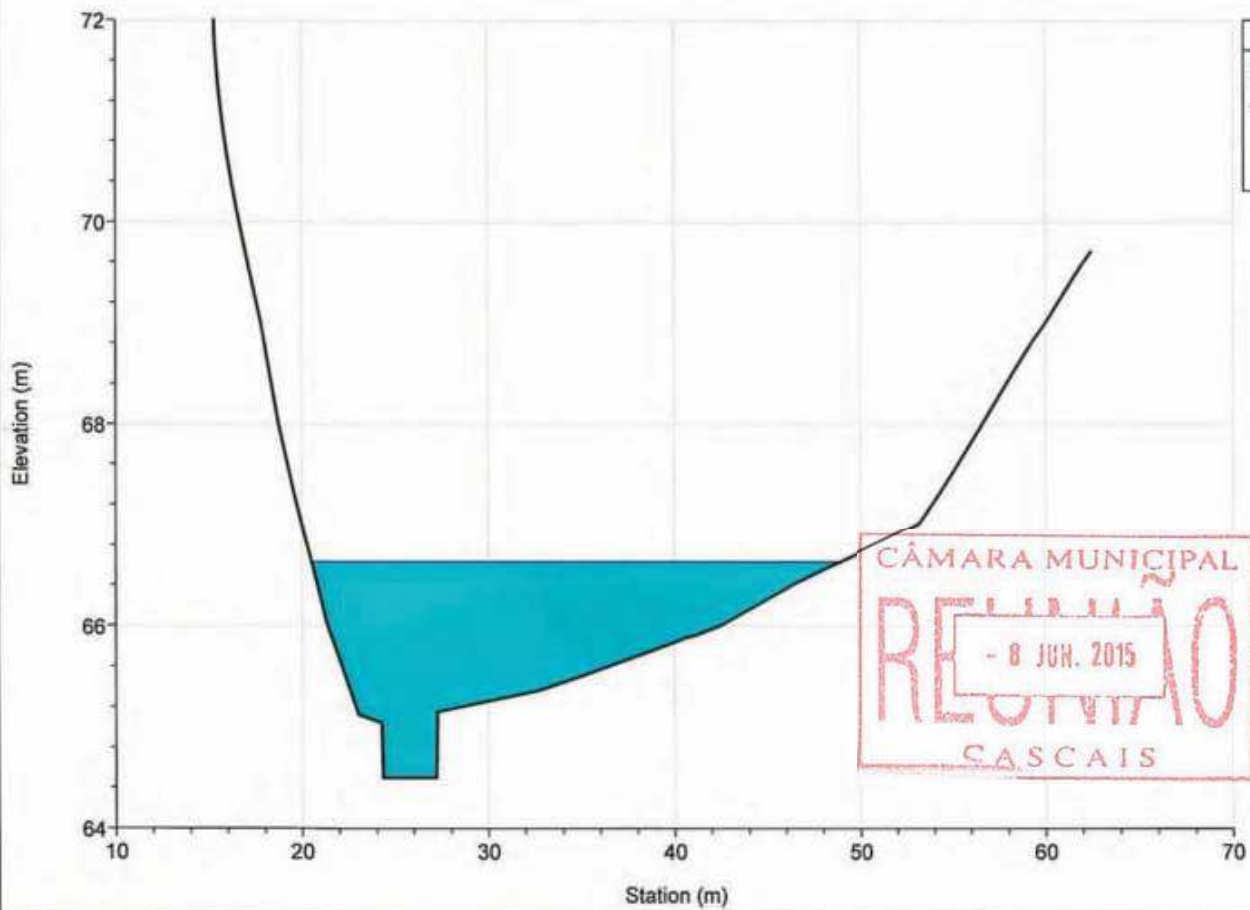
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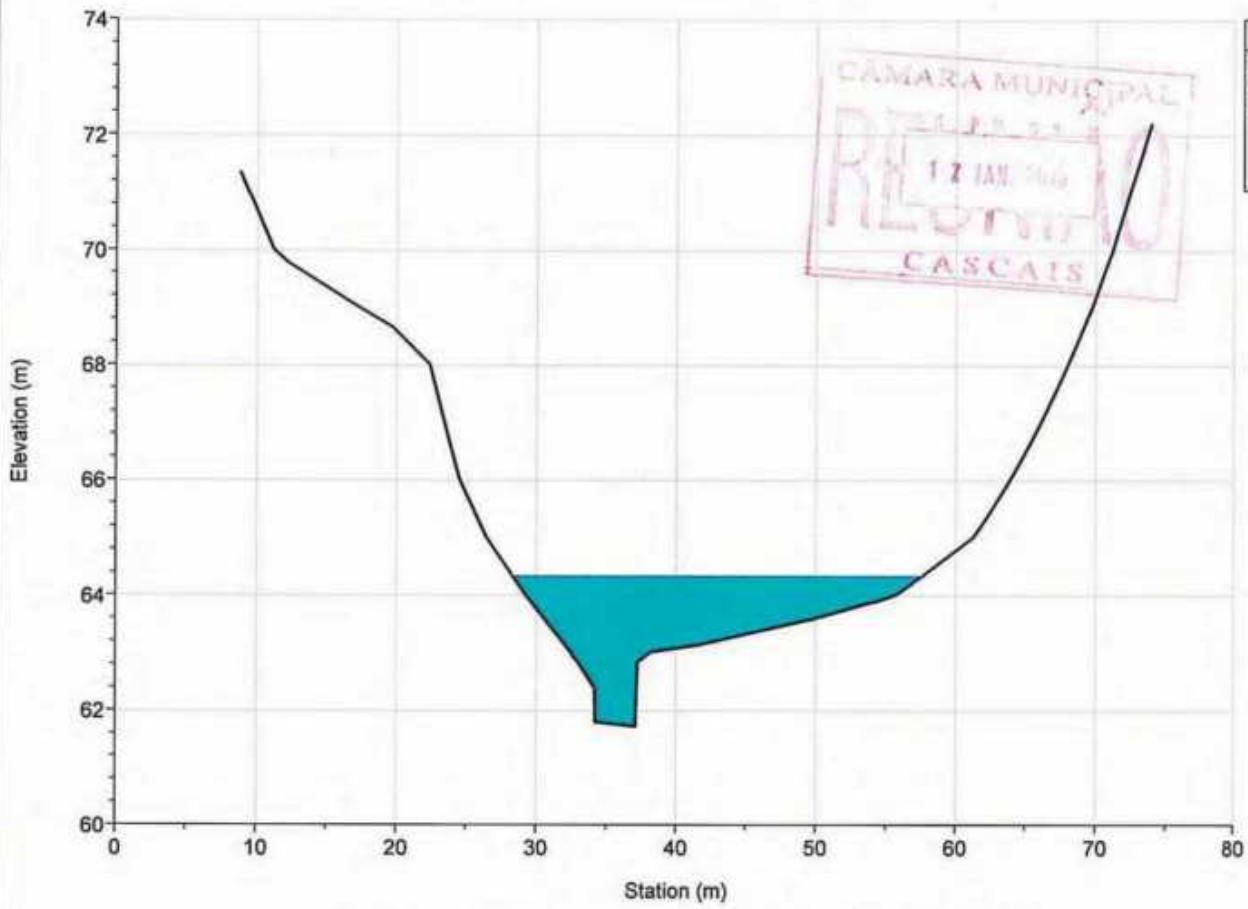
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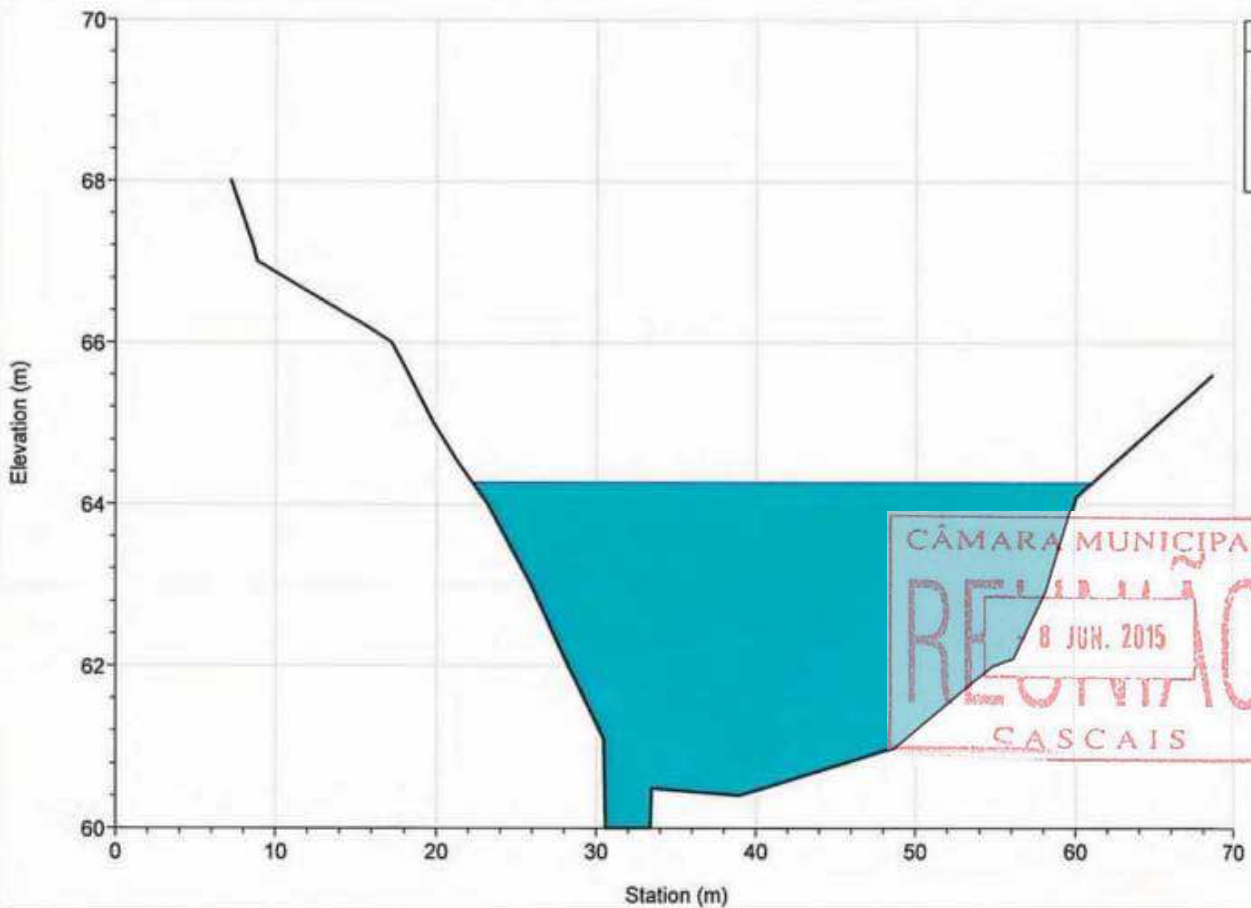
River = VINHAS Reach = interm3 RS = 5953.667



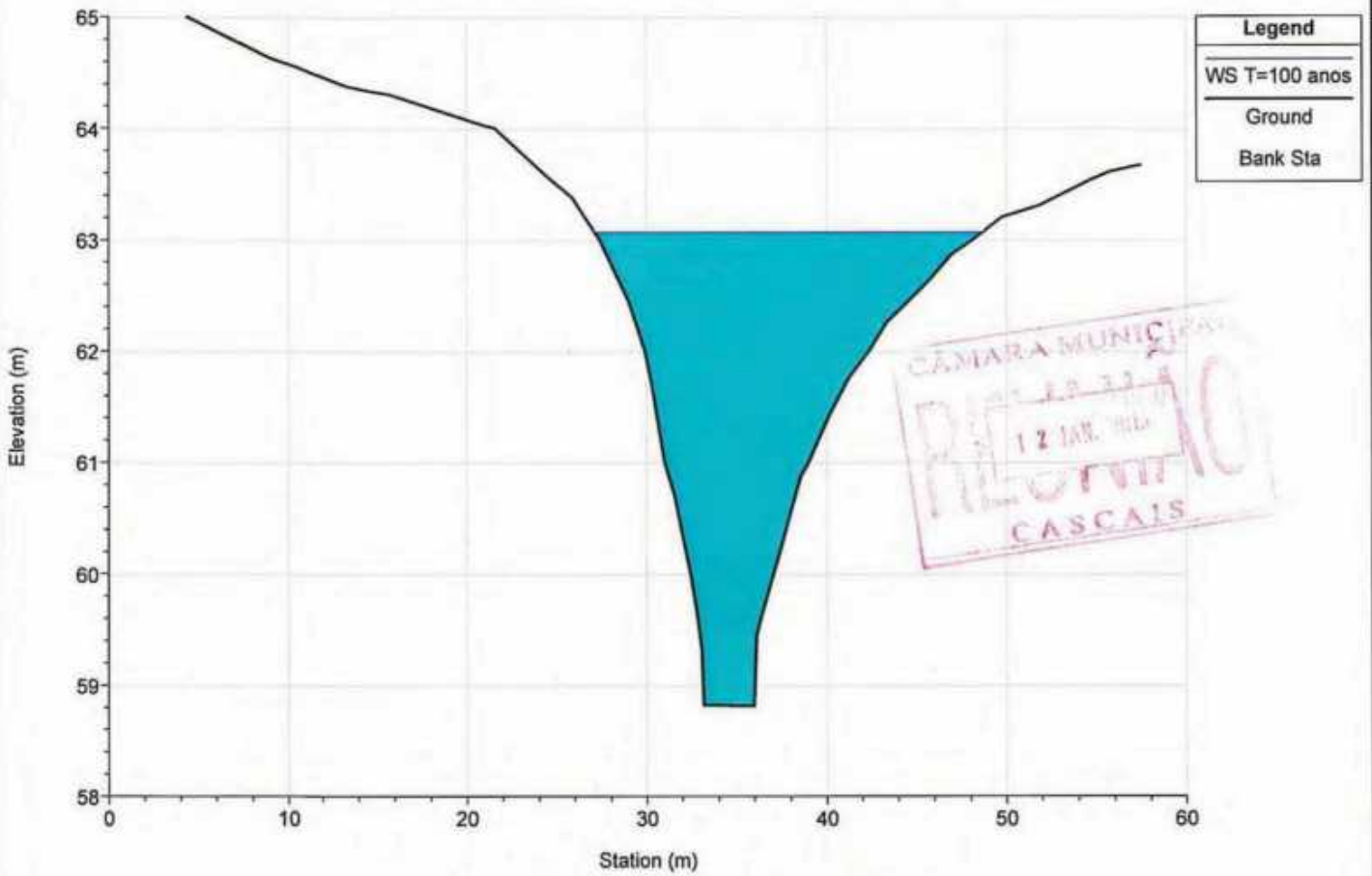
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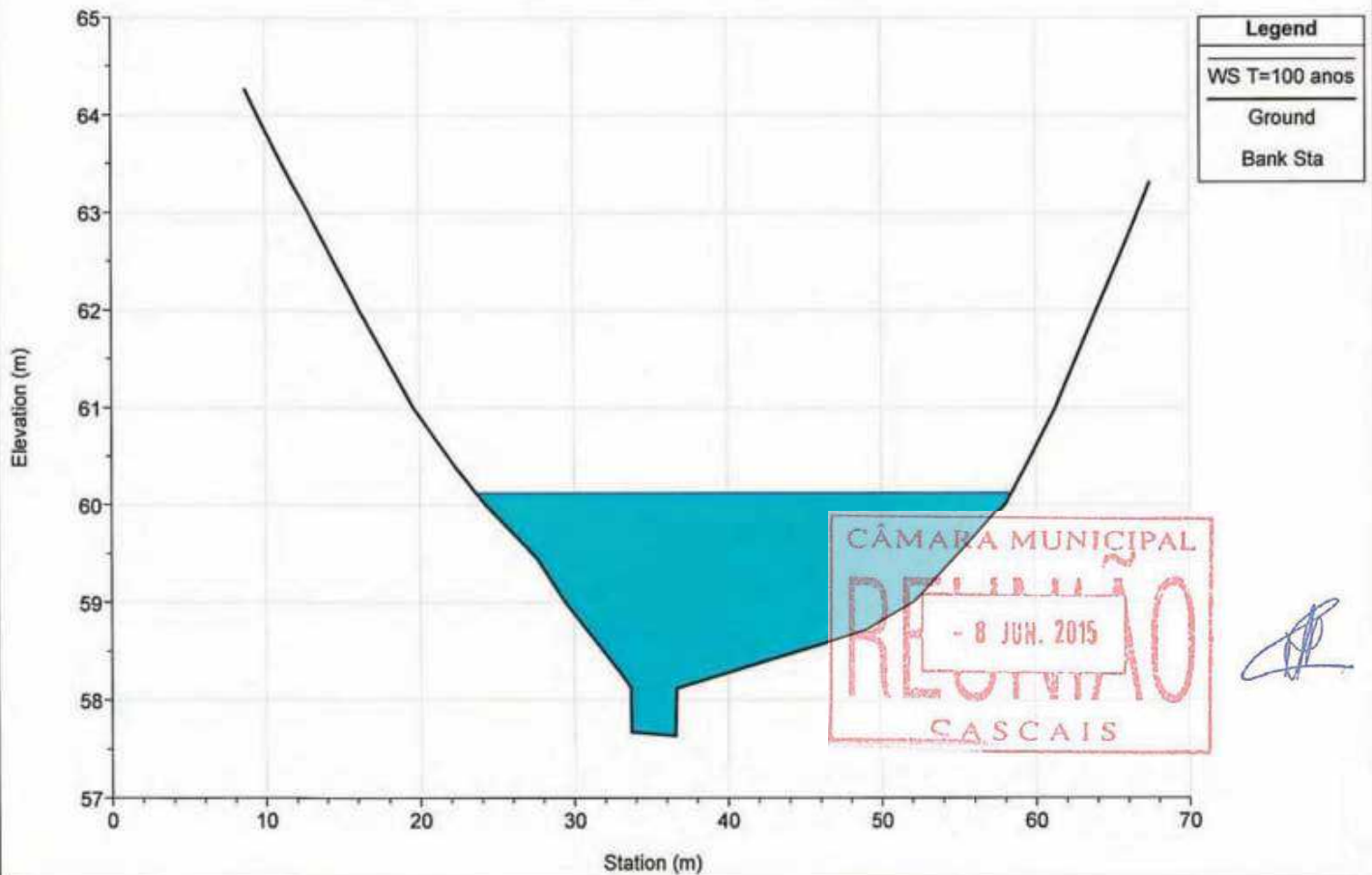
River = VINHAS Reach = interm3 RS = 5765.737



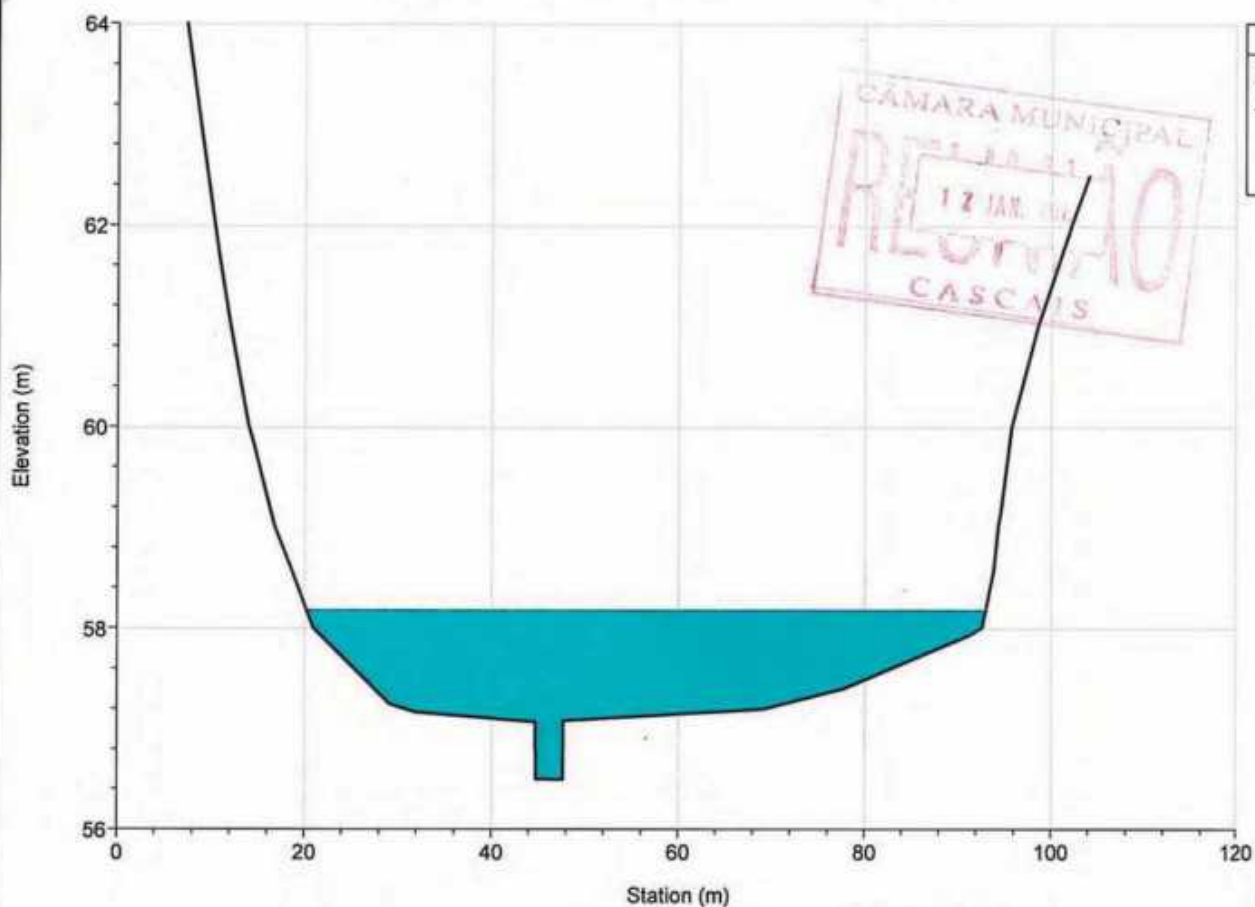
River = VINHAS Reach = jusante RS = 5718.660



River = VINHAS Reach = jusante RS = 5603.786

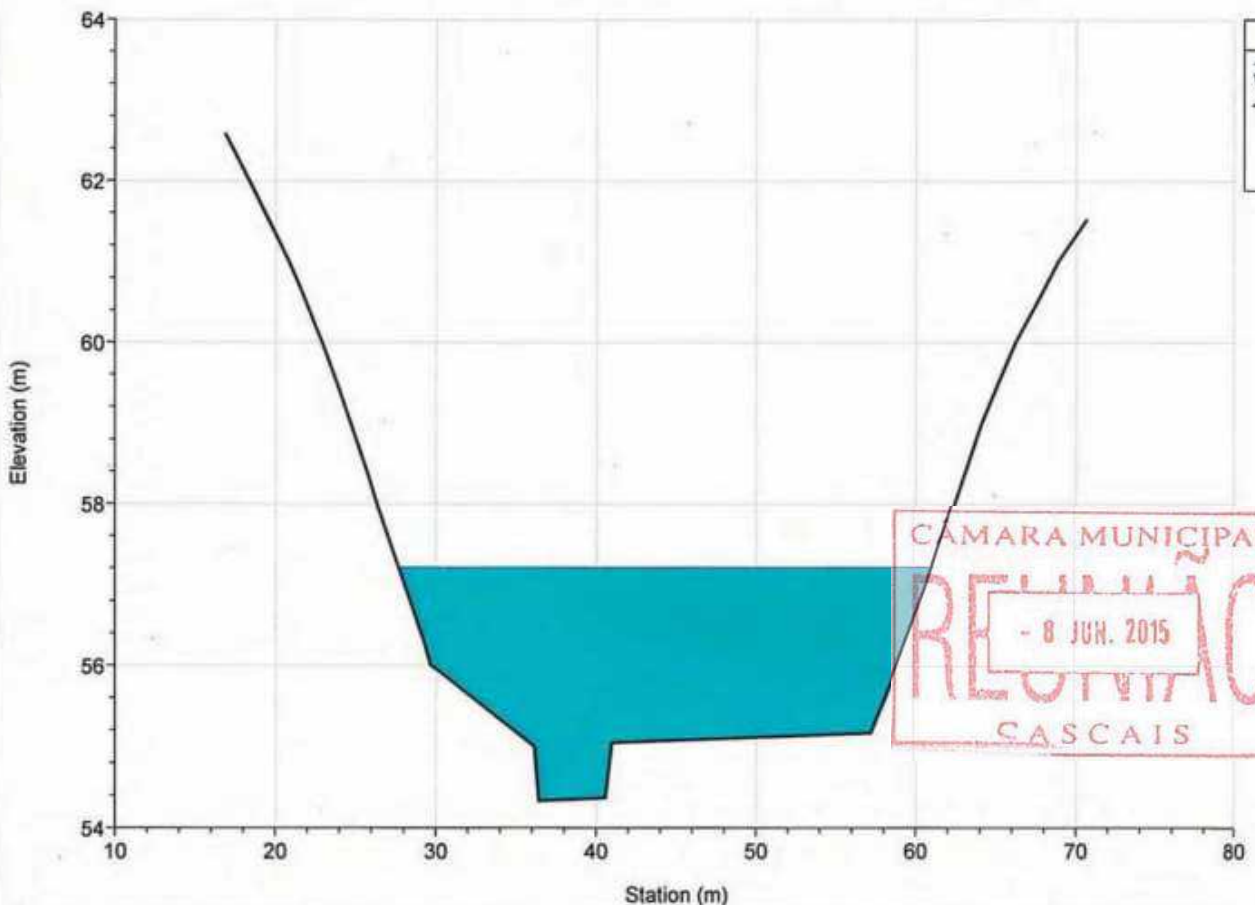


River = VINHAS Reach = jusante RS = 5427.976



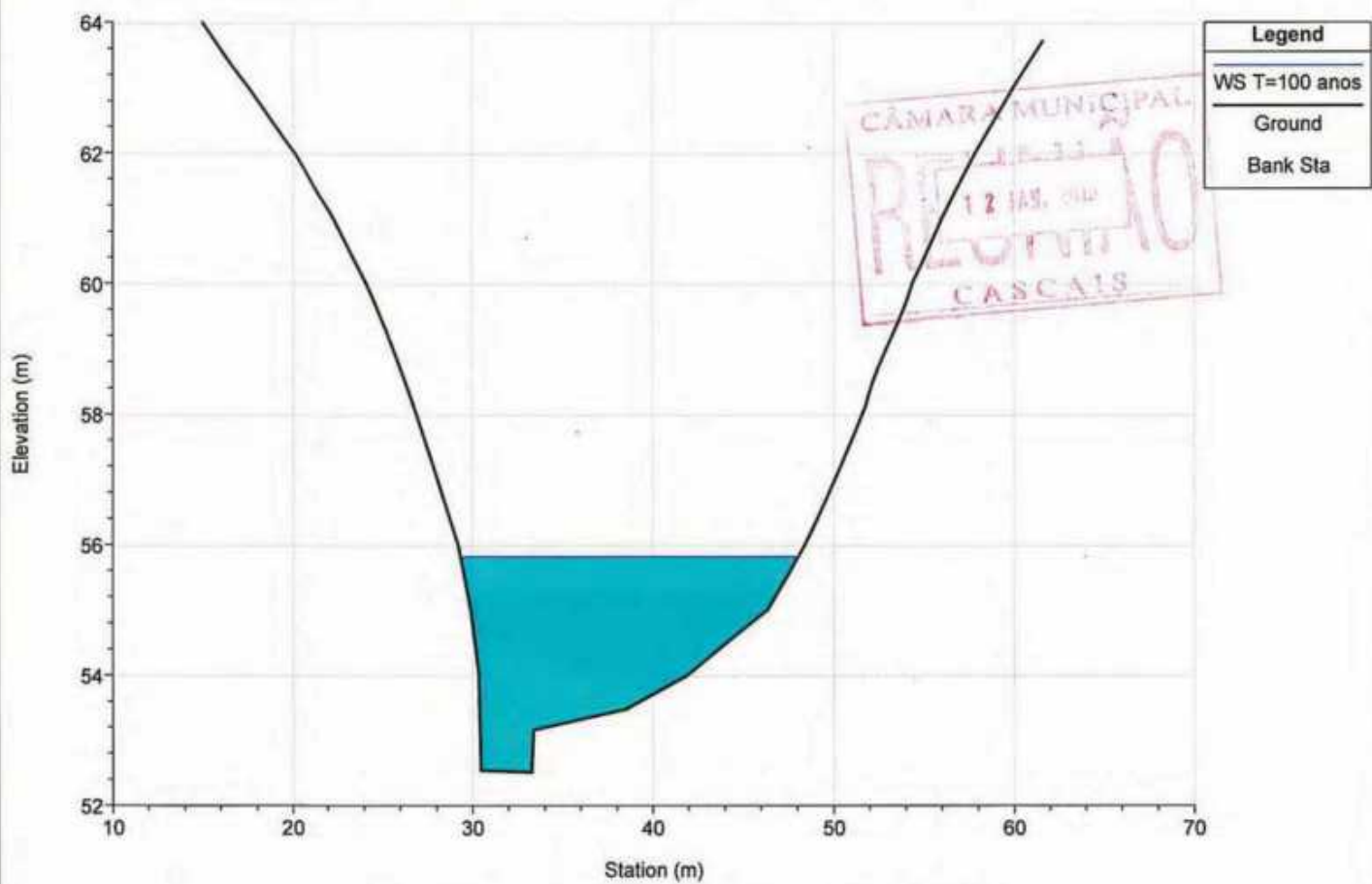
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12 JAN. 2015  
CASCAIS

River = VINHAS Reach = jusante RS = 5279.666

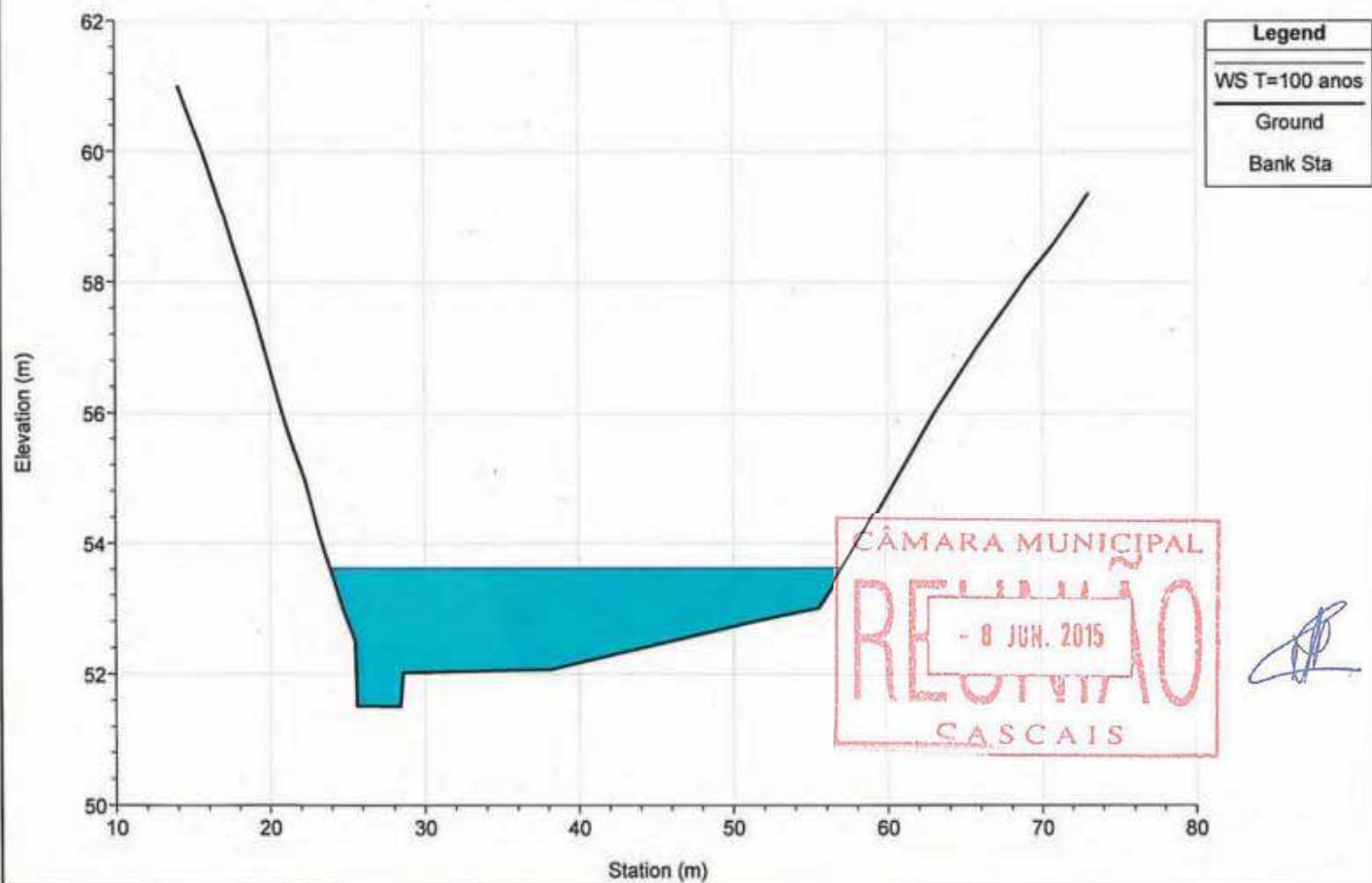


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RECEBIMOS  
- 8 JUN. 2015  
CASCAIS

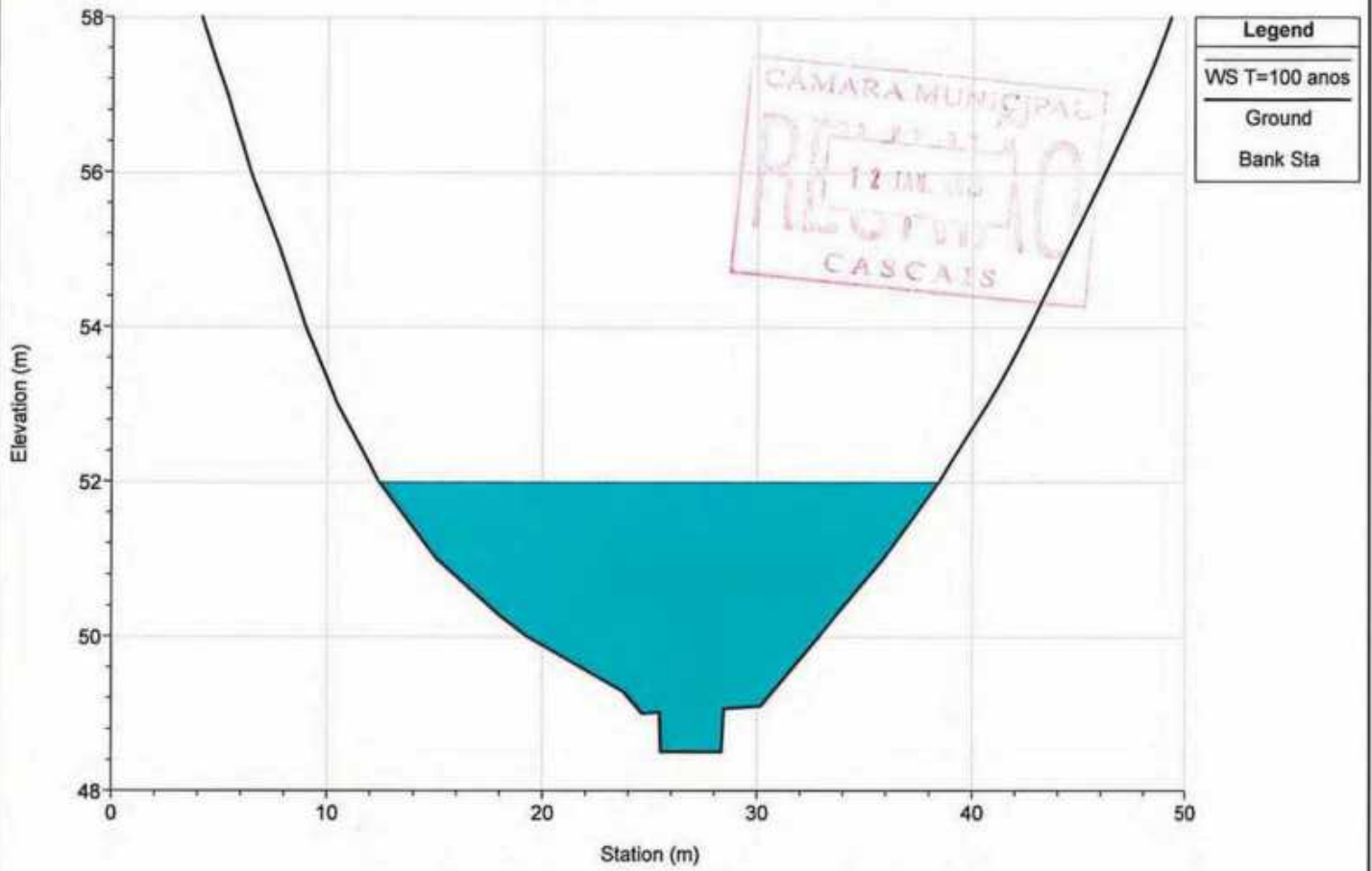
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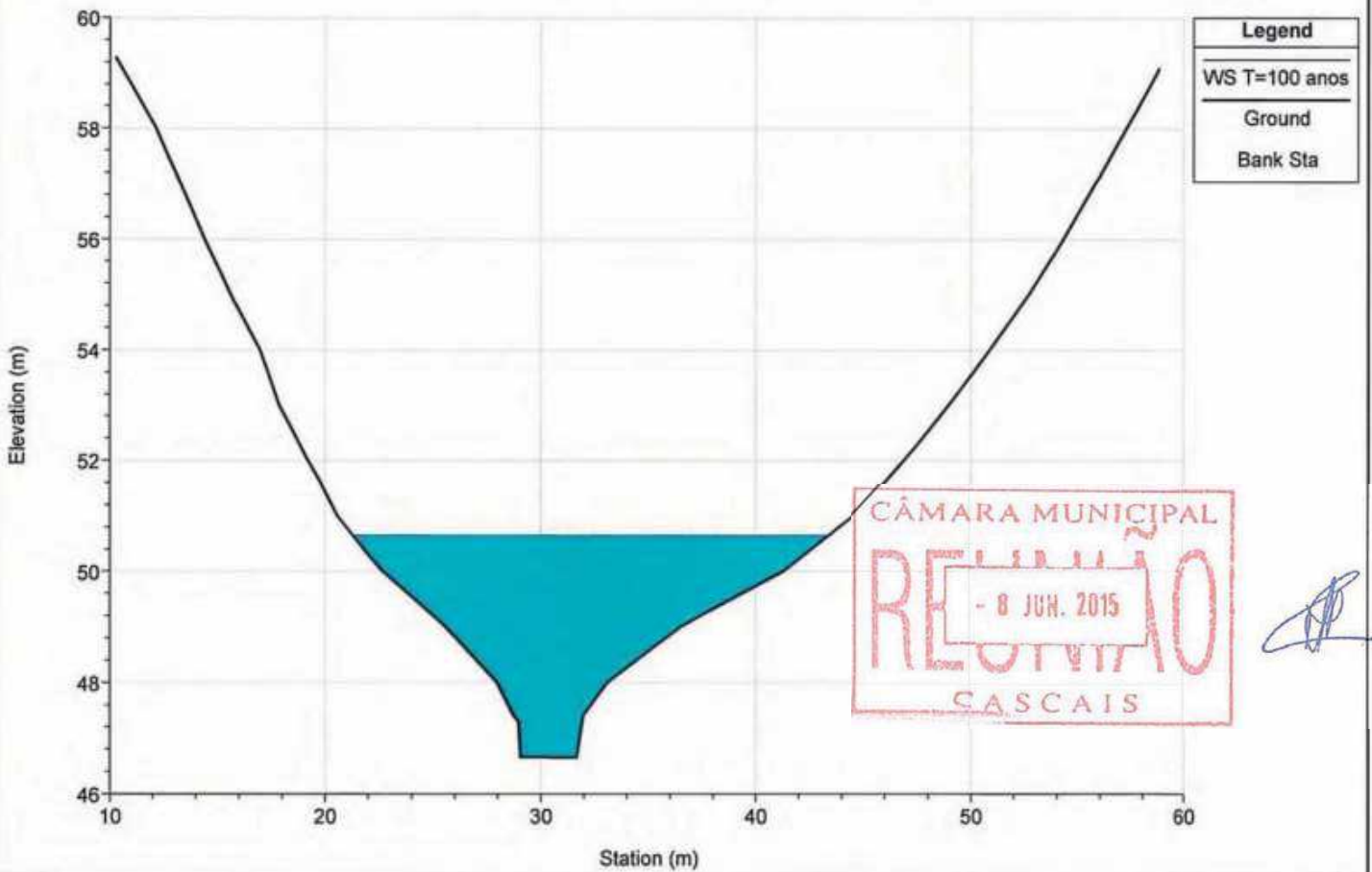
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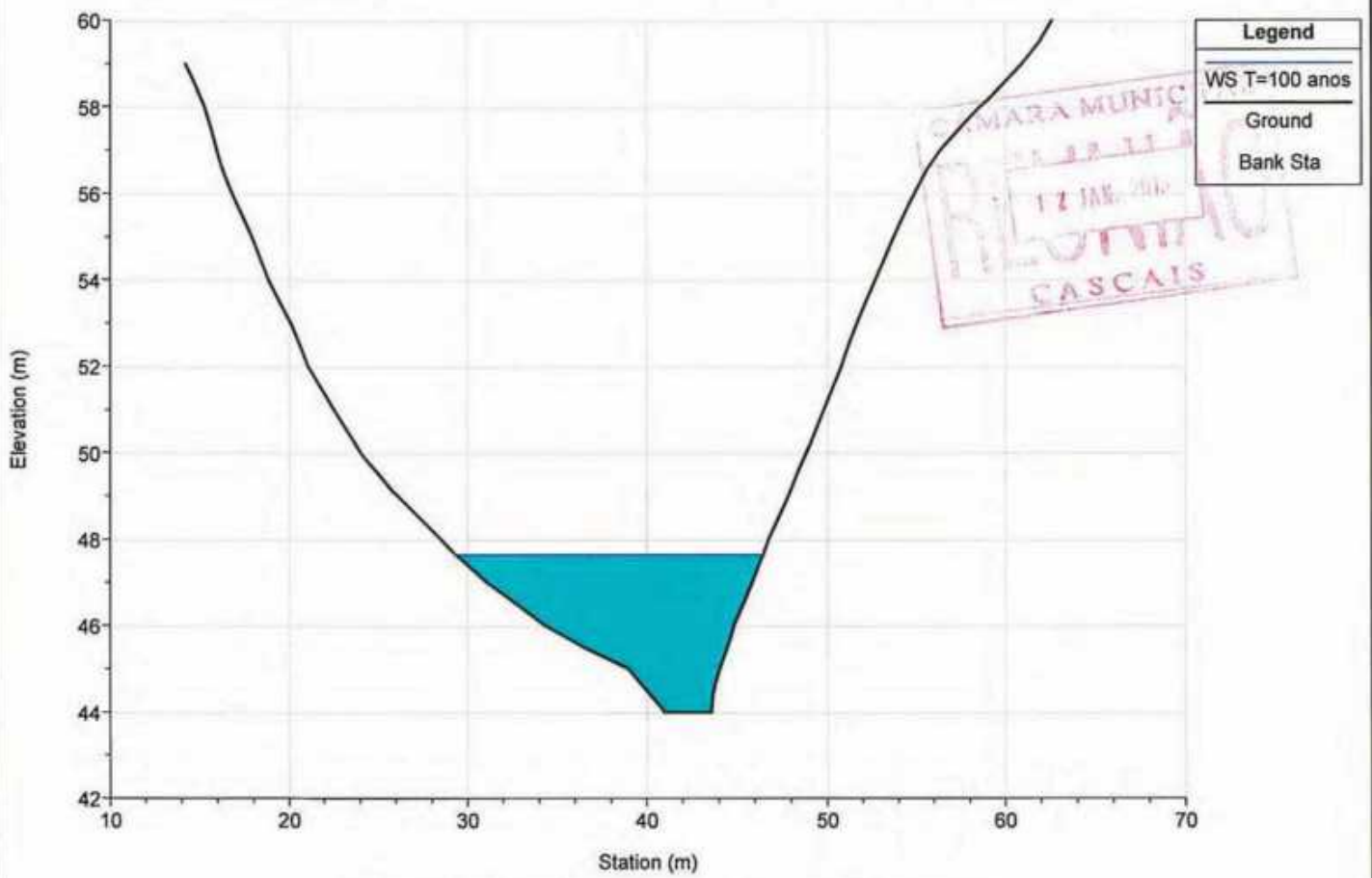
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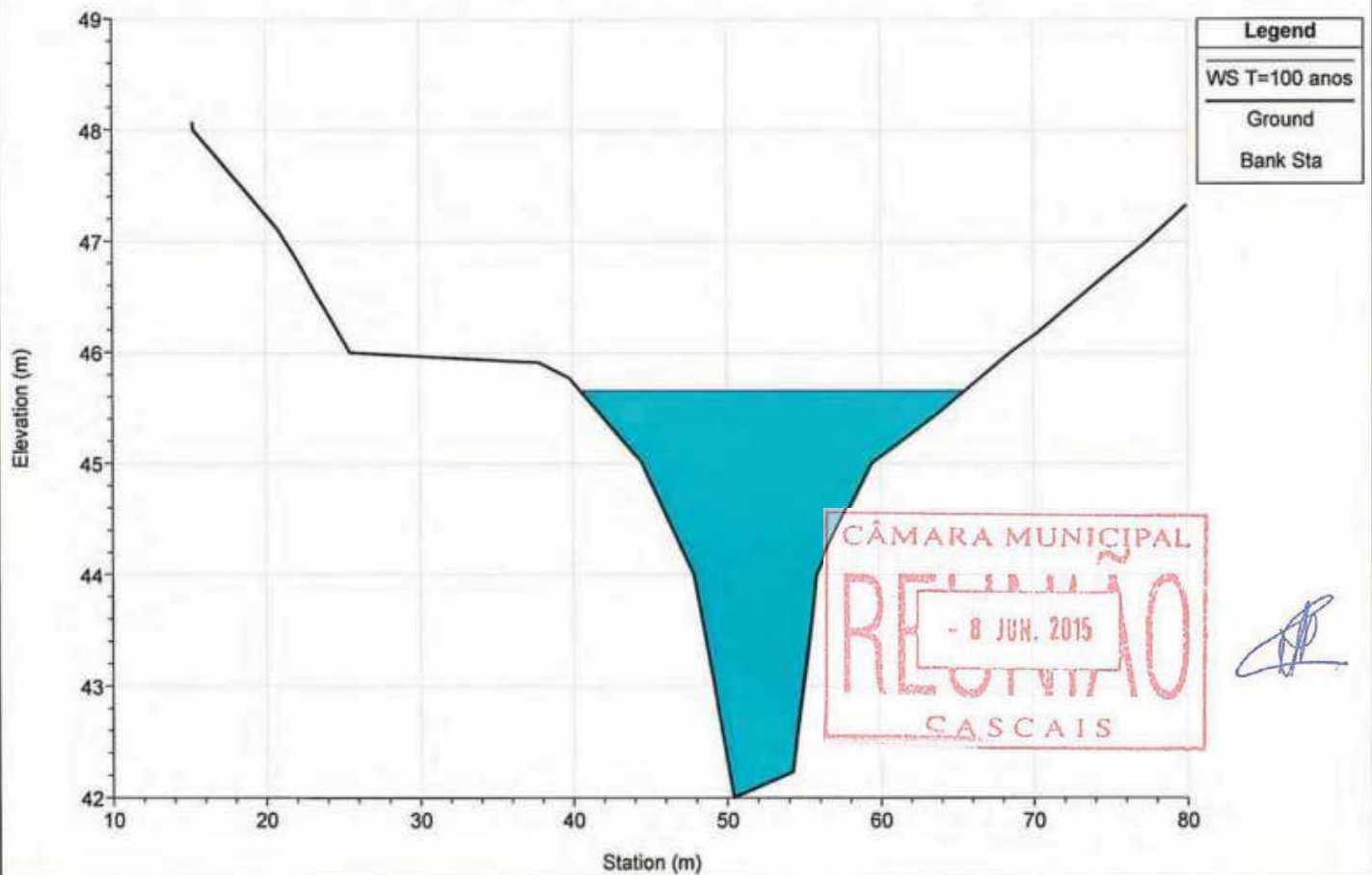
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River = VINHAS Reach = jusante RS = 4510.440

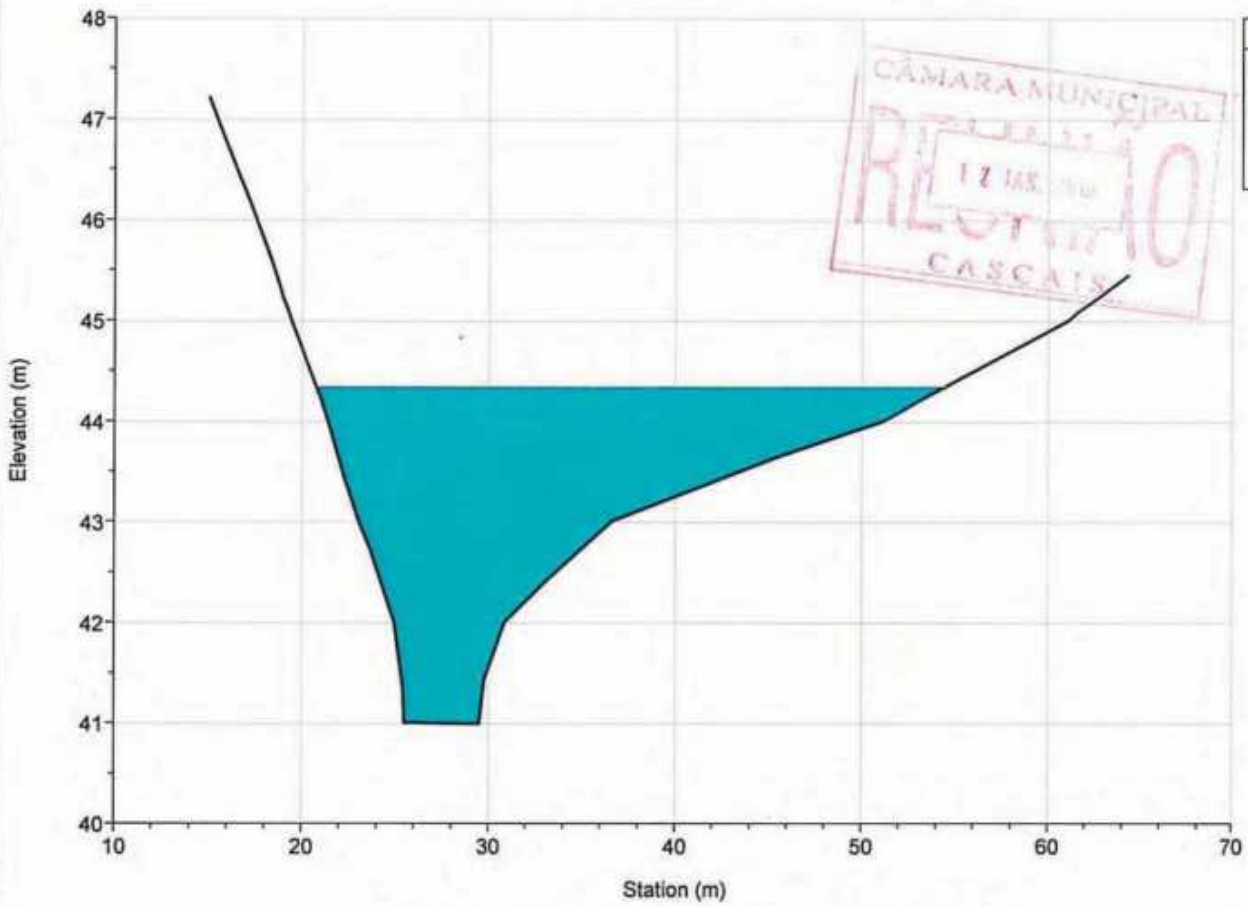


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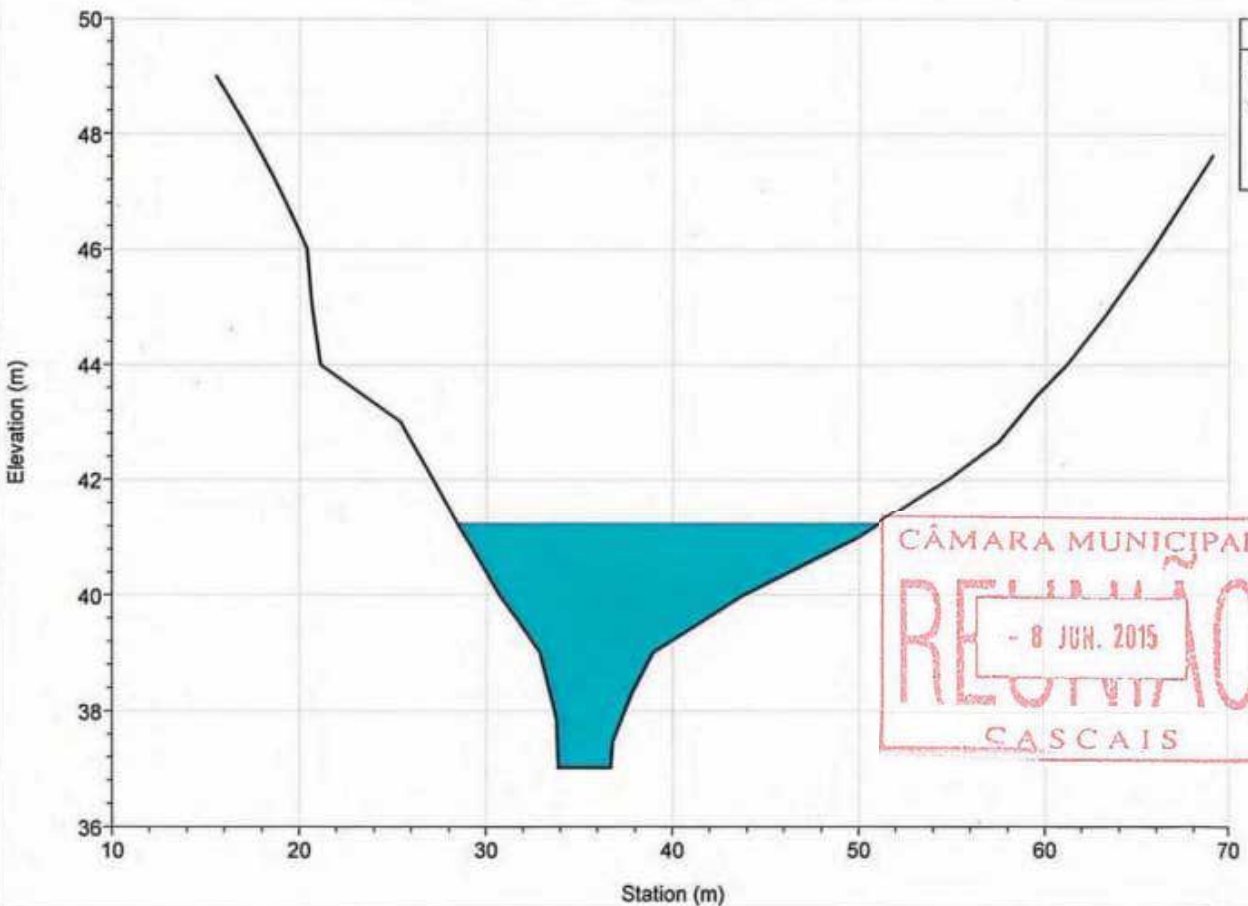




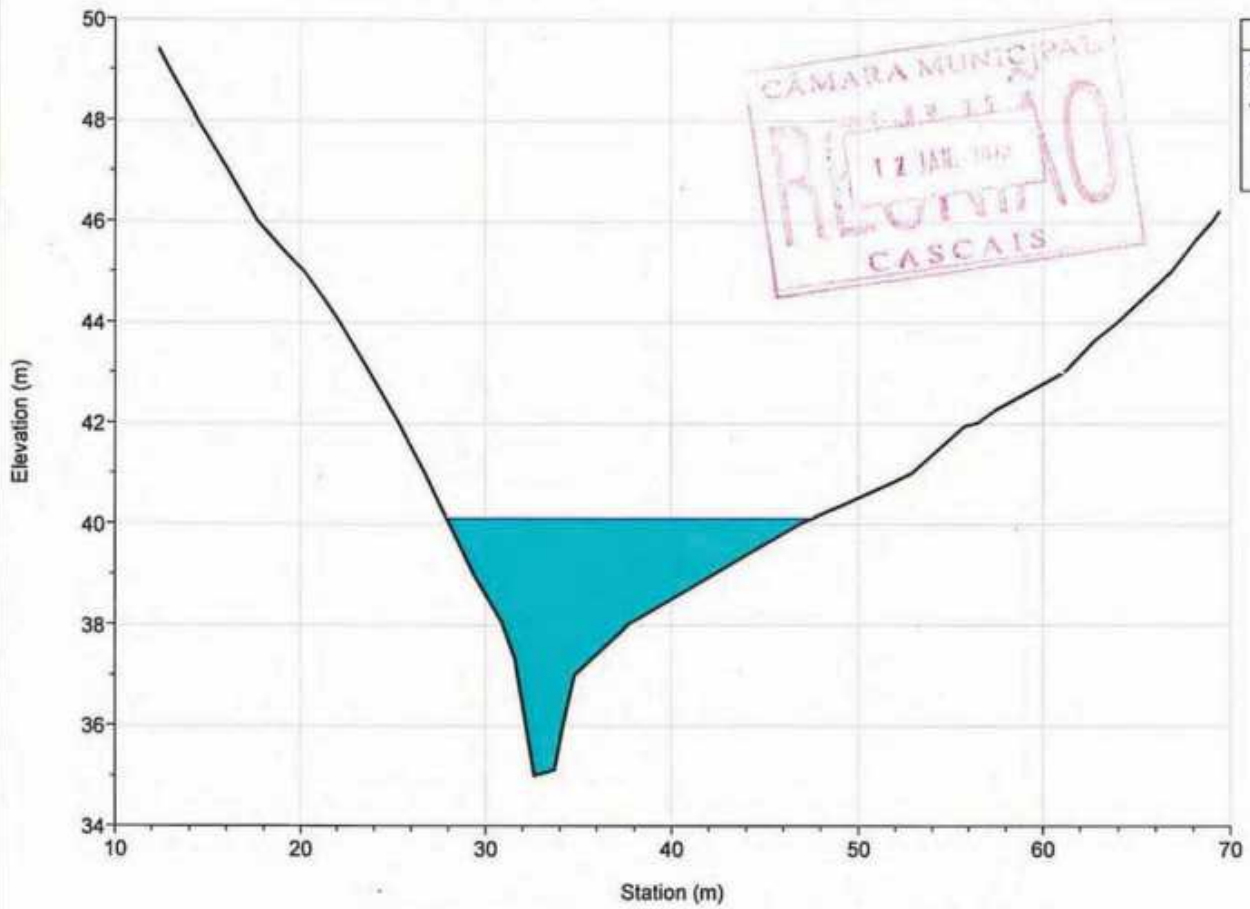
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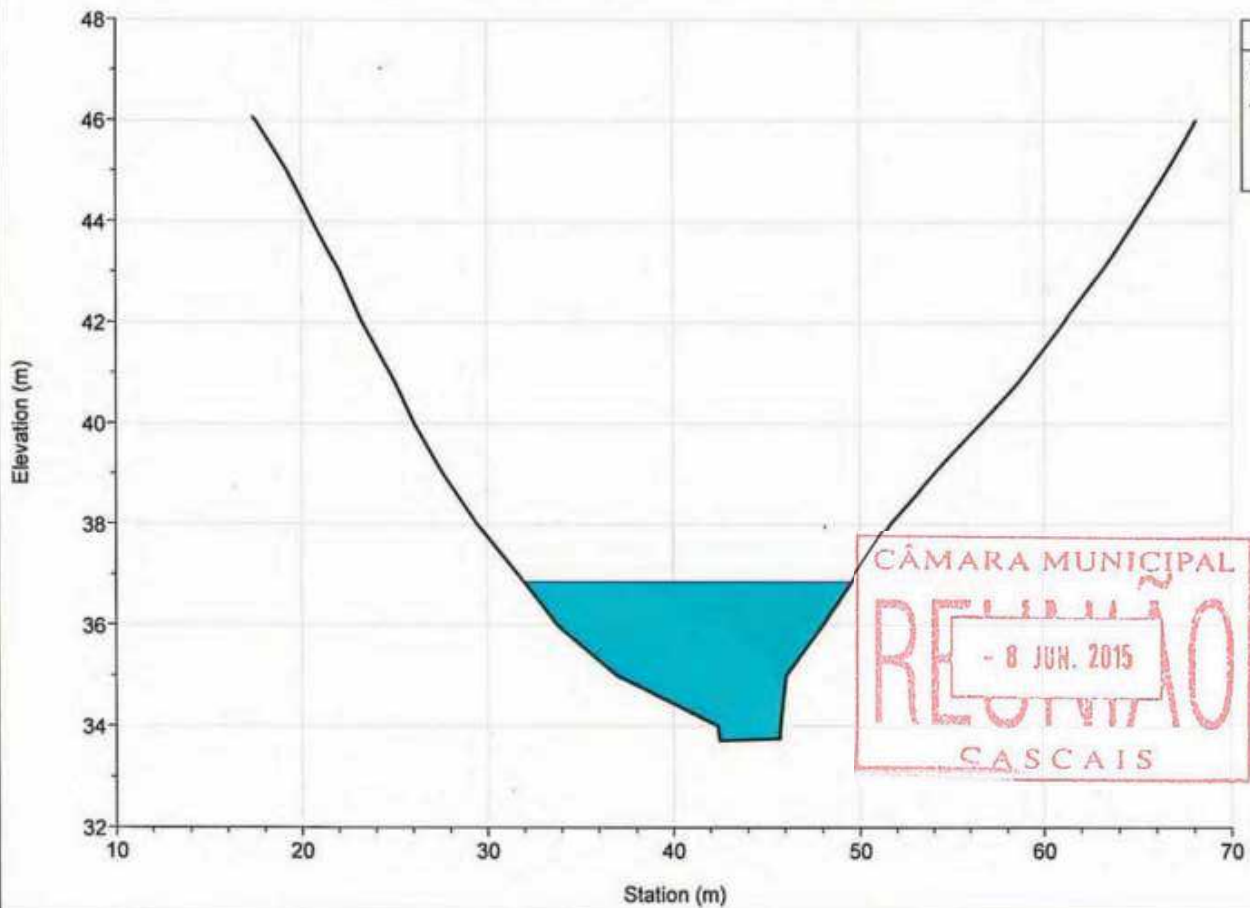
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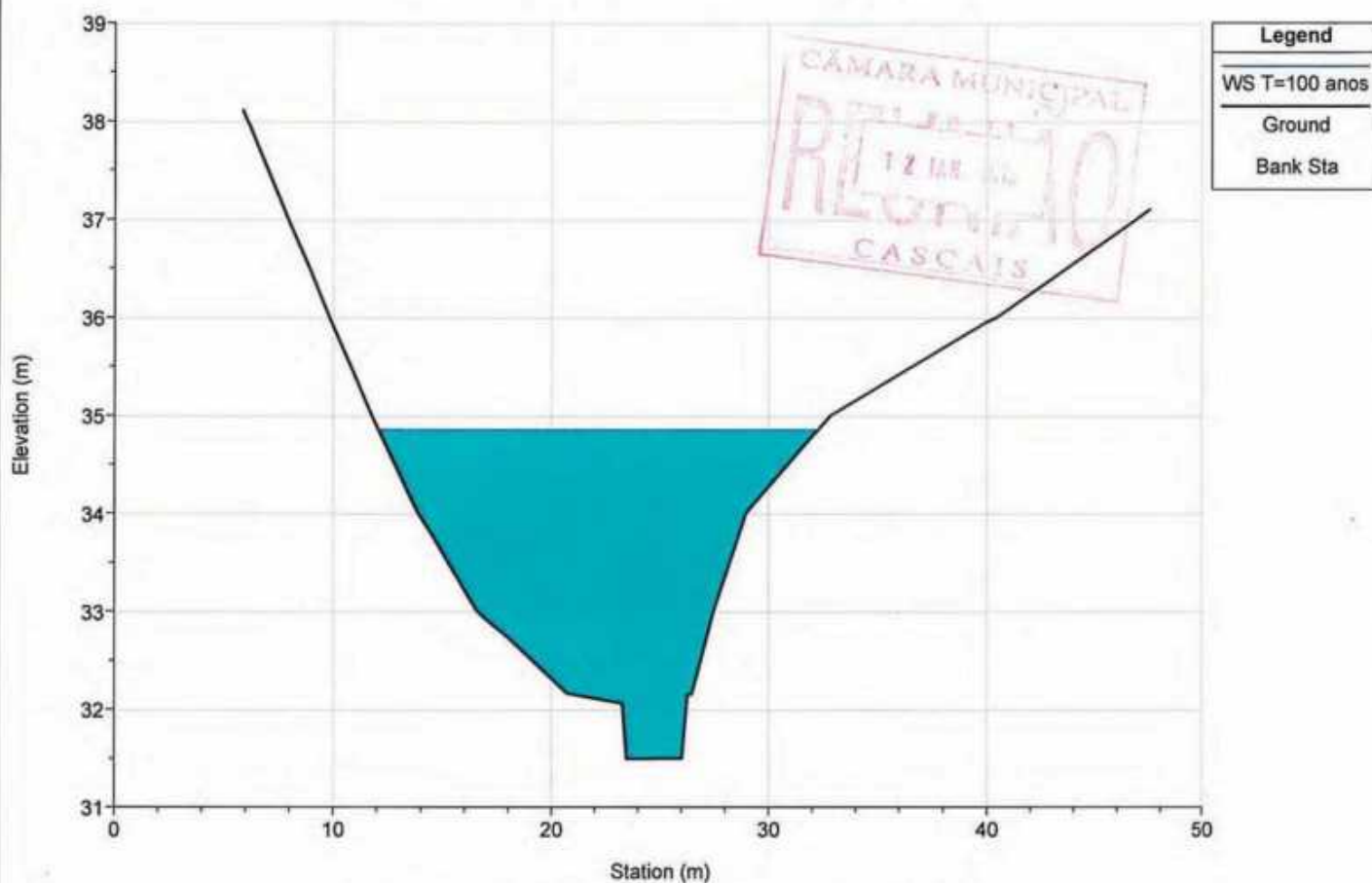
River = VINHAS Reach = jusante RS = 4039.267



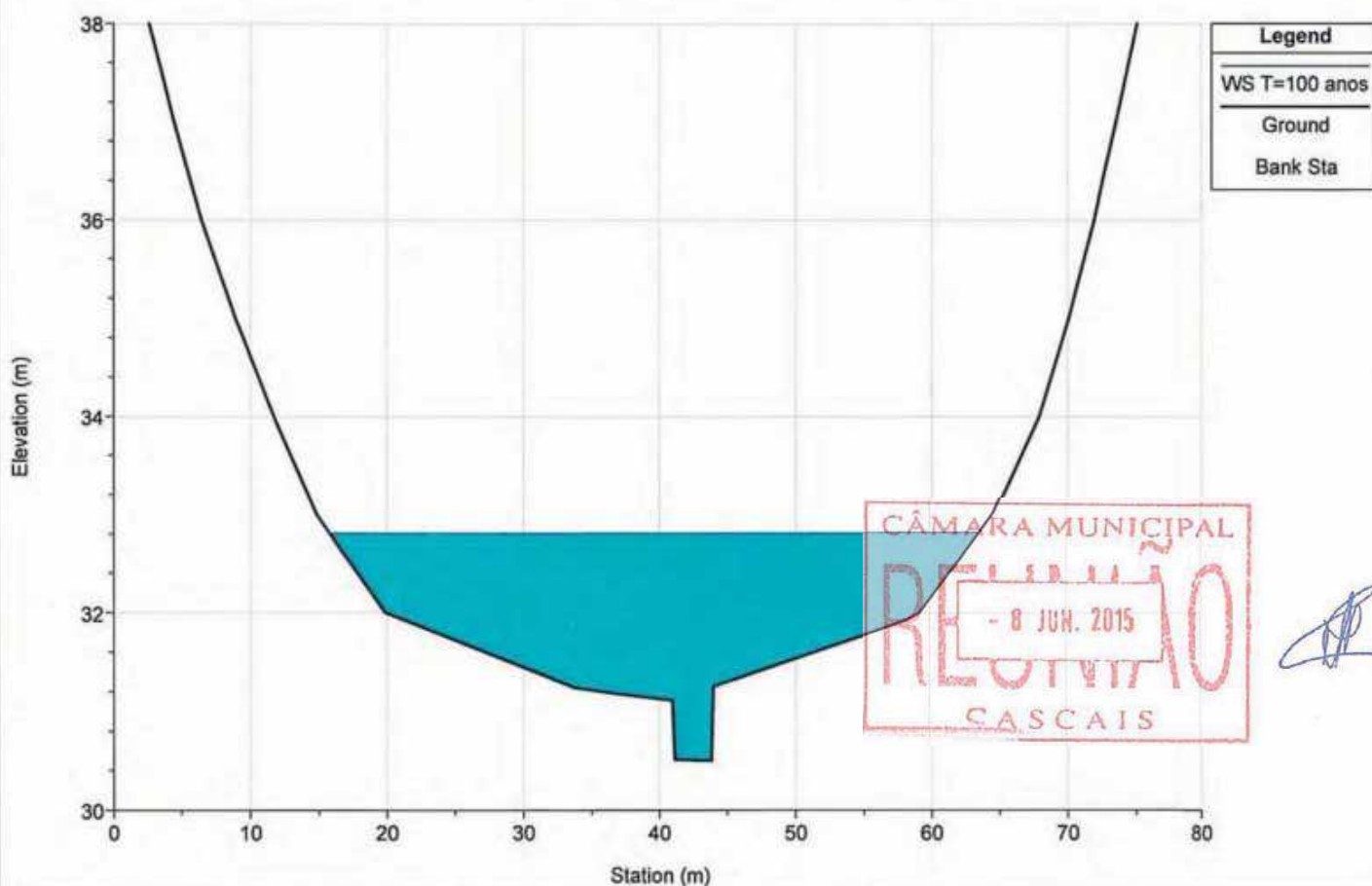
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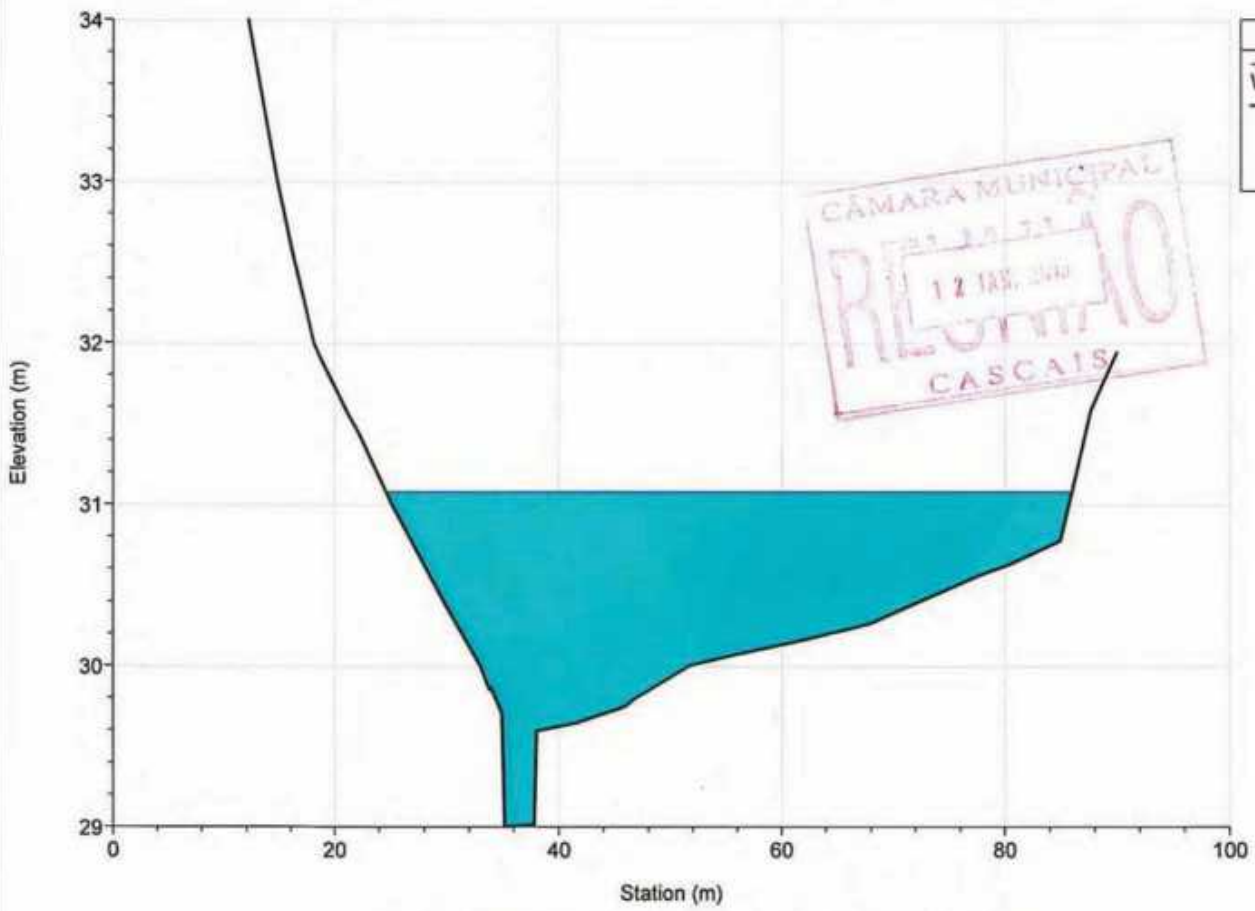
River = VINHAS Reach = jusante RS = 3791.535



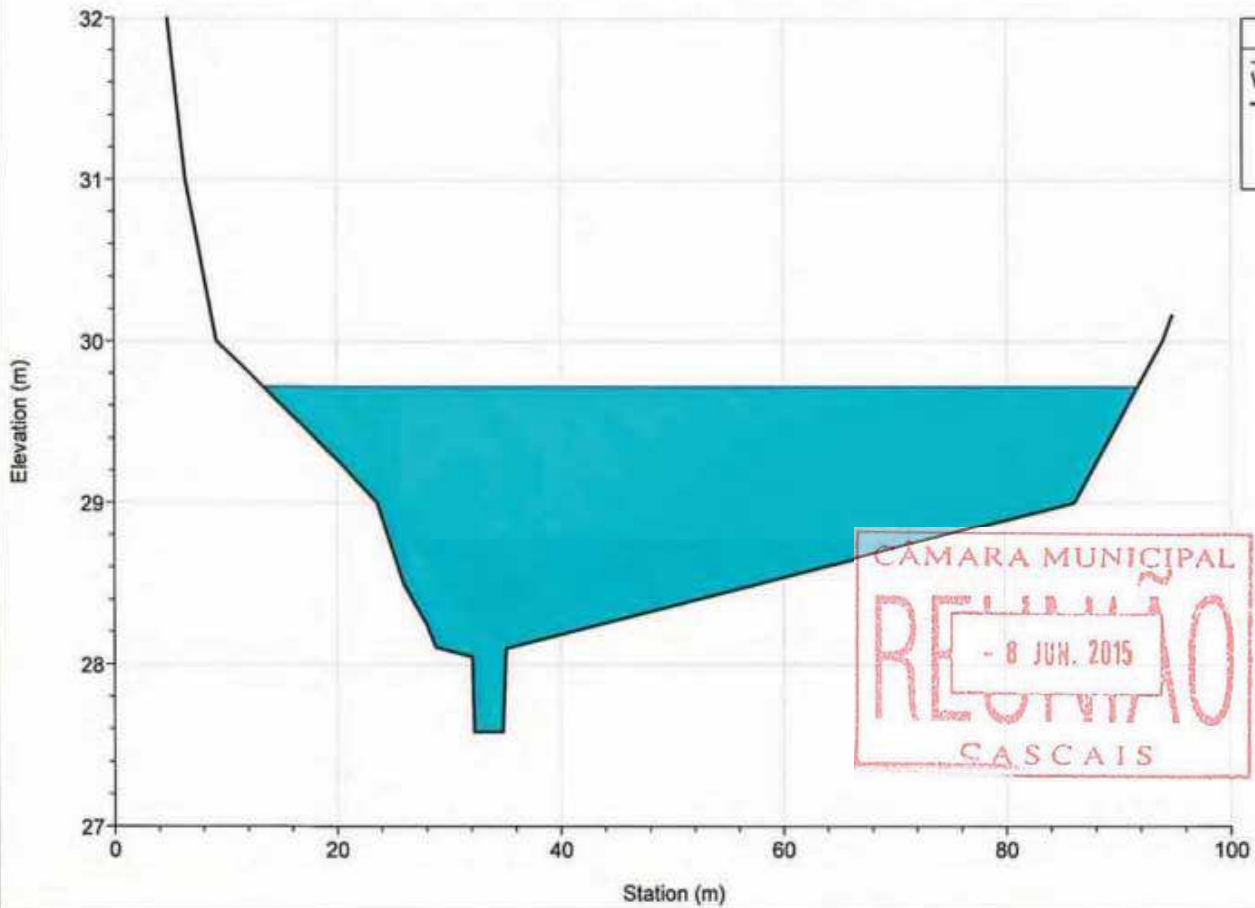
River = VINHAS Reach = jusante RS = 3646.810



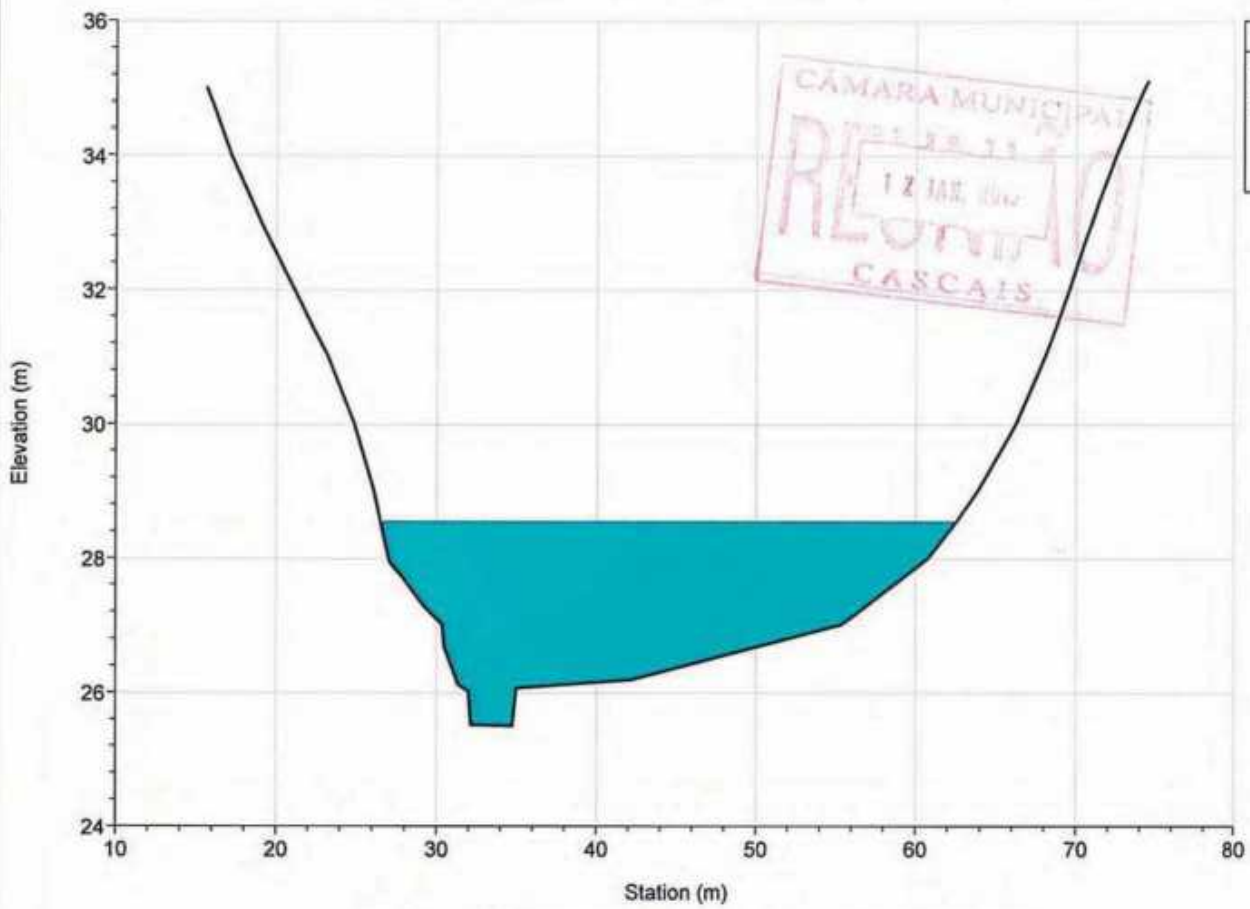
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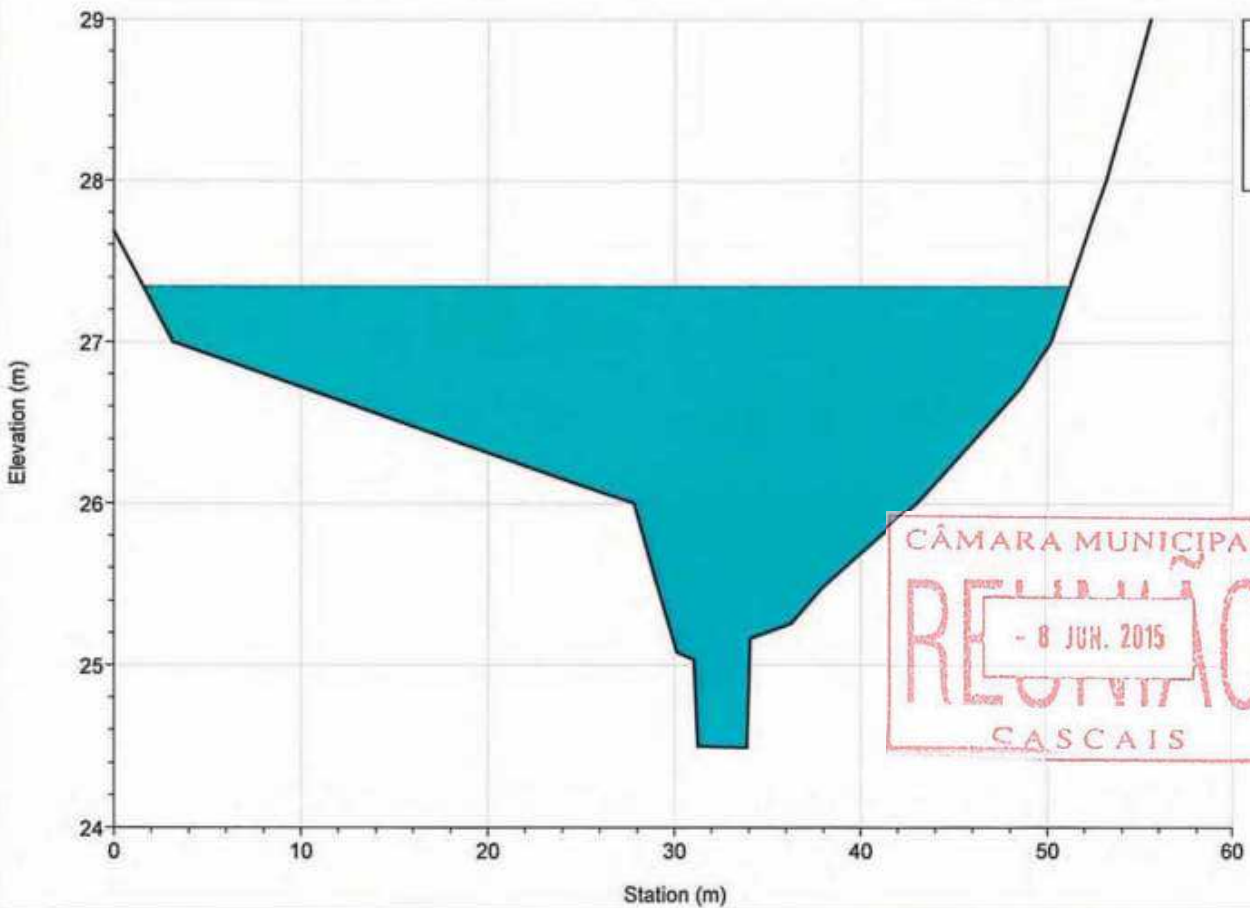
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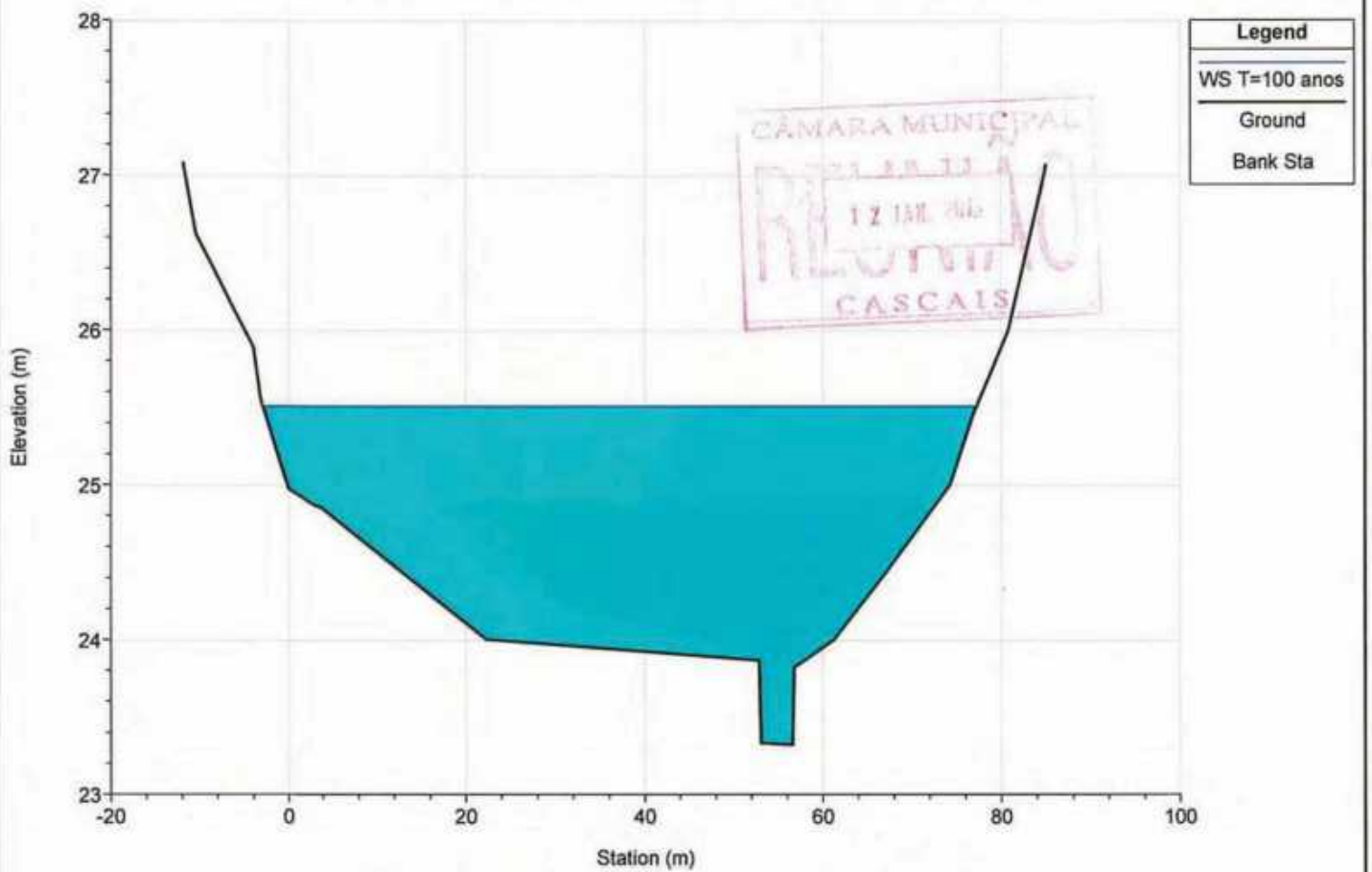
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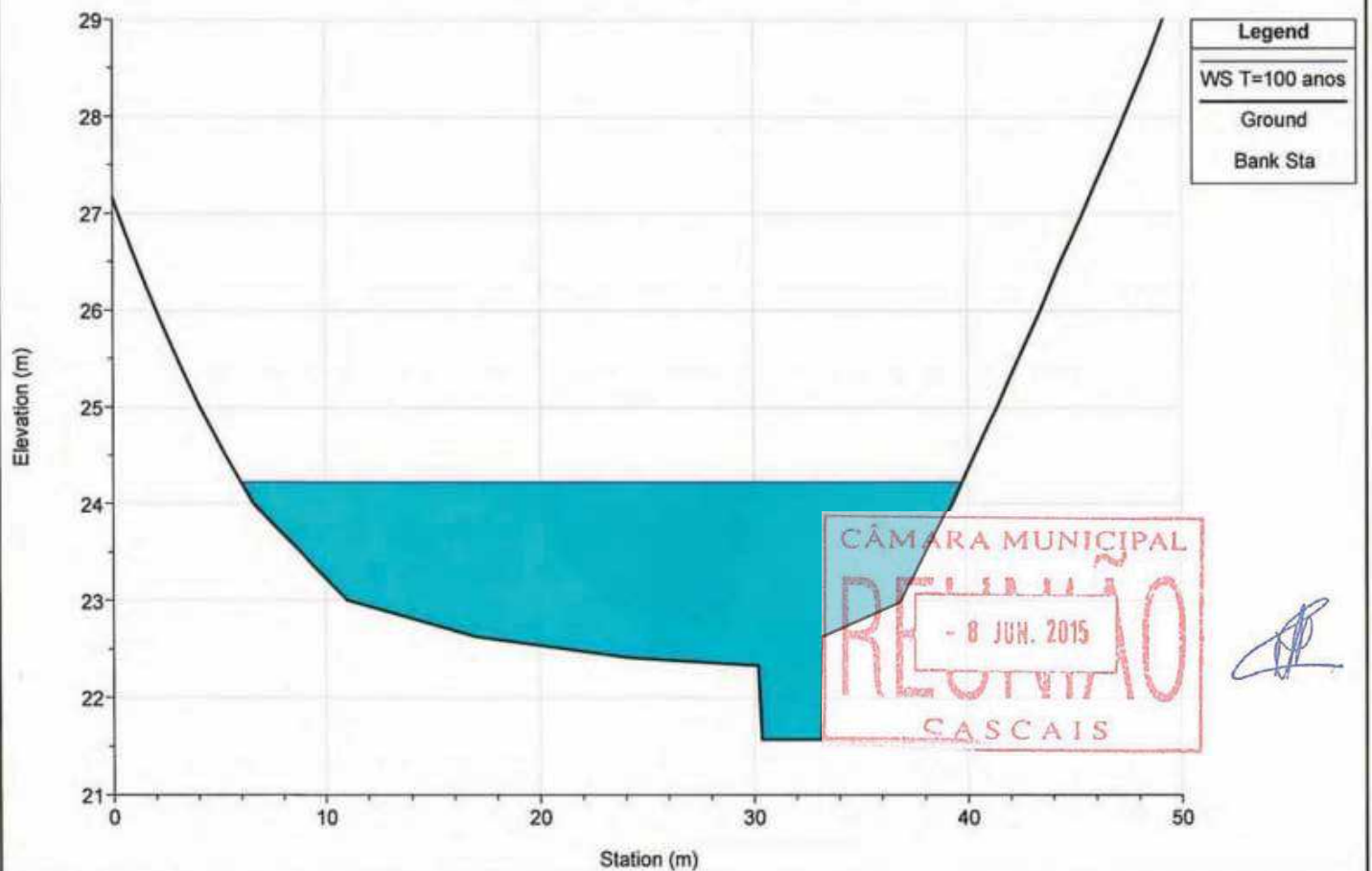
River = VINHAS Reach = jusante RS = 3030.644



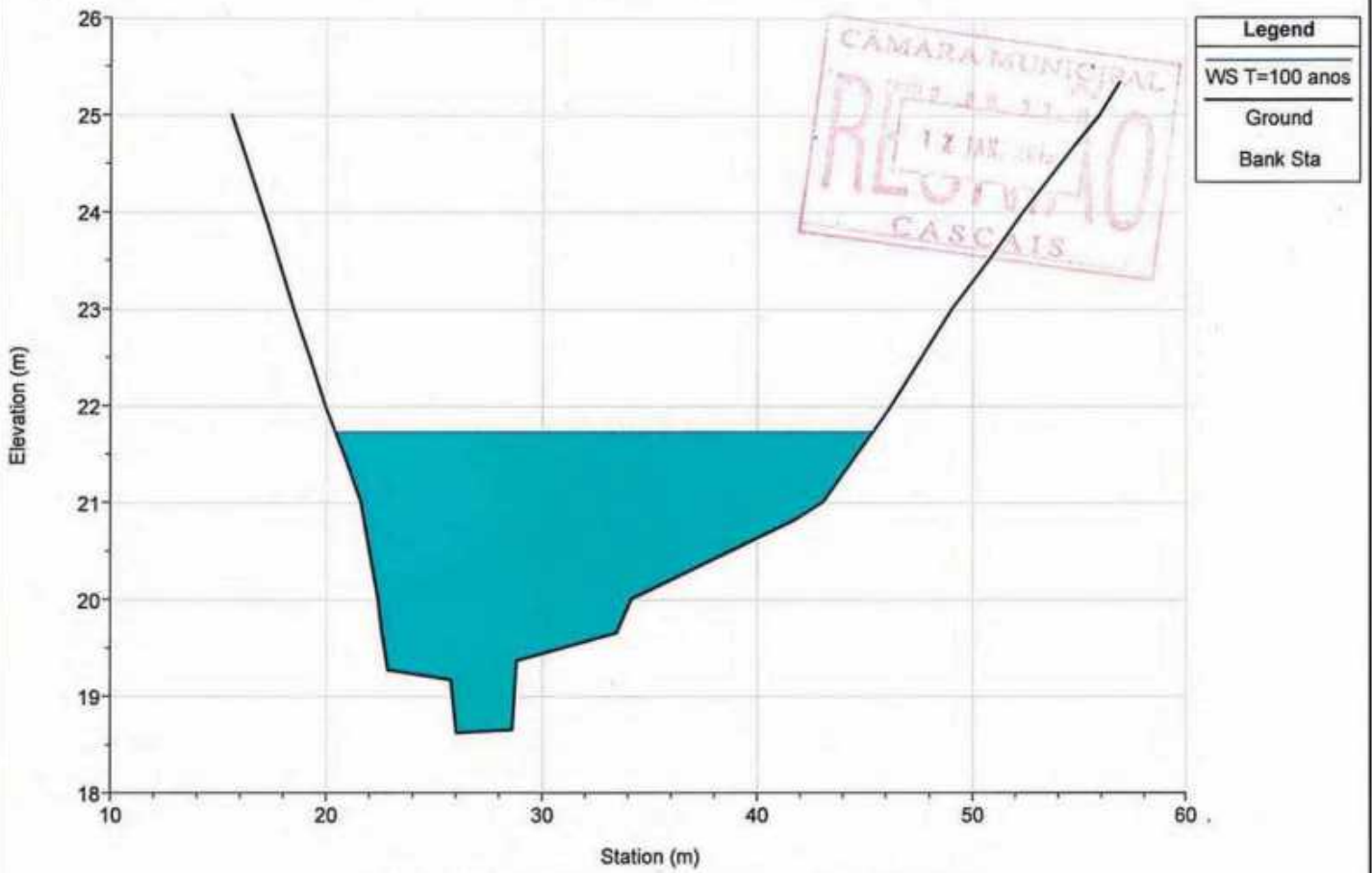
River = VINHAS Reach = jusante RS = 2855.486



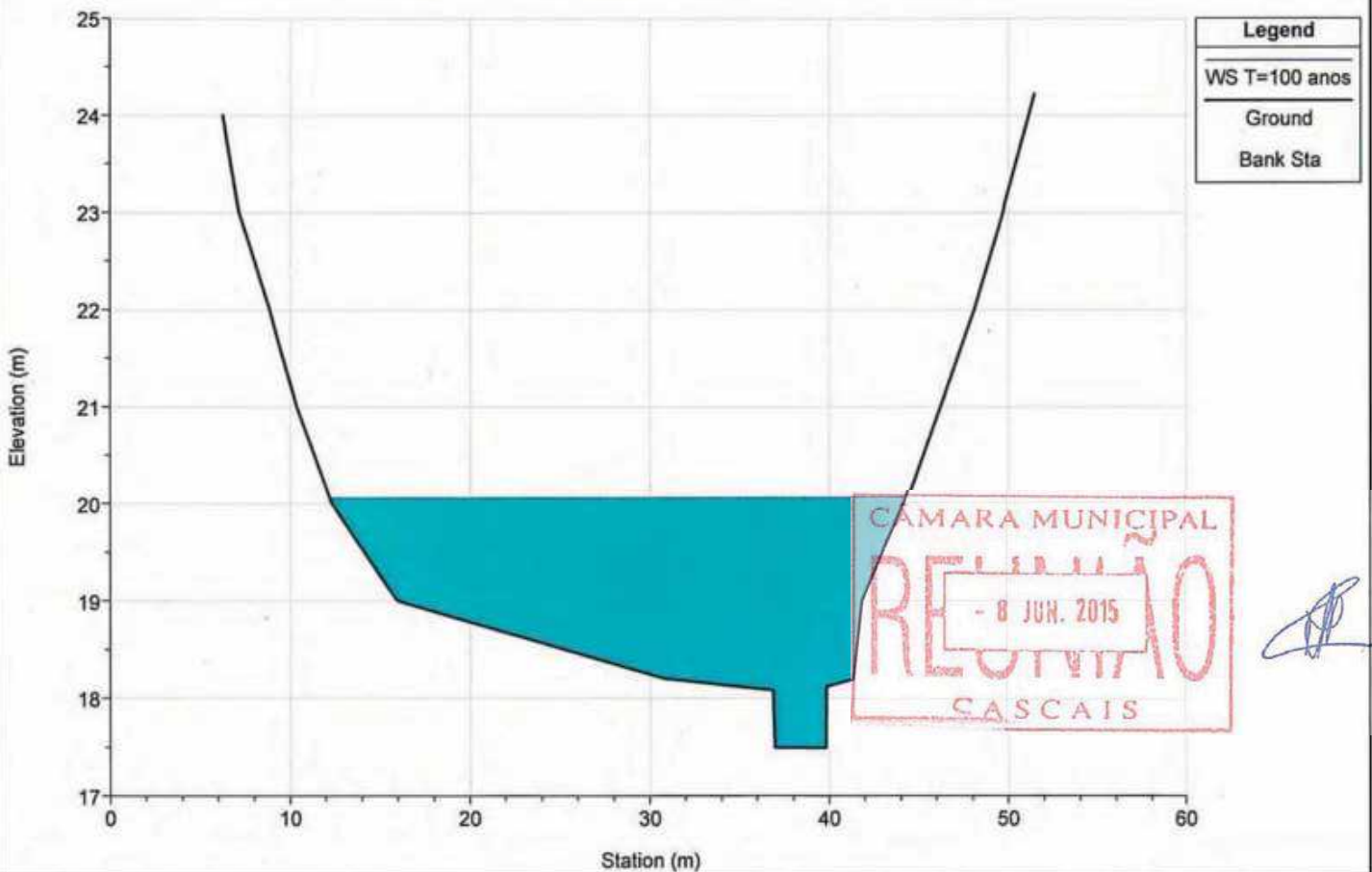
River = VINHAS Reach = jusante RS = 2697.769



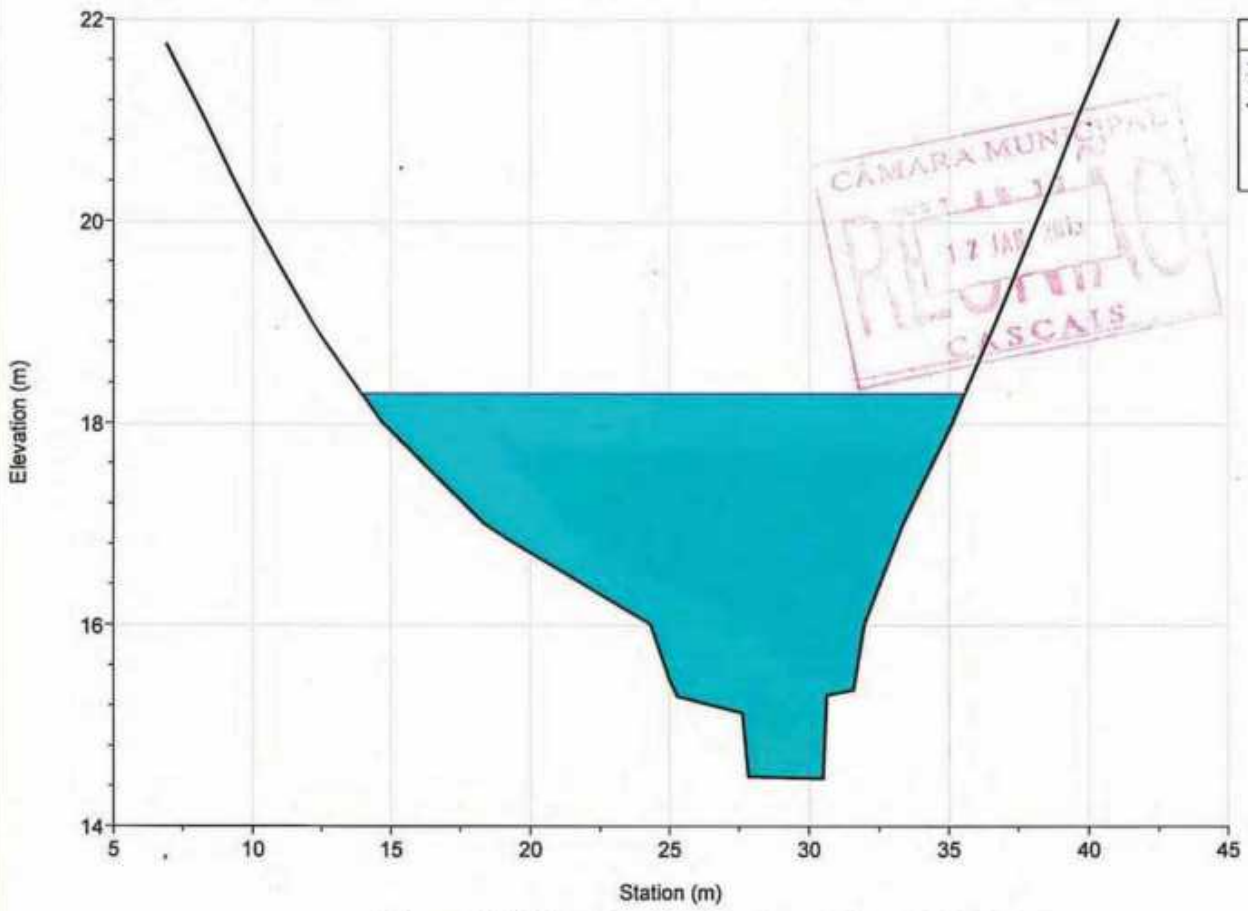
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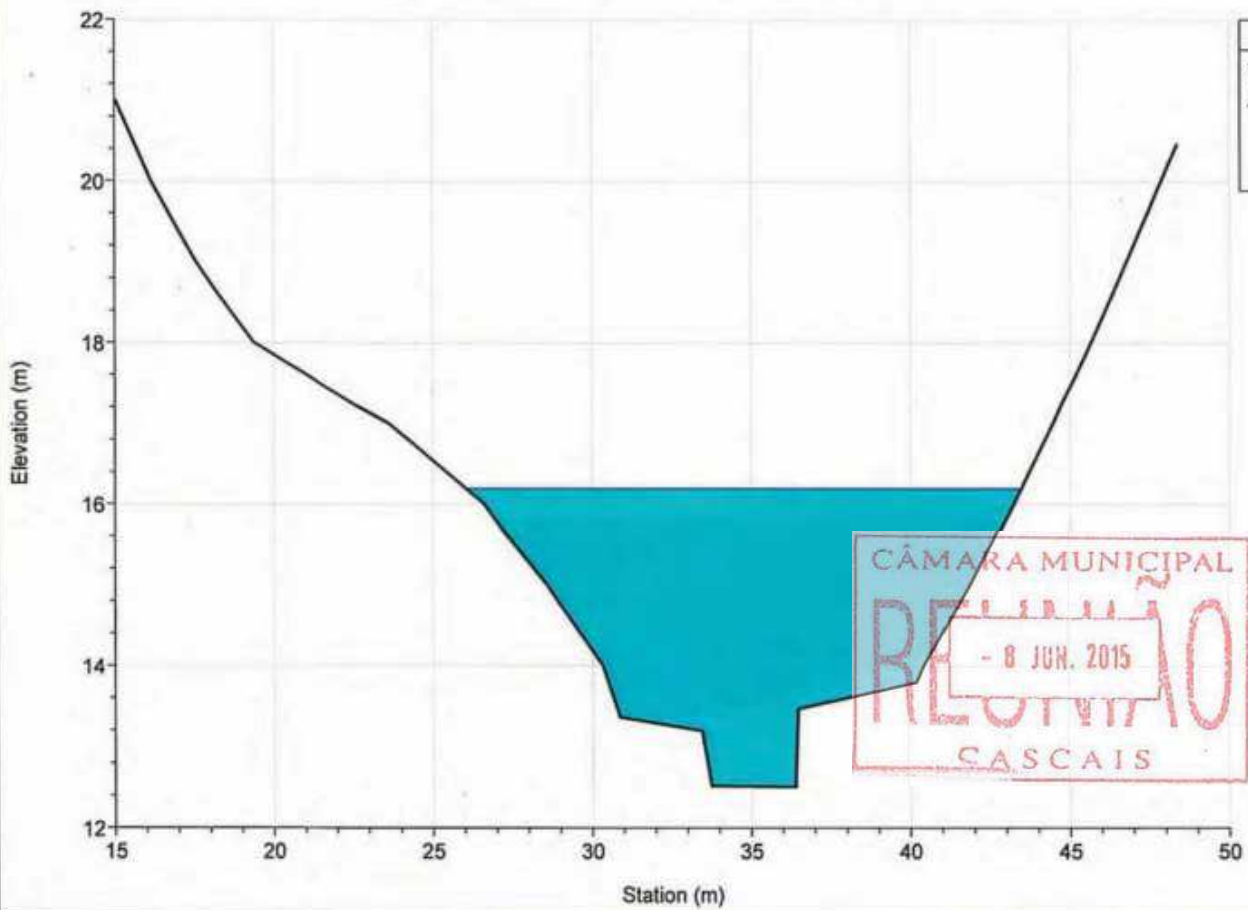
River = VINHAS Reach = jusante RS = 2364.311



River = VINHAS Reach = jusante RS = 2225.388

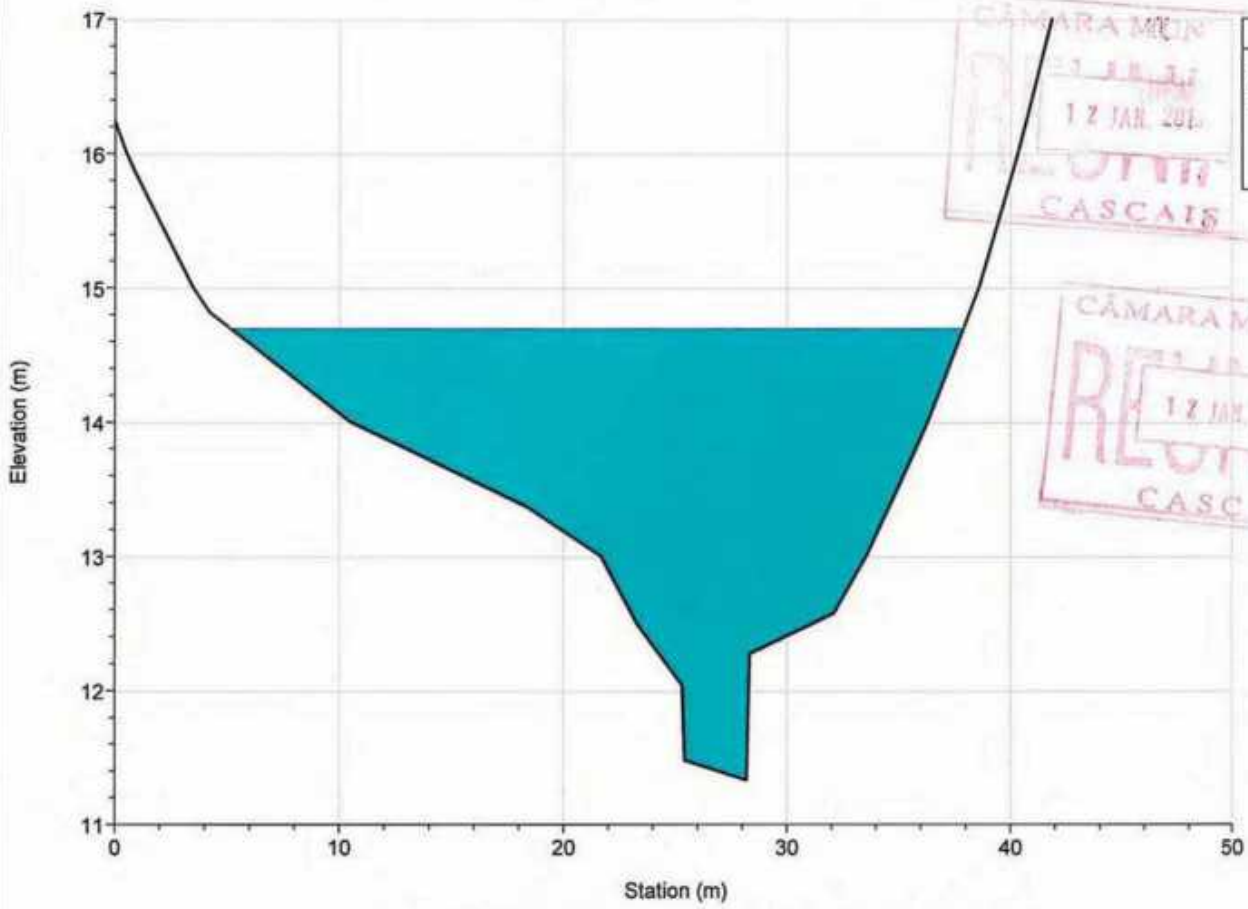


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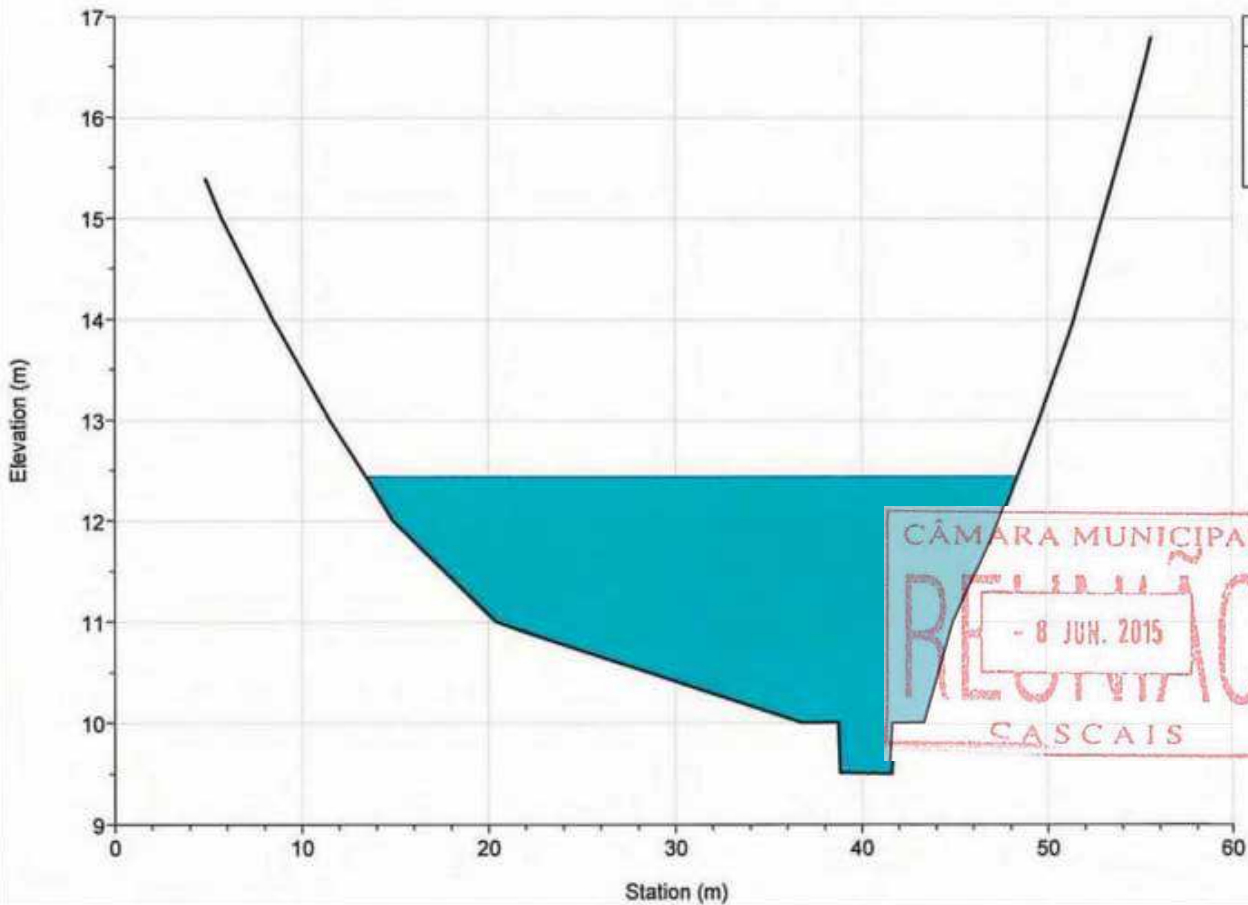




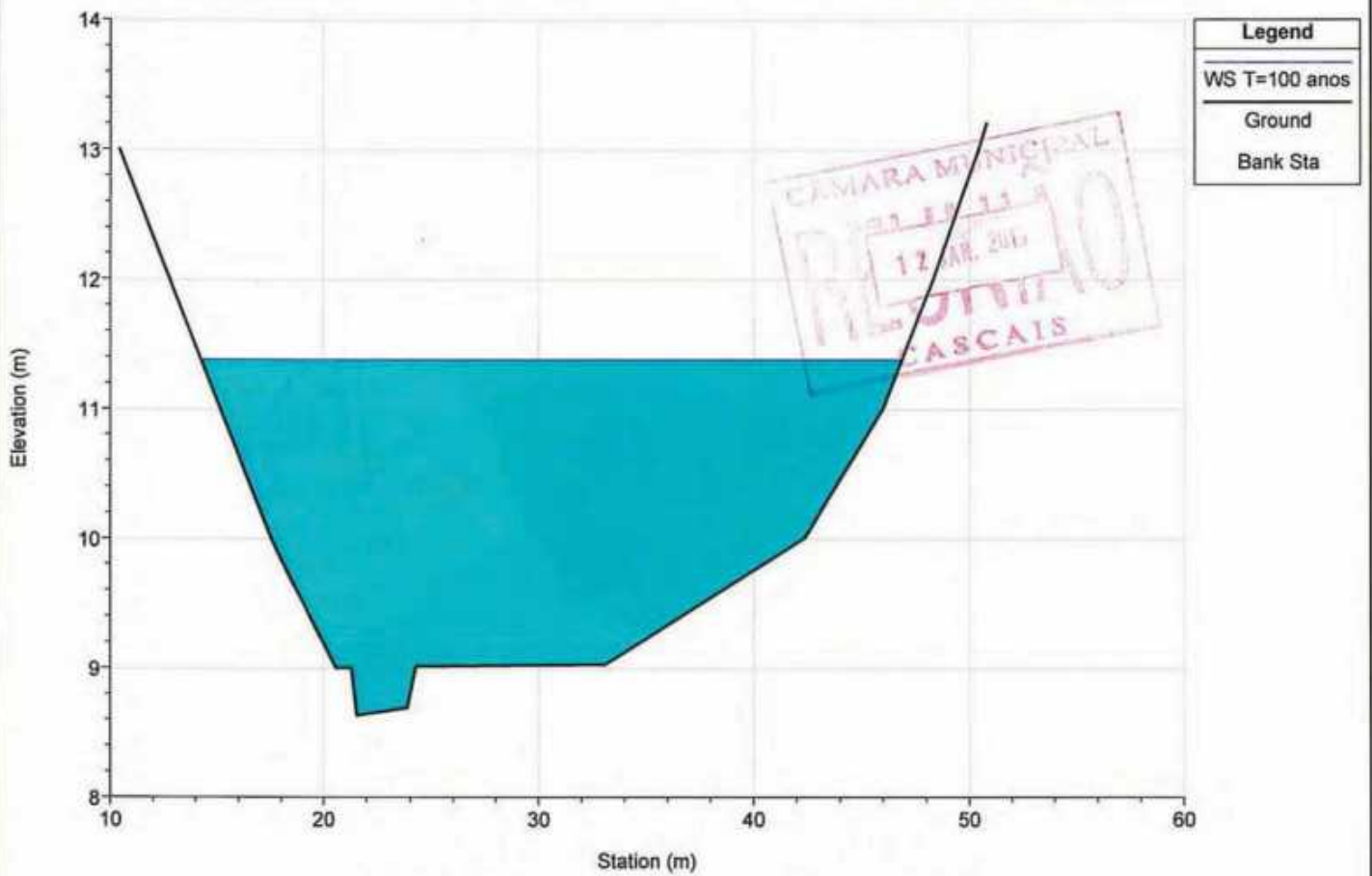
River = VINHAS Reach = jusante RS = 1879.163



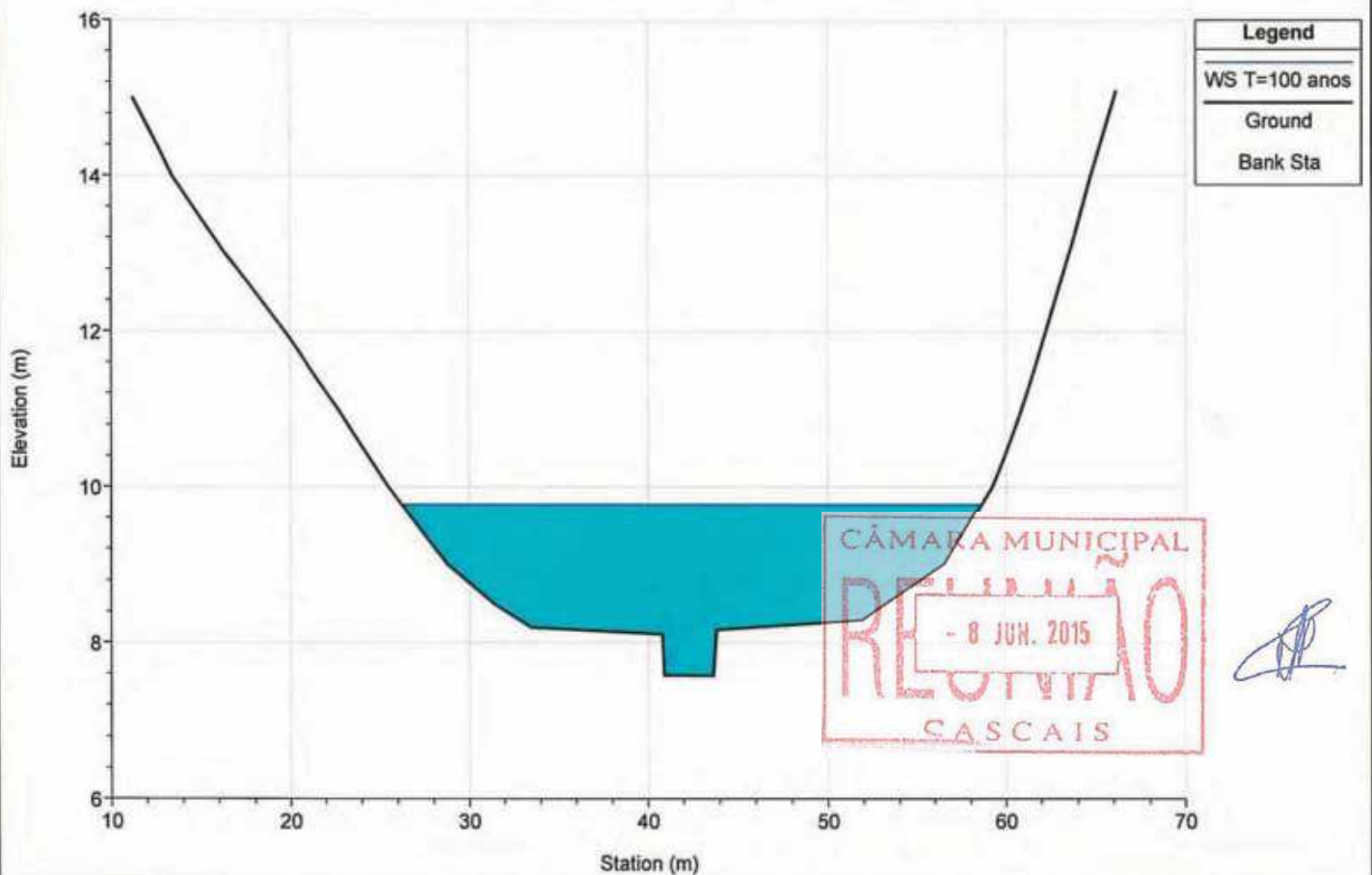
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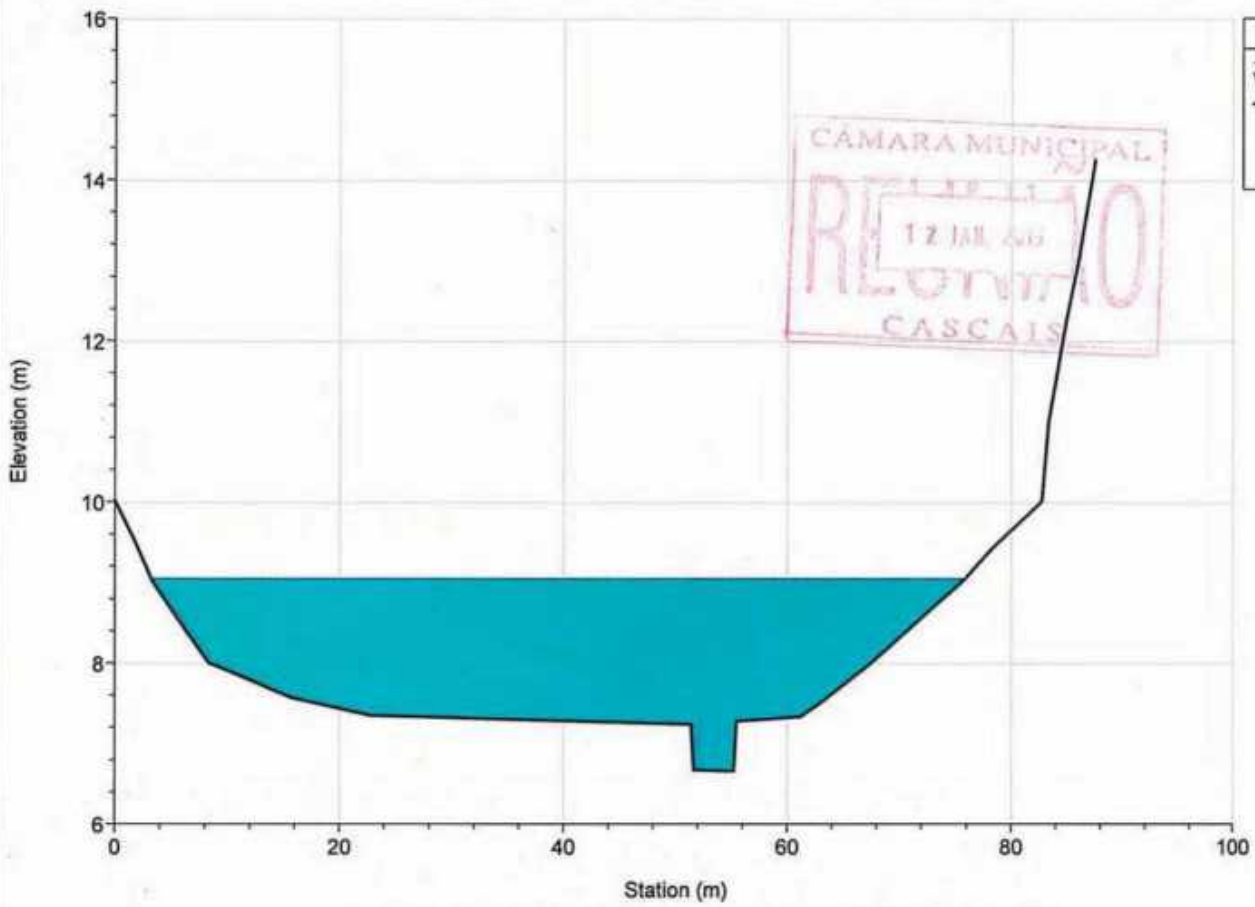
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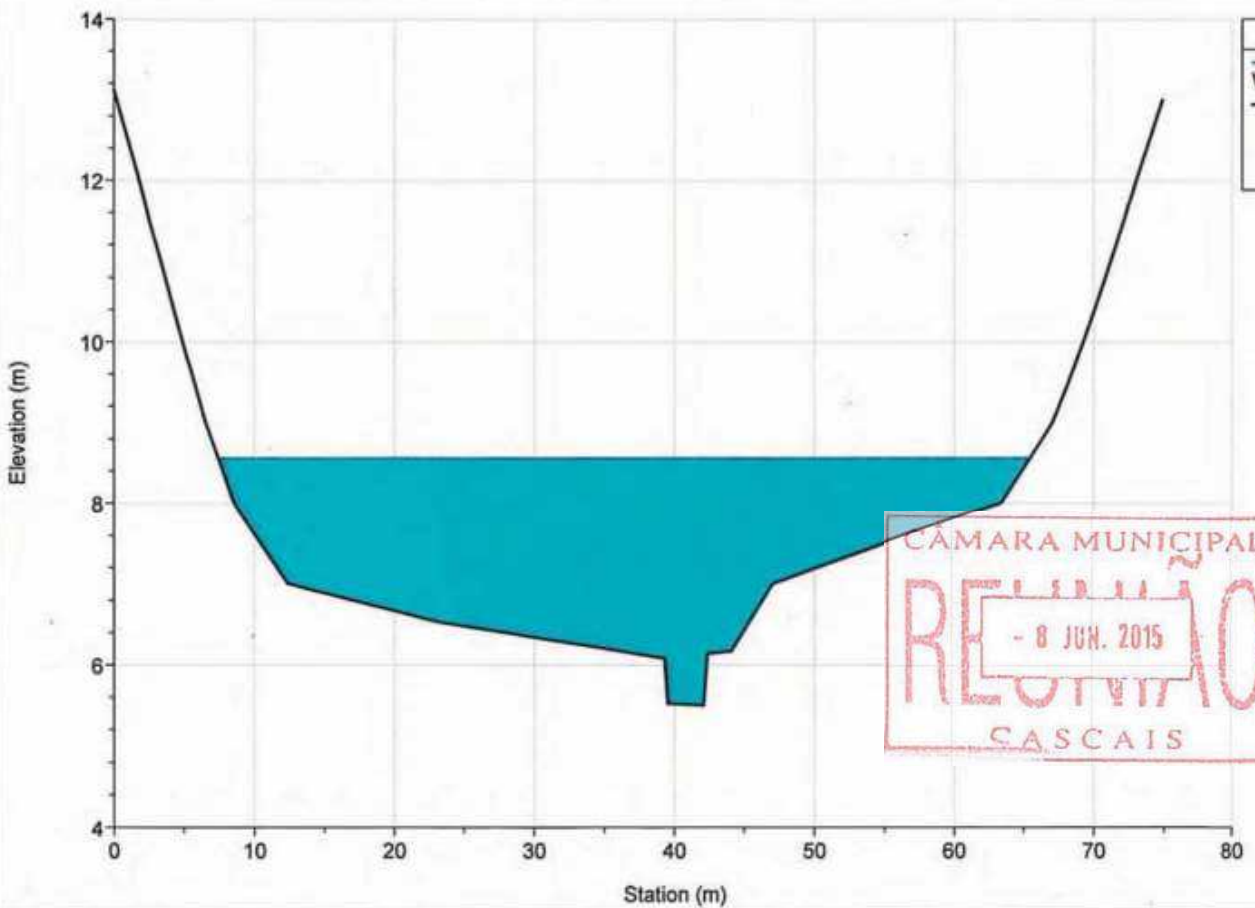
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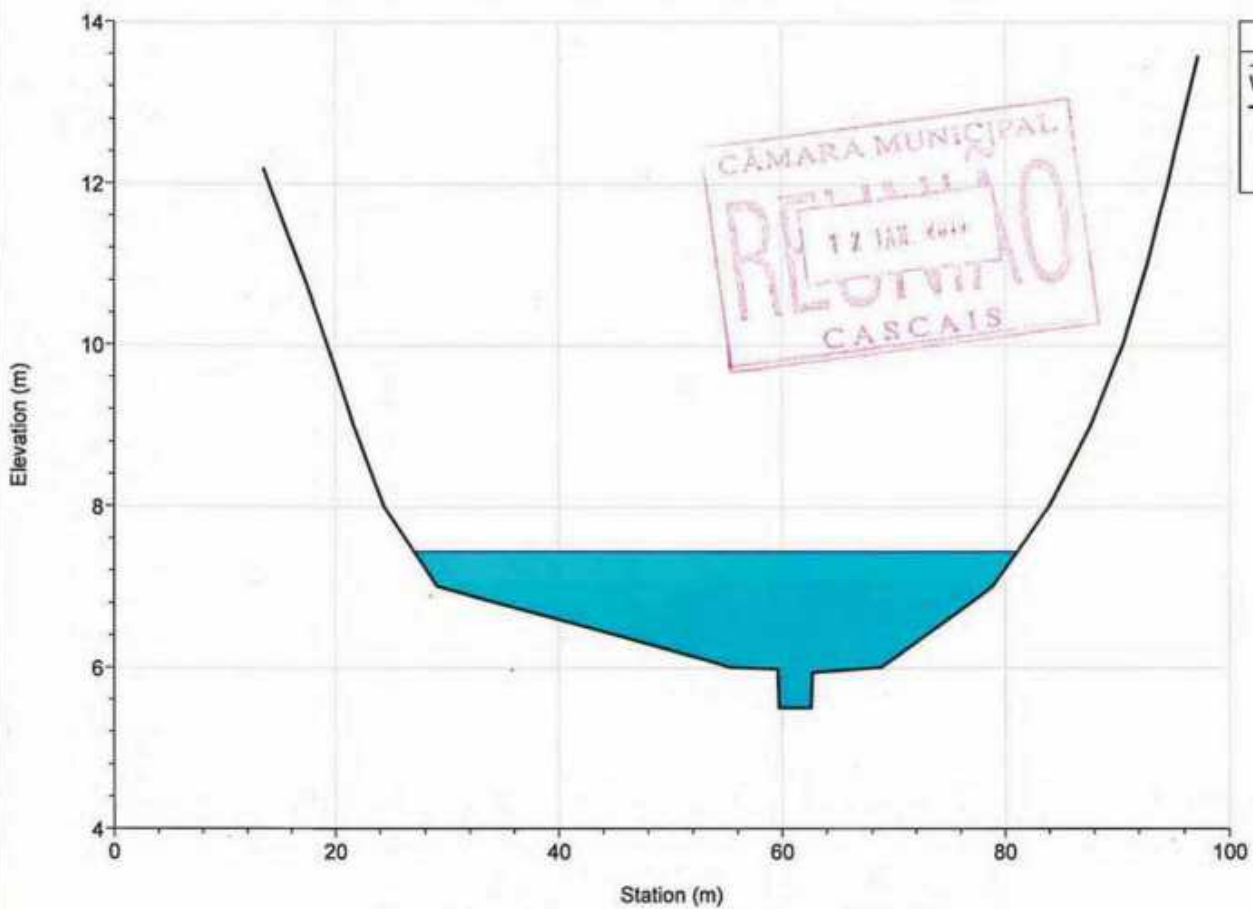
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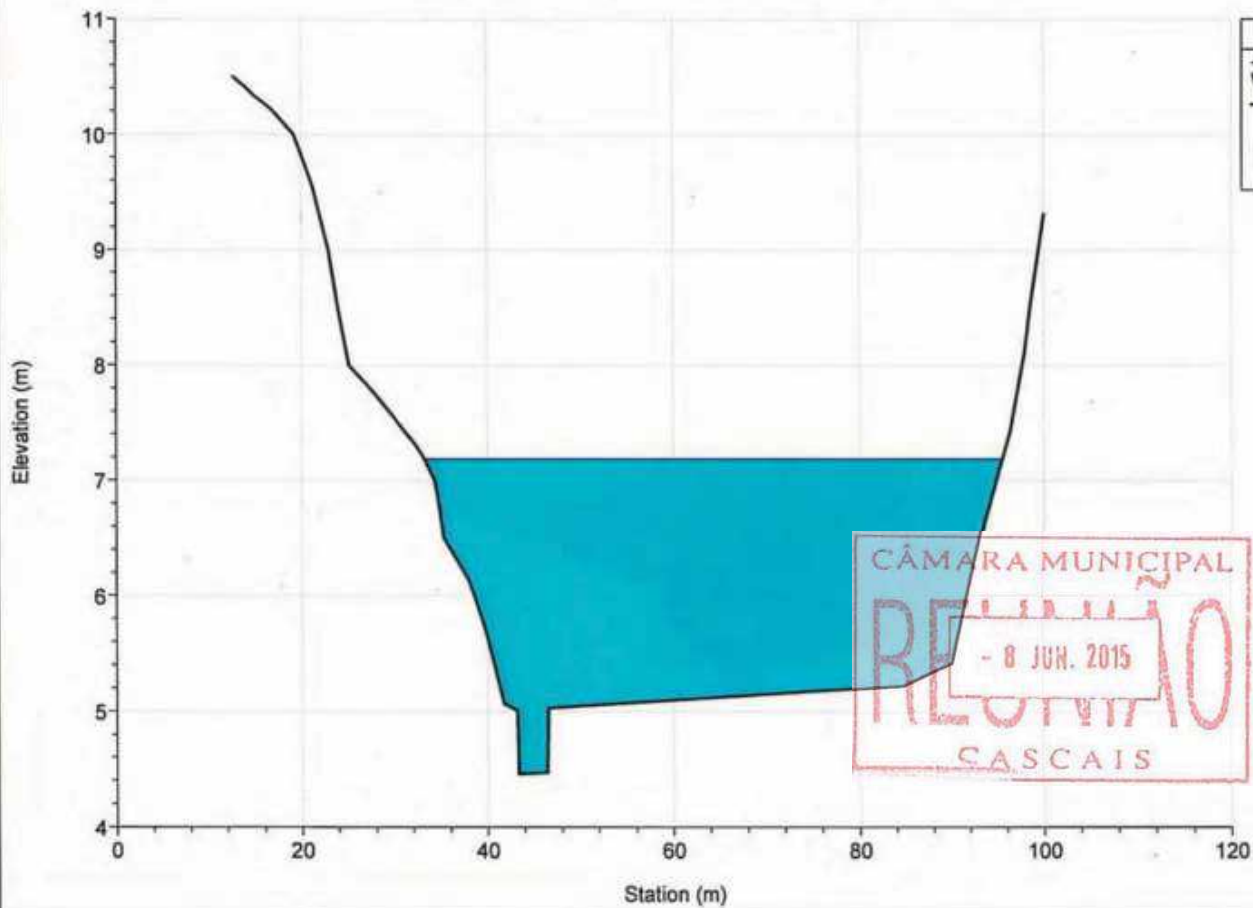
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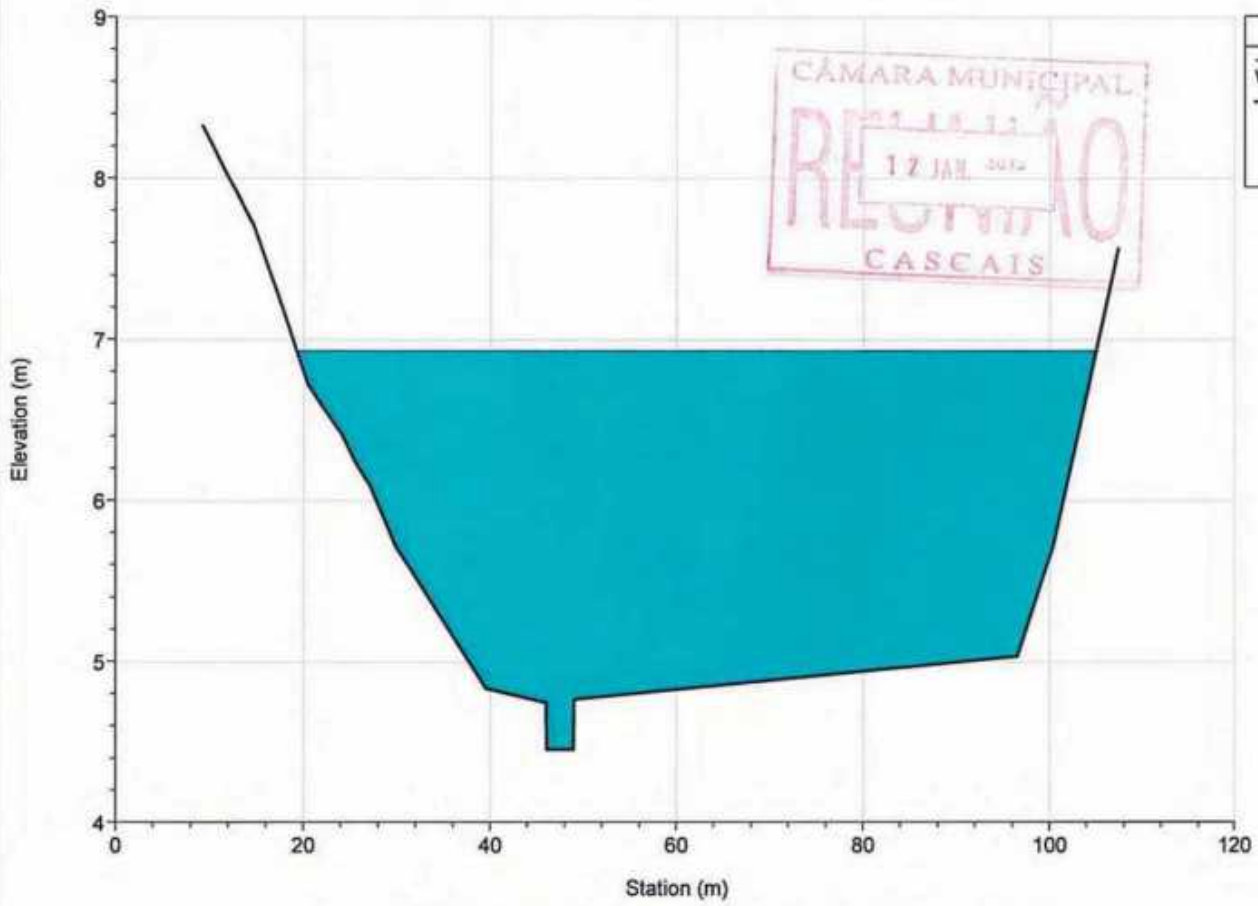
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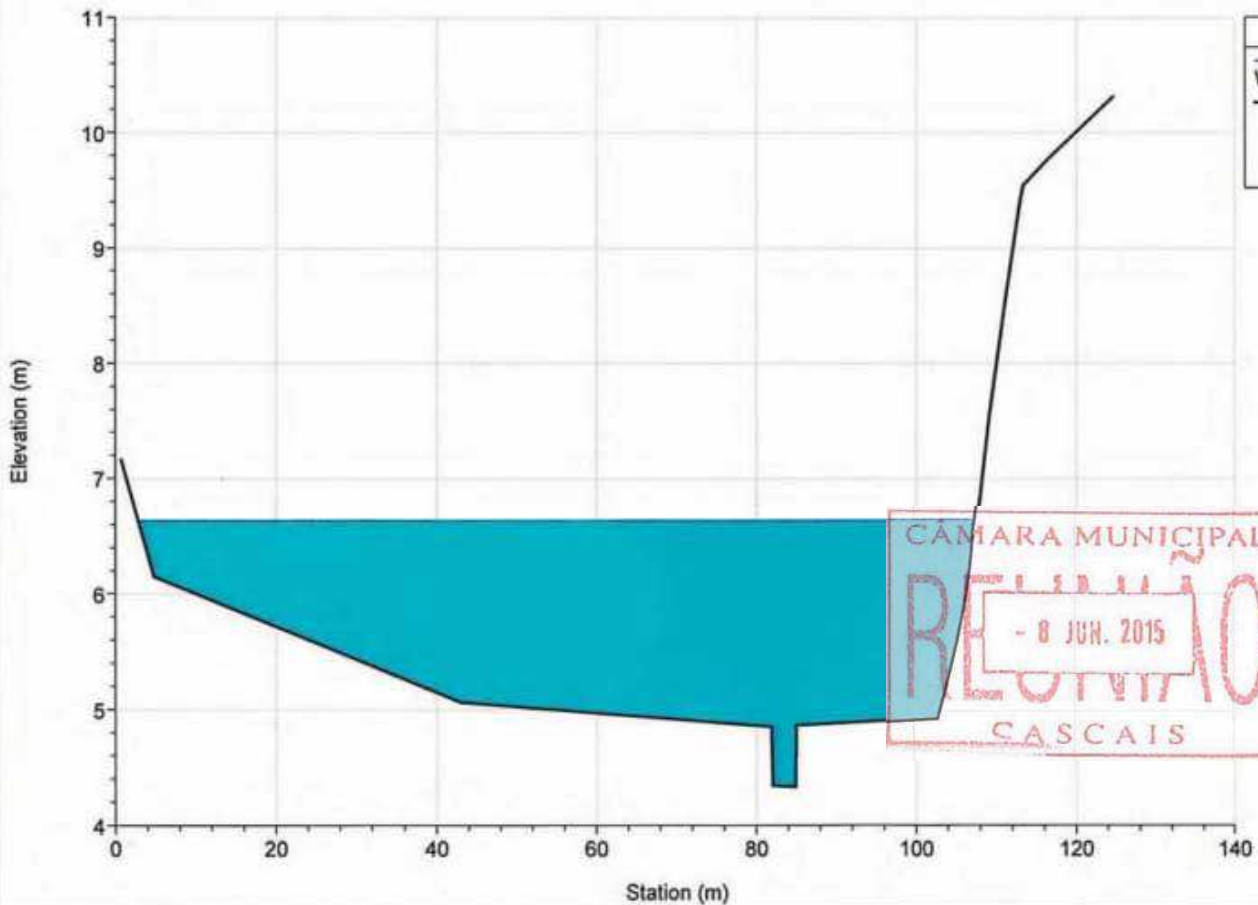
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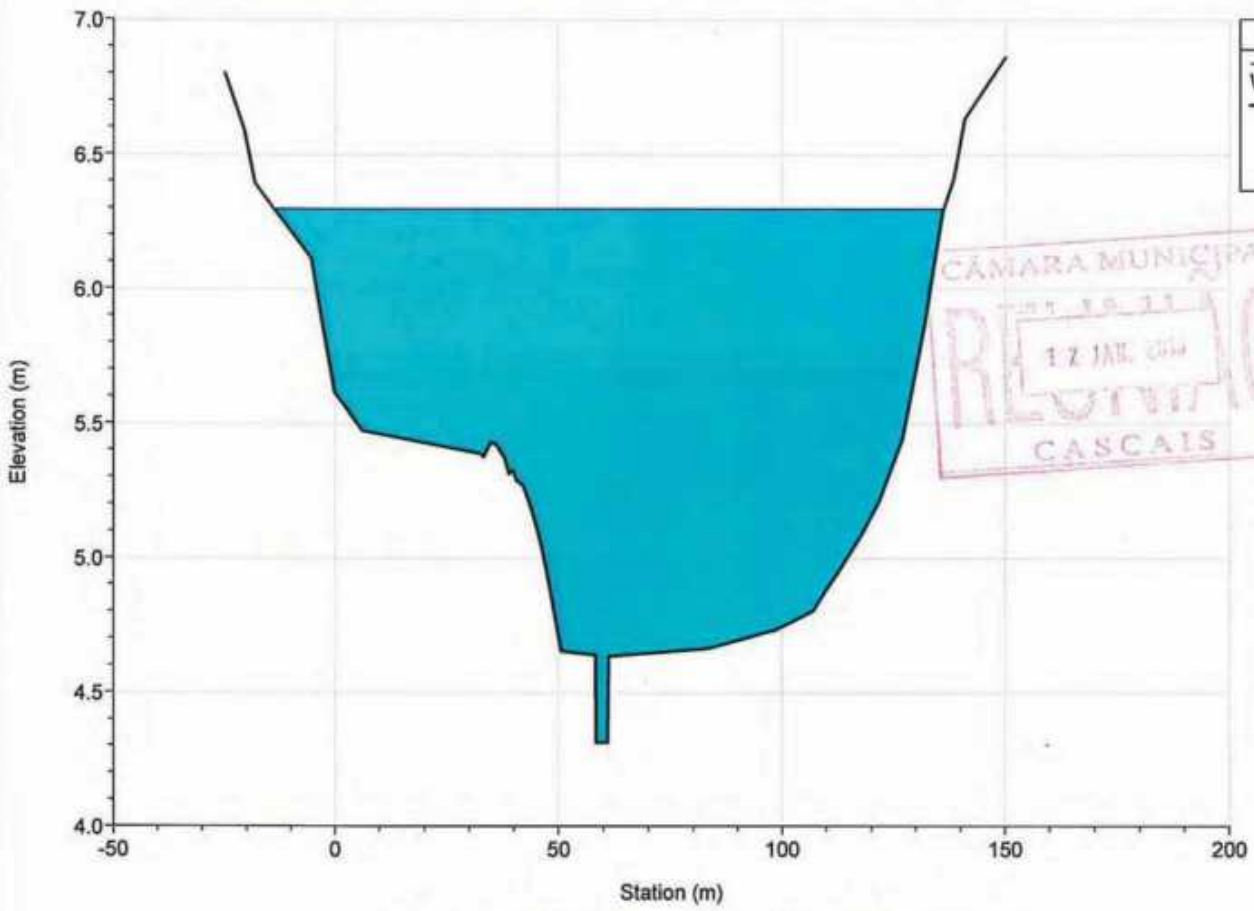
River = VINHAS Reach = jusante RS = 635.817



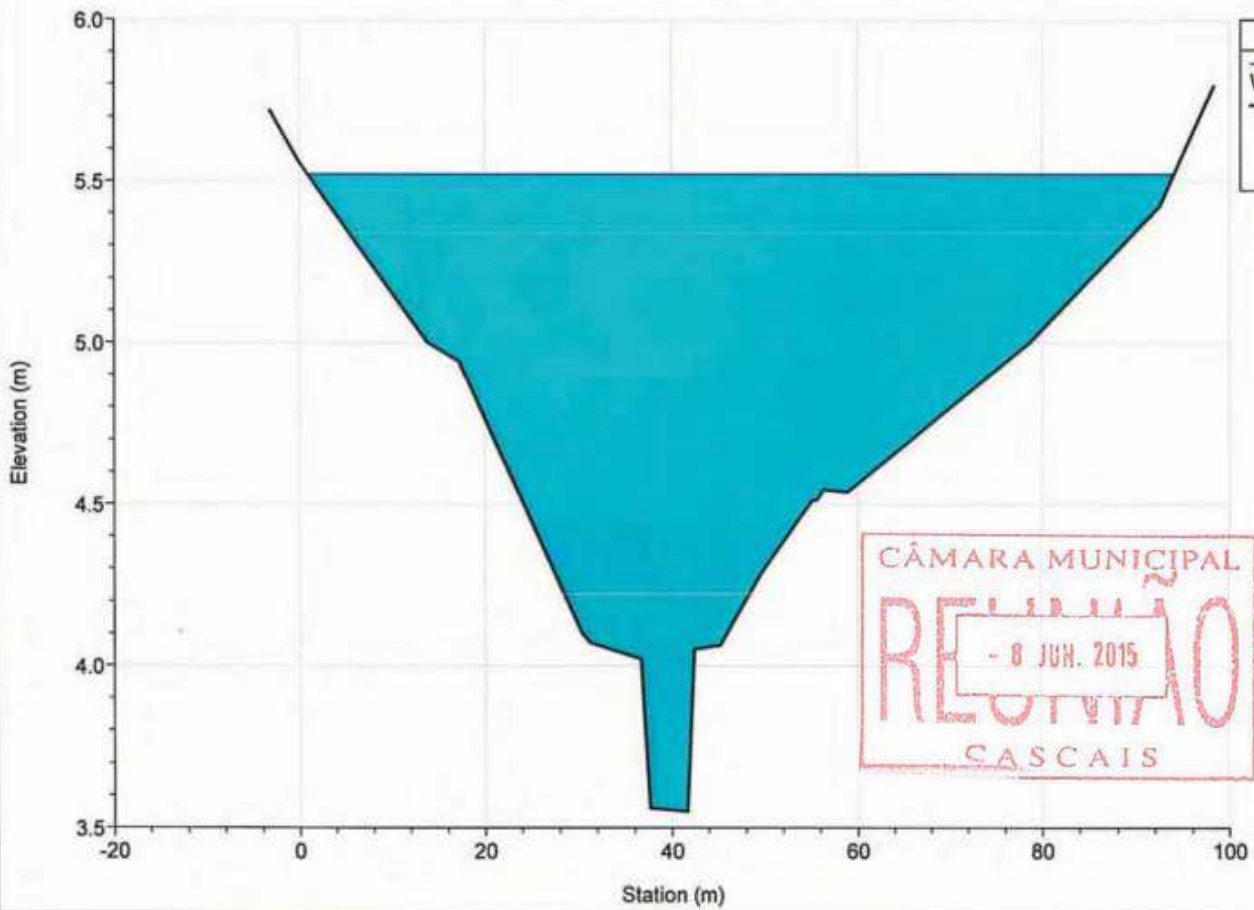
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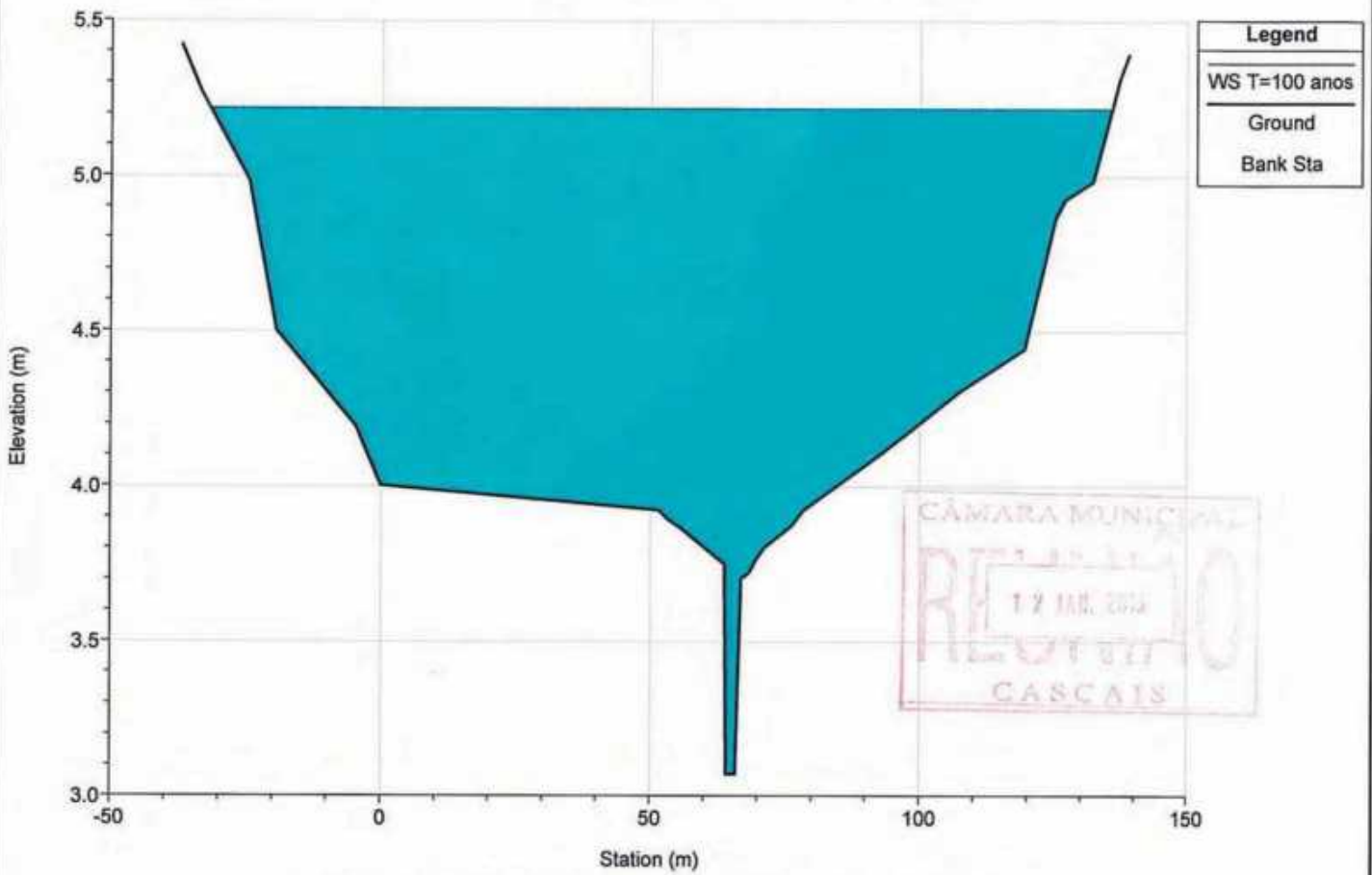
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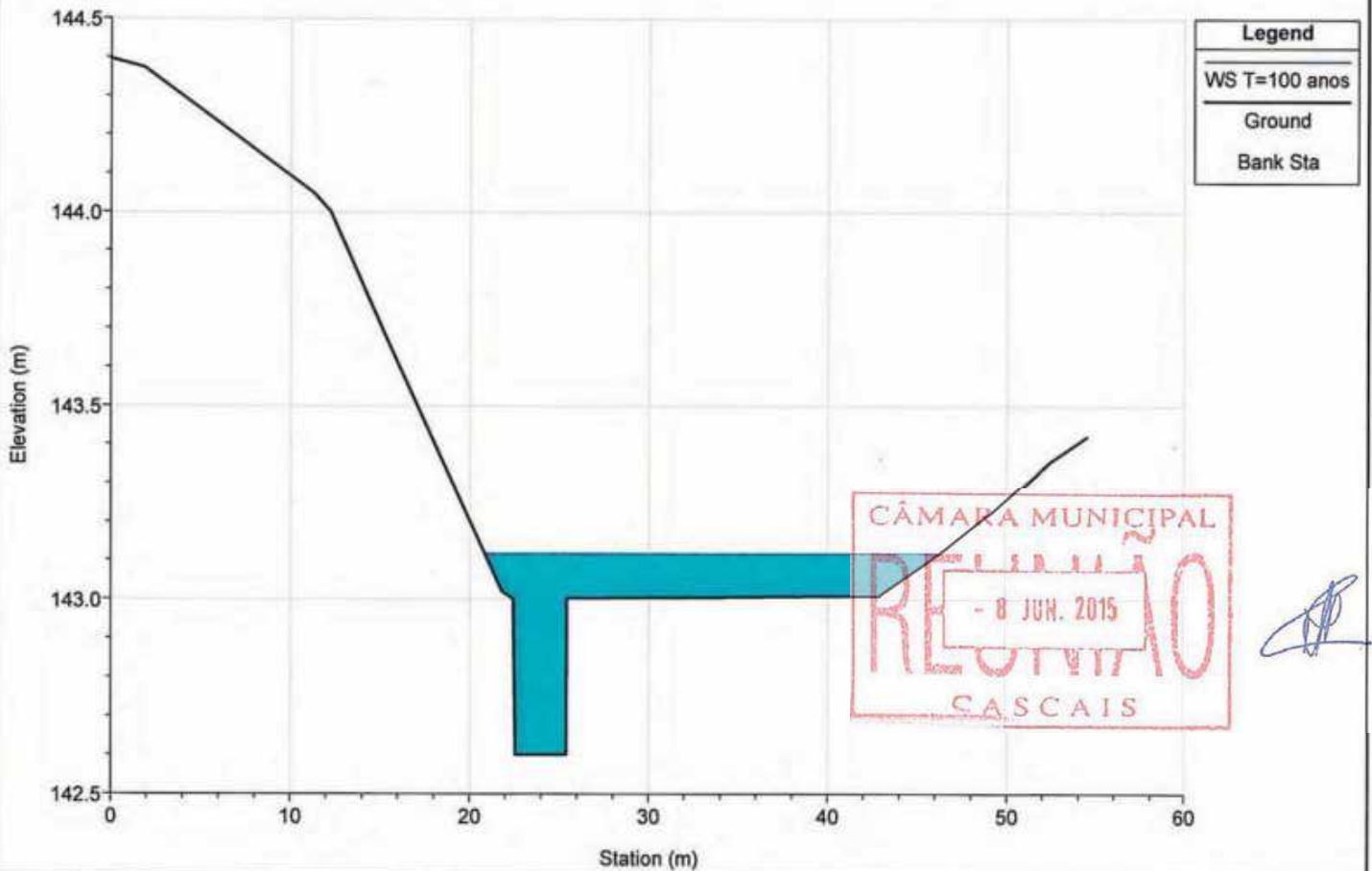
River = VINHAS Reach = jusante RS = 119.307



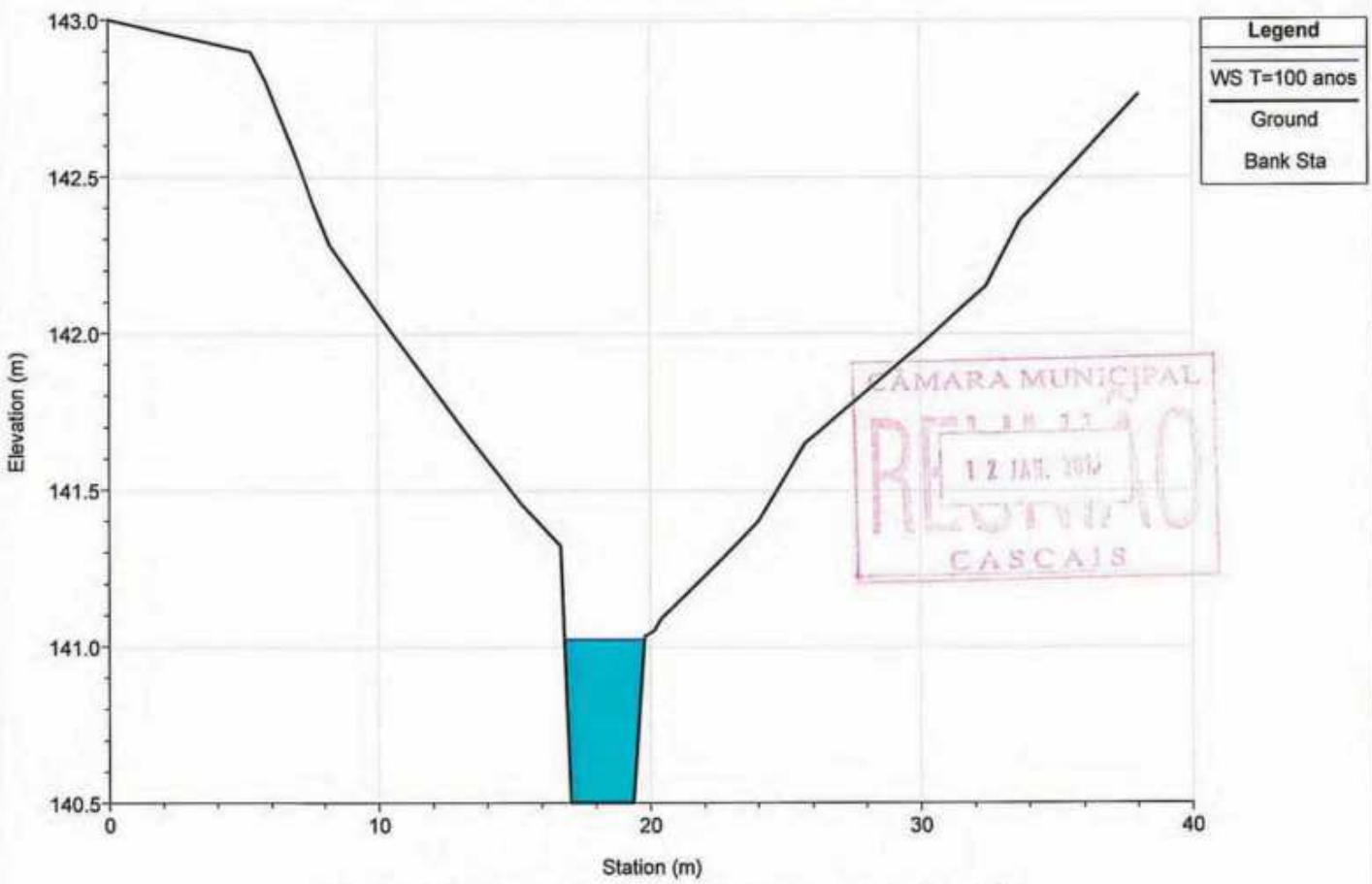
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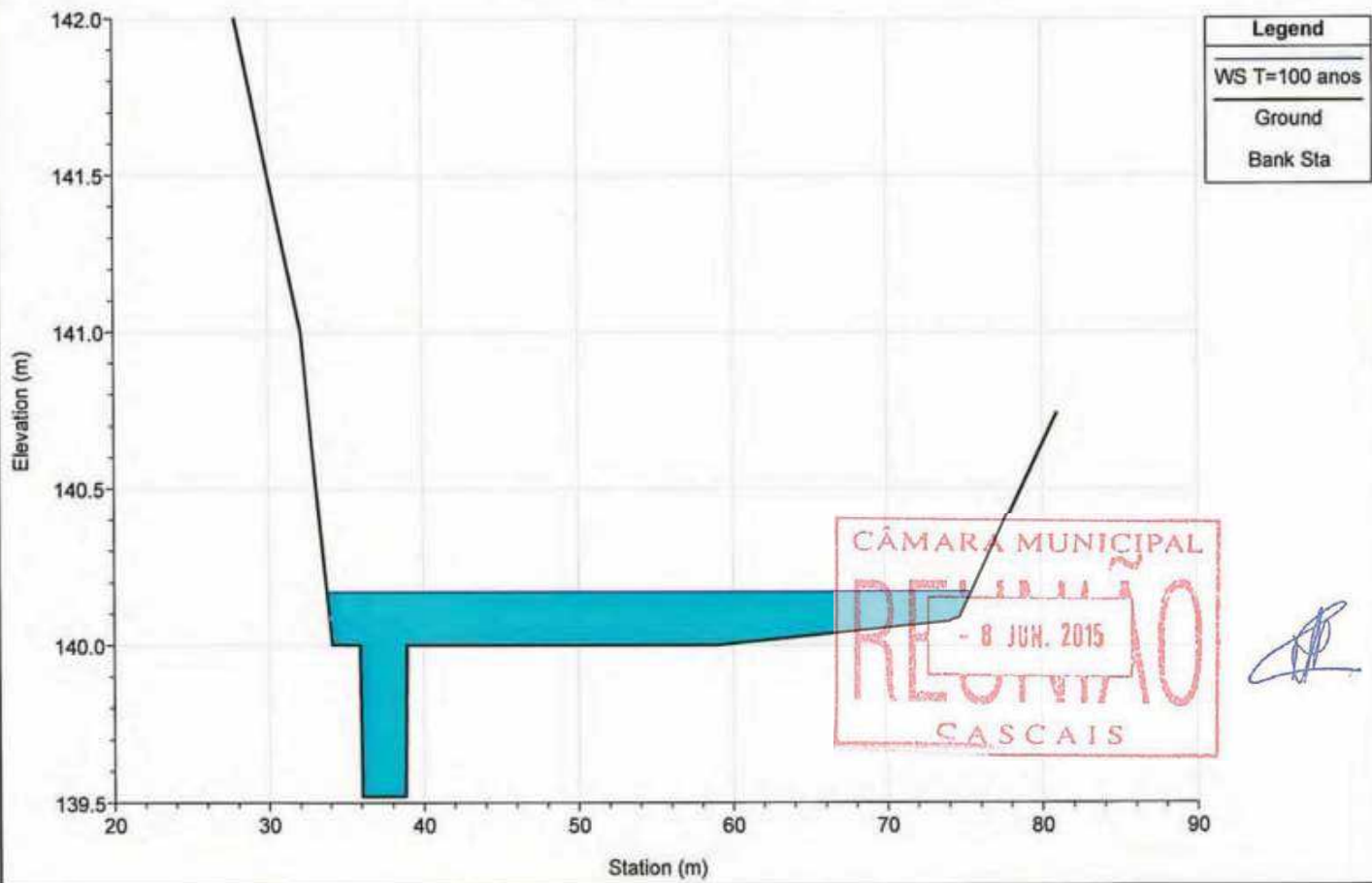
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River = ME1-VINHAS Reach = montante RS = 1249.015

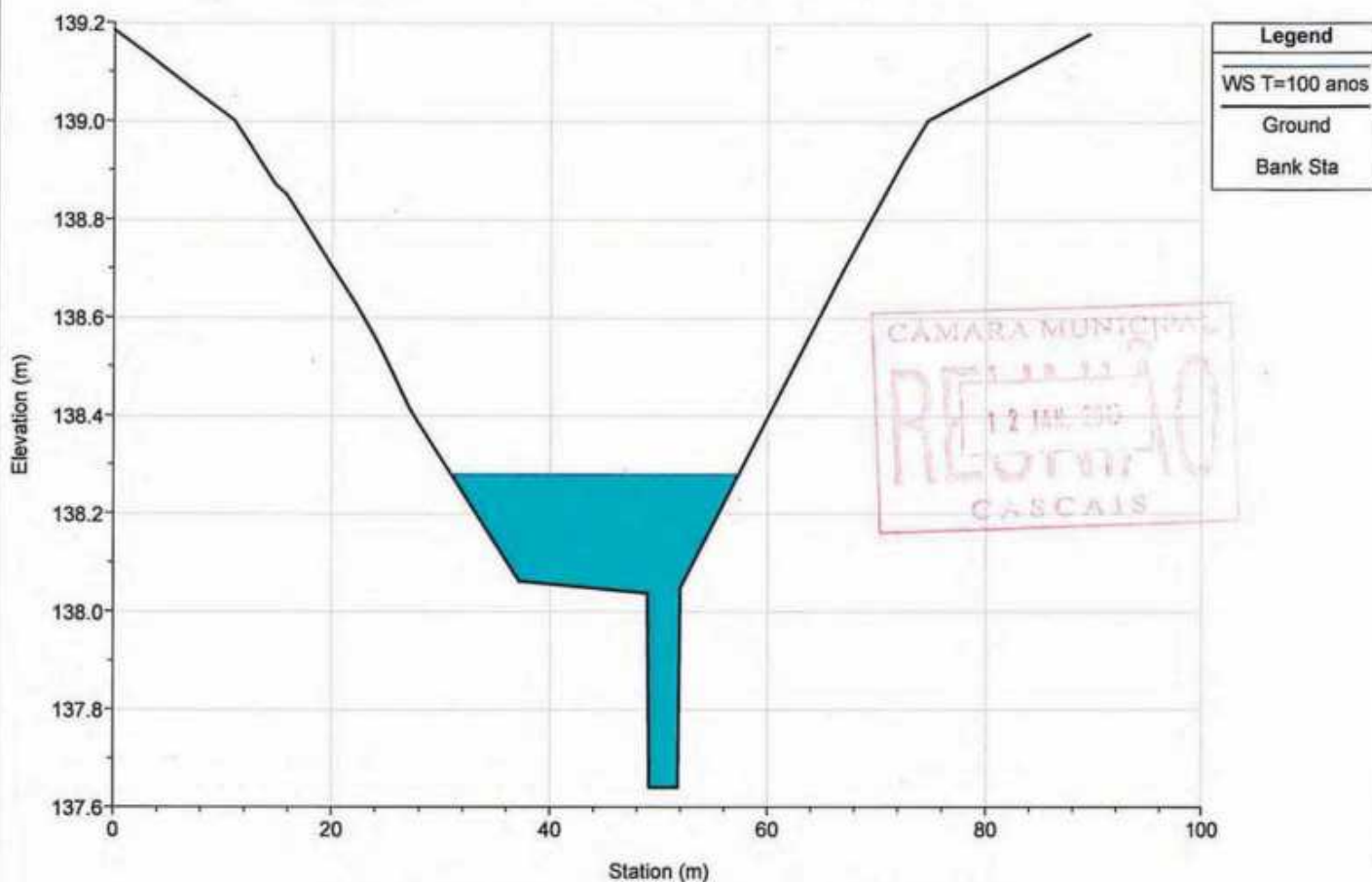


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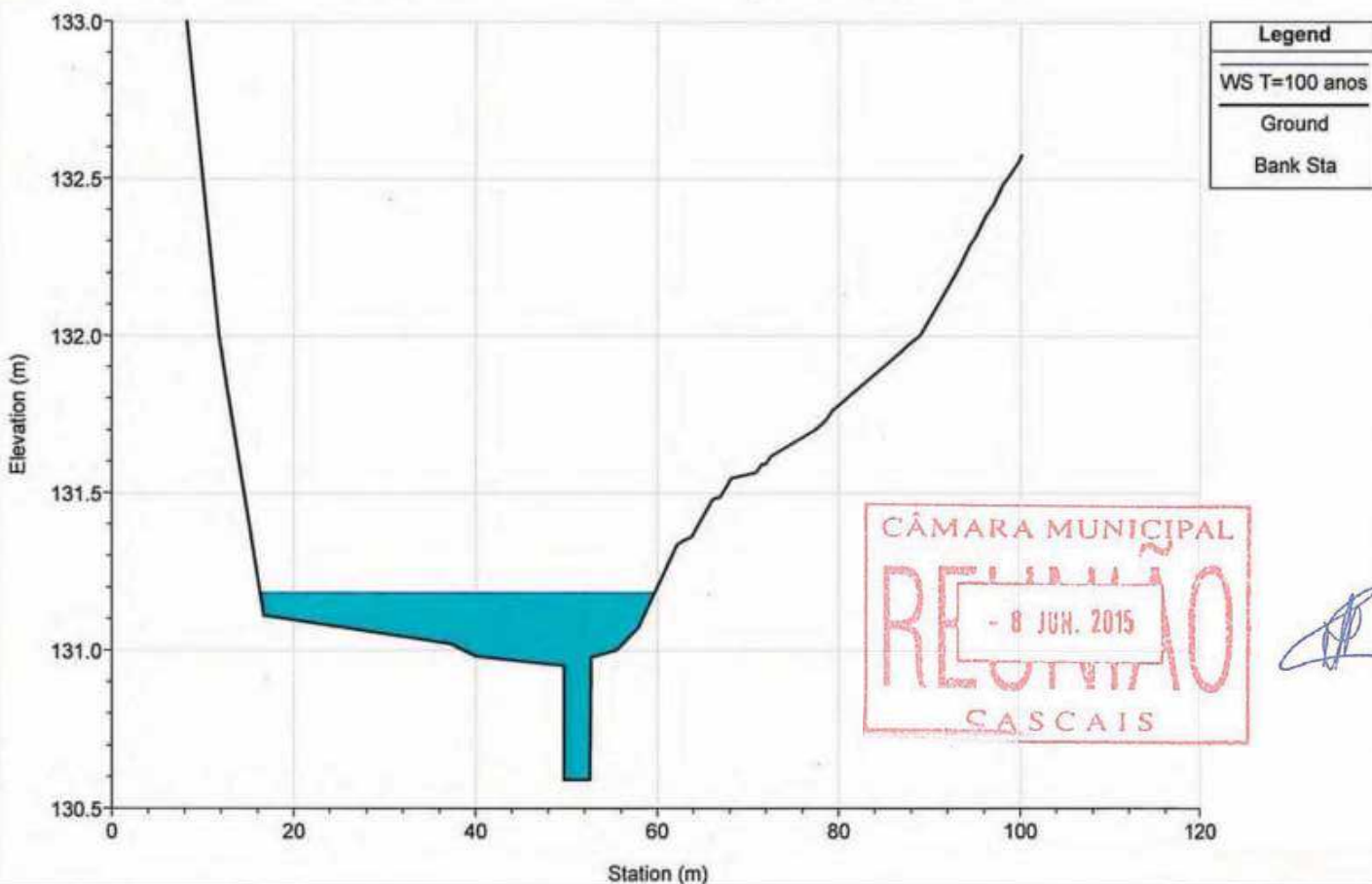




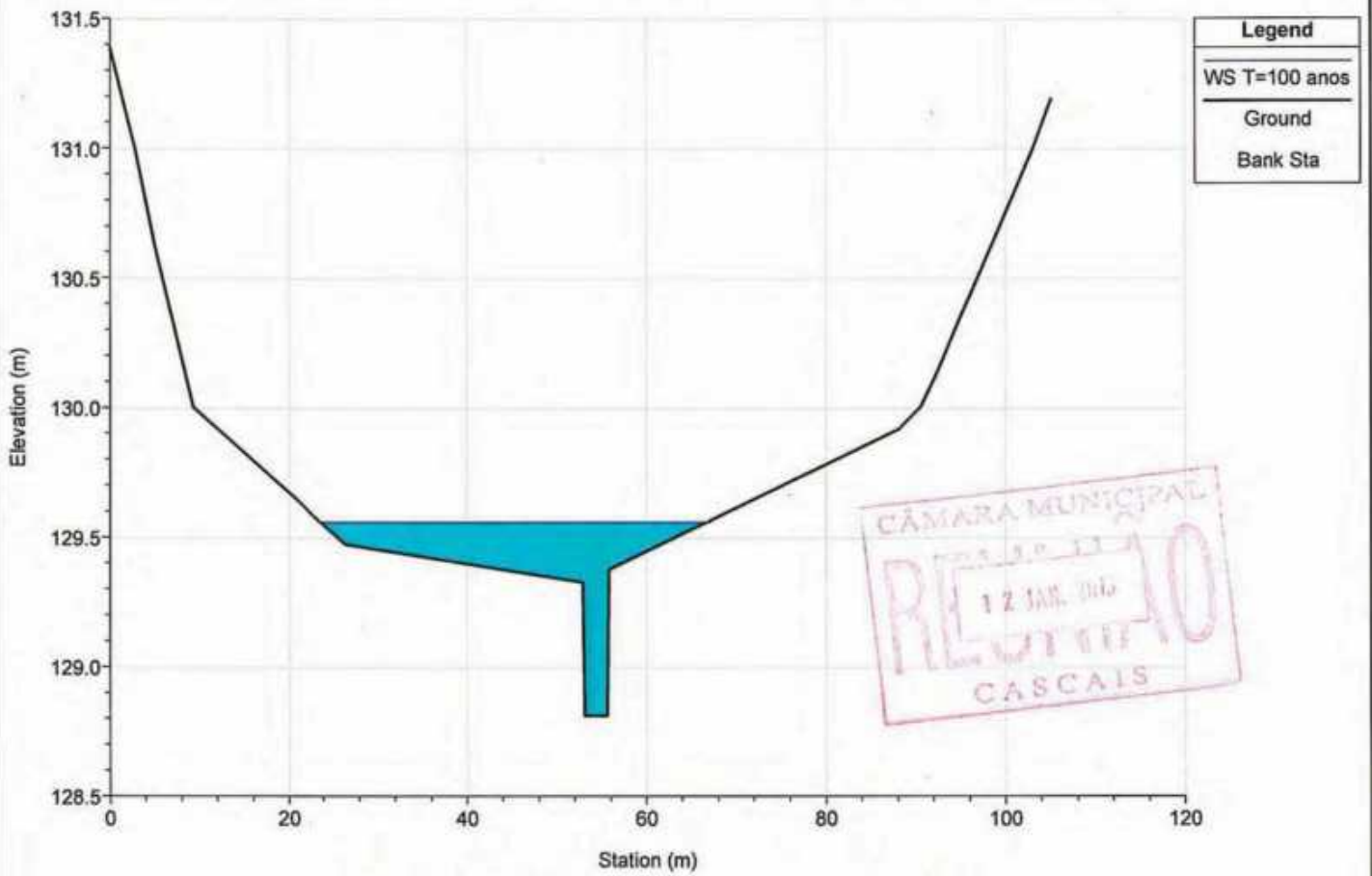
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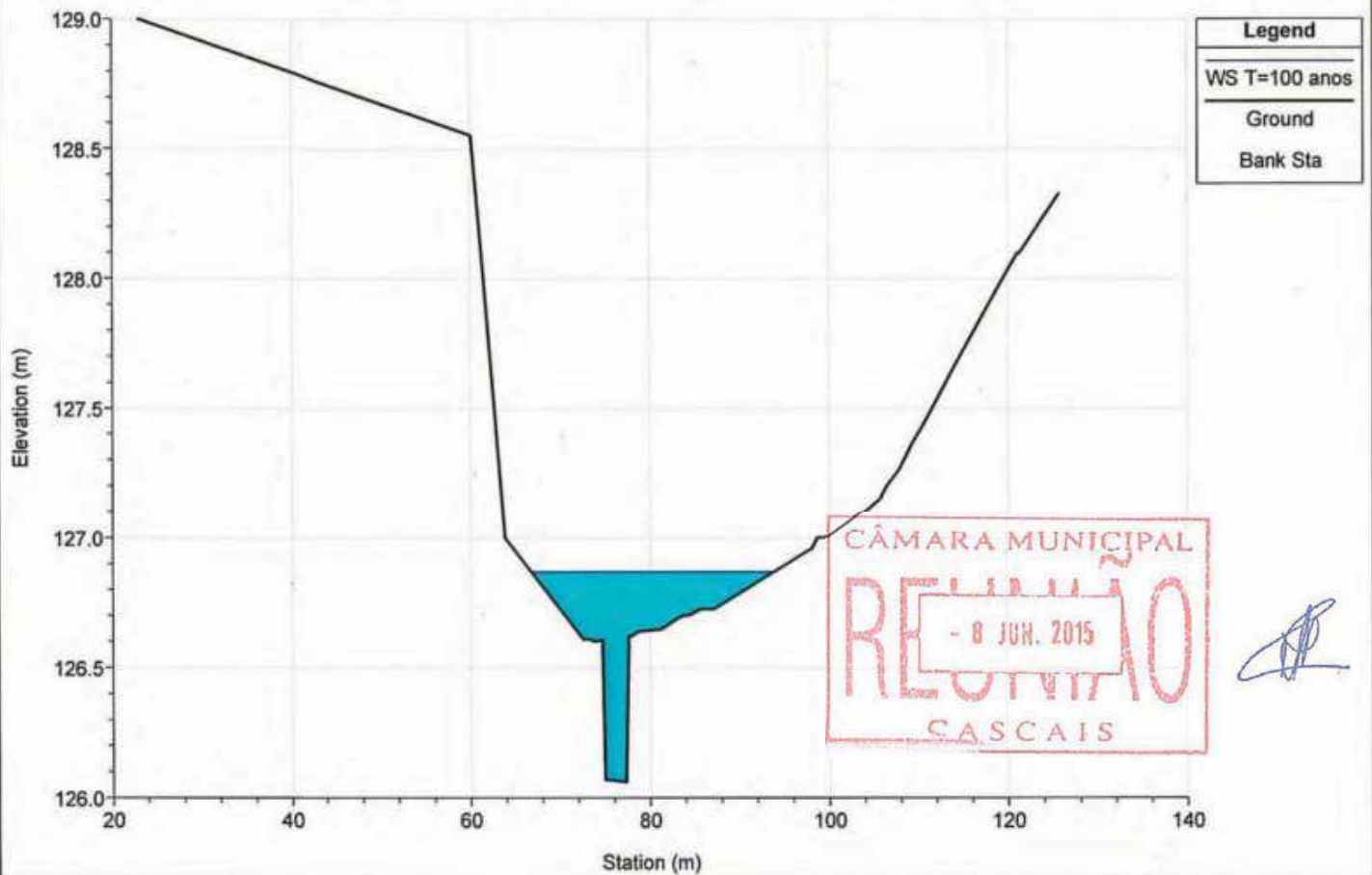
River = ME1-VINHAS Reach = jusante RS = 927.676



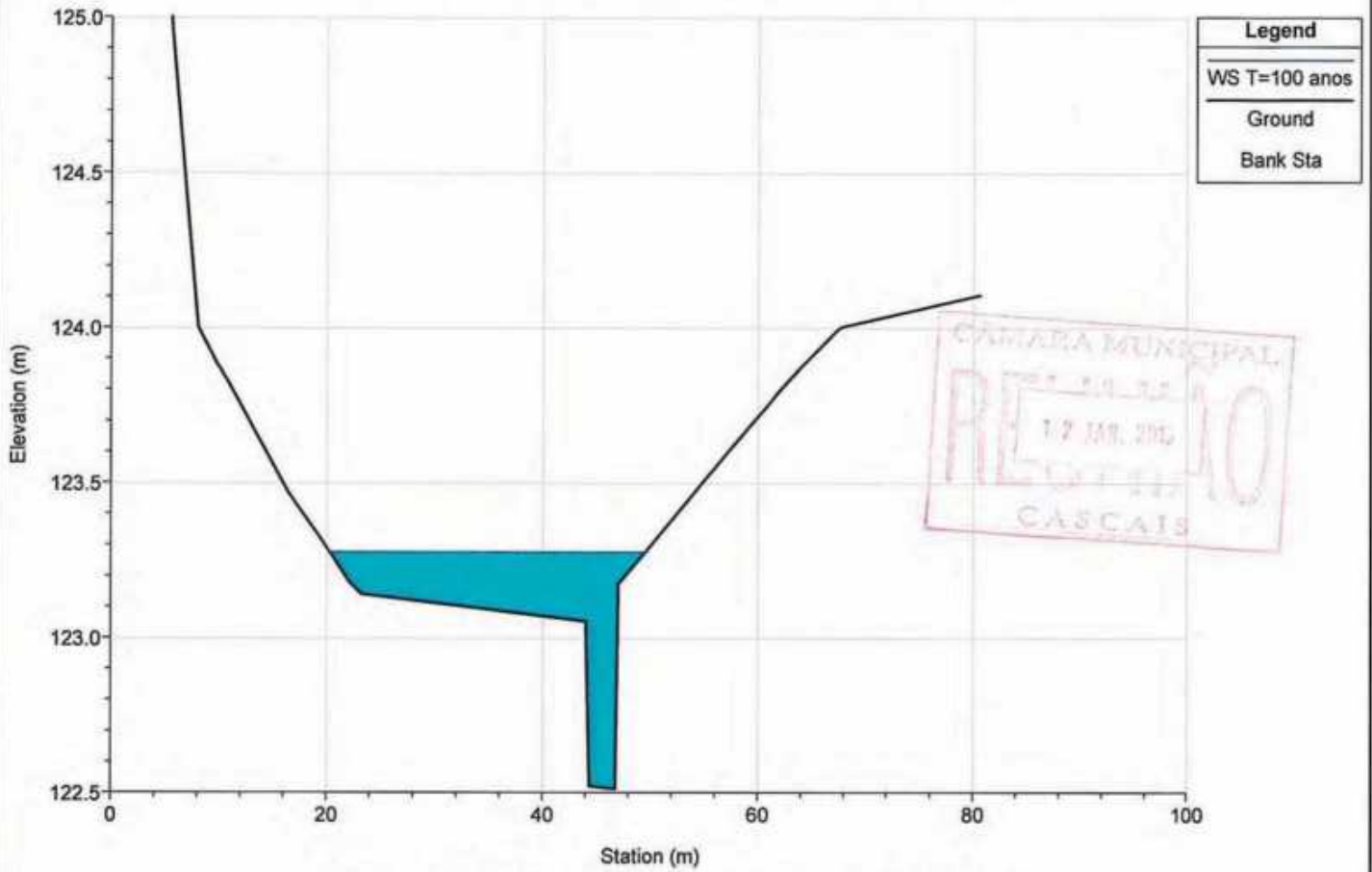
River = ME1-VINHAS Reach = jusante RS = 791.067



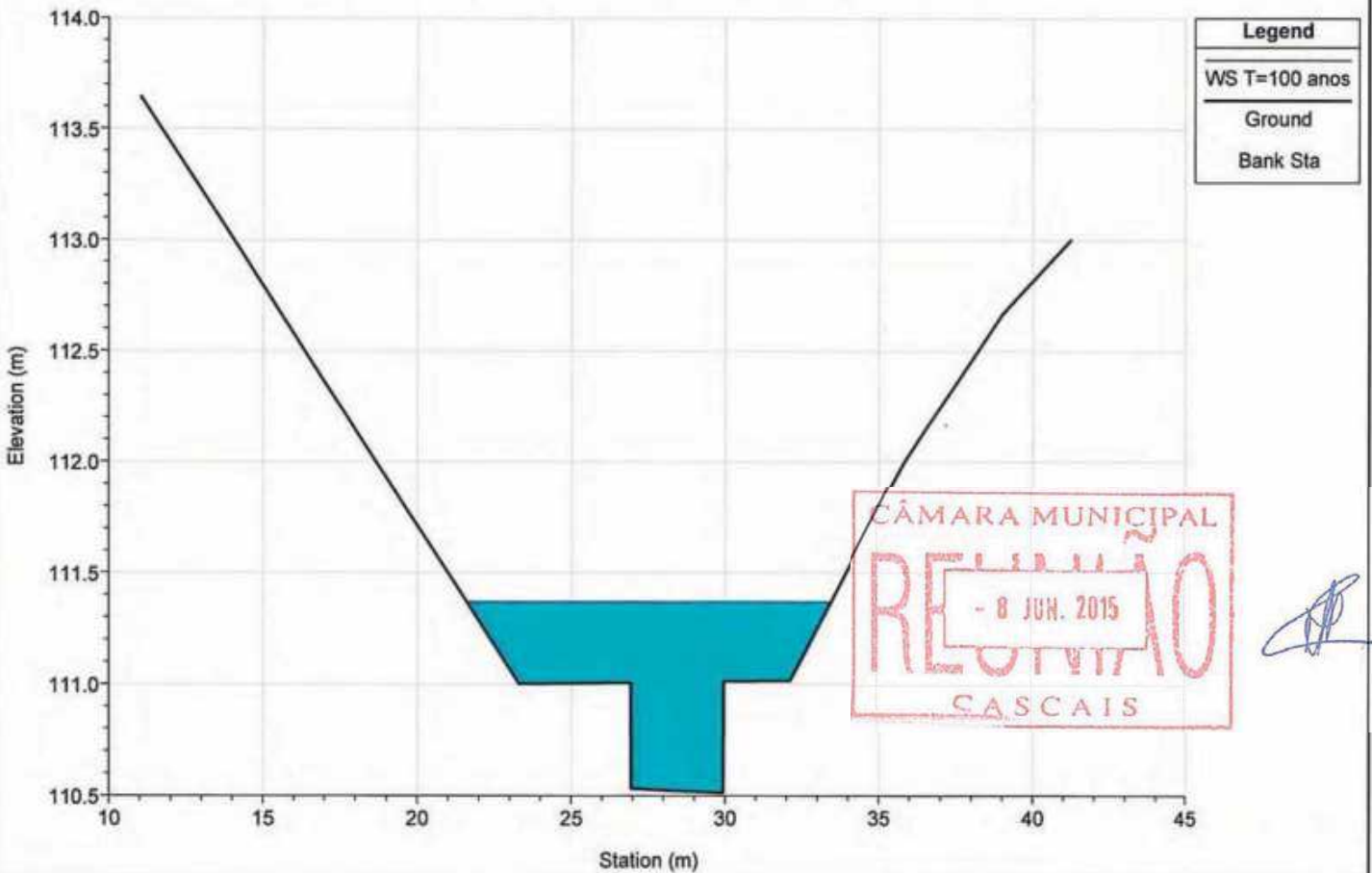
River = ME1-VINHAS Reach = jusante RS = 640.612



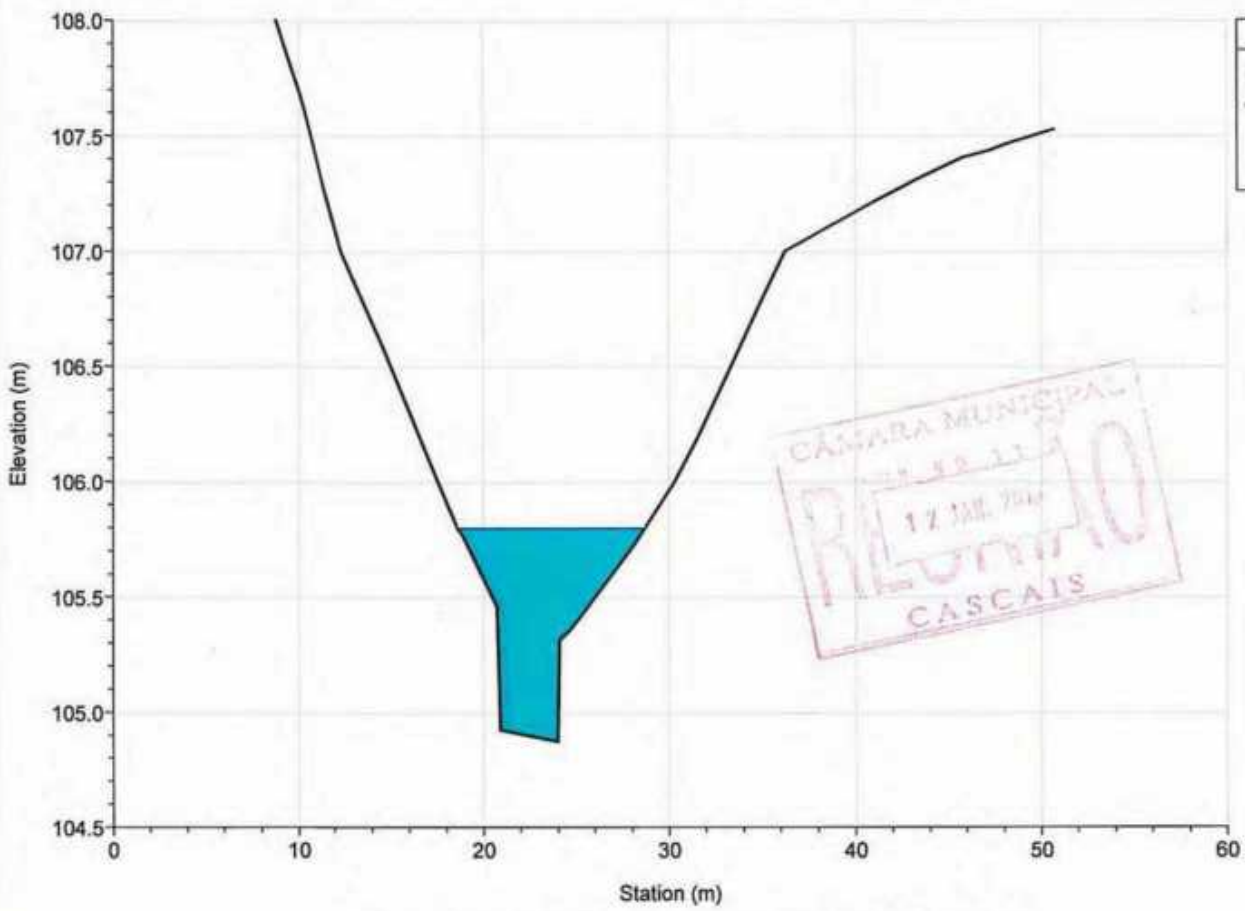
River = ME1-VINHAS Reach = jusante RS = 511.566



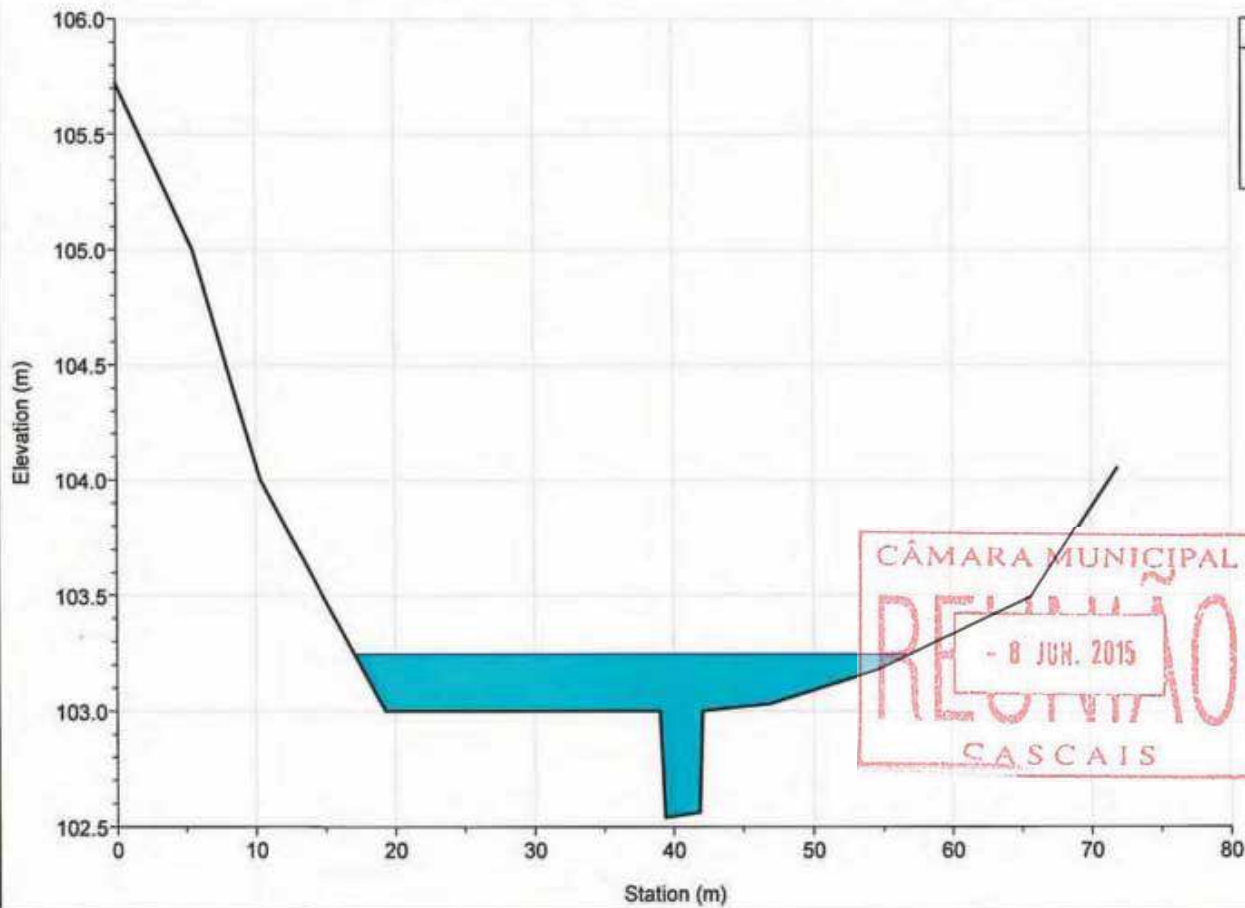
River = ME1-VINHAS Reach = jusante RS = 335.294



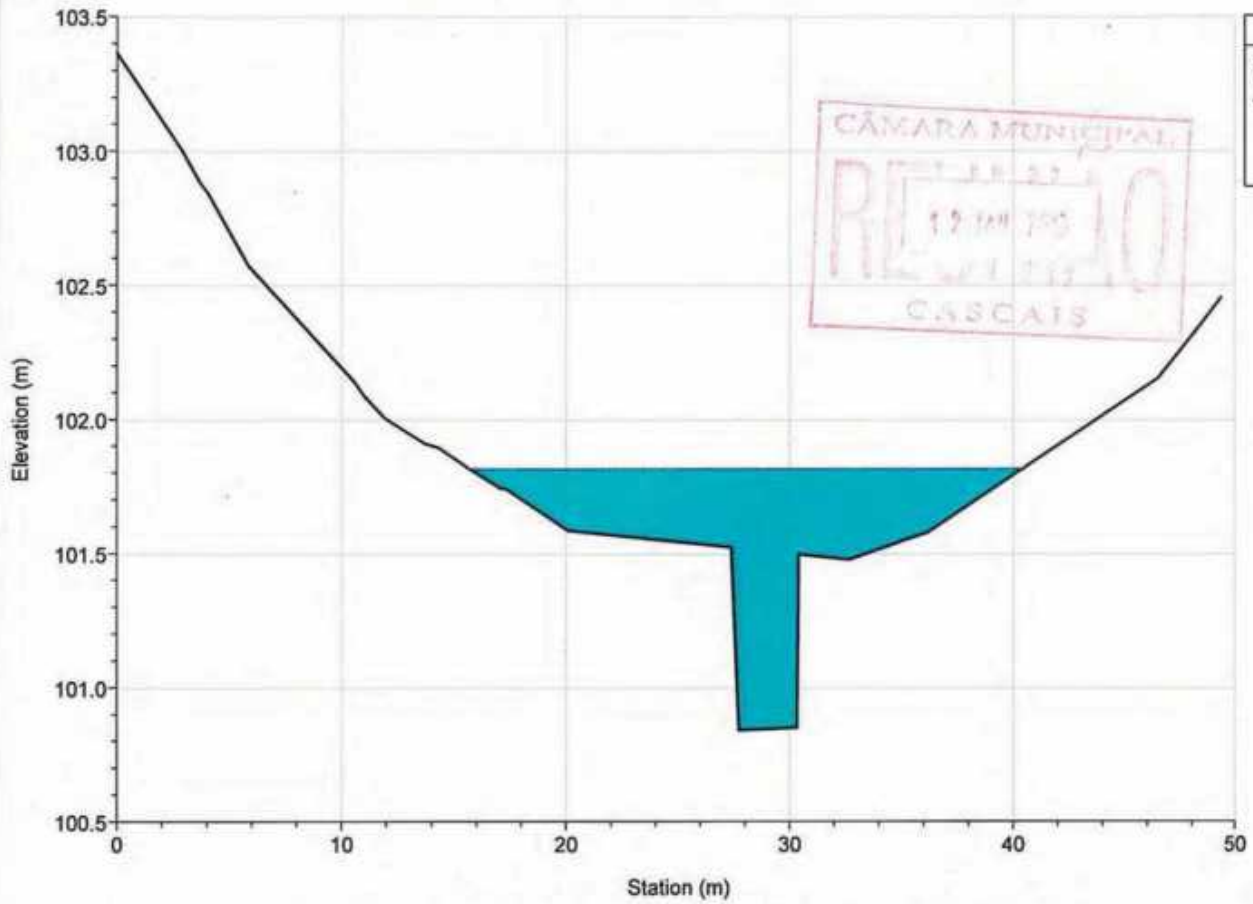
River = ME1-VINHAS Reach = jusante RS = 208.980



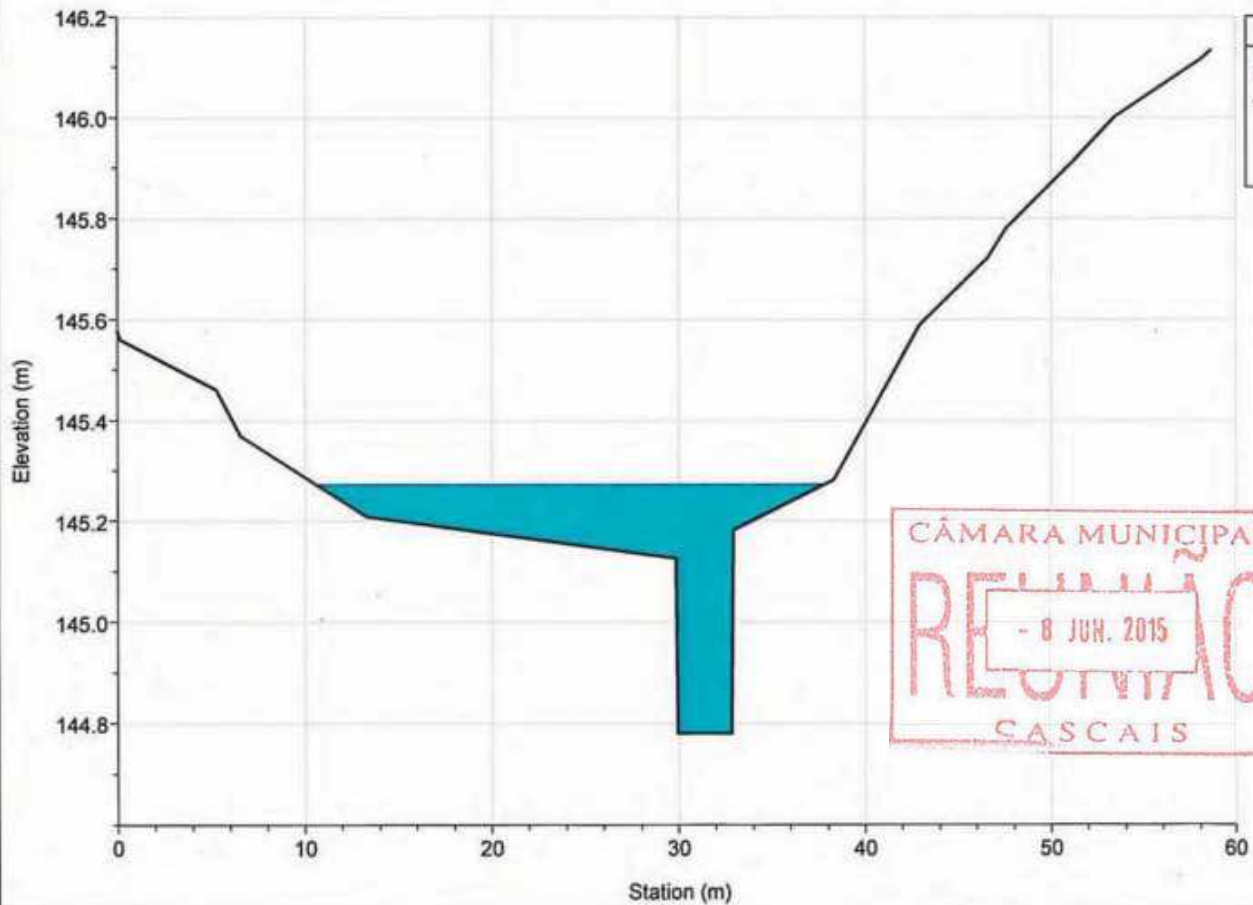
River = ME1-VINHAS Reach = jusante RS = 106.760



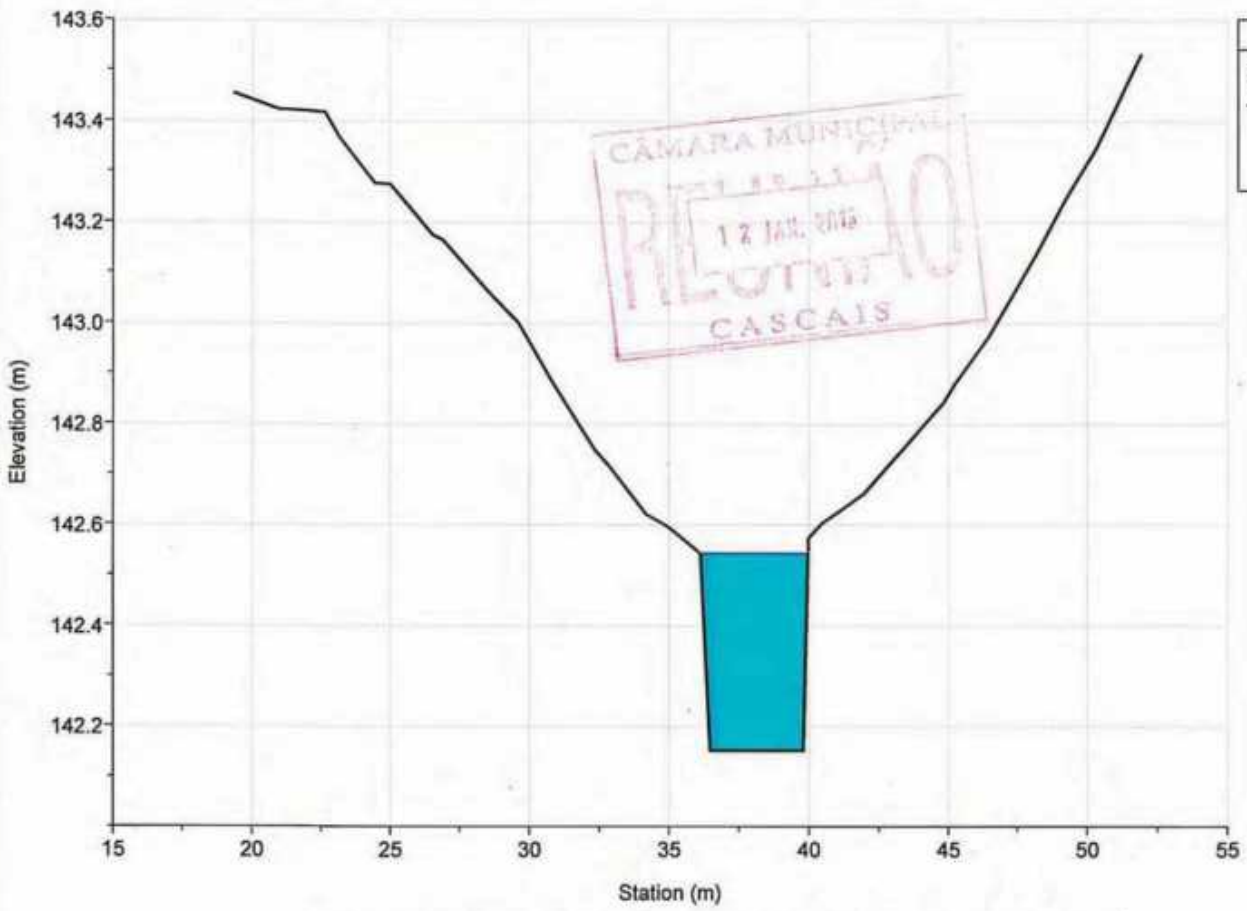
River = ME1-VINHAS Reach = jusante RS = 30.064



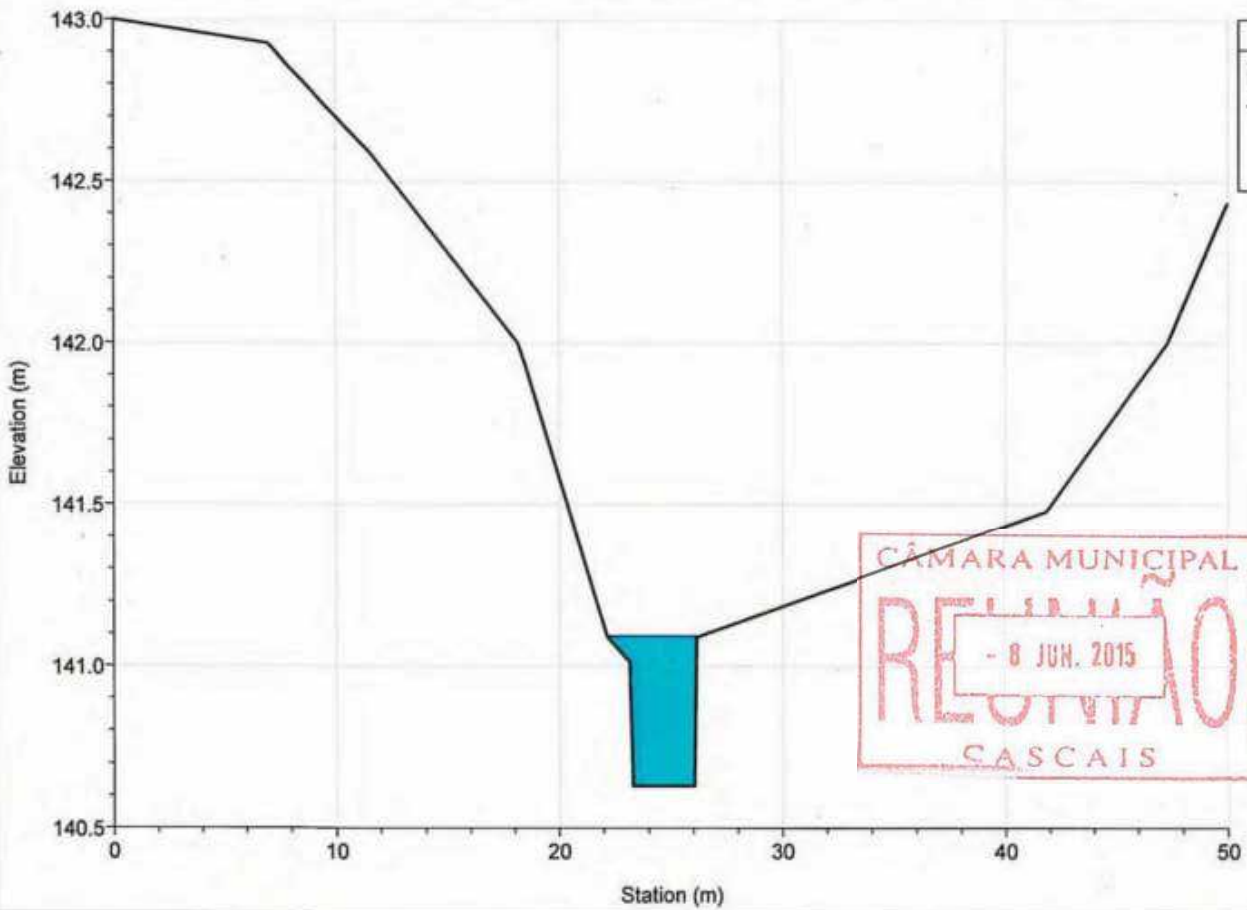
River = AFL\_ME1-VINHAS Reach = afluente RS = 144.657



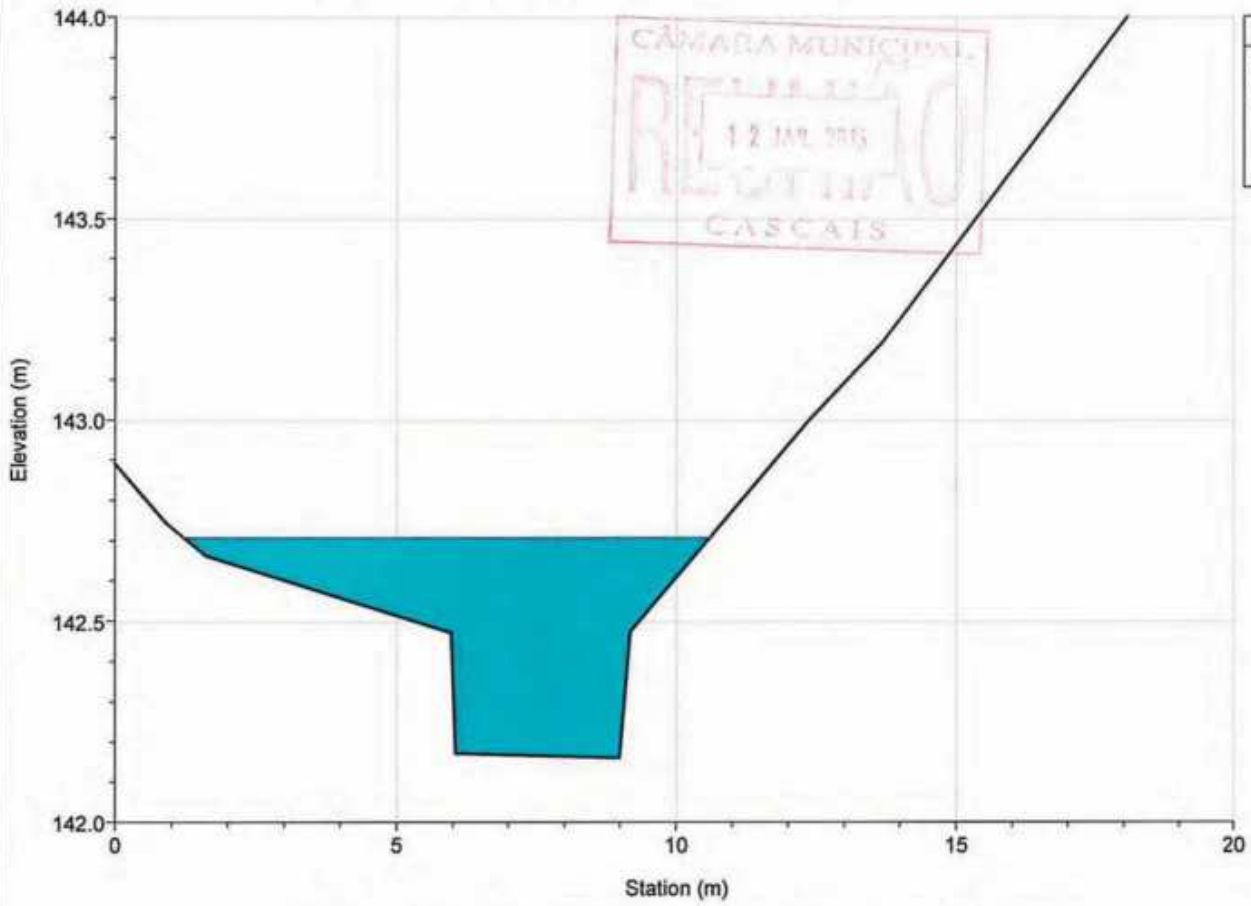
River = AFL\_ME1-VINHAS Reach = afluente RS = 49.447



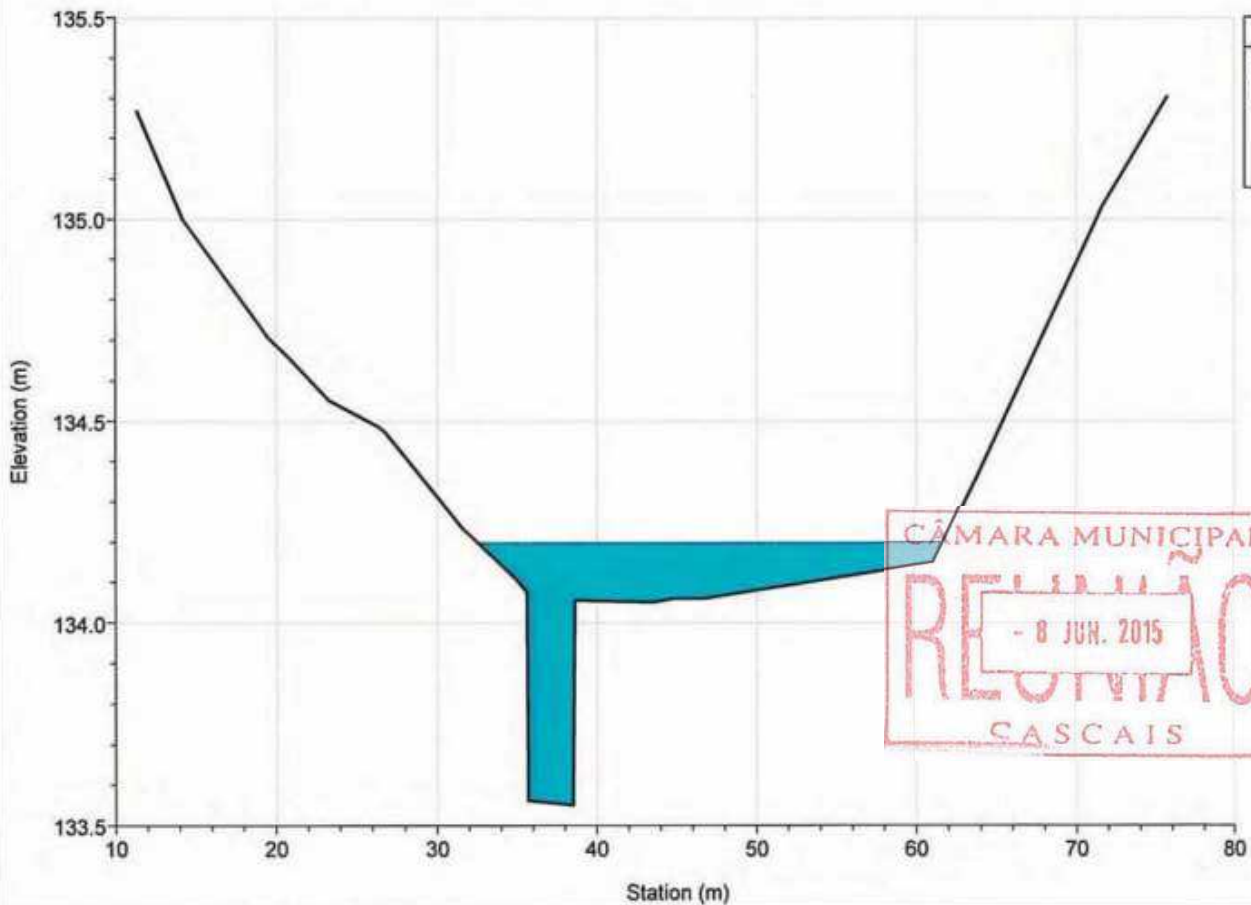
River = AFL\_ME1-VINHAS Reach = afluente RS = 15.383



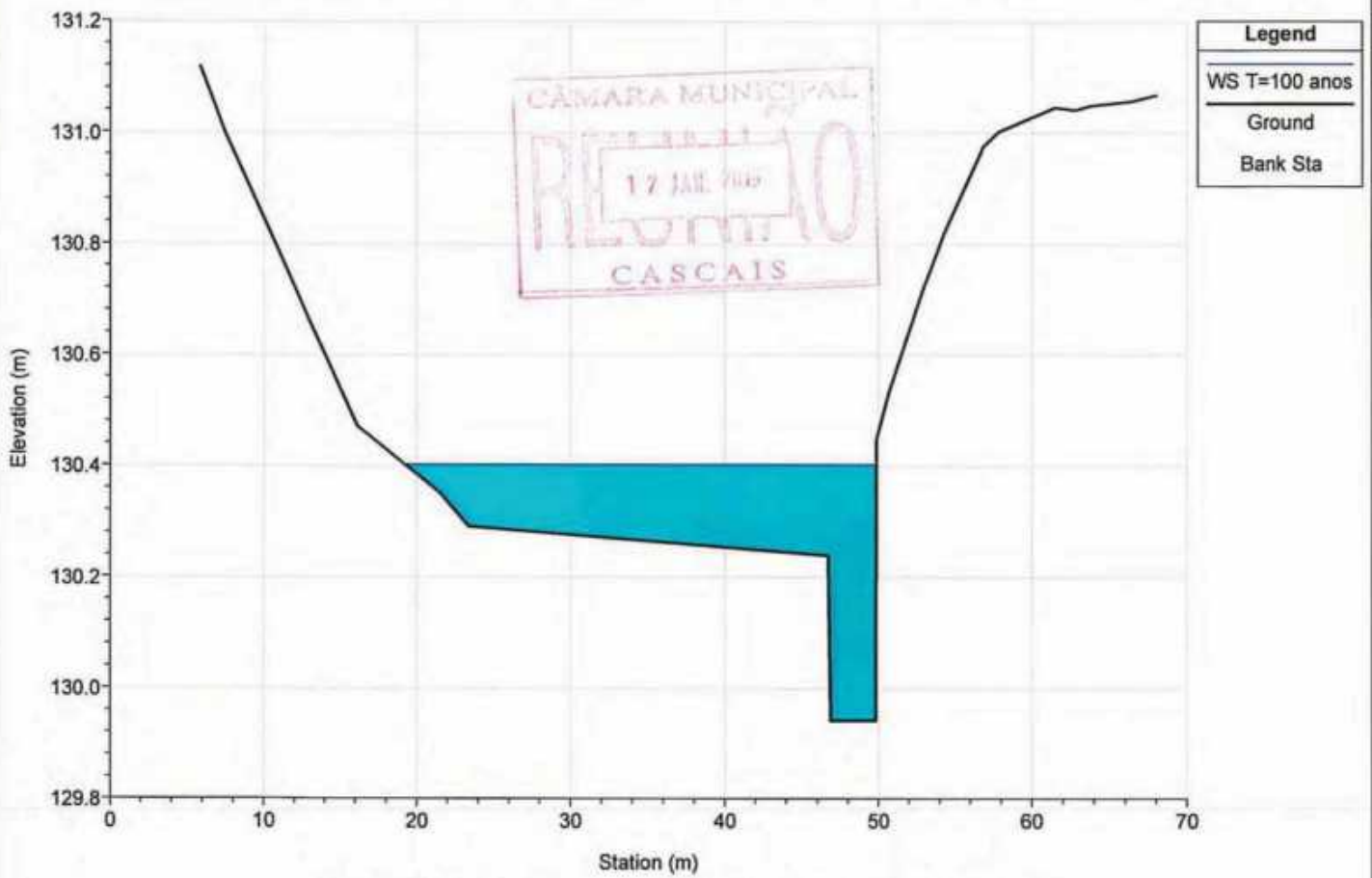
River = AFL\_MD1-VINHAS Reach = afluente RS = 686.920



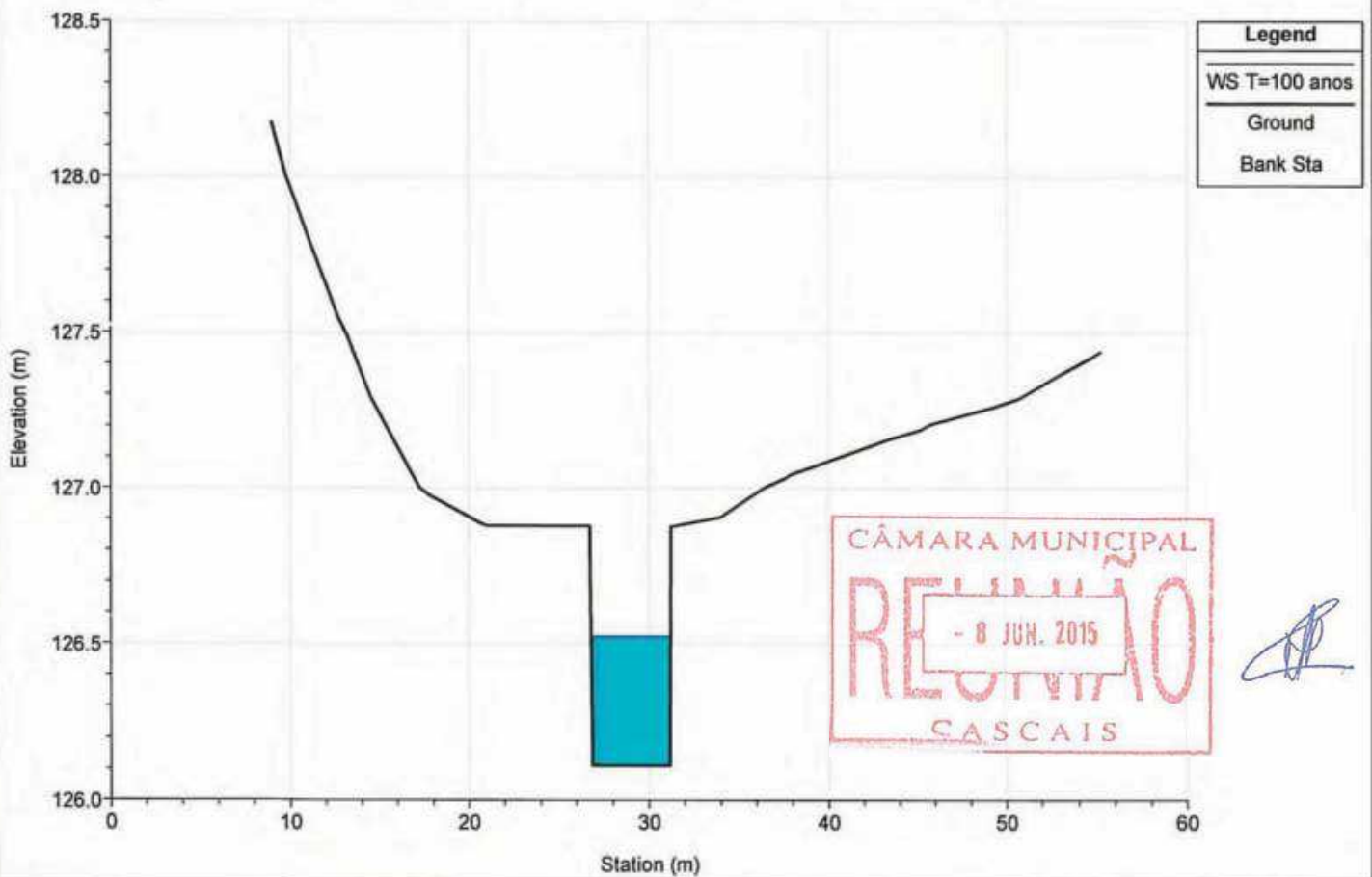
River = AFL\_MD1-VINHAS Reach = afluente RS = 584.001



River = AFL\_MD1-VINHAS Reach = afluyente RS = 482.163

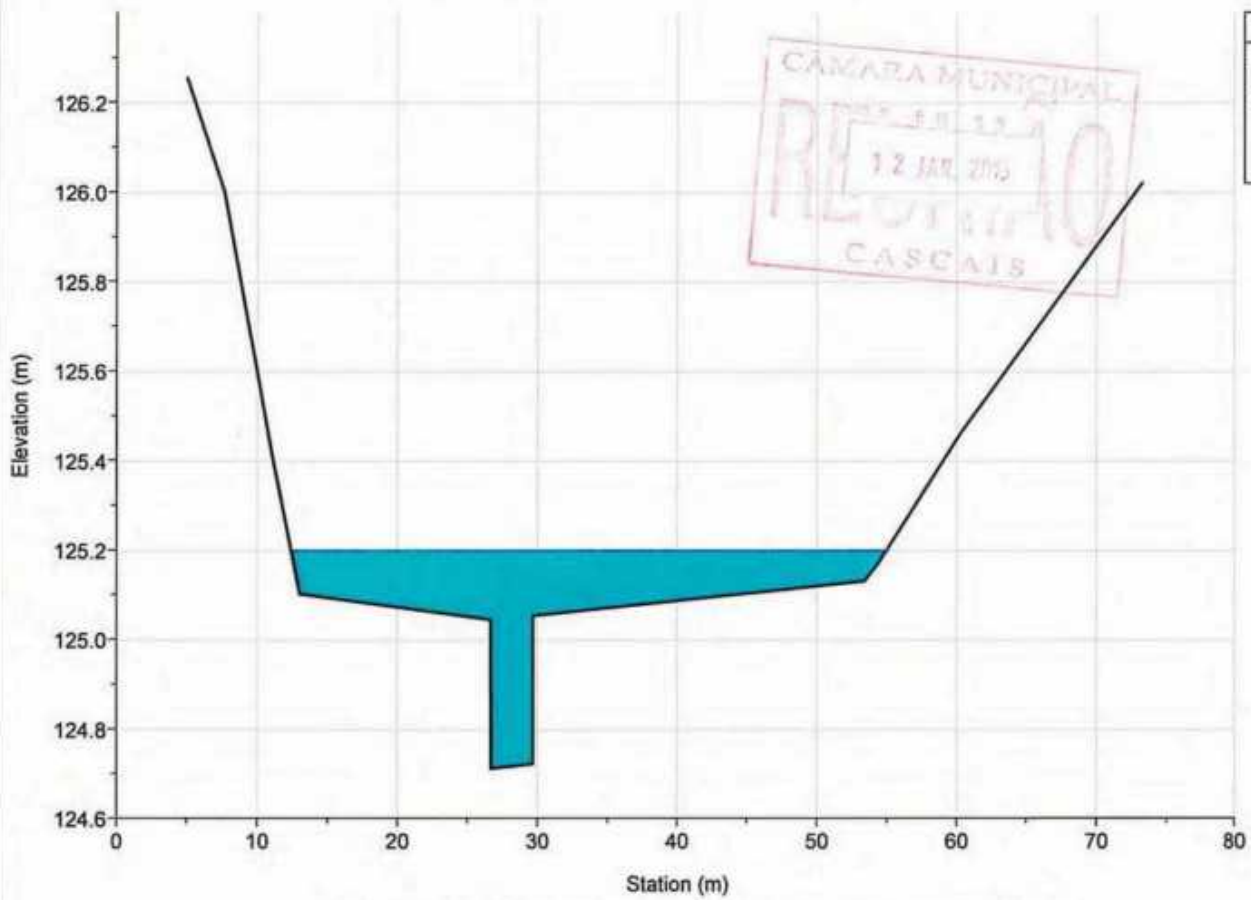


River = AFL\_MD1-VINHAS Reach = afluyente RS = 397.922

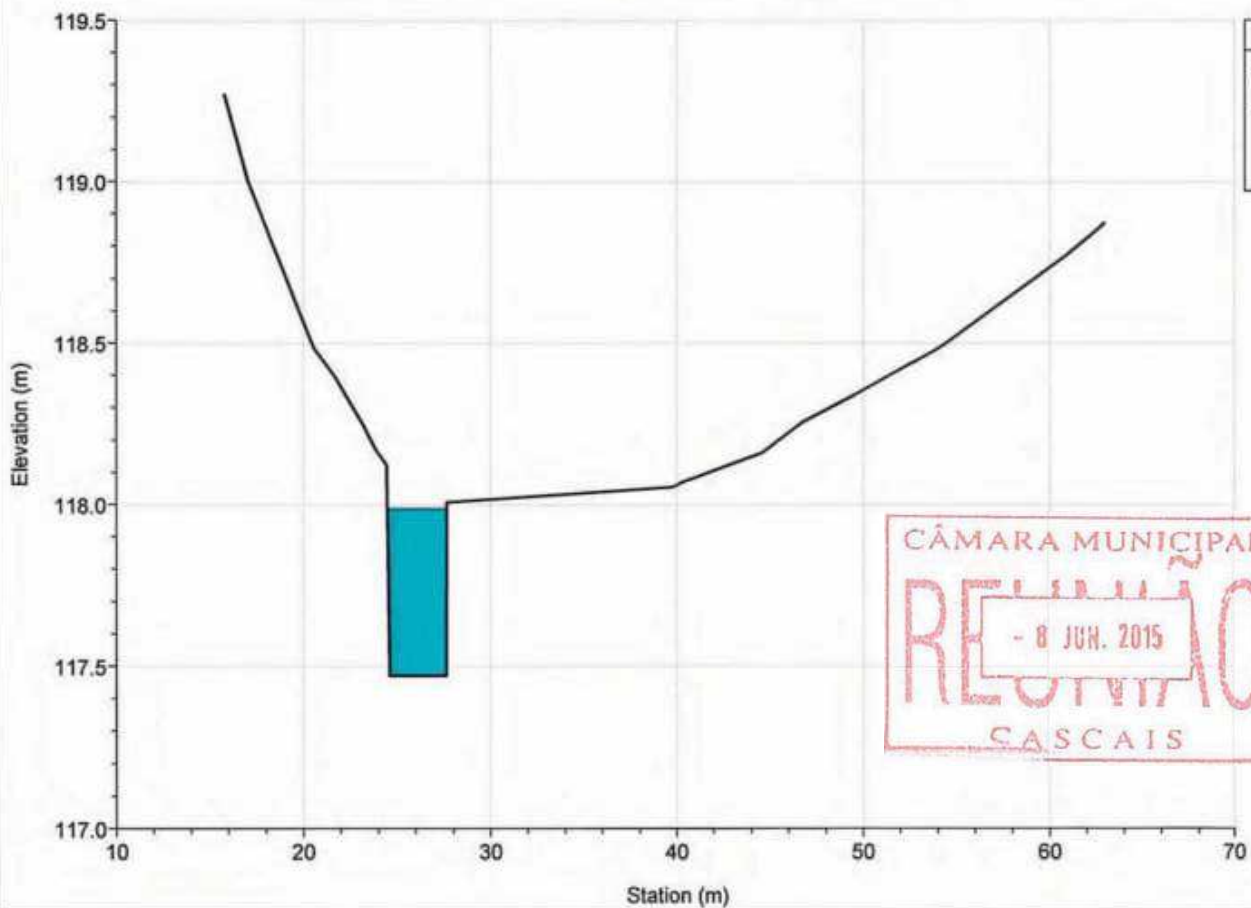


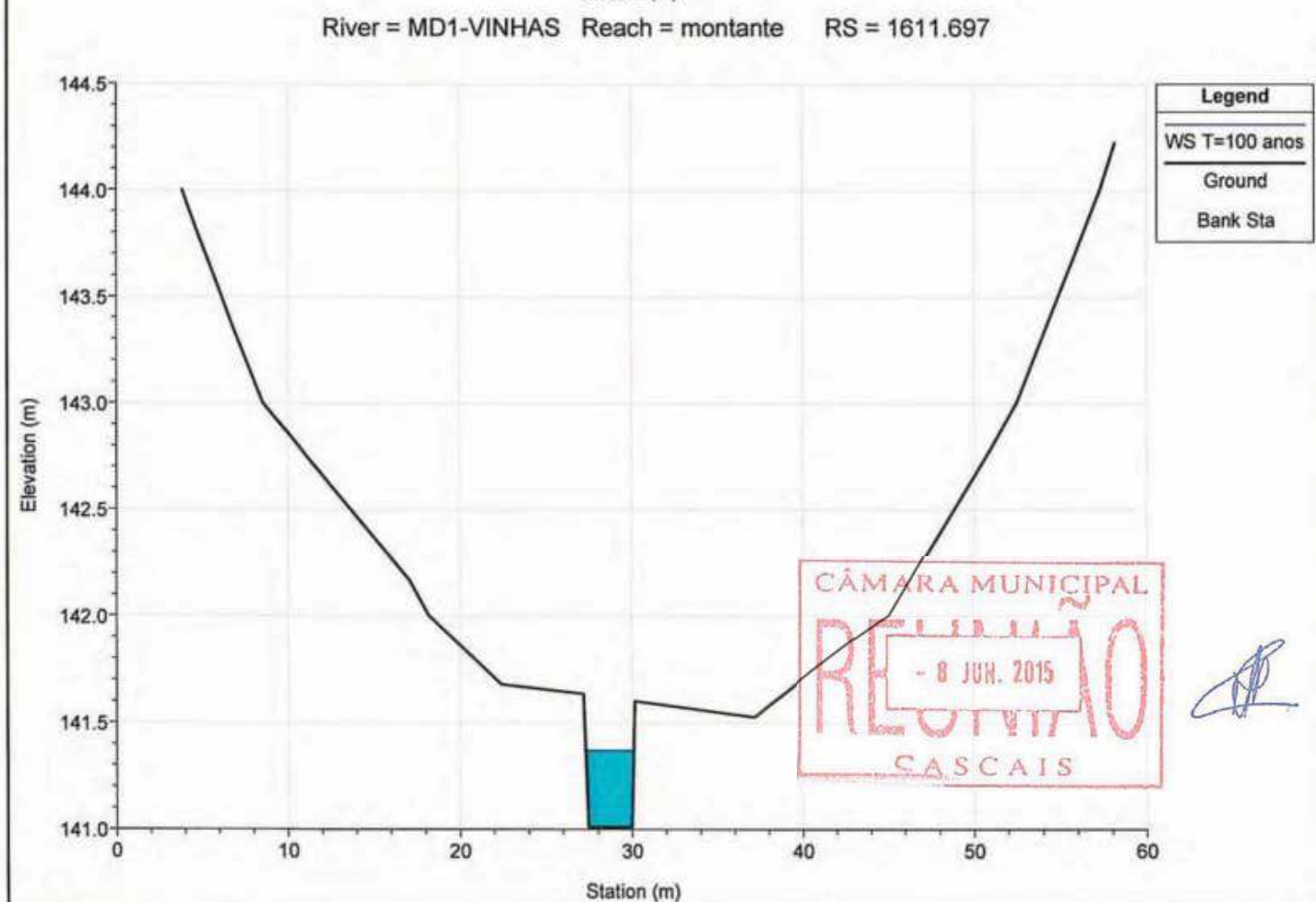
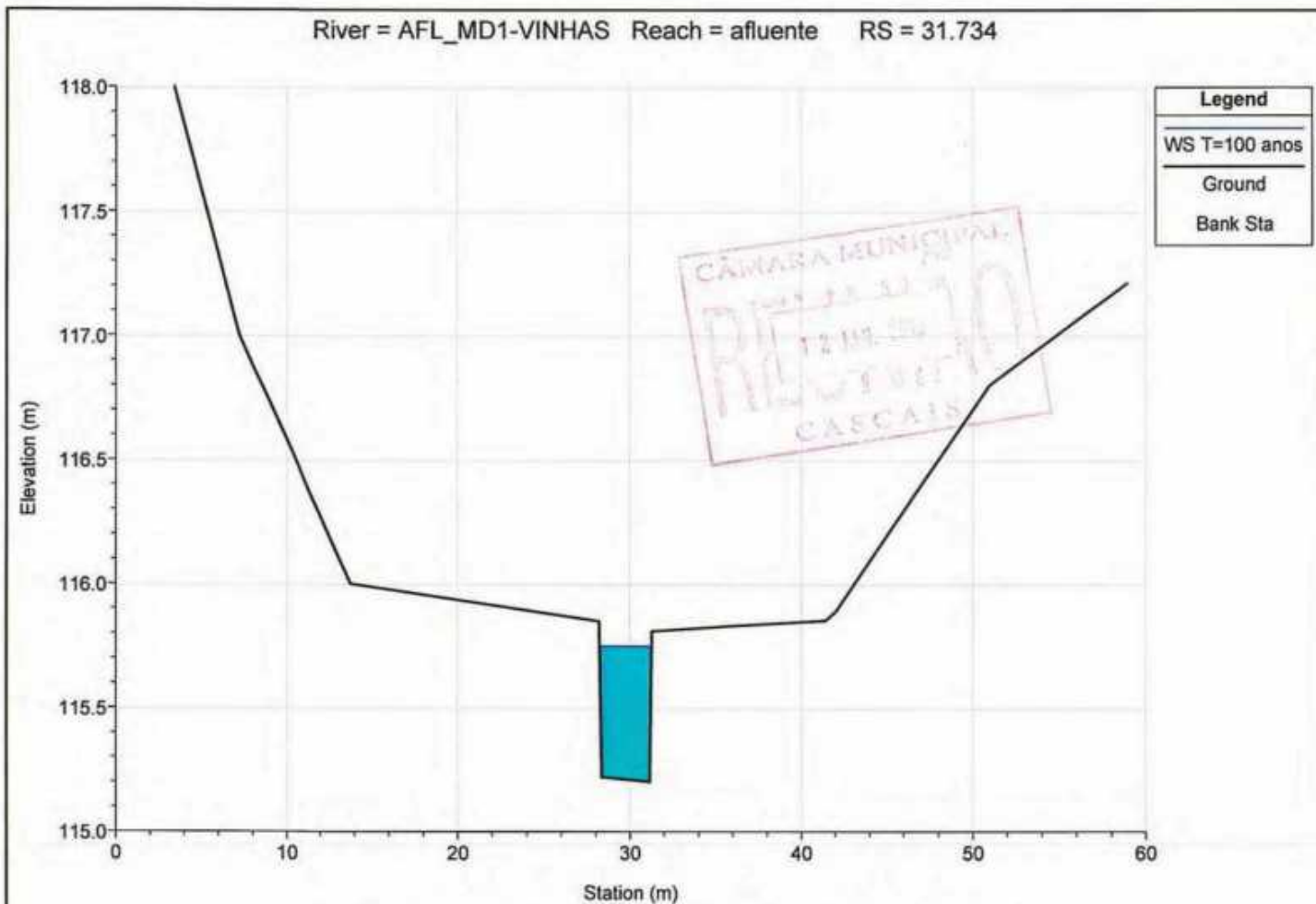


River = AFL\_MD1-VINHAS Reach = afluyente RS = 279.568

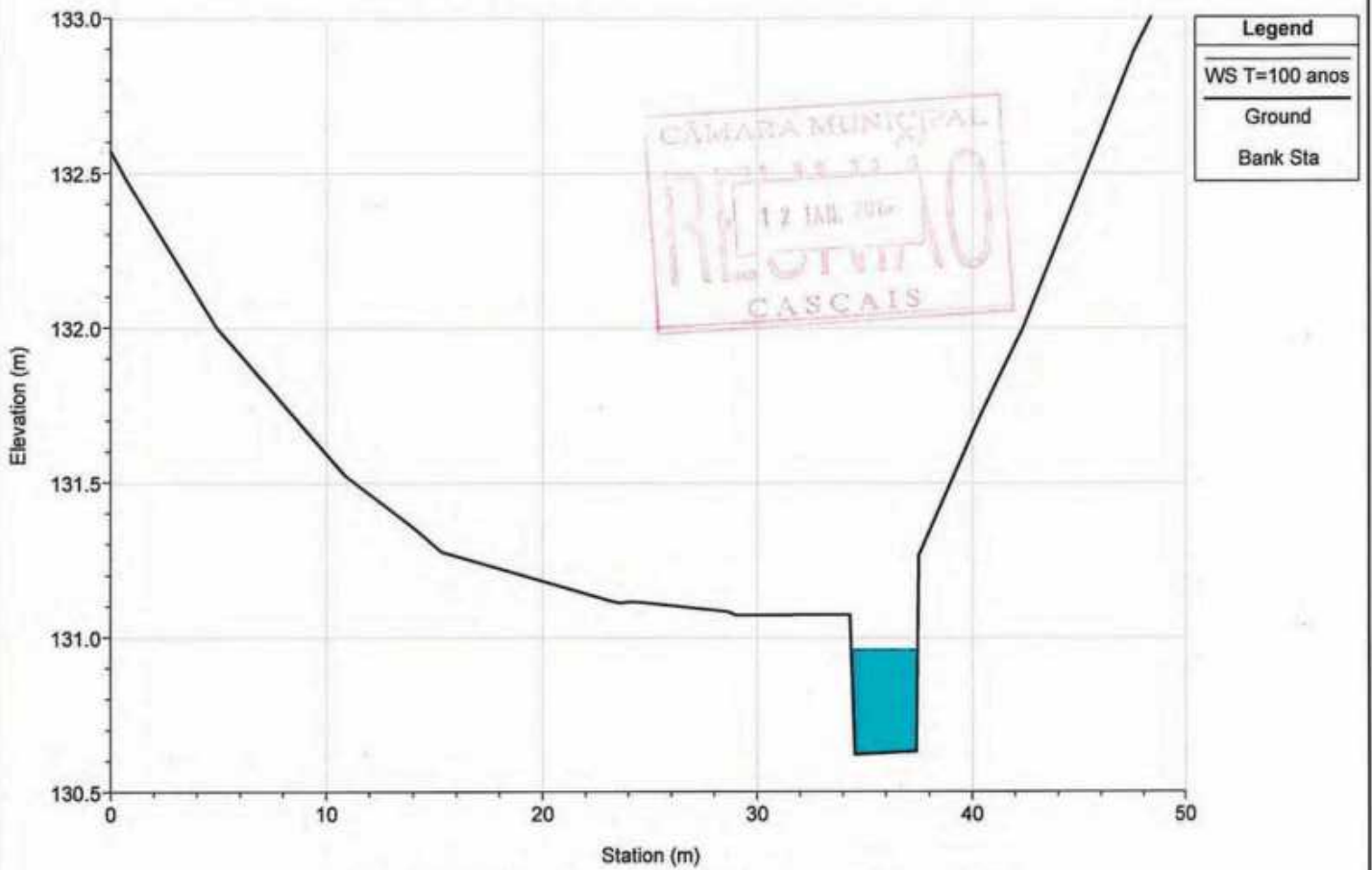


River = AFL\_MD1-VINHAS Reach = afluyente RS = 96.373

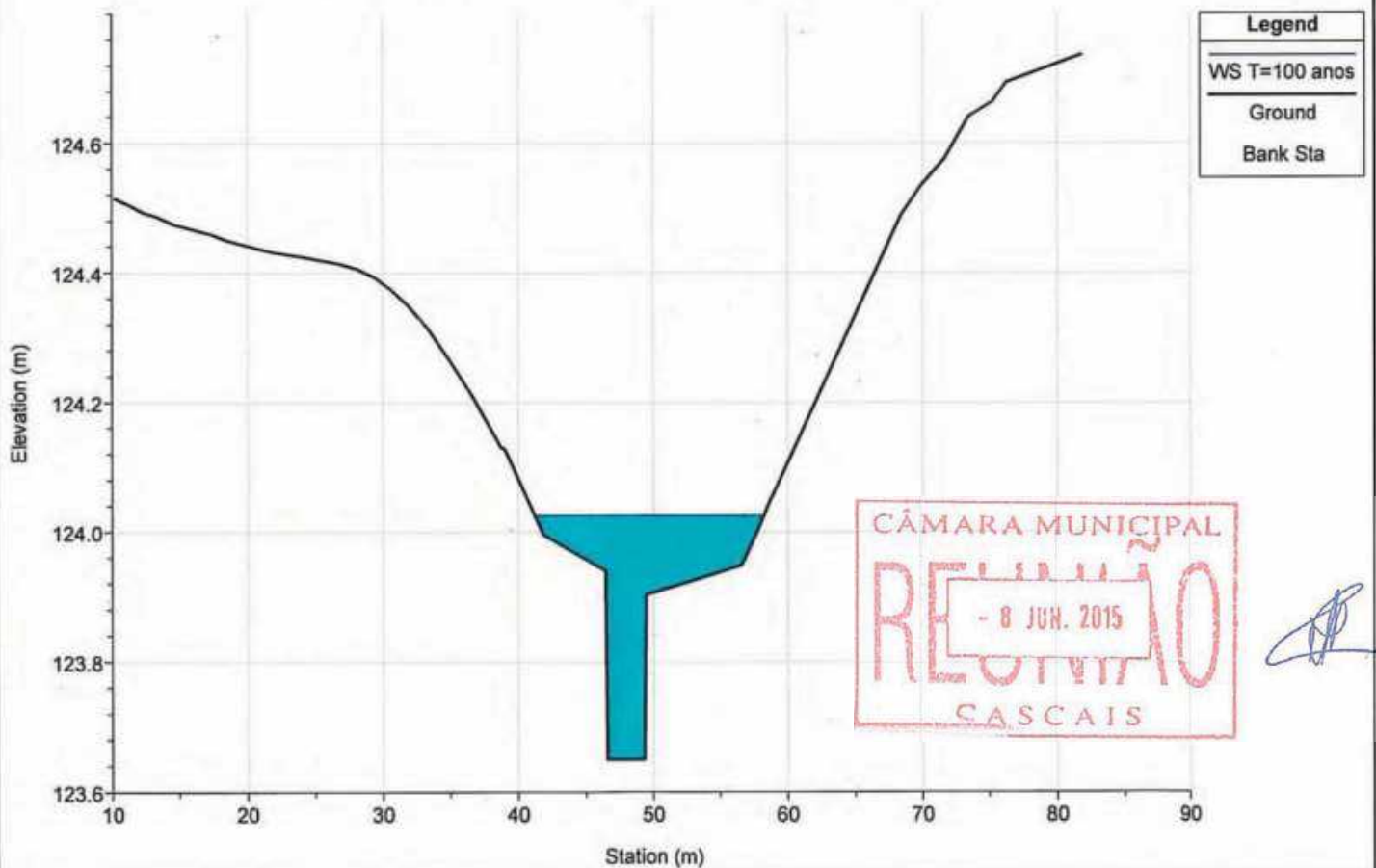




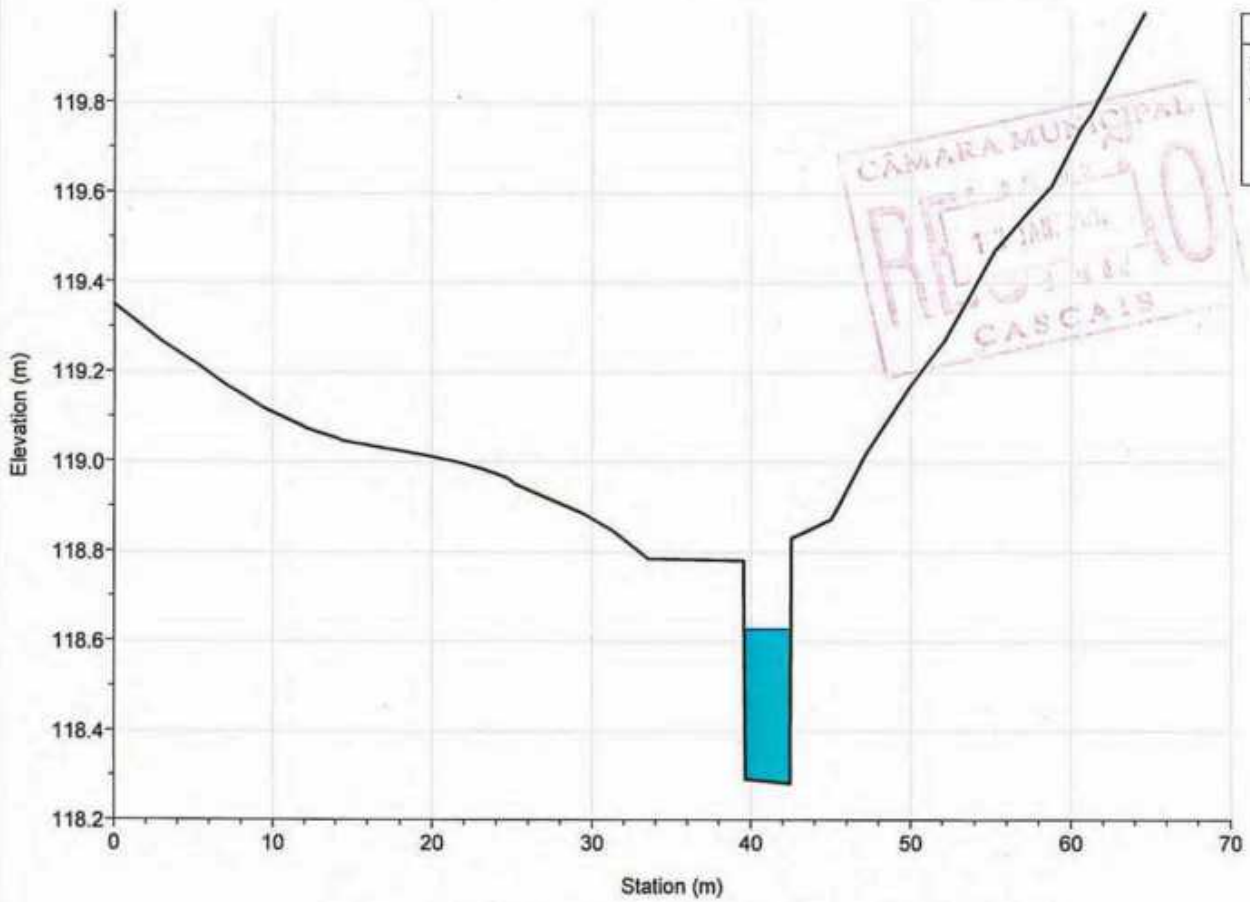
River = MD1-VINHAS Reach = montante RS = 1481.022



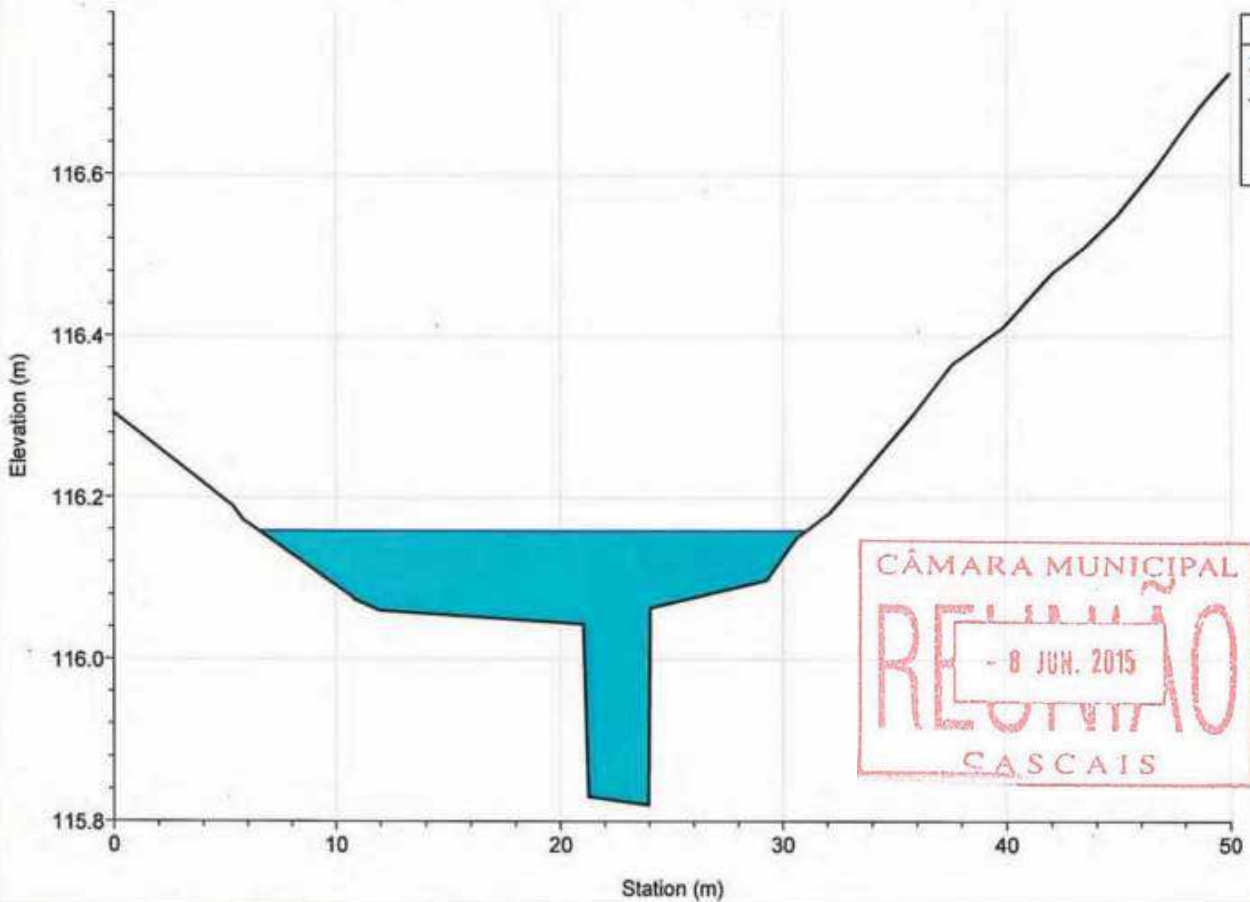
River = MD1-VINHAS Reach = montante RS = 1373.853



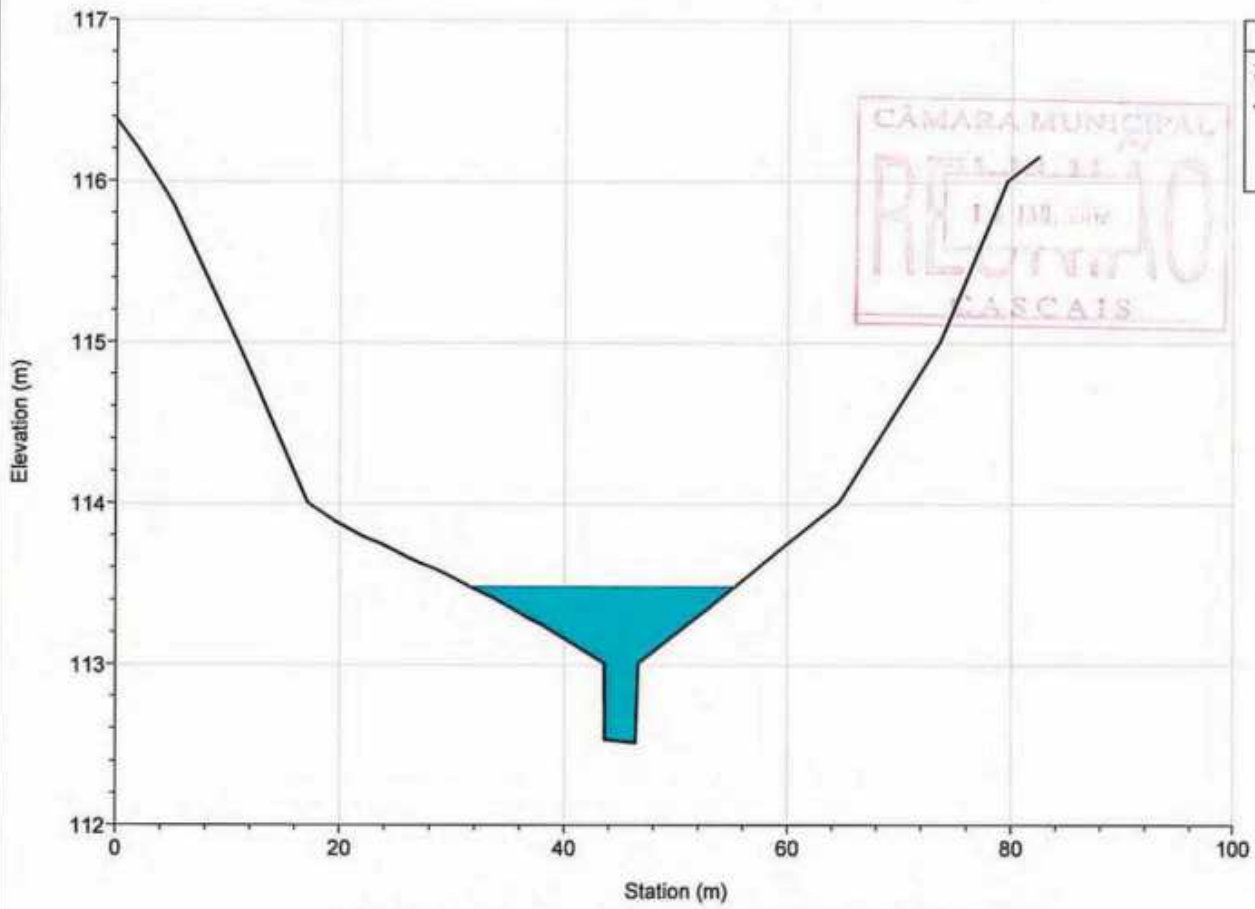
River = MD1-VINHAS Reach = montante RS = 1274.805



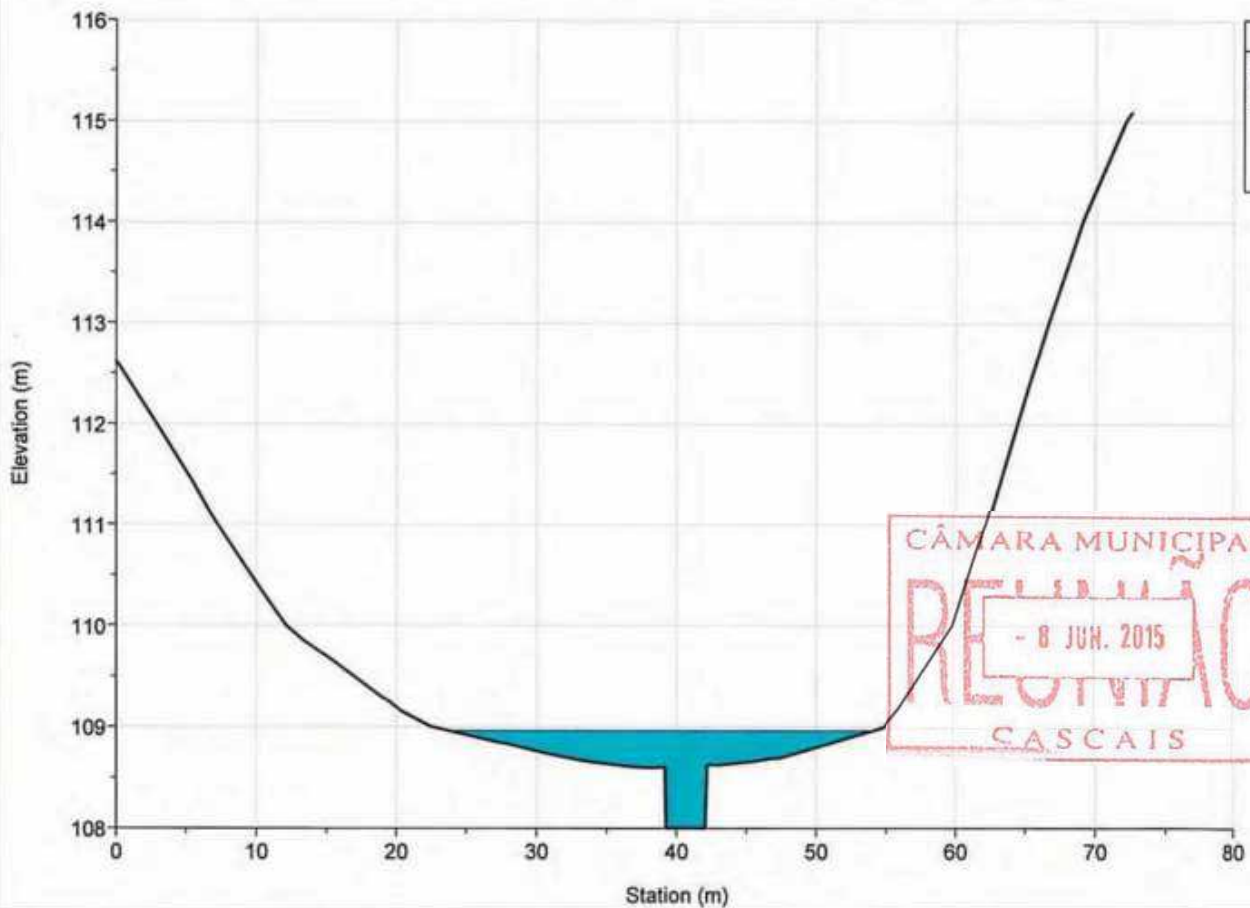
River = MD1-VINHAS Reach = montante RS = 1211.602



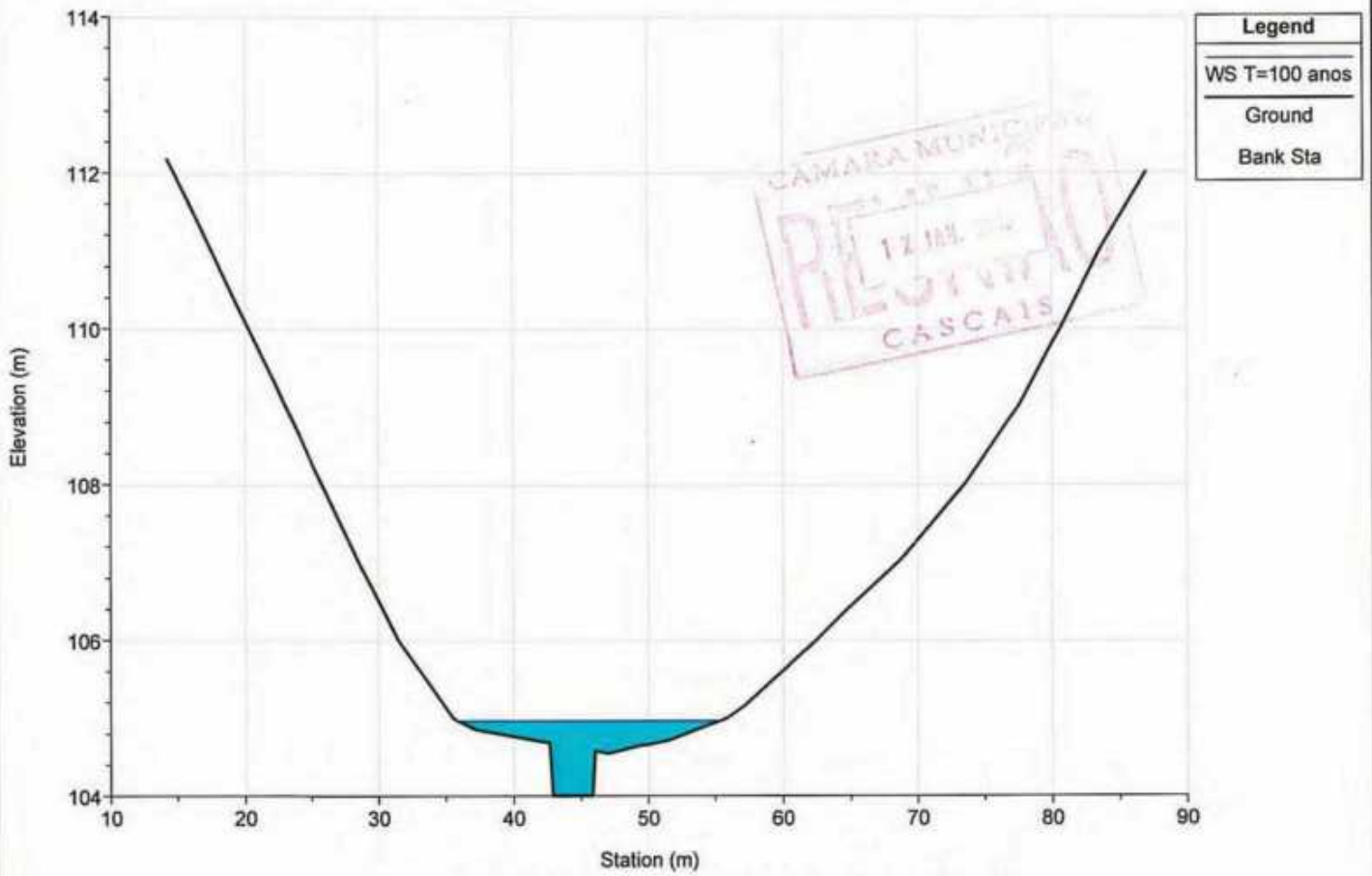
River = MD1-VINHAS Reach = jusante RS = 1145.104



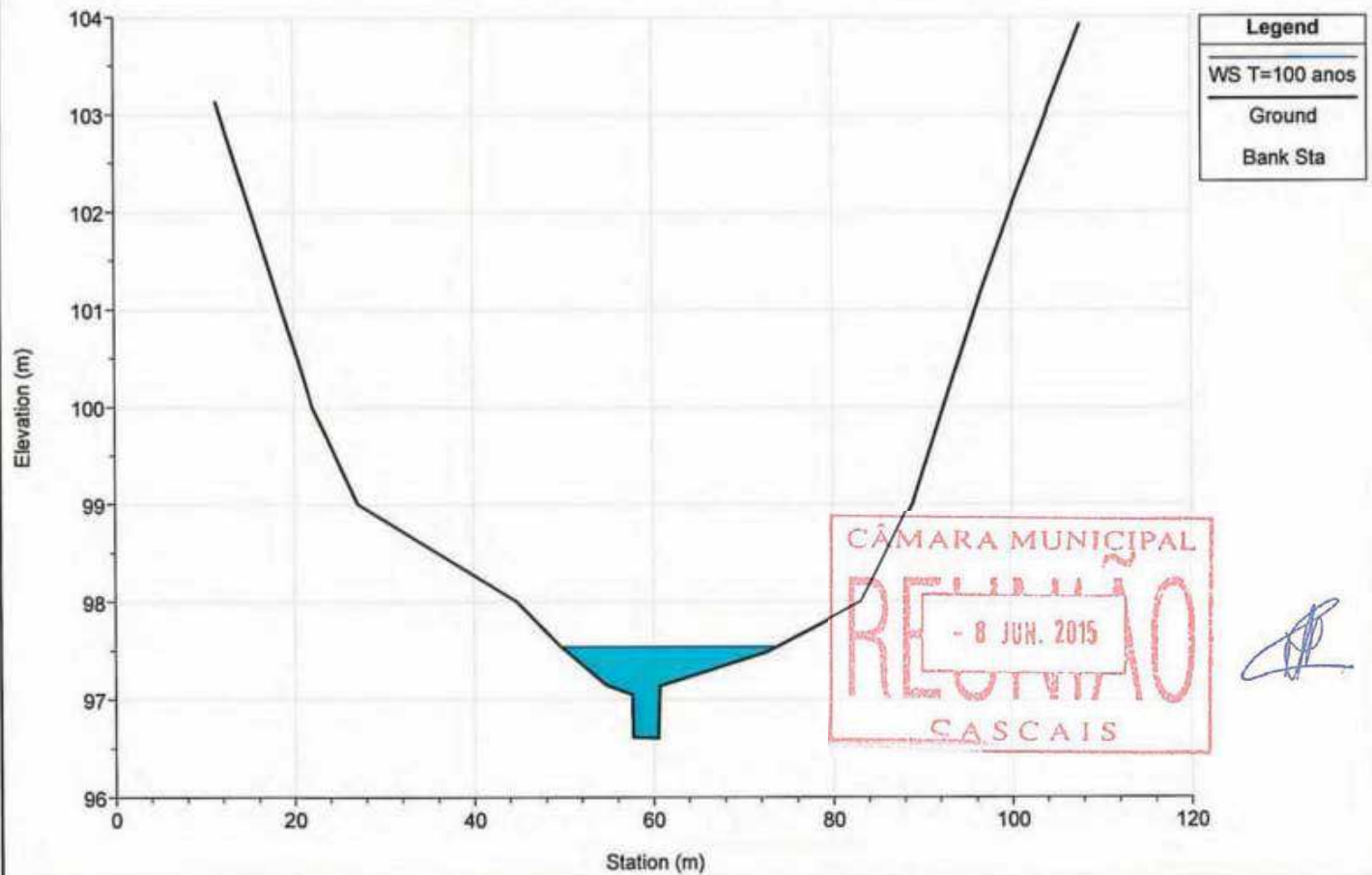
River = MD1-VINHAS Reach = jusante RS = 1039.233



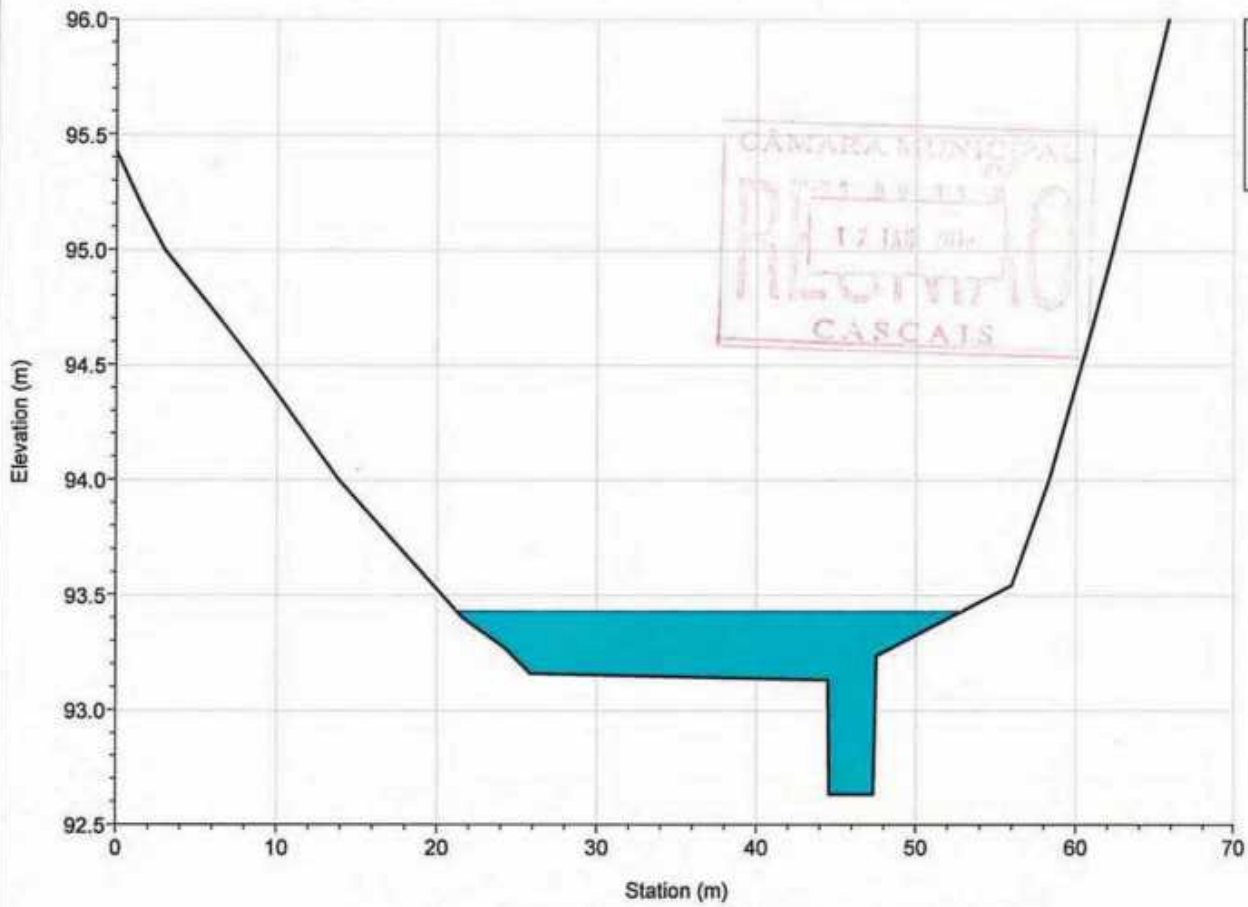
River = MD1-VINHAS Reach = jusante RS = 915.339



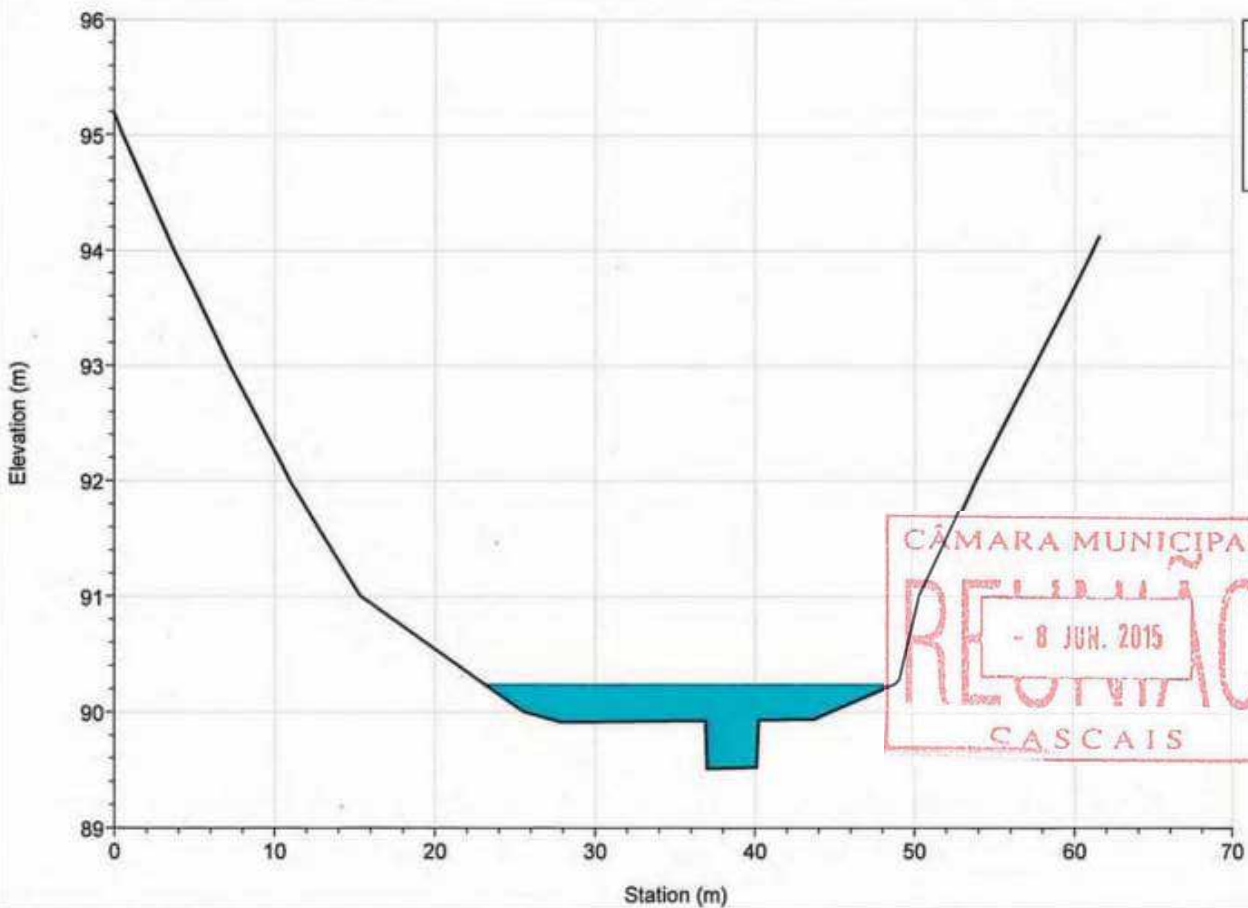
River = MD1-VINHAS Reach = jusante RS = 762.561



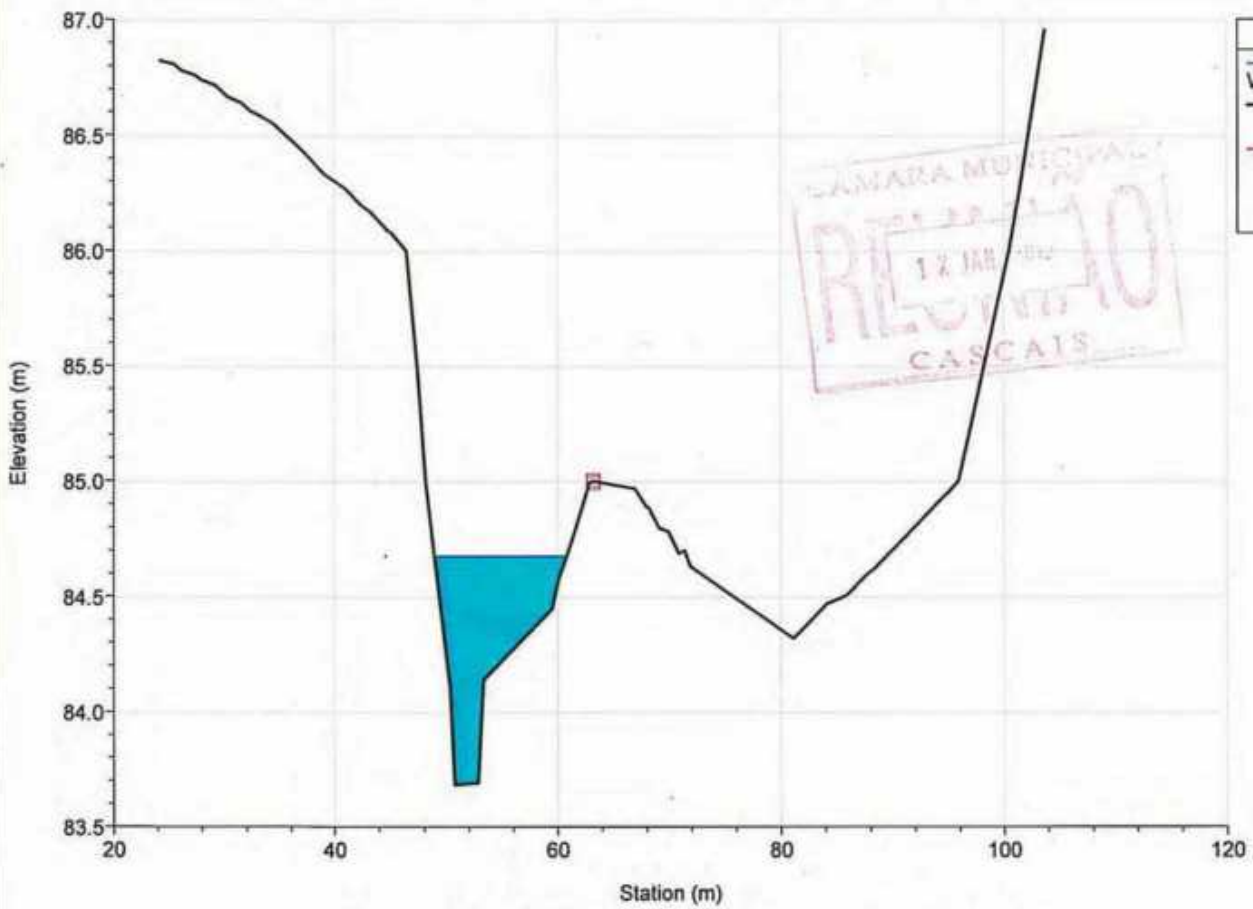
River = MD1-VINHAS Reach = jusante RS = 604.771



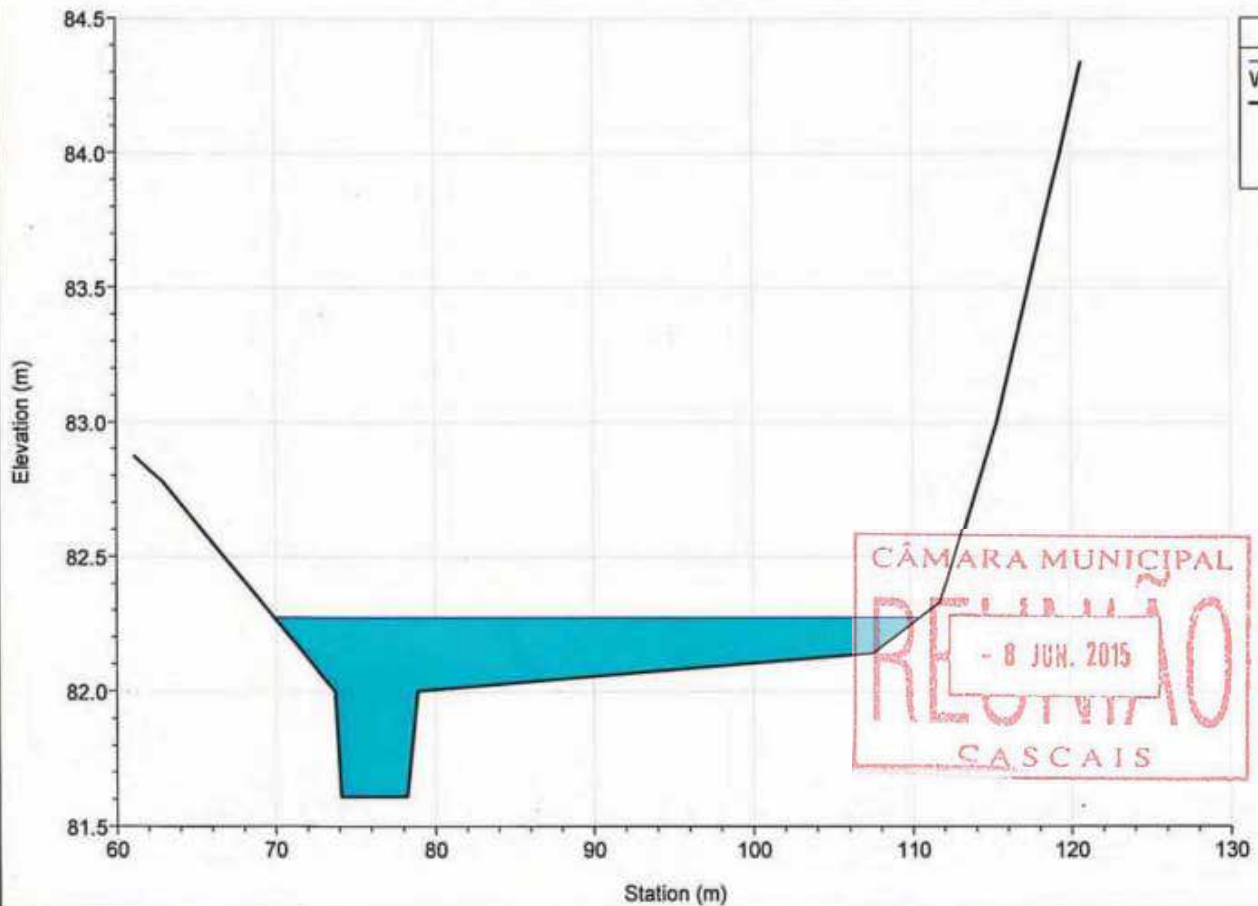
River = MD1-VINHAS Reach = jusante RS = 470.832



River = MD1-VINHAS Reach = jusante RS = 289.111

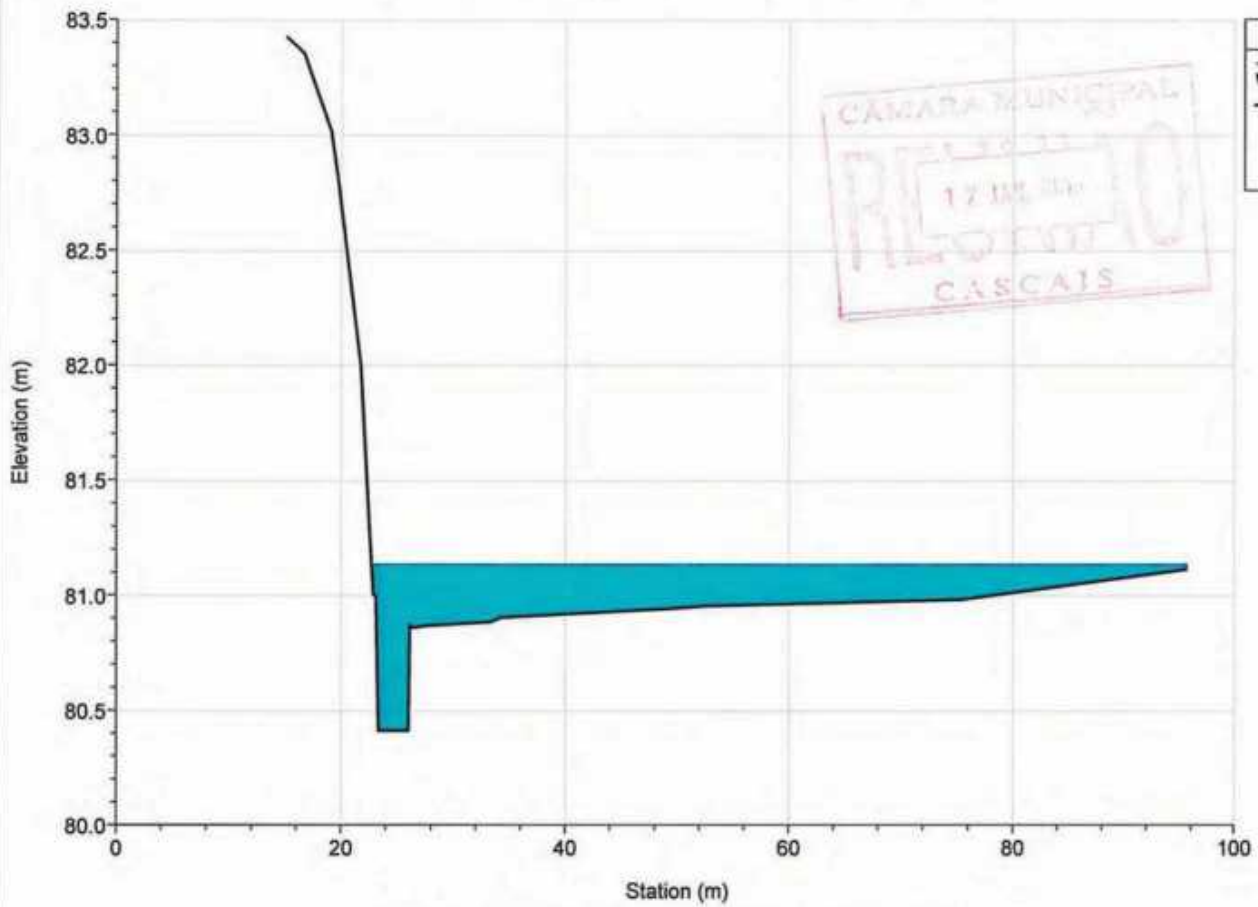


River = MD1-VINHAS Reach = jusante RS = 138.047

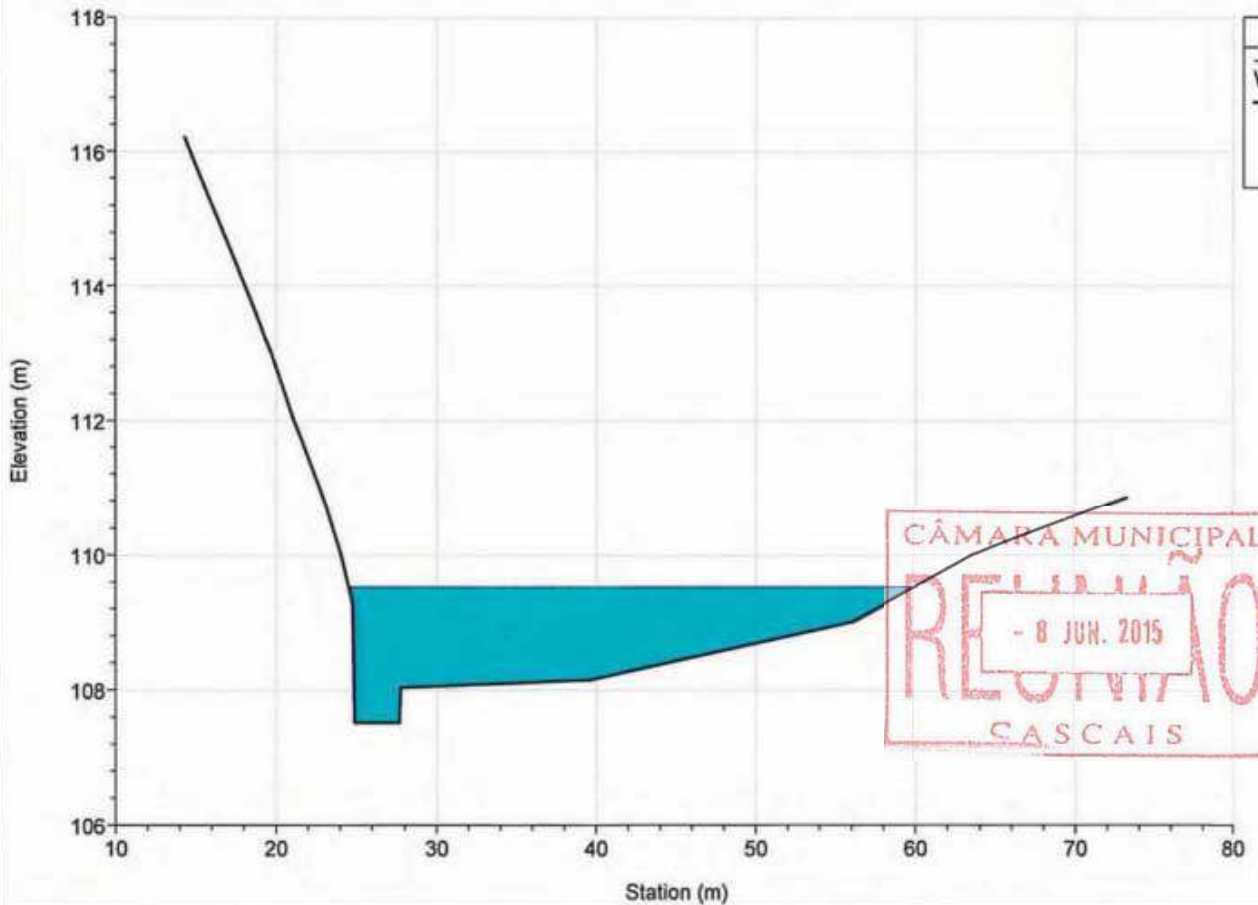




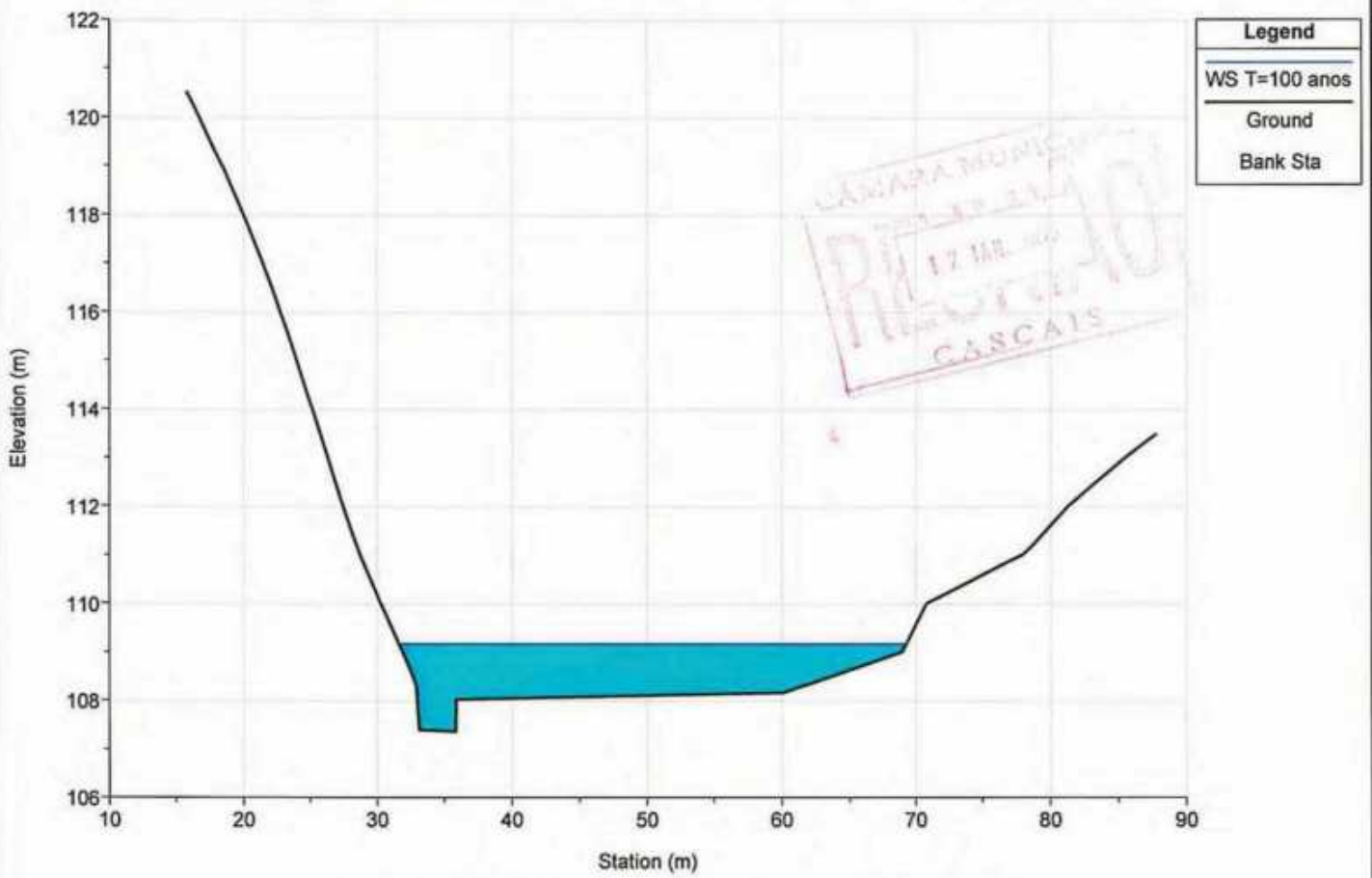
River = MD1-VINHAS Reach = jusante RS = 50.457



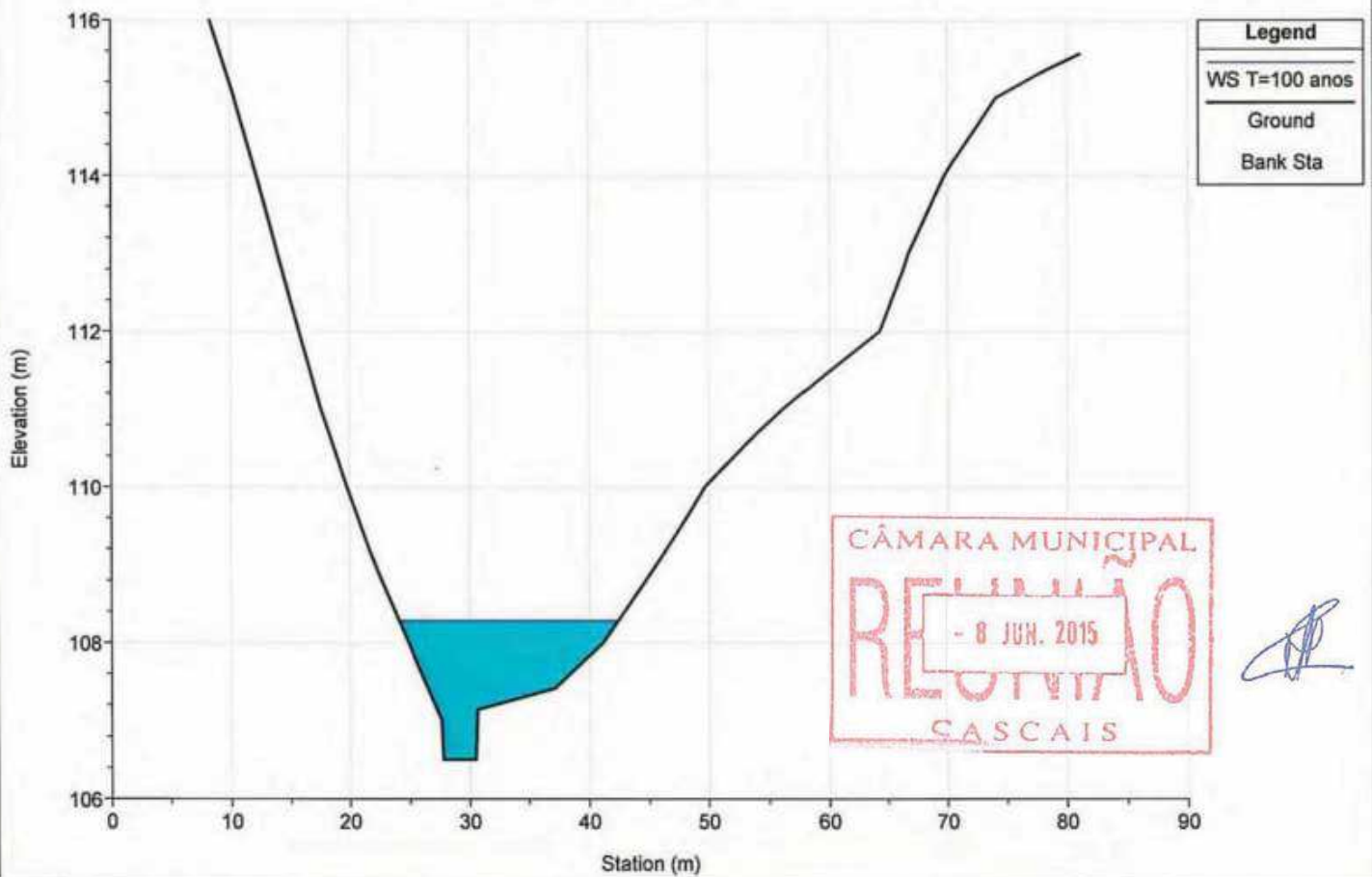
River = MULA Reach = montante RS = 2770.160



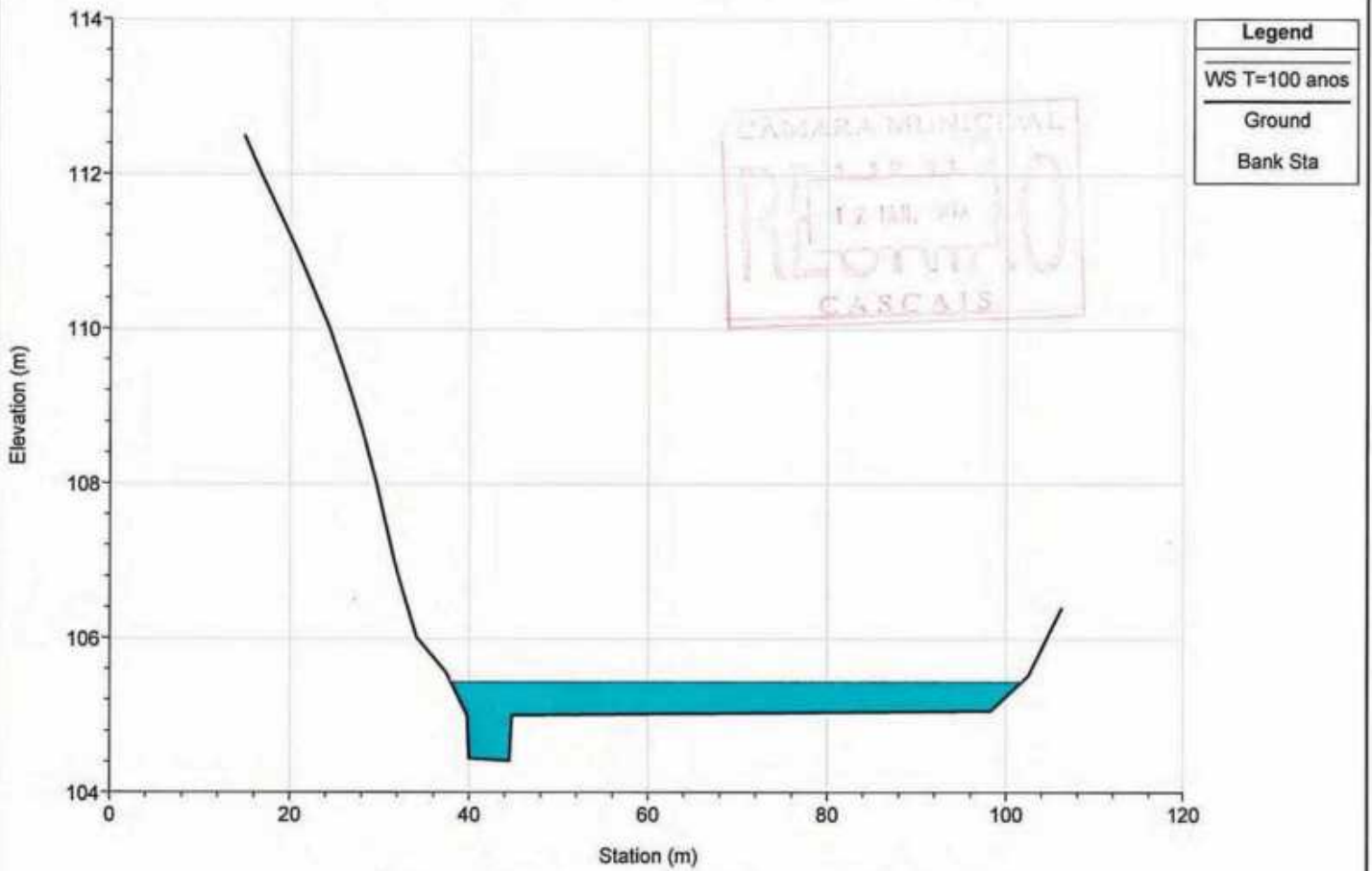
River = MULA Reach = montante RS = 2630.349



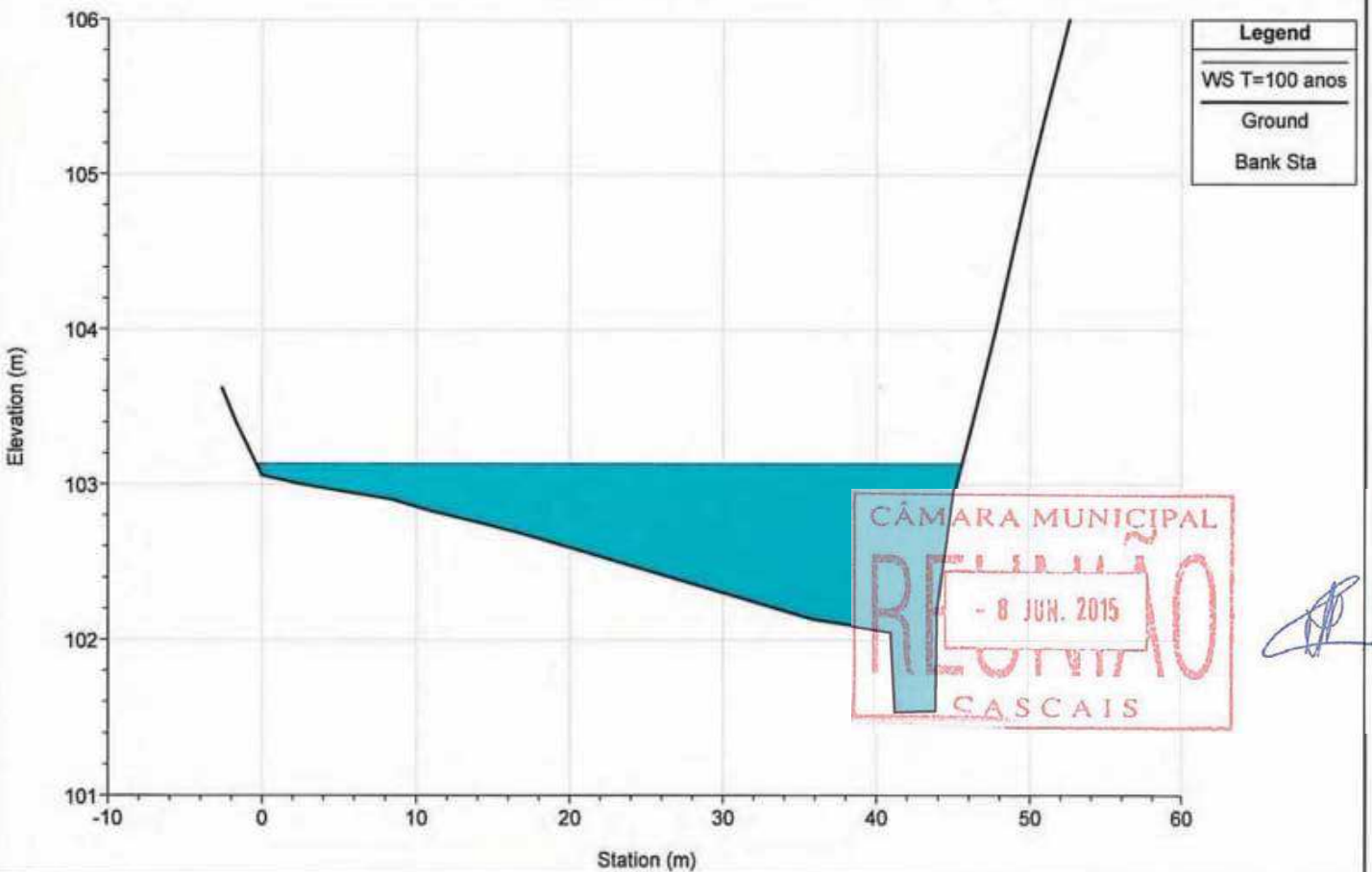
River = MULA Reach = montante RS = 2520.874



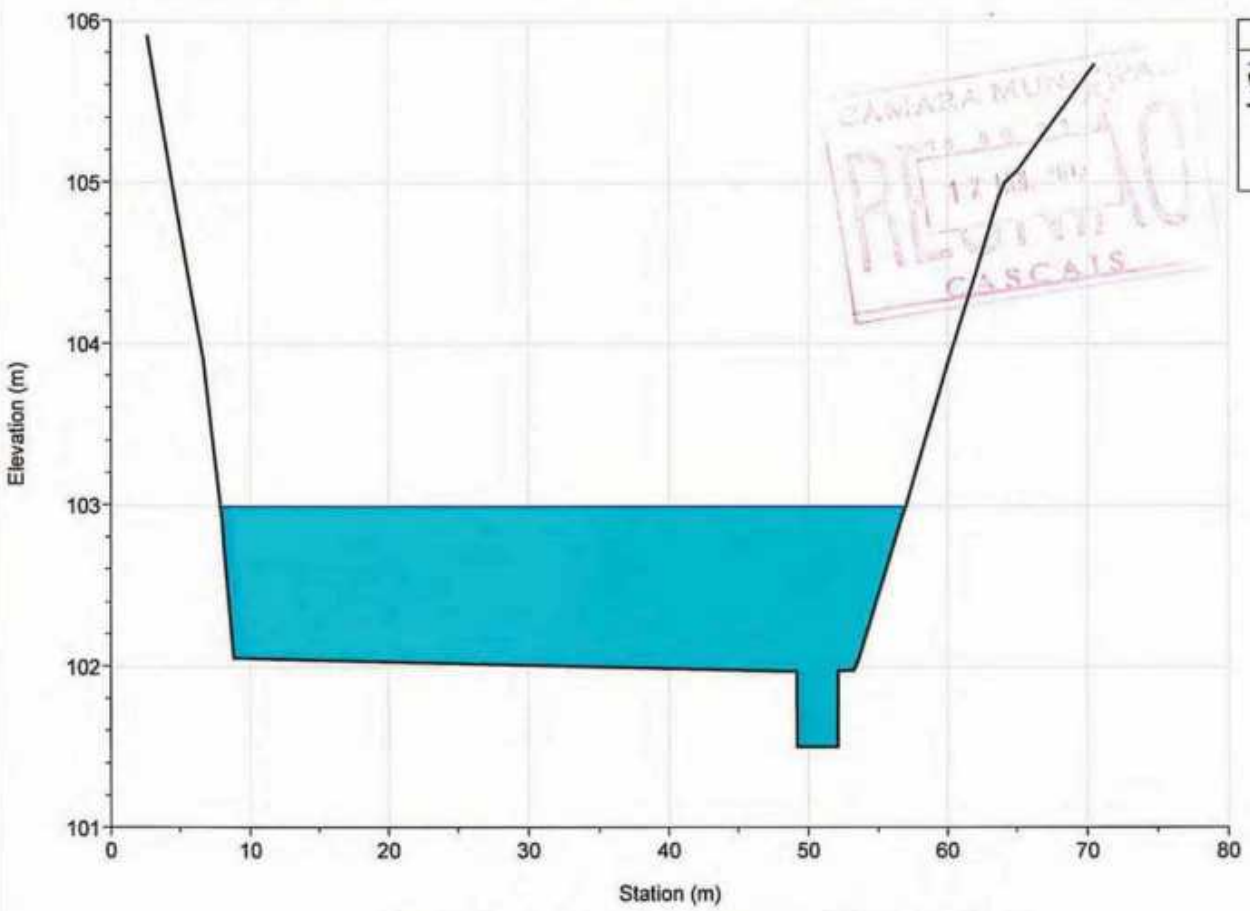
River = MULA Reach = montante RS = 2405.011



River = MULA Reach = montante RS = 2258.204

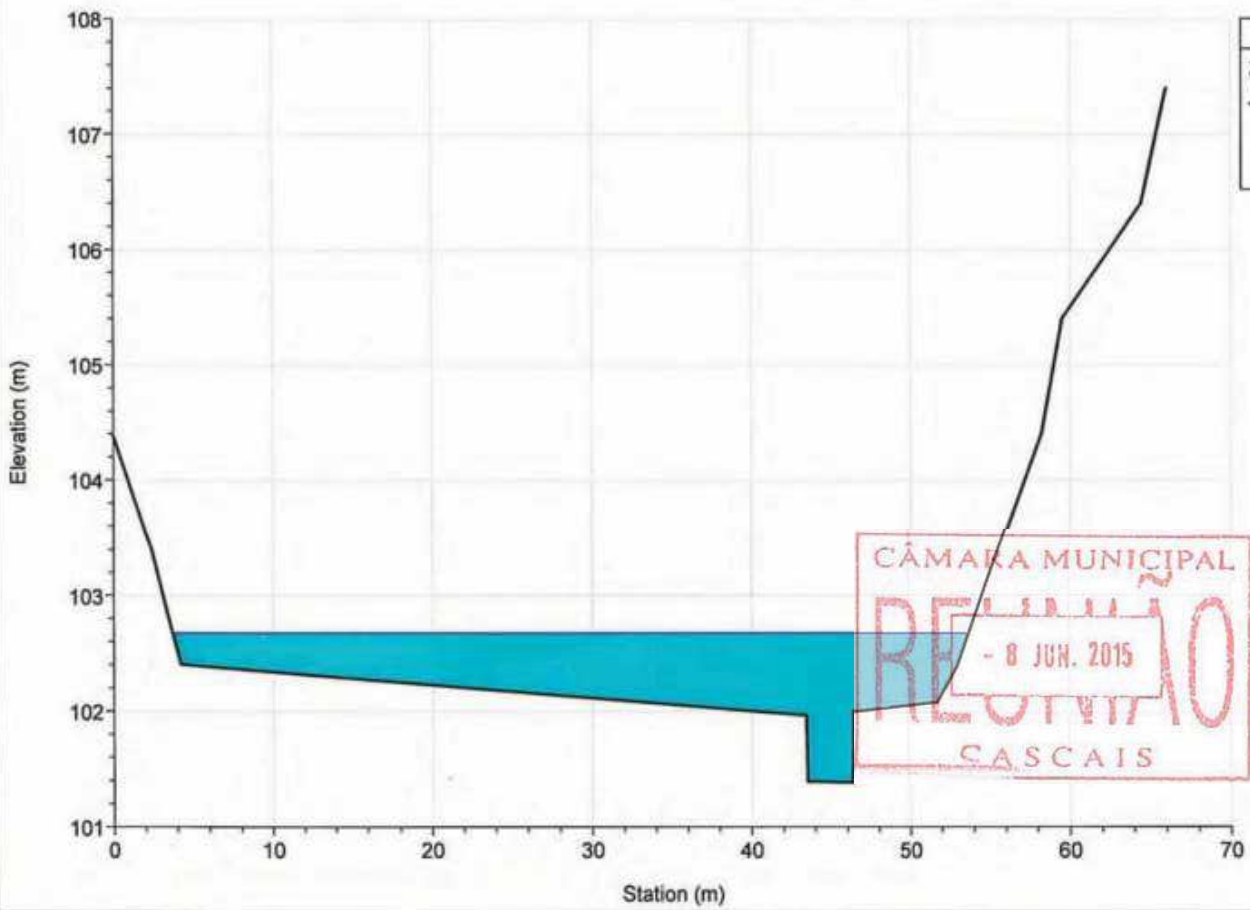


River = MULA Reach = montante RS = 2177.404



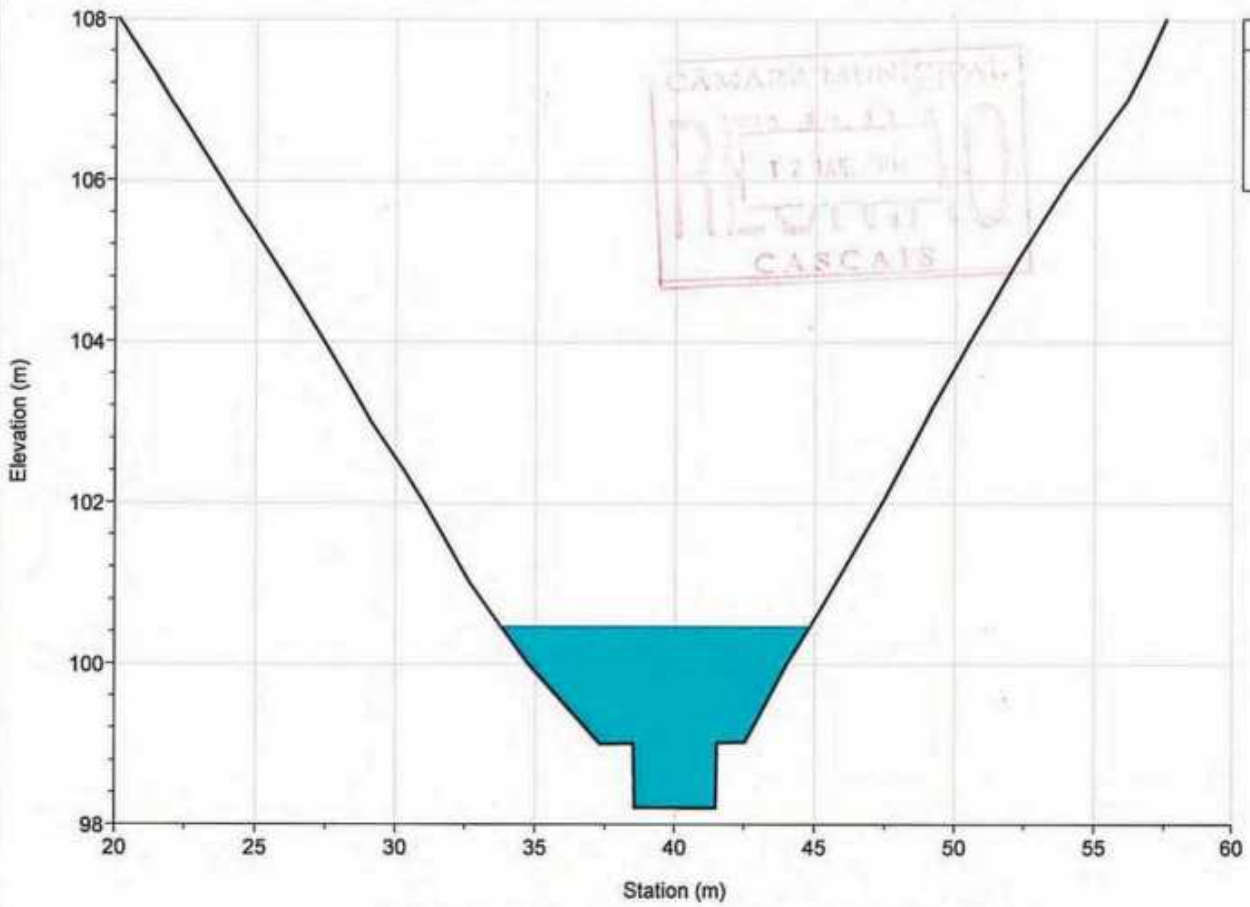
Legend
WS T=100 anos
Ground
Bank Sta

River = MULA Reach = jusante RS = 2143.703

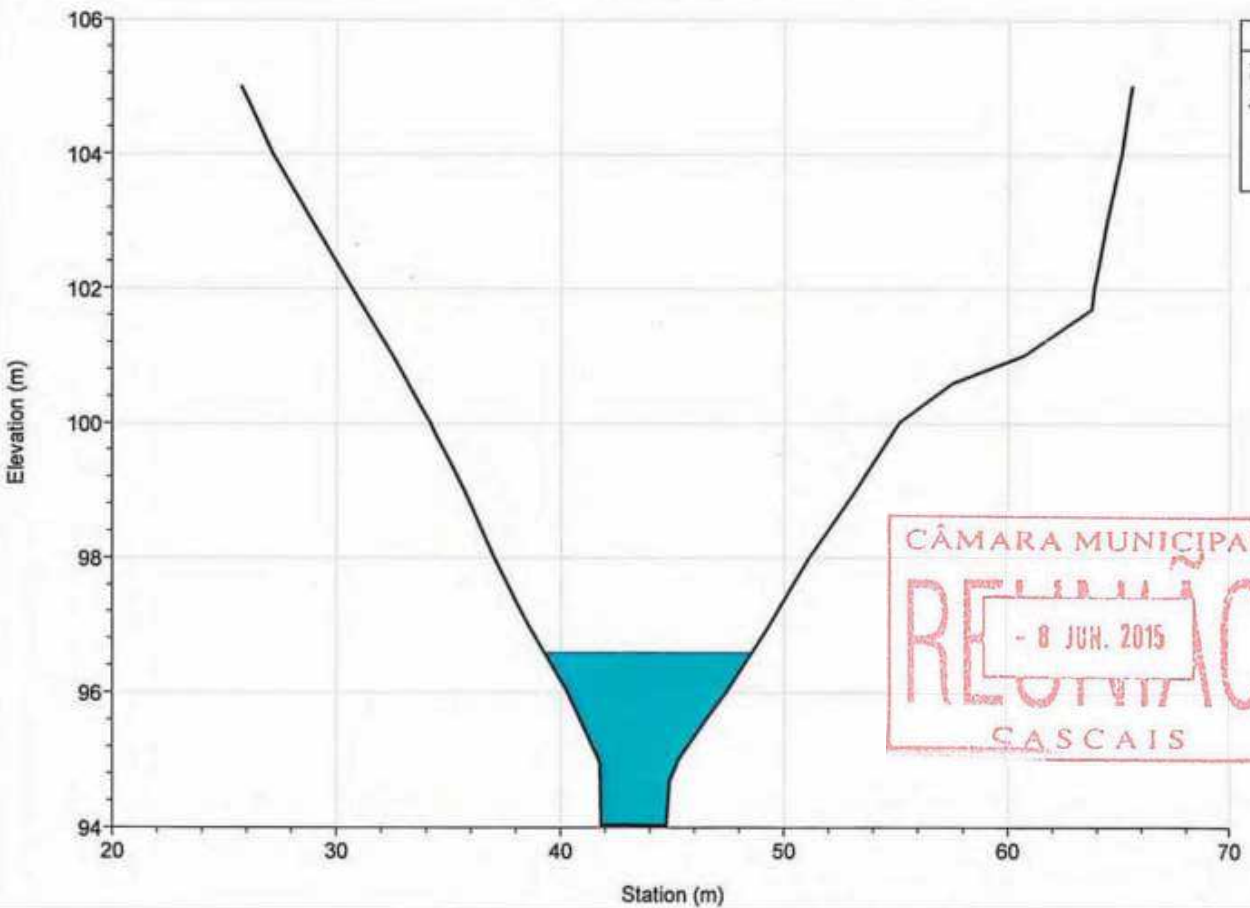


Legend
WS T=100 anos
Ground
Bank Sta

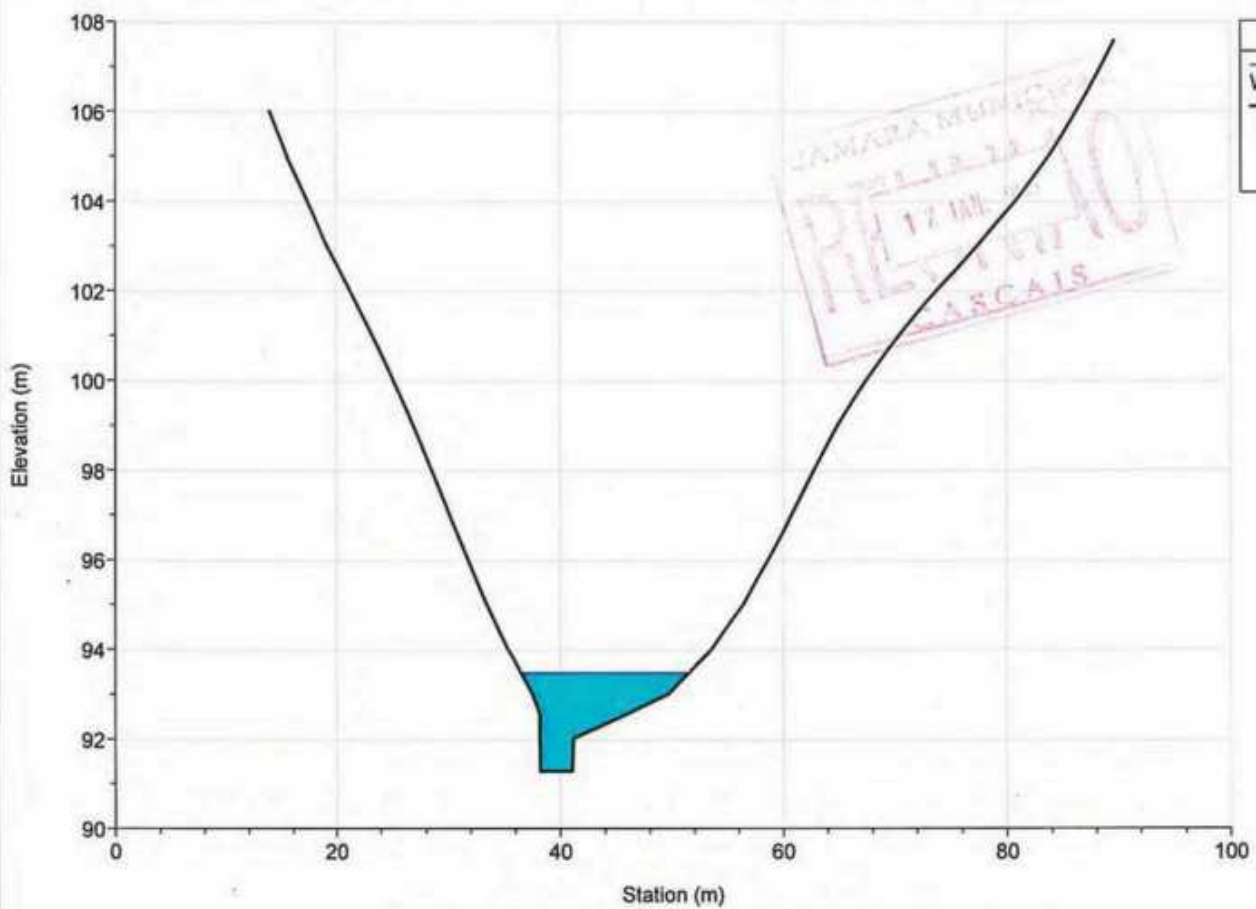
River = MULA Reach = jusante RS = 2015.475



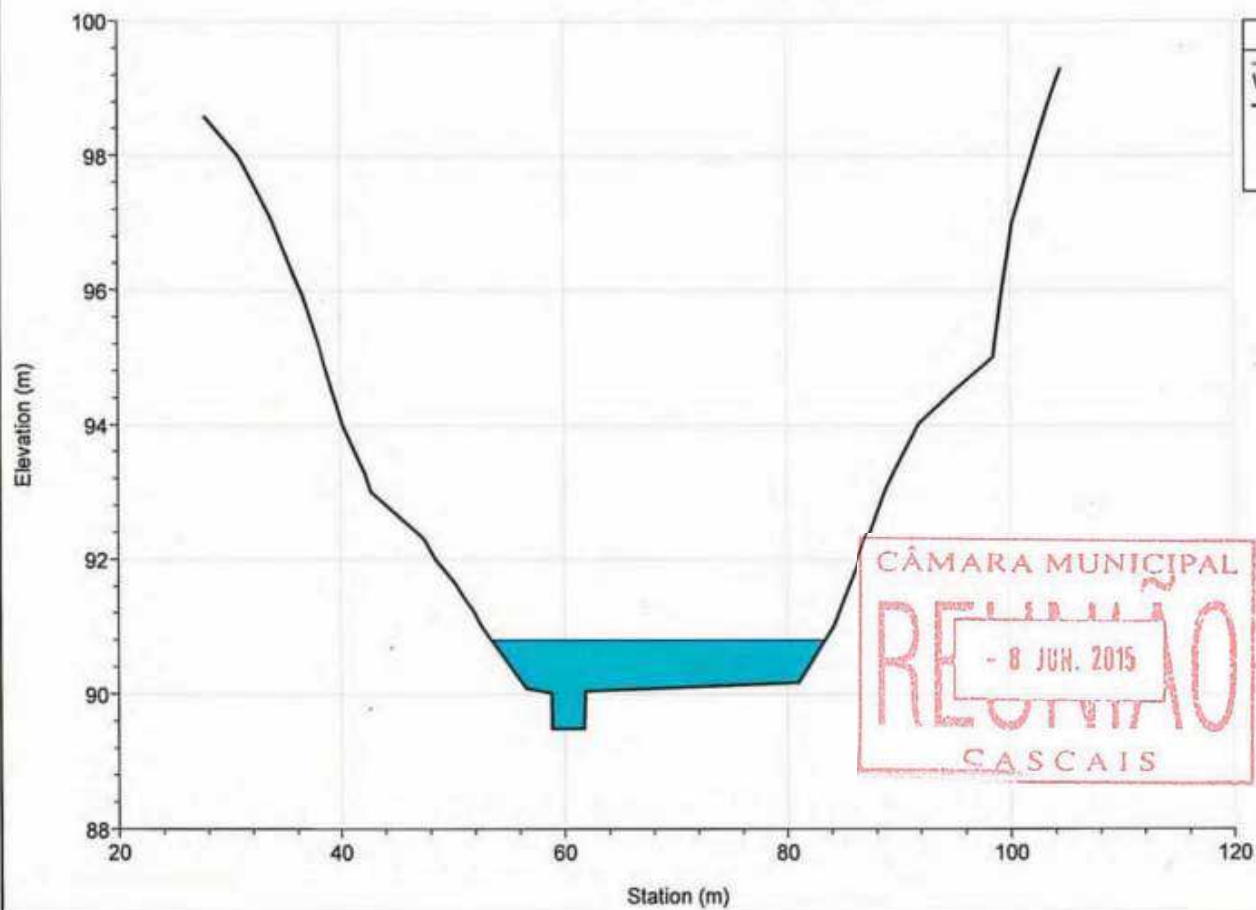
River = MULA Reach = jusante RS = 1895.839



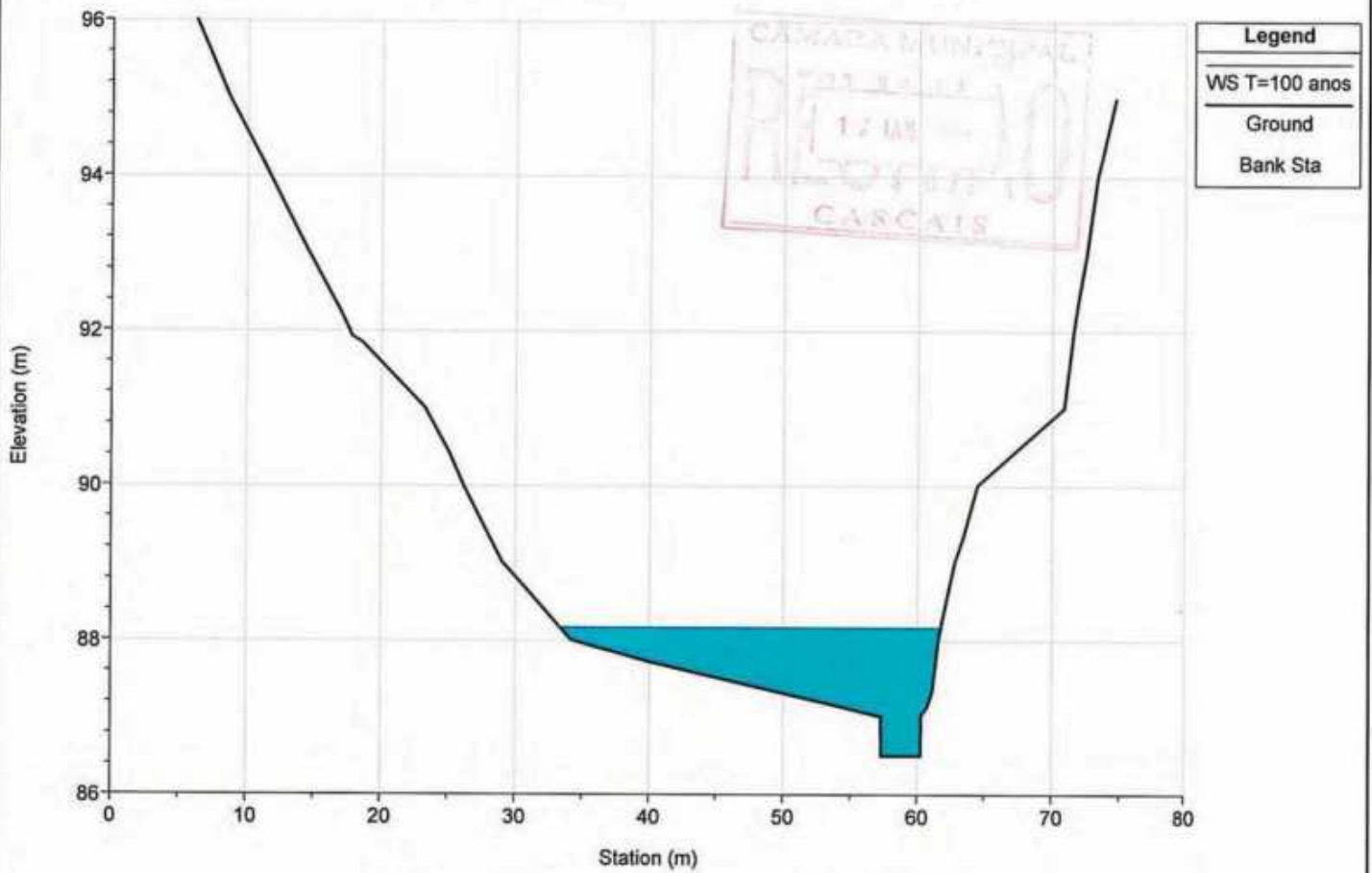
River = MULA Reach = jusante RS = 1754.632



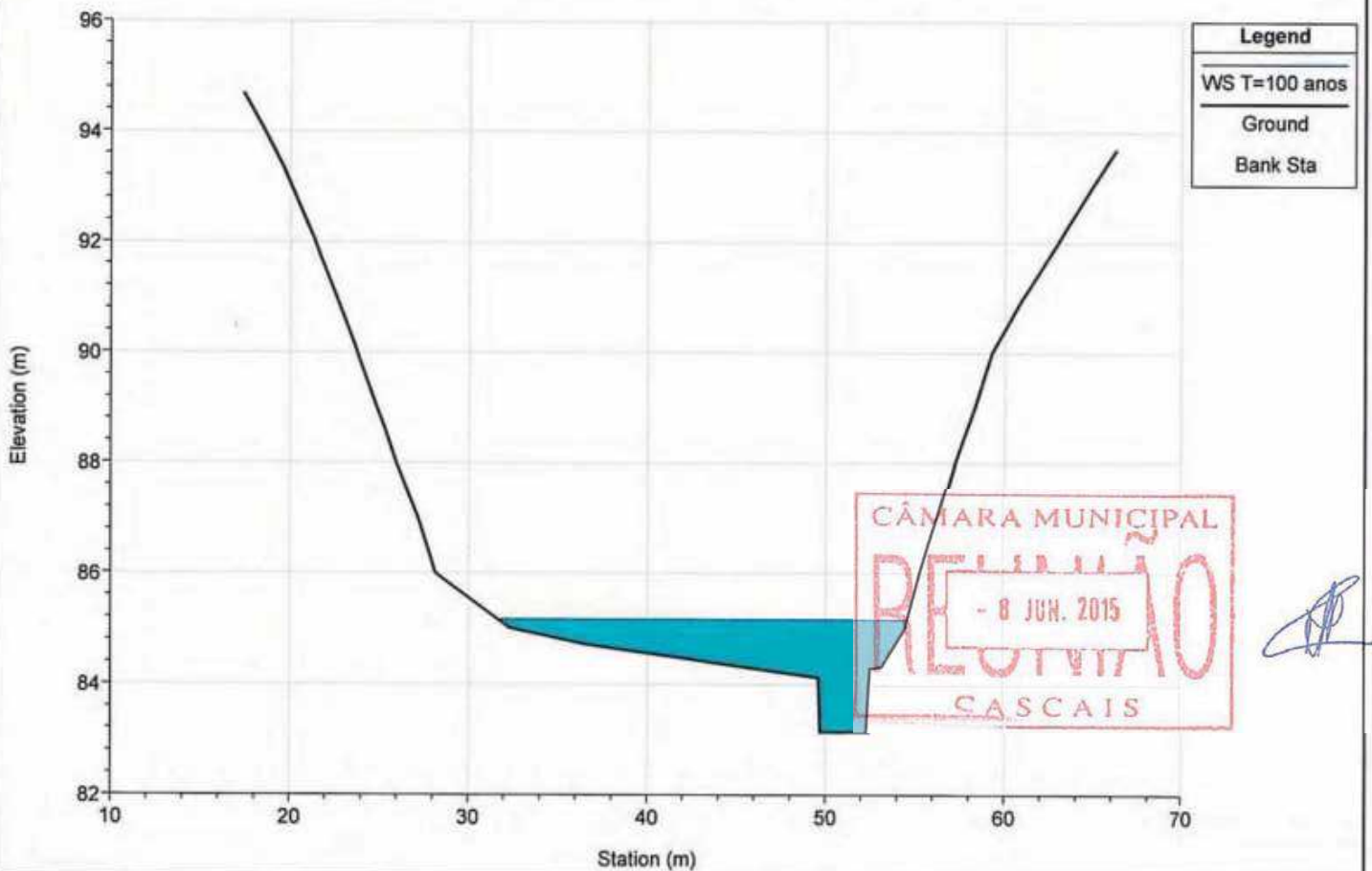
River = MULA Reach = jusante RS = 1609.015

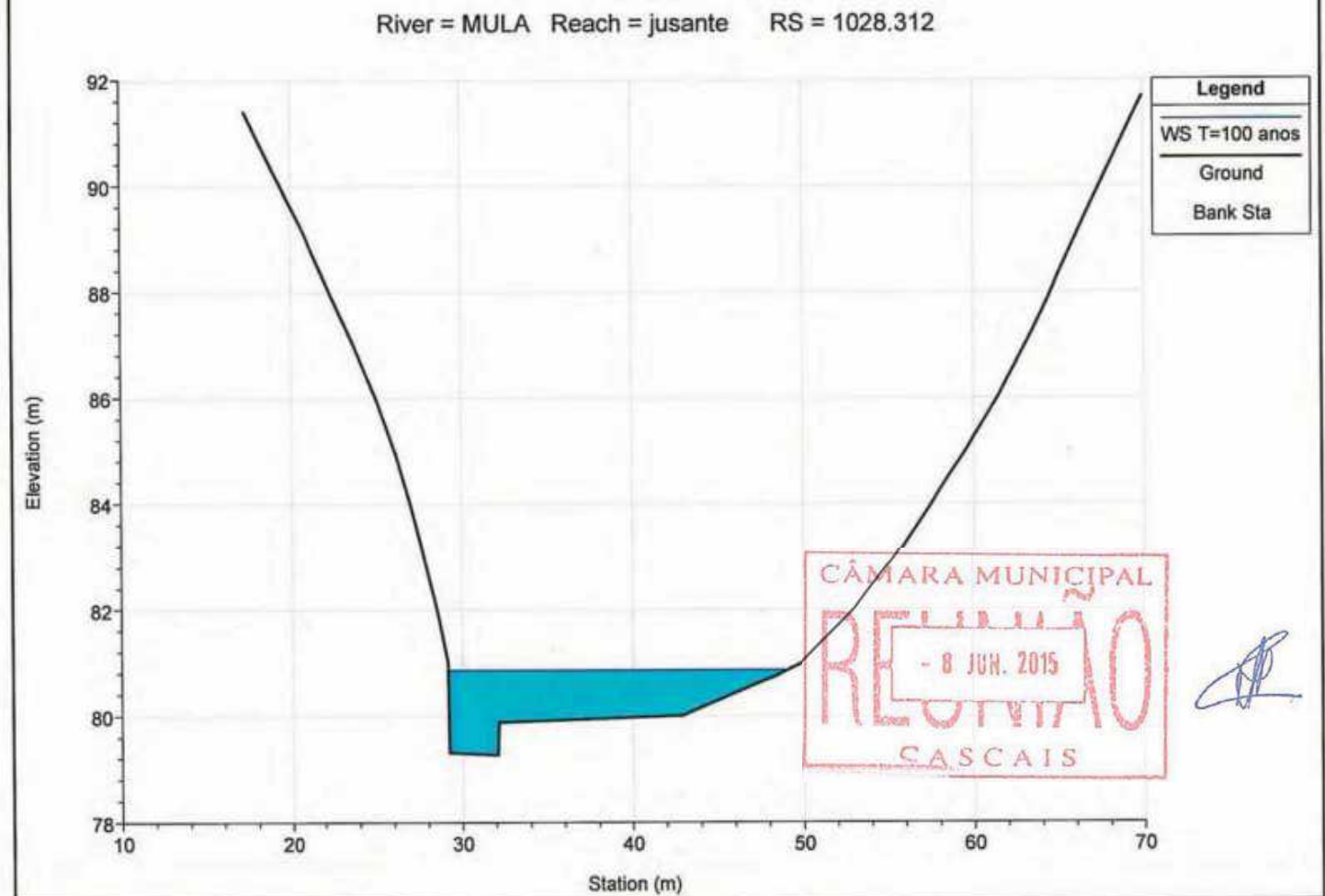
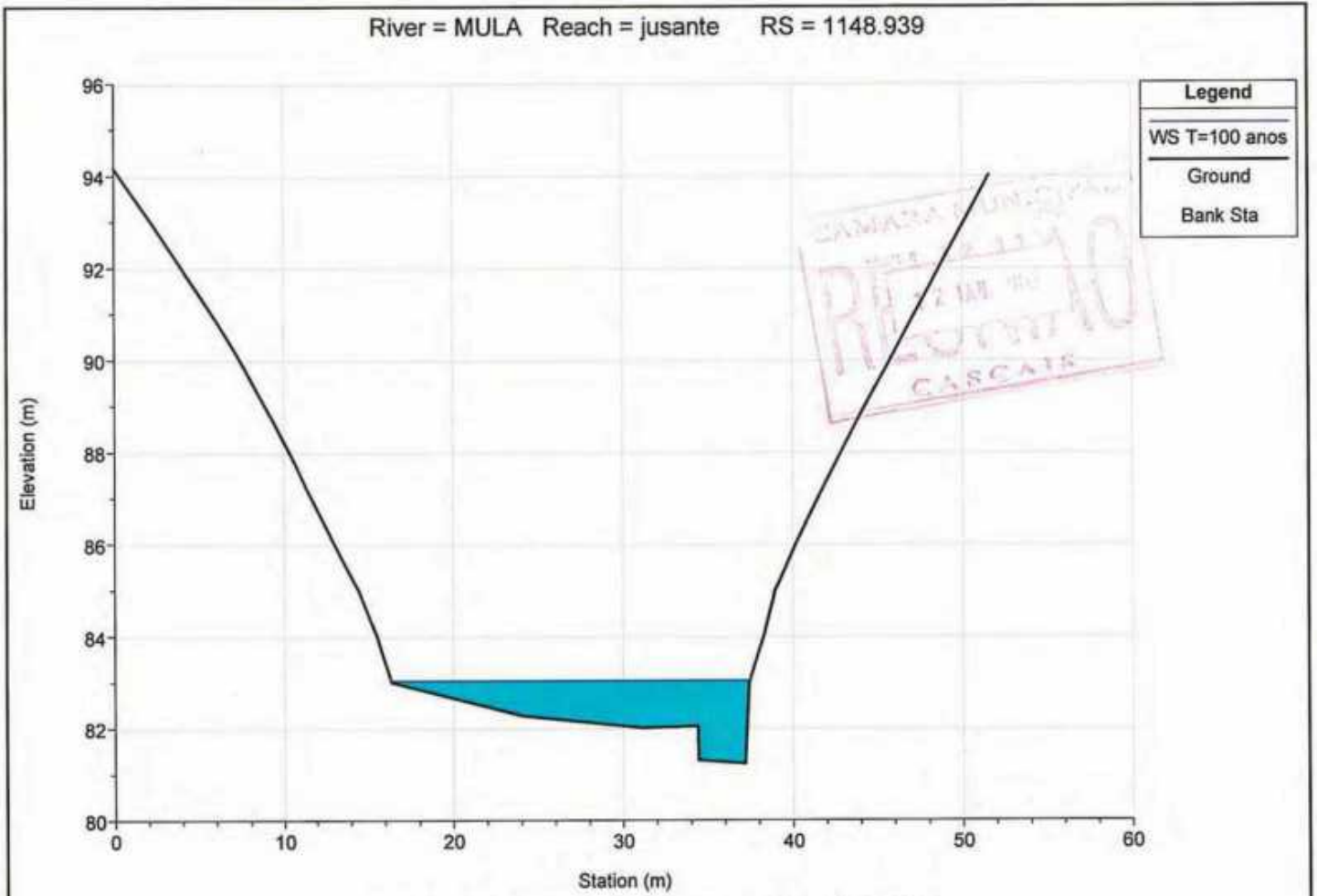


River = MULA Reach = jusante RS = 1439.059



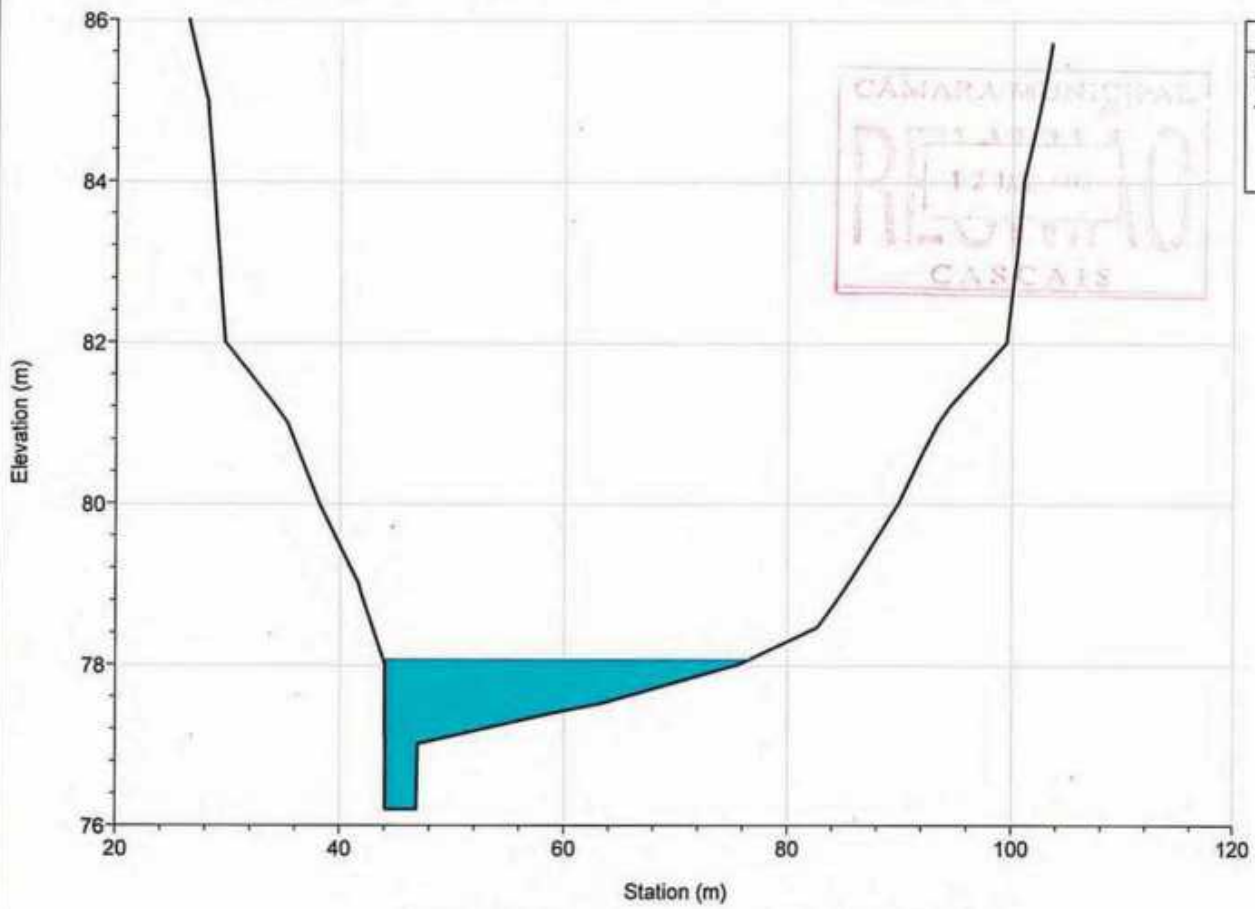
River = MULA Reach = jusante RS = 1299.621



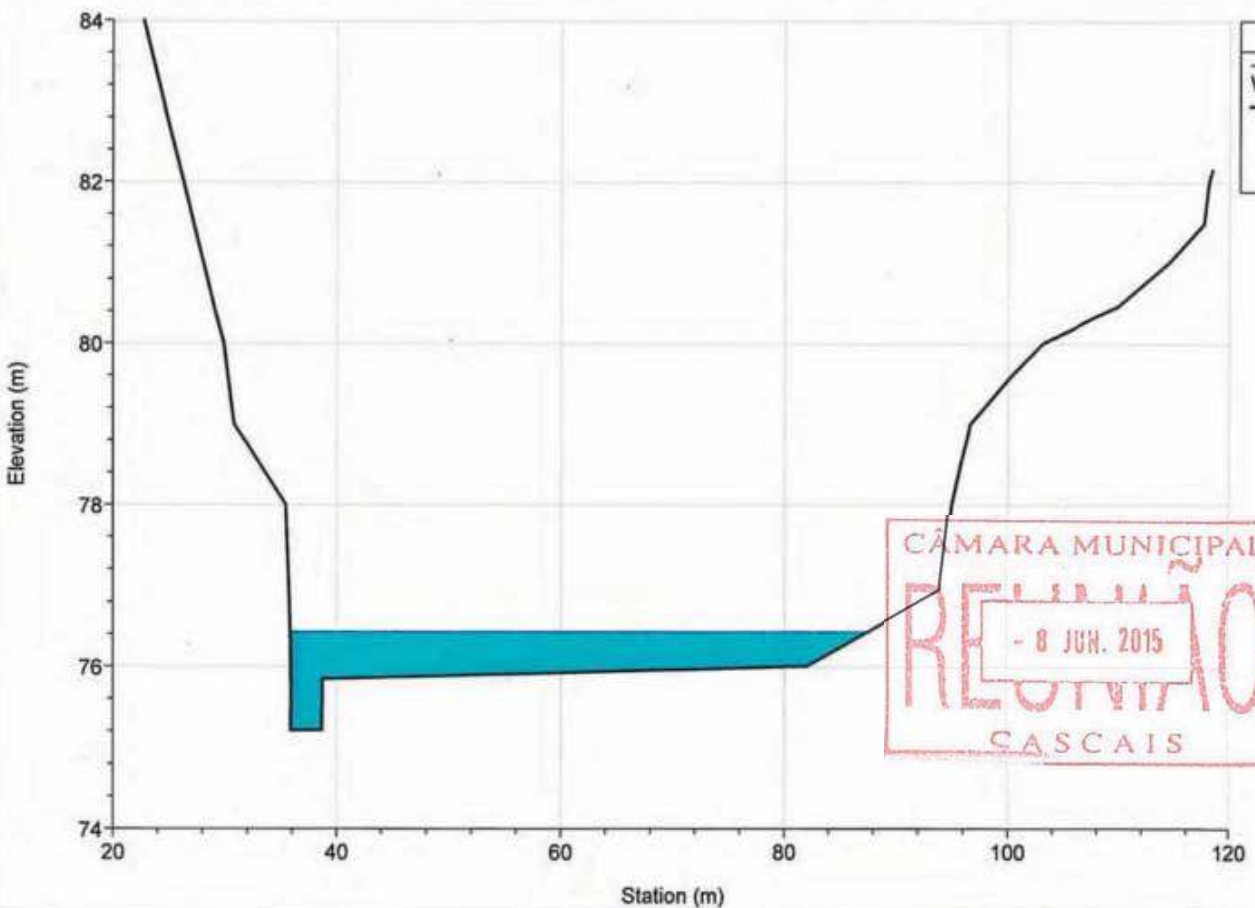




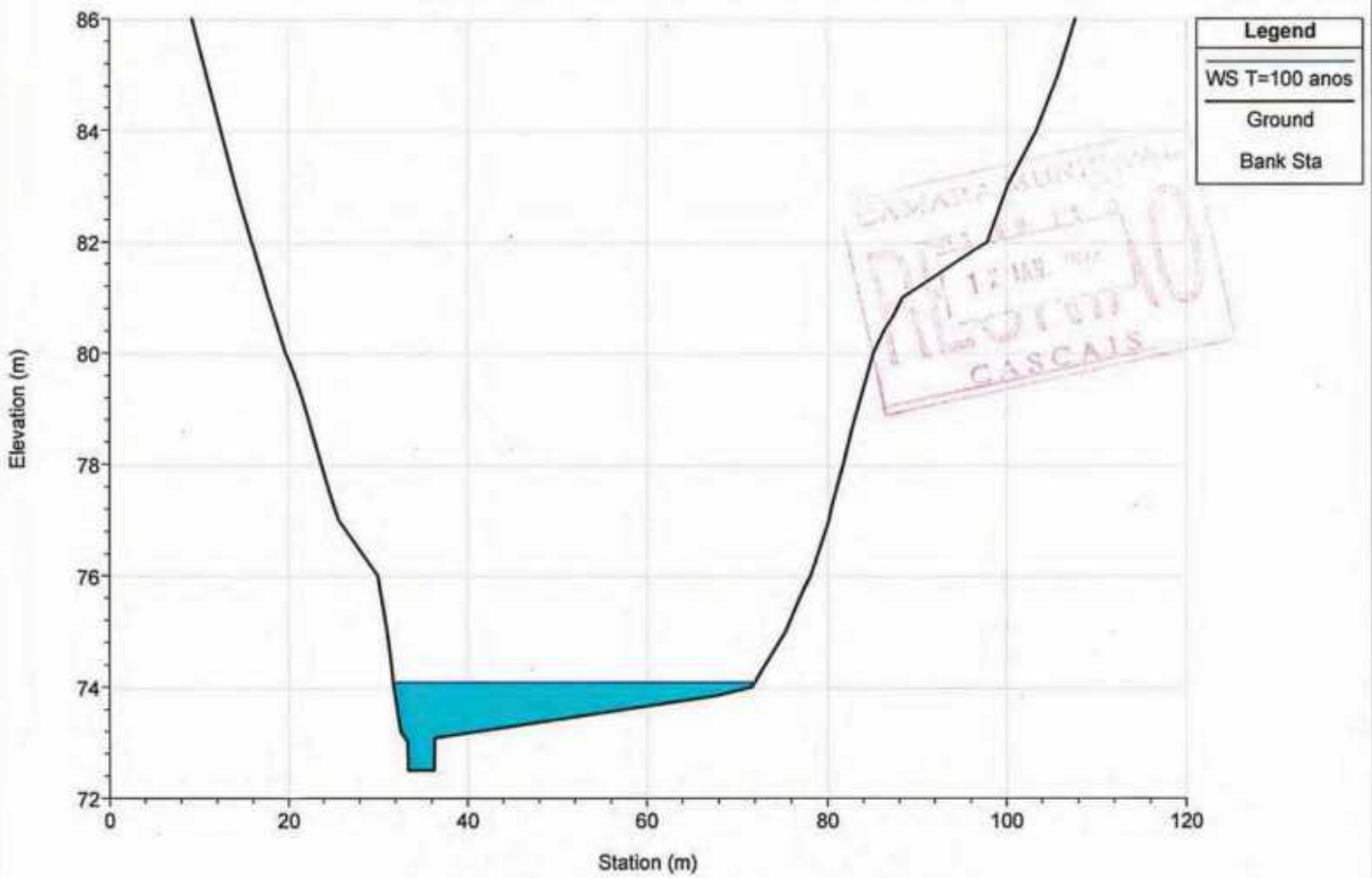
River = MULA Reach = jusante RS = 898.652



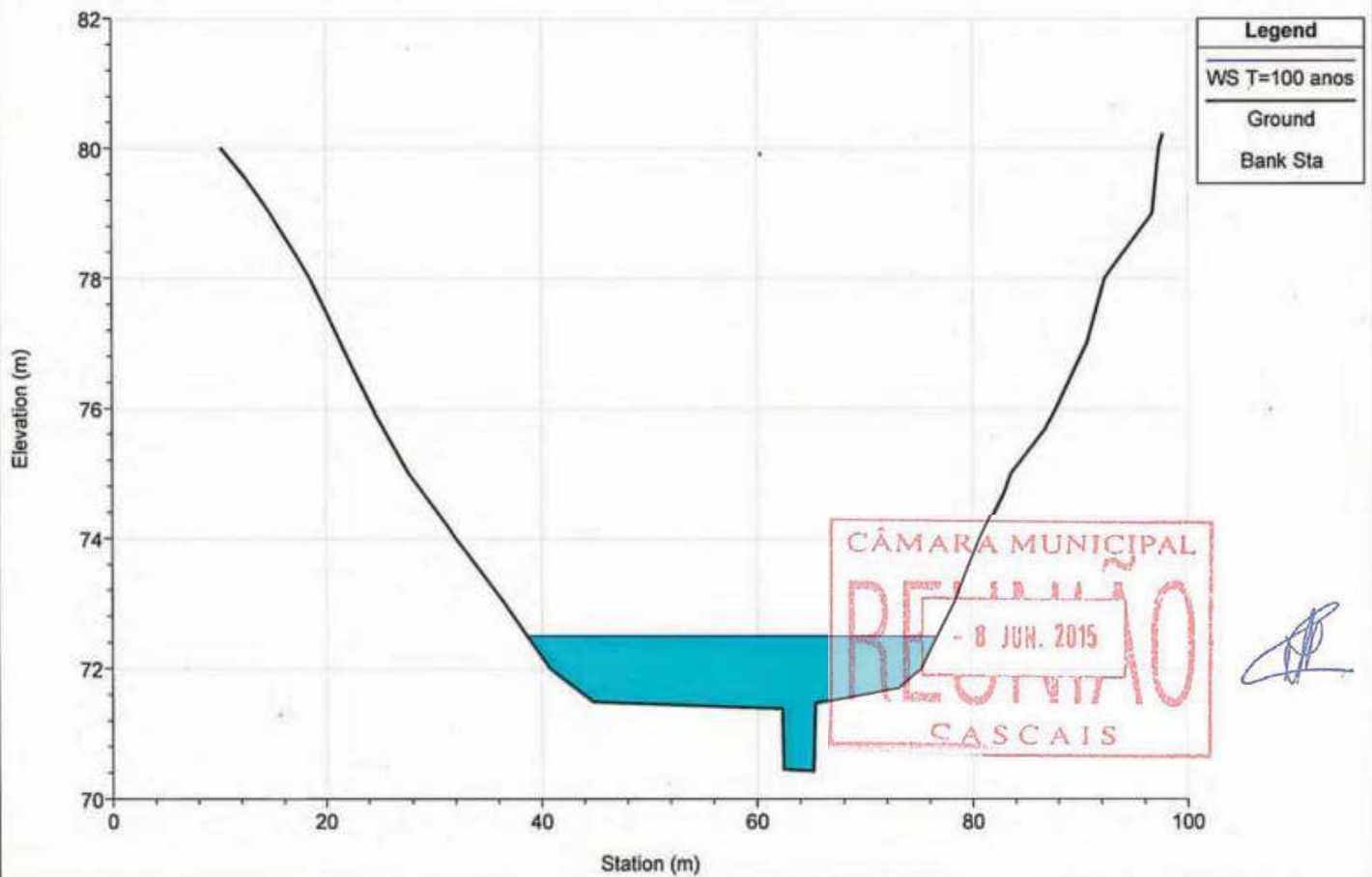
River = MULA Reach = jusante RS = 798.165



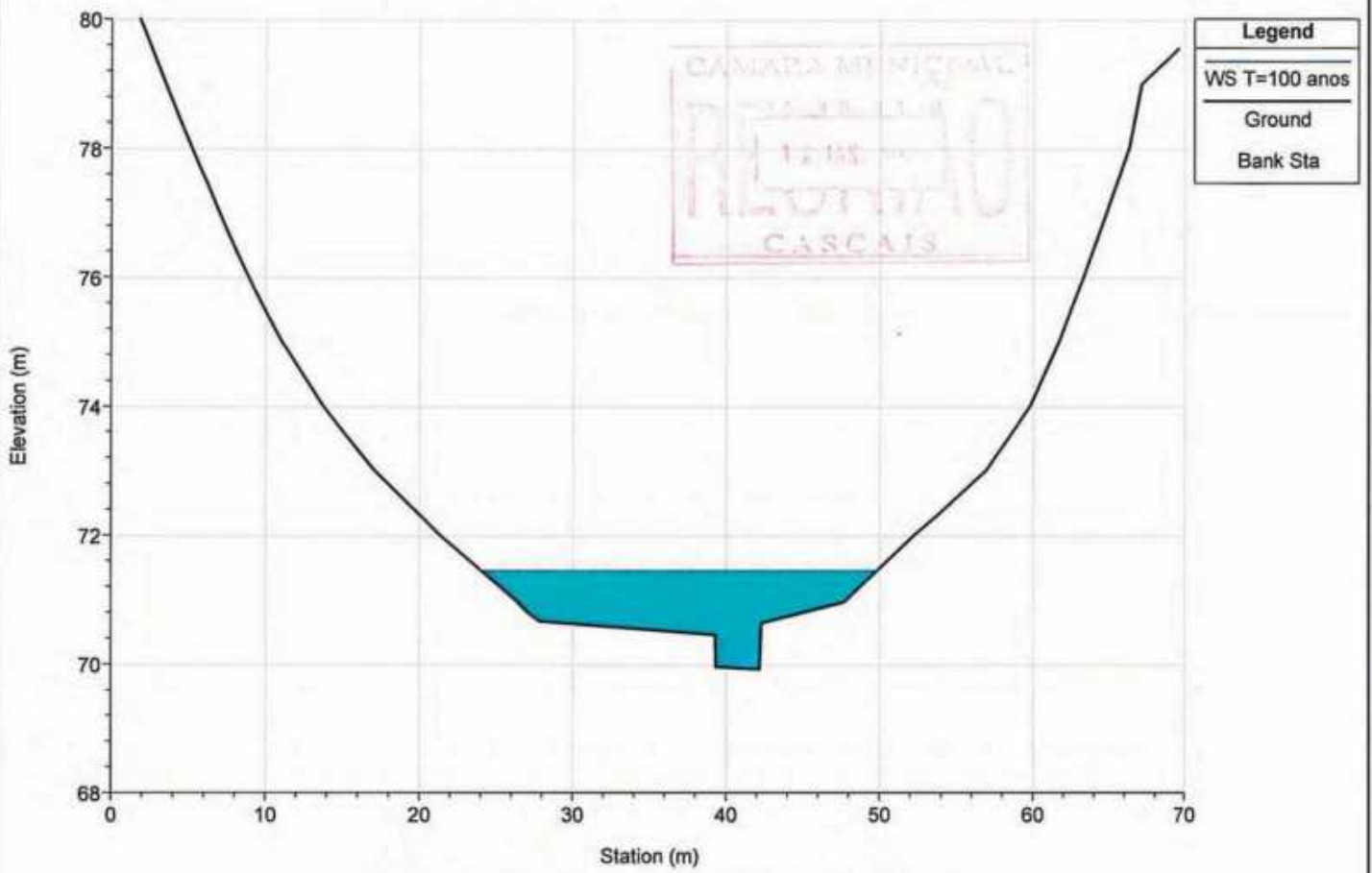
River = MULA Reach = jusante RS = 667.644



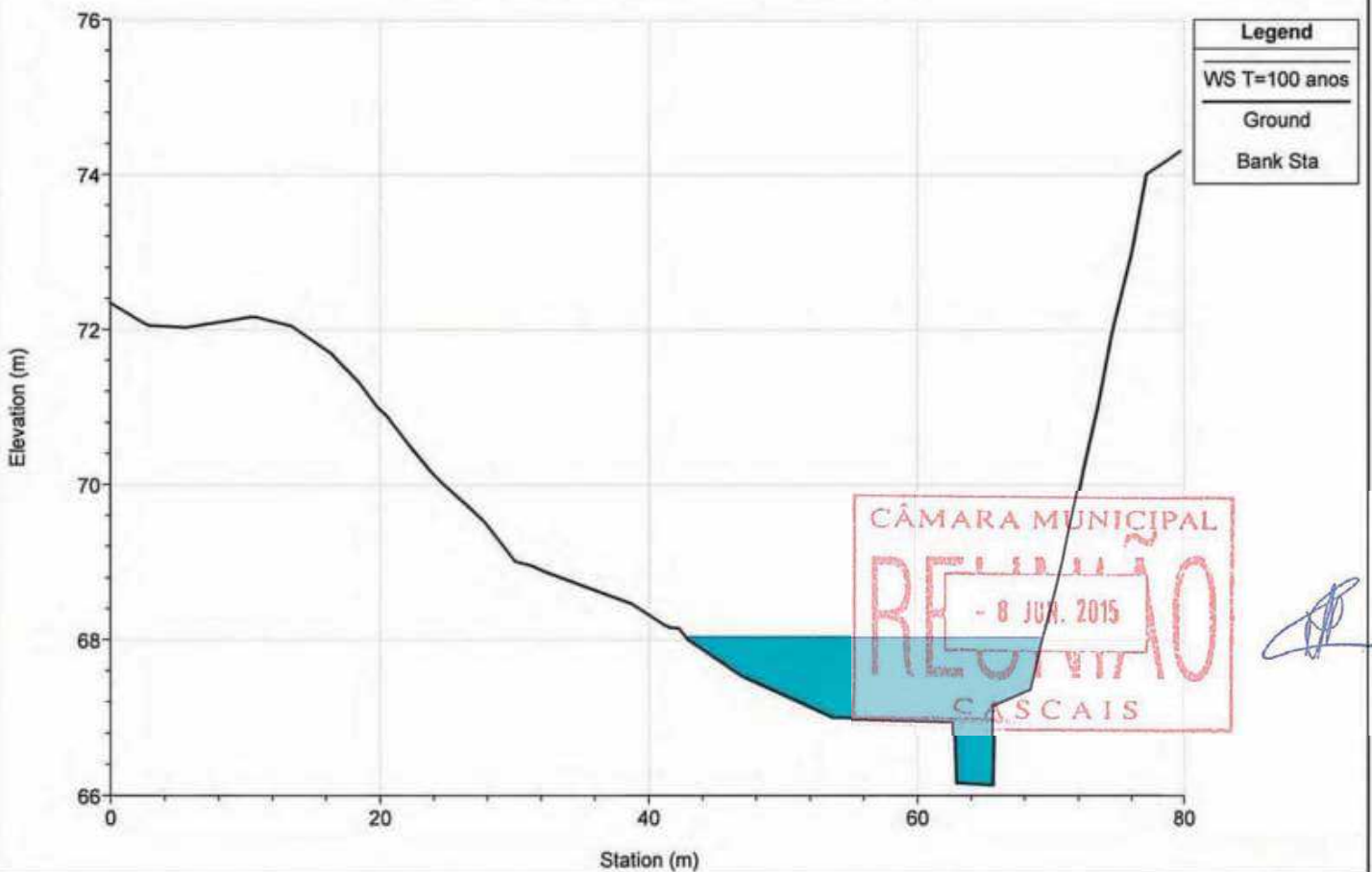
River = MULA Reach = jusante RS = 509.219



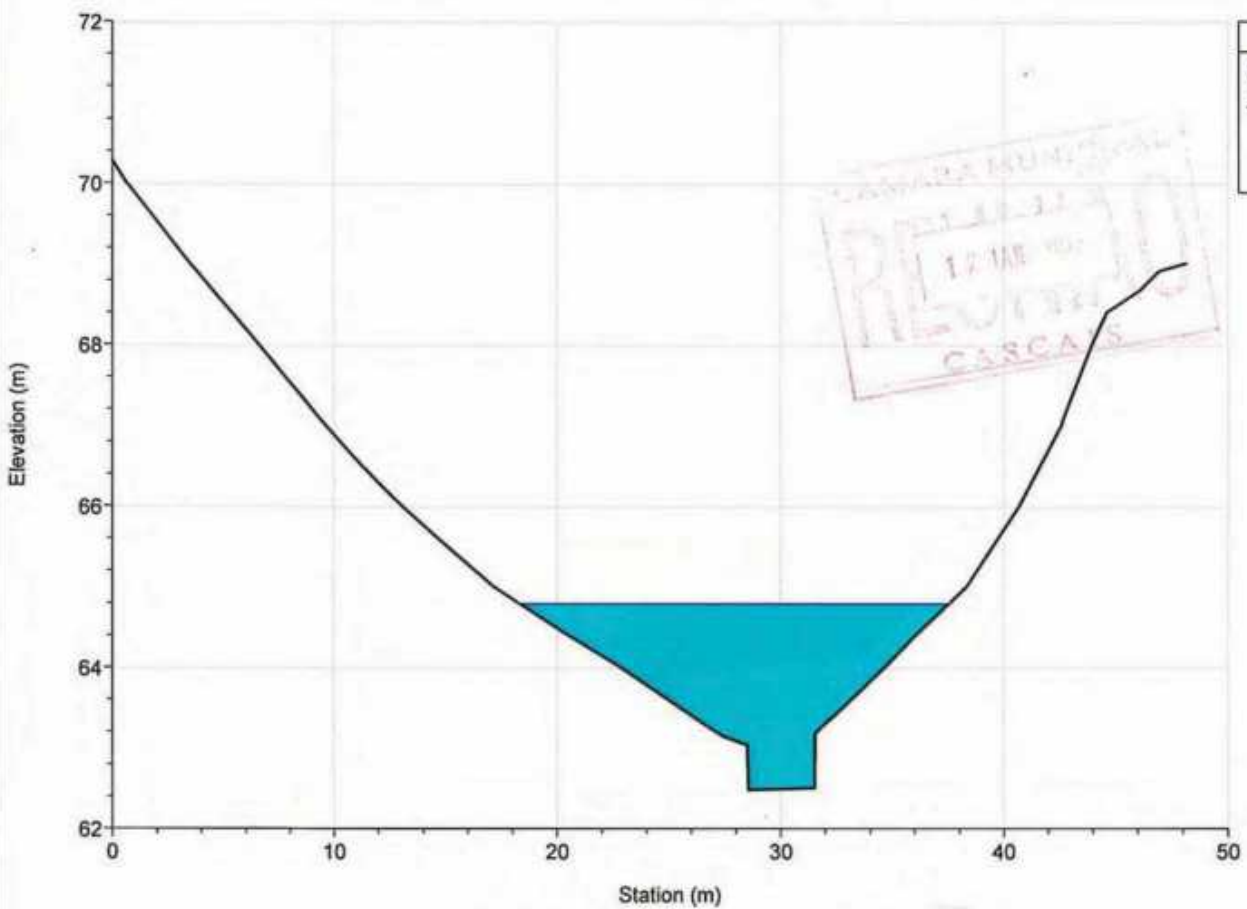
River = MULA Reach = jusante RS = 393.310



River = MULA Reach = jusante RS = 279.906

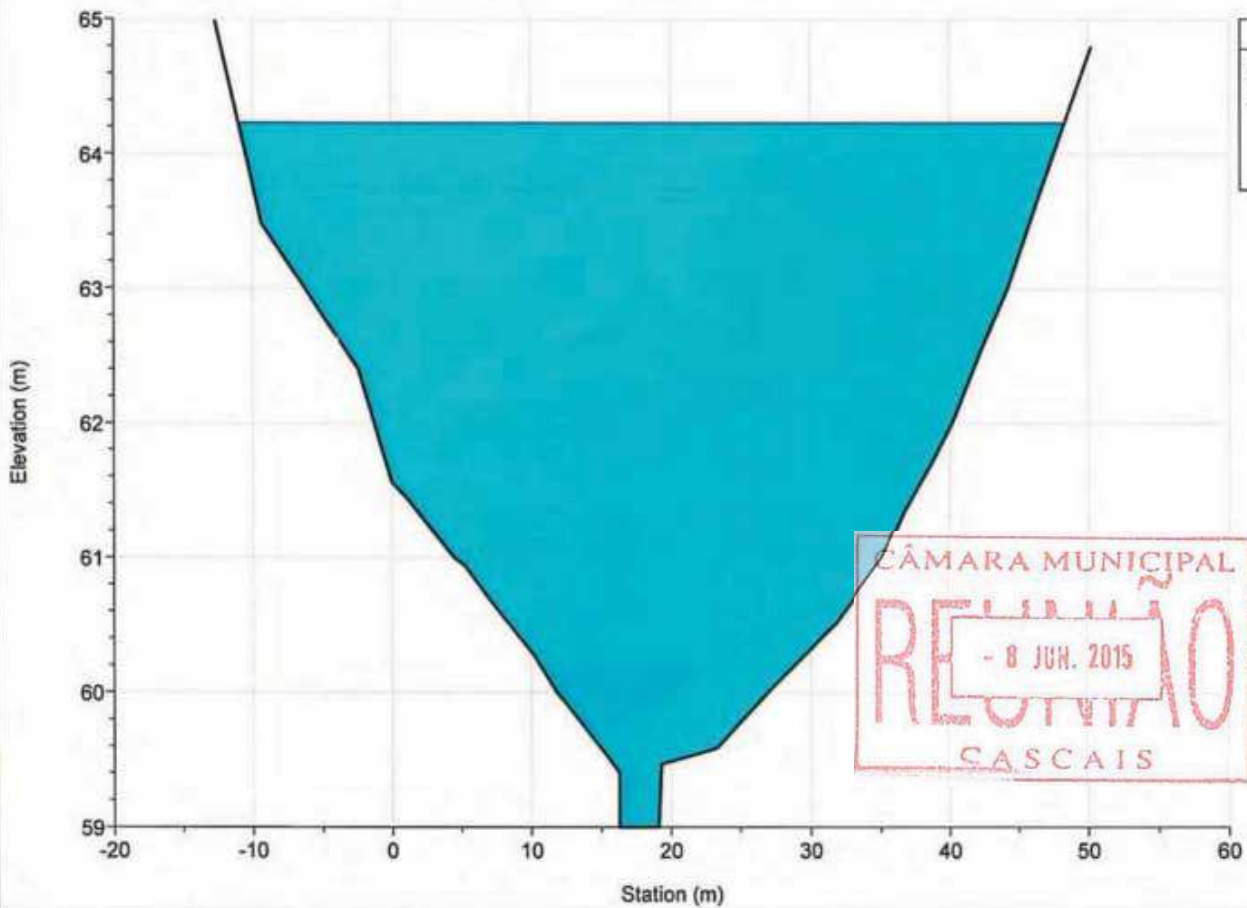


River = MULA Reach = jusante RS = 148.421



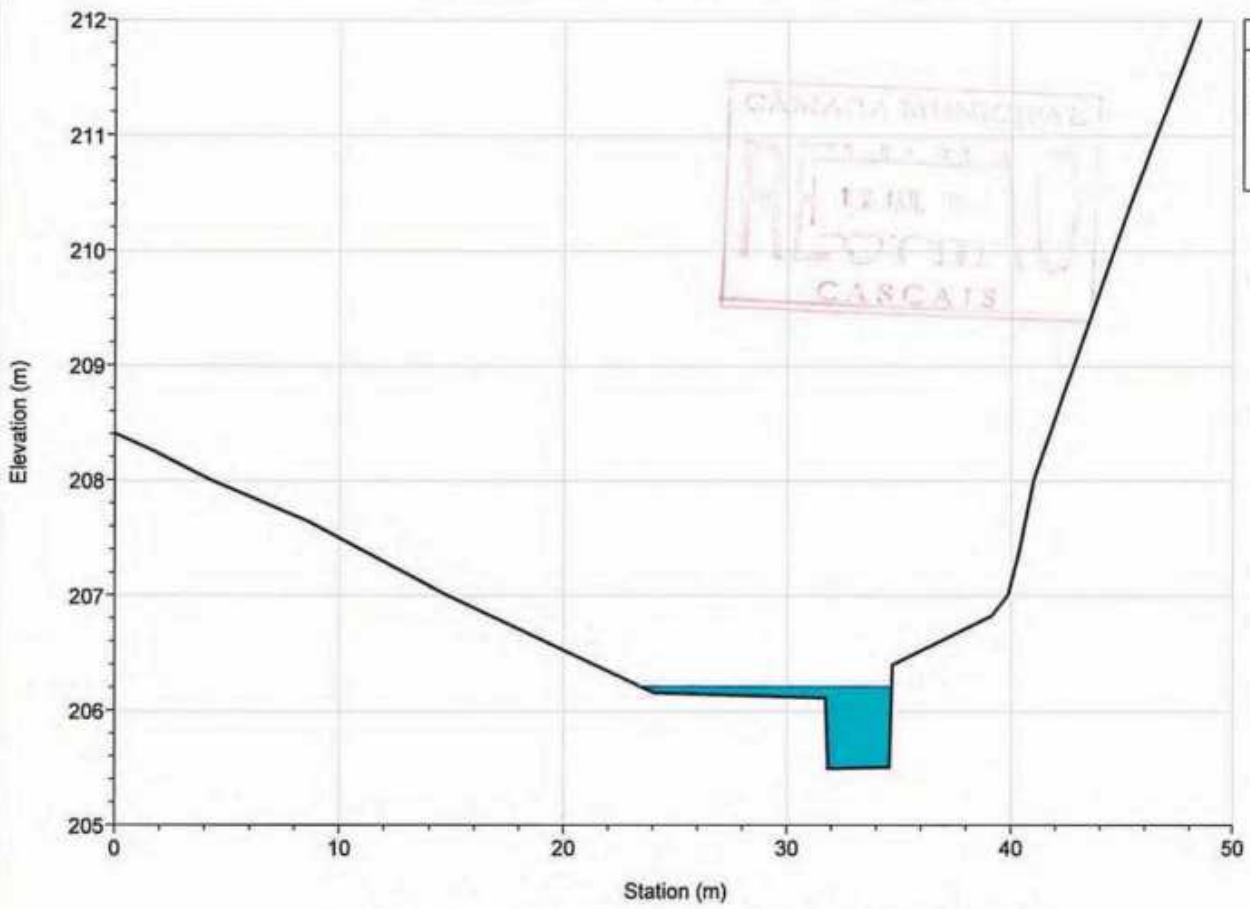
Legend
WS T=100 anos
Ground
Bank Sta

River = MULA Reach = jusante RS = 23.060

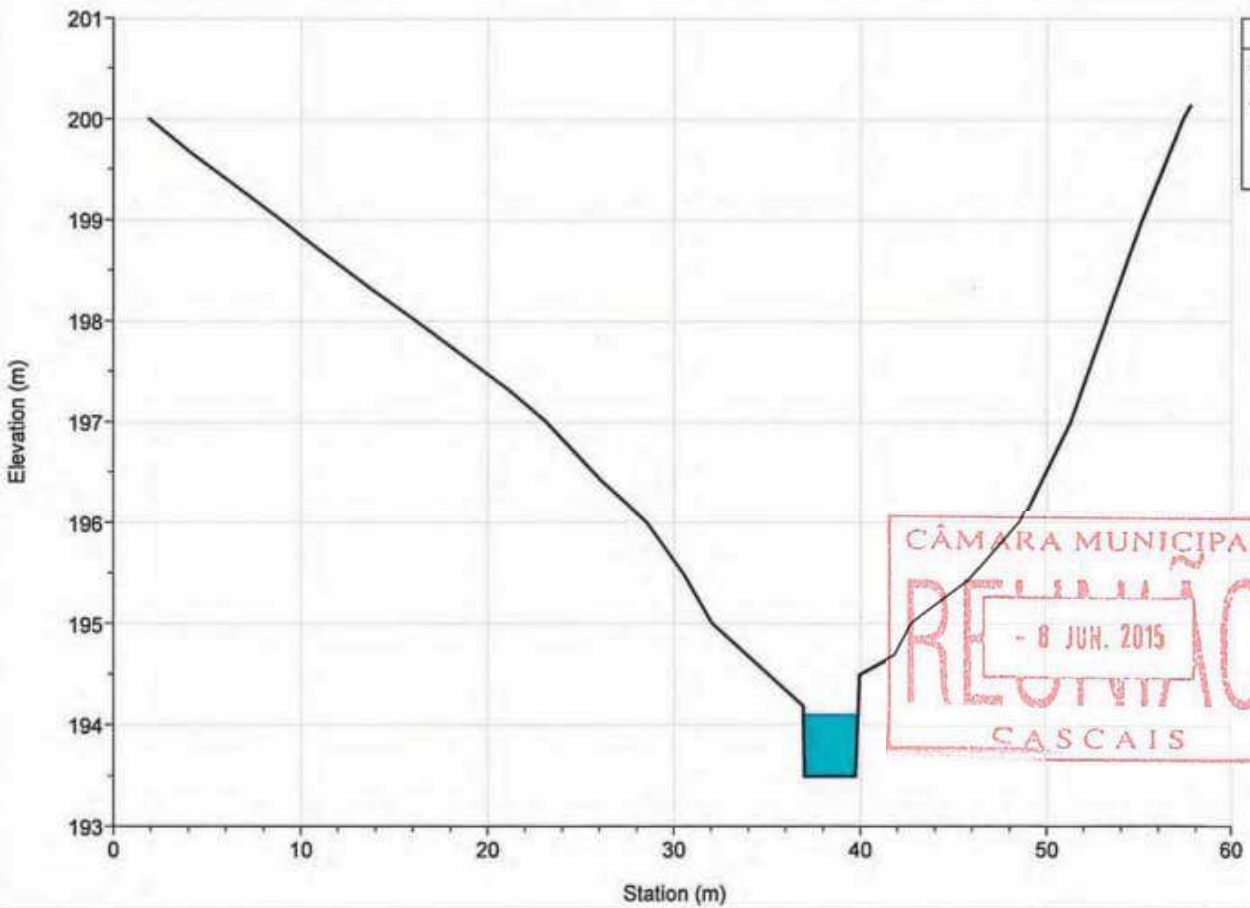


Legend
WS T=100 anos
Ground
Bank Sta

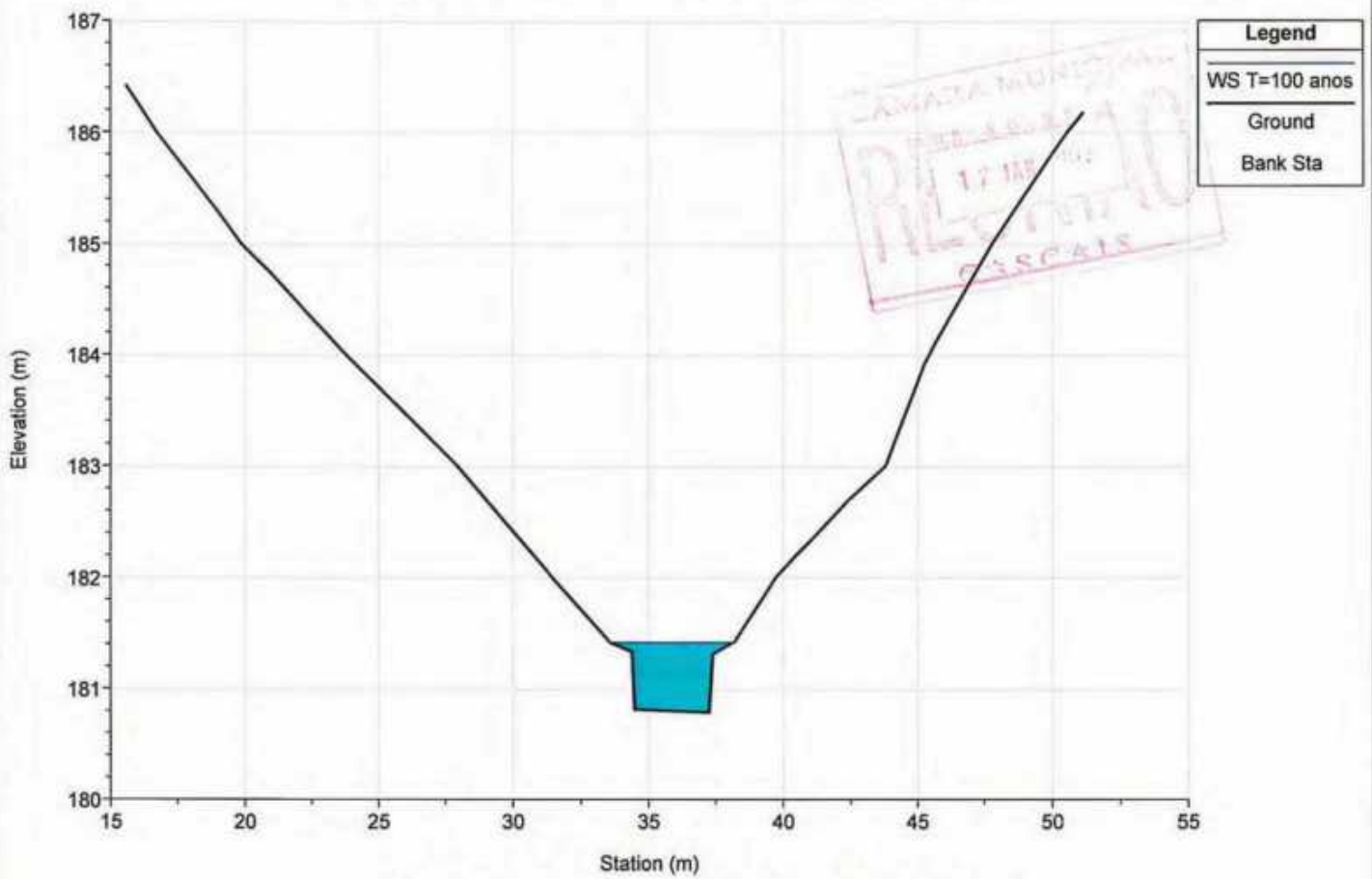
River = MD1-MULA Reach = afluyente RS = 871.517



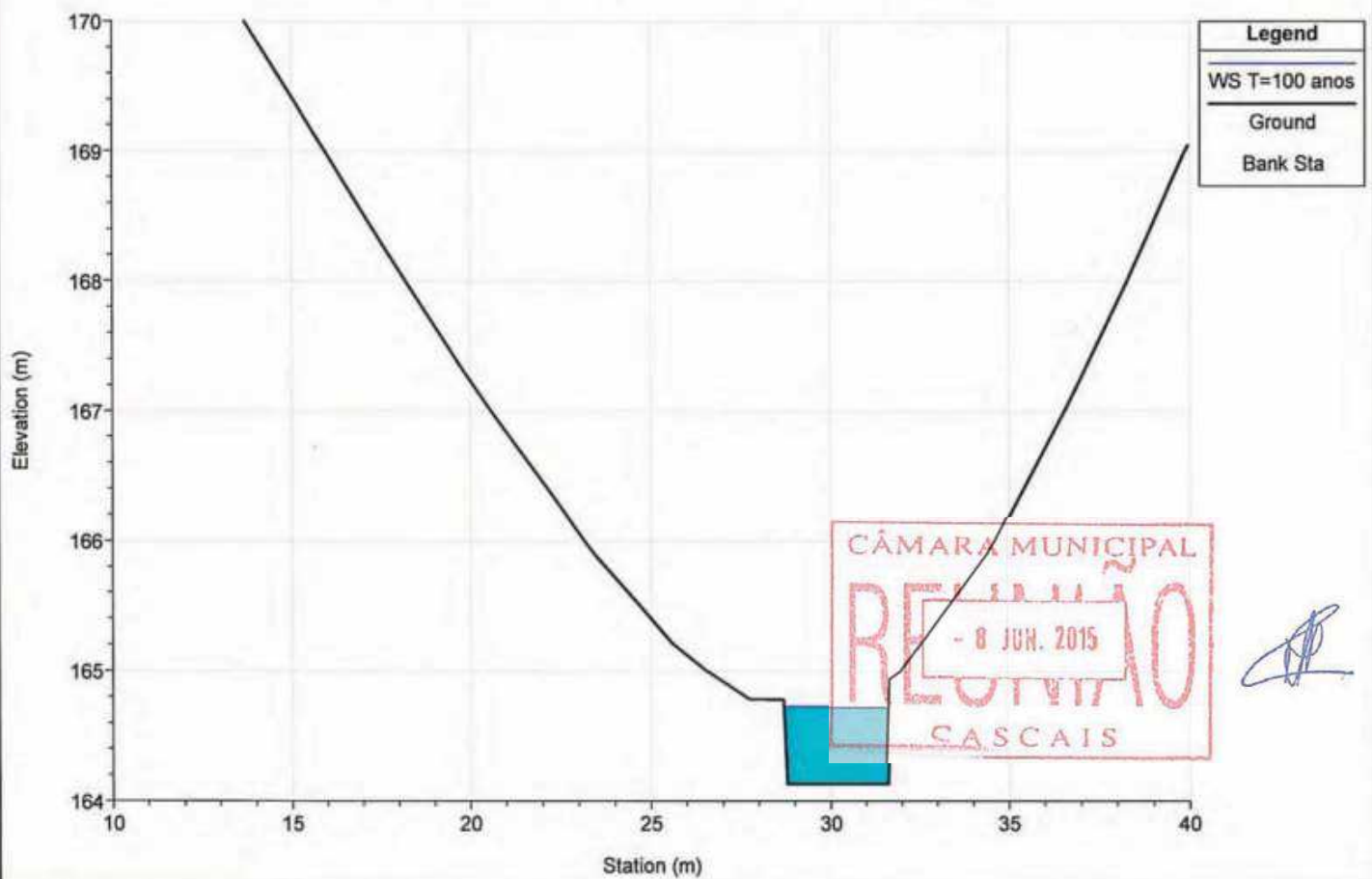
River = MD1-MULA Reach = afluyente RS = 723.987



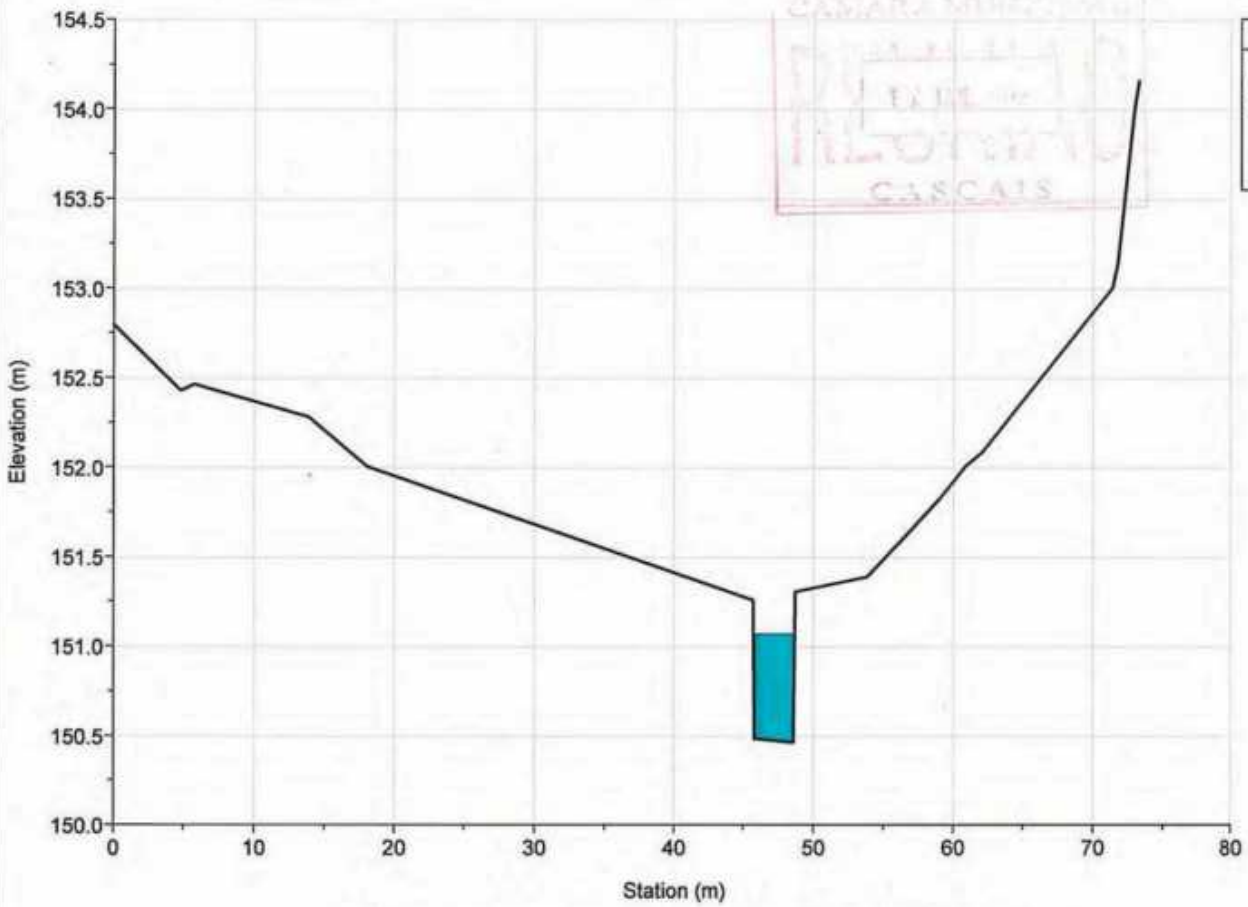
River = MD1-MULA Reach = afluente RS = 611.637



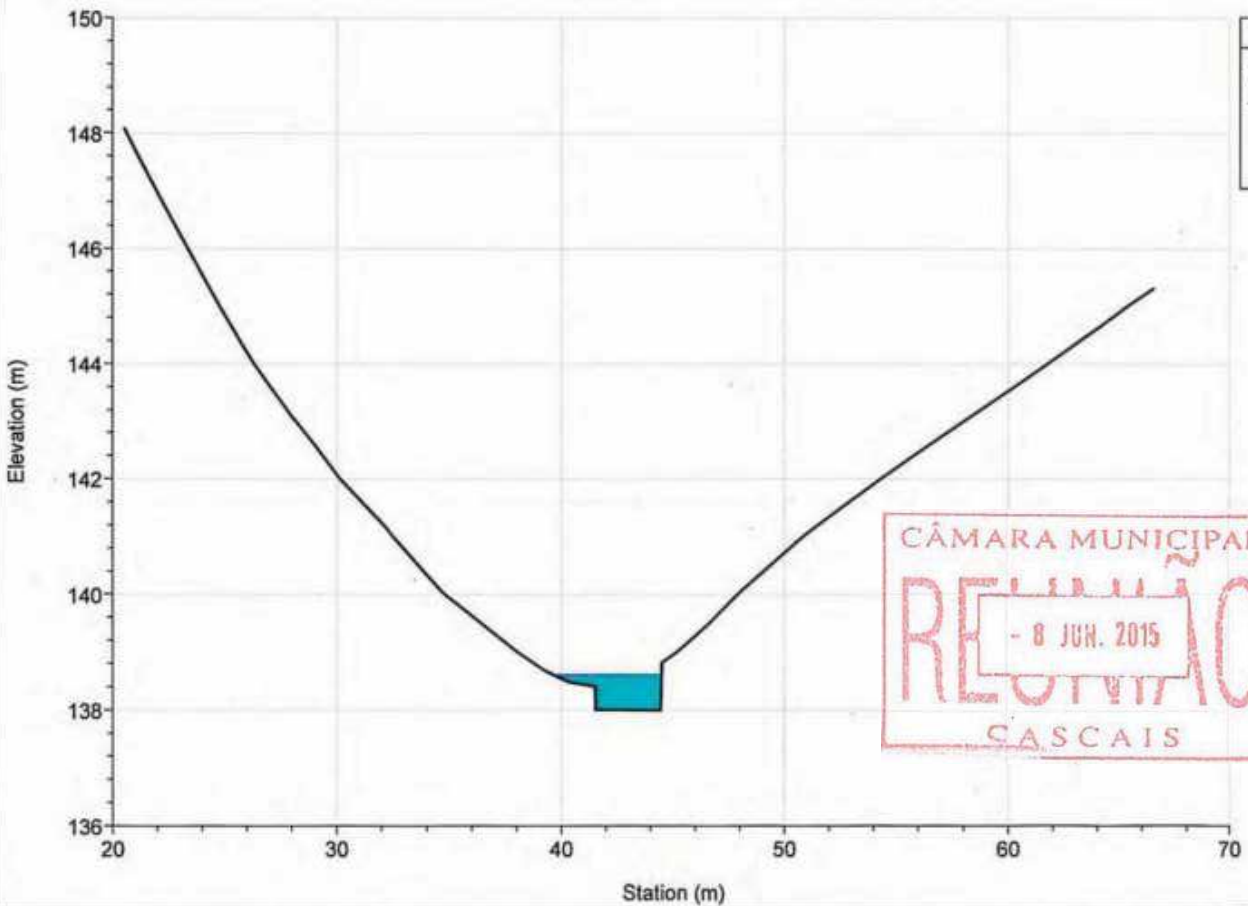
River = MD1-MULA Reach = afluente RS = 496.435



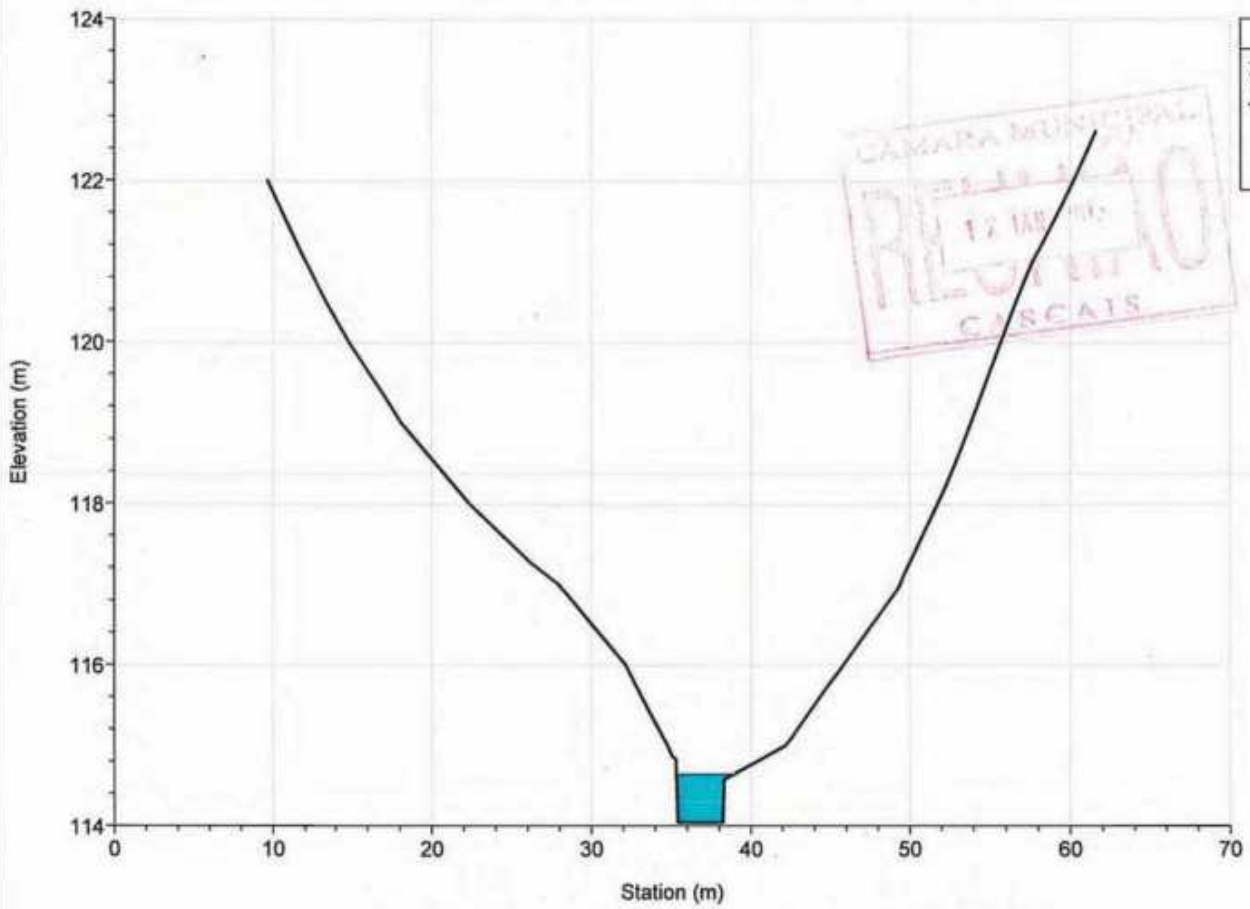
River = MD1-MULA Reach = afluente RS = 366.187



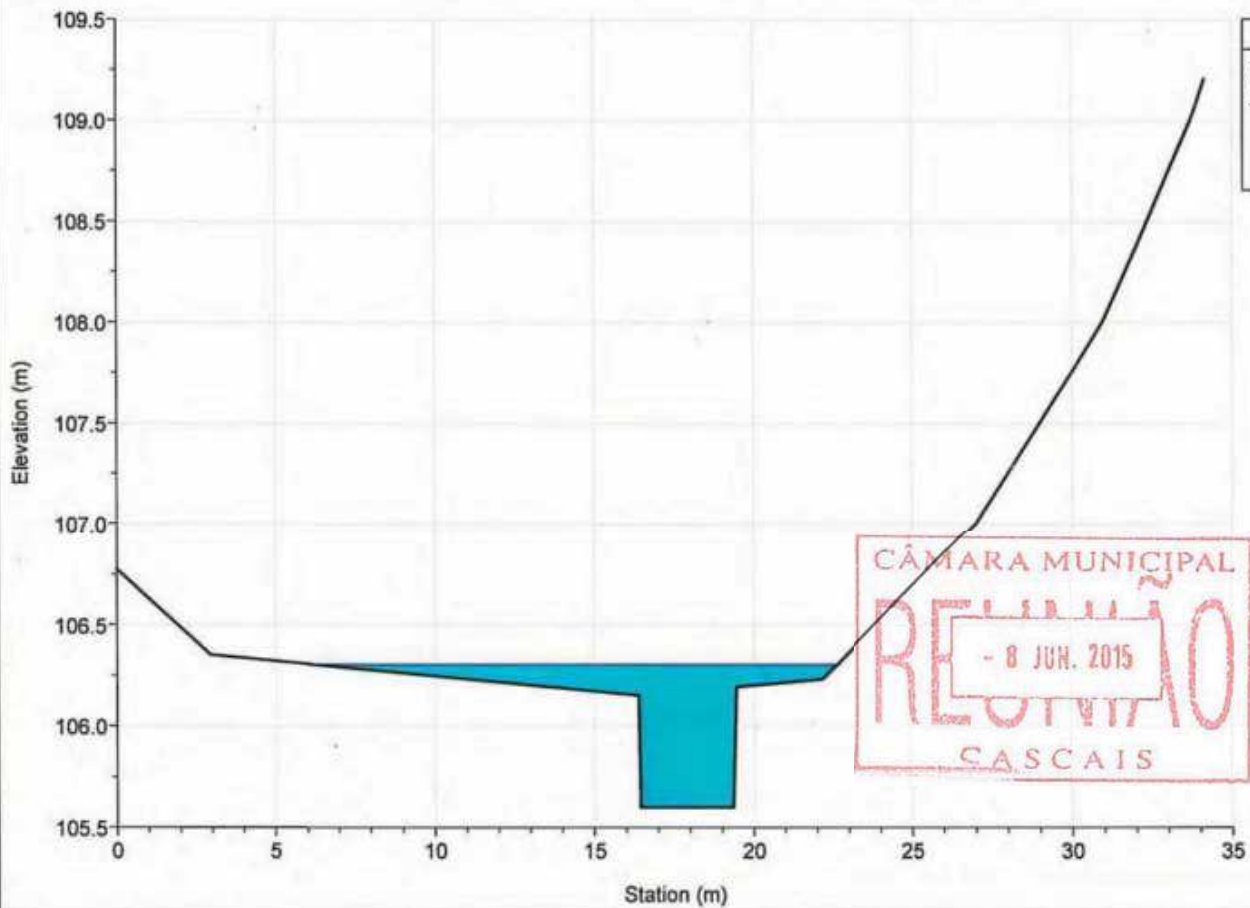
River = MD1-MULA Reach = afluente RS = 276.633



River = MD1-MULA Reach = afluyente RS = 159.480

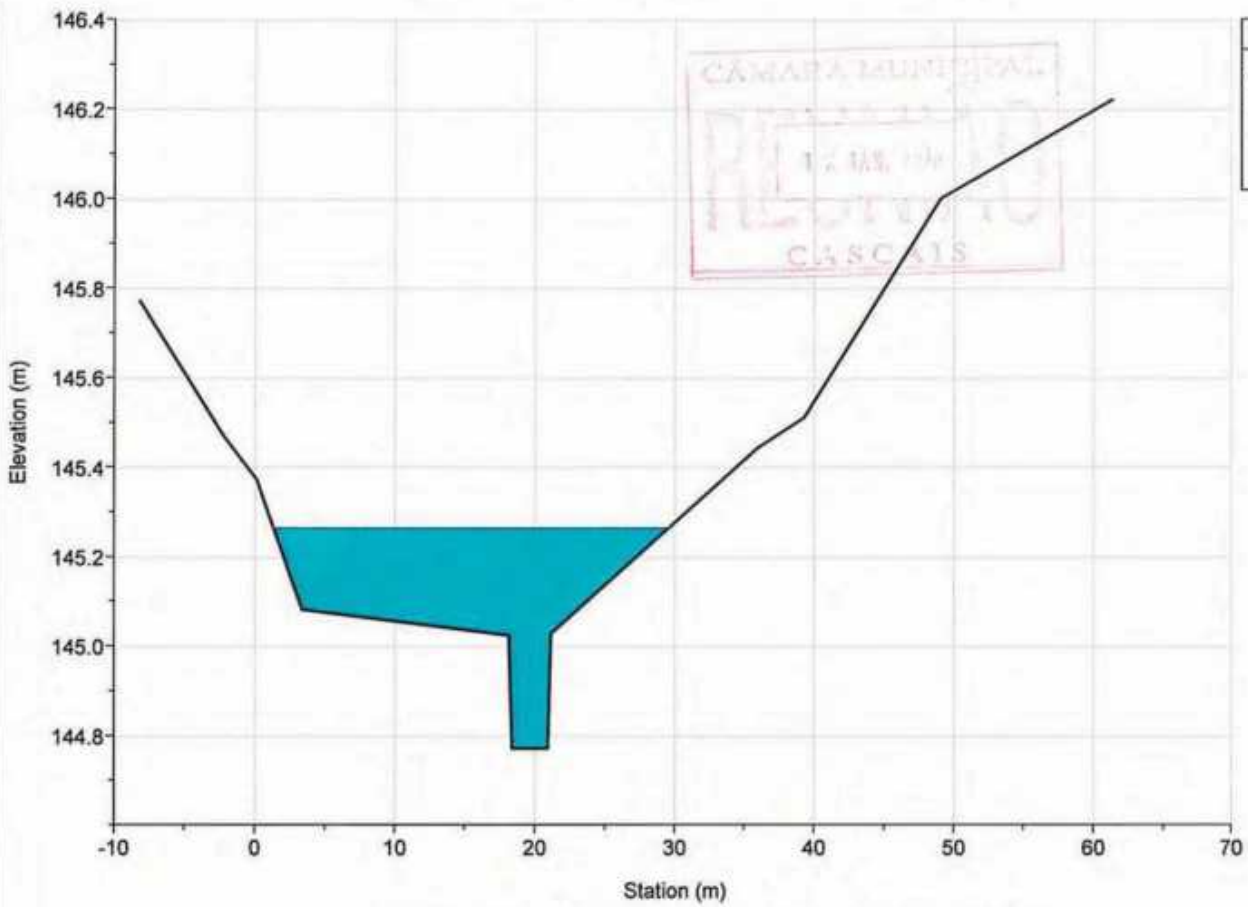


River = MD1-MULA Reach = afluyente RS = 27.887



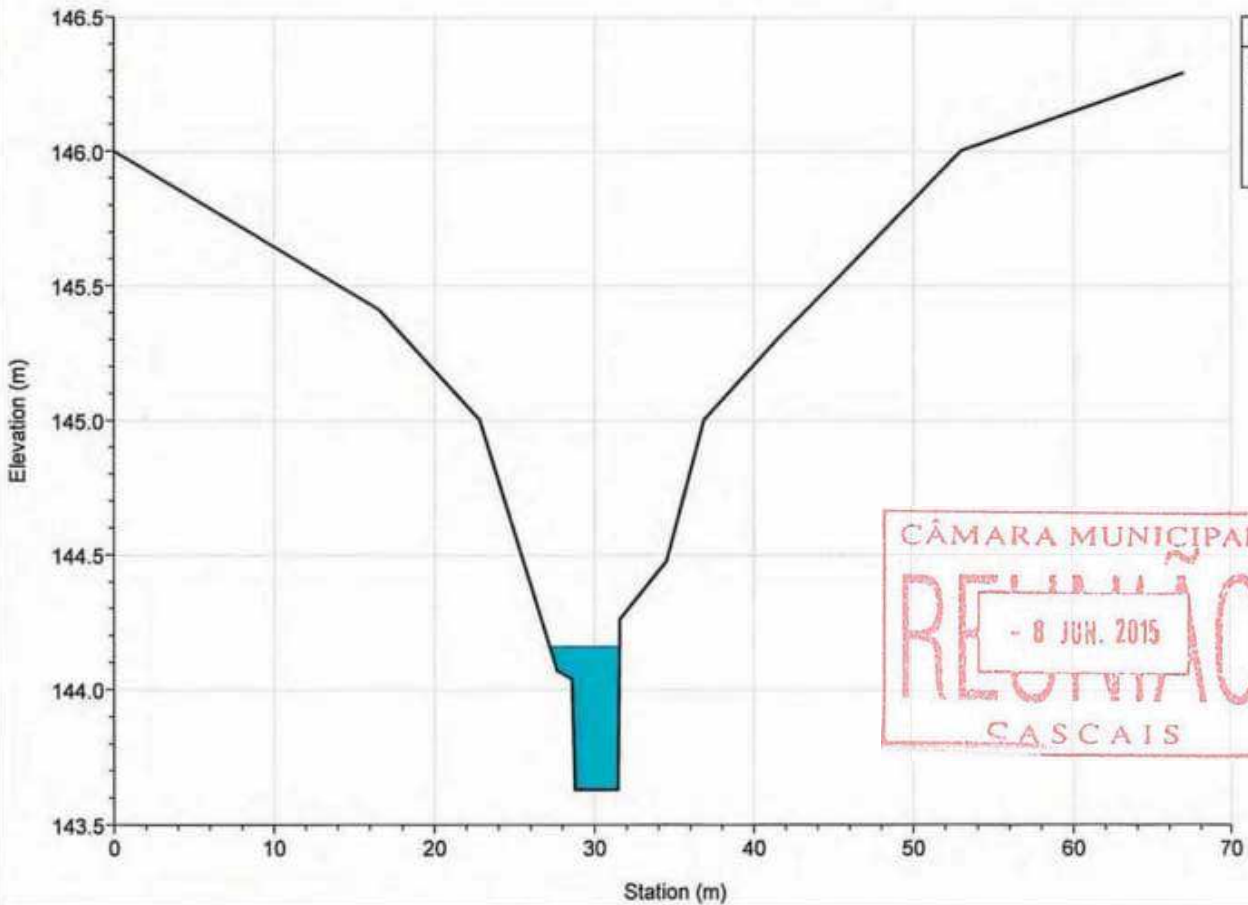


River = ALGARVE Reach = rib<sup>a</sup> RS = 2410.381



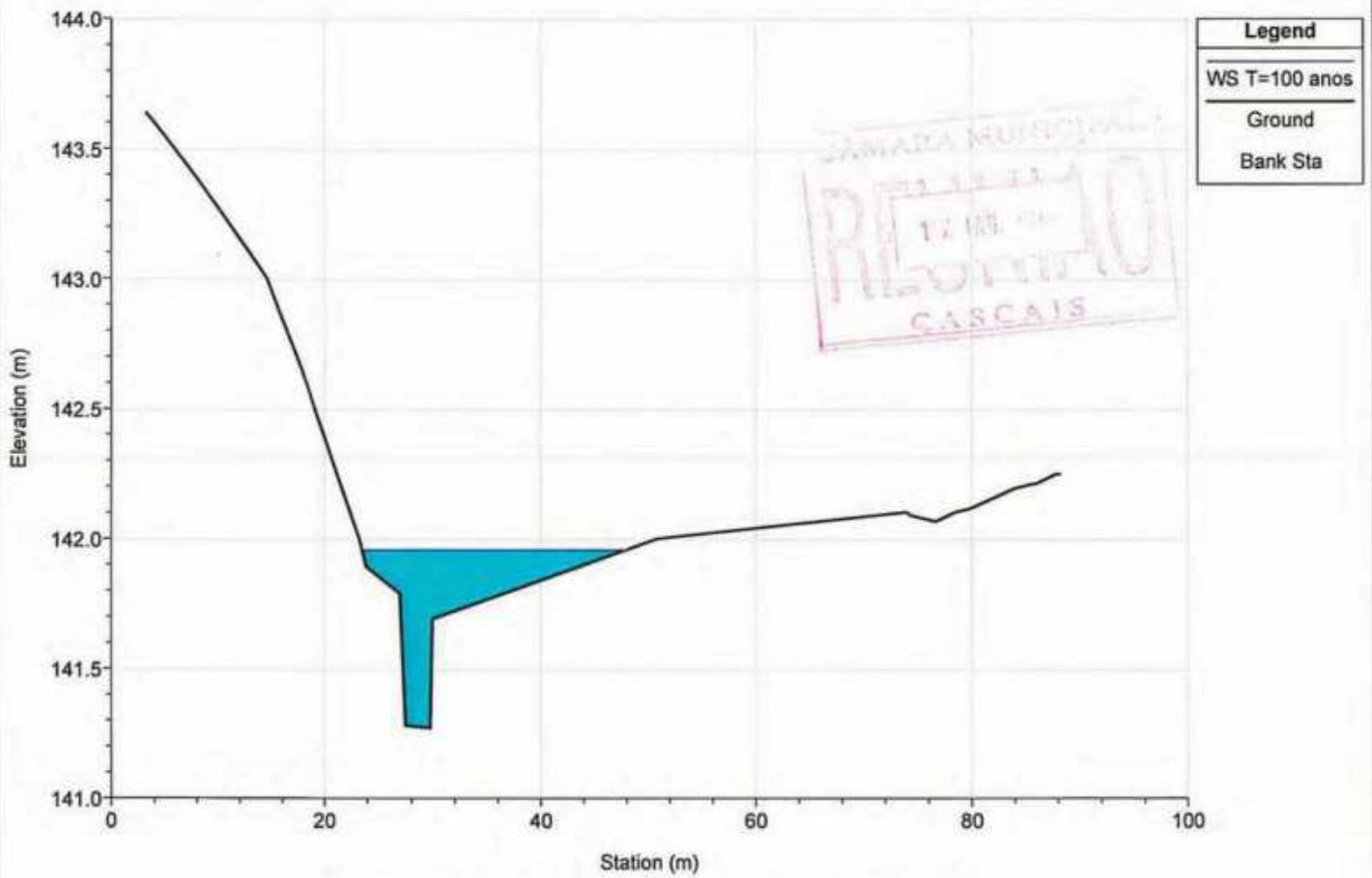
Legend	
WS T=100 anos	
Ground	
Bank Sta	

River = ALGARVE Reach = rib<sup>a</sup> RS = 2295.983

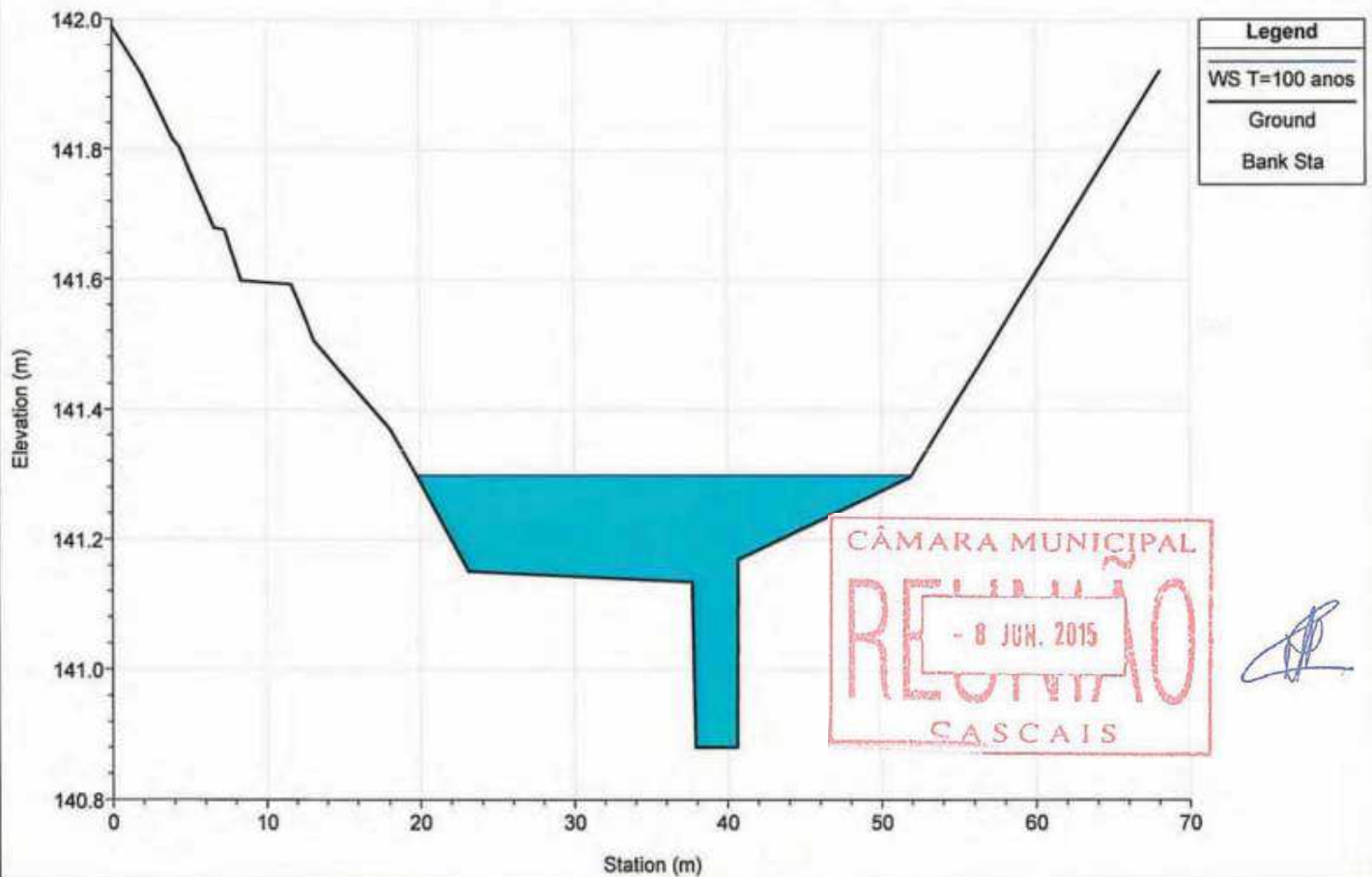


Legend	
WS T=100 anos	
Ground	
Bank Sta	

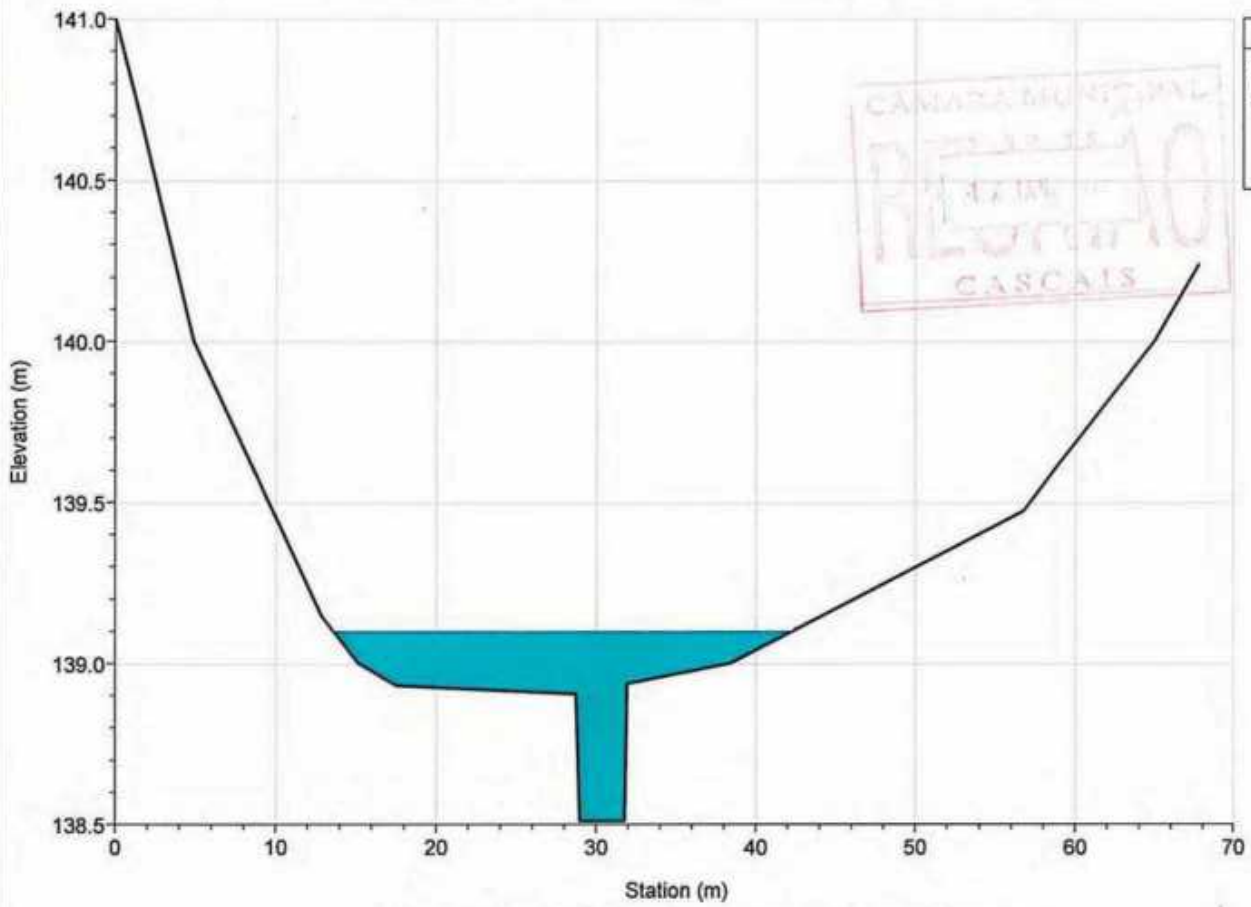
River = ALGARVE Reach = rib<sup>a</sup> RS = 2170.239



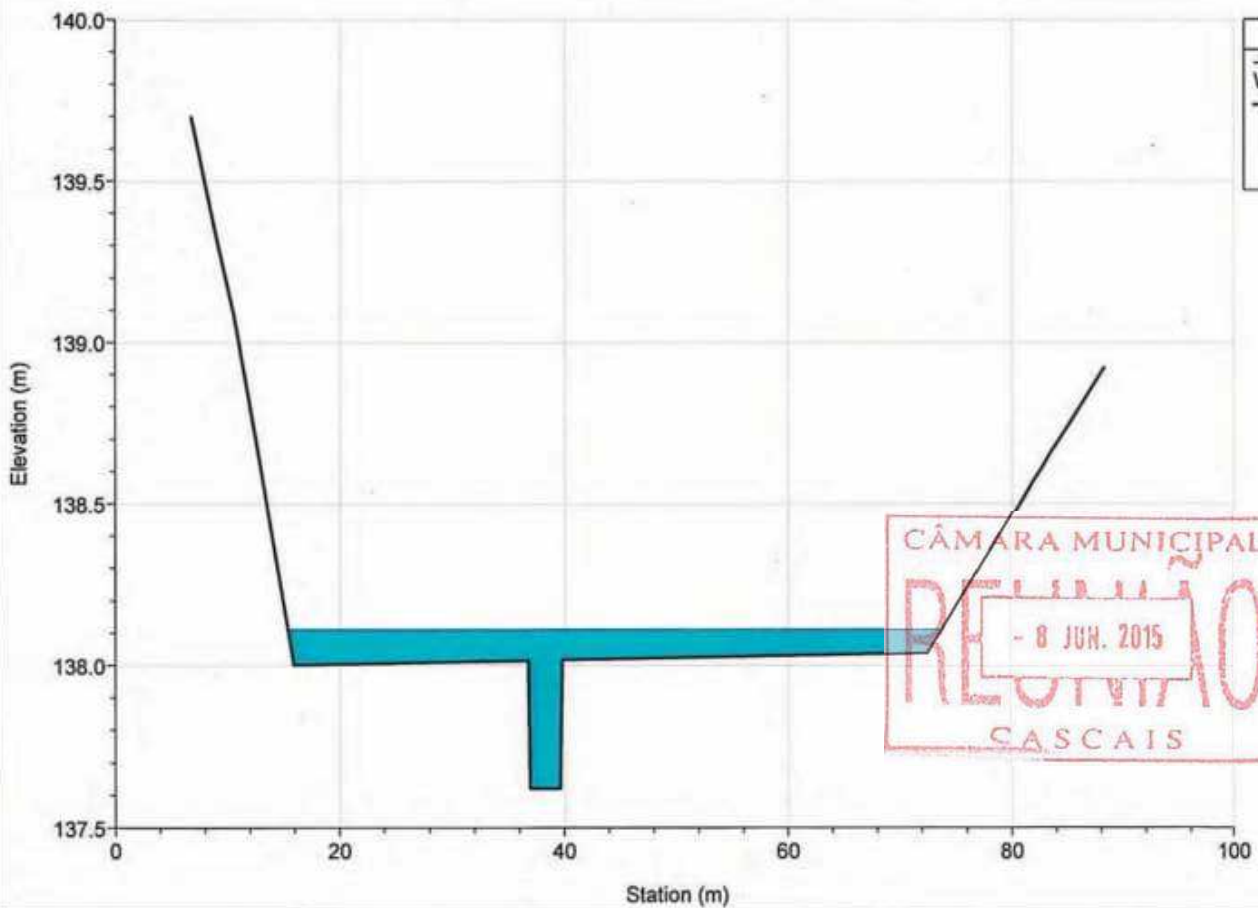
River = ALGARVE Reach = rib<sup>a</sup> RS = 2069.563

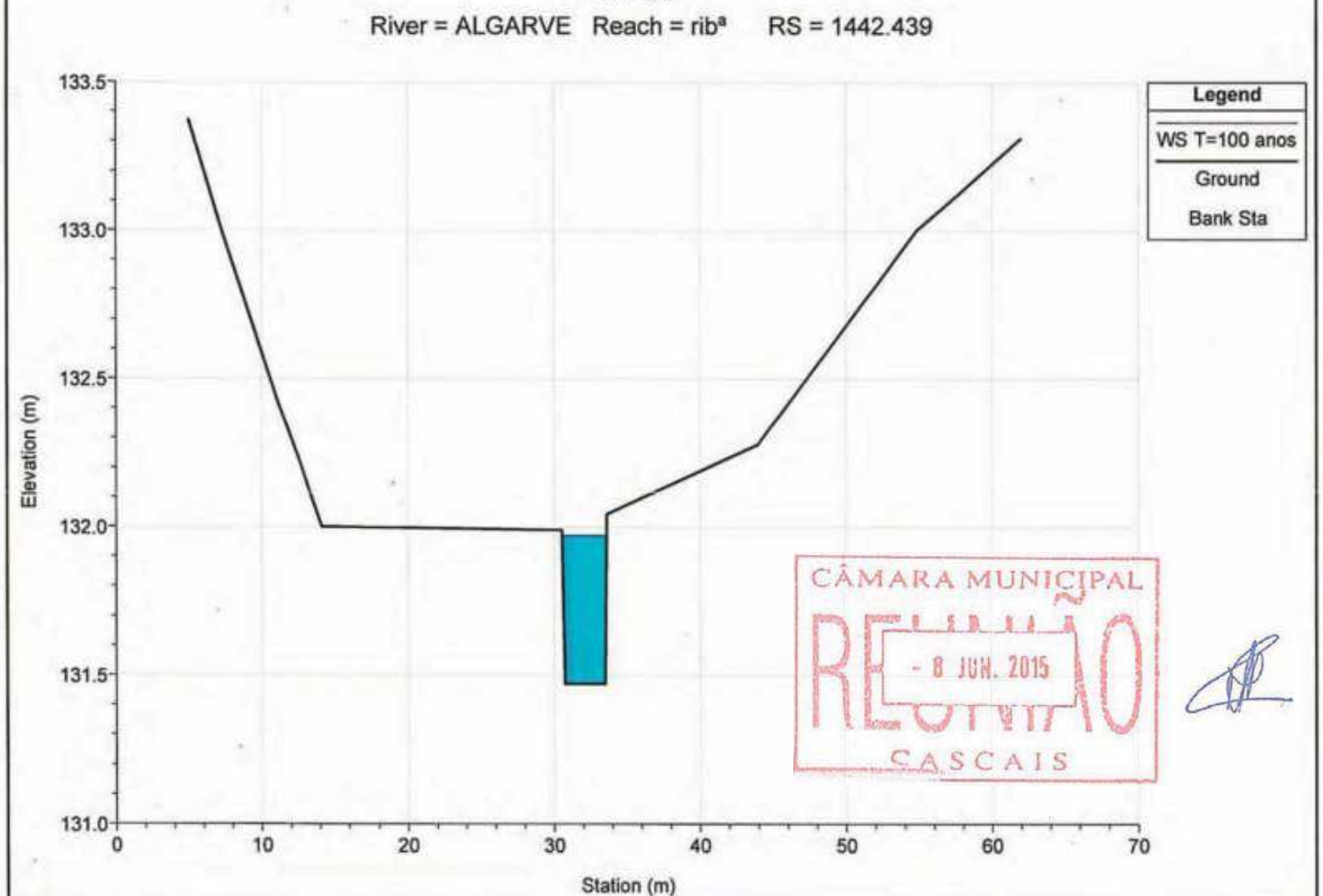
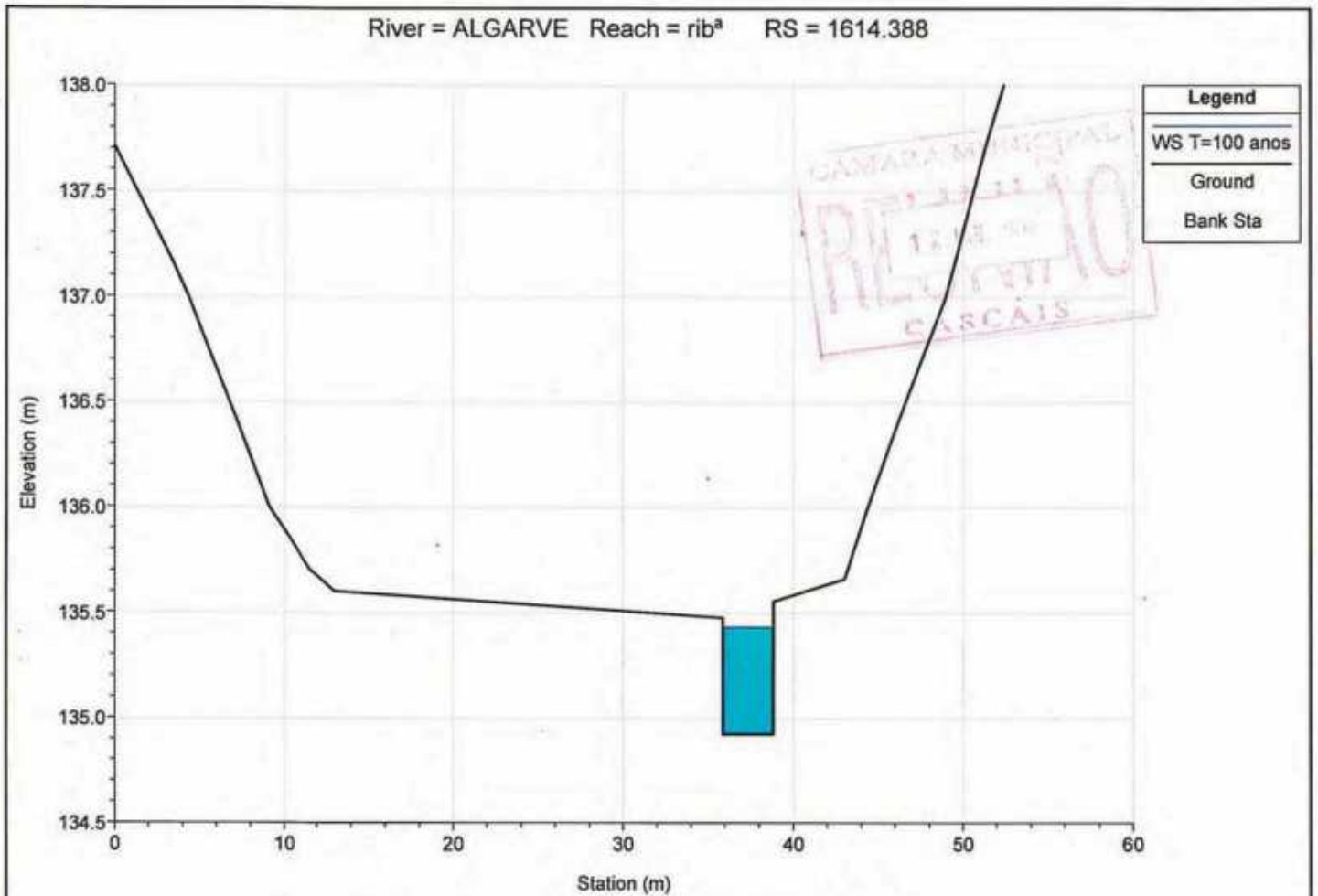


River = ALGARVE Reach = rib<sup>a</sup> RS = 1956.104

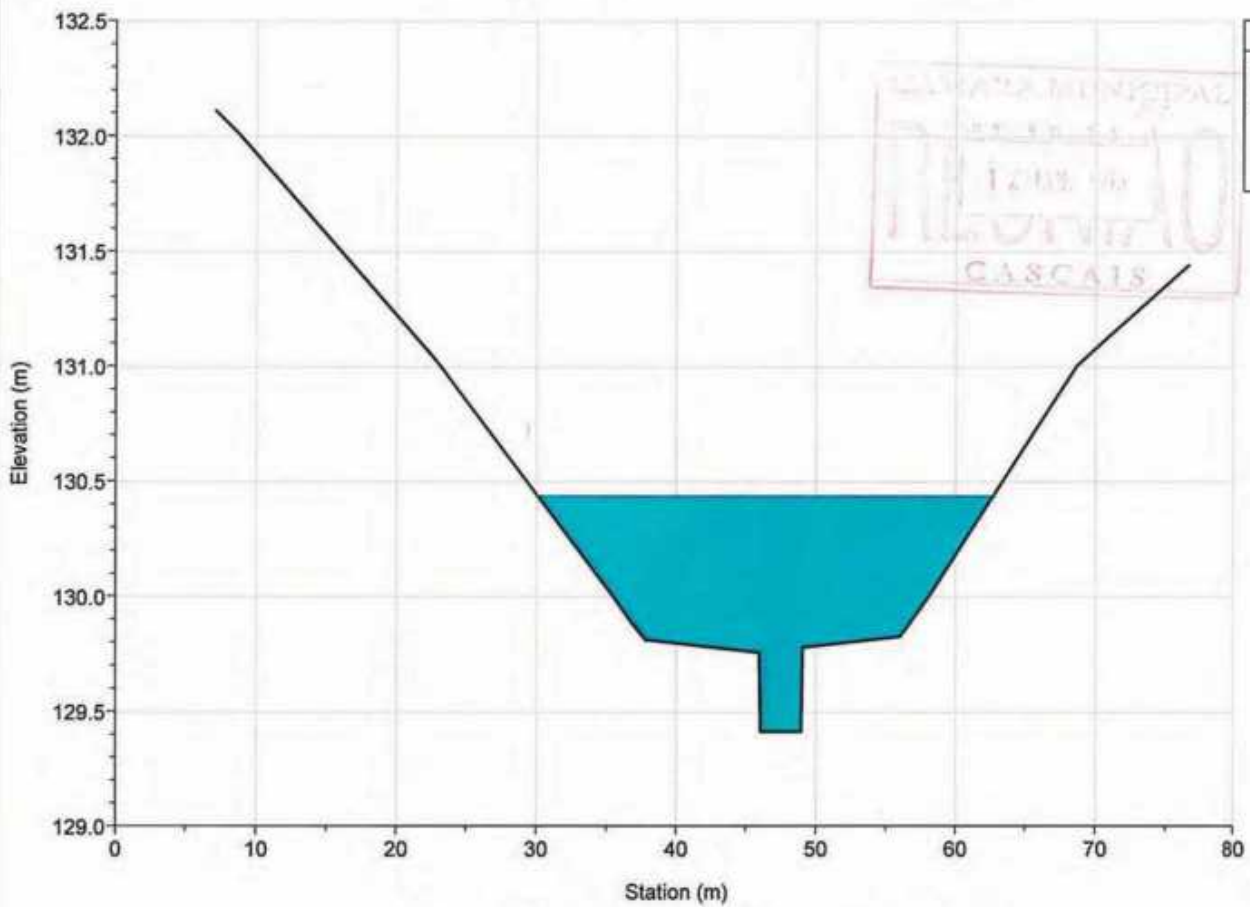


River = ALGARVE Reach = rib<sup>a</sup> RS = 1768.973



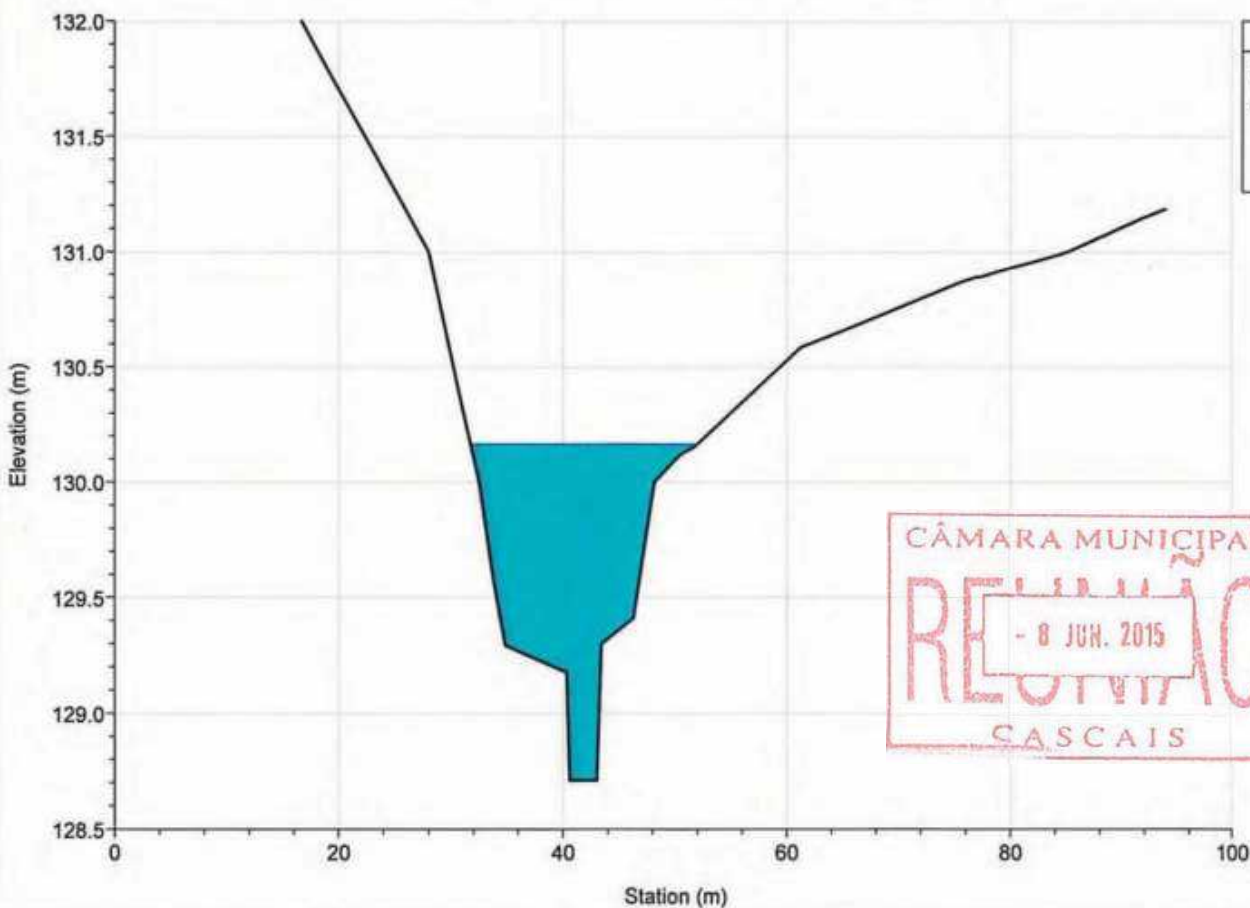


River = ALGARVE Reach = rib<sup>a</sup> RS = 1306.826

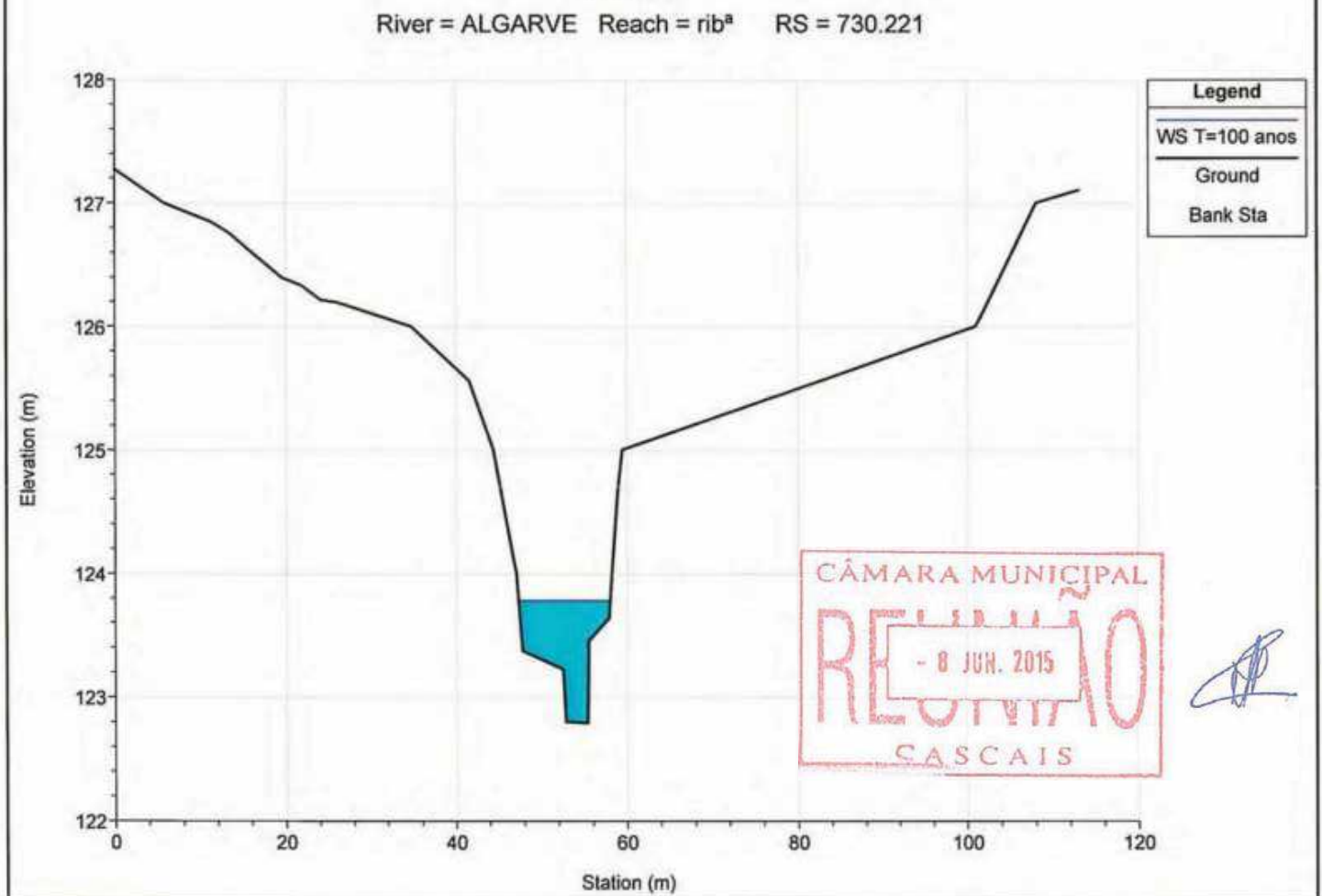
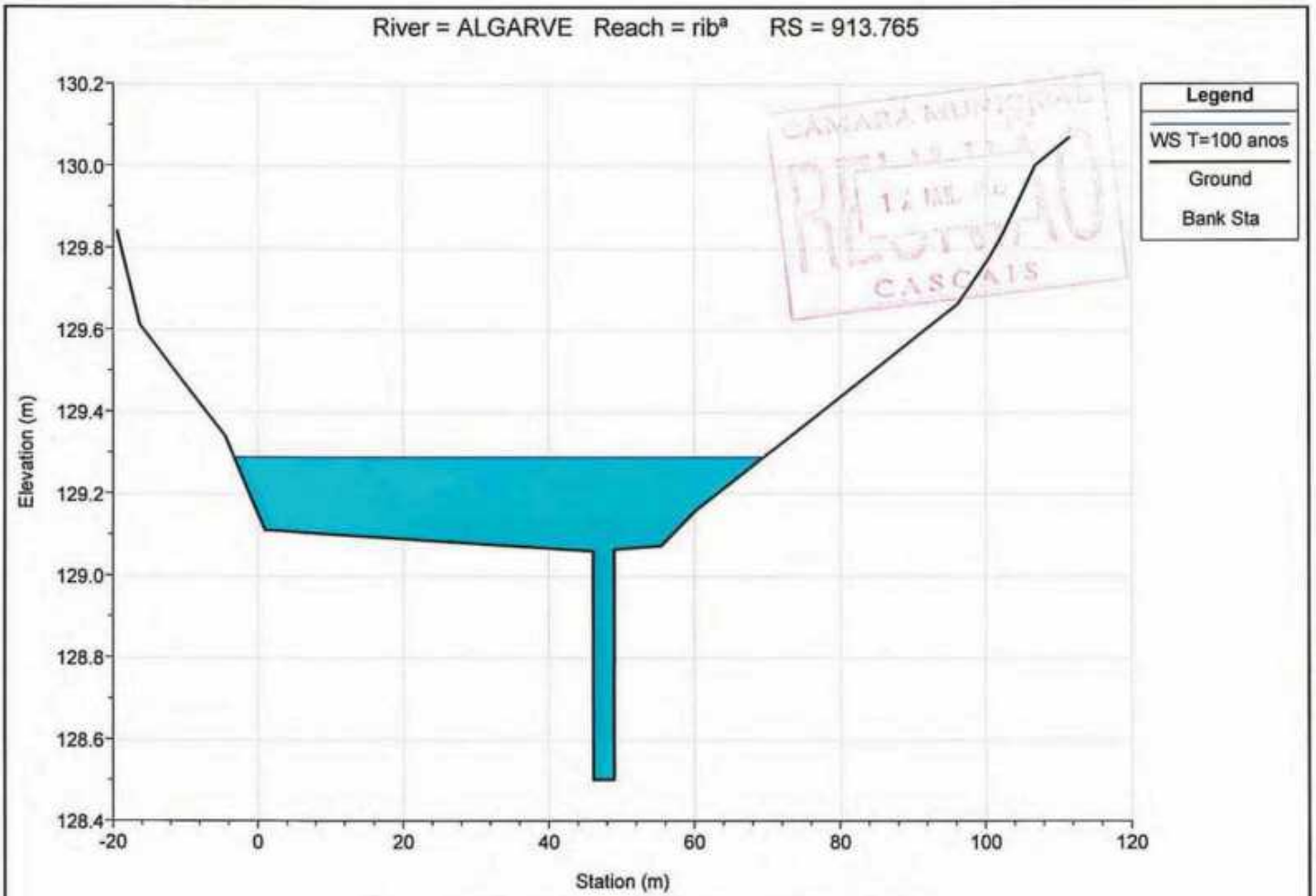


Legend
WS T=100 anos
Ground
Bank Sta

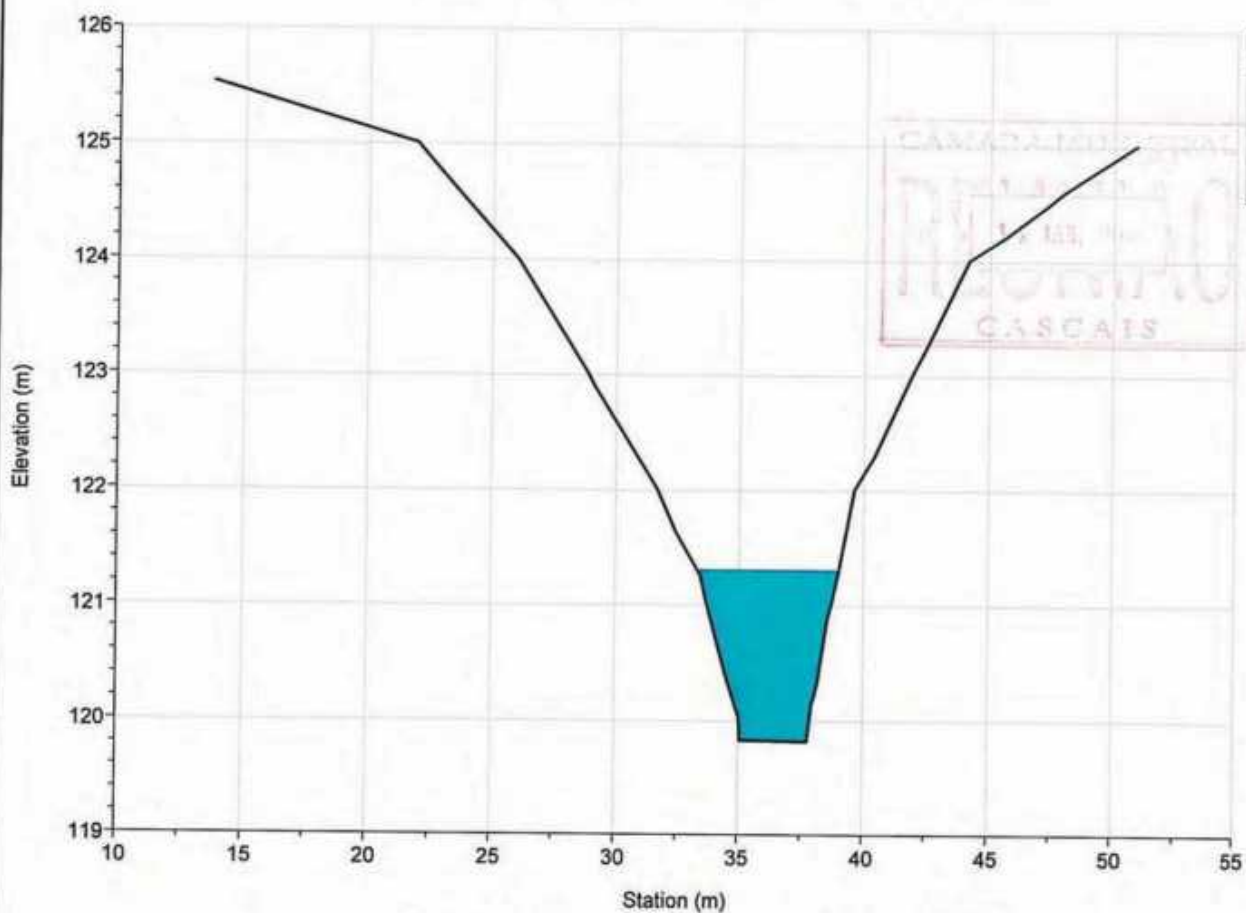
River = ALGARVE Reach = rib<sup>a</sup> RS = 1173.376



Legend
WS T=100 anos
Ground
Bank Sta



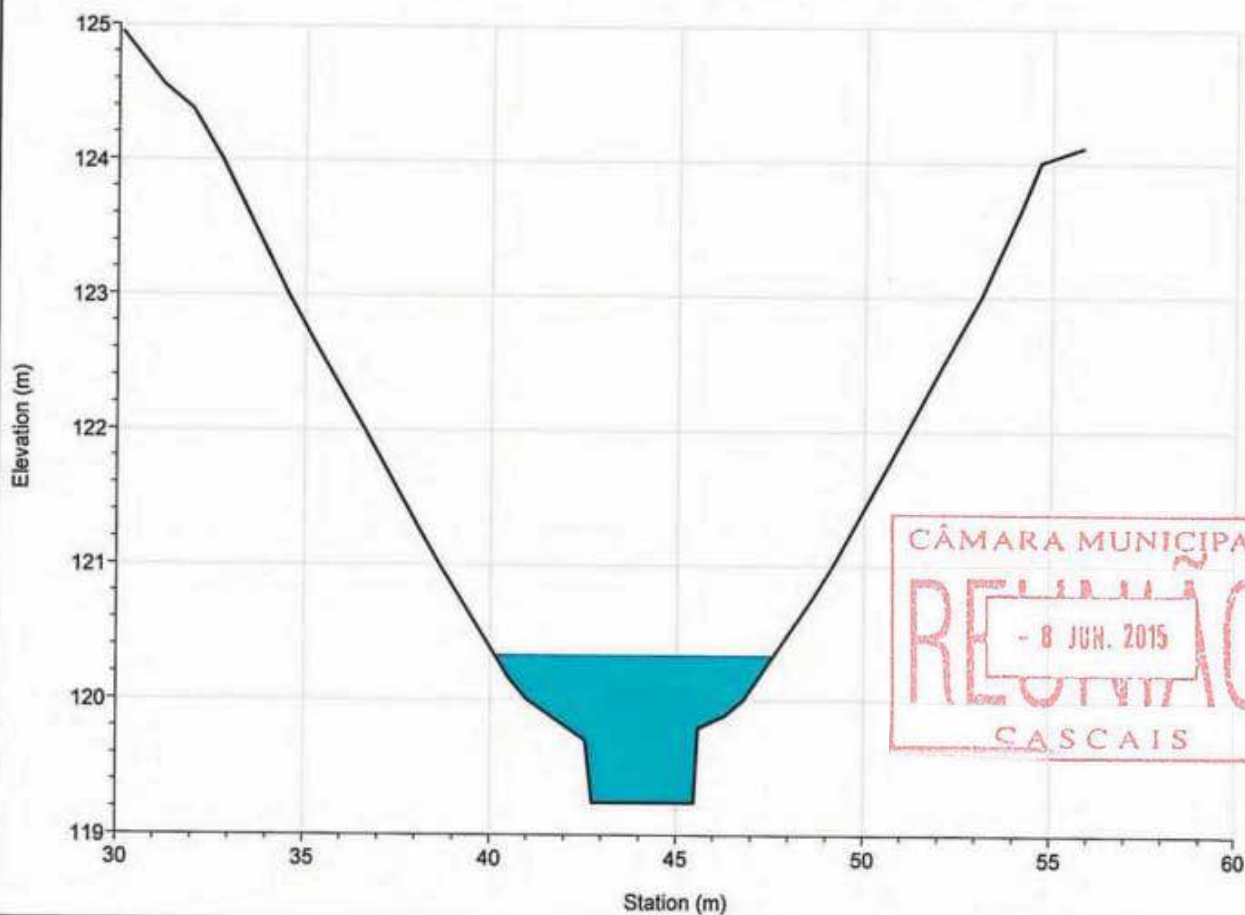
River = ALGARVE Reach = rib<sup>a</sup> RS = 610.855



Legend	
WS T=100 anos	
Ground	
Bank Sta	

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REQUISIÇÃO  
- 8 JUN. 2015  
CASCAIS

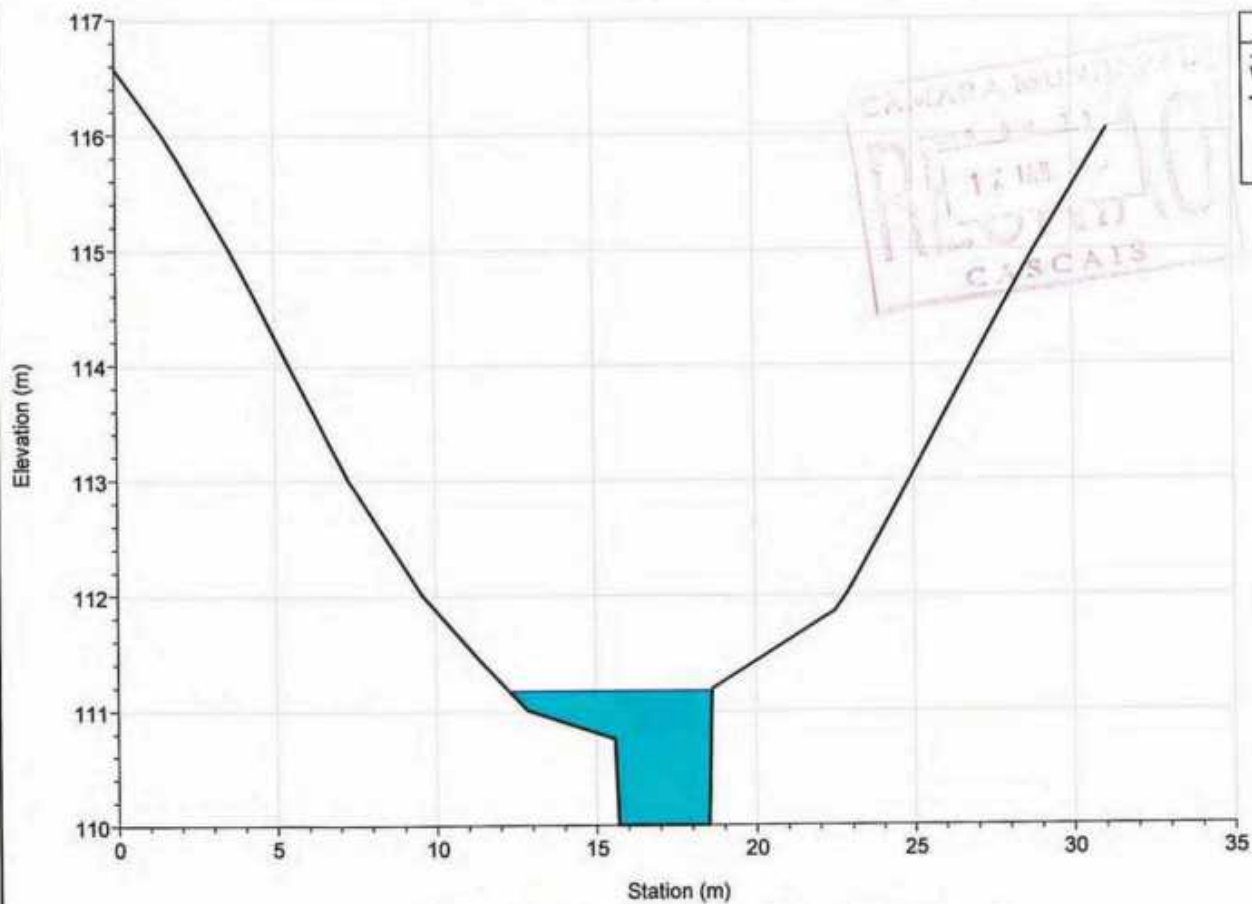
River = ALGARVE Reach = rib<sup>a</sup> RS = 488.820



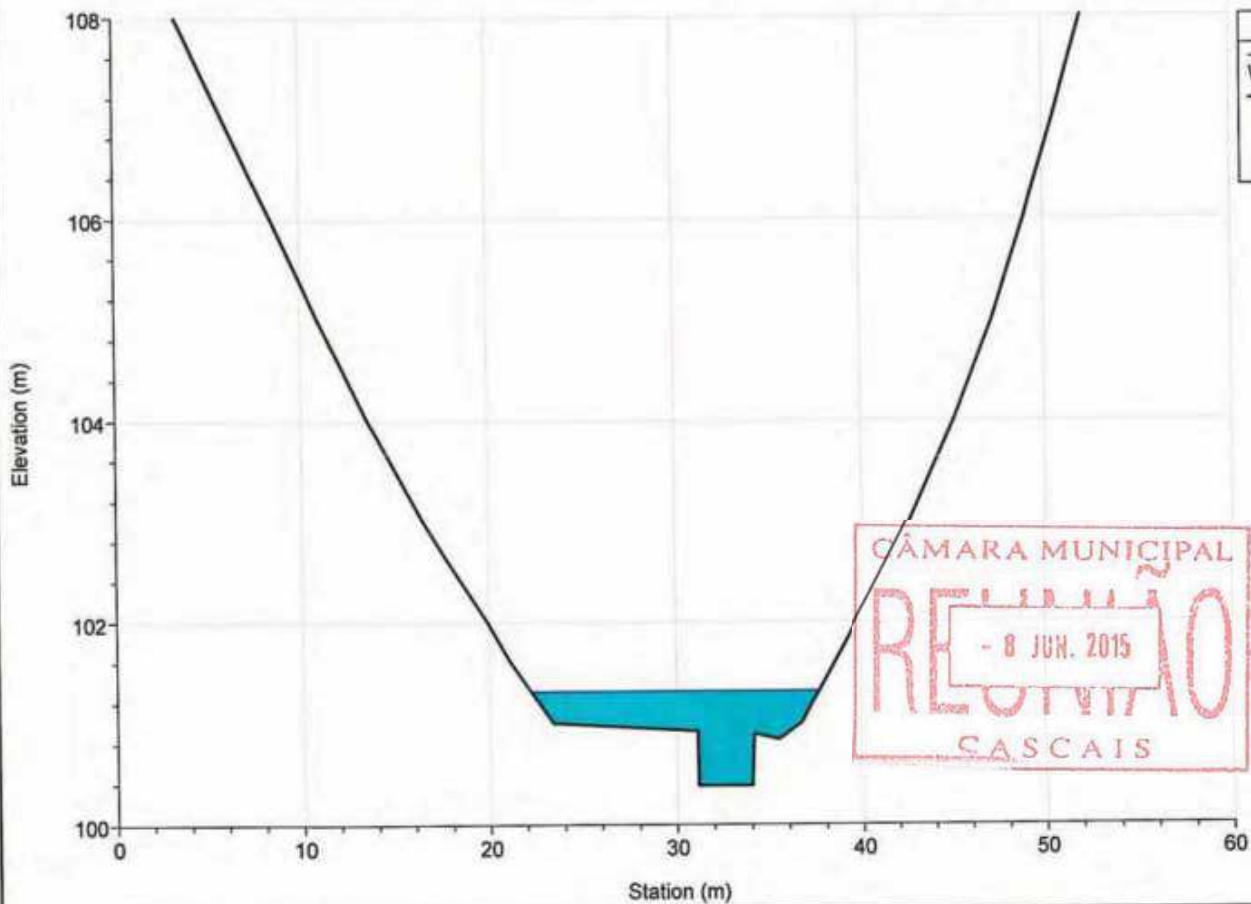
Legend	
WS T=100 anos	
Ground	
Bank Sta	

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REQUISIÇÃO  
- 8 JUN. 2015  
CASCAIS

River = ALGARVE Reach = rib<sup>a</sup> RS = 313.931

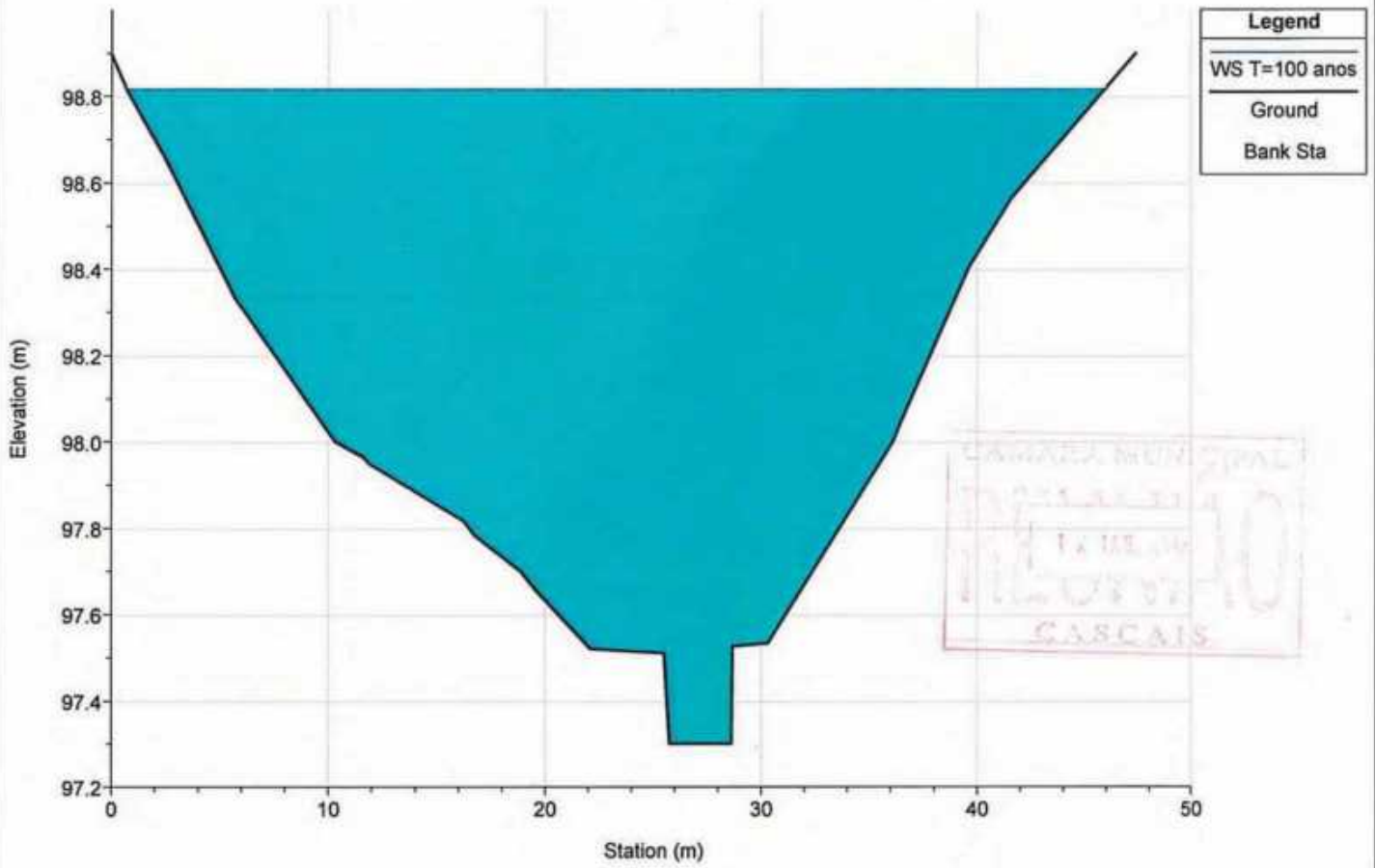


River = ALGARVE Reach = rib<sup>a</sup> RS = 140.121





River = ALGARVE Reach = rib<sup>a</sup> RS = 19.983

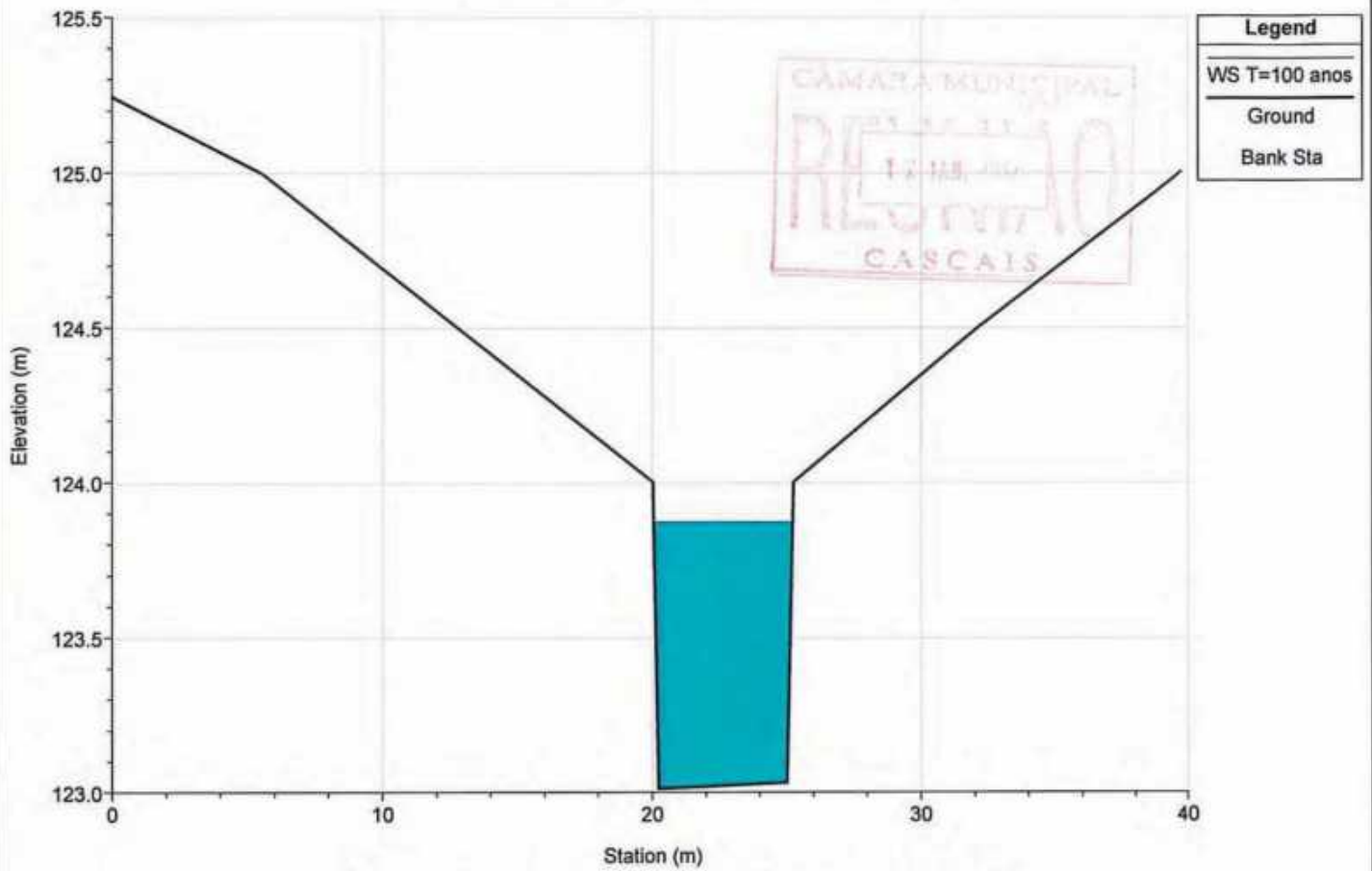


CÂMARA MUNICIPAL  
RECEBIMOS  
- 8 JUN. 2015  
CASCAIS

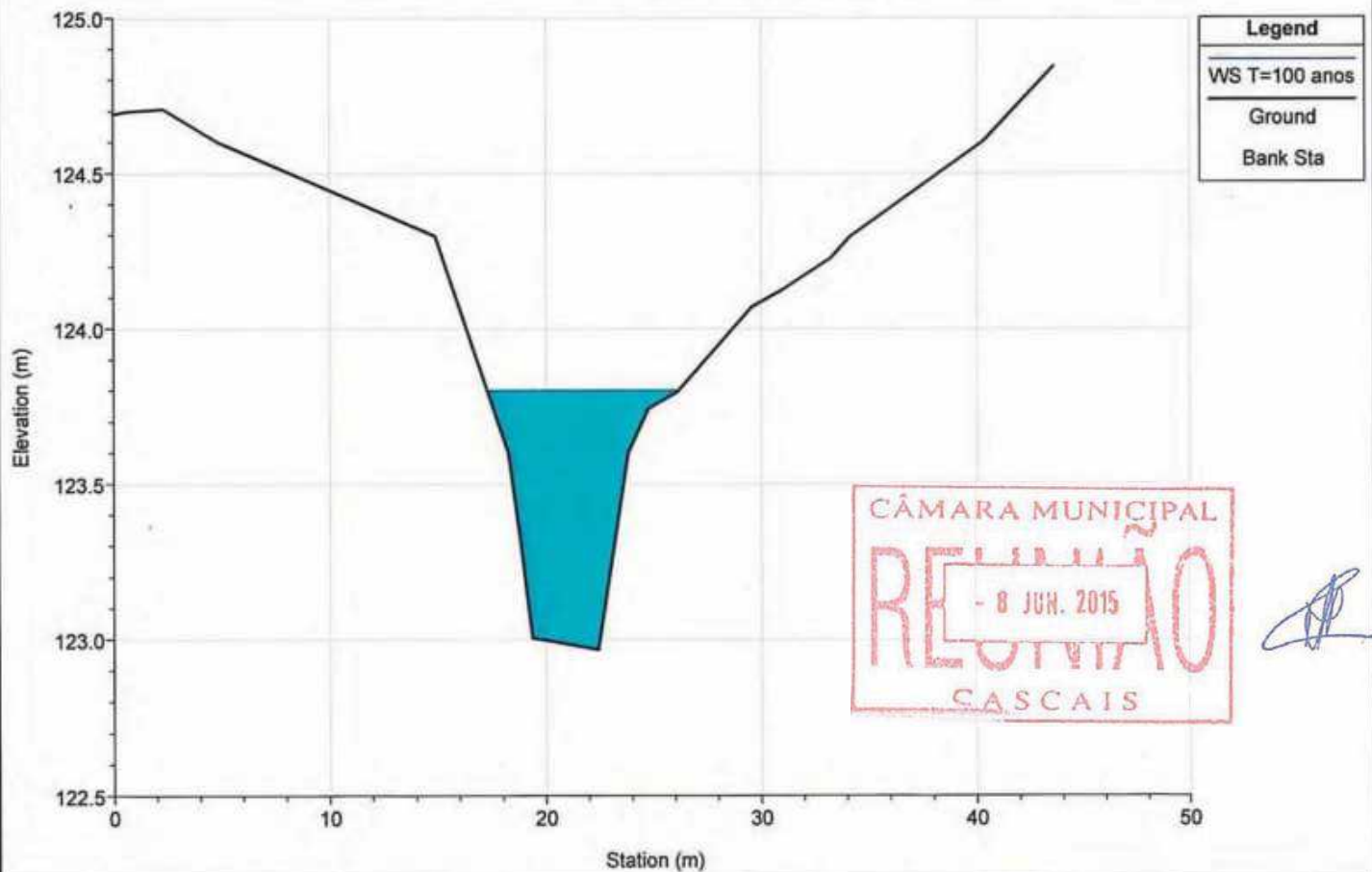


A handwritten signature in blue ink, located to the right of the red stamp.

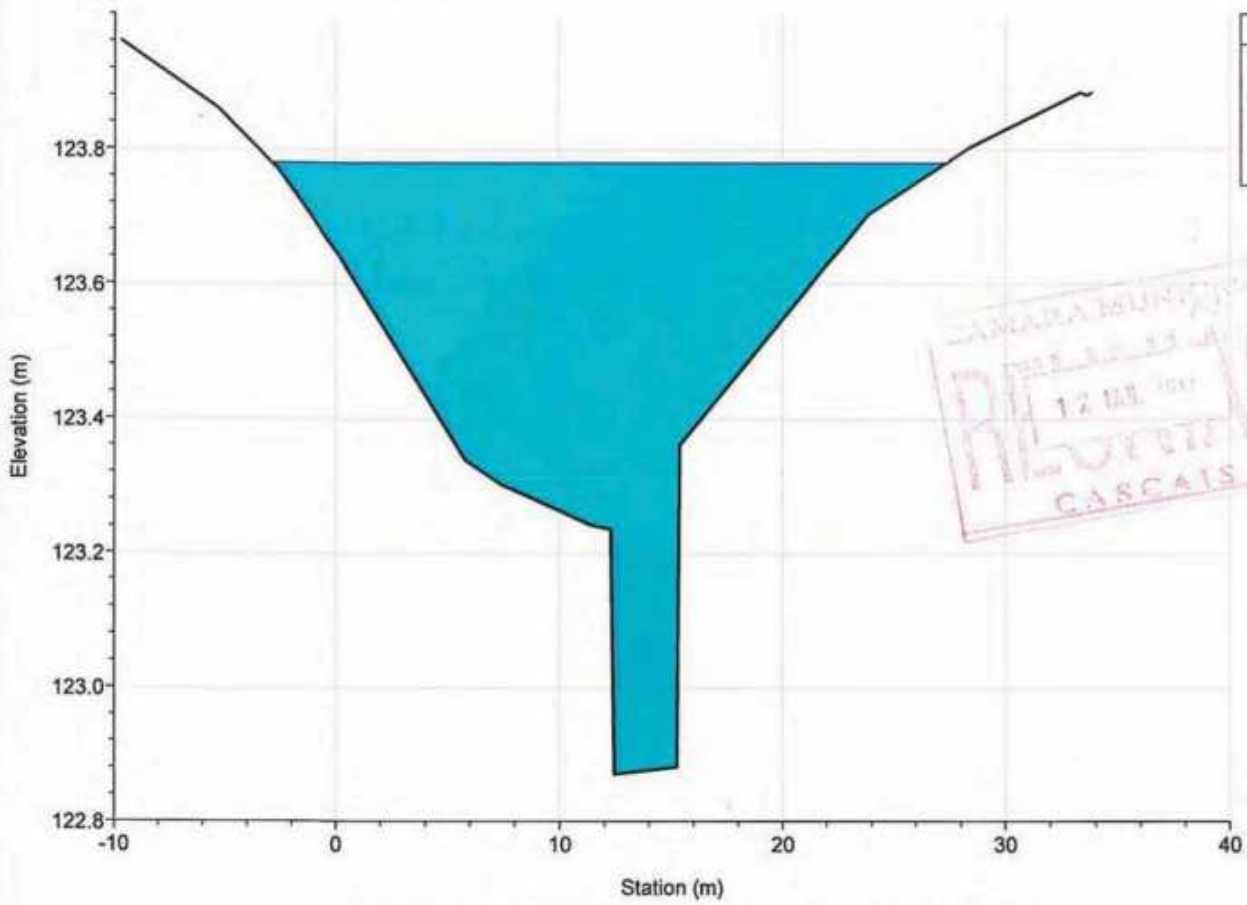
River = BICESSE Reach = montante RS = 6193.699



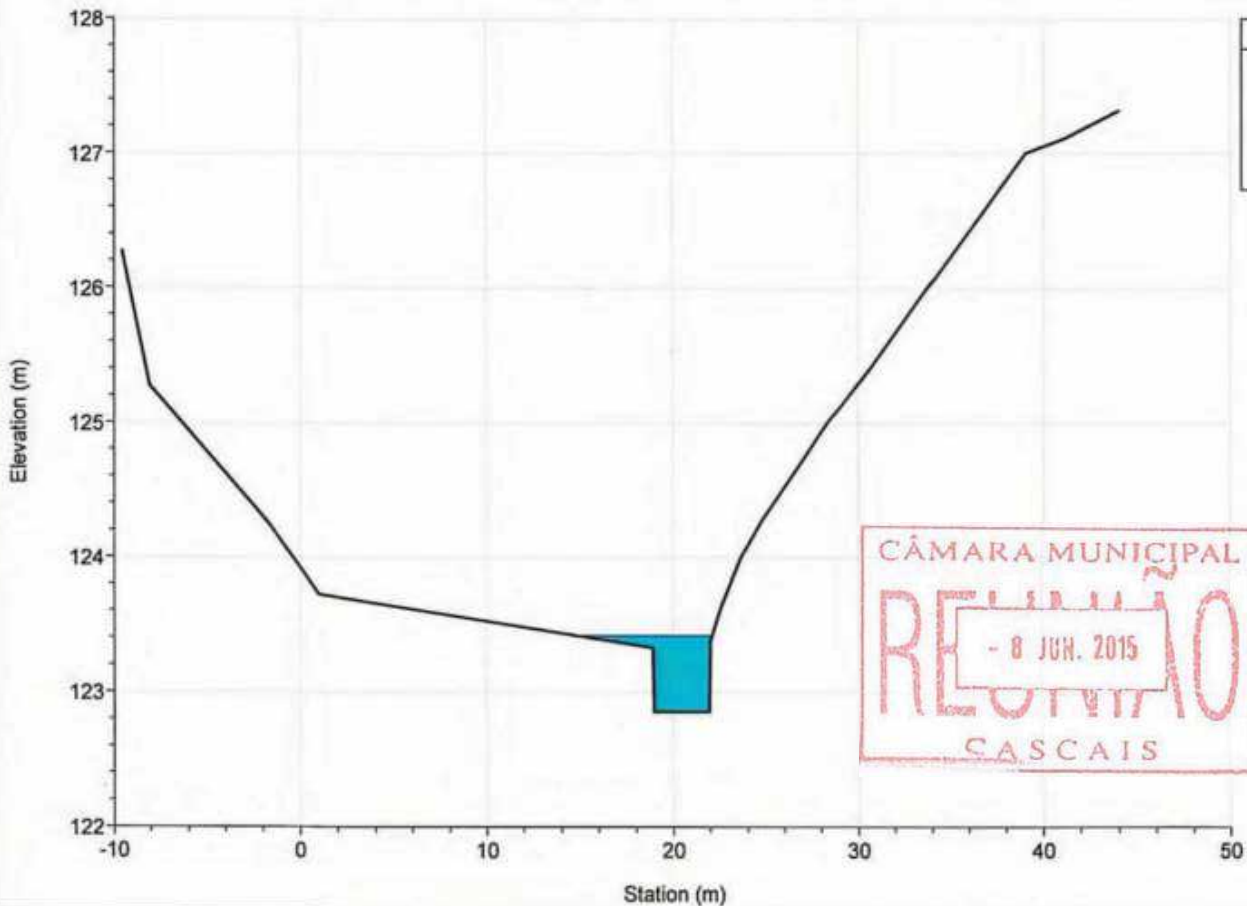
River = BICESSE Reach = montante RS = 6157.786



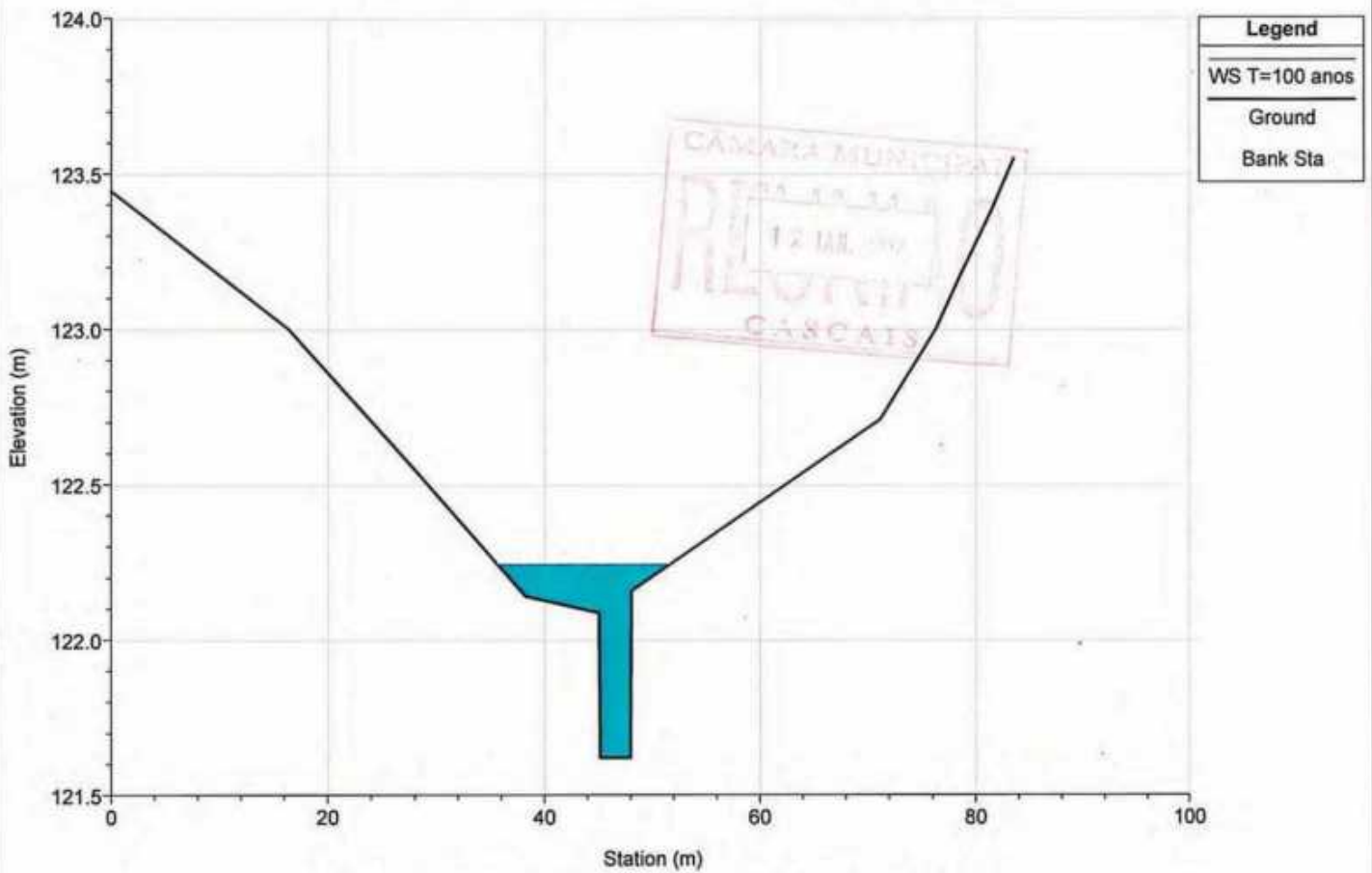
River = BICESSE Reach = montante RS = 6123.919



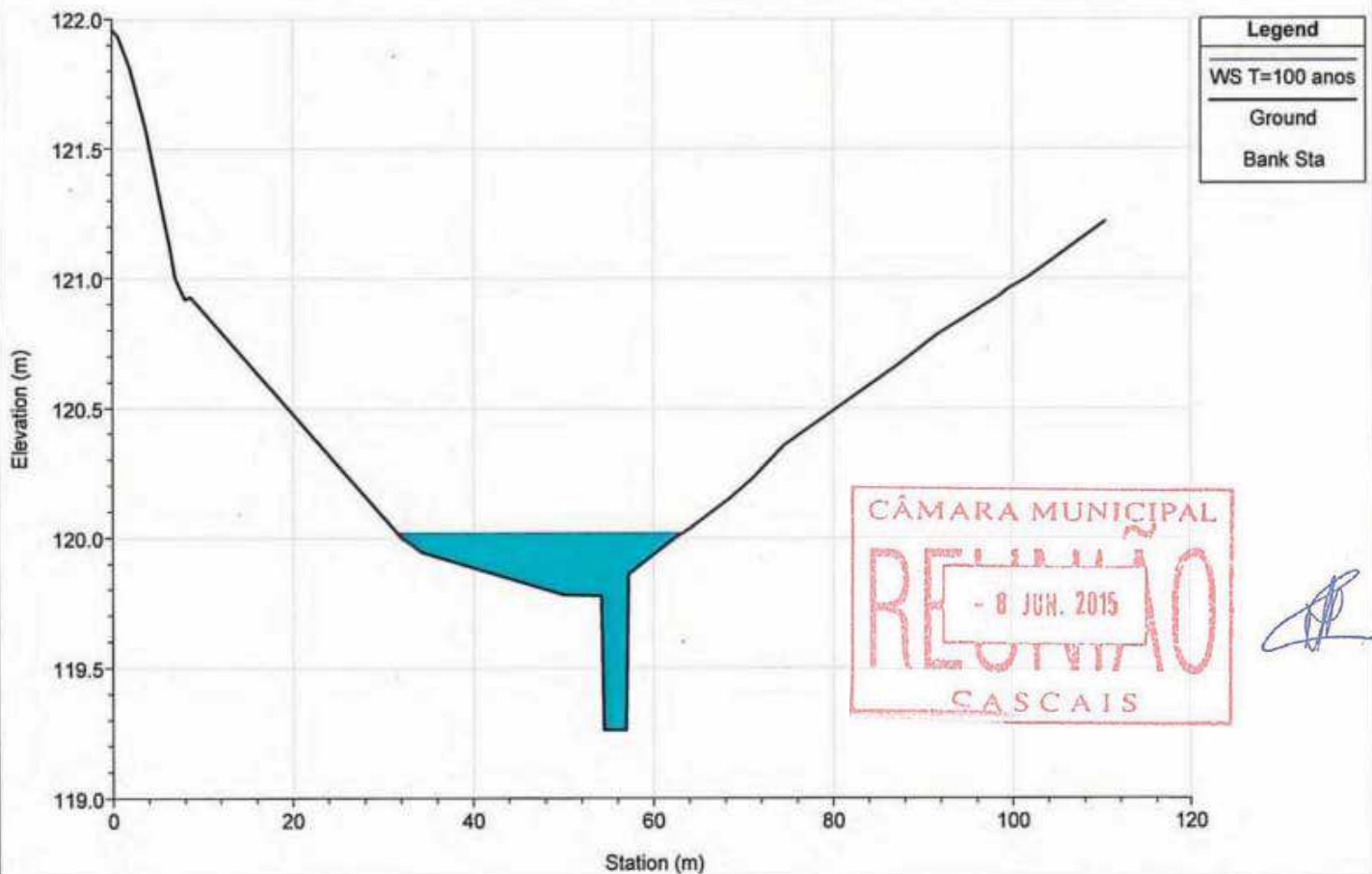
River = BICESSE Reach = montante RS = 6053.939



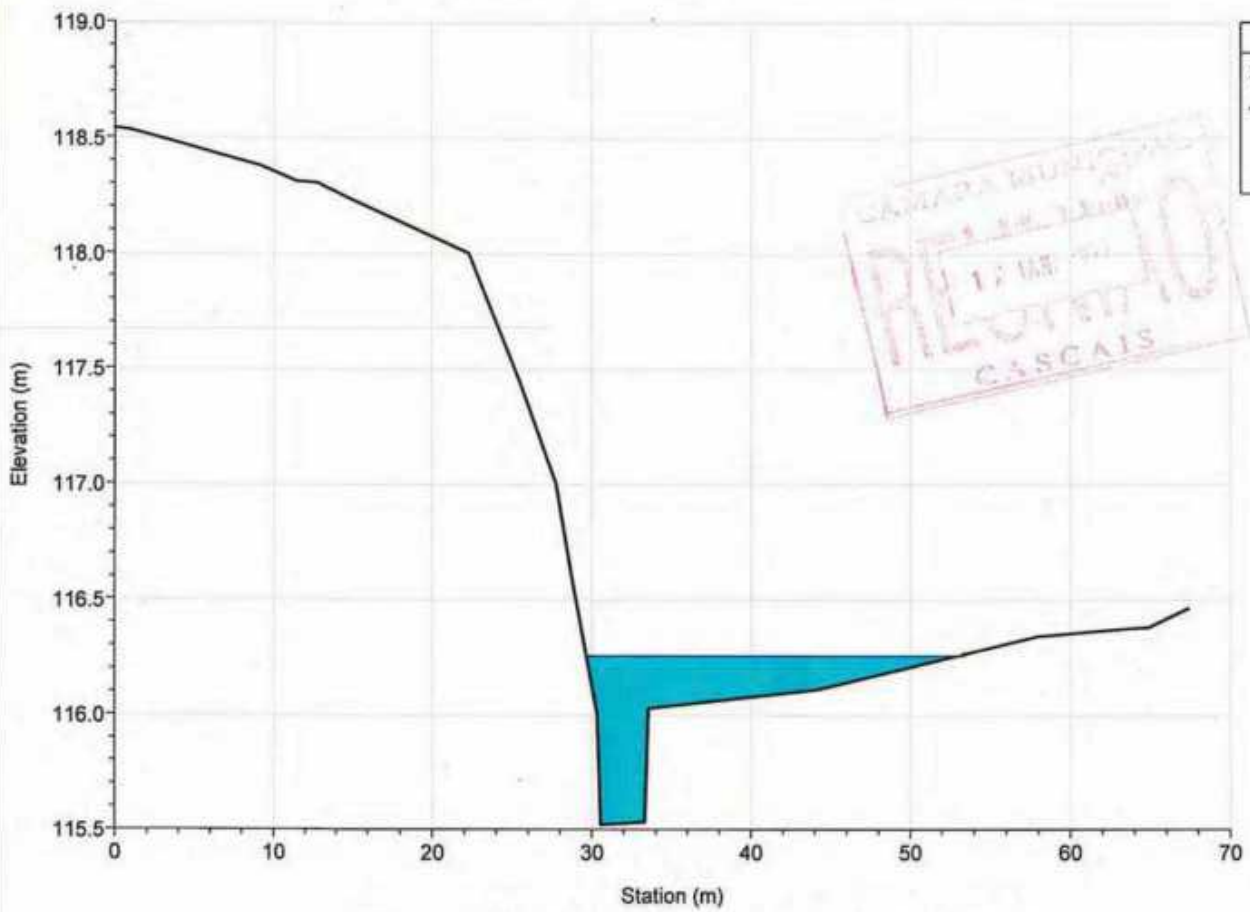
River = BICESSE Reach = montante RS = 5957.885



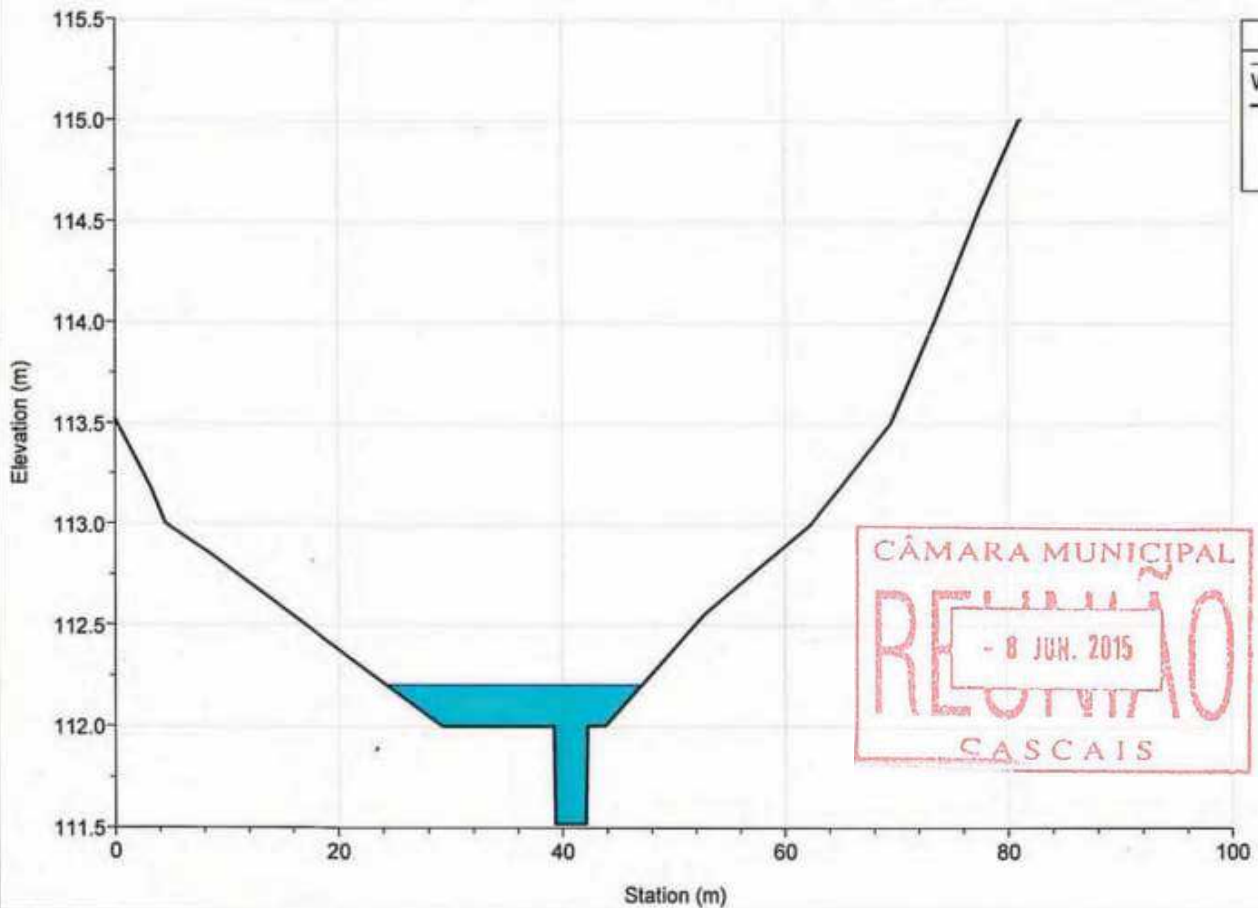
River = BICESSE Reach = montante RS = 5816.145



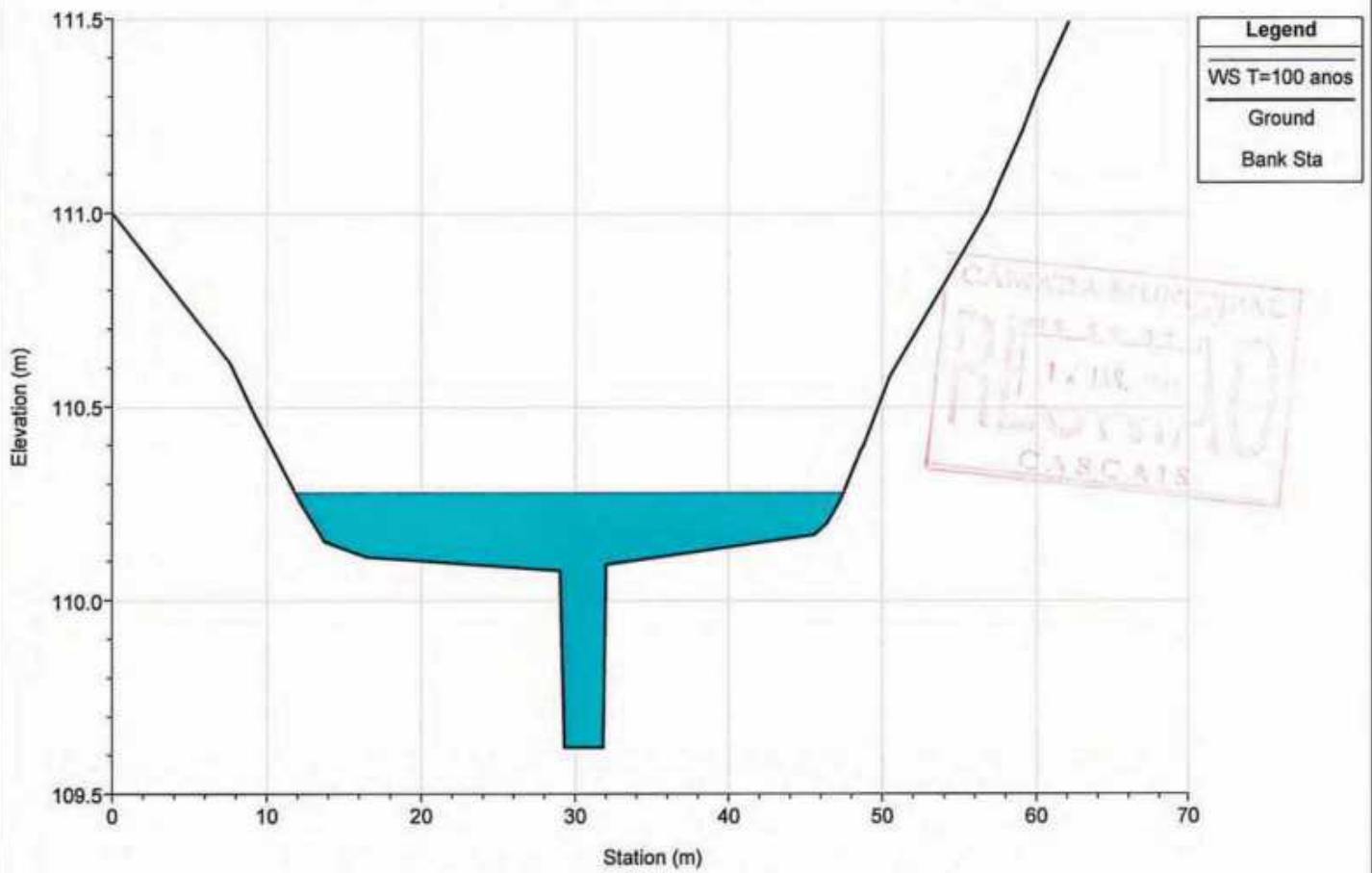
River = BICESSE Reach = montante RS = 5703.681



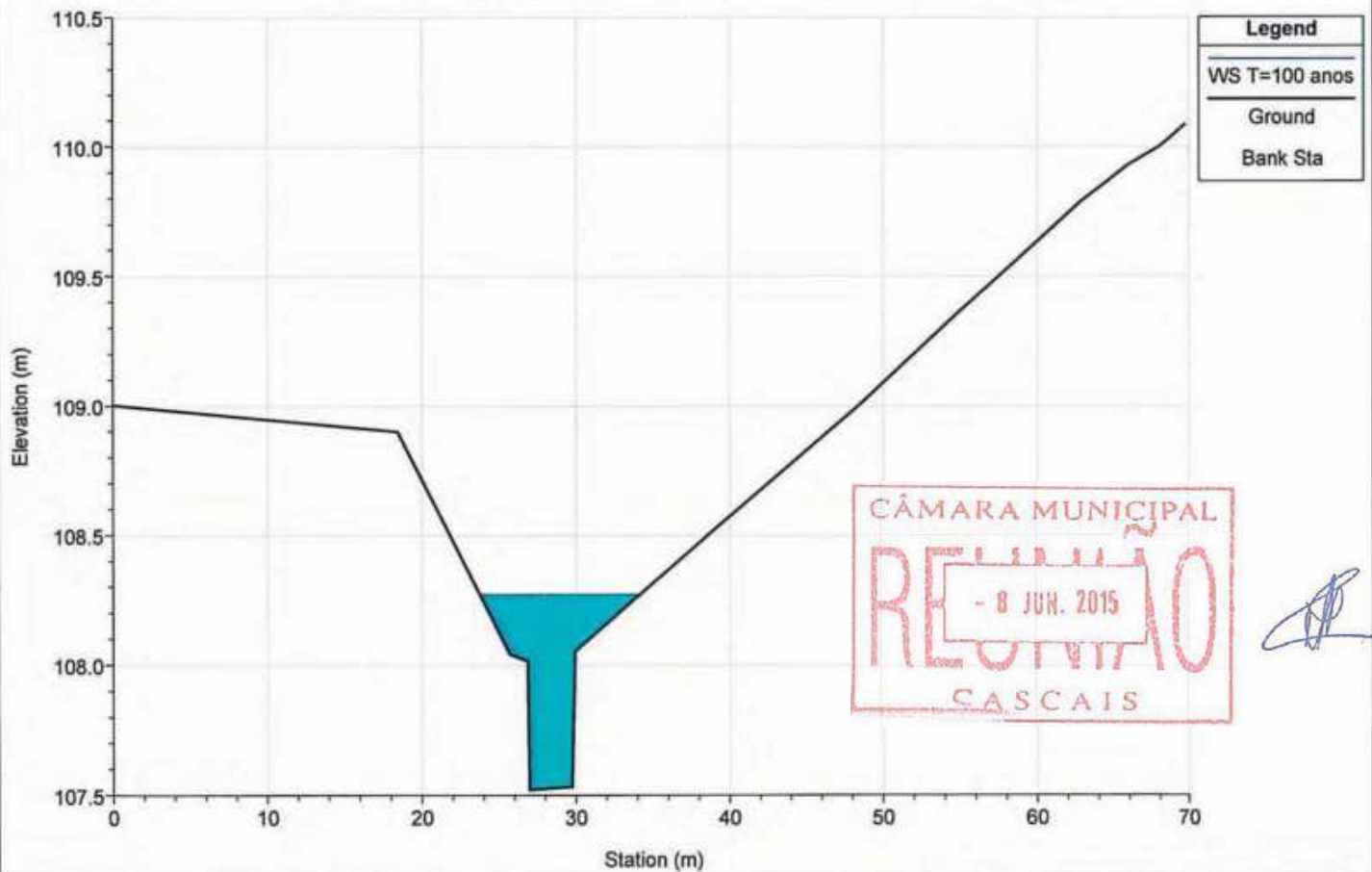
River = BICESSE Reach = montante RS = 5600.034



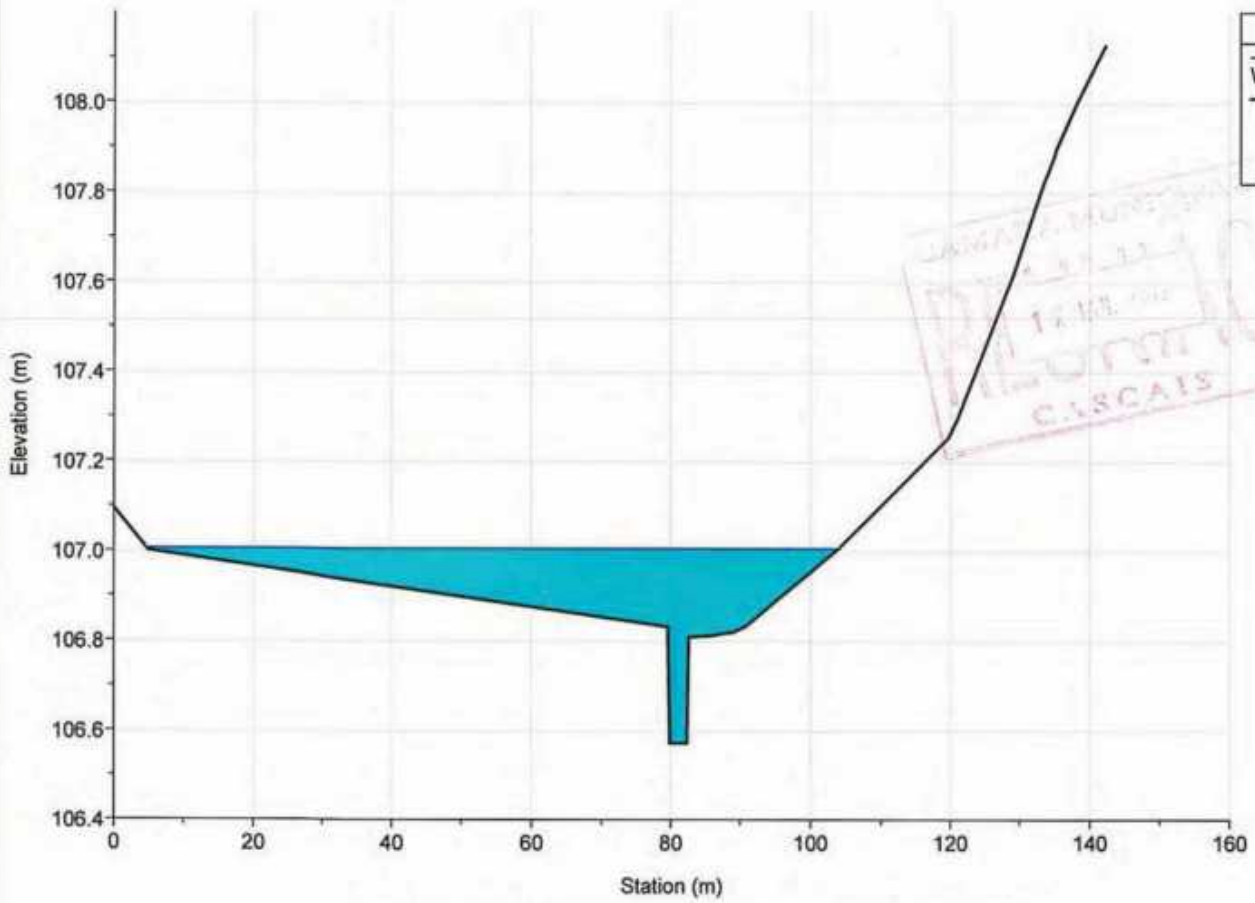
River = BICESSE Reach = montante RS = 5476.243



River = BICESSE Reach = montante RS = 5366.685

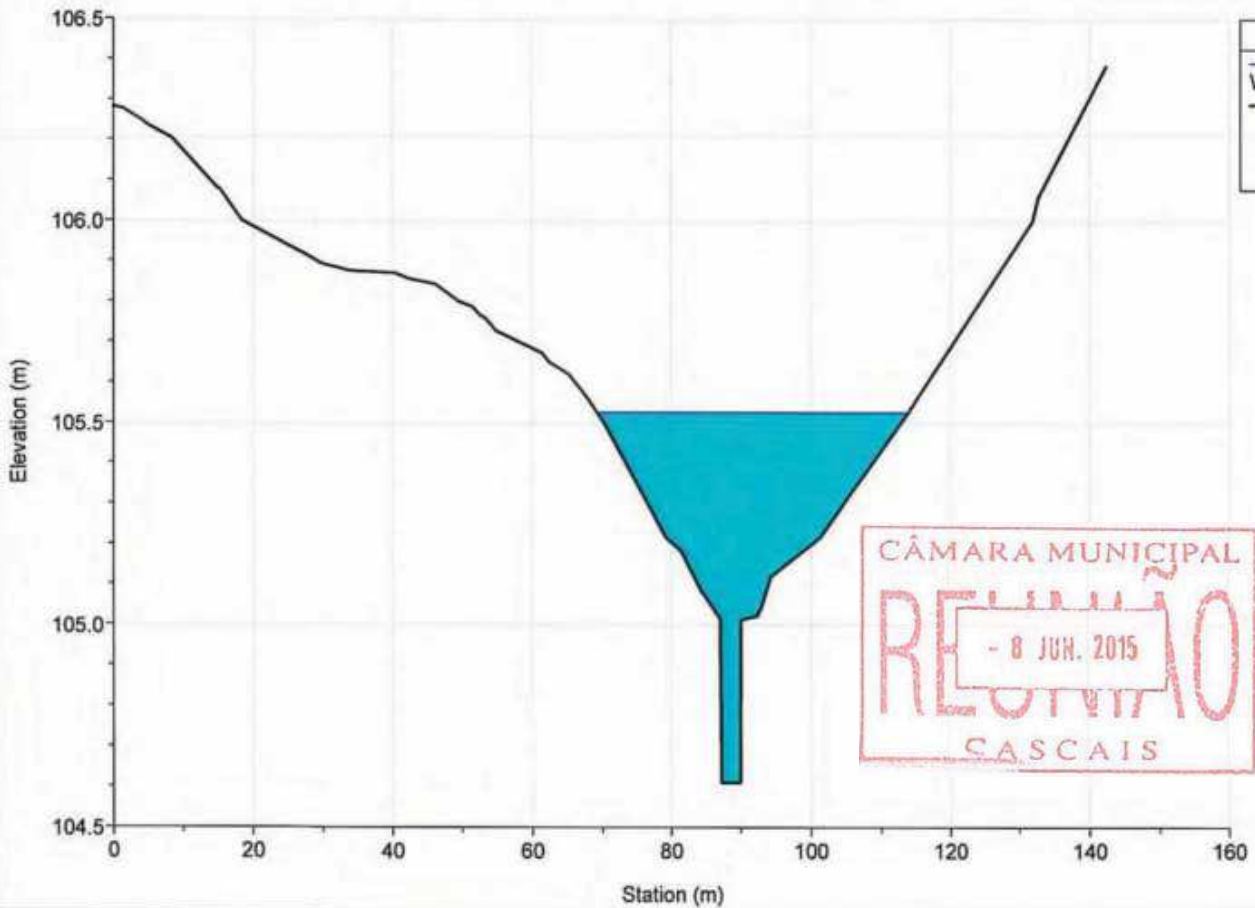


River = BICESSE Reach = montante RS = 5240.453



Legend
WS T=100 anos
Ground
Bank Sta

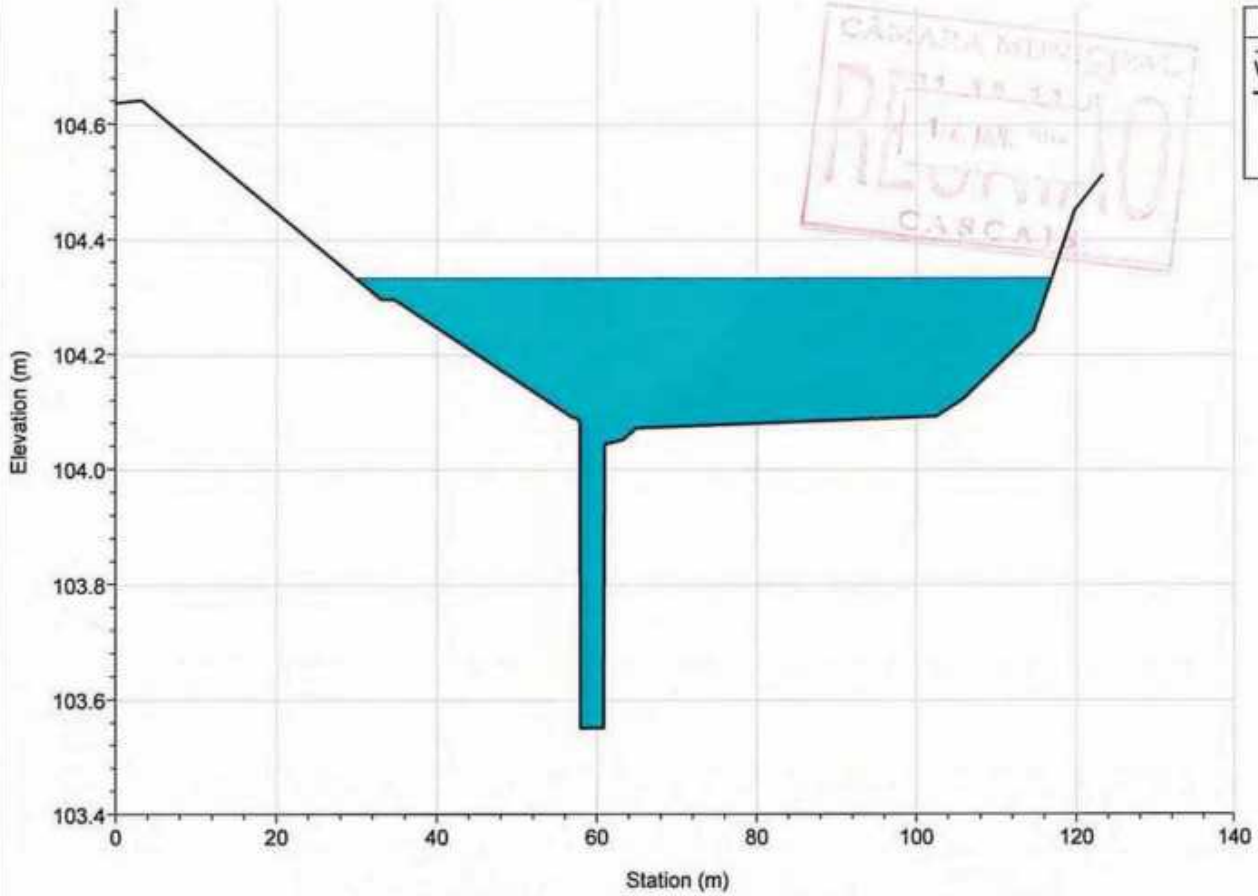
River = BICESSE Reach = montante RS = 5121.556



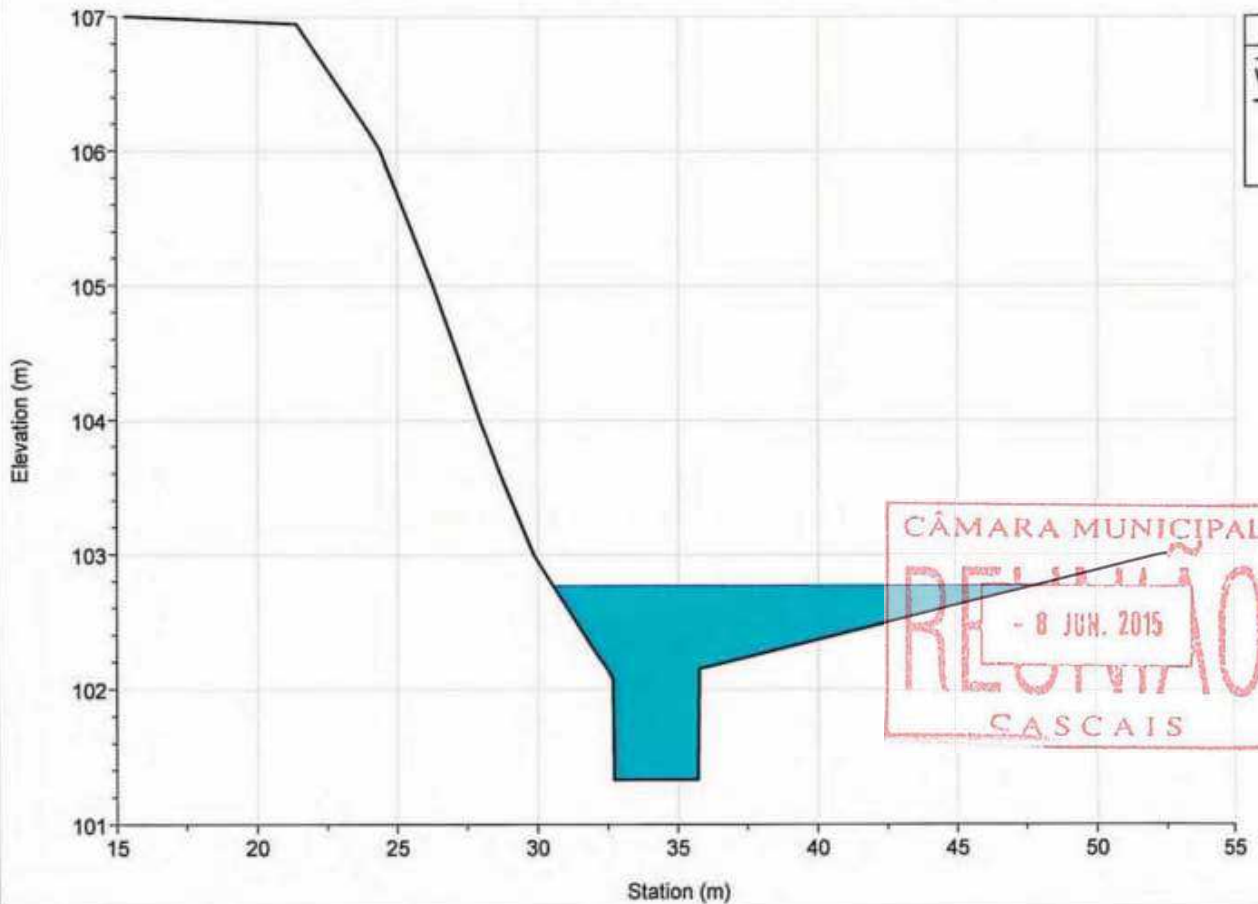
Legend
WS T=100 anos
Ground
Bank Sta



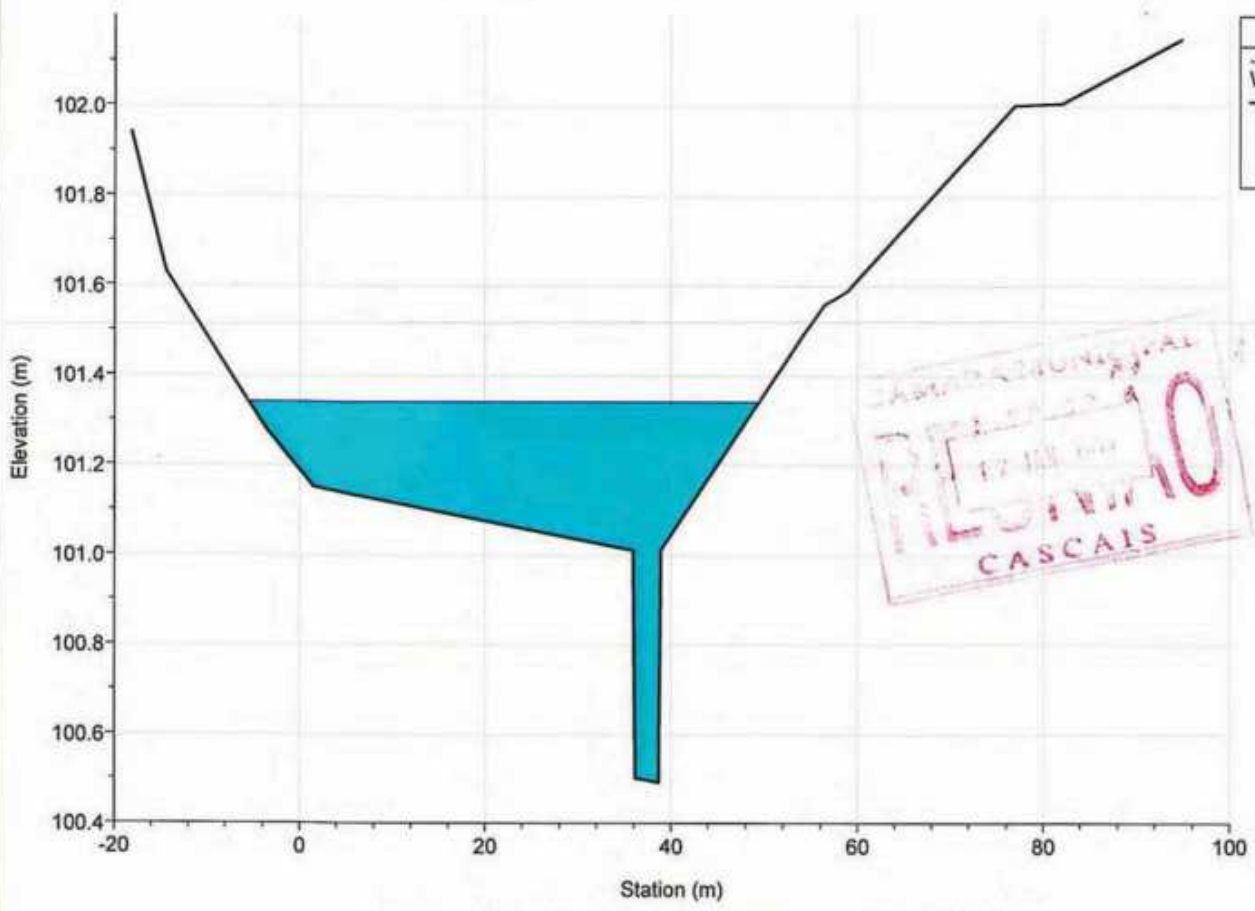
River = BICESSE Reach = montante RS = 5013.694



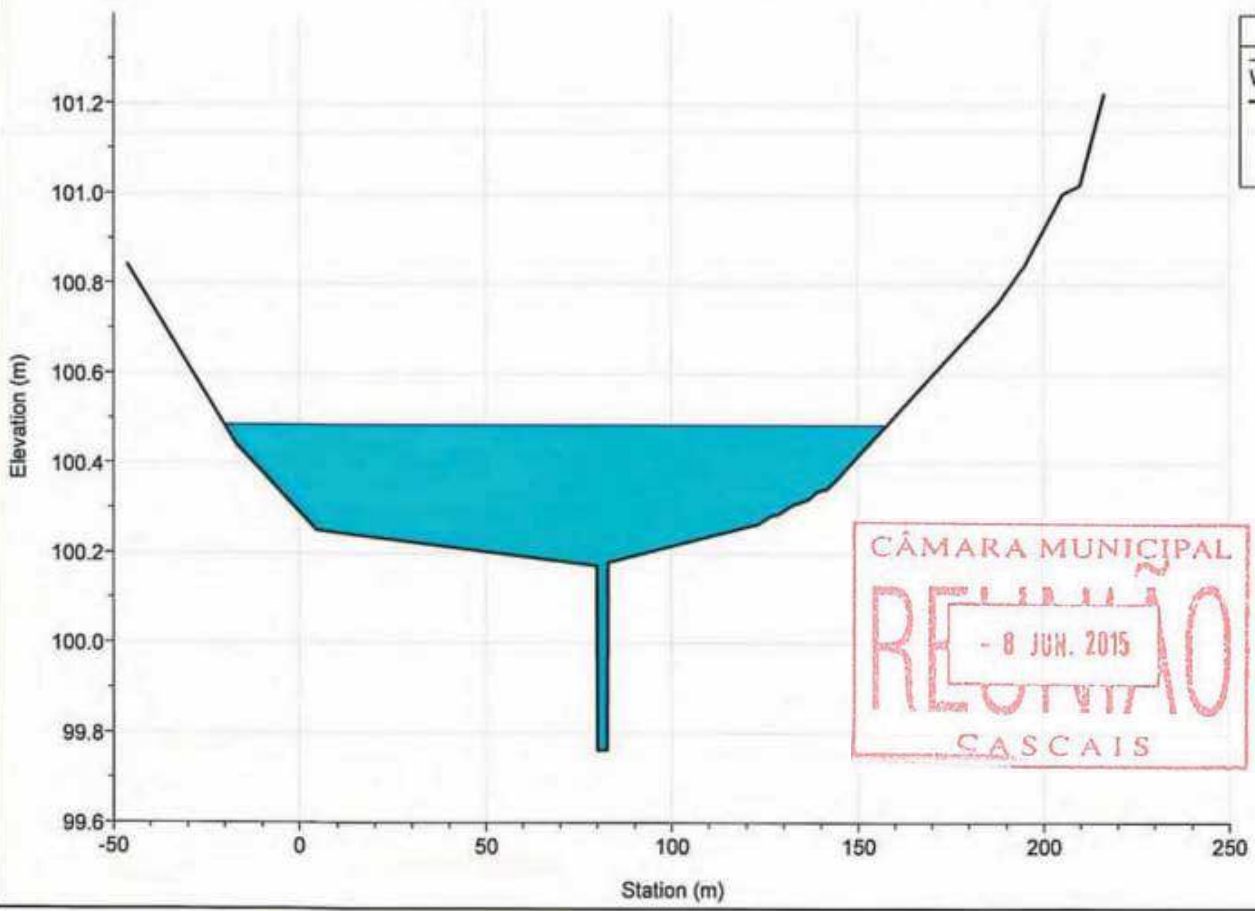
River = BICESSE Reach = montante RS = 4868.329



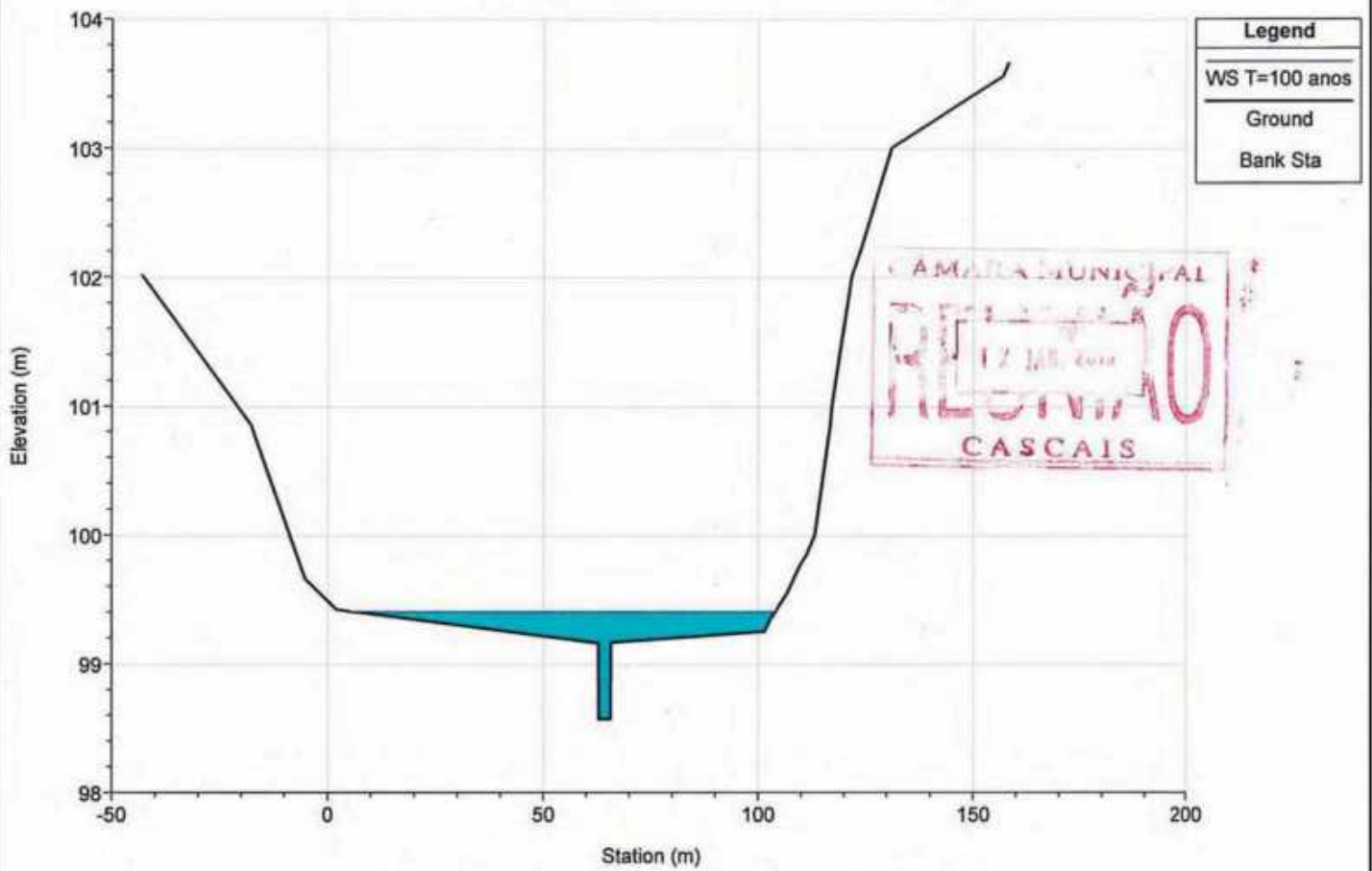
River = BICESSE Reach = montante RS = 4722.195



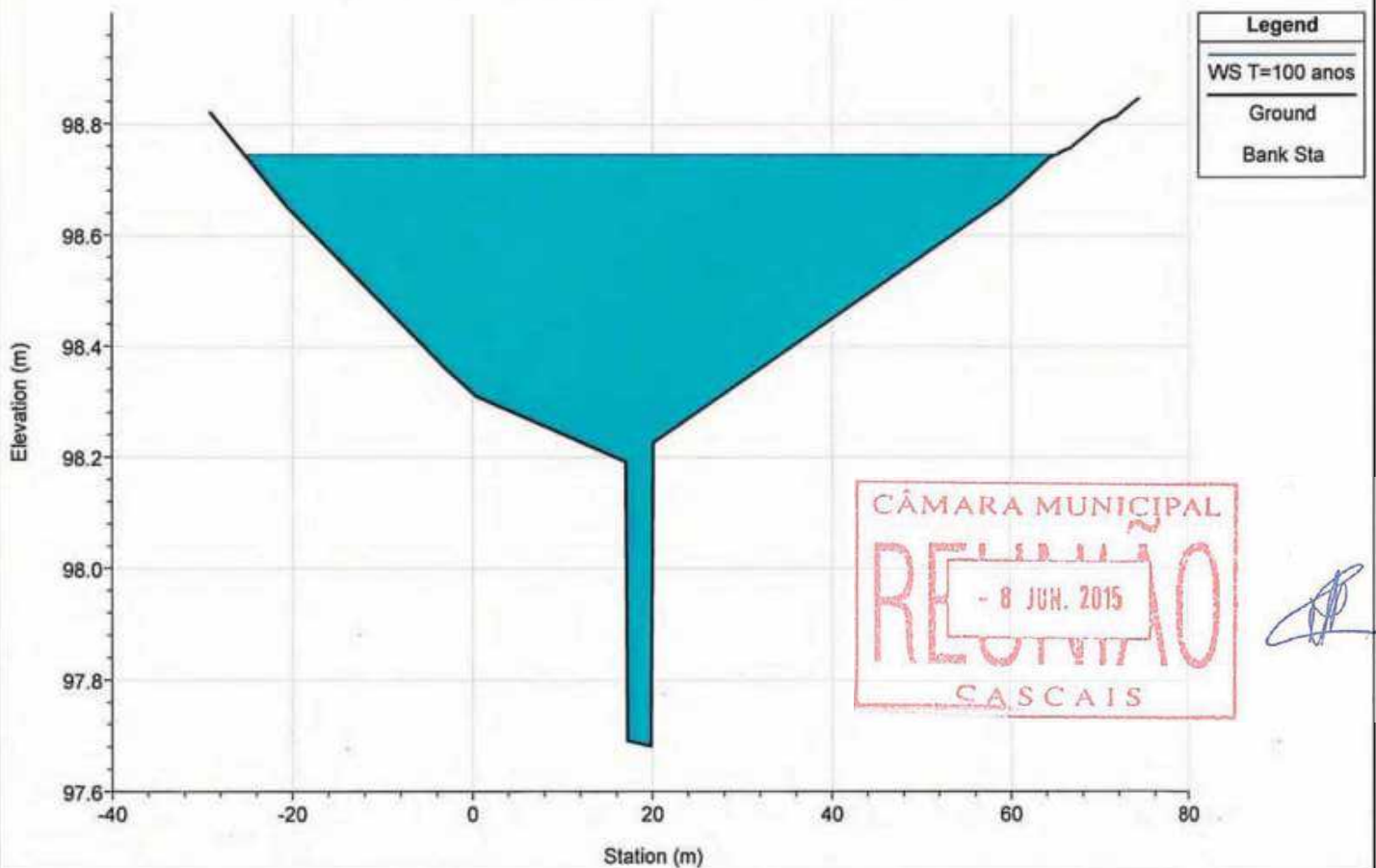
River = BICESSE Reach = montante RS = 4524.667



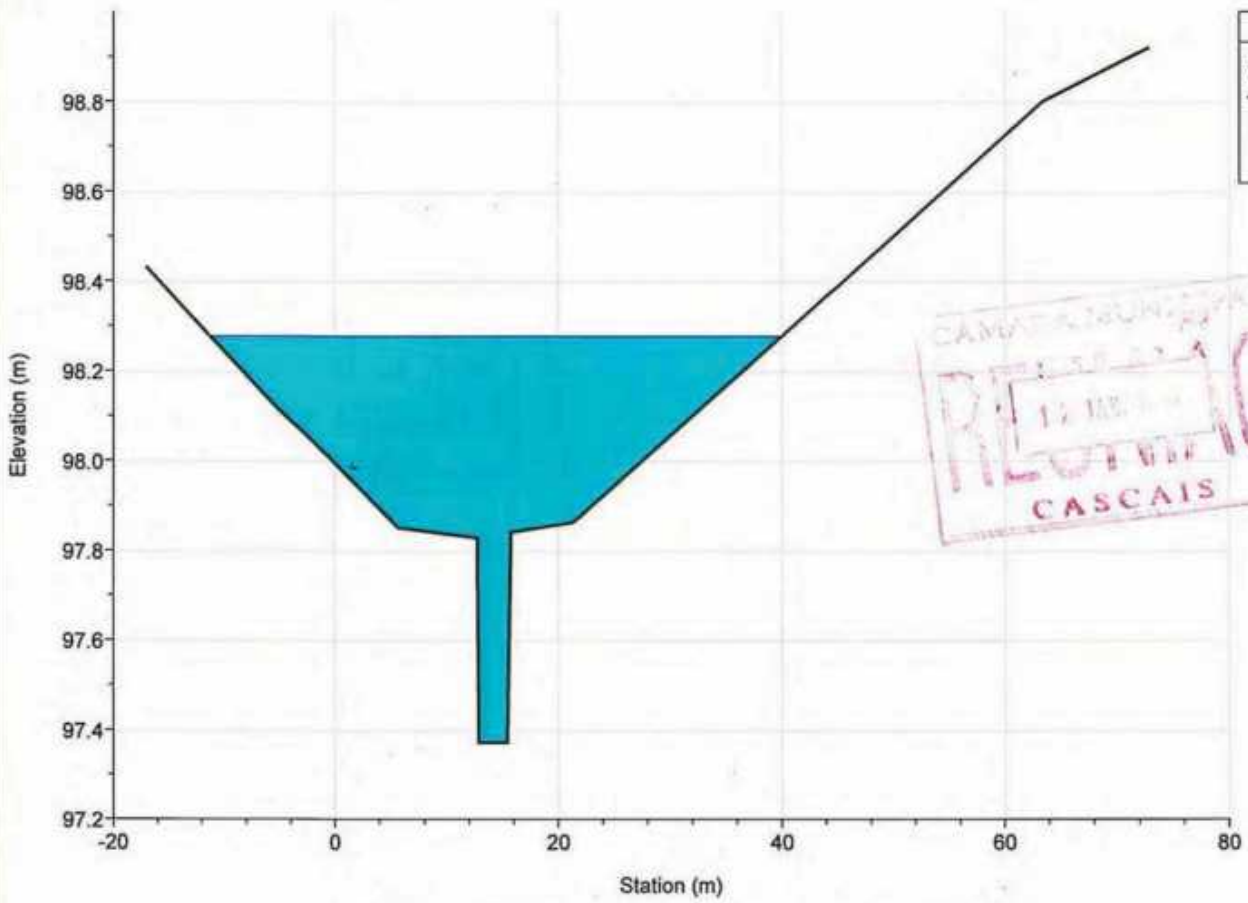
River = BICESSE Reach = montante RS = 4337.096



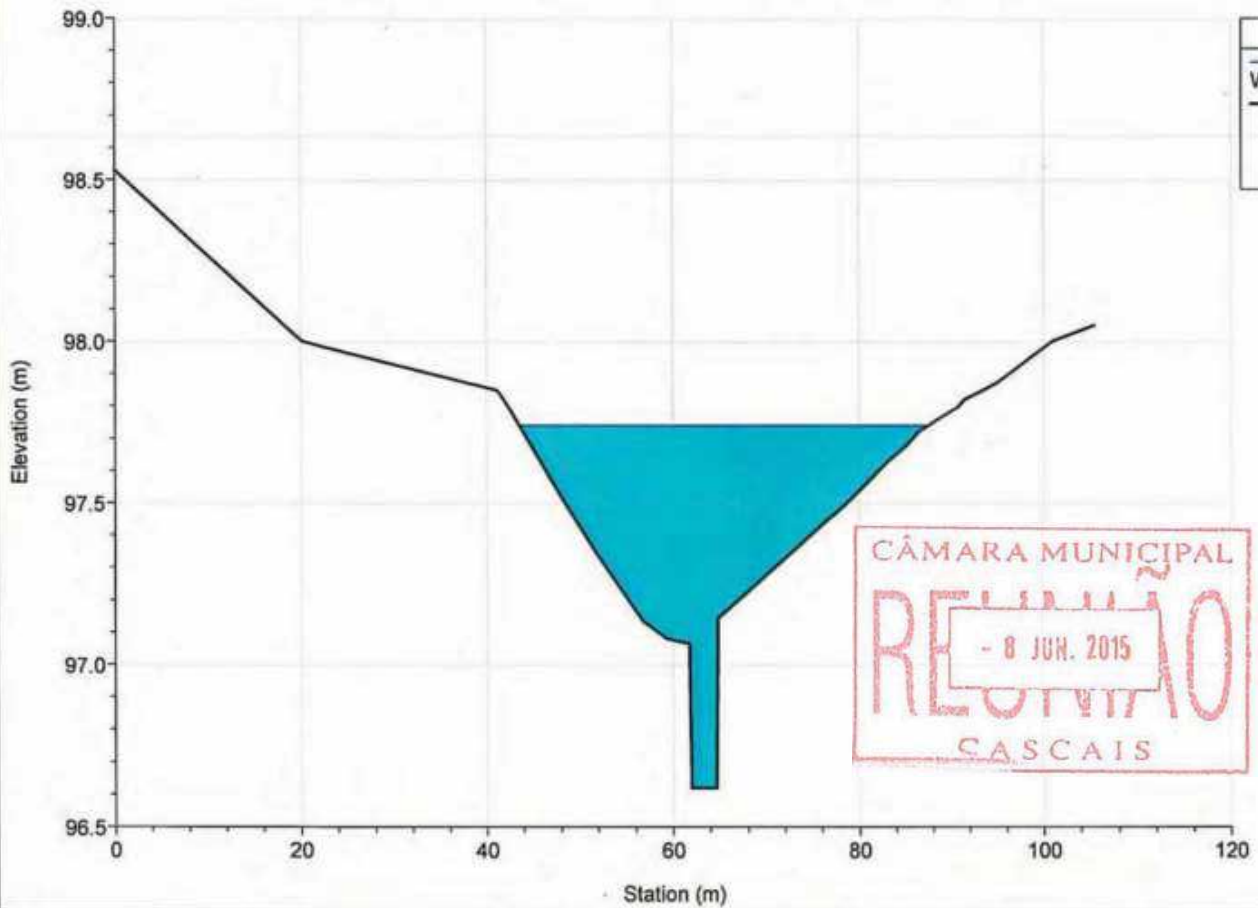
River = BICESSE Reach = montante RS = 4193.345



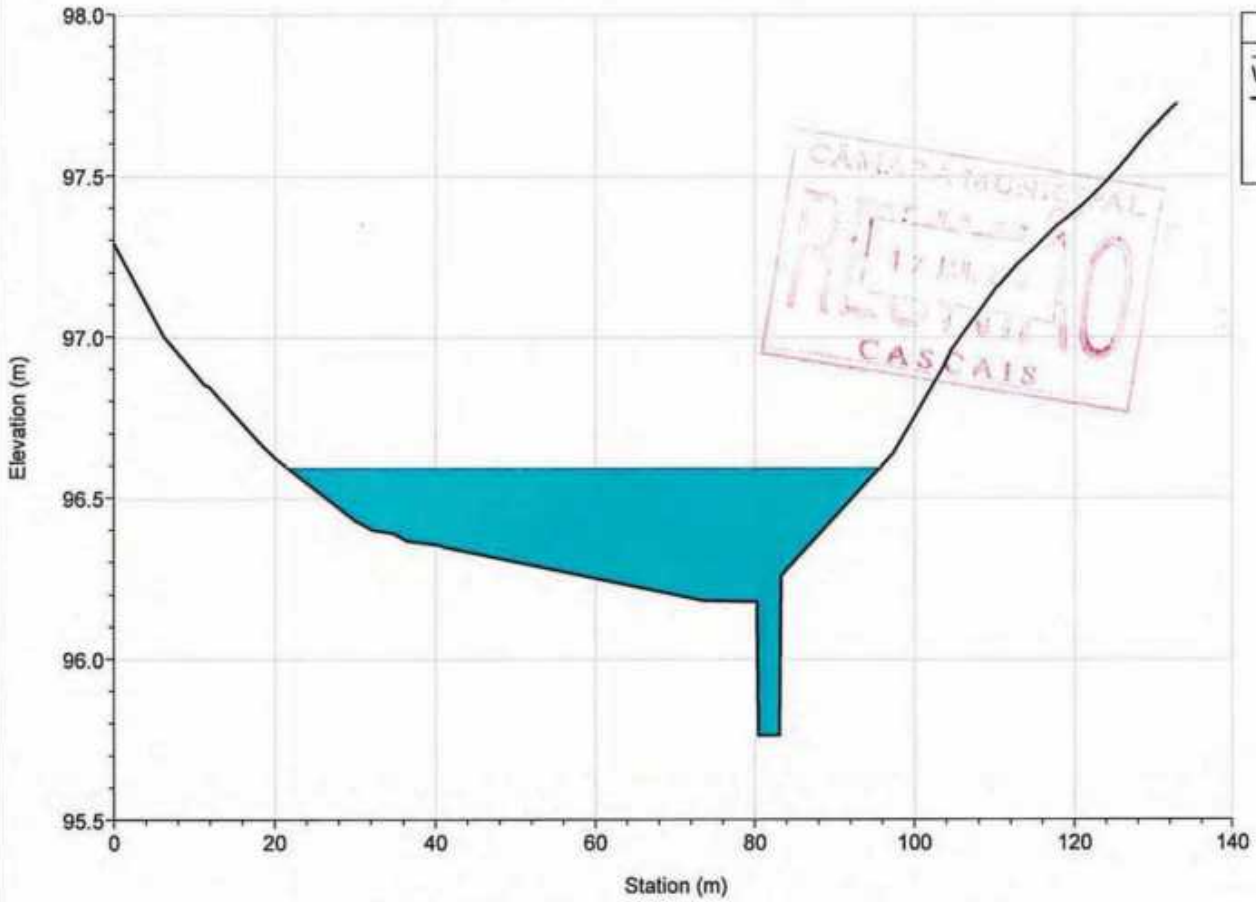
River = BICESSE Reach = montante RS = 4109.464



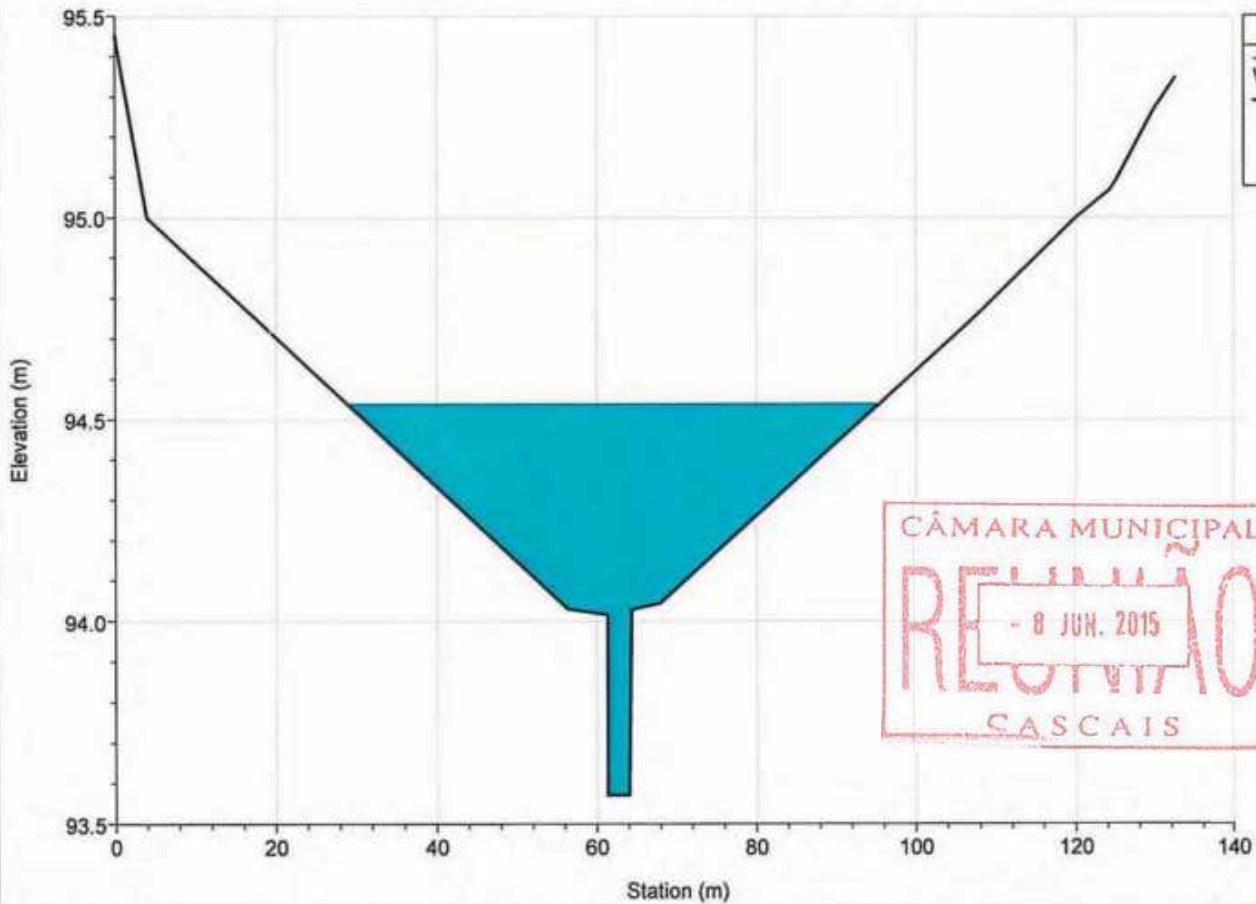
River = BICESSE Reach = interm.1 RS = 4060.435



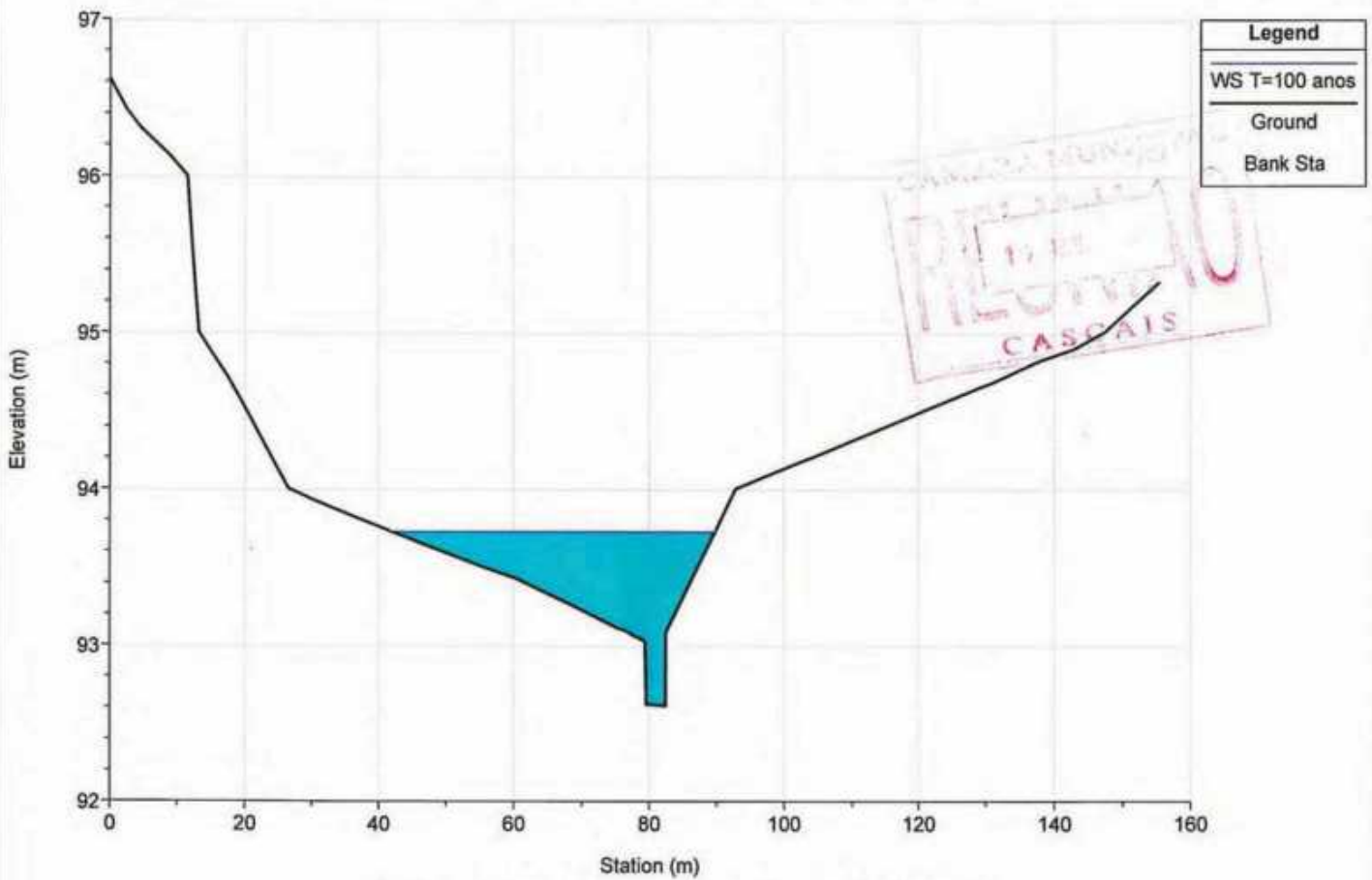
River = BICESSE Reach = interm.1 RS = 3955.087



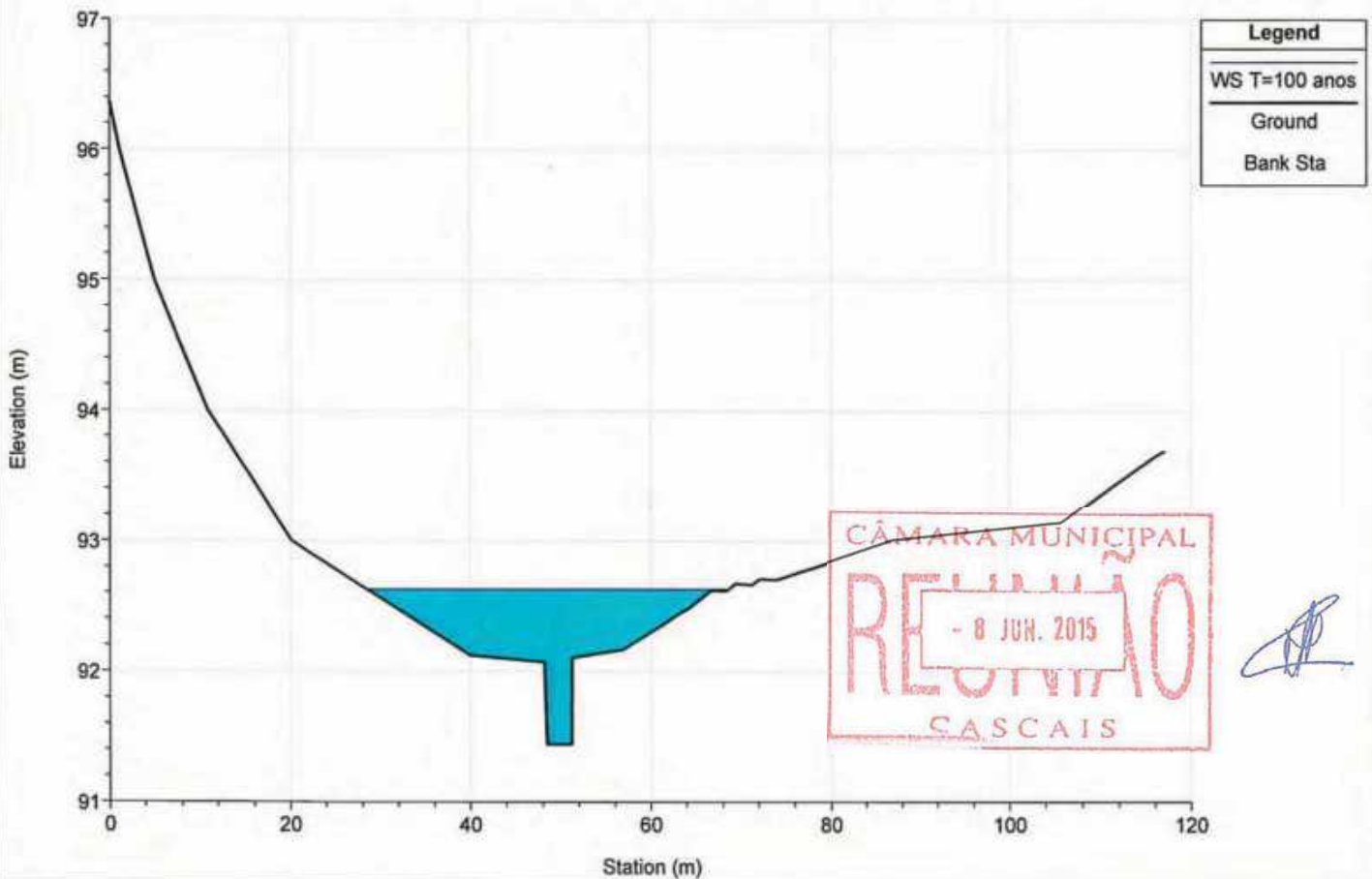
River = BICESSE Reach = interm.1 RS = 3824.804



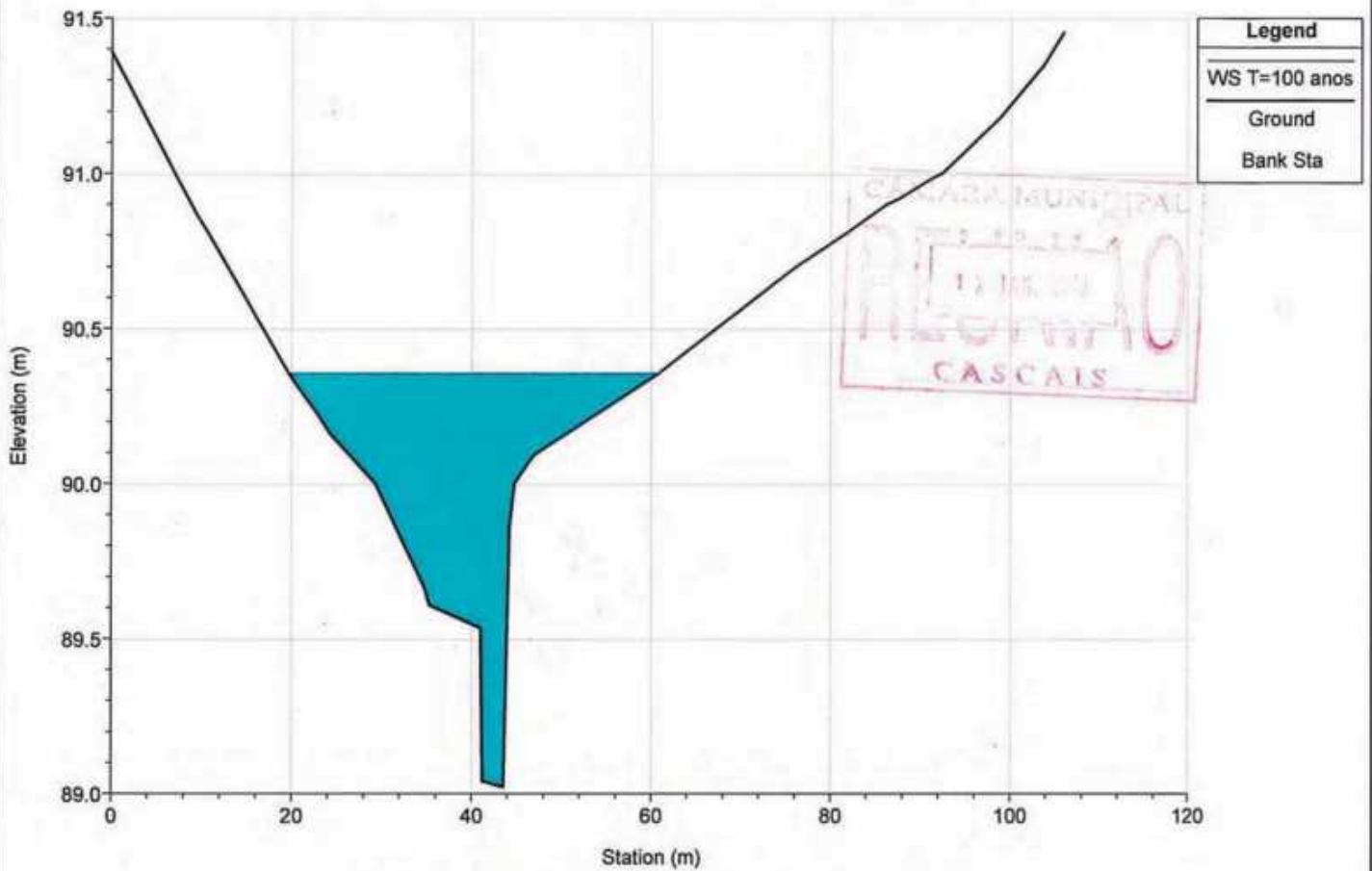
River = BICESSE Reach = interm.1 RS = 3751.342



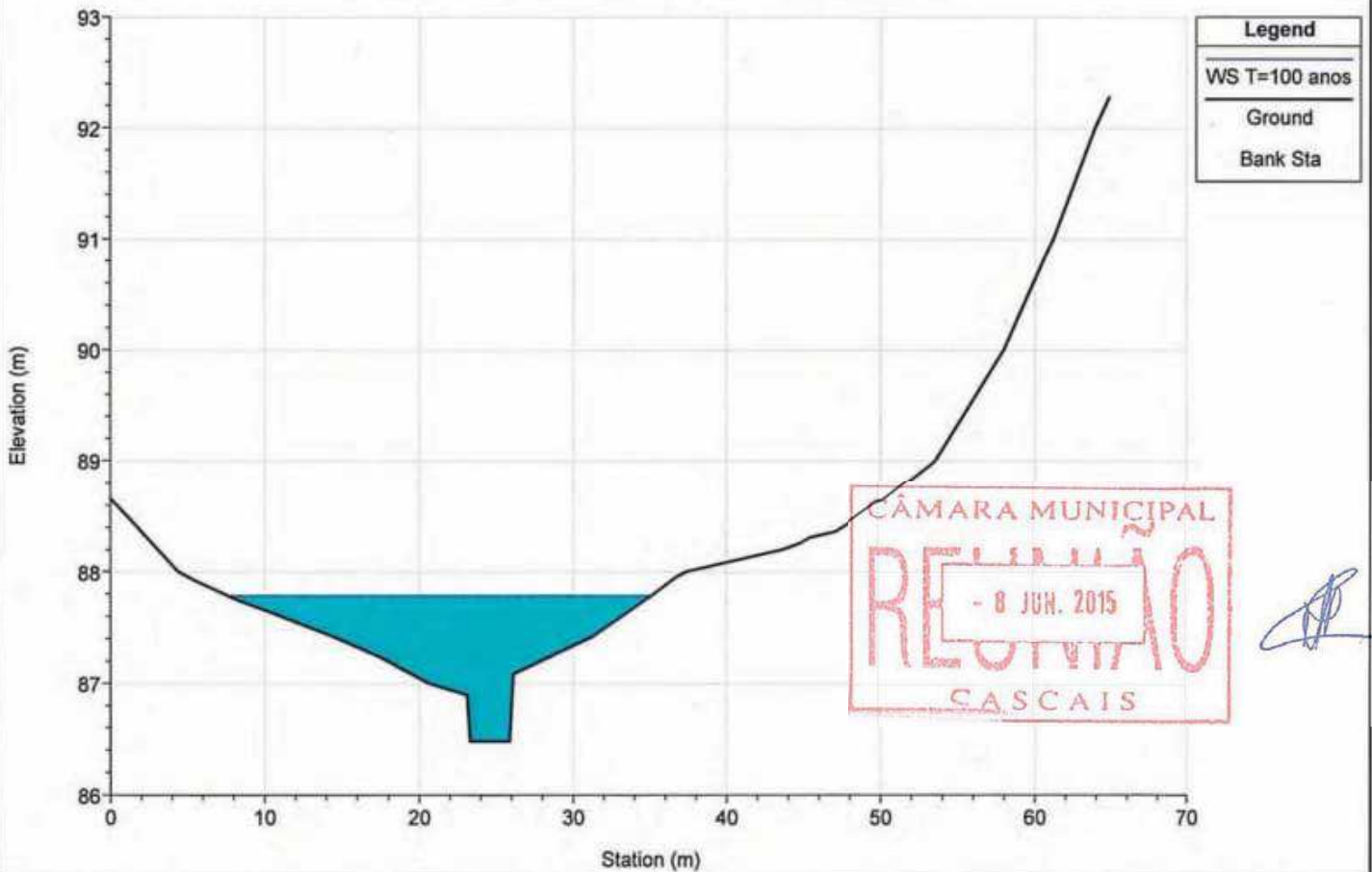
River = BICESSE Reach = interm.1 RS = 3651.407



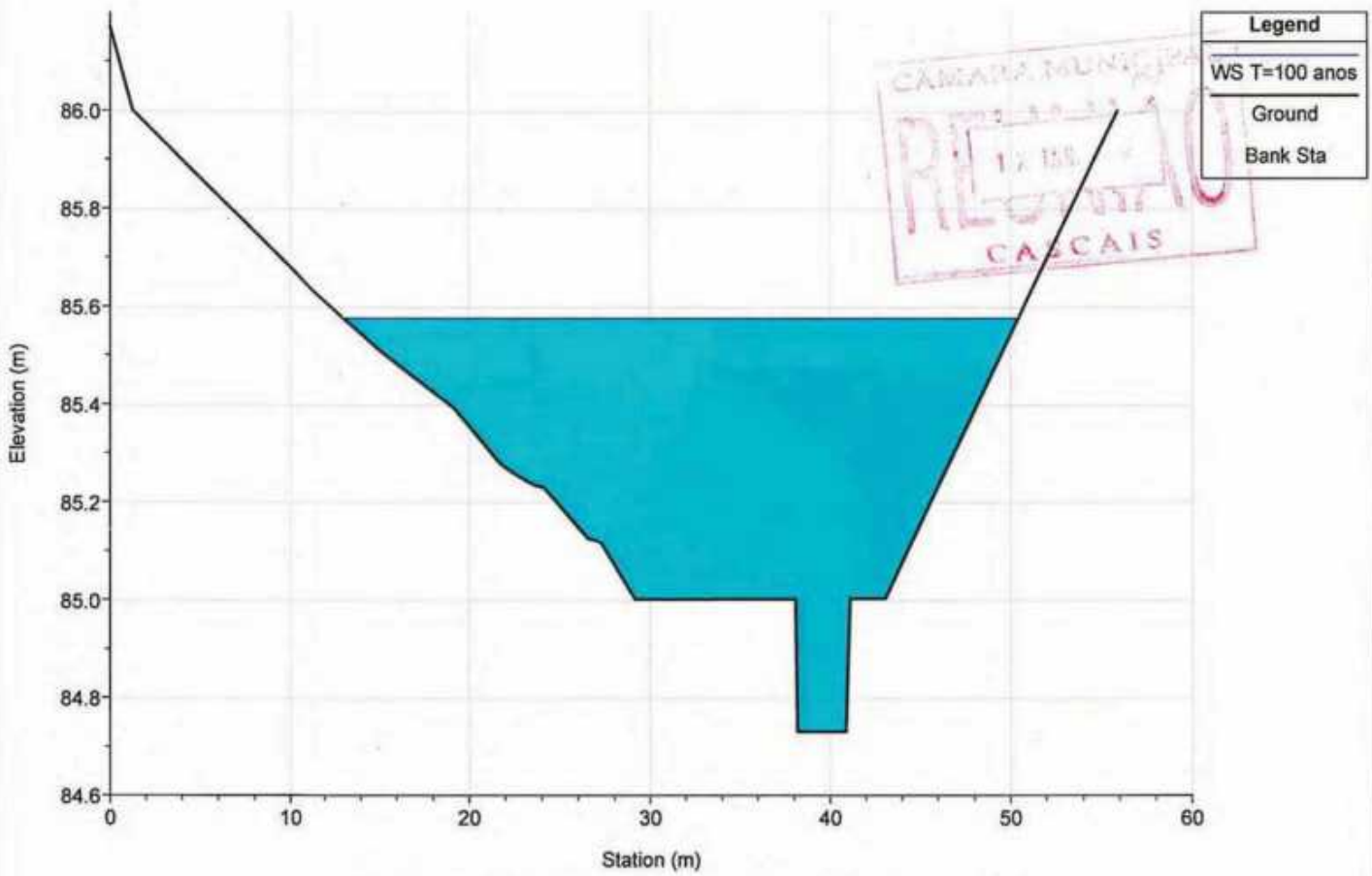
River = BICESSE Reach = interm.1 RS = 3529.293



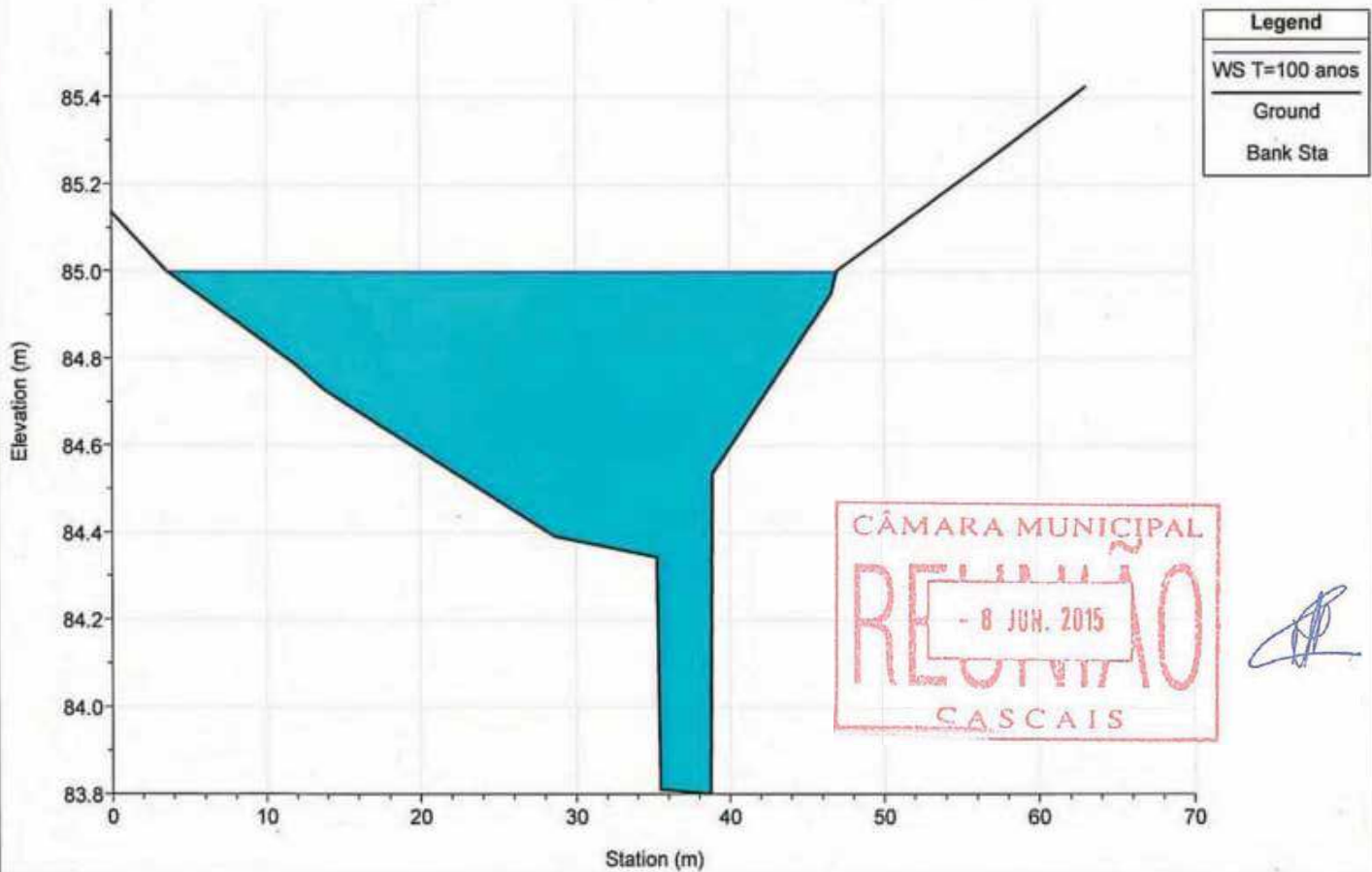
River = BICESSE Reach = interm.1 RS = 3433.421



River = BICESSE Reach = interm.1 RS = 3356.850

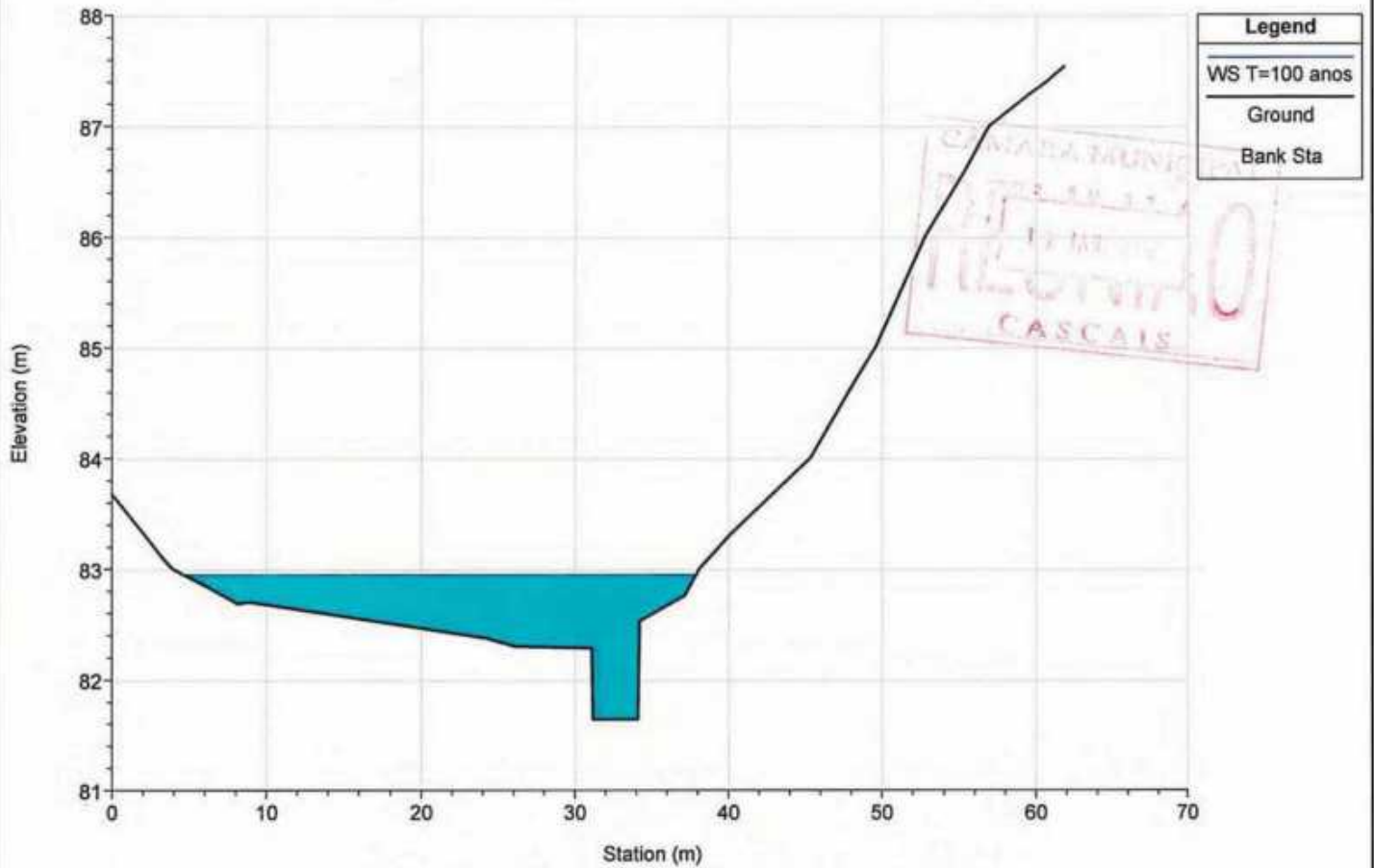


River = BICESSE Reach = interm.2 RS = 3320.208

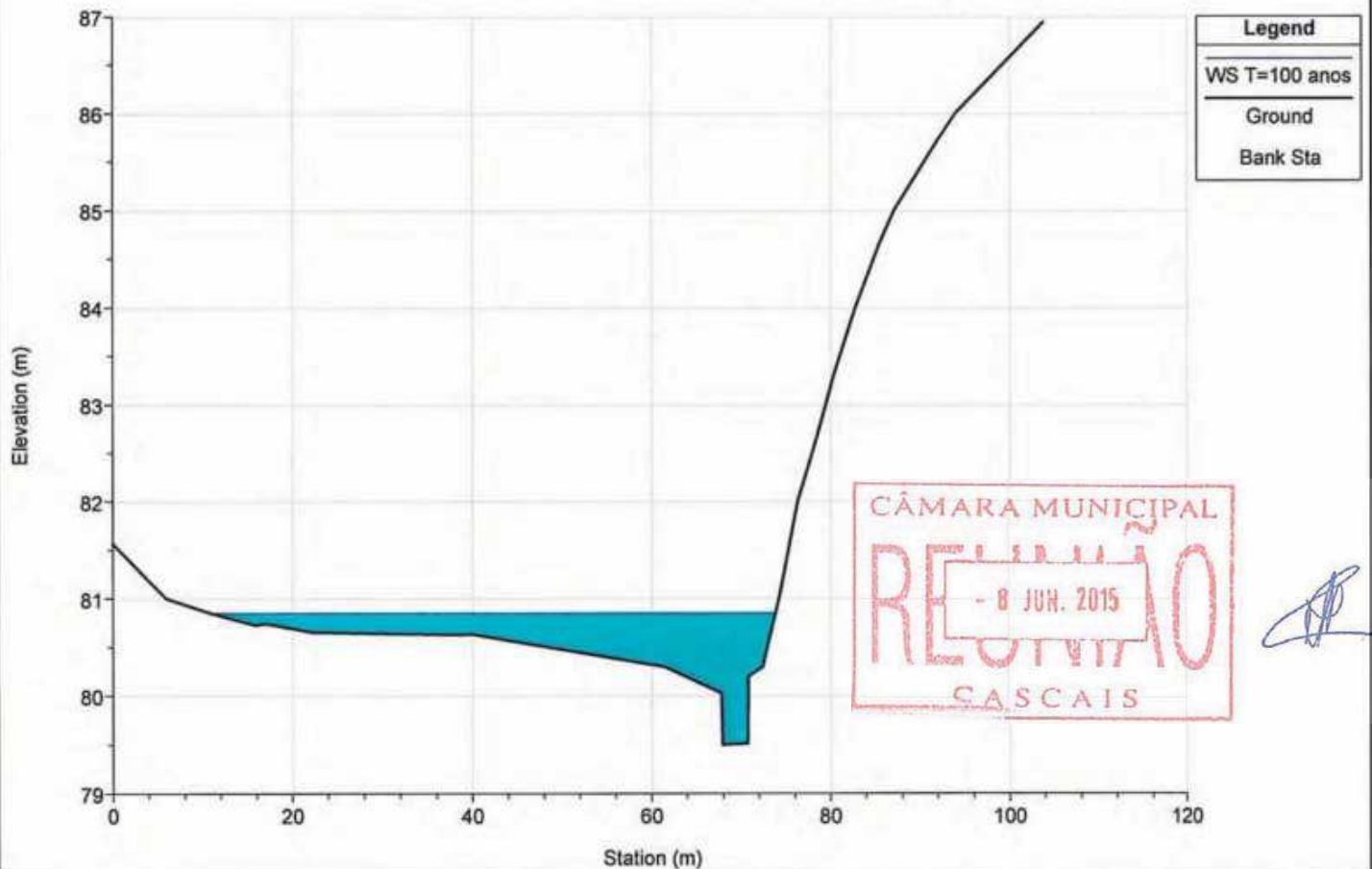




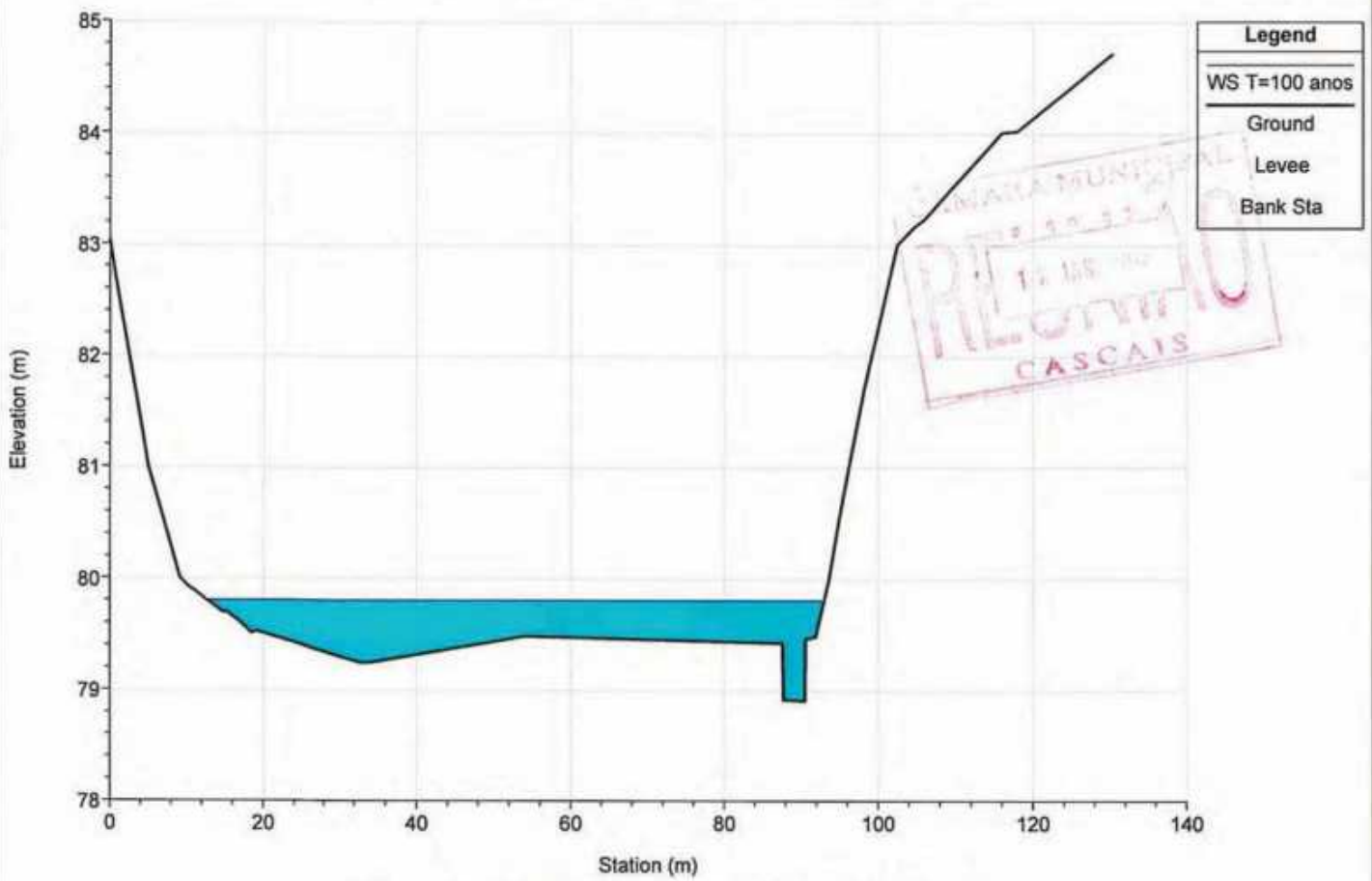
River = BICESSE Reach = interm.2 RS = 3216.774



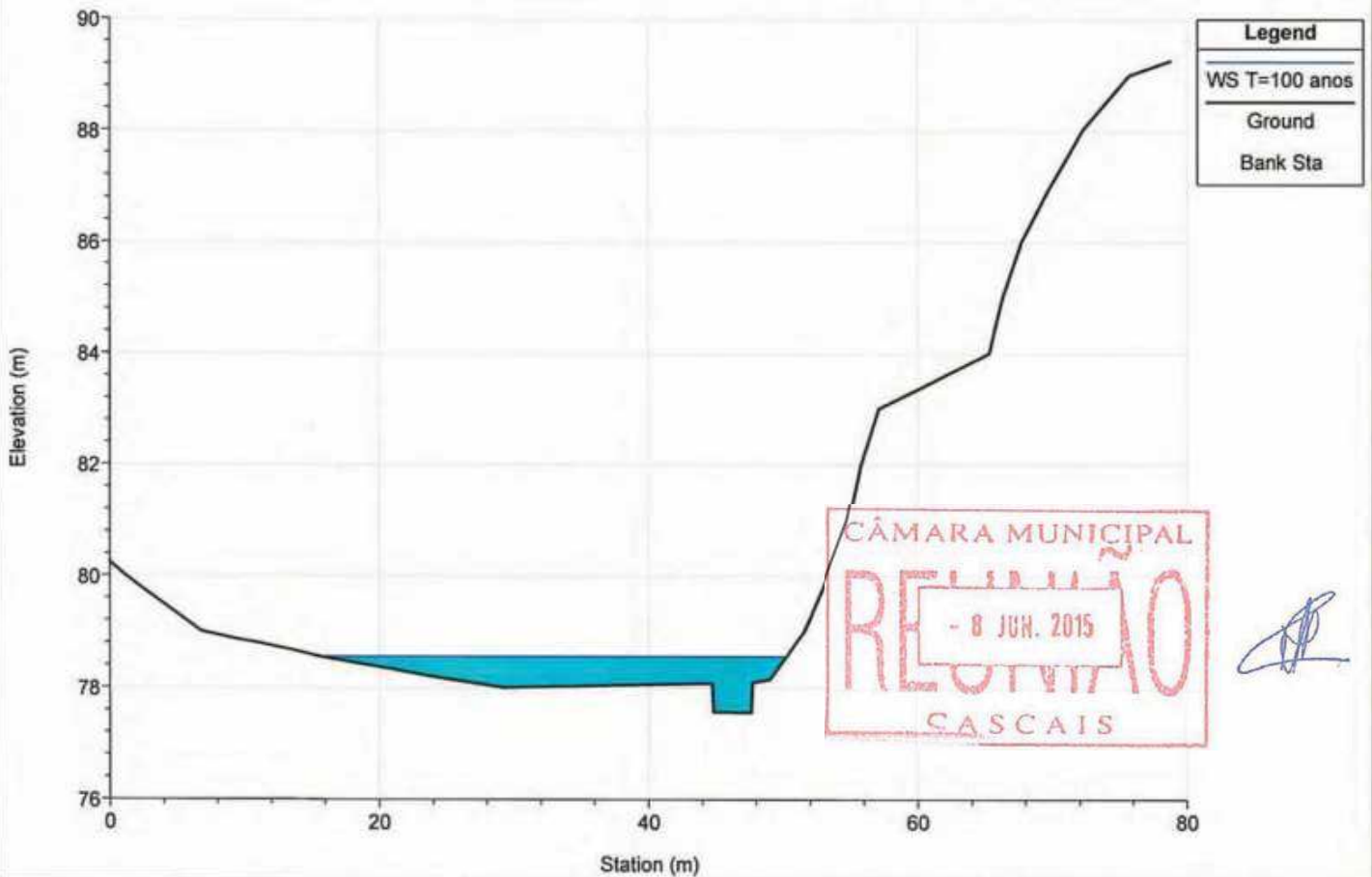
River = BICESSE Reach = interm.2 RS = 3108.527



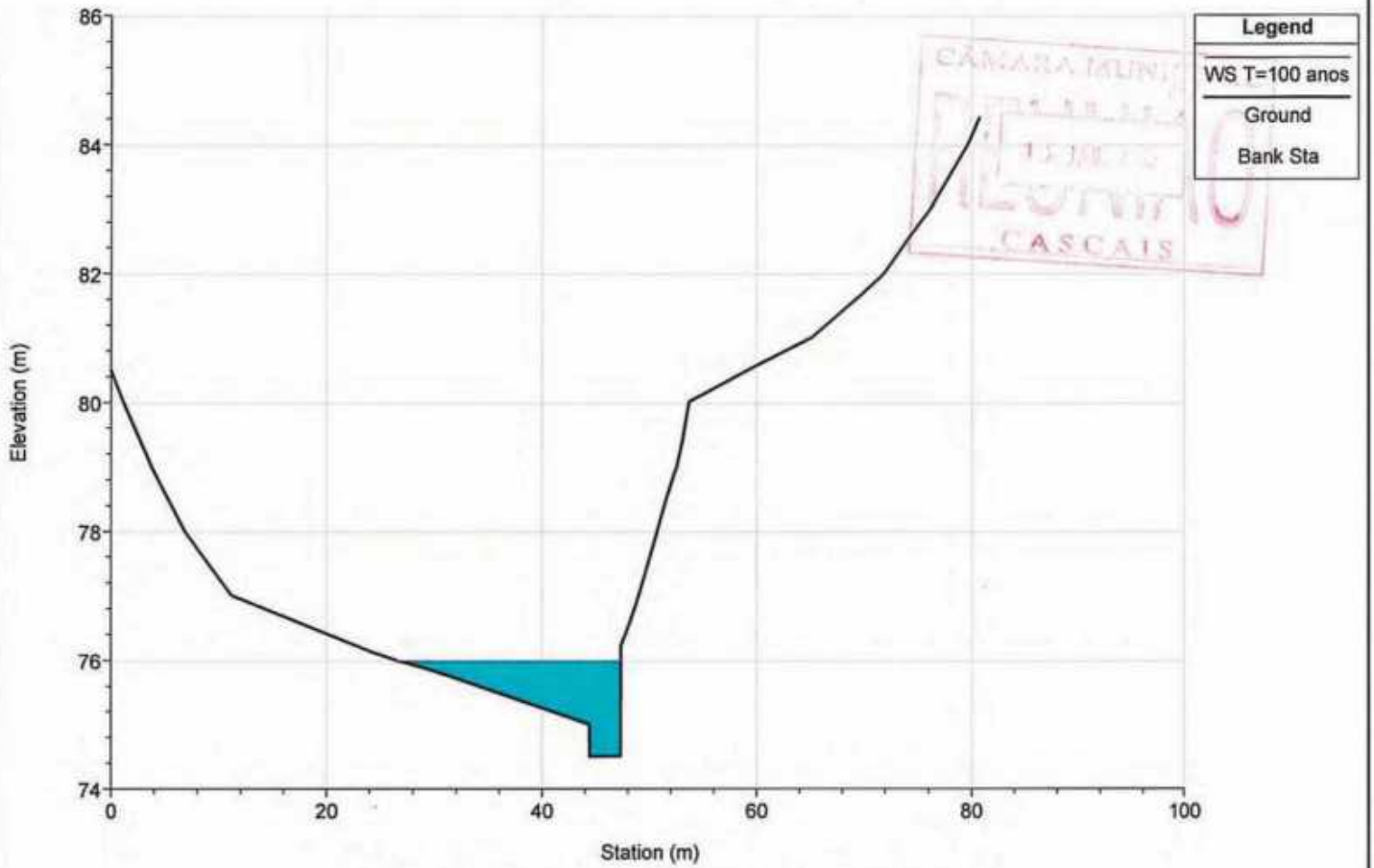
River = BICESSE Reach = interm.2 RS = 2984.035



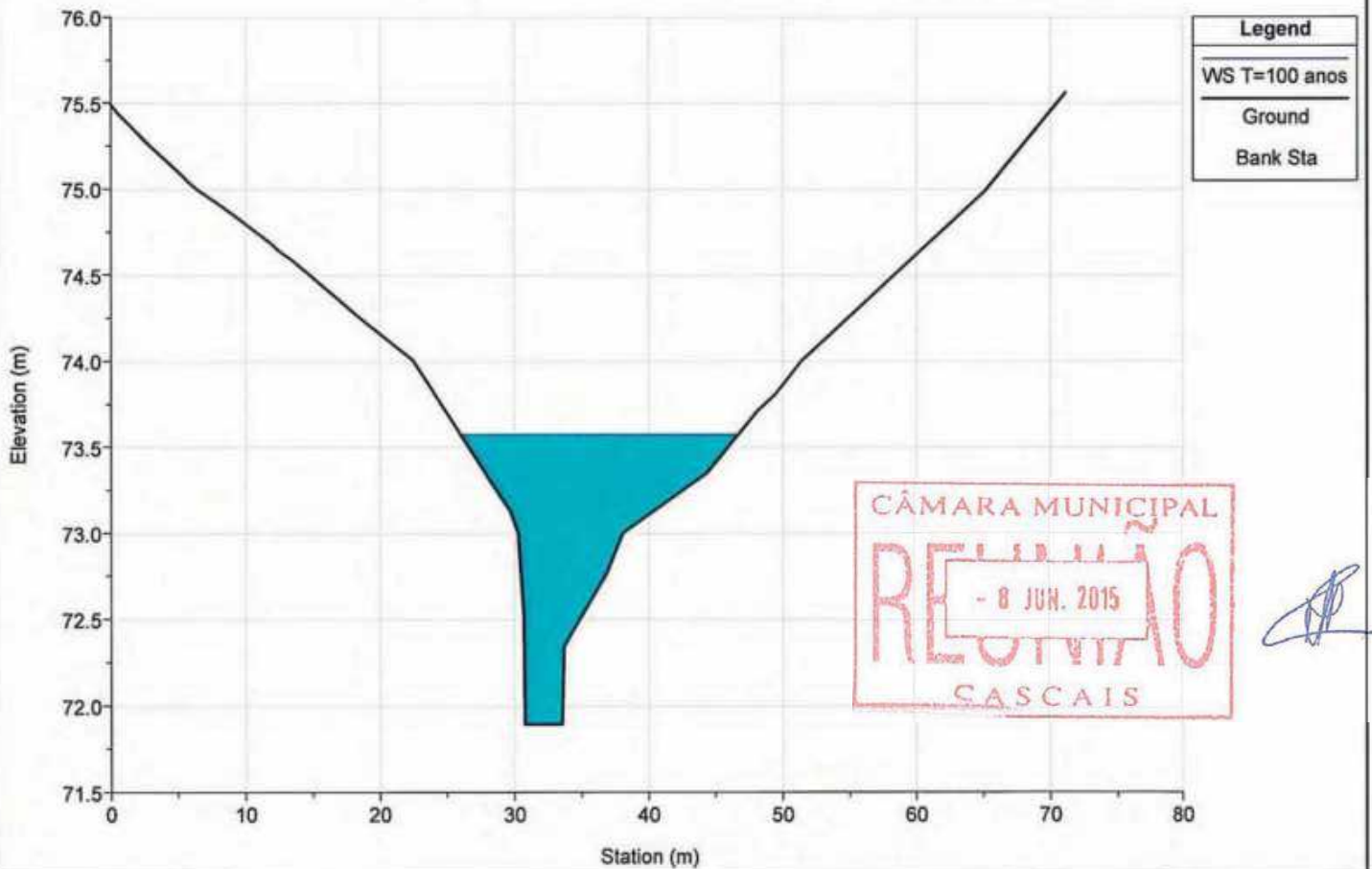
River = BICESSE Reach = interm.2 RS = 2852.816



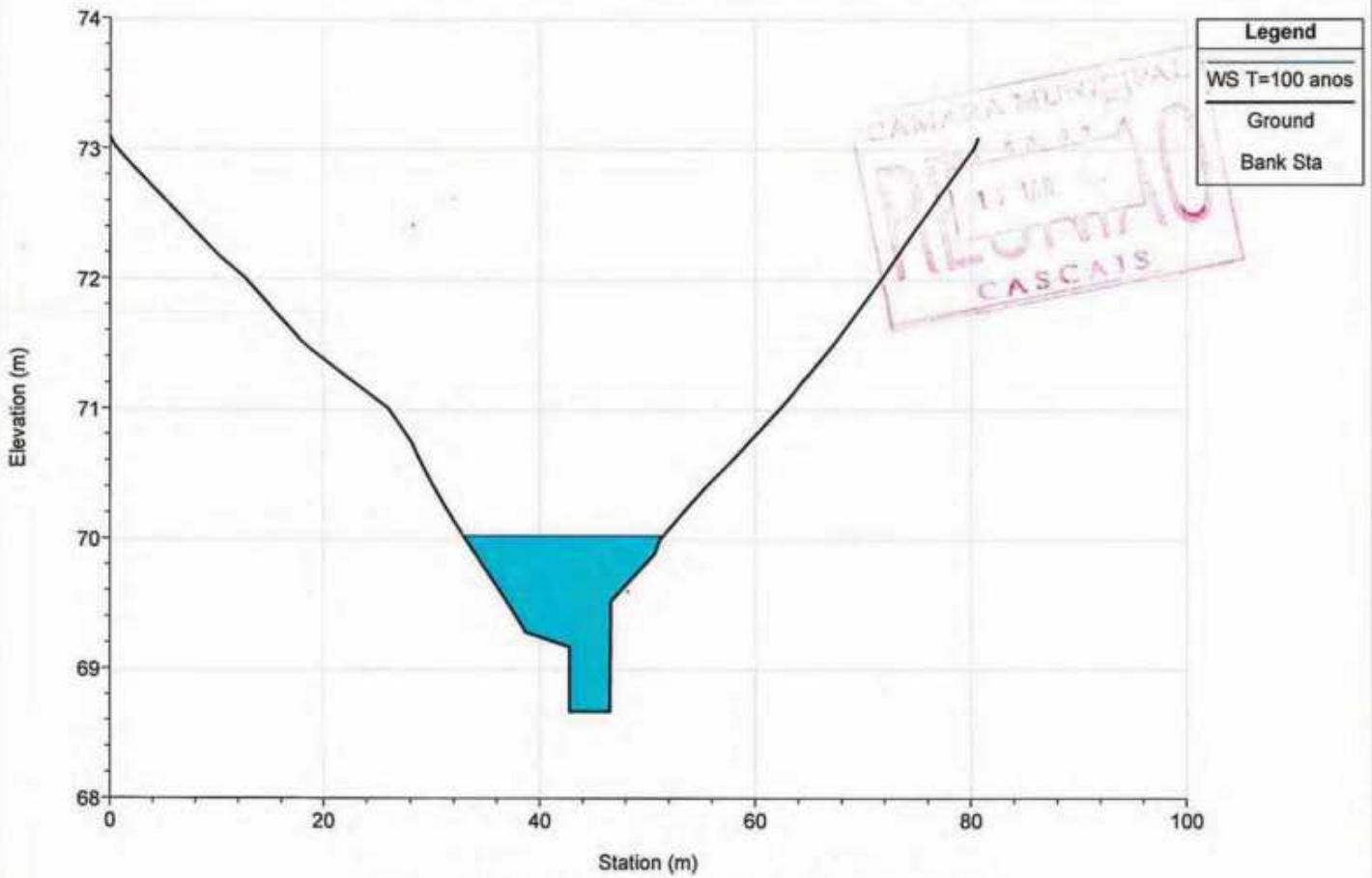
River = BICESSE Reach = interm.2 RS = 2735.860



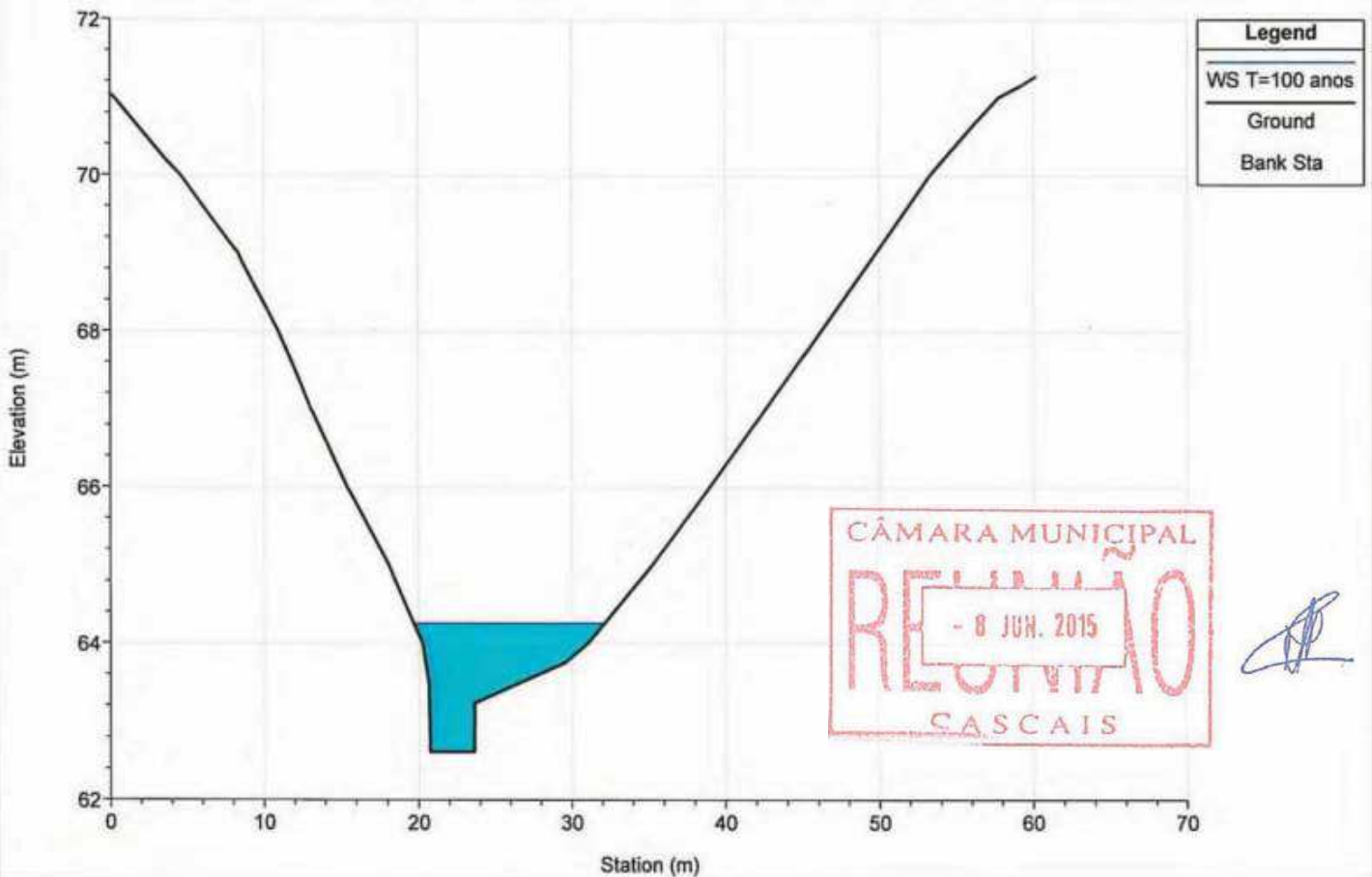
River = BICESSE Reach = interm.2 RS = 2624.283



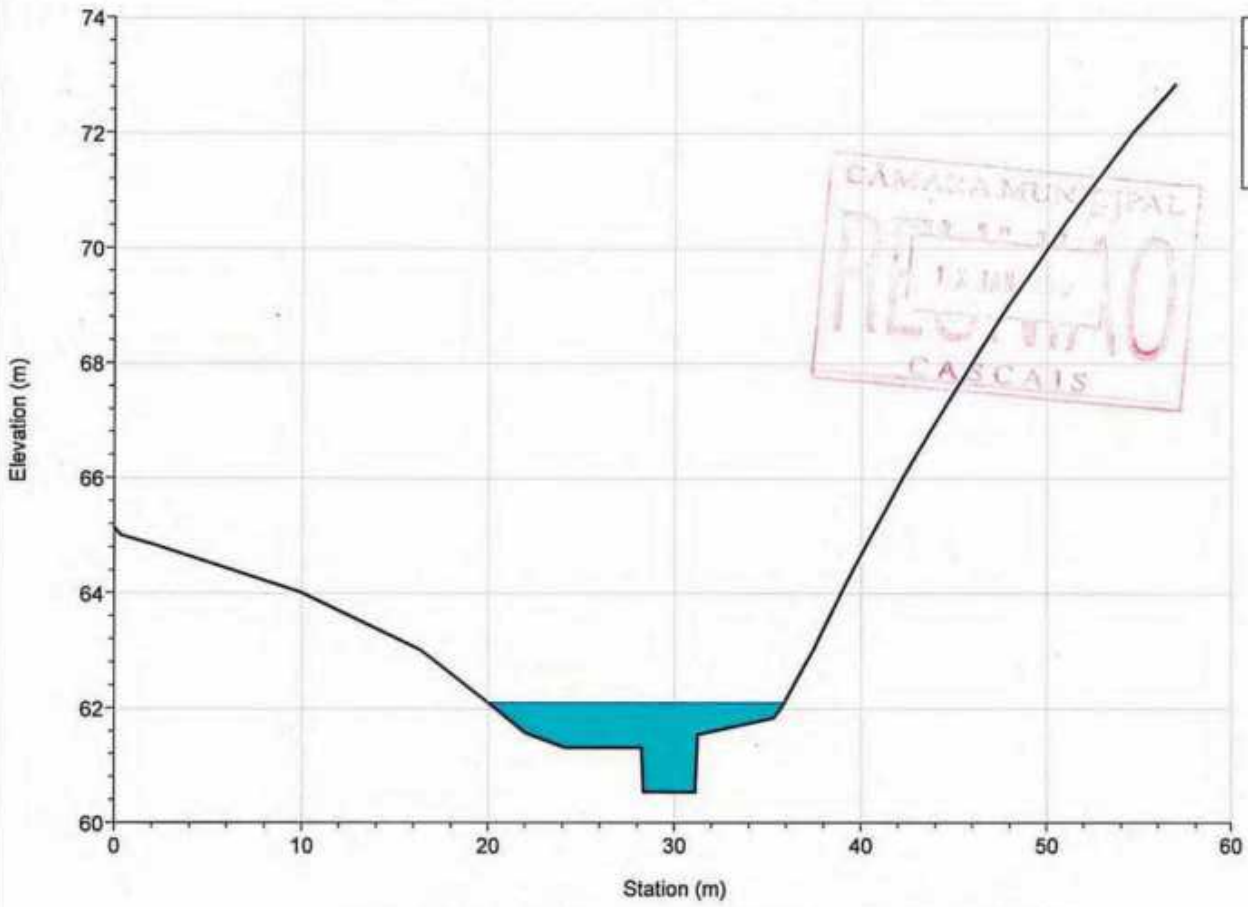
River = BICESSE Reach = interm.2 RS = 2529.924



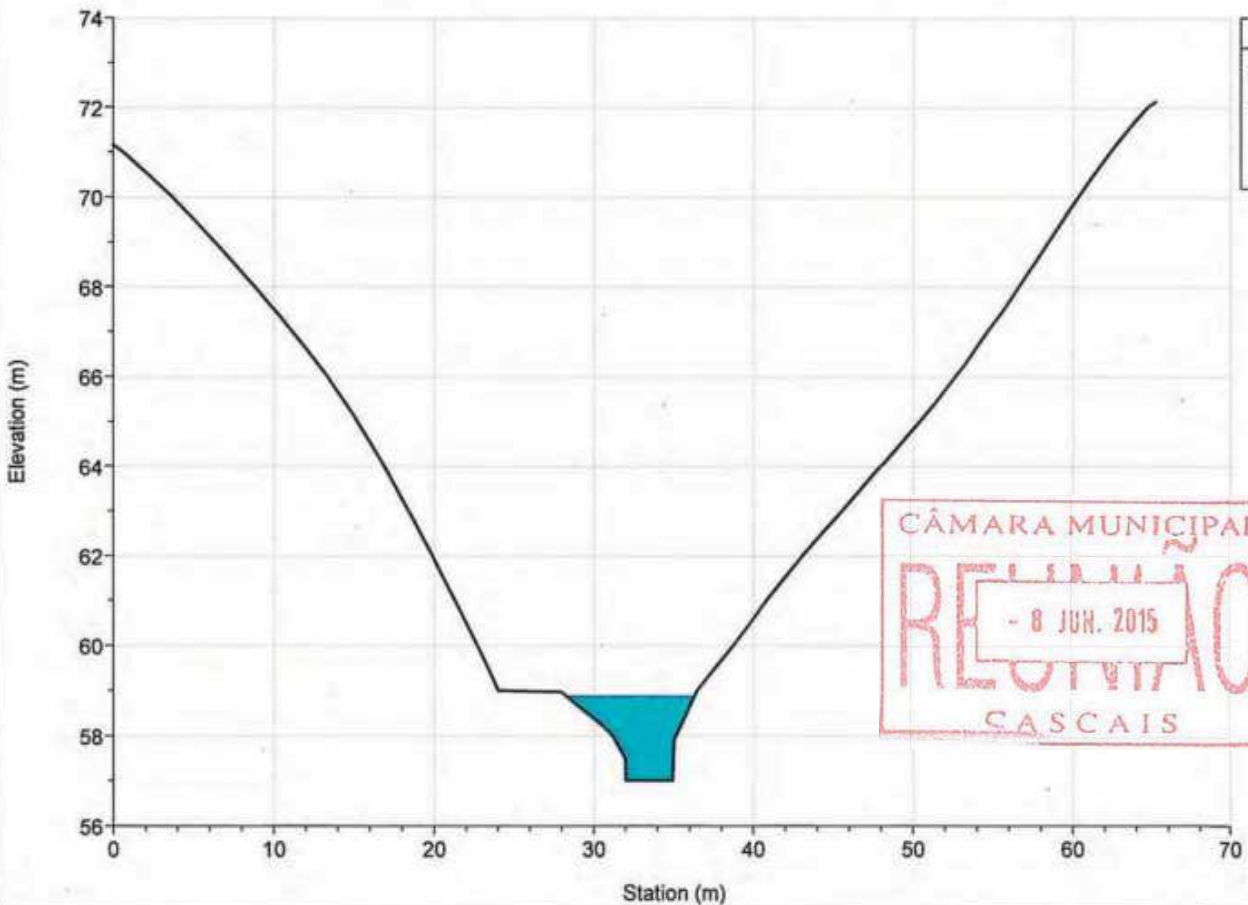
River = BICESSE Reach = interm.2 RS = 2420.598



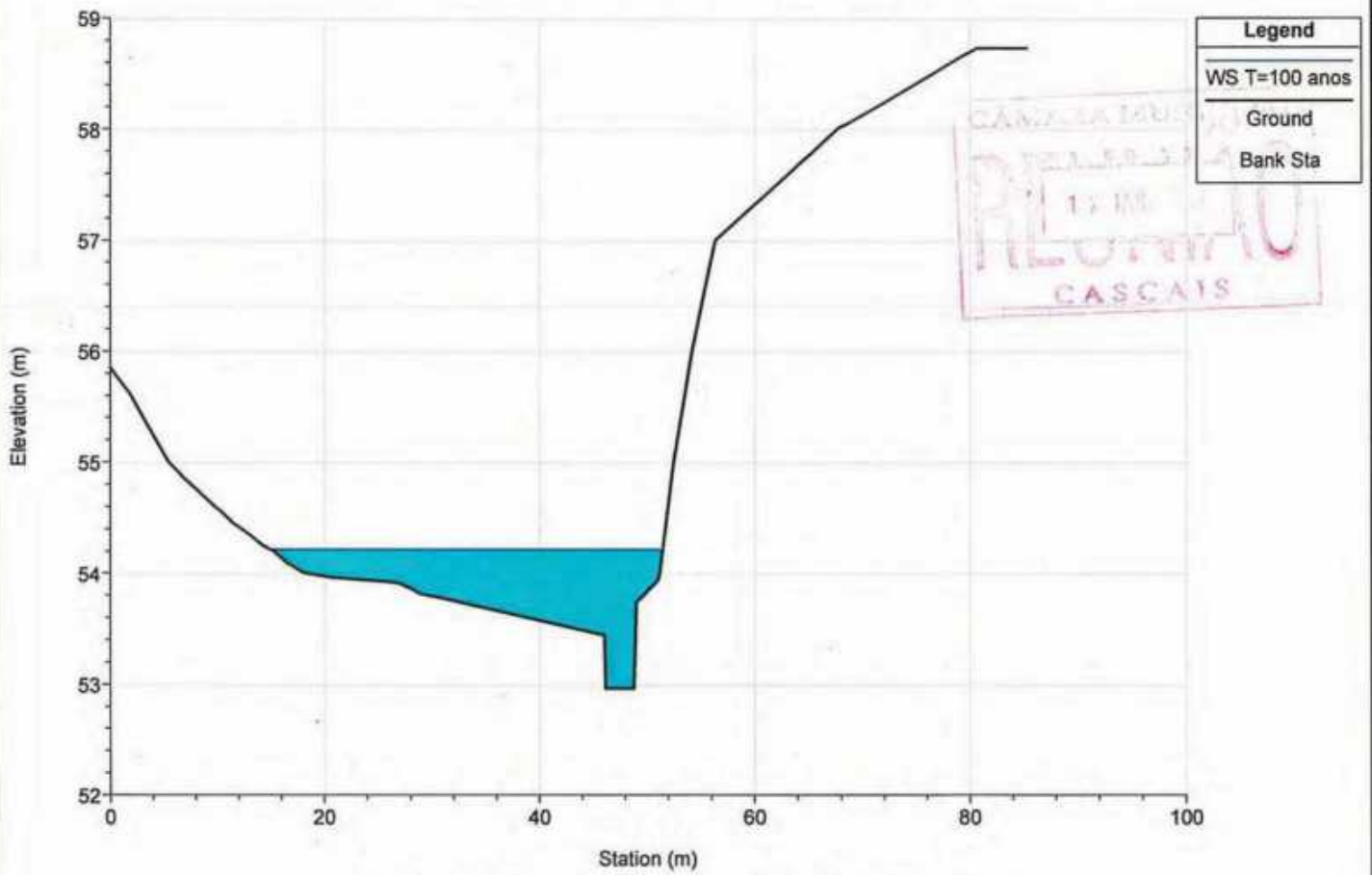
River = BICESSE Reach = interm.2 RS = 2342.411



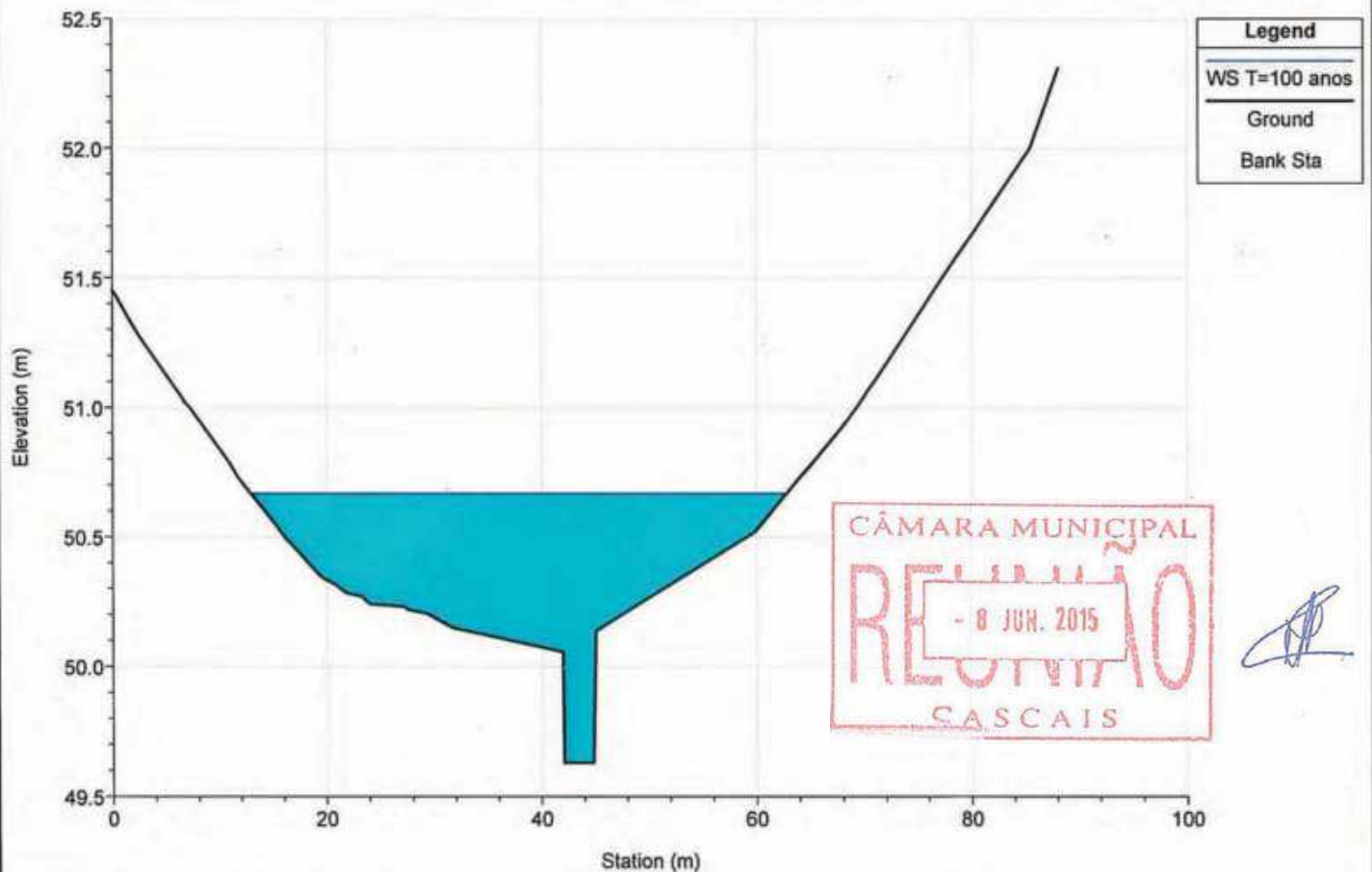
River = BICESSE Reach = interm.2 RS = 2276.978



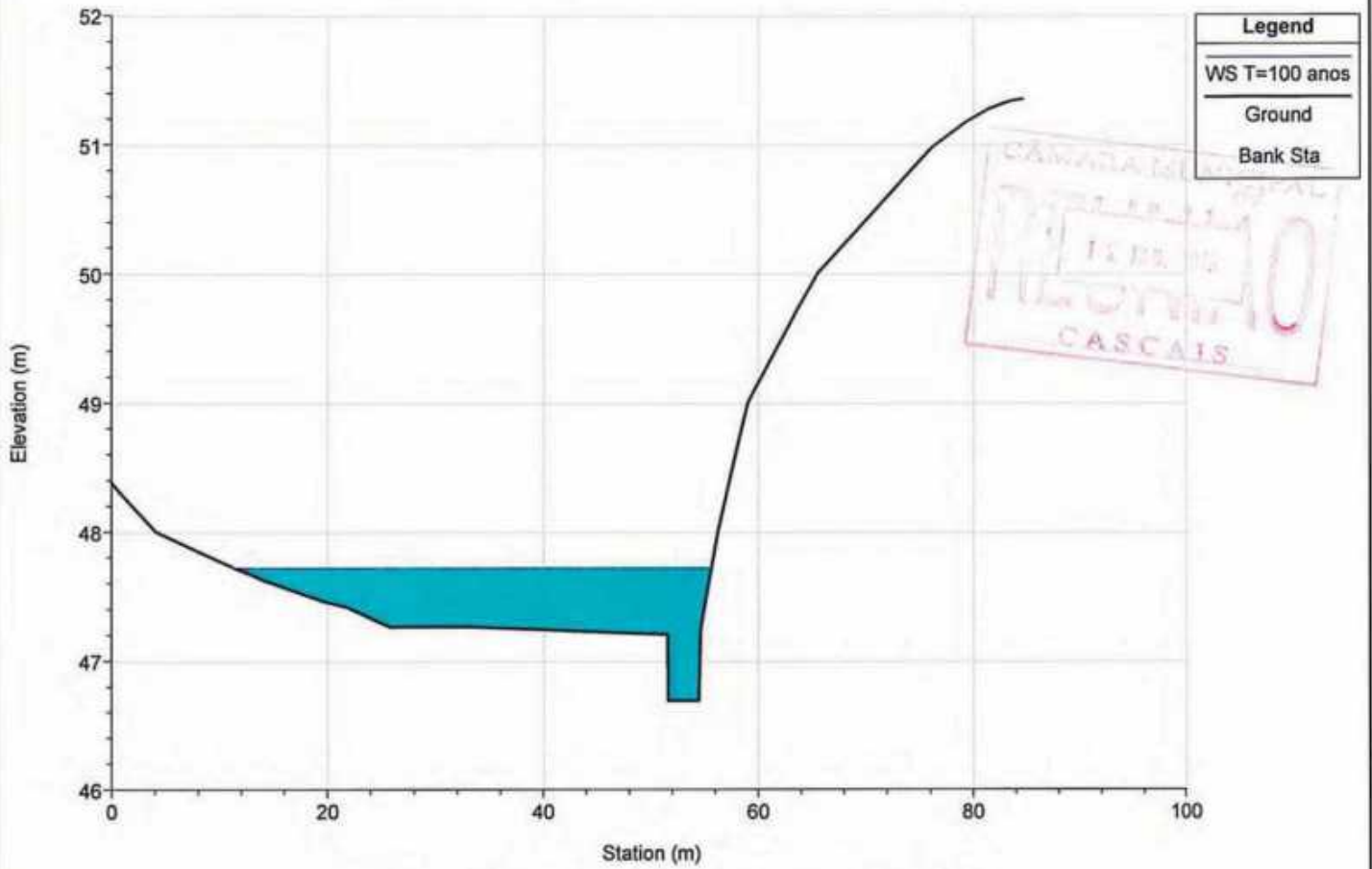
River = BICESSE Reach = interm.2 RS = 2129.581



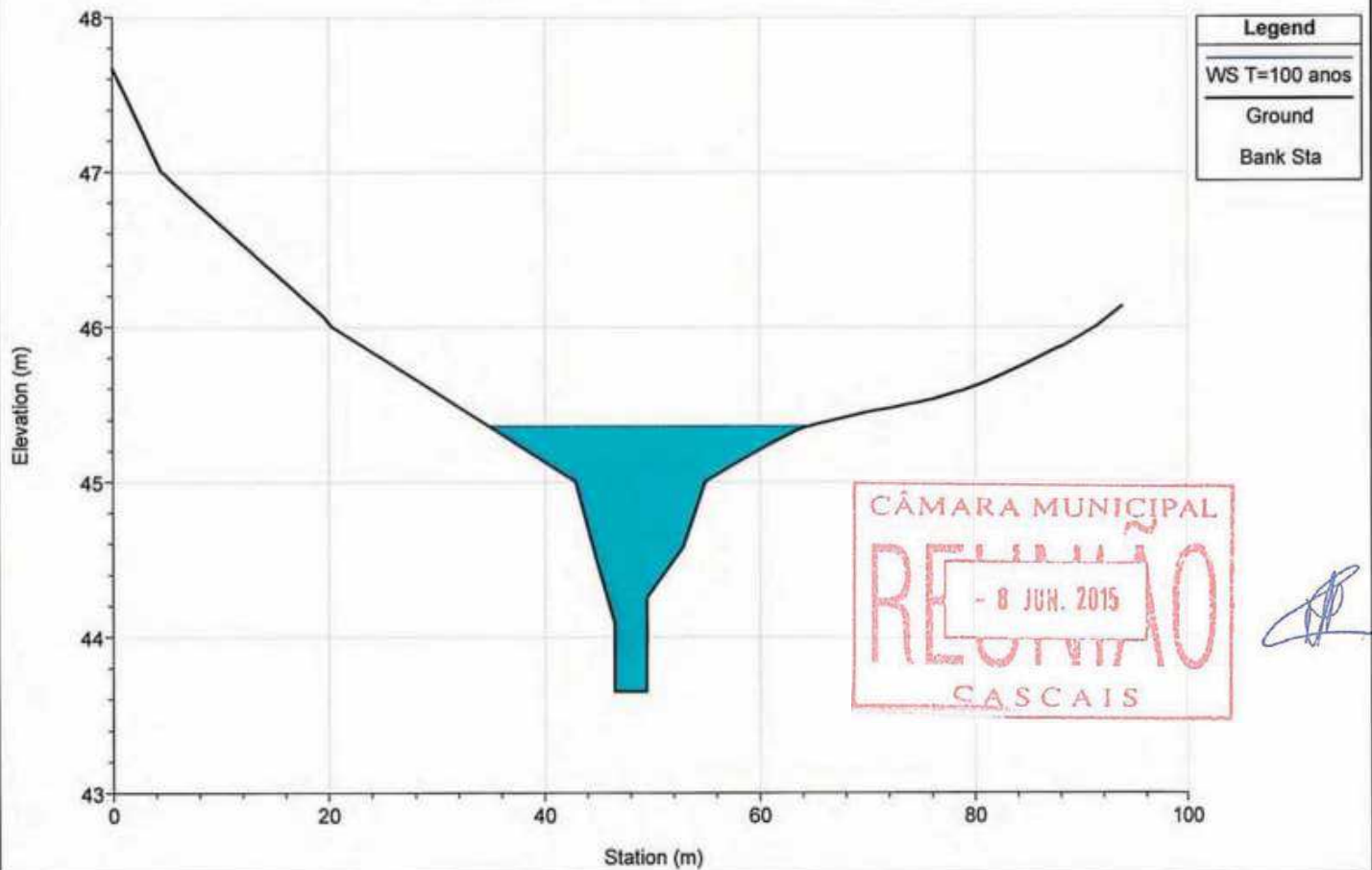
River = BICESSE Reach = interm.2 RS = 1983.300



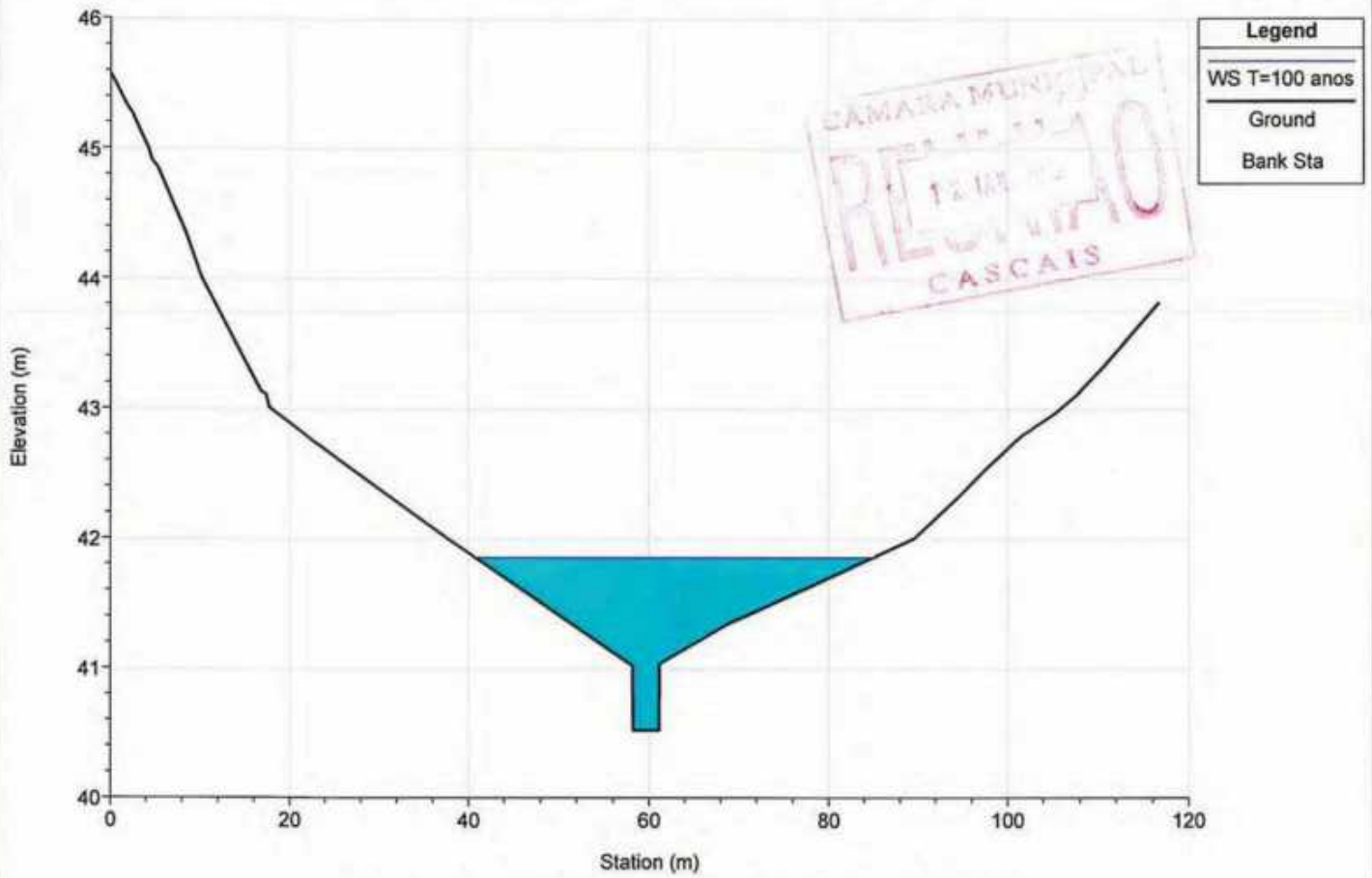
River = BICESSE Reach = interm.2 RS = 1881.238



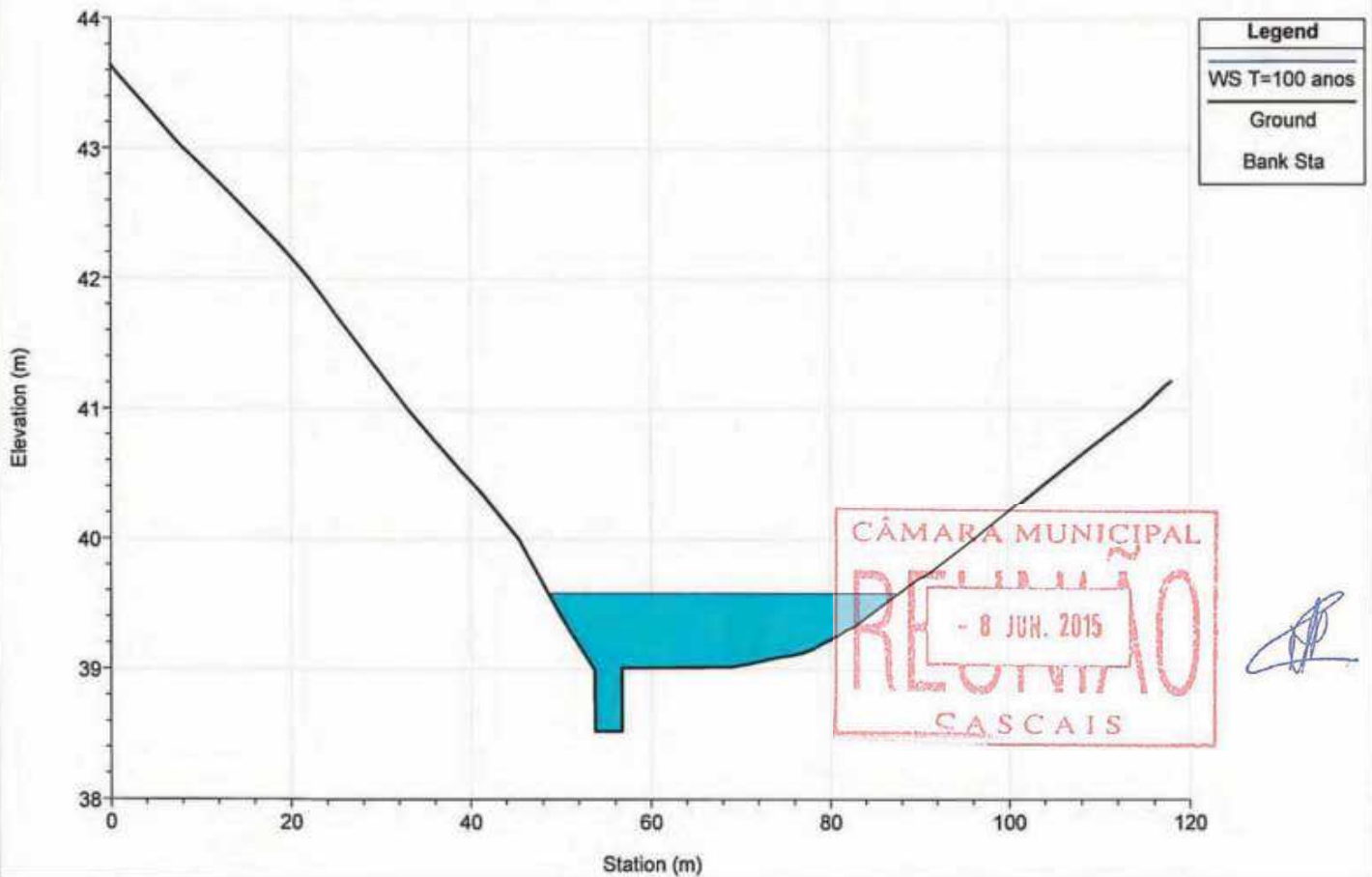
River = BICESSE Reach = interm.2 RS = 1788.006



River = BICESSE Reach = interm.2 RS = 1647.507

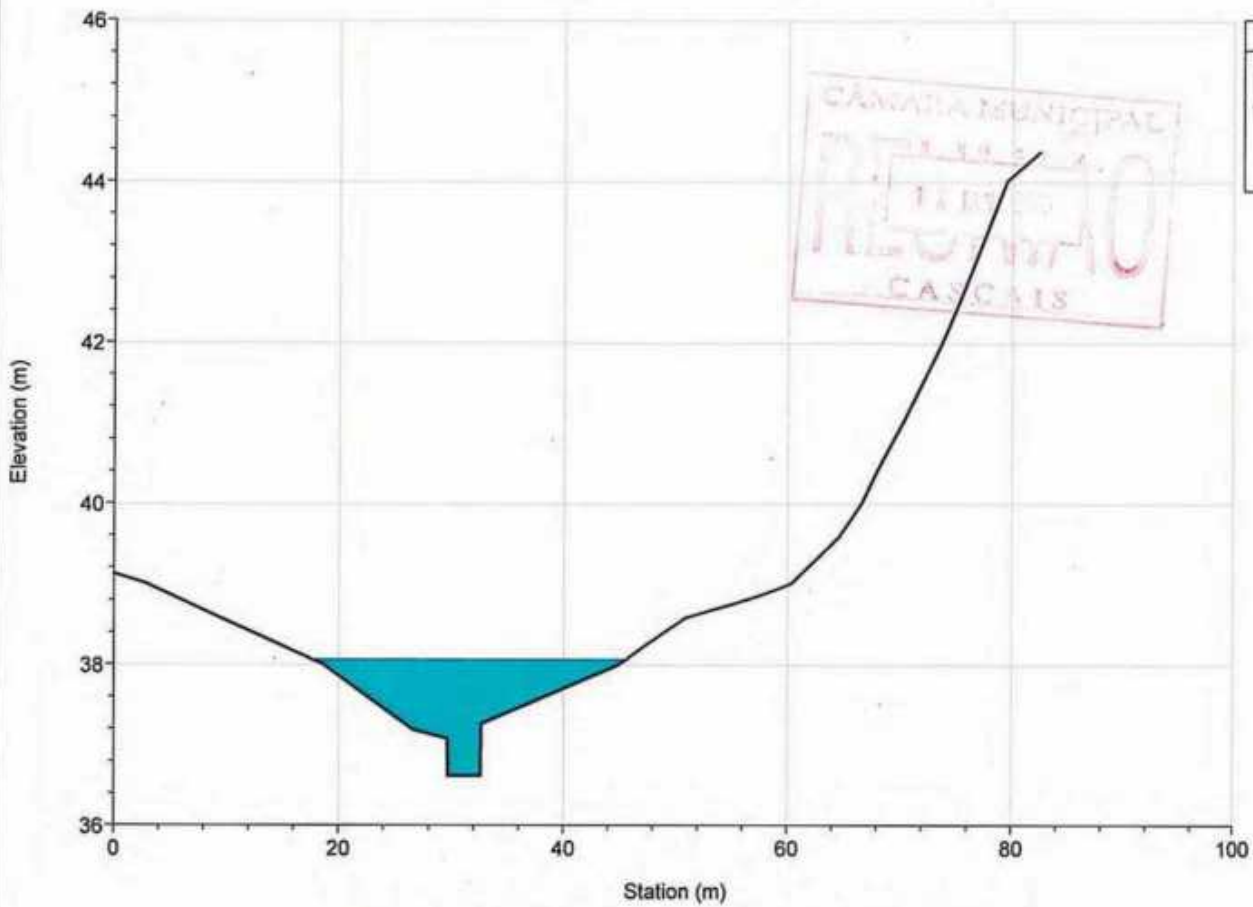


River = BICESSE Reach = interm.2 RS = 1499.891

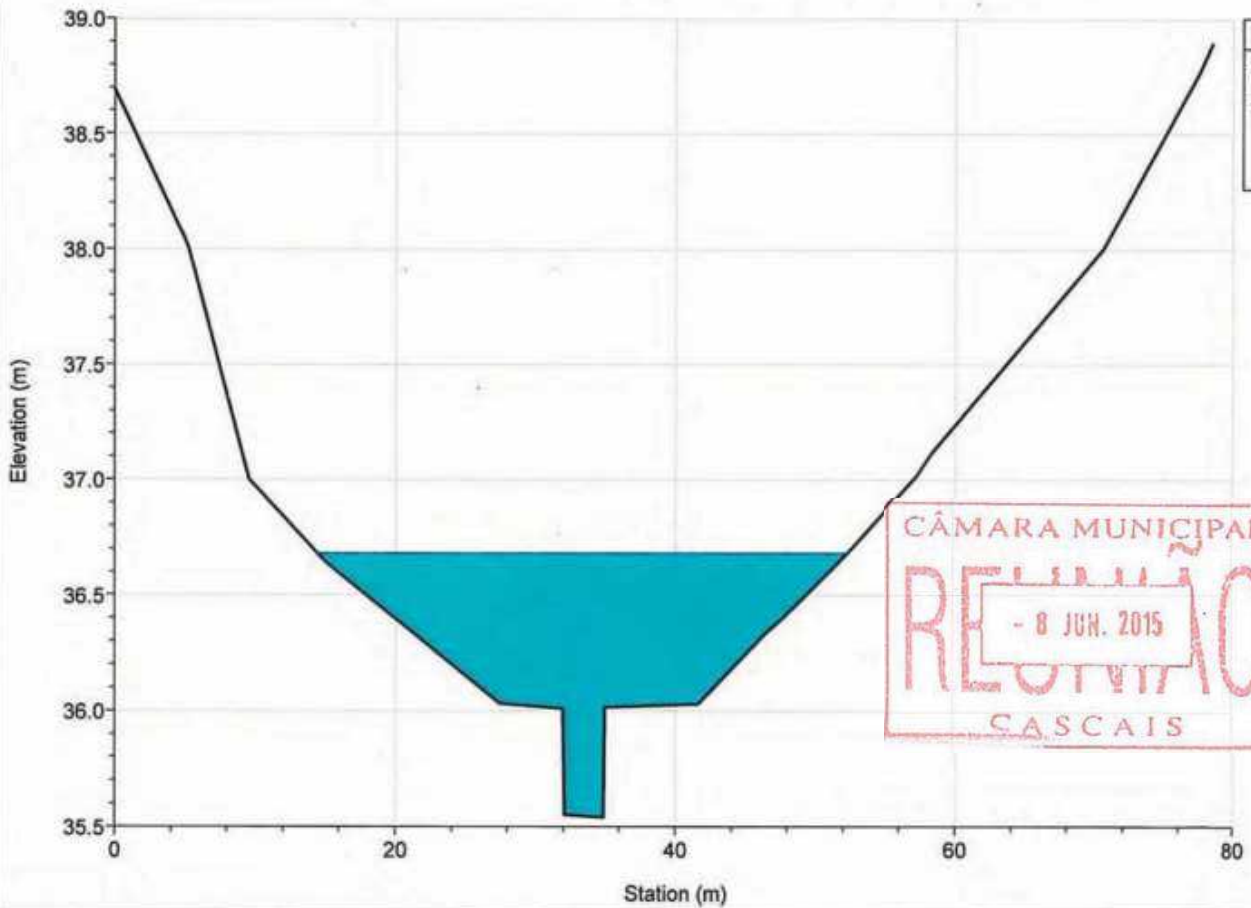




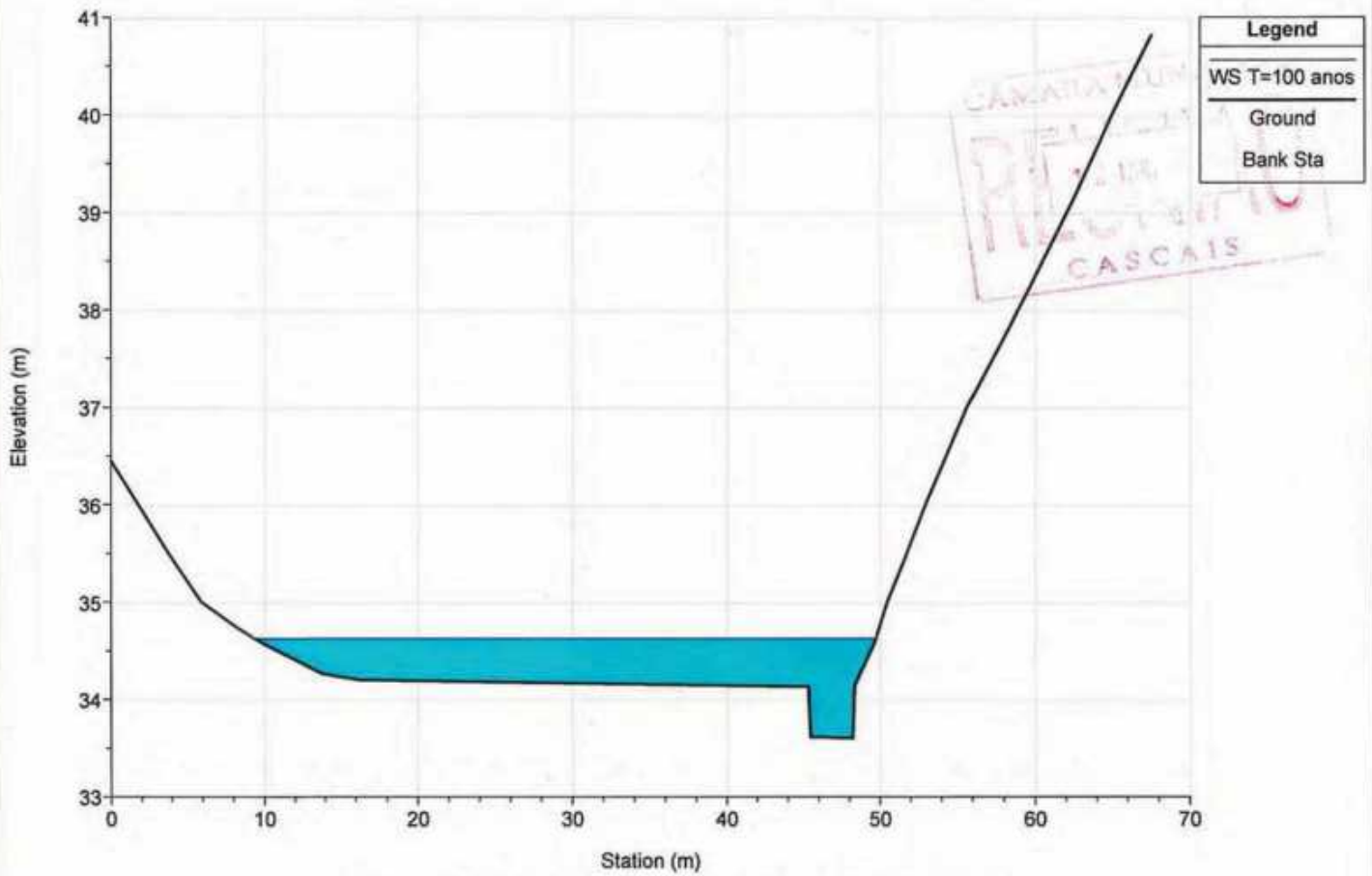
River = BICESSE Reach = interm.2 RS = 1390.780



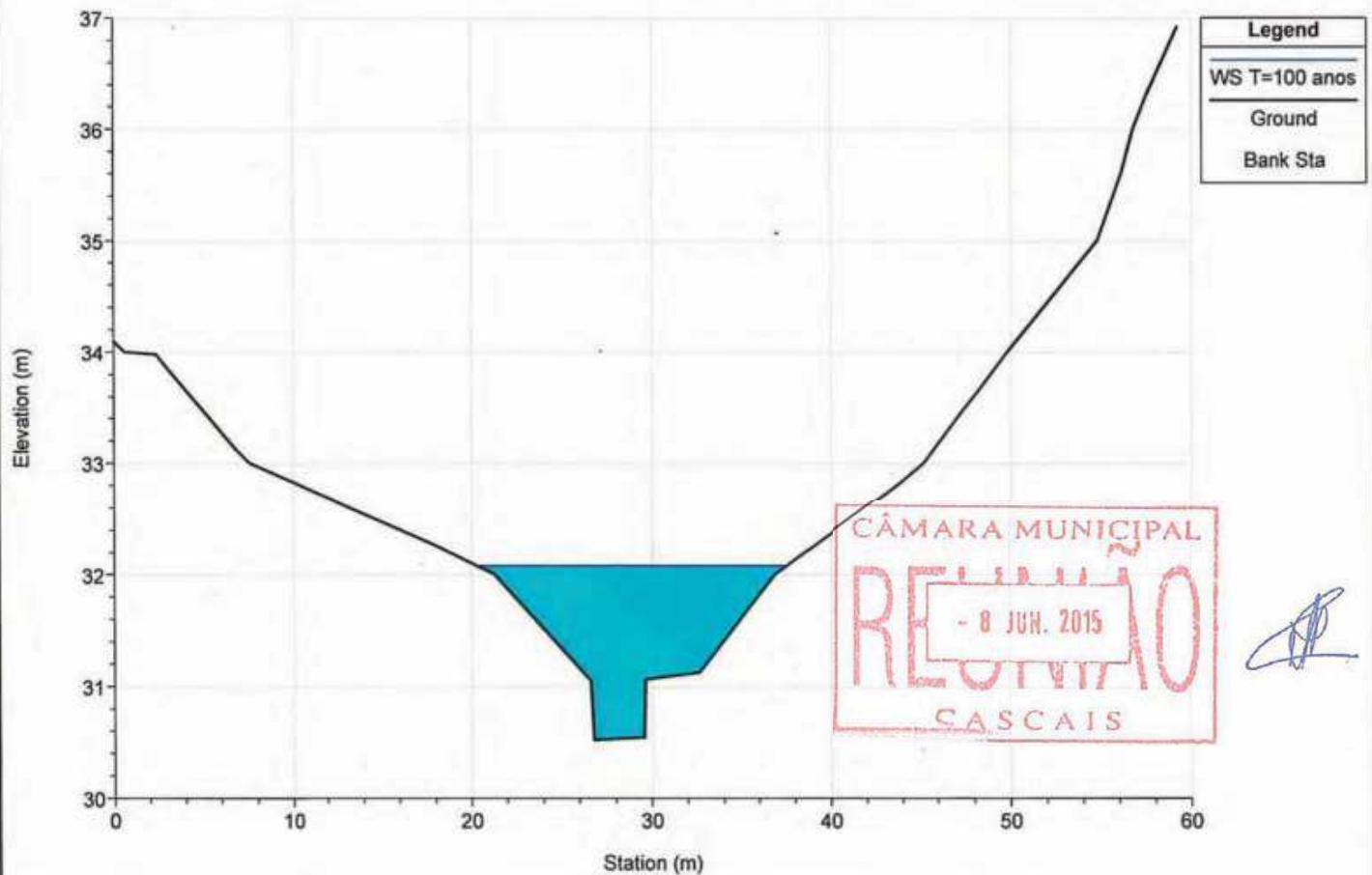
River = BICESSE Reach = interm.2 RS = 1309.036



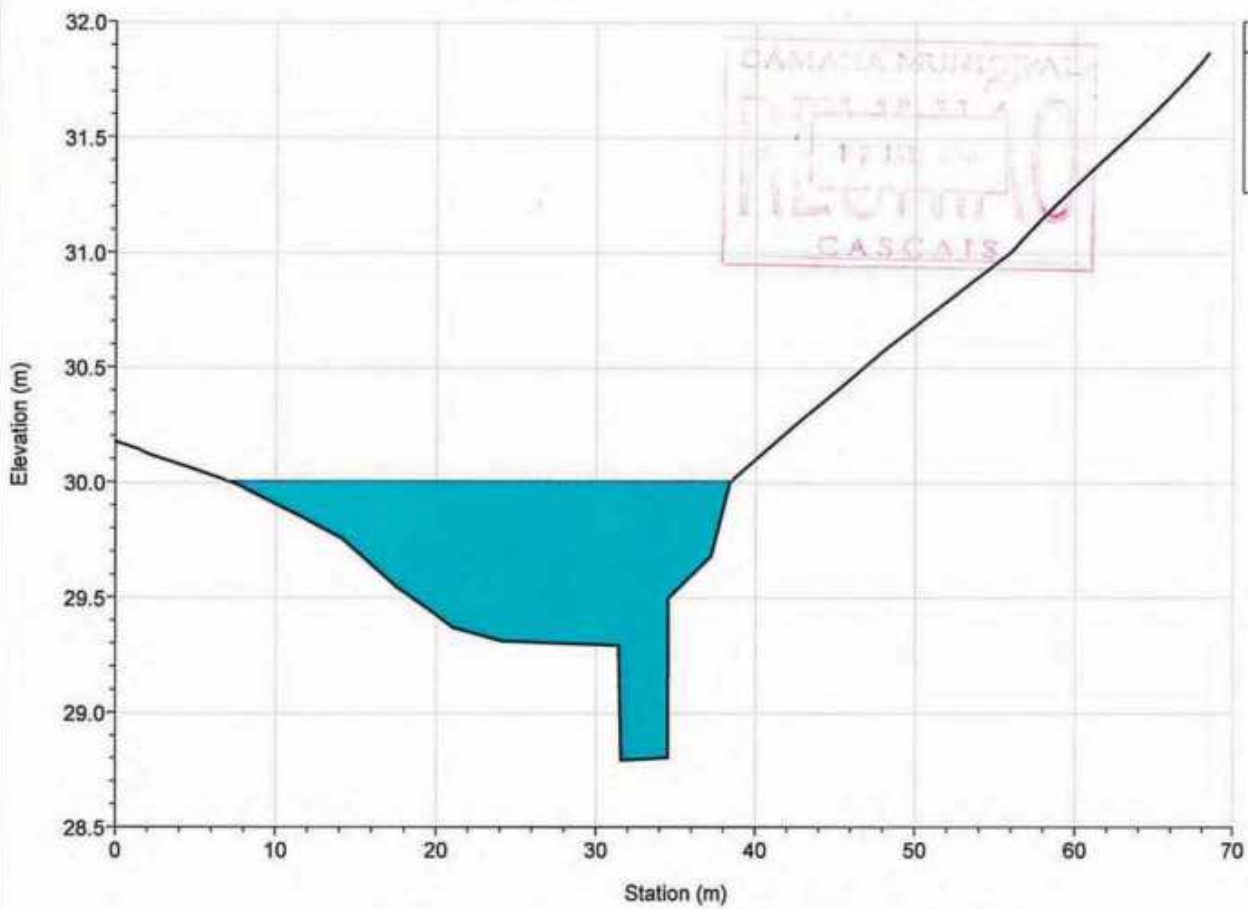
River = BICESSE Reach = interm.2 RS = 1186.868



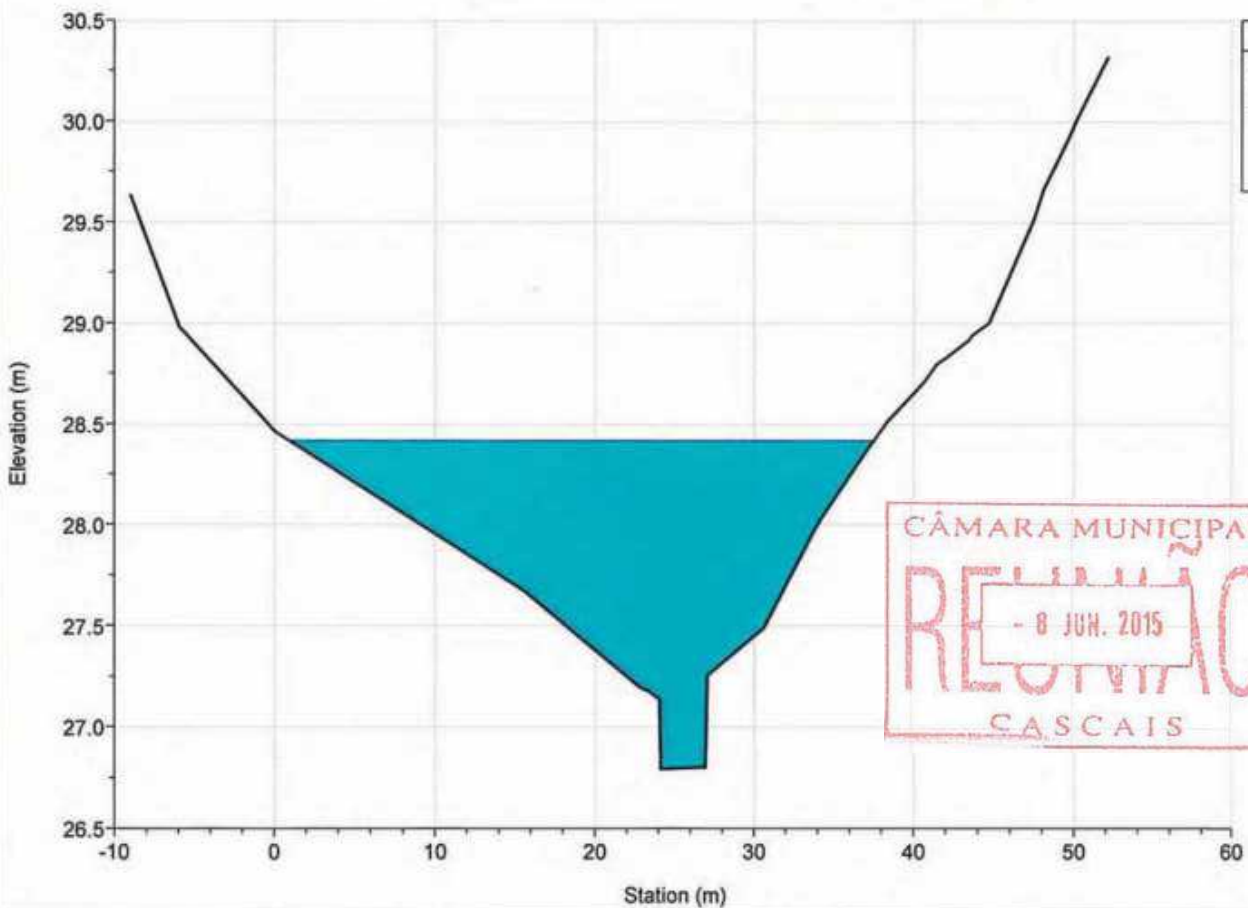
River = BICESSE Reach = interm.2 RS = 1058.193



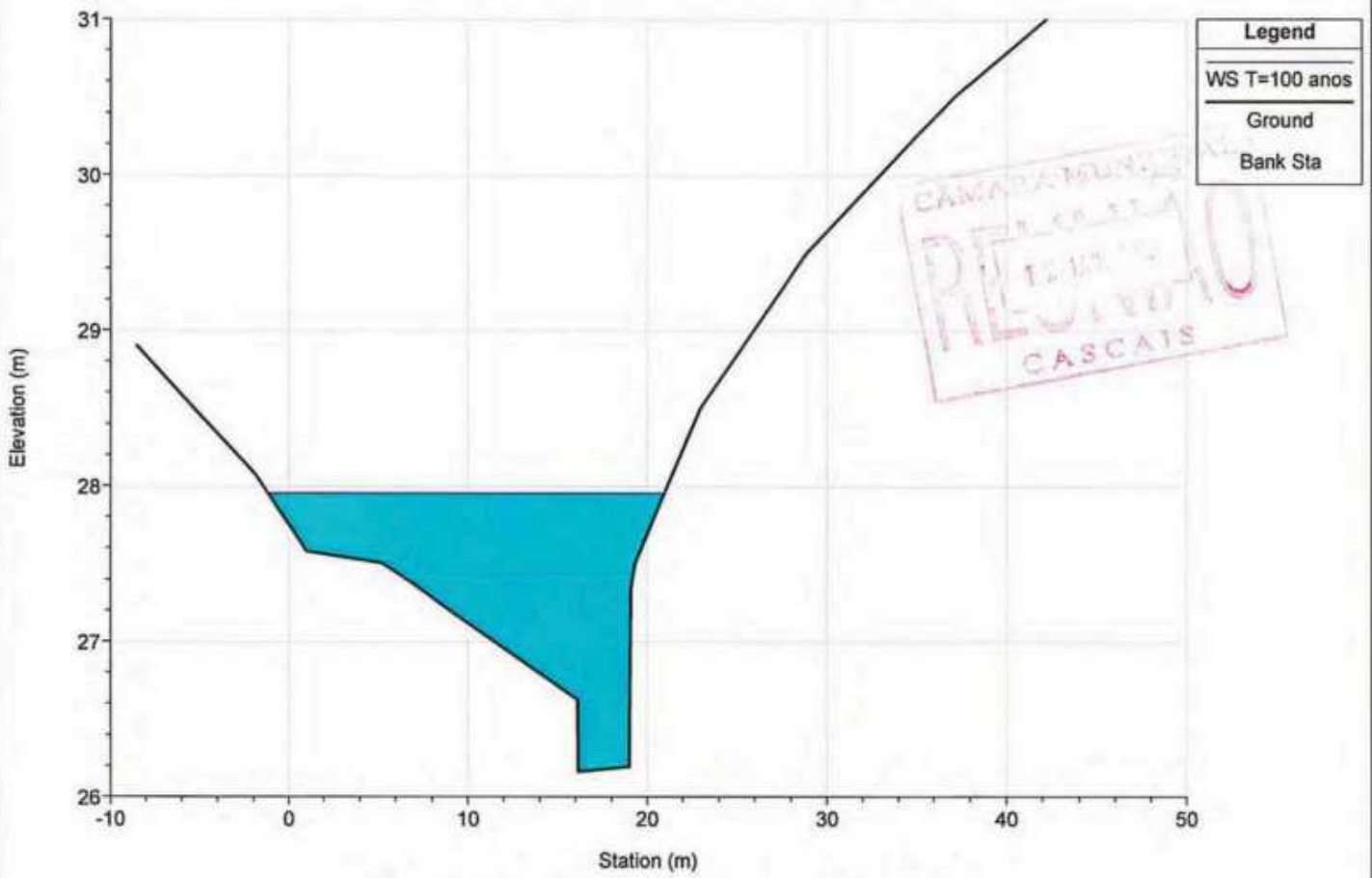
River = BICESSE Reach = interm.2 RS = 946.419



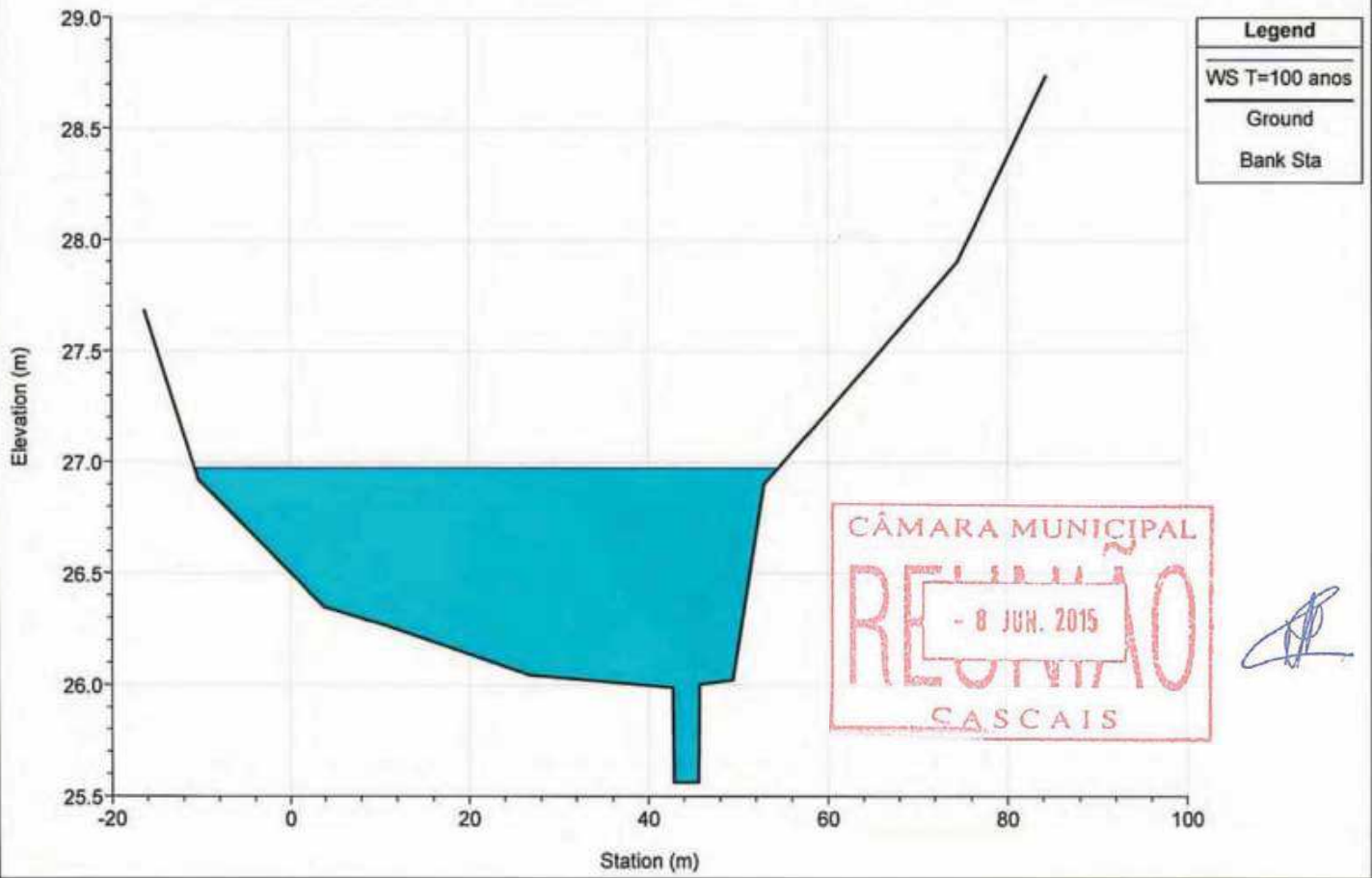
River = BICESSE Reach = interm.2 RS = 836.485



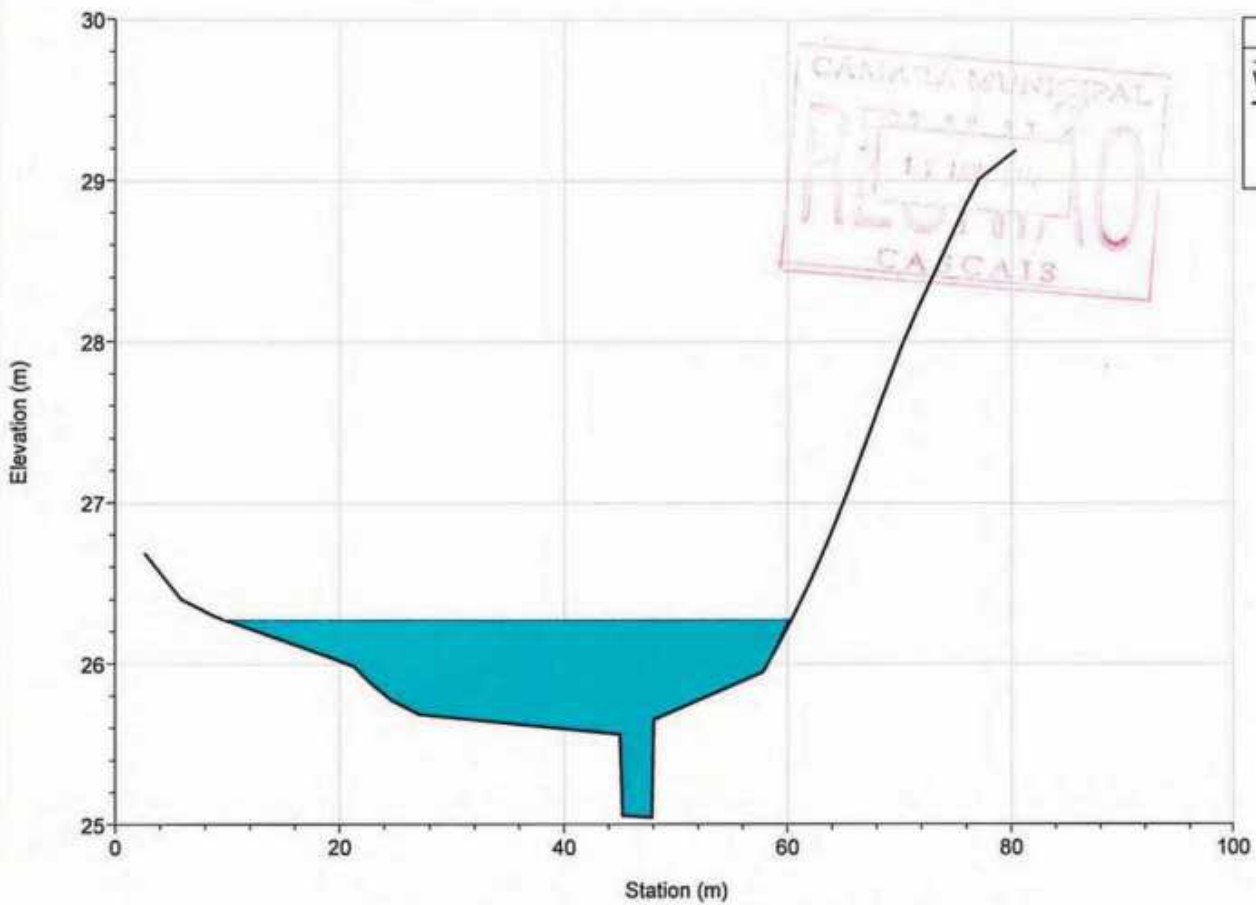
River = BICESSE Reach = jusante RS = 808.126



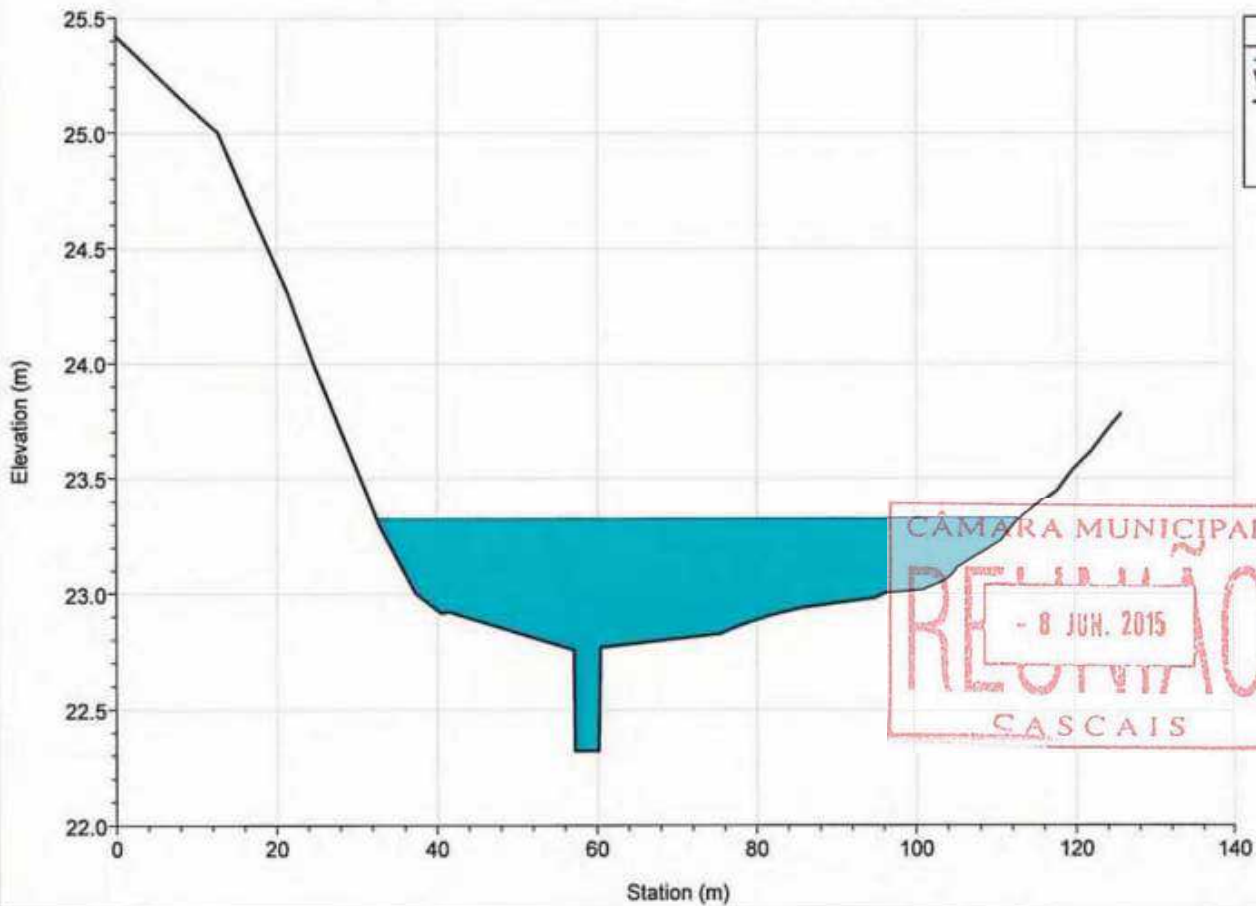
River = BICESSE Reach = jusante RS = 728.394



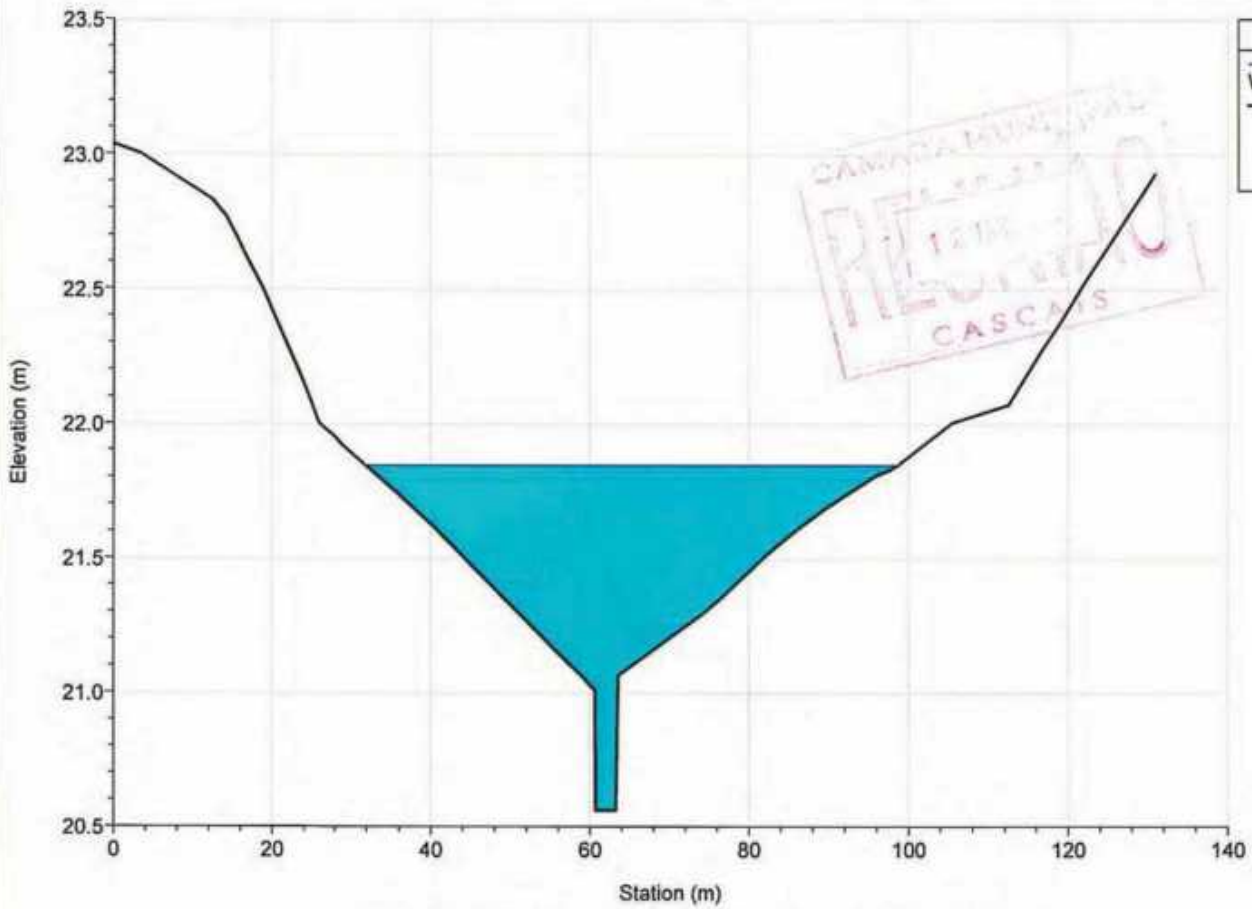
River = BICESSE Reach = jusante RS = 625.438



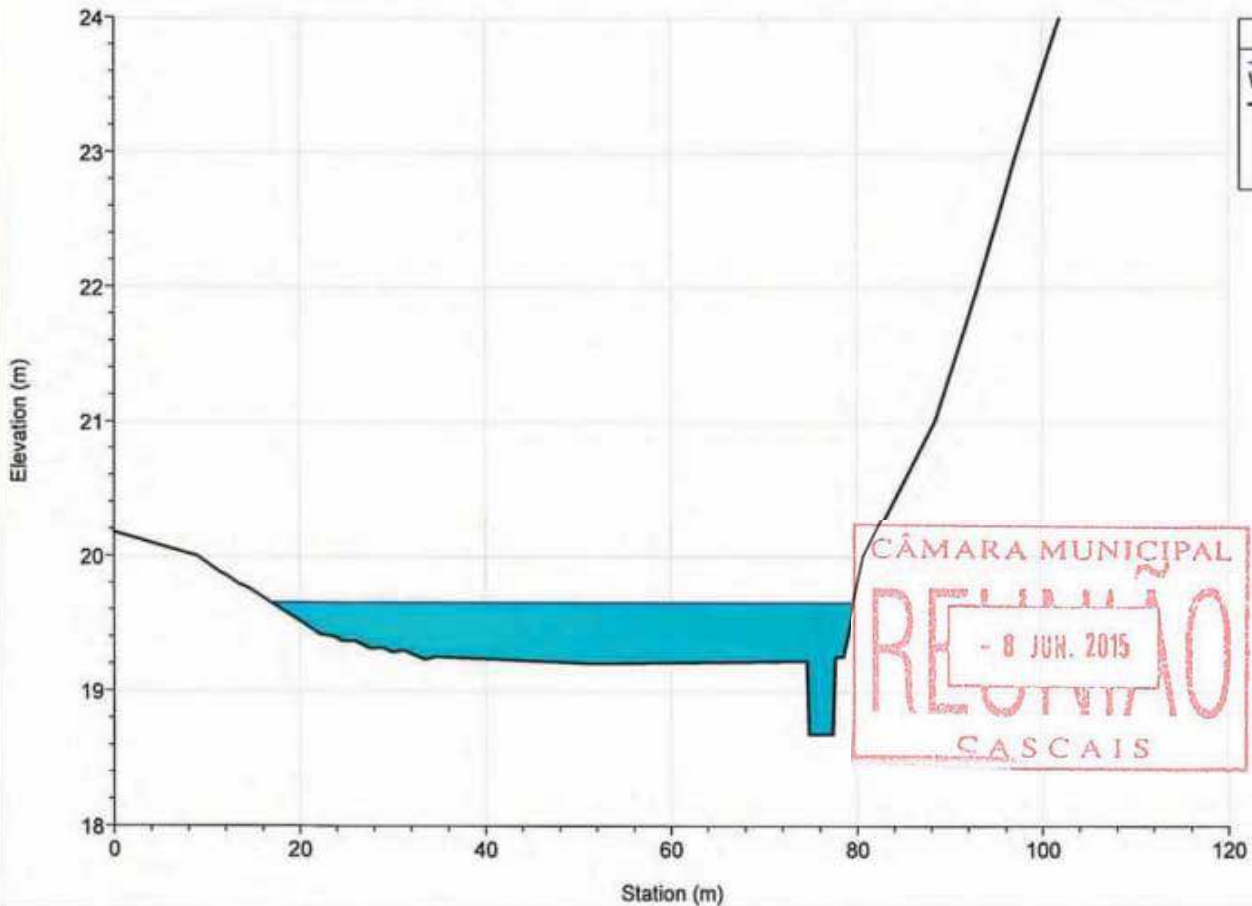
River = BICESSE Reach = jusante RS = 508.202



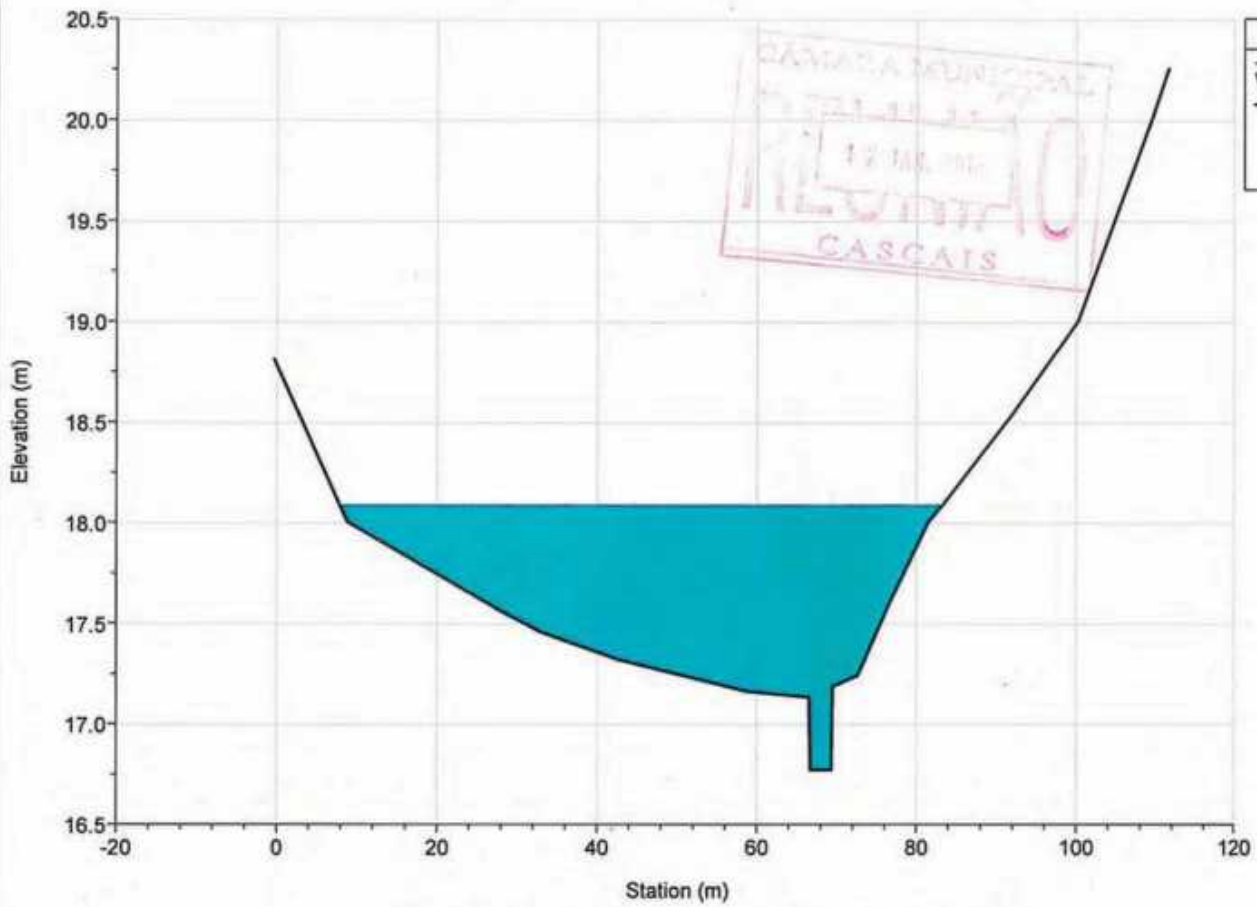
River = BICESSE Reach = jusante RS = 382.122



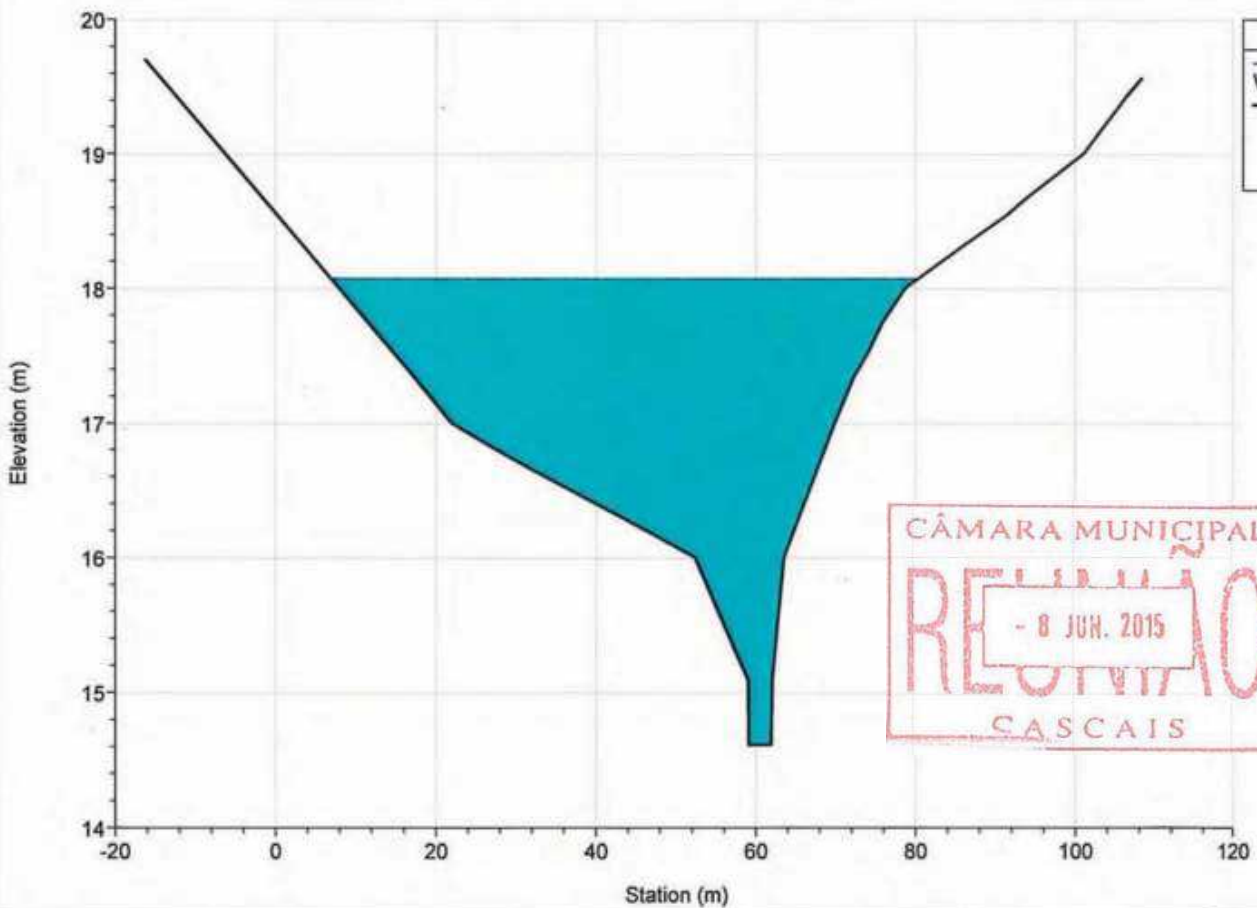
River = BICESSE Reach = jusante RS = 275.888



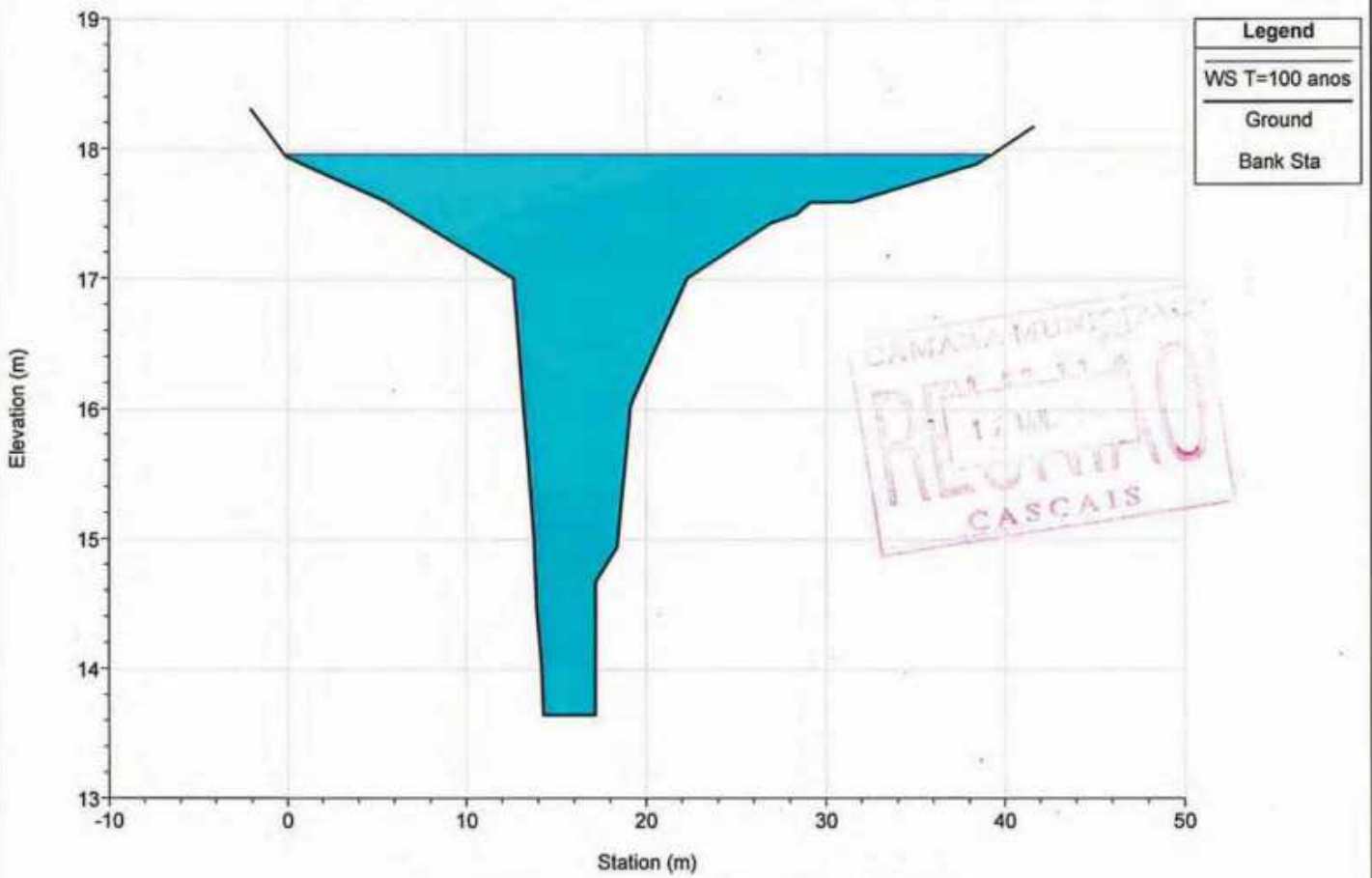
River = BICESSE Reach = jusante RS = 167.530



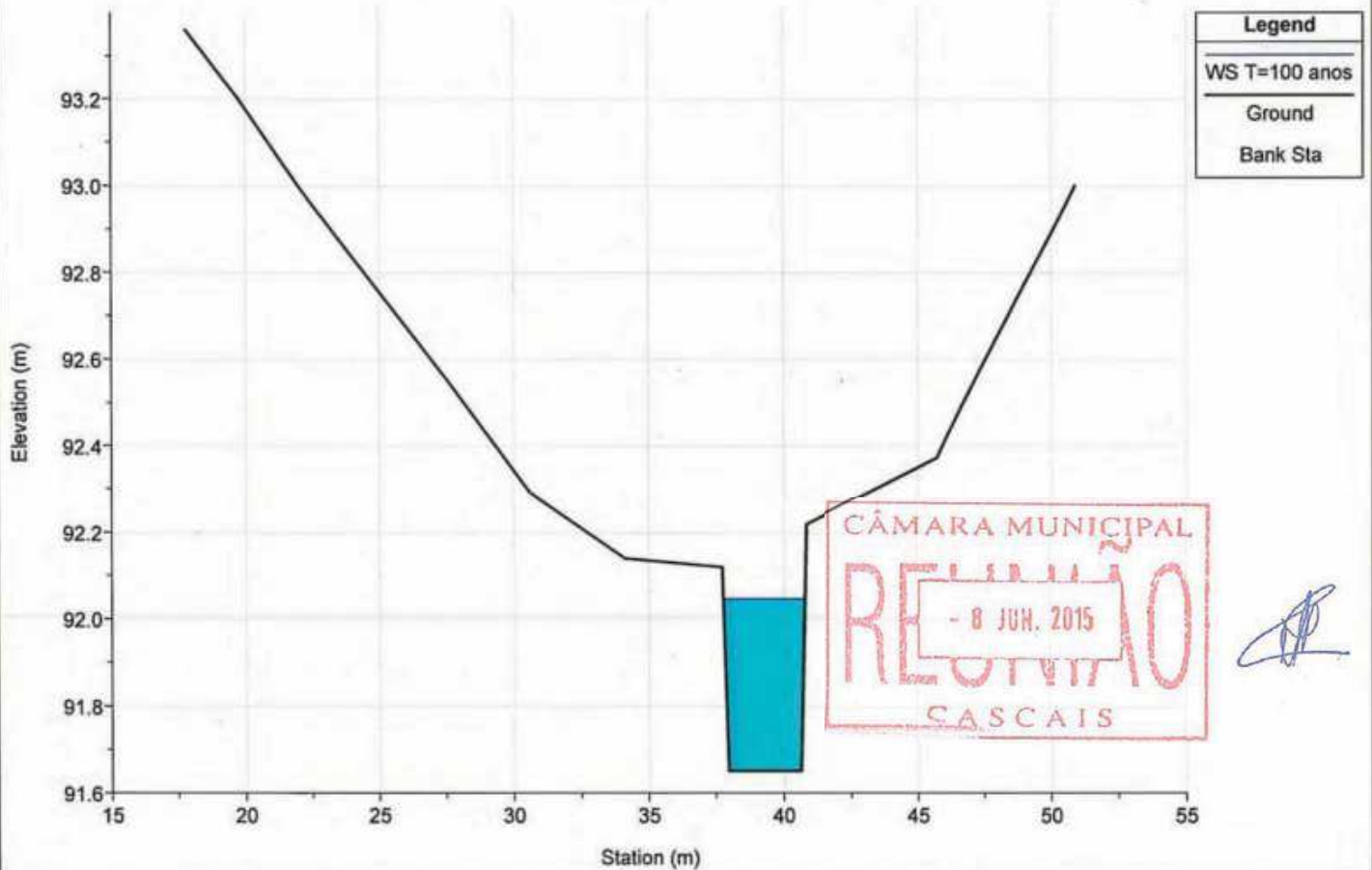
River = BICESSE Reach = jusante RS = 72.082



River = BICESSE Reach = jusante RS = 12.787

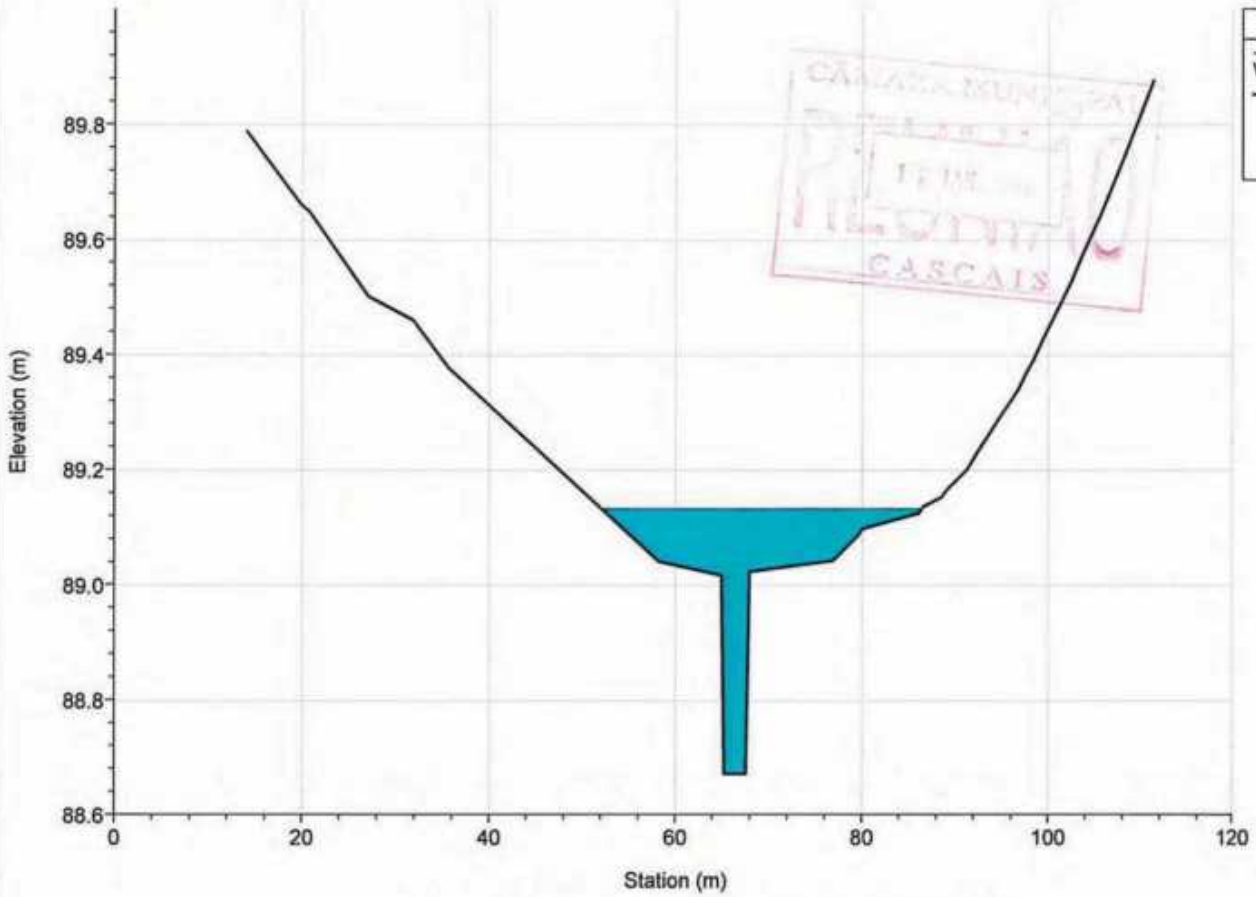


River = MD1 Reach = afluente RS = 245.431

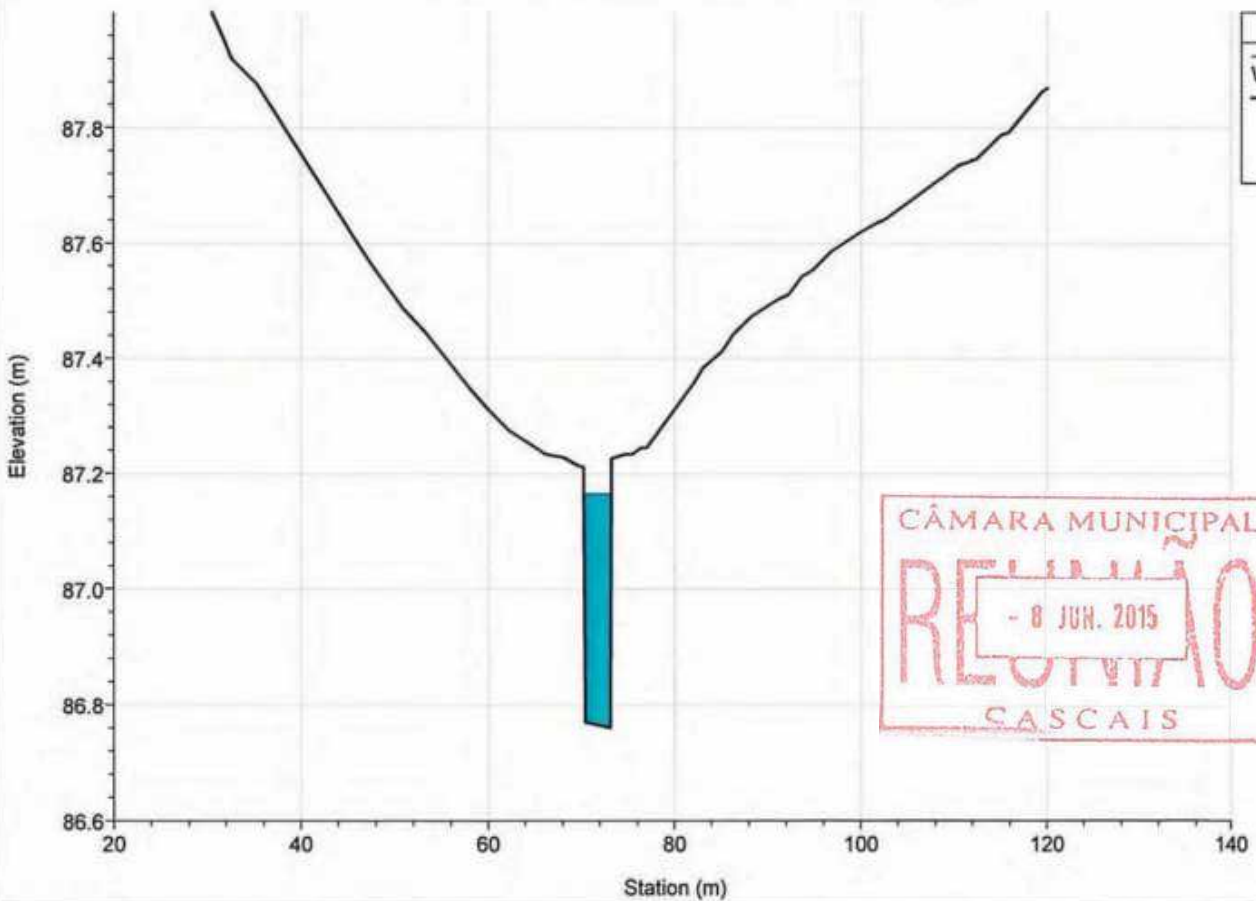




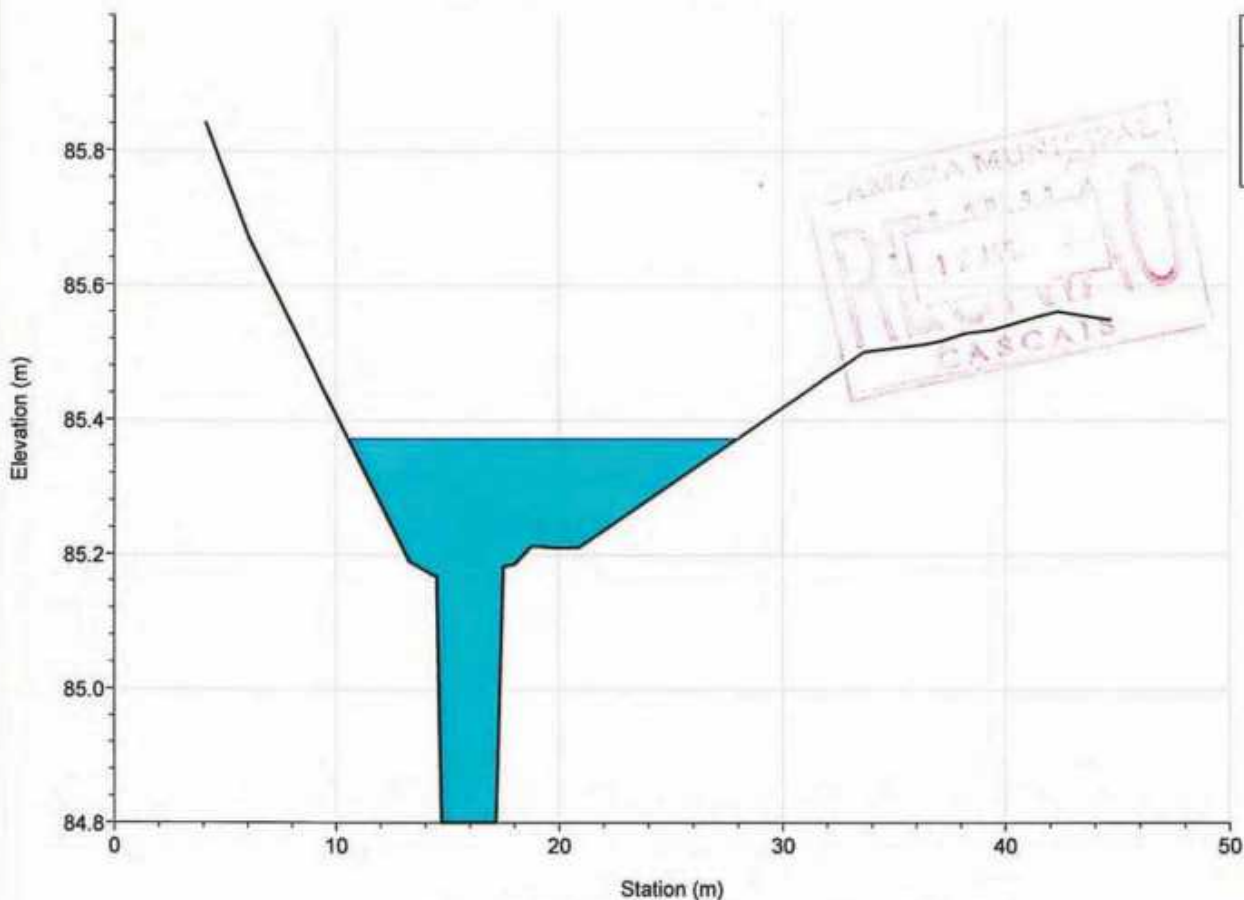
River = MD1 Reach = afluente RS = 145.277



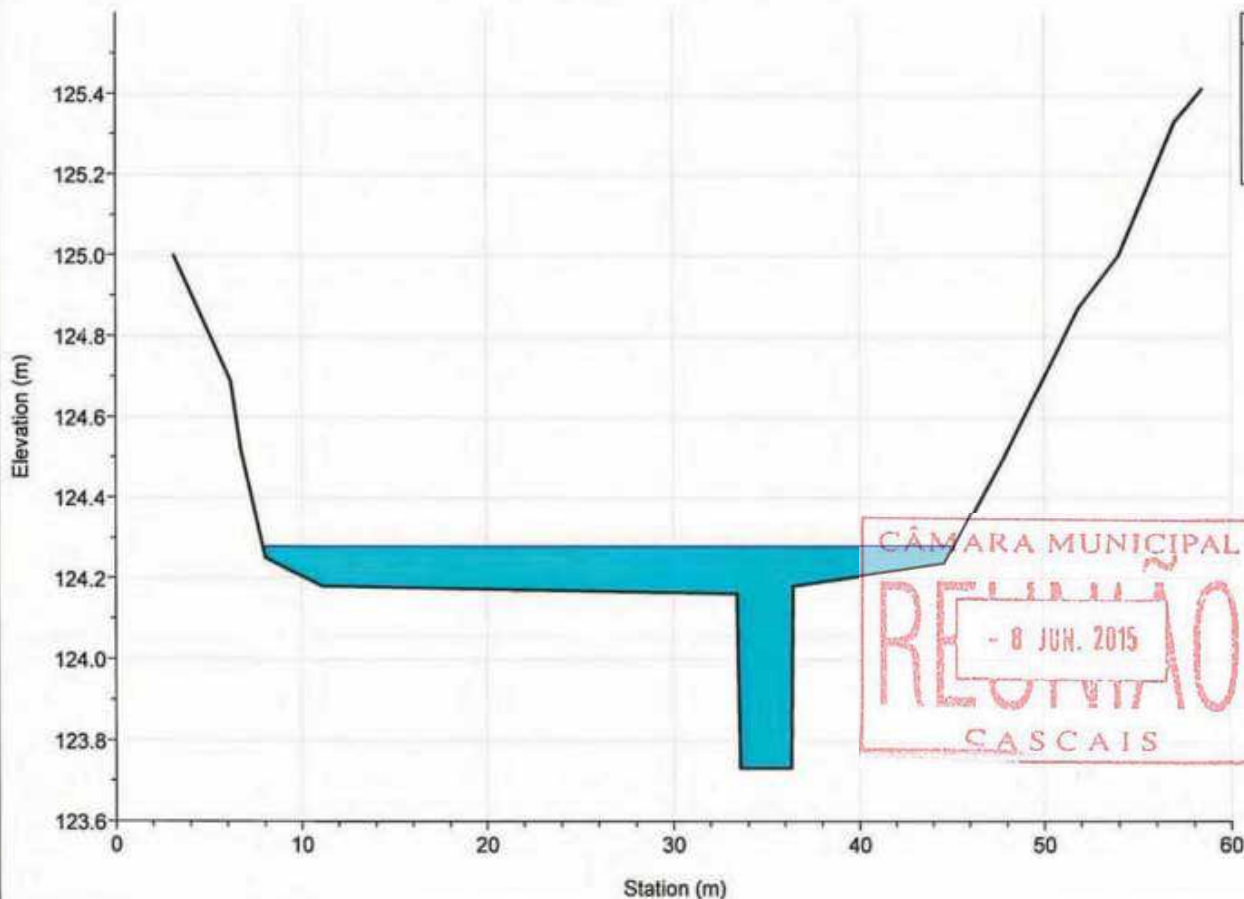
River = MD1 Reach = afluente RS = 74.075



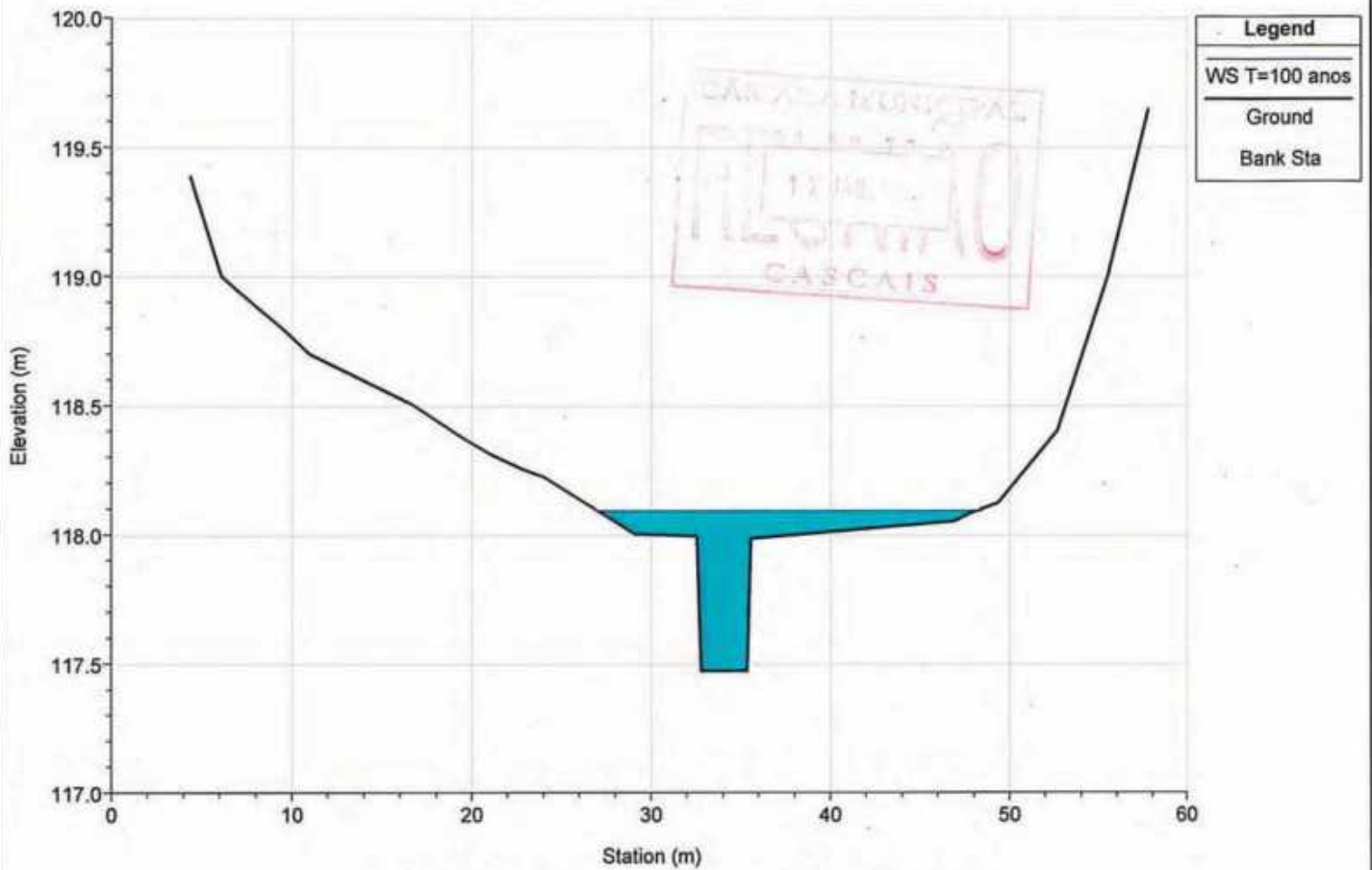
River = MD1 Reach = afluyente RS = 23.156



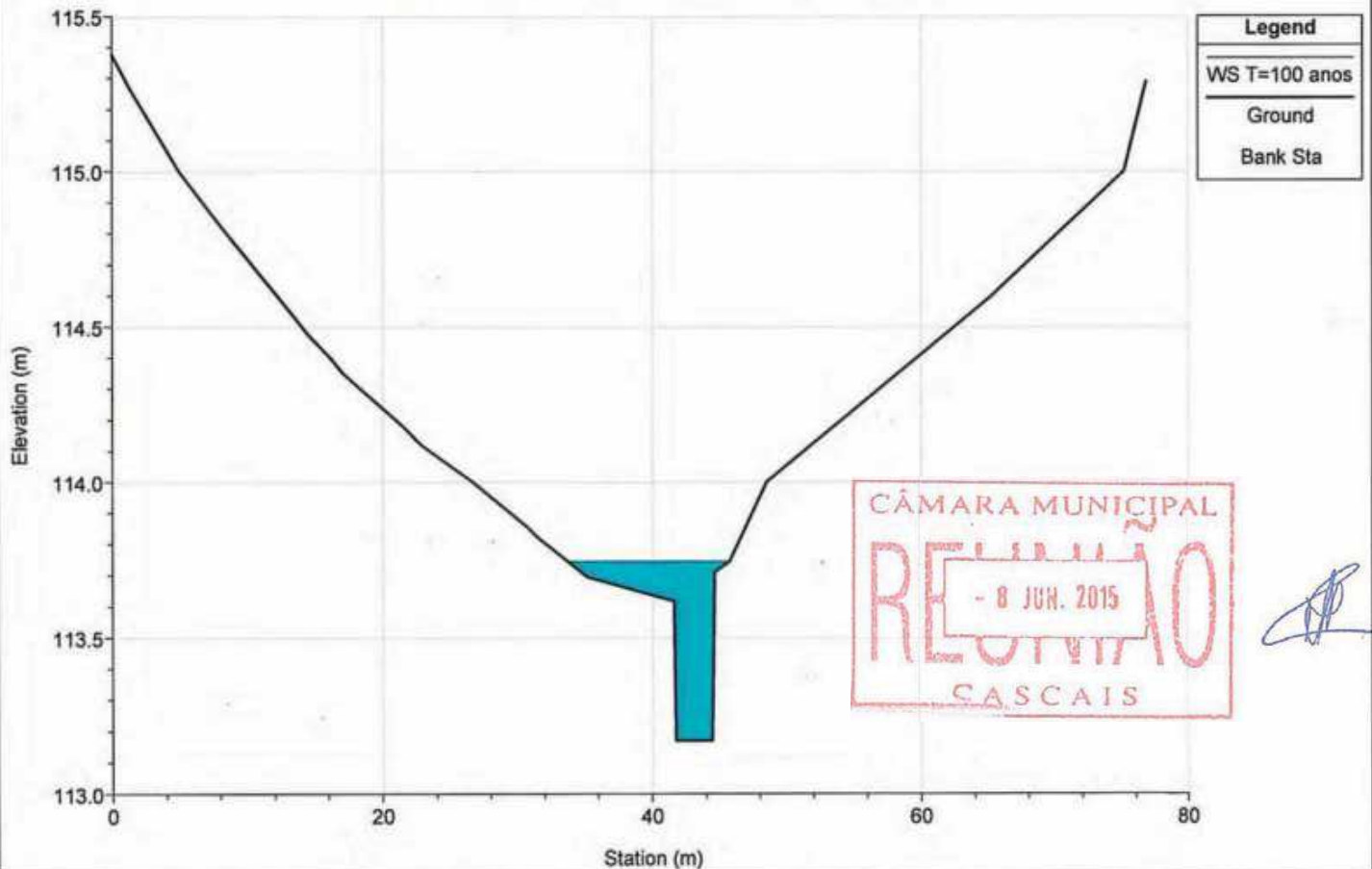
River = ME1 Reach = afluyente RS = 1408.799

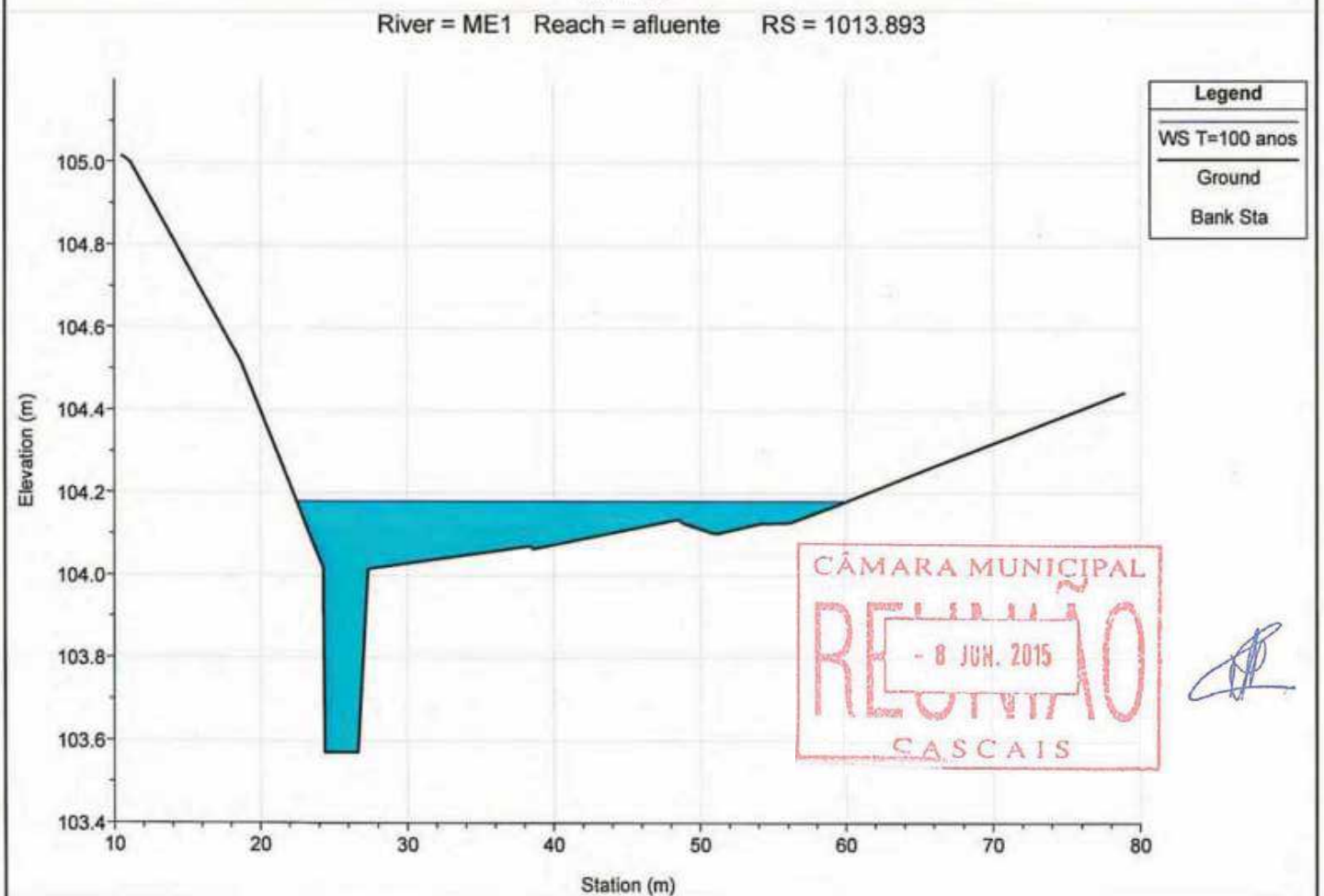
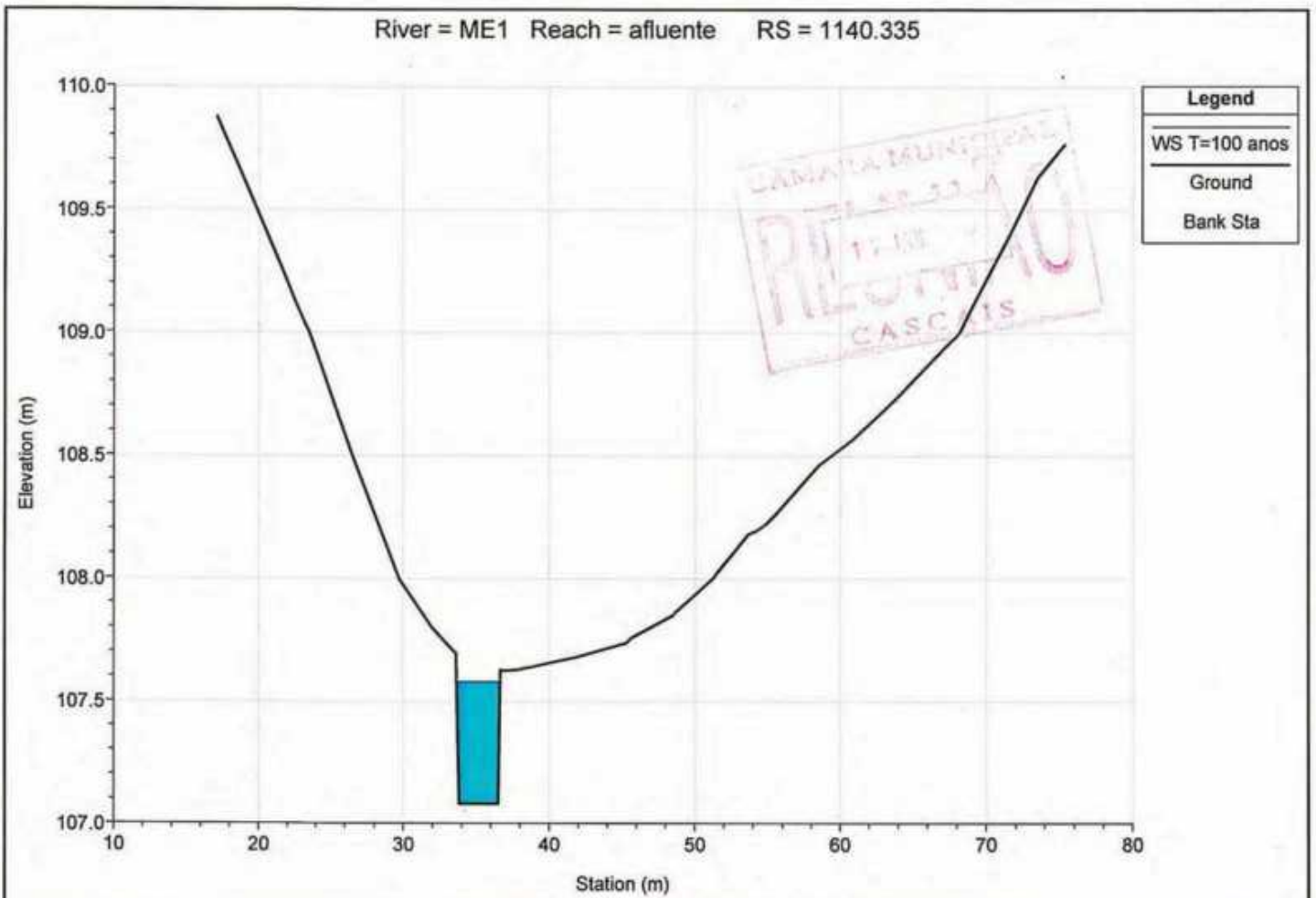


River = ME1 Reach = afluente RS = 1318.093

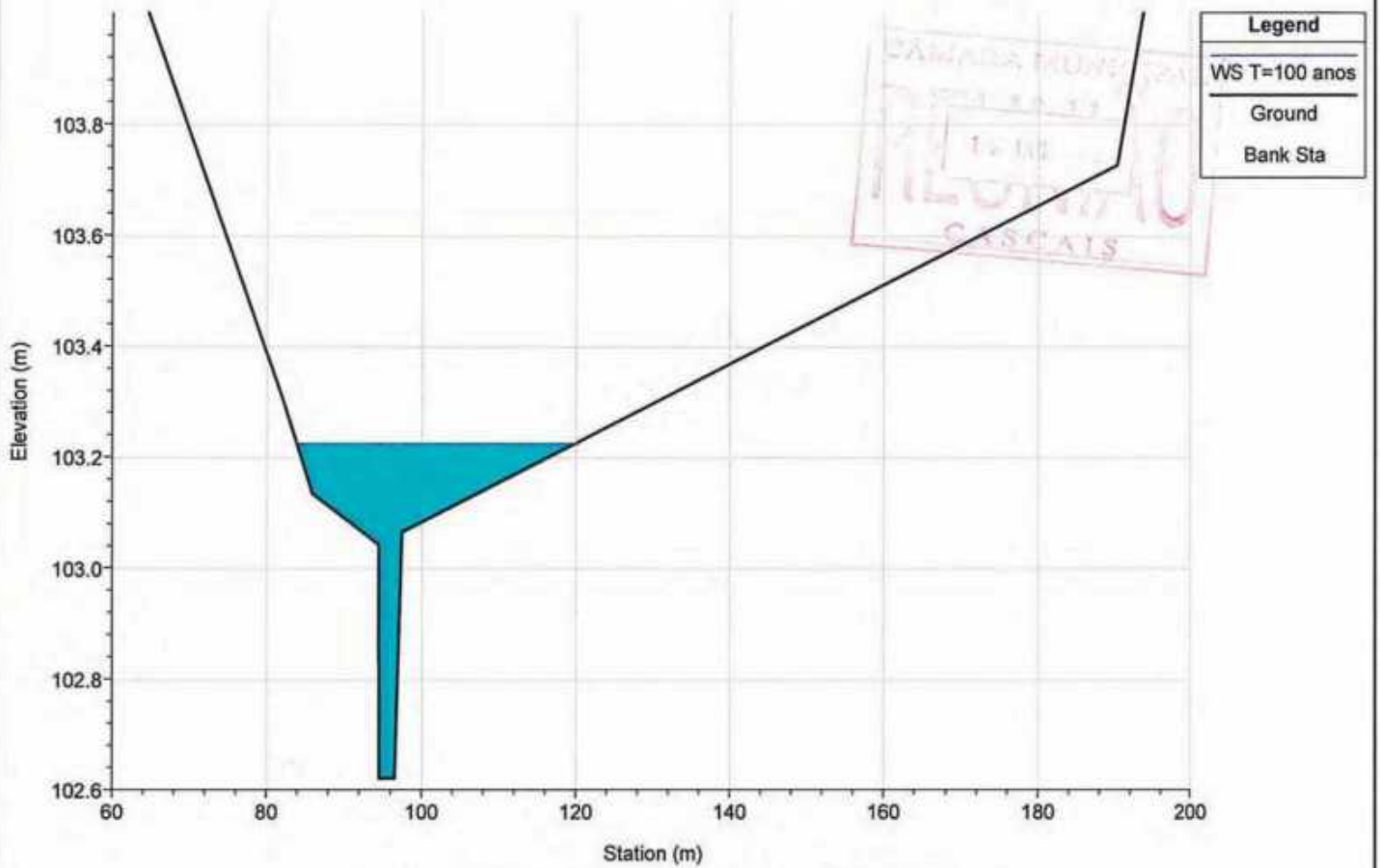


River = ME1 Reach = afluente RS = 1236.116

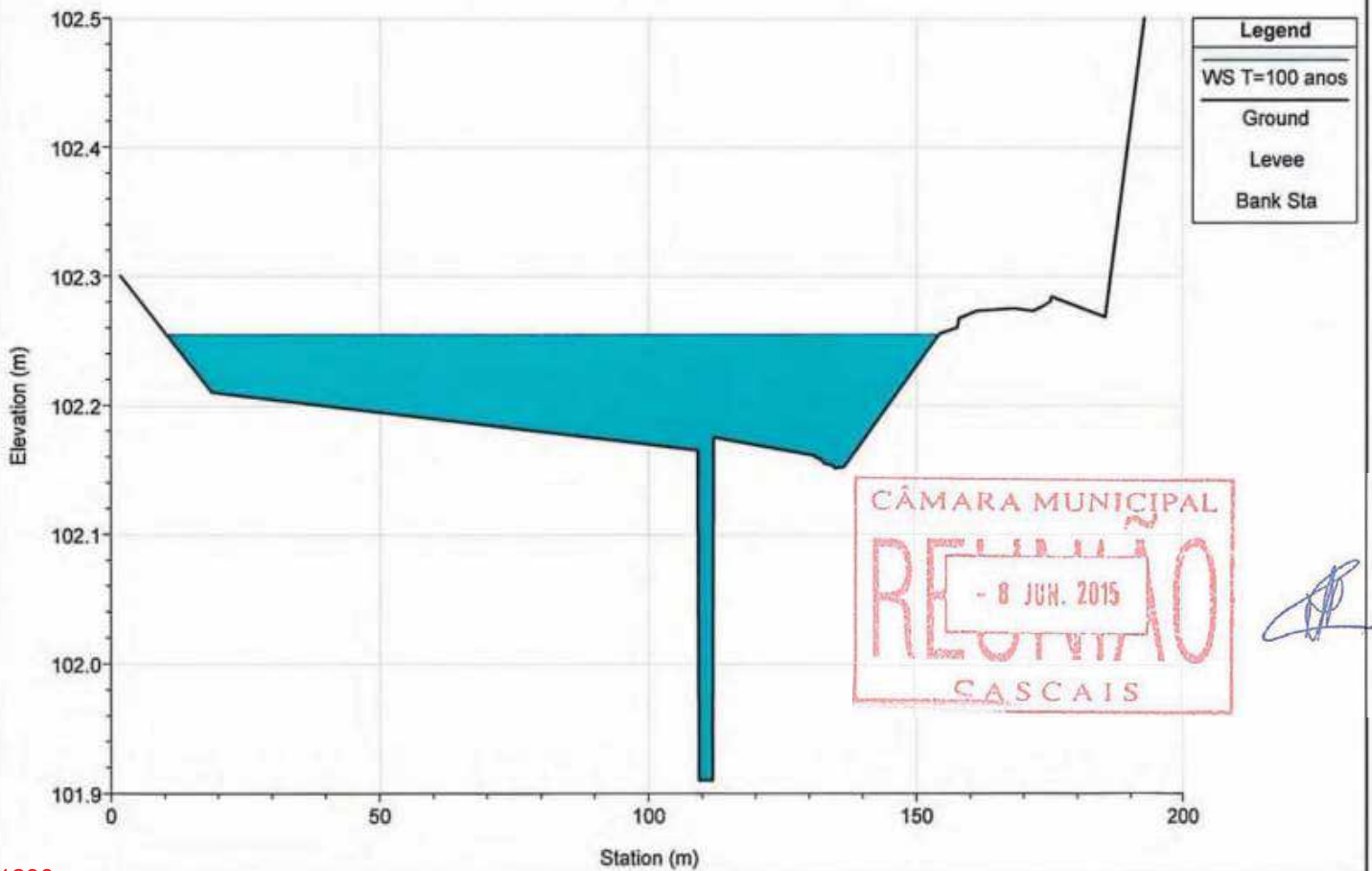


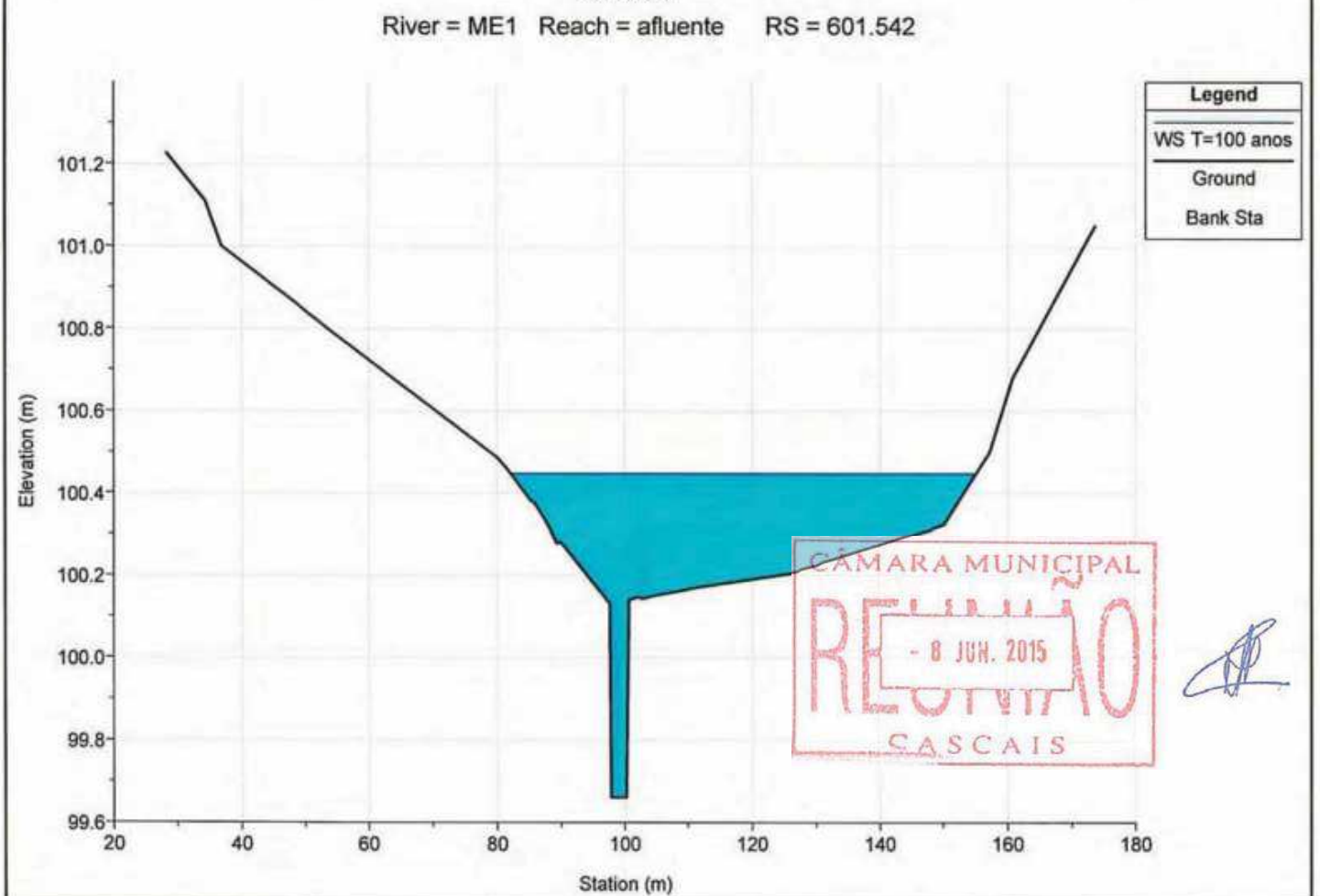
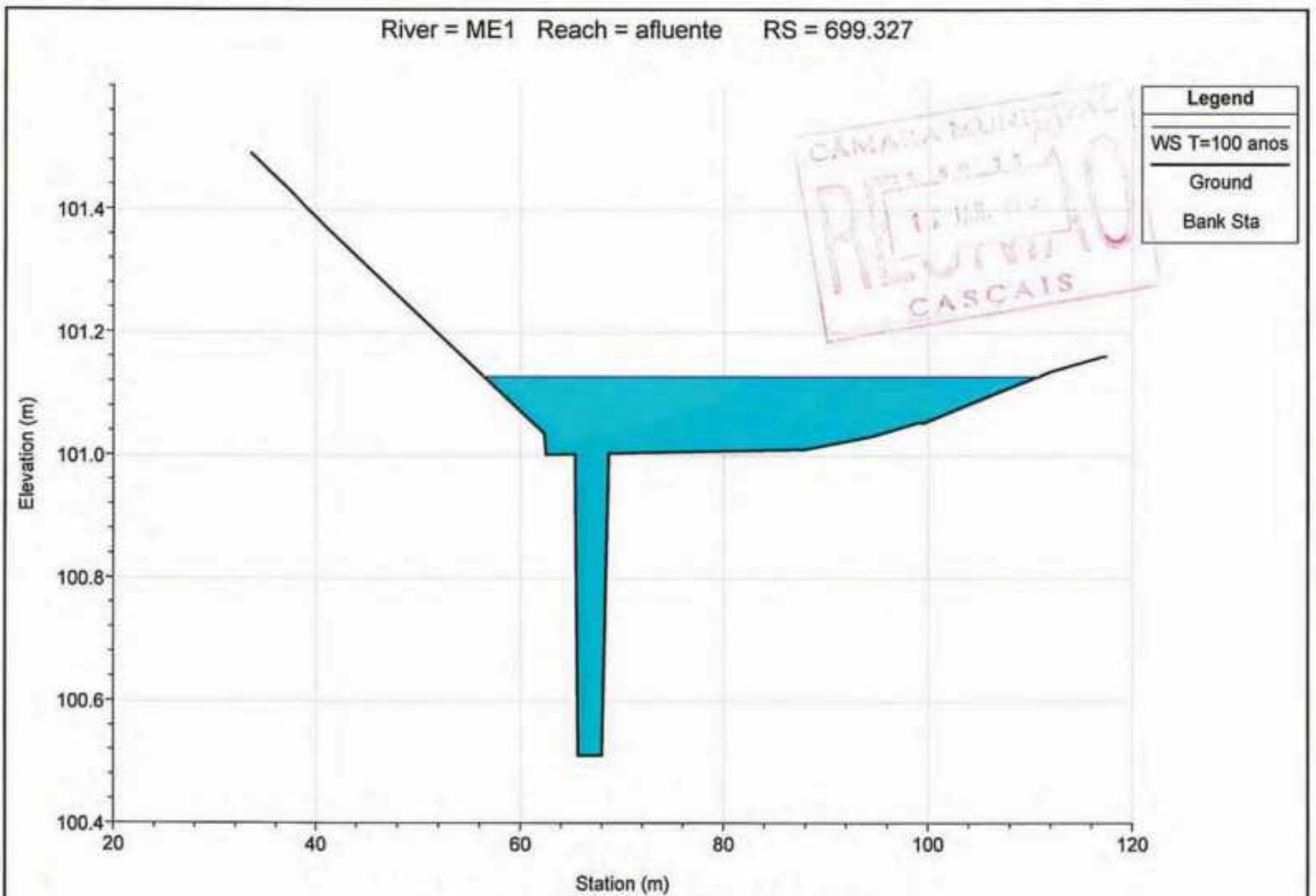


River = ME1 Reach = afluente RS = 919.677

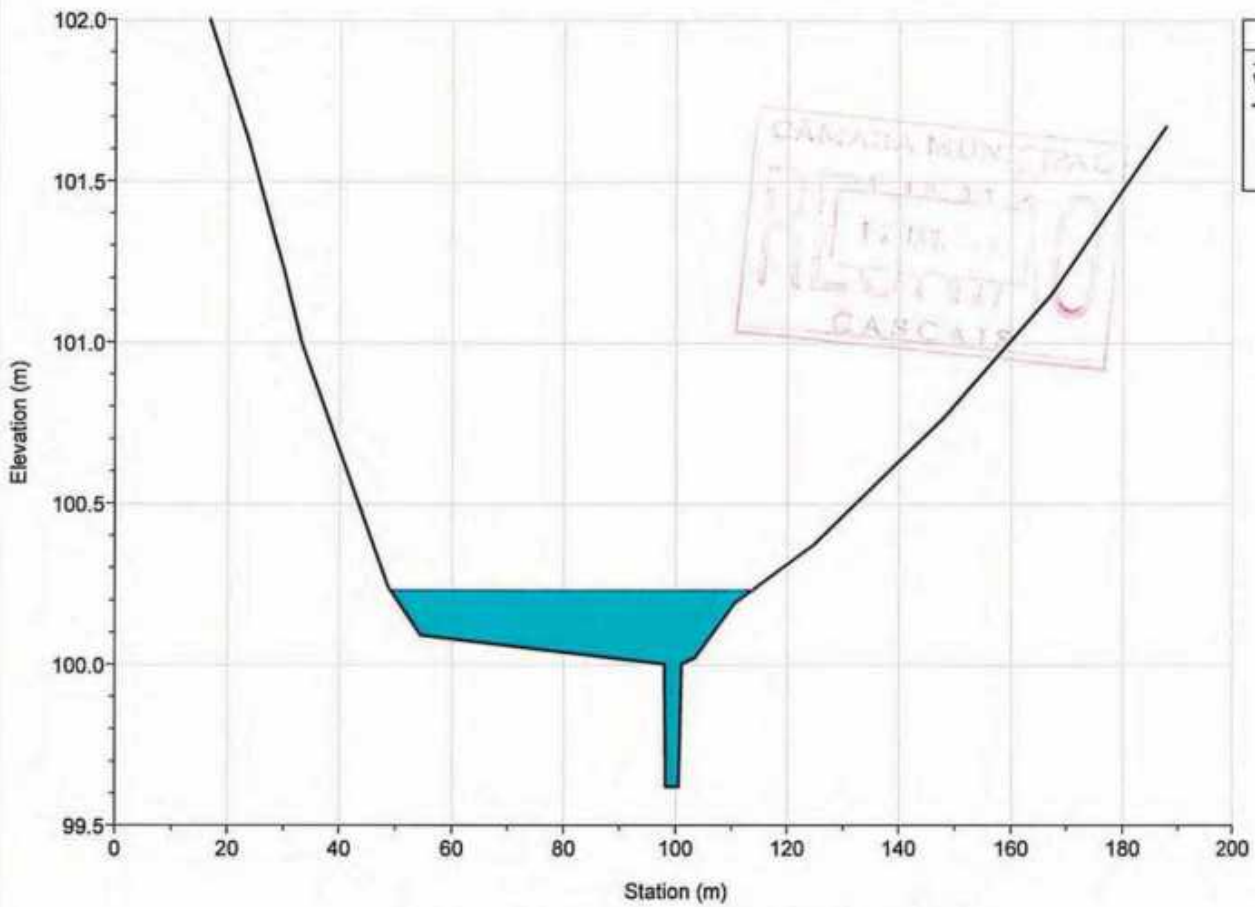


River = ME1 Reach = afluente RS = 832.624

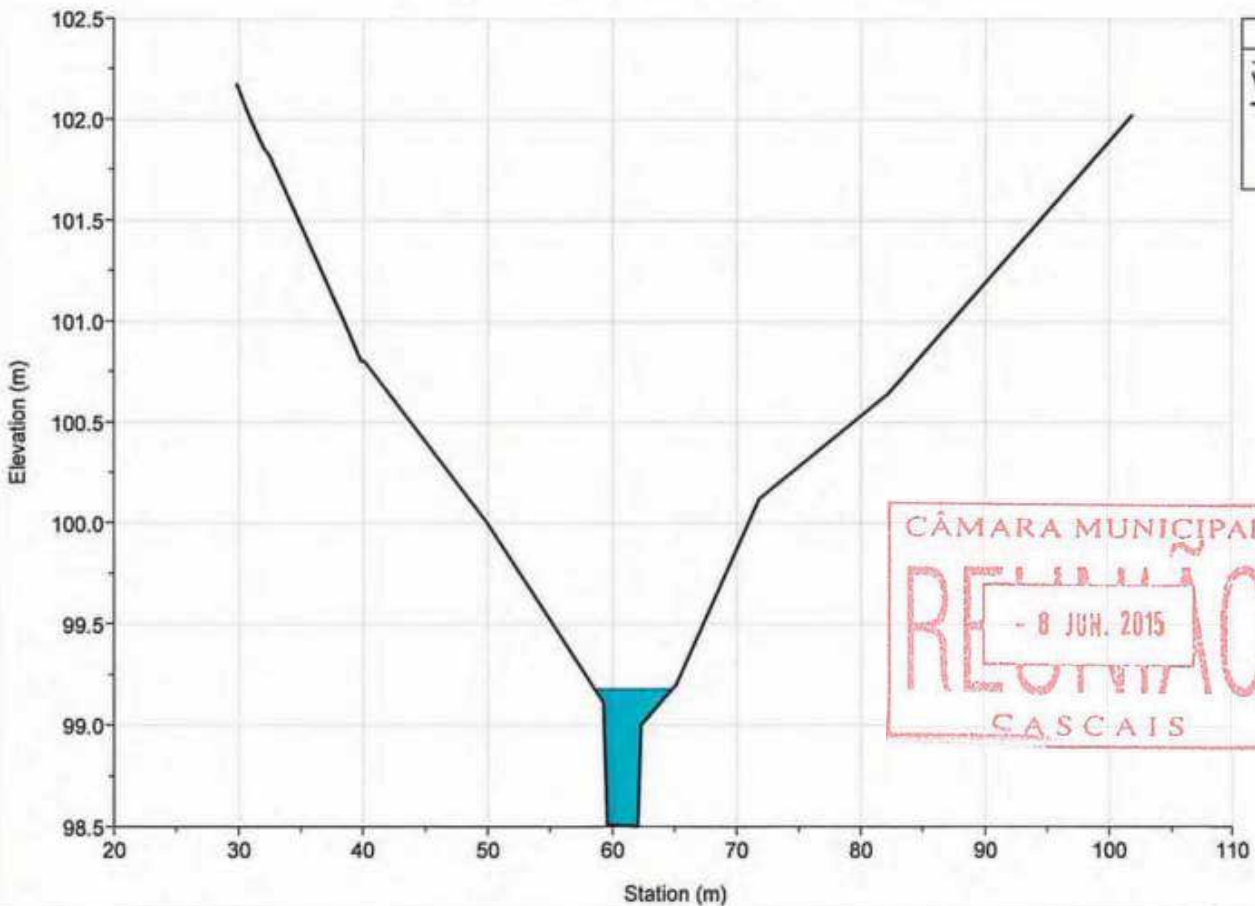




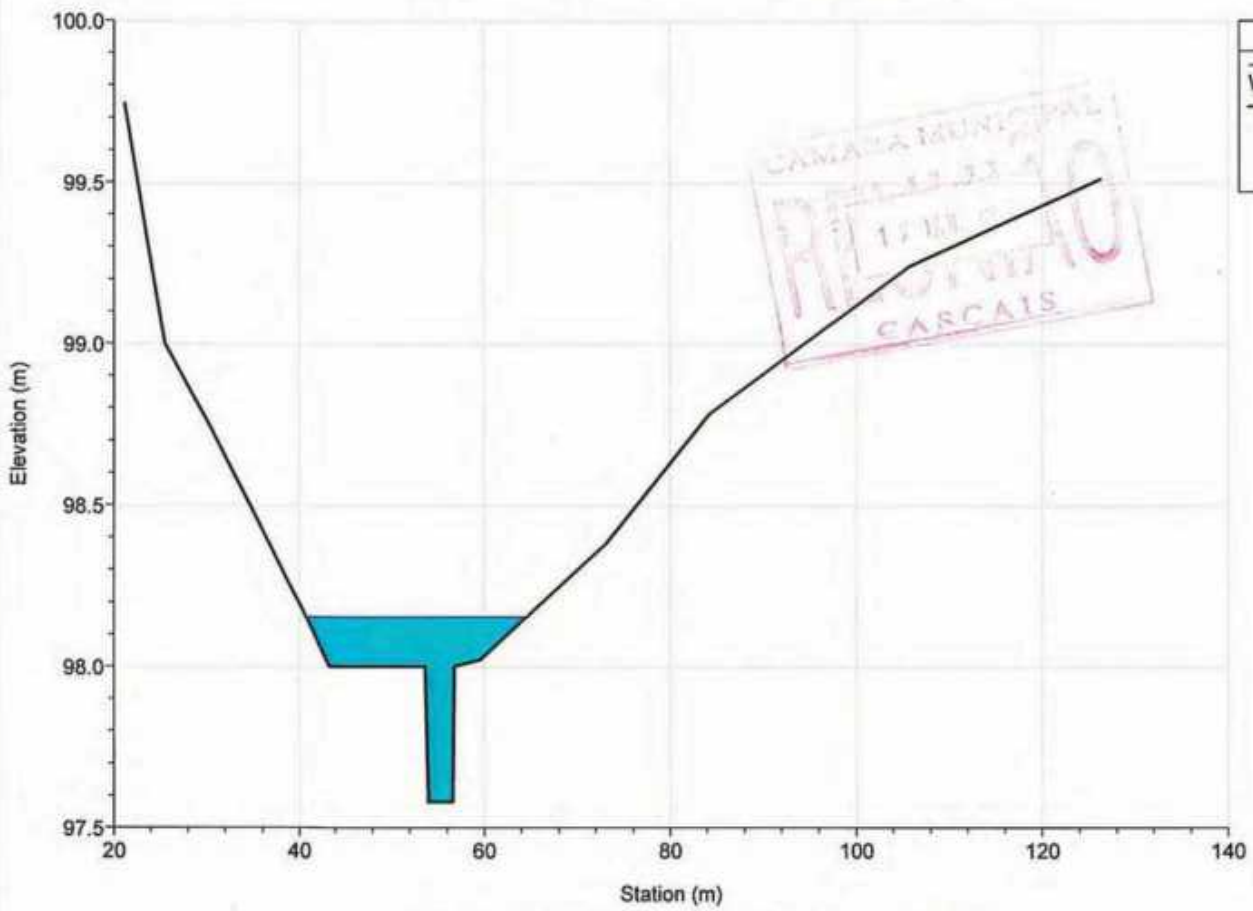
River = ME1 Reach = afluente RS = 438.207



River = ME1 Reach = afluente RS = 233.347

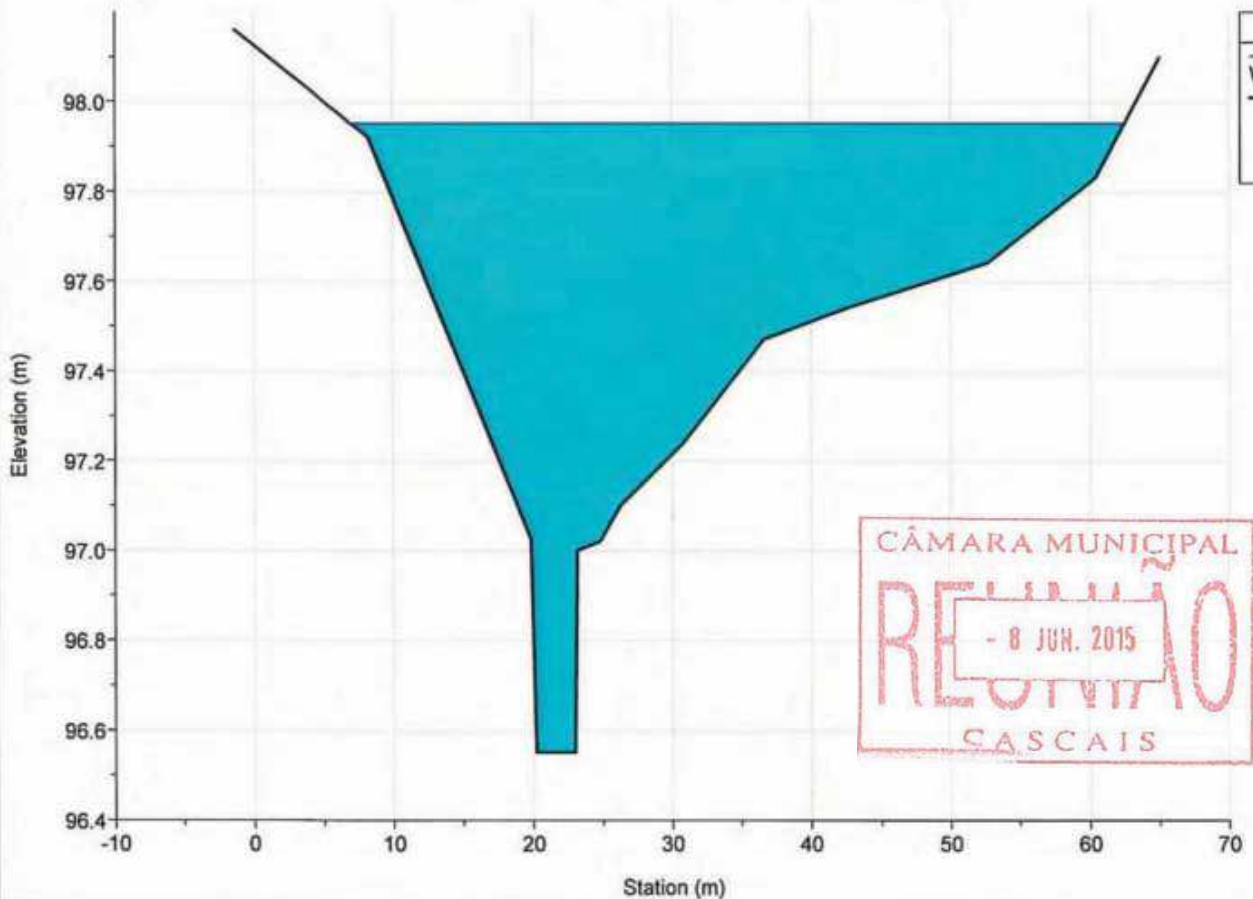


River = ME1 Reach = afluente RS = 123.688



Legend
WS T=100 anos
Ground
Bank Sta

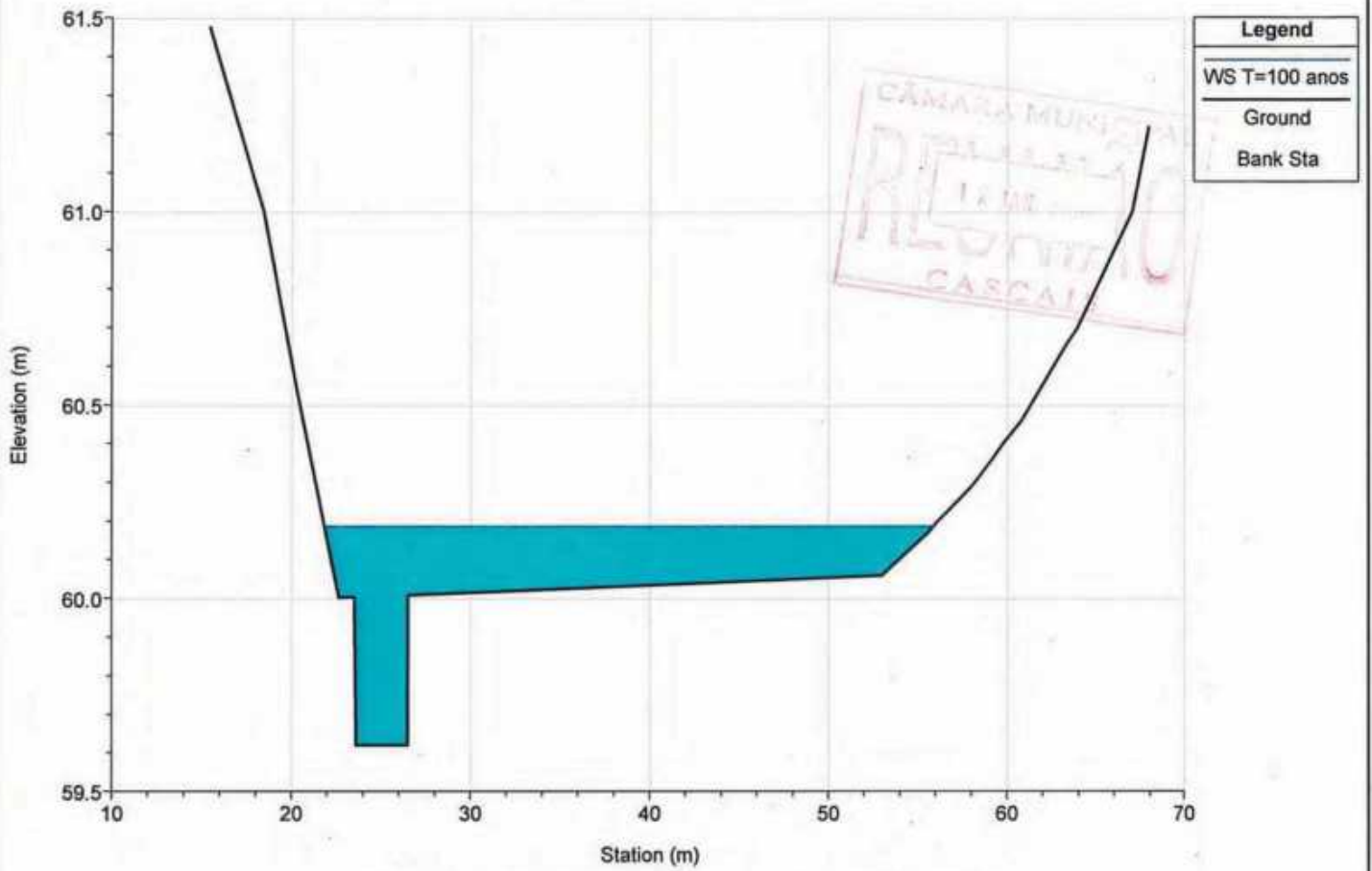
River = ME1 Reach = afluente RS = 21.639



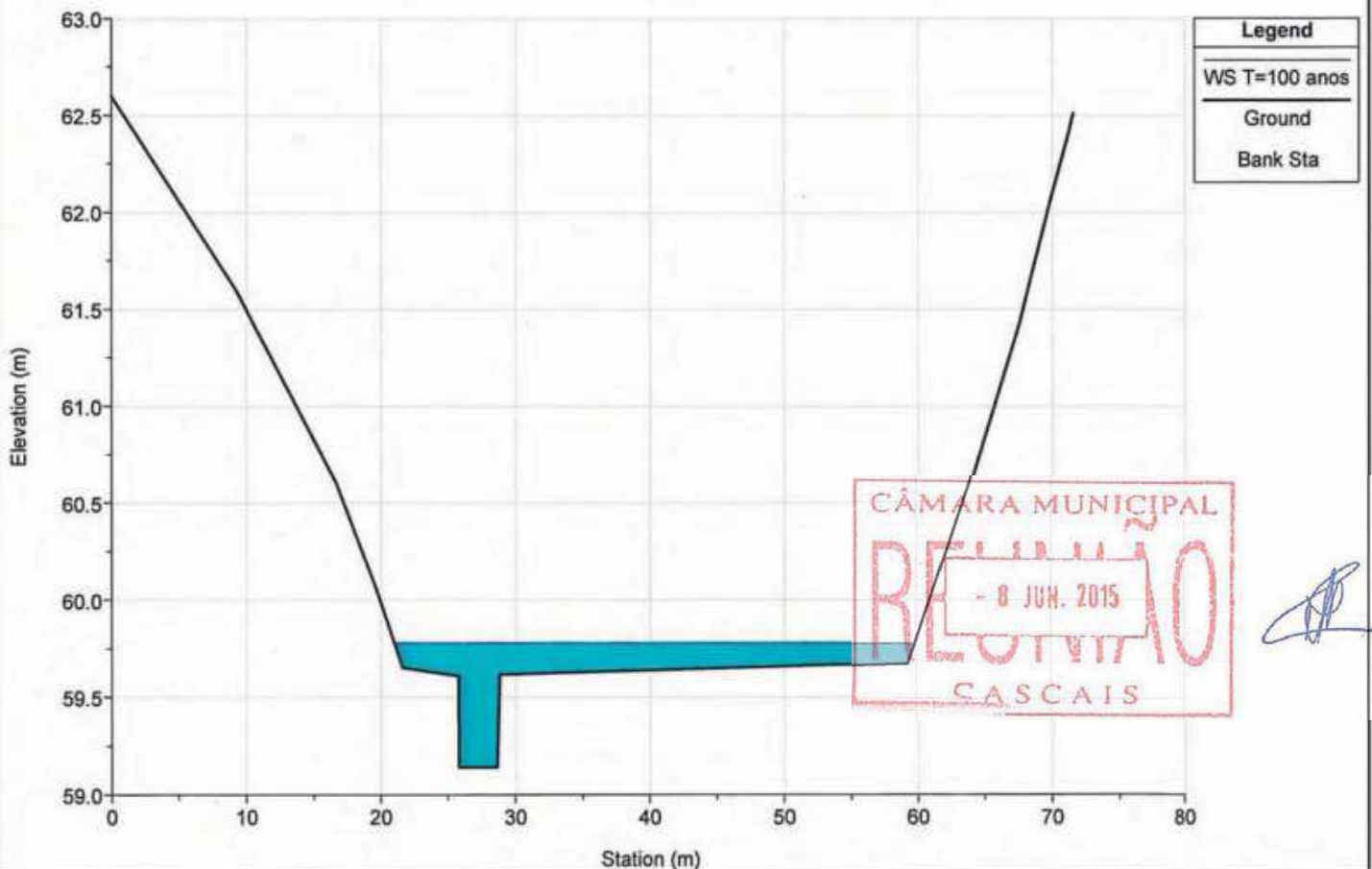
Legend
WS T=100 anos
Ground
Bank Sta



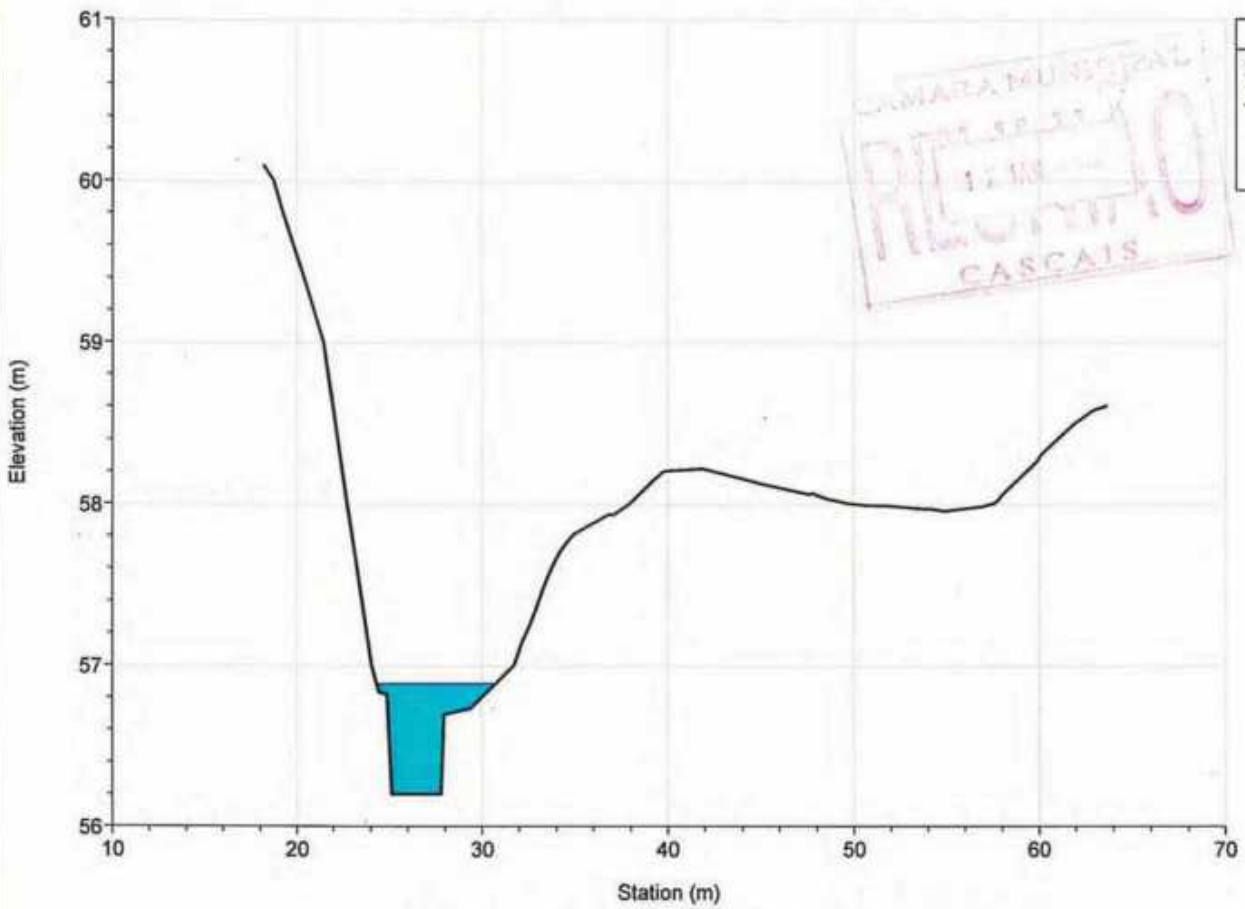
River = ME2 Reach = afluente RS = 1613.038



River = ME2 Reach = afluente RS = 1593.135

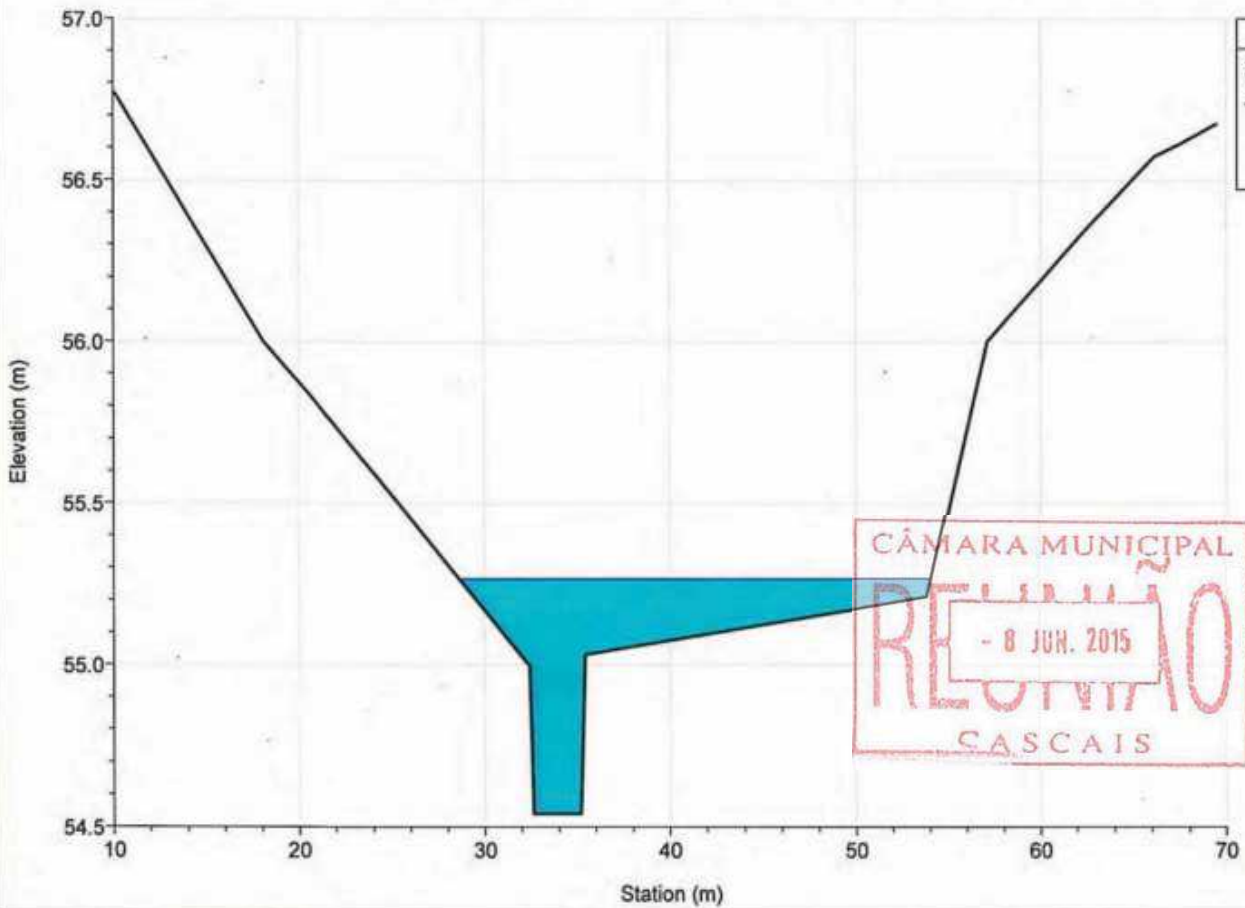


River = ME2 Reach = afluente RS = 1509.130



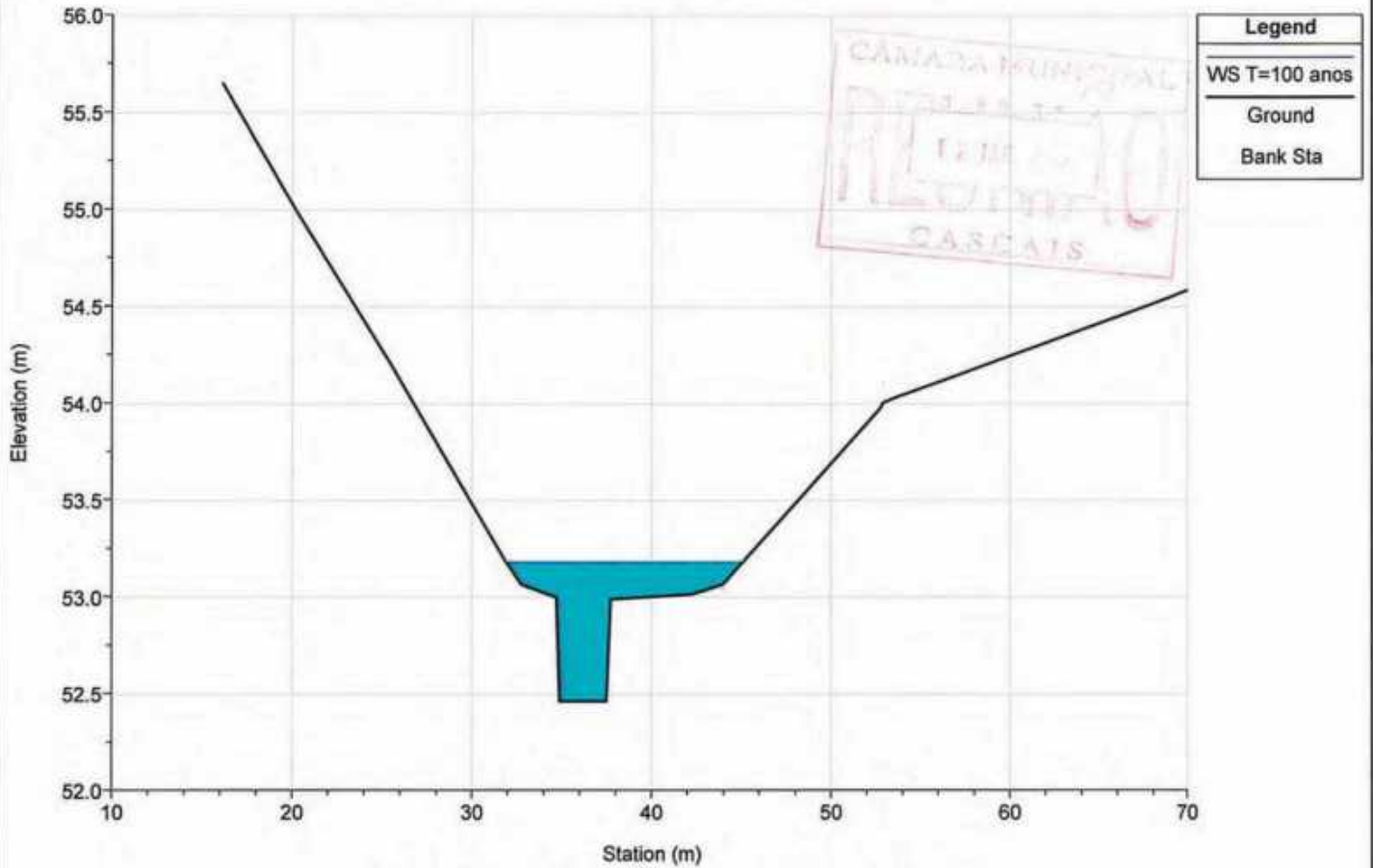
Legend
WS T=100 anos
Ground
Bank Sta

River = ME2 Reach = afluente RS = 1392.379

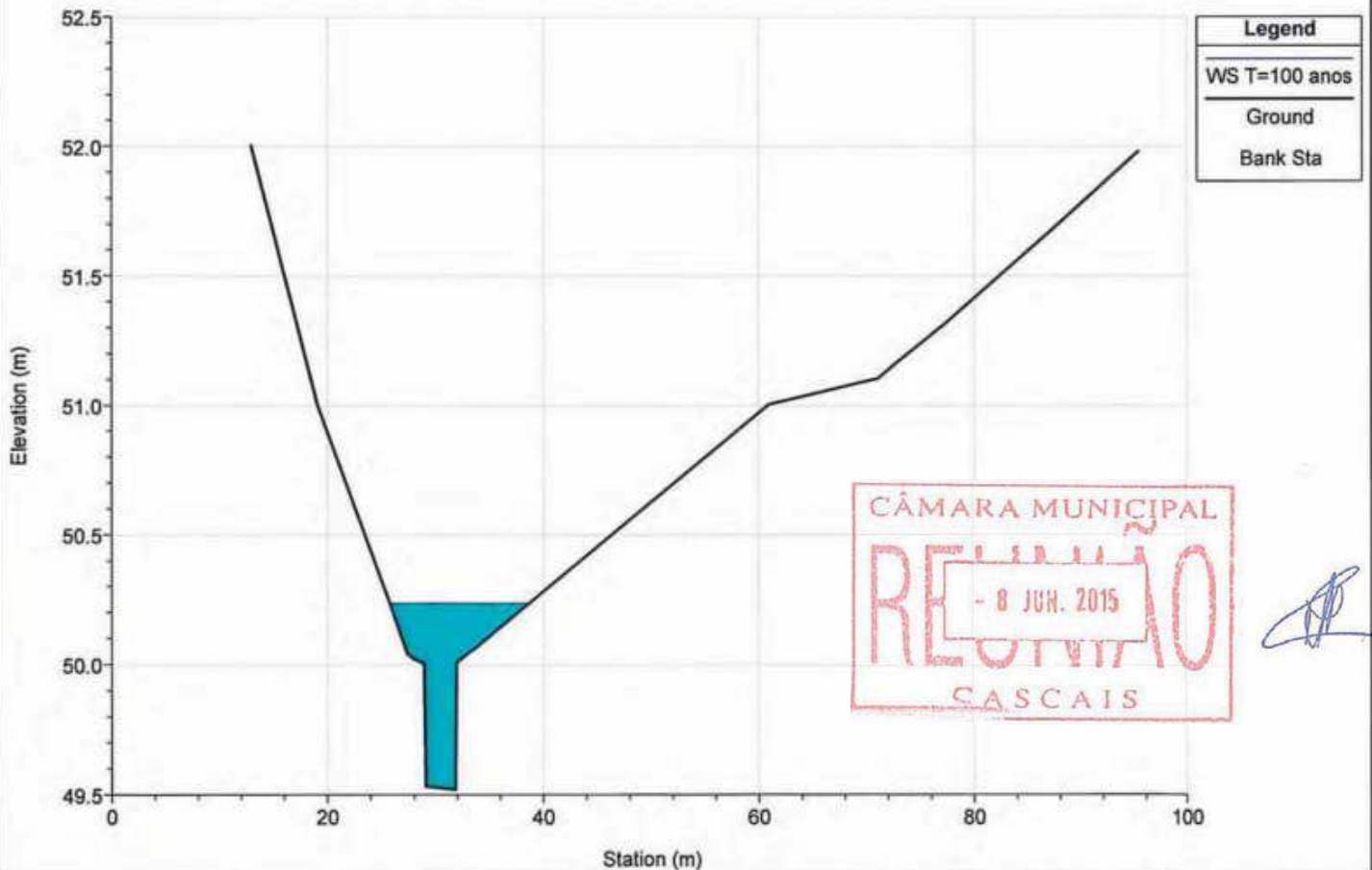


Legend
WS T=100 anos
Ground
Bank Sta

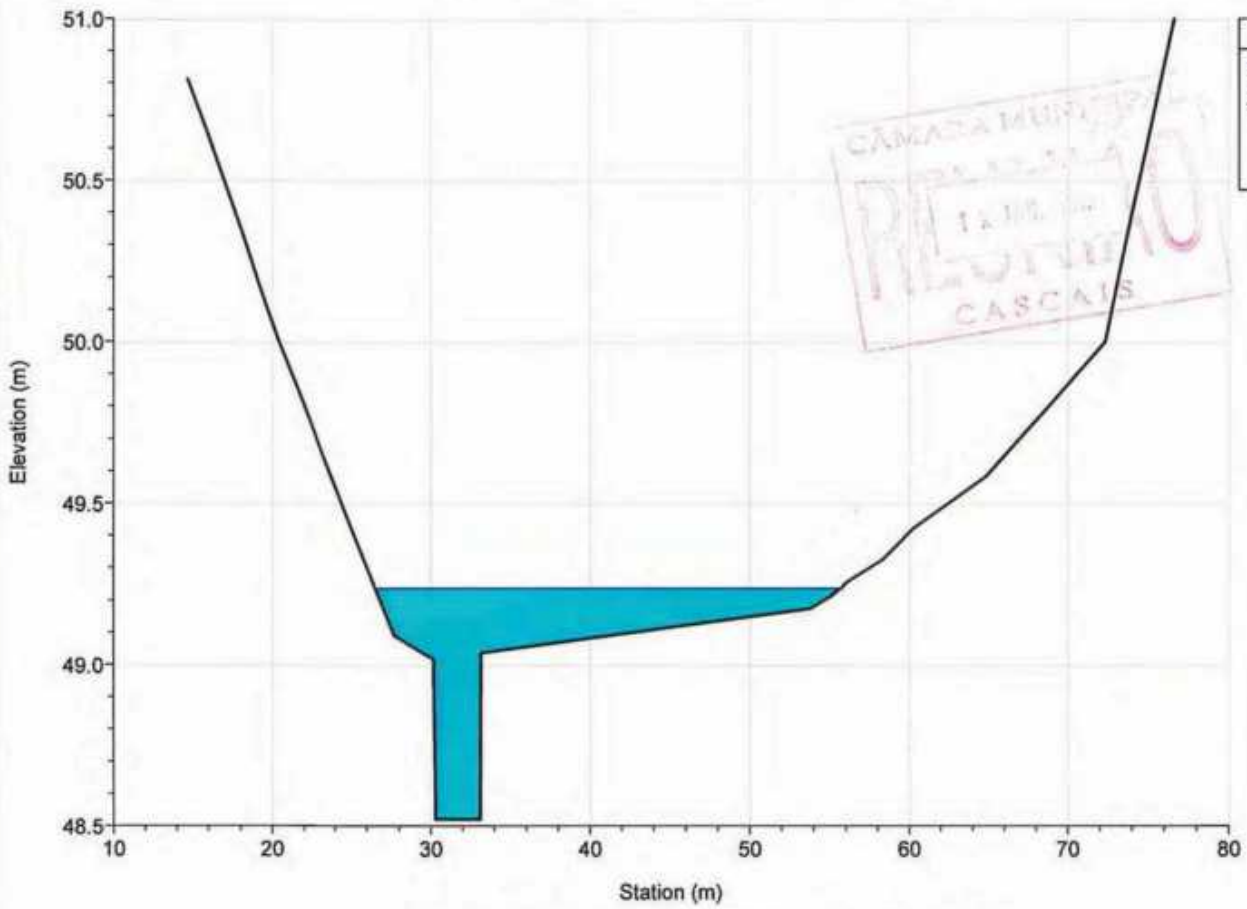
River = ME2 Reach = afluyente RS = 1314.148



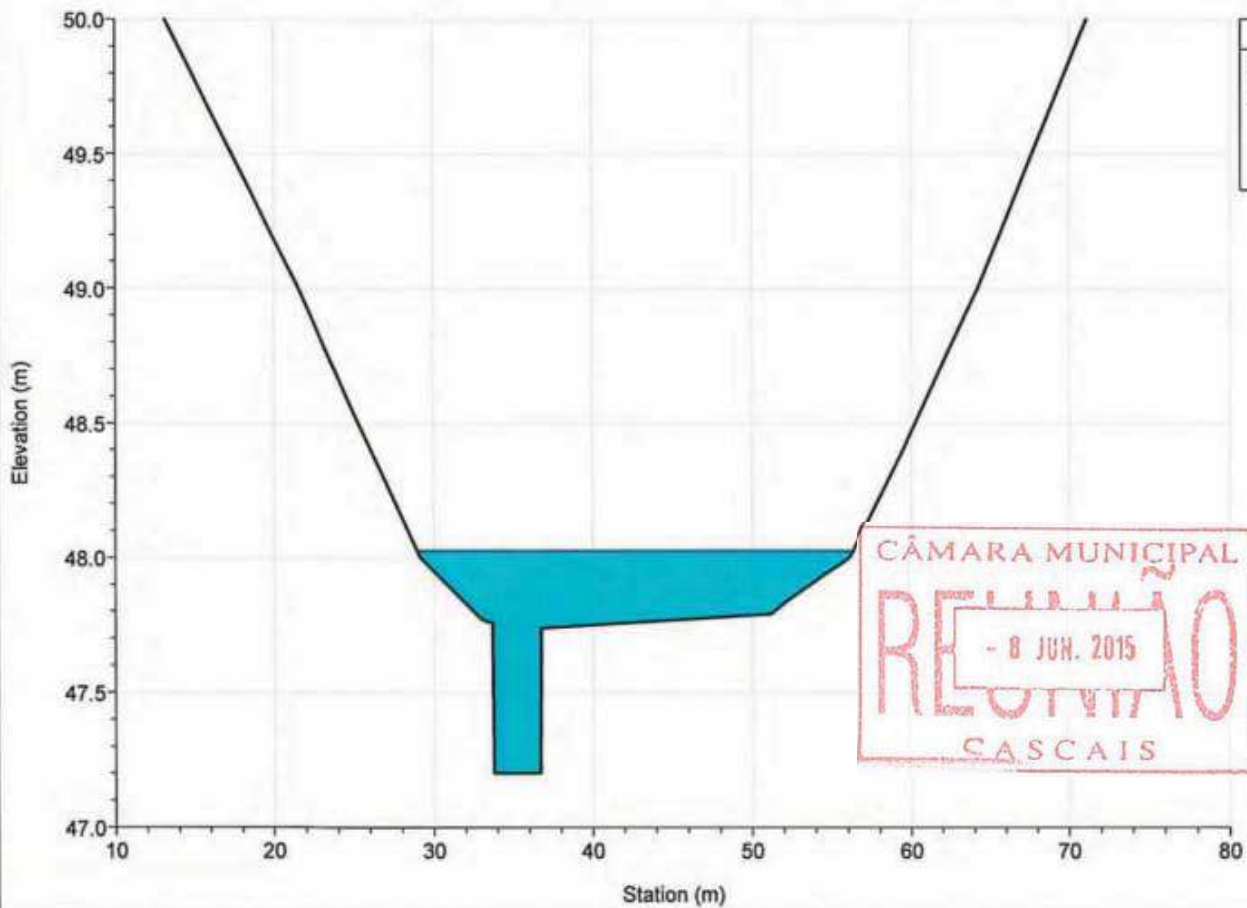
River = ME2 Reach = afluyente RS = 1209.786



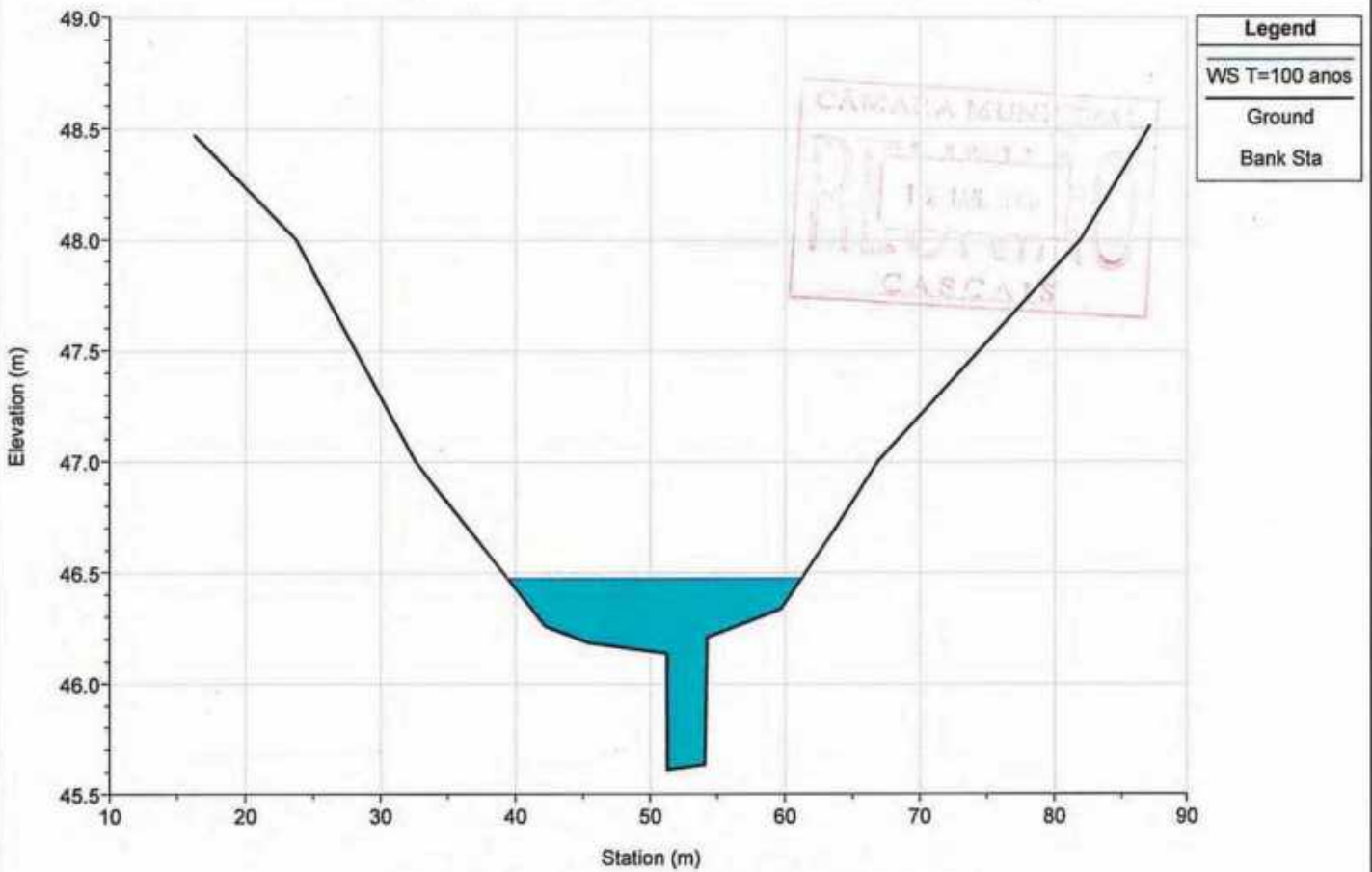
River = ME2 Reach = afluente RS = 1135.686



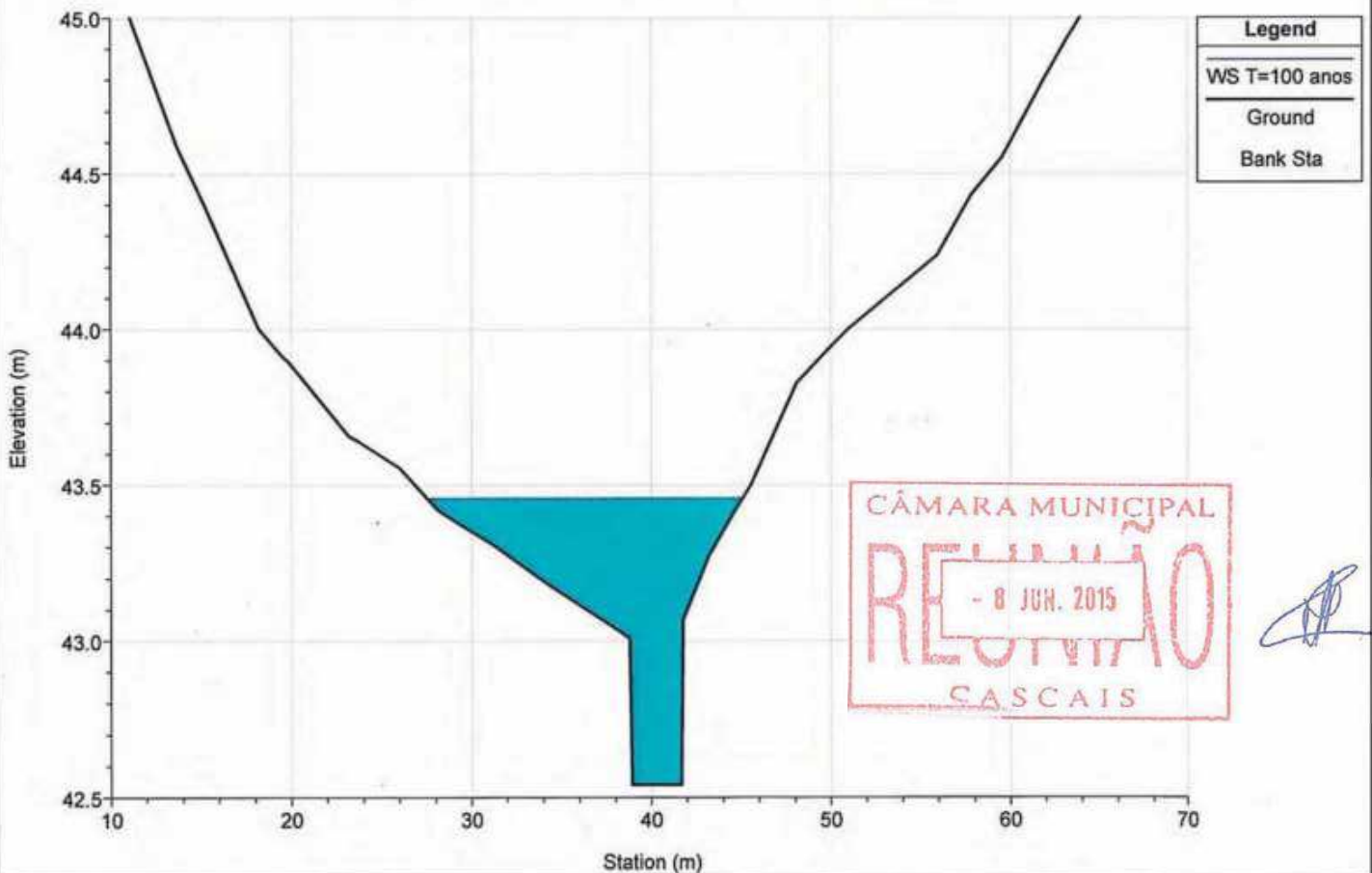
River = ME2 Reach = afluente RS = 1056.015



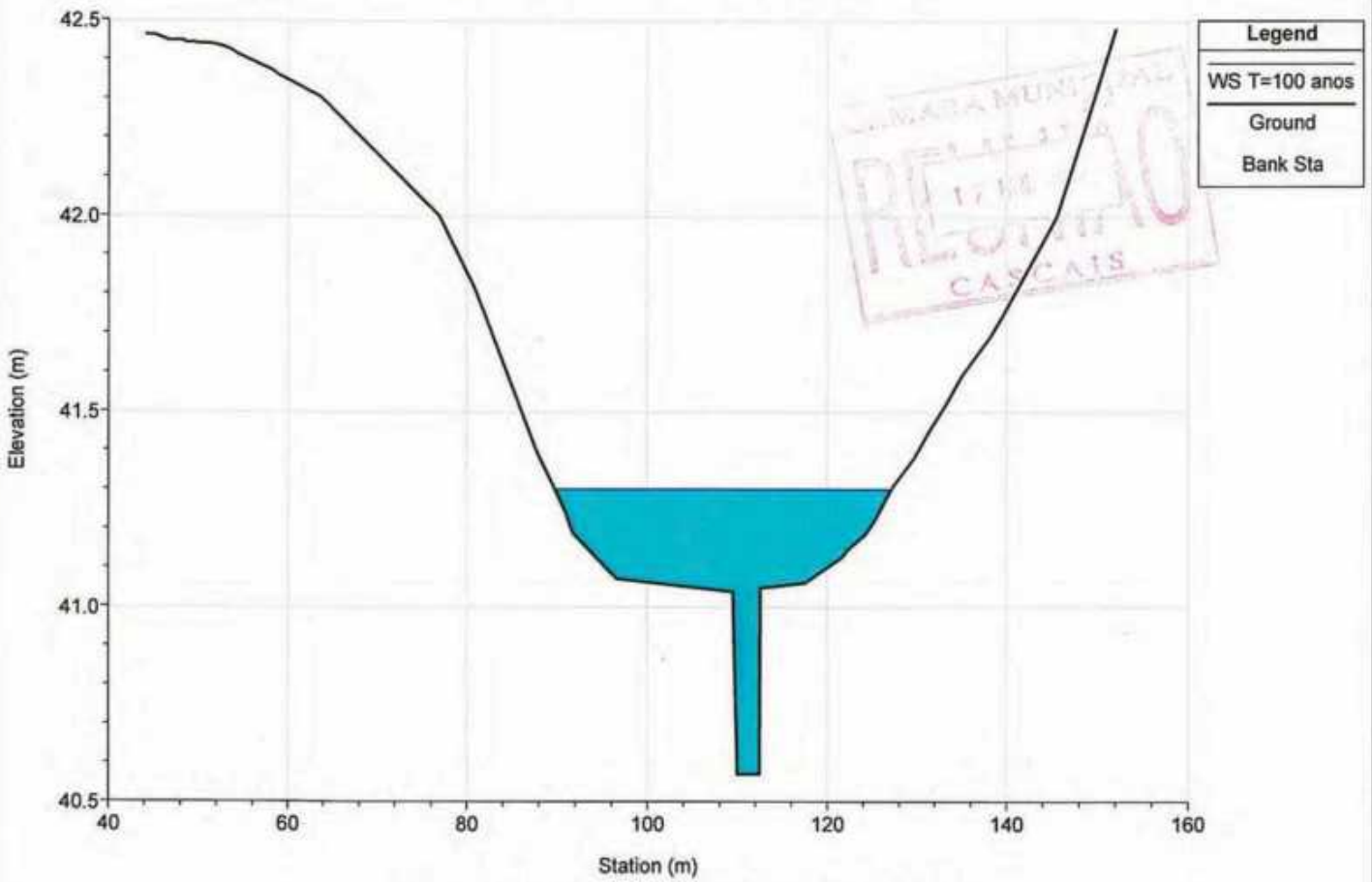
River = ME2 Reach = afluente RS = 952.608



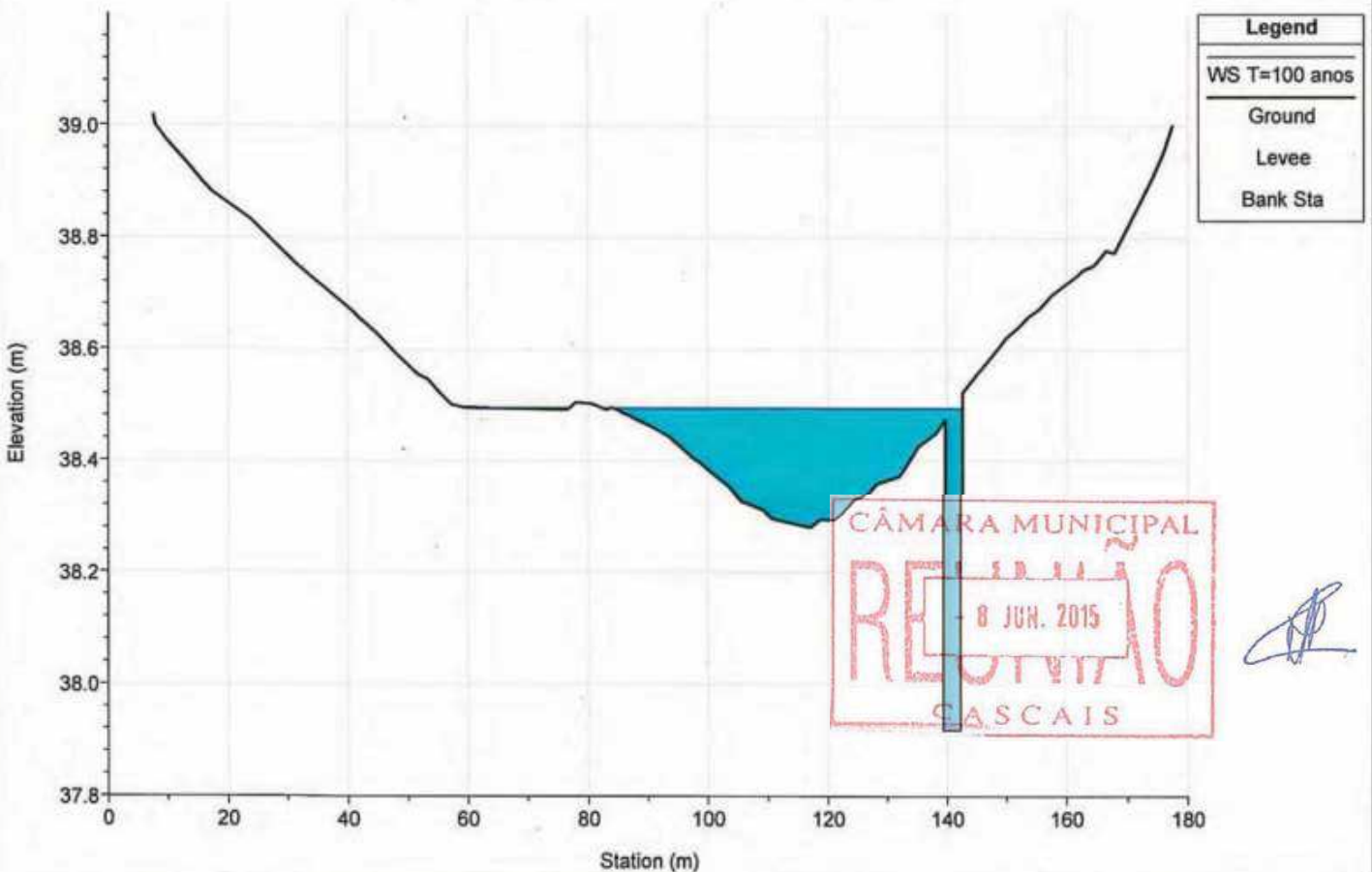
River = ME2 Reach = afluente RS = 838.992



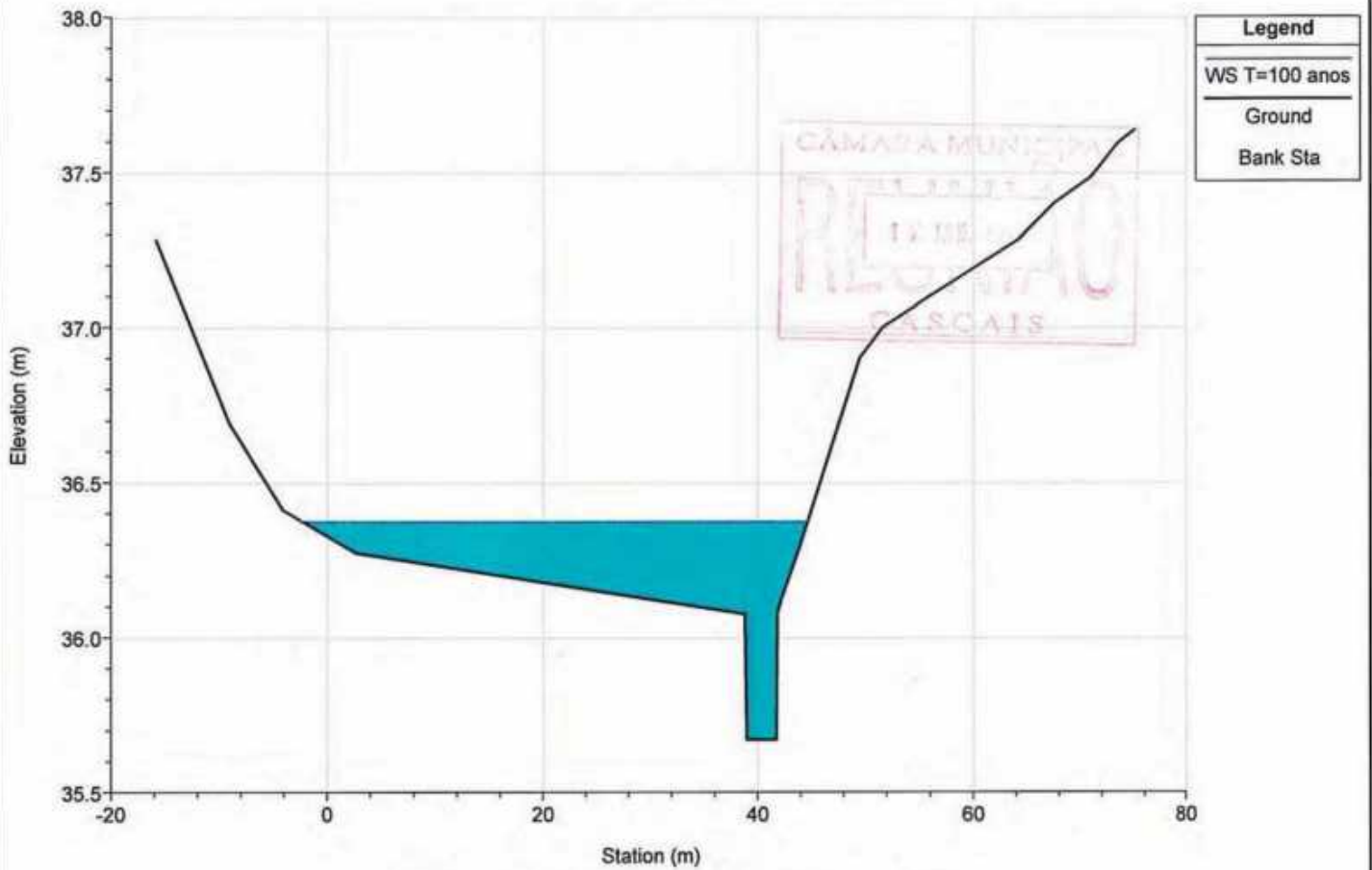
River = ME2 Reach = afluente RS = 710.274



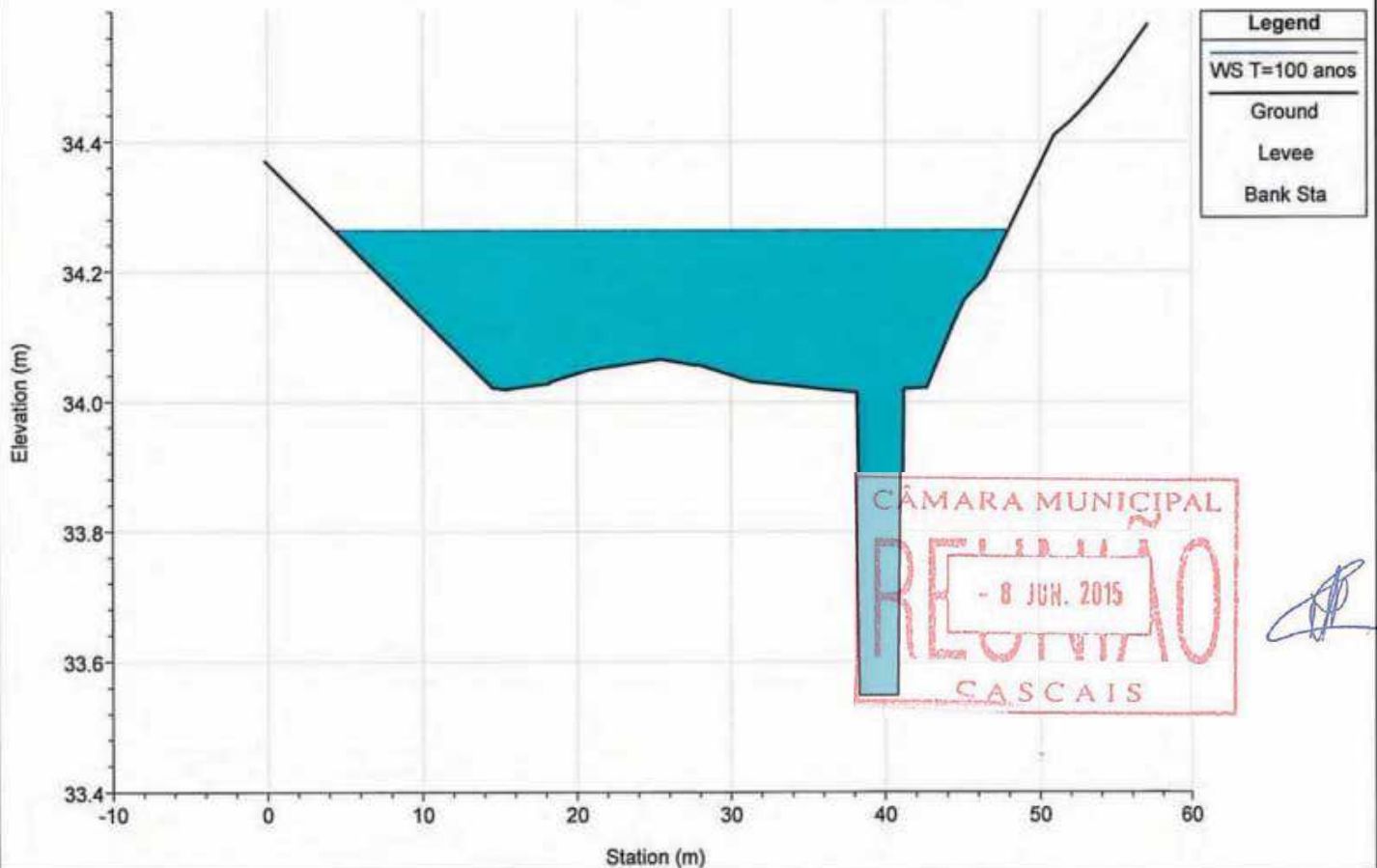
River = ME2 Reach = afluente RS = 595.023



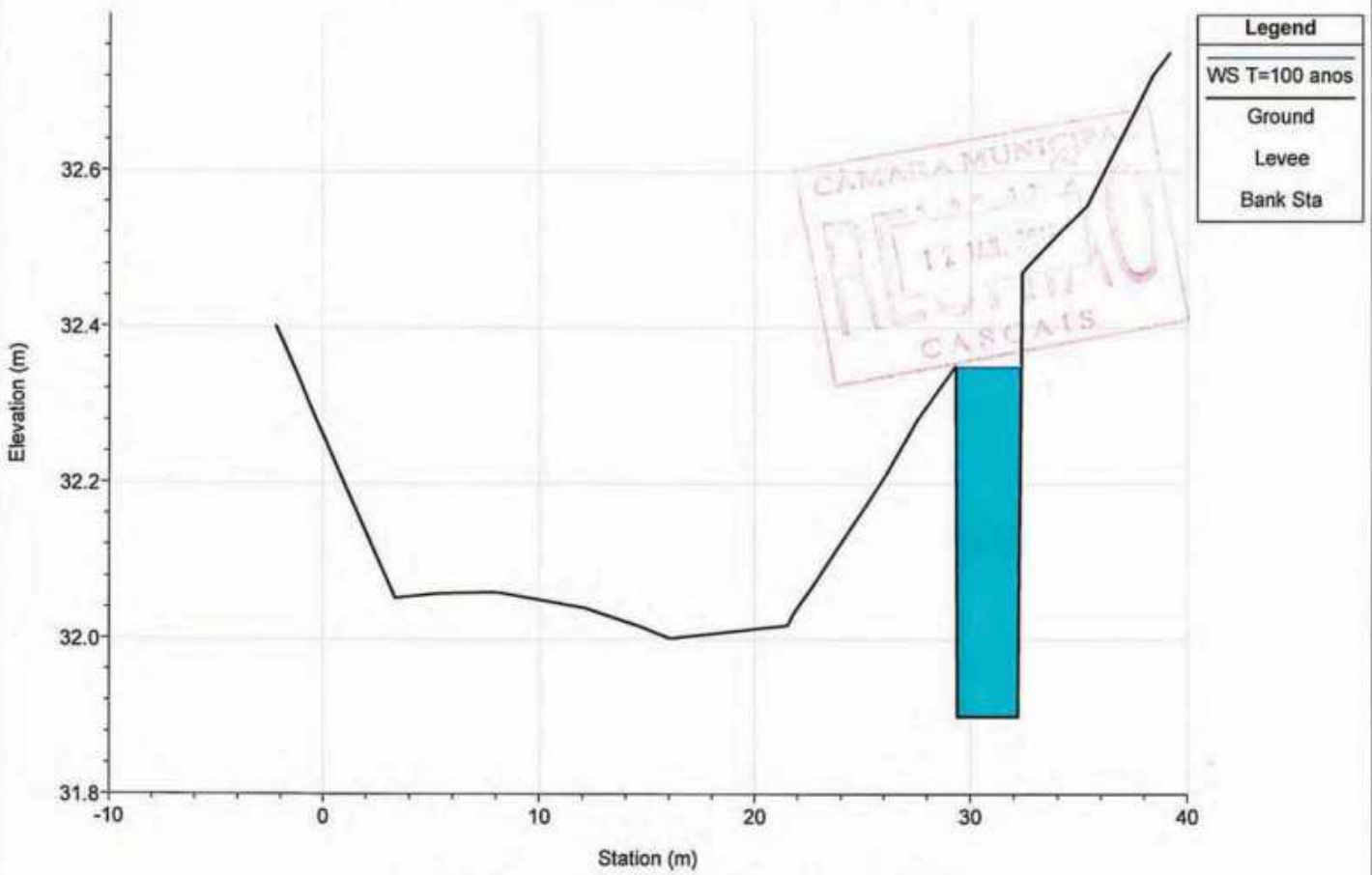
River = ME2 Reach = afluyente RS = 474.155



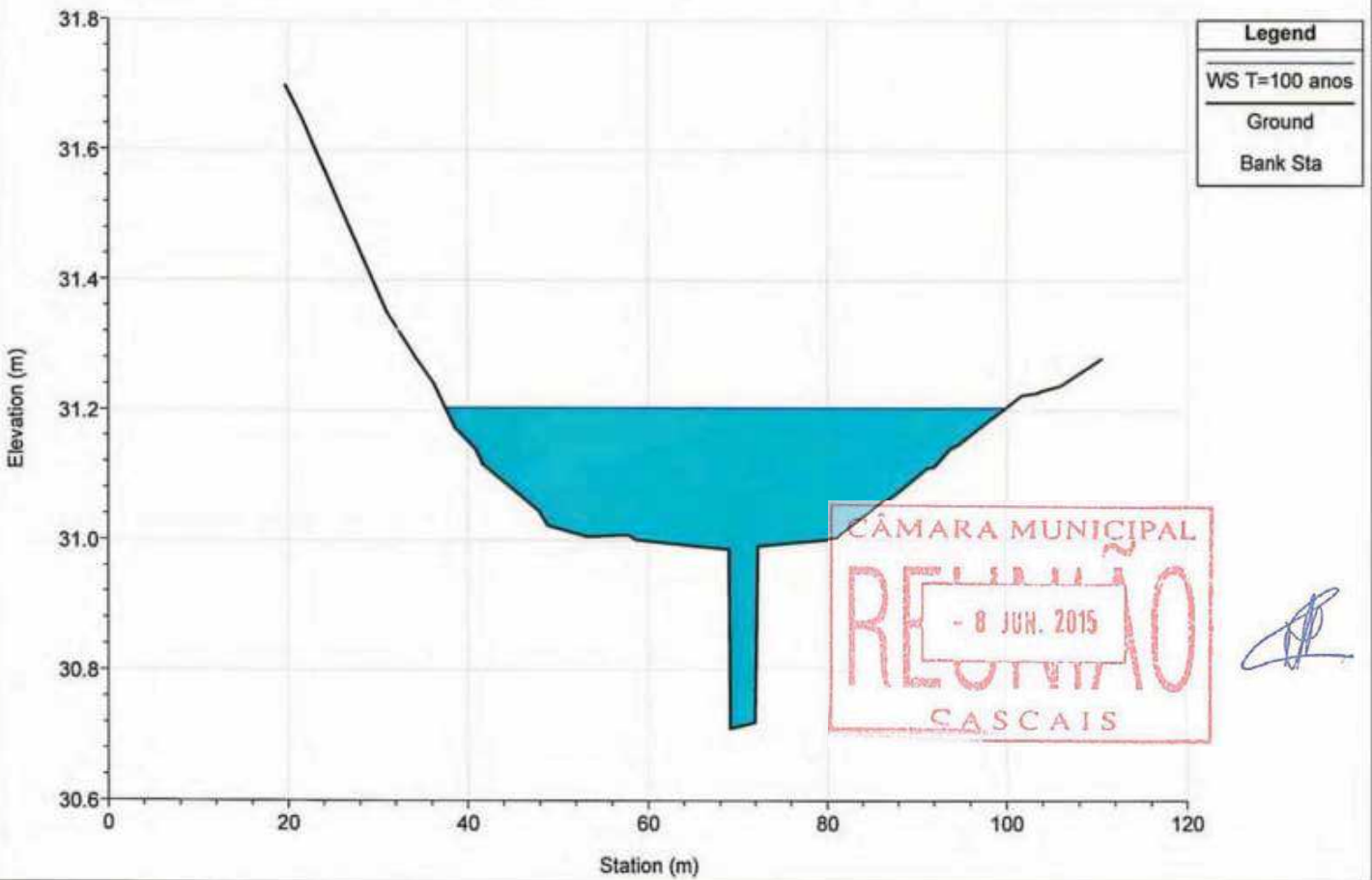
River = ME2 Reach = afluyente RS = 364.986



River = ME2 Reach = afluente RS = 277.478

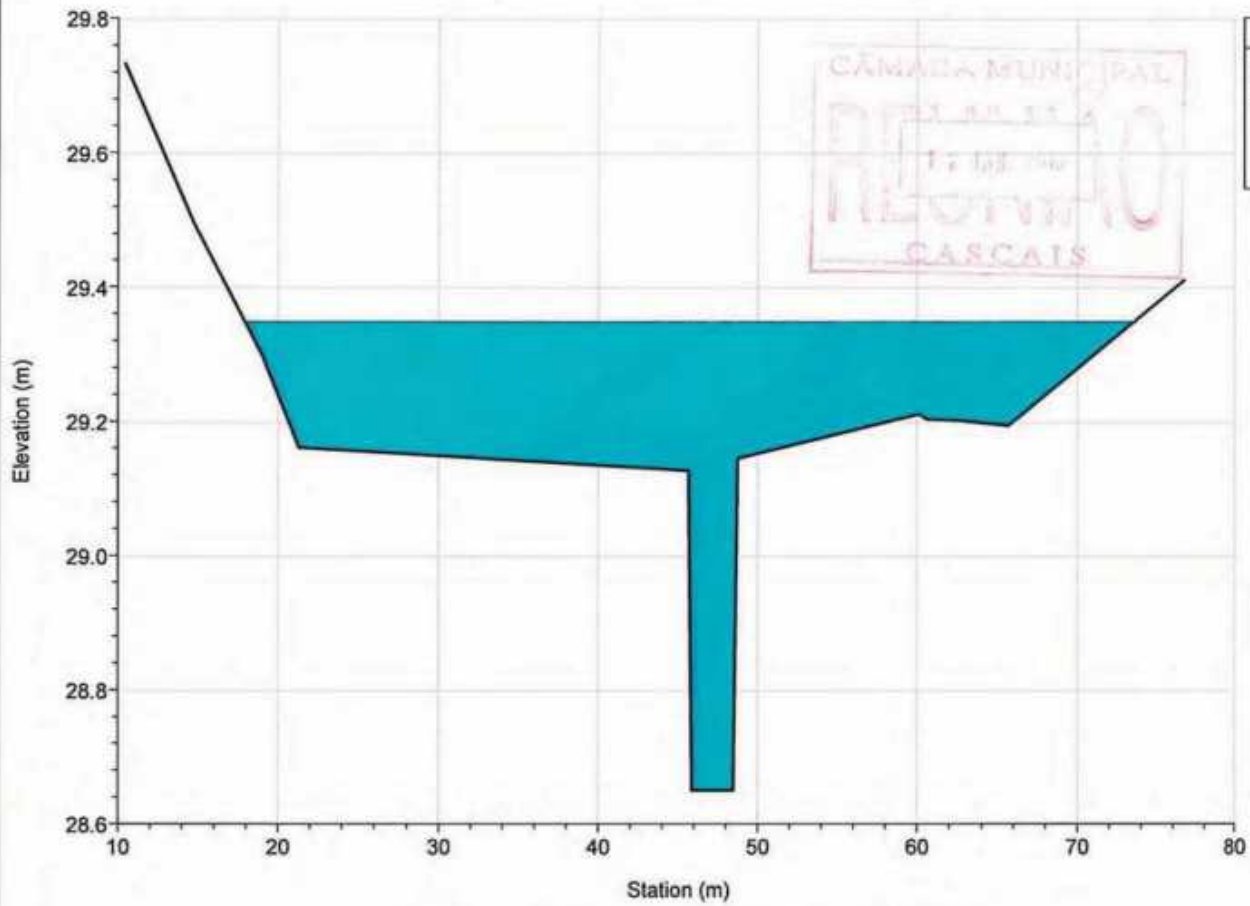


River = ME2 Reach = afluente RS = 202.618





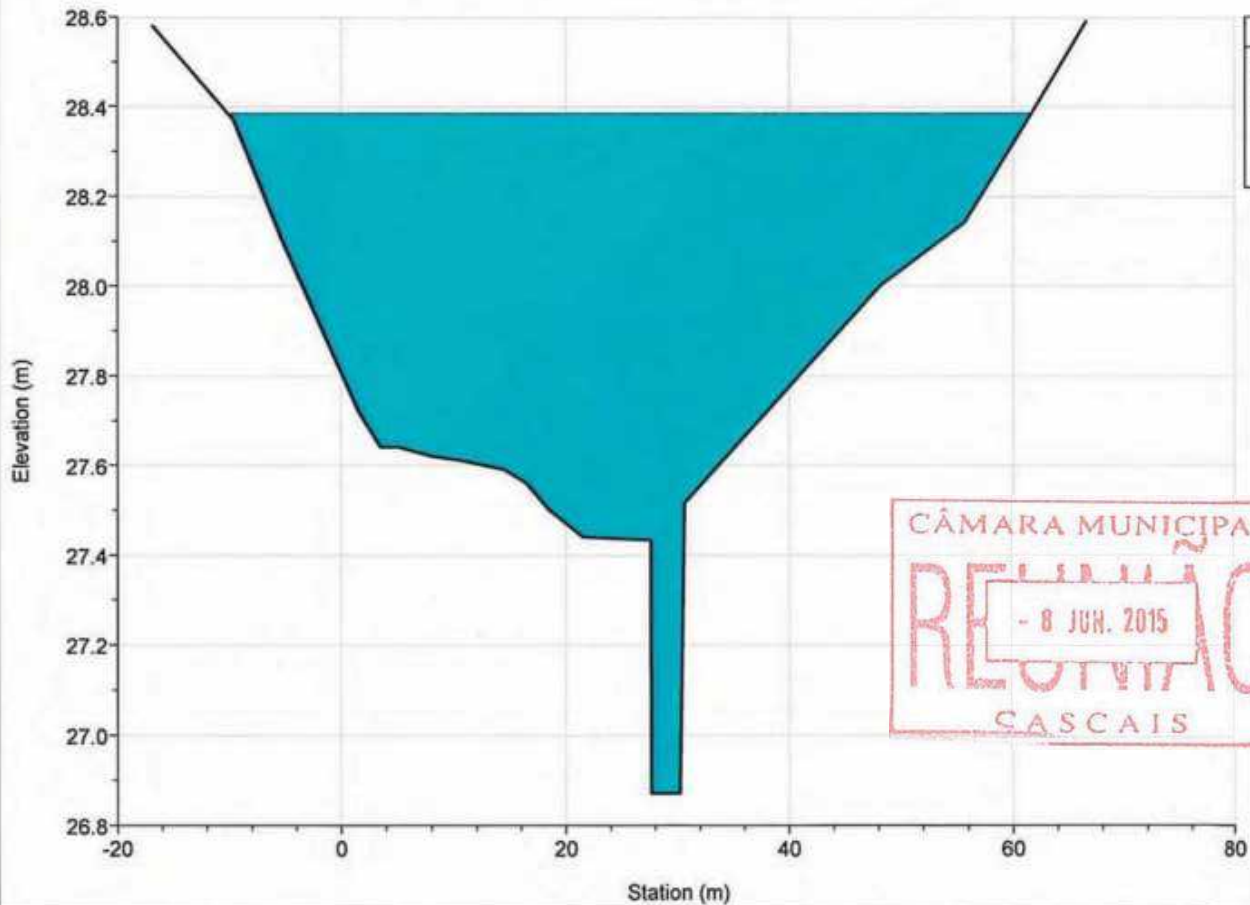
River = ME2 Reach = afluyente RS = 104.346



Legend
WS T=100 anos
Ground
Bank Sta

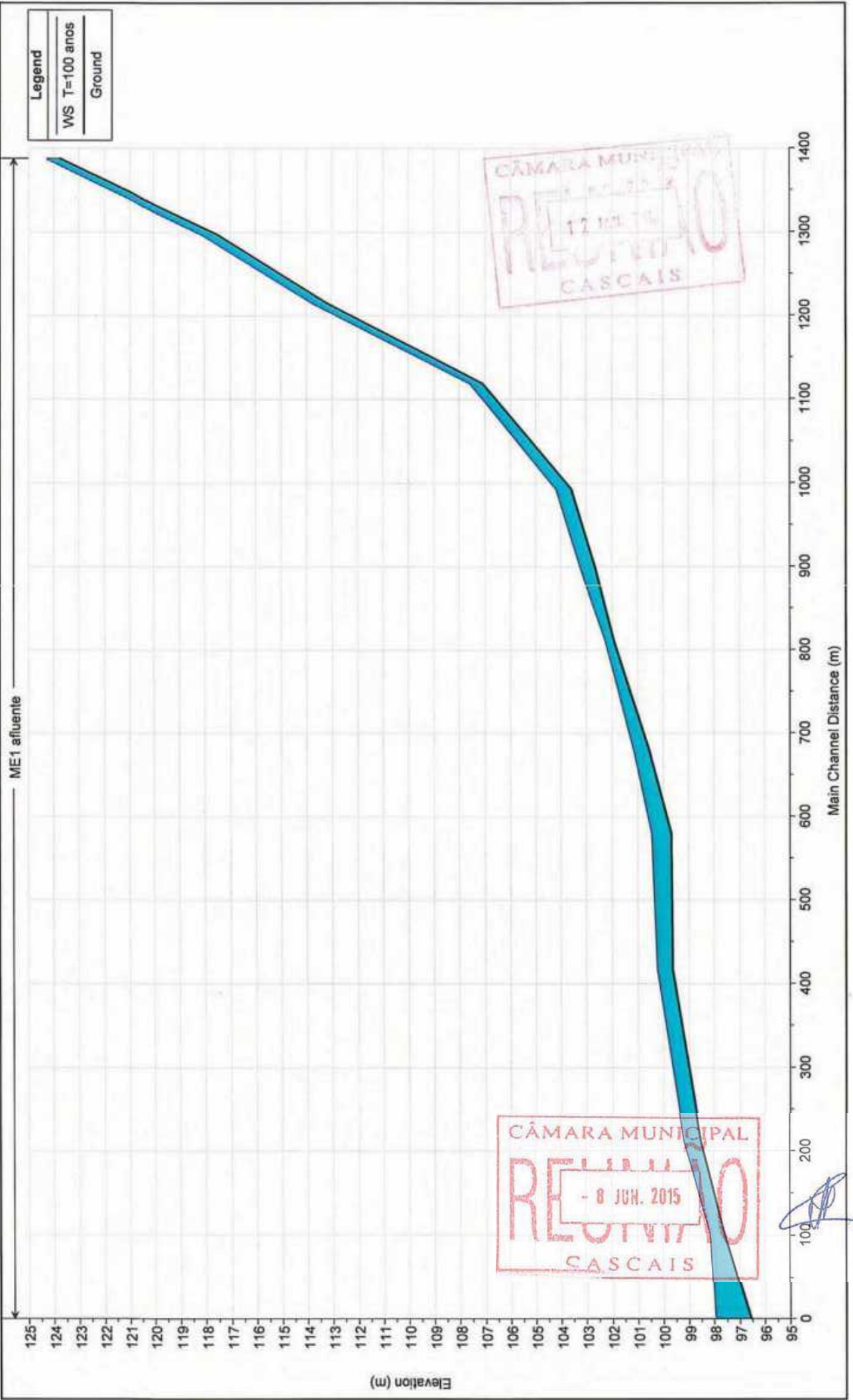
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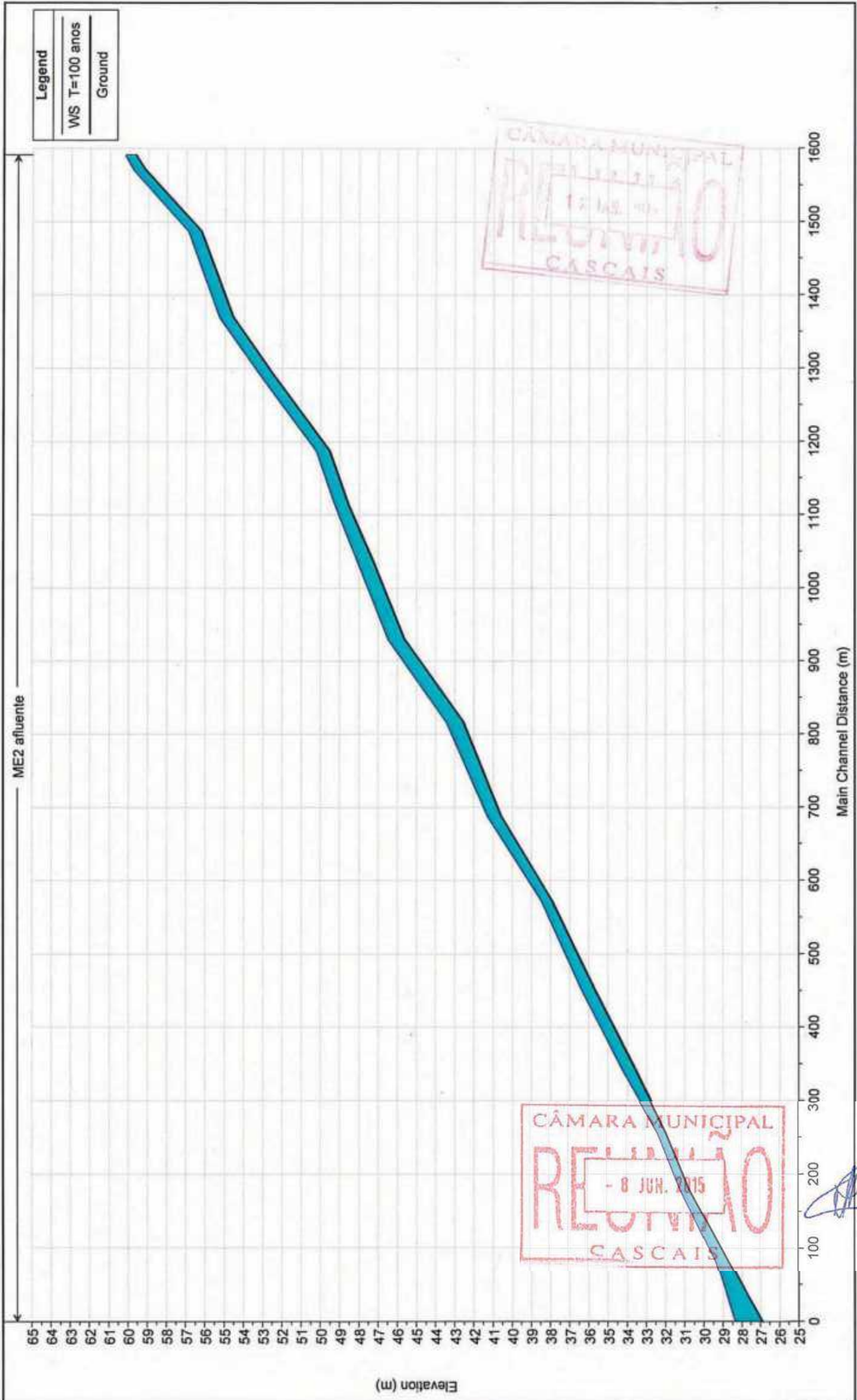
River = ME2 Reach = afluyente RS = 22.904

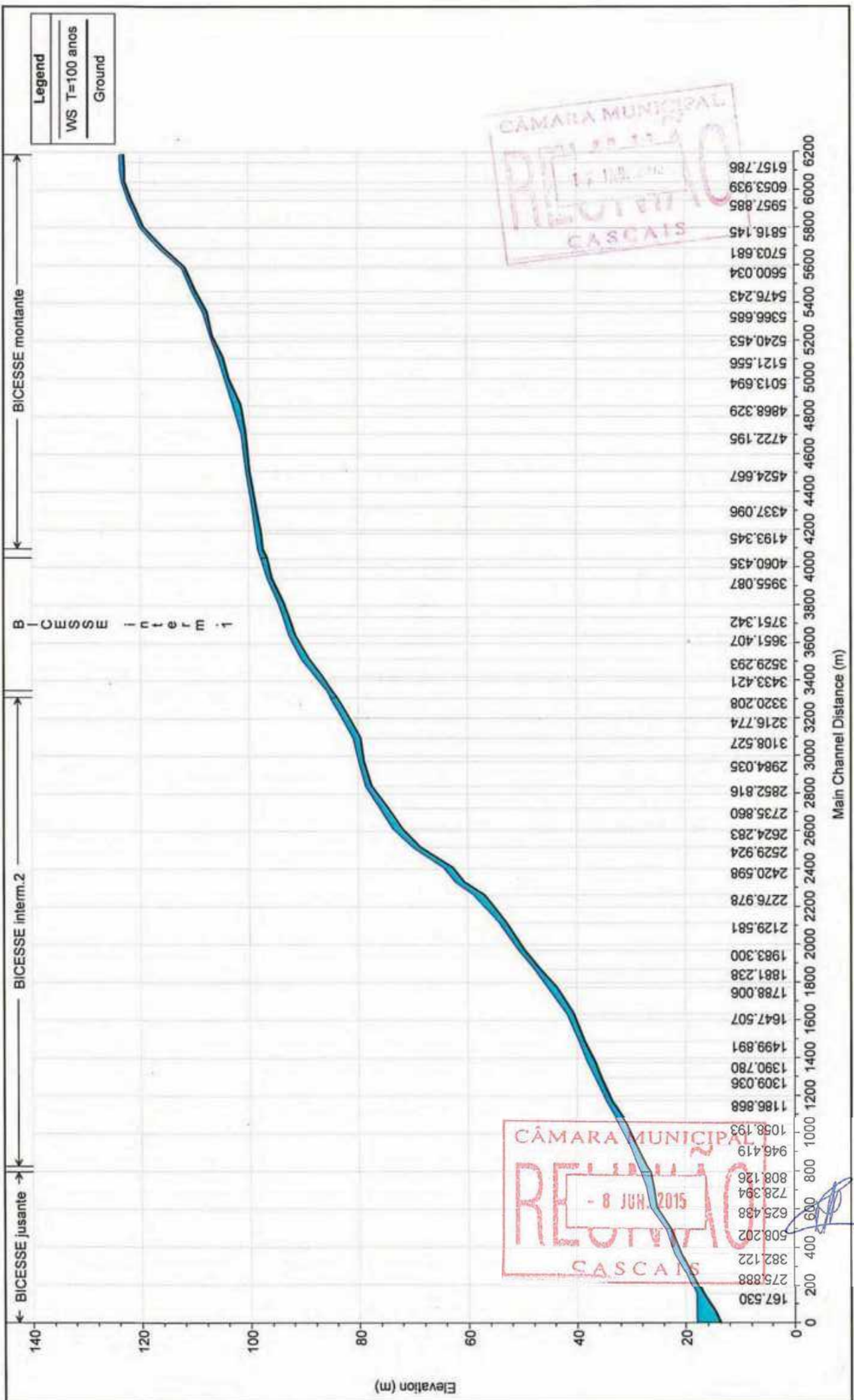


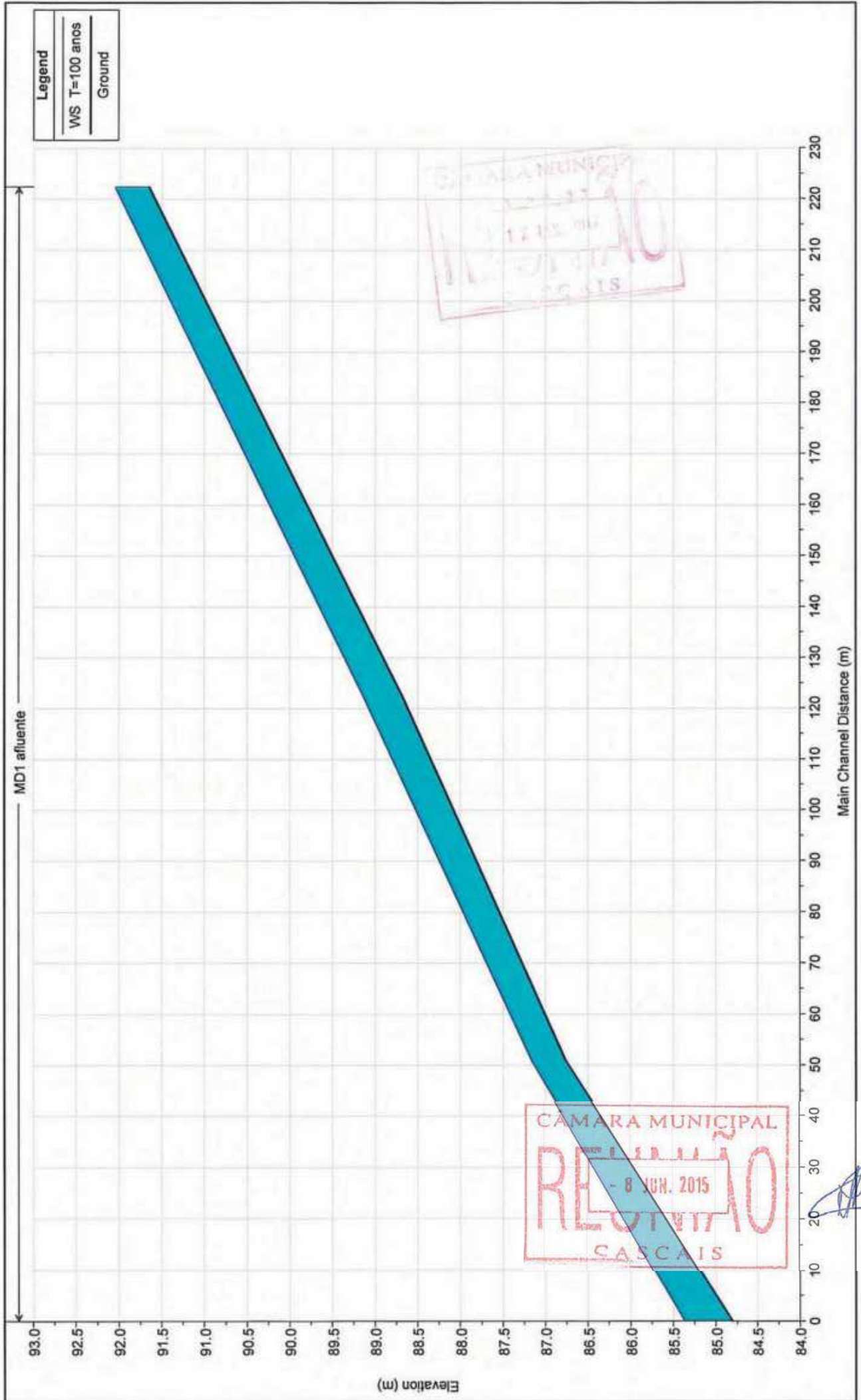
Legend
WS T=100 anos
Ground
Bank Sta

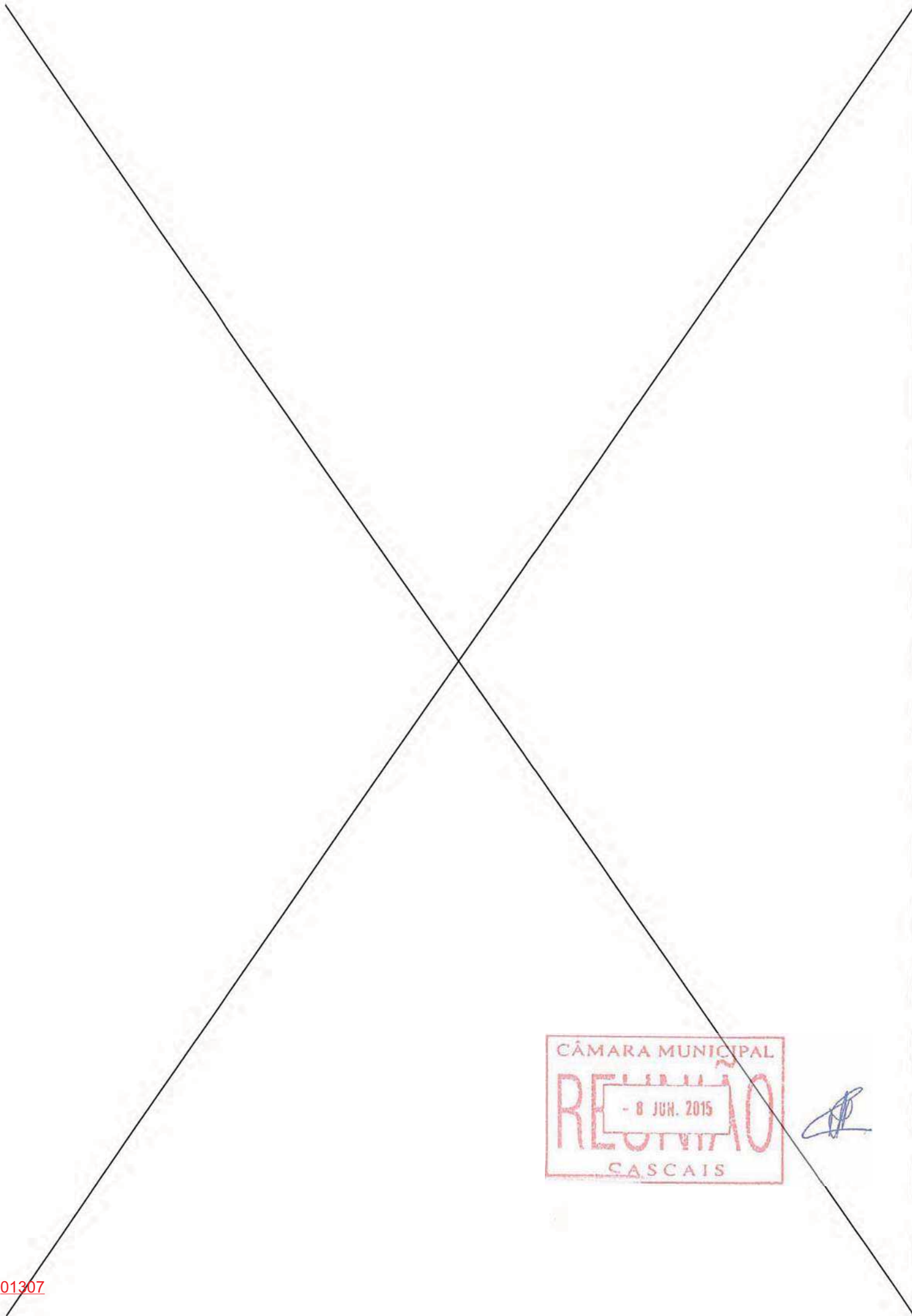
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CASCAIS





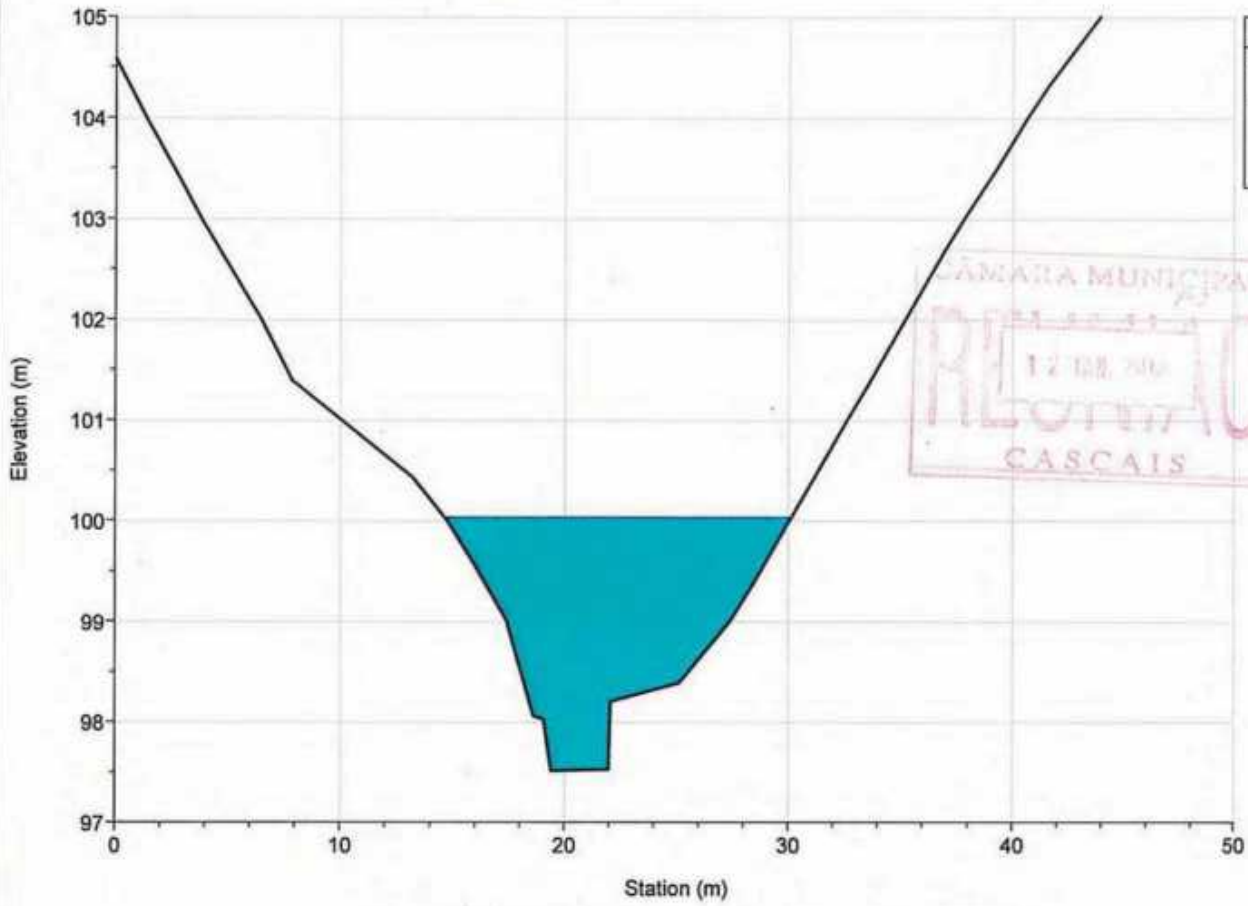




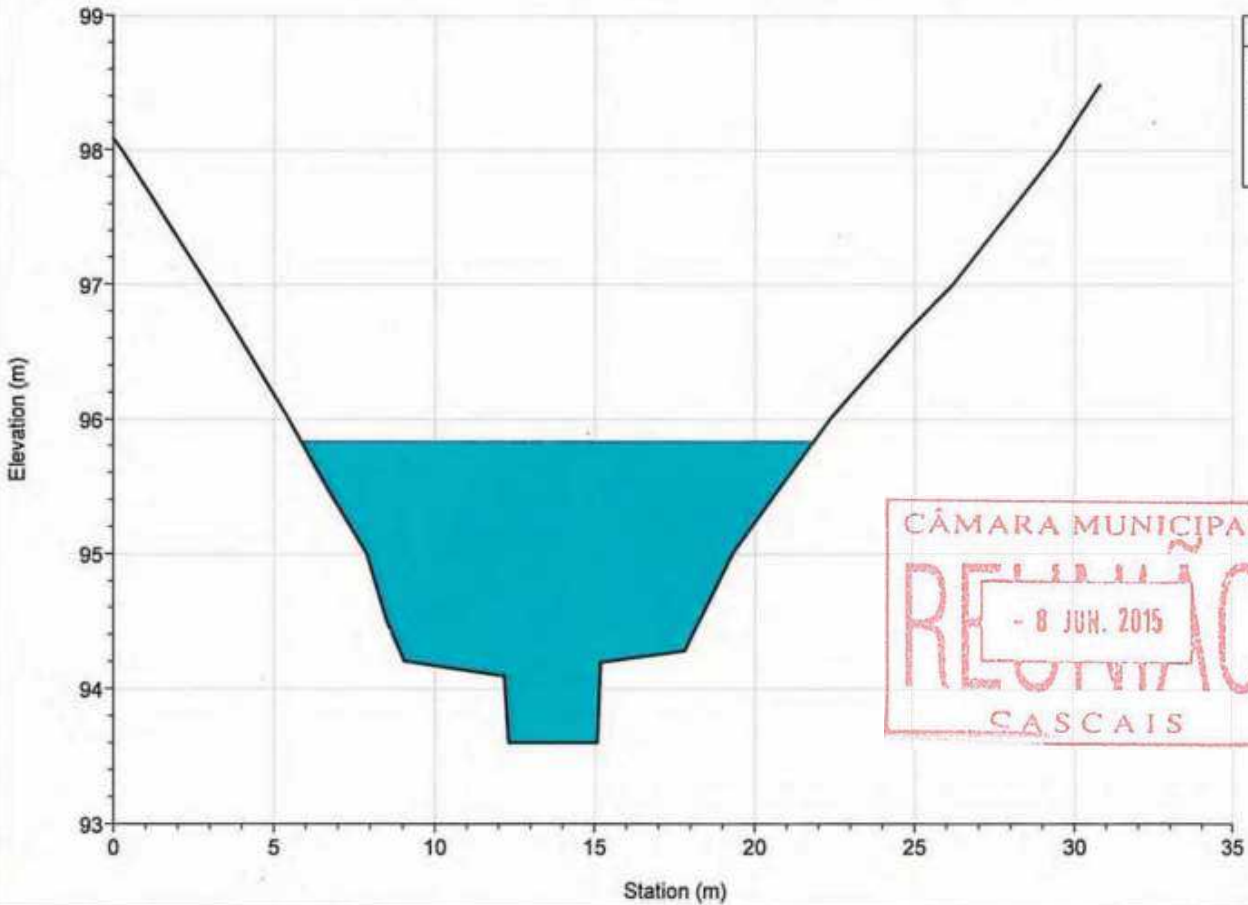


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- 8 JUN. 2015  
CASCAIS

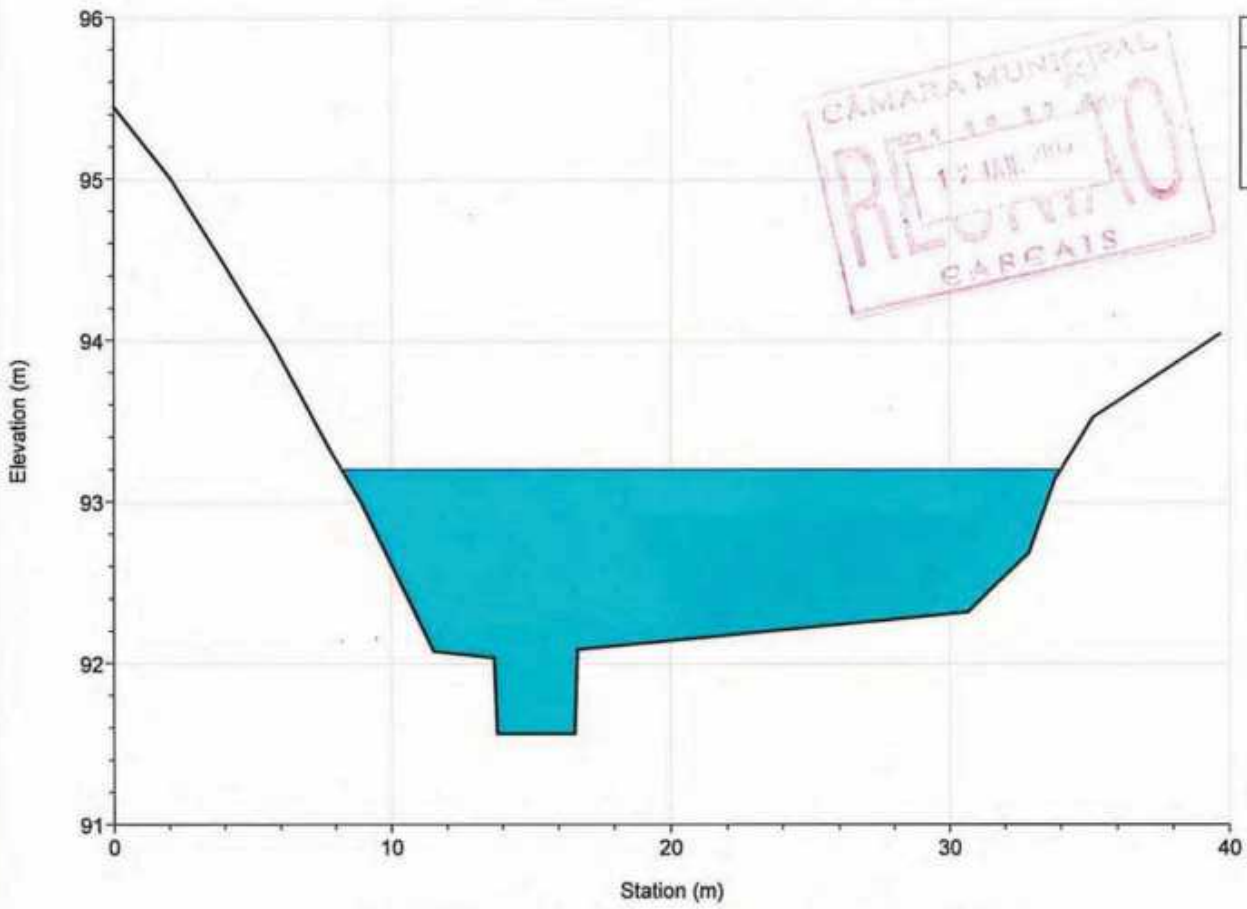
River = MANIQUE Reach = montante RS = 6124.220



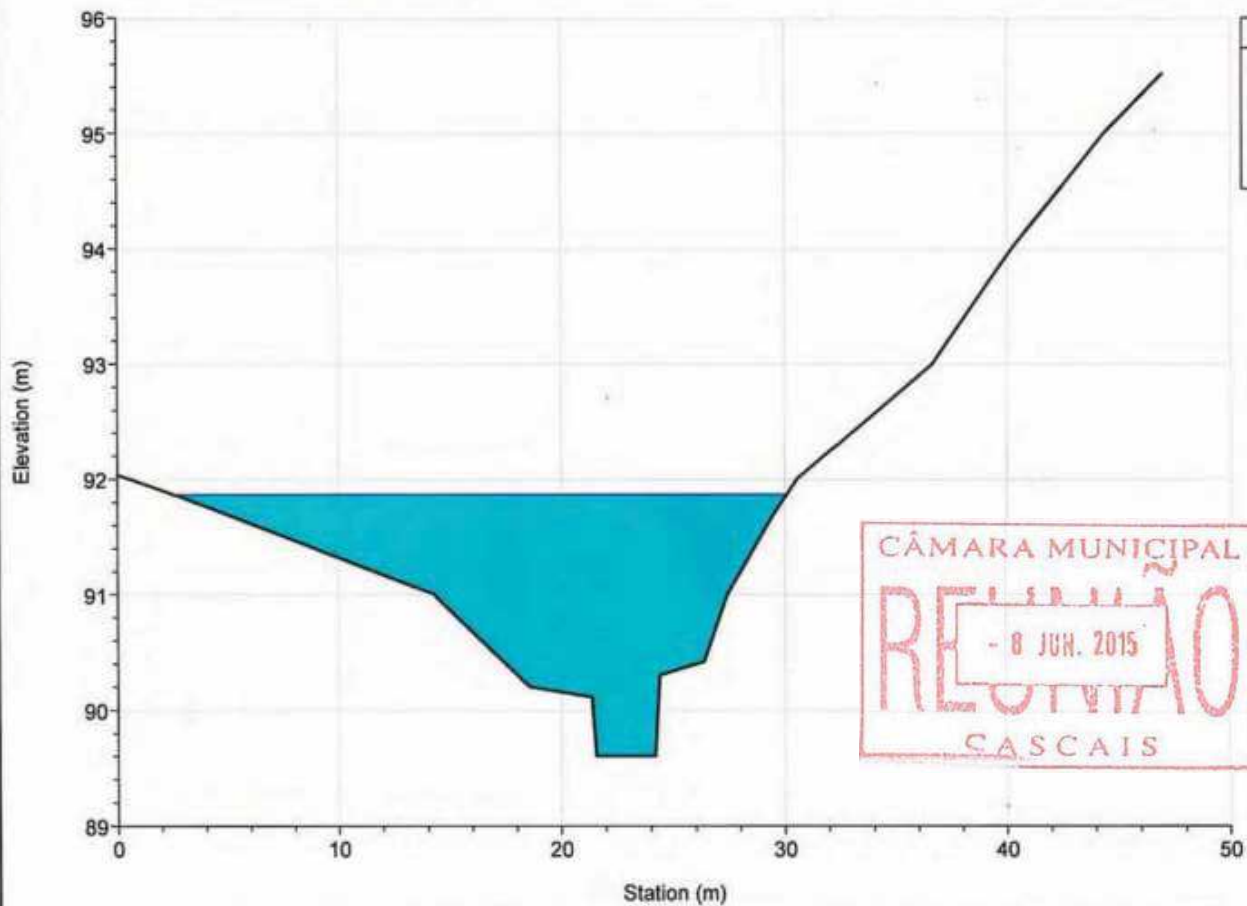
River = MANIQUE Reach = montante RS = 6018.411



River = MANIQUE Reach = montante RS = 5914.623

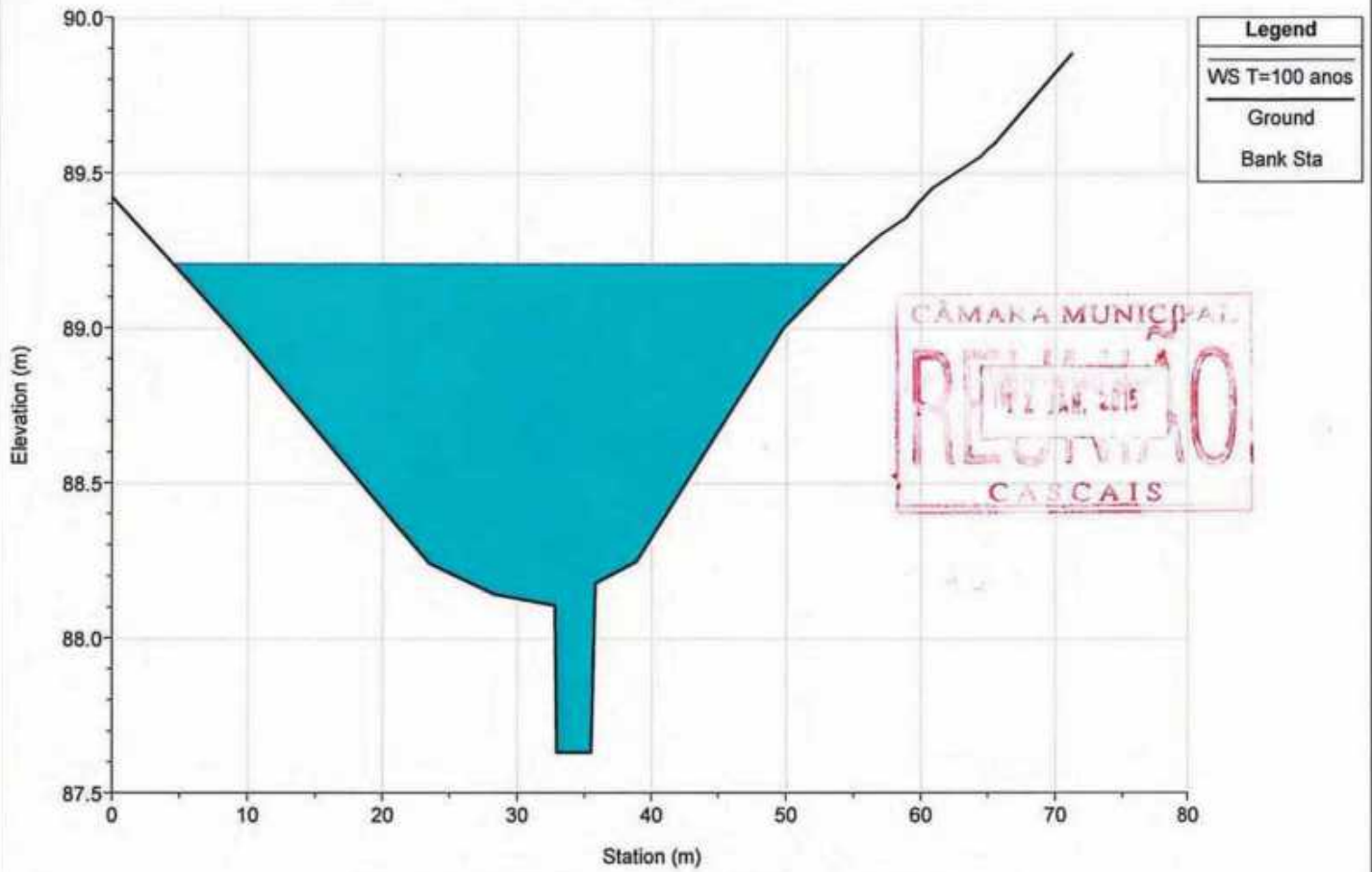


River = MANIQUE Reach = montante RS = 5841.988

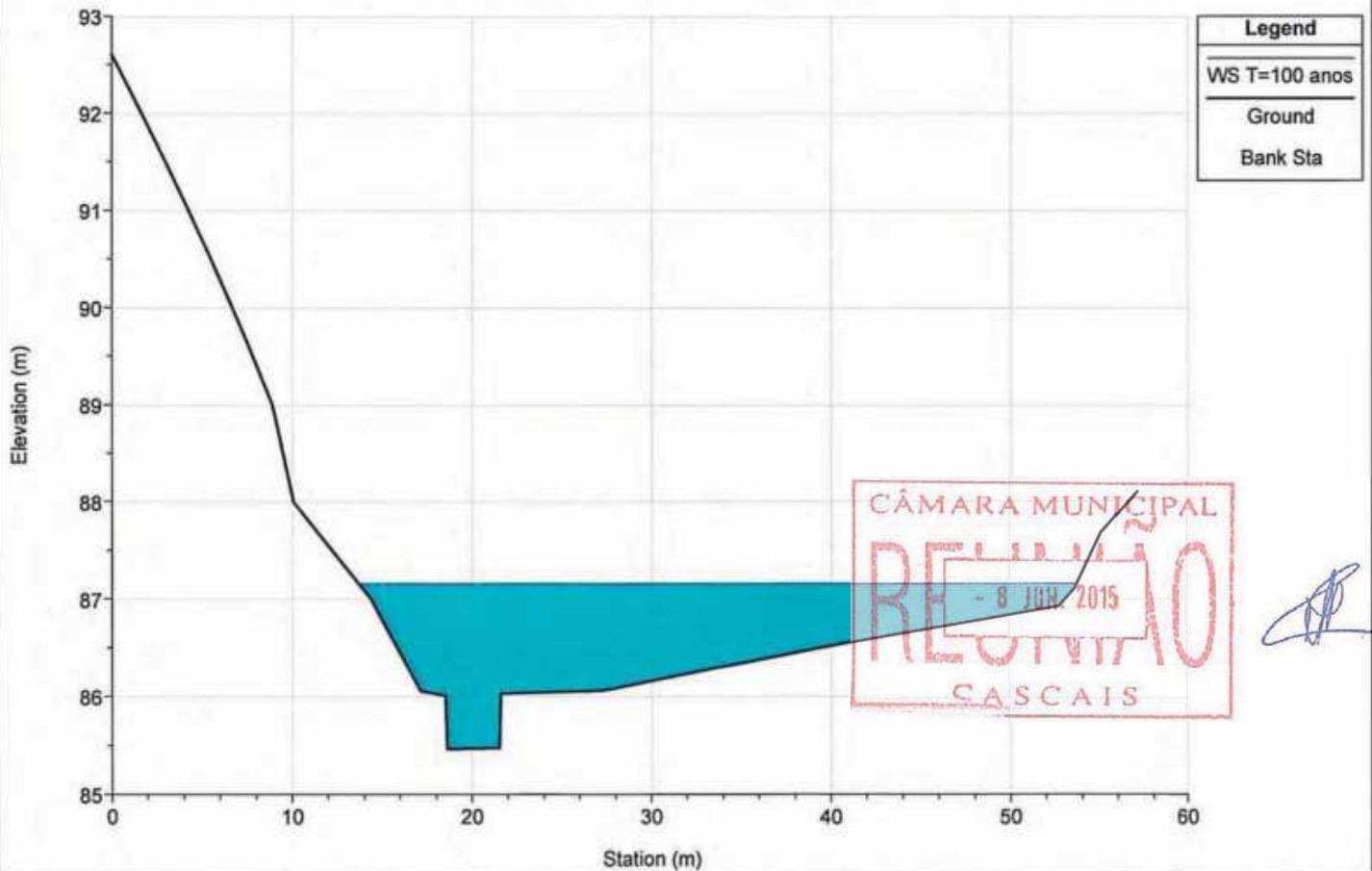




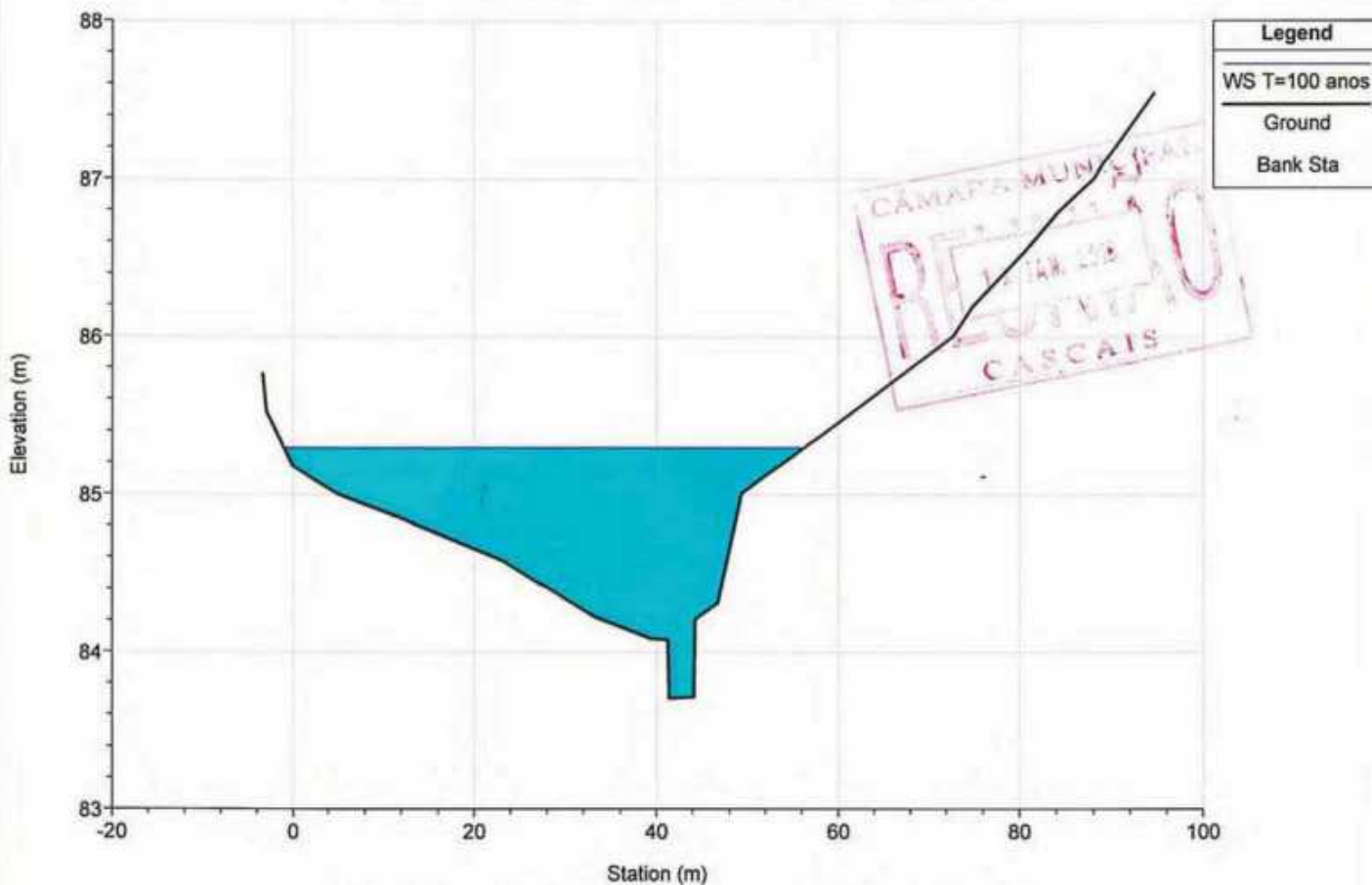
River = MANIQUE Reach = montante RS = 5739.916



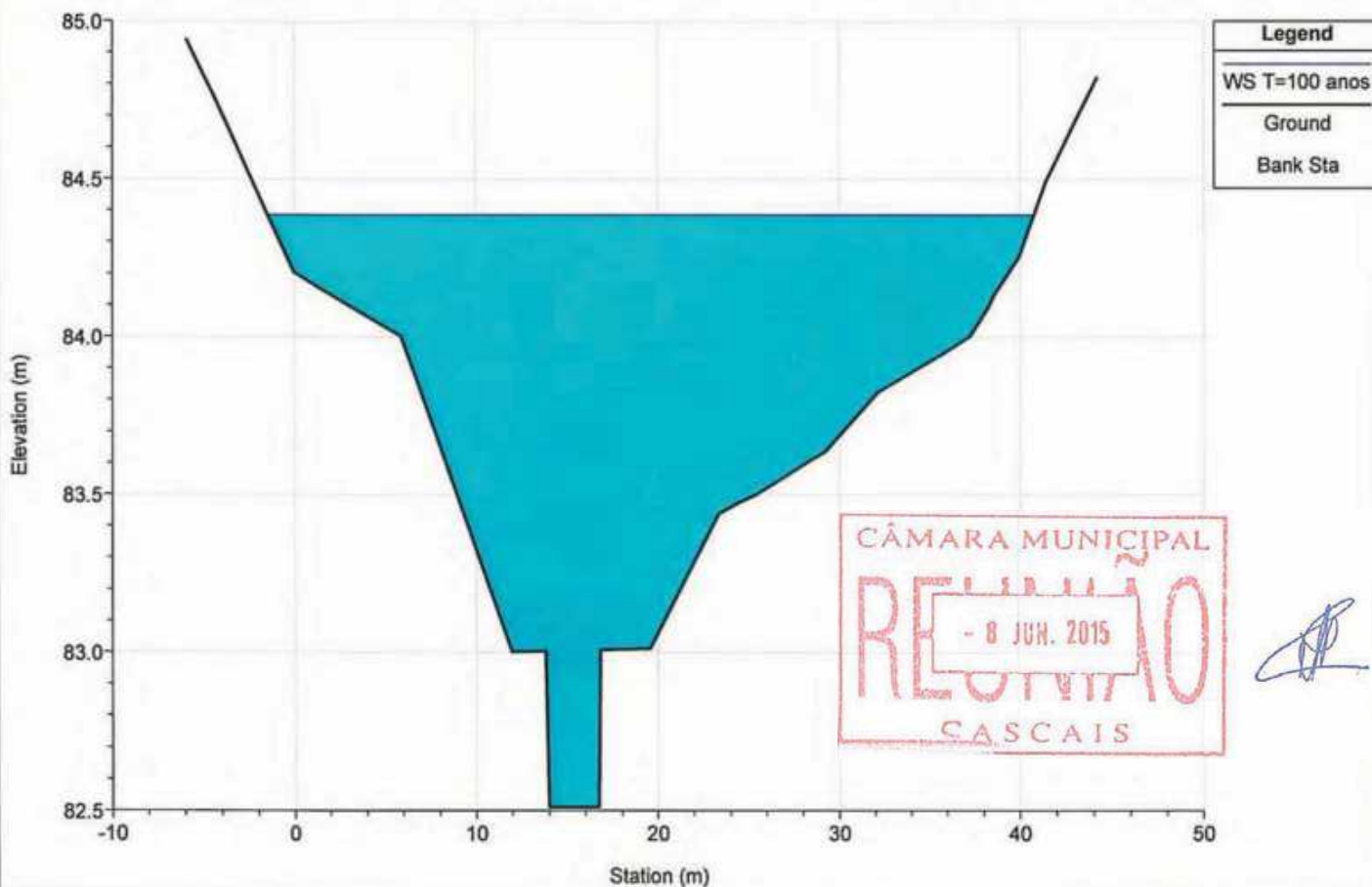
River = MANIQUE Reach = montante RS = 5646.427



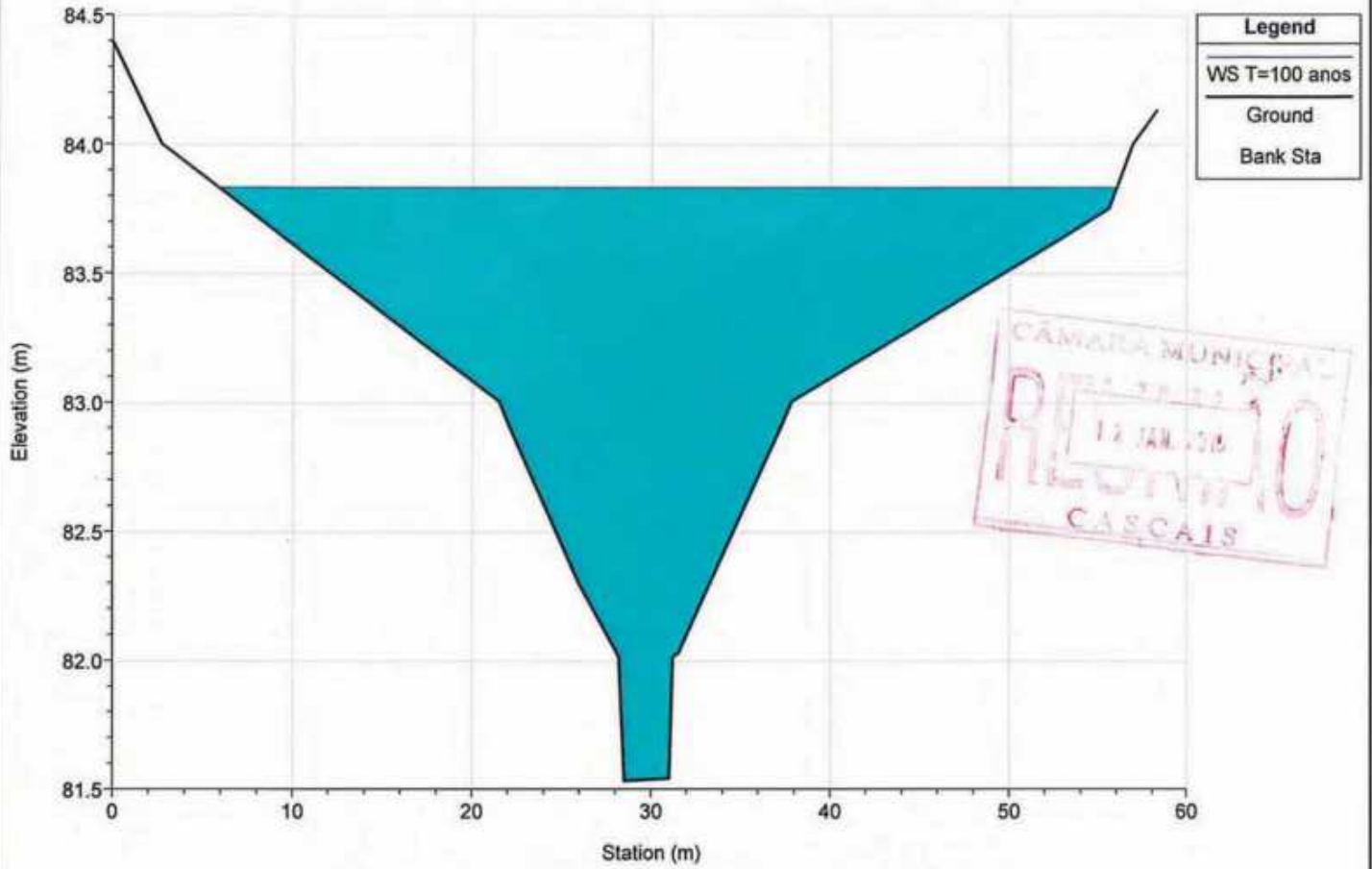
River = MANIQUE Reach = montante RS = 5554.797



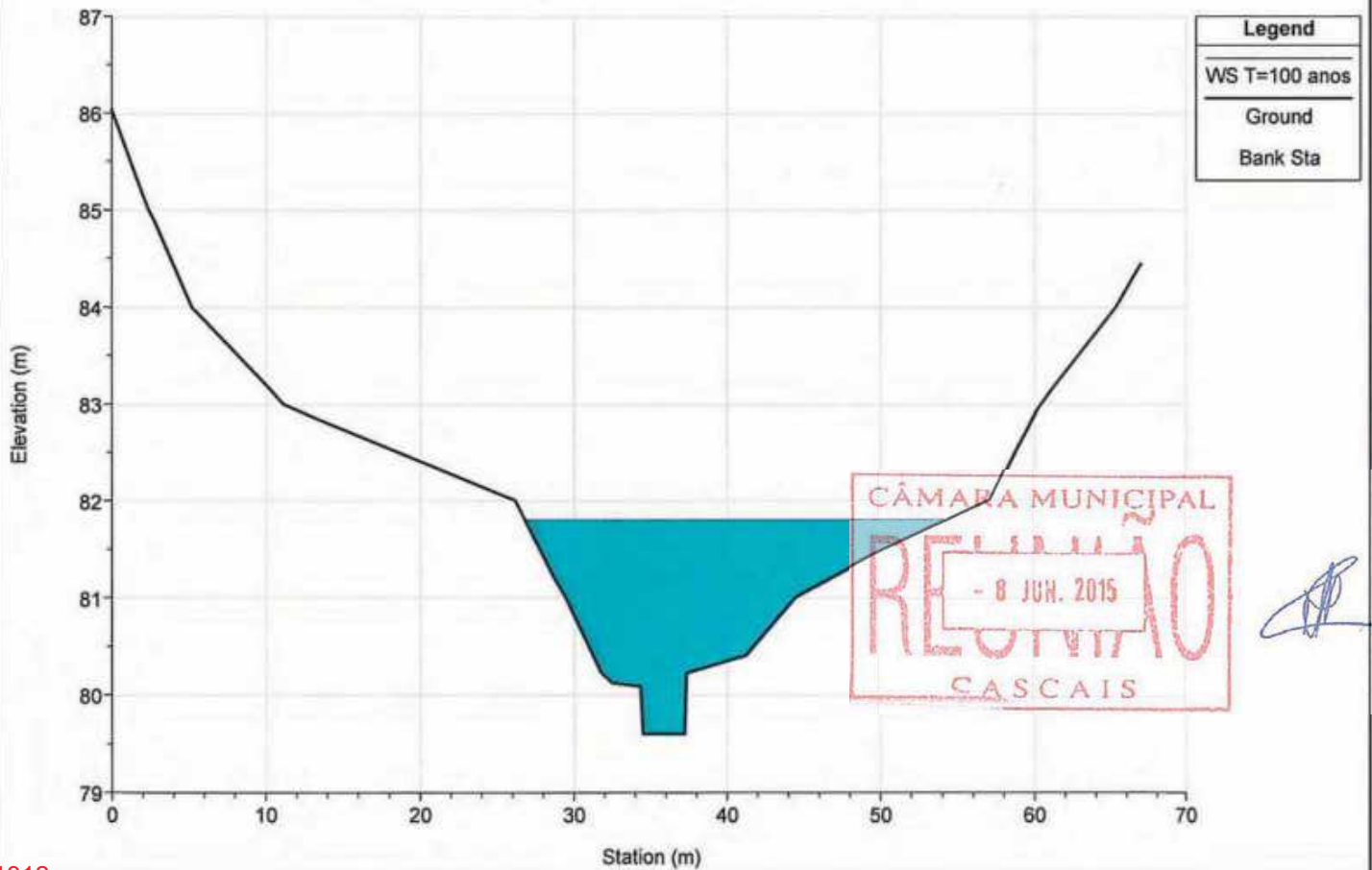
River = MANIQUE Reach = montante RS = 5477.849



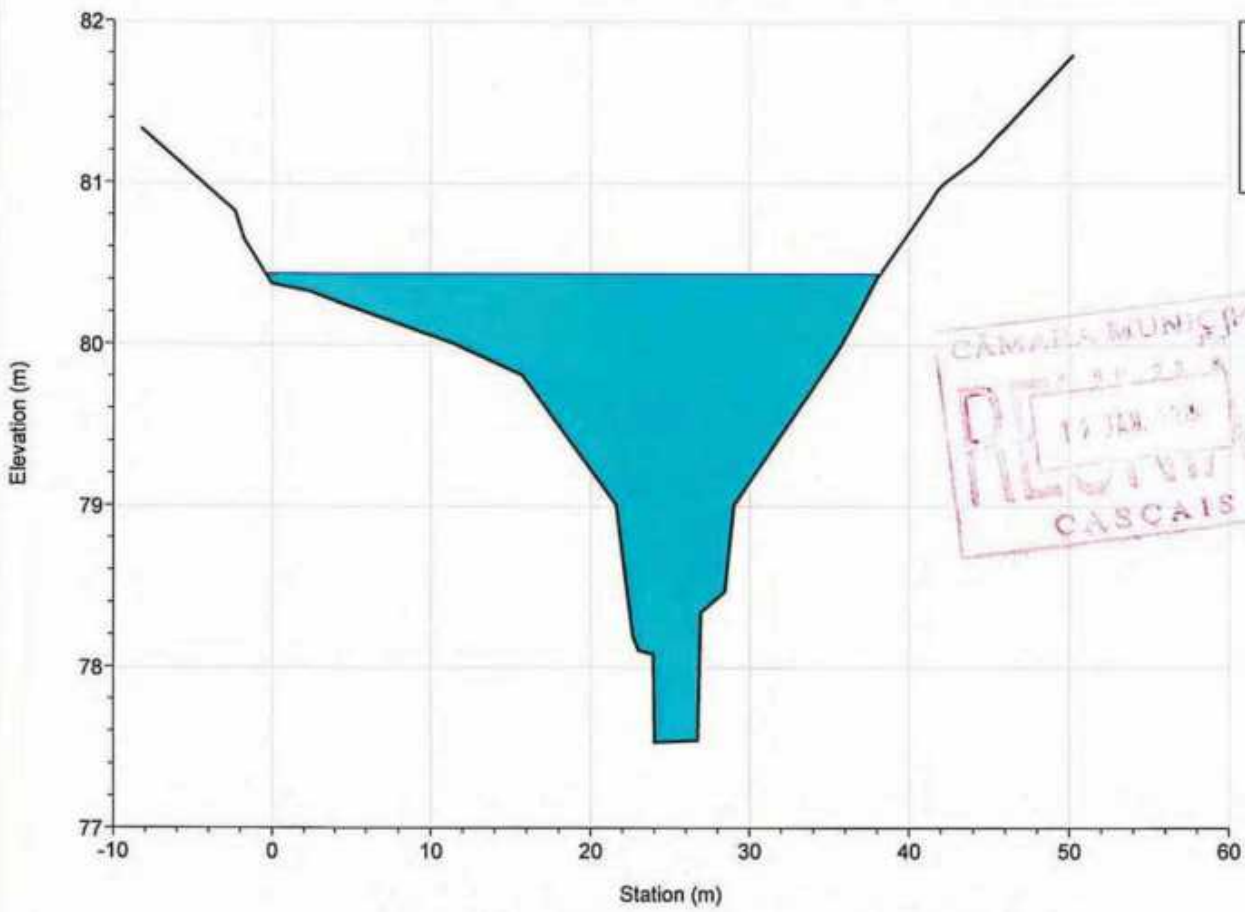
River = MANIQUE Reach = inter1 RS = 5447.488



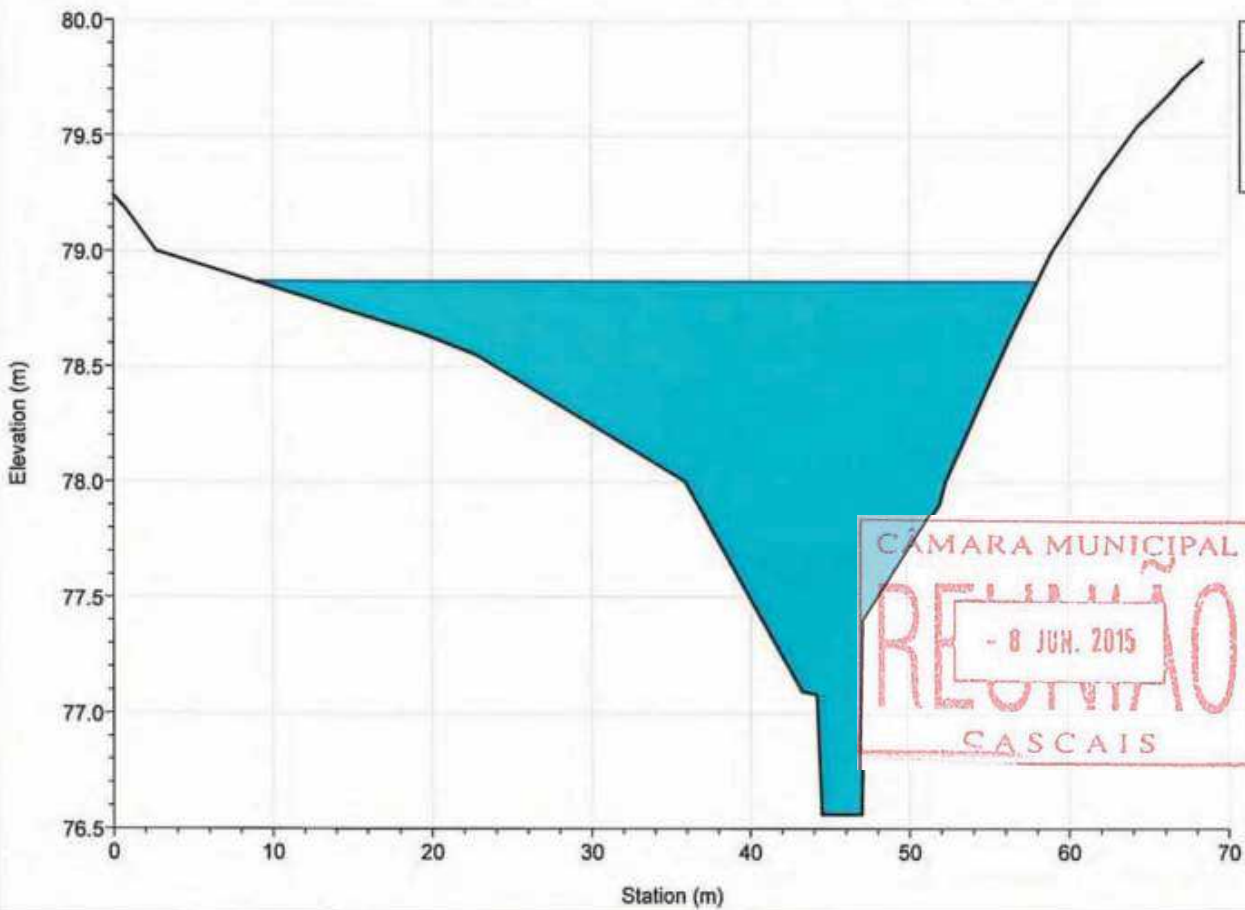
River = MANIQUE Reach = inter1 RS = 5337.855



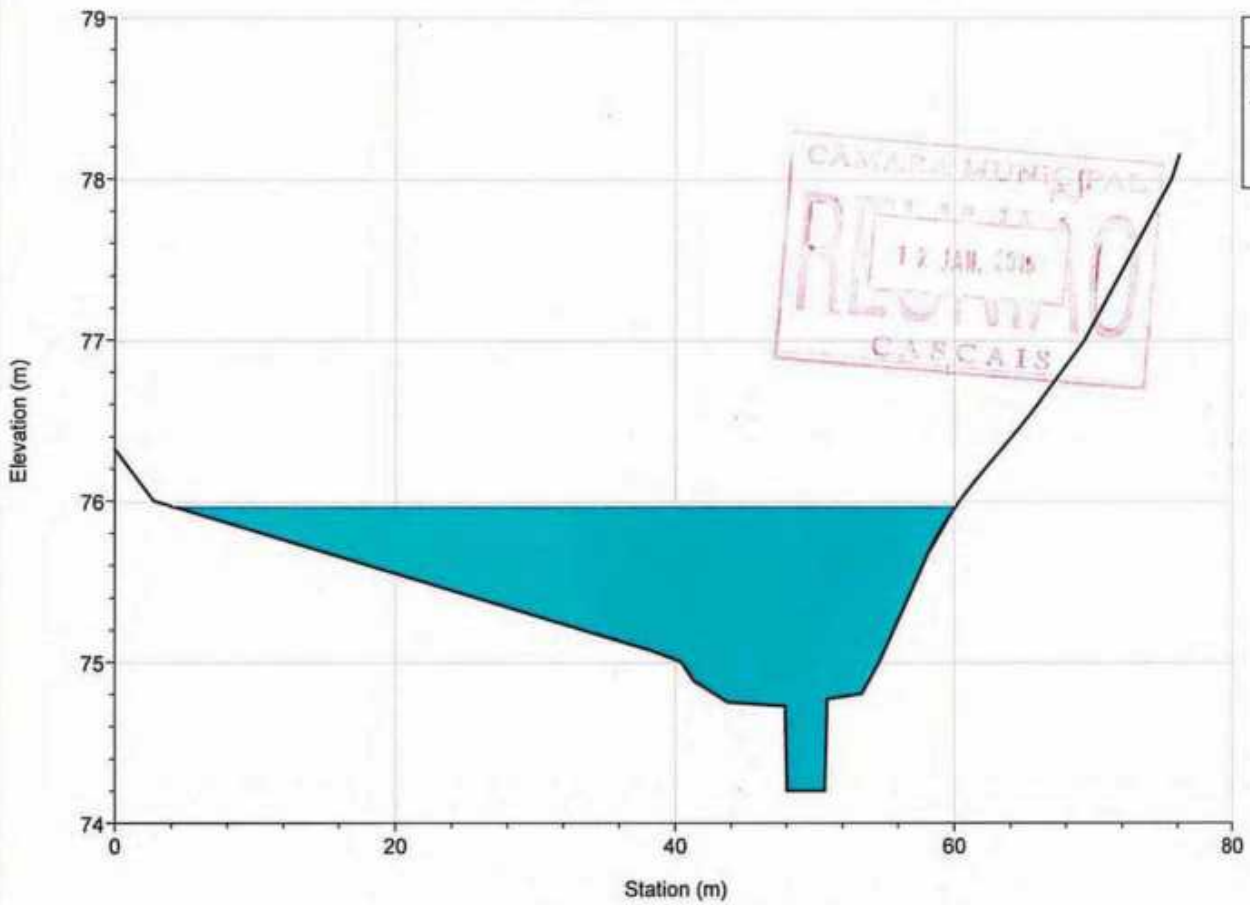
River = MANIQUE Reach = inter1 RS = 5229.520



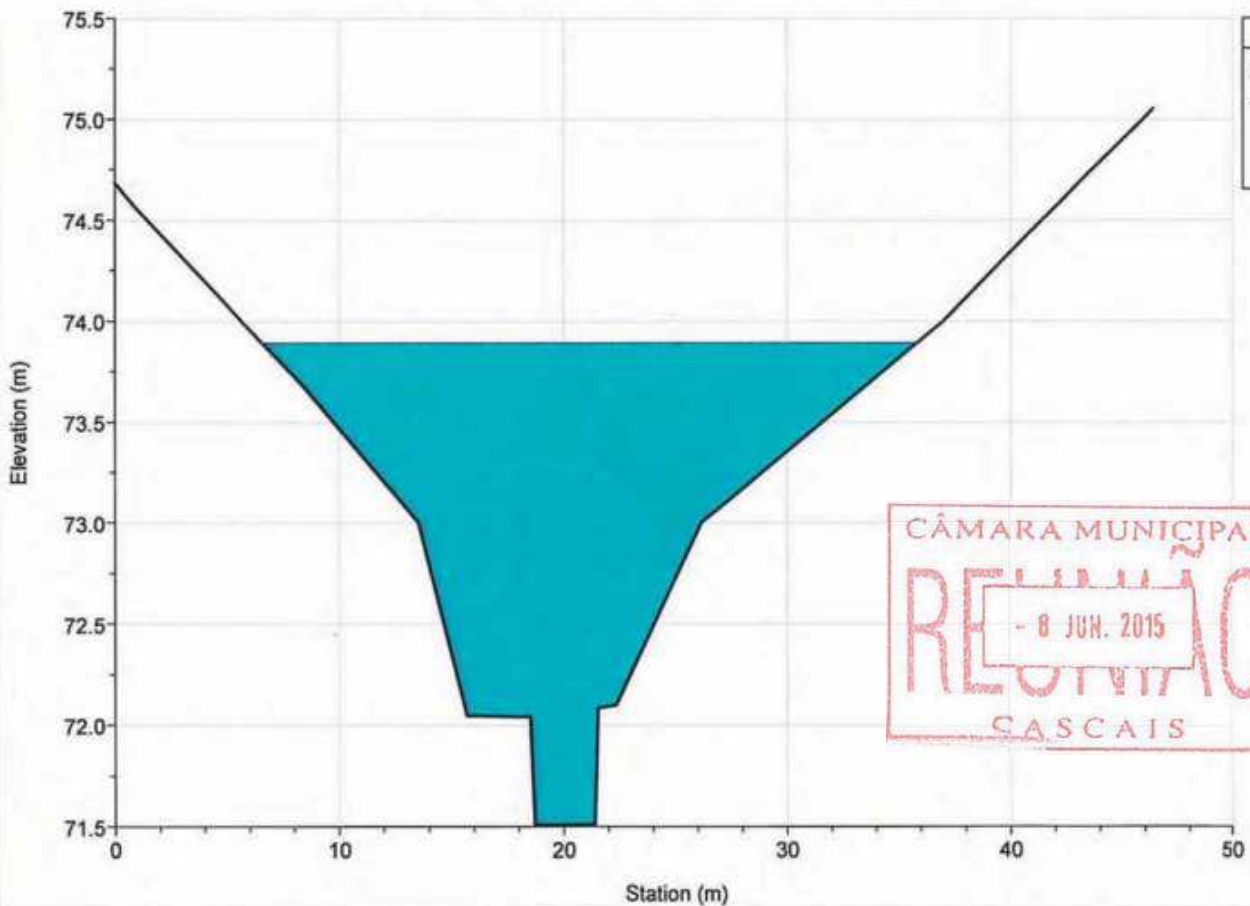
River = MANIQUE Reach = inter1 RS = 5116.860



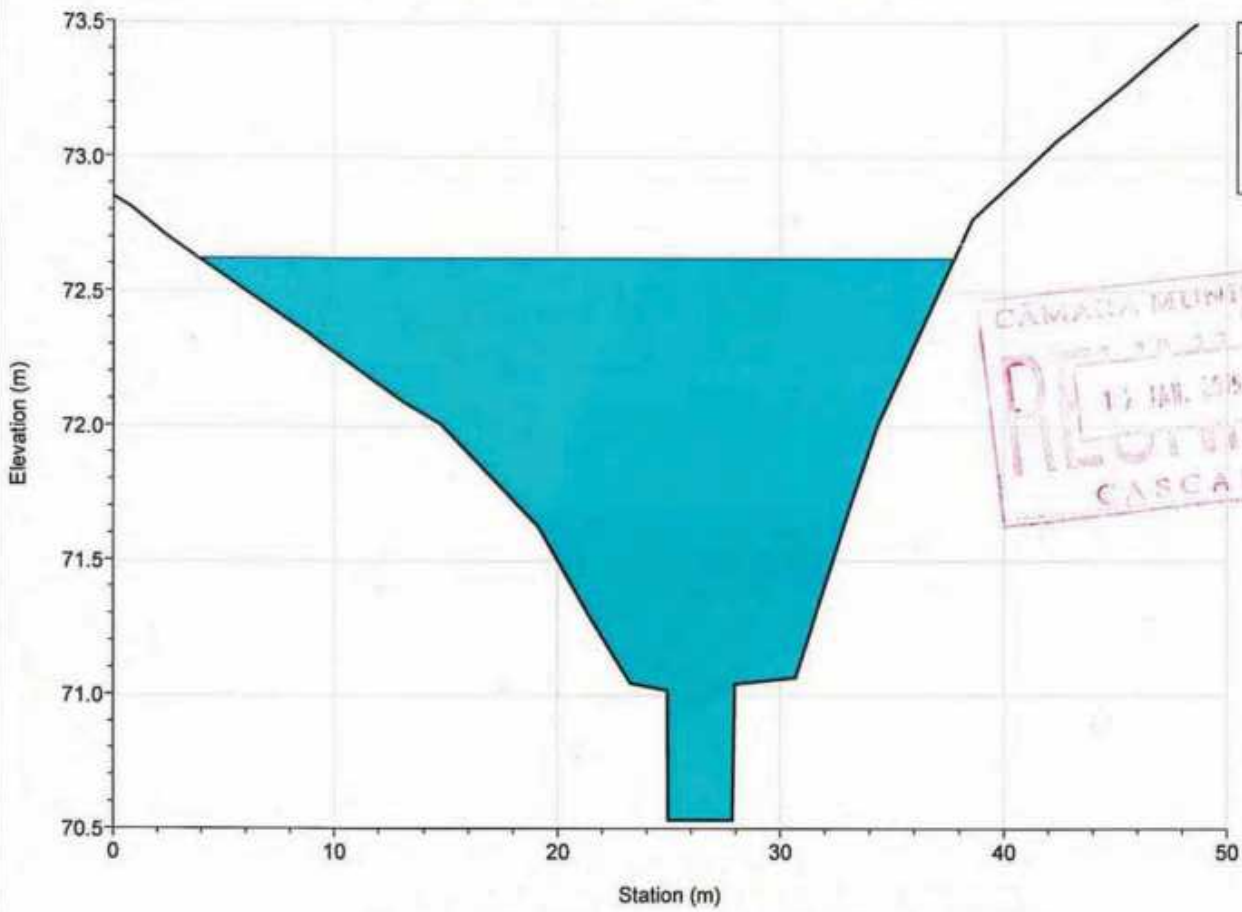
River = MANIQUE Reach = inter1 RS = 5006.869



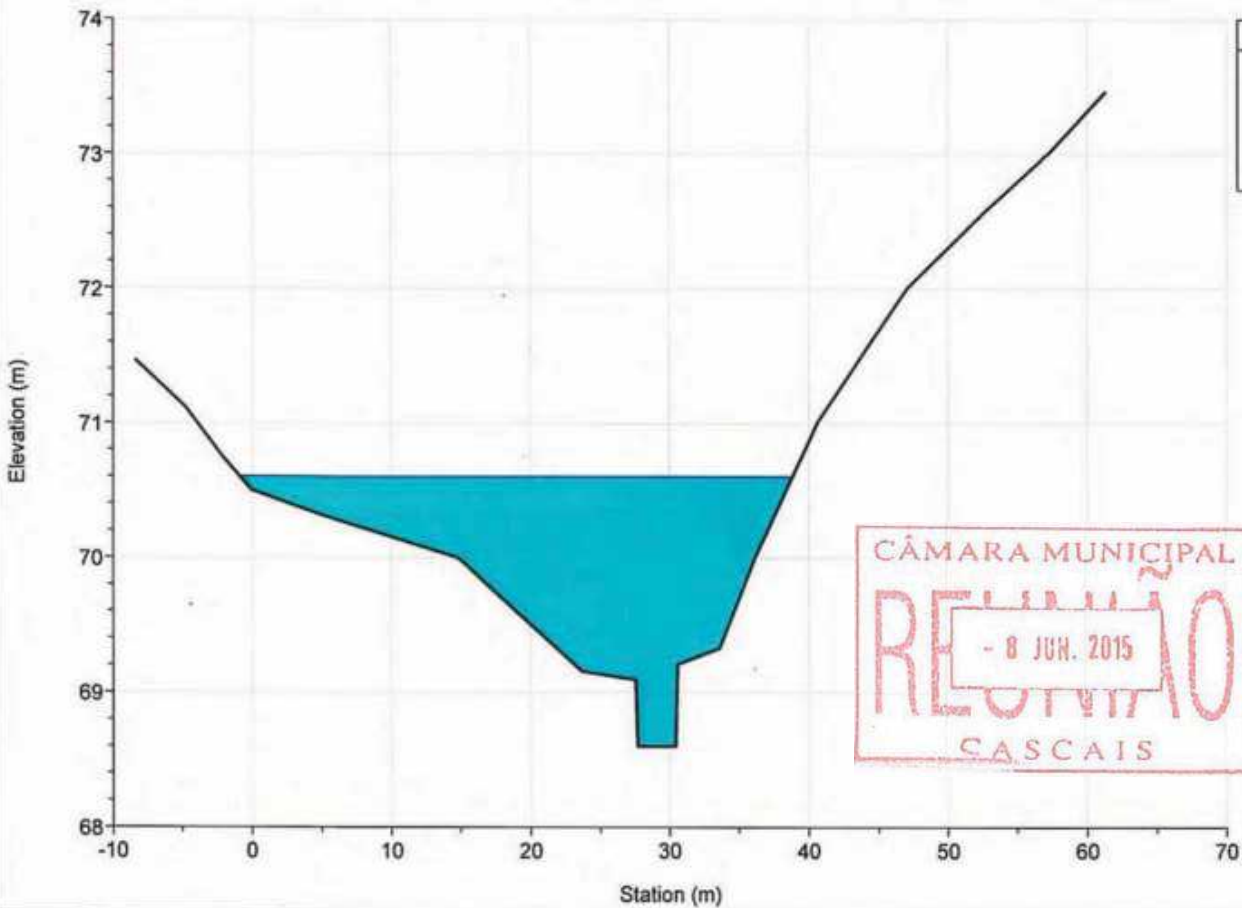
River = MANIQUE Reach = inter1 RS = 4888.842



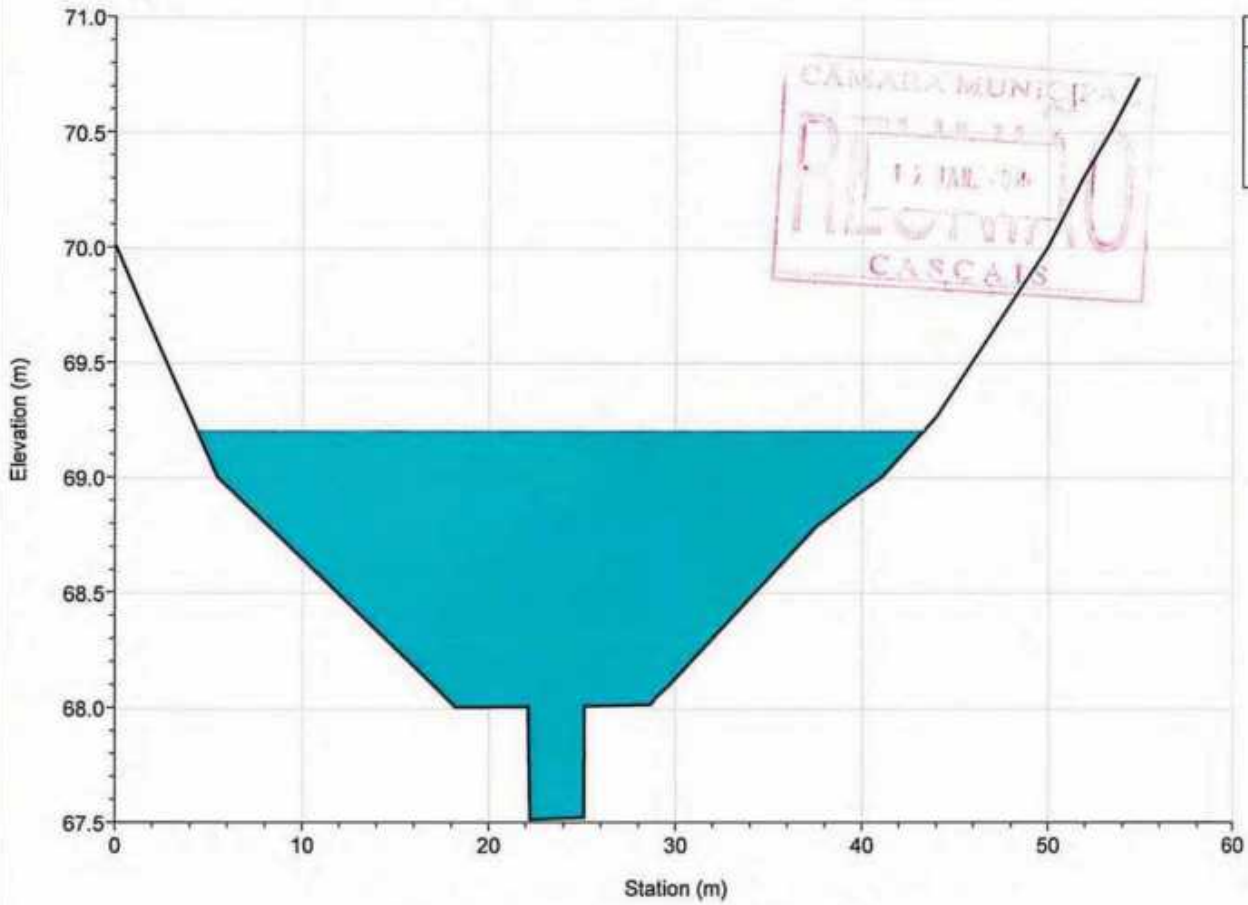
River = MANIQUE Reach = inter1 RS = 4794.791



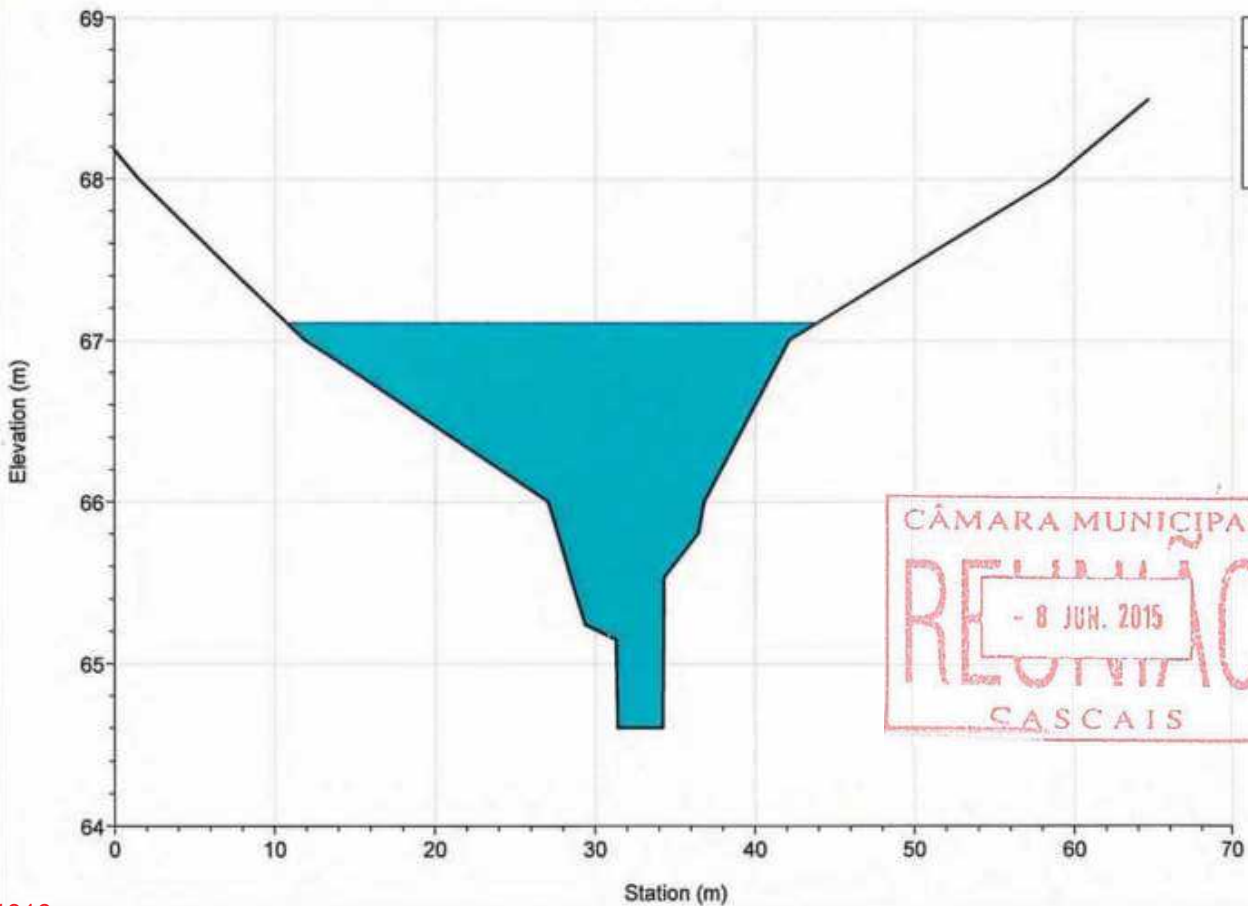
River = MANIQUE Reach = inter1 RS = 4674.507



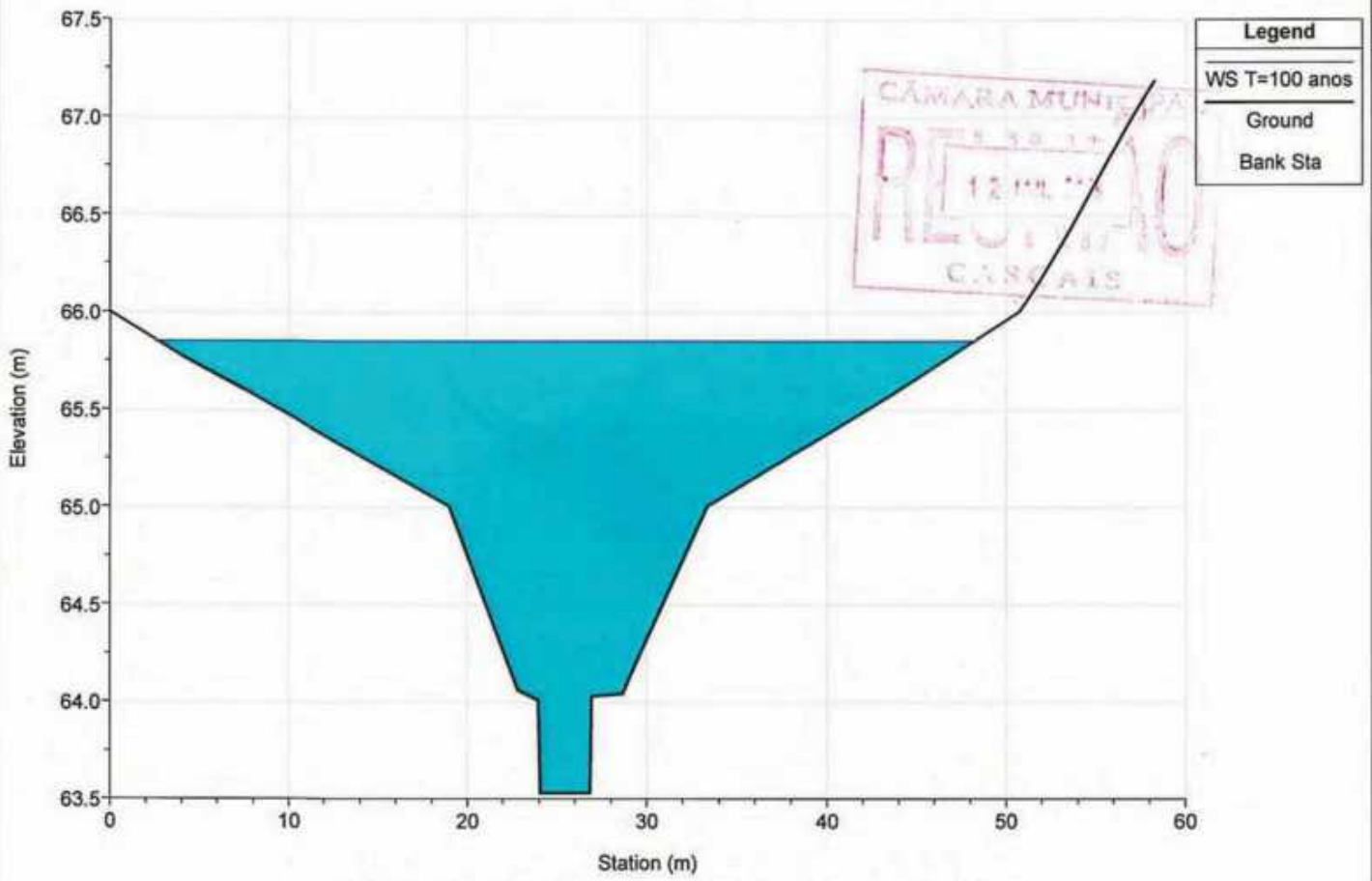
River = MANIQUE Reach = inter1 RS = 4576.844



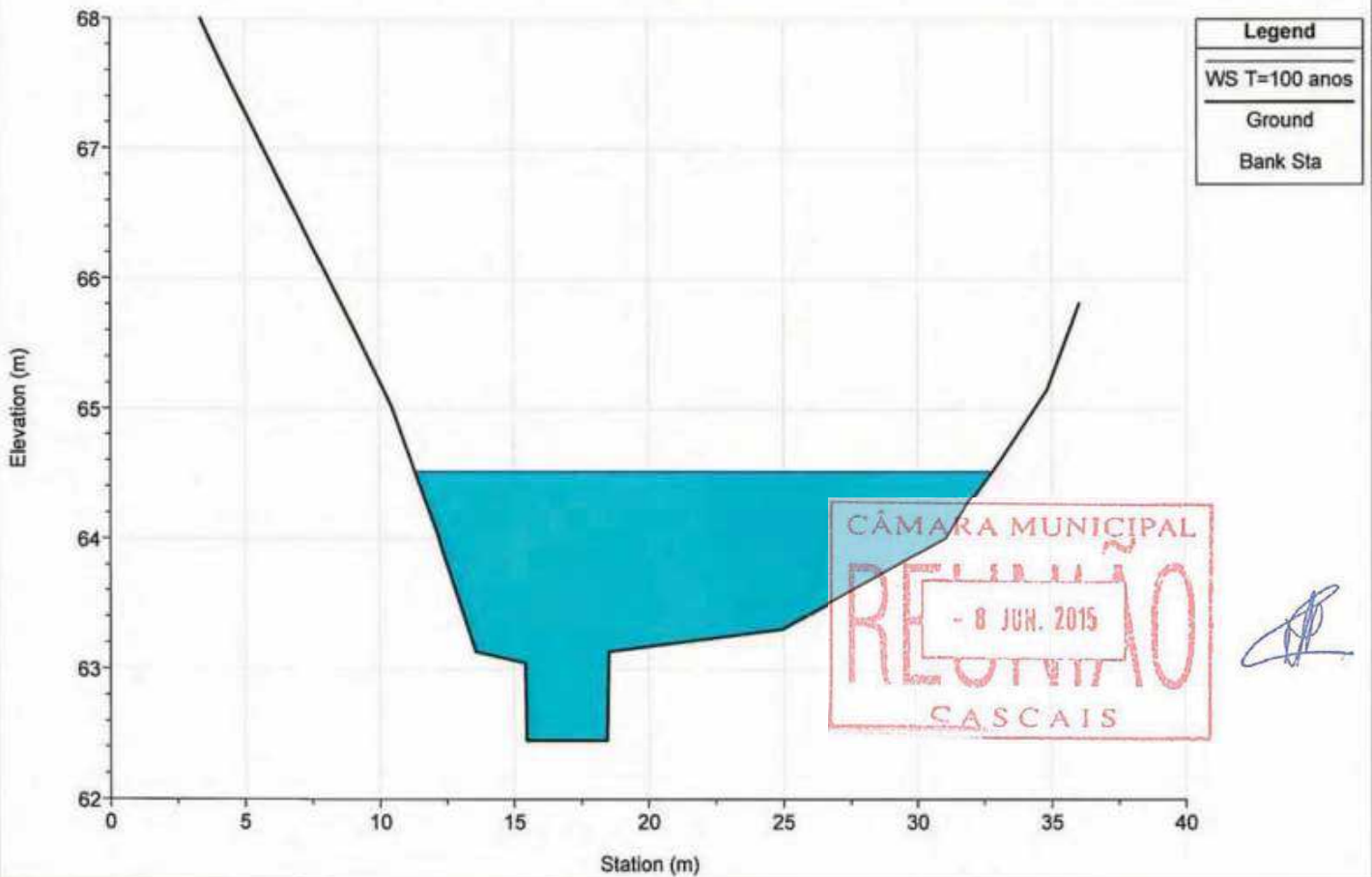
River = MANIQUE Reach = inter1 RS = 4469.105



River = MANIQUE Reach = inter1 RS = 4367.050

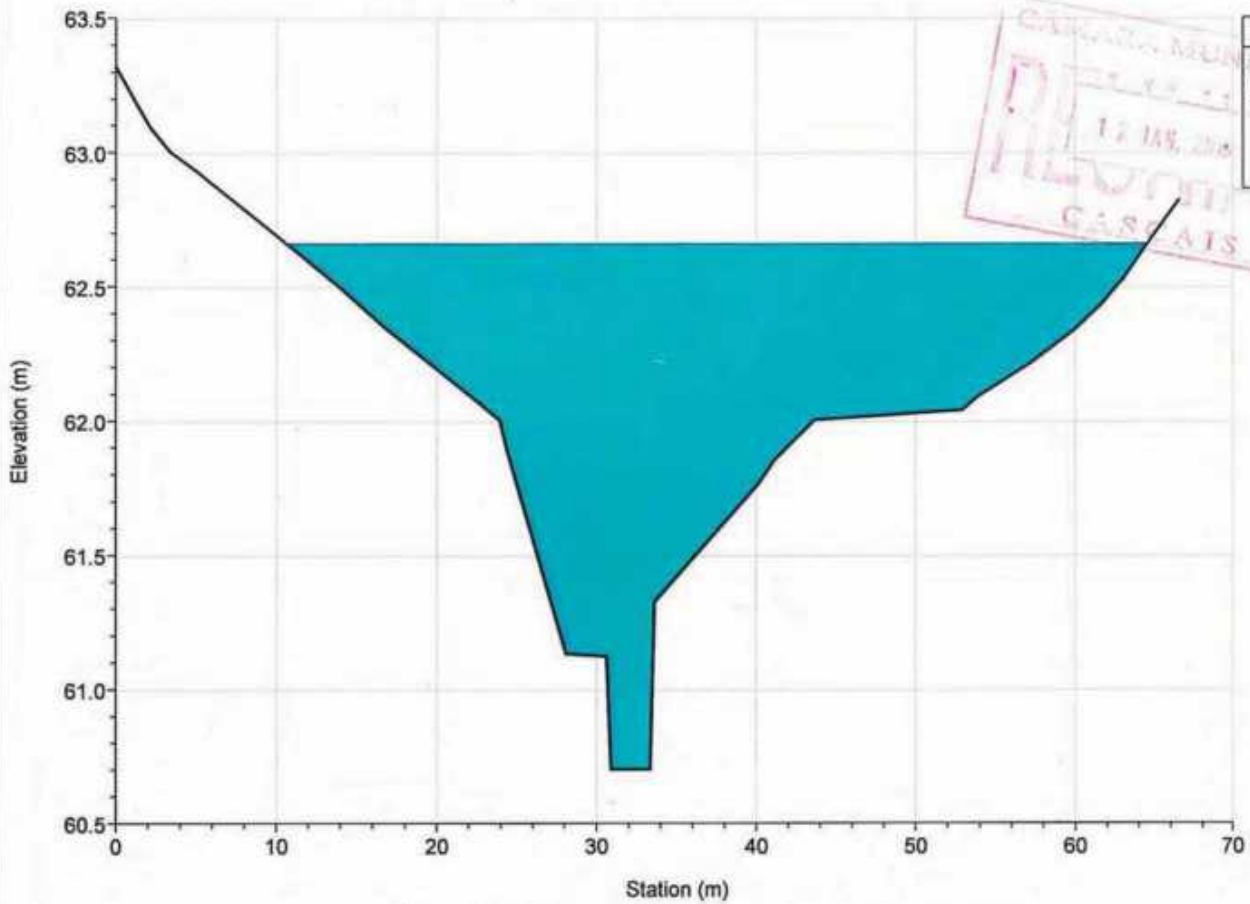


River = MANIQUE Reach = inter1 RS = 4280.820

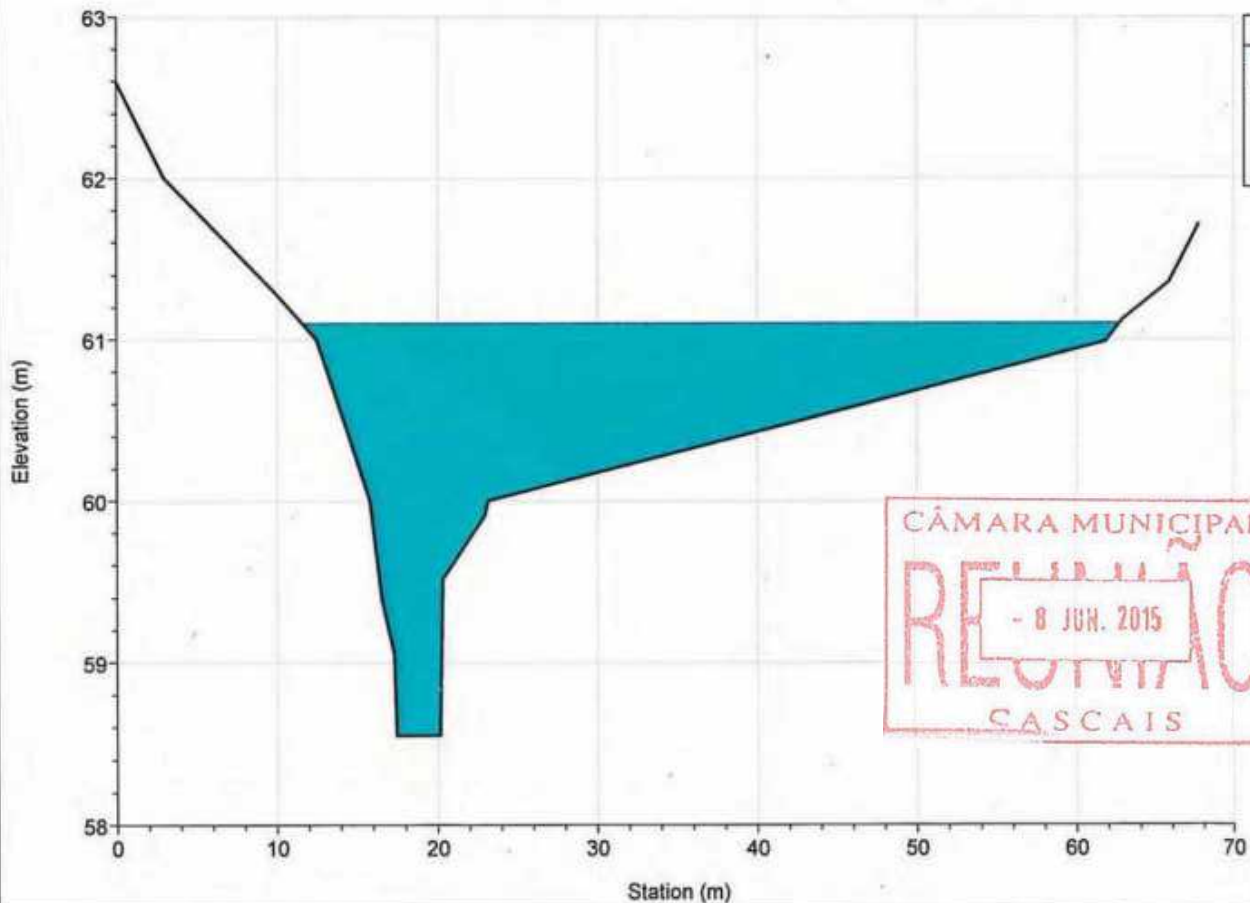




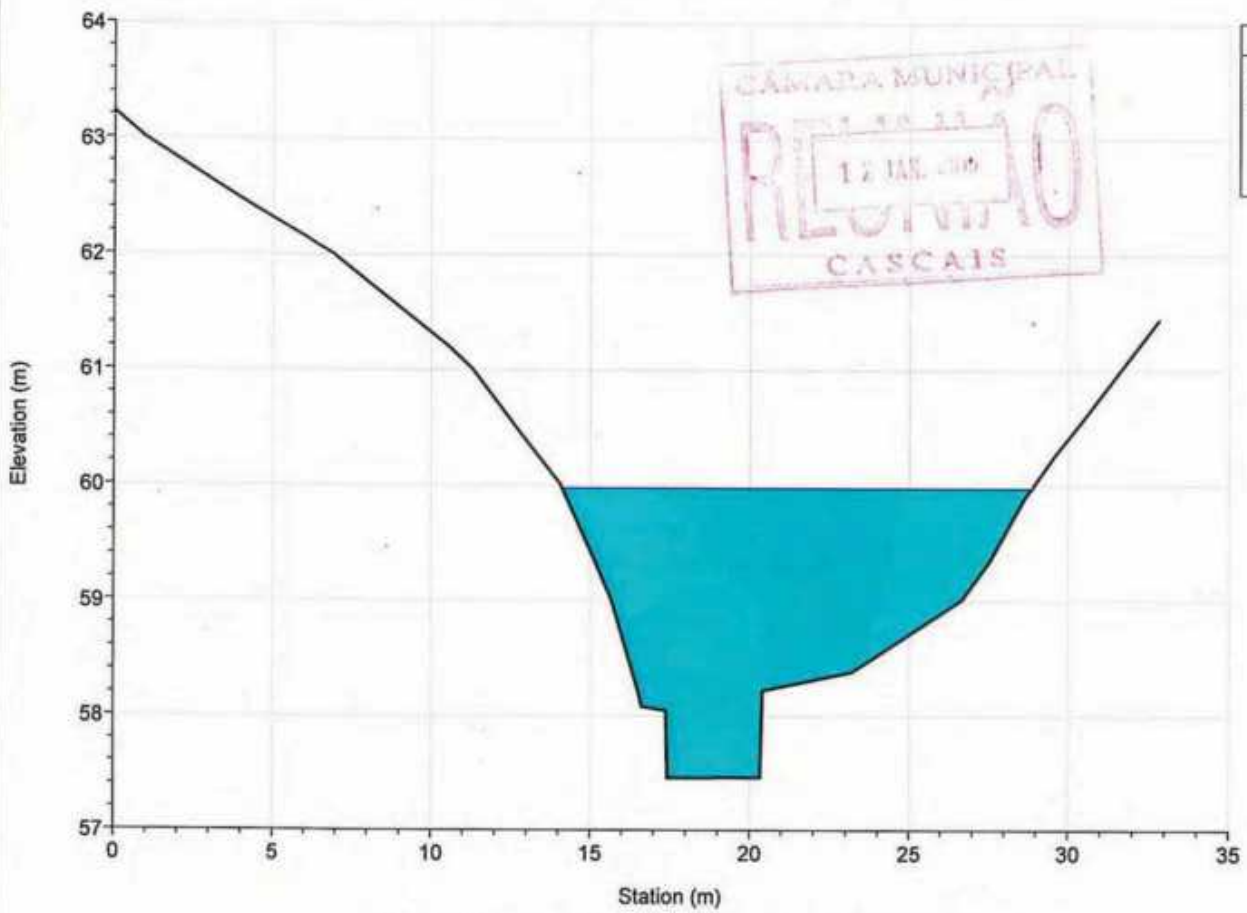
River = MANIQUE Reach = inter1 RS = 4176.977



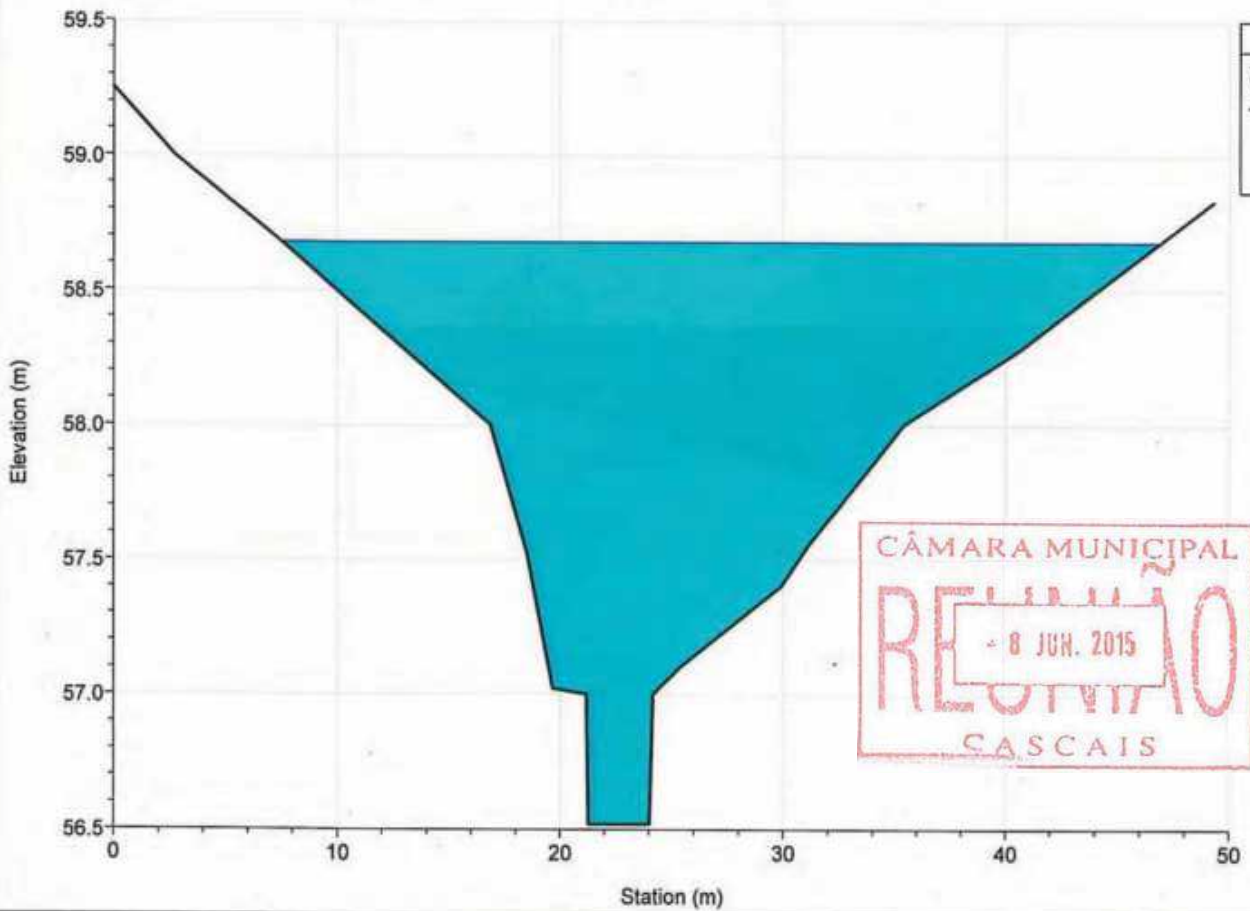
River = MANIQUE Reach = inter1 RS = 4077.215



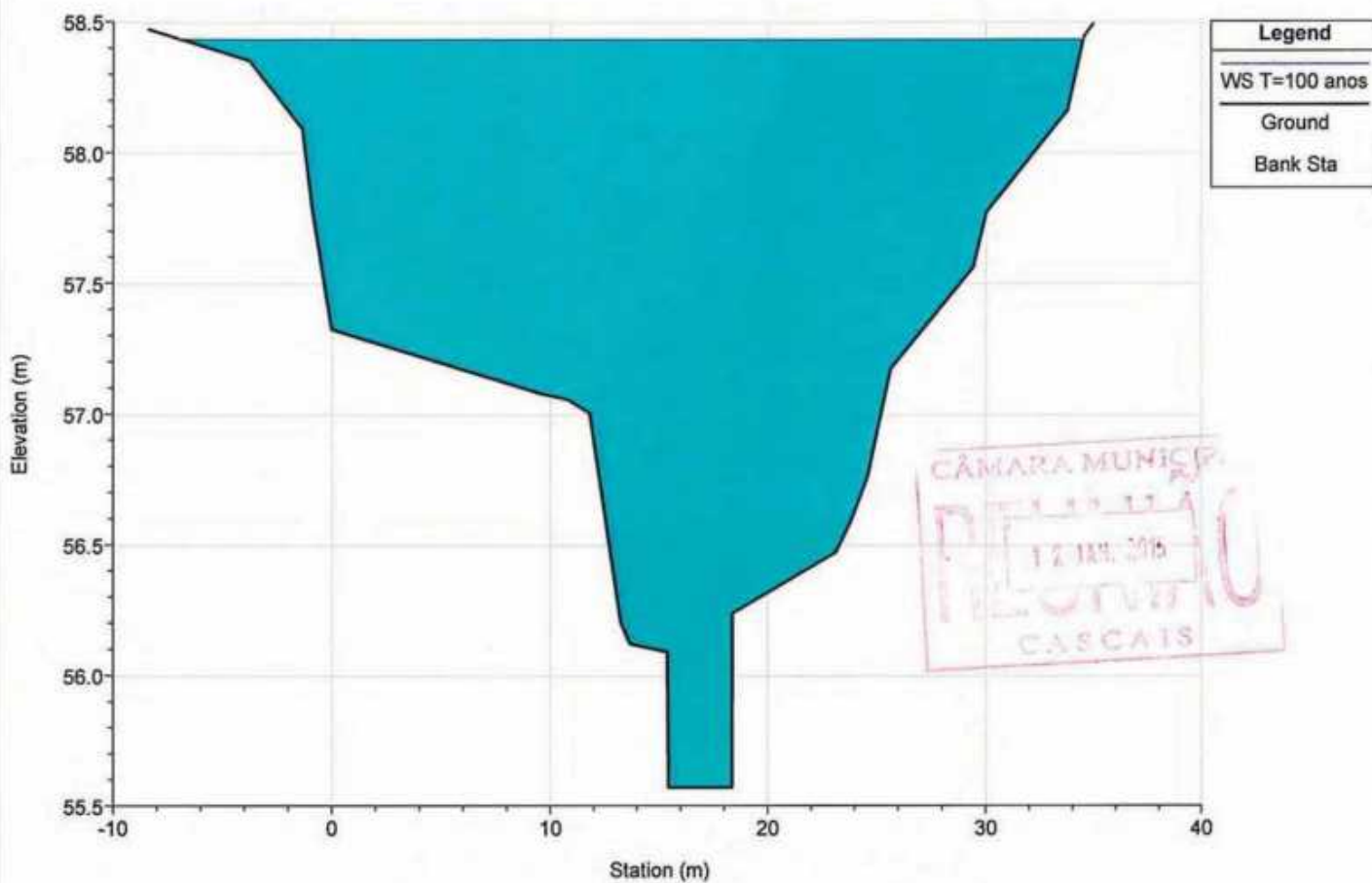
River = MANIQUE Reach = inter1 RS = 4001.840



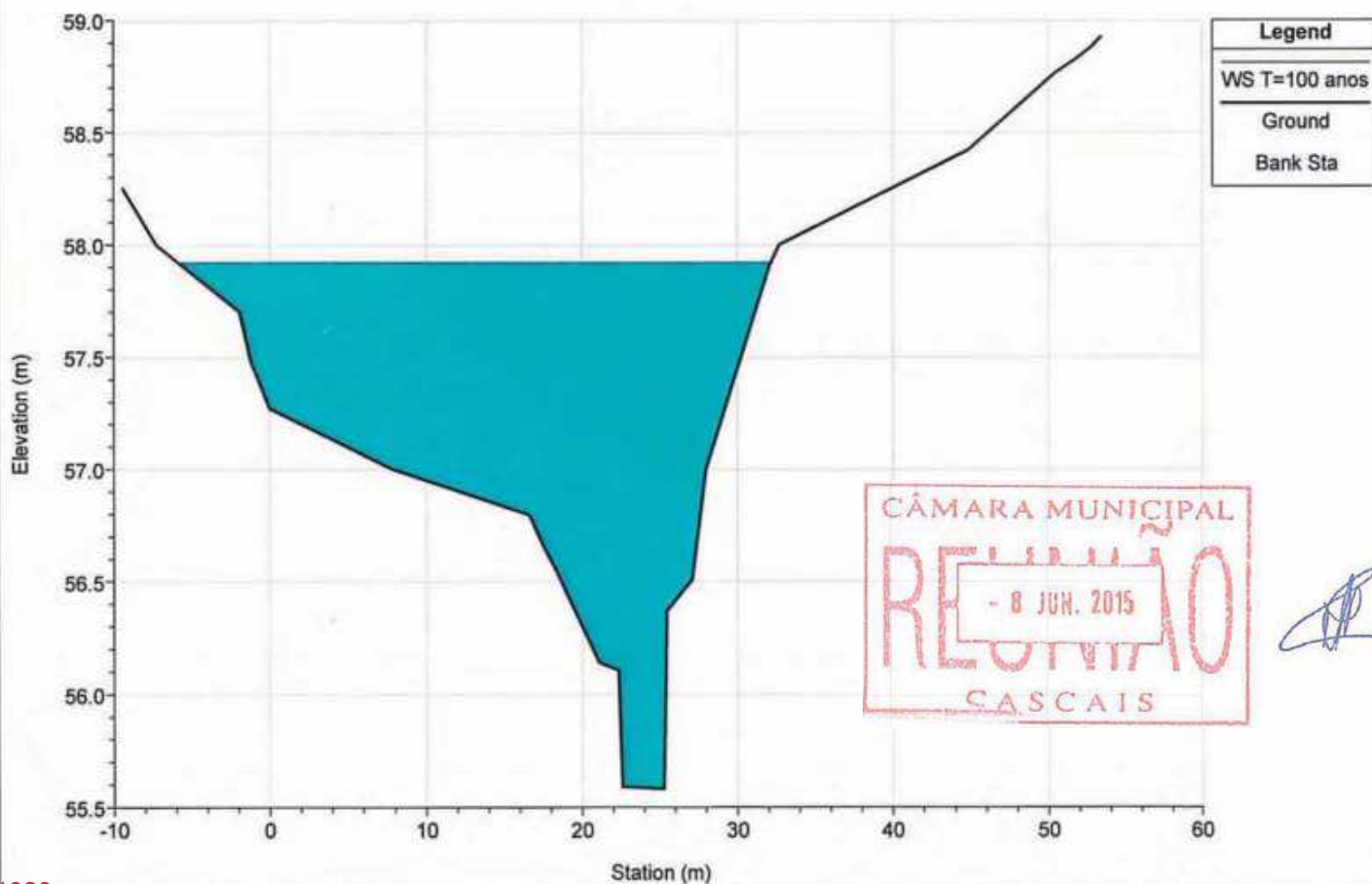
River = MANIQUE Reach = inter1 RS = 3905.841



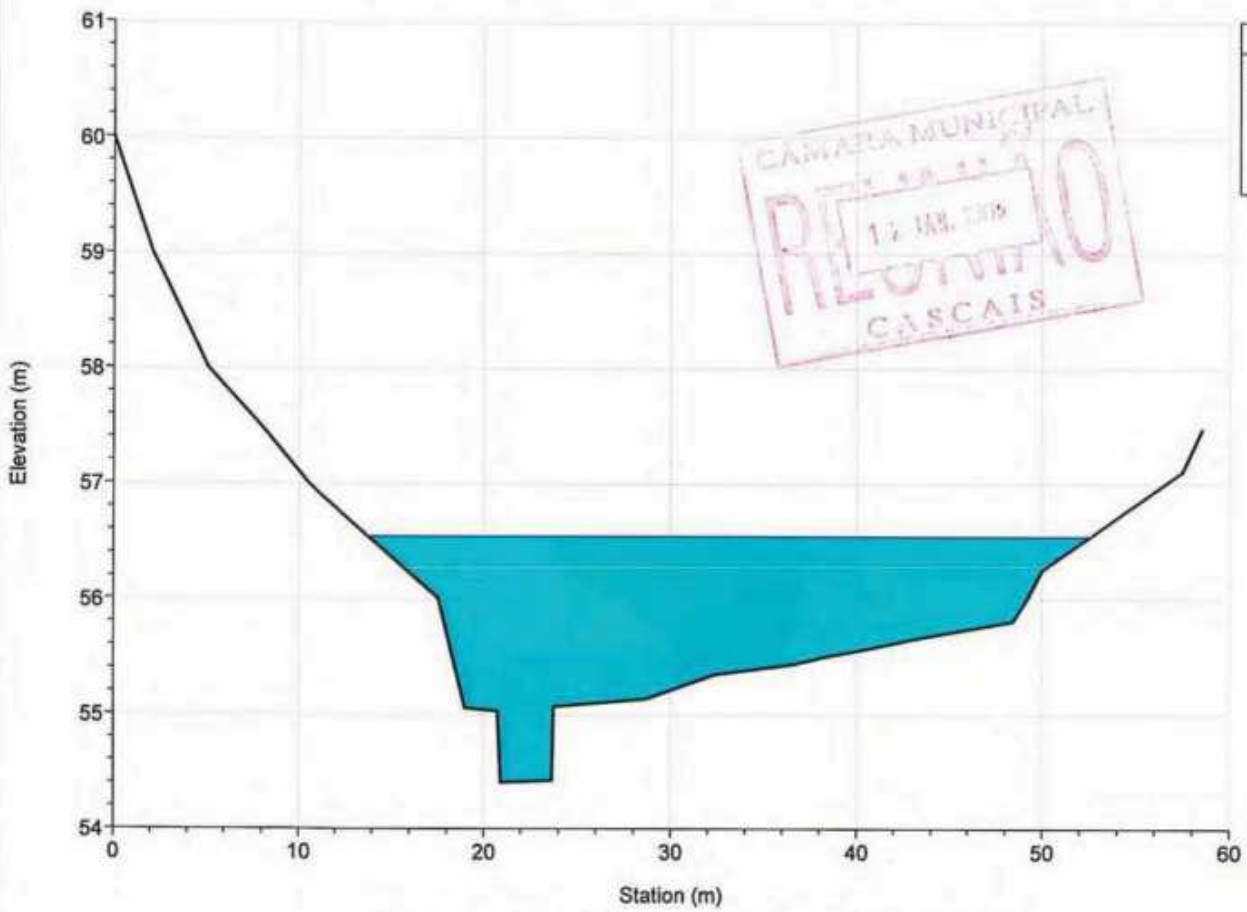
River = MANIQUE Reach = inter1 RS = 3868.144



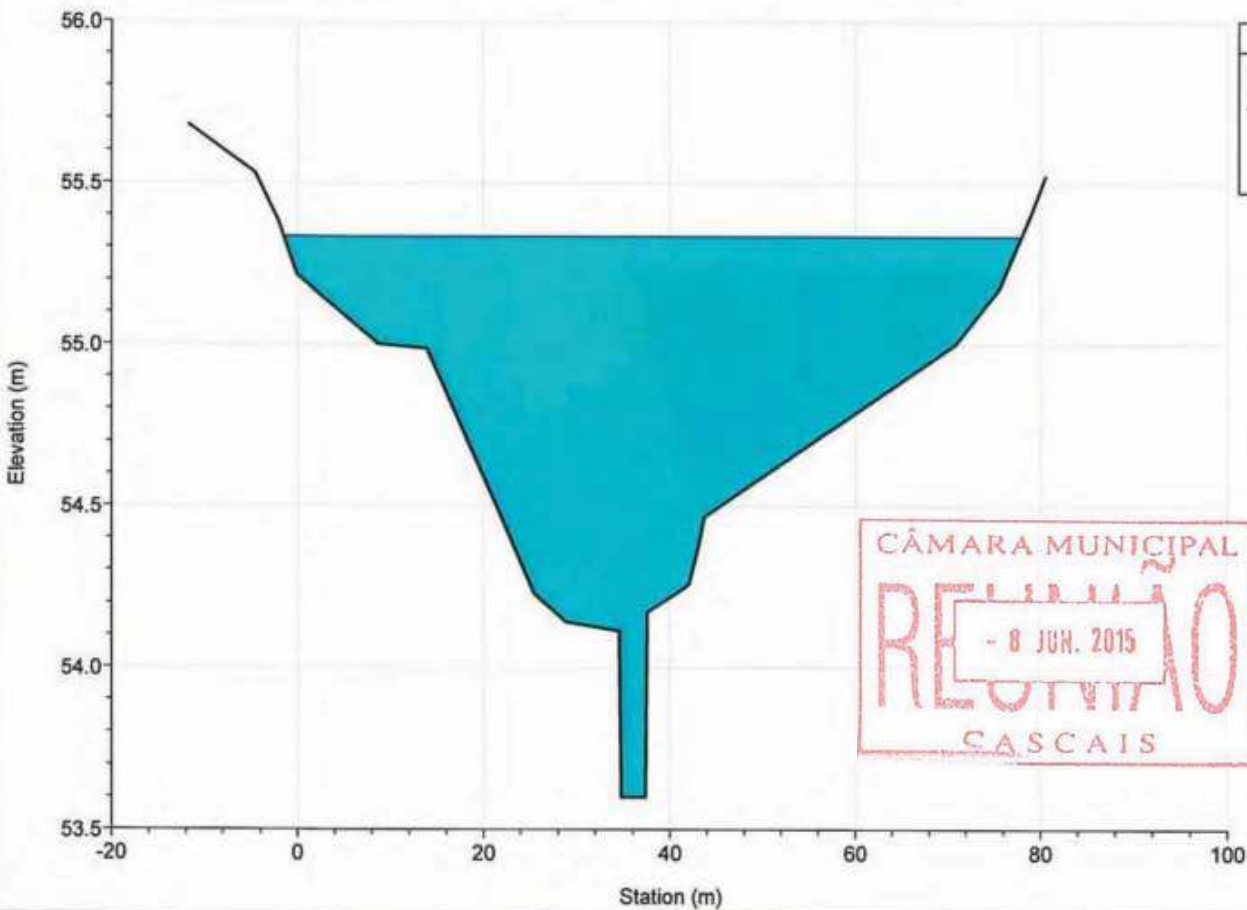
River = MANIQUE Reach = inter2 RS = 3840.527



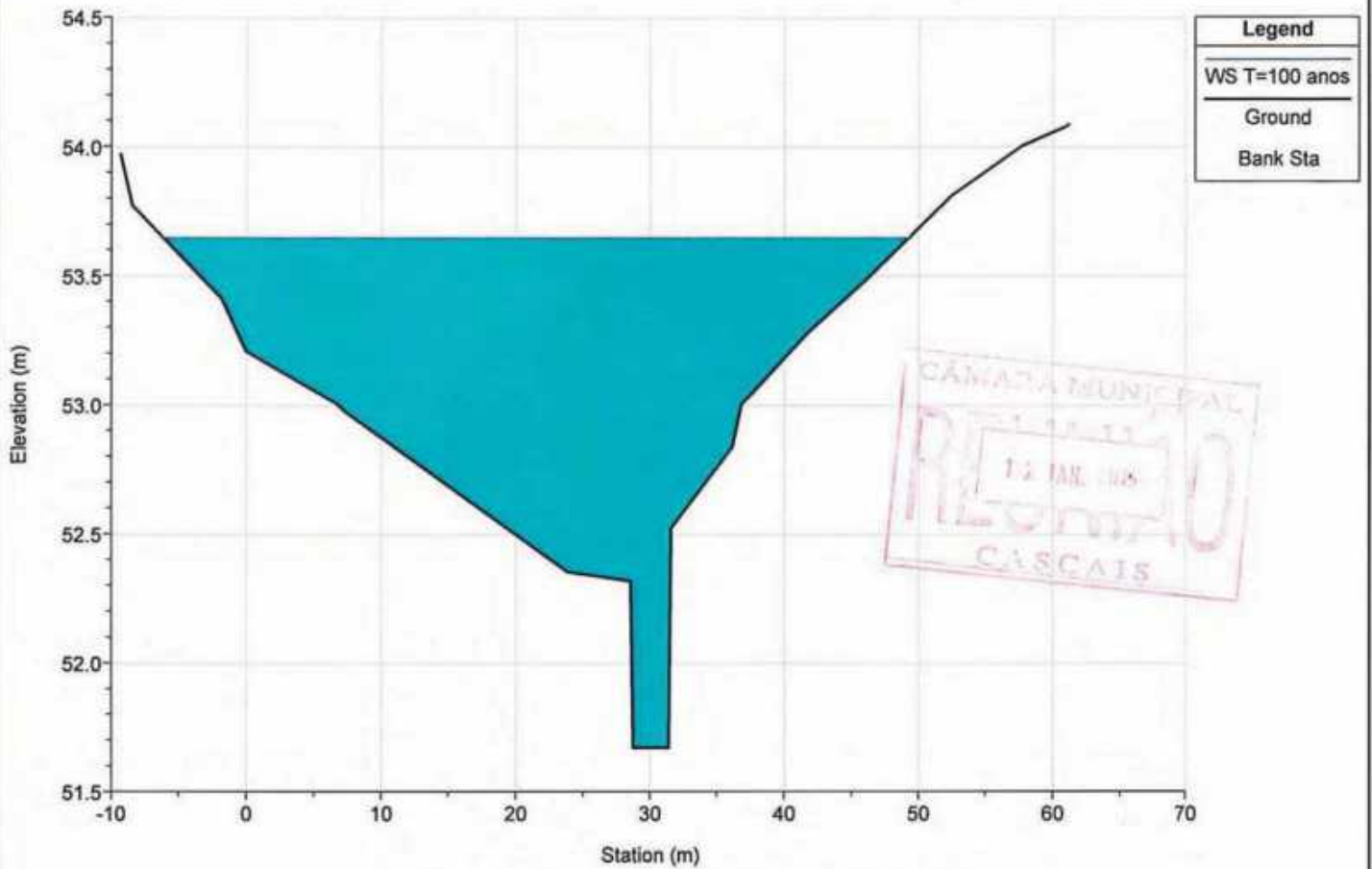
River = MANIQUE Reach = inter2 RS = 3740.065



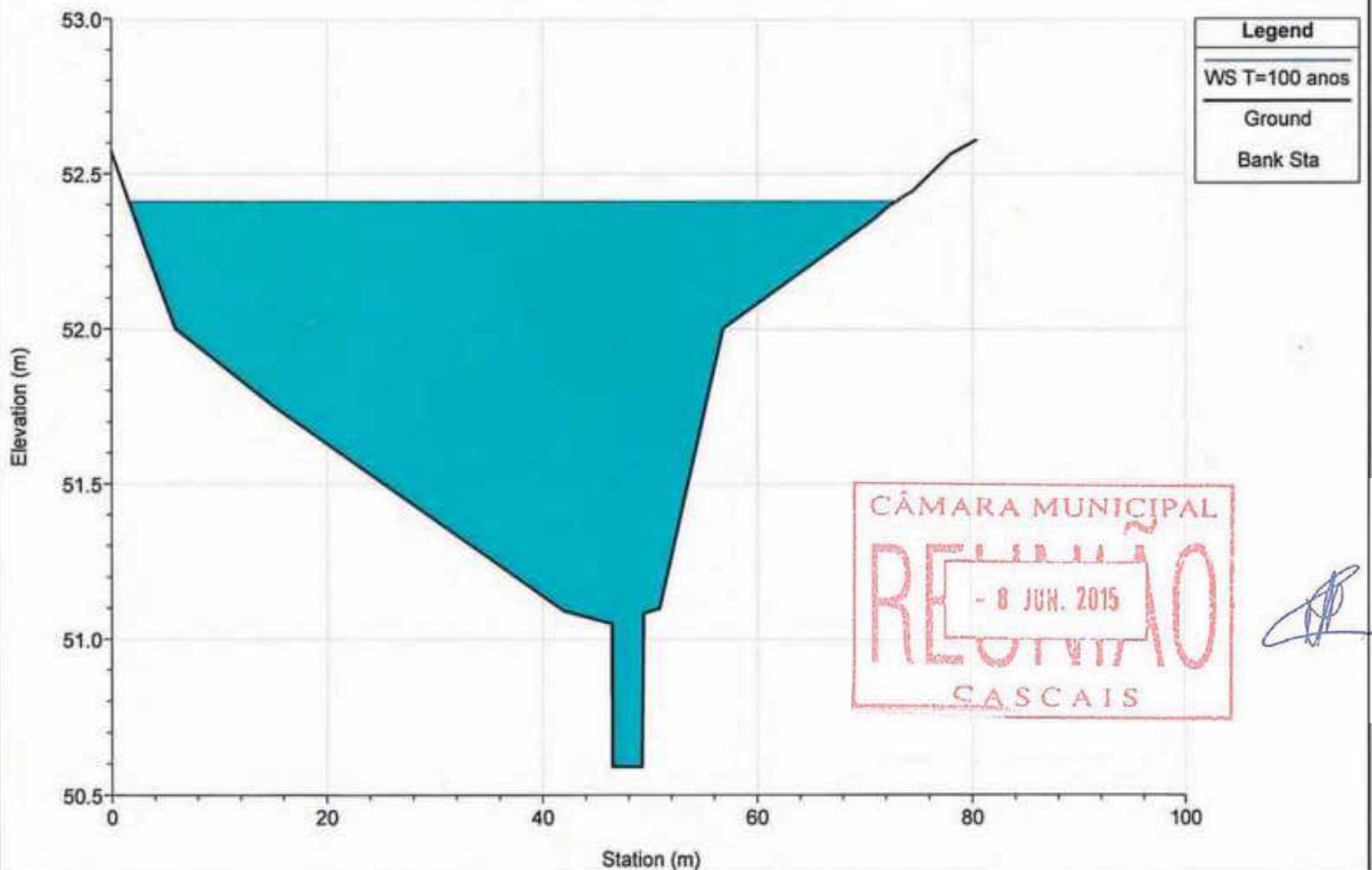
River = MANIQUE Reach = inter2 RS = 3624.721



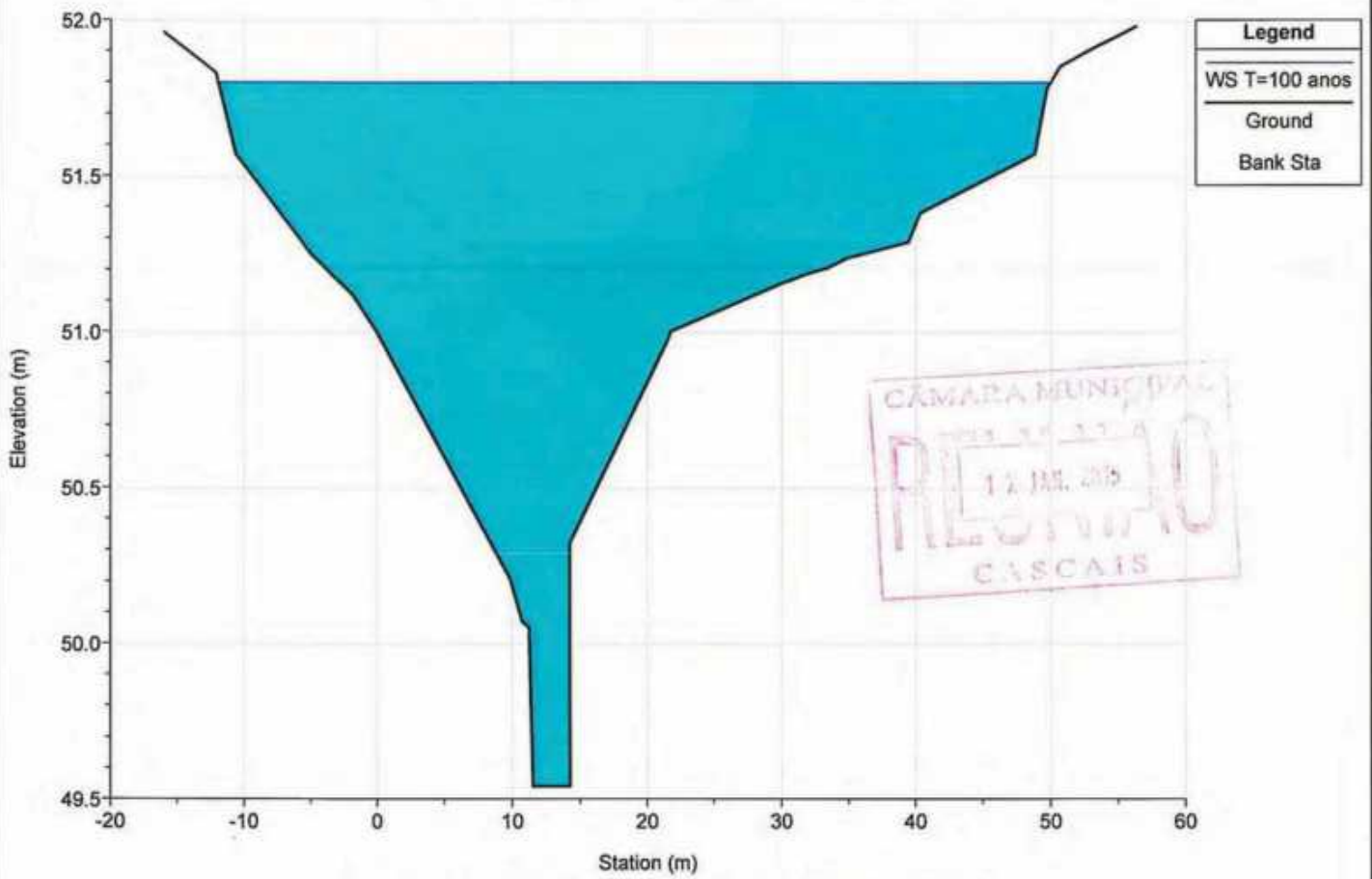
River = MANIQUE Reach = inter2 RS = 3504.845



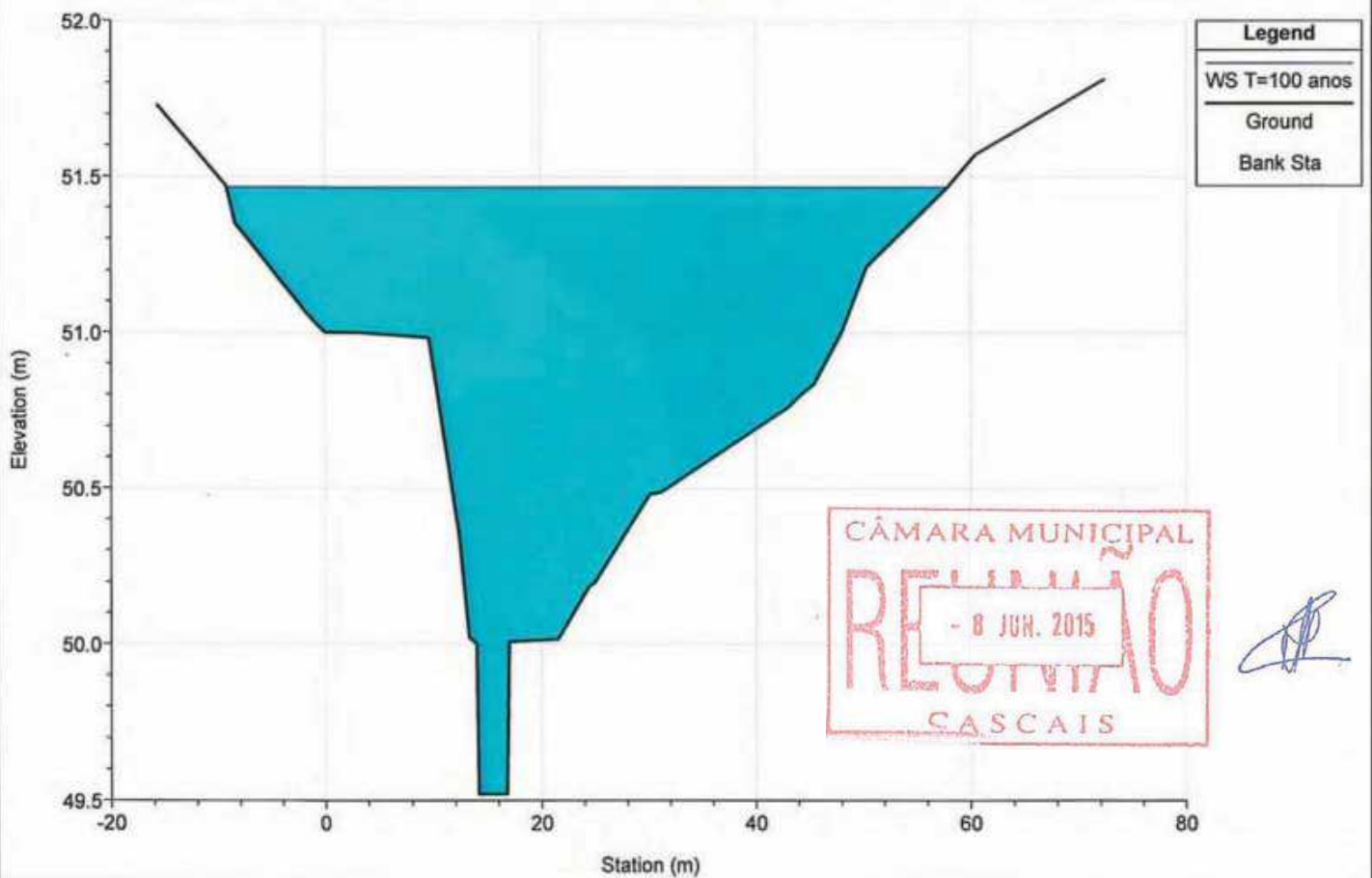
River = MANIQUE Reach = inter2 RS = 3398.734



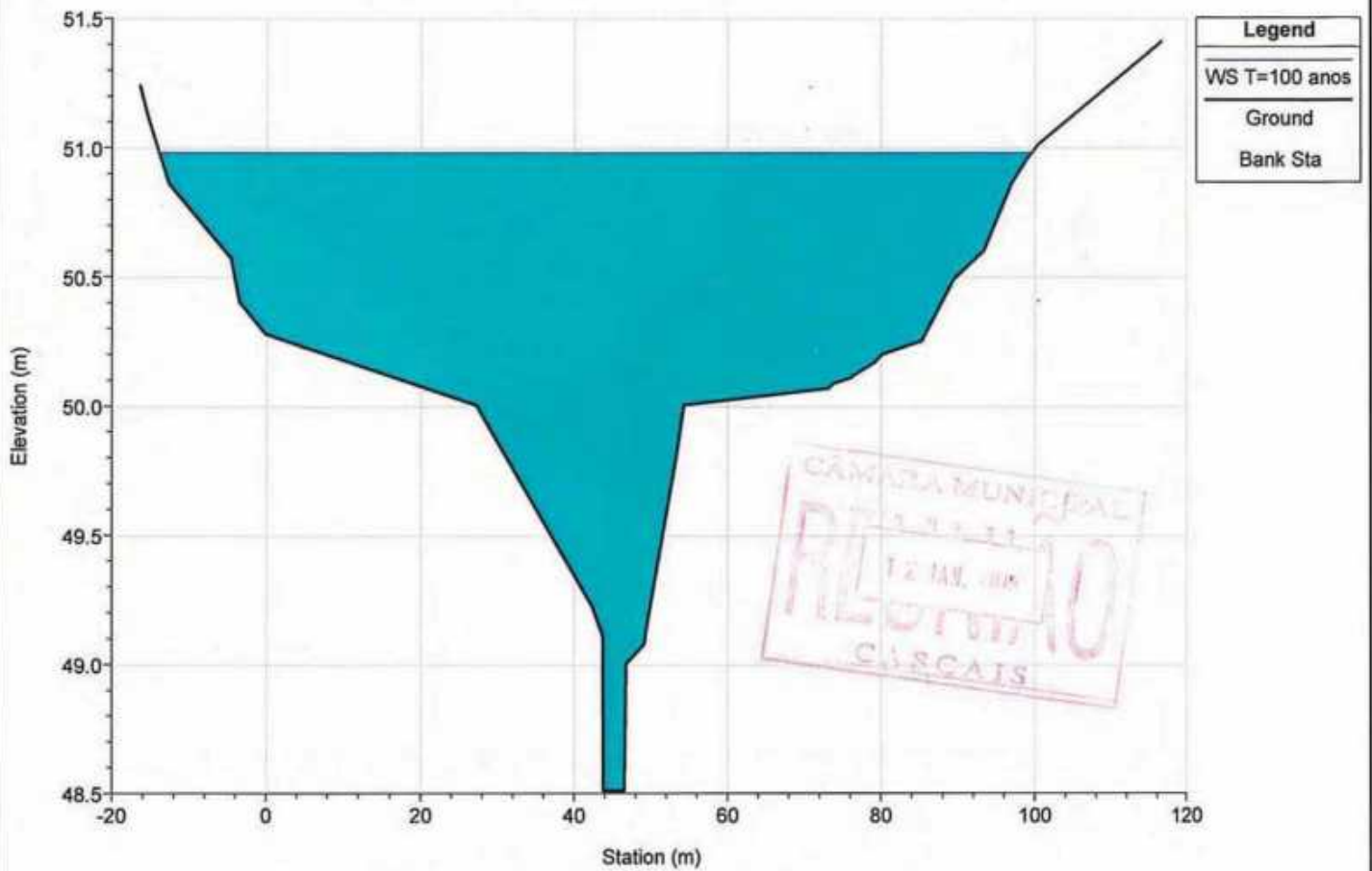
River = MANIQUE Reach = inter2 RS = 3341.828



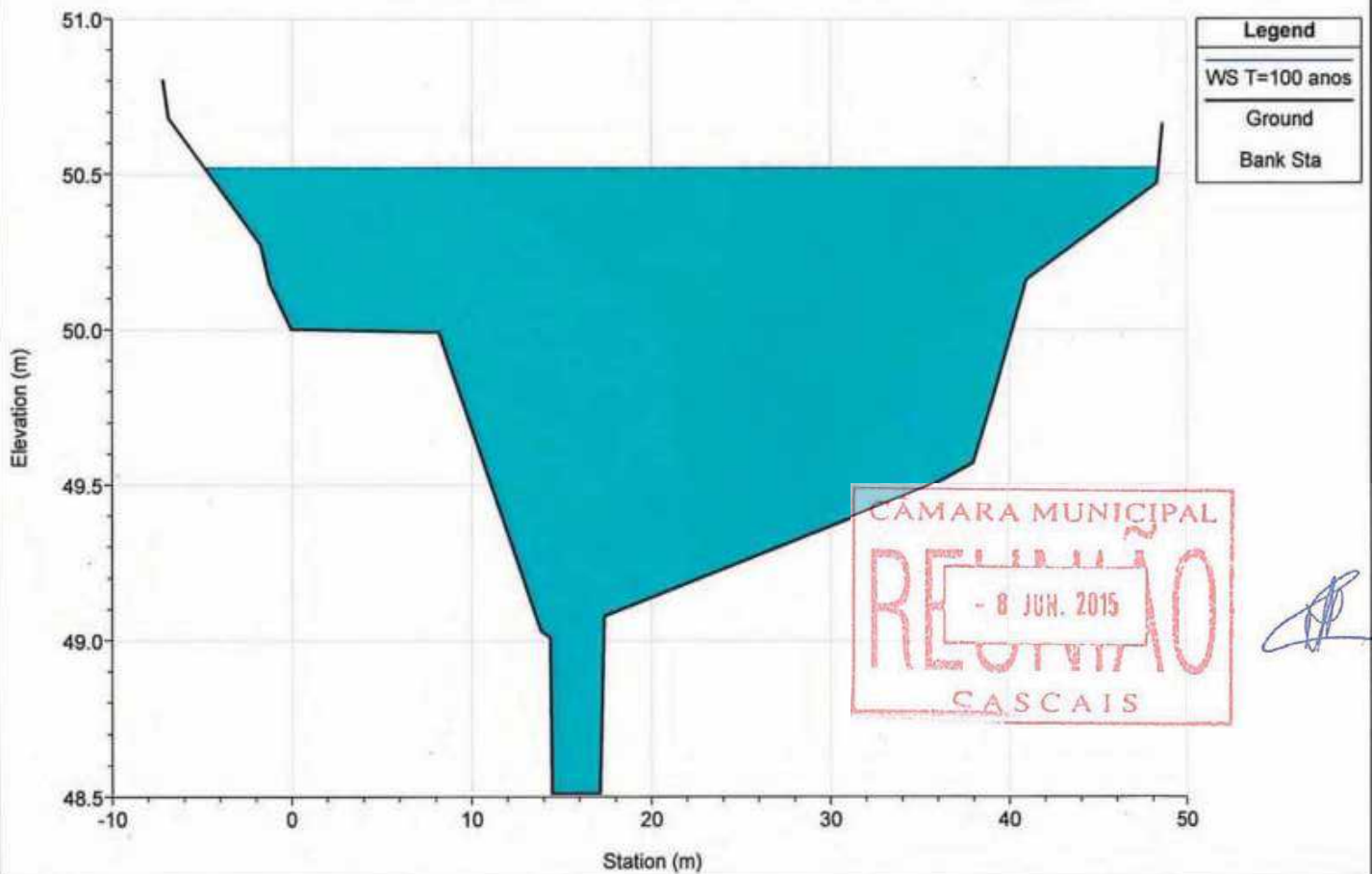
River = MANIQUE Reach = inter3 RS = 3314.462



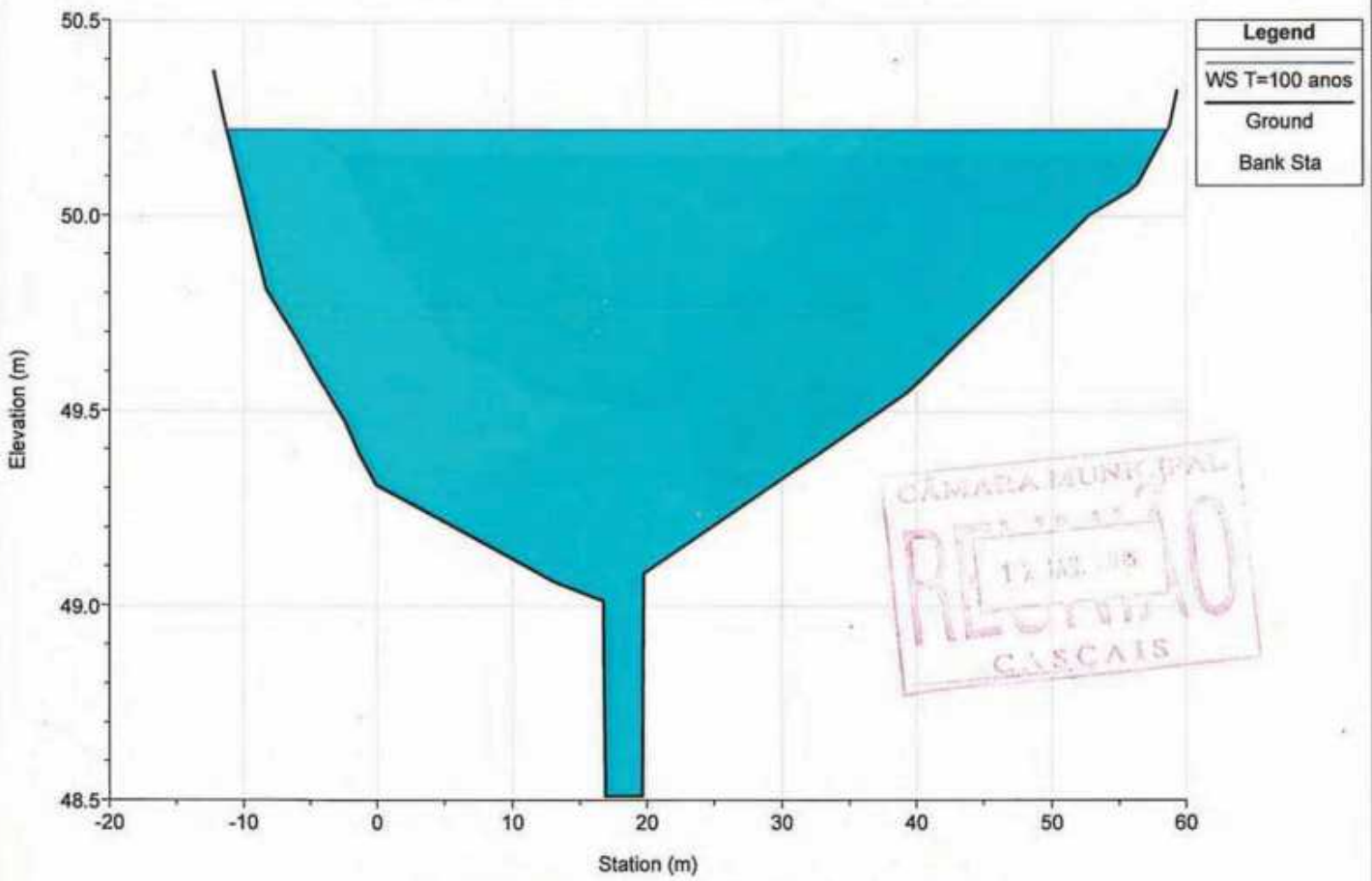
River = MANIQUE Reach = inter3 RS = 3246.931



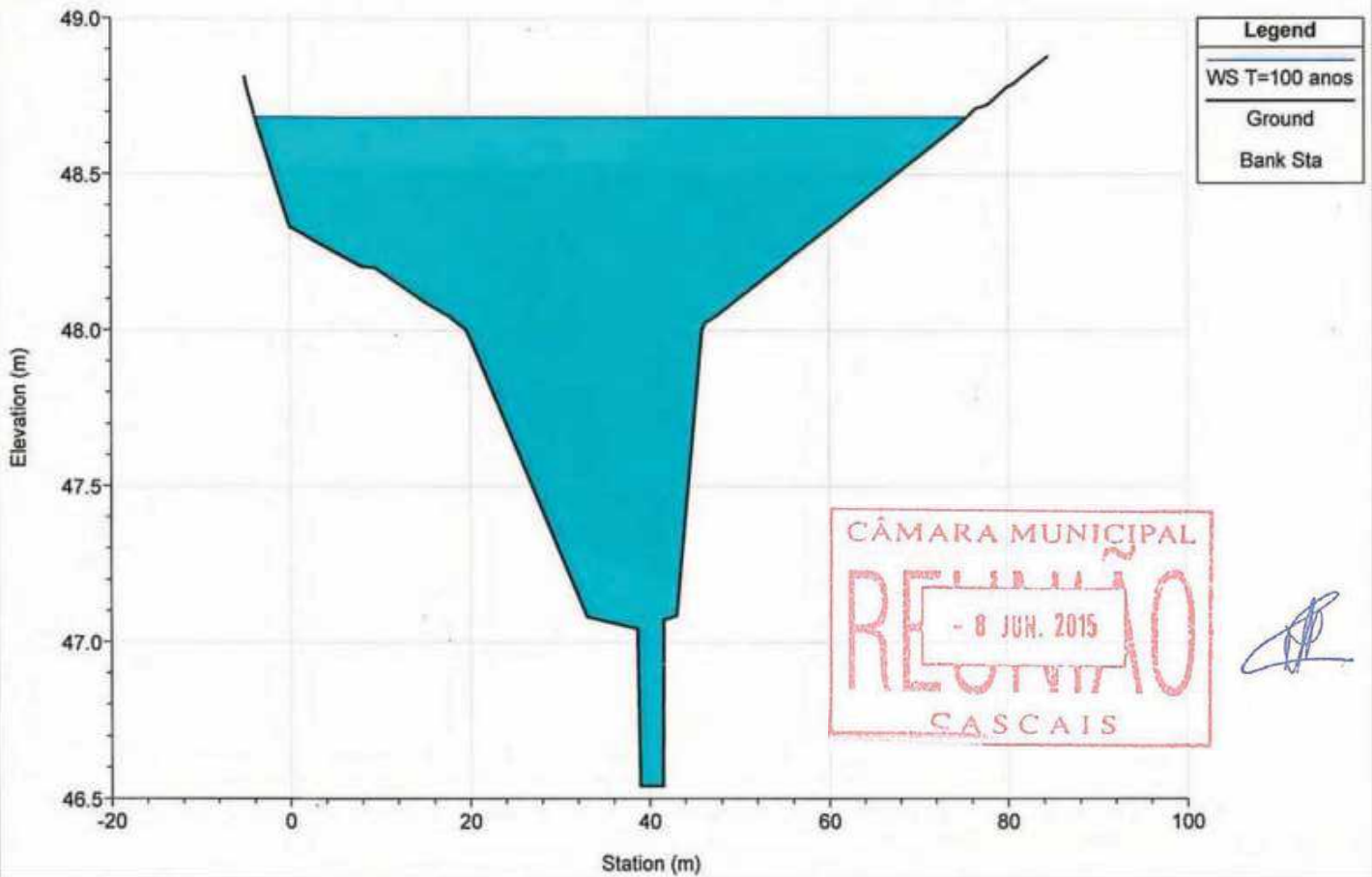
River = MANIQUE Reach = inter3 RS = 3213.544



River = MANIQUE Reach = inter4 RS = 3184.035

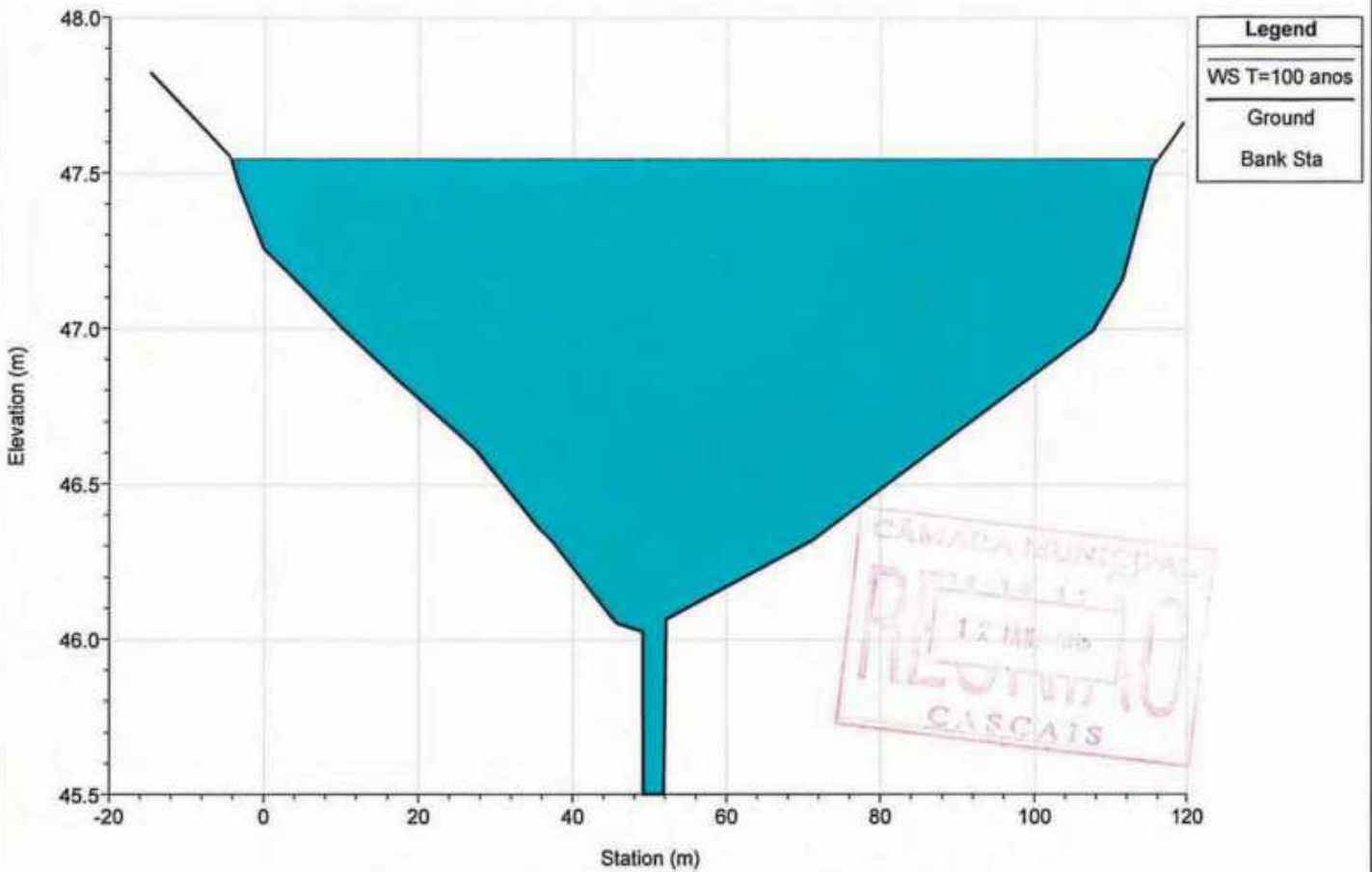


River = MANIQUE Reach = inter4 RS = 3048.627

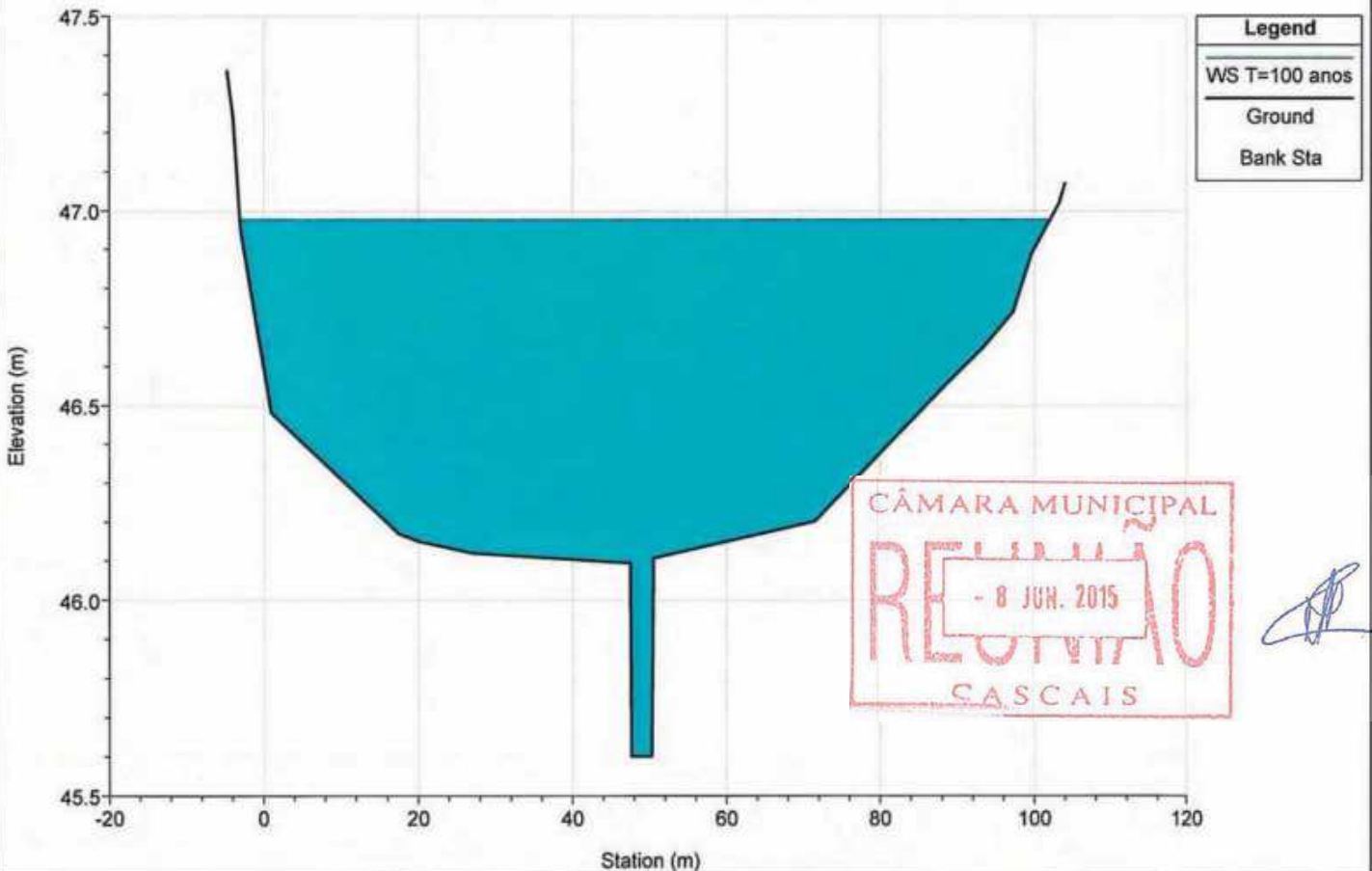




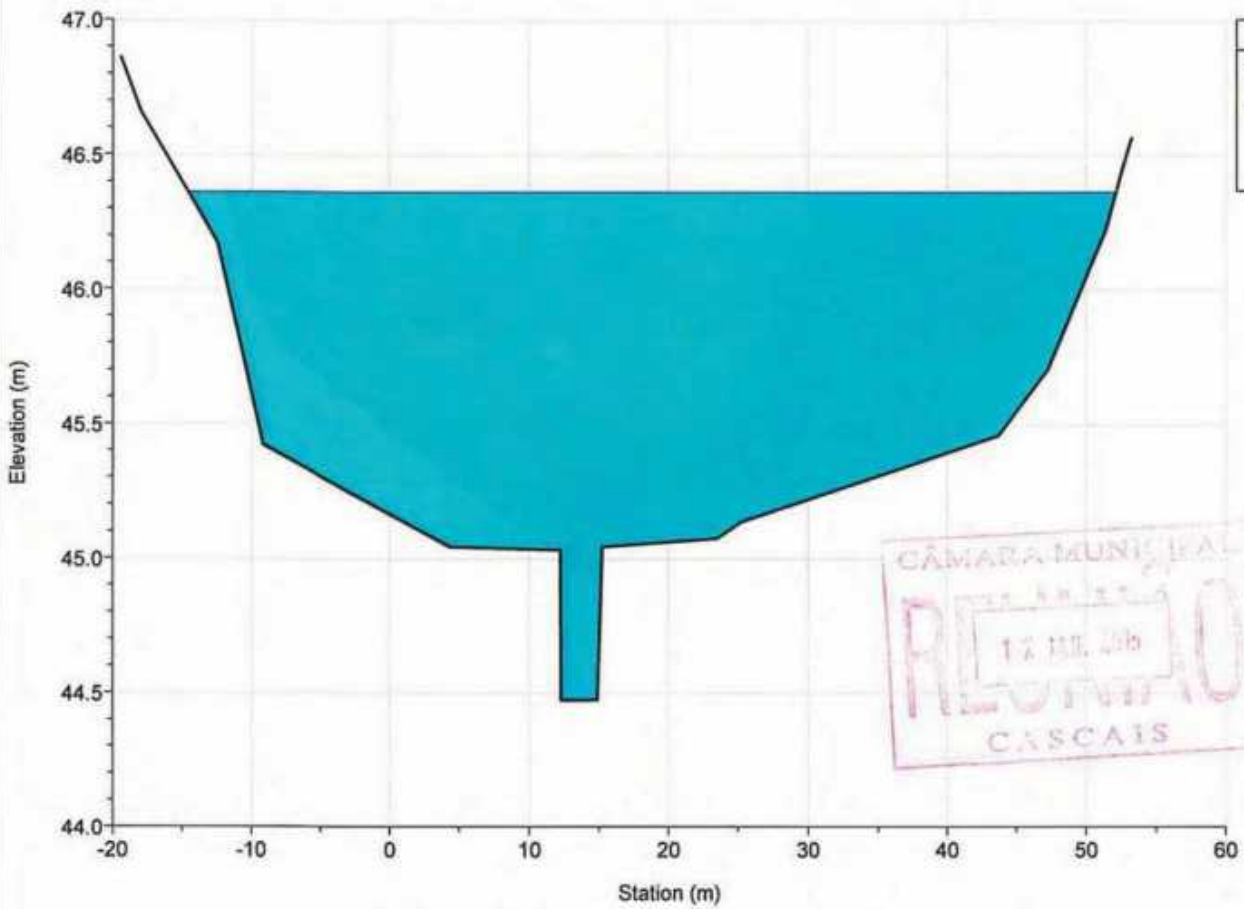
River = MANIQUE Reach = inter4 RS = 2911.655



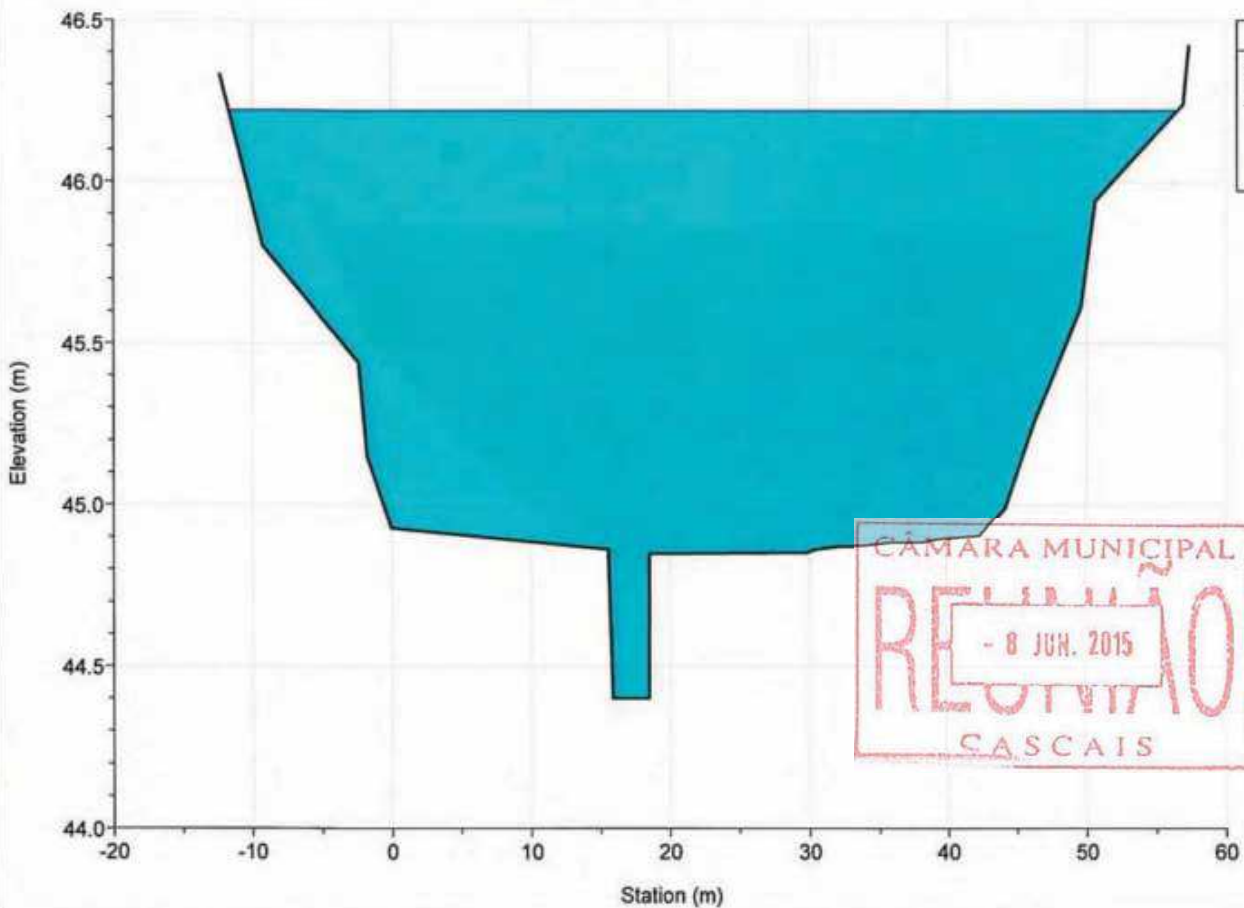
River = MANIQUE Reach = inter4 RS = 2787.684



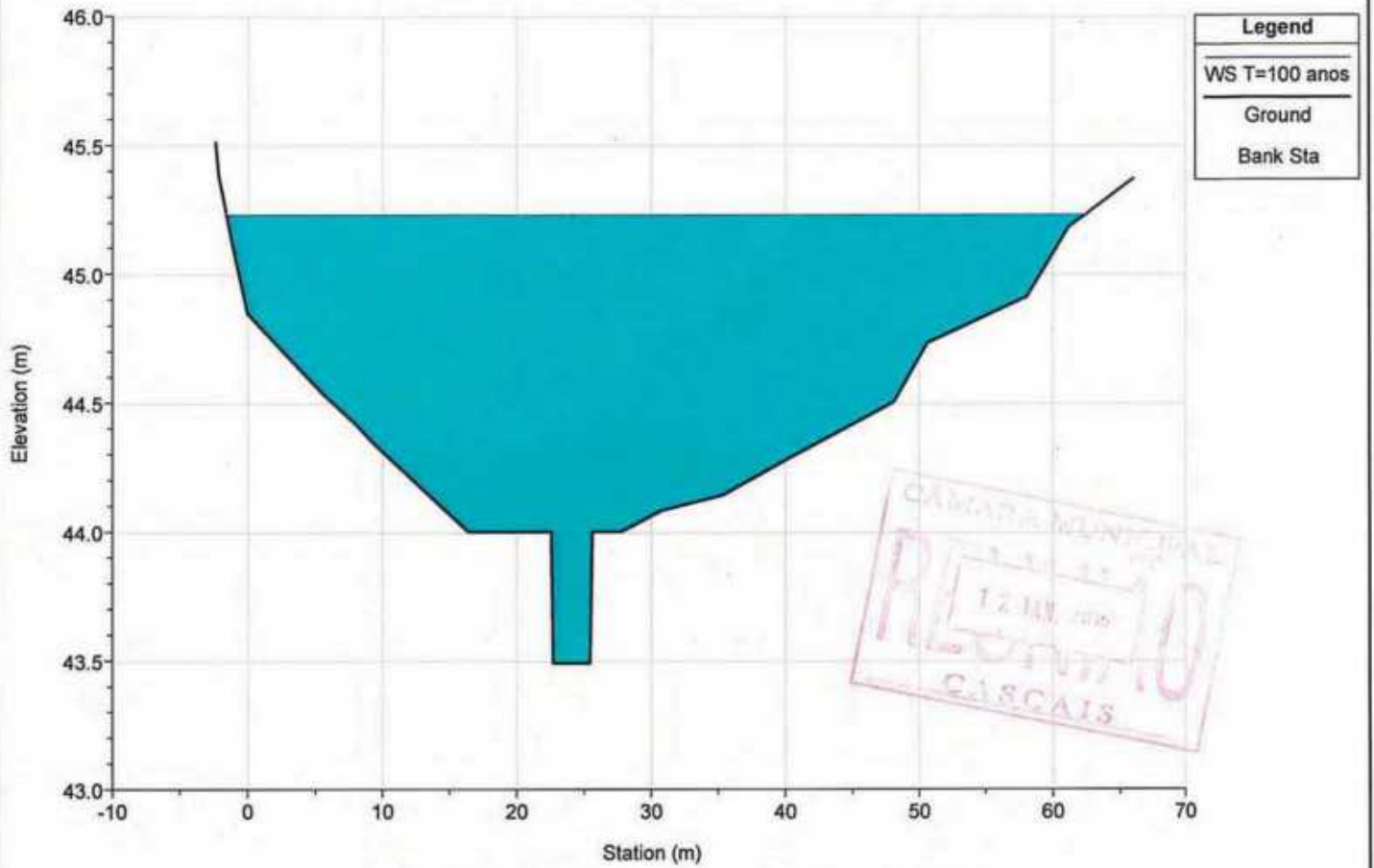
River = MANIQUE Reach = inter4 RS = 2692.064



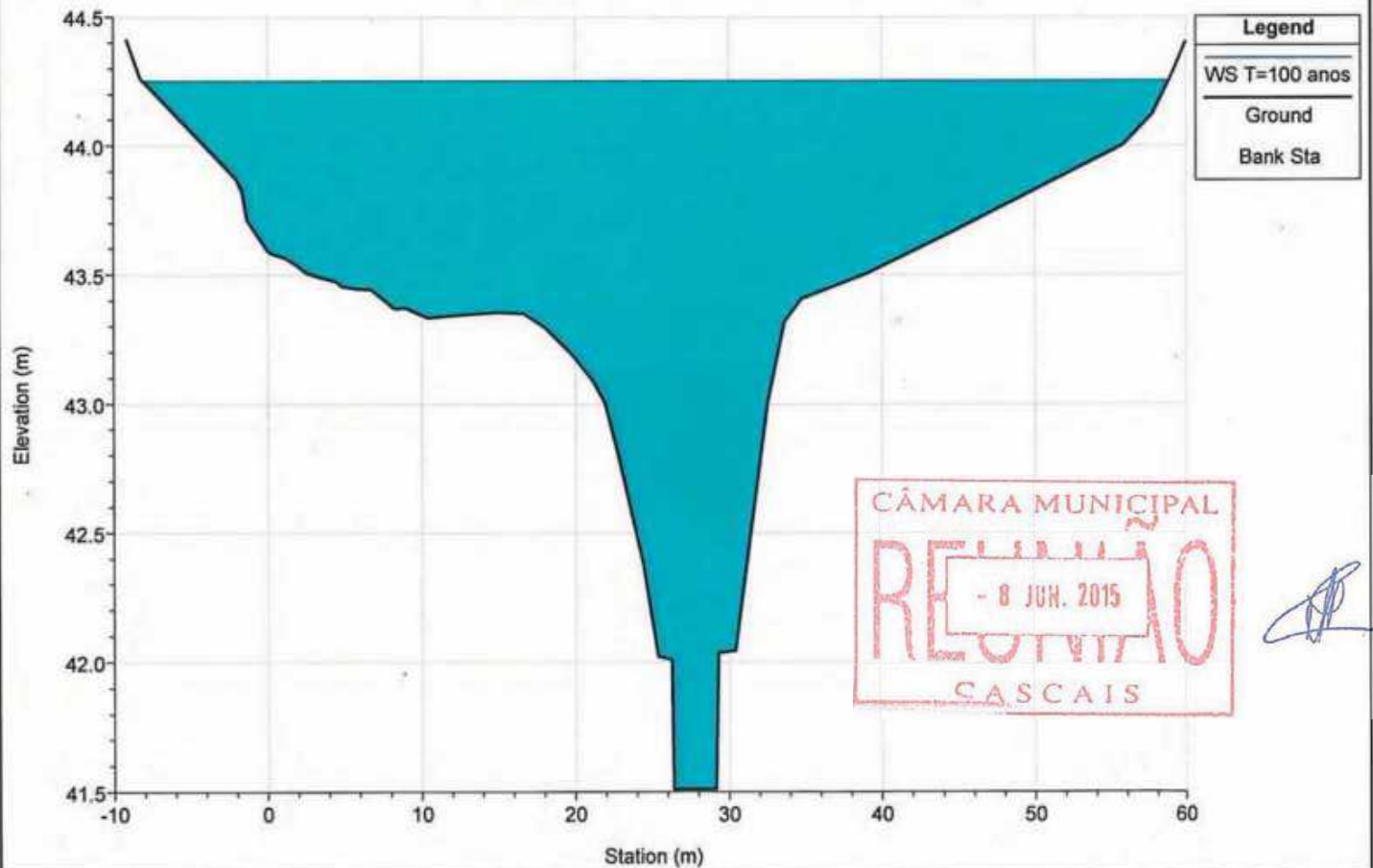
River = MANIQUE Reach = inter5 RS = 2662.096



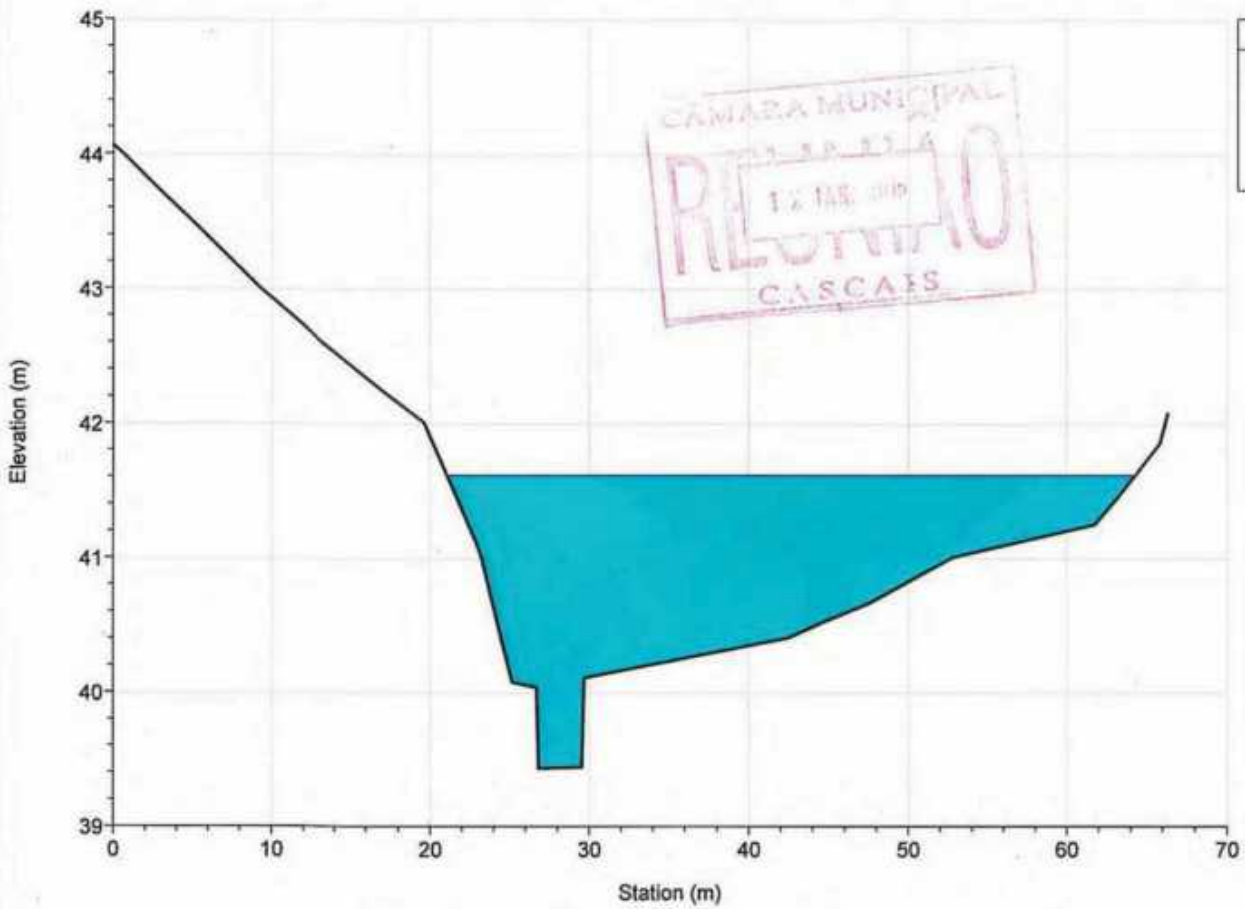
River = MANIQUE Reach = inter5 RS = 2538.731



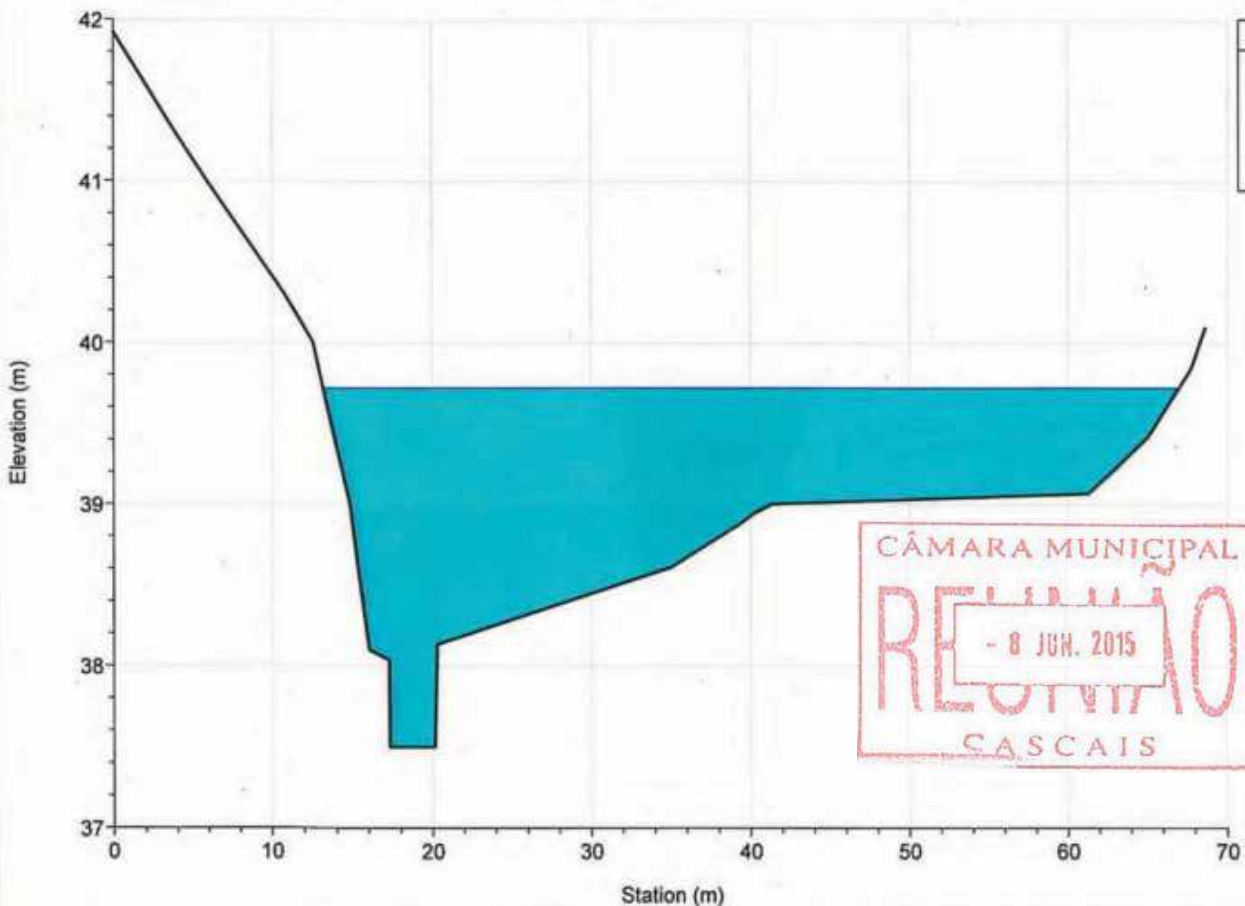
River = MANIQUE Reach = inter5 RS = 2443.573



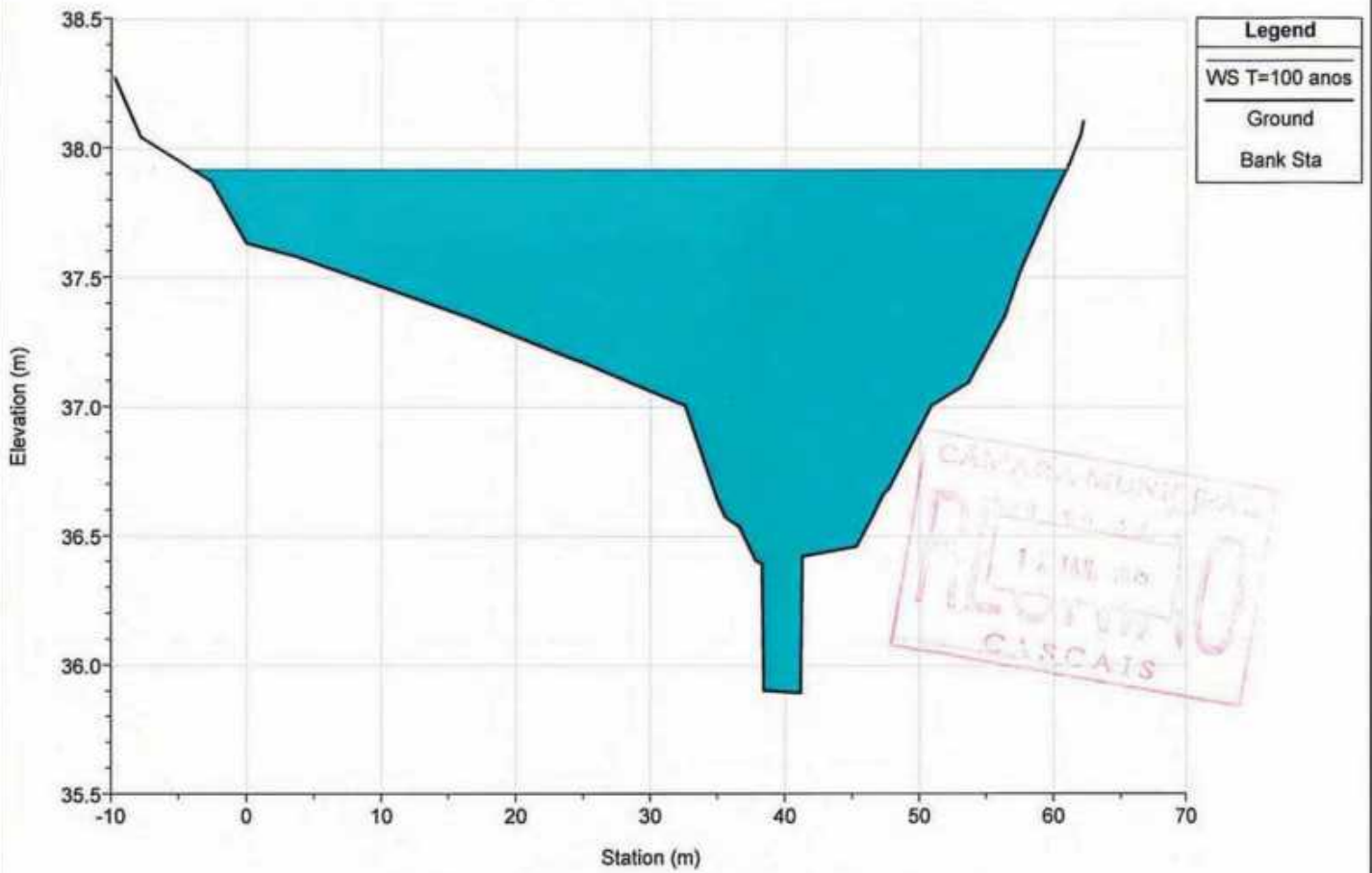
River = MANIQUE Reach = inter5 RS = 2289.987



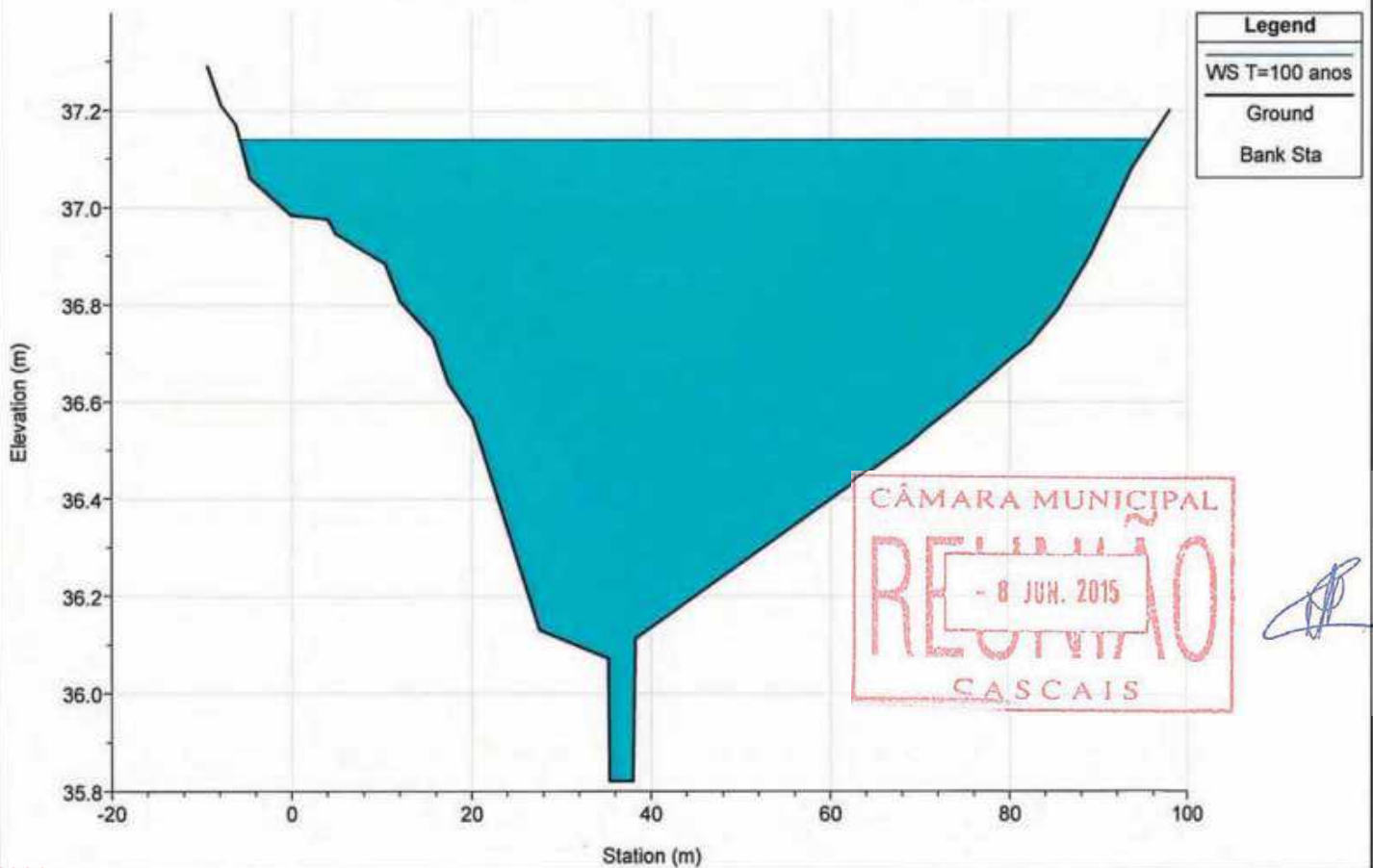
River = MANIQUE Reach = inter5 RS = 2139.092



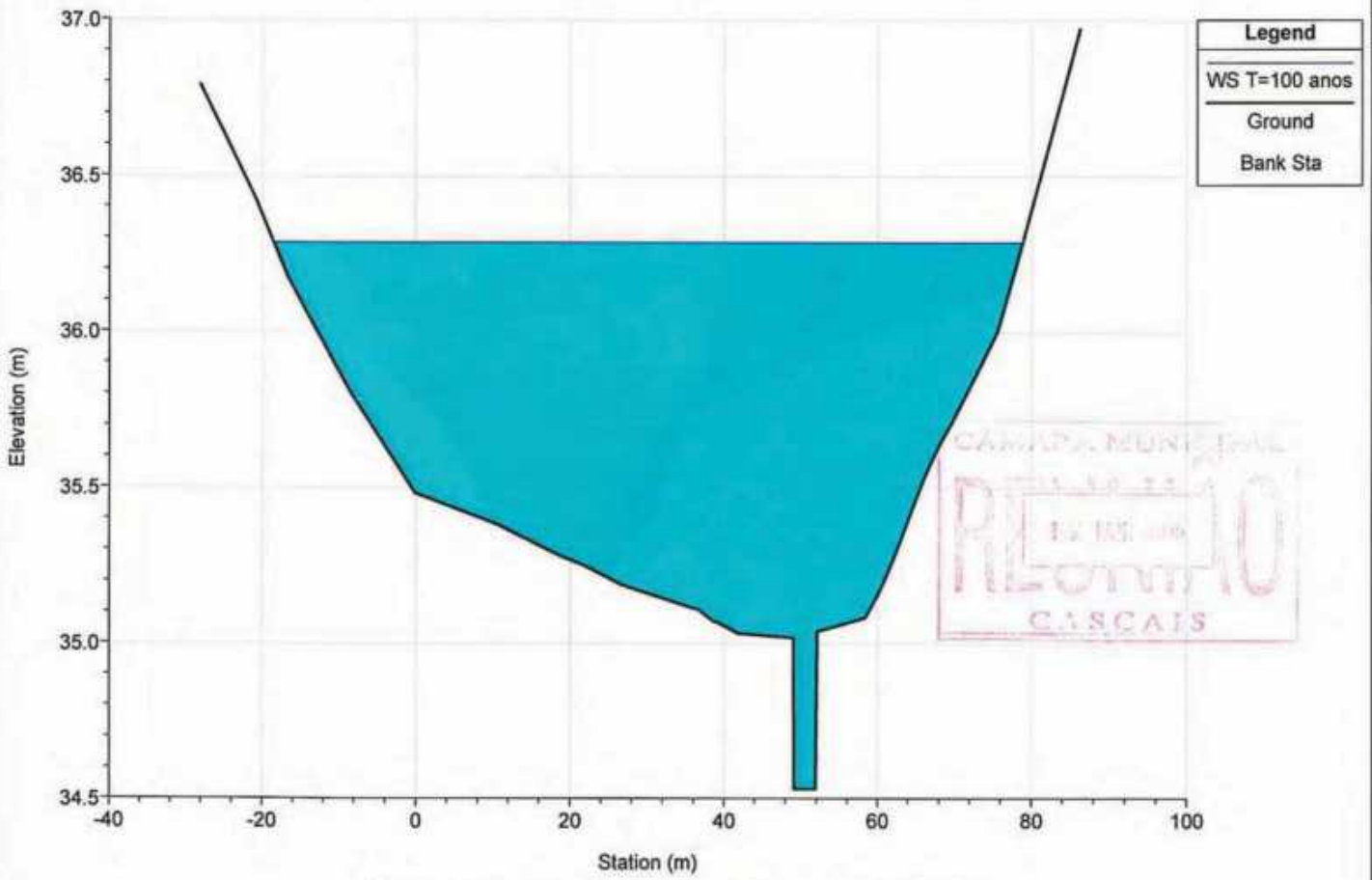
River = MANIQUE Reach = inter5 RS = 1982.613



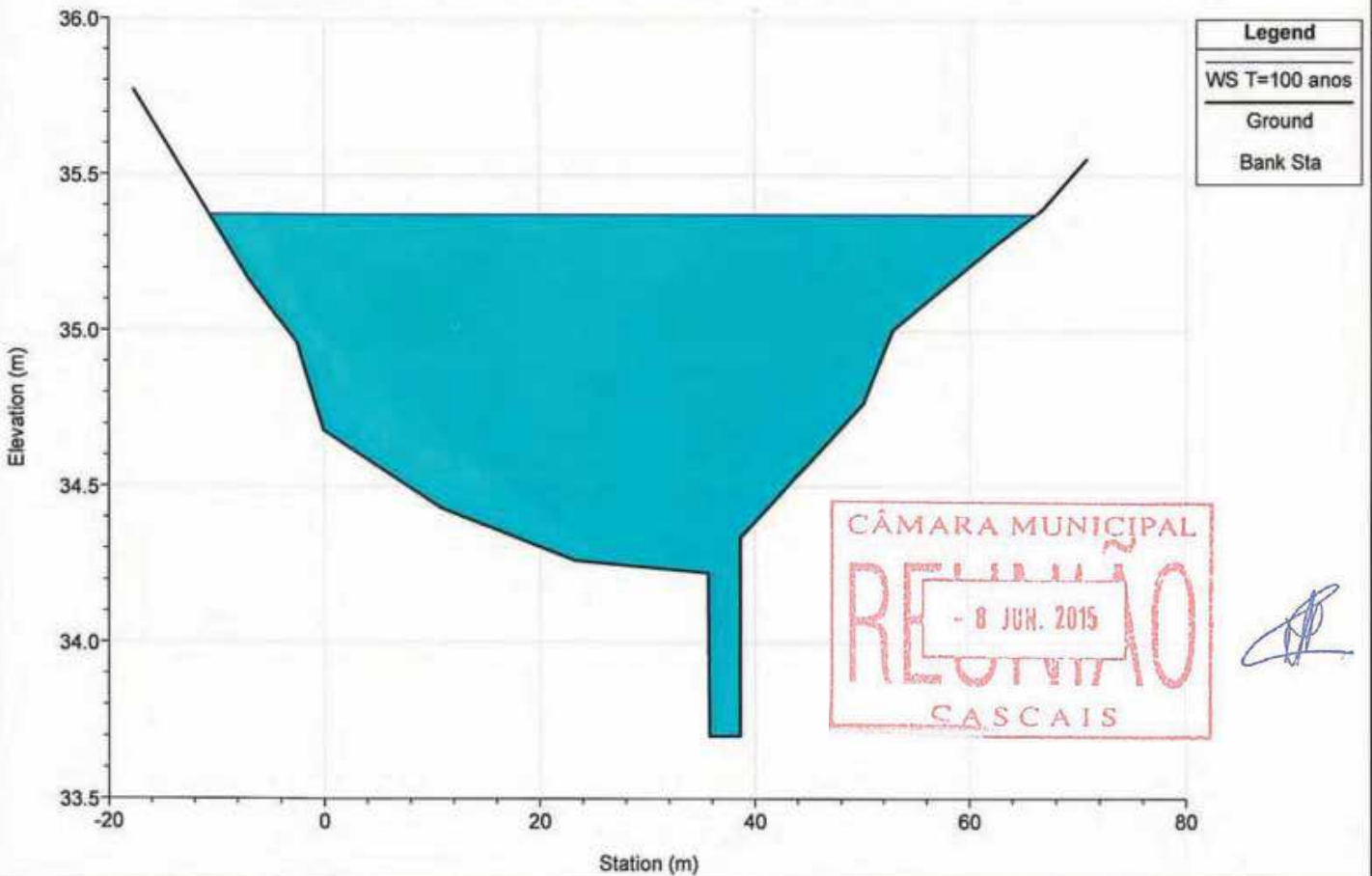
River = MANIQUE Reach = inter6 RS = 1945.488



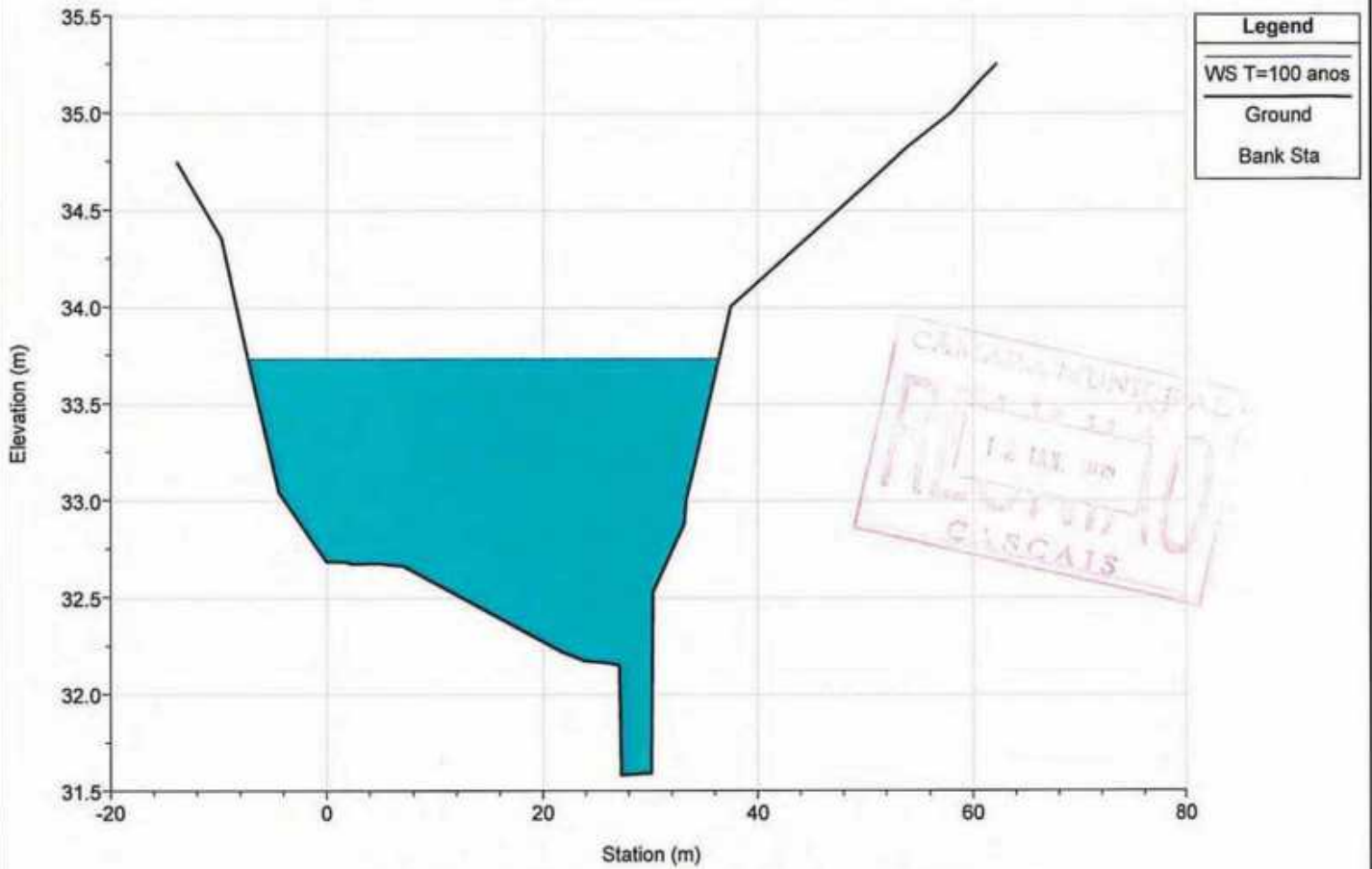
River = MANIQUE Reach = inter6 RS = 1818.761



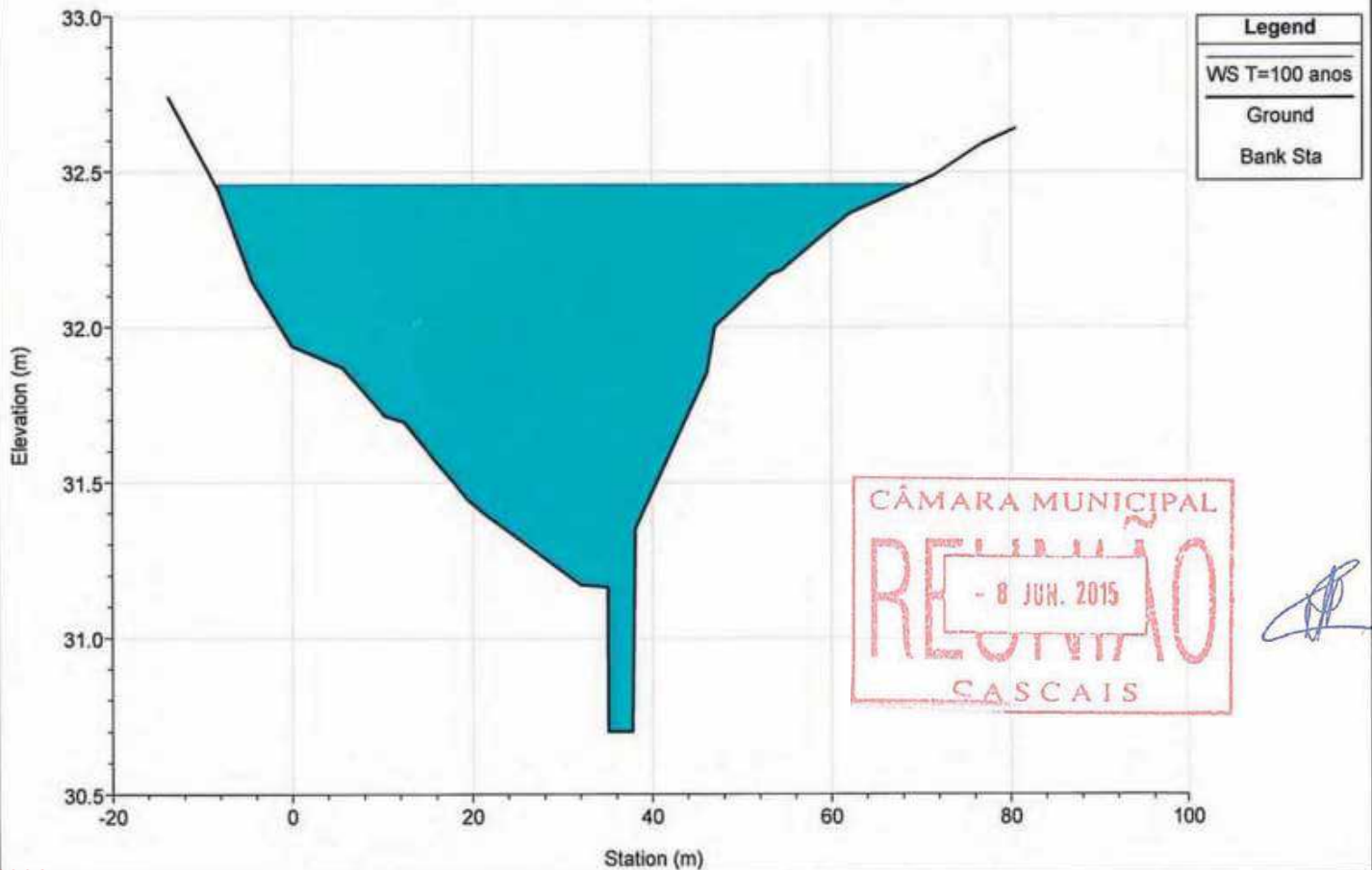
River = MANIQUE Reach = inter6 RS = 1708.068



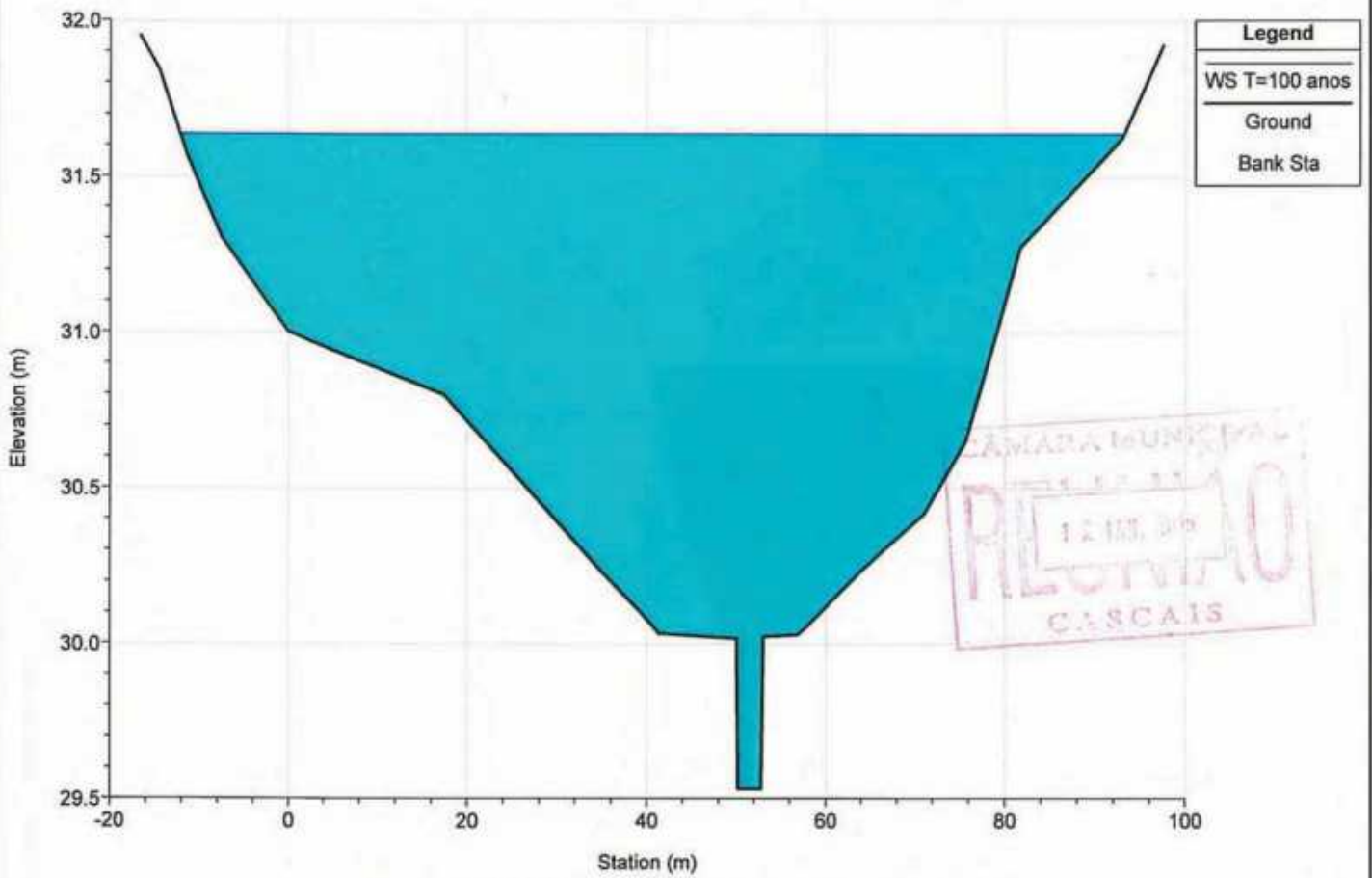
River = MANIQUE Reach = inter6 RS = 1559.024



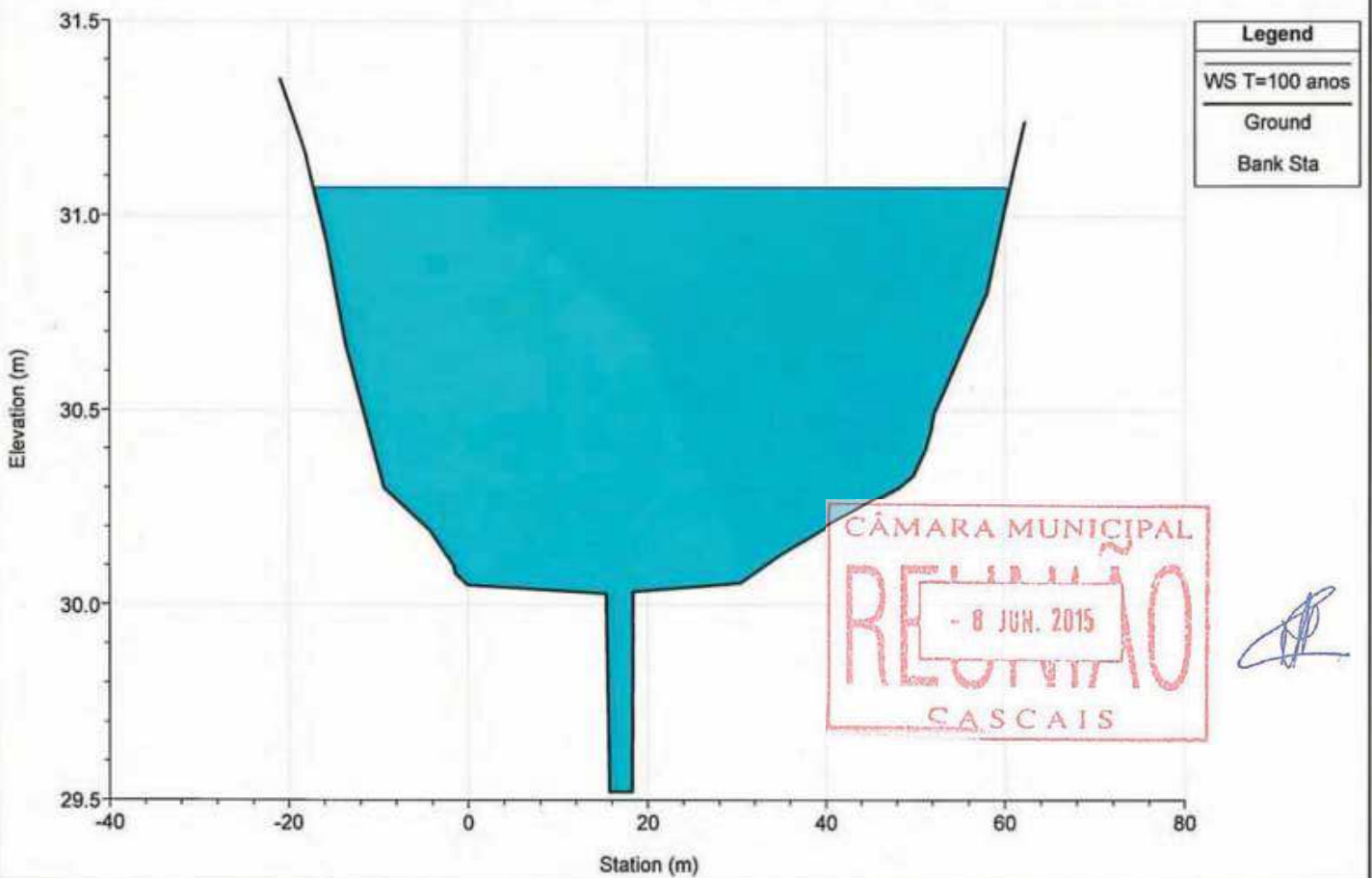
River = MANIQUE Reach = inter6 RS = 1447.463



River = MANIQUE Reach = inter6 RS = 1326.535

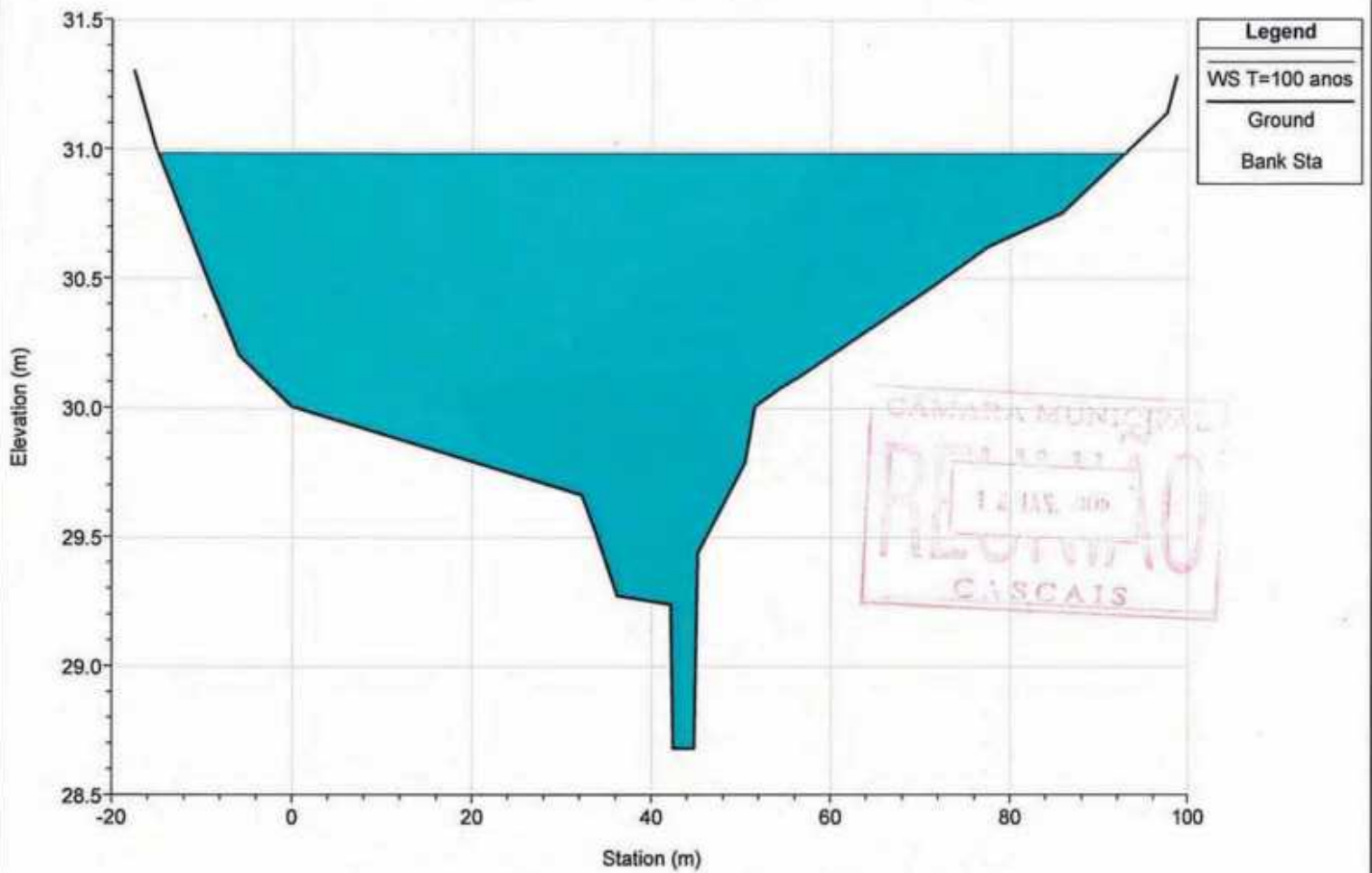


River = MANIQUE Reach = inter6 RS = 1219.297

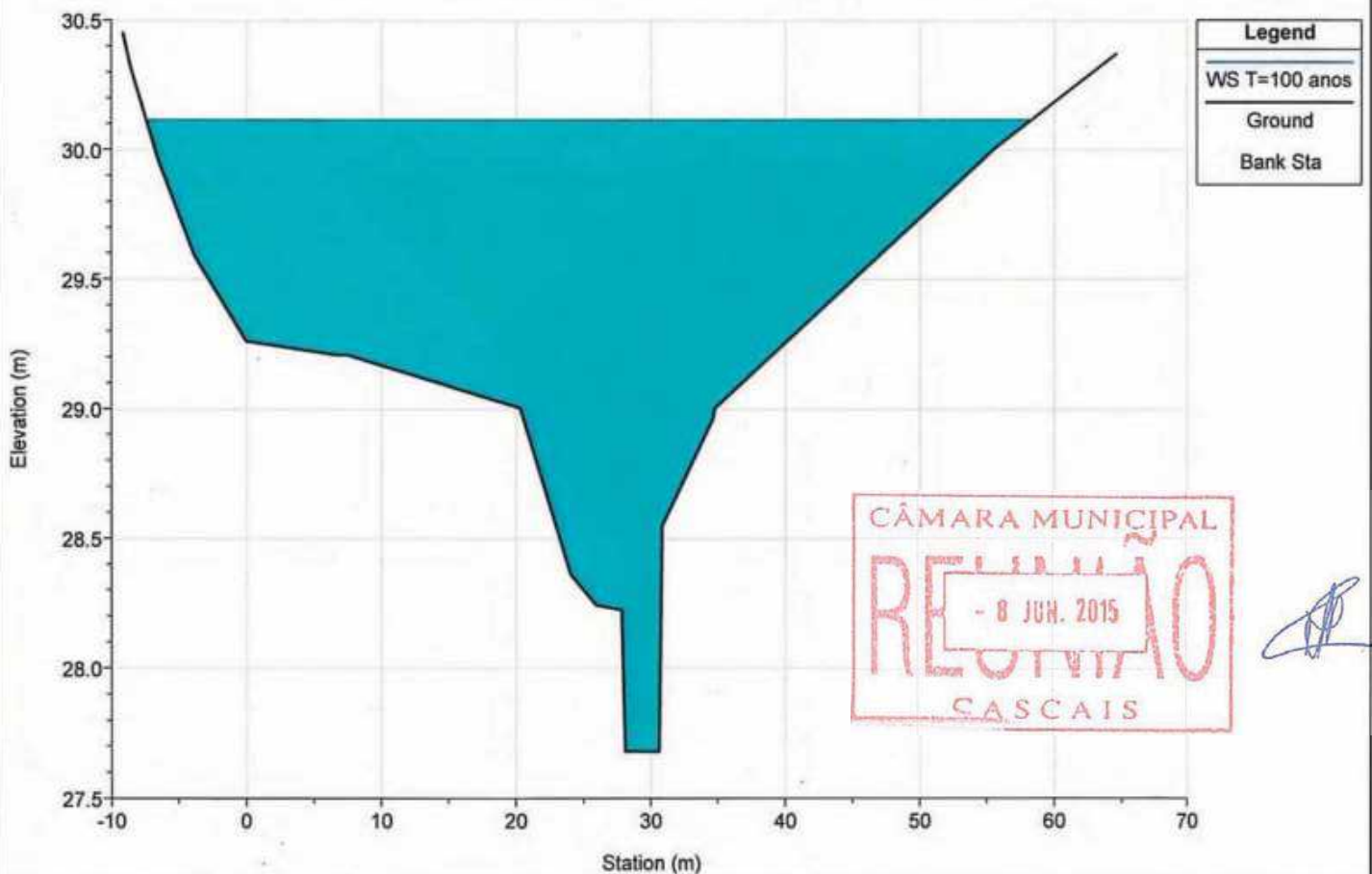




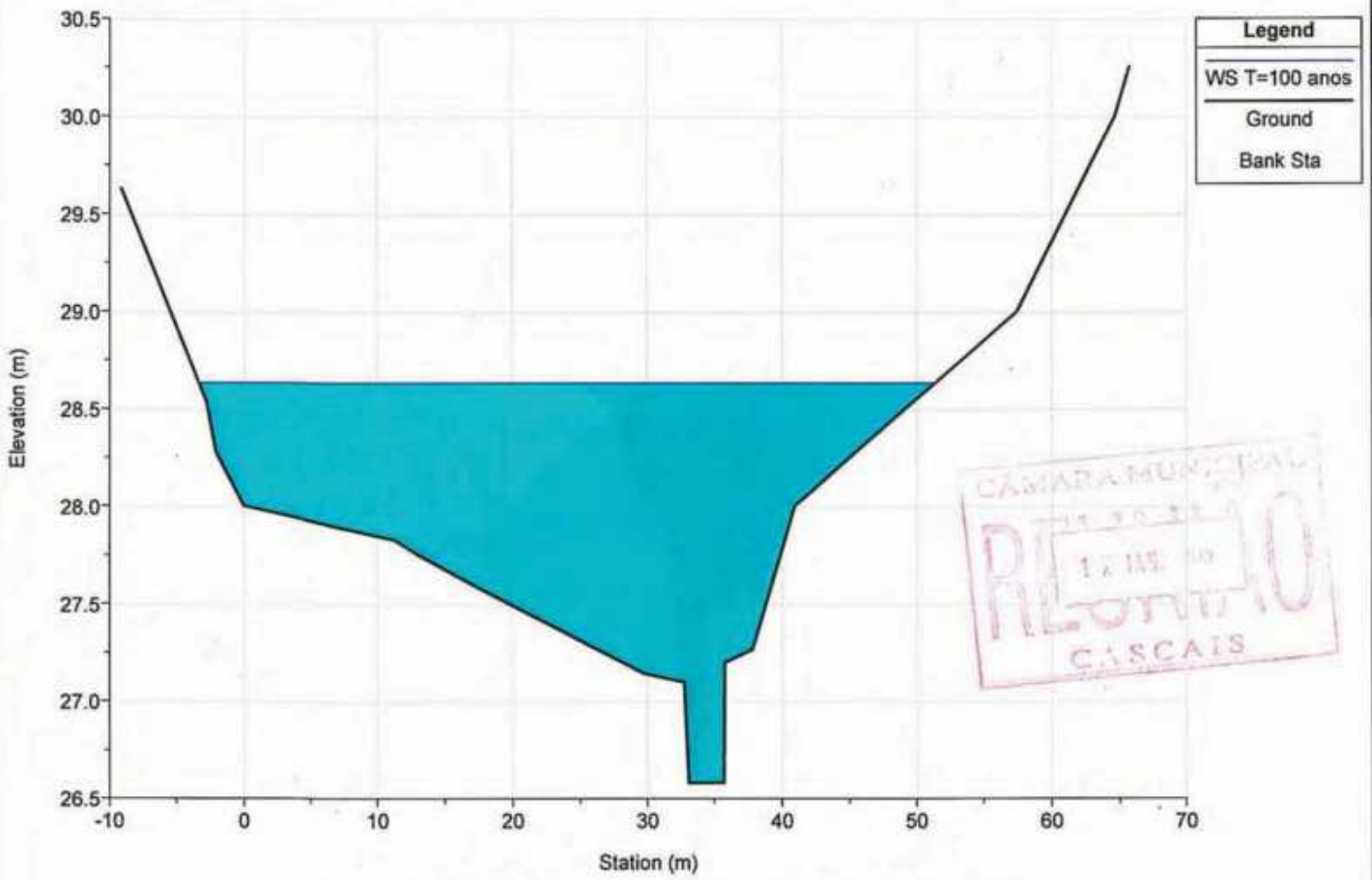
River = MANIQUE Reach = jusante RS = 1194.088



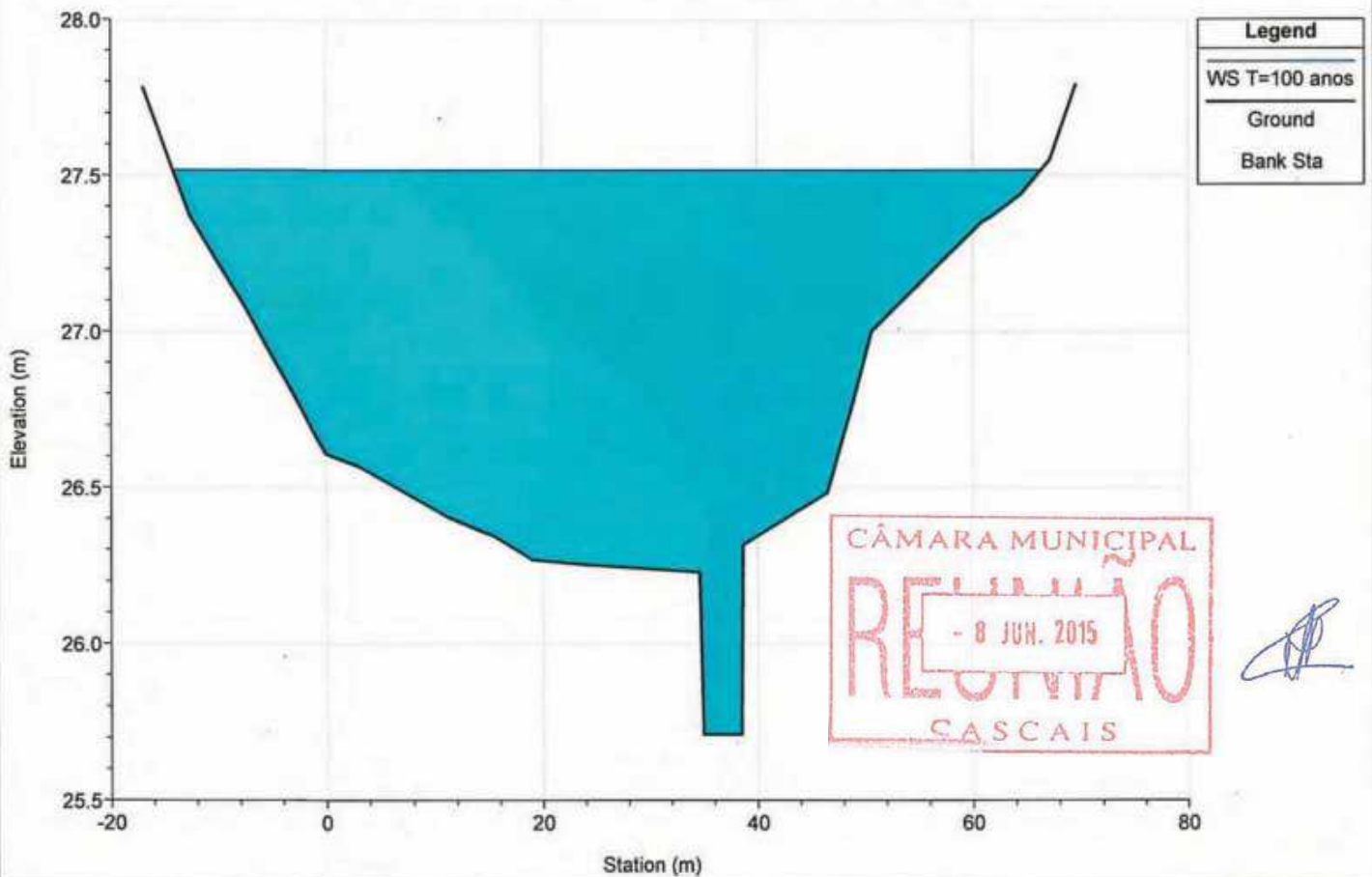
River = MANIQUE Reach = jusante RS = 1073.290



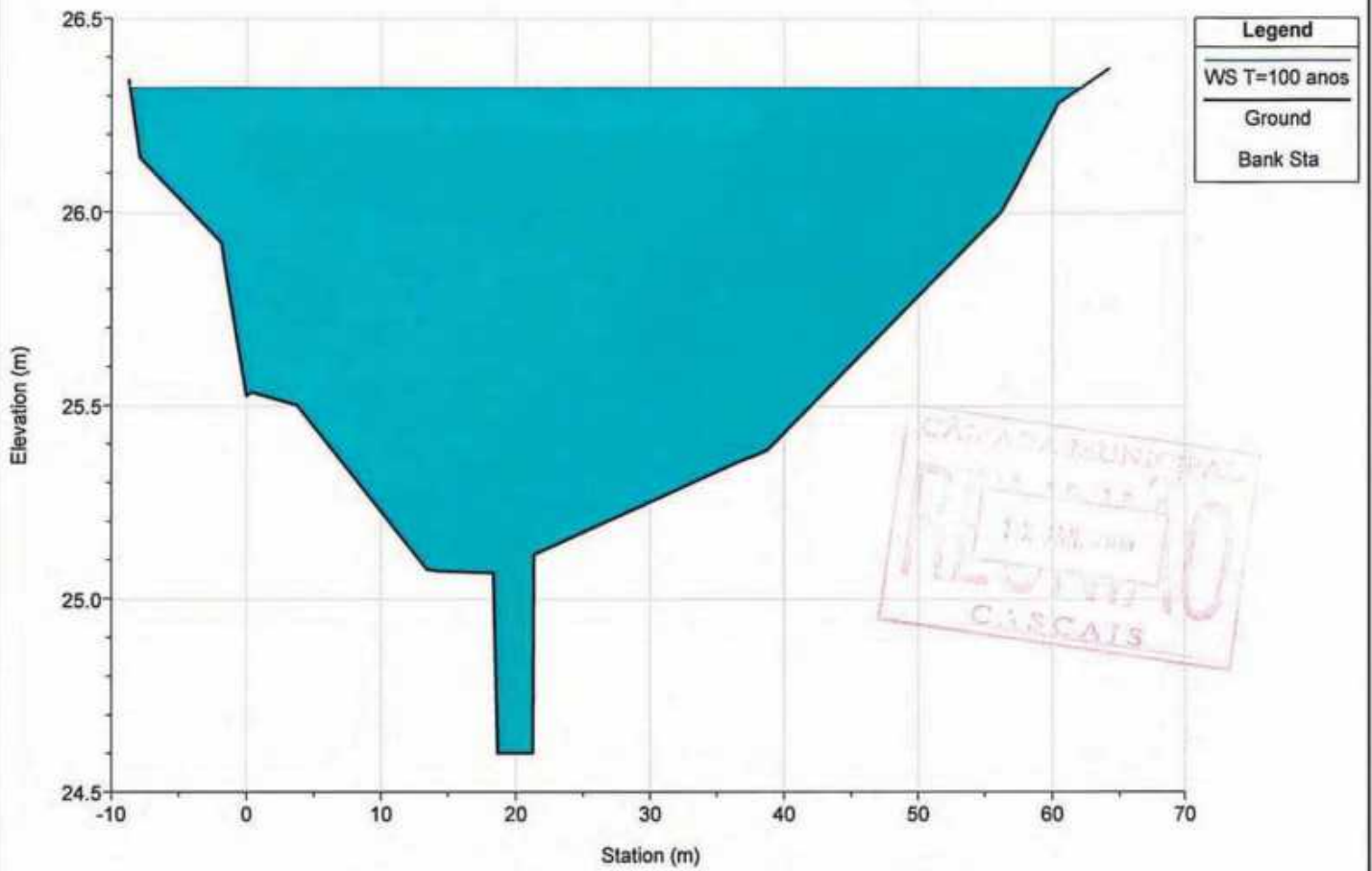
River = MANIQUE Reach = jusante RS = 948.441



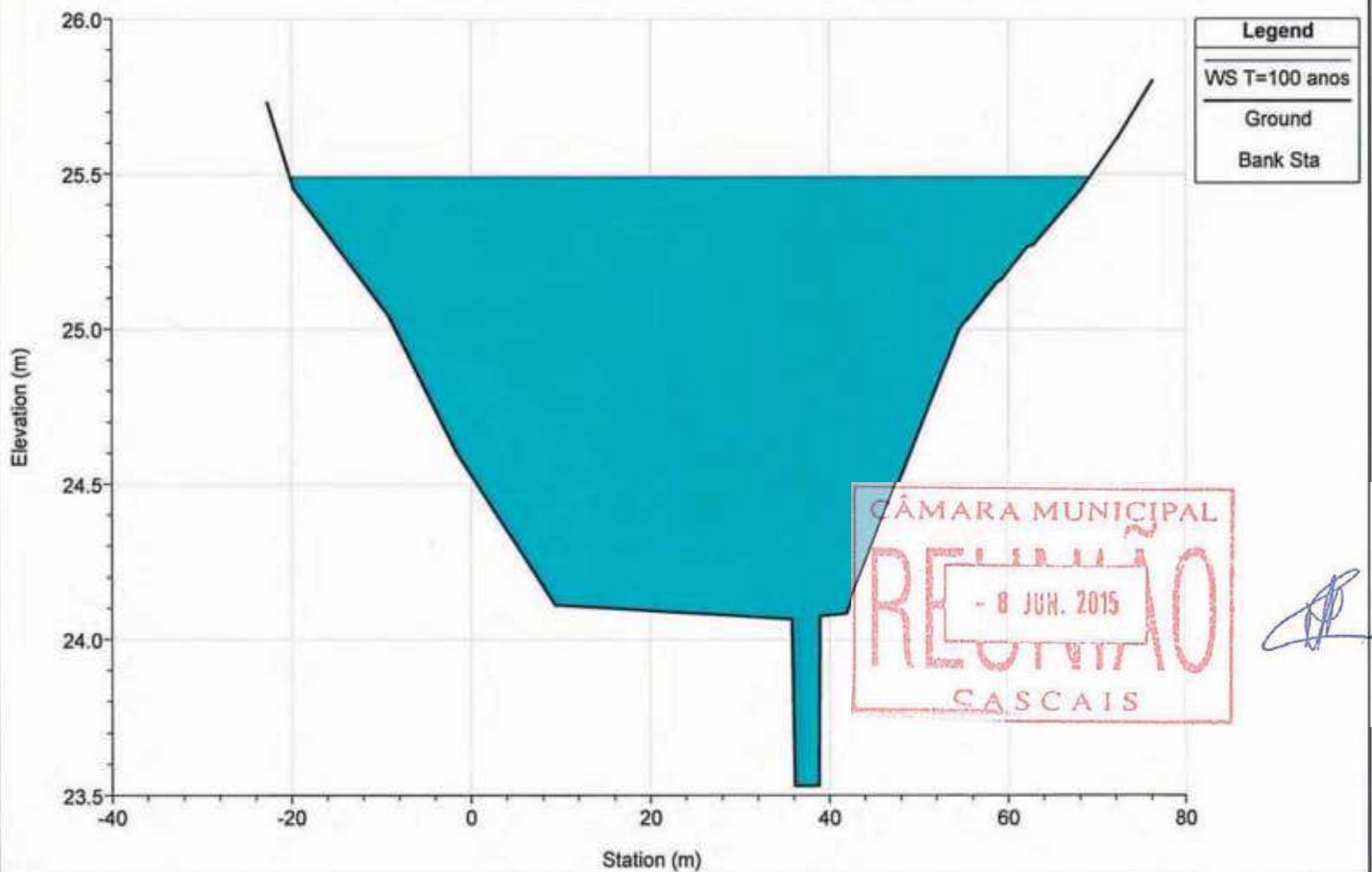
River = MANIQUE Reach = jusante RS = 816.972



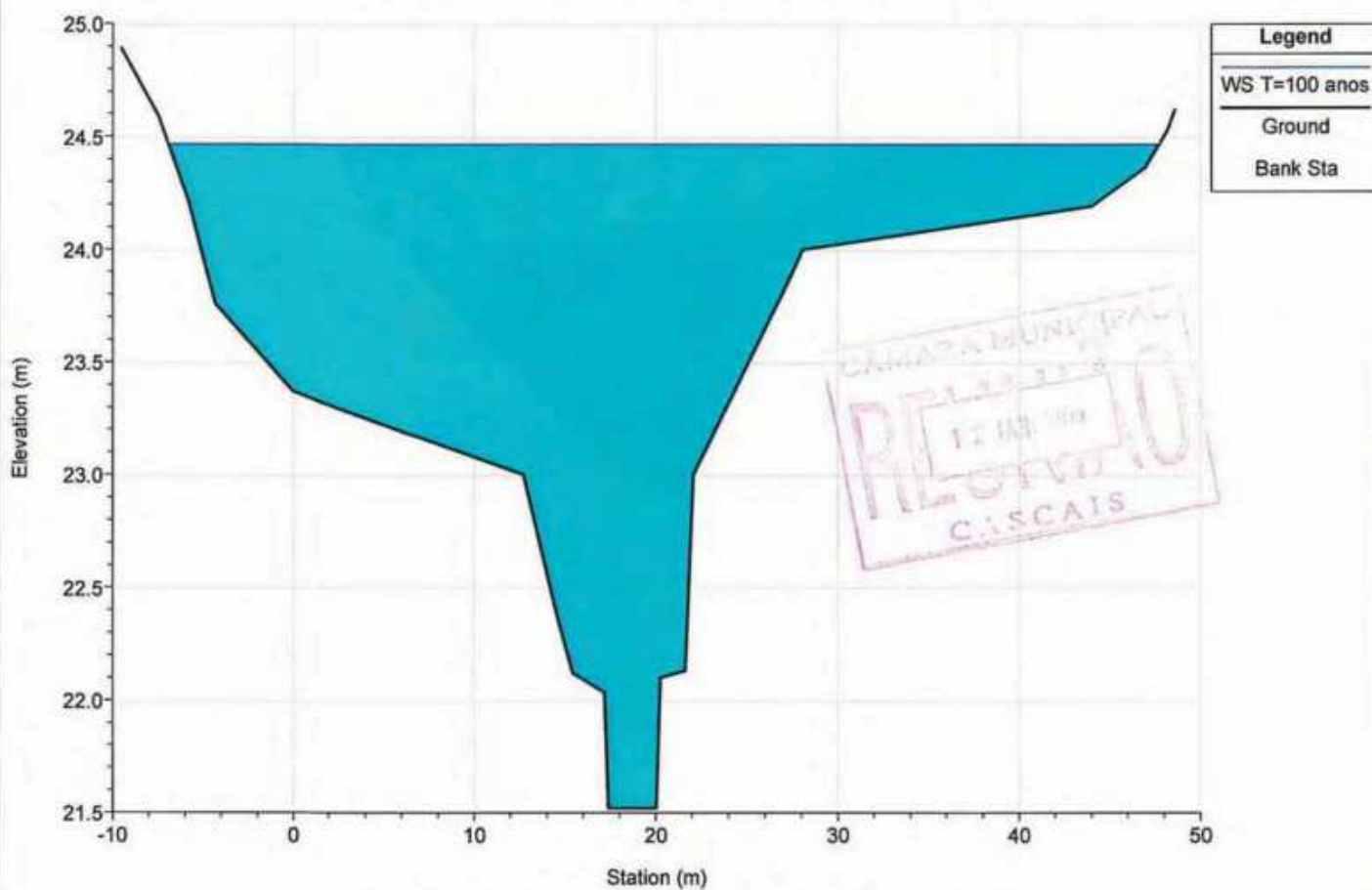
River = MANIQUE Reach = jusante RS = 707.995



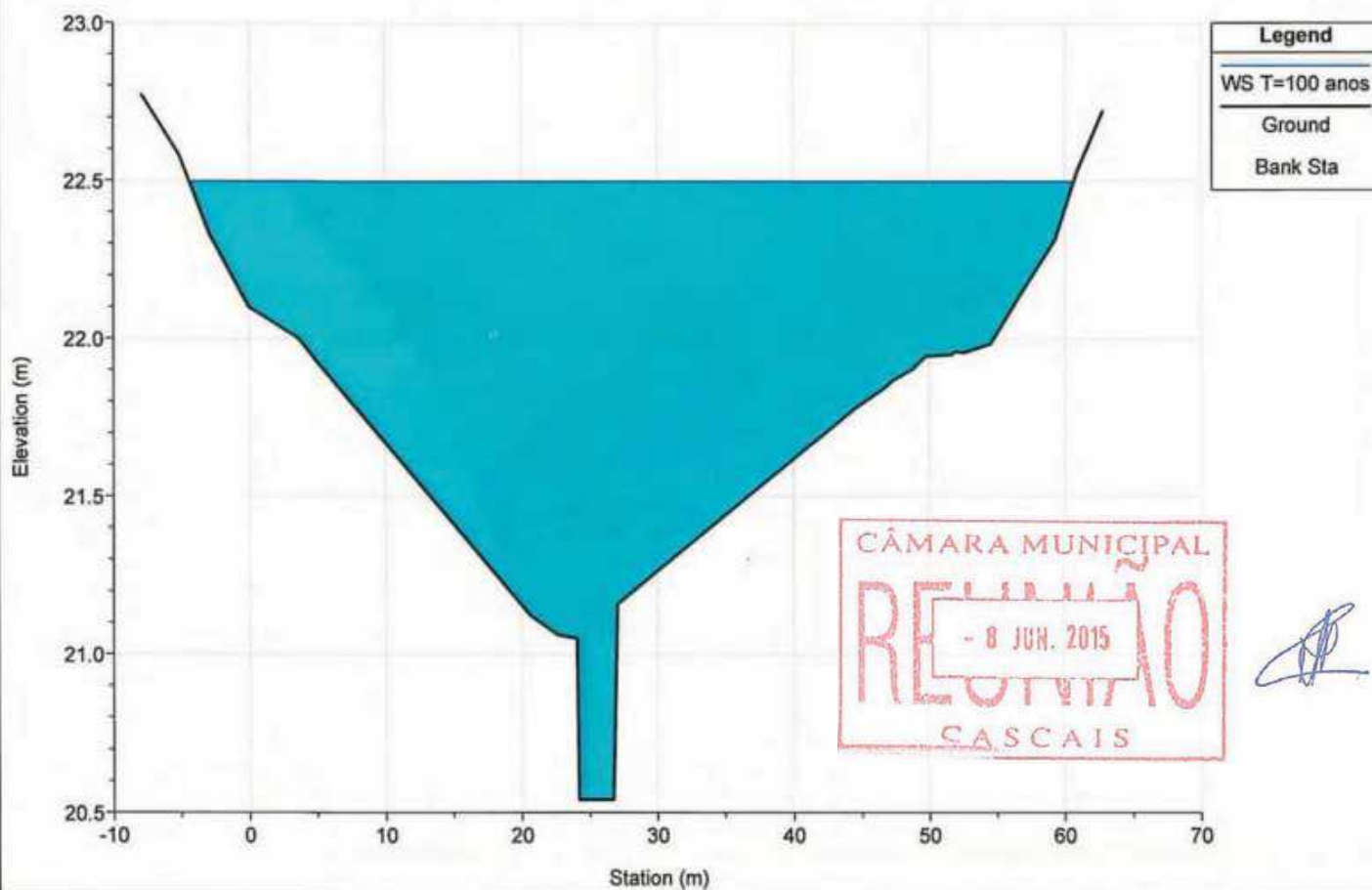
River = MANIQUE Reach = jusante RS = 587.448



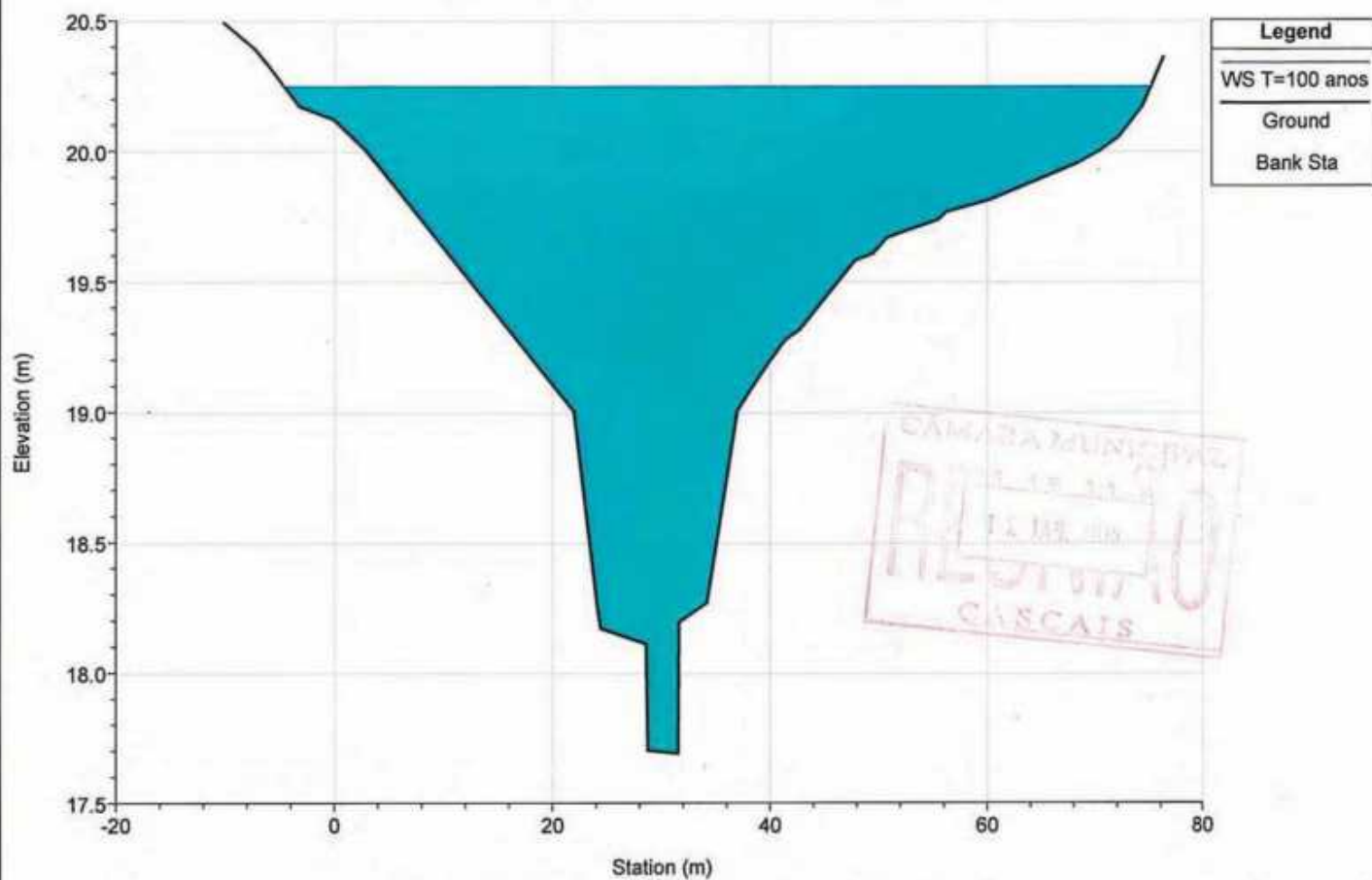
River = MANIQUE Reach = jusante RS = 472.167



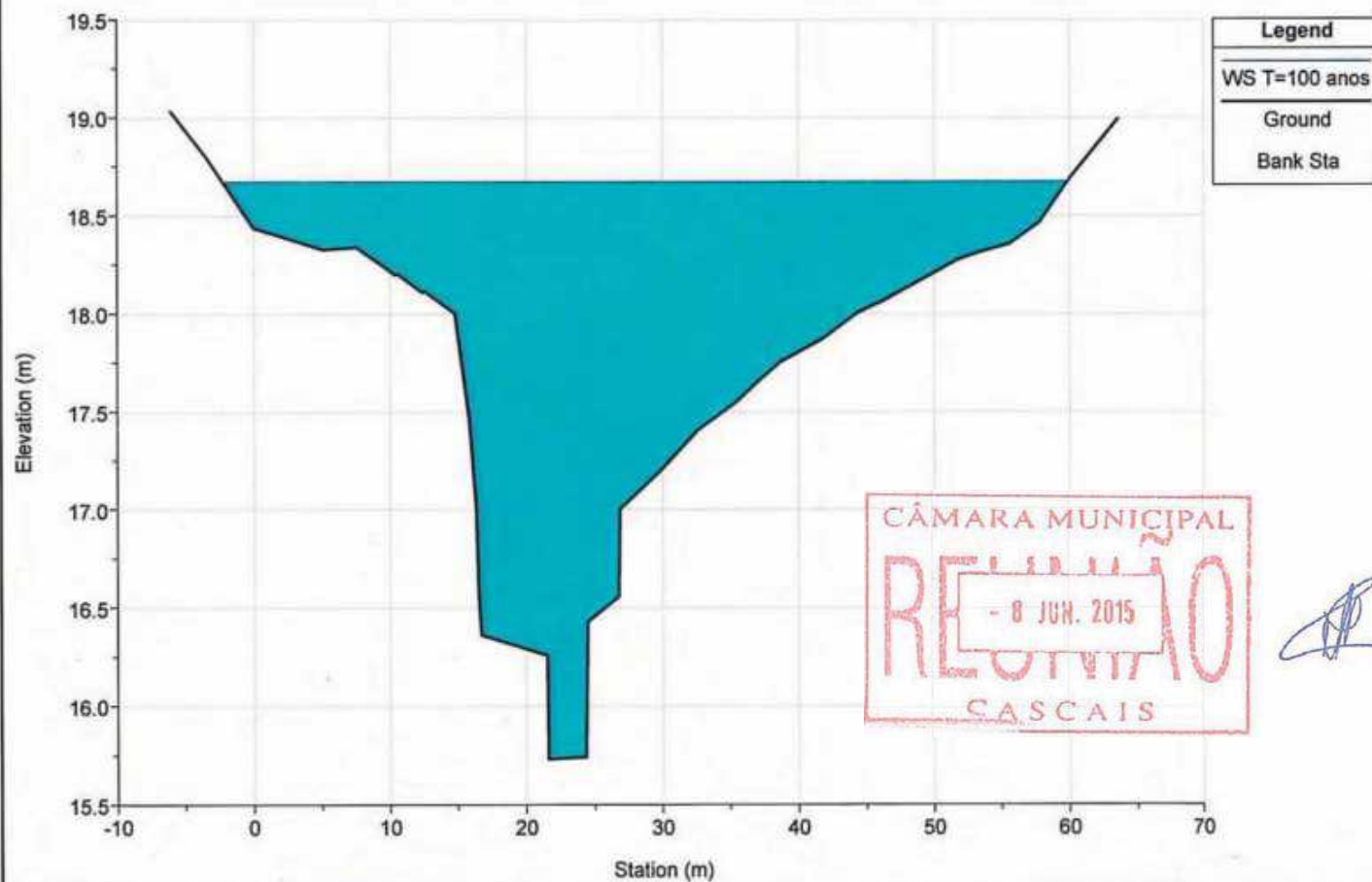
River = MANIQUE Reach = jusante RS = 327.576



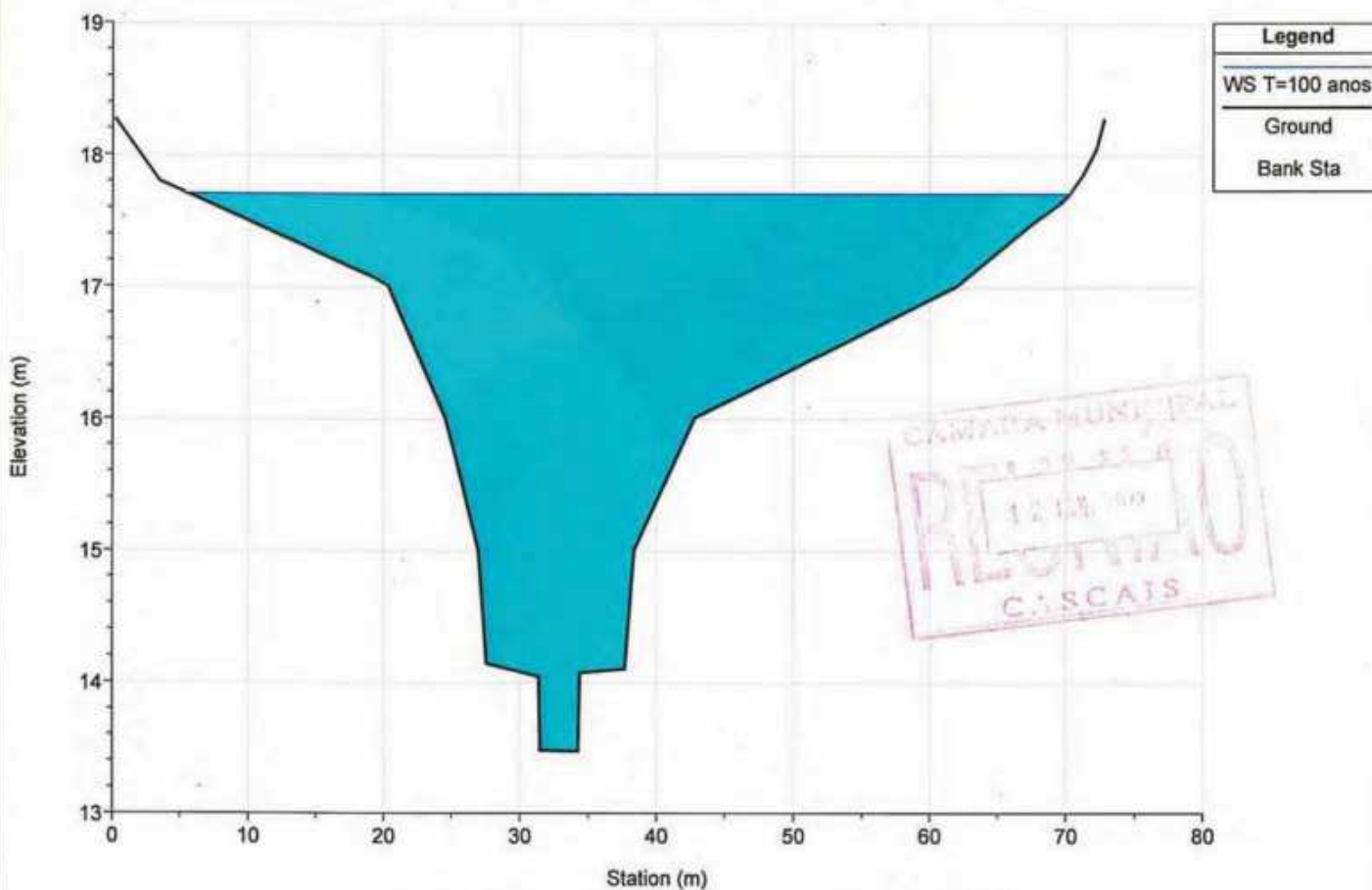
River = MANIQUE Reach = jusante RS = 185.338



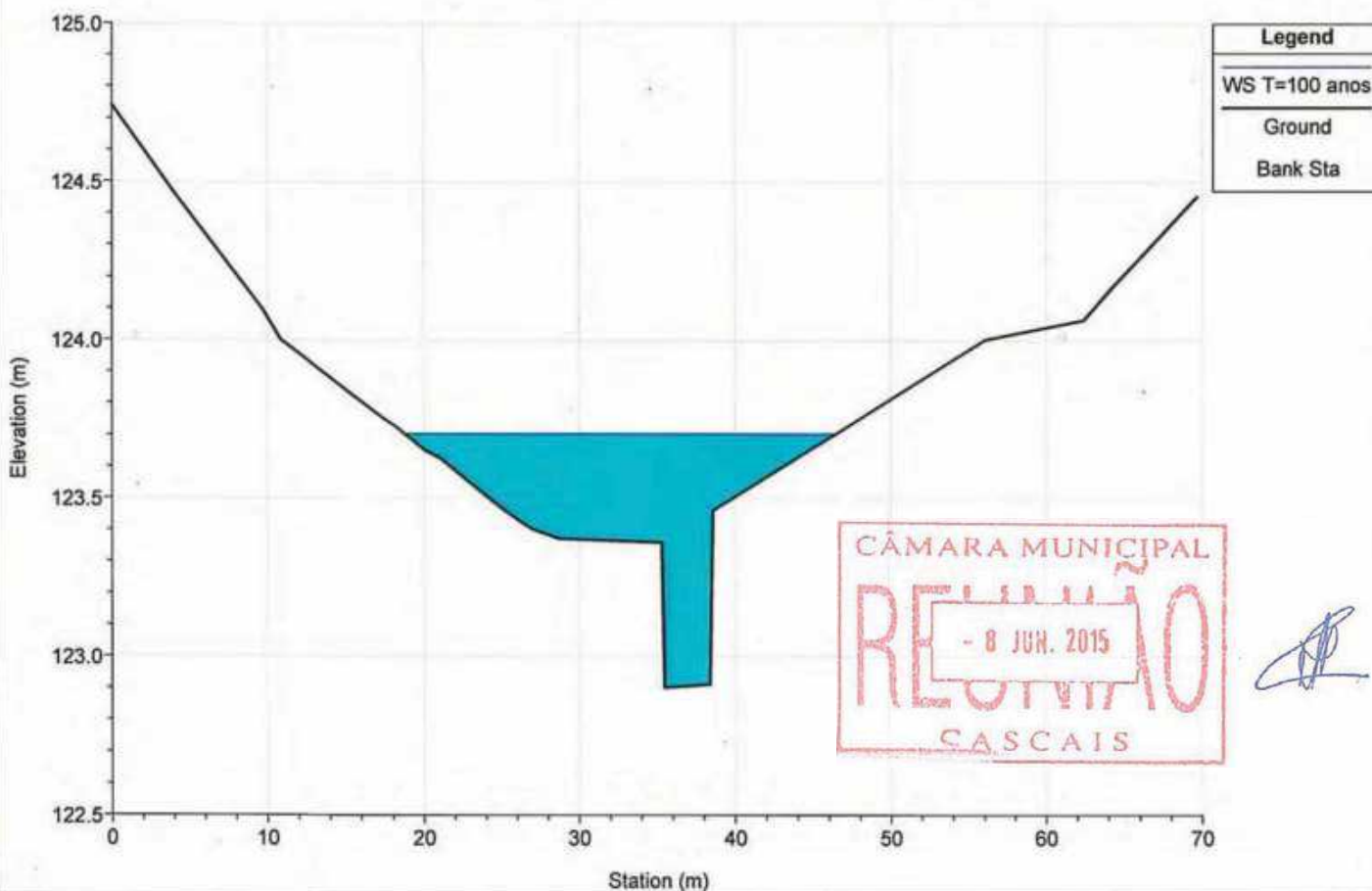
River = MANIQUE Reach = jusante RS = 72.274



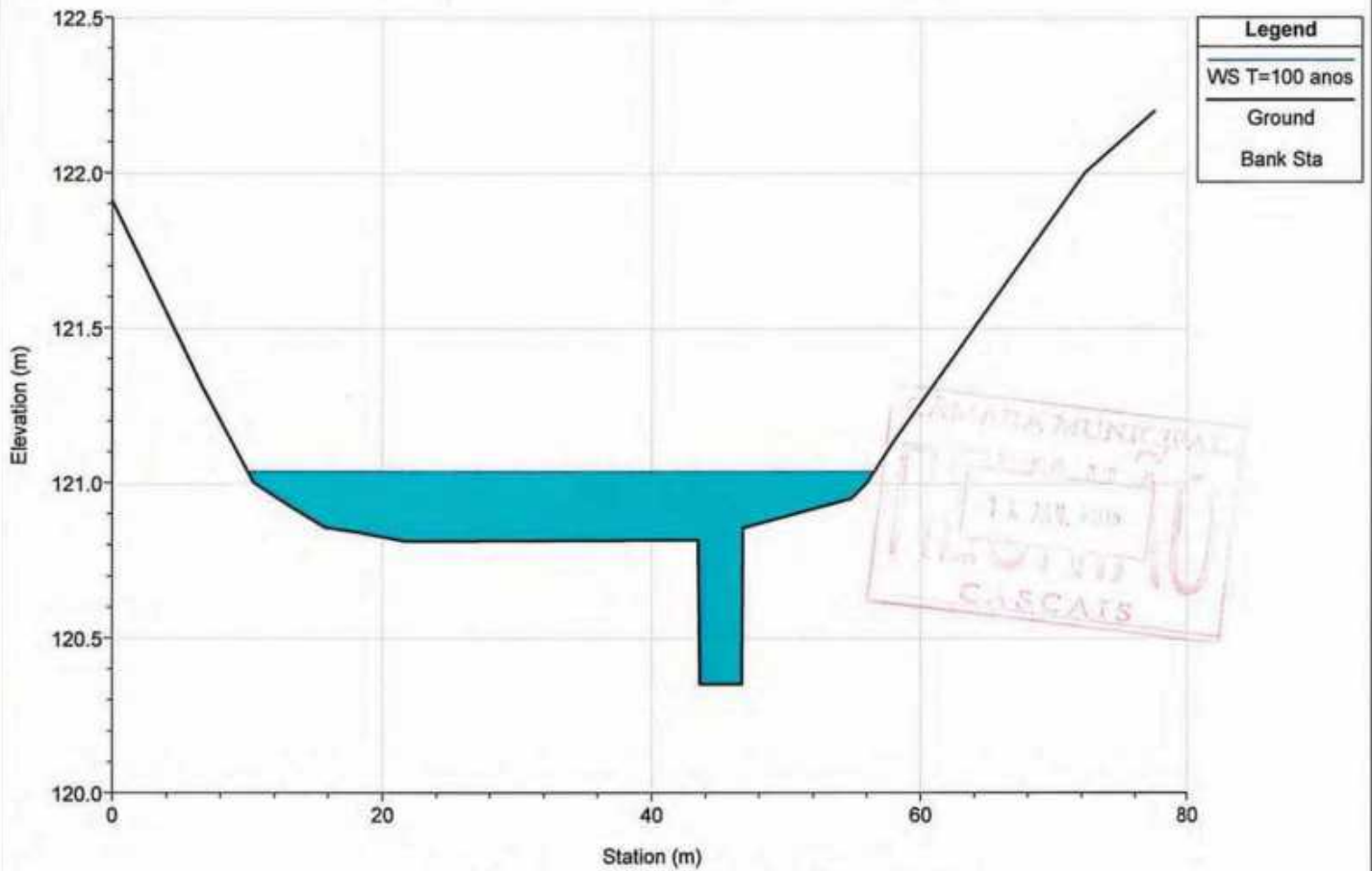
River = MANIQUE Reach = jusante RS = 9.385



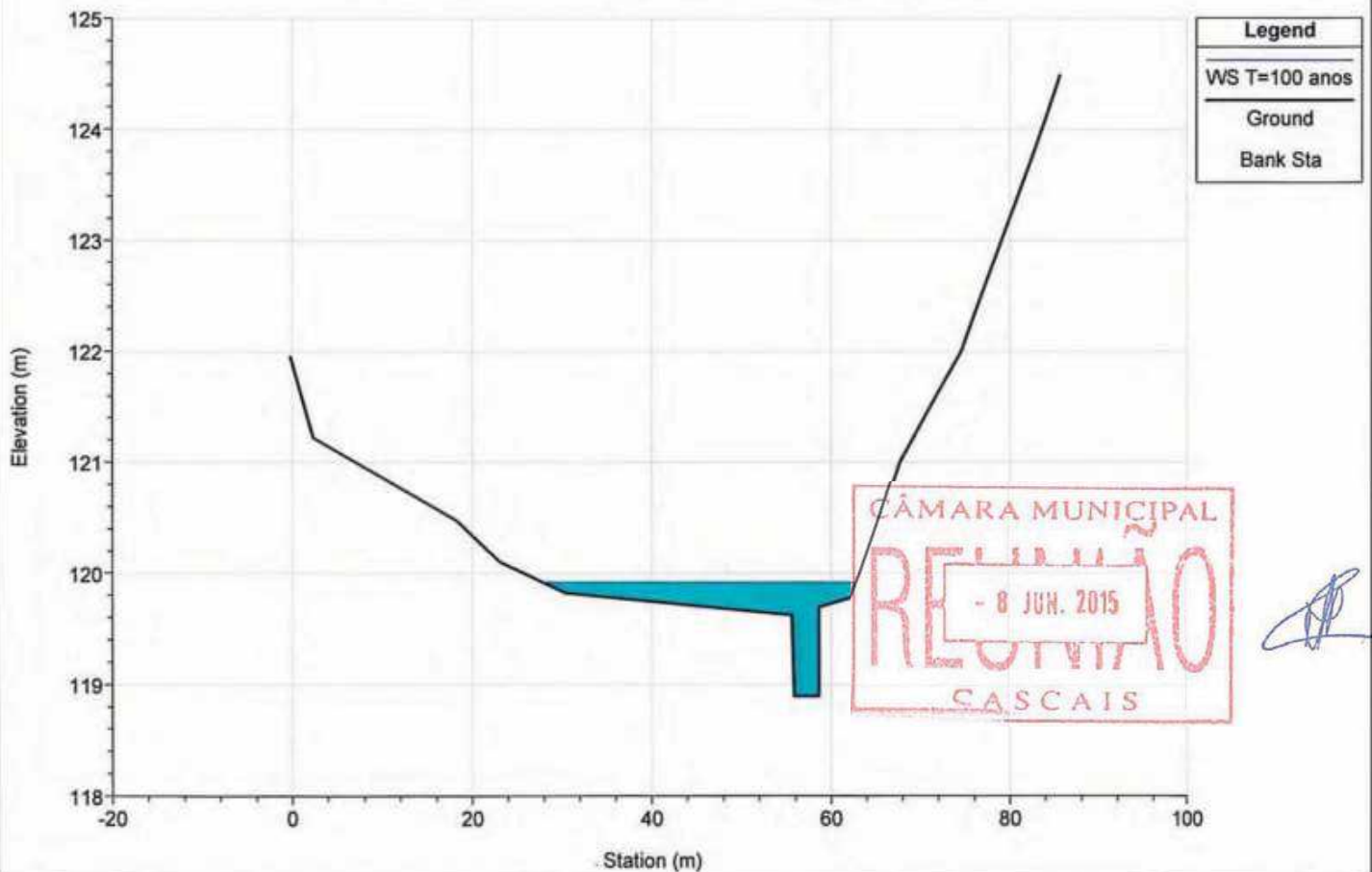
River = MD1 Reach = afluyente RS = 3148.332



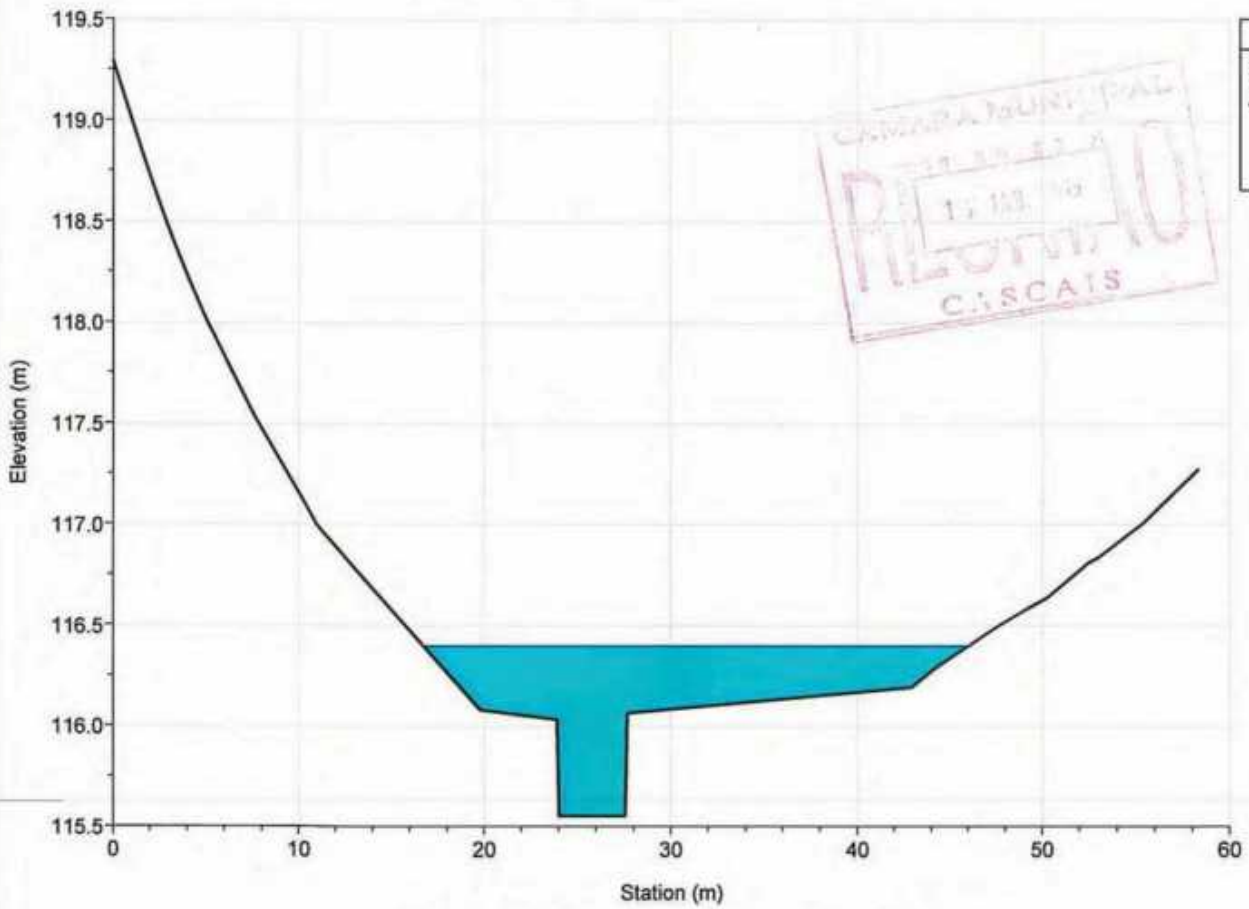
River = MD1 Reach = afluente RS = 3036.901



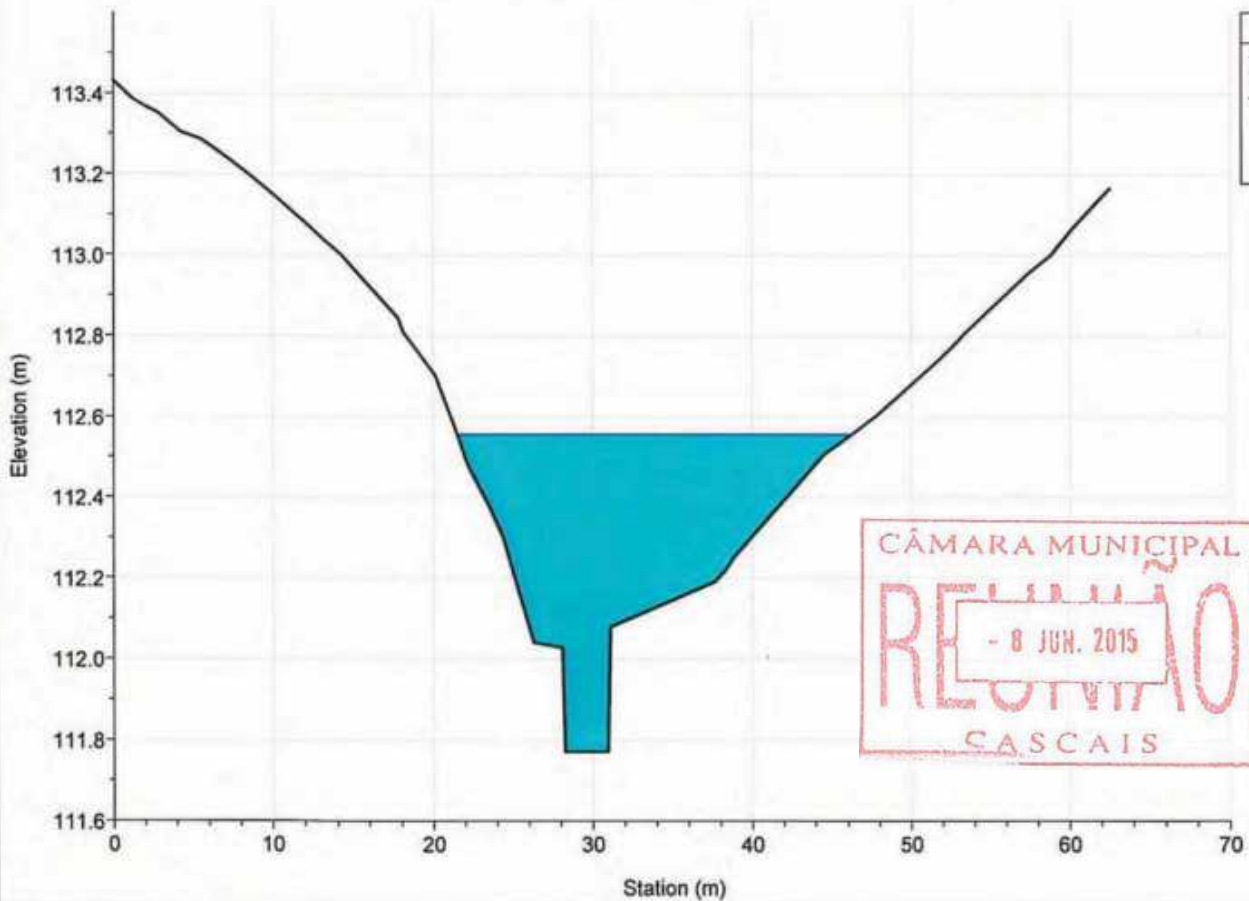
River = MD1 Reach = afluente RS = 2920.903



River = MD1 Reach = afluyente RS = 2810.768

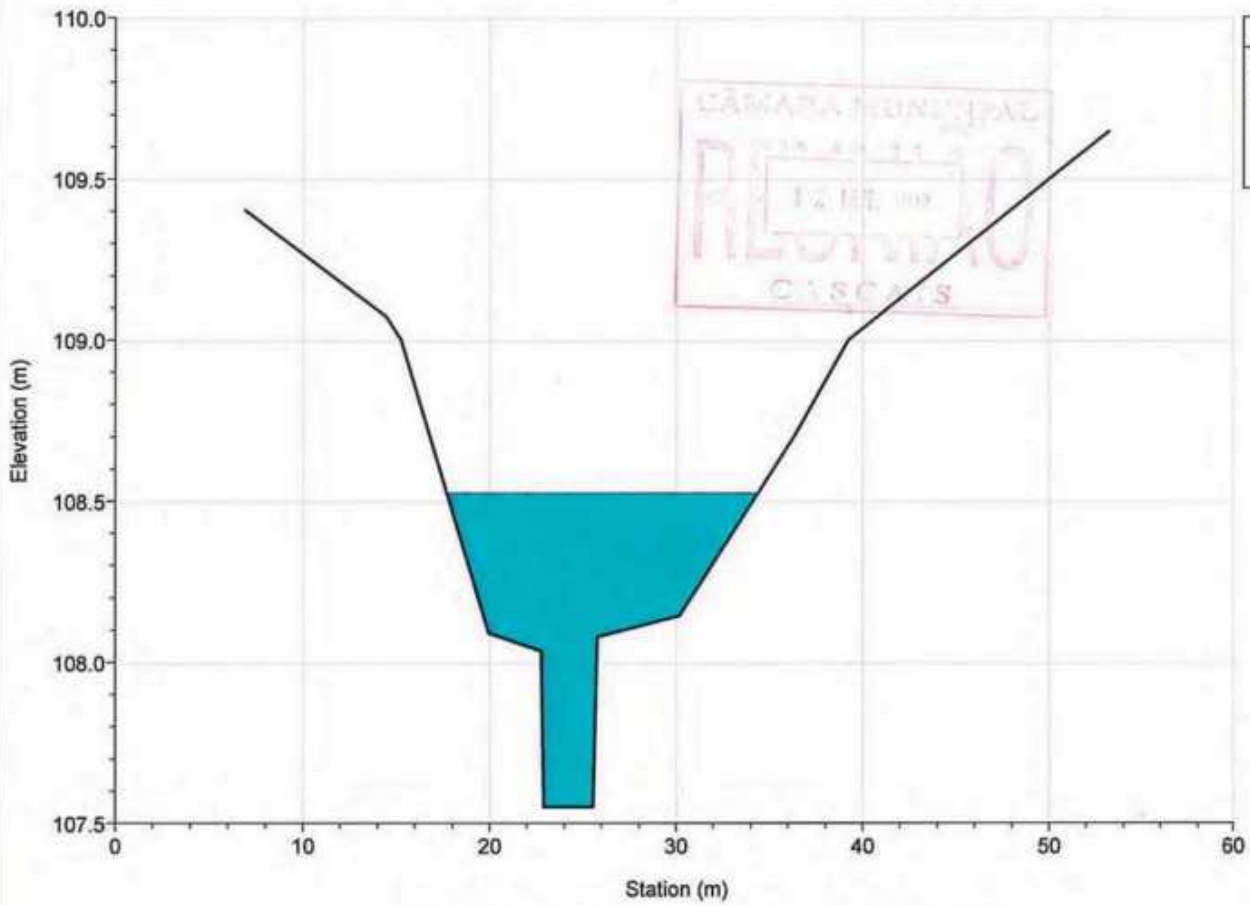


River = MD1 Reach = afluyente RS = 2673.880



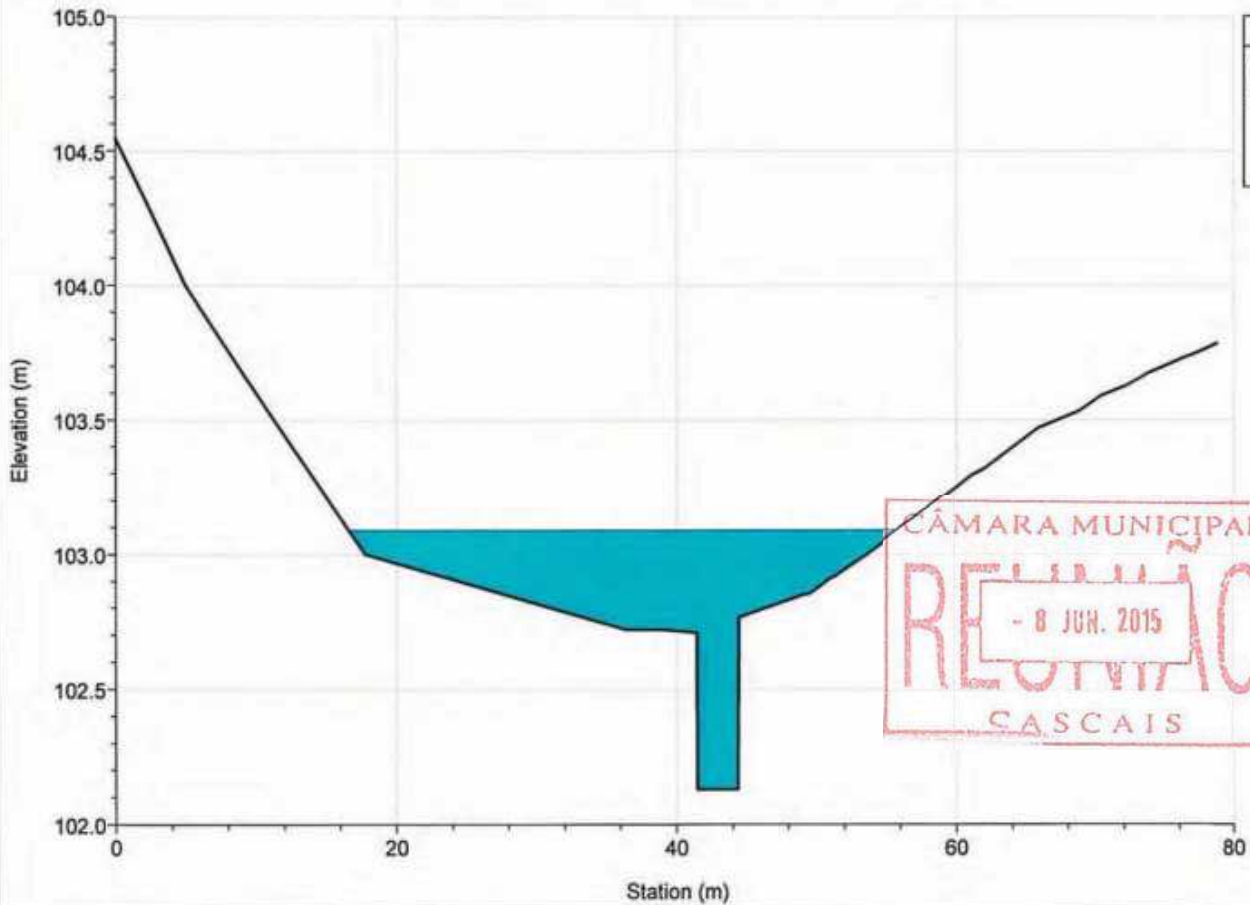


River = MD1 Reach = afluente RS = 2563.559



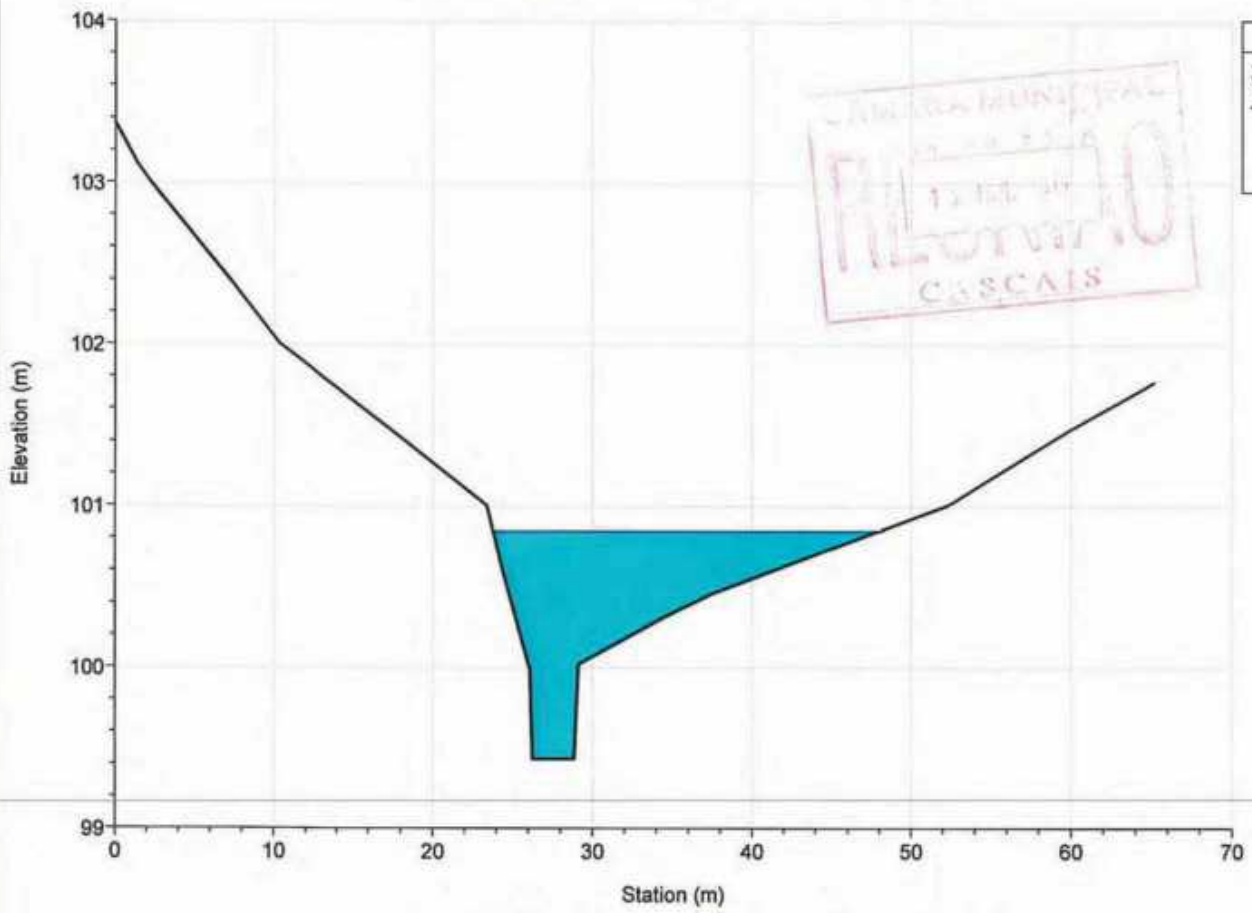
Legend
WS T=100 anos
Ground
Bank Sta

River = MD1 Reach = afluente RS = 2448.382



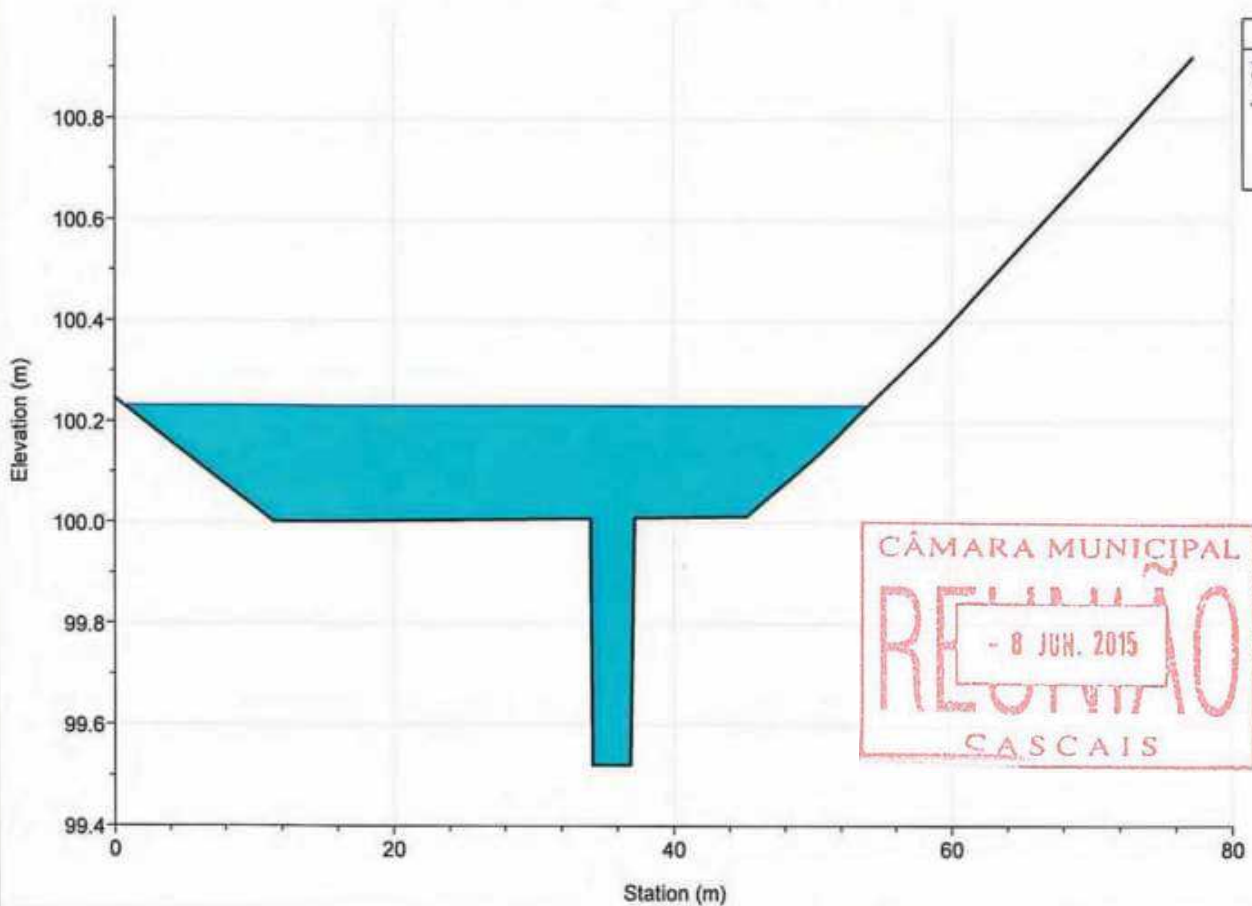
Legend
WS T=100 anos
Ground
Bank Sta

River = MD1 Reach = afluente RS = 2348.202



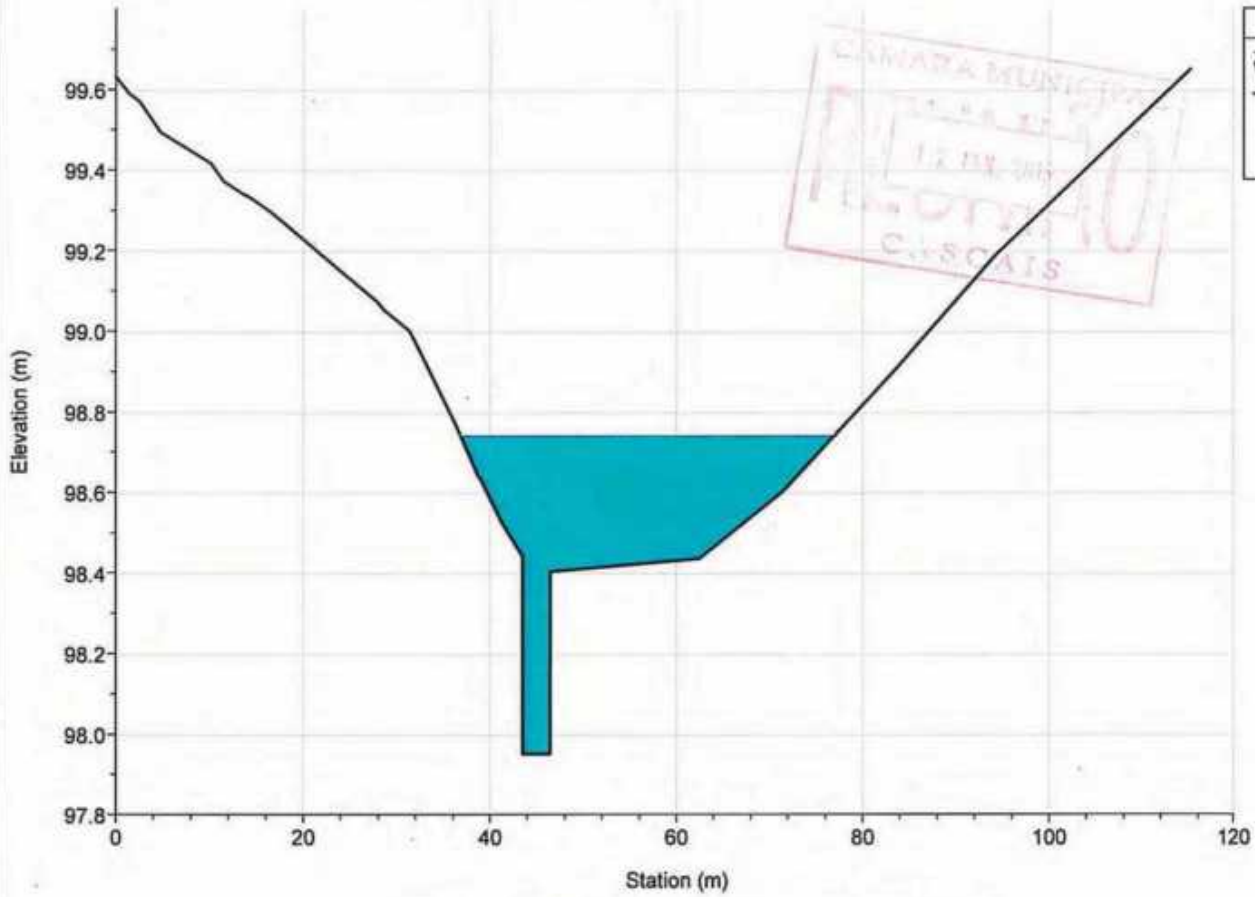
Legend	
WS T=100 anos	
Ground	
Bank Sta	

River = MD1 Reach = afluente RS = 2243.453



Legend	
WS T=100 anos	
Ground	
Bank Sta	

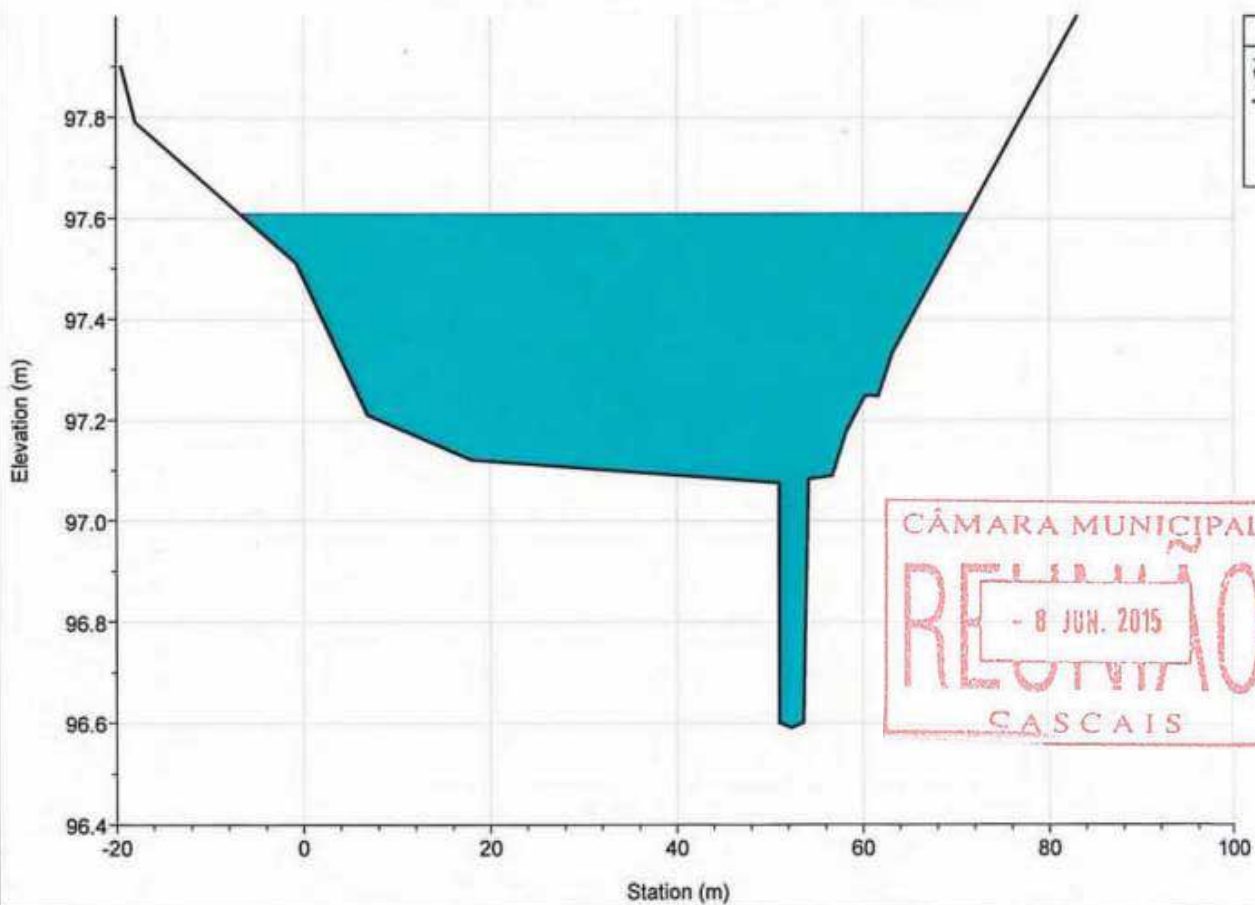
River = MD1 Reach = afluente RS = 2120.718



Legend
WS T=100 anos
Ground
Bank Sta

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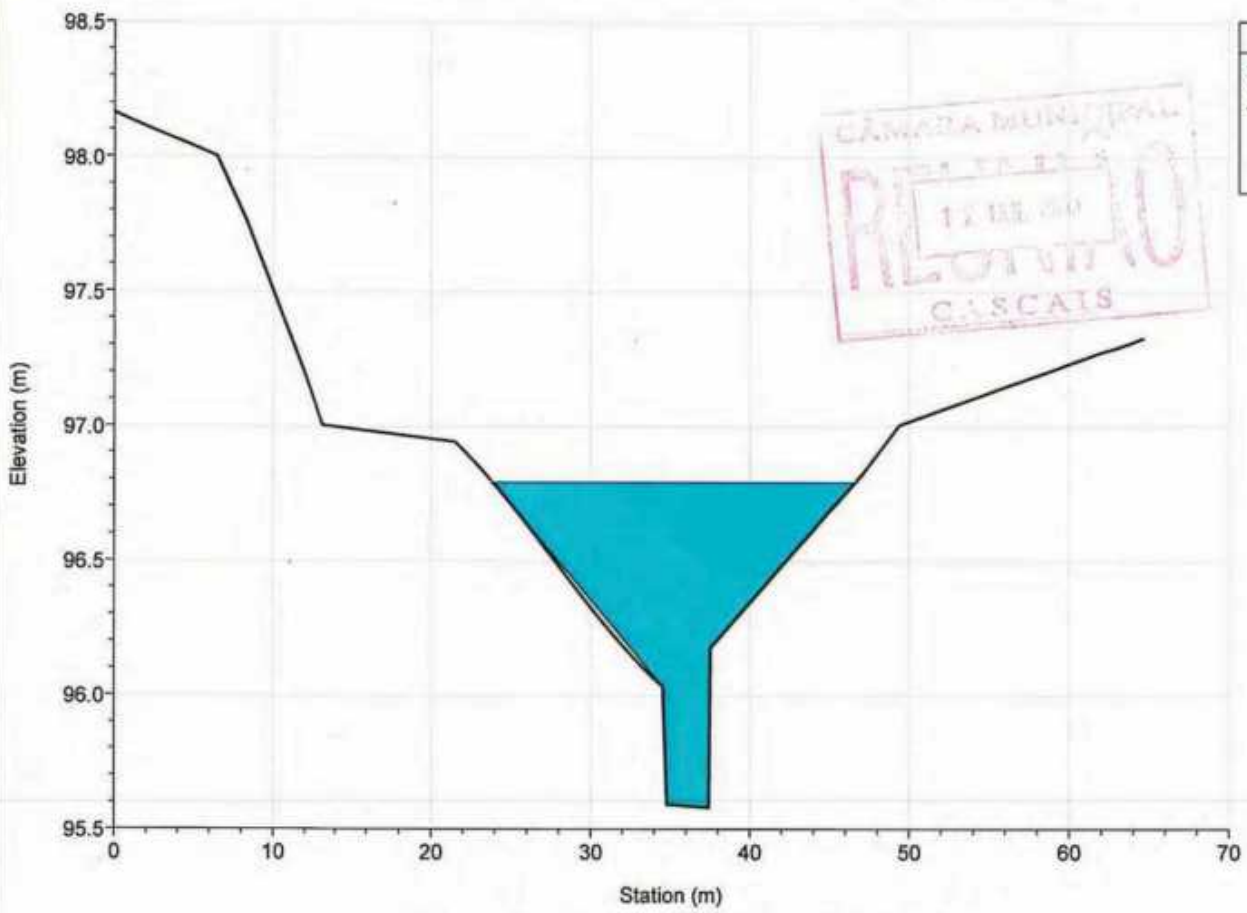
River = MD1 Reach = afluente RS = 1988.085



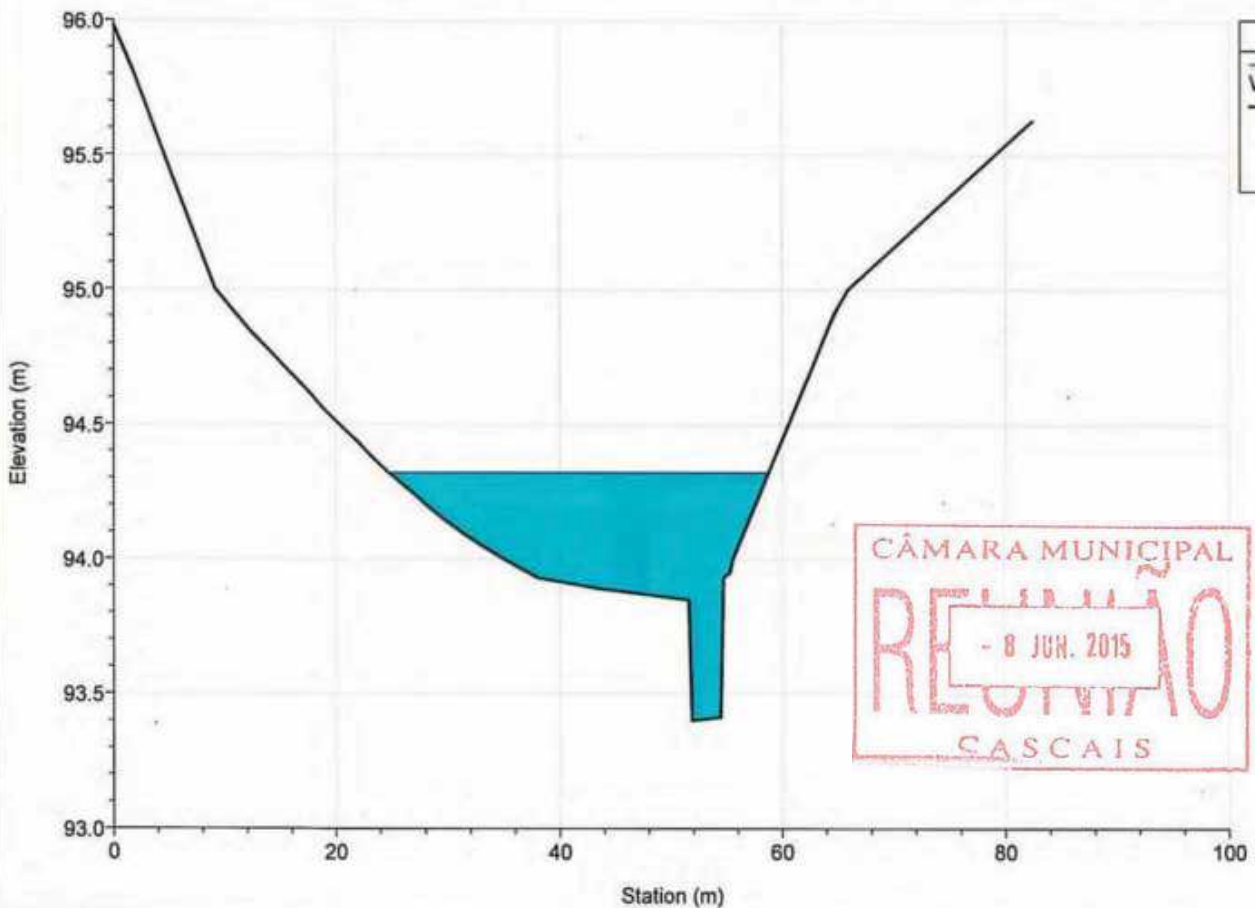
Legend
WS T=100 anos
Ground
Bank Sta

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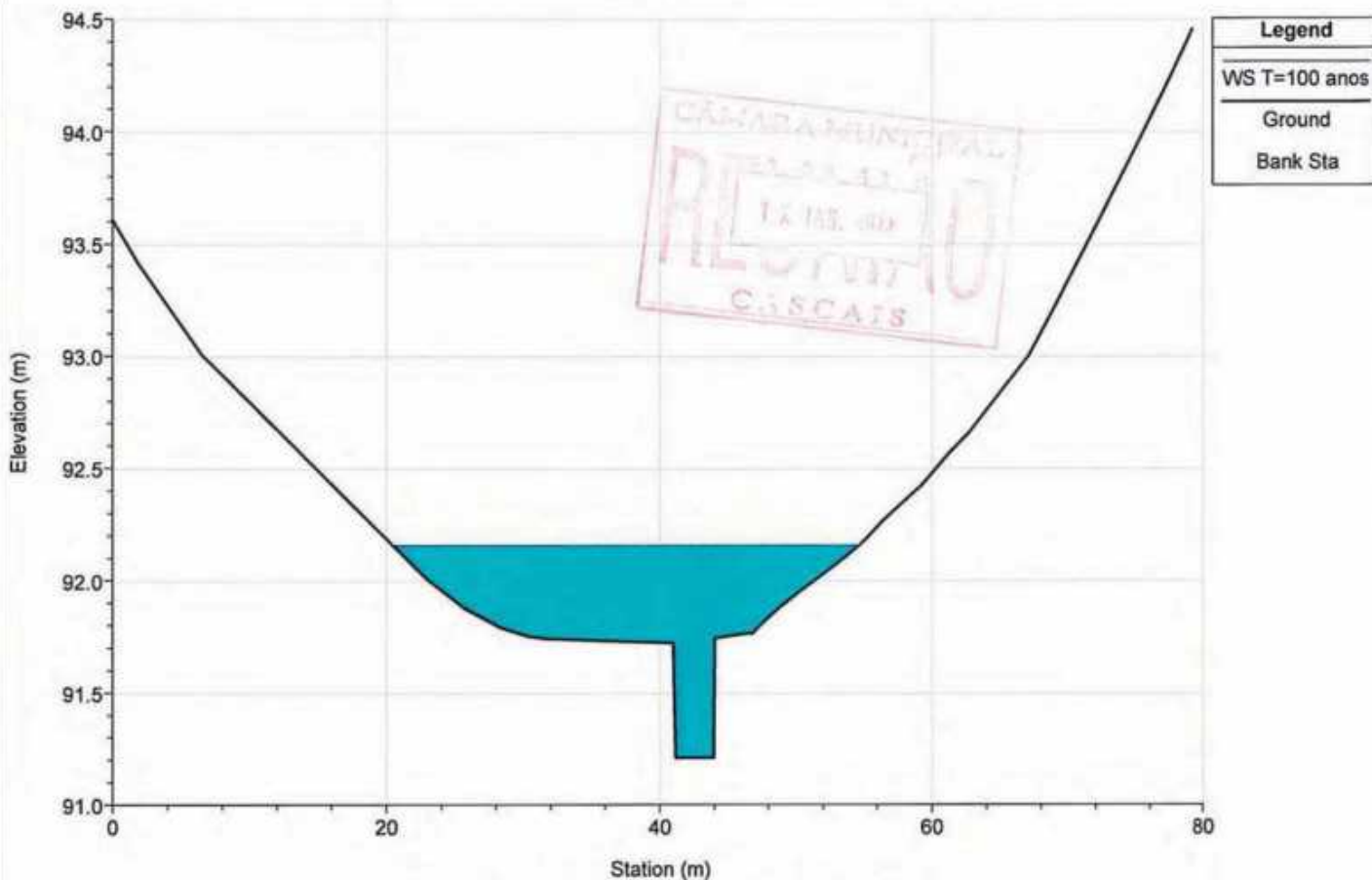
River = MD1 Reach = afluente RS = 1825.814



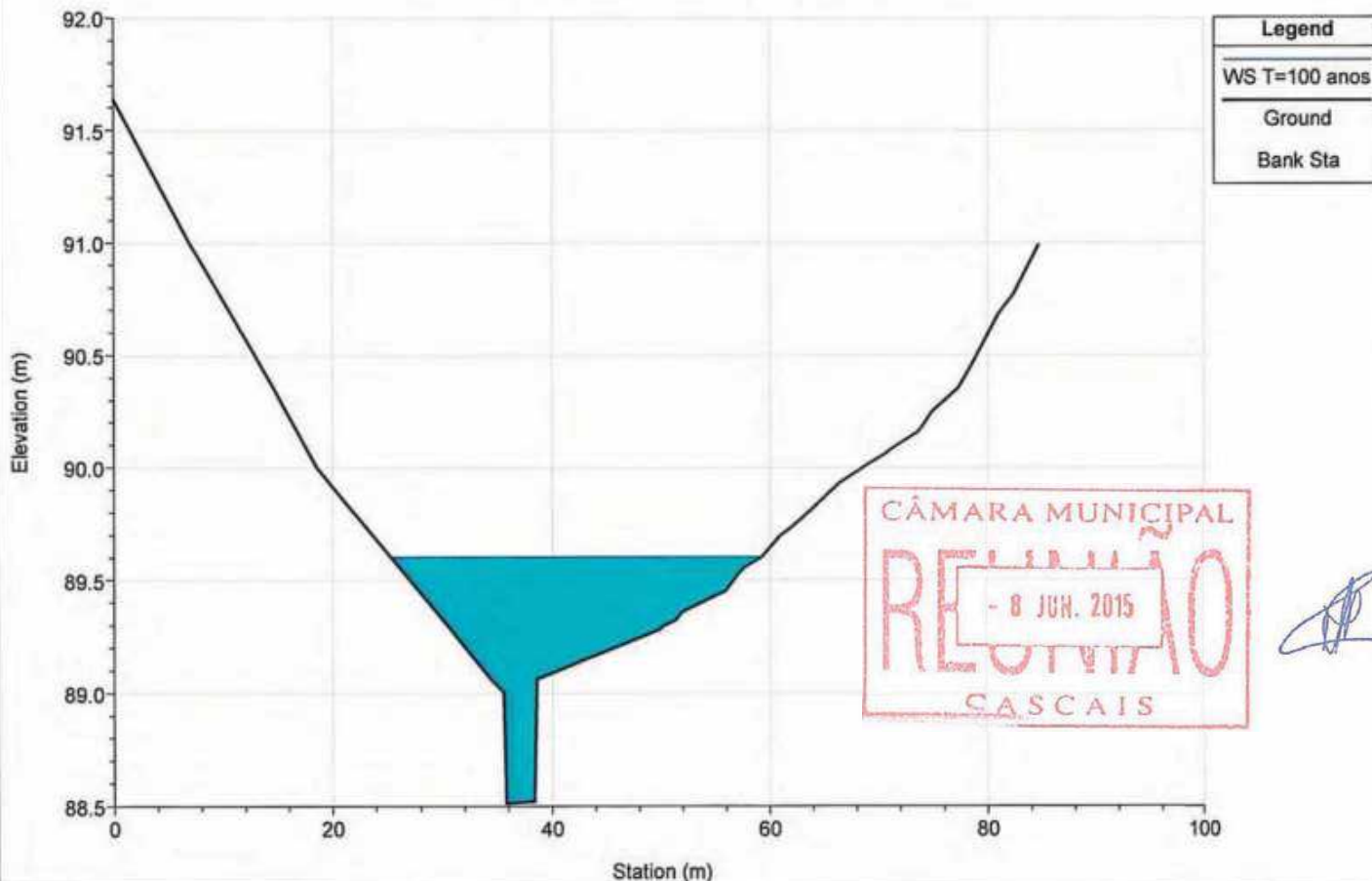
River = MD1 Reach = afluente RS = 1665.701



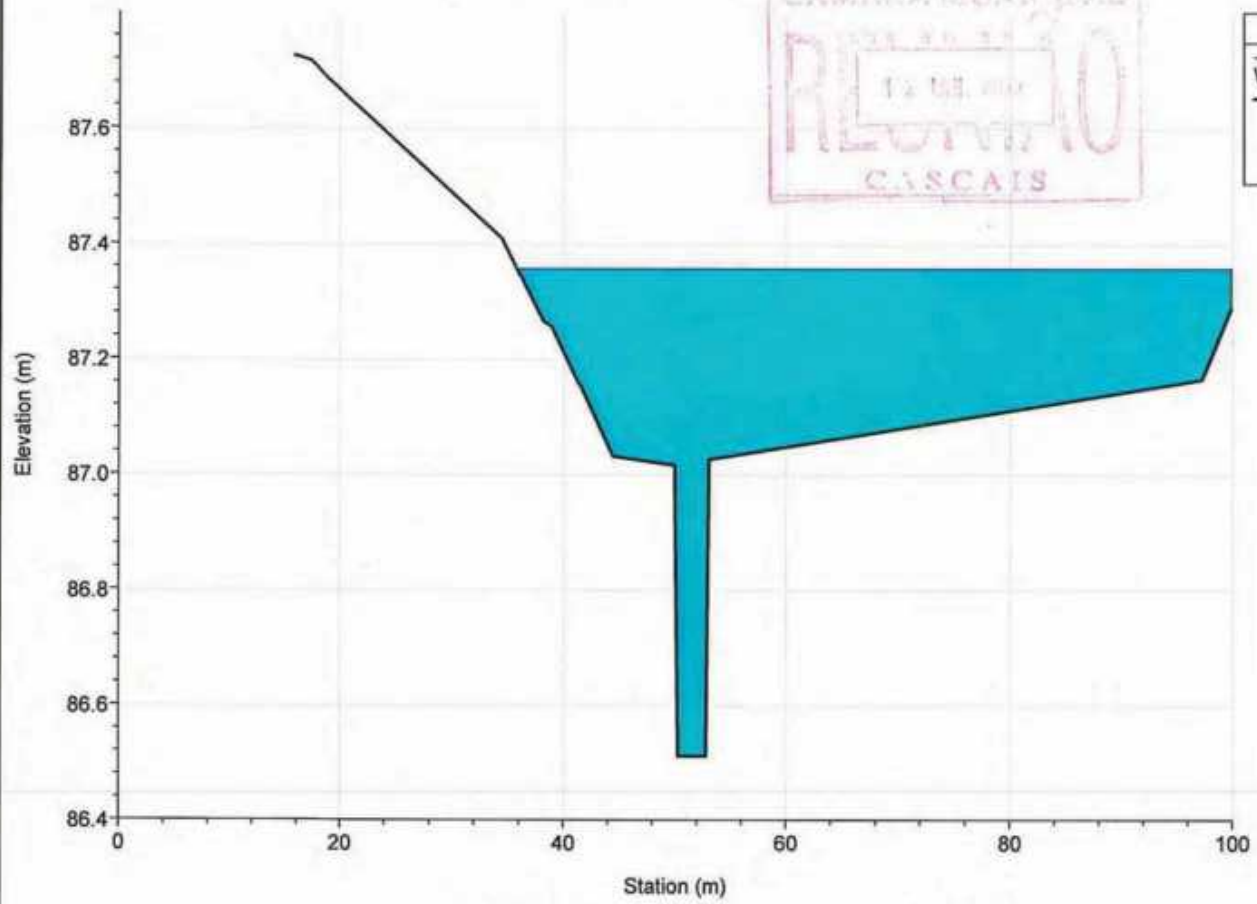
River = MD1 Reach = afluente RS = 1521.009



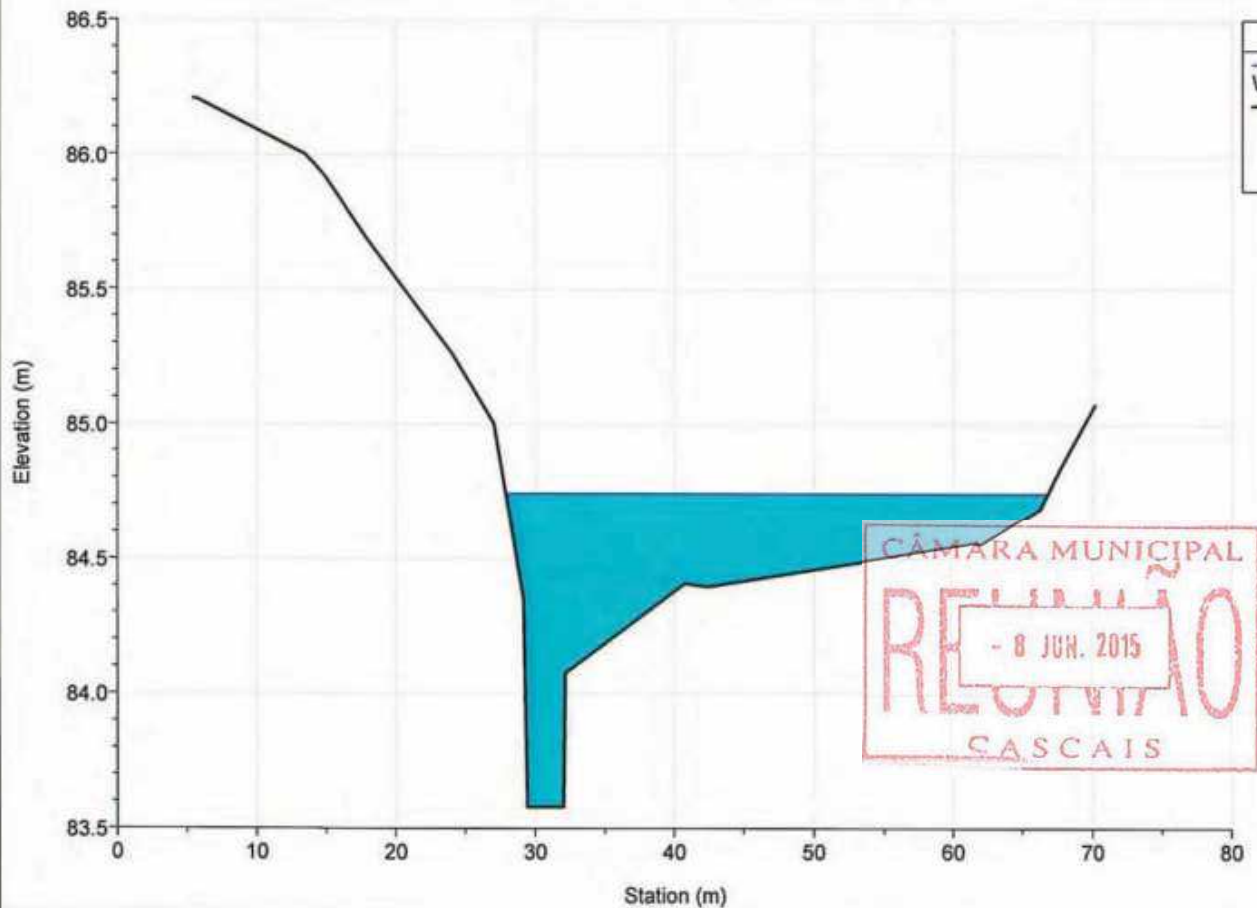
River = MD1 Reach = afluente RS = 1411.598



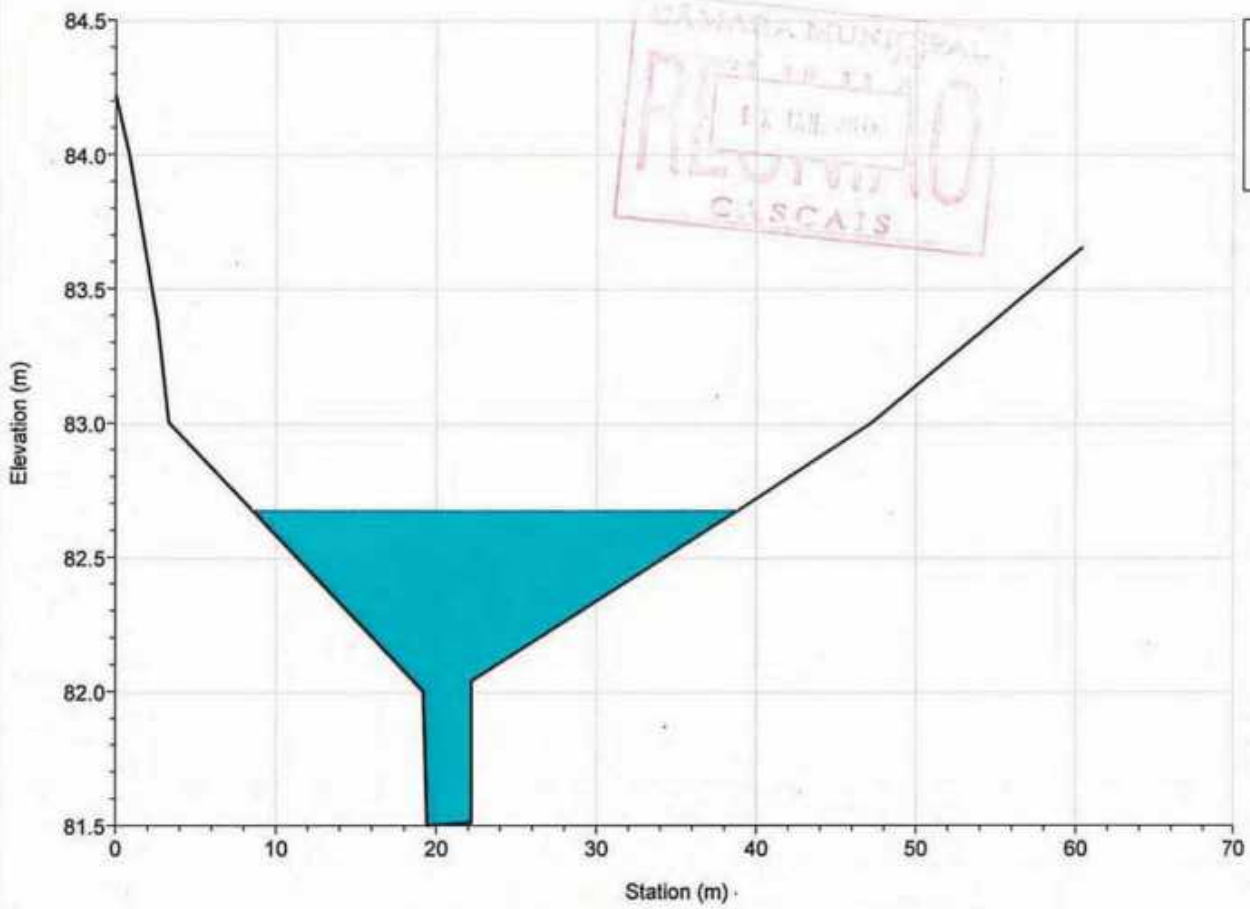
River = MD1 Reach = afluyente RS = 1296.941



River = MD1 Reach = afluyente RS = 1149.377



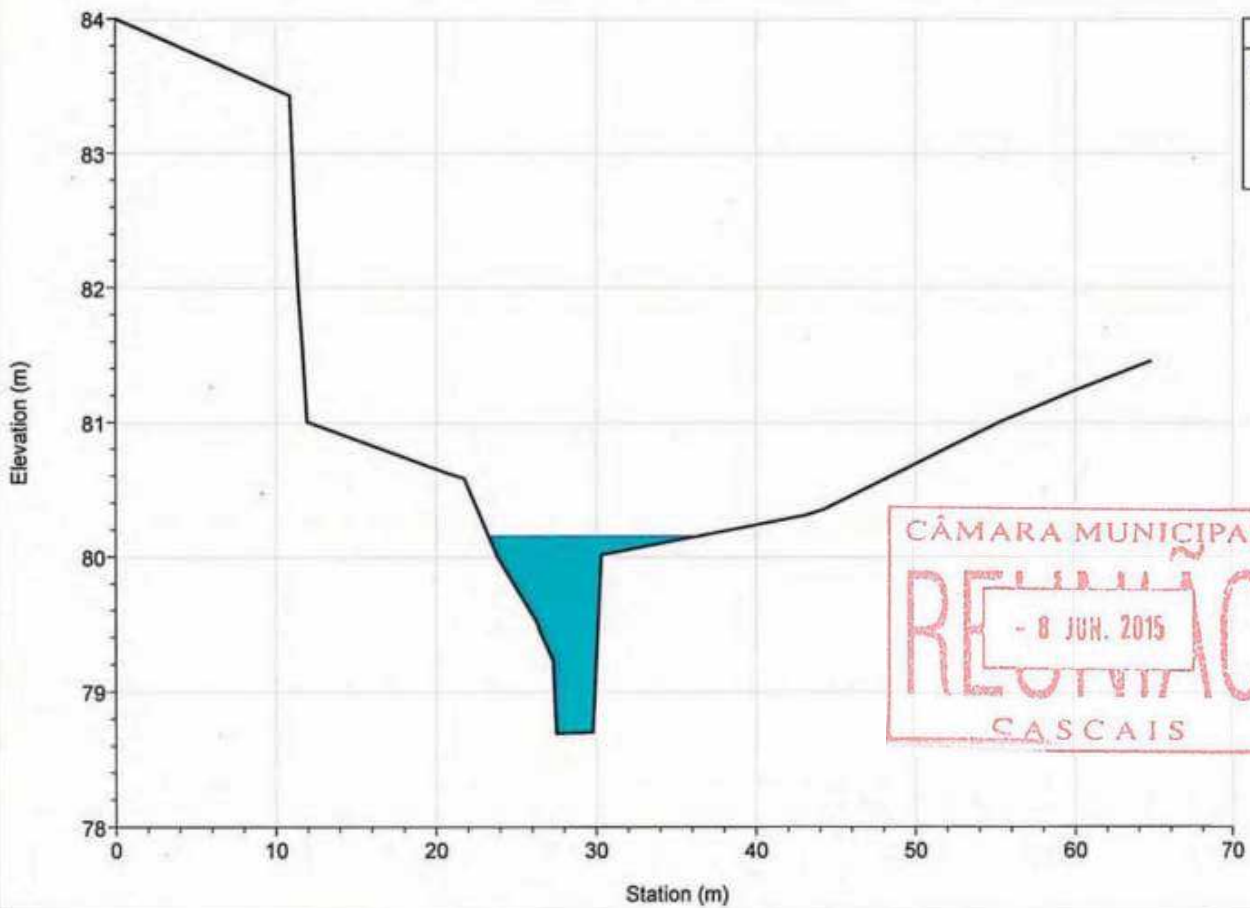
River = MD1 Reach = afluente RS = 1019.311



Legend
WS T=100 anos
Ground
Bank Sta

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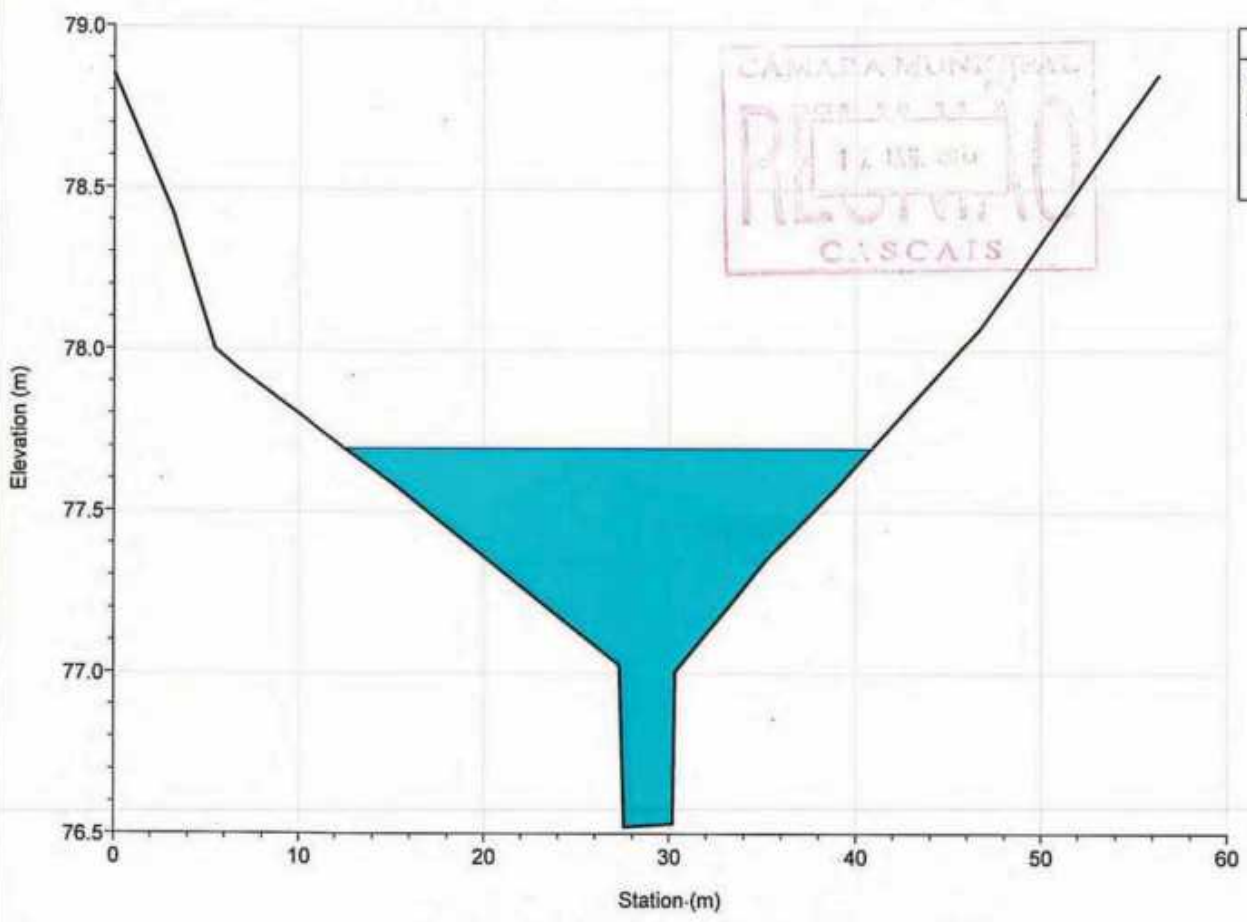
River = MD1 Reach = afluente RS = 887.876



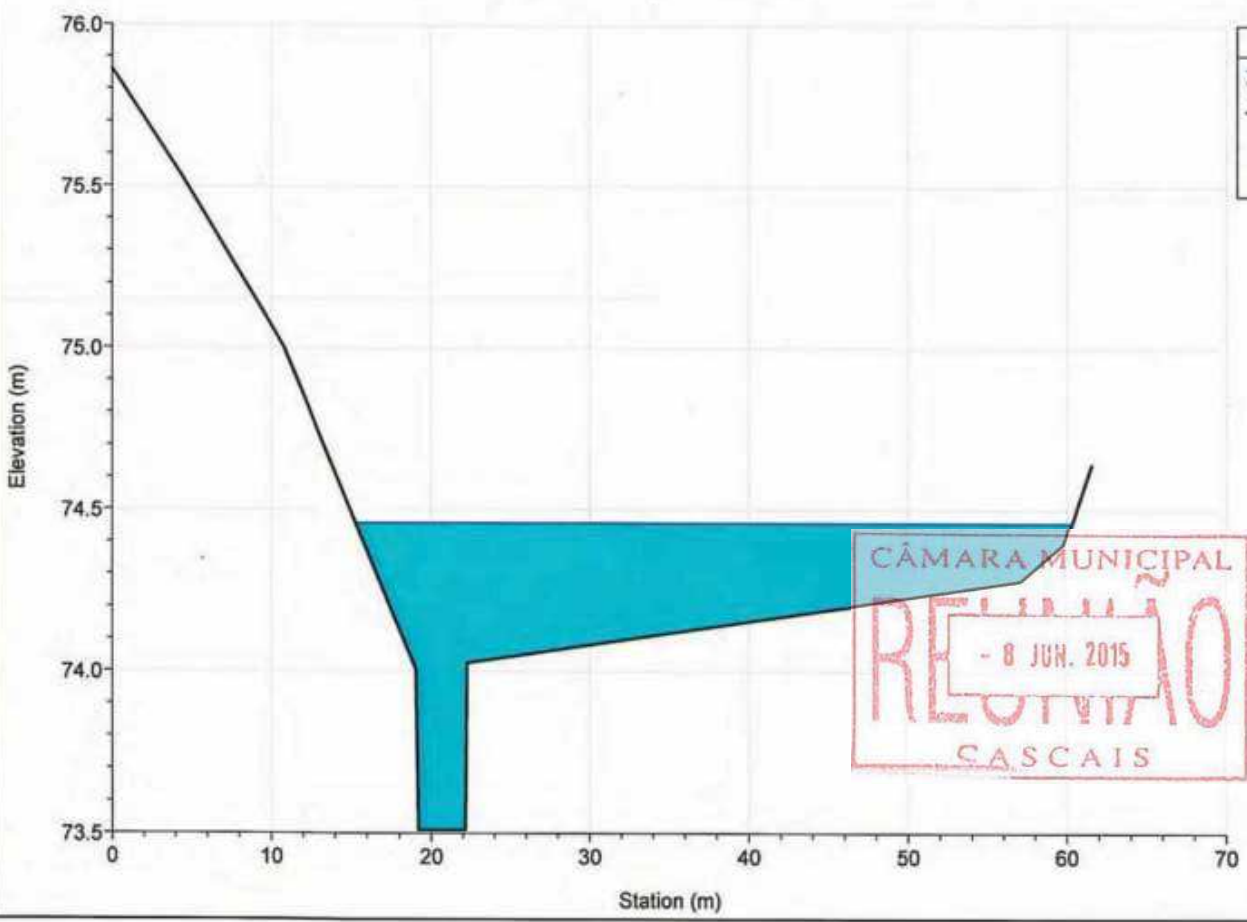
Legend
WS T=100 anos
Ground
Bank Sta

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- 8 JUN. 2015  
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River = MD1 Reach = afluente RS = 776.157

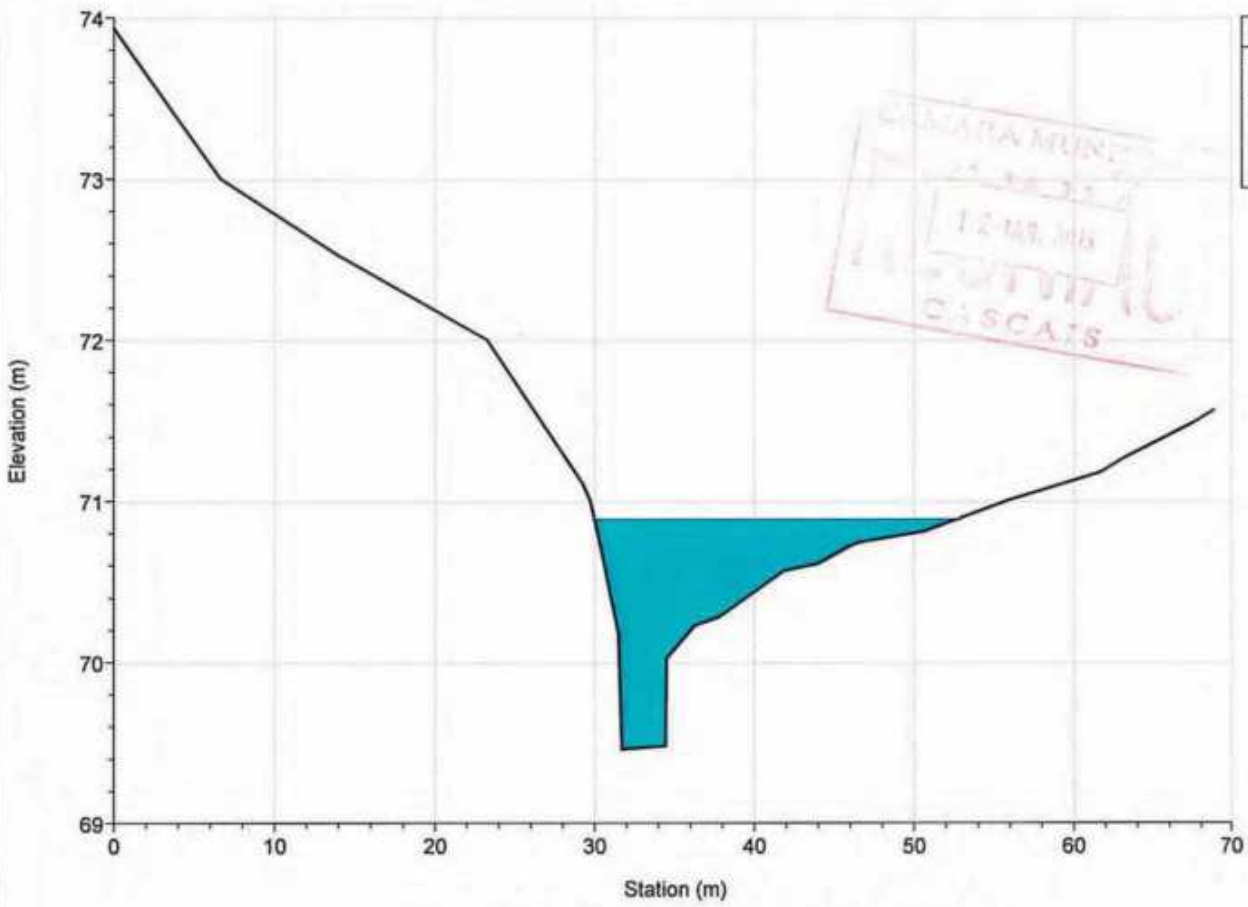


River = MD1 Reach = afluente RS = 658.205

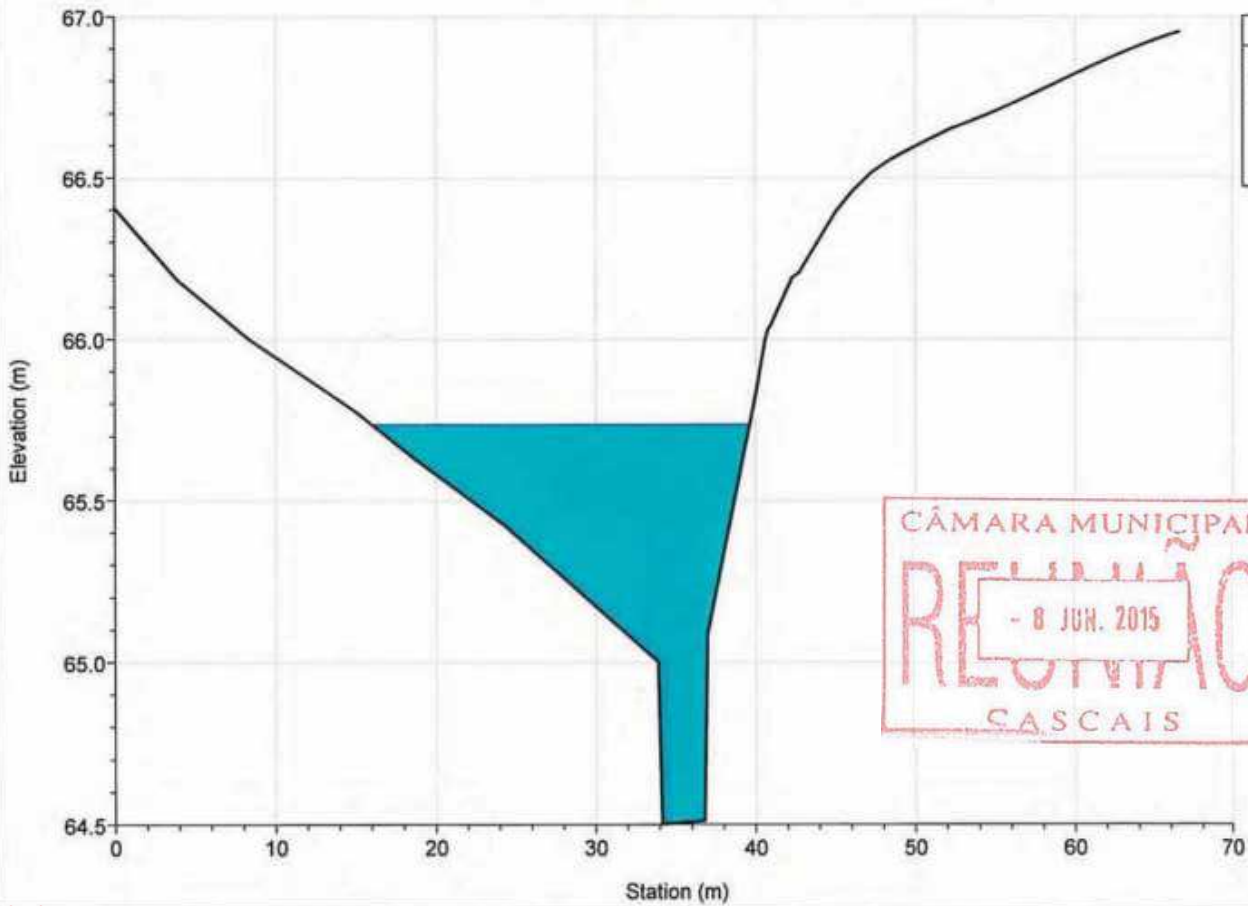




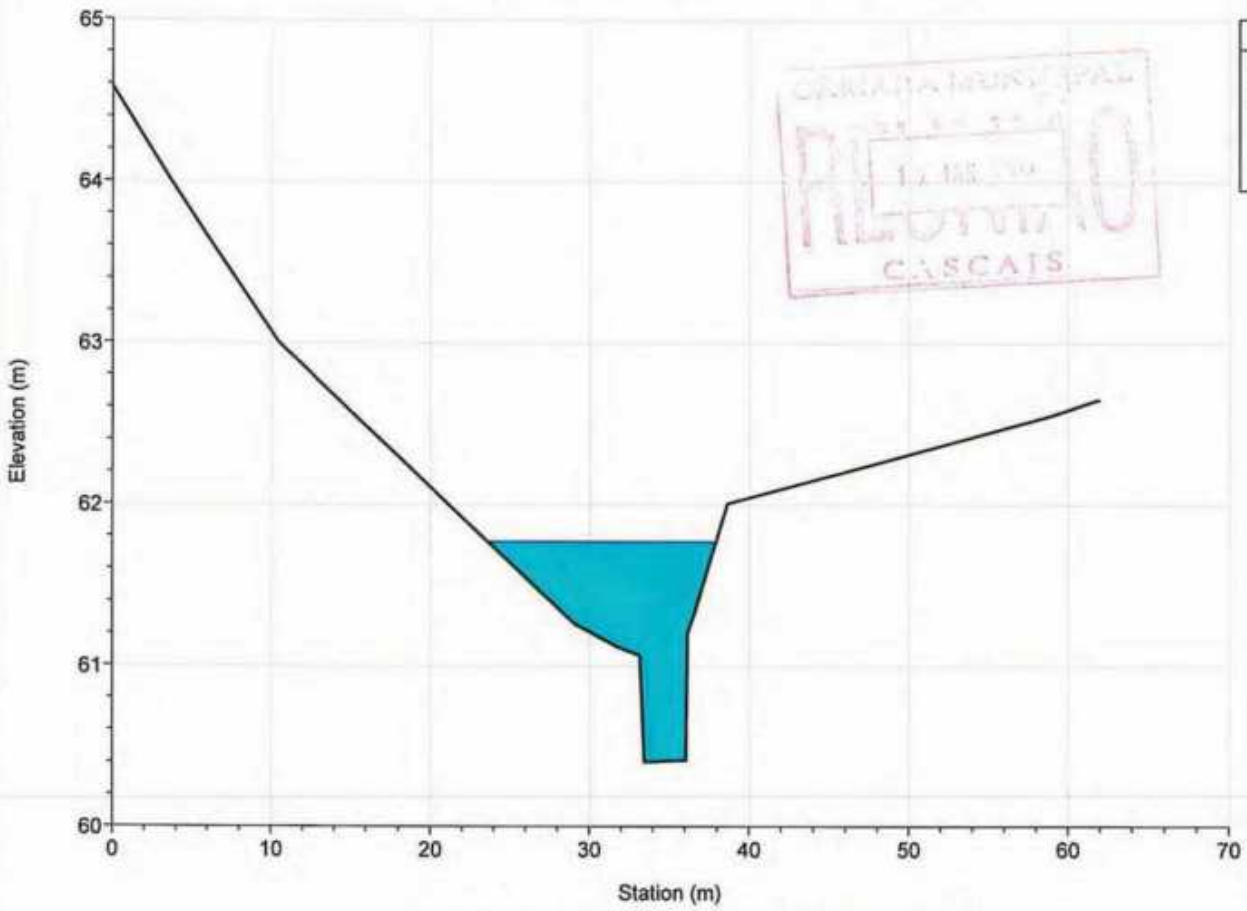
River = MD1 Reach = afluente RS = 524.785



River = MD1 Reach = afluente RS = 380.834

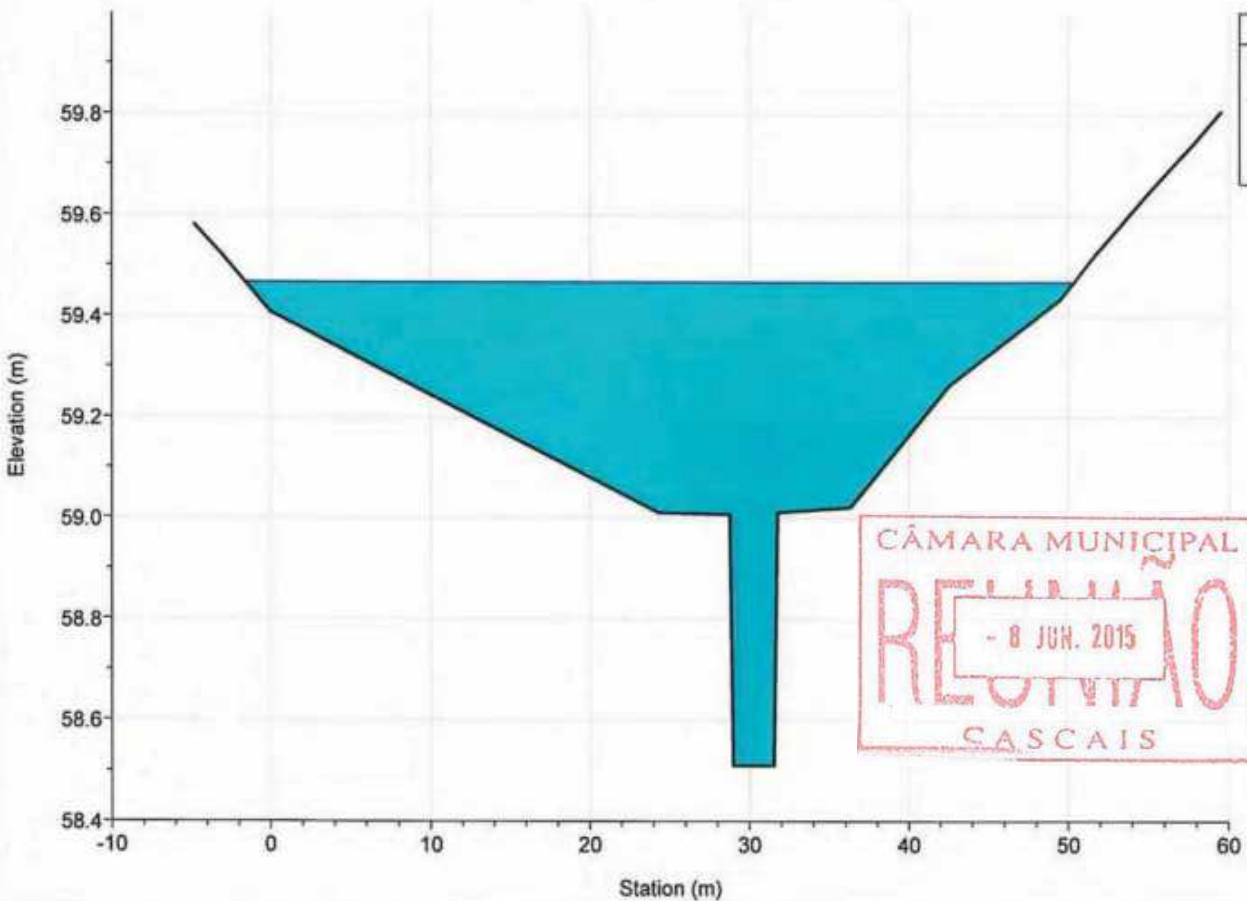


River = MD1 Reach = afluente RS = 261.948



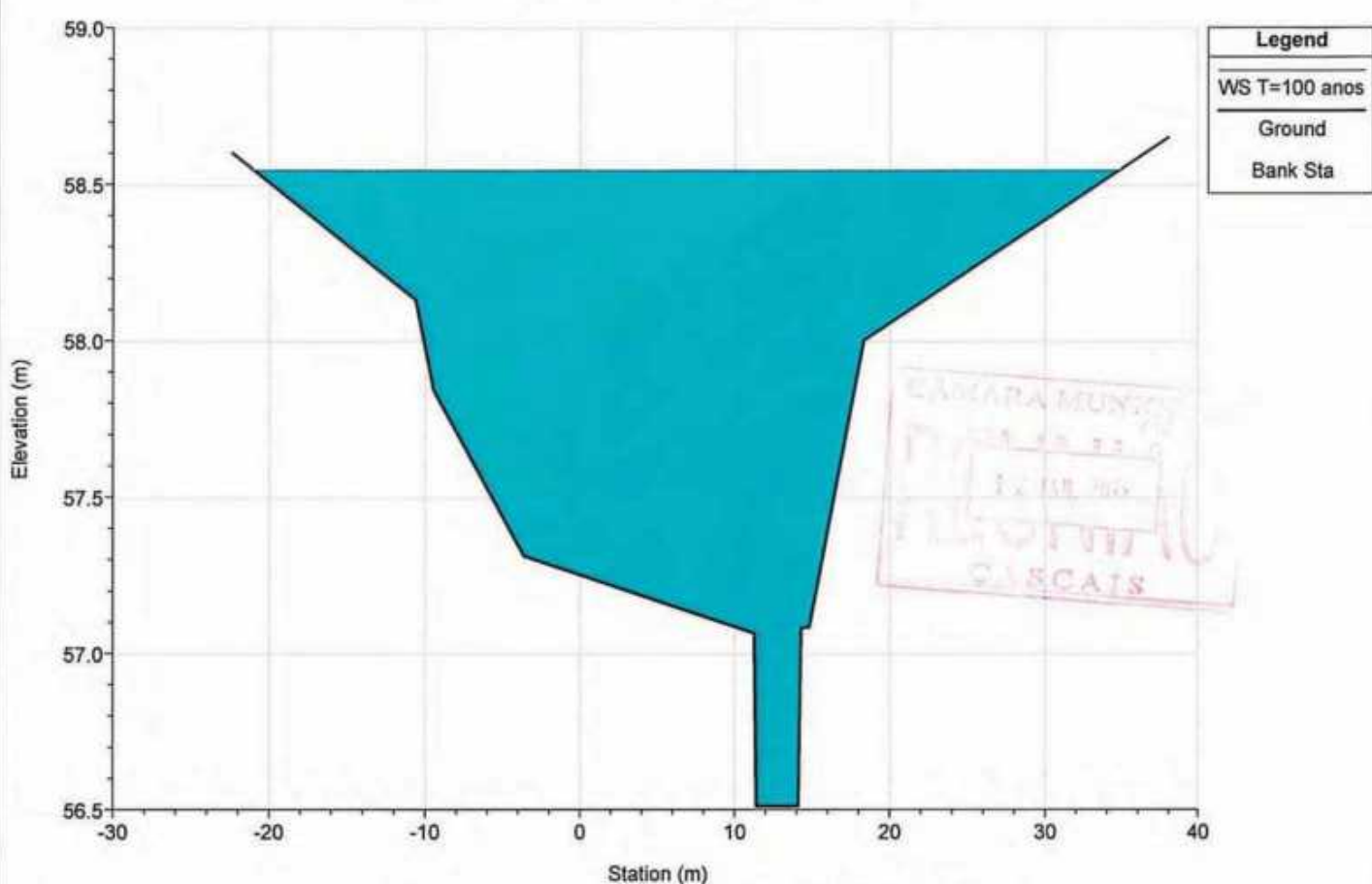
Legend	
WS T=100 anos	
Ground	
Bank Sta	

River = MD1 Reach = afluente RS = 149.356

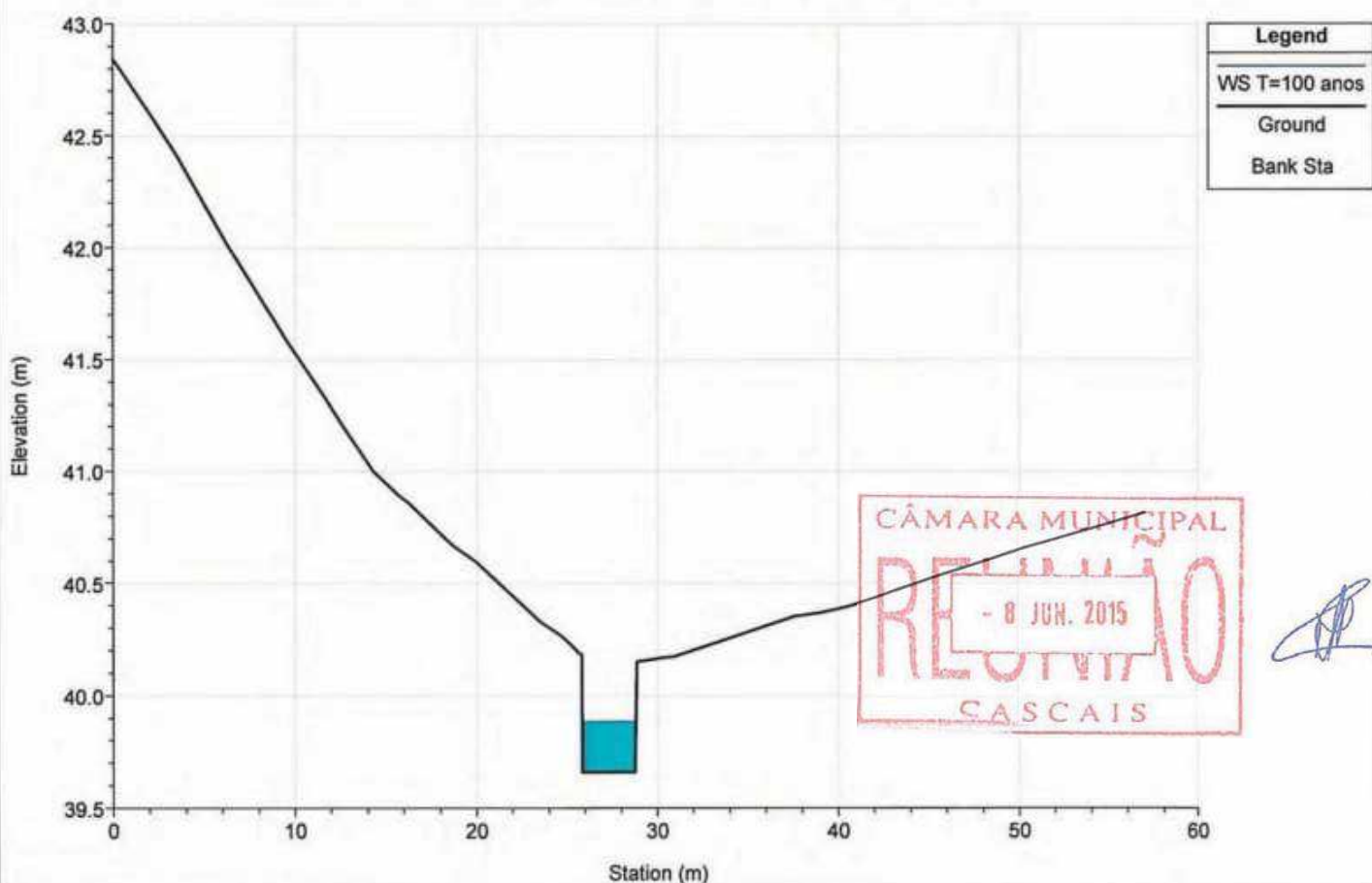


Legend	
WS T=100 anos	
Ground	
Bank Sta	

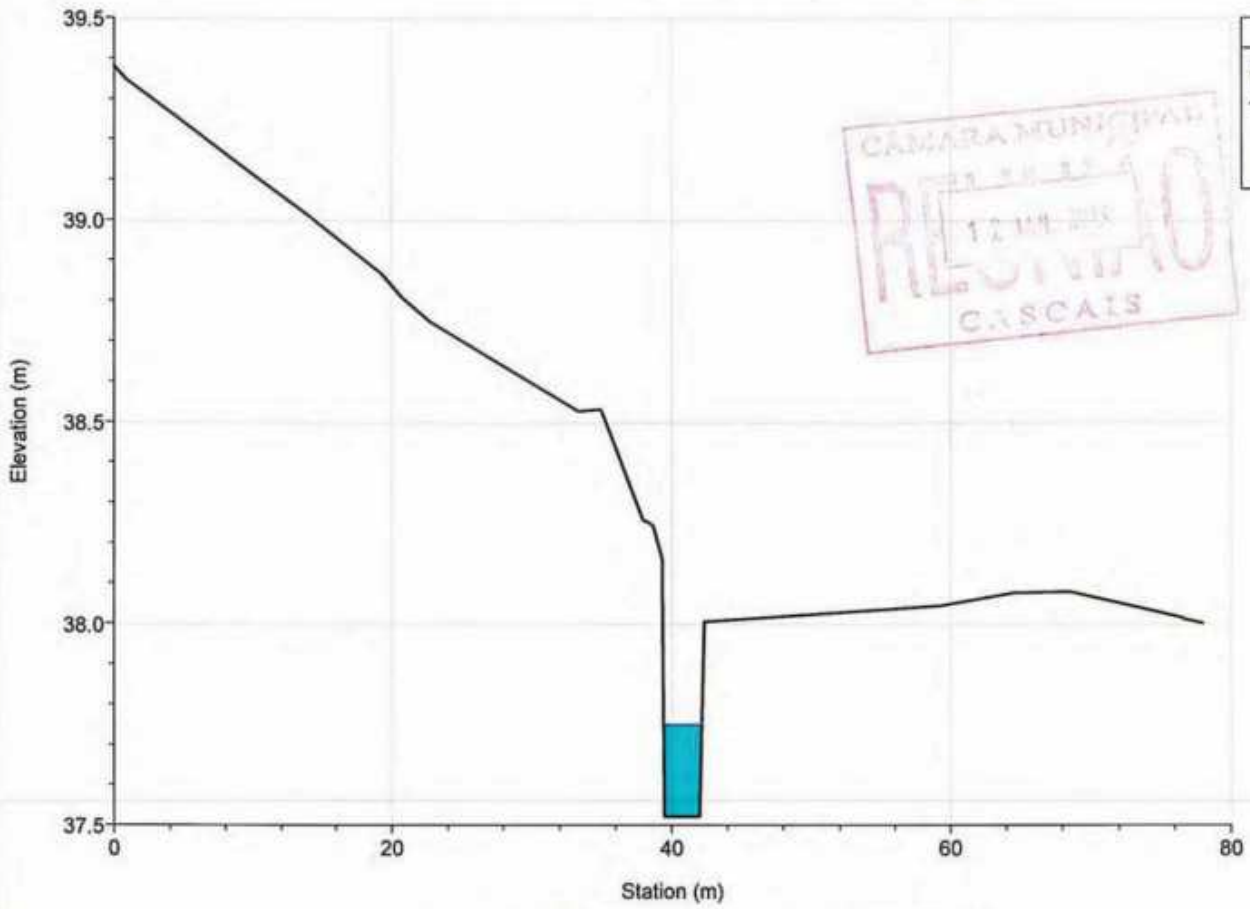
River = MD1 Reach = afluyente RS = 34.711



River = MD2 Reach = afluyente RS = 300.869

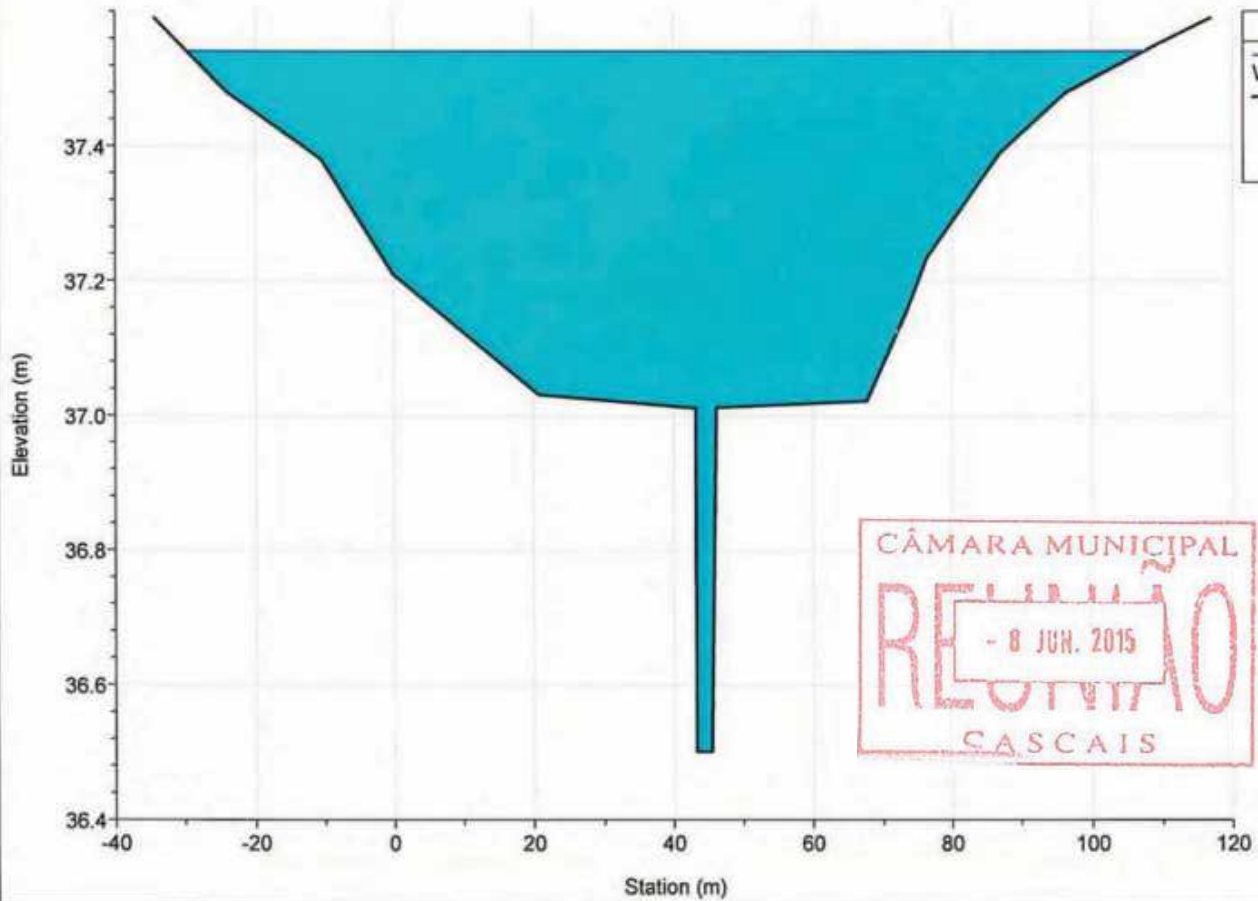


River = MD2 Reach = afluyente RS = 202.027



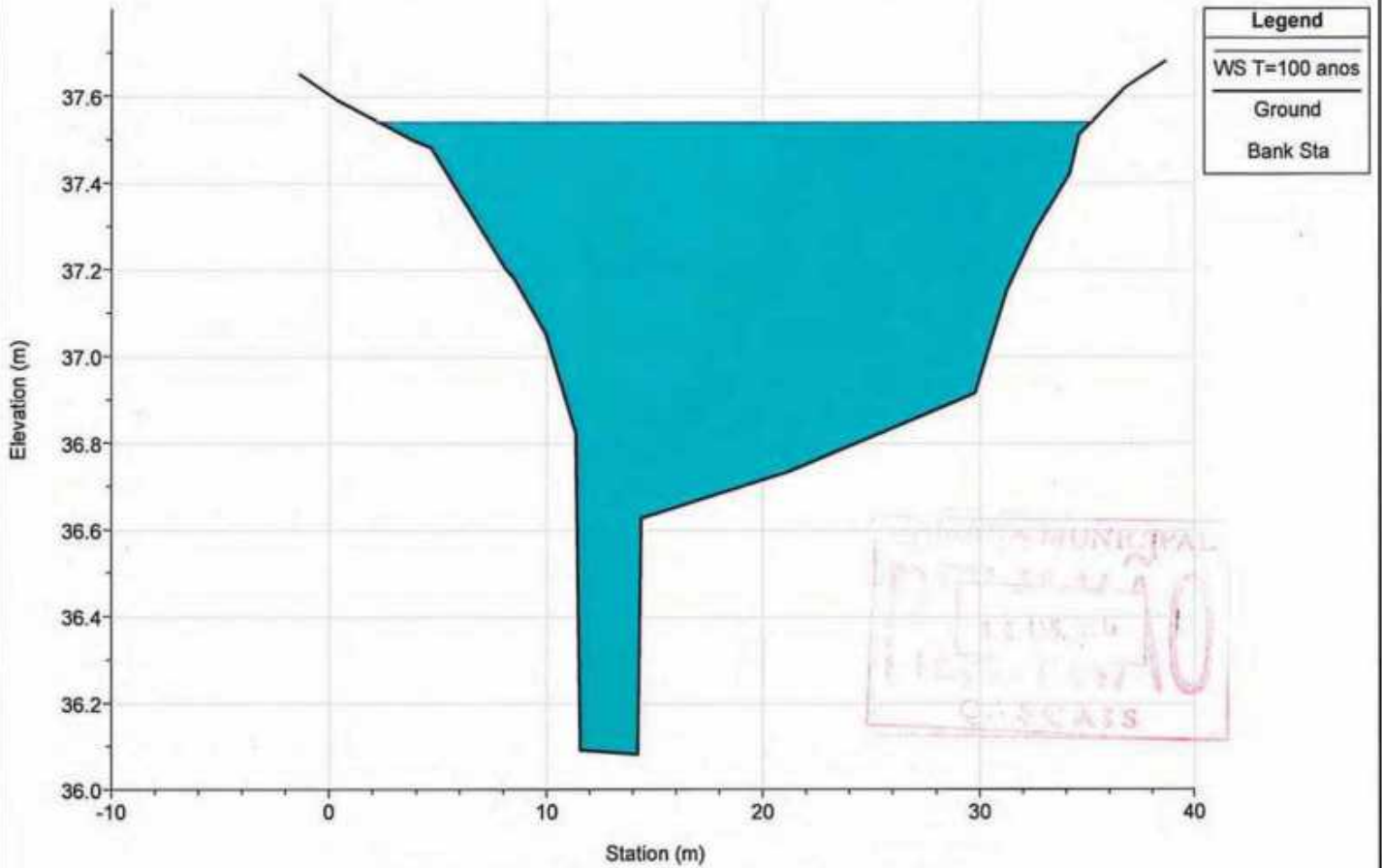
Legend
WS T=100 anos
Ground
Bank Sta

River = MD2 Reach = afluyente RS = 76.525

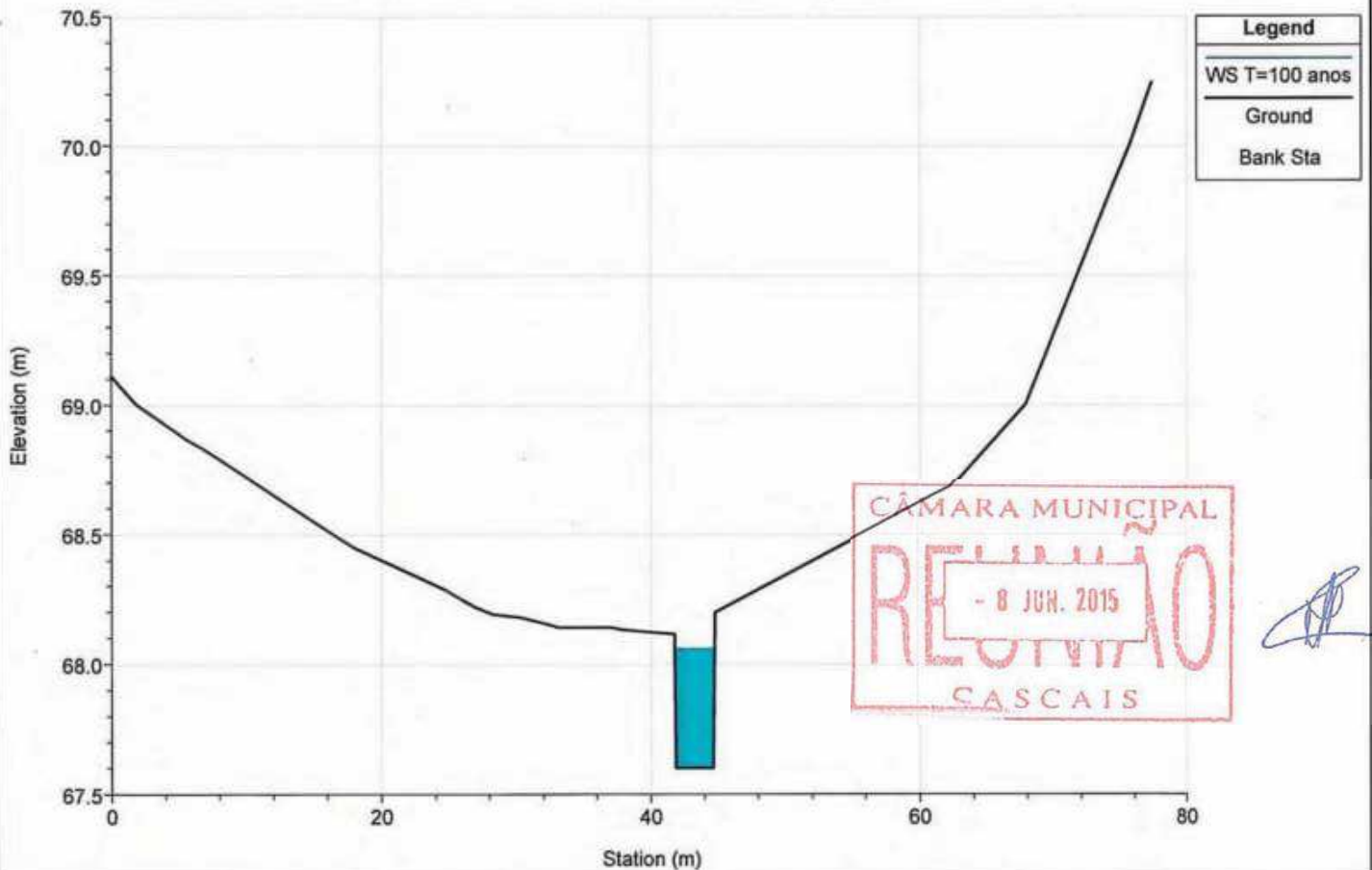


Legend
WS T=100 anos
Ground
Bank Sta

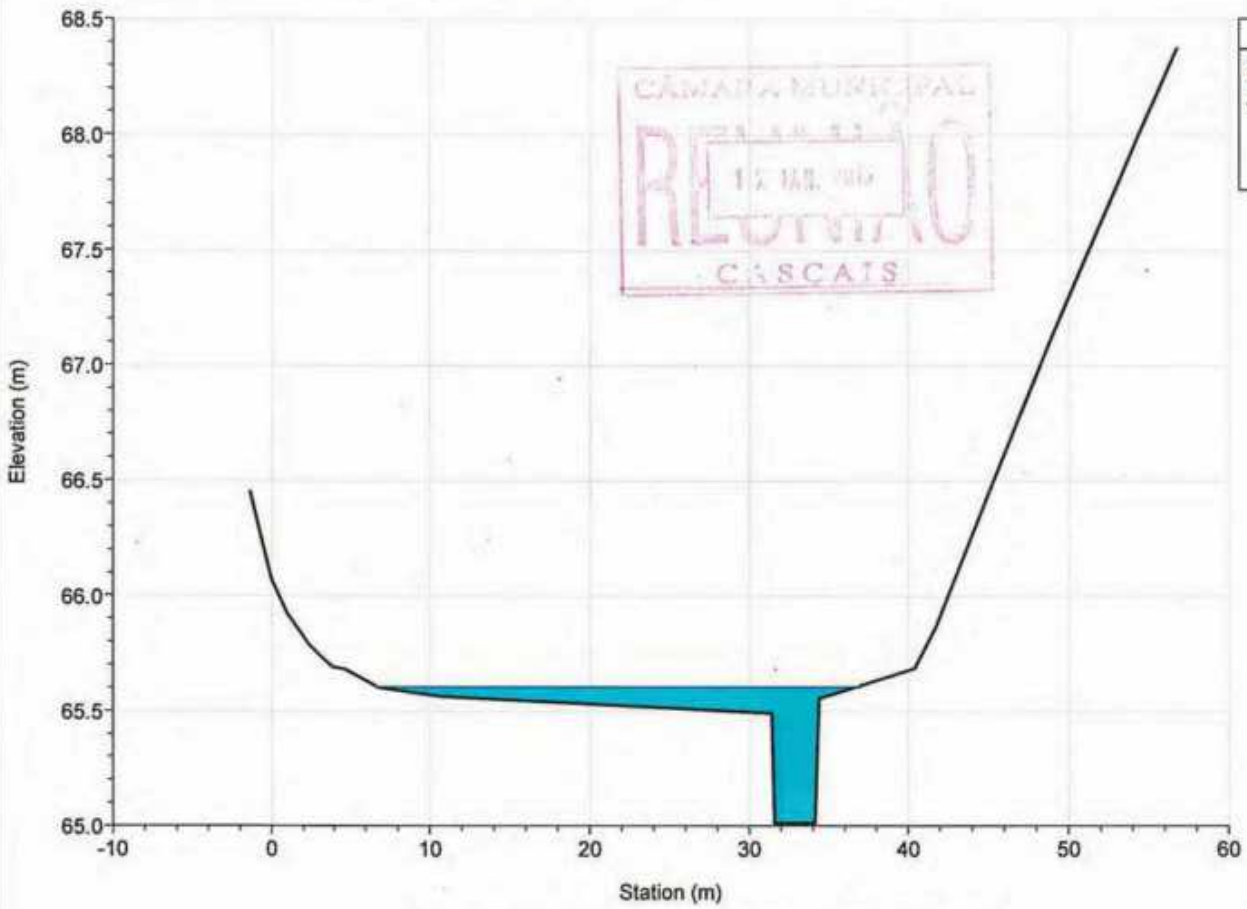
River = MD2 Reach = afluyente RS = 21.596



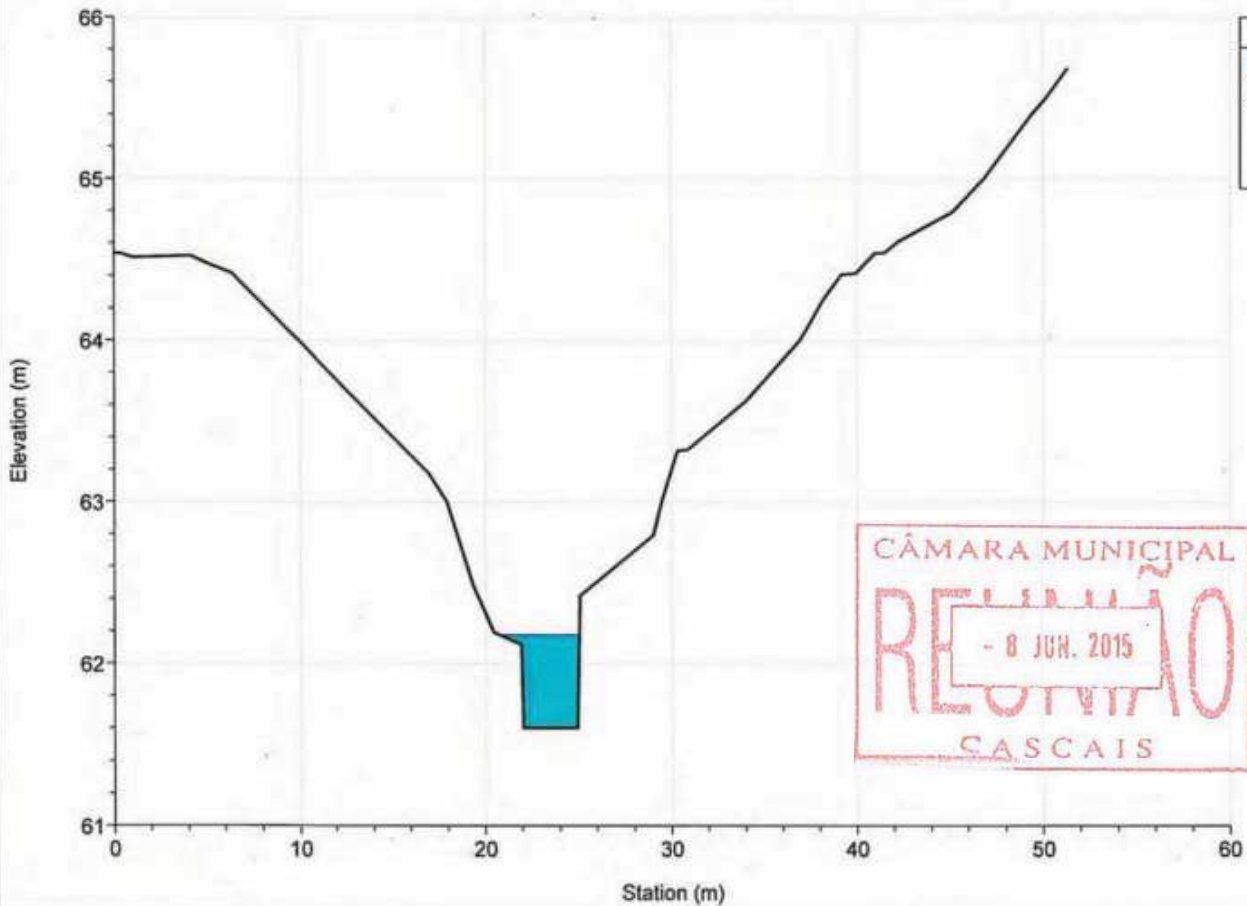
River = MD3 Reach = afluyente RS = 1923.159



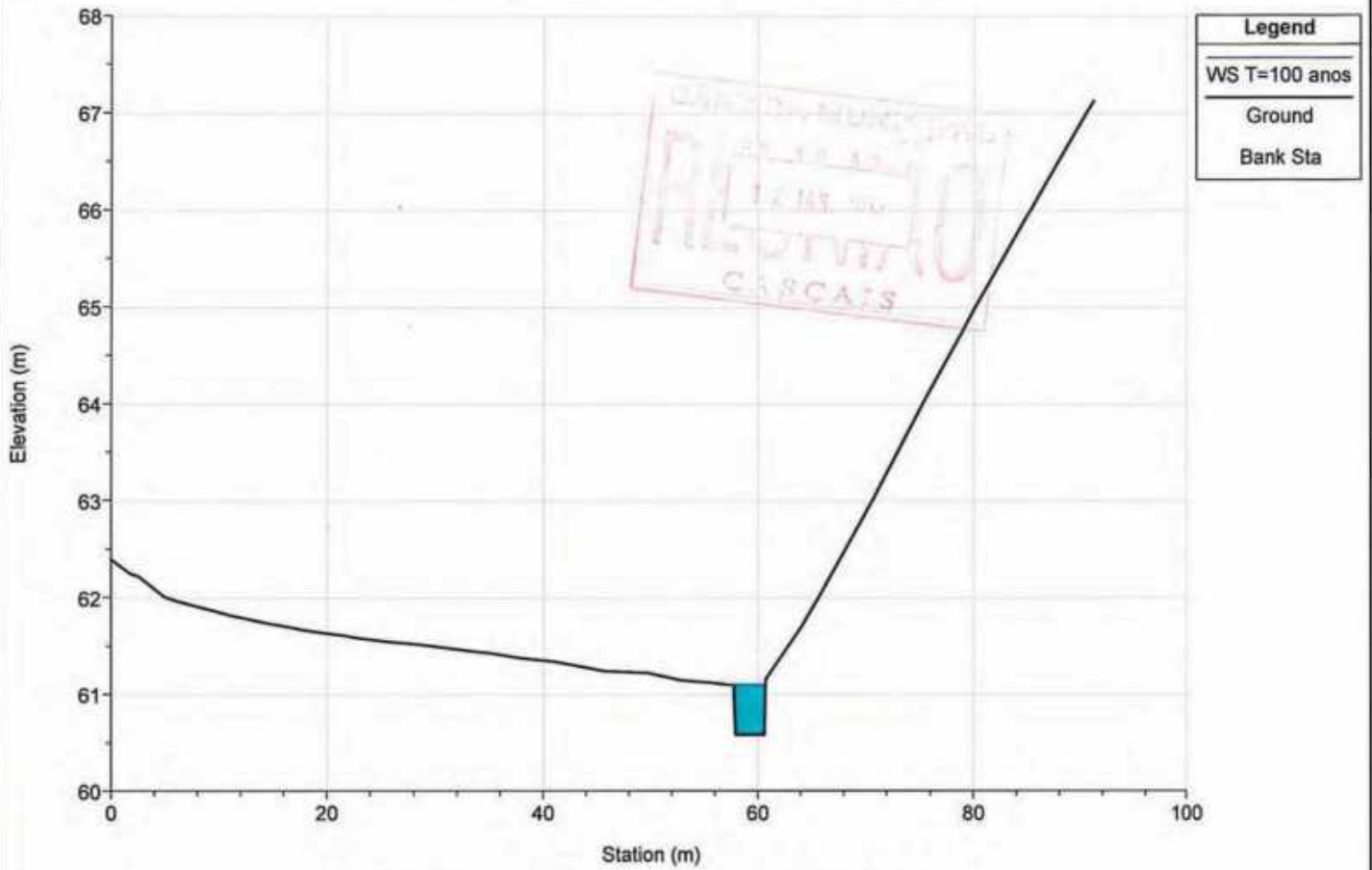
River = MD3 Reach = afluyente RS = 1783.891



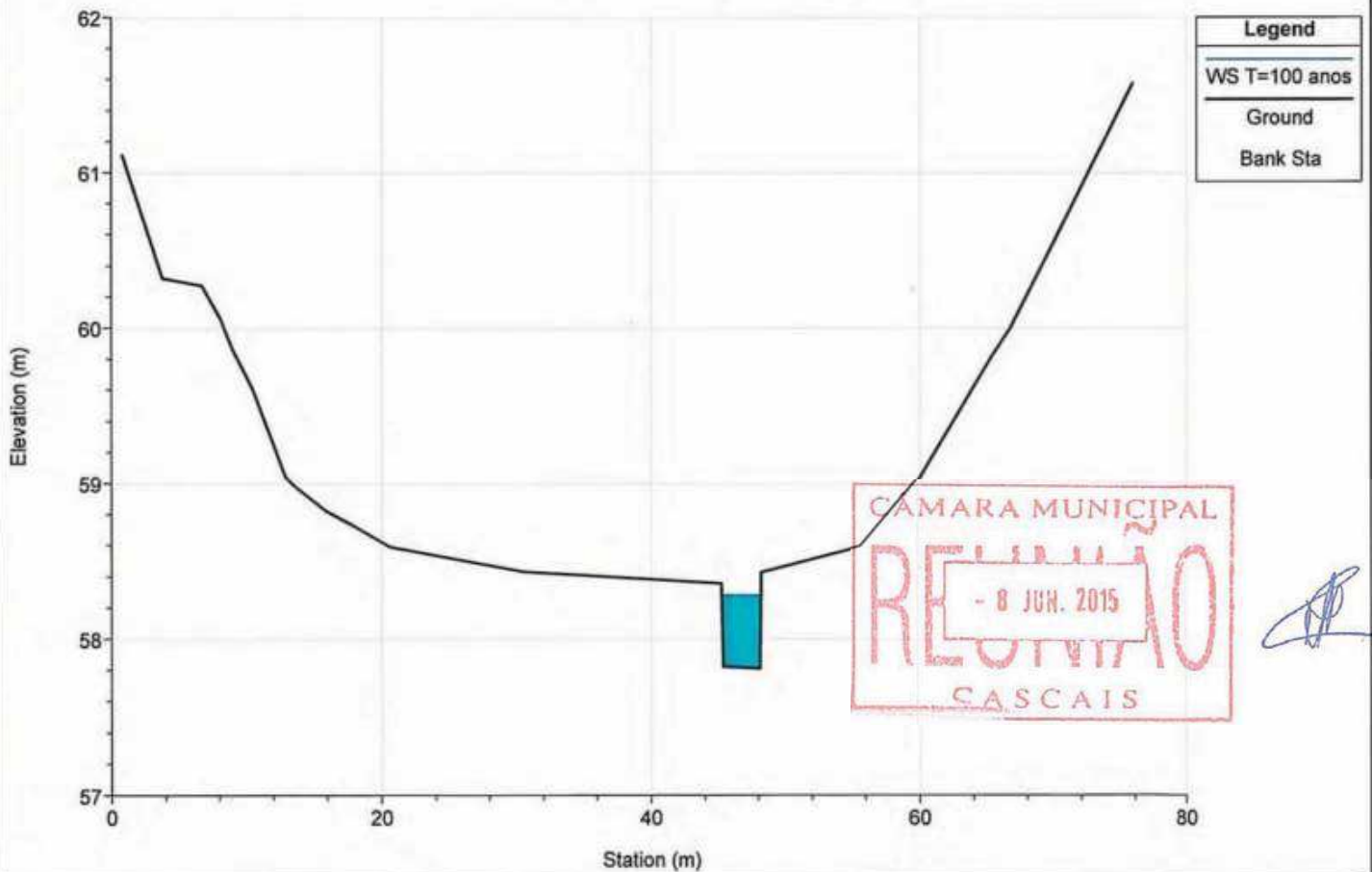
River = MD3 Reach = afluyente RS = 1659.775



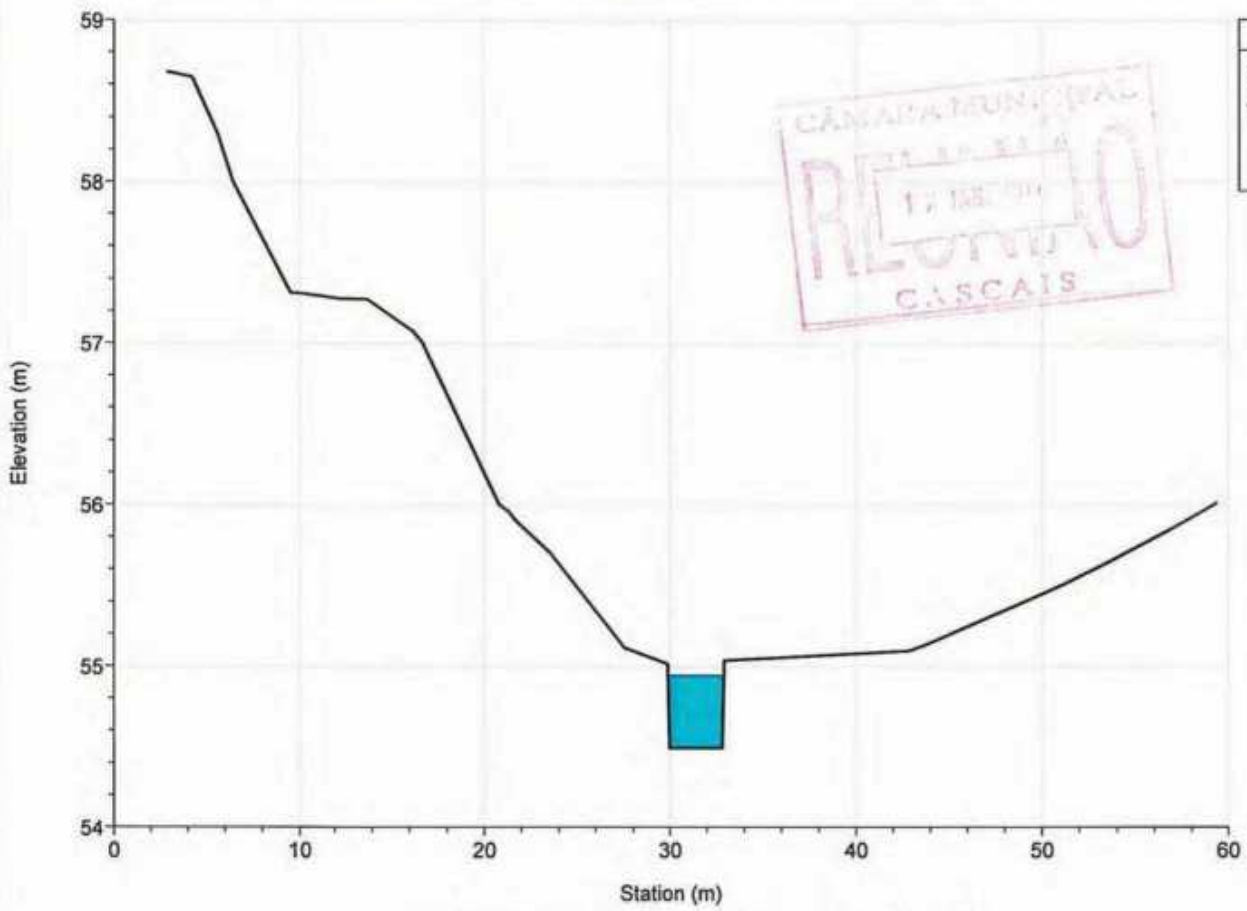
River = MD3 Reach = afluente RS = 1572.147



River = MD3 Reach = afluente RS = 1412.730



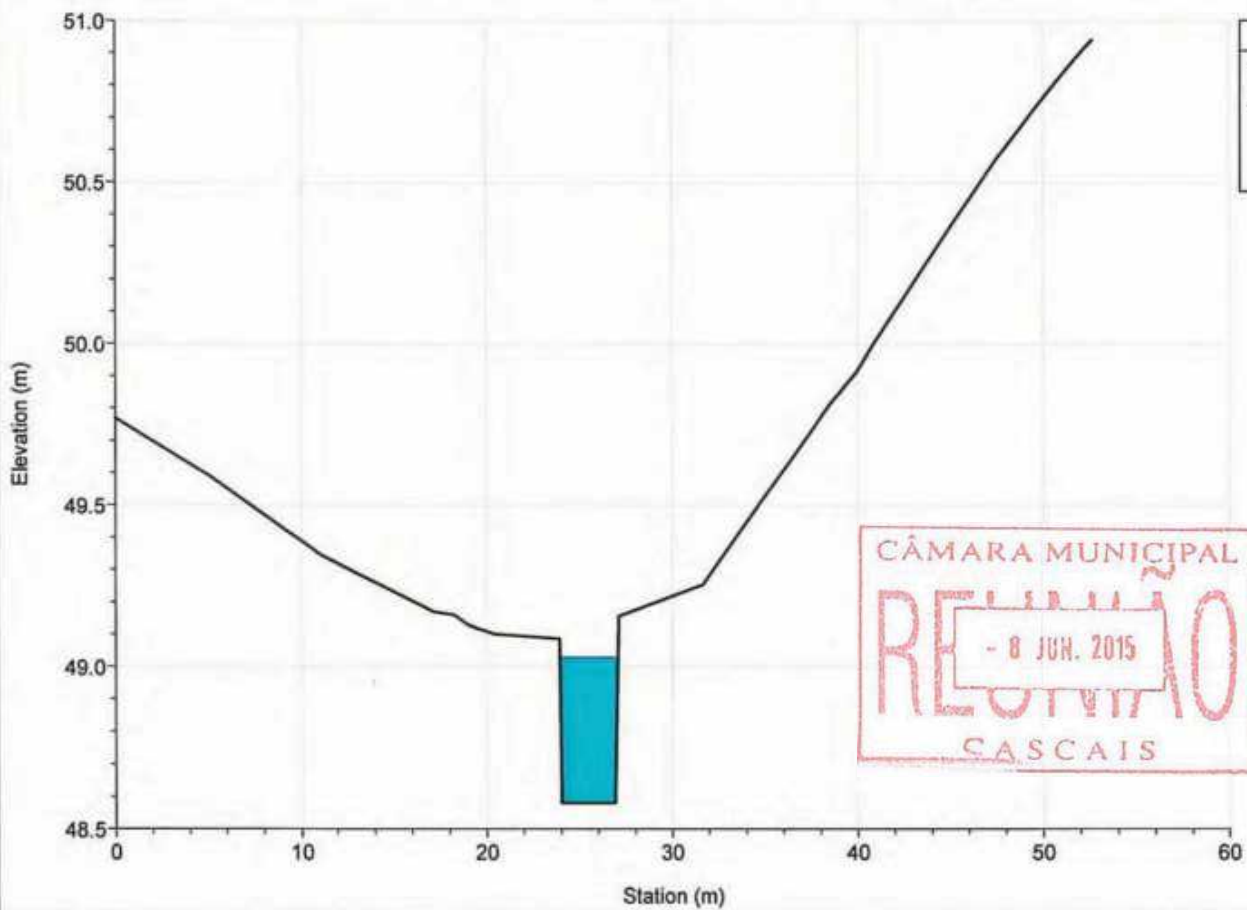
River = MD3 Reach = afluyente RS = 1267.828



Legend
WS T=100 anos
Ground
Bank Sta

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River = MD3 Reach = afluyente RS = 1119.618

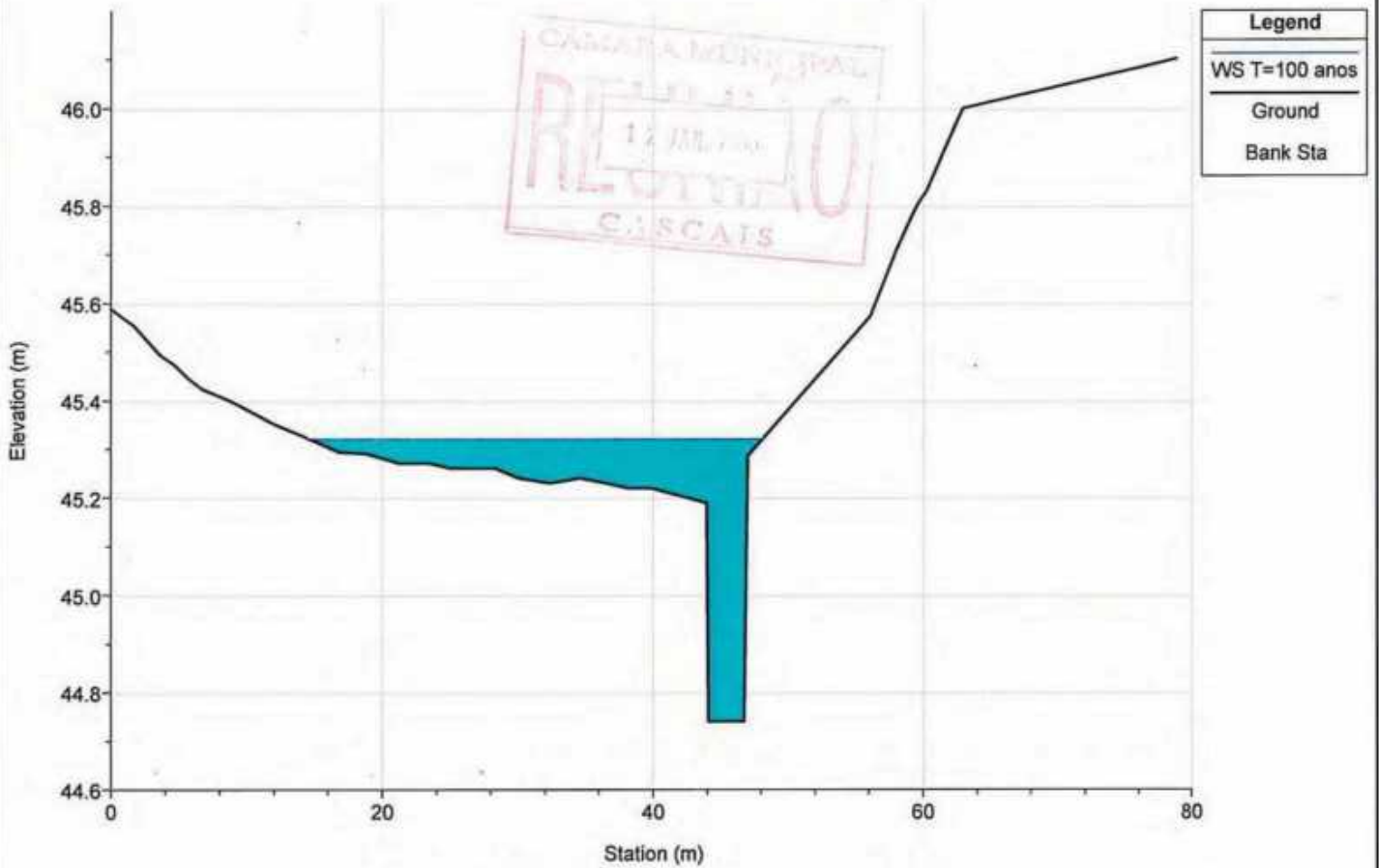


Legend
WS T=100 anos
Ground
Bank Sta

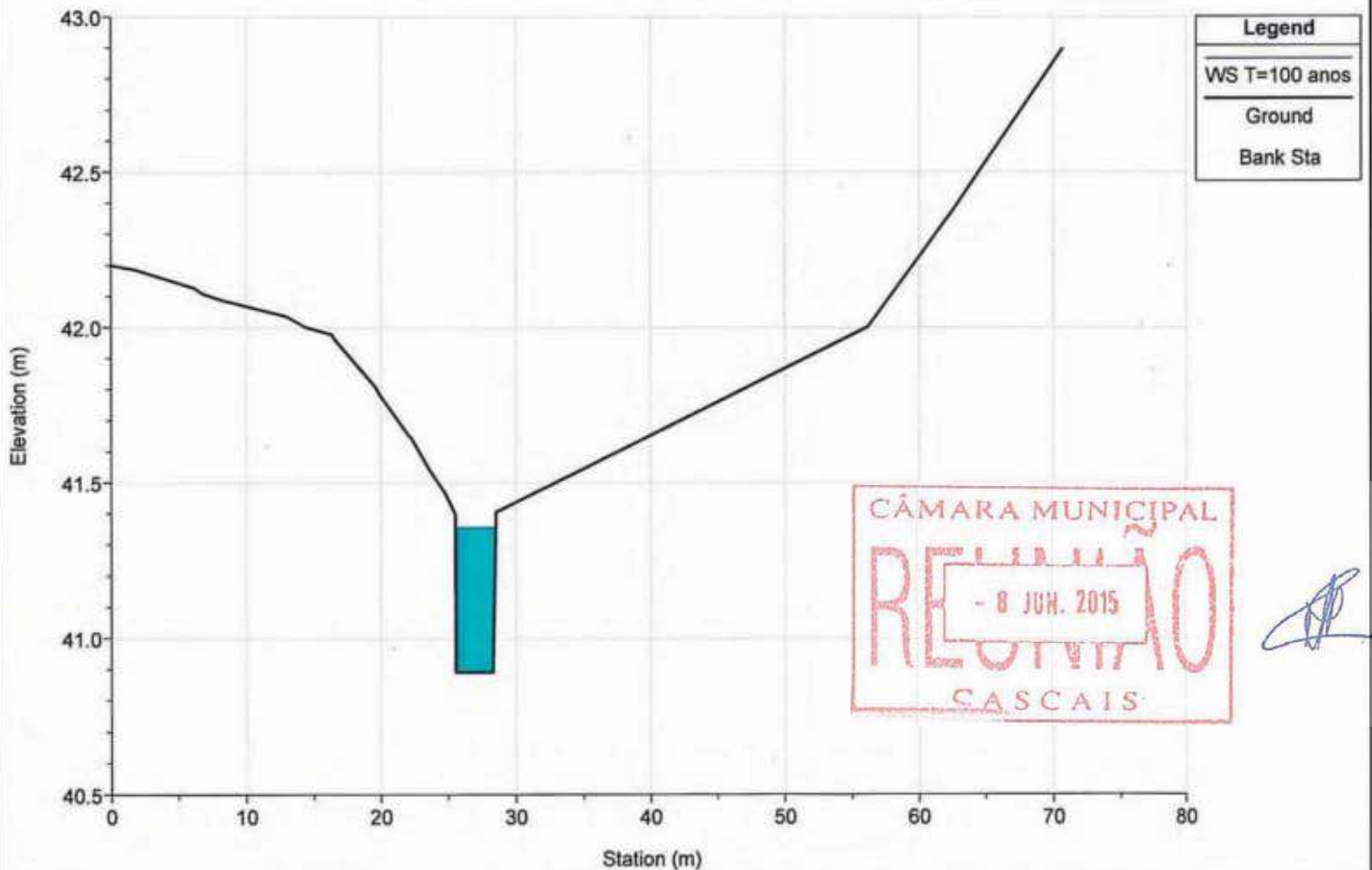
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- 8 JUN. 2015  
CASCAIS



River = MD3 Reach = afluyente RS = 984.931



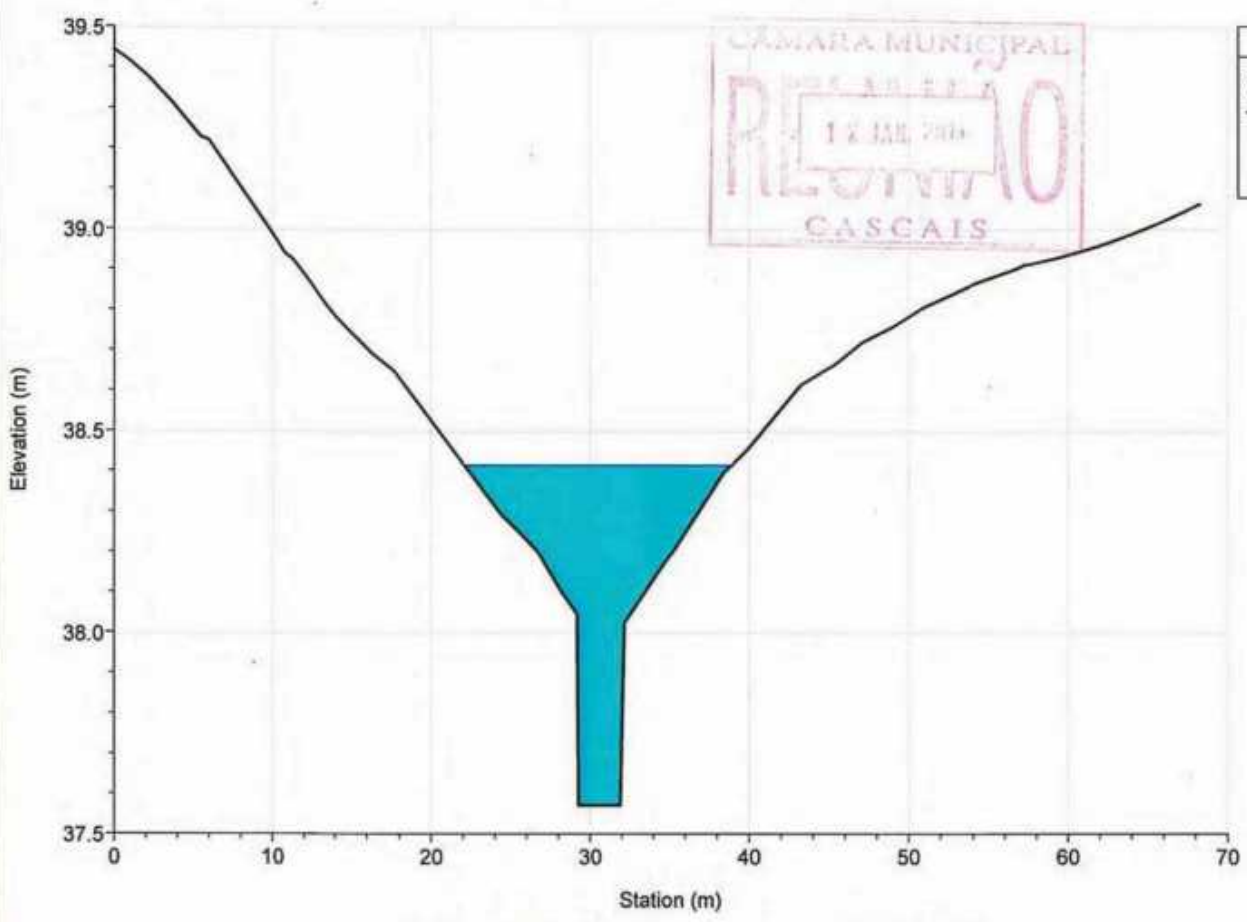
River = MD3 Reach = afluyente RS = 830.577



River = MD3 Reach = afluyente RS = 669.193



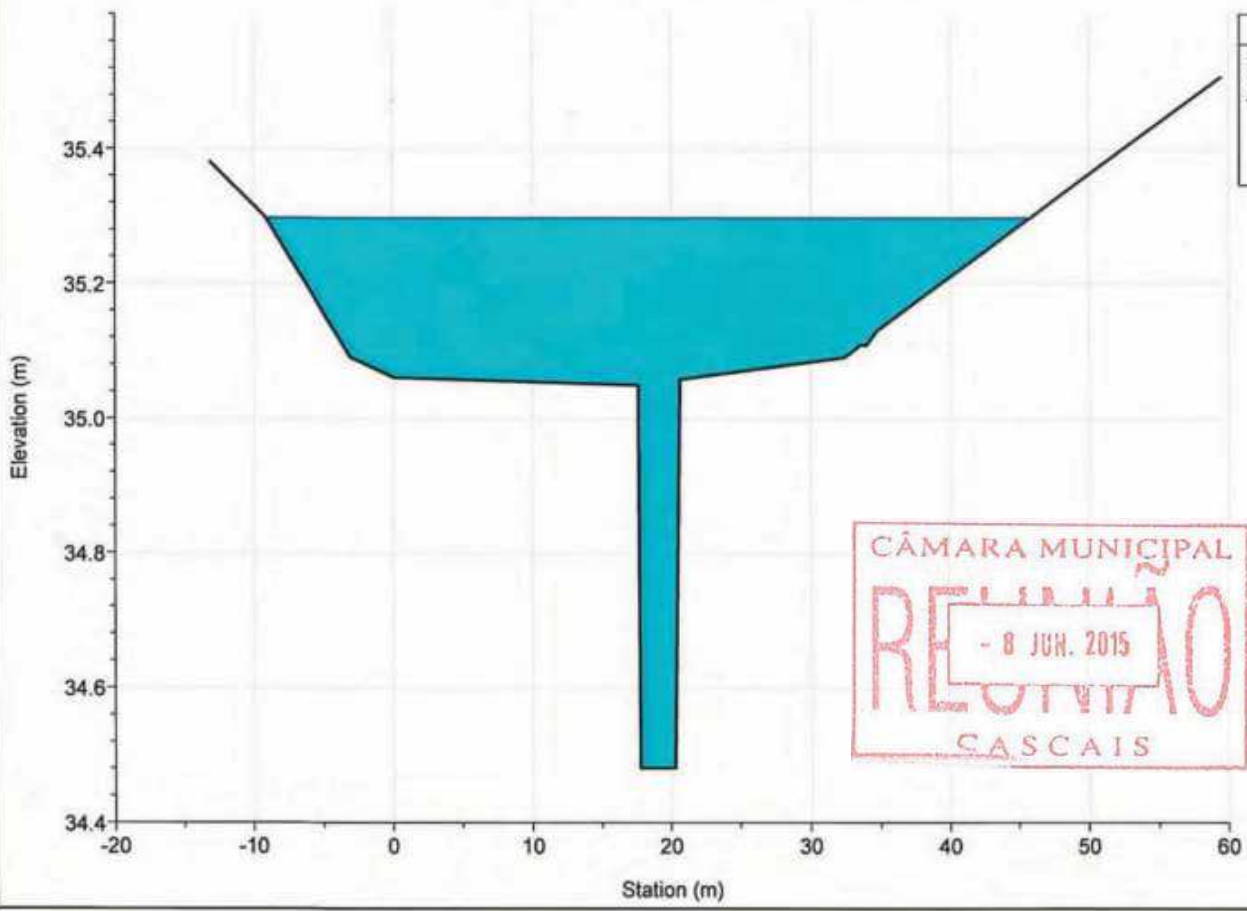
Legend
WS T=100 anos
Ground
Bank Sta



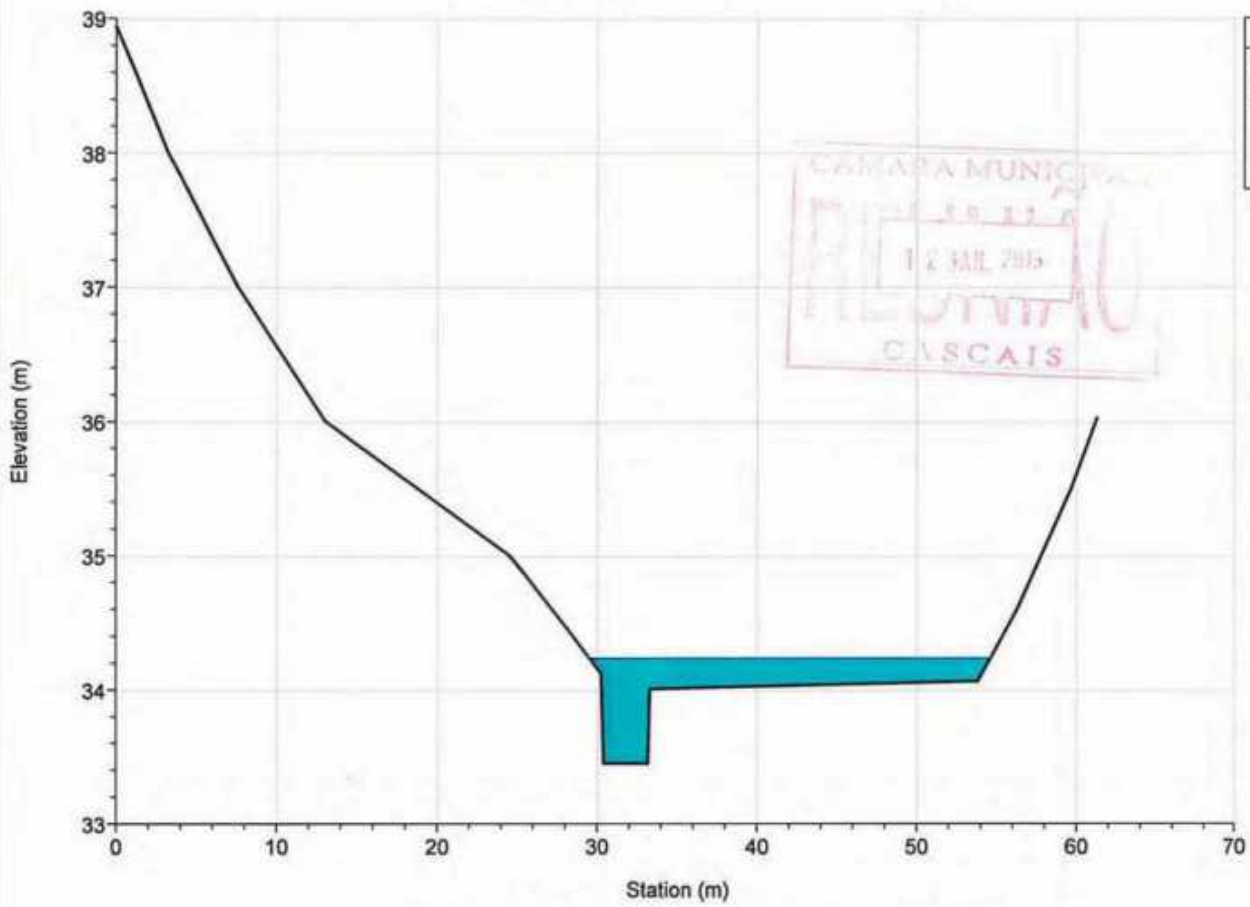
River = MD3 Reach = afluyente RS = 542.881



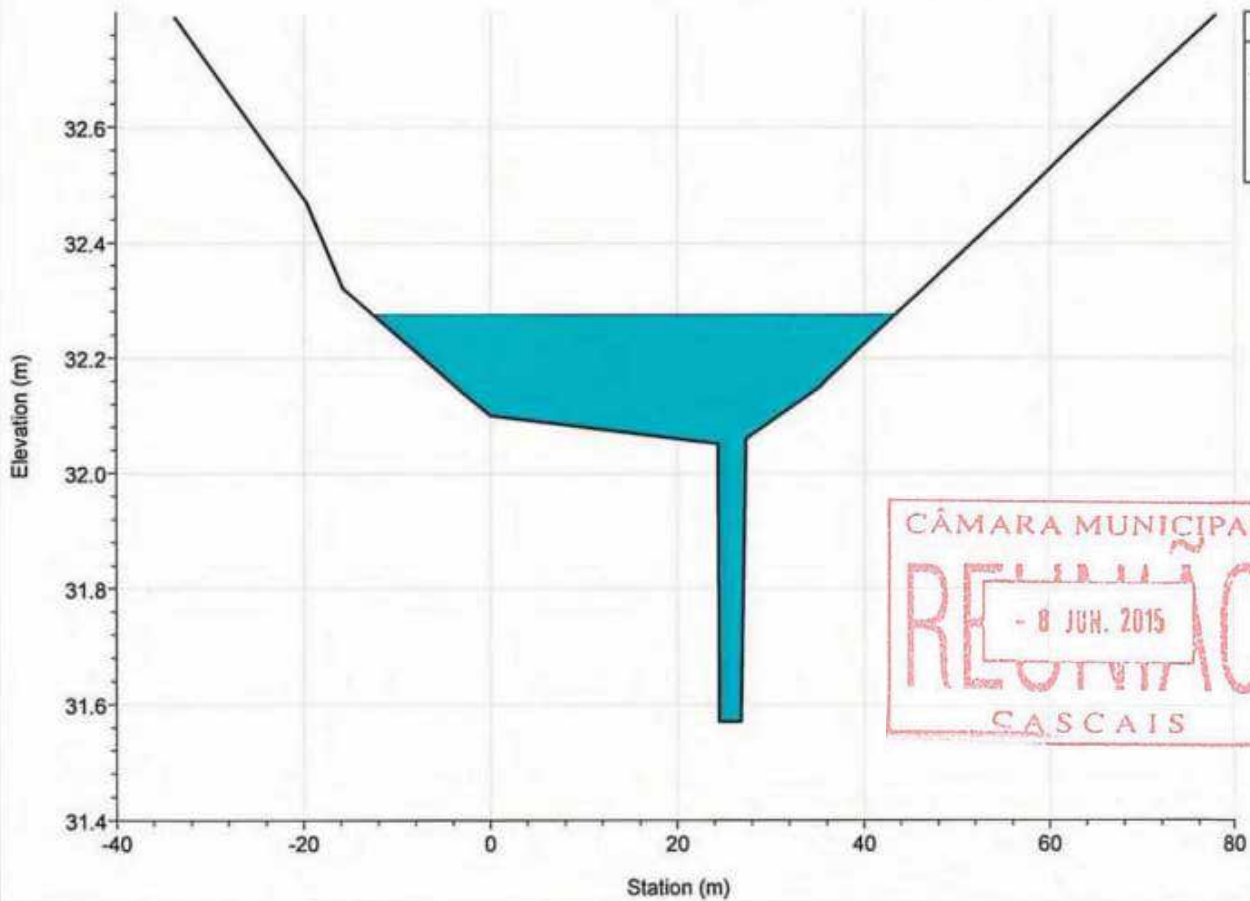
Legend
WS T=100 anos
Ground
Bank Sta



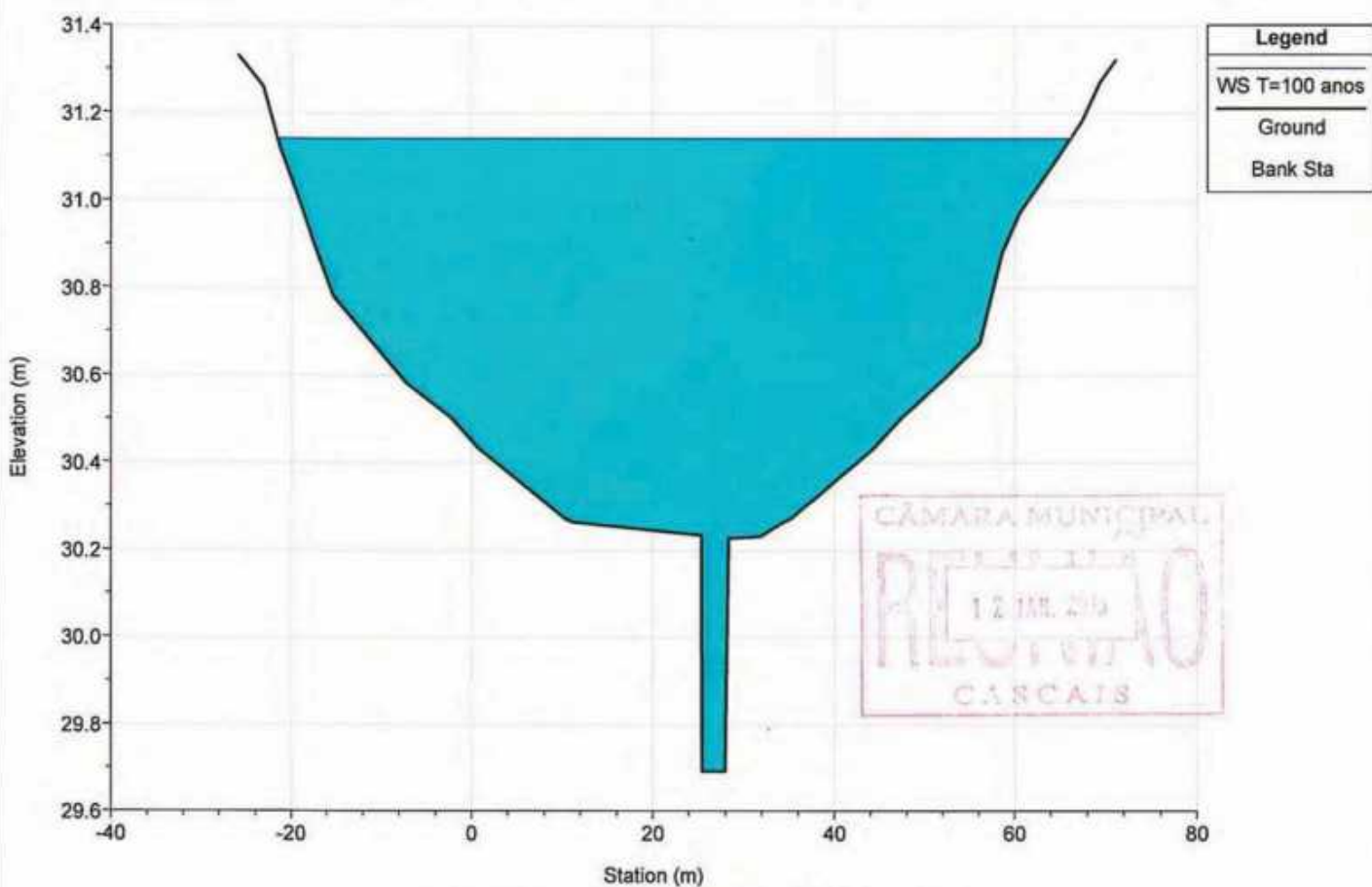
River = MD3 Reach = afluente RS = 379.387



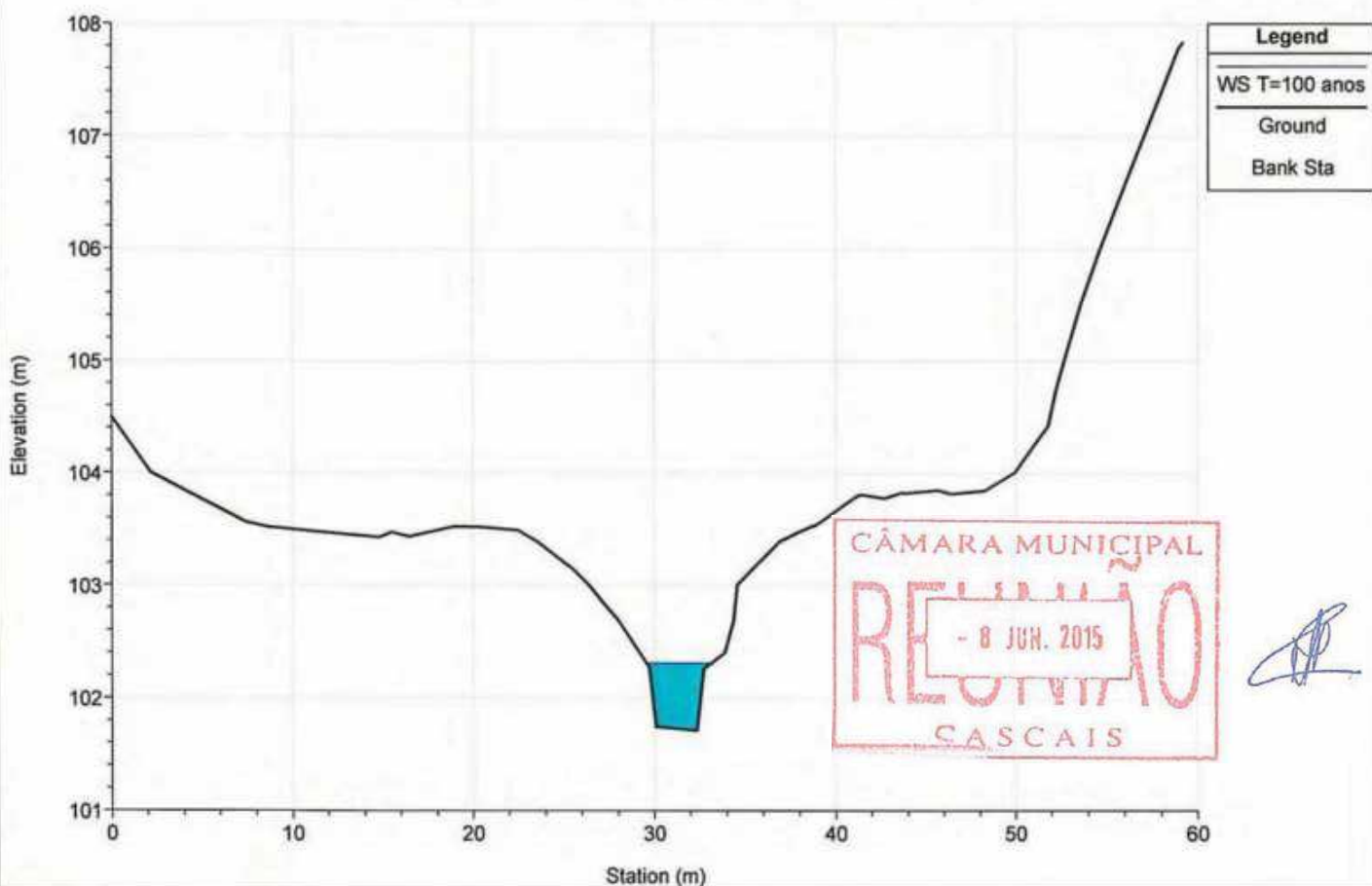
River = MD3 Reach = afluente RS = 220.725



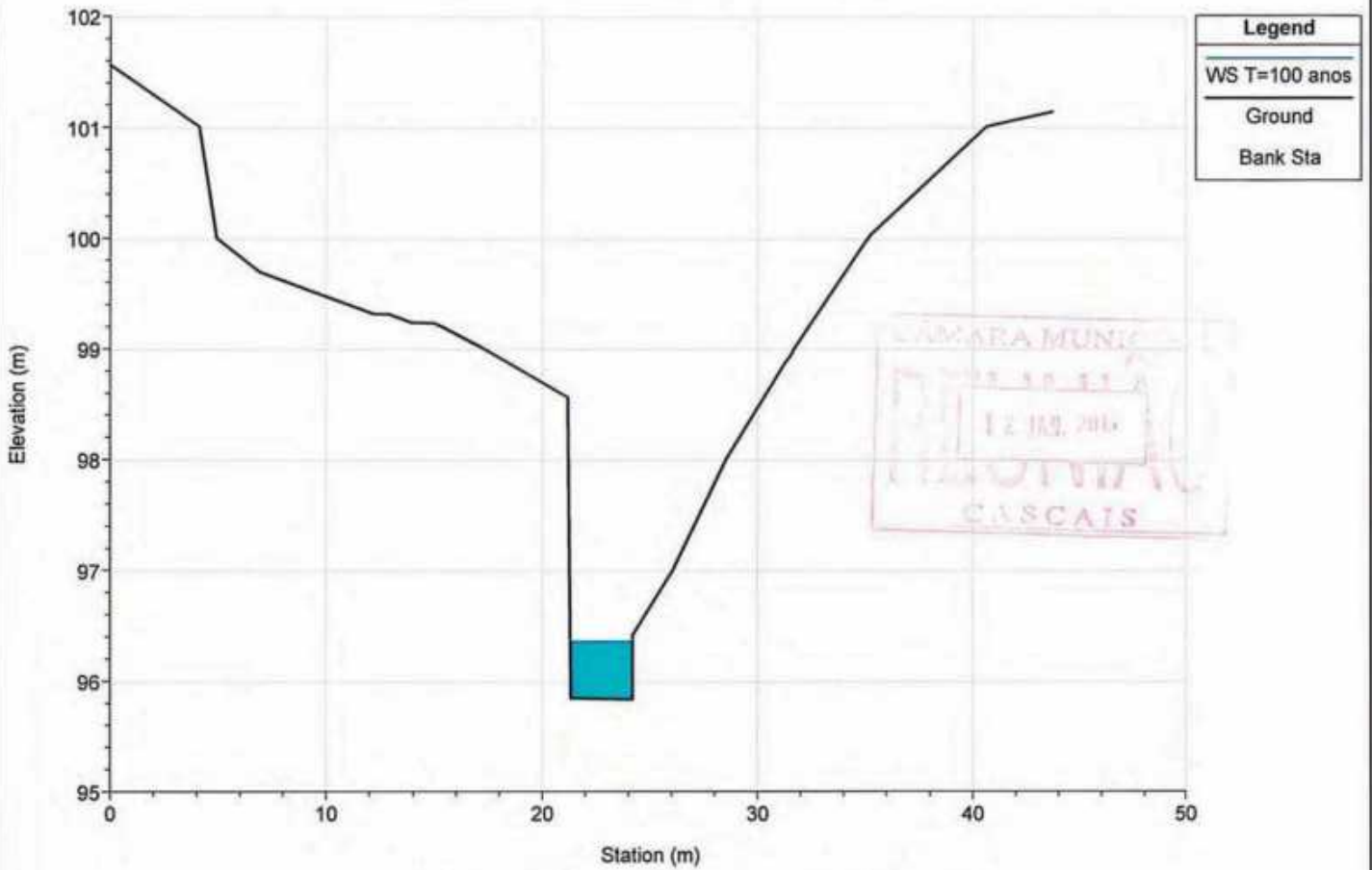
River = MD3 Reach = afluyente RS = 28.231



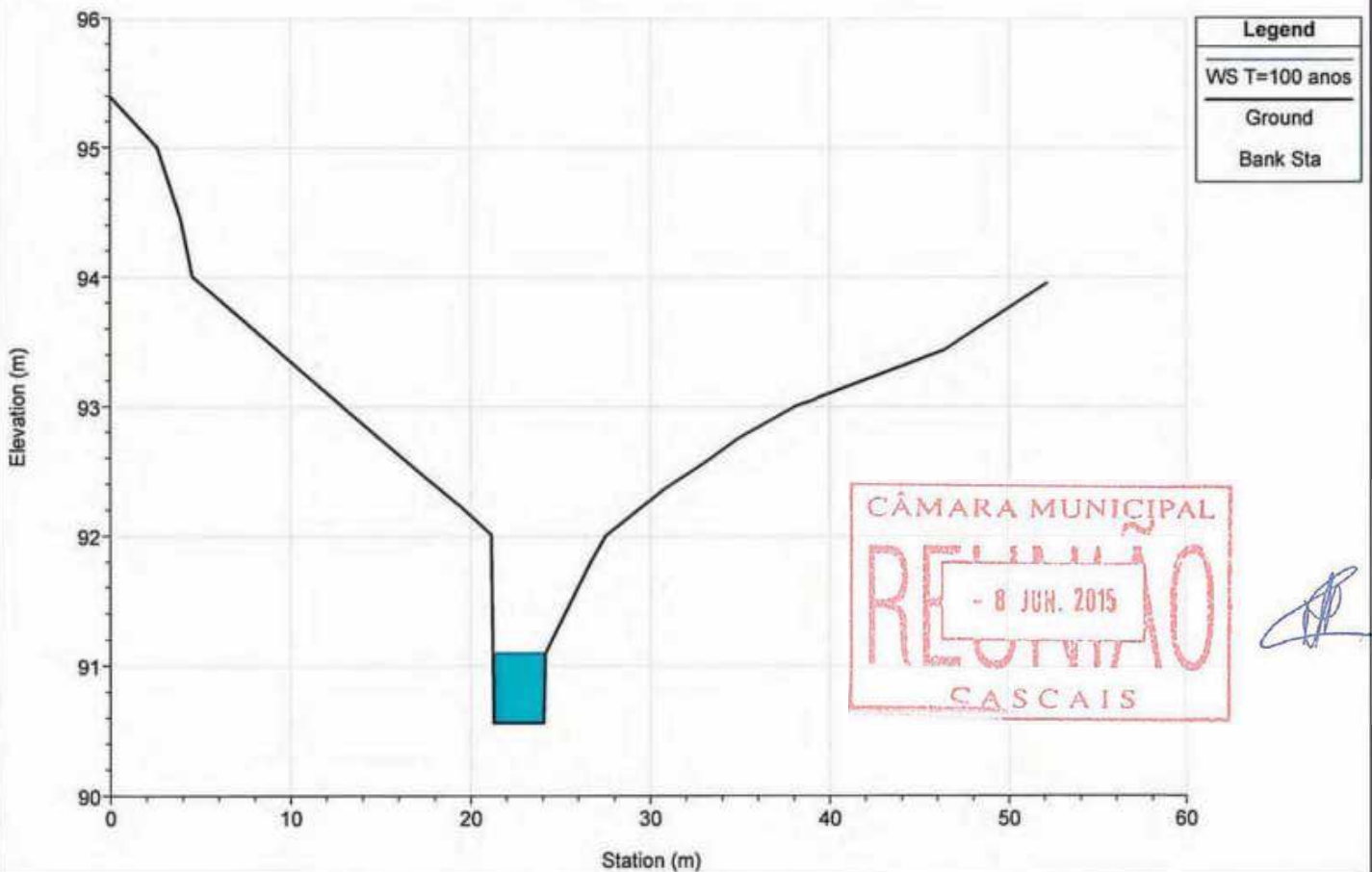
River = ME1 Reach = afluyente RS = 310.481

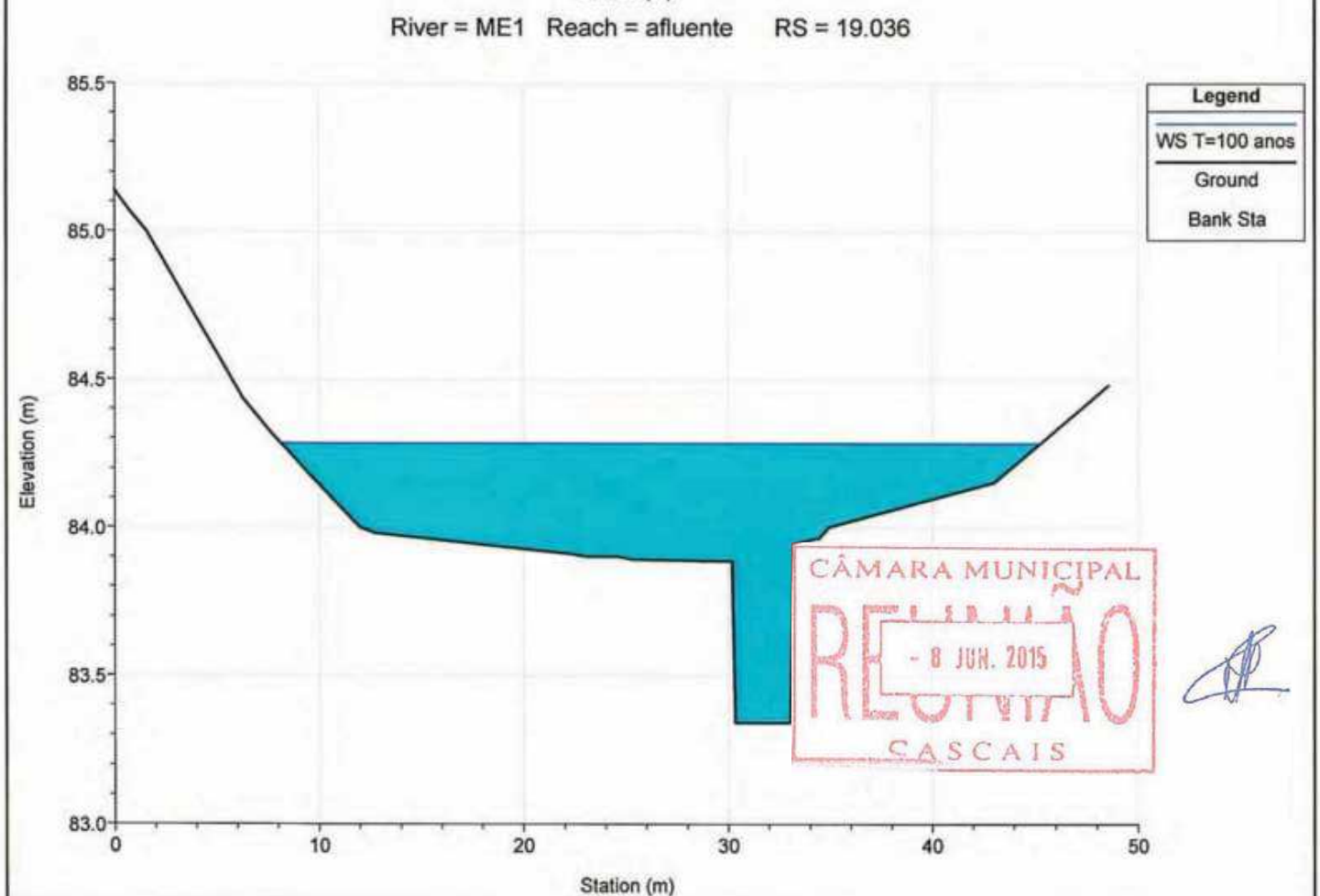
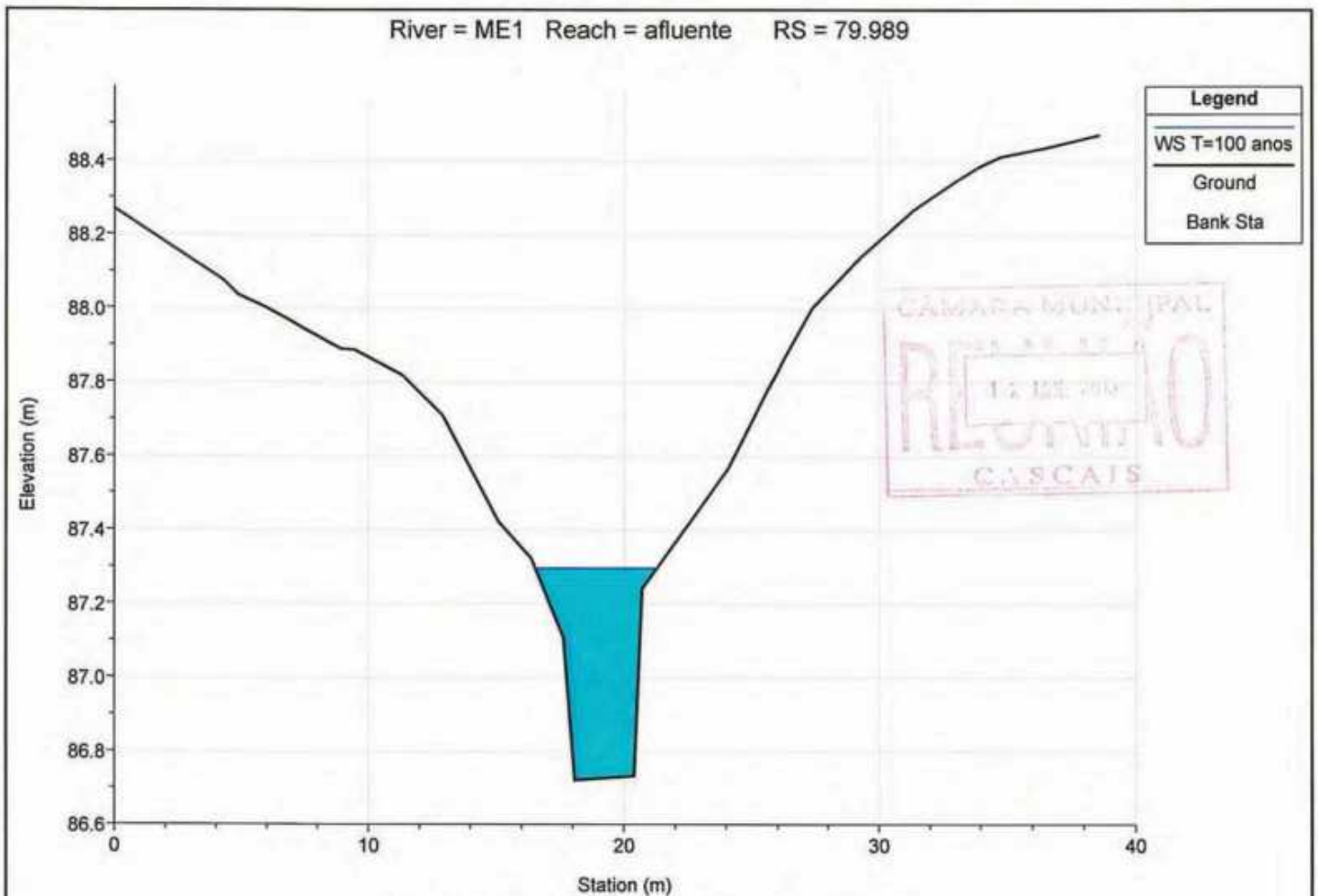


River = ME1 Reach = afluyente RS = 236.300

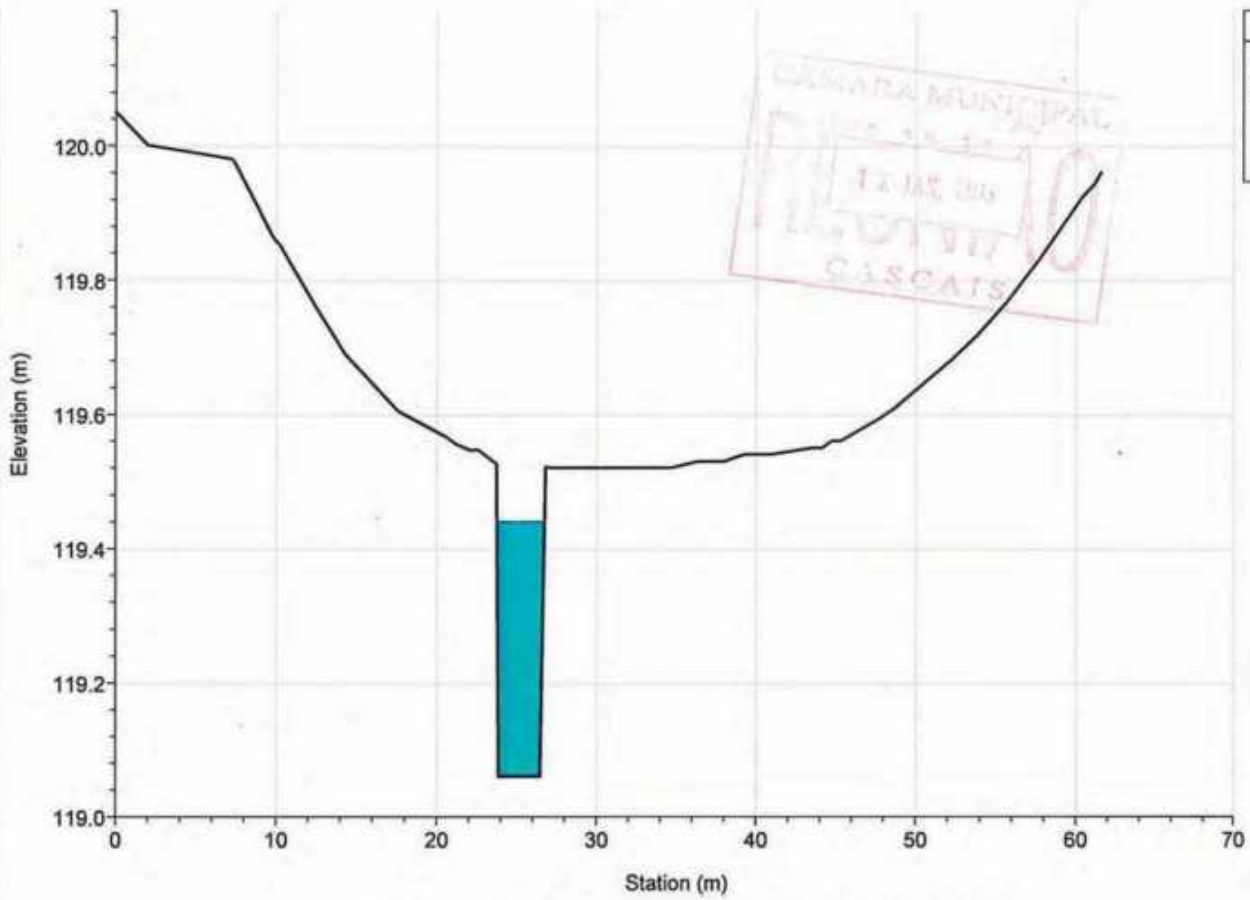


River = ME1 Reach = afluyente RS = 156.255

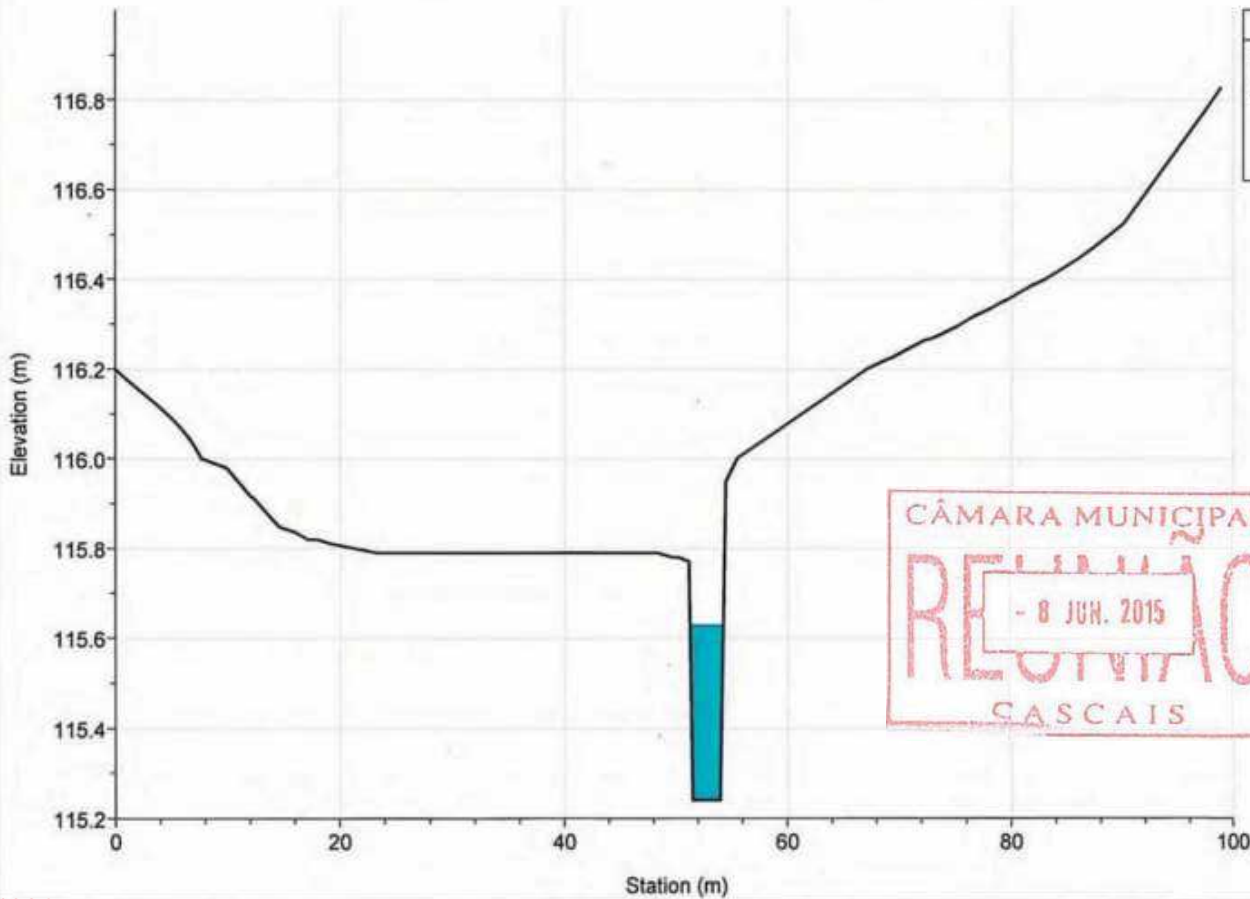


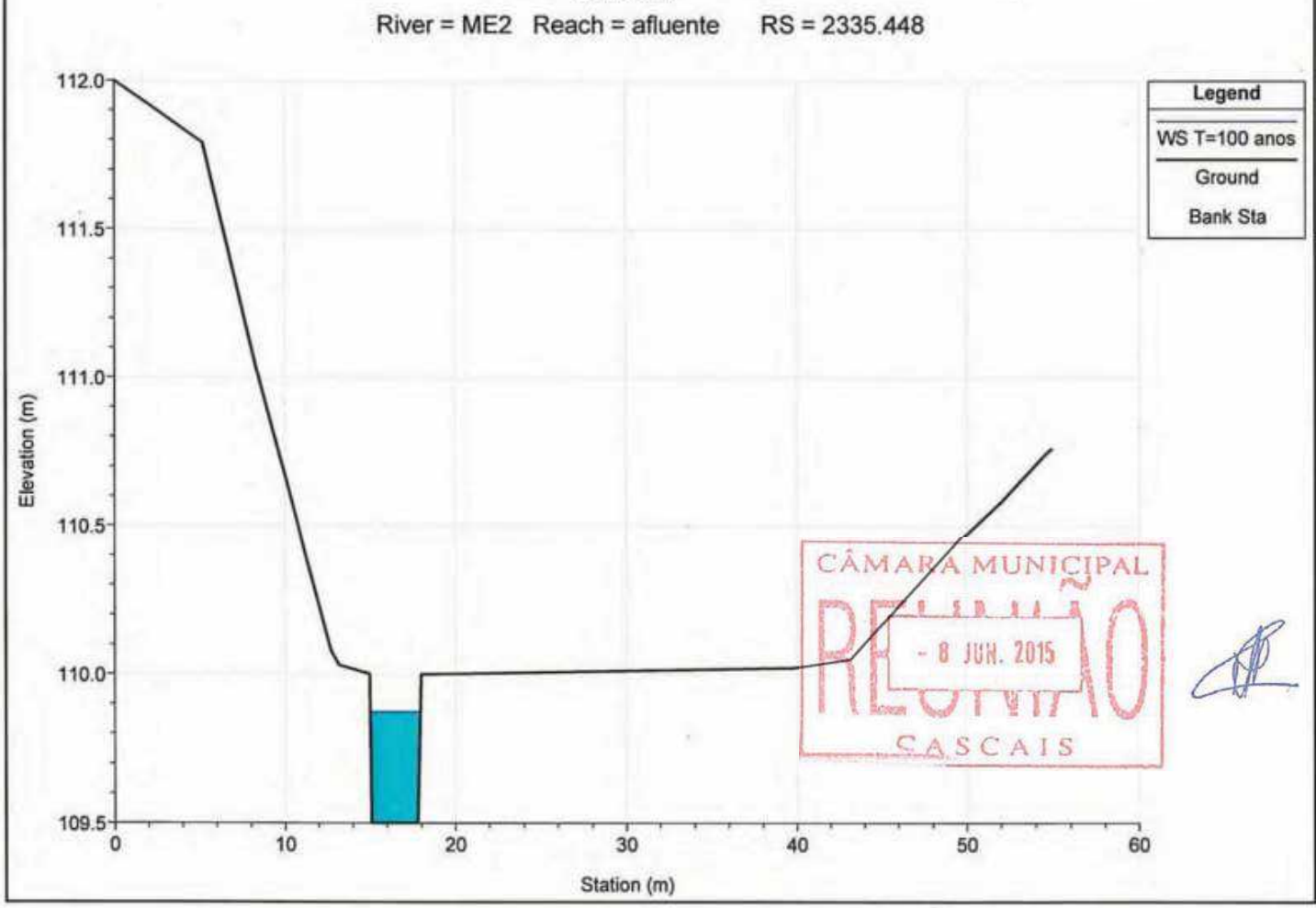
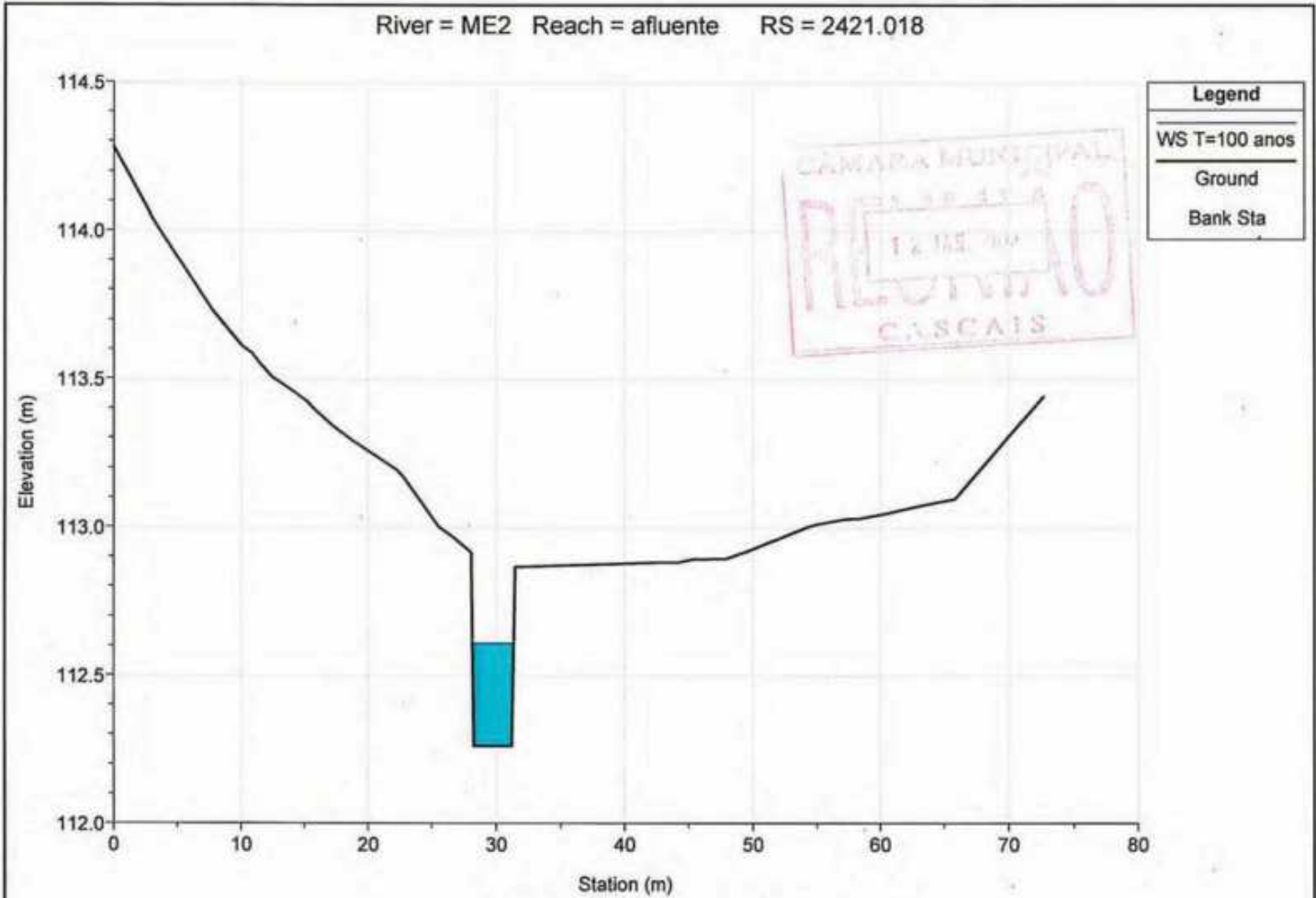


River = ME2 Reach = afluyente RS = 2665.903



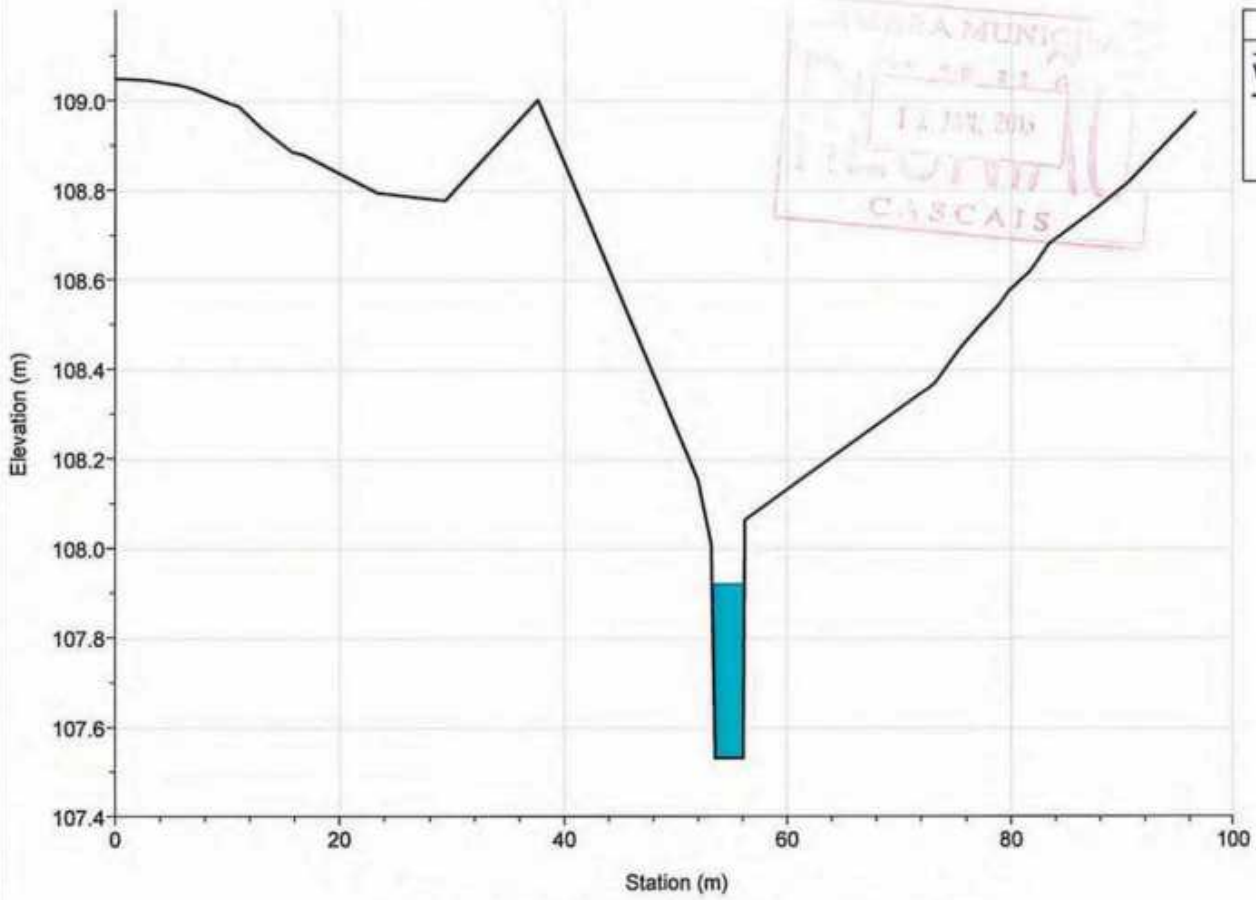
River = ME2 Reach = afluyente RS = 2541.450



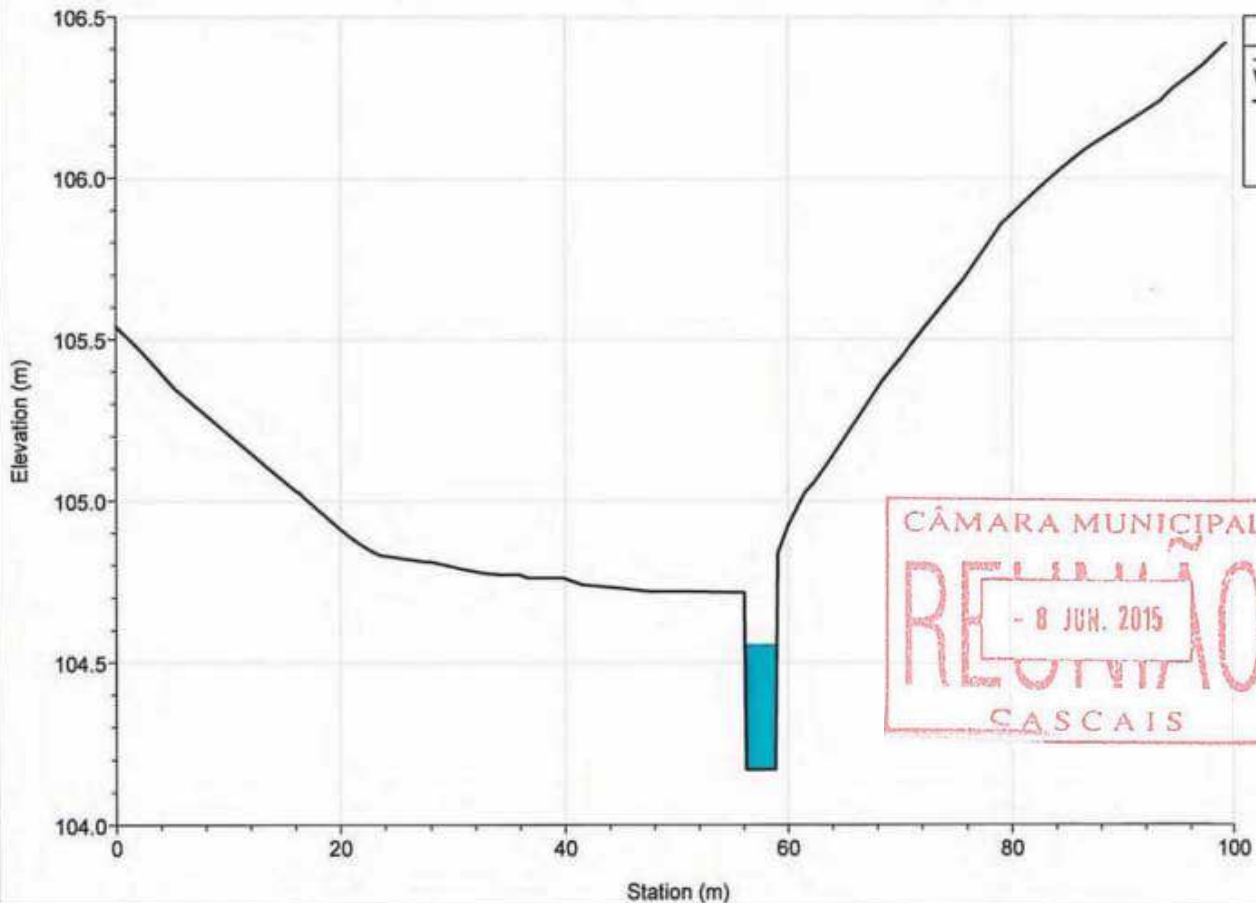




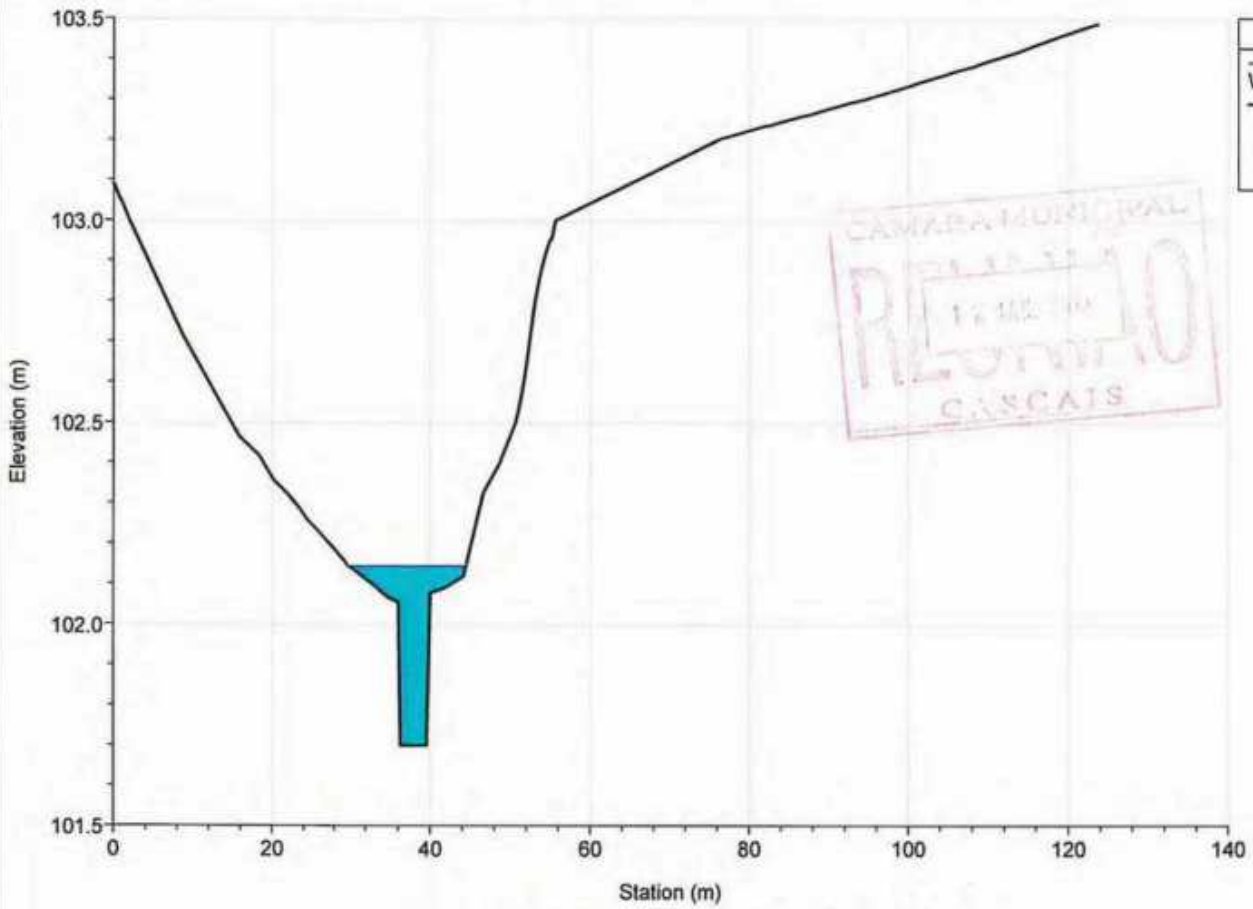
River = ME2 Reach = afluyente RS = 2267.206



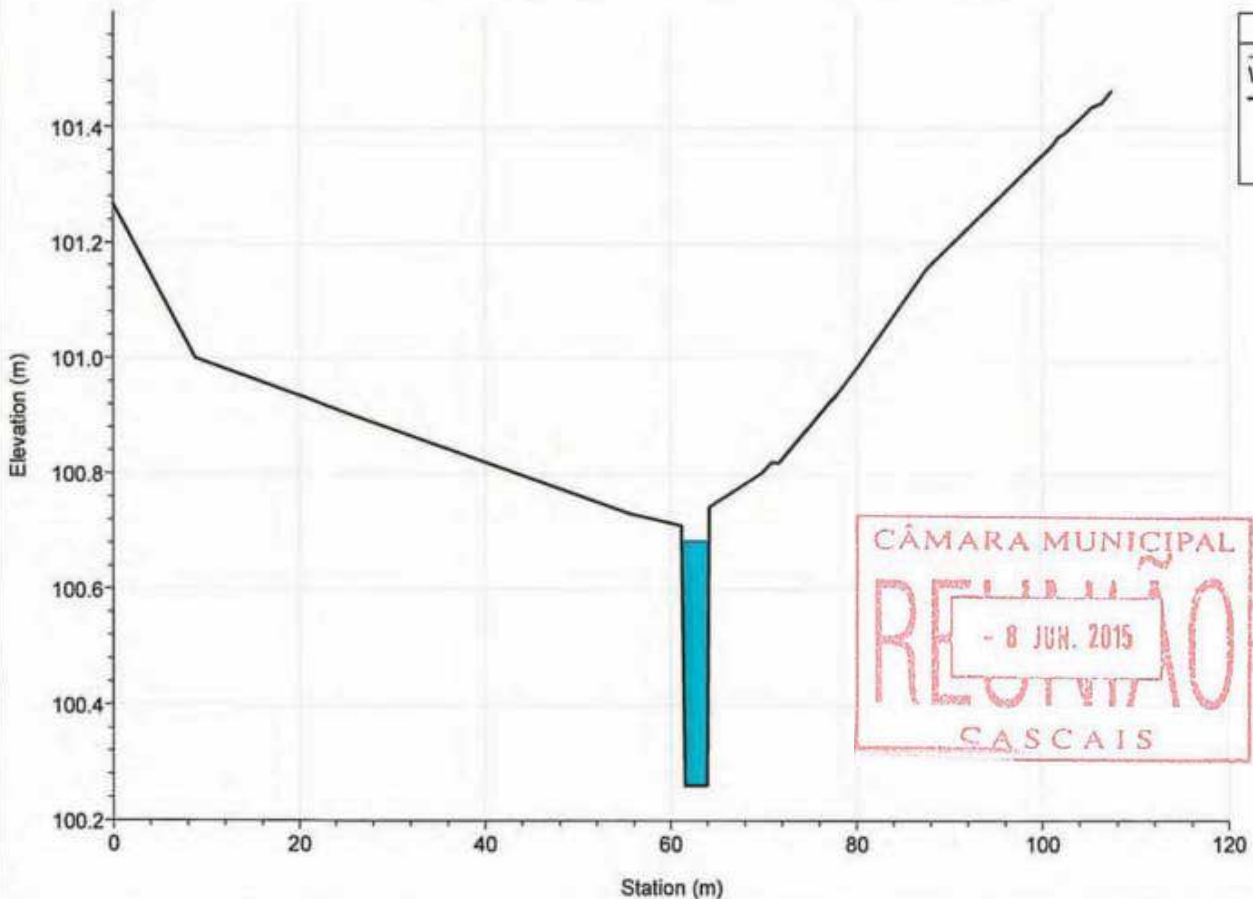
River = ME2 Reach = afluyente RS = 2139.841



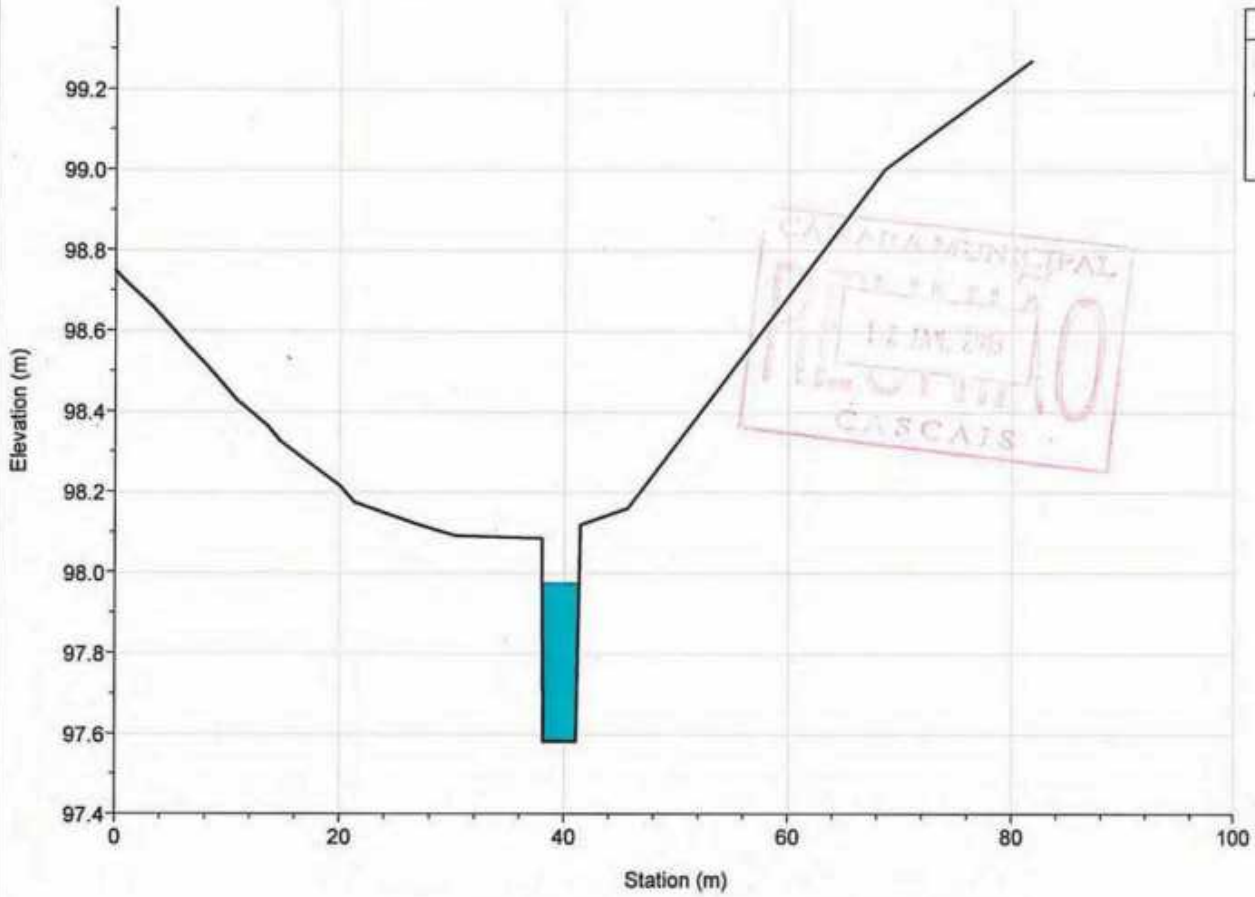
River = ME2 Reach = afluente RS = 1996.830



River = ME2 Reach = afluente RS = 1848.639

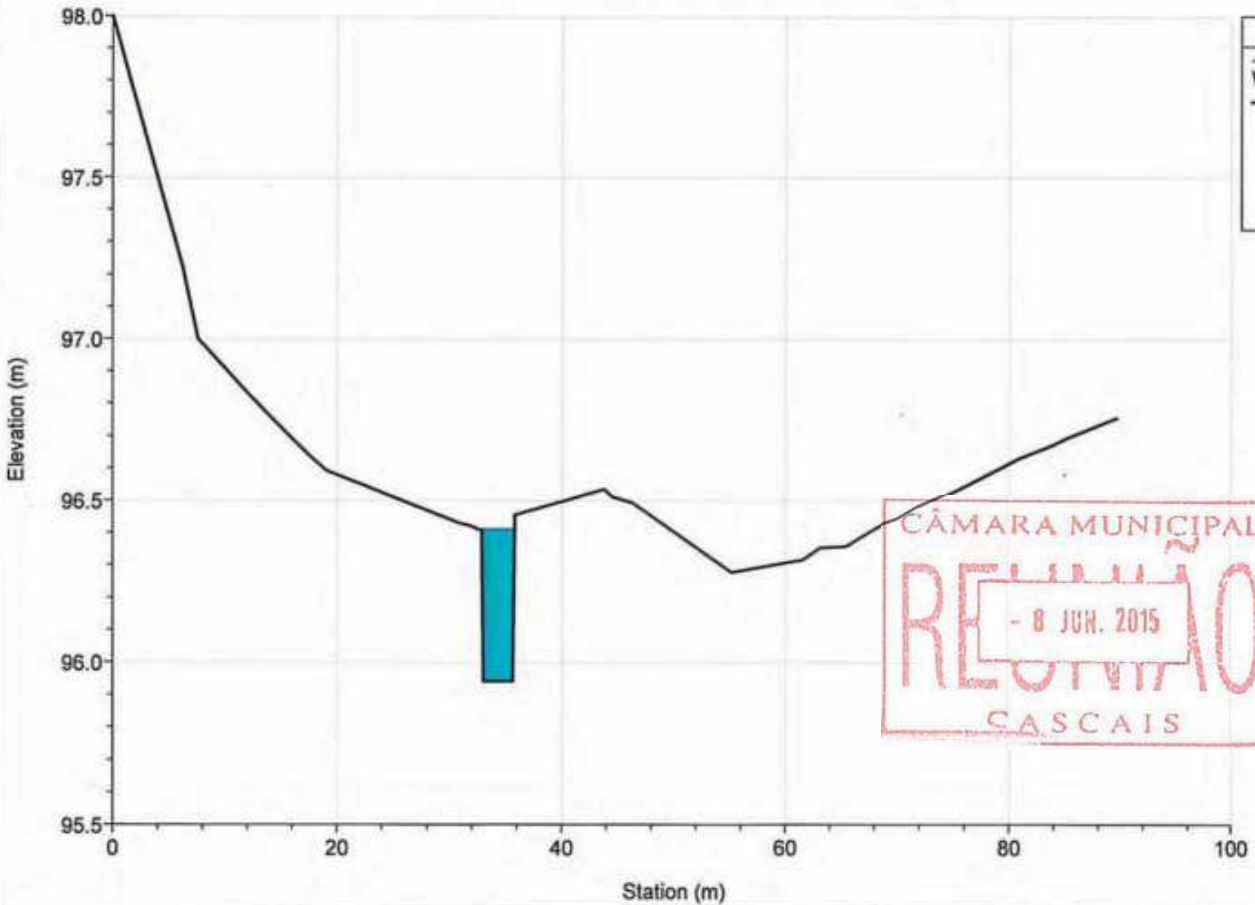


River = ME2 Reach = afluente RS = 1675.596



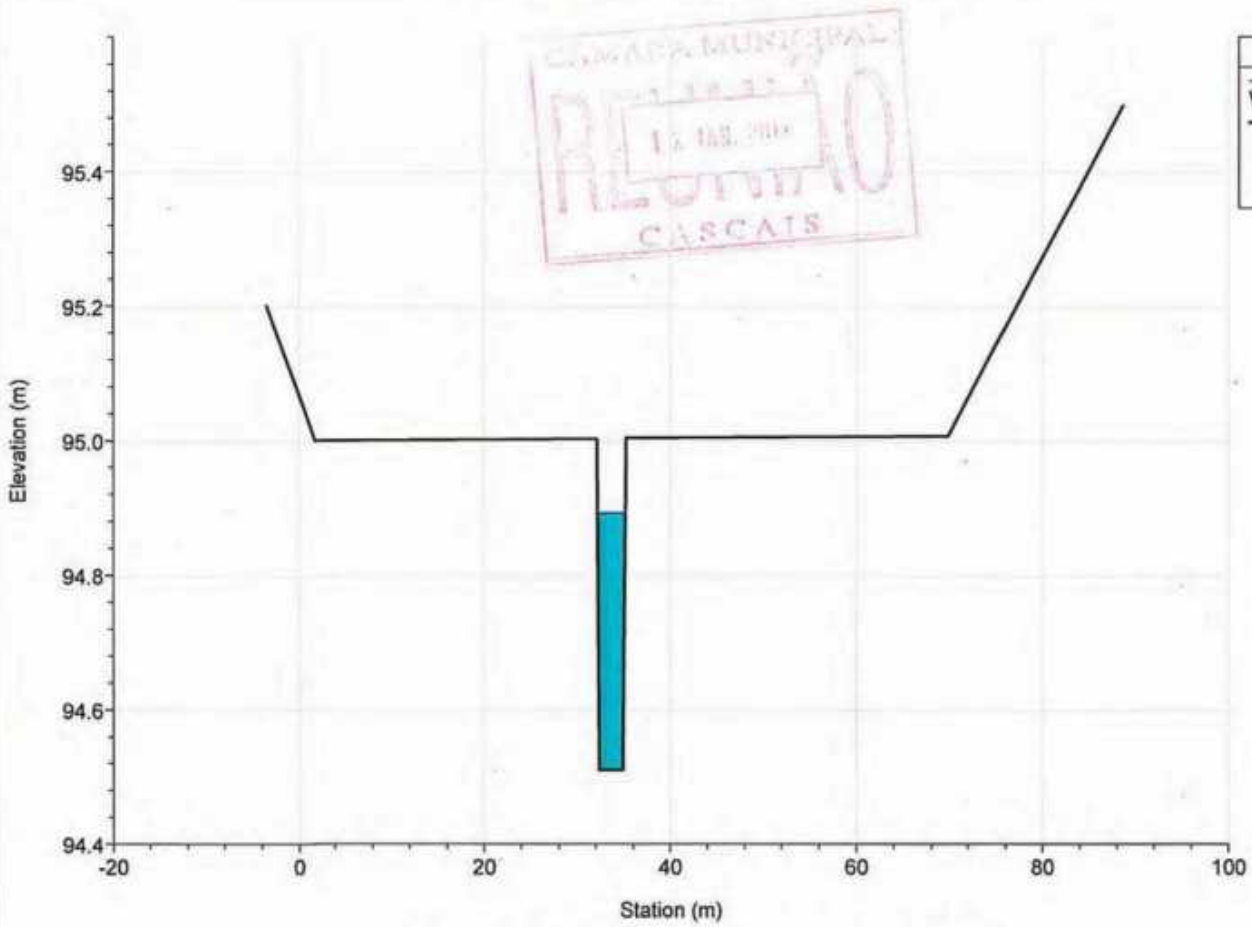
Legend
WS T=100 anos
Ground
Bank Sta

River = ME2 Reach = afluente RS = 1547.457



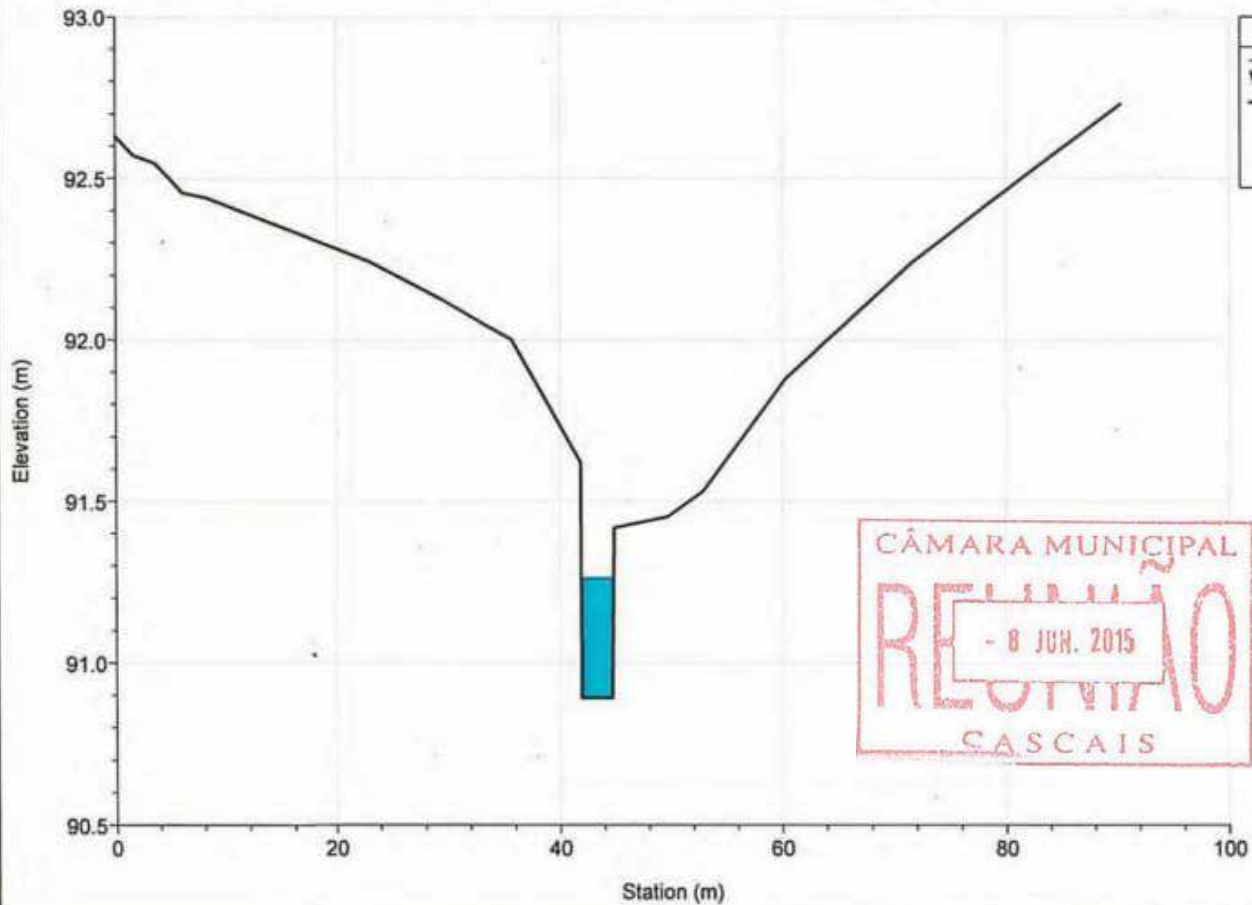
Legend
WS T=100 anos
Ground
Levee
Bank Sta

River = ME2 Reach = afluyente RS = 1445.231



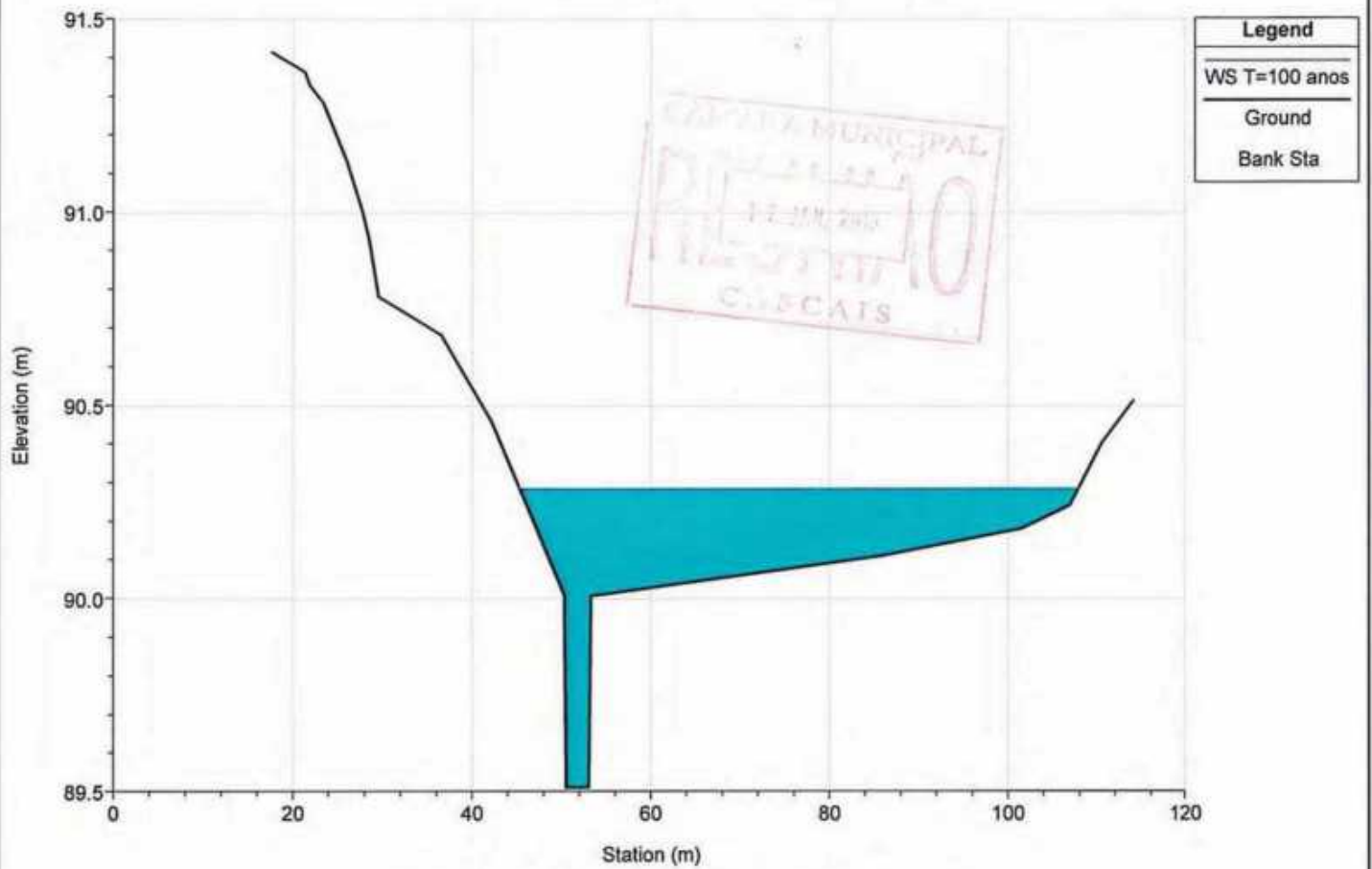
Legend
WS T=100 anos
Ground
Bank Sta

River = ME2 Reach = afluyente RS = 1290.688

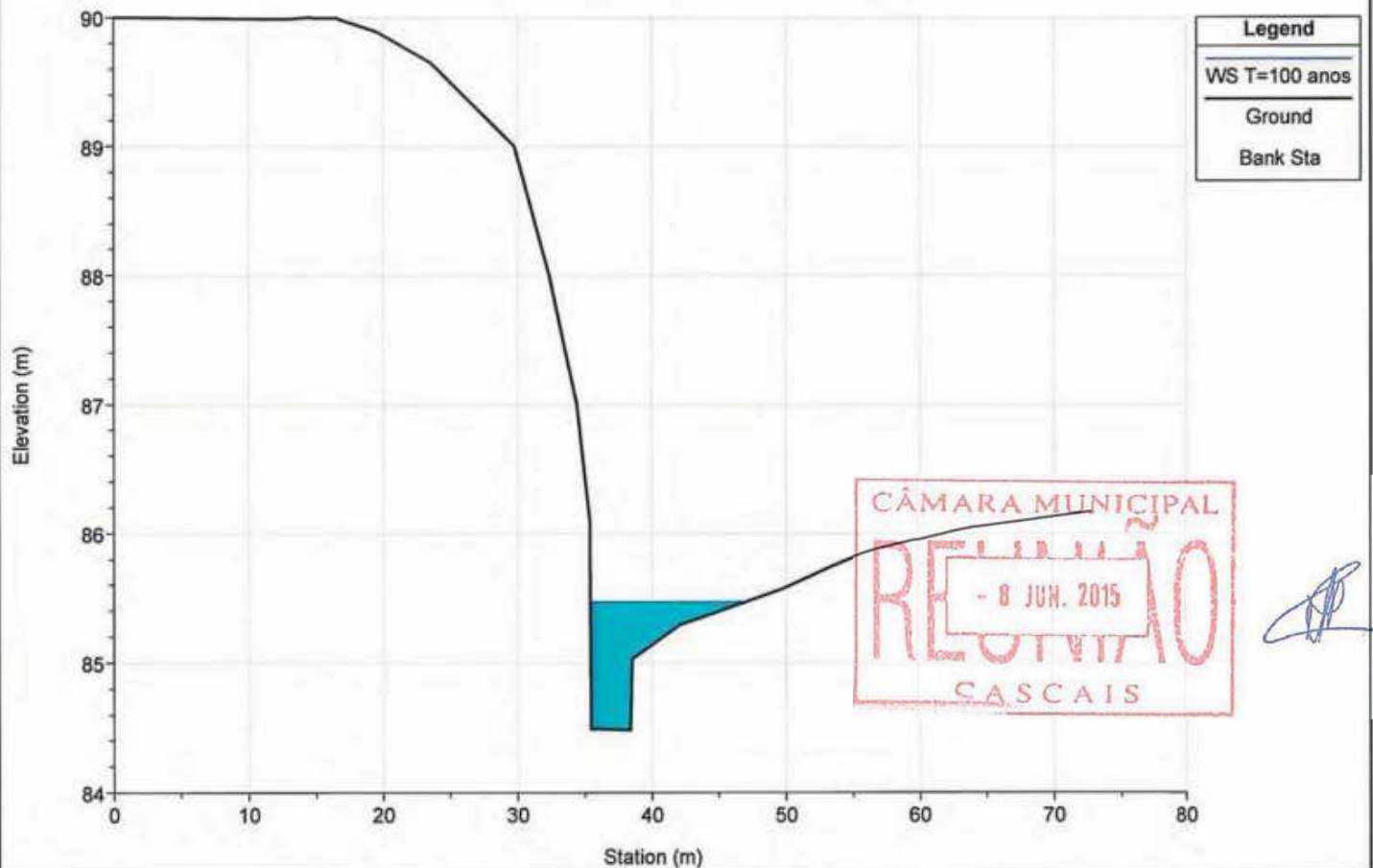


Legend
WS T=100 anos
Ground
Bank Sta

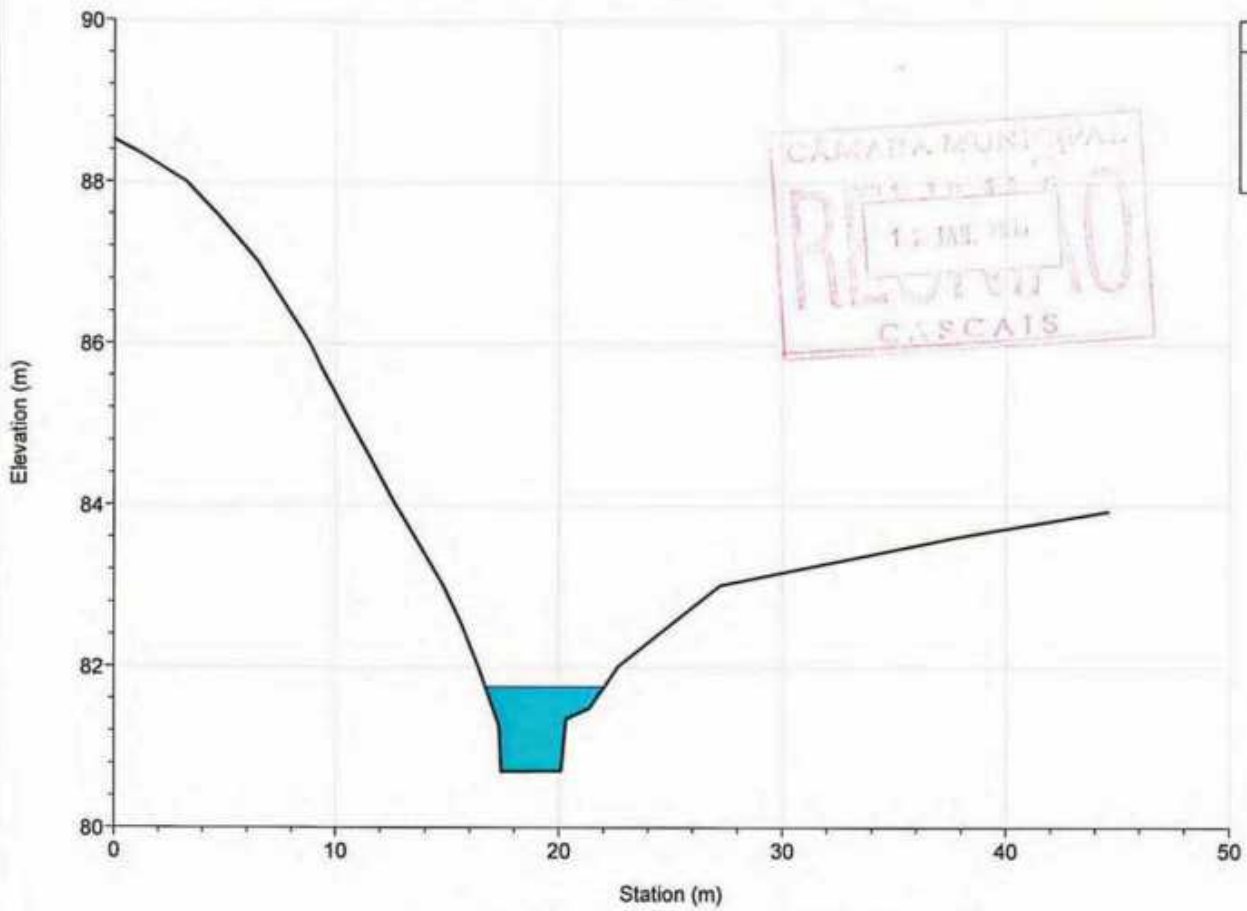
River = ME2 Reach = afluente RS = 1181.820



River = ME2 Reach = afluente RS = 1060.441

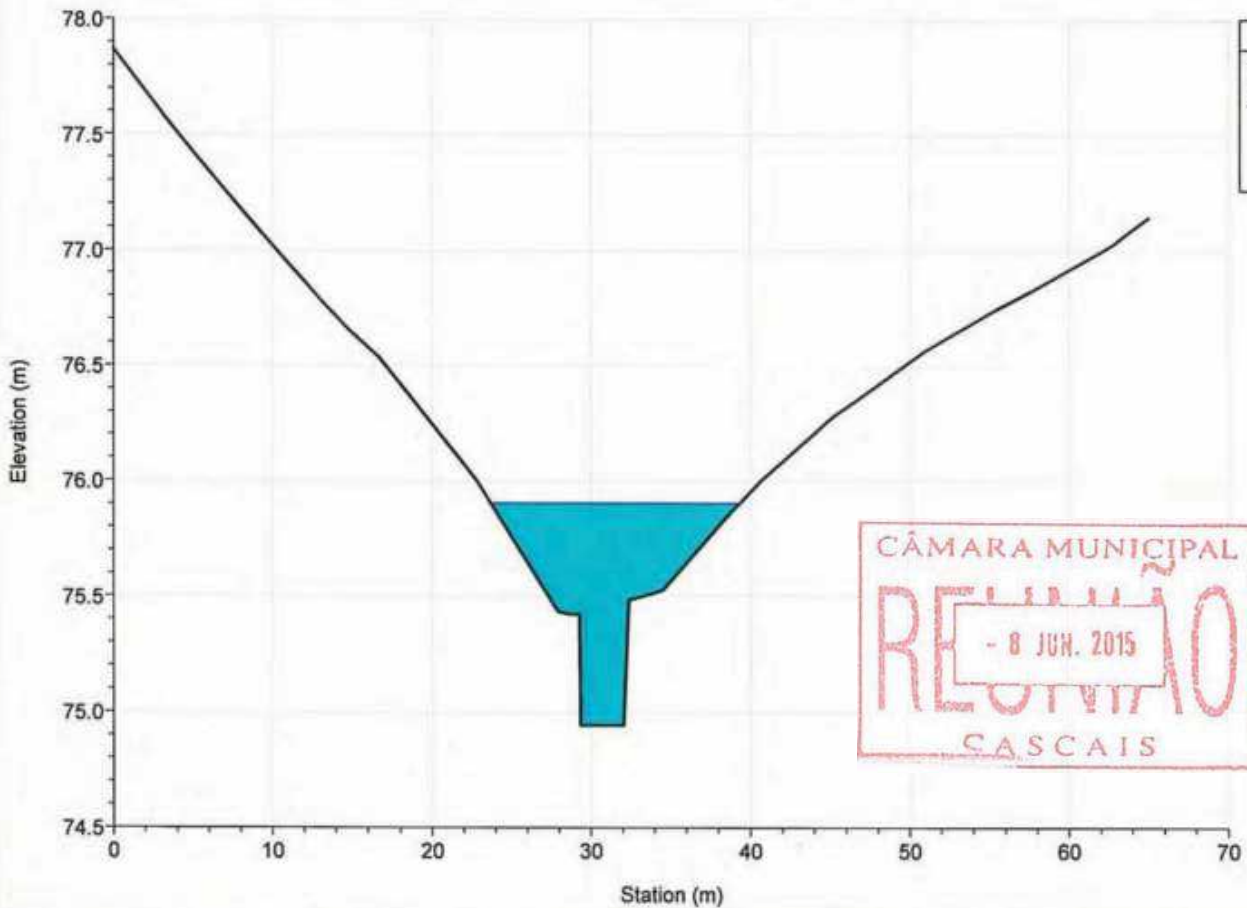


River = ME2 Reach = afluente RS = 948.138

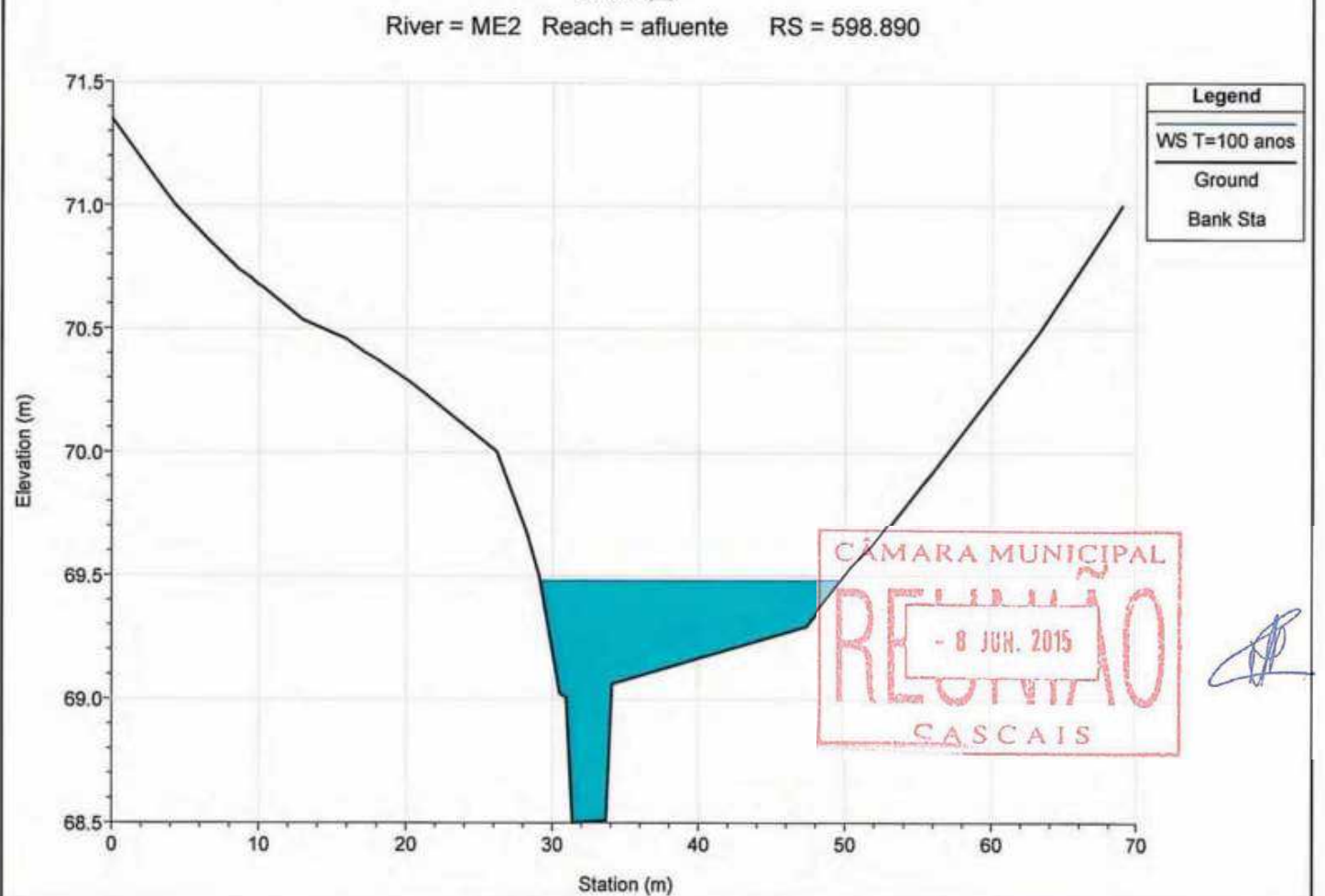
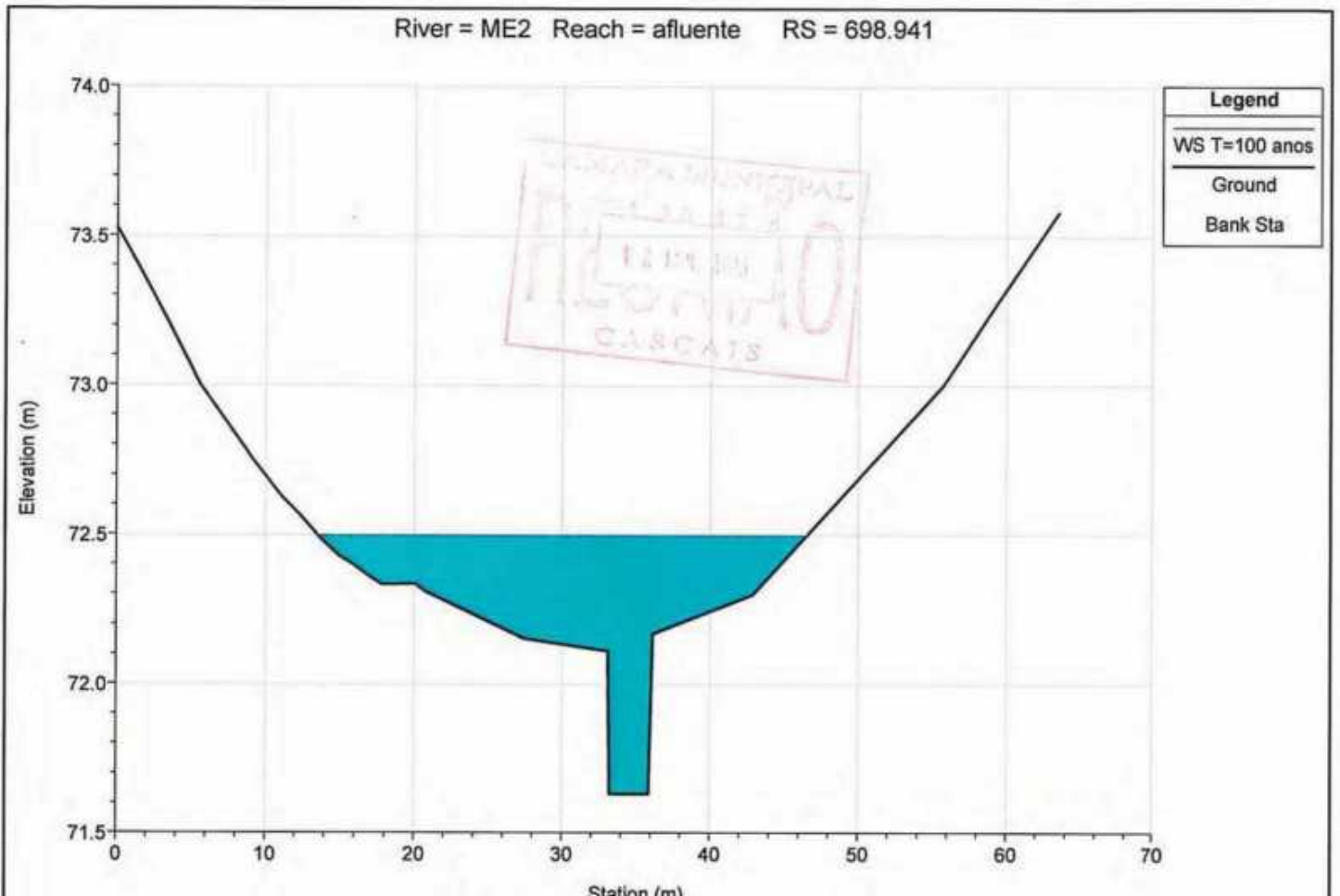


Legend
WS T=100 anos
Ground
Bank Sta

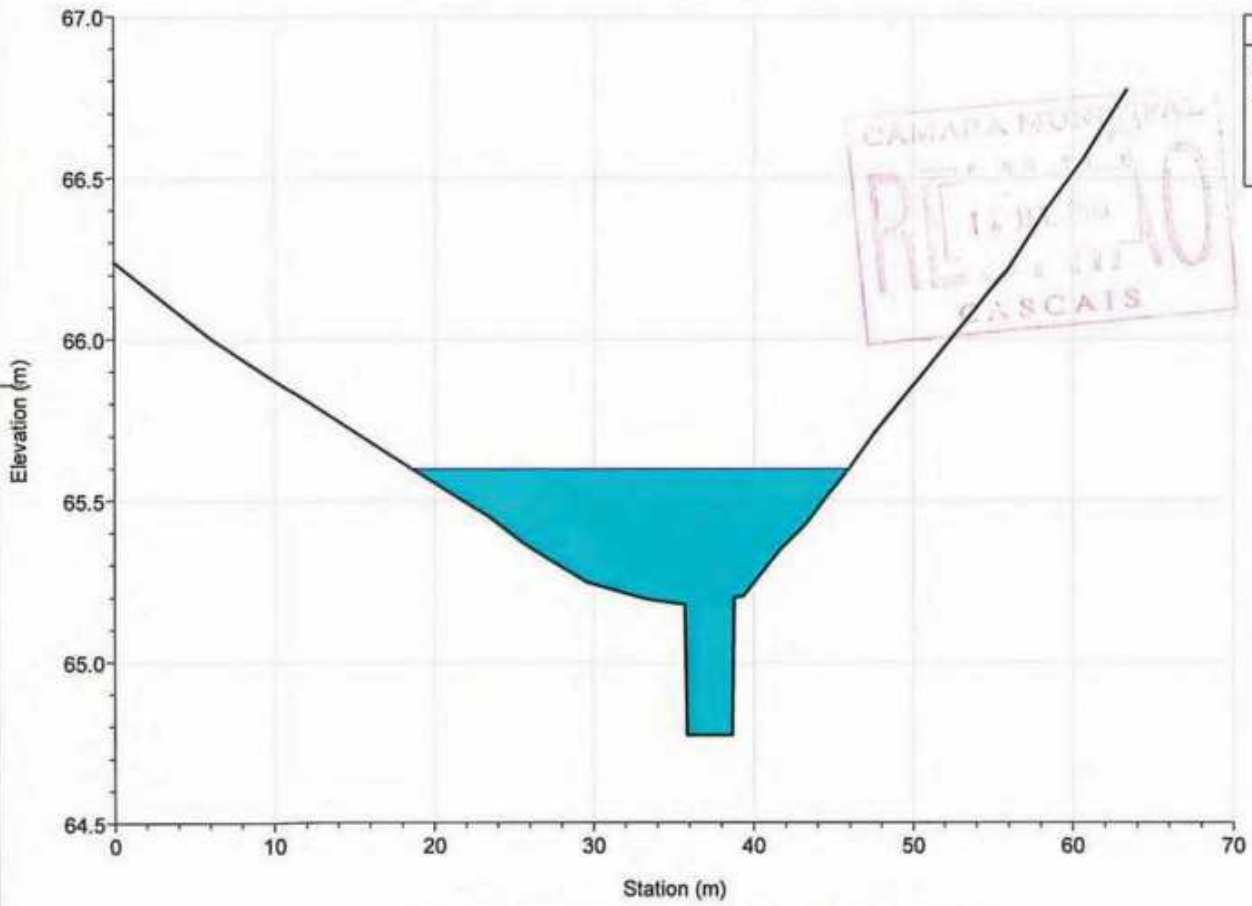
River = ME2 Reach = afluente RS = 828.495



Legend
WS T=100 anos
Ground
Bank Sta

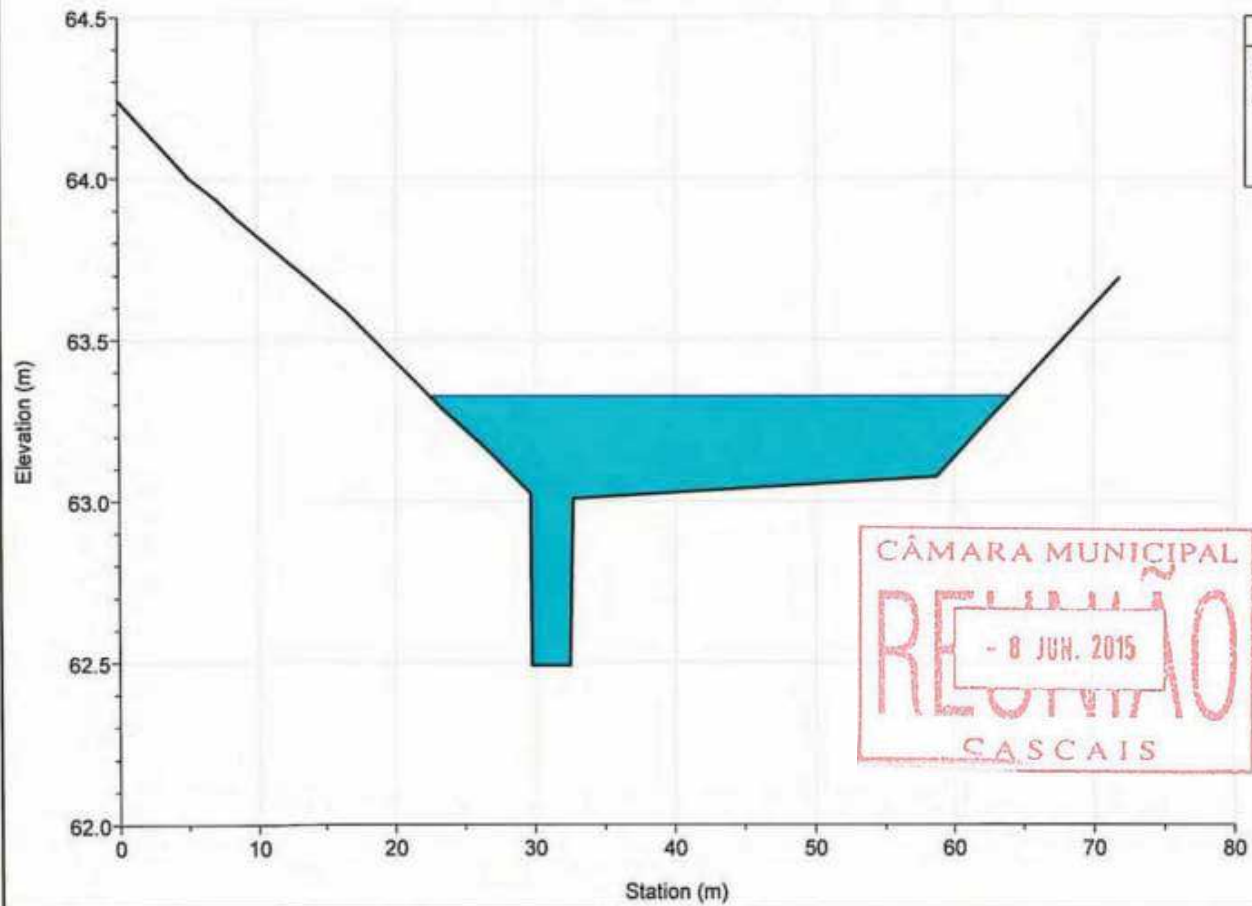


River = ME2 Reach = afluente RS = 482.650



Legend
WS T=100 anos
Ground
Bank Sta

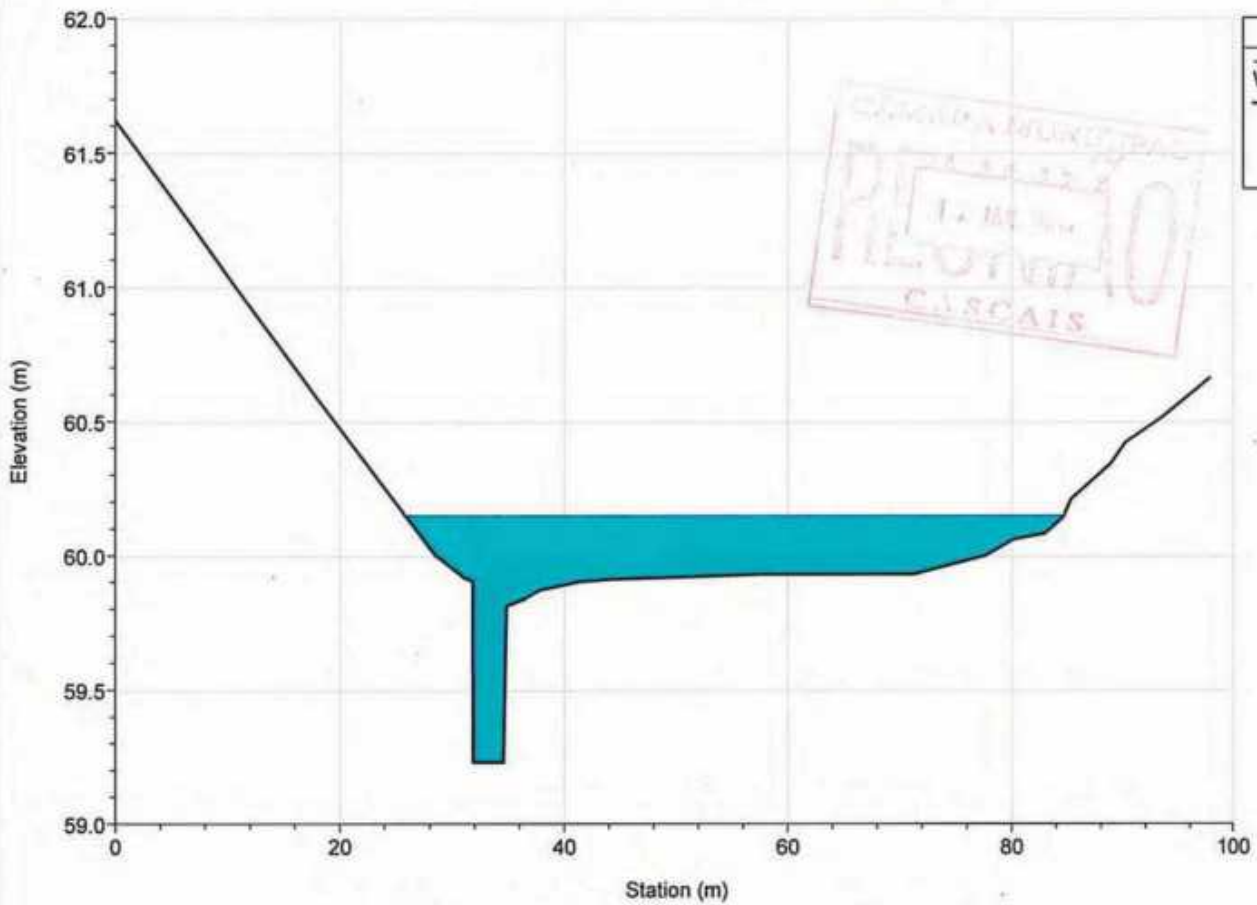
River = ME2 Reach = afluente RS = 384.053



Legend
WS T=100 anos
Ground
Bank Sta

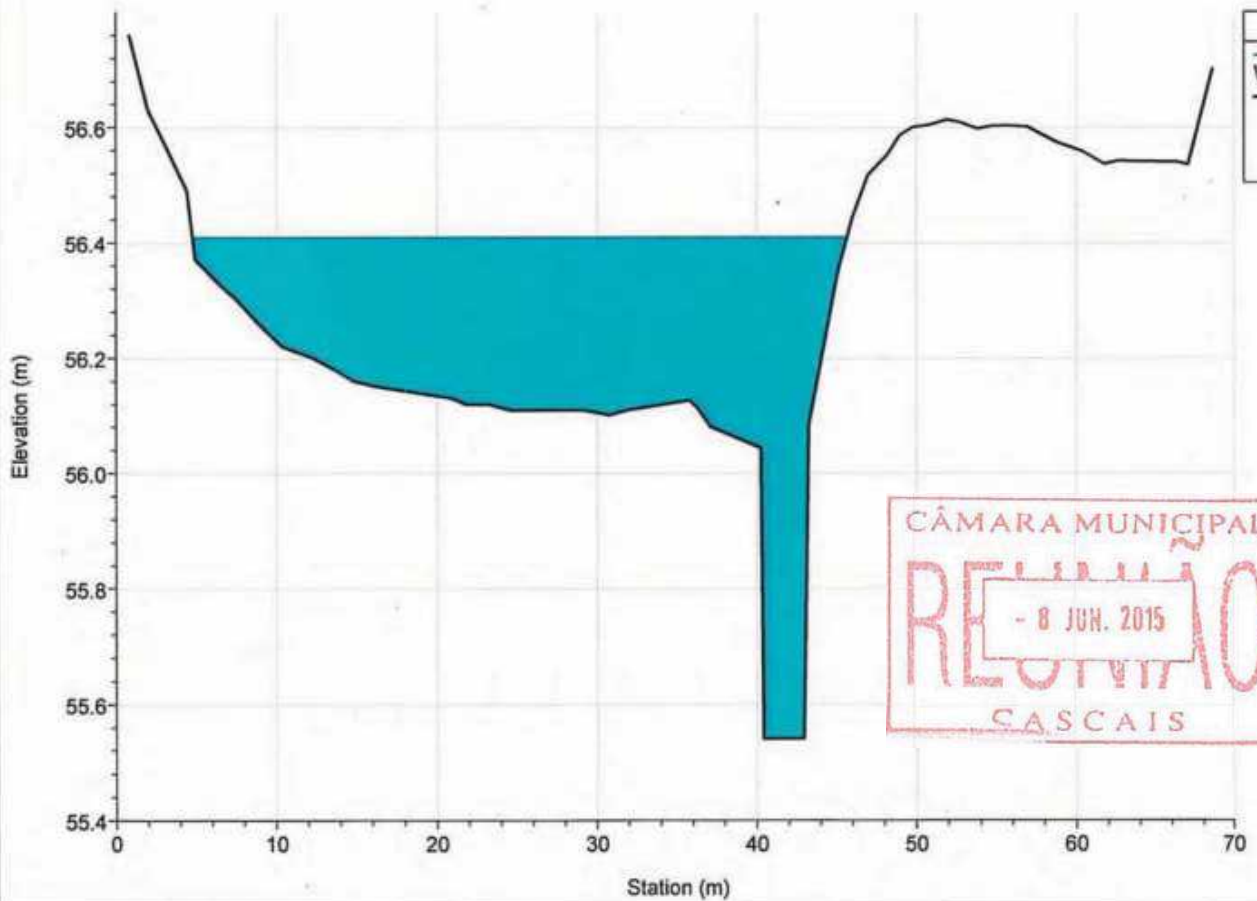


River = ME2 Reach = afluente RS = 268.561



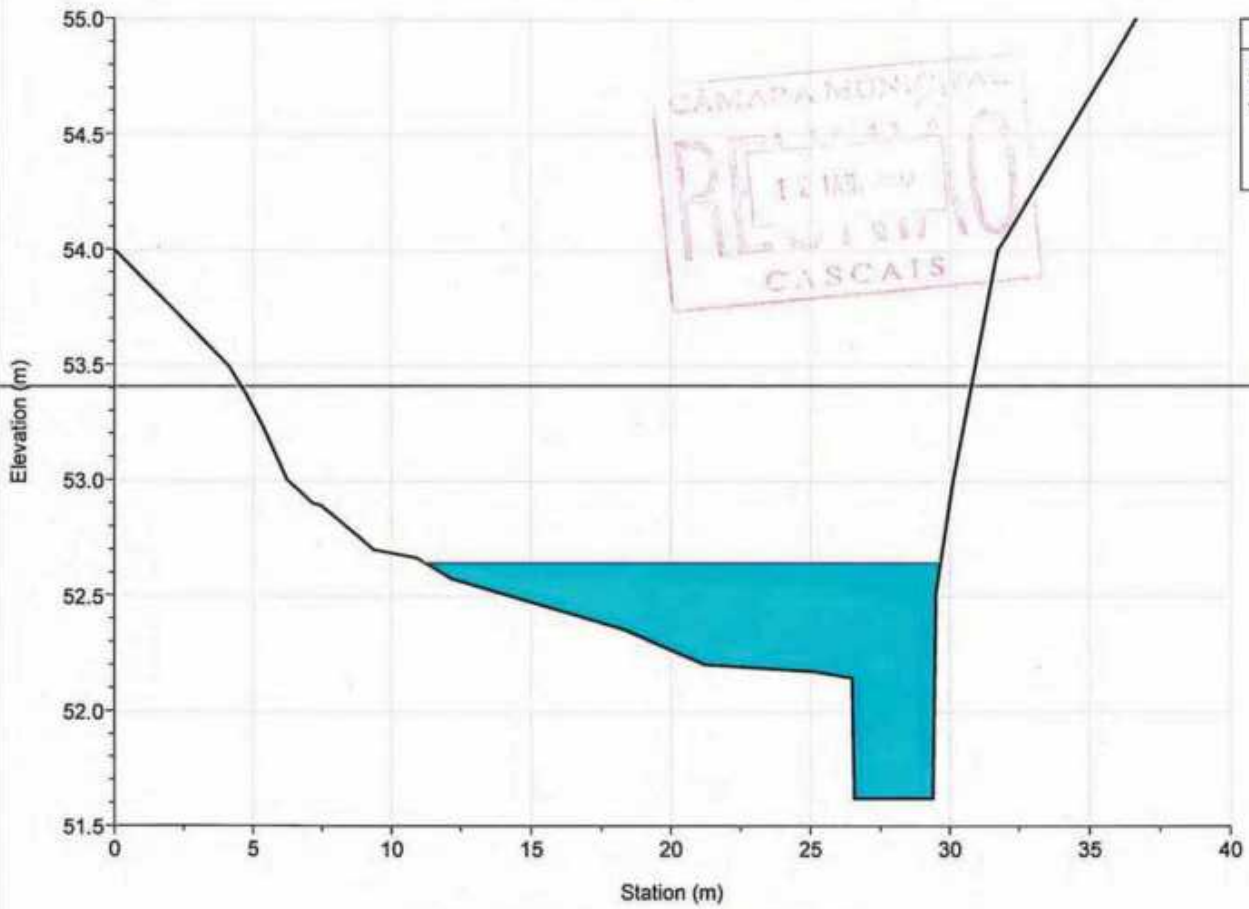
Legend
WS T=100 anos
Ground
Bank Sta

River = ME2 Reach = afluente RS = 173.045

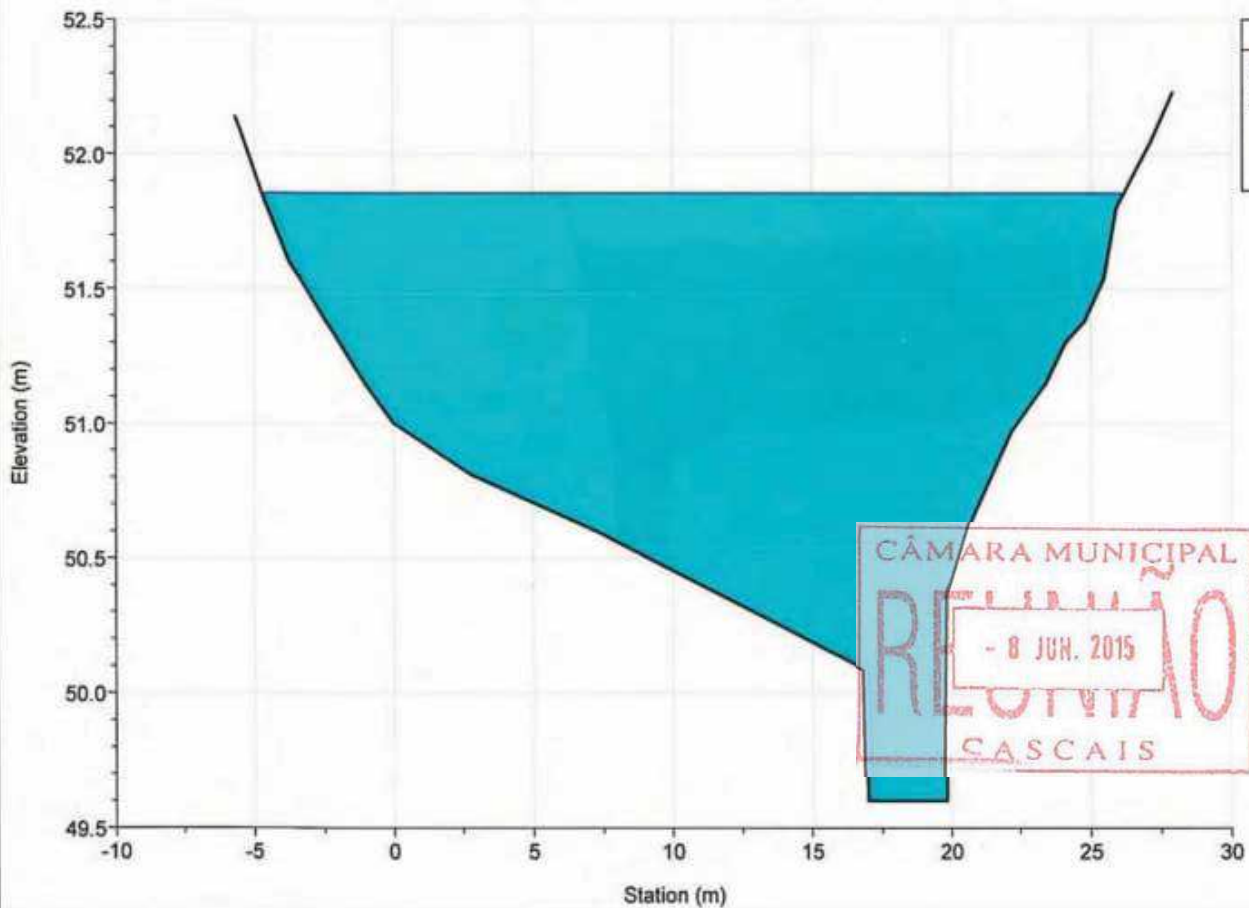


Legend
WS T=100 anos
Ground
Bank Sta

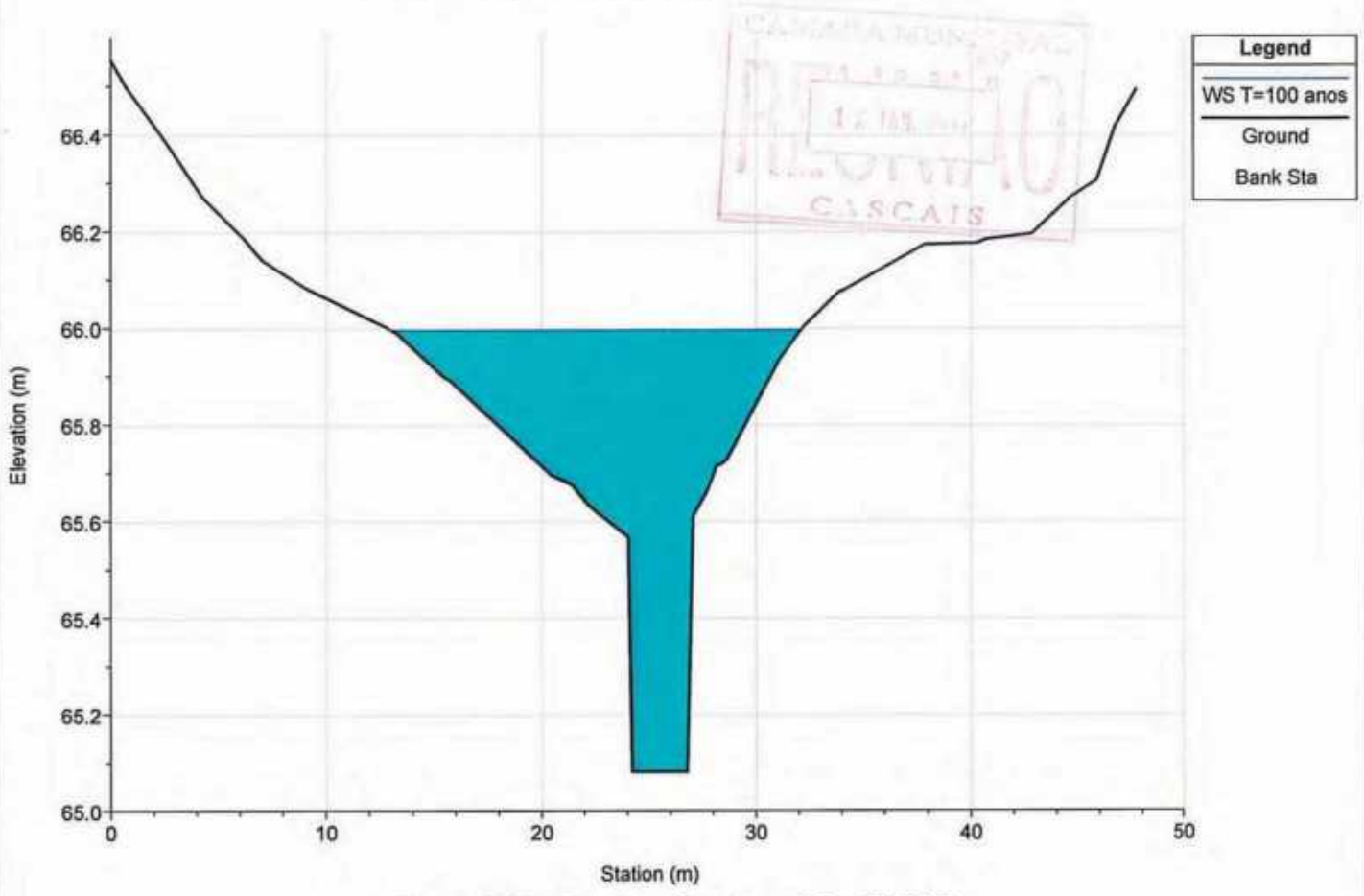
River = ME2 Reach = afluente RS = 82.446



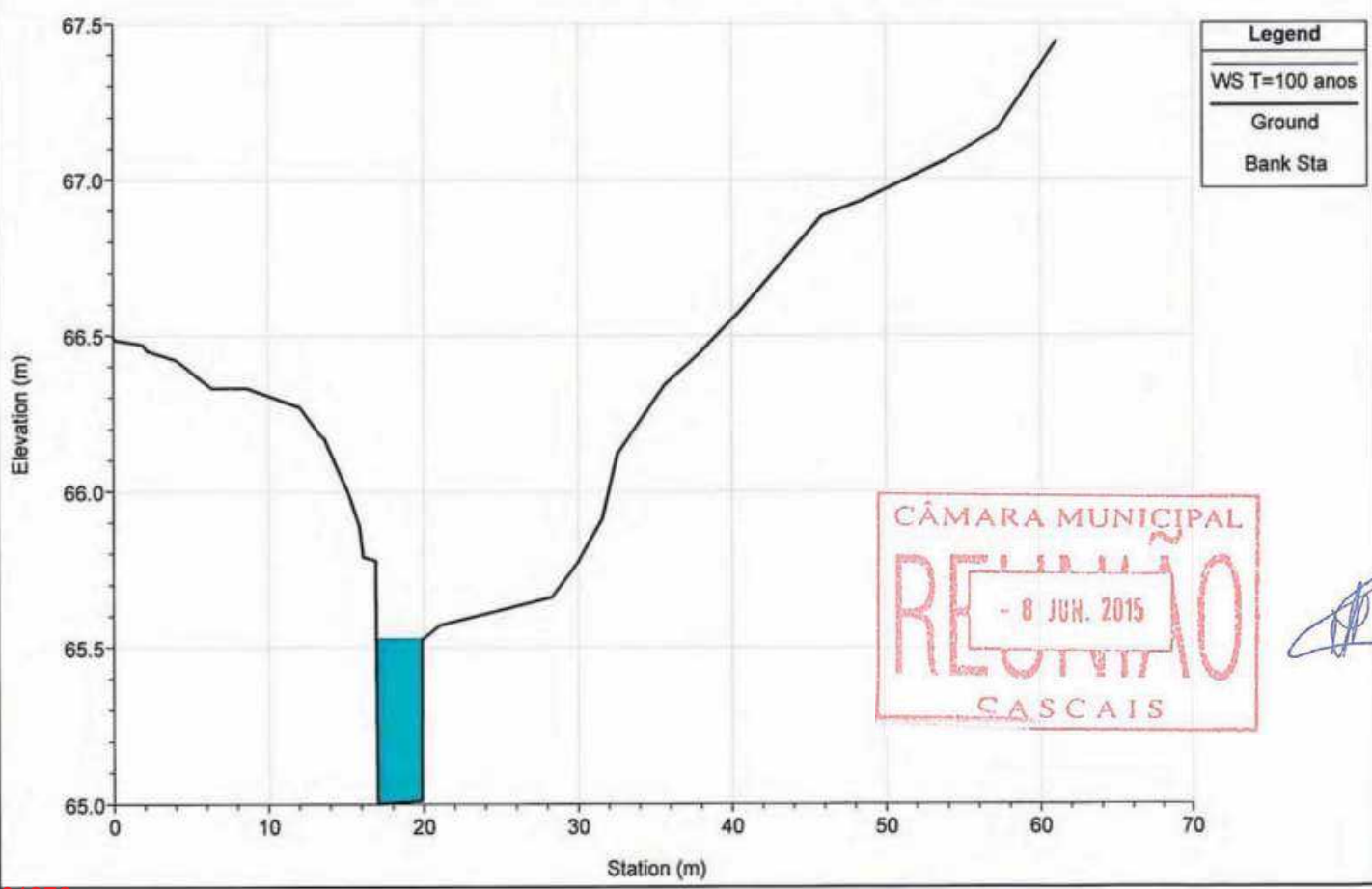
River = ME2 Reach = afluente RS = 14.320



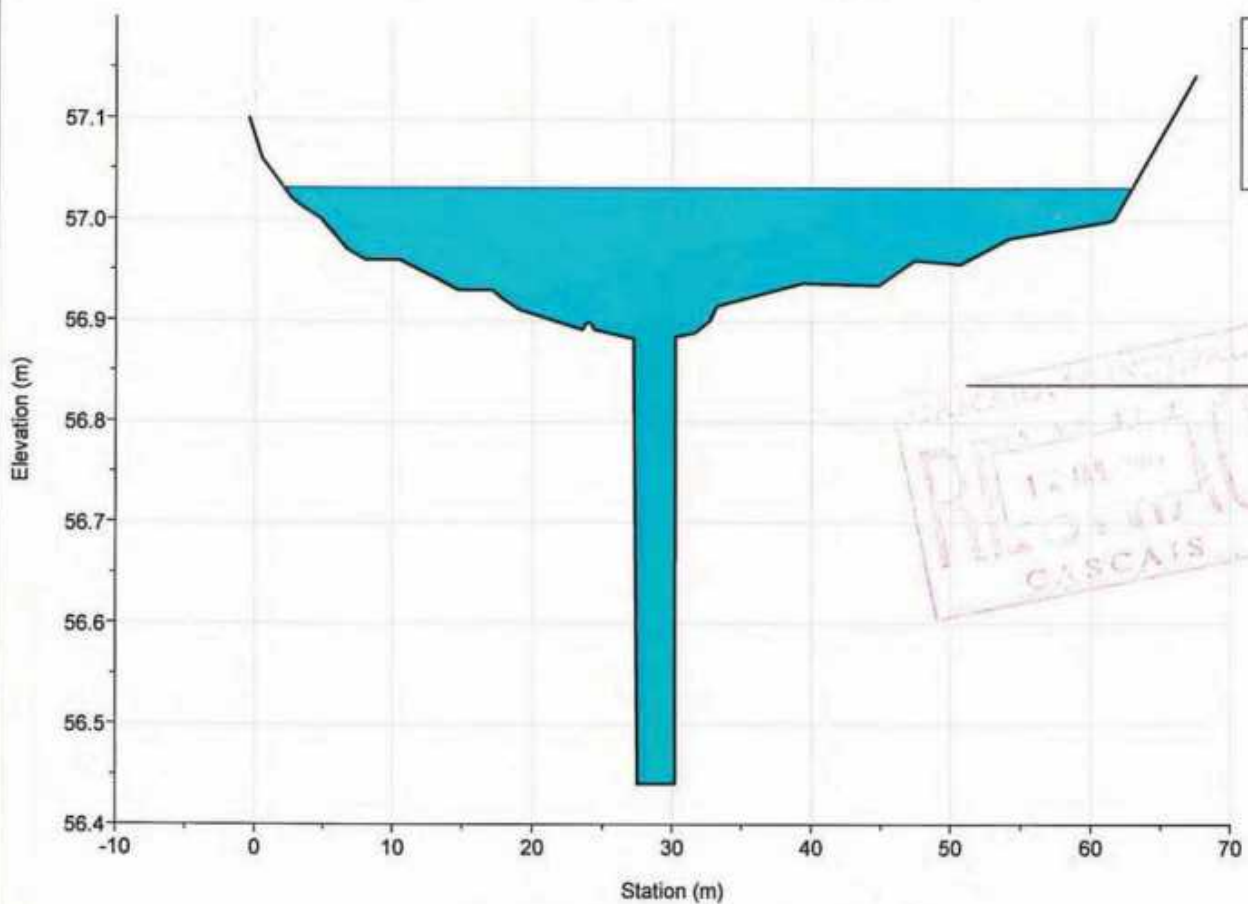
River = ME3 Reach = afluente RS = 306.026



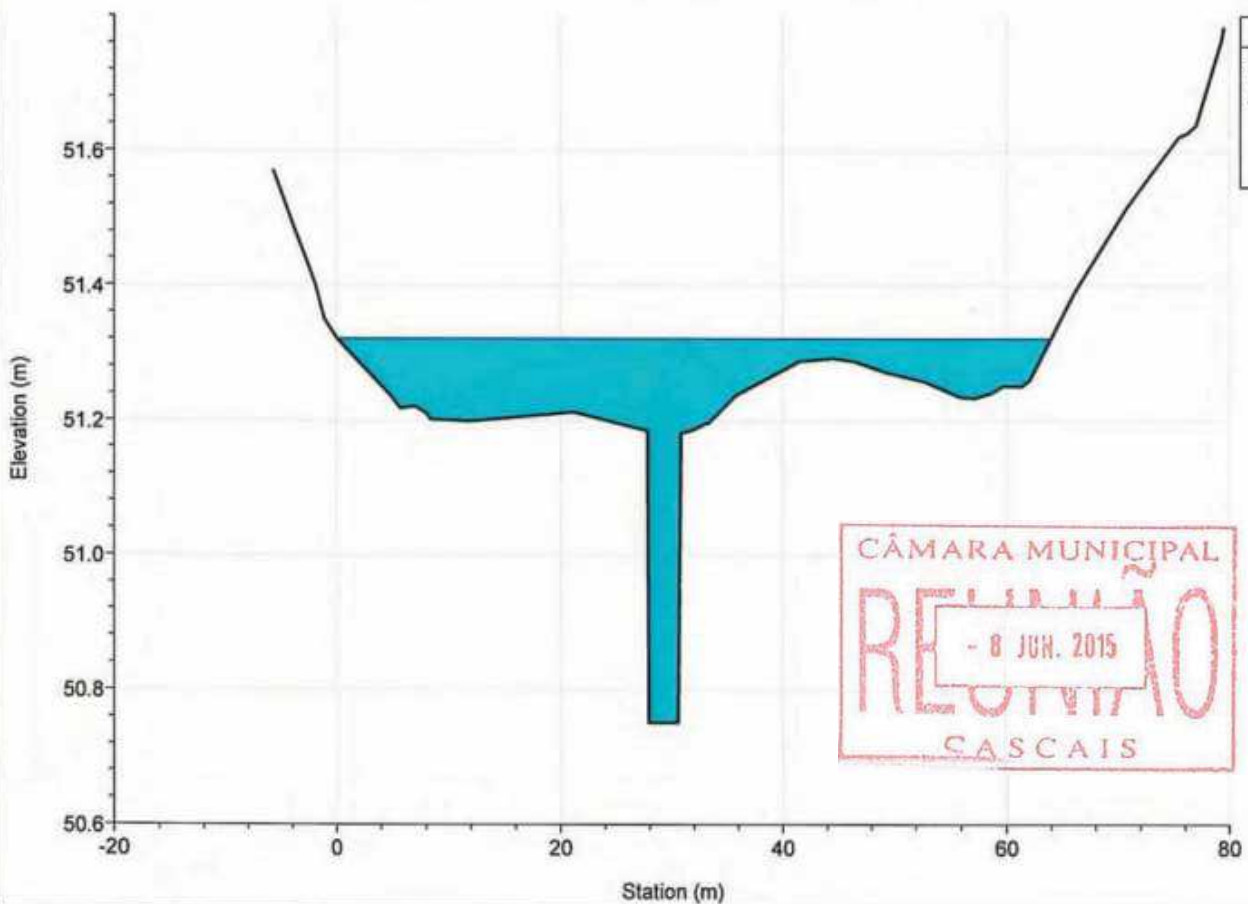
River = ME3 Reach = afluente RS = 248.723



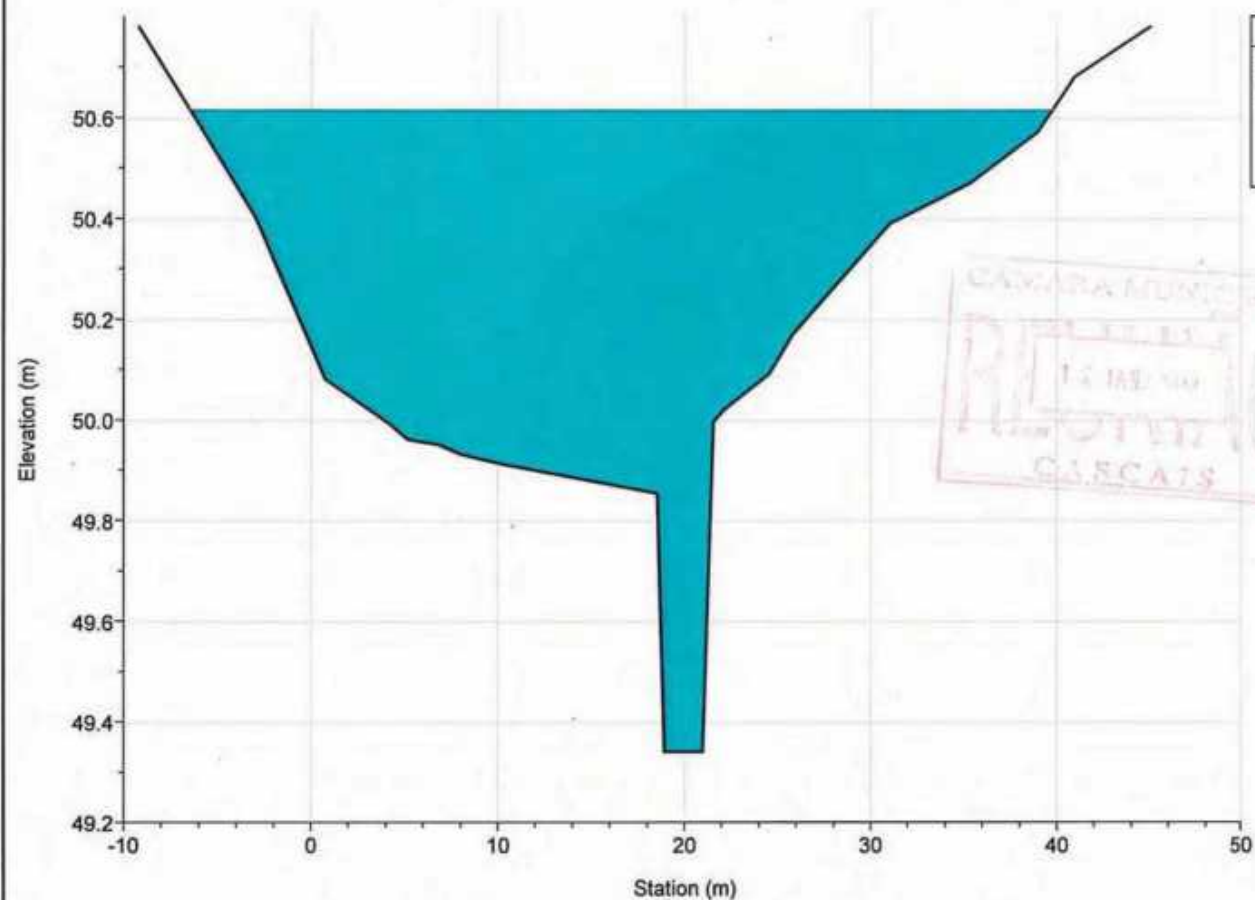
River = ME3 Reach = afluyente RS = 186.484



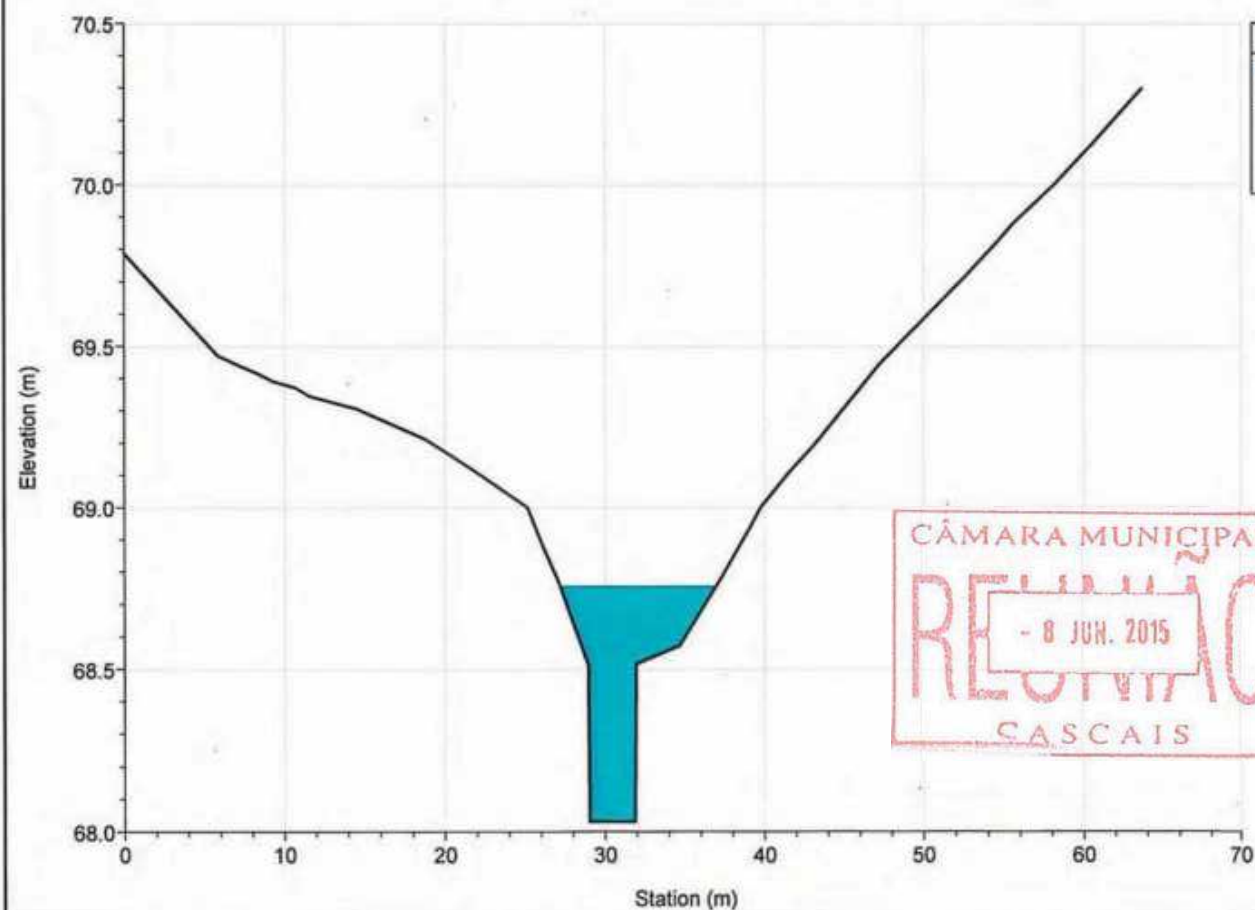
River = ME3 Reach = afluyente RS = 95.027



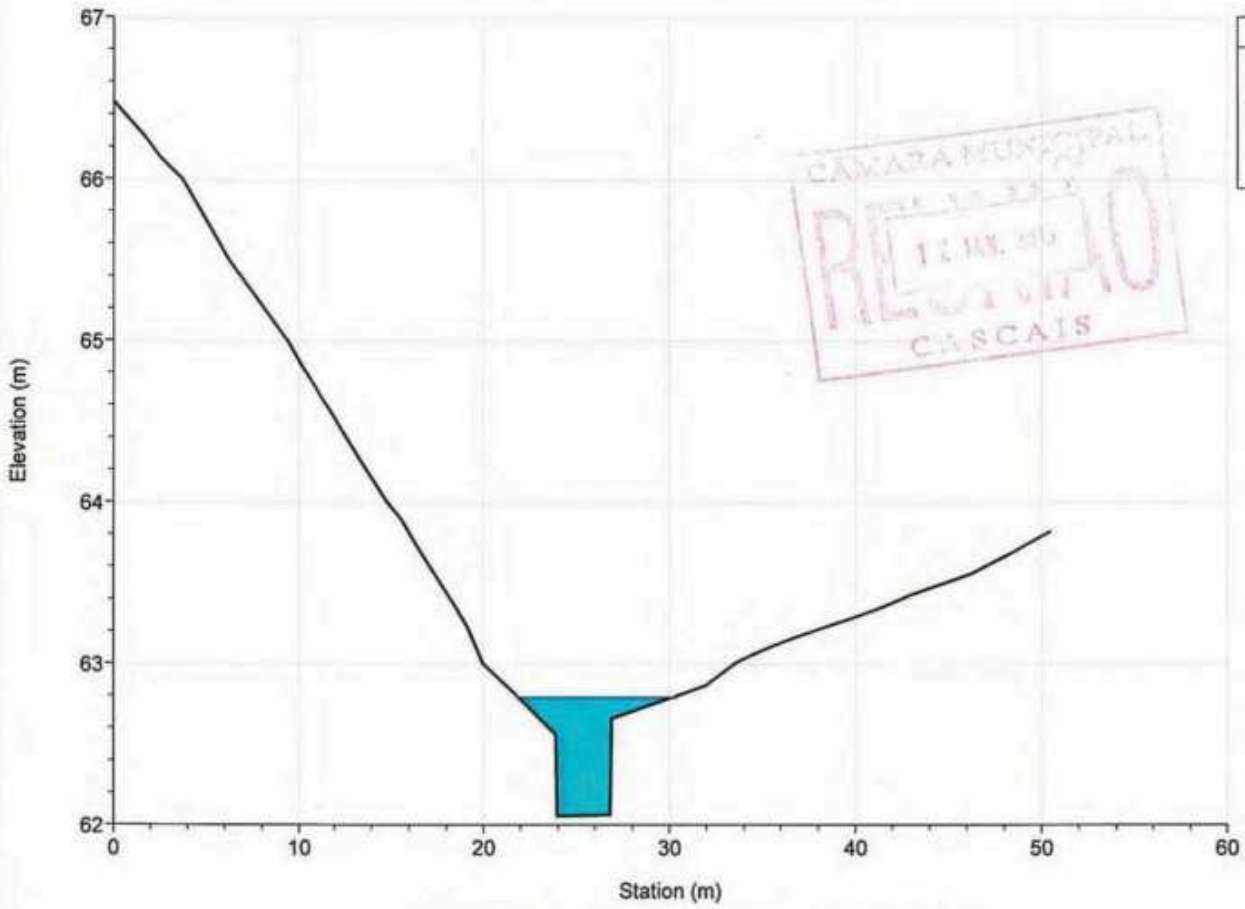
River = ME3 Reach = afluente RS = 20.853



River = ME4 Reach = afluente RS = 503.920

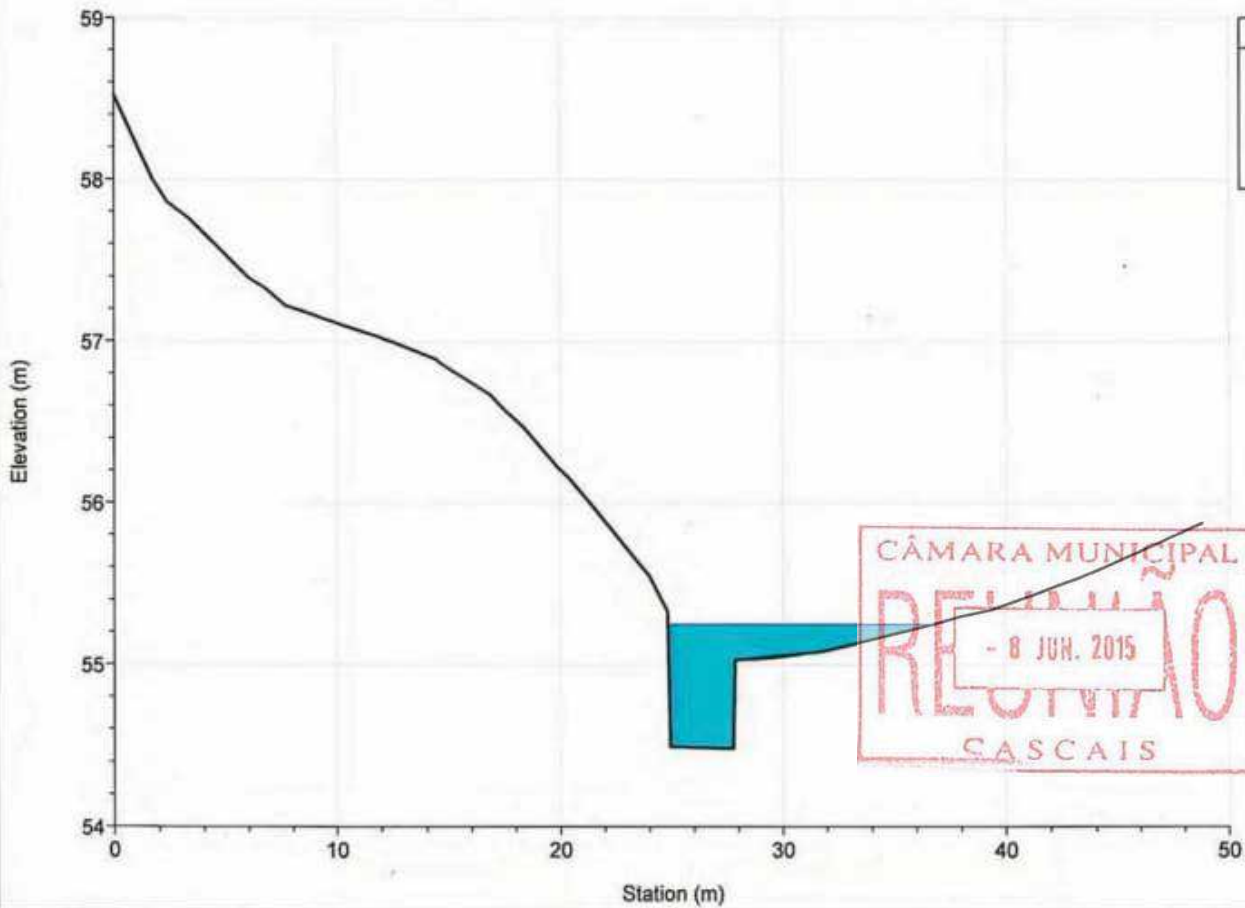


River = ME4 Reach = afluente RS = 396.290



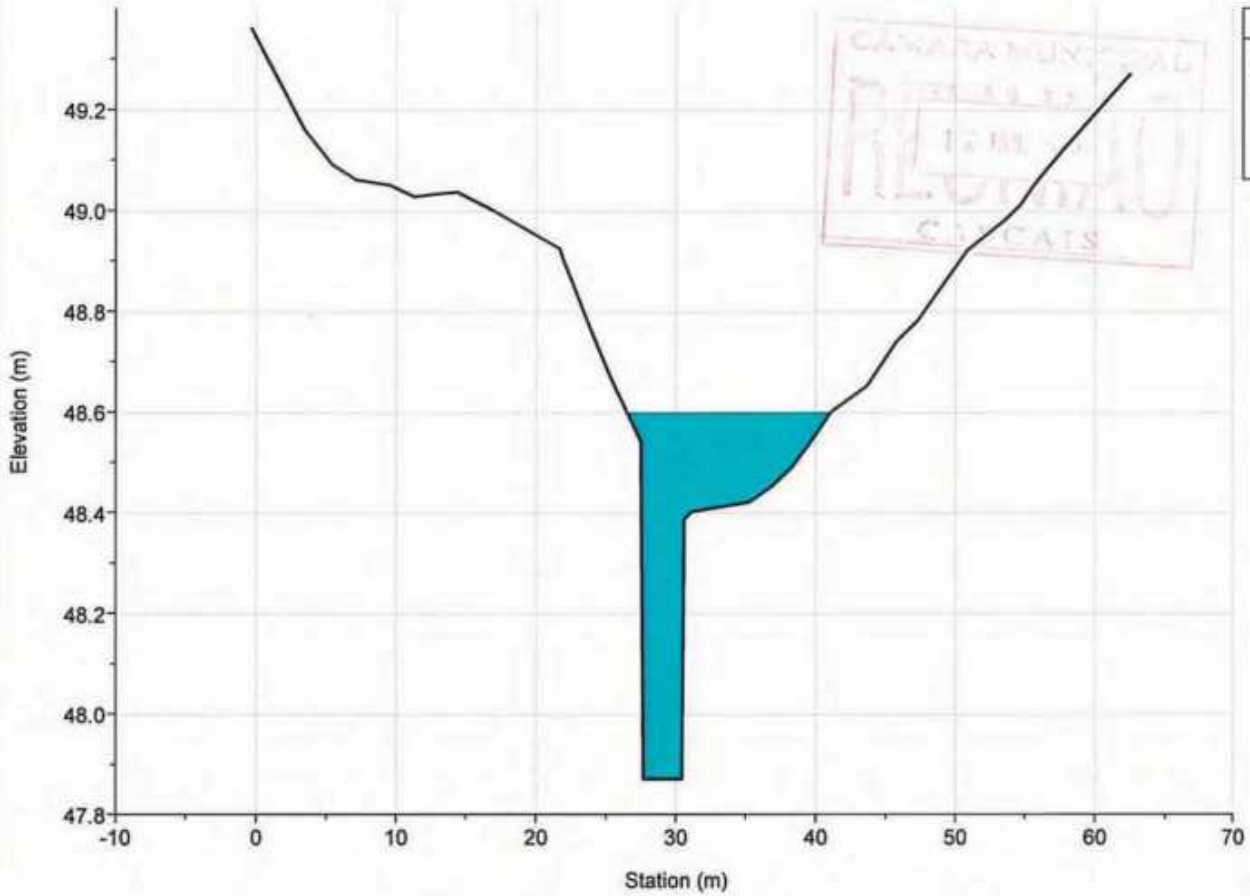
Legend
WS T=100 anos
Ground
Bank Sta

River = ME4 Reach = afluente RS = 282.594

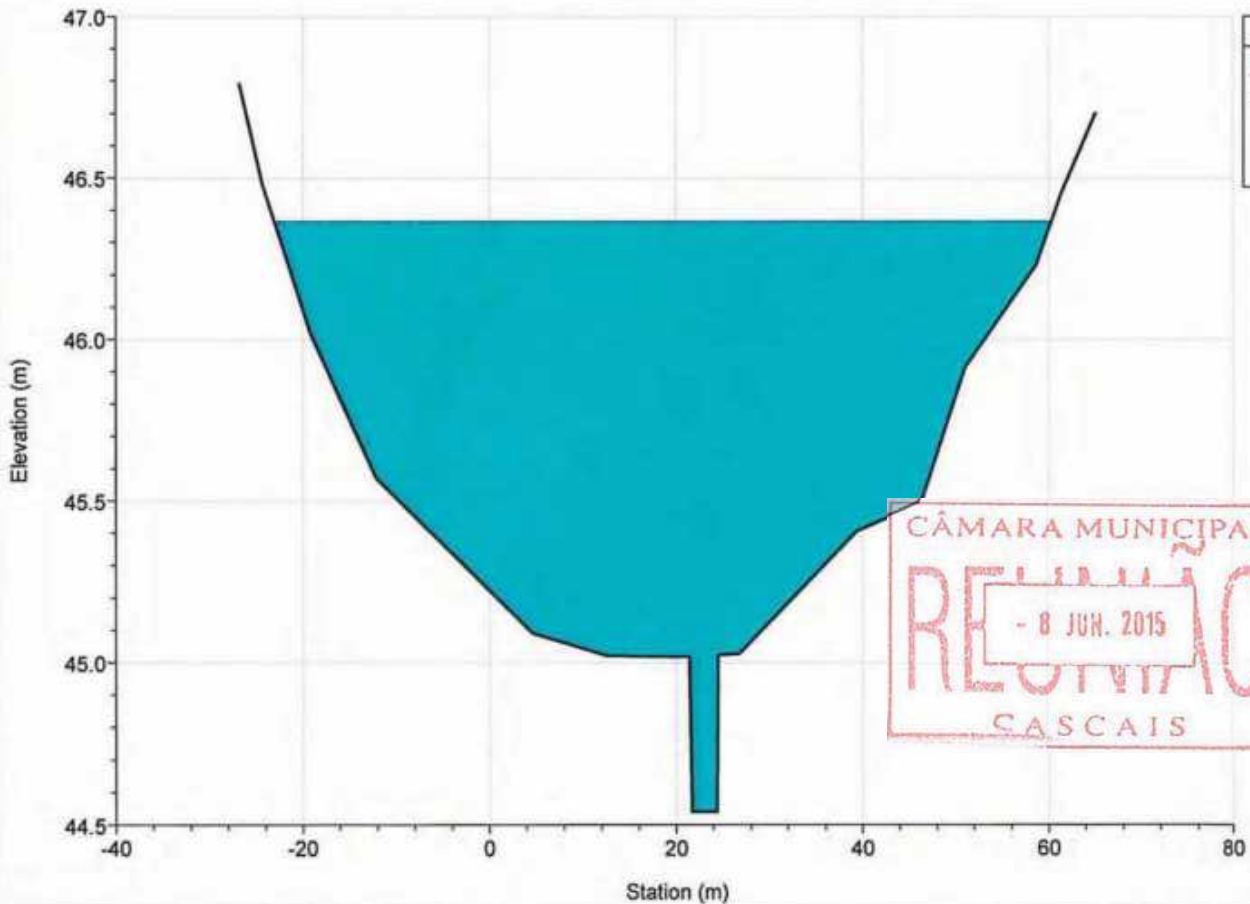


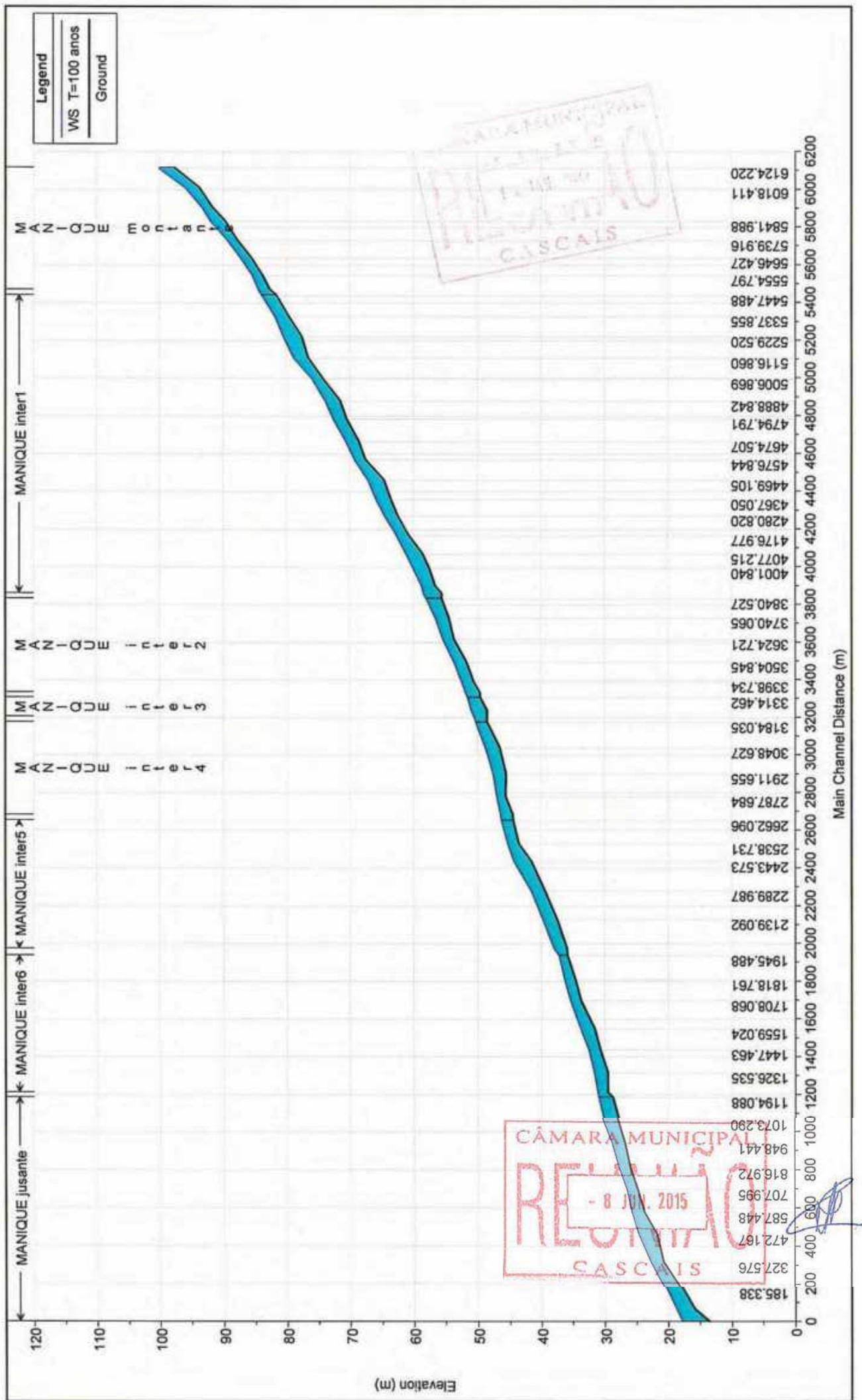
Legend
WS T=100 anos
Ground
Bank Sta

River = ME4 Reach = afluyente RS = 139.152

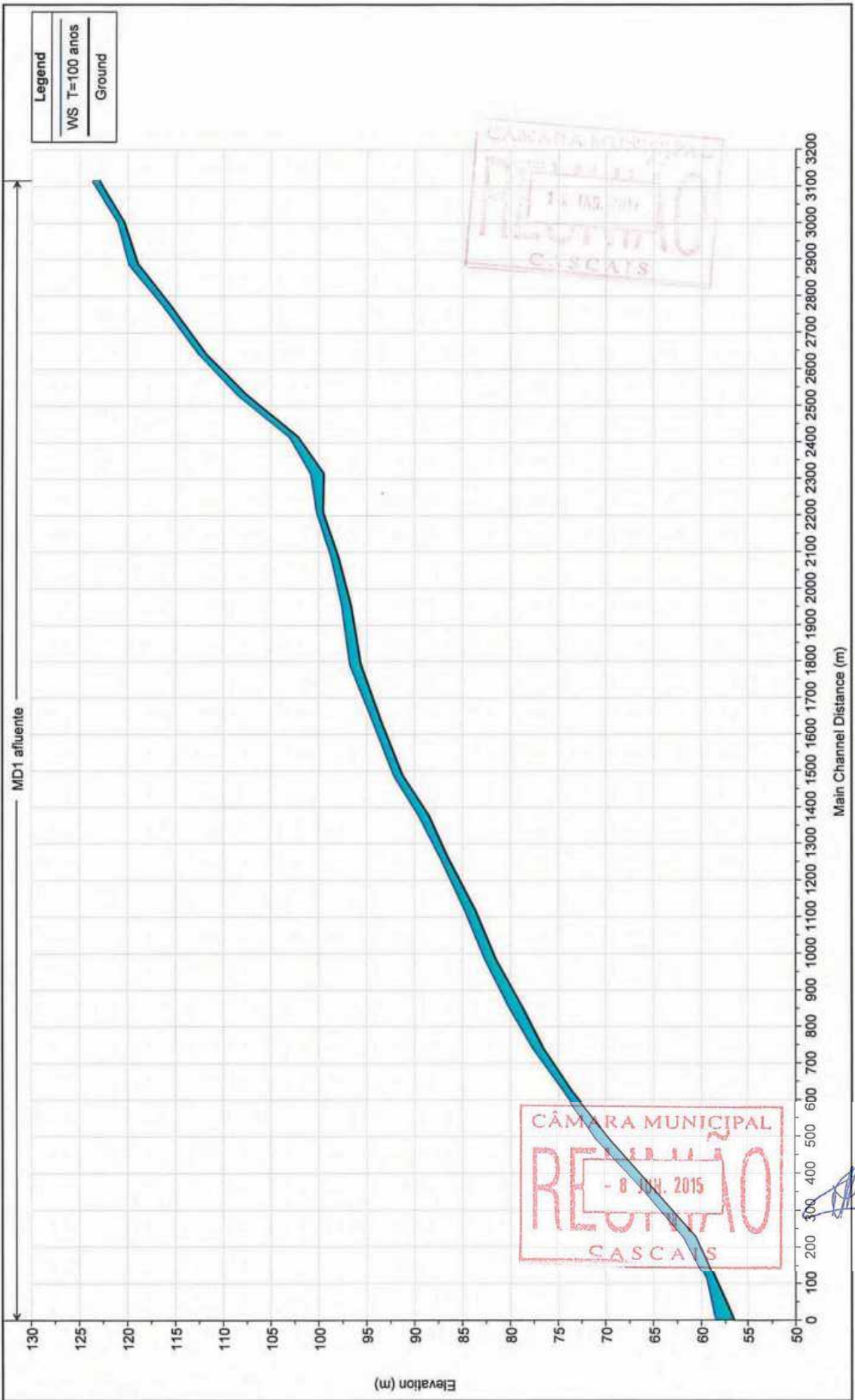


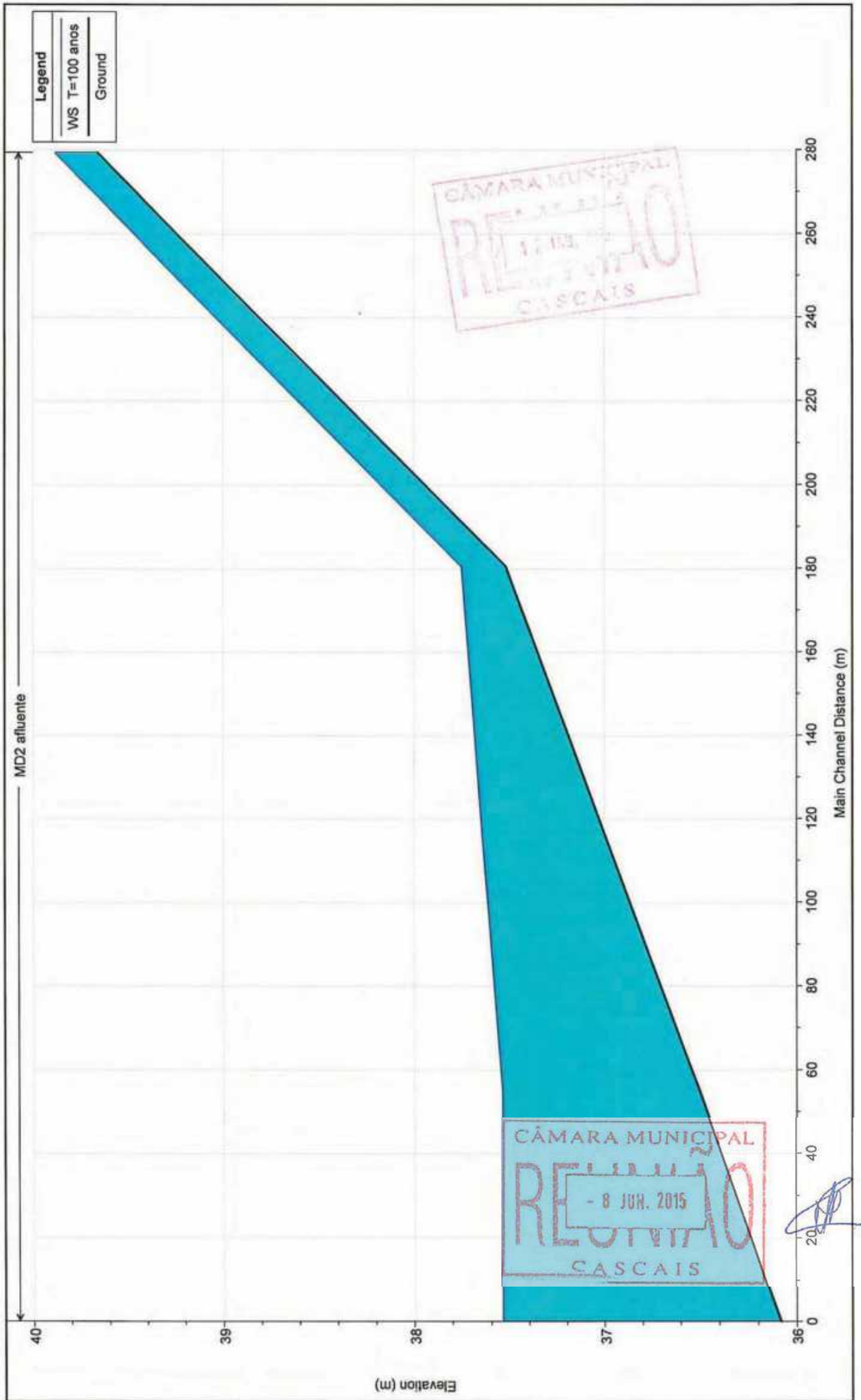
River = ME4 Reach = afluyente RS = 24.162

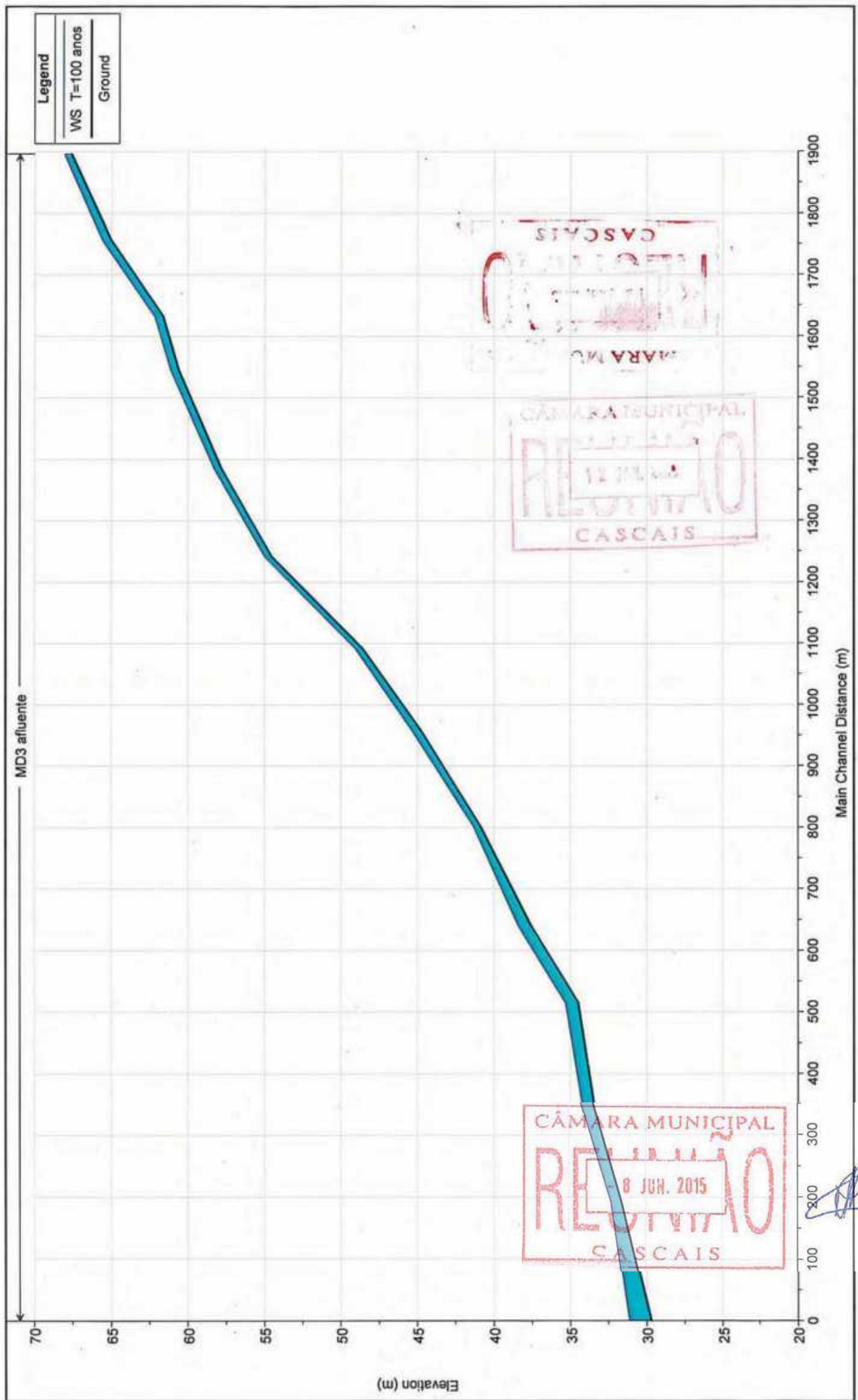


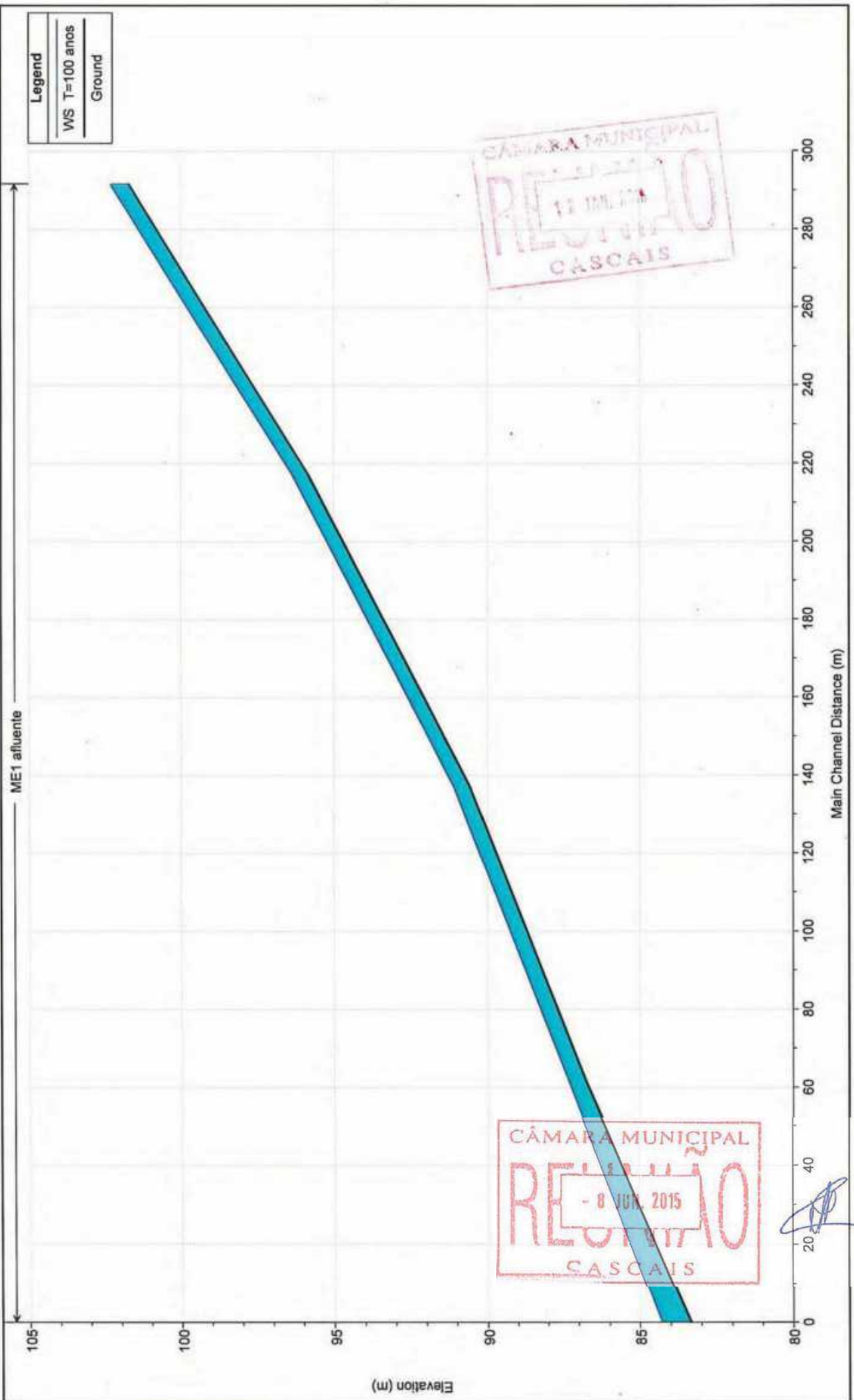


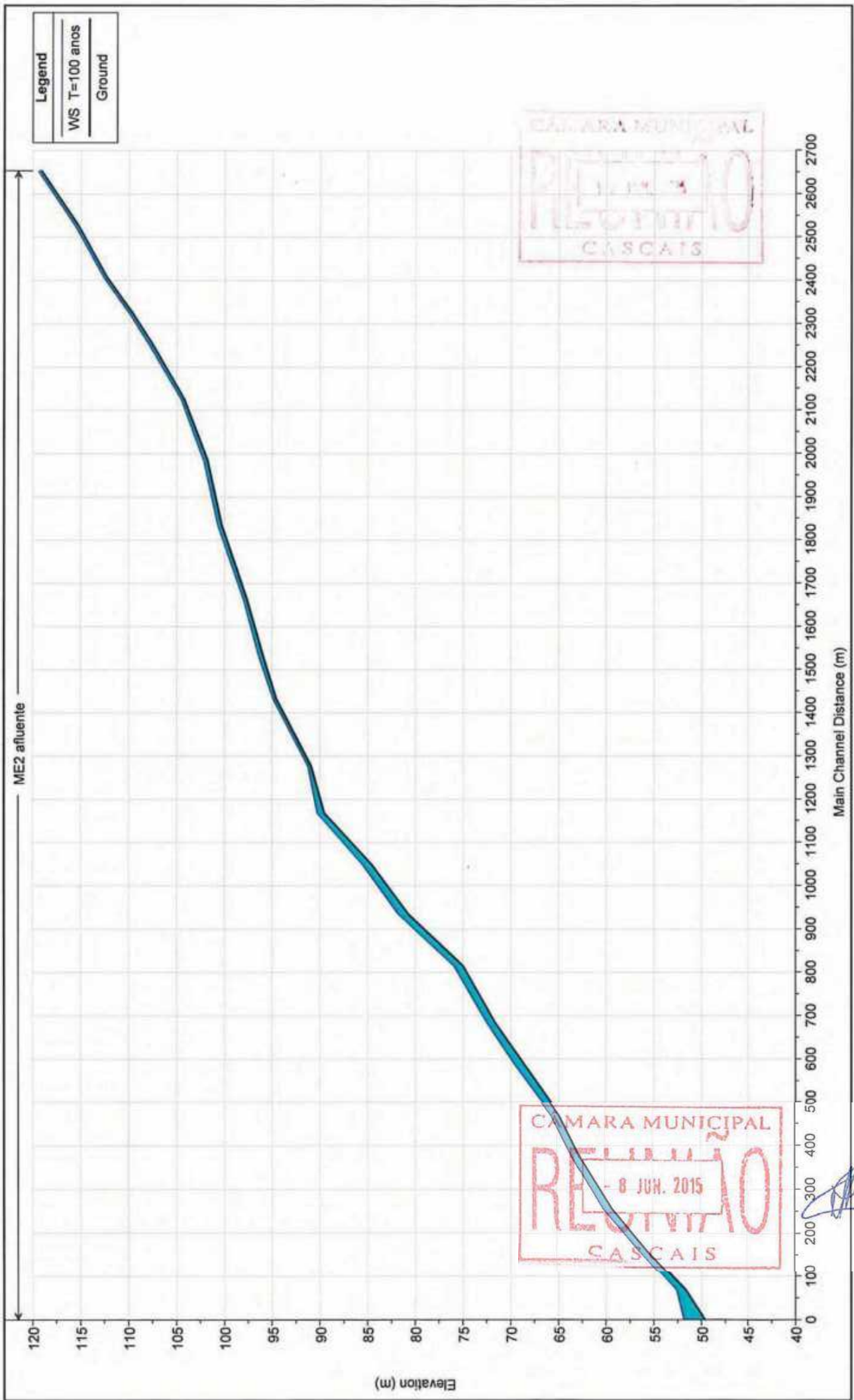


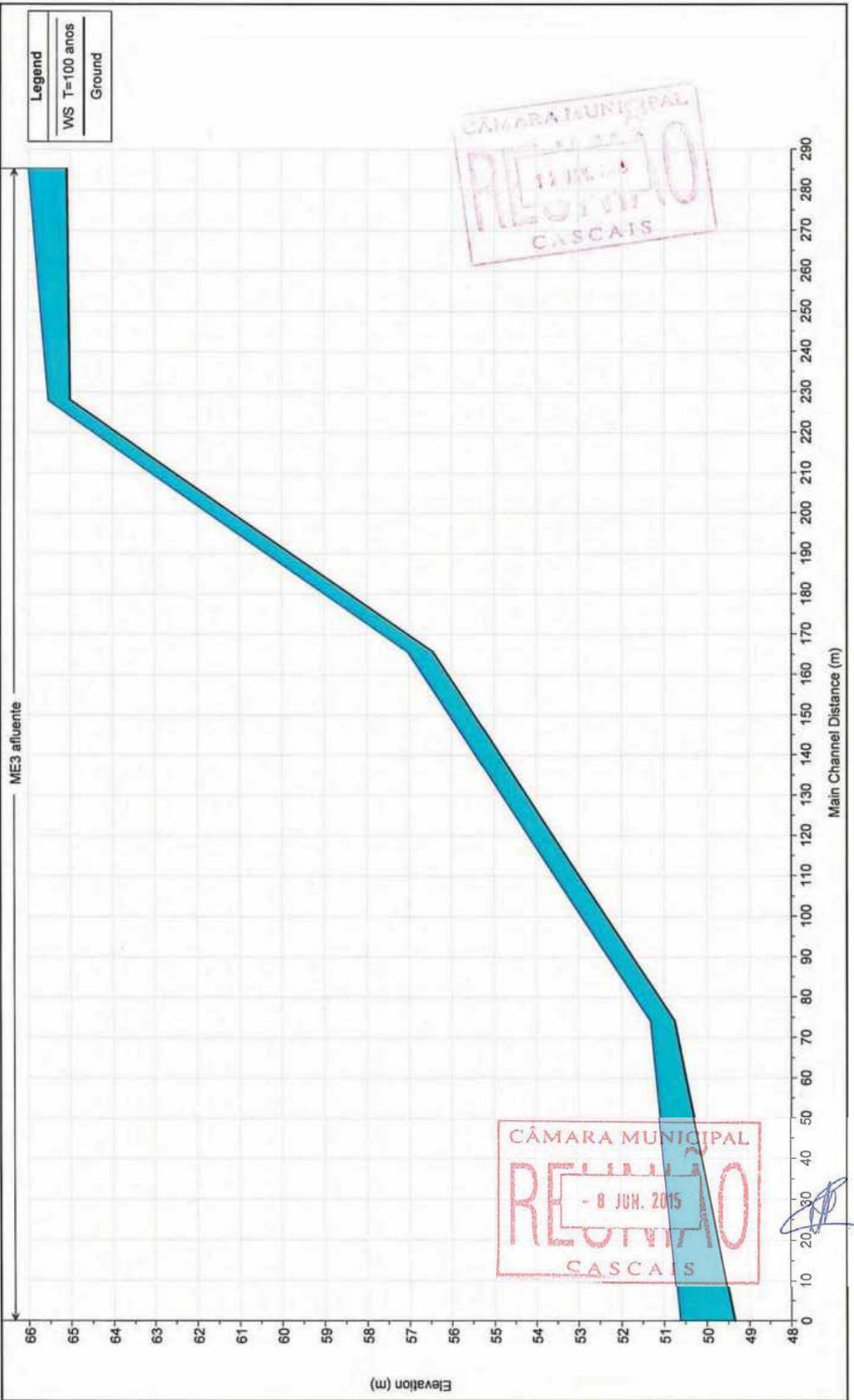


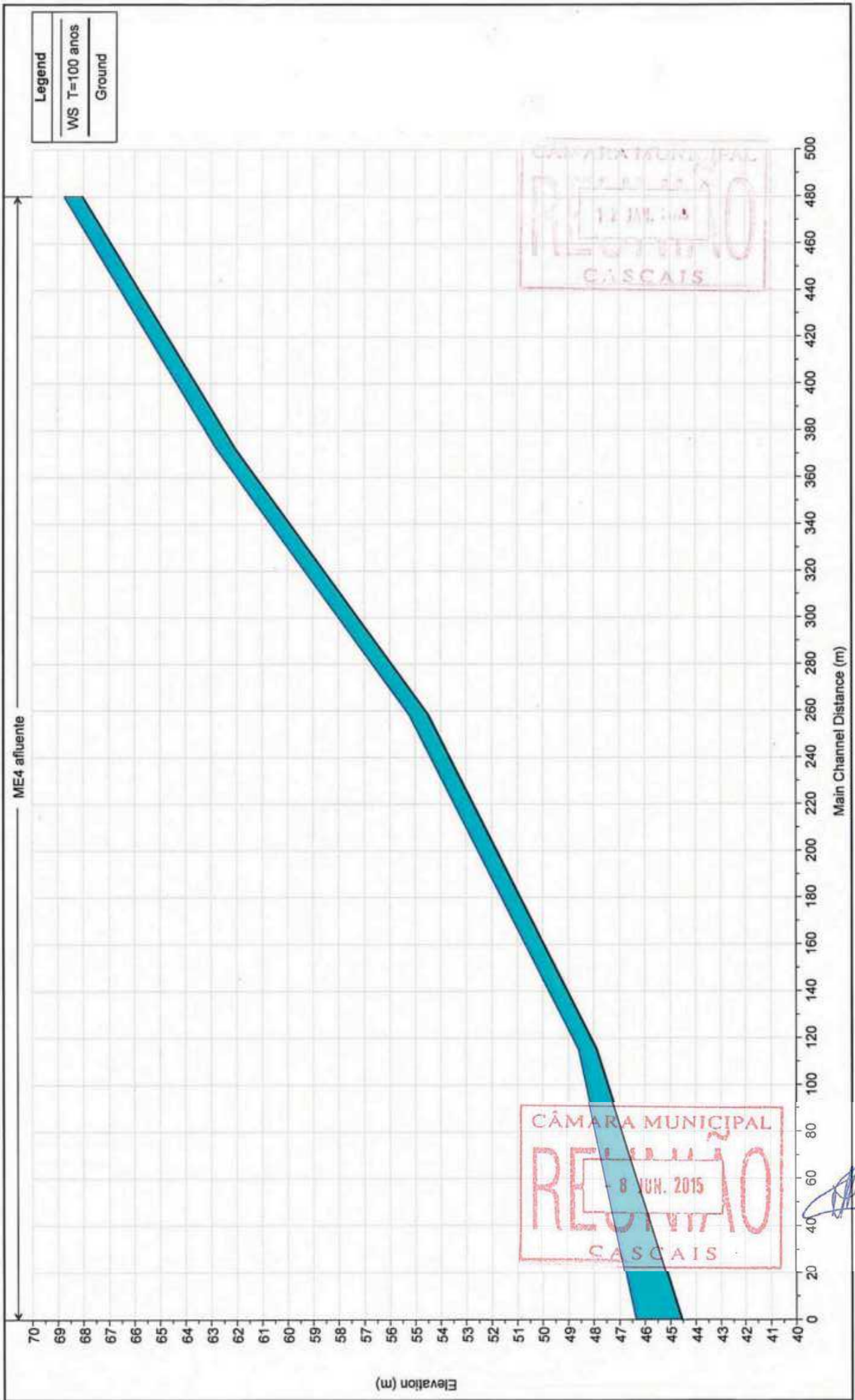








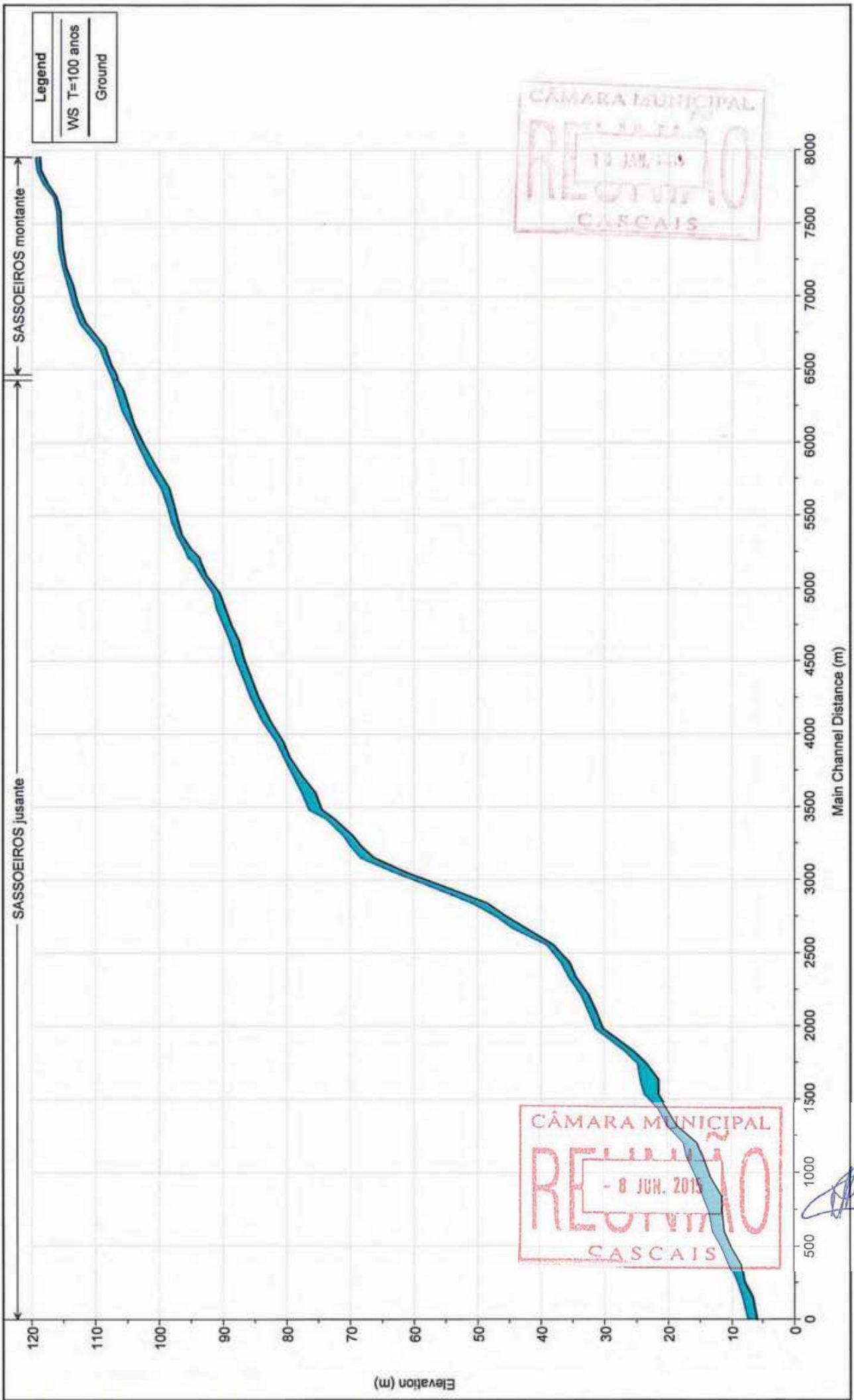


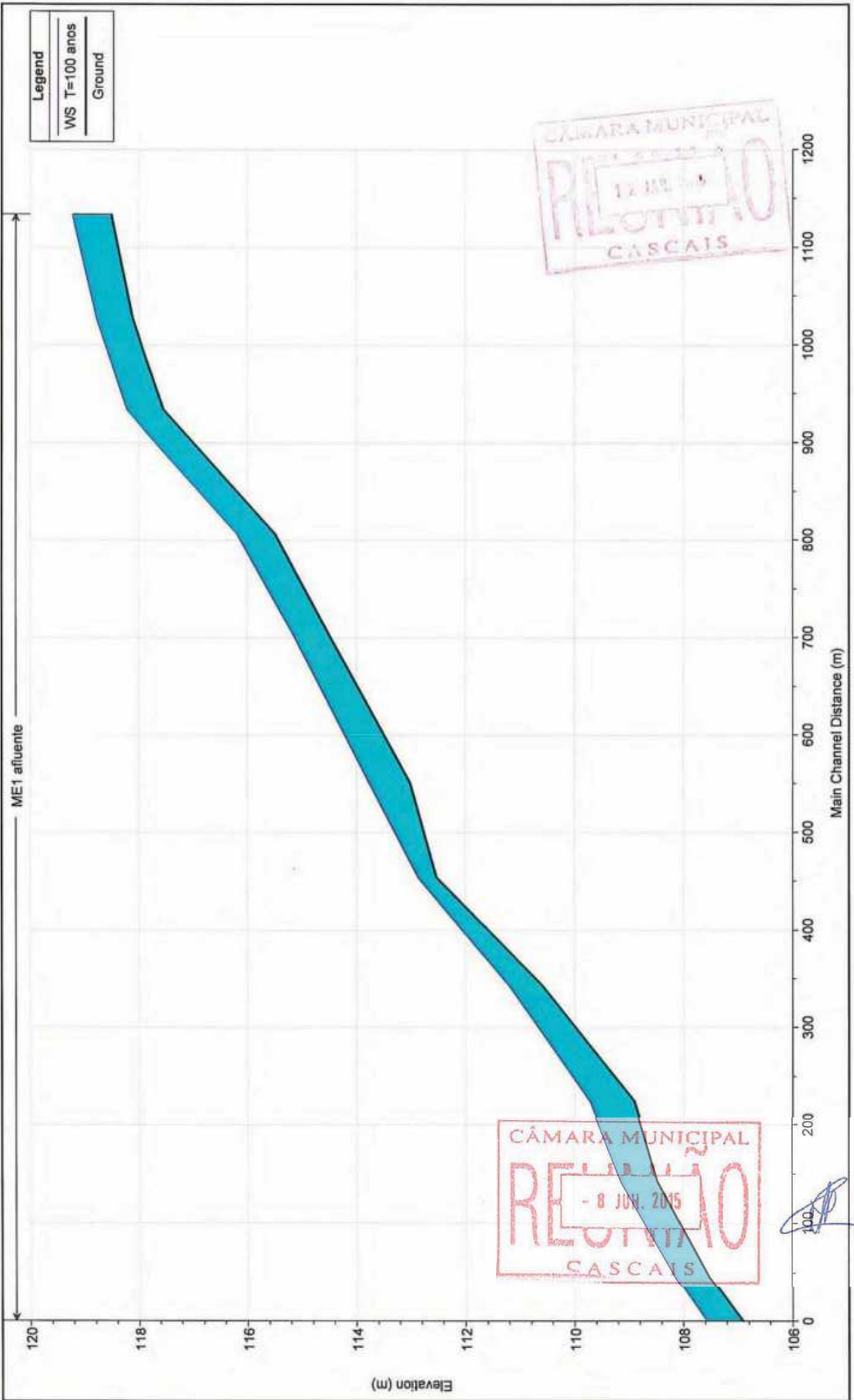




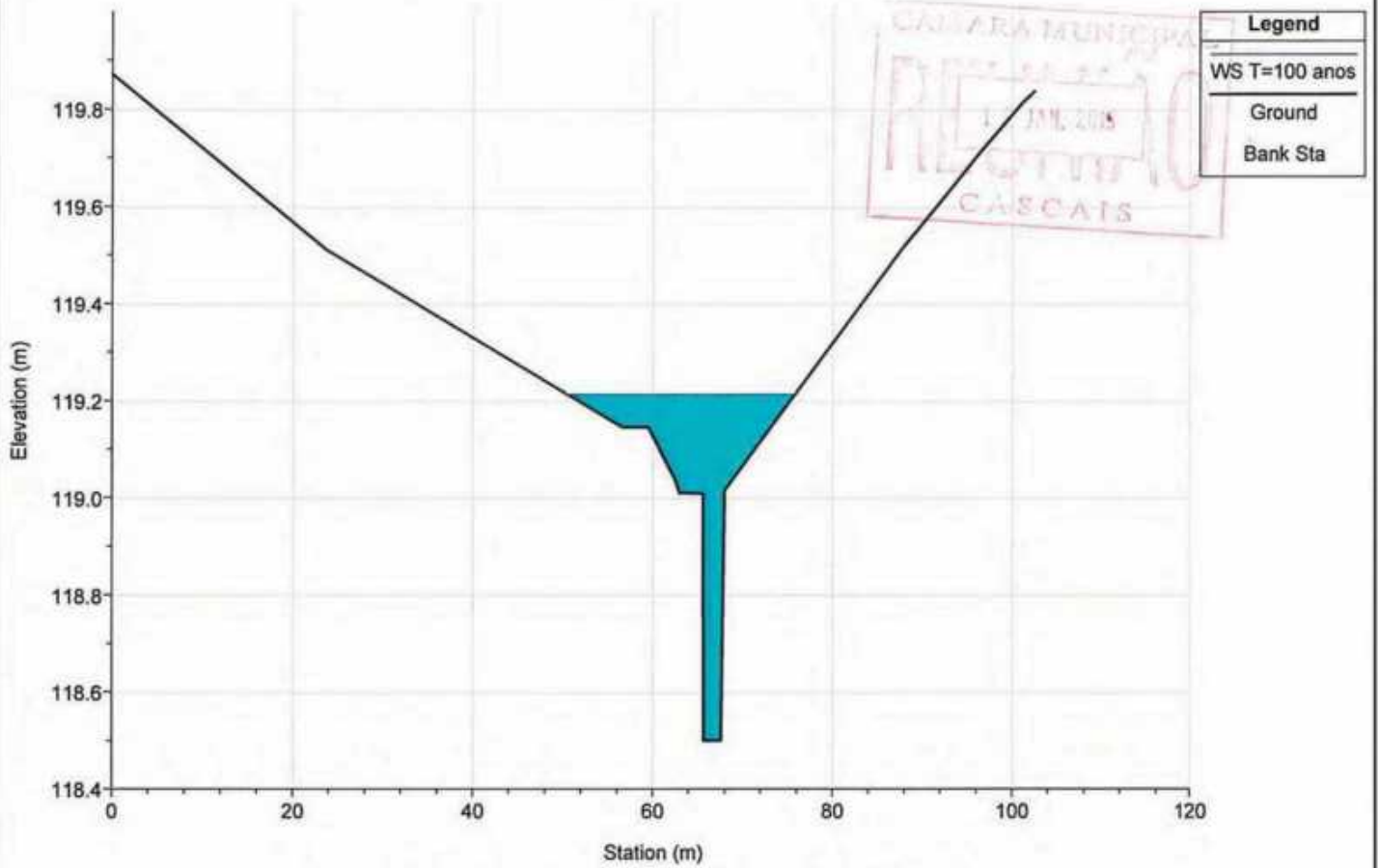
A handwritten signature in blue ink, located to the right of the red stamp.



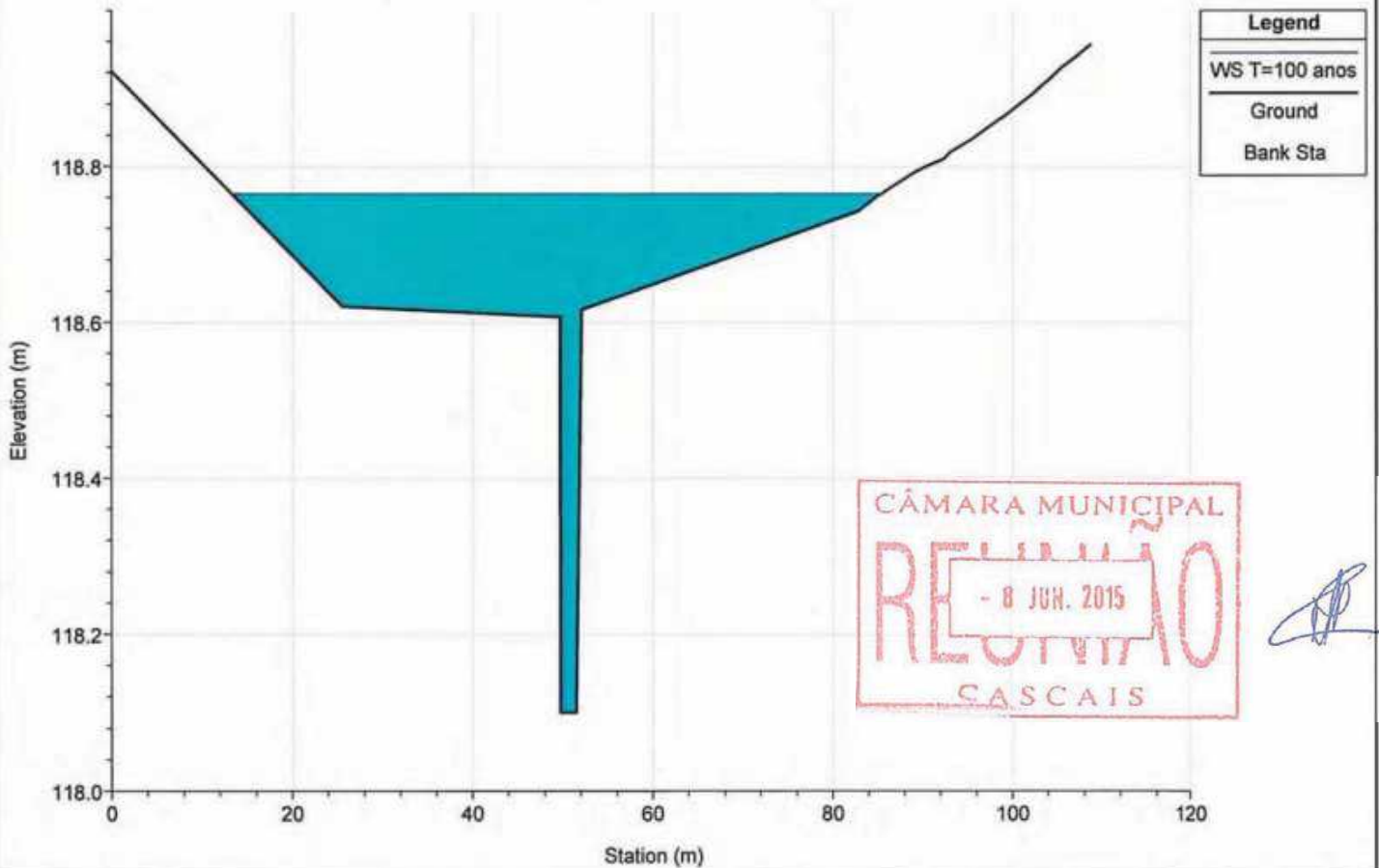




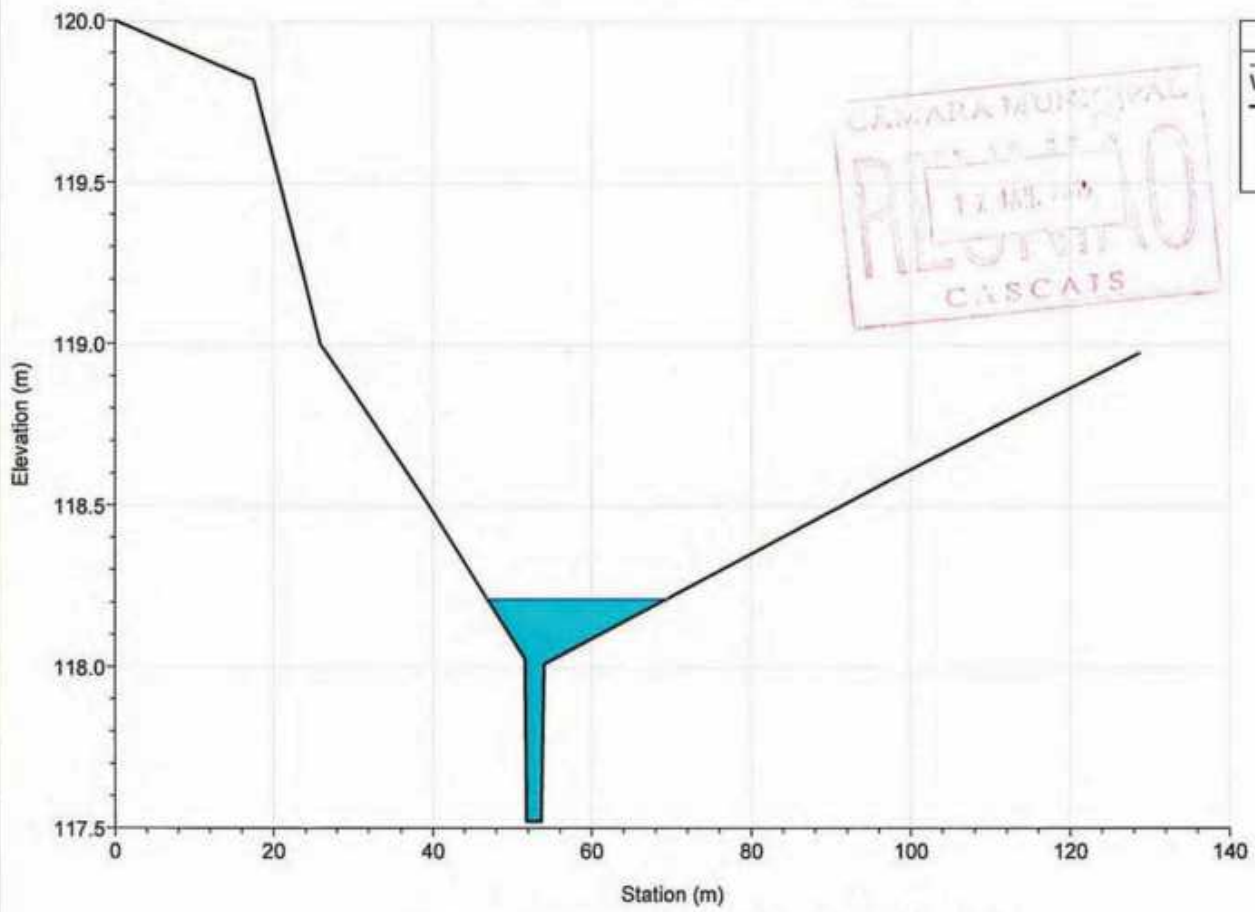
River = ME1 Reach = afluente RS = 1151.804



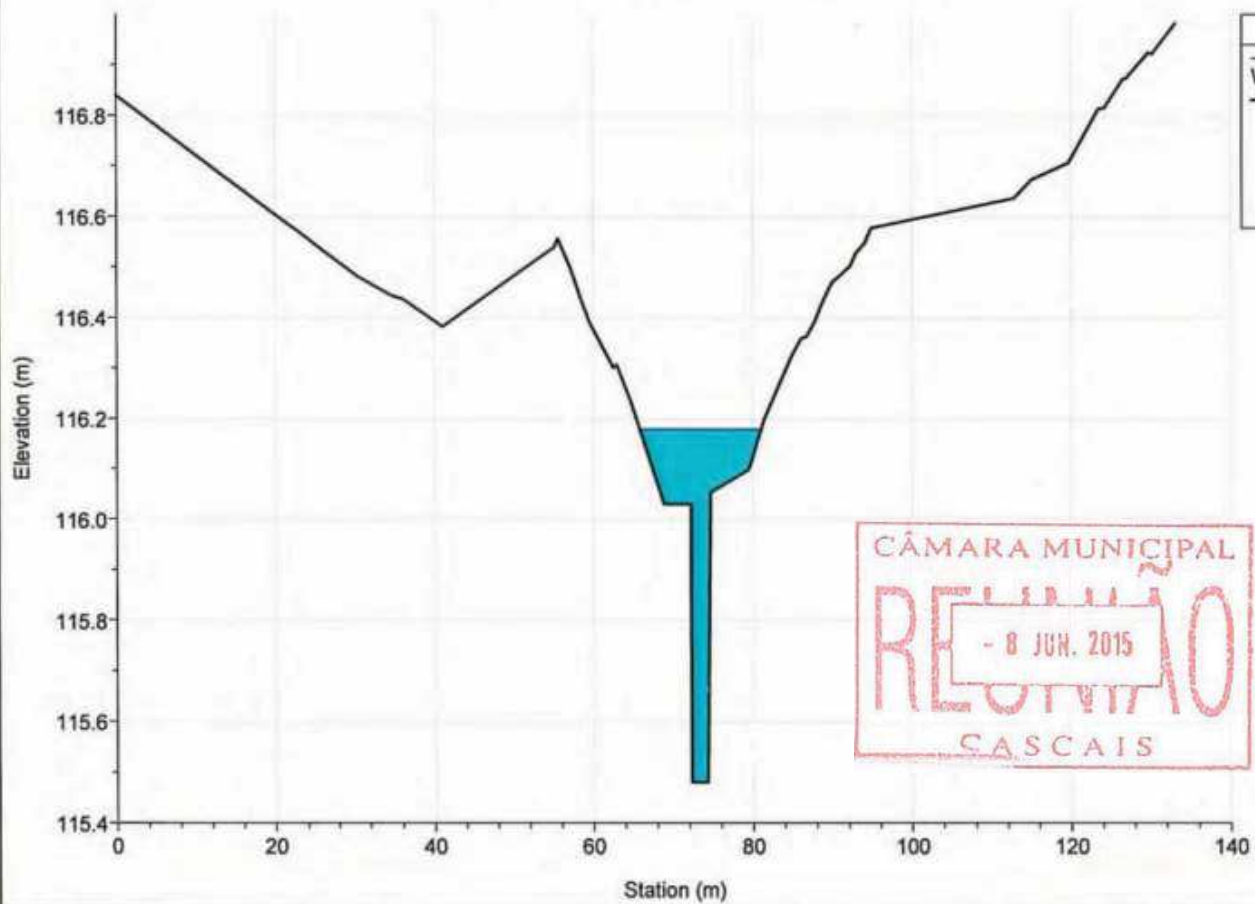
River = ME1 Reach = afluente RS = 1044.726



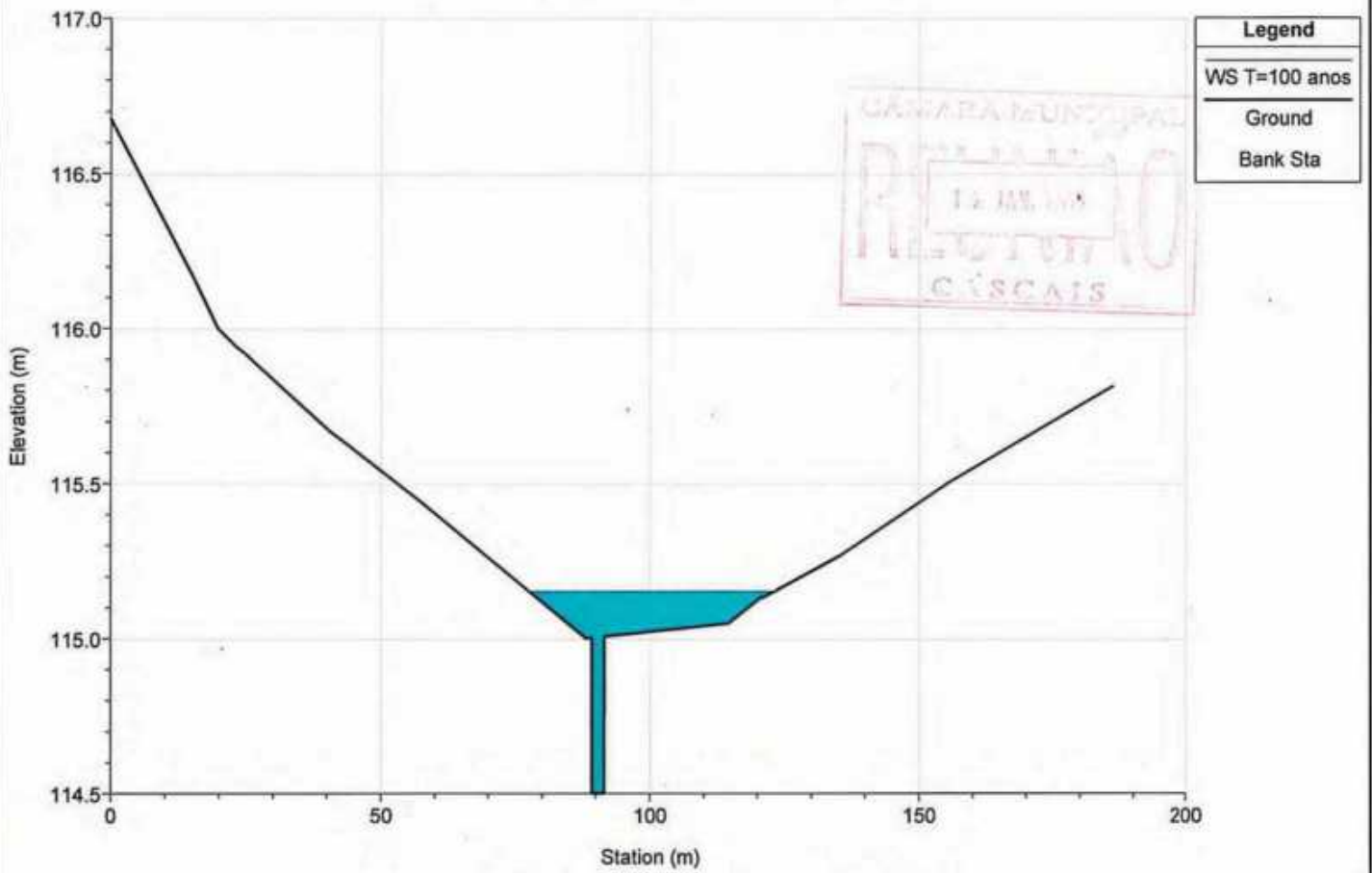
River = ME1 Reach = afluente RS = 951.730



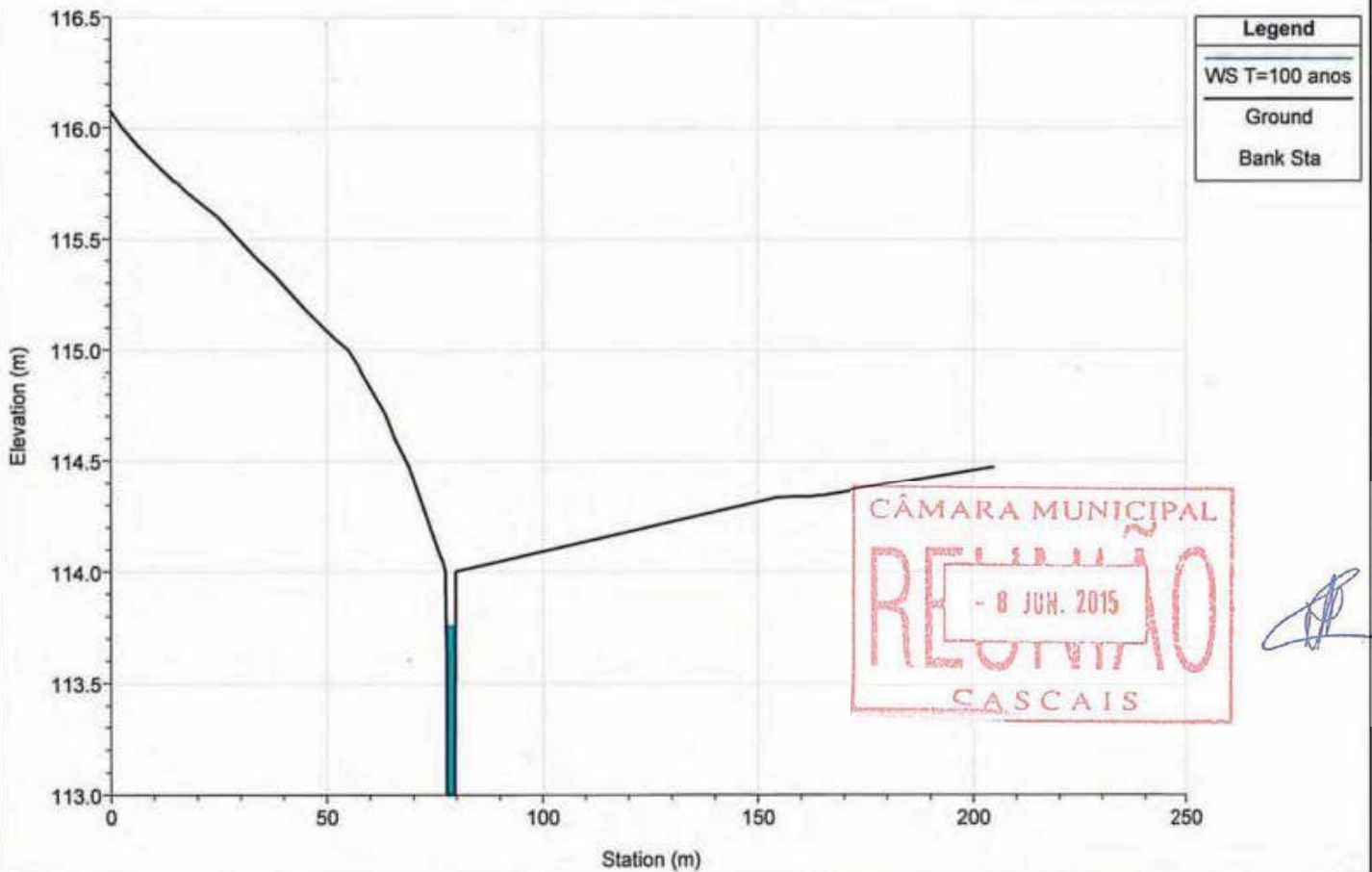
River = ME1 Reach = afluente RS = 825.256



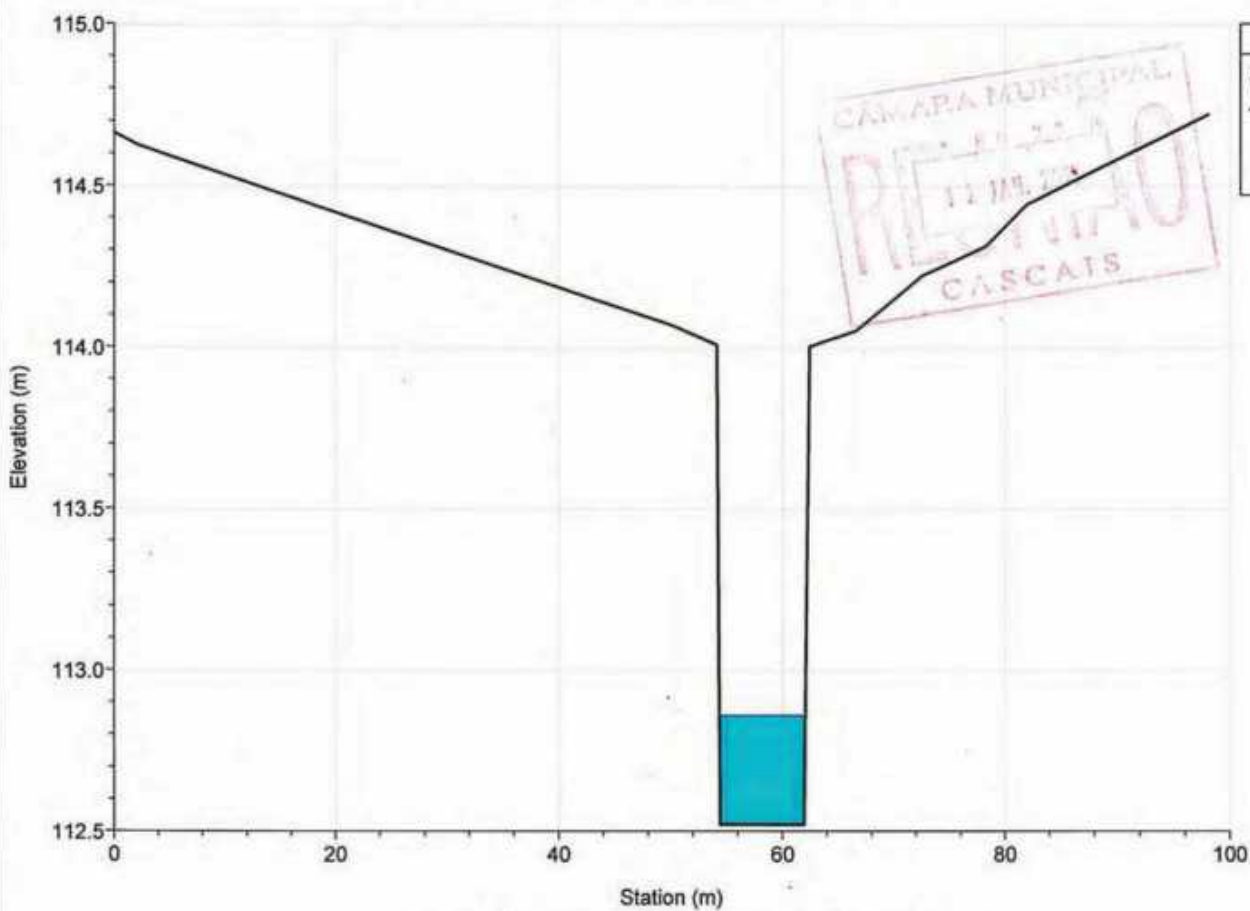
River = ME1 Reach = afluente RS = 721.974



River = ME1 Reach = afluente RS = 569.217

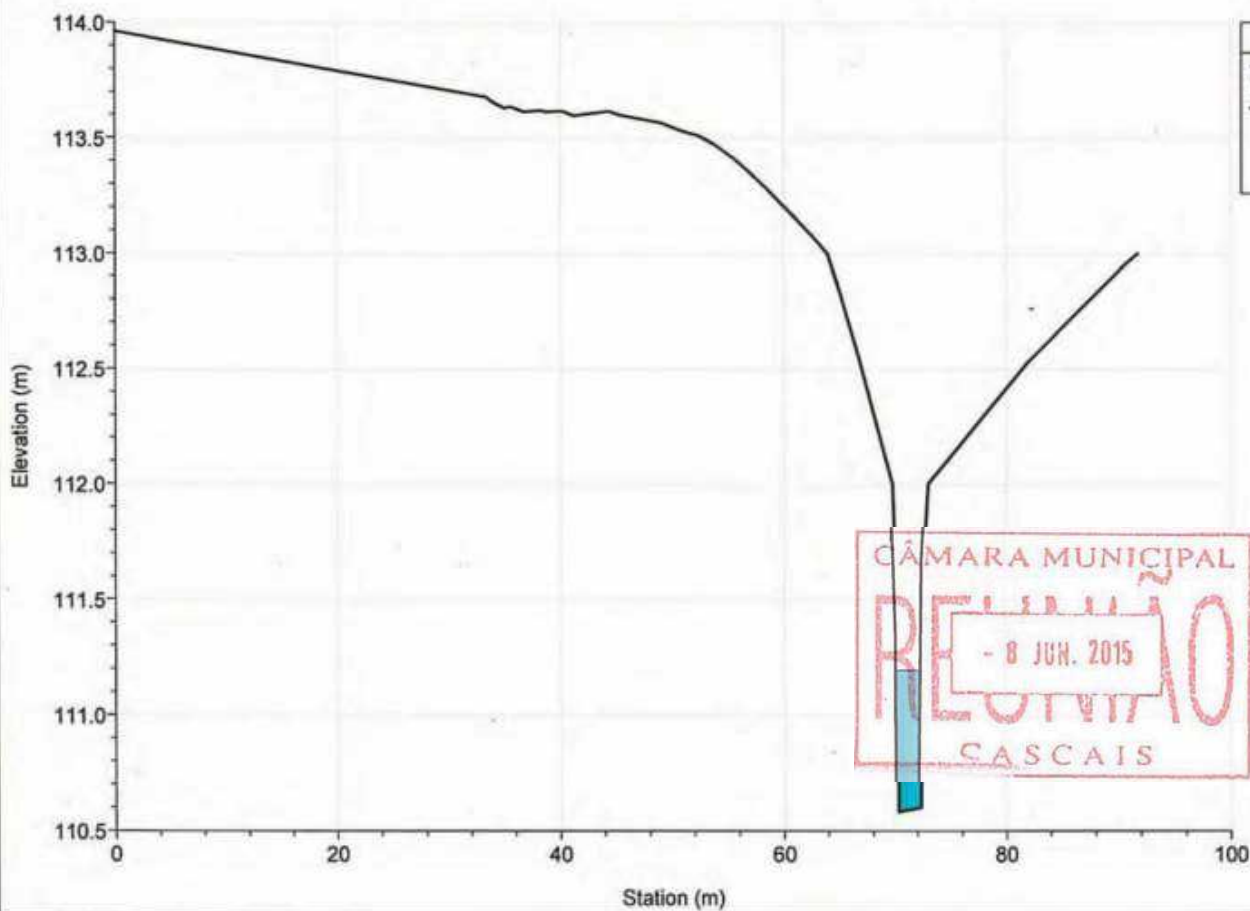


River = ME1 Reach = afluyente RS = 472.518



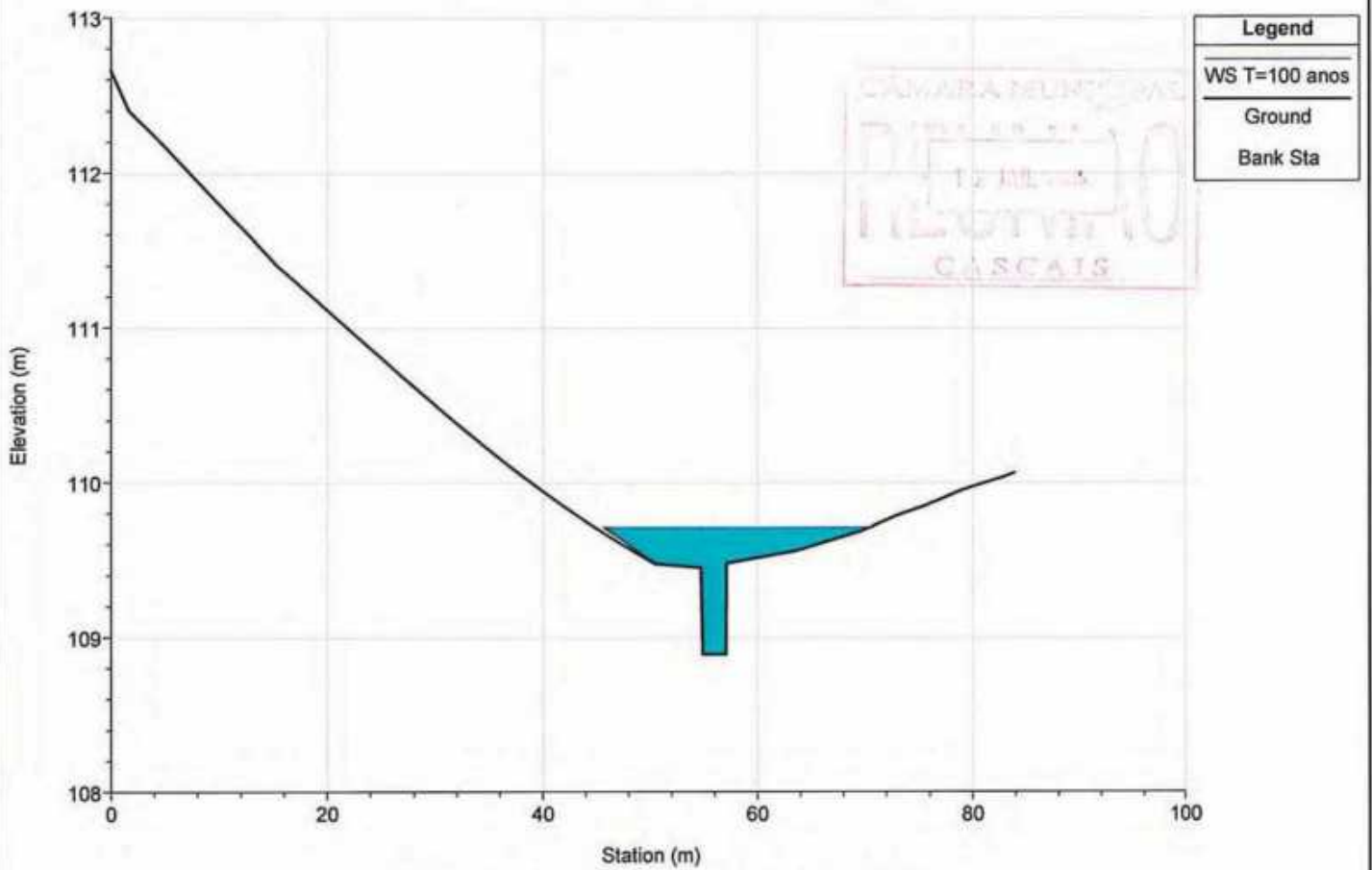
Legend
WS T=100 anos
Ground
Bank Sta

River = ME1 Reach = afluyente RS = 361.355

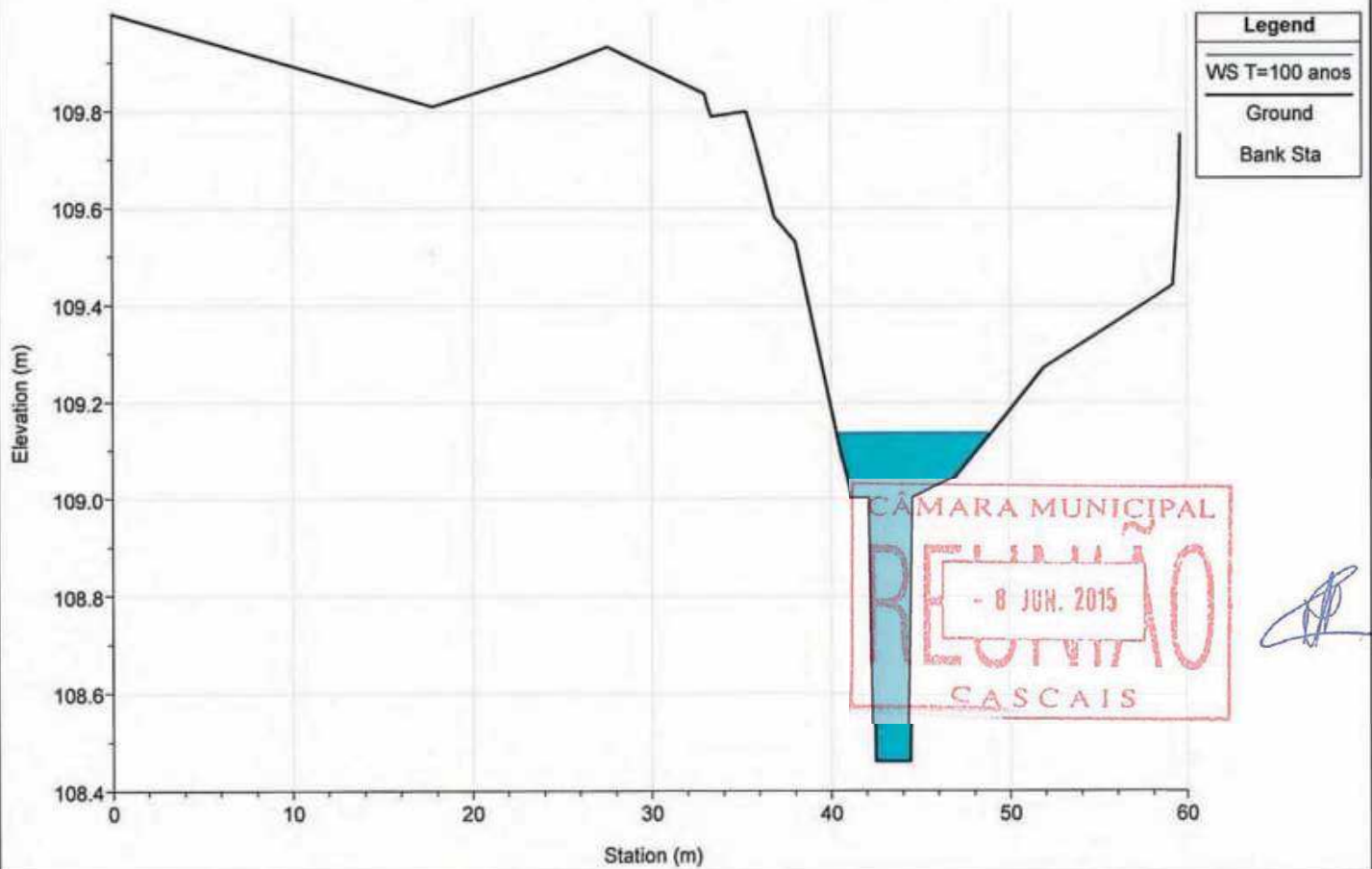


Legend
WS T=100 anos
Ground
Bank Sta

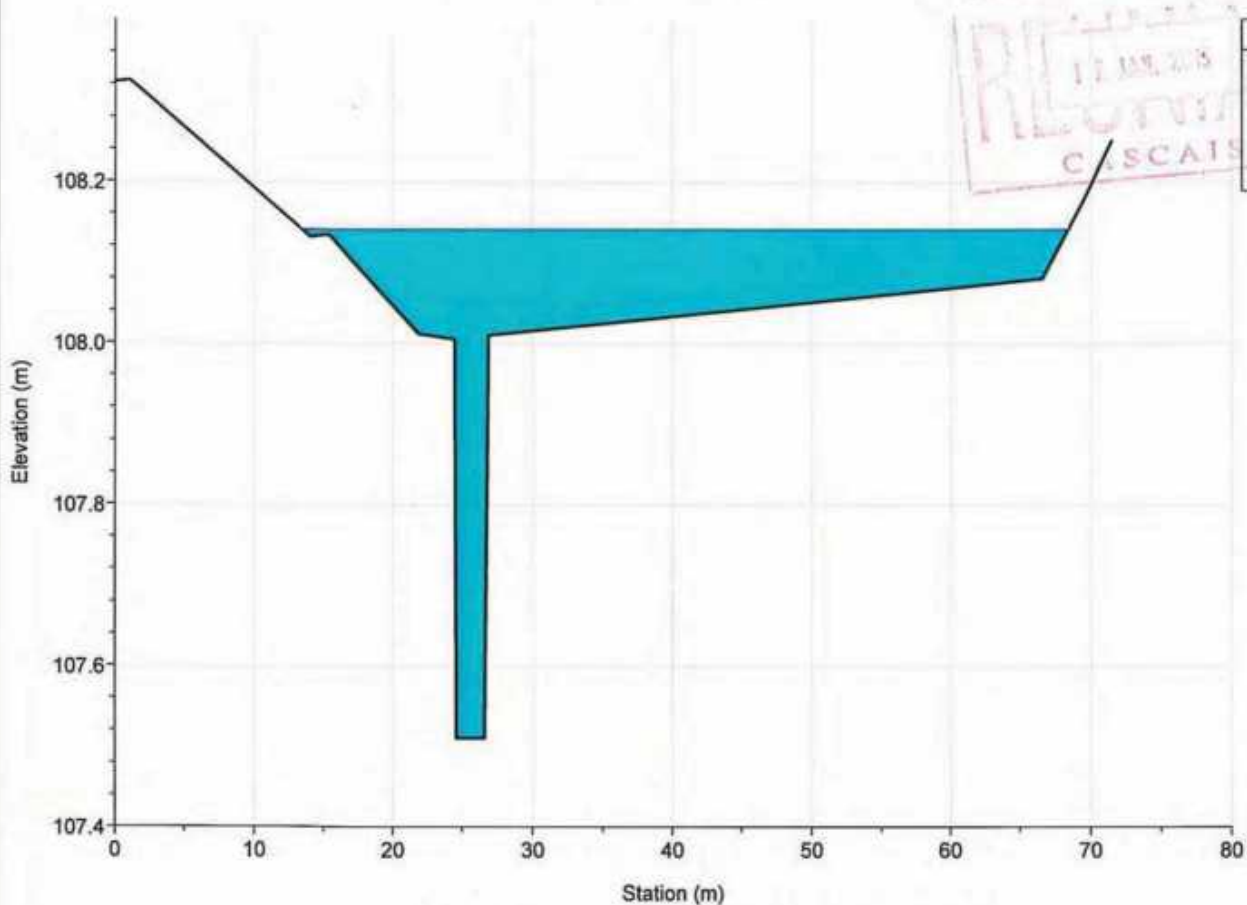
River = ME1 Reach = afluente RS = 243.160



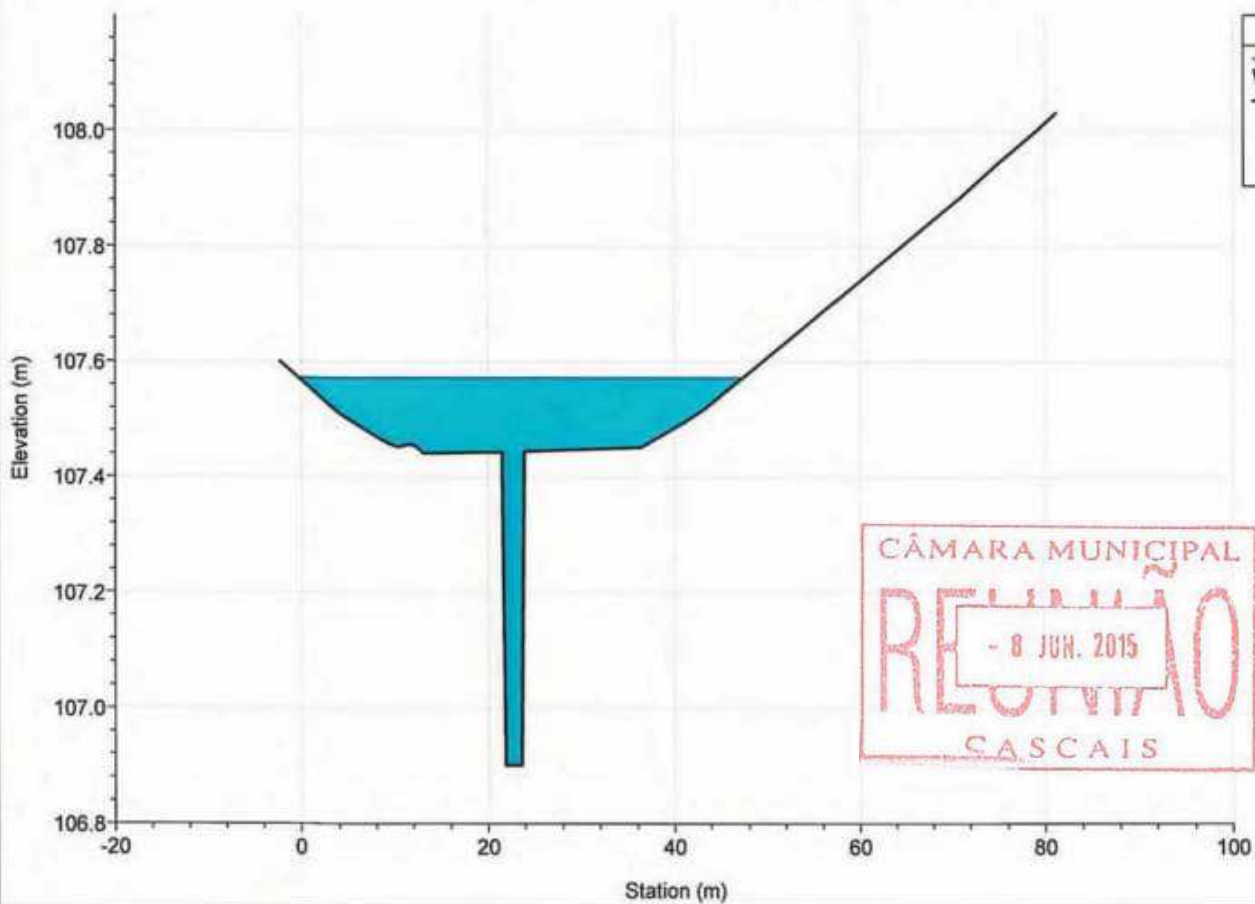
River = ME1 Reach = afluente RS = 161.400



River = ME1 Reach = afluente RS = 64.701

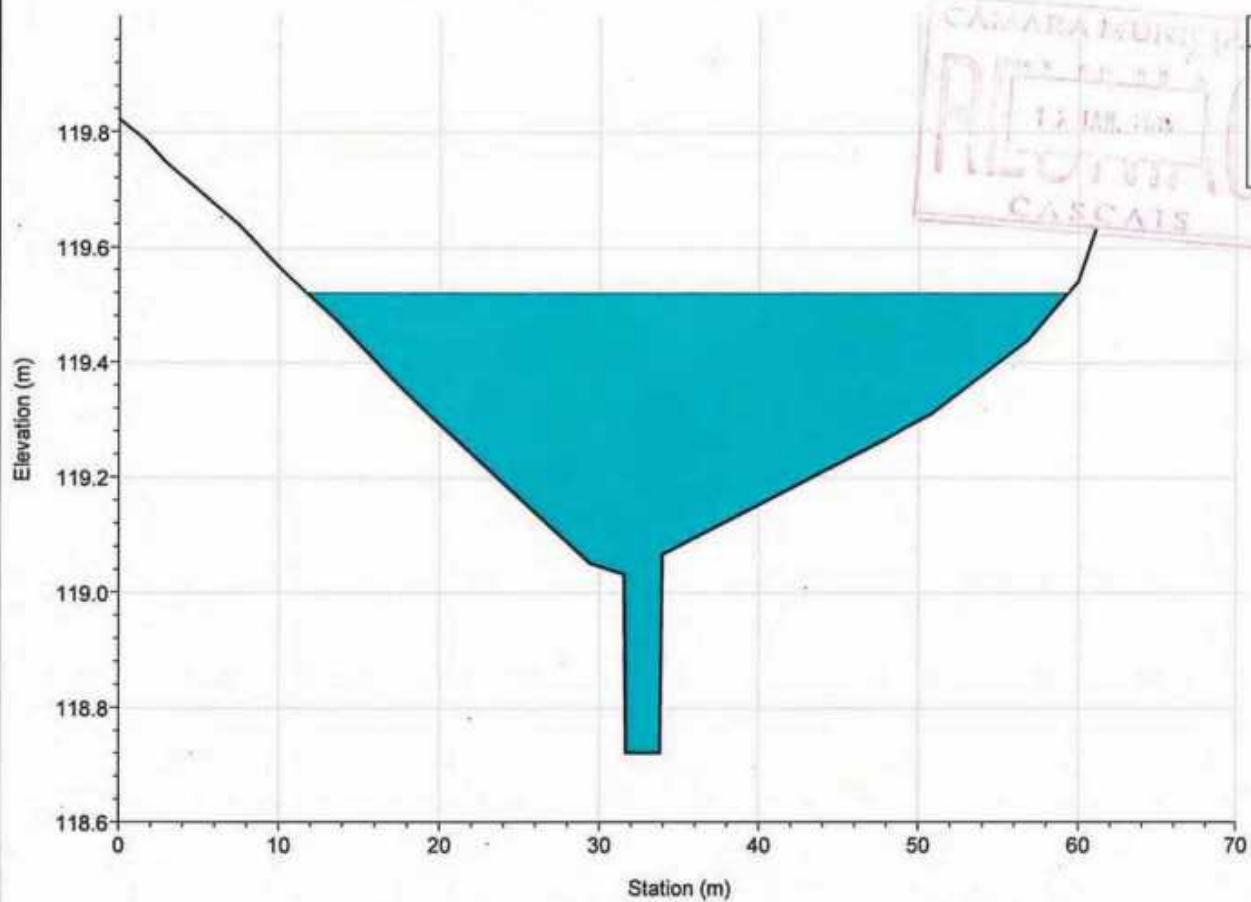


River = ME1 Reach = afluente RS = 18.843

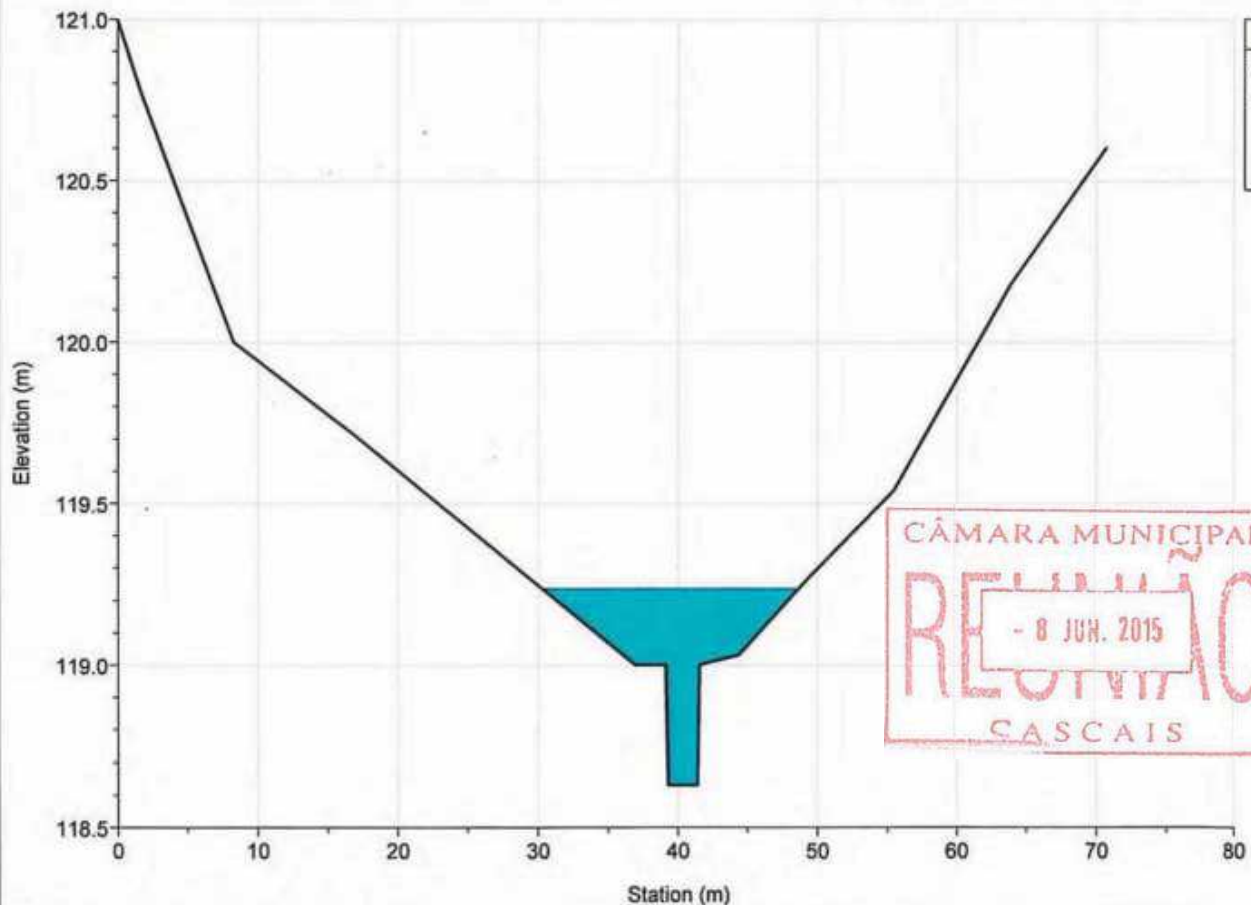




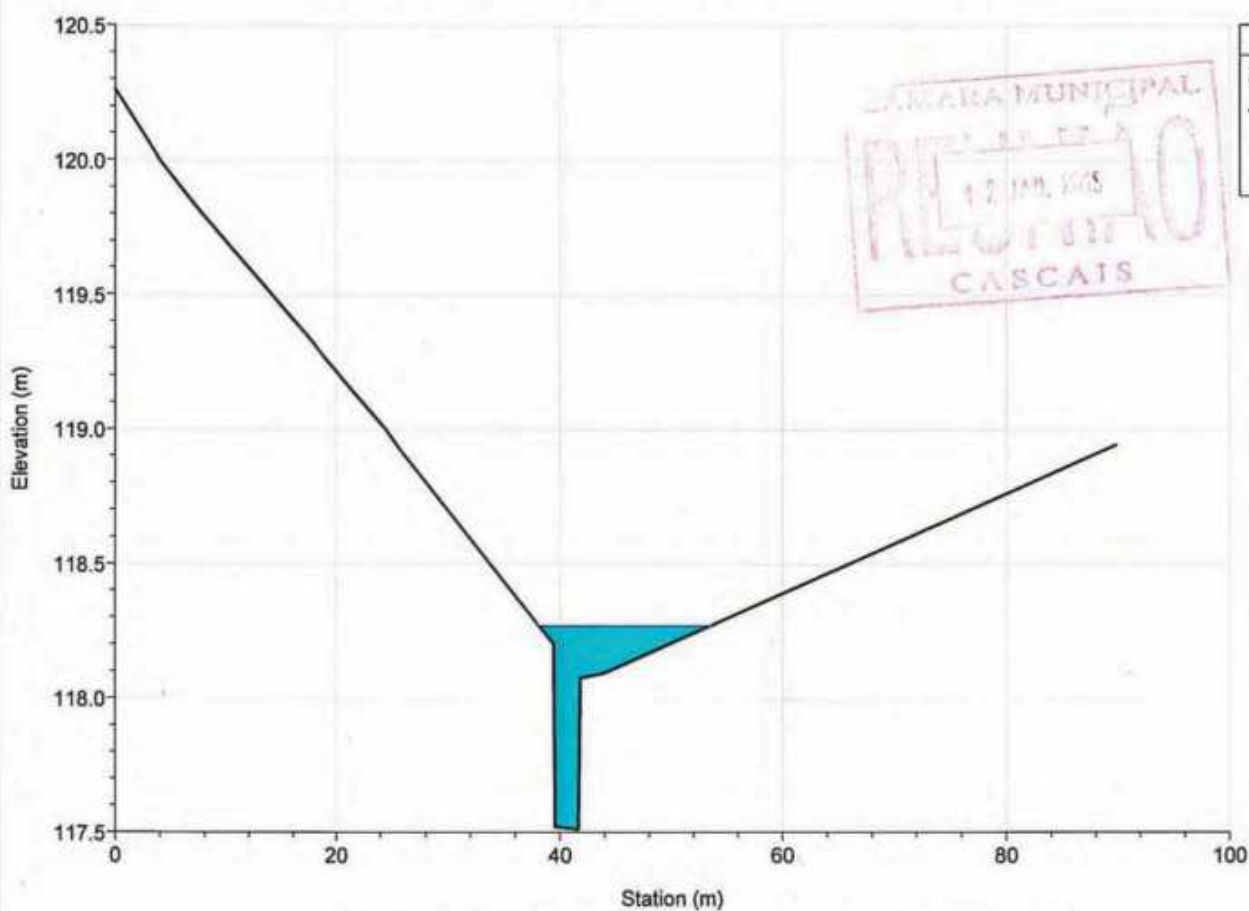
River = SASSOEIROS Reach = montante RS = 7976.135



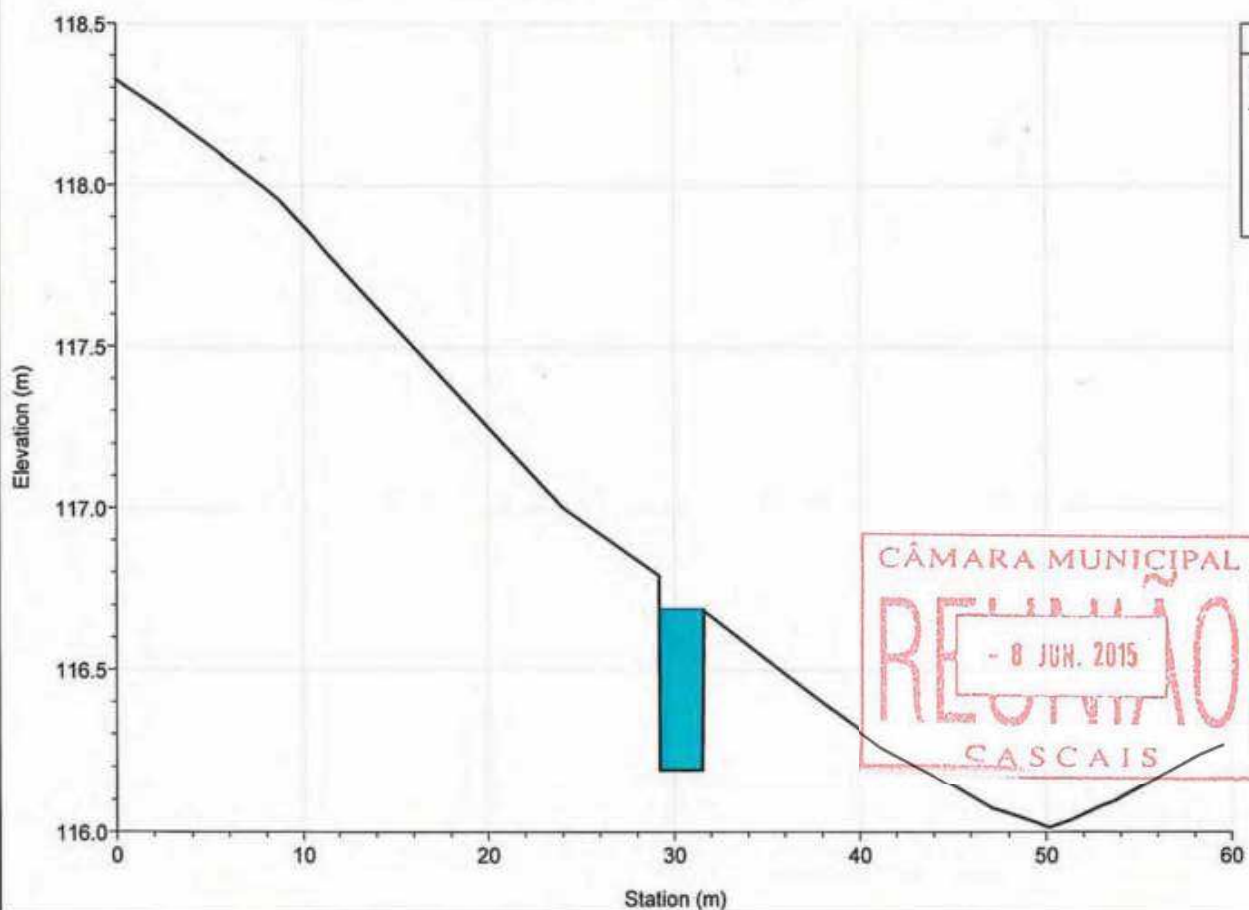
River = SASSOEIROS Reach = montante RS = 7889.715



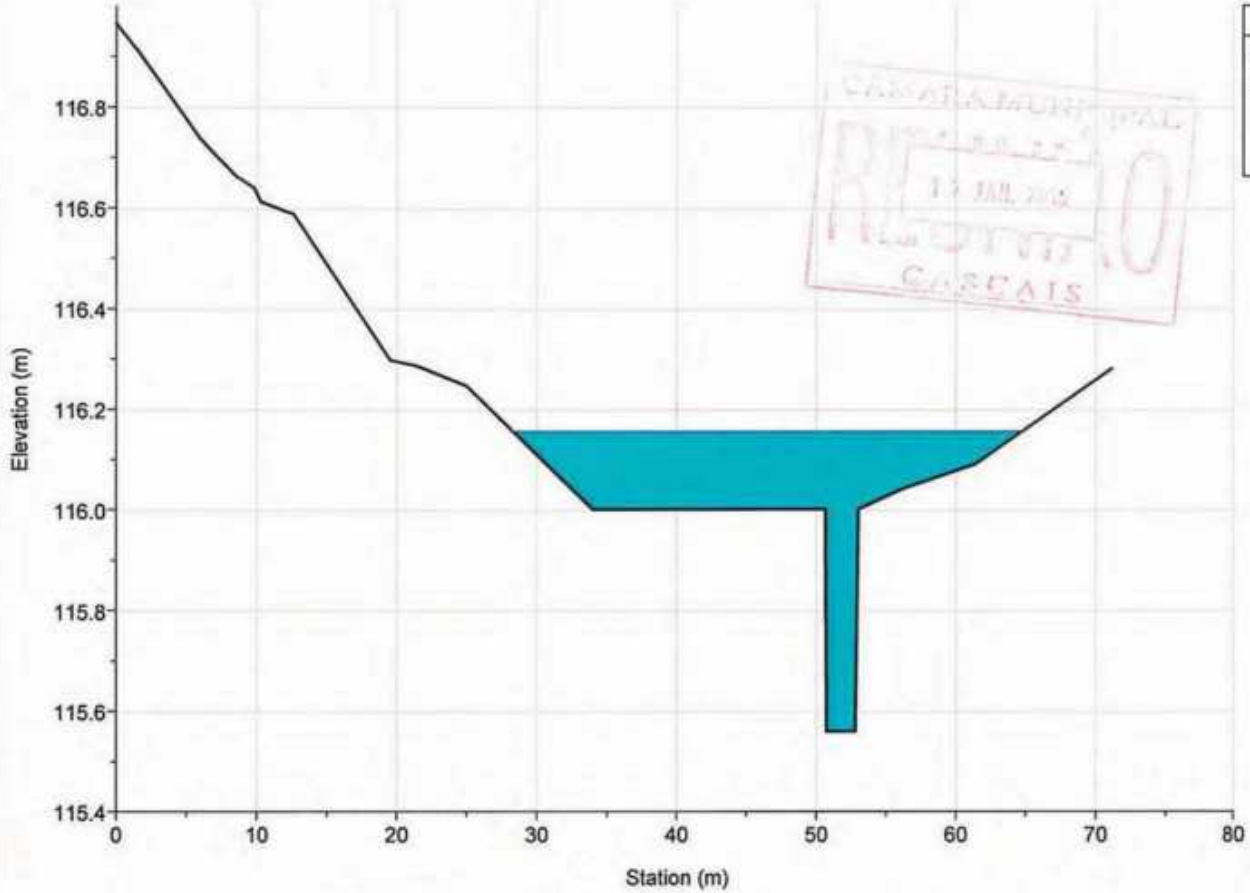
River = SASSOEIROS Reach = montante RS = 7795.412



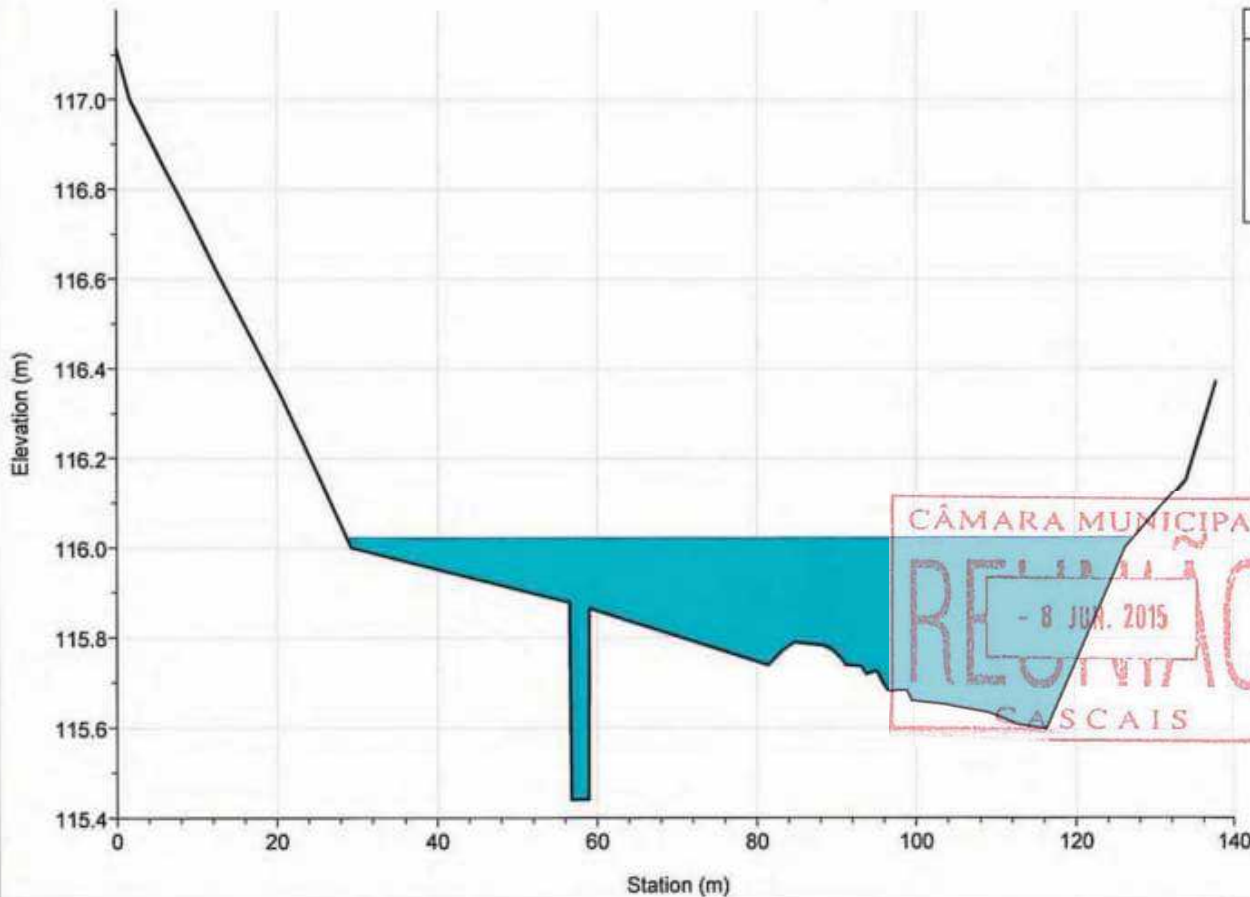
River = SASSOEIROS Reach = montante RS = 7707.524



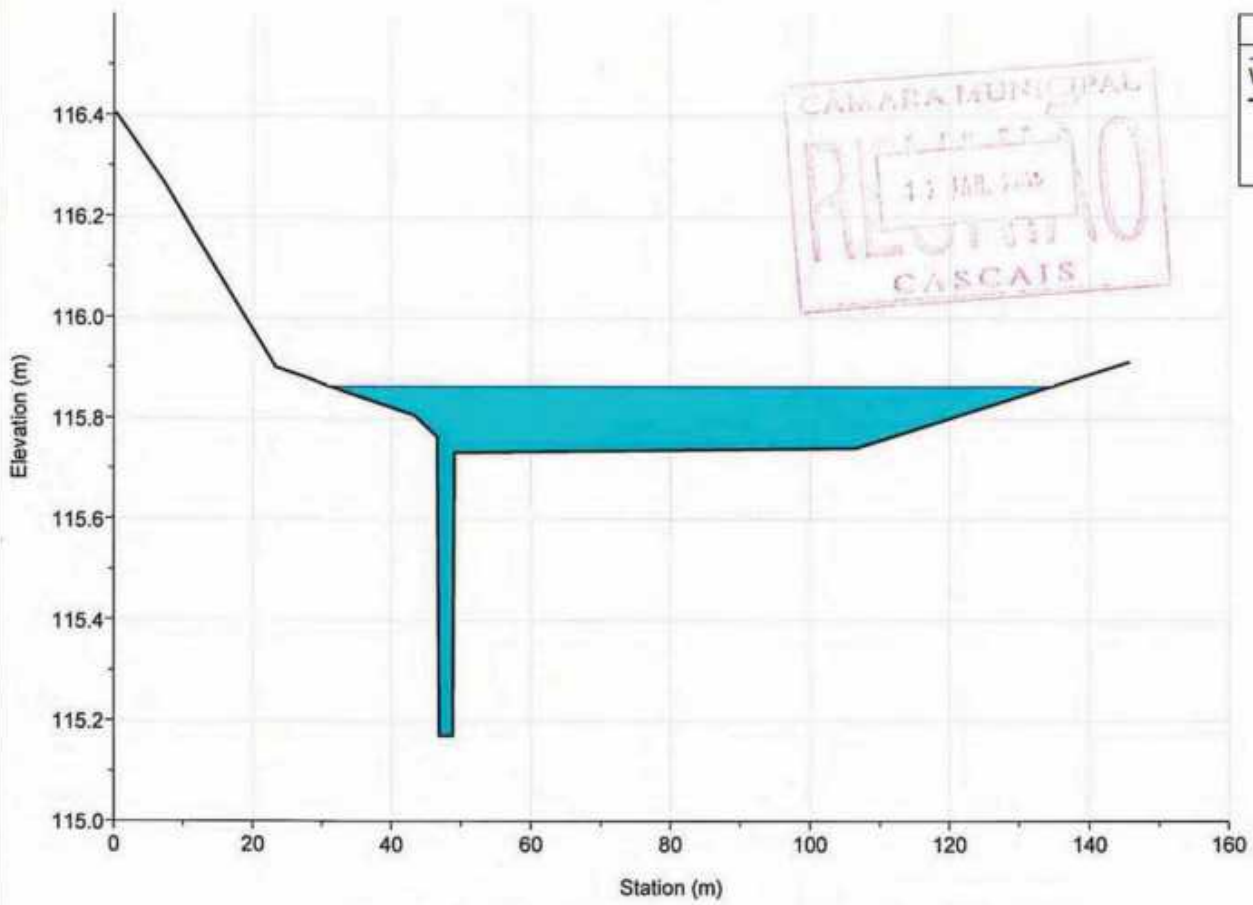
River = SASSOEIROS Reach = montante RS = 7610.221



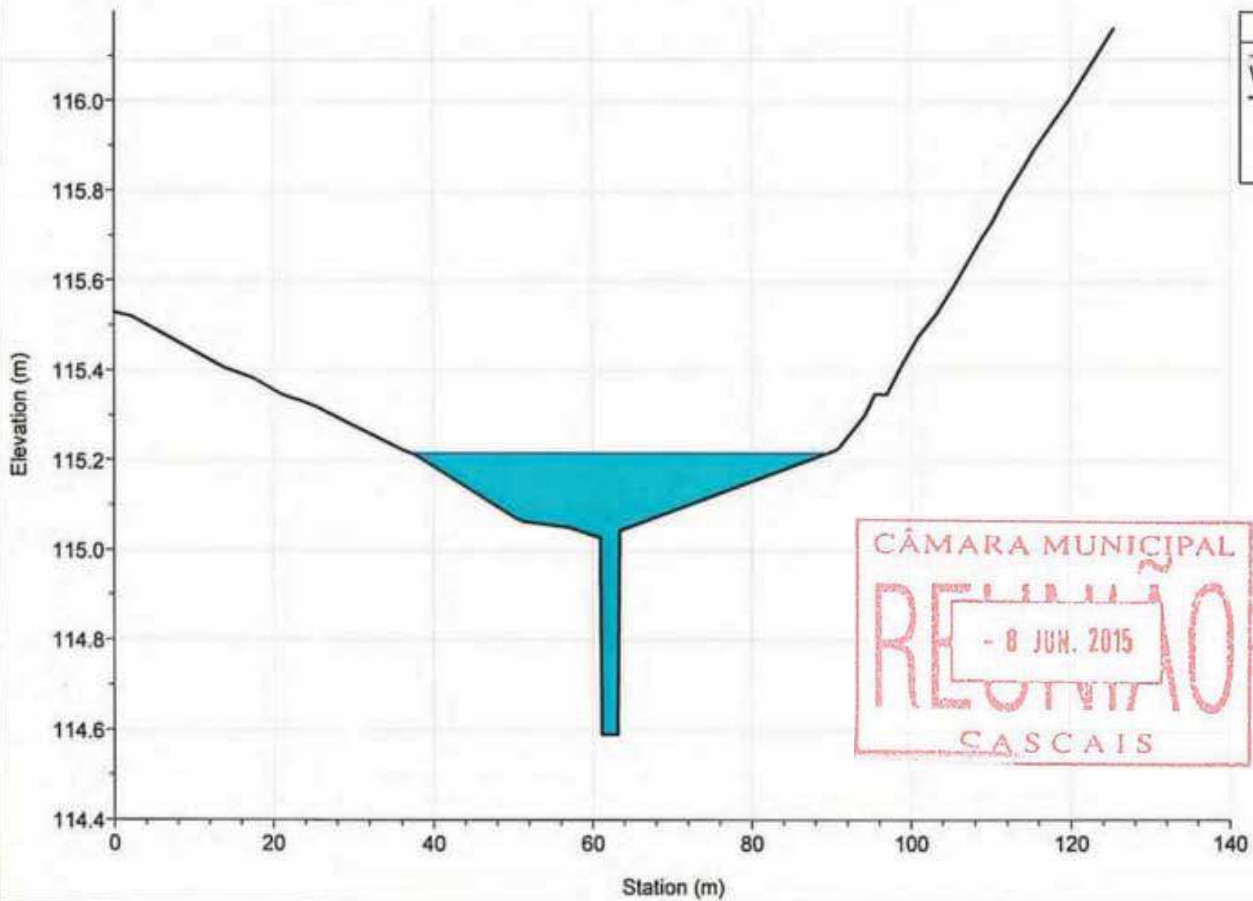
River = SASSOEIROS Reach = montante RS = 7490.648



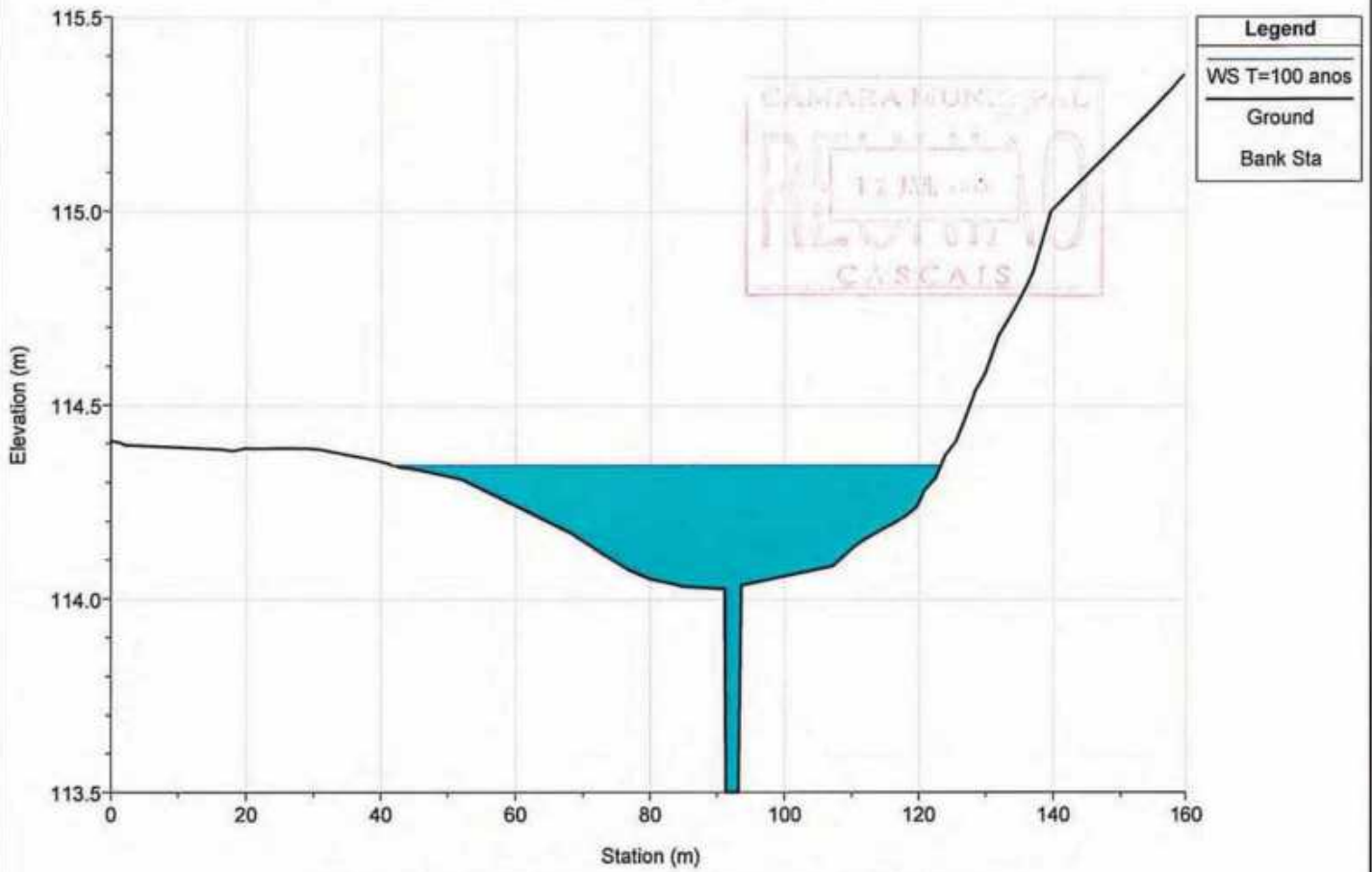
River = SASSOEIROS Reach = montante RS = 7355.014



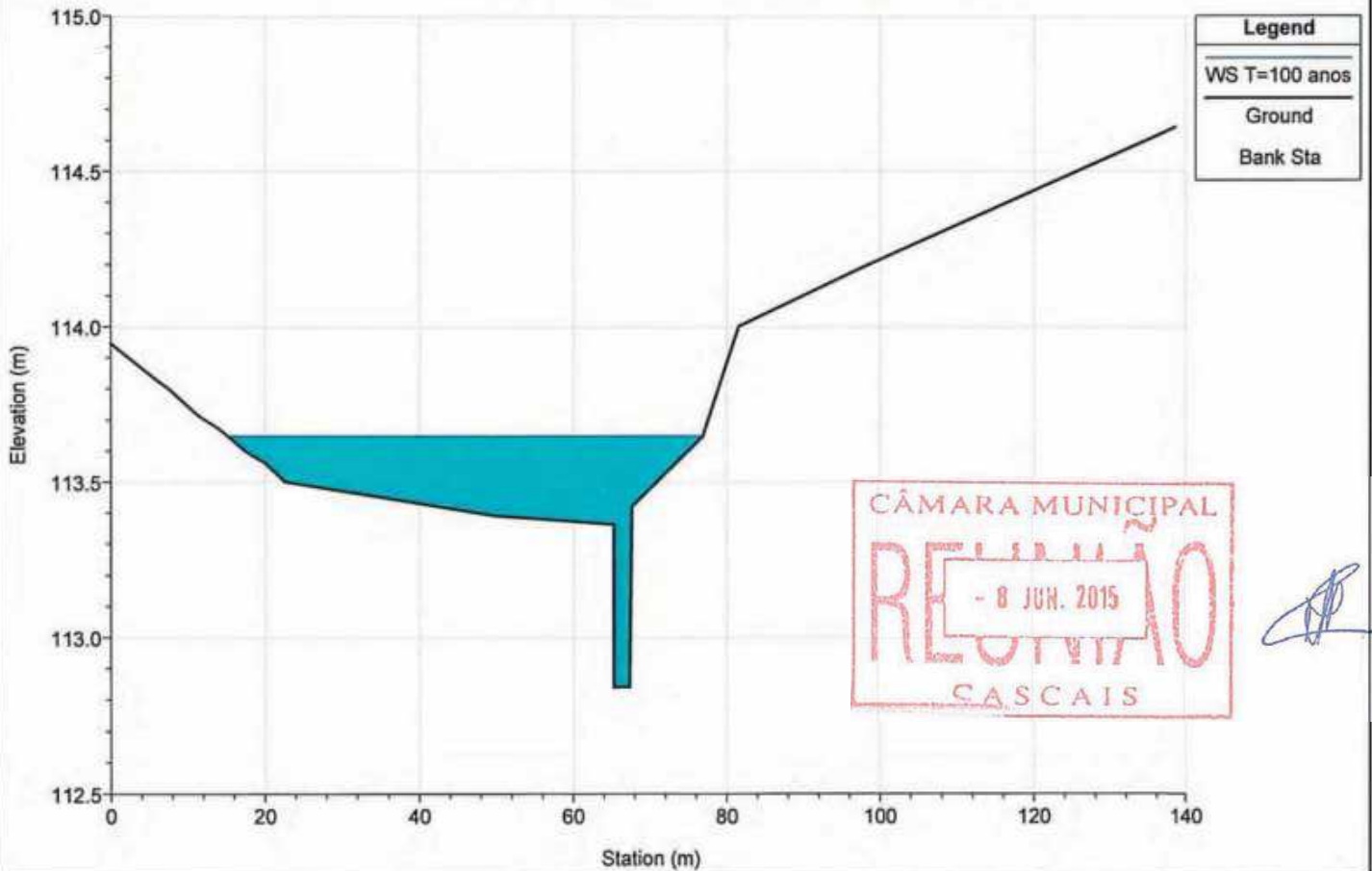
River = SASSOEIROS Reach = montante RS = 7222.037



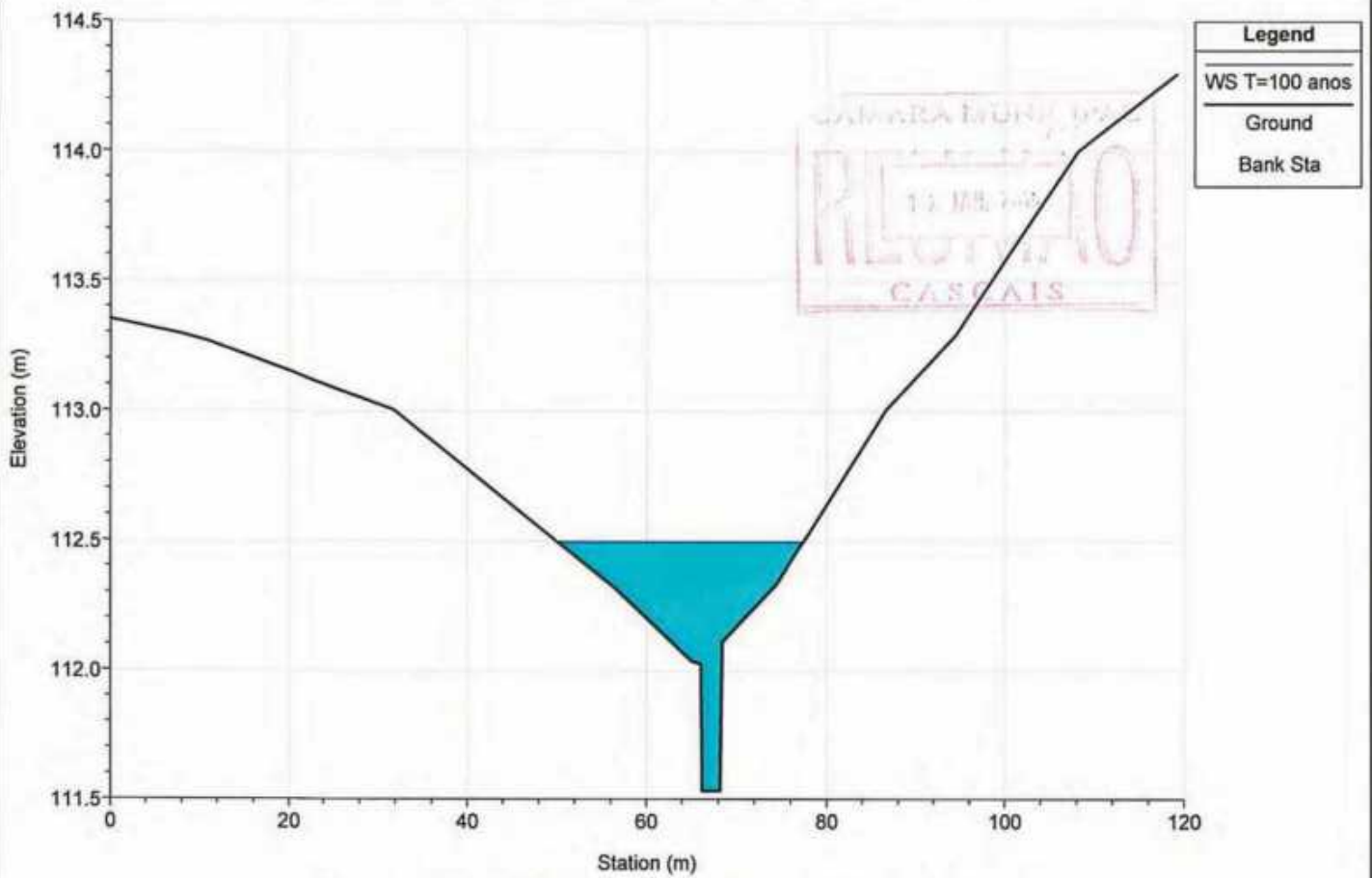
River = SASSOEIROS Reach = montante RS = 7092.028



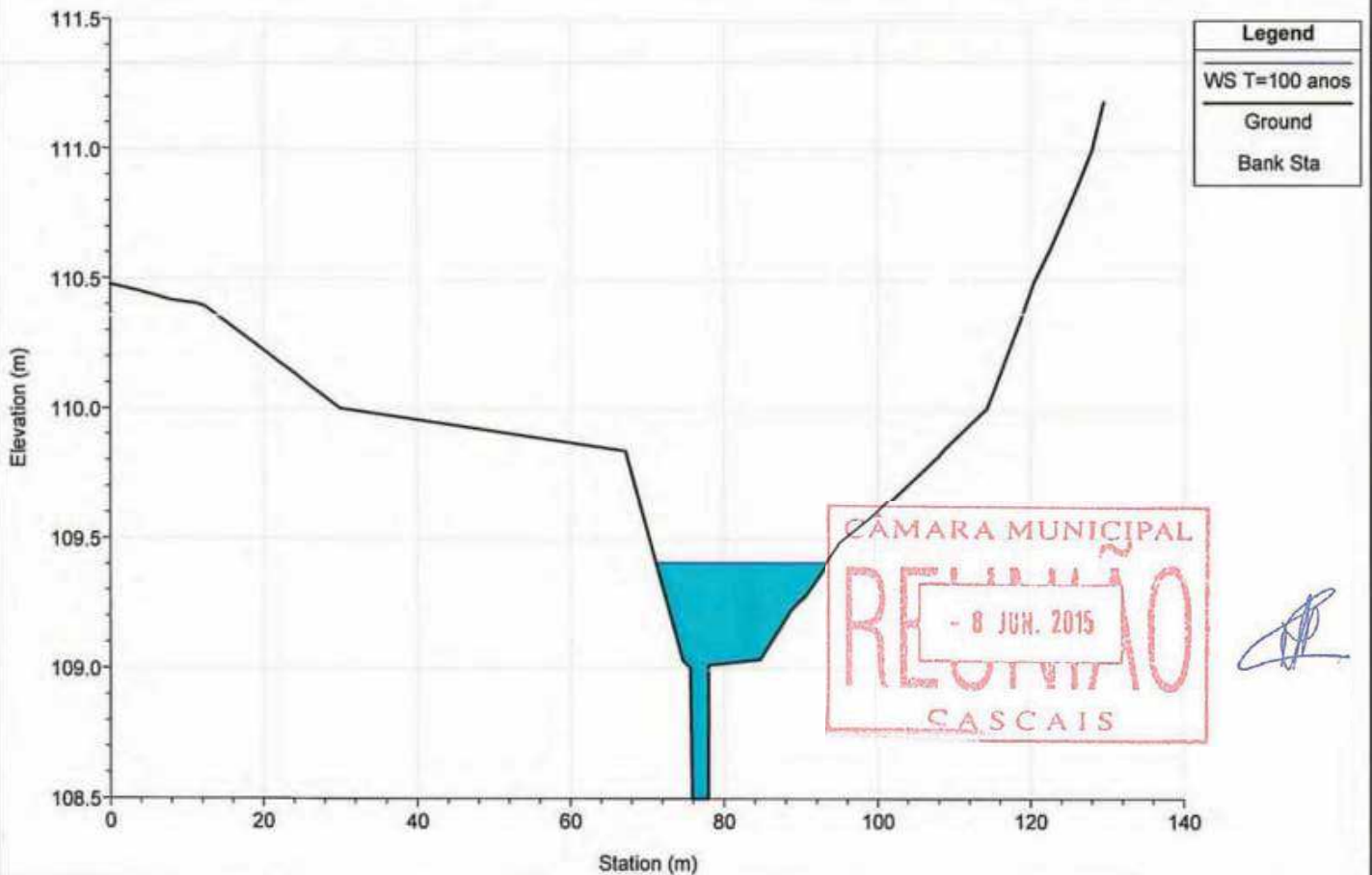
River = SASSOEIROS Reach = montante RS = 6973.218



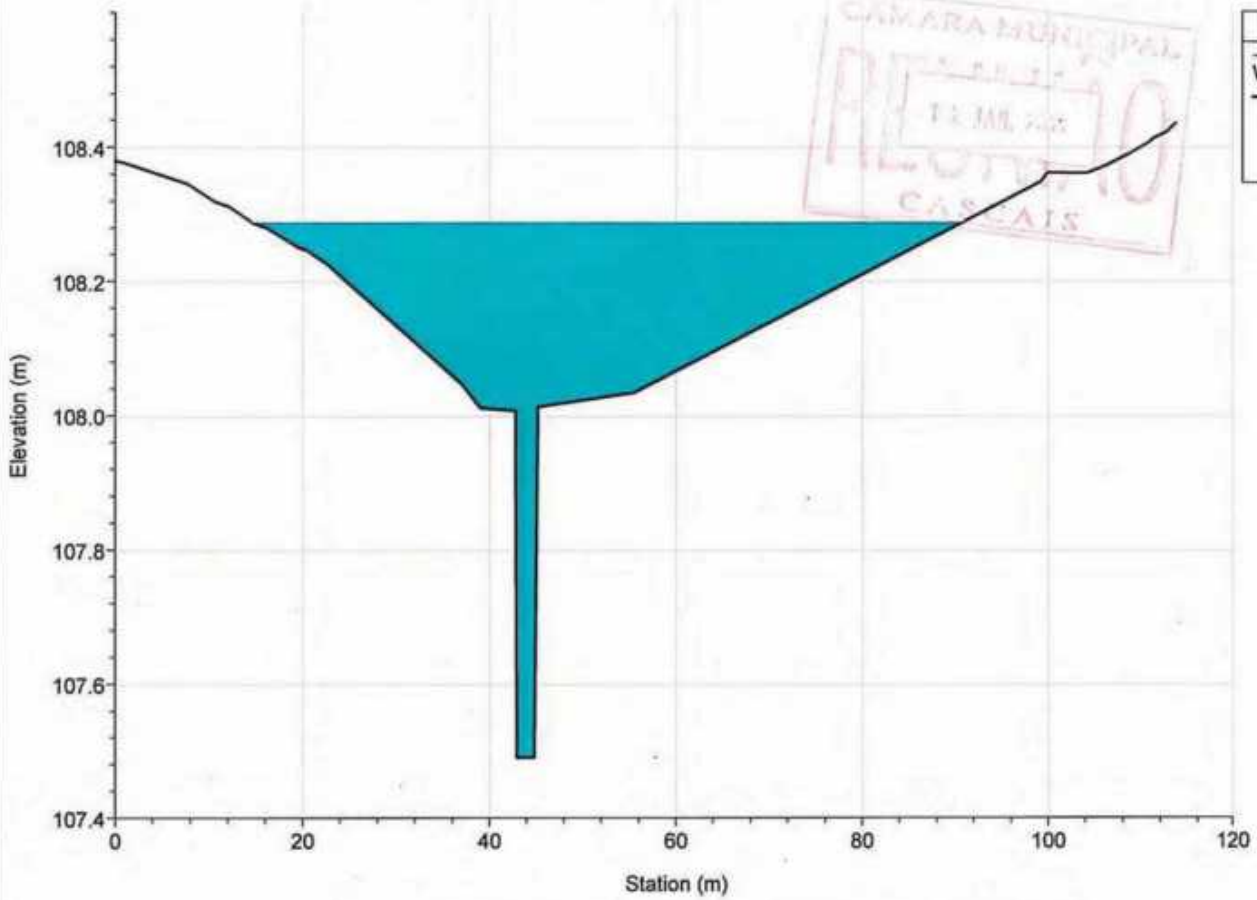
River = SASSOEIROS Reach = montante RS = 6843.514



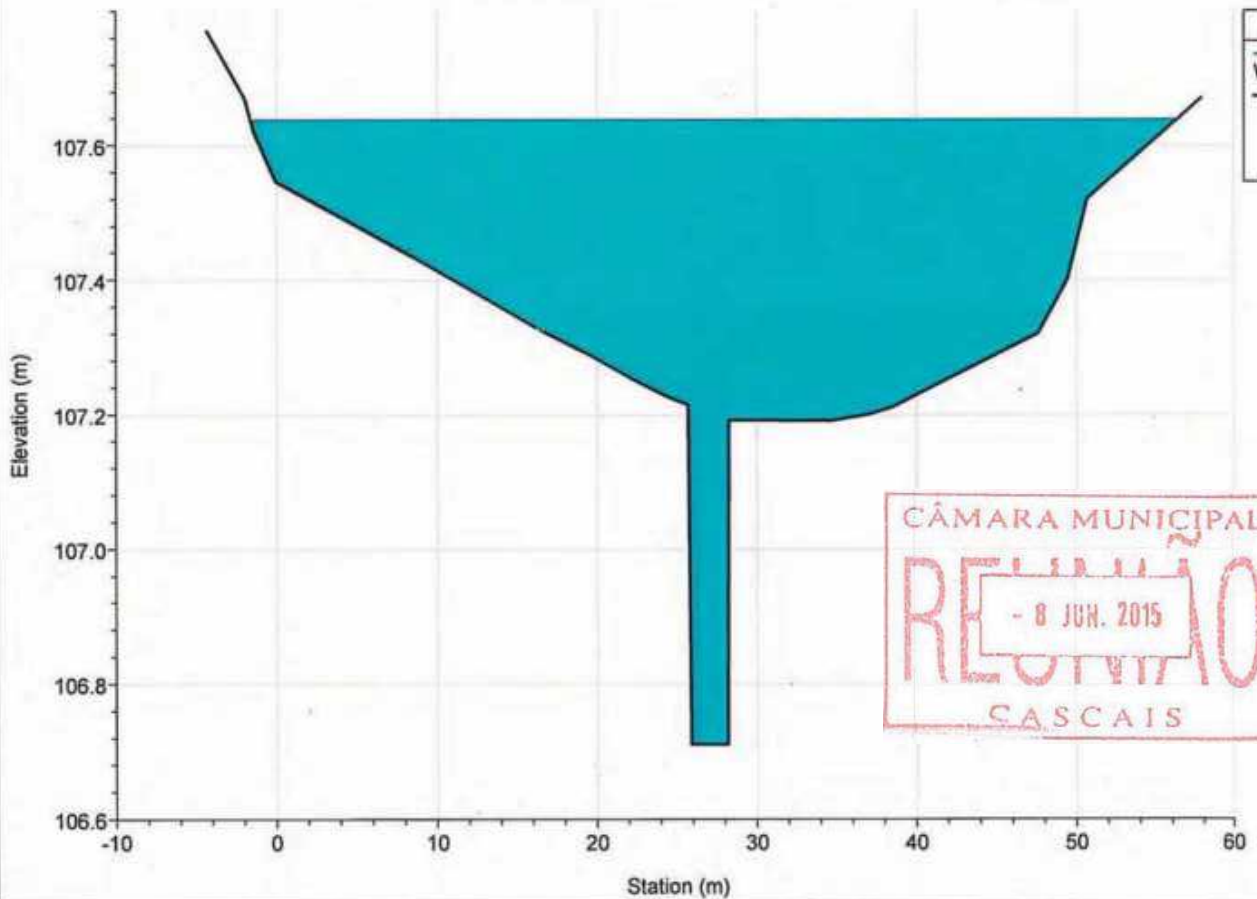
River = SASSOEIROS Reach = montante RS = 6676.379



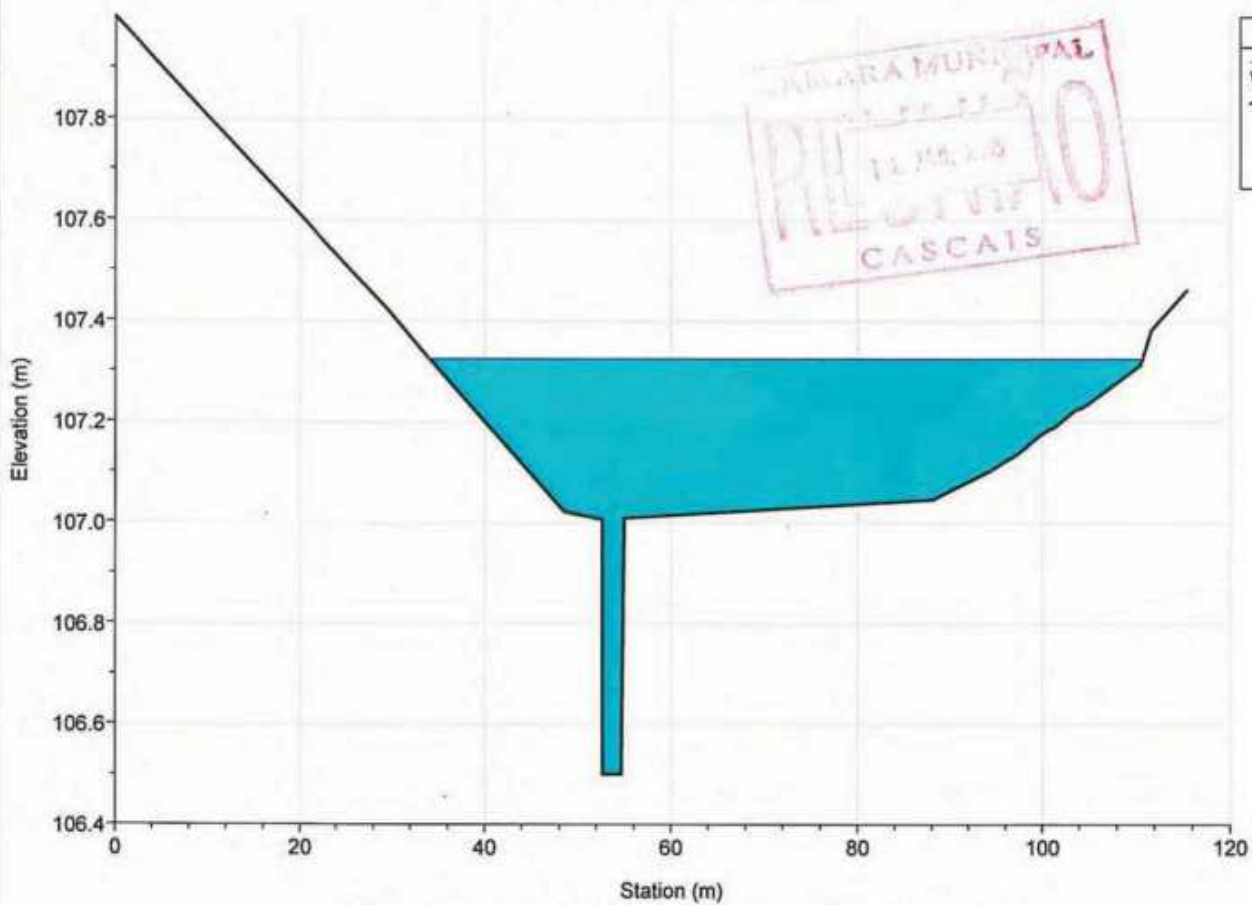
River = SASSOEIROS Reach = montante RS = 6552.446



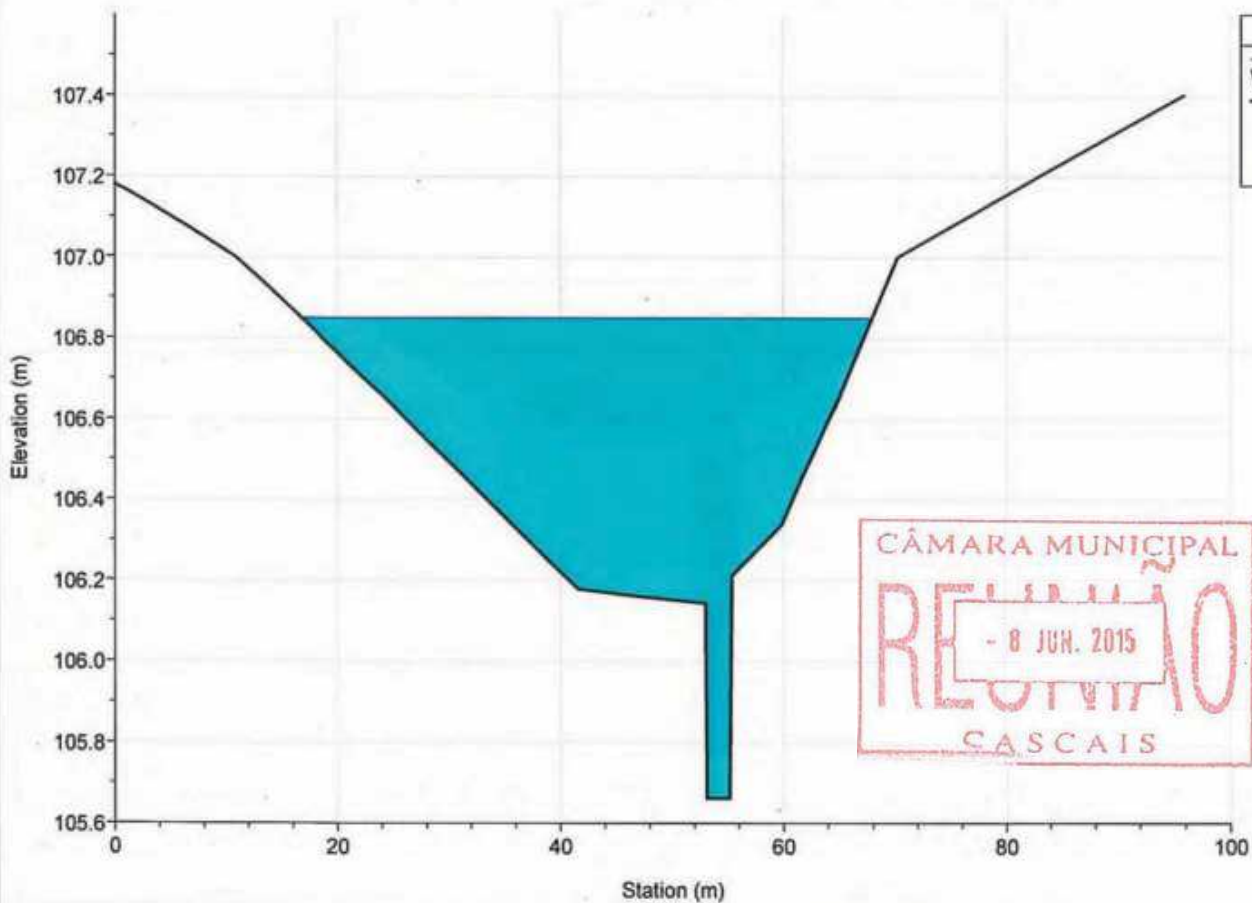
River = SASSOEIROS Reach = montante RS = 6487.185



River = SASSOEIROS Reach = jusante RS = 6448.366

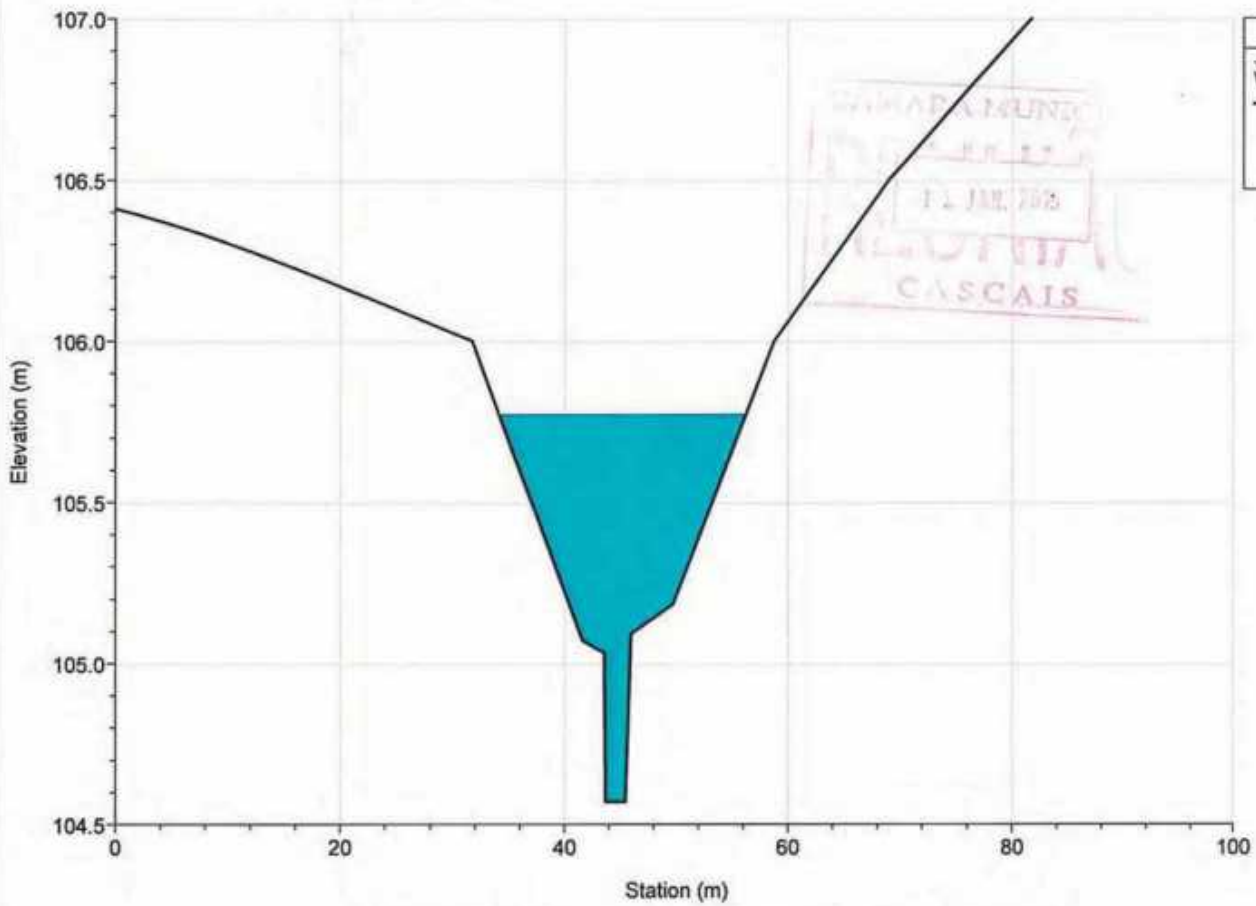


River = SASSOEIROS Reach = jusante RS = 6381.966

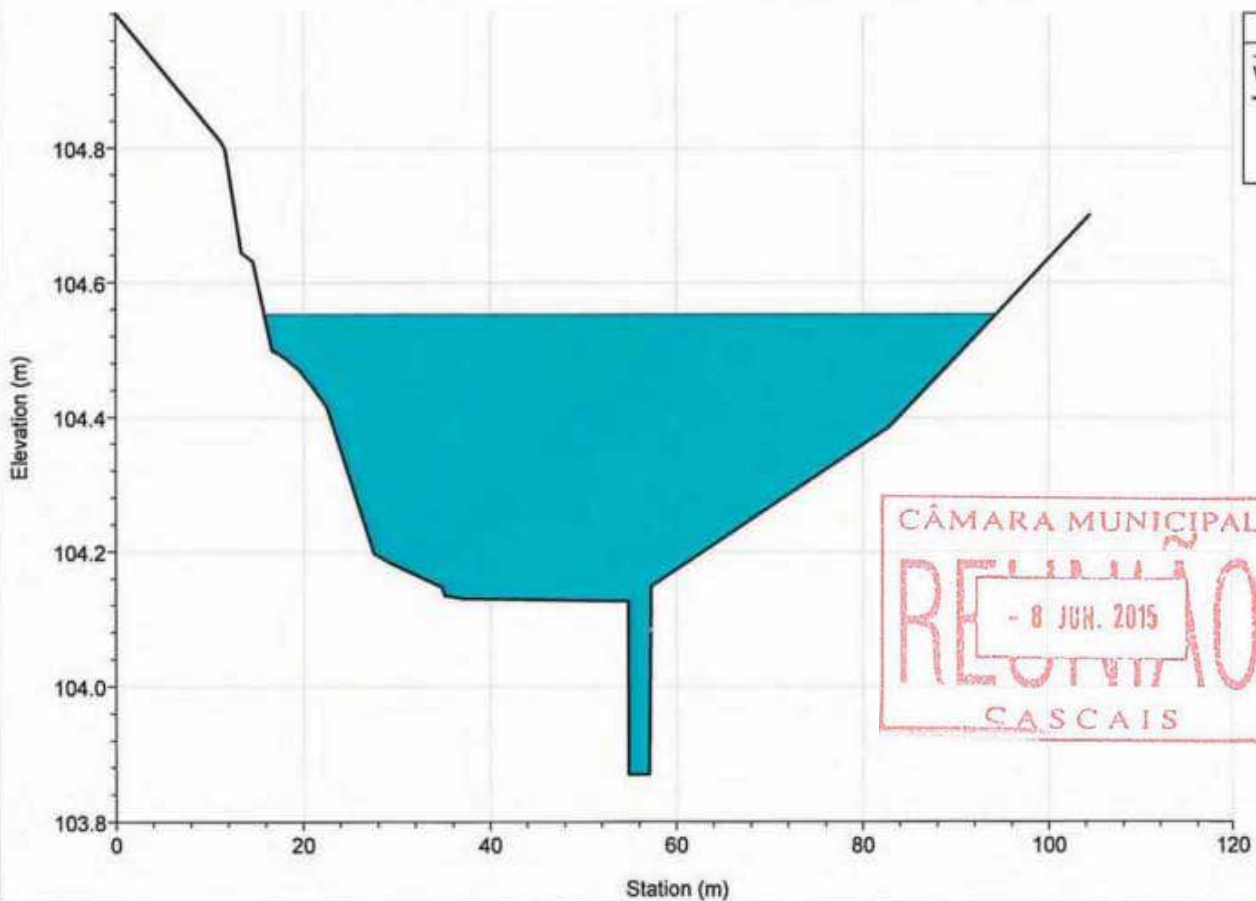




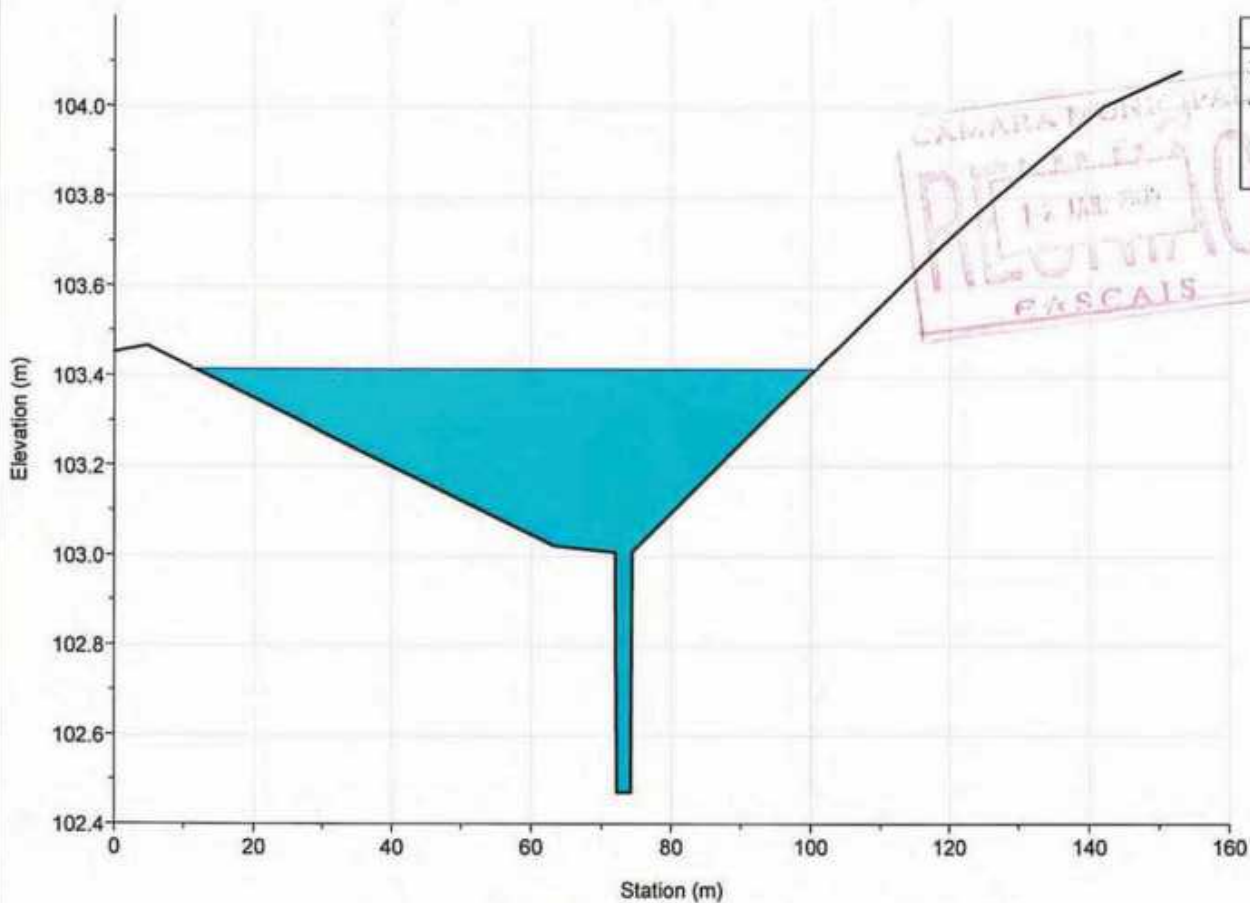
River = SASSOEIROS Reach = jusante RS = 6237.557



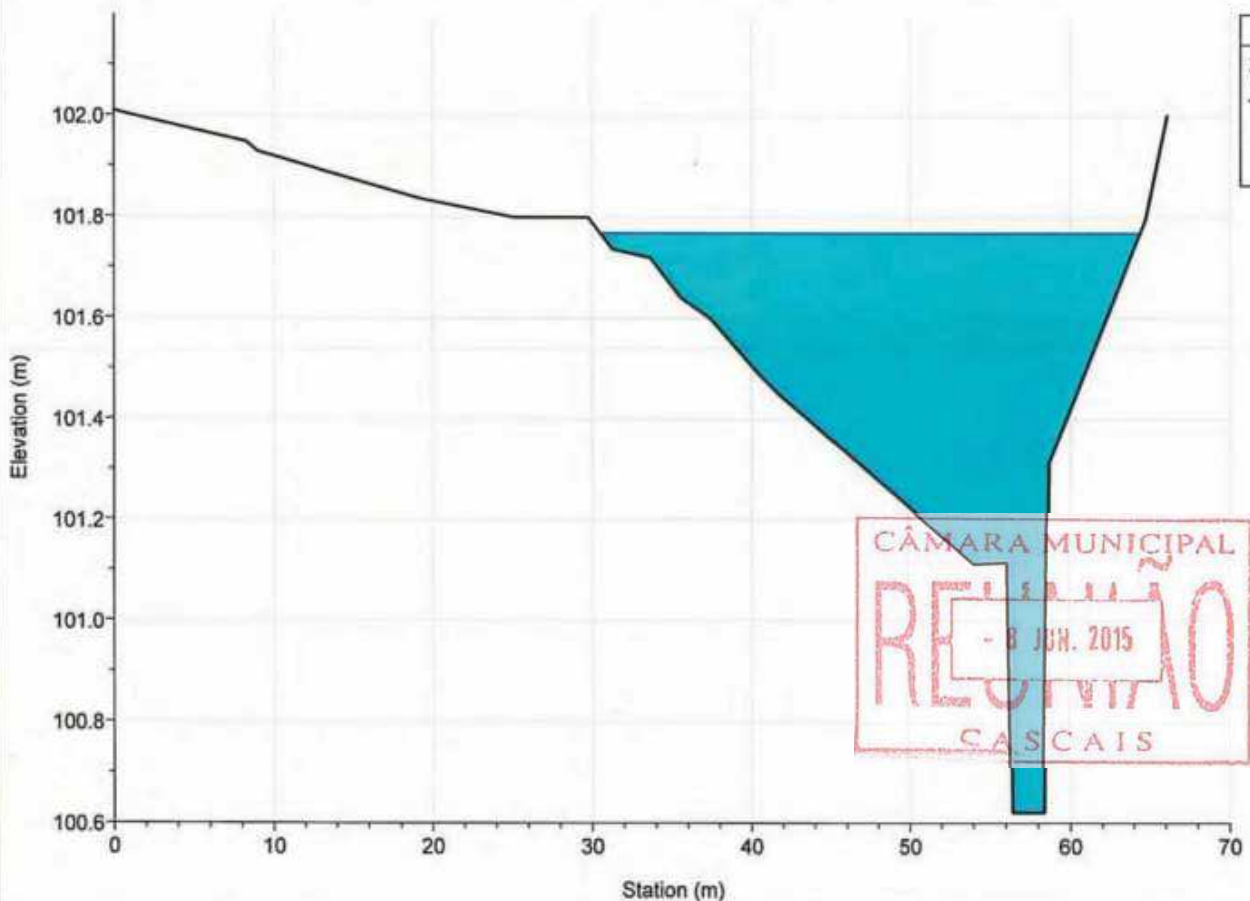
River = SASSOEIROS Reach = jusante RS = 6139.316



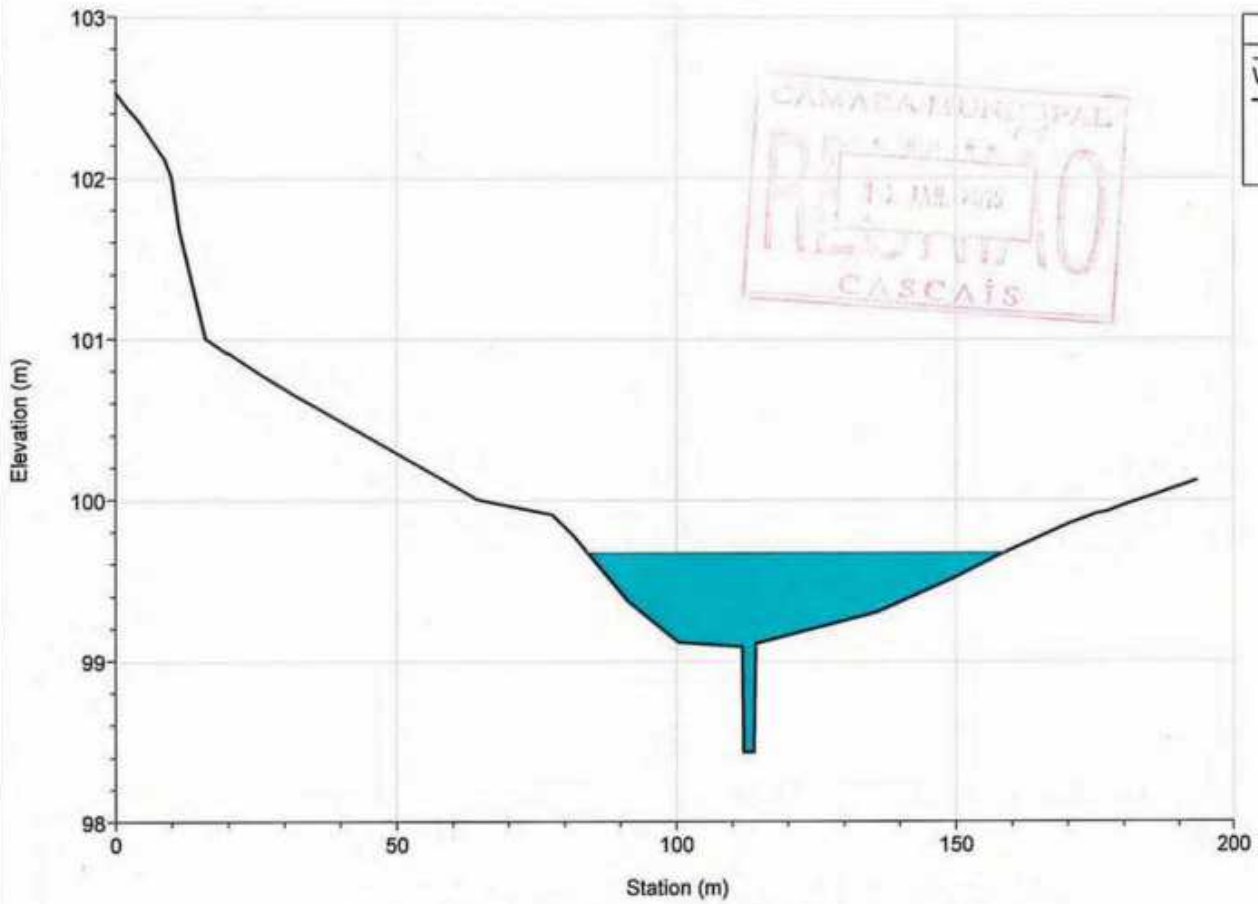
River = SASSOEIROS Reach = jusante RS = 6013.908



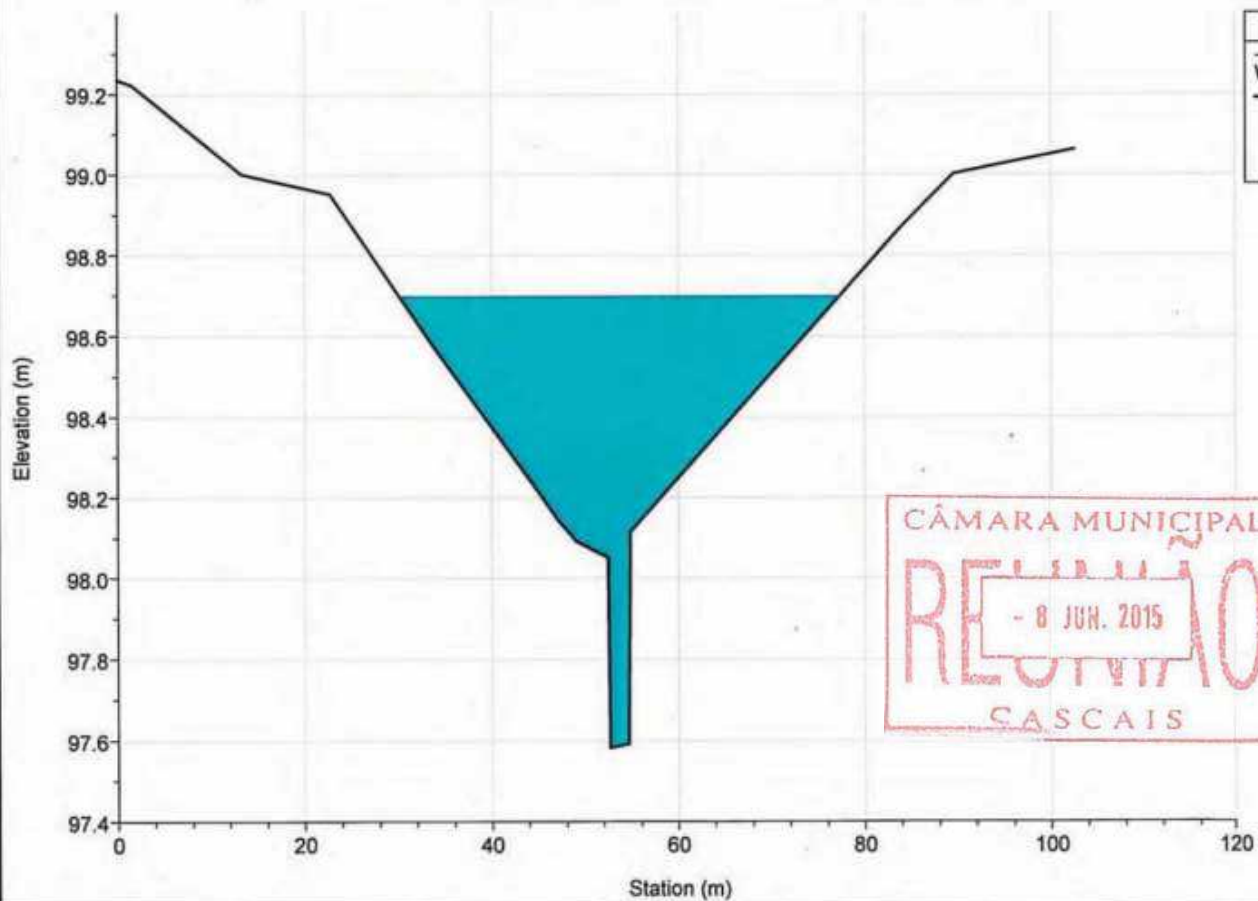
River = SASSOEIROS Reach = jusante RS = 5868.240



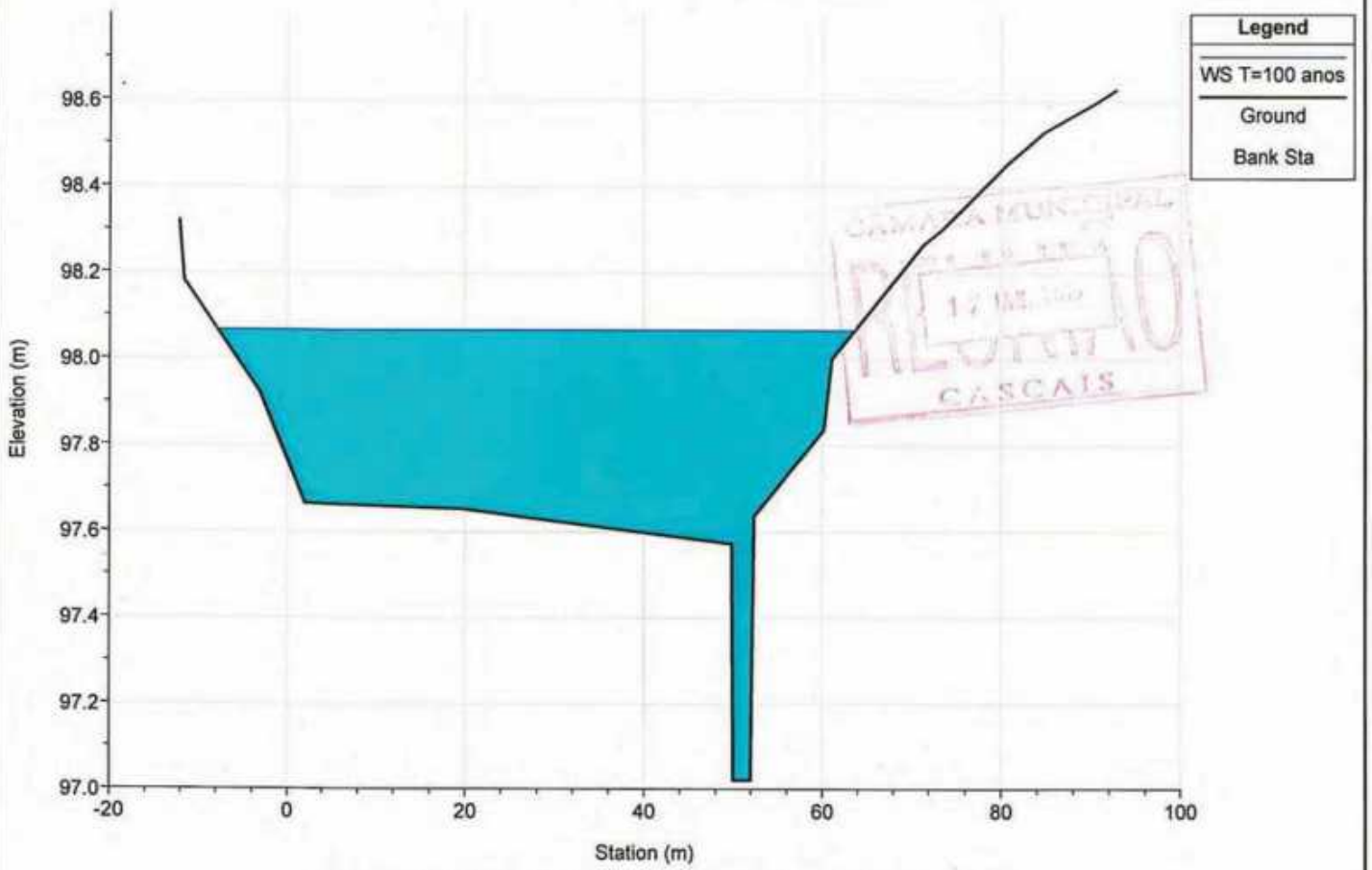
River = SASSOEIROS Reach = jusante RS = 5712.051



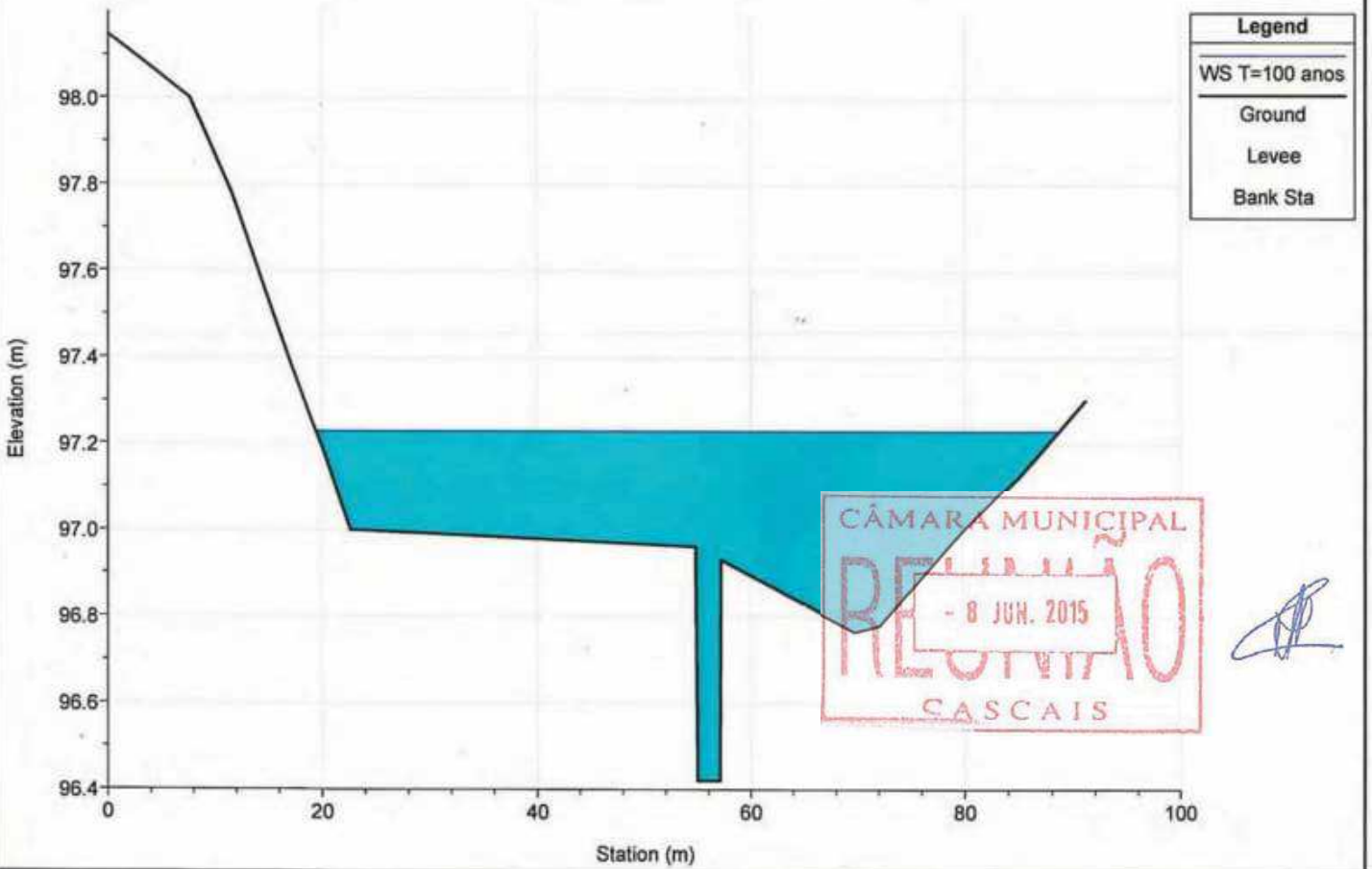
River = SASSOEIROS Reach = jusante RS = 5586.244



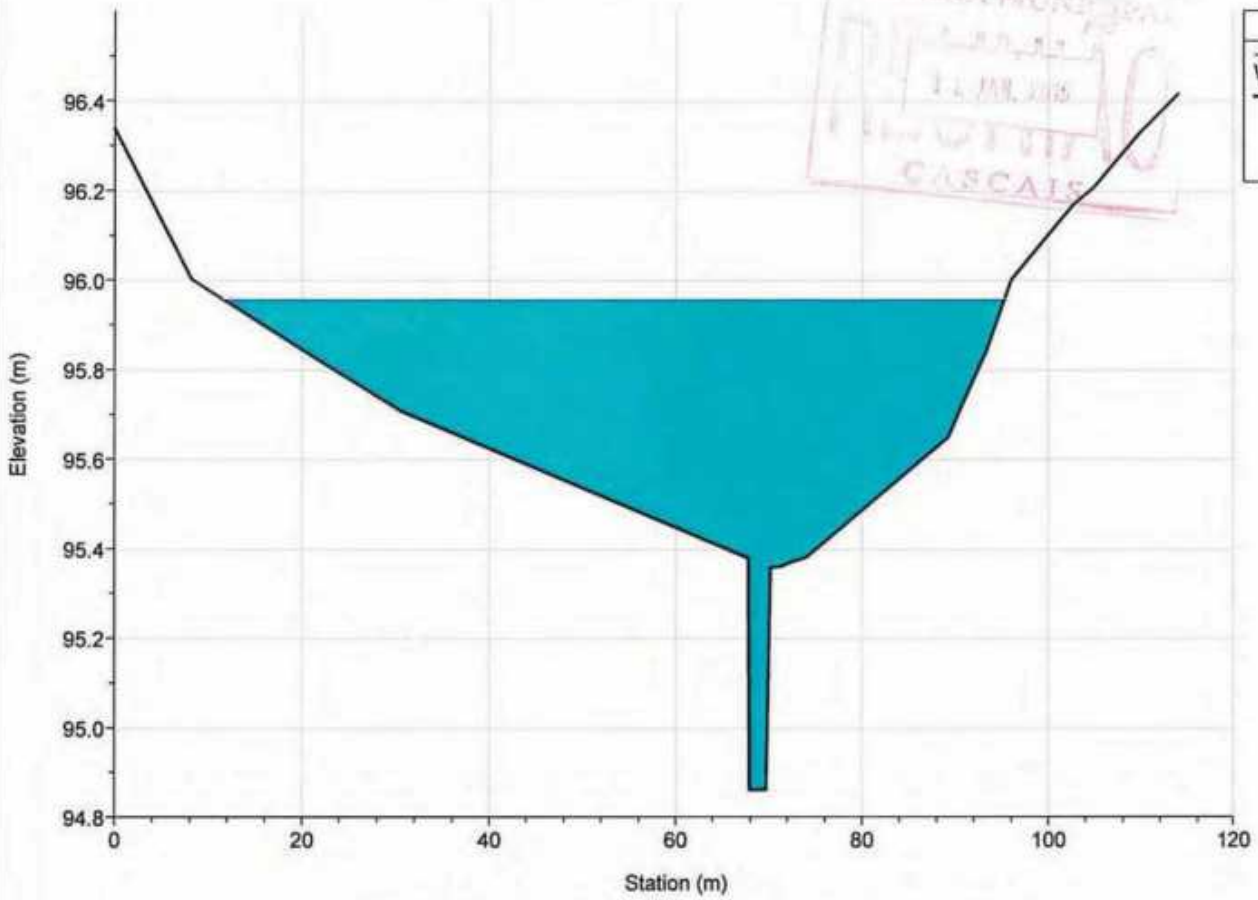
River = SASSOEIROS Reach = jusante RS = 5484.228



River = SASSOEIROS Reach = jusante RS = 5390.513

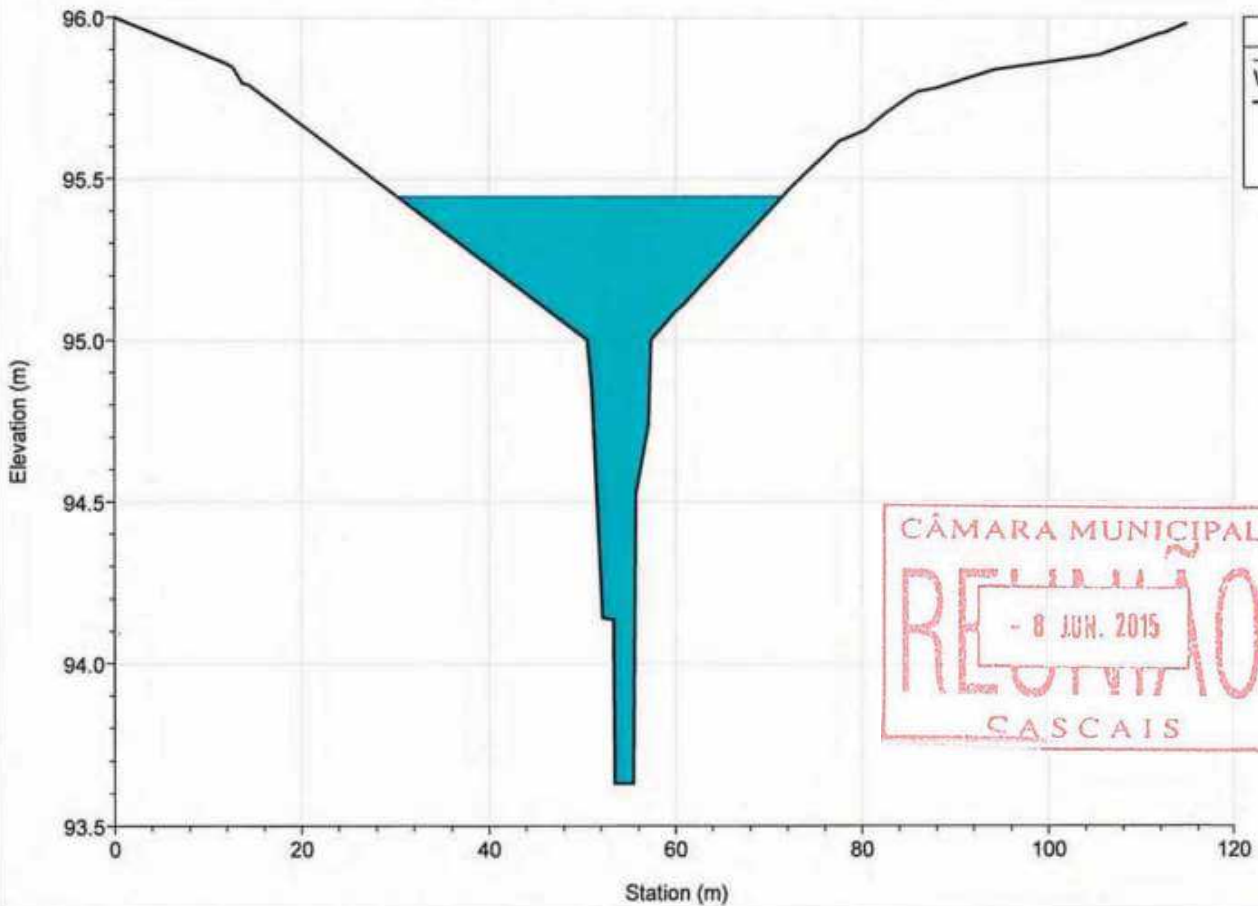


River = SASSOEIROS Reach = jusante RS = 5290.896



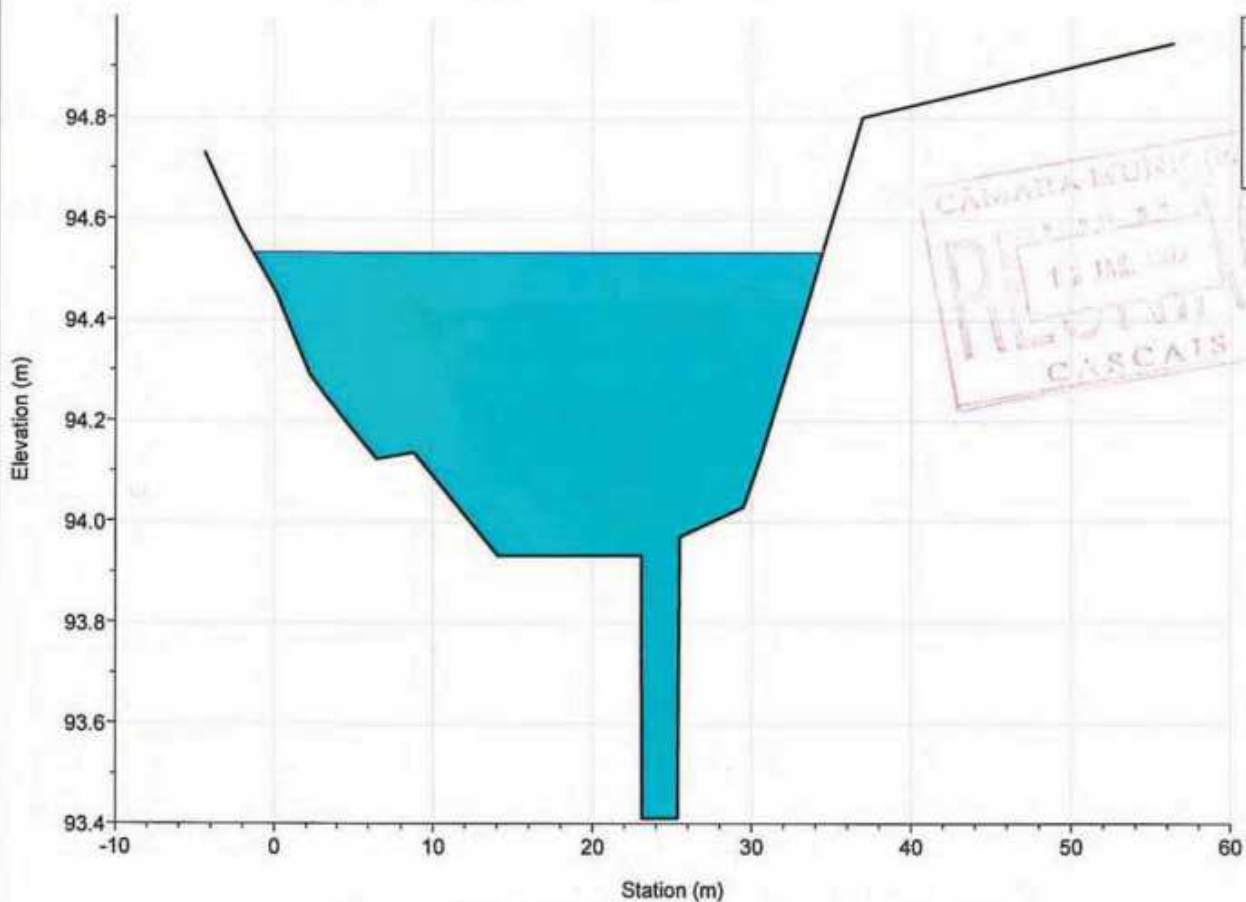
Legend	
WS T=100 anos	
Ground	
Bank Sta	

River = SASSOEIROS Reach = jusante RS = 5235.694

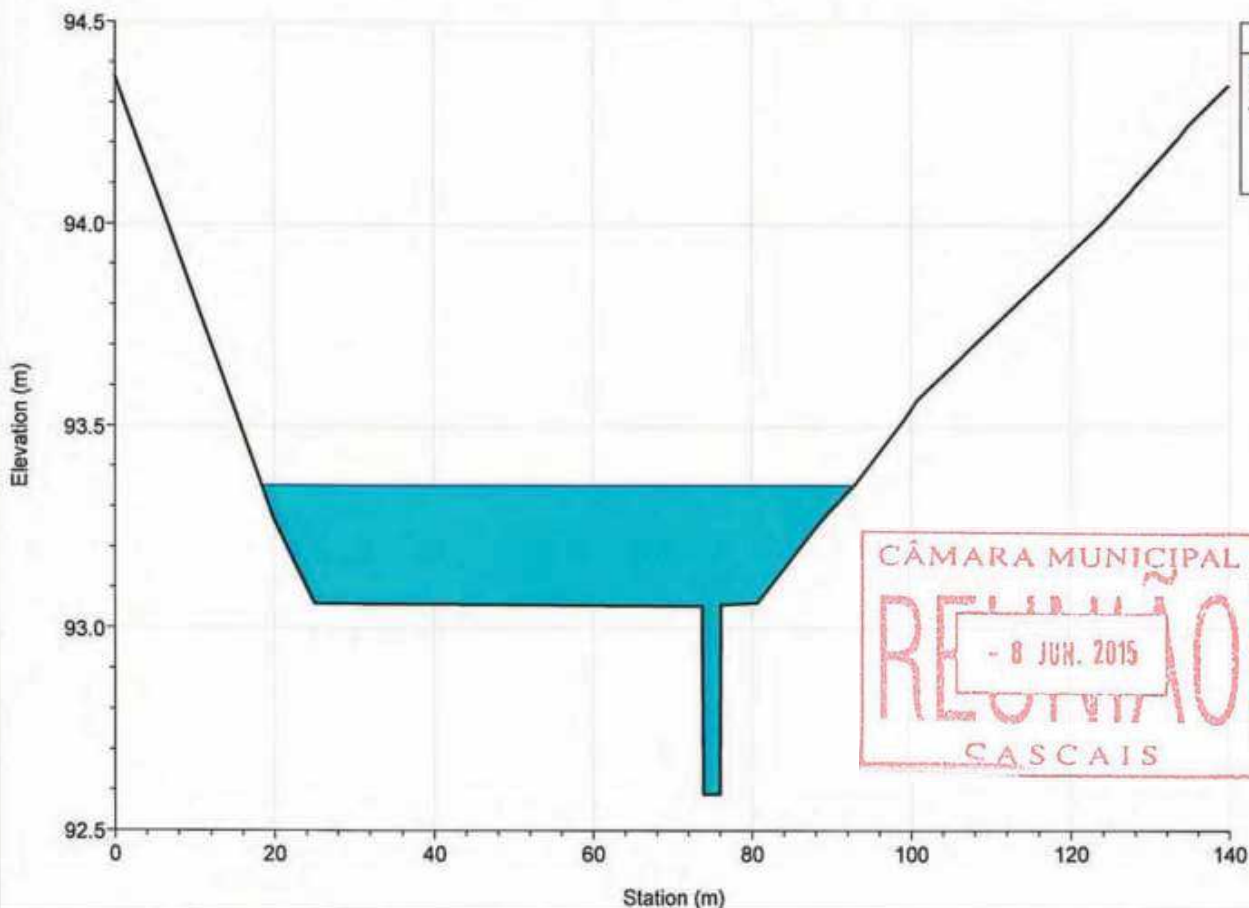


Legend	
WS T=100 anos	
Ground	
Bank Sta	

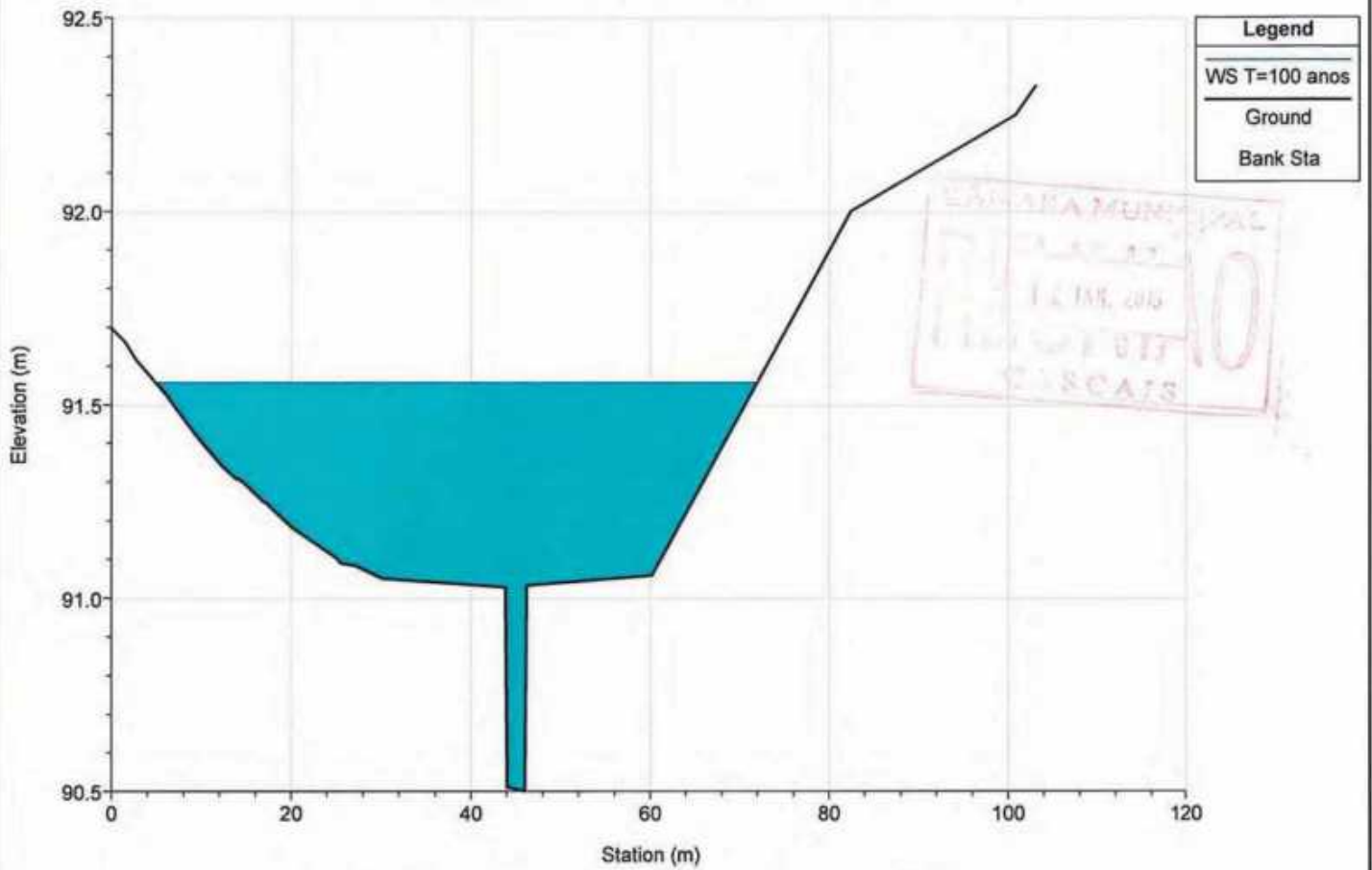
River = SASSOEIROS Reach = jusante RS = 5203.559



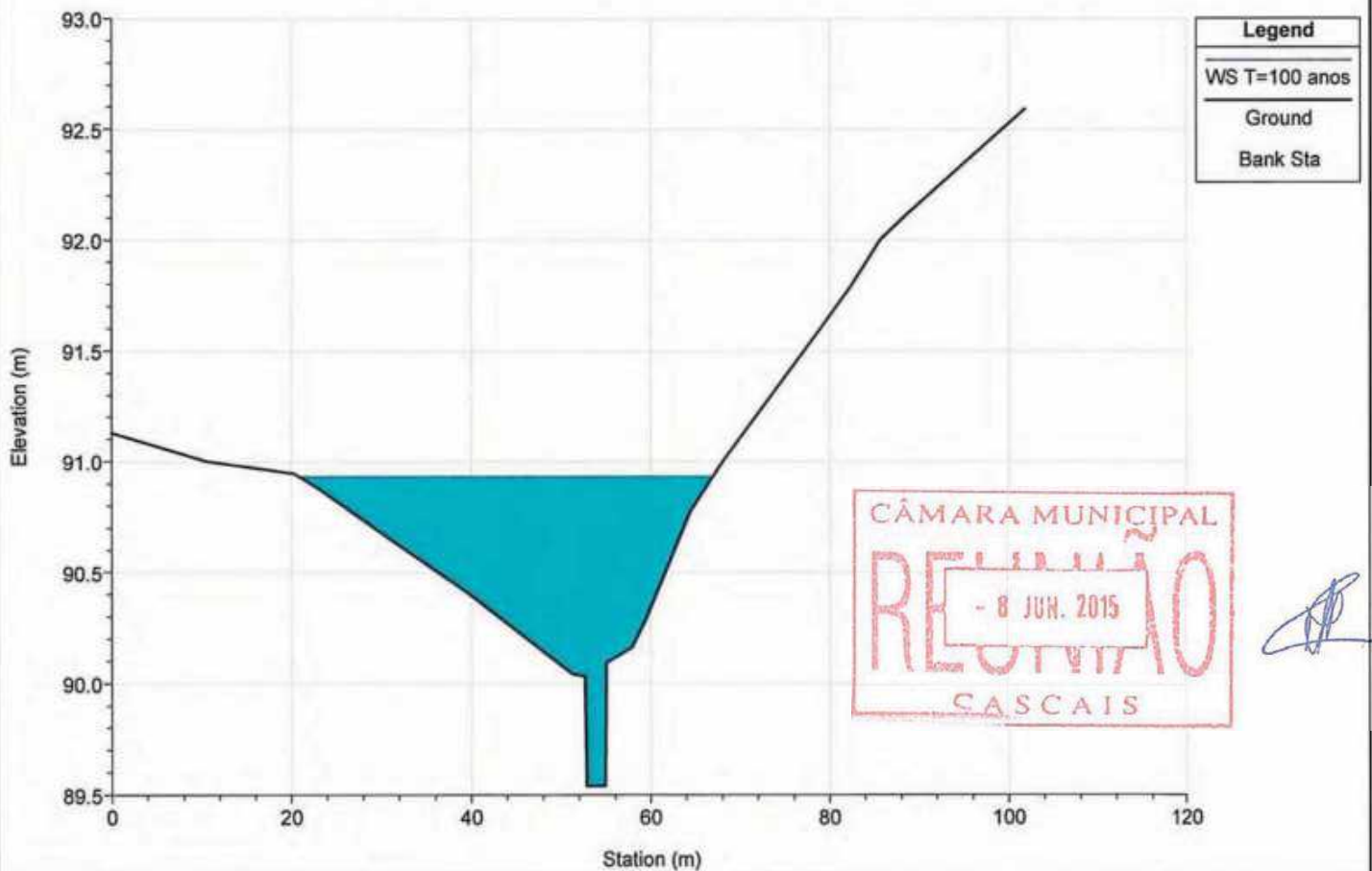
River = SASSOEIROS Reach = jusante RS = 5116.390



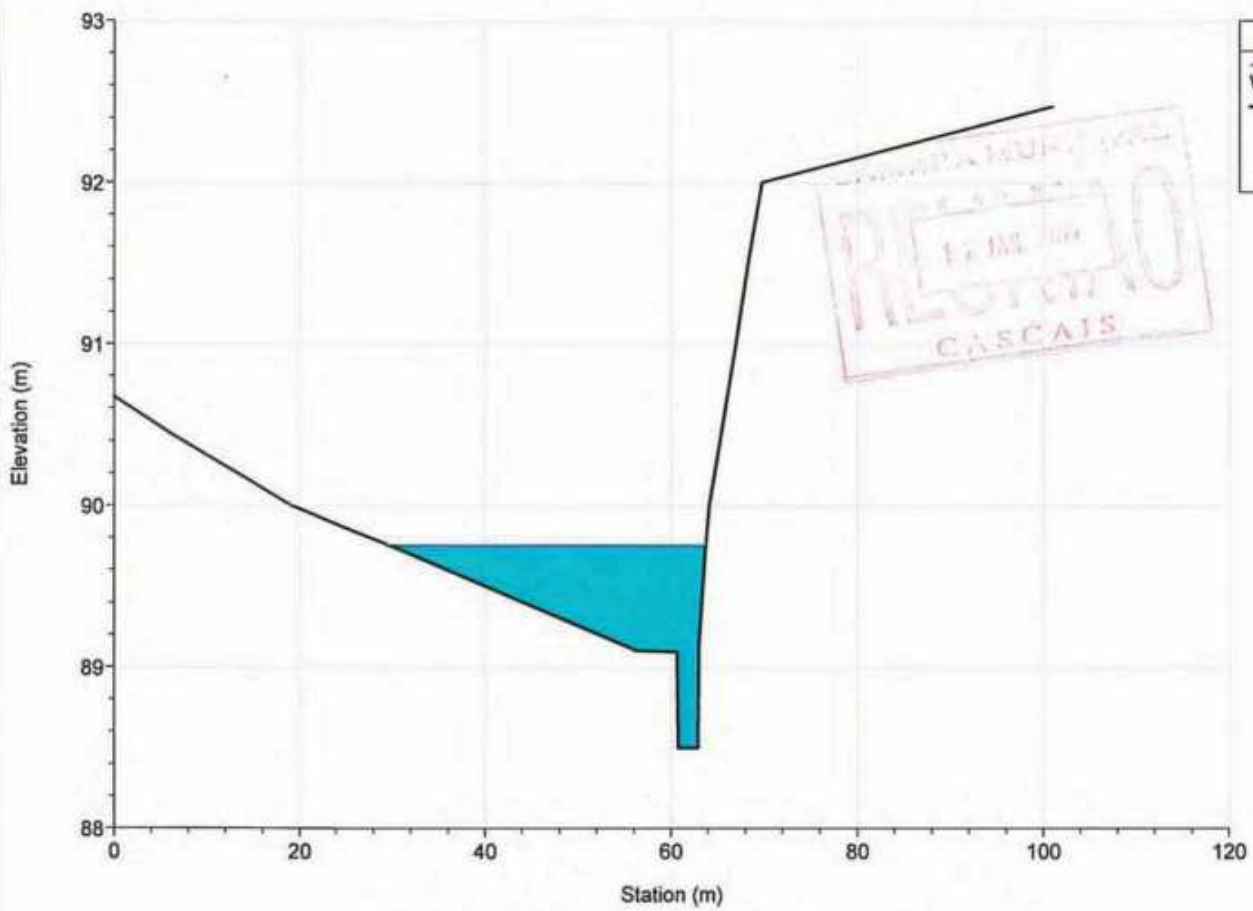
River = SASSOEIROS Reach = jusante RS = 4994.218



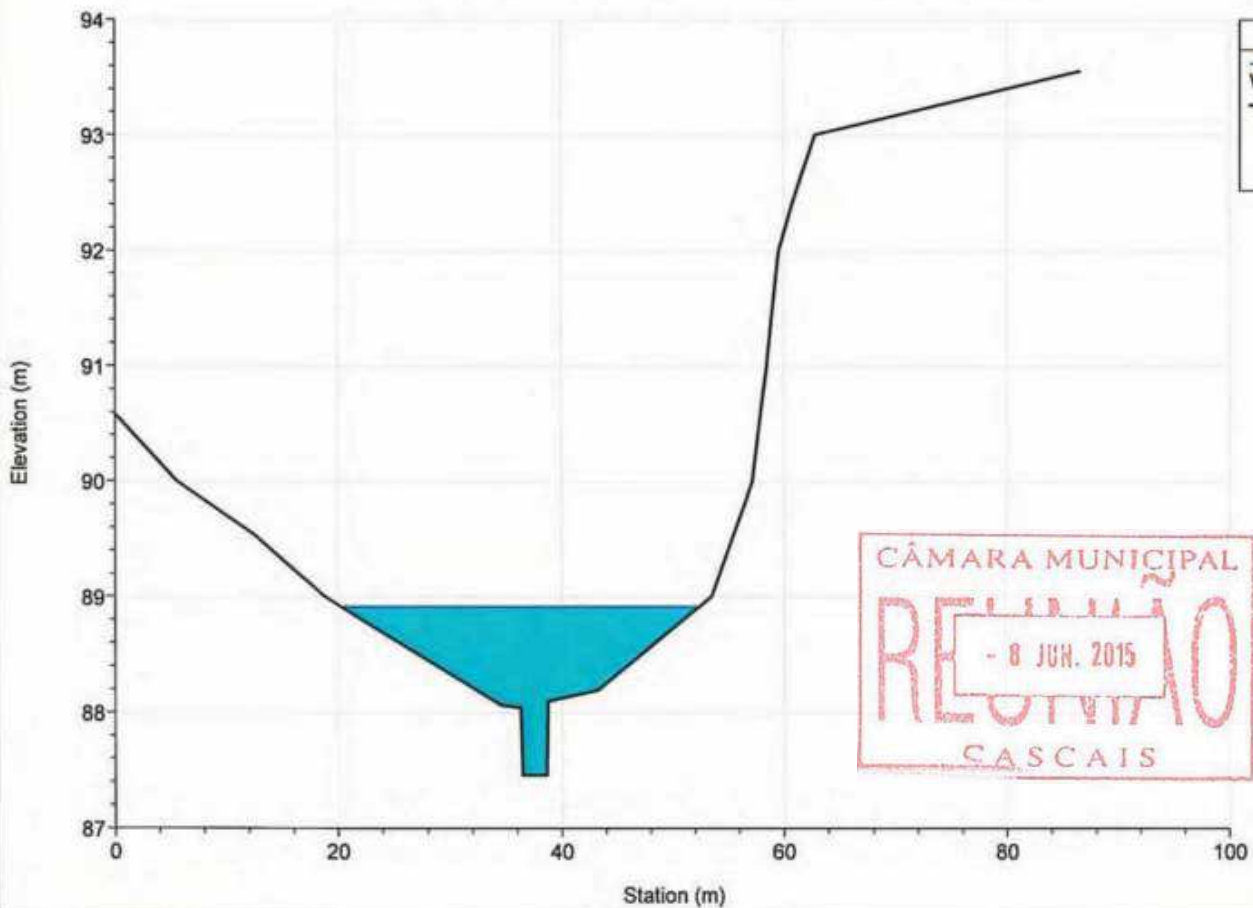
River = SASSOEIROS Reach = jusante RS = 4885.490



River = SASSOEIROS Reach = jusante RS = 4759.651

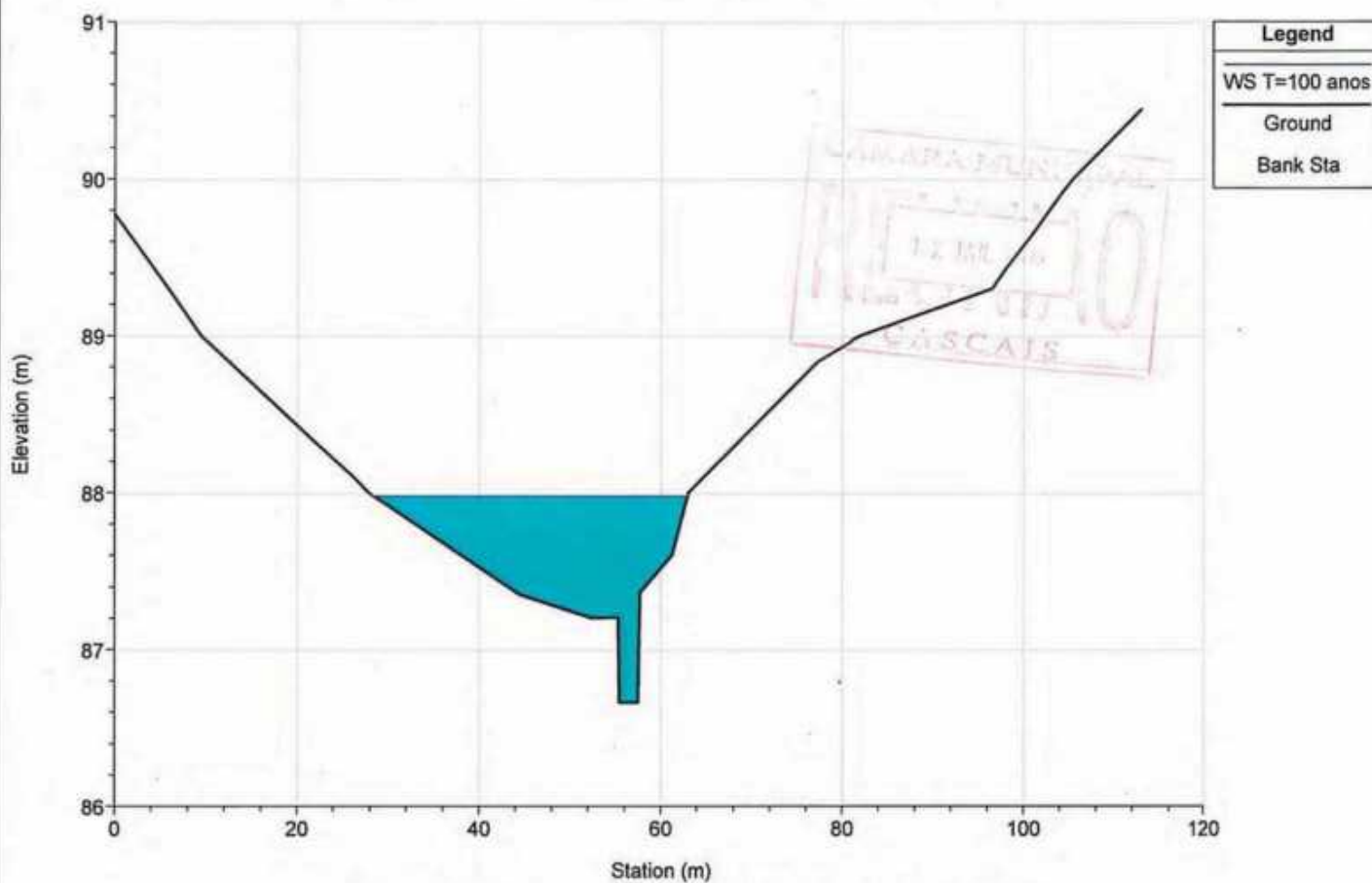


River = SASSOEIROS Reach = jusante RS = 4665.275

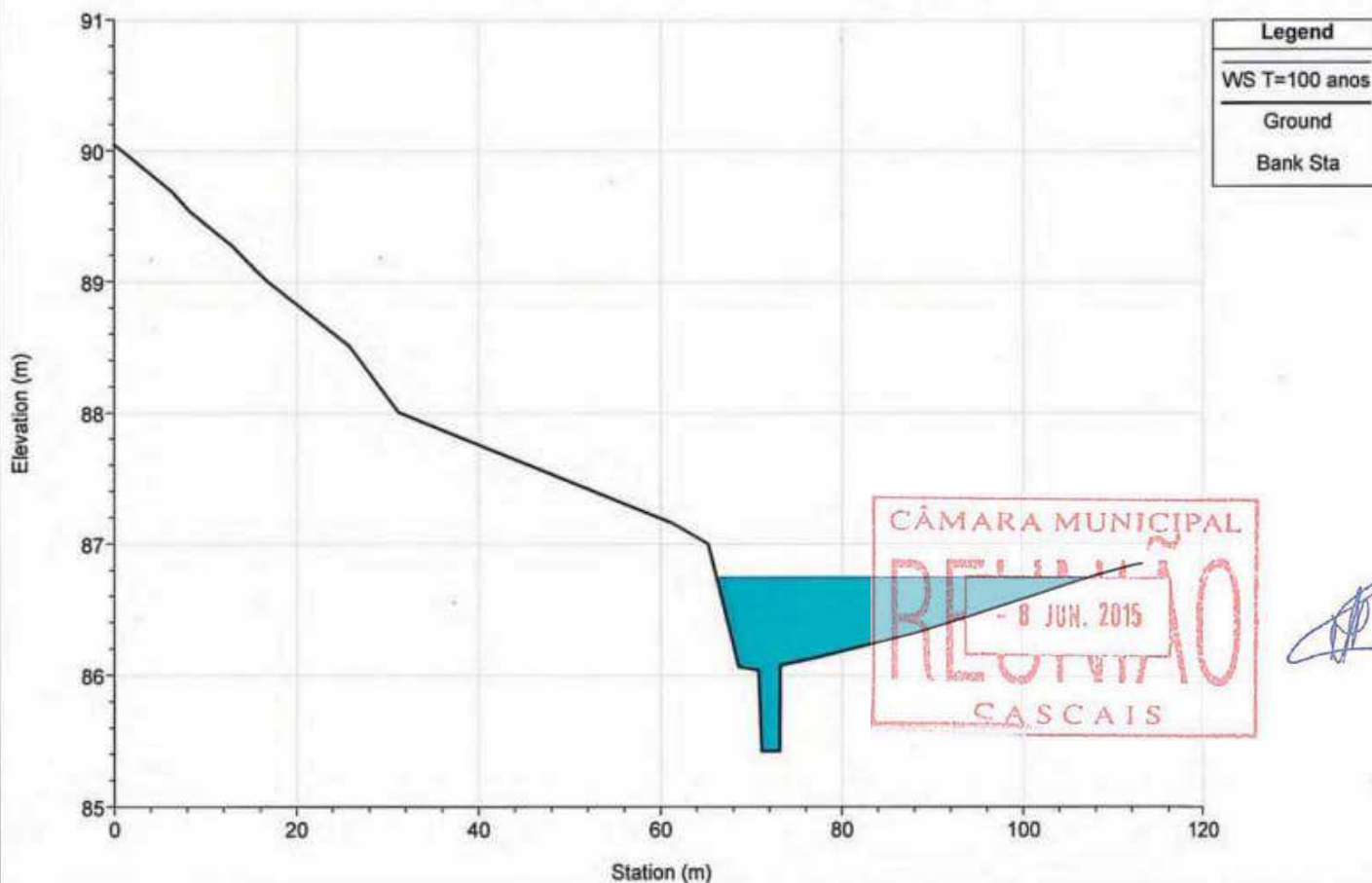




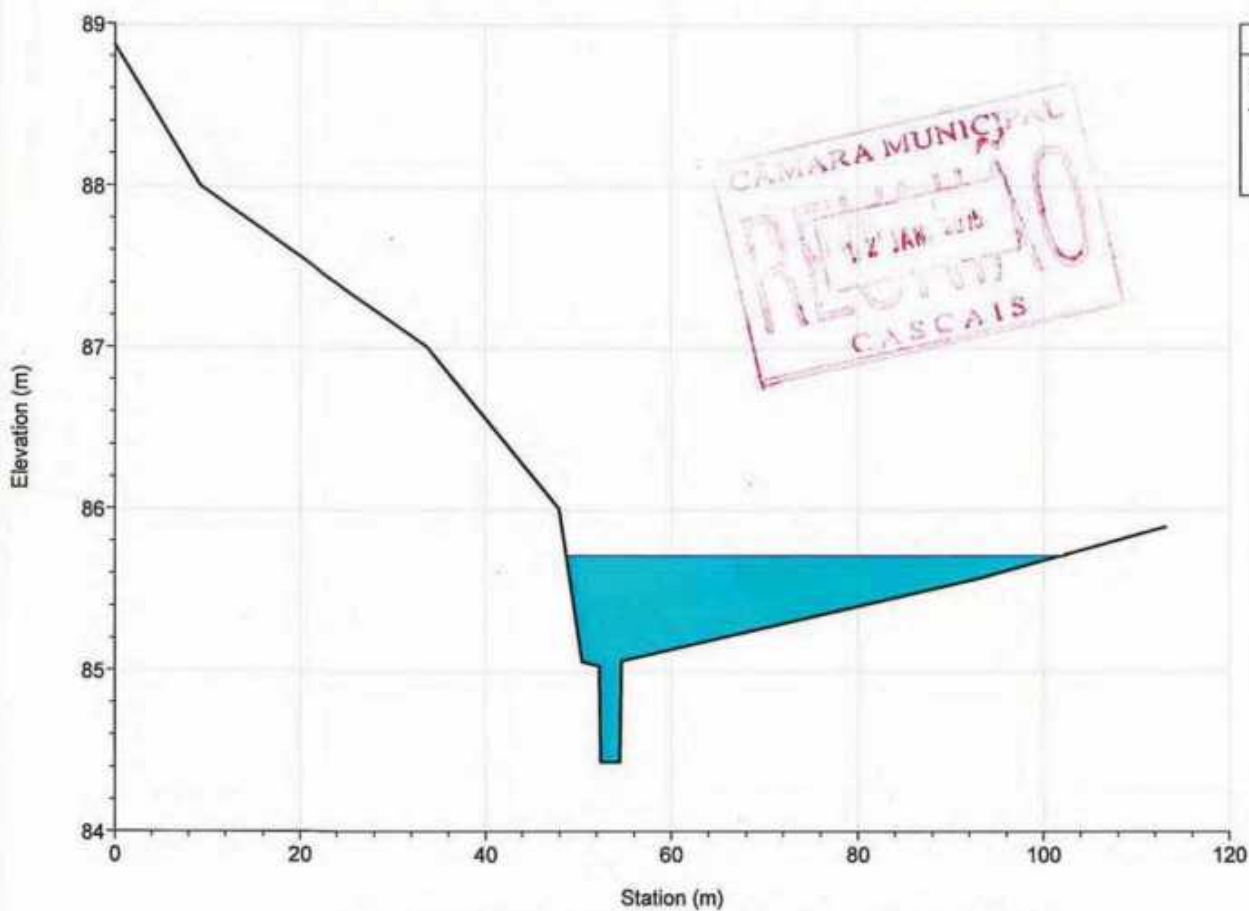
River = SASSOEIROS Reach = jusante RS = 4537.739



River = SASSOEIROS Reach = jusante RS = 4401.638



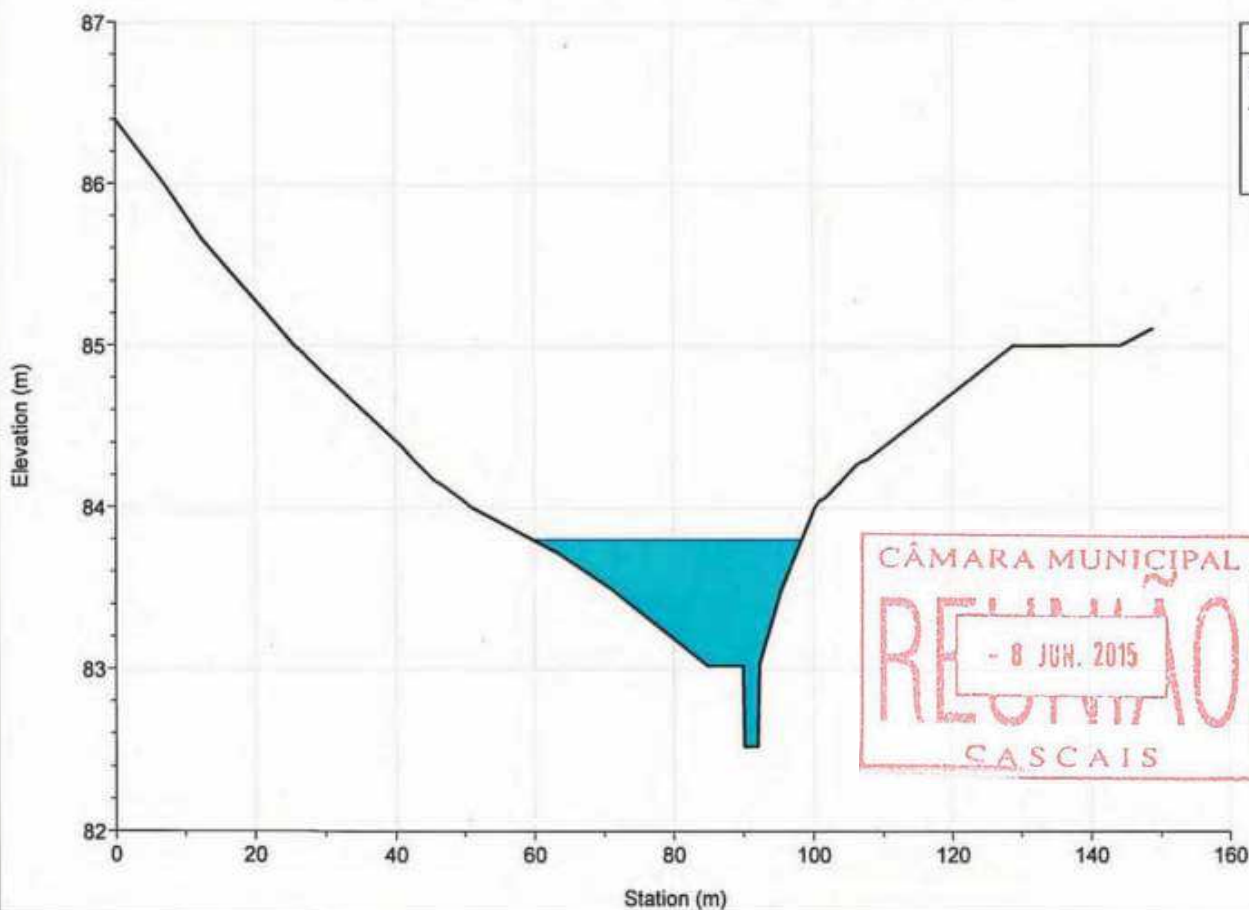
River = SASSOEIROS Reach = jusante RS = 4285.355



Legend
WS T=100 anos
Ground
Bank Sta

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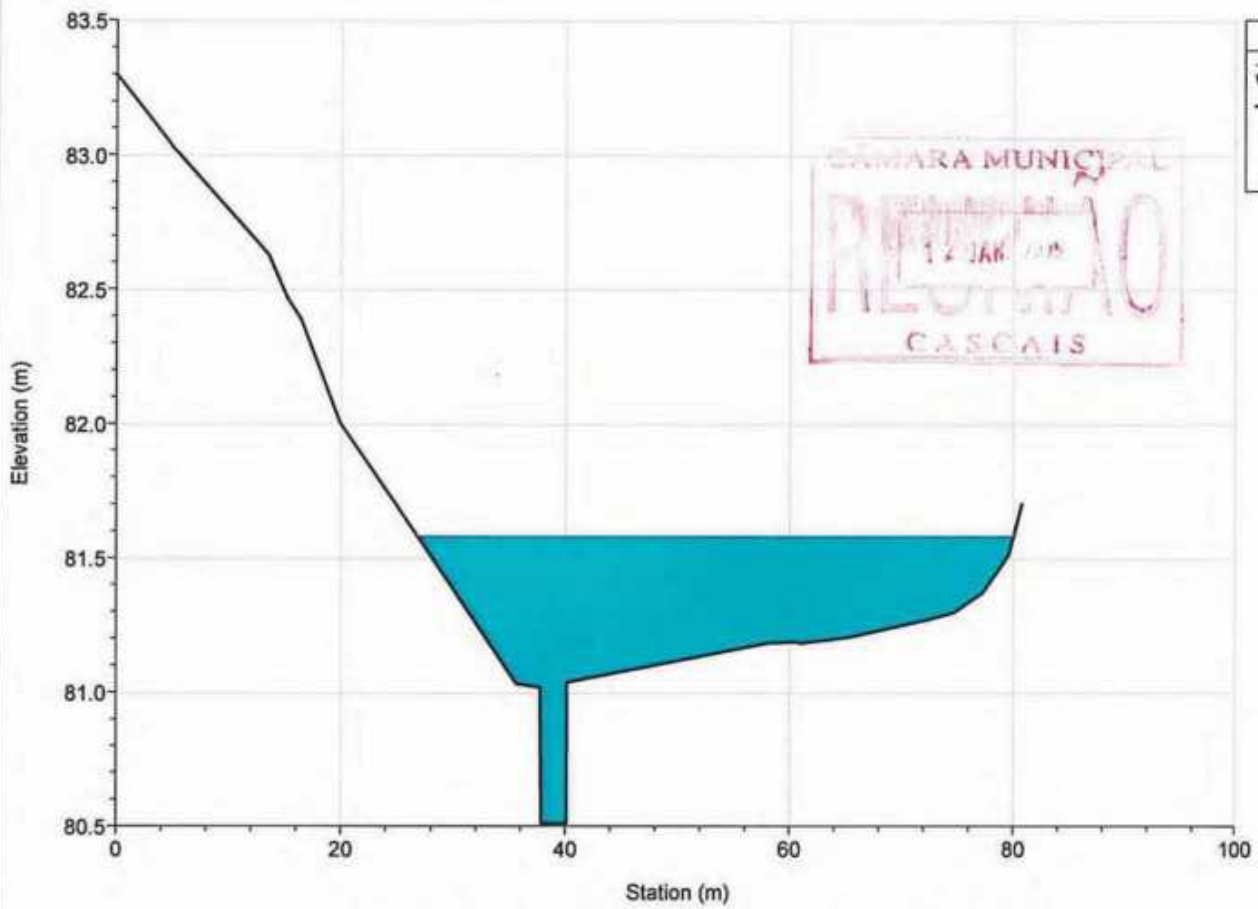
River = SASSOEIROS Reach = jusante RS = 4112.488



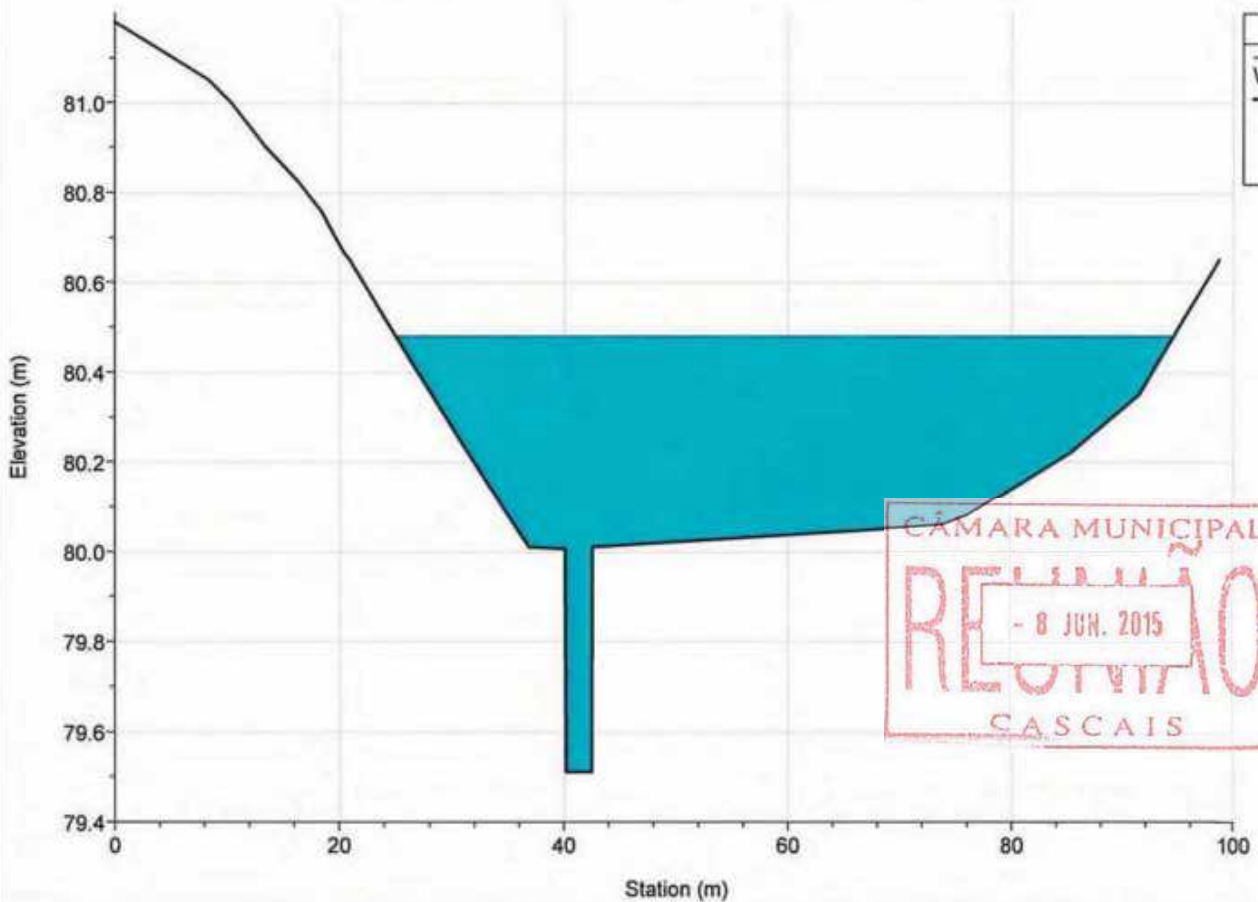
Legend
WS T=100 anos
Ground
Bank Sta

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- 8 JUN. 2015  
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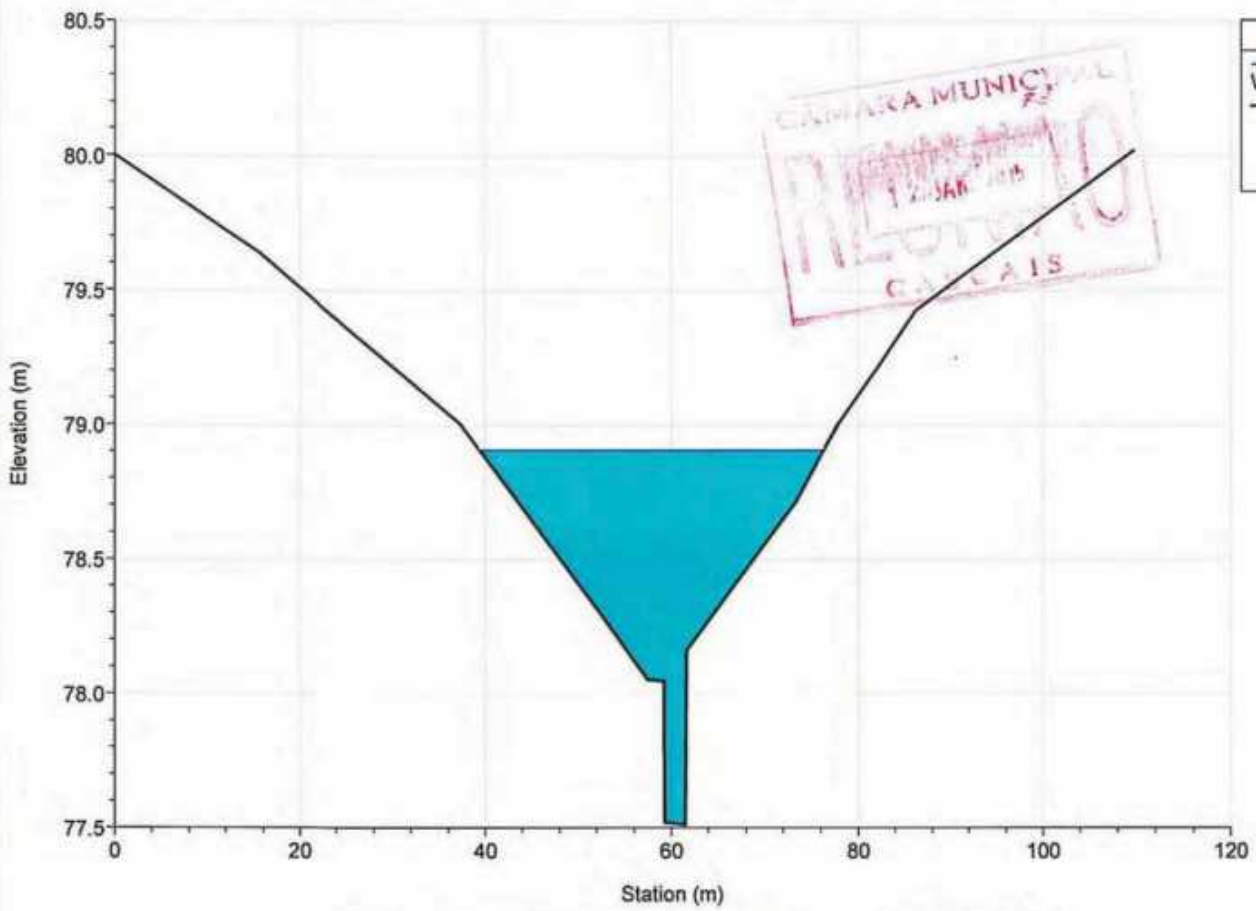
River = SASSOEIROS Reach = jusante RS = 3971.809



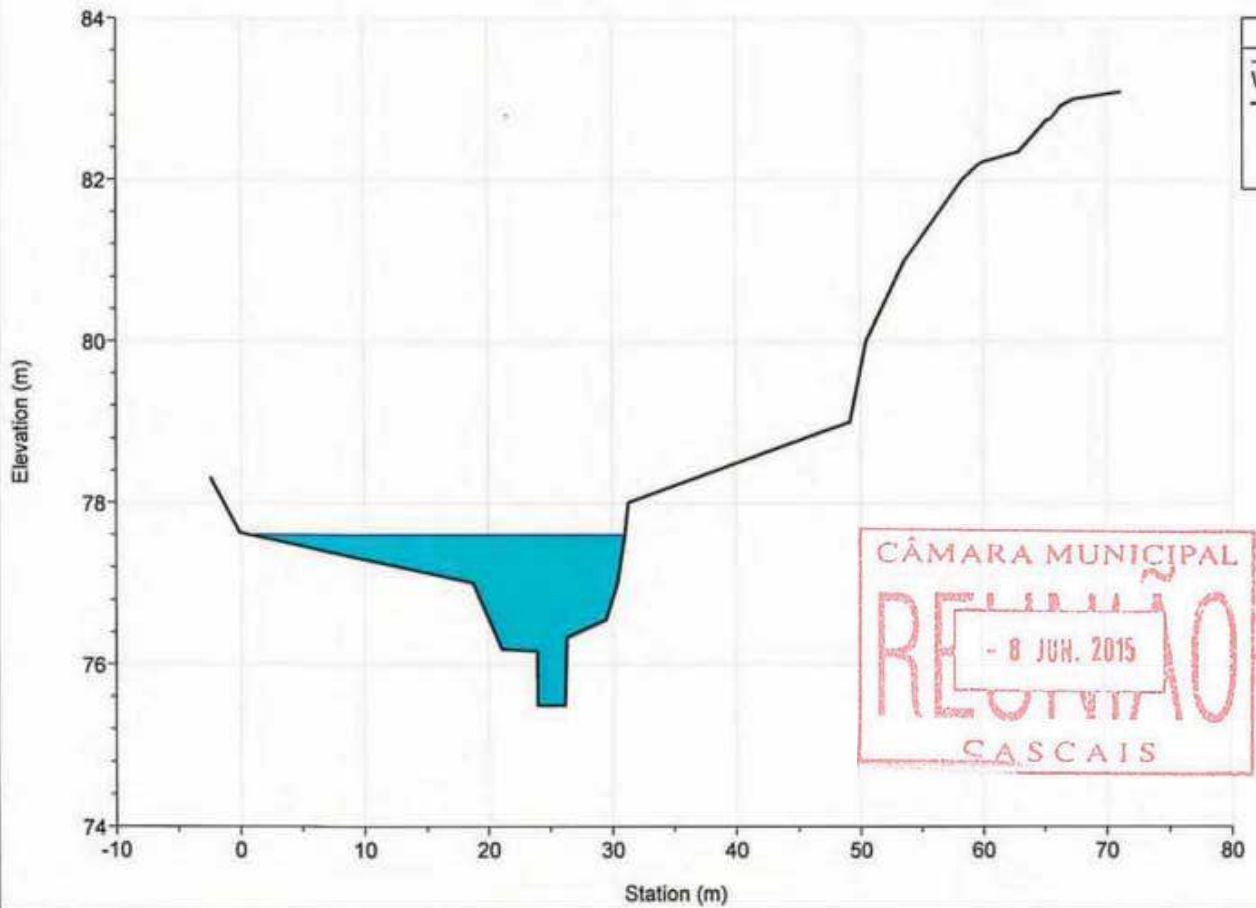
River = SASSOEIROS Reach = jusante RS = 3869.342



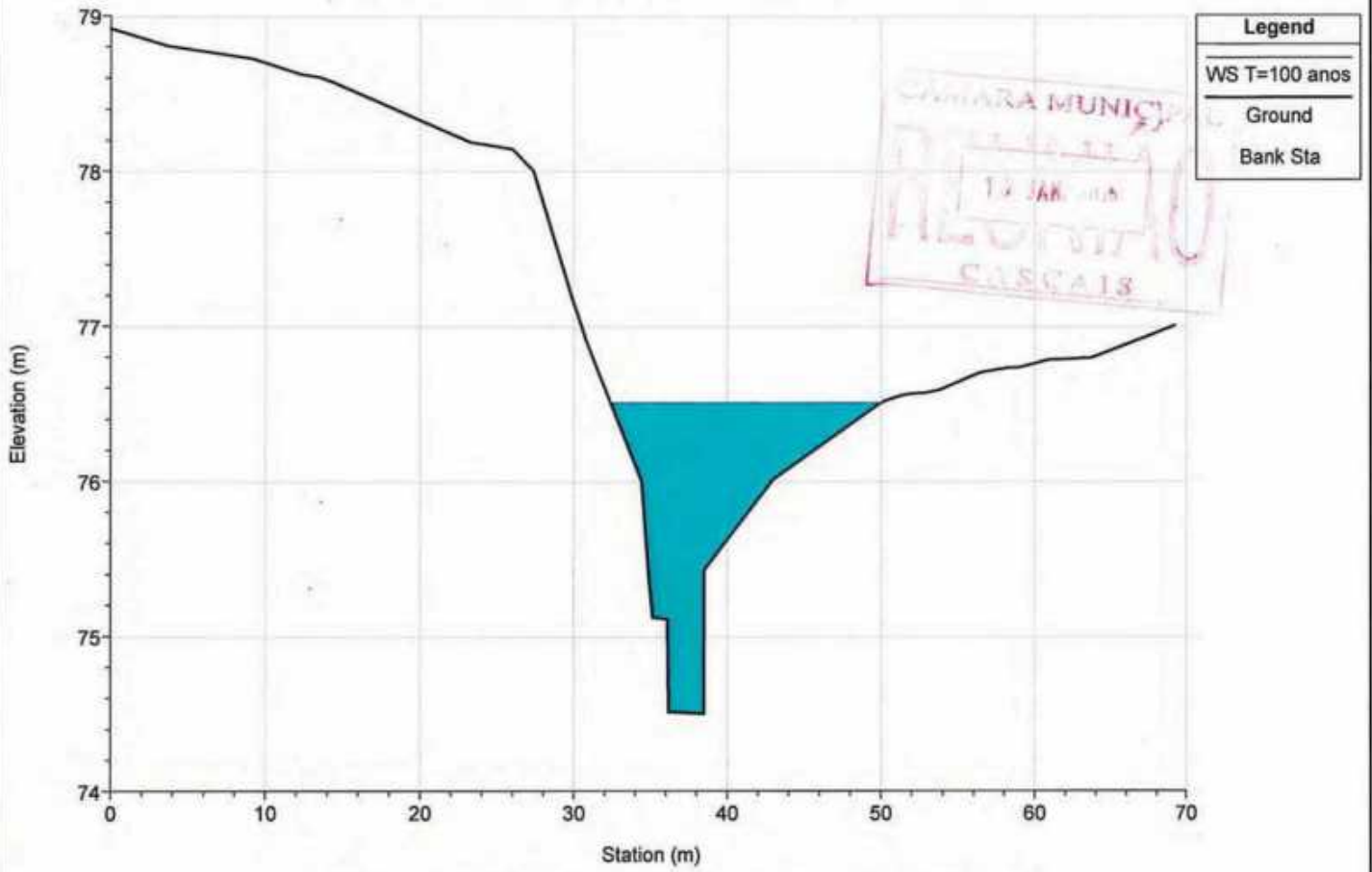
River = SASSOEIROS Reach = jusante RS = 3737.886



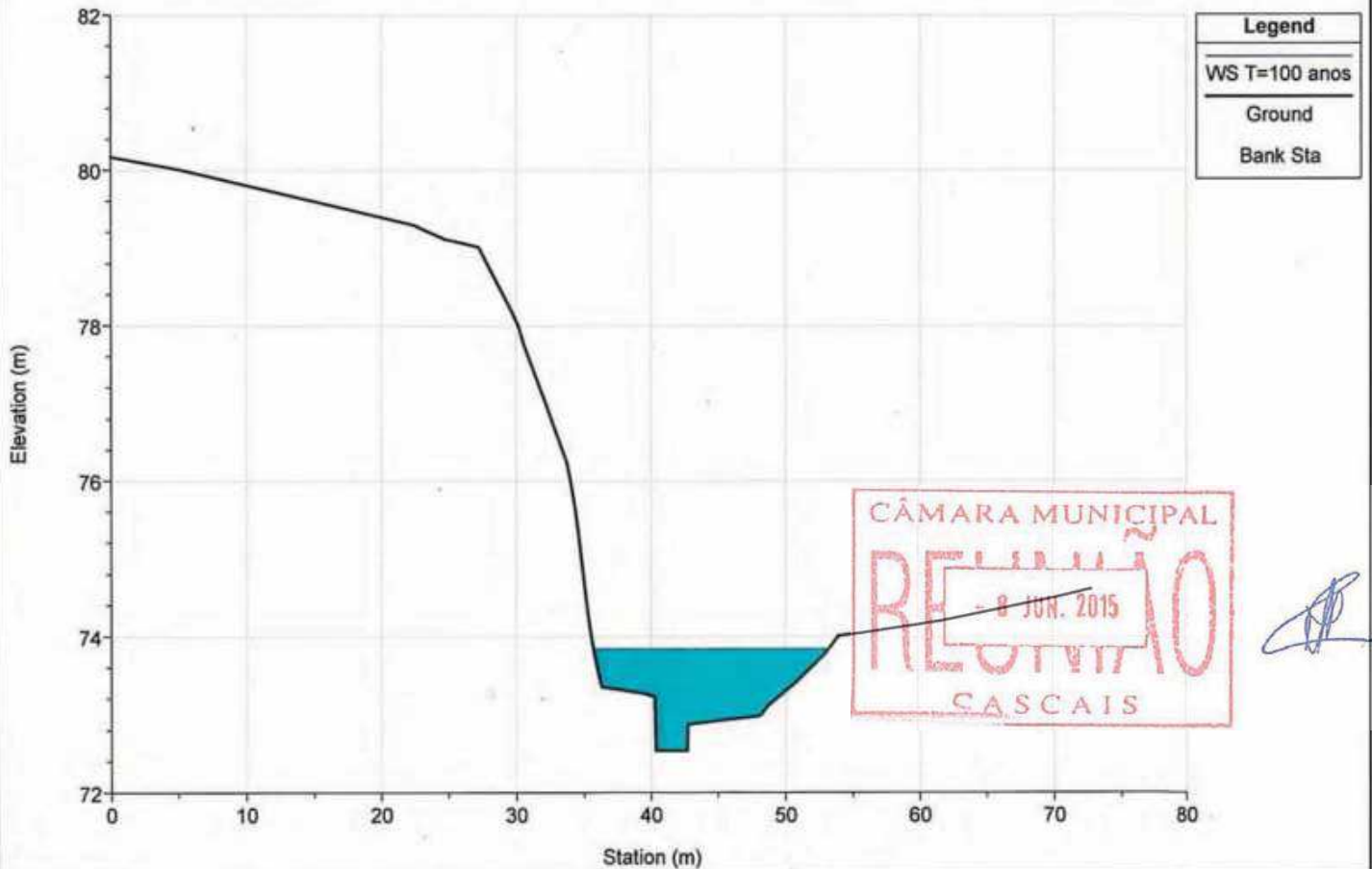
River = SASSOEIROS Reach = jusante RS = 3623.912



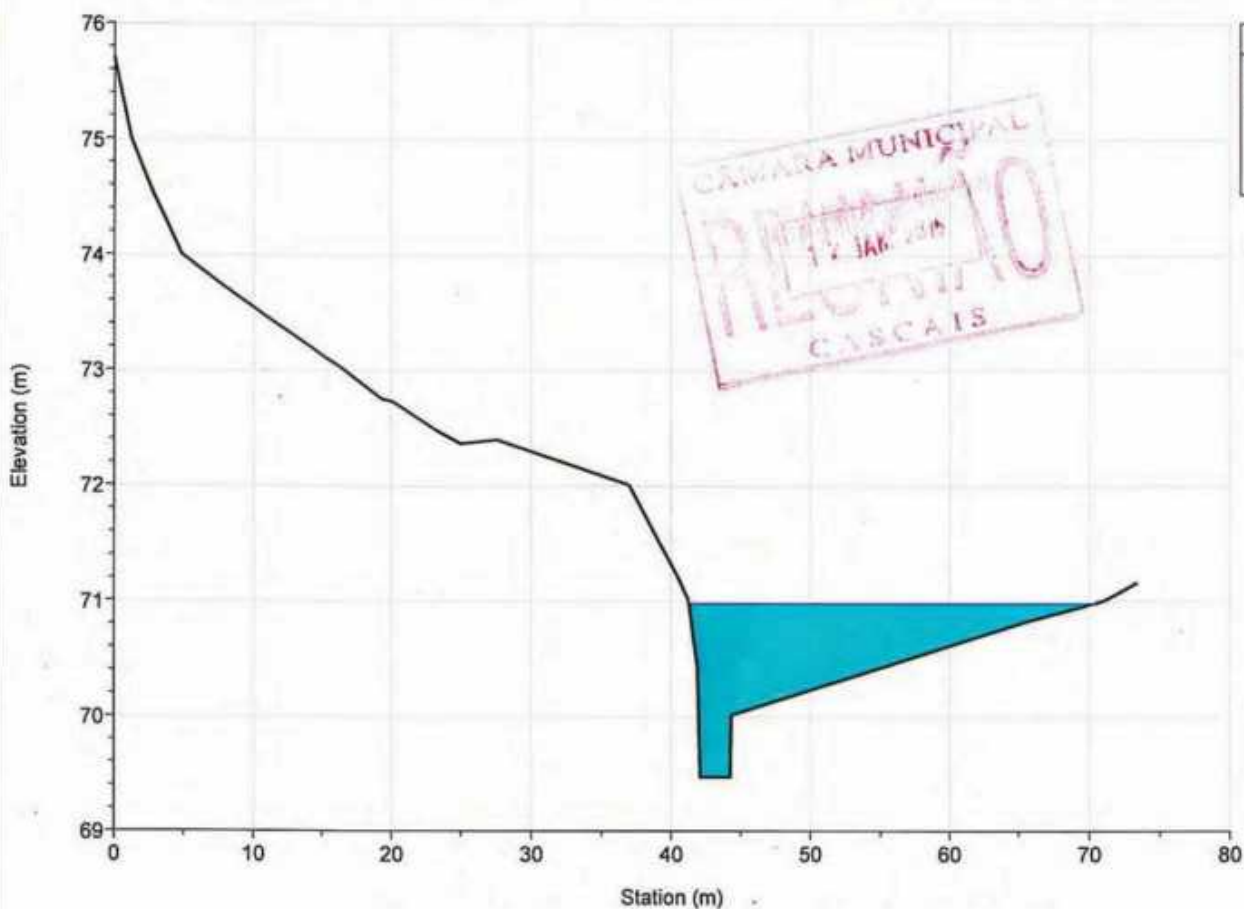
River = SASSOEIROS Reach = jusante RS = 3506.579



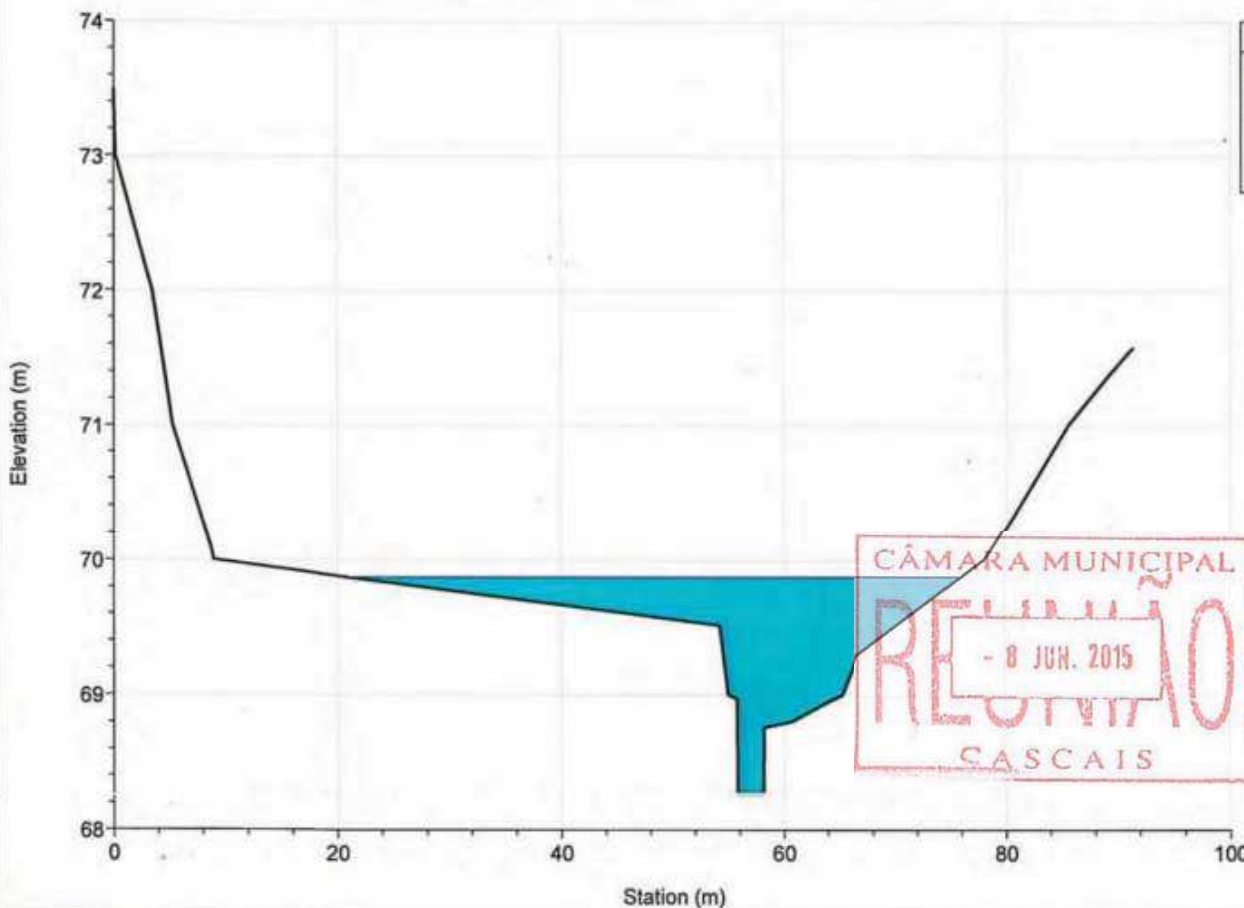
River = SASSOEIROS Reach = jusante RS = 3444.505



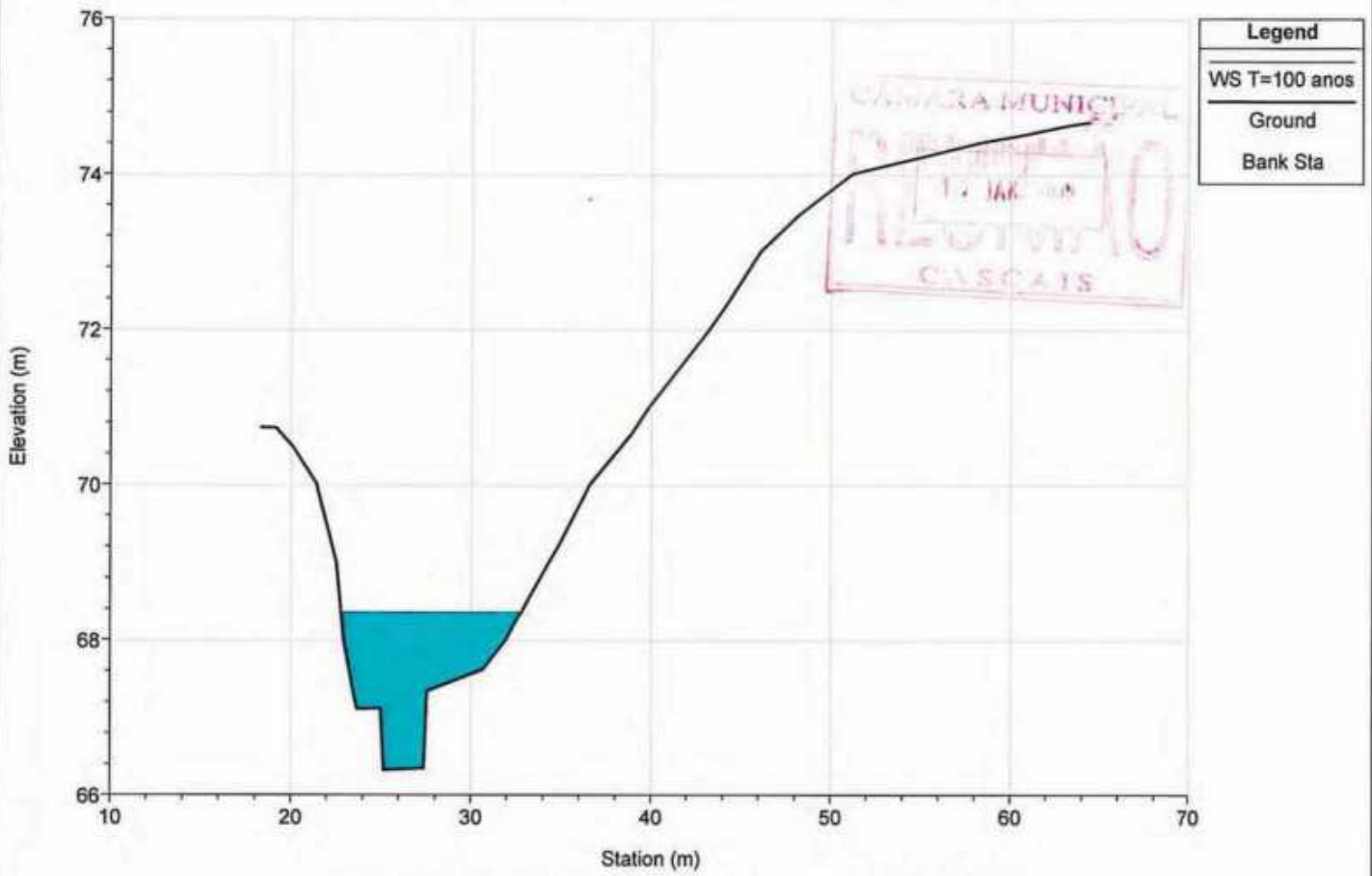
River = SASSOEIROS Reach = jusante RS = 3324.277



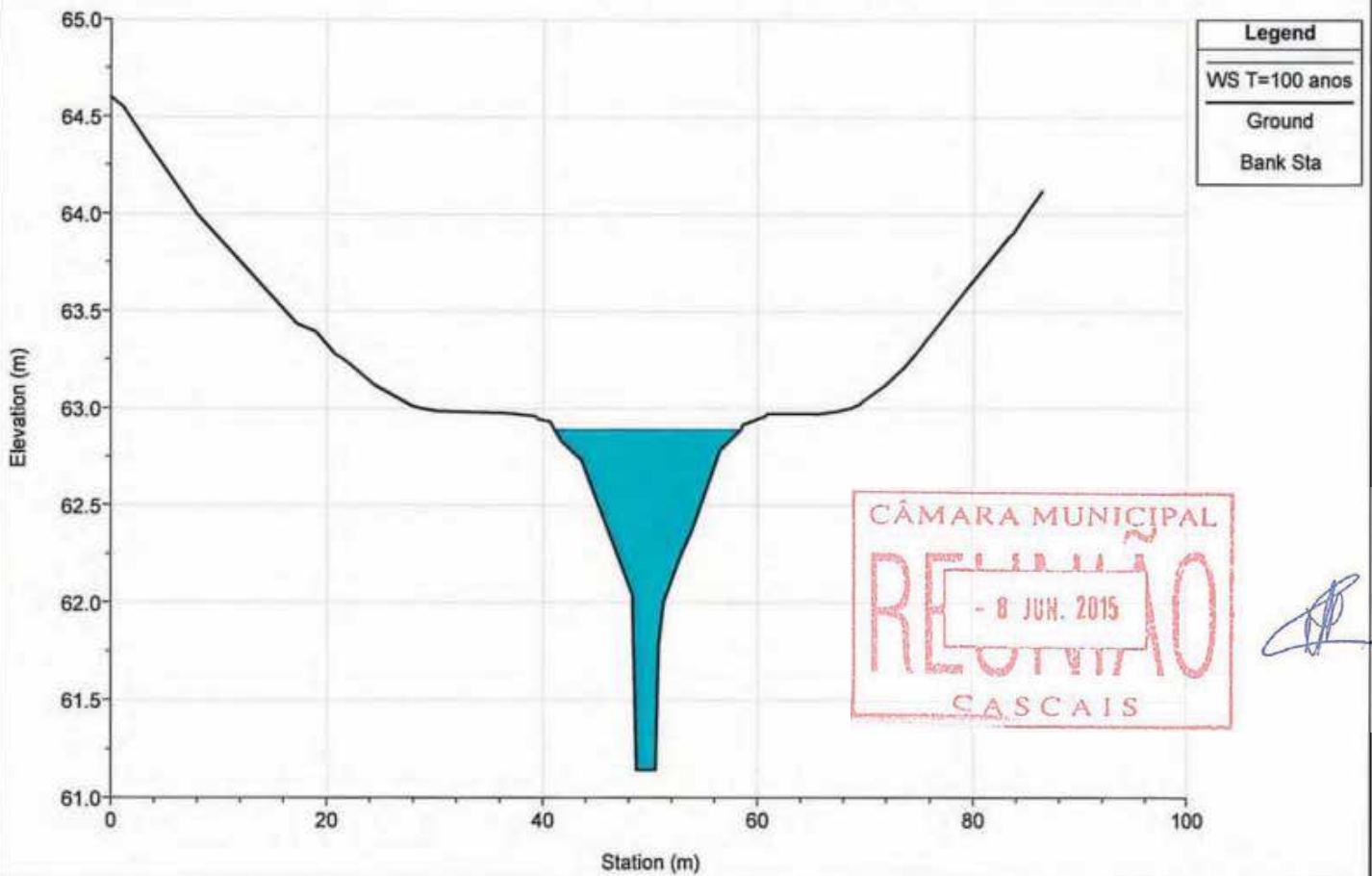
River = SASSOEIROS Reach = jusante RS = 3252.784



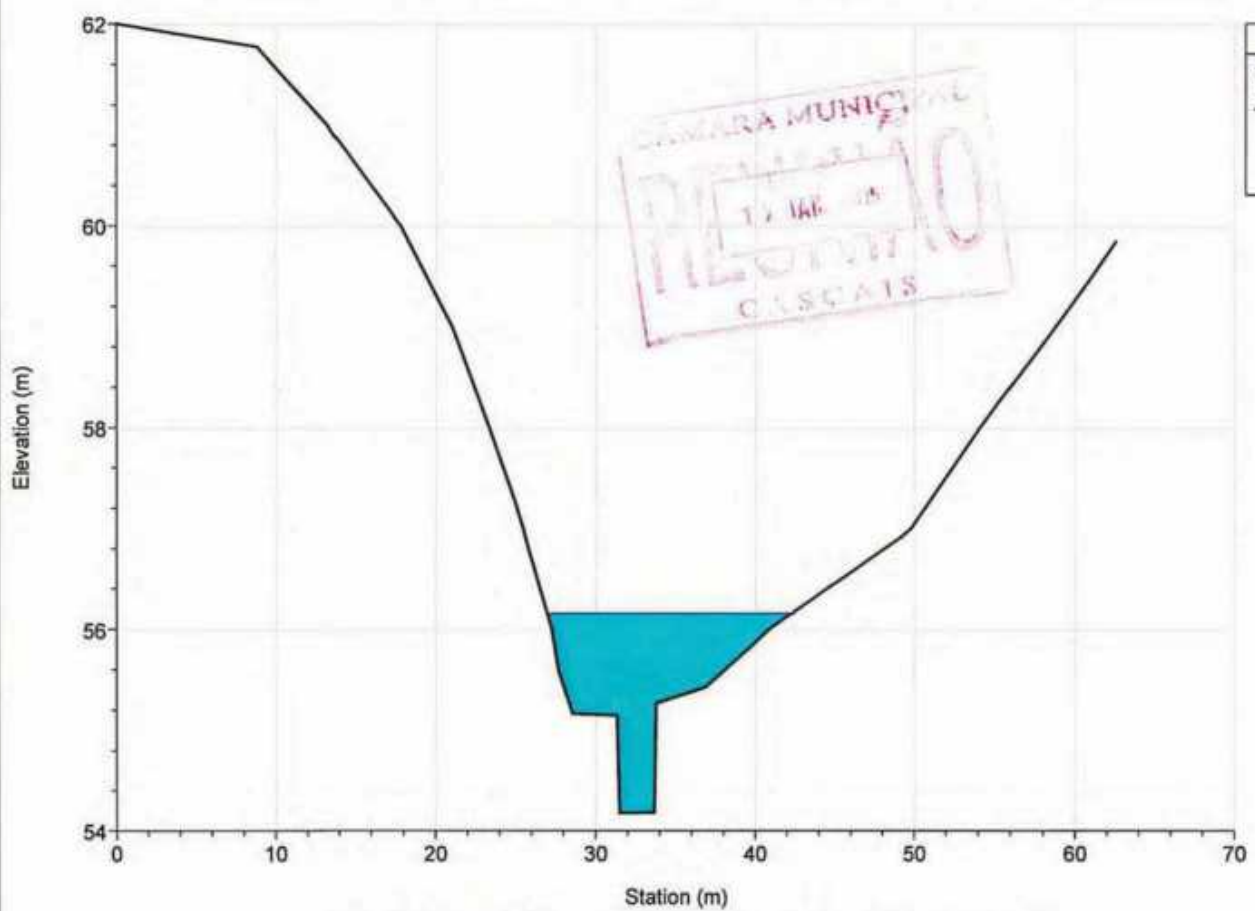
River = SASSOEIROS Reach = jusante RS = 3177.174



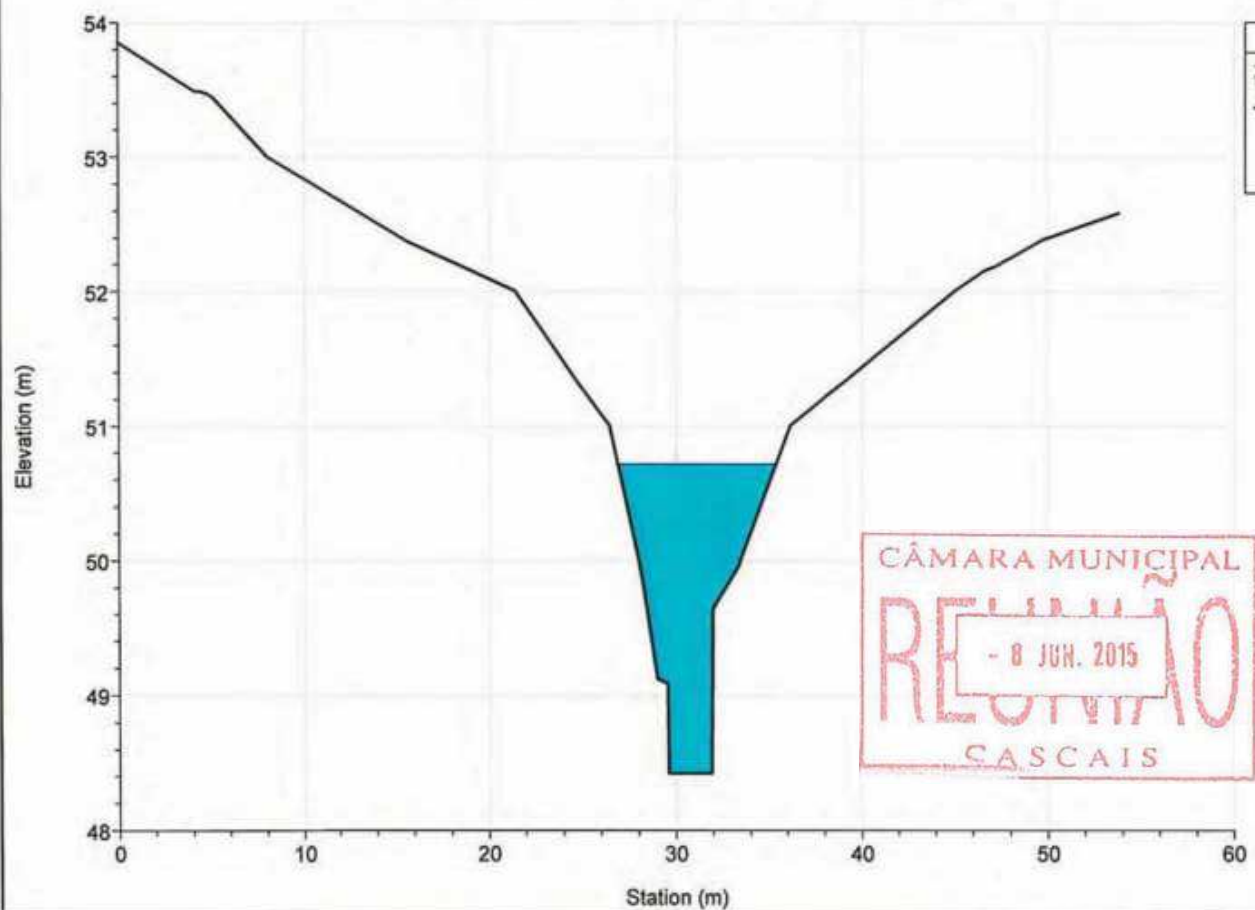
River = SASSOEIROS Reach = jusante RS = 3075.805



River = SASOEIROS Reach = jusante RS = 2961.456

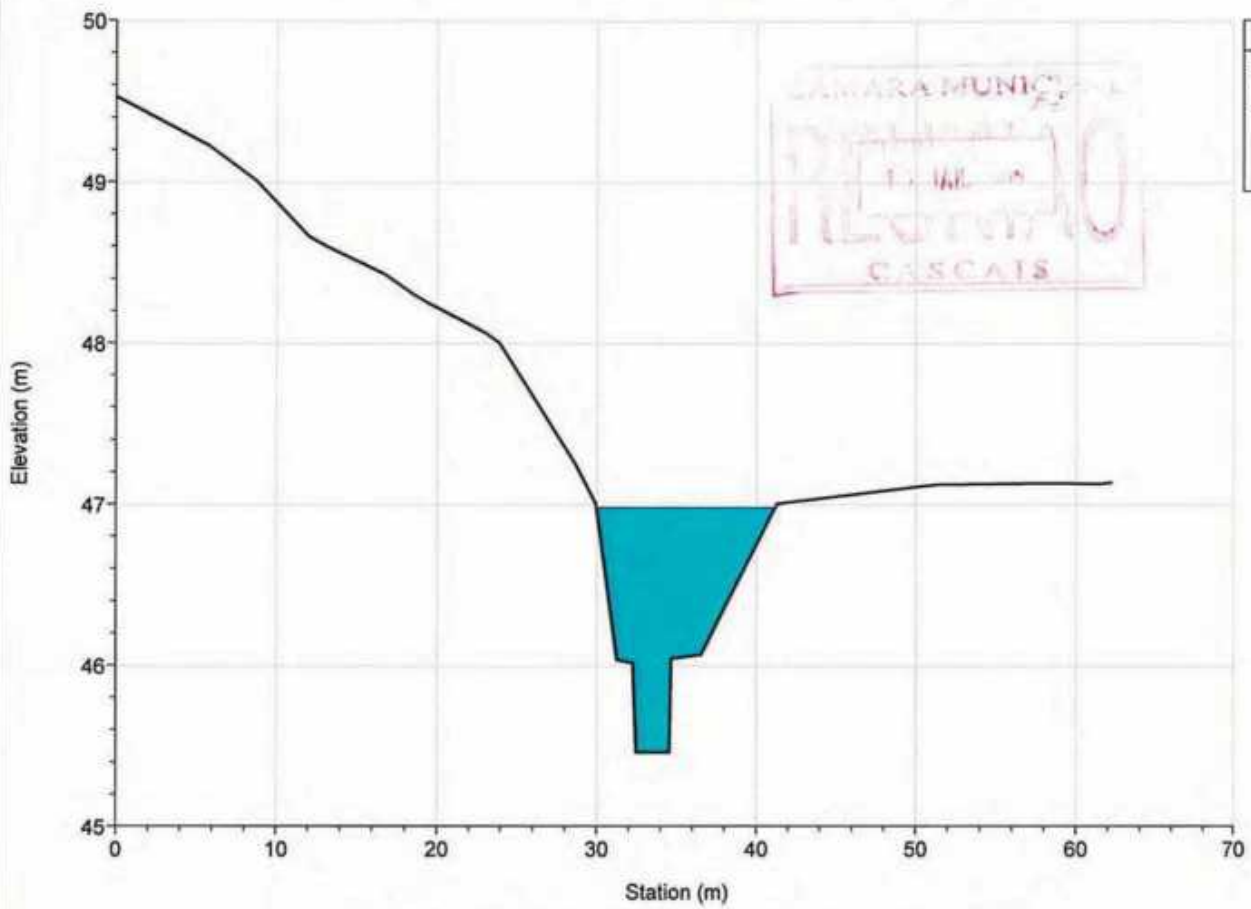


River = SASOEIROS Reach = jusante RS = 2866.407



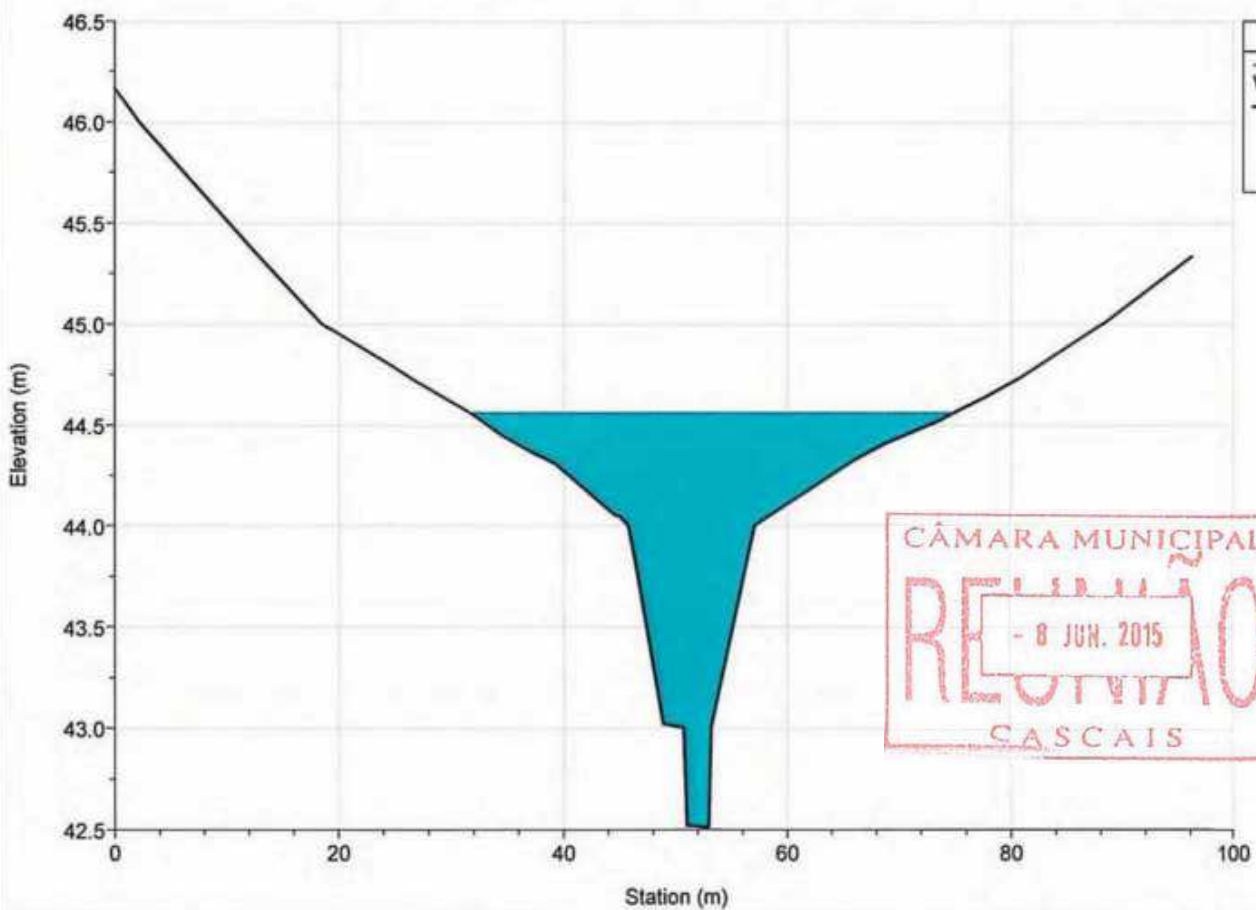


River = SASSOEIROS Reach = jusante RS = 2776.081



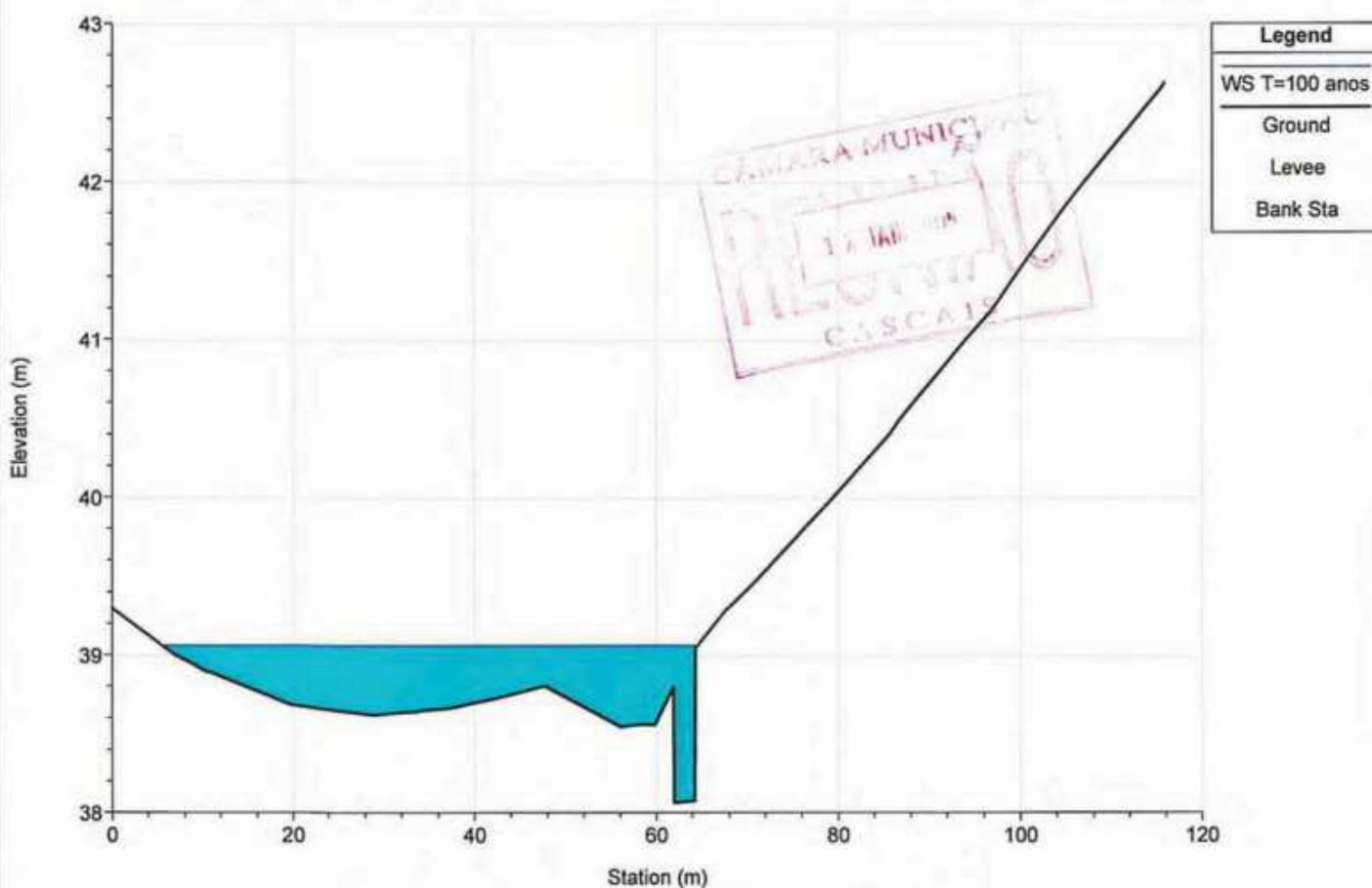
Legend
WS T=100 anos
Ground
Bank Sta

River = SASSOEIROS Reach = jusante RS = 2700.340

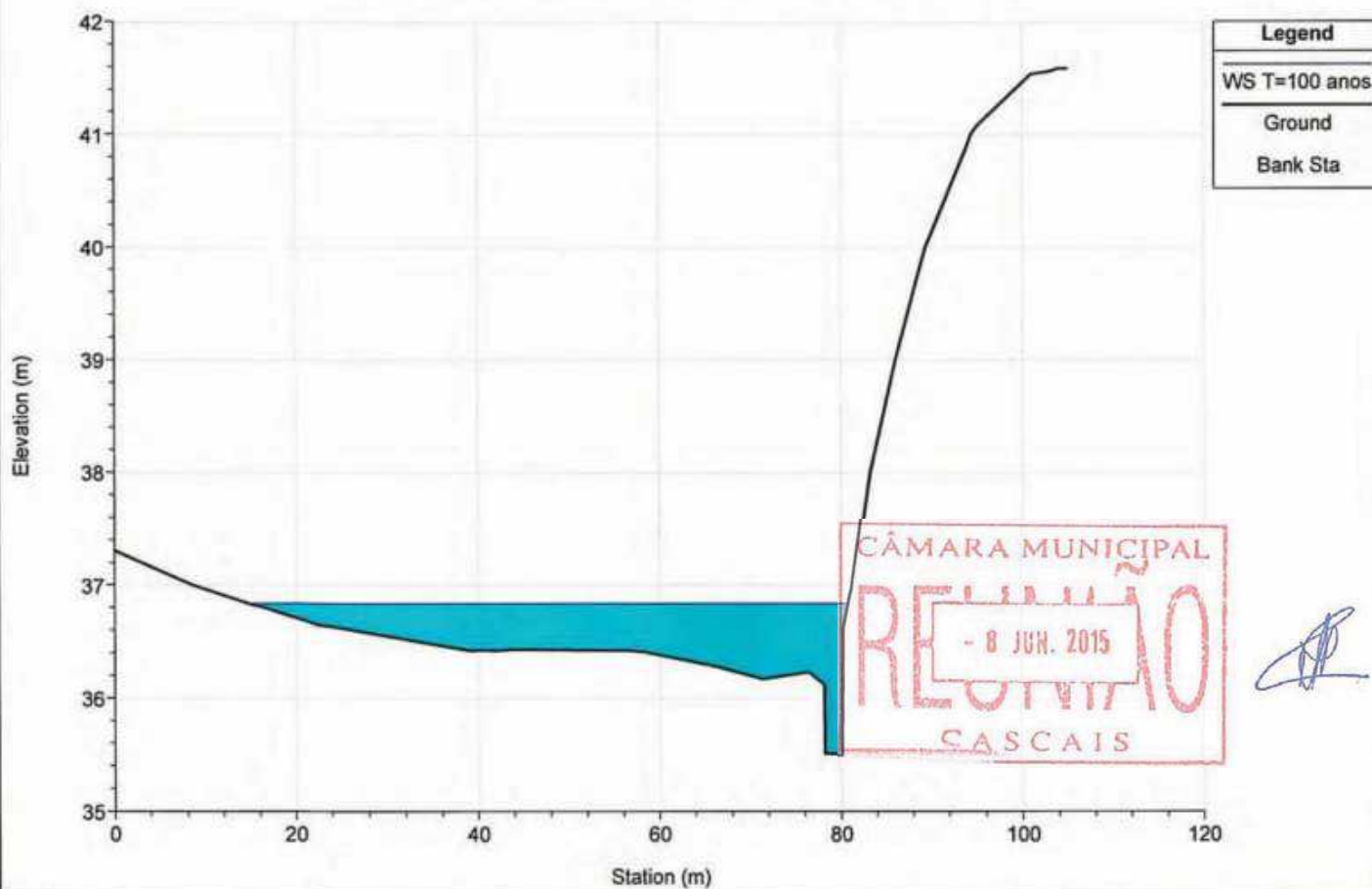


Legend
WS T=100 anos
Ground
Bank Sta

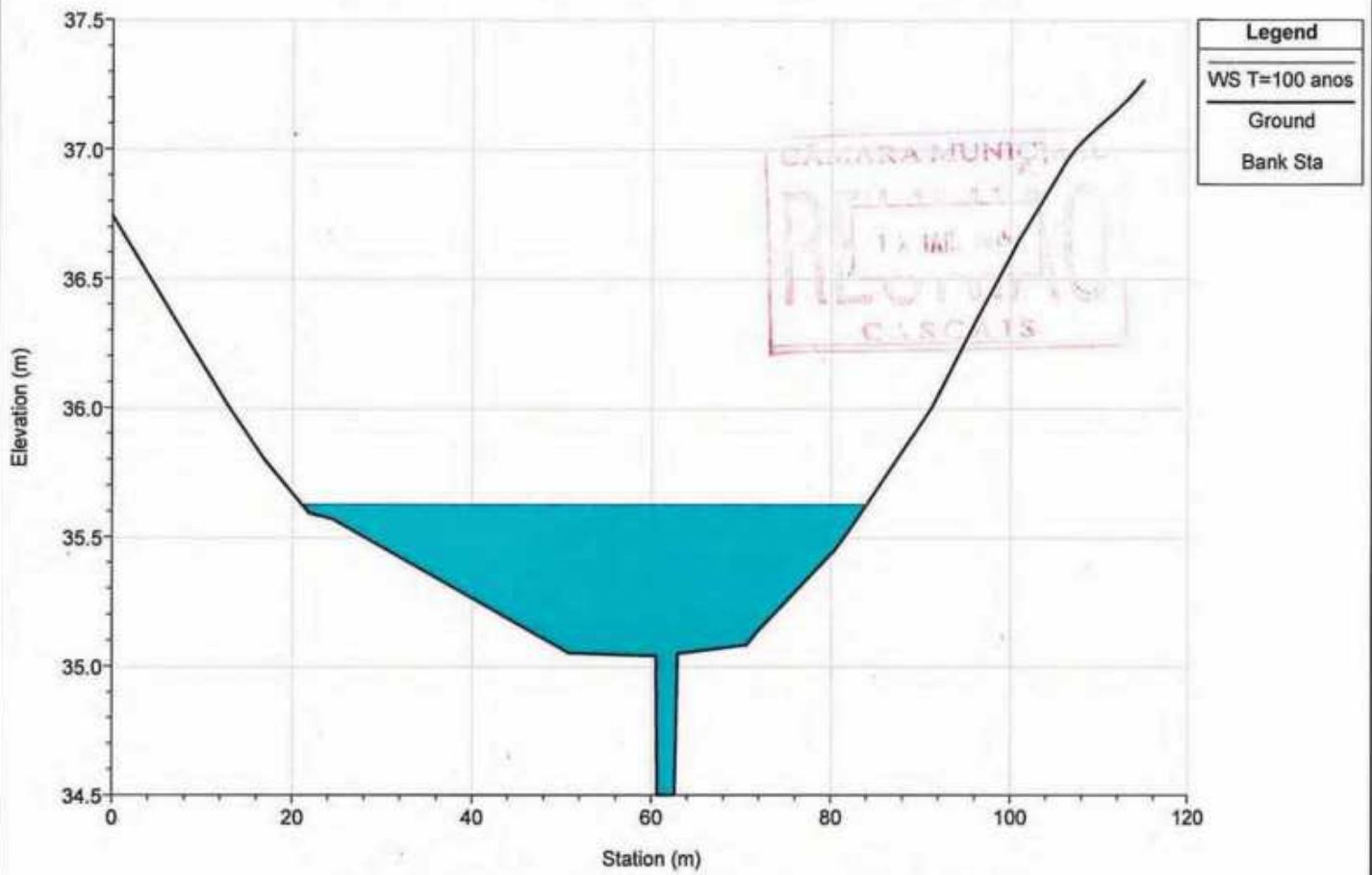
River = SASSOEIROS Reach = jusante RS = 2583.109



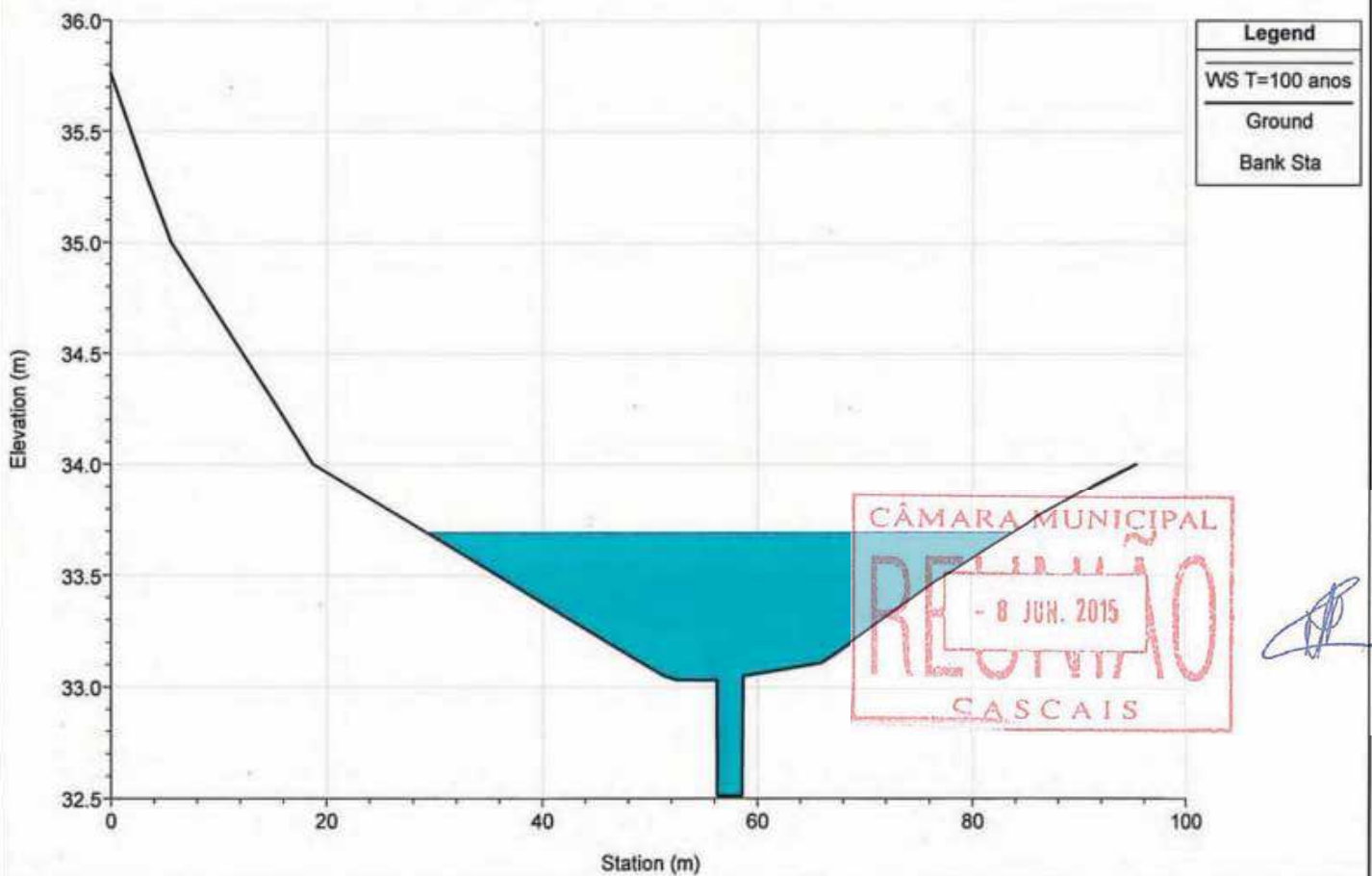
River = SASSOEIROS Reach = jusante RS = 2459.872



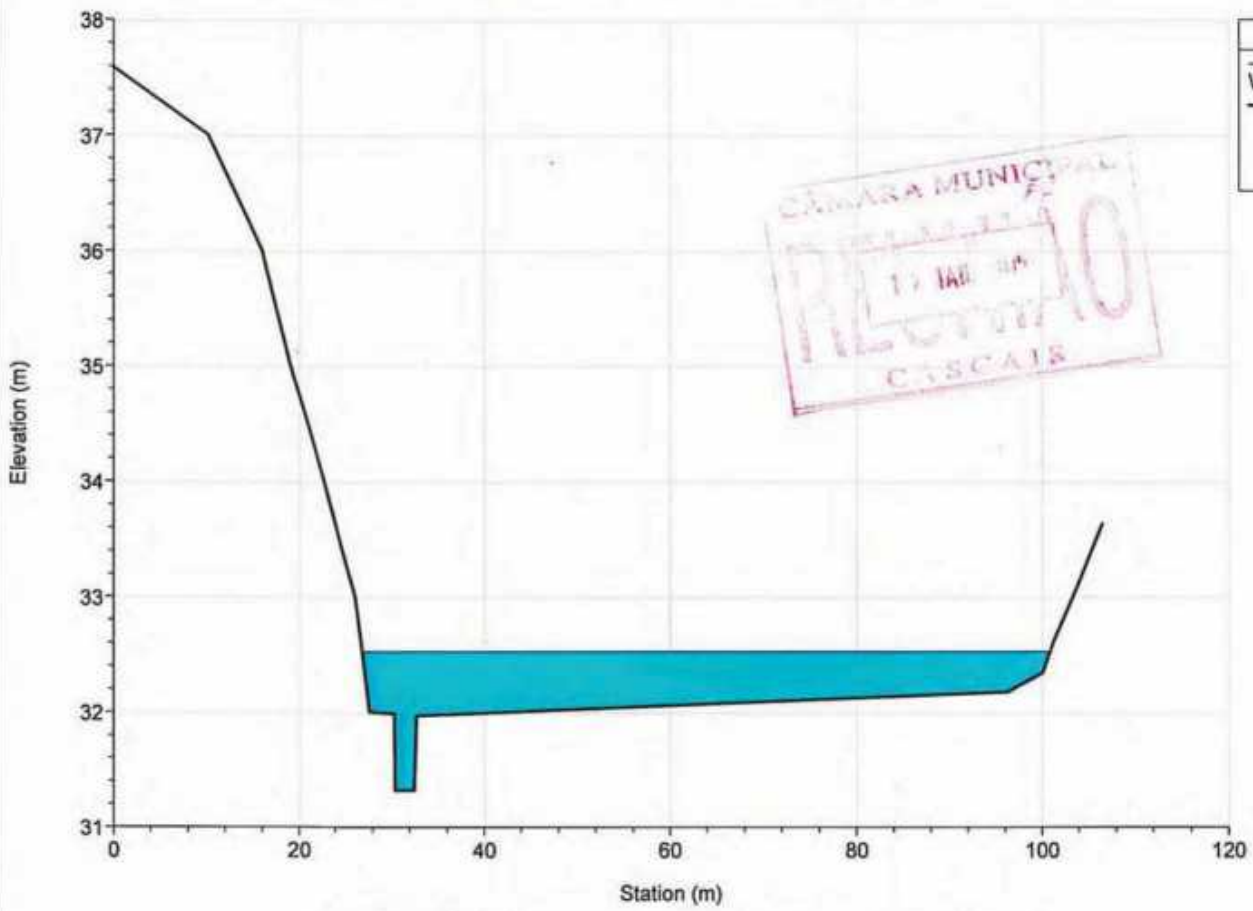
River = SASSOEIROS Reach = jusante RS = 2361.865



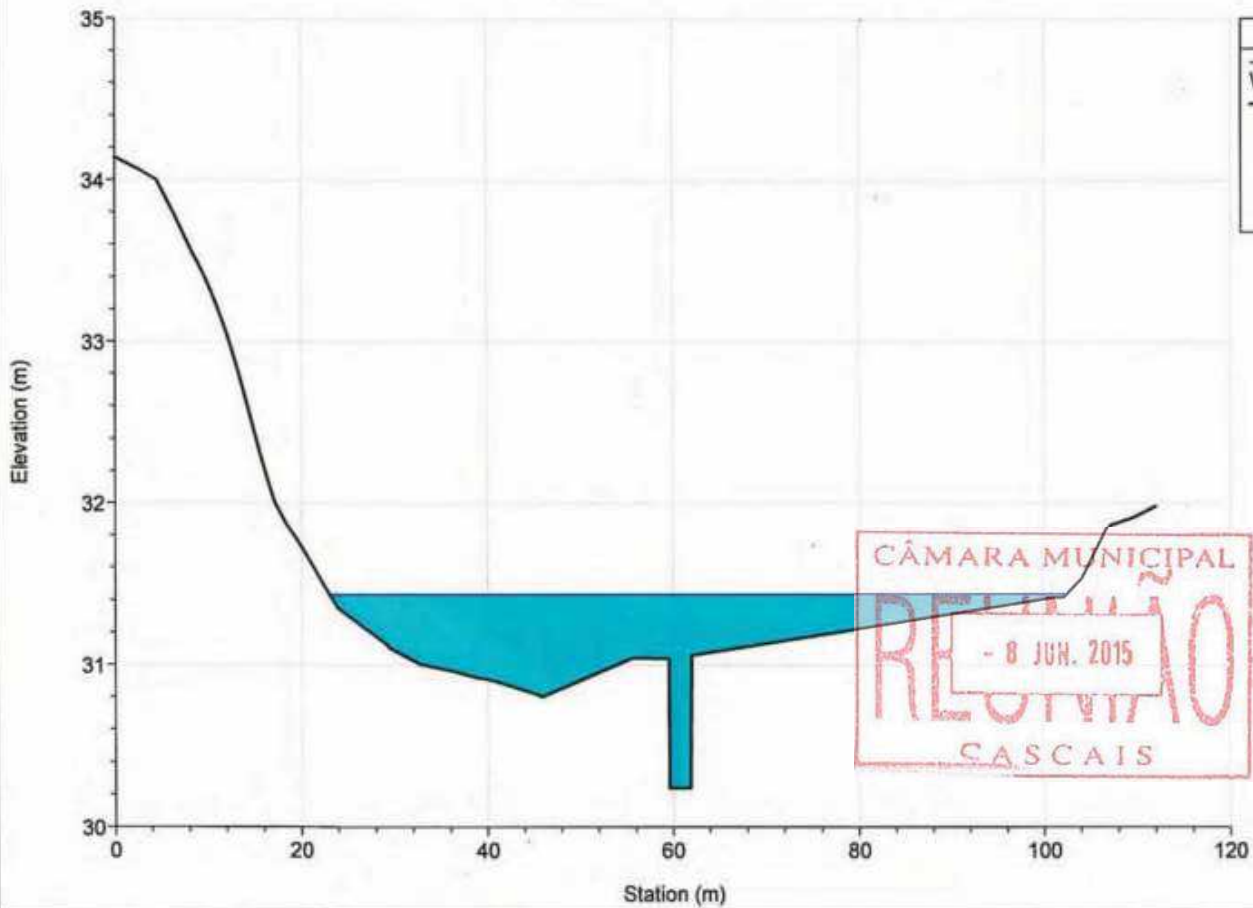
River = SASSOEIROS Reach = jusante RS = 2240.382



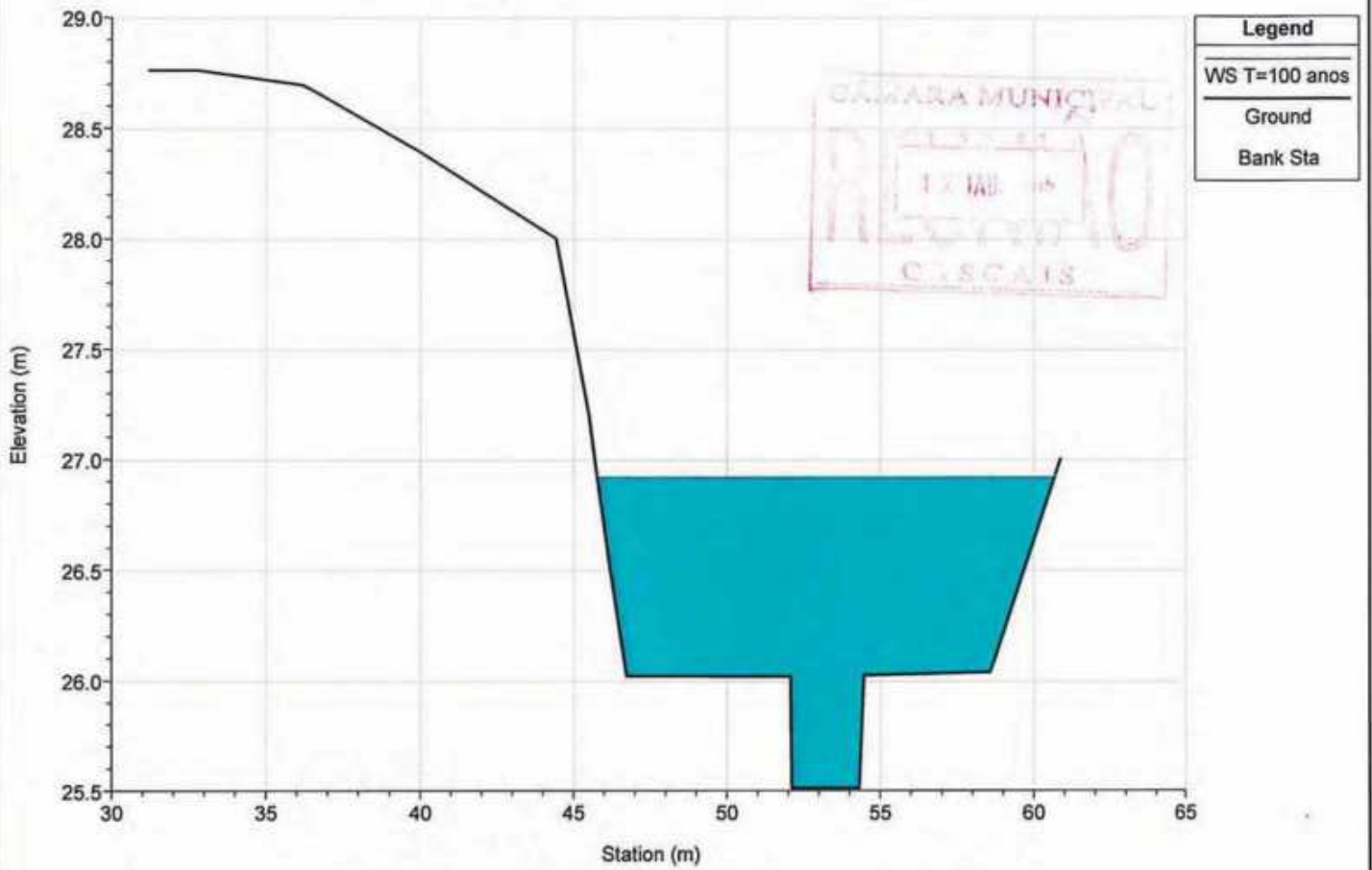
River = SASSOEIROS Reach = jusante RS = 2125.222



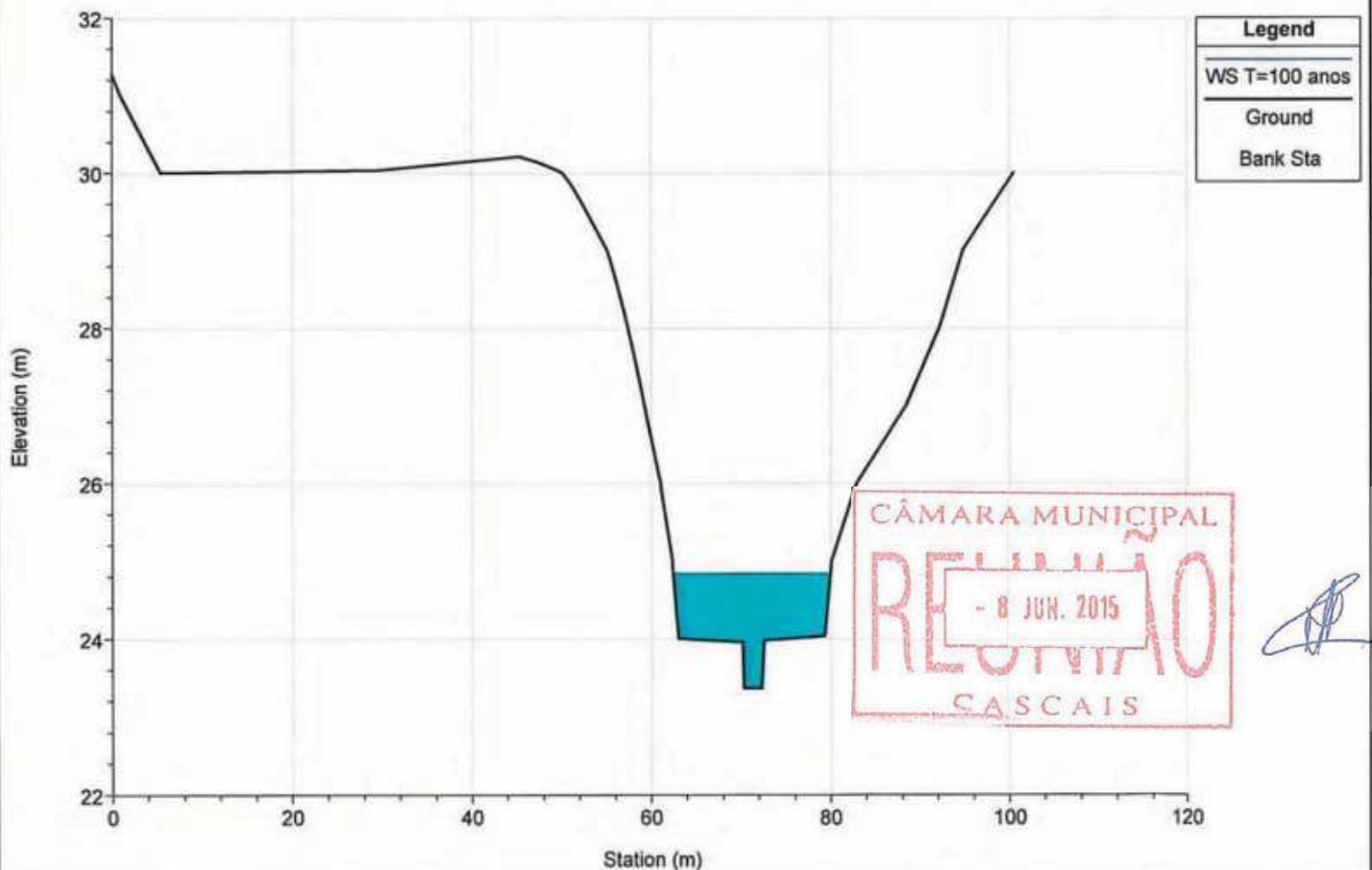
River = SASSOEIROS Reach = jusante RS = 2010.314



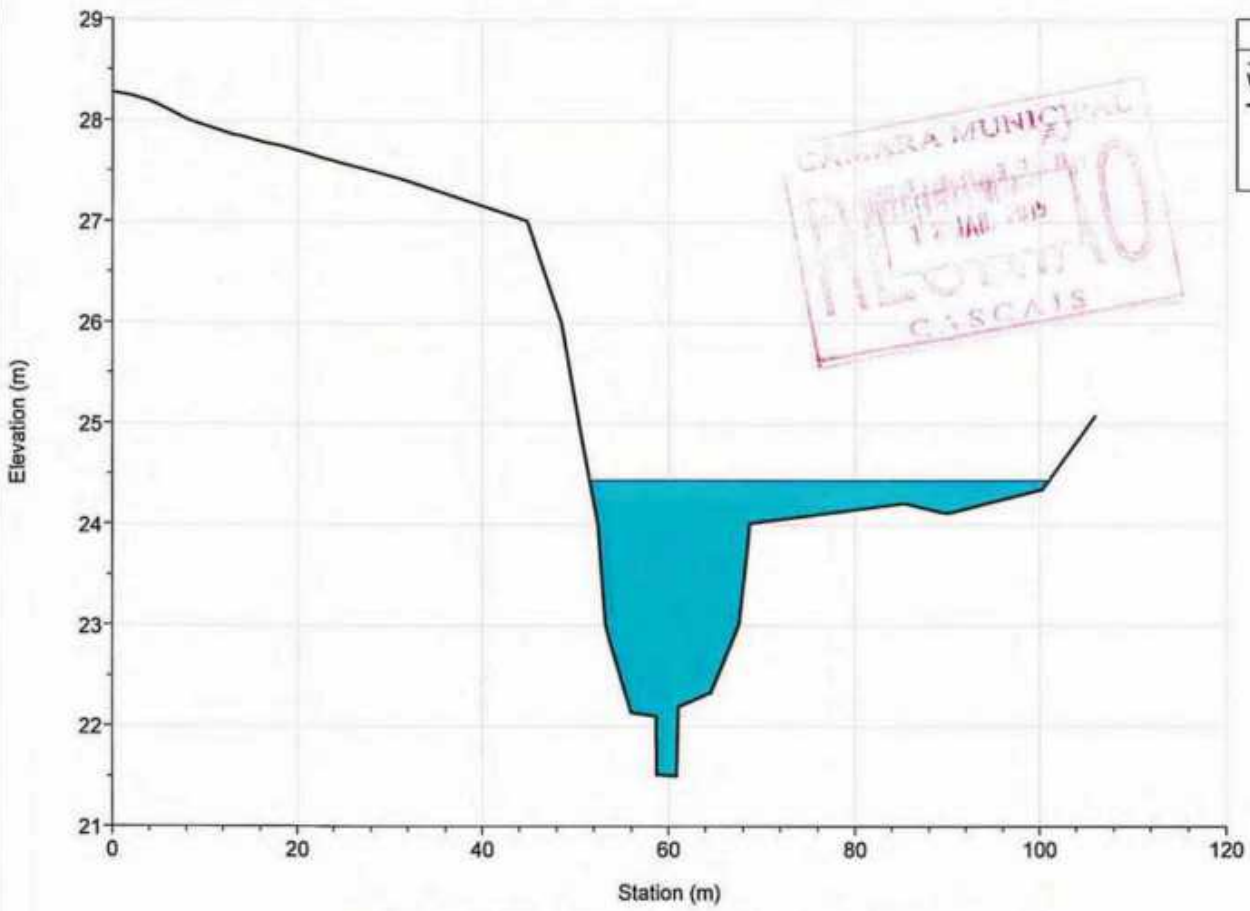
River = SASSOEIROS Reach = jusante RS = 1857.406



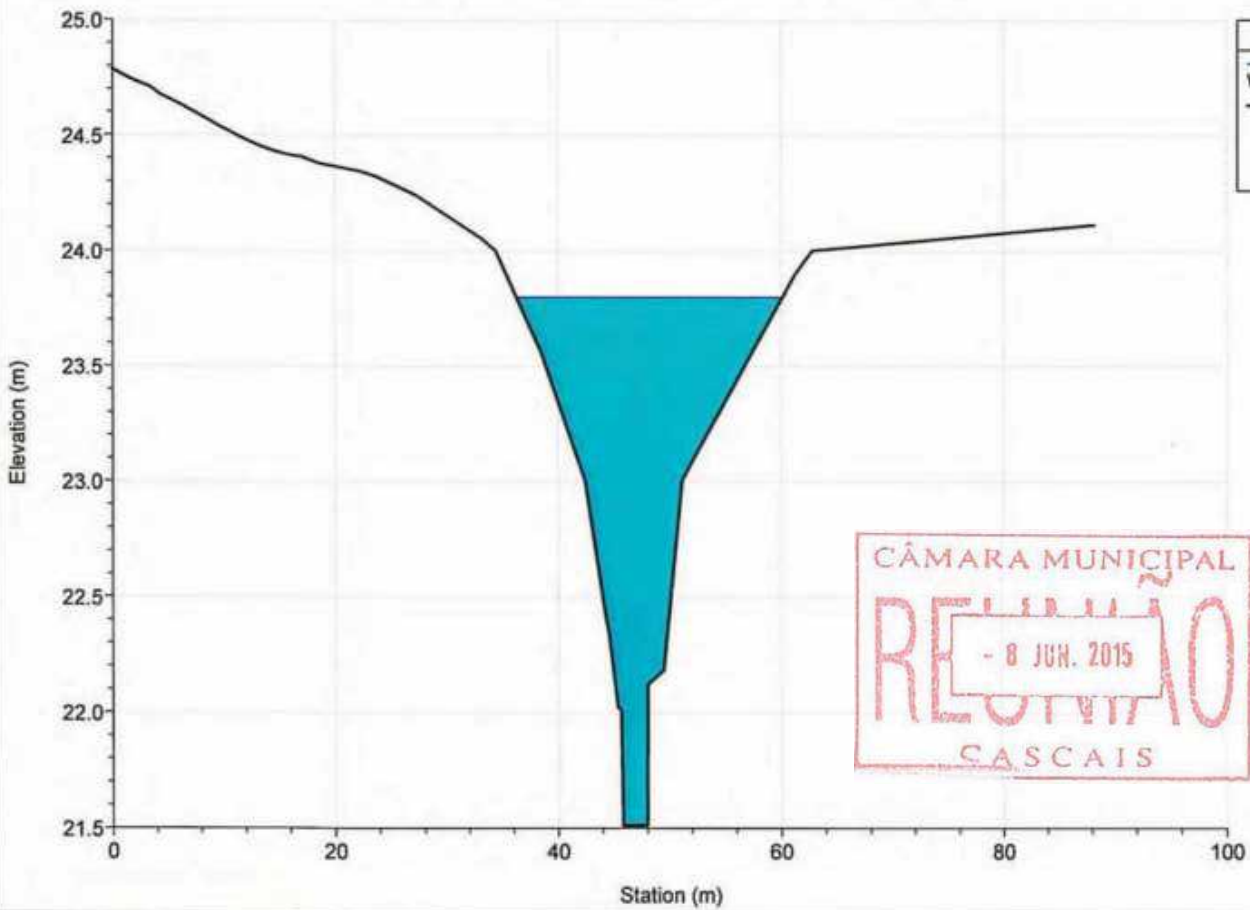
River = SASSOEIROS Reach = jusante RS = 1769.375



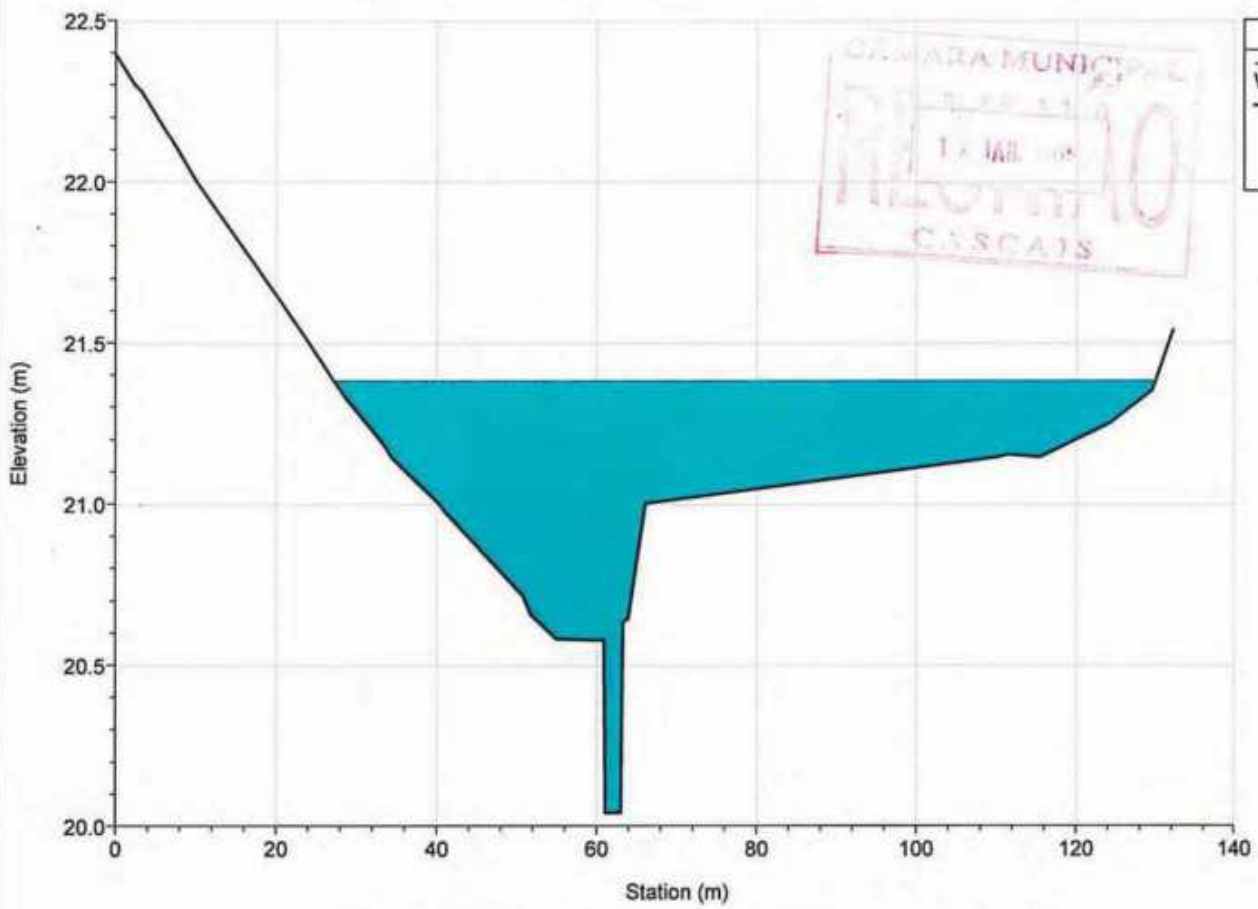
River = SASSOEIROS Reach = jusante RS = 1658.338



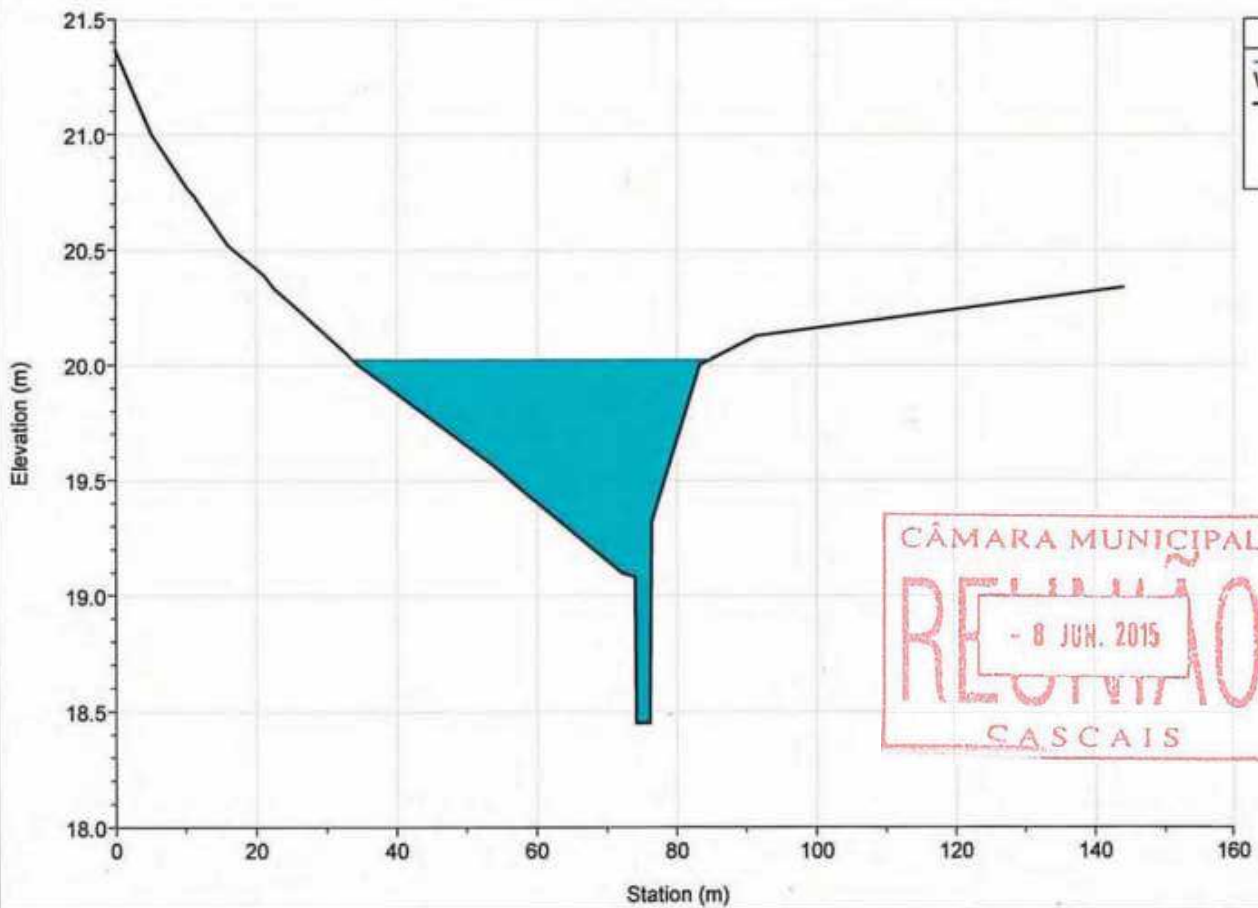
River = SASSOEIROS Reach = jusante RS = 1560.488

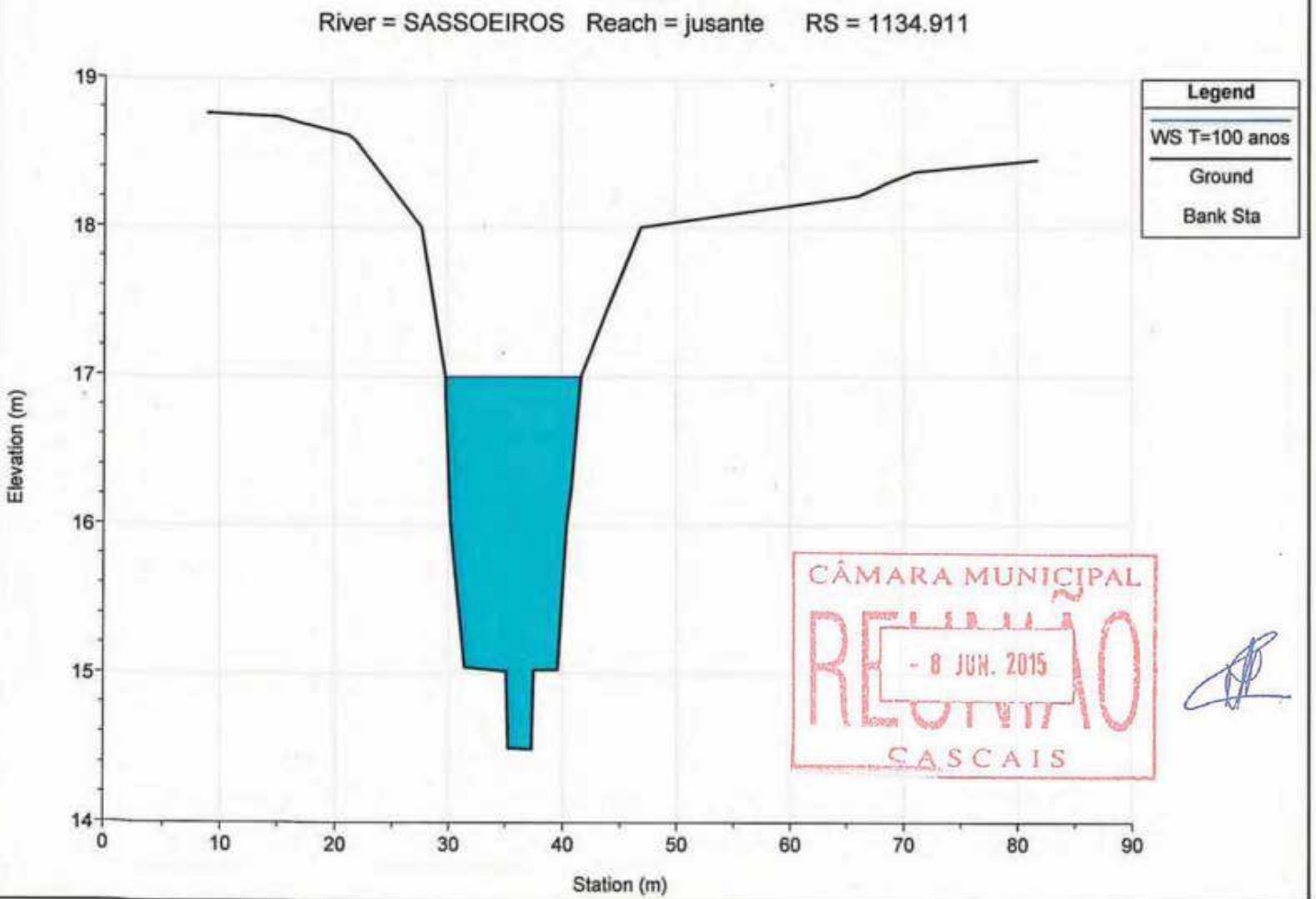
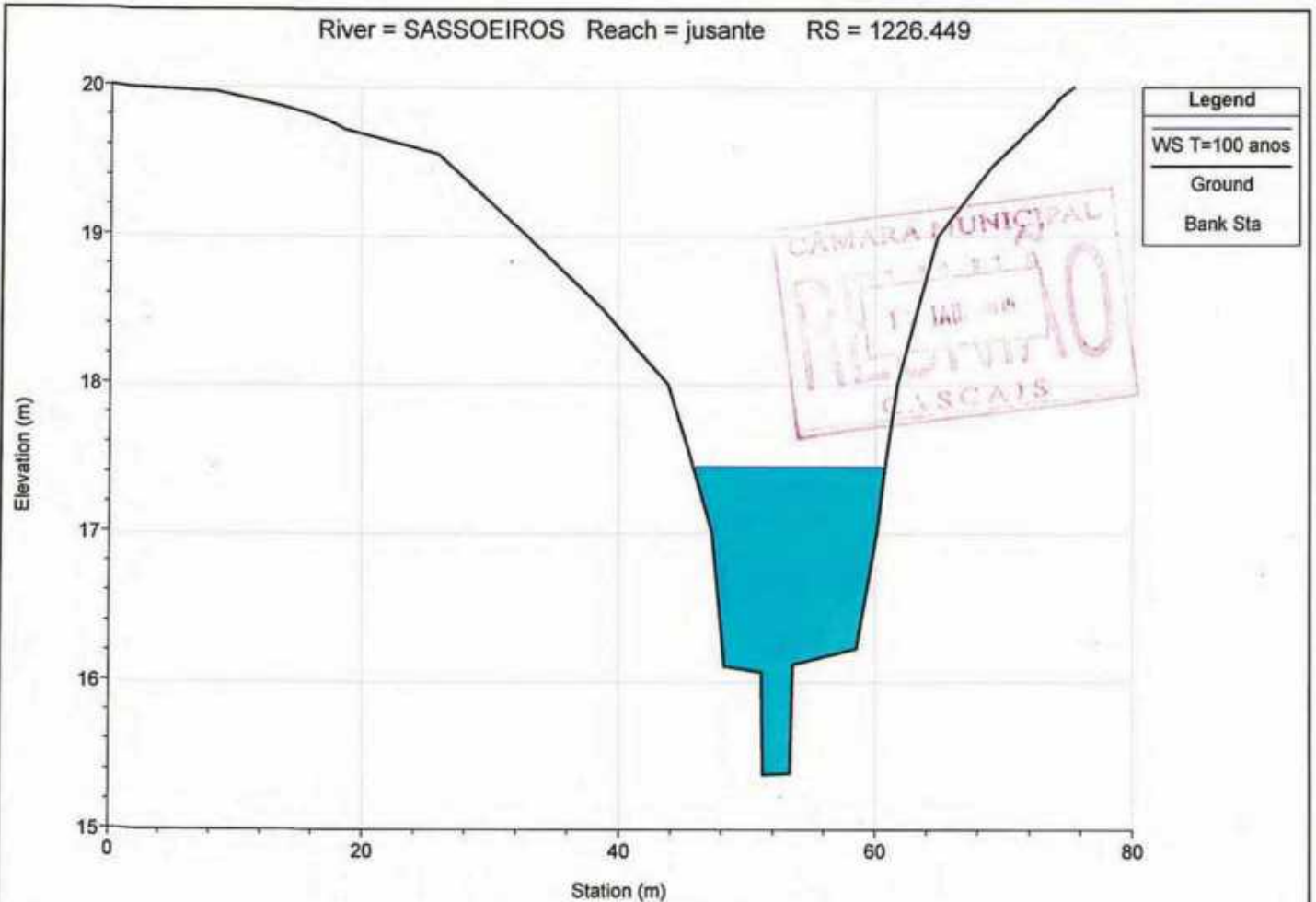


River = SASSOEIROS Reach = jusante RS = 1454.930



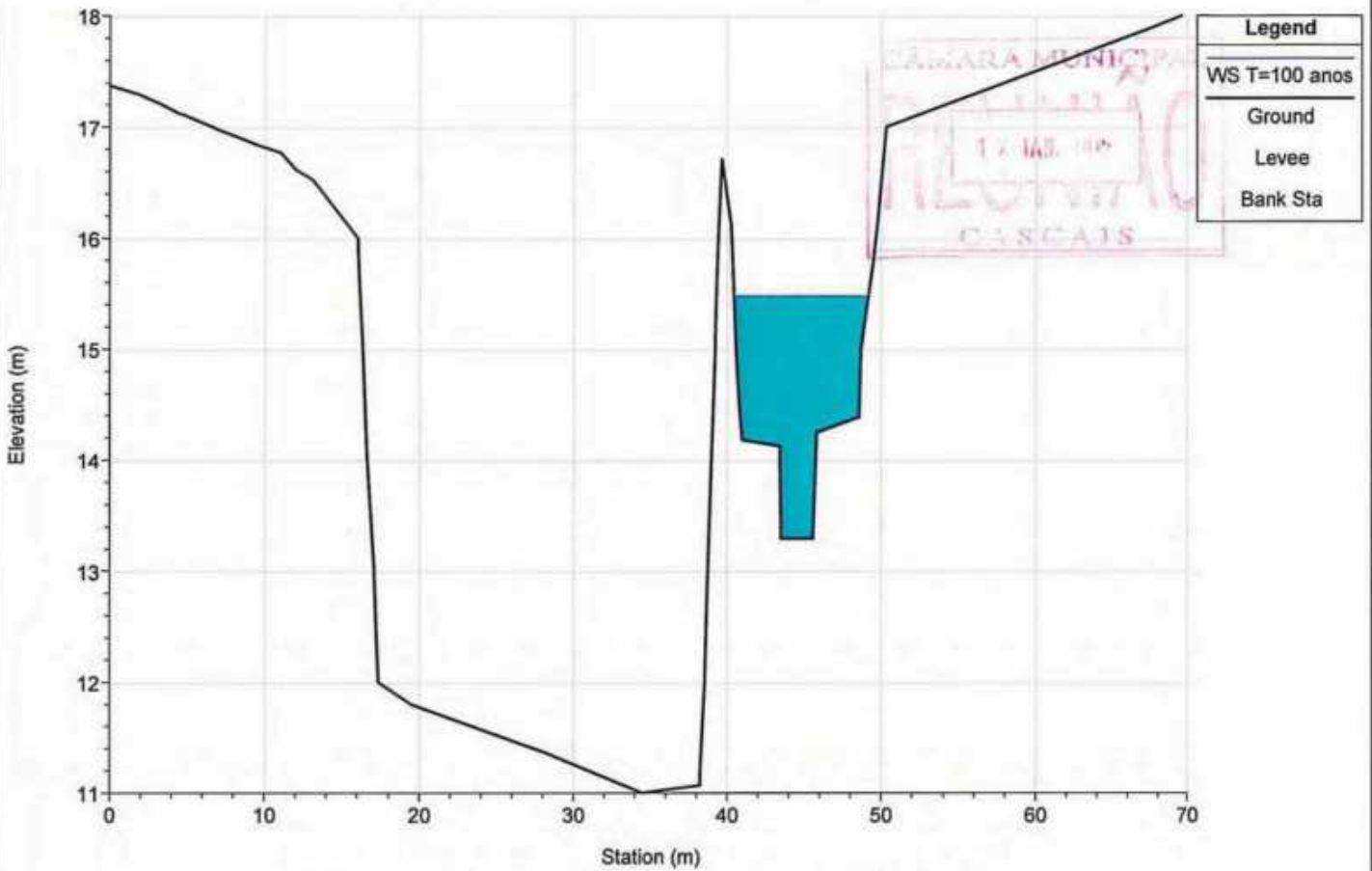
River = SASSOEIROS Reach = jusante RS = 1341.045



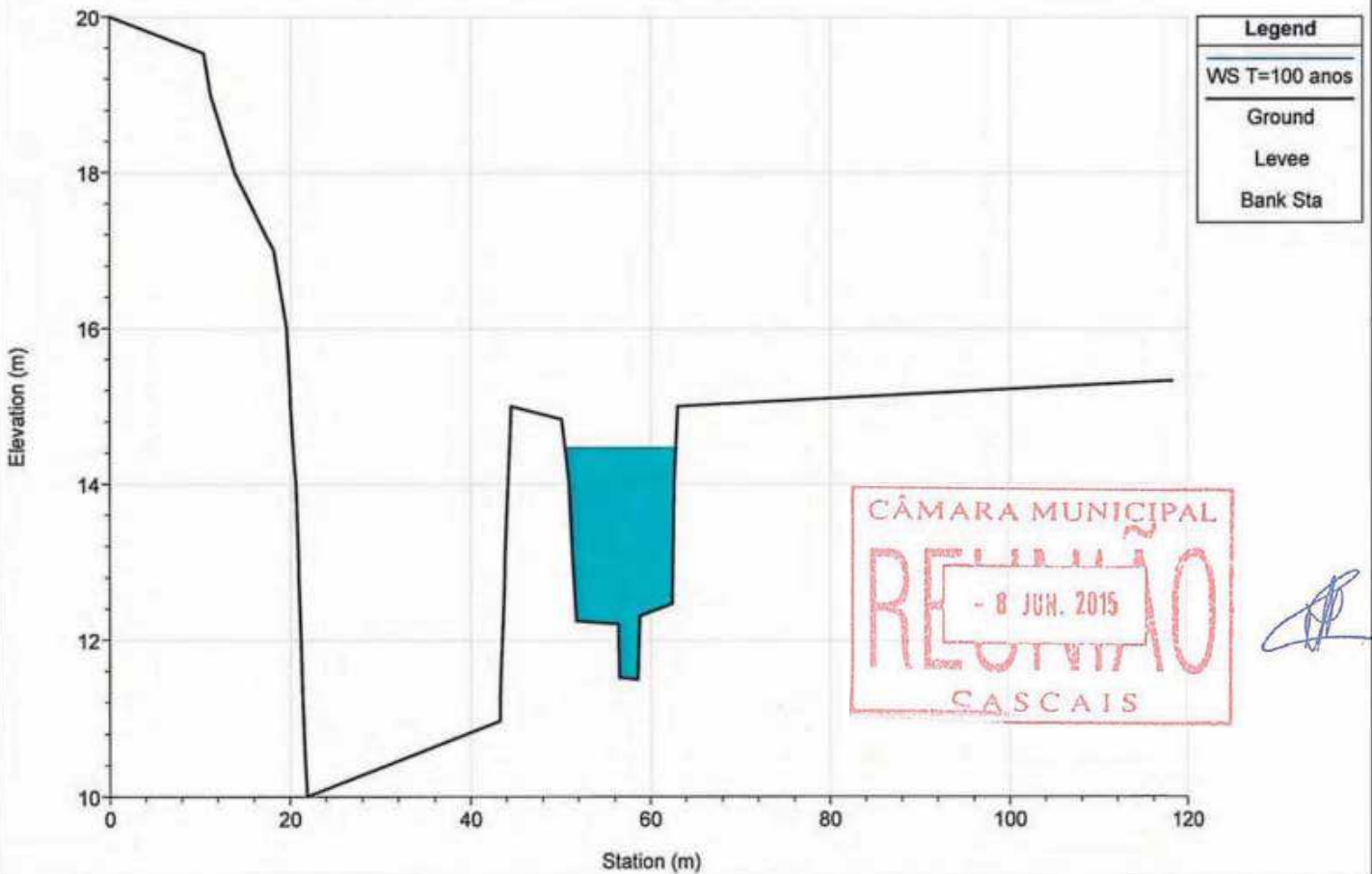




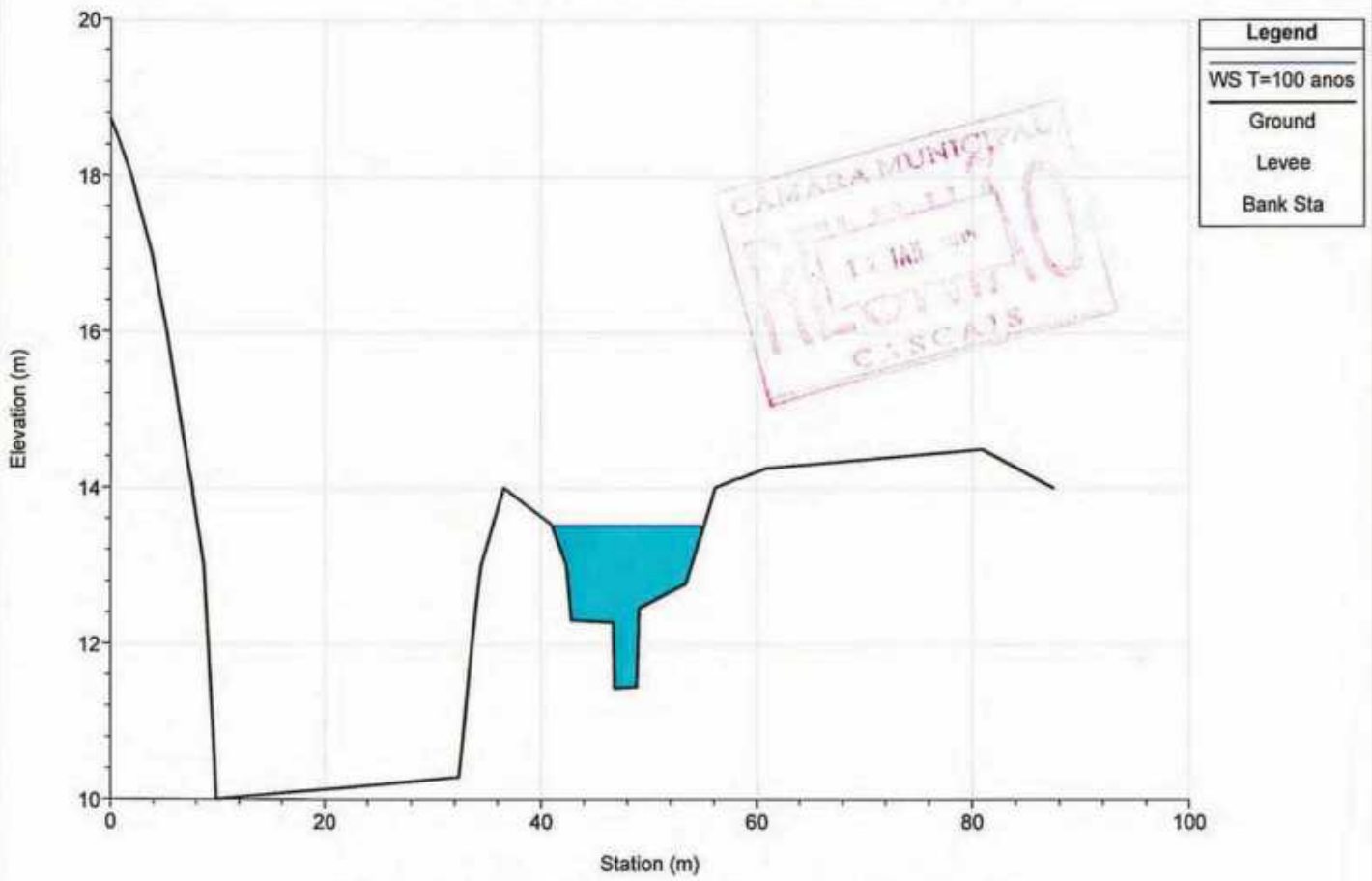
River = SASSOEIROS Reach = jusante RS = 994.535



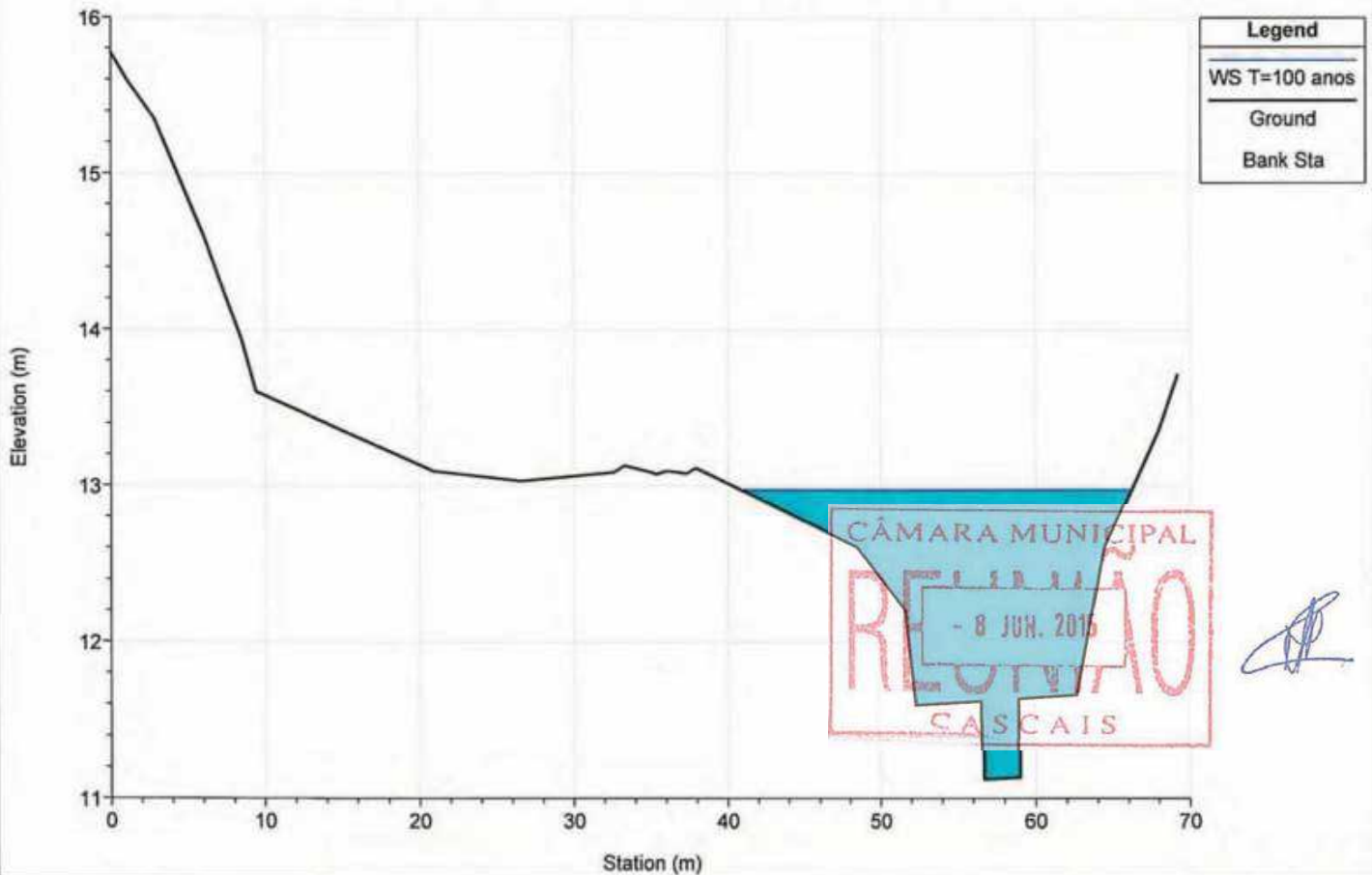
River = SASSOEIROS Reach = jusante RS = 863.767



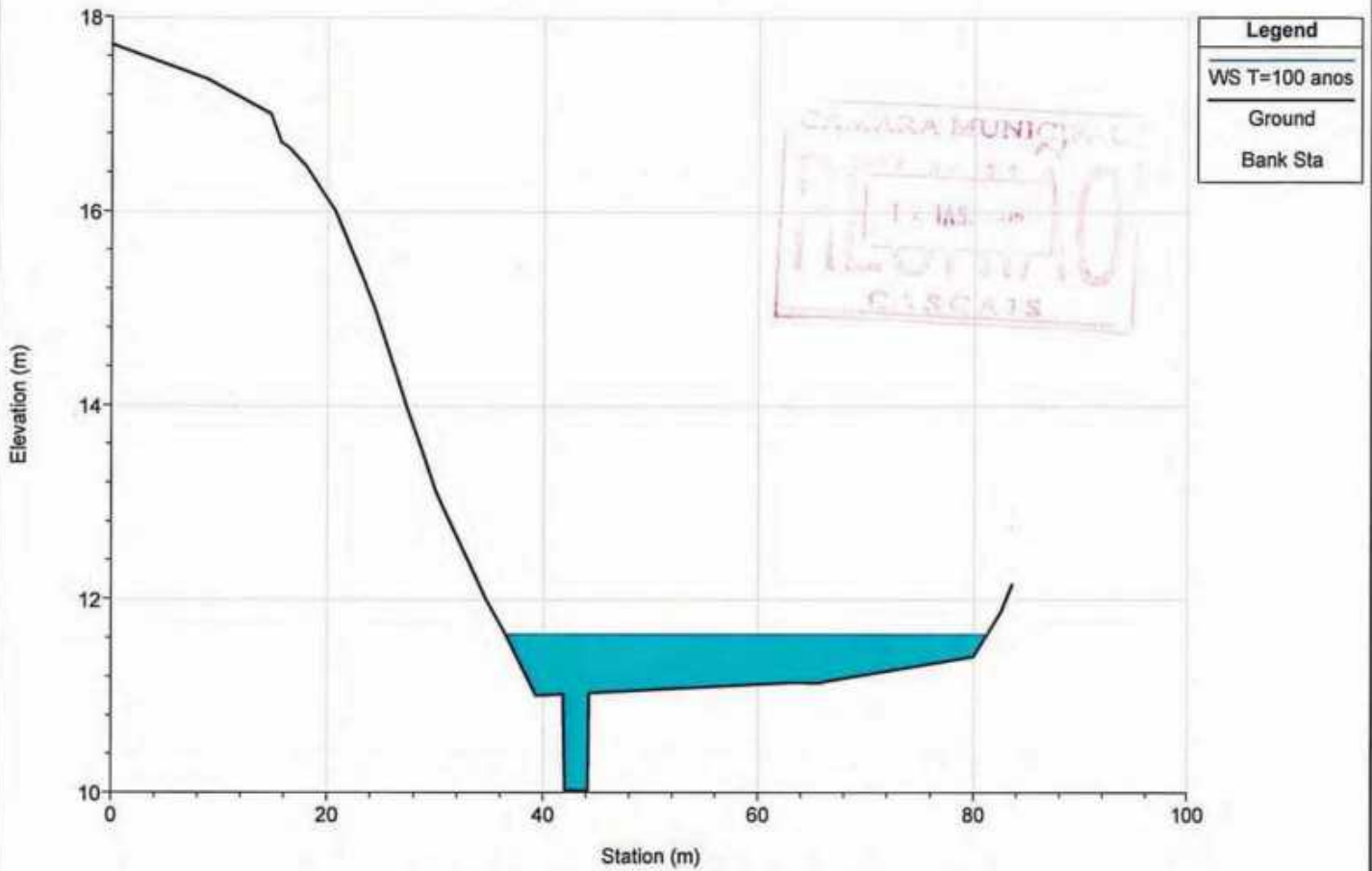
River = SASSOEIROS Reach = jusante RS = 761.918



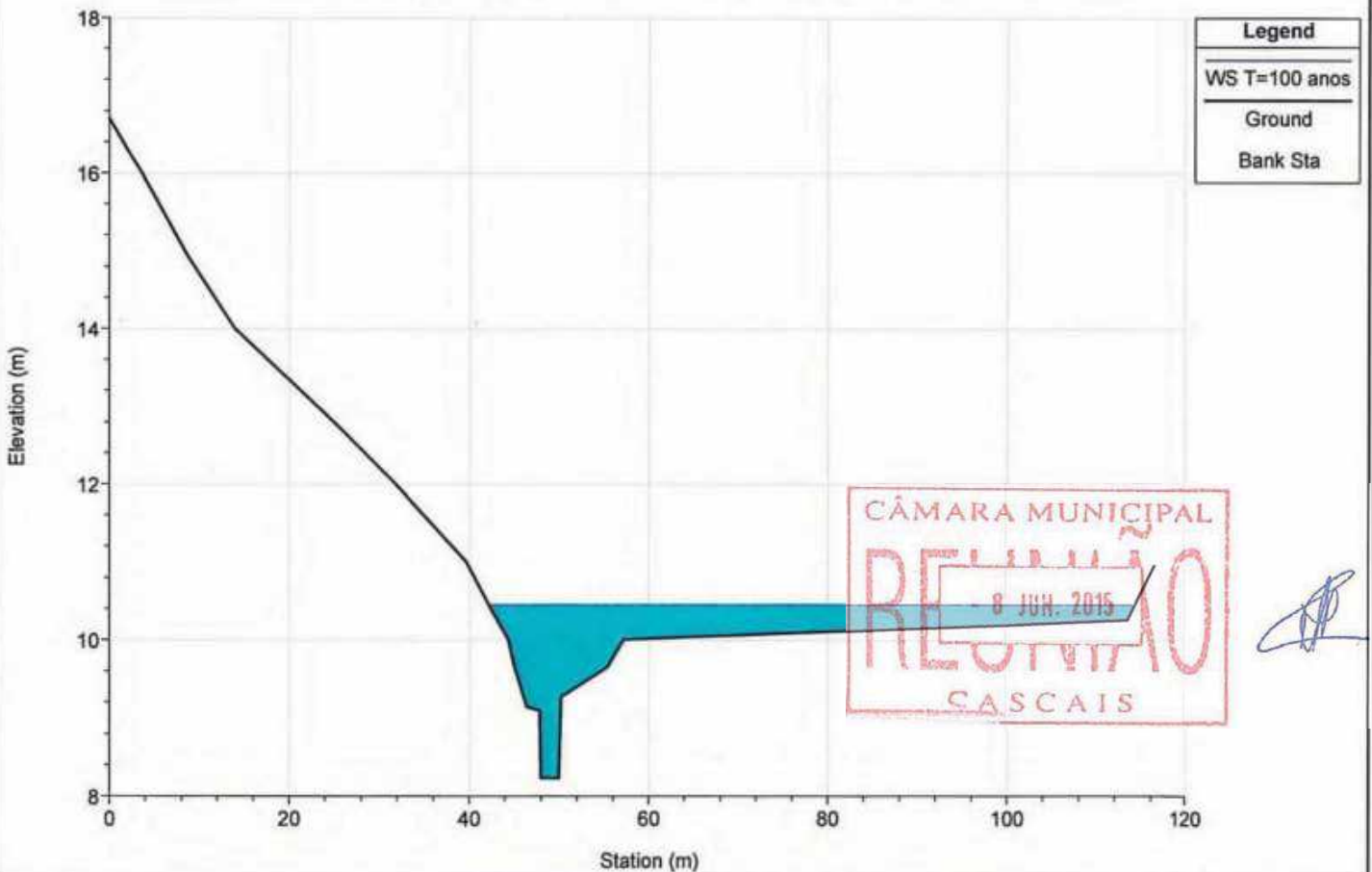
River = SASSOEIROS Reach = jusante RS = 629.860



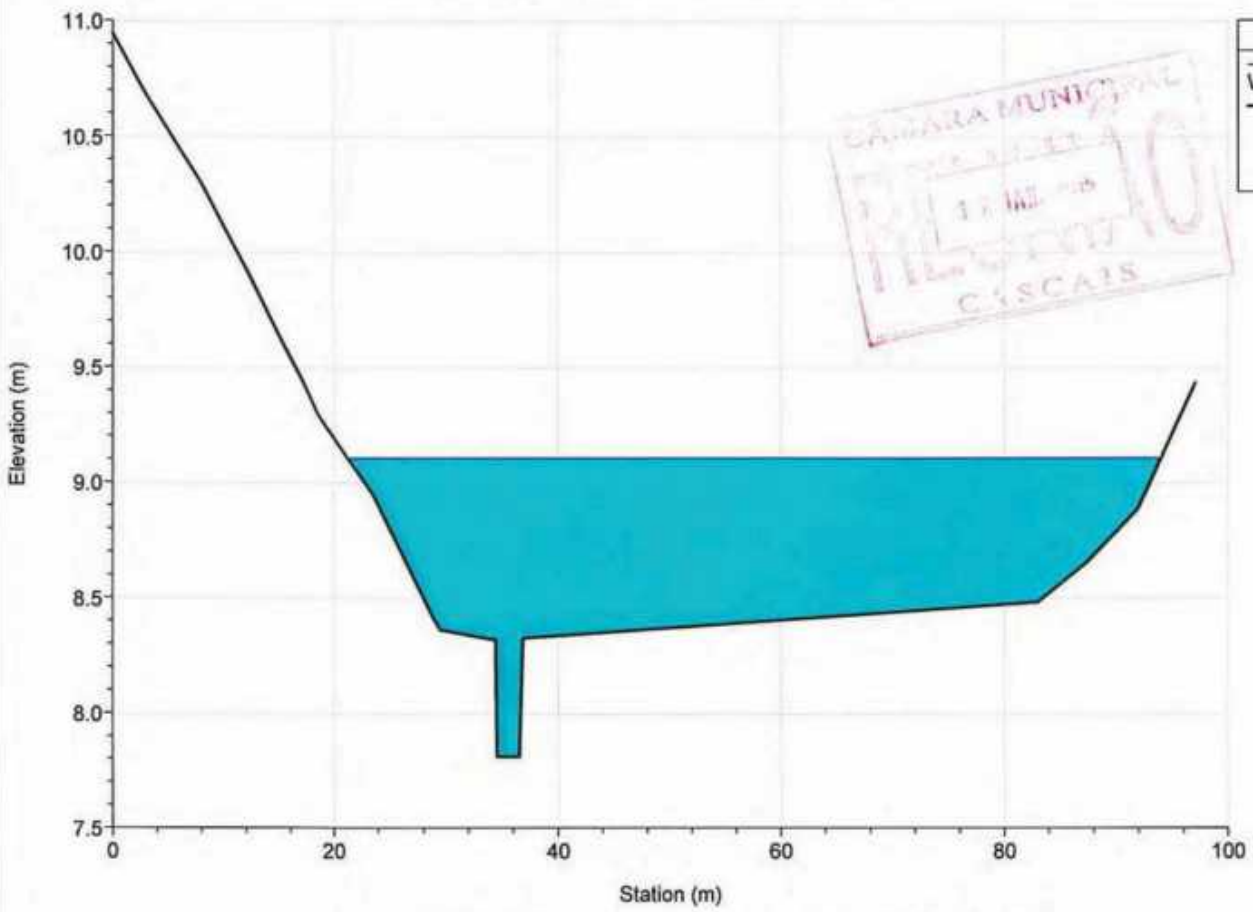
River = SASSOEIROS Reach = jusante RS = 525.164



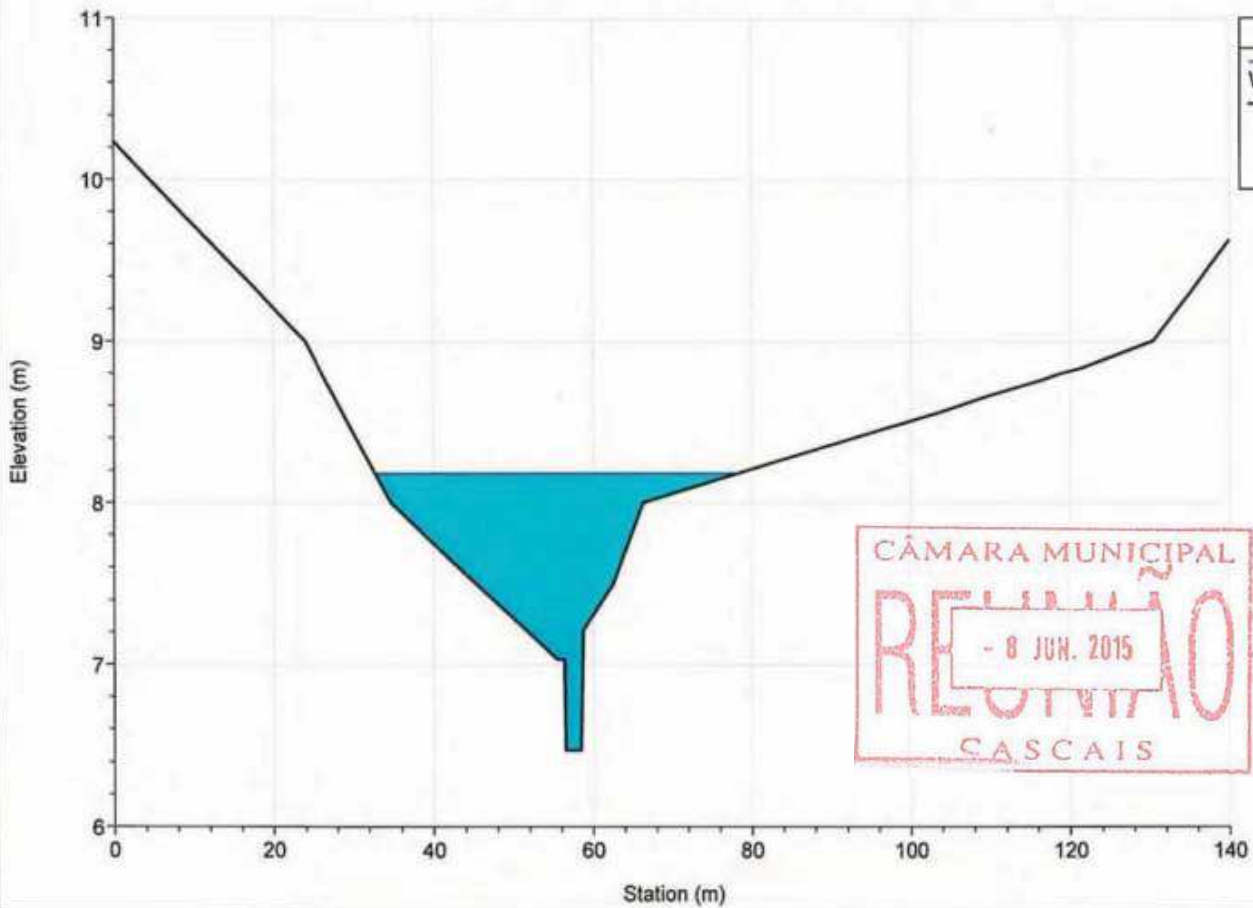
River = SASSOEIROS Reach = jusante RS = 406.666



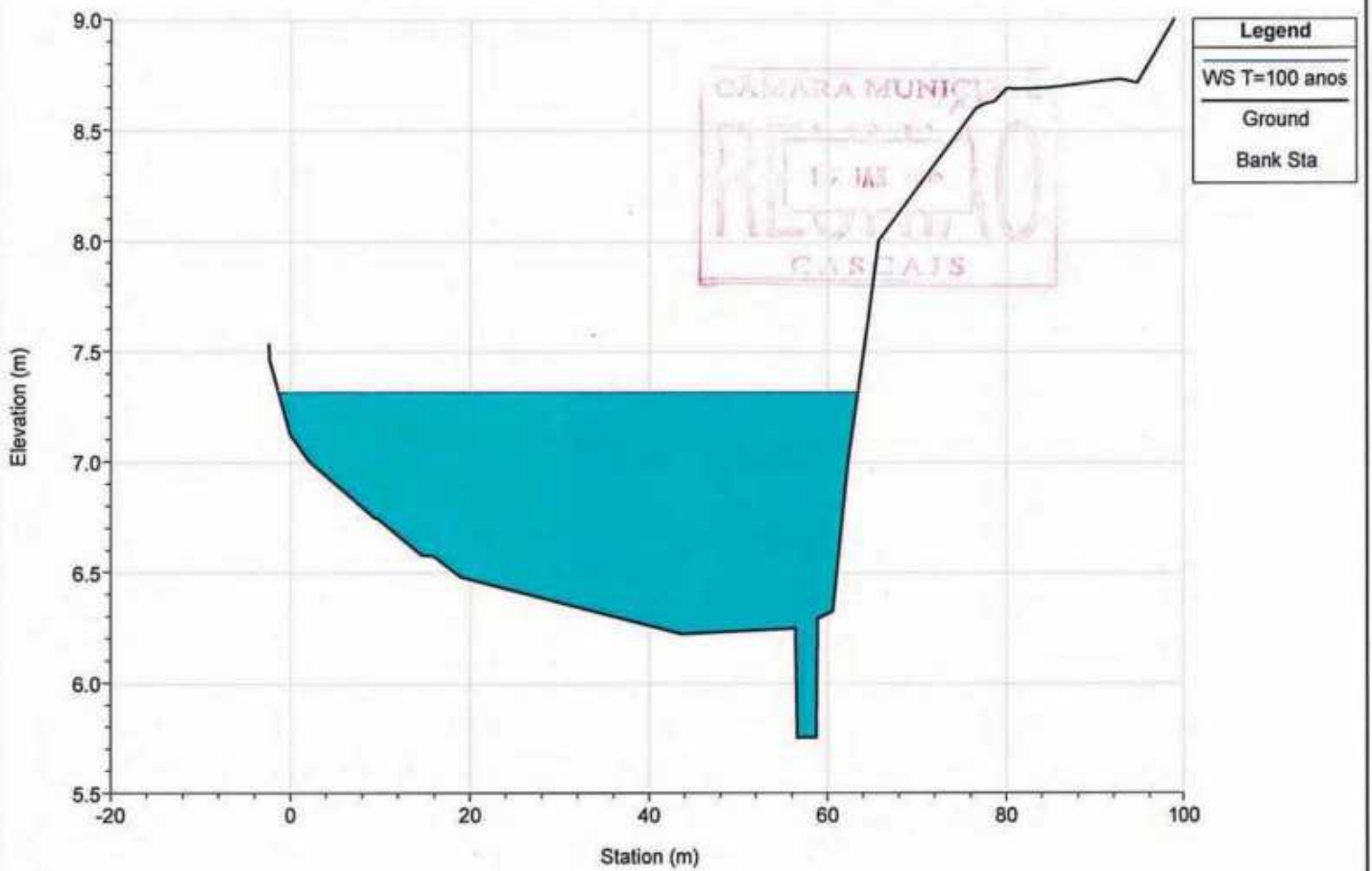
River = SASSOEIROS Reach = jusante RS = 287.832



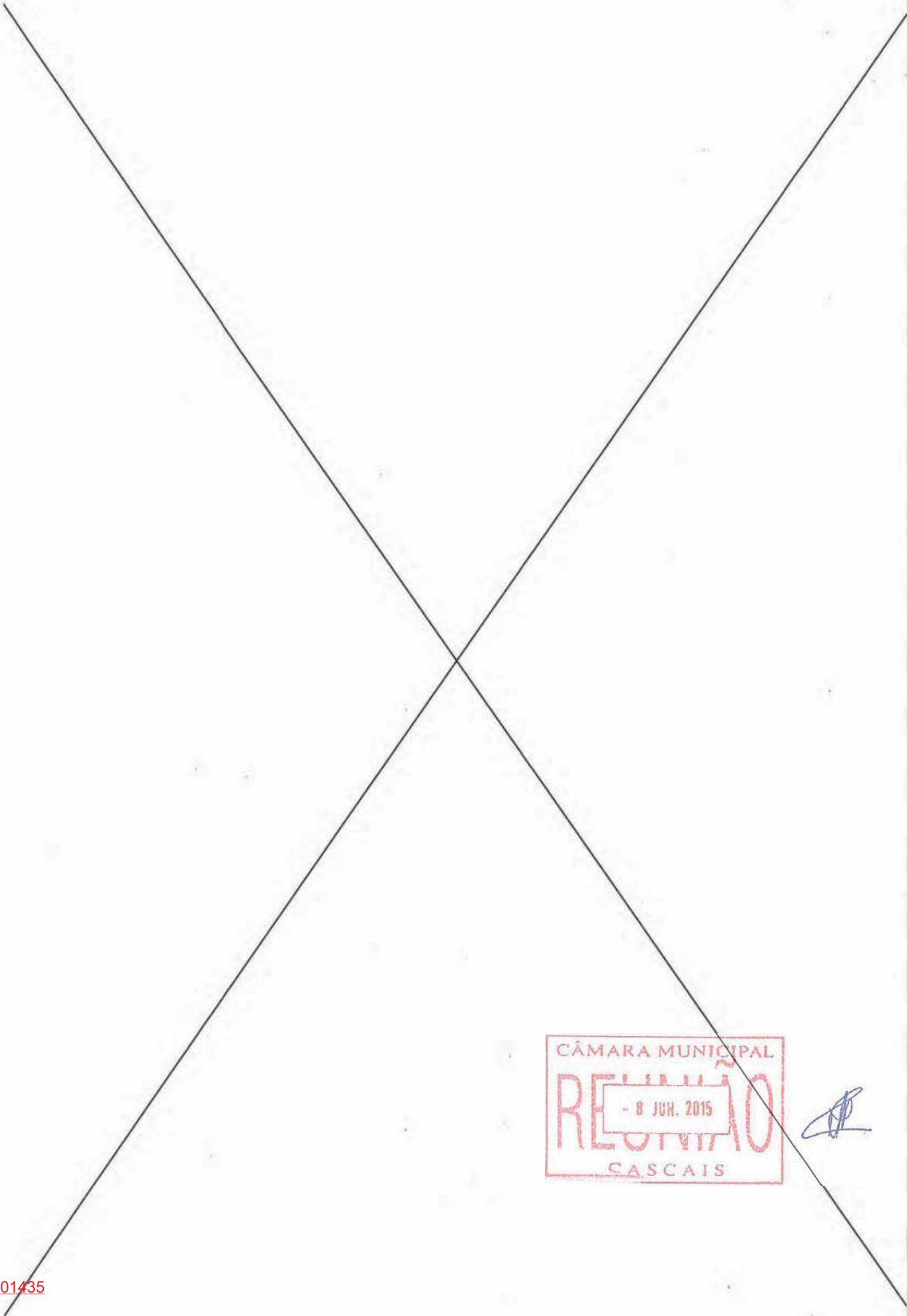
River = SASSOEIROS Reach = jusante RS = 178.087



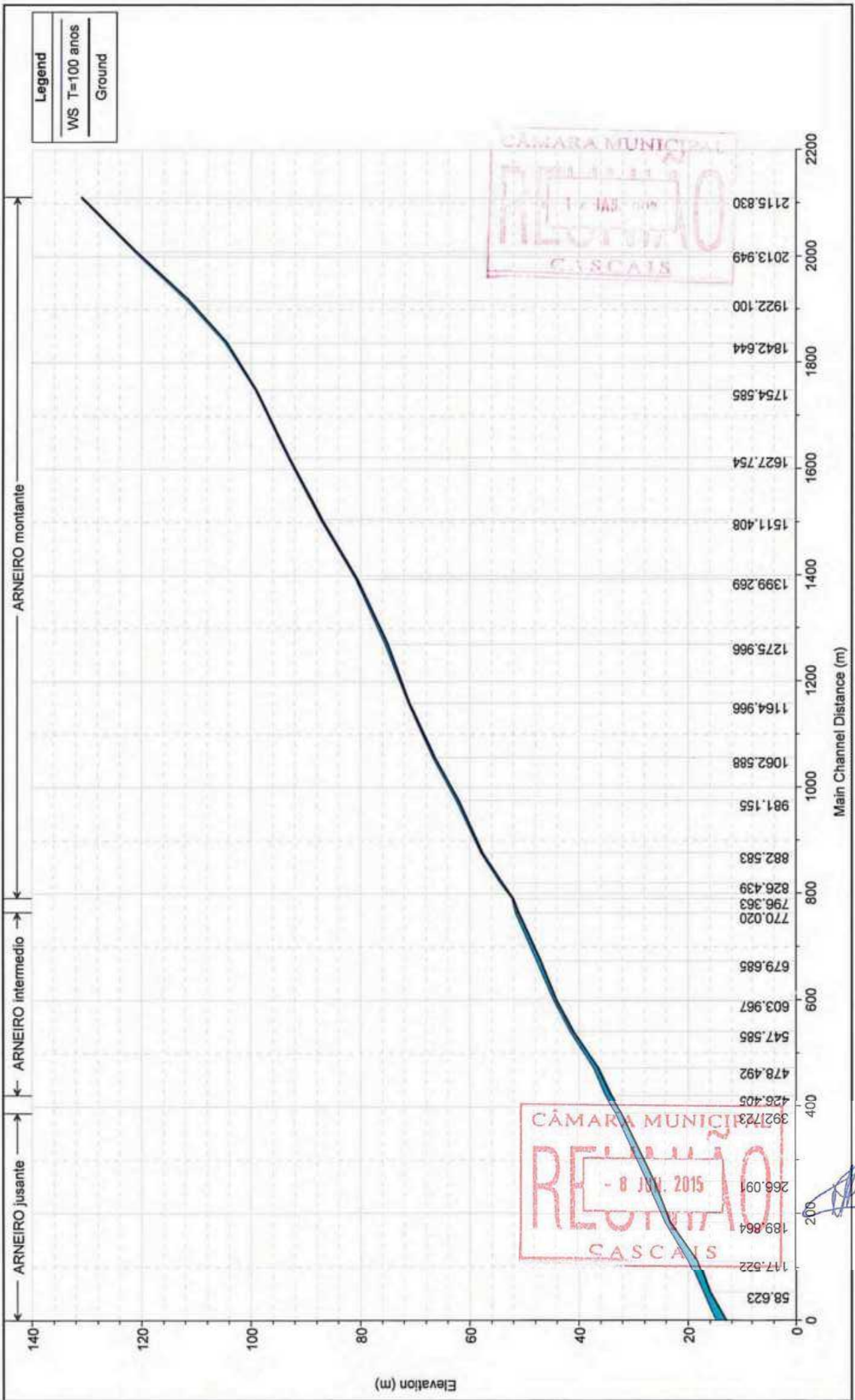
River = SASOEIROS Reach = jusante RS = 28.303



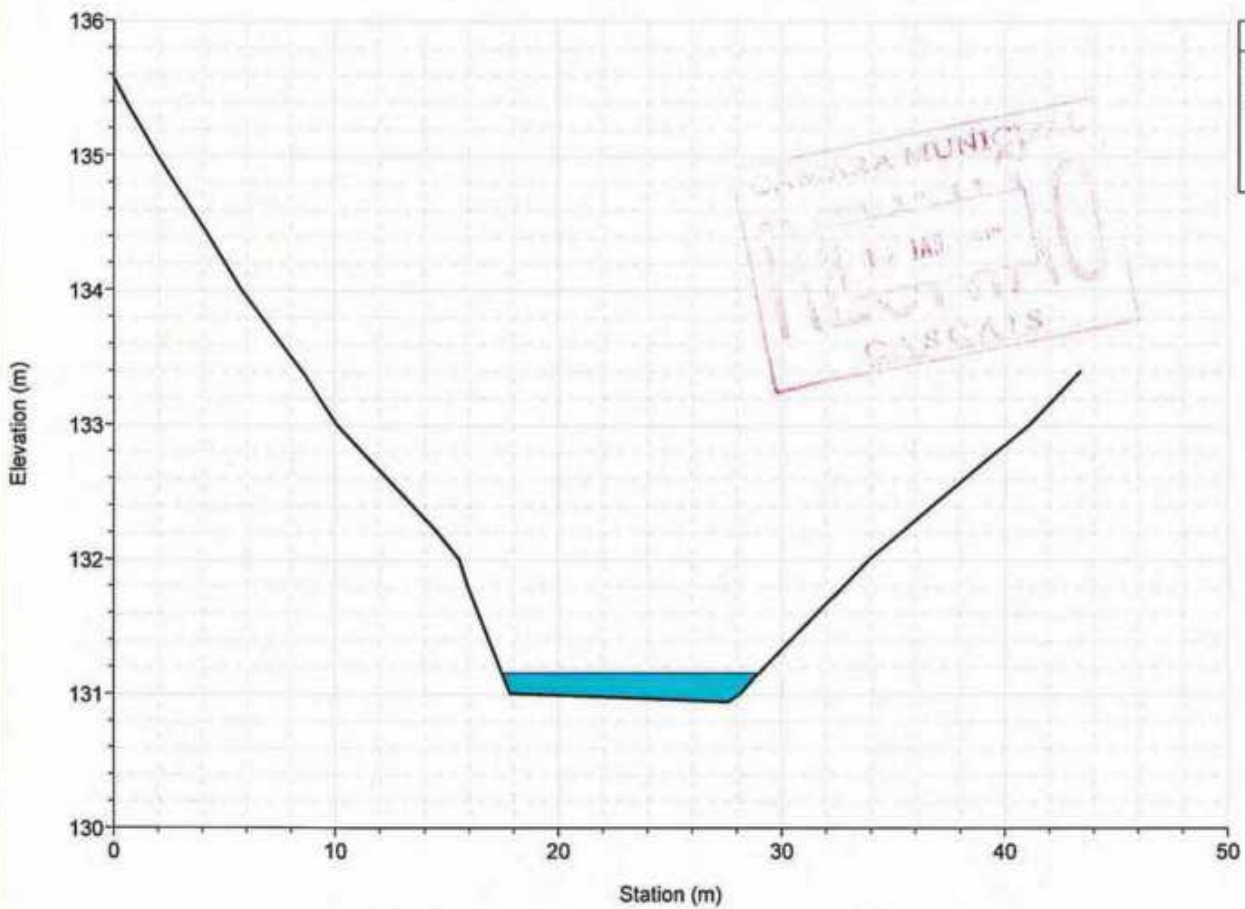
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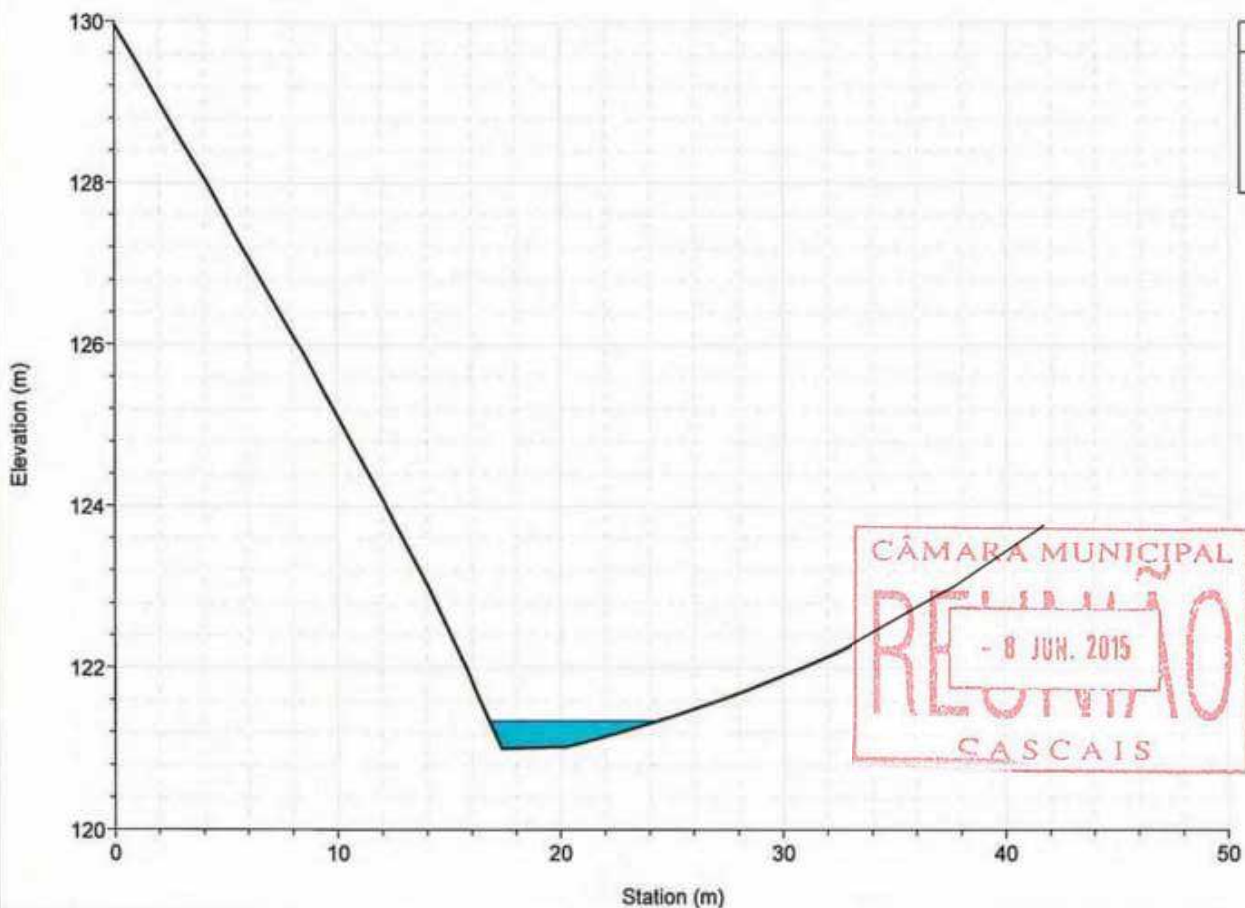
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REUNIÃO  
- 8 JUN. 2015  
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River = ARNEIRO Reach = montante RS = 2115.830

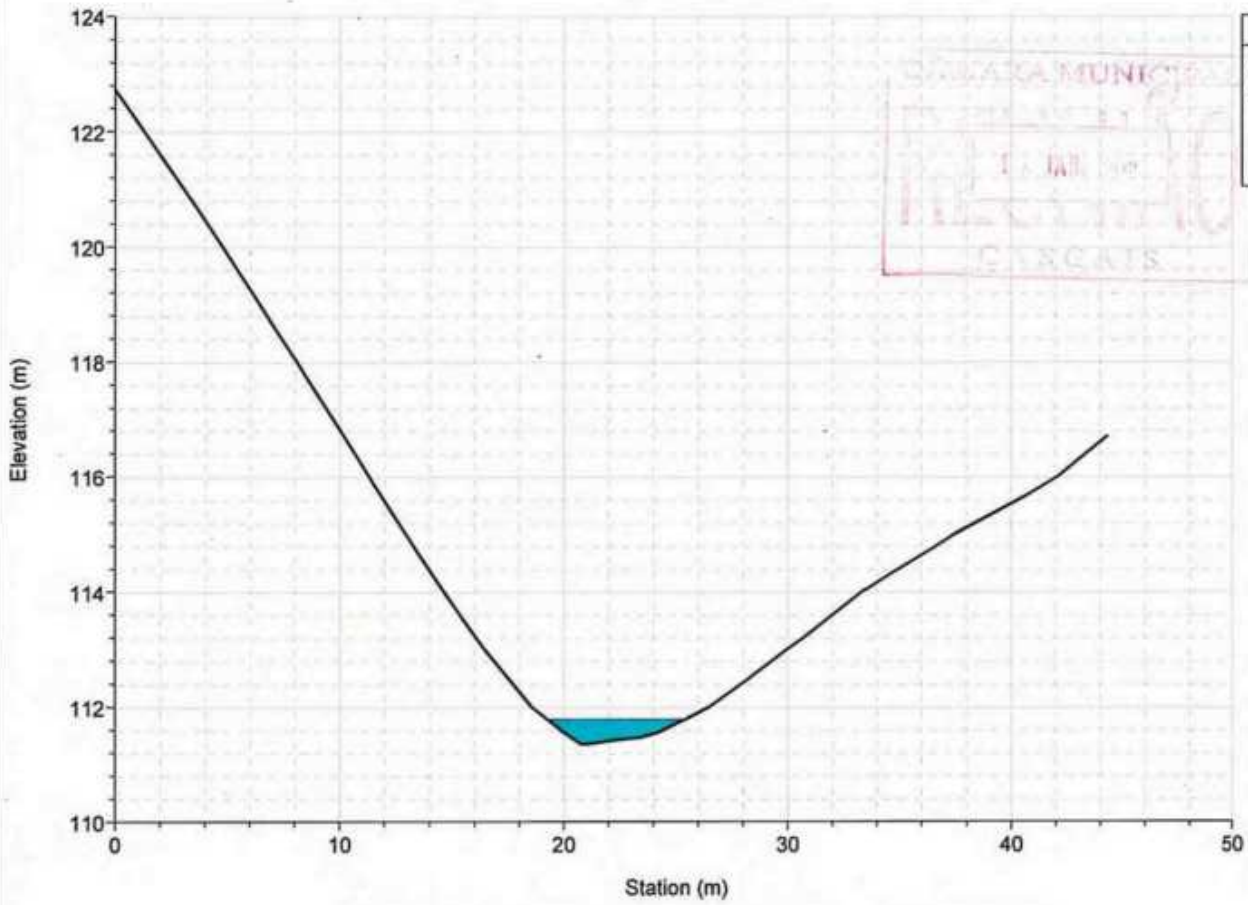


River = ARNEIRO Reach = montante RS = 2013.949



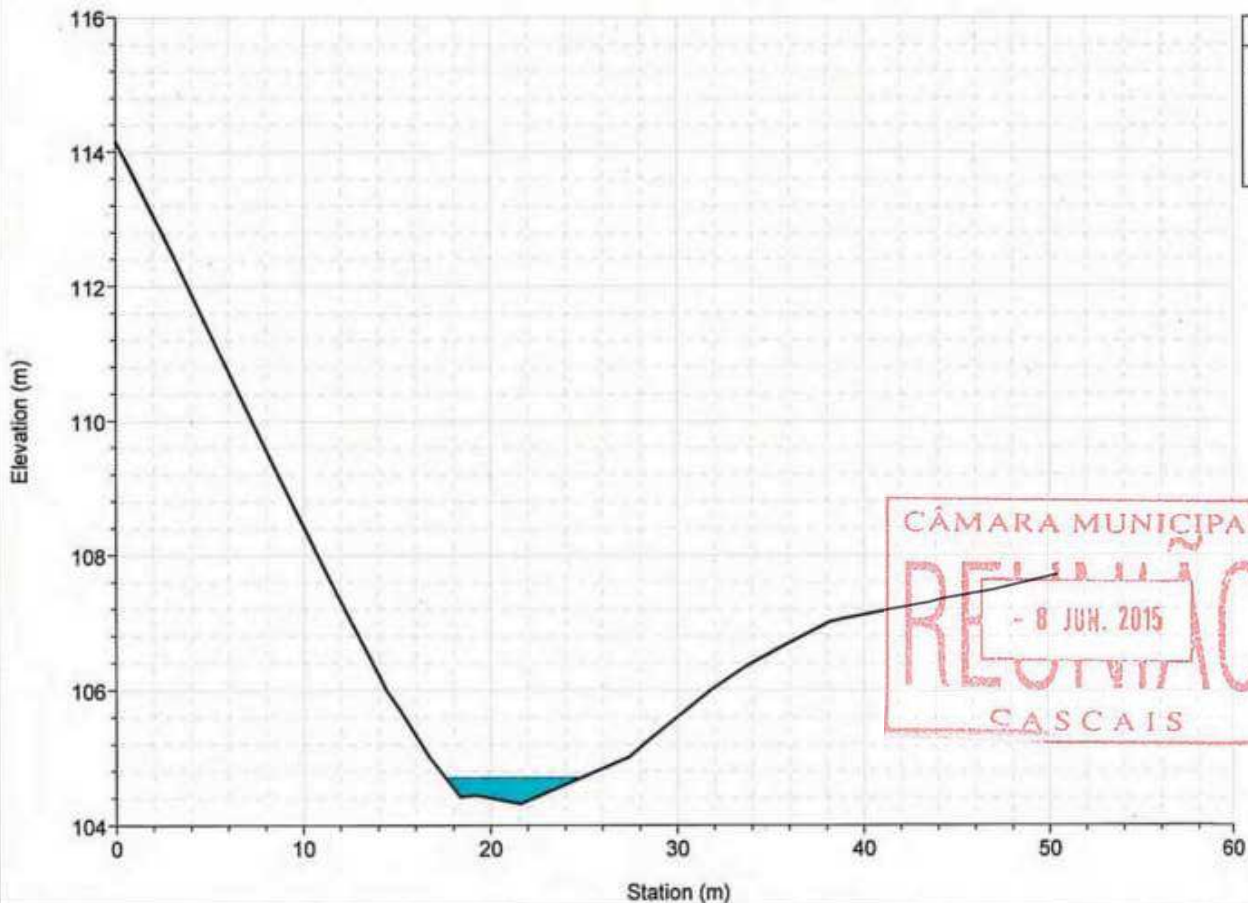


River = ARNEIRO Reach = montante RS = 1922.100



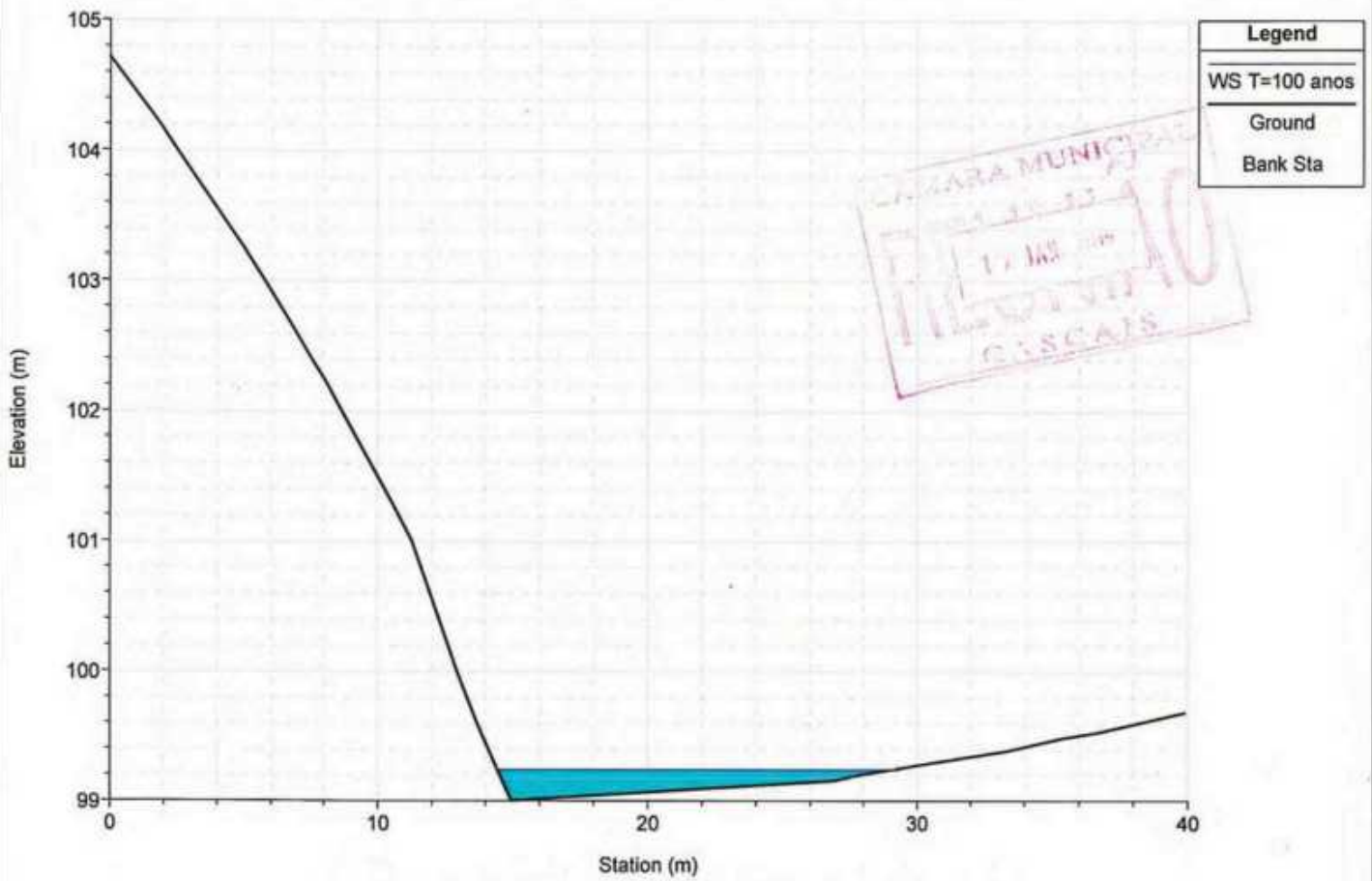
Legend
WS T=100 anos
Ground
Bank Sta

River = ARNEIRO Reach = montante RS = 1842.644

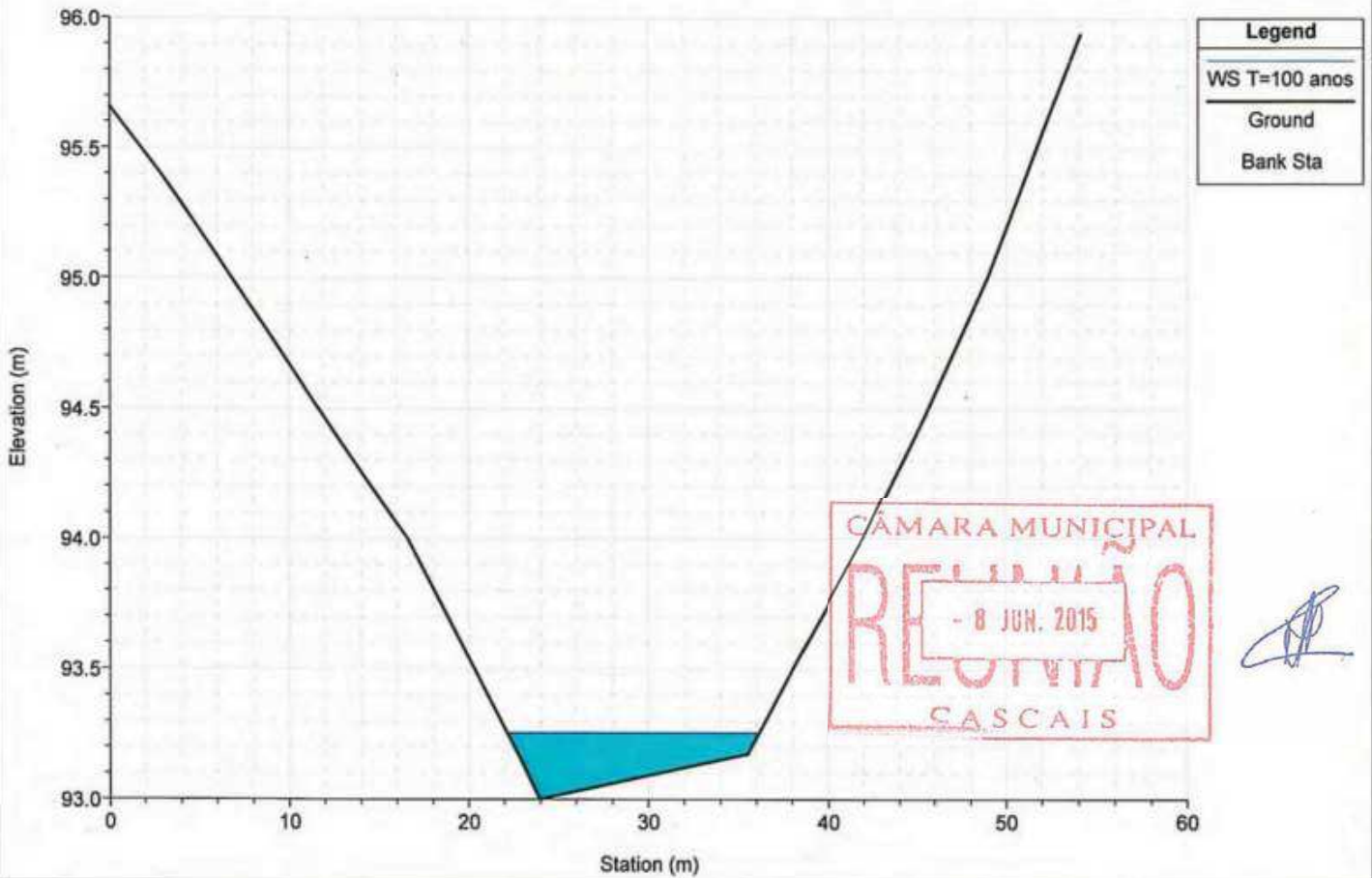


Legend
WS T=100 anos
Ground
Bank Sta

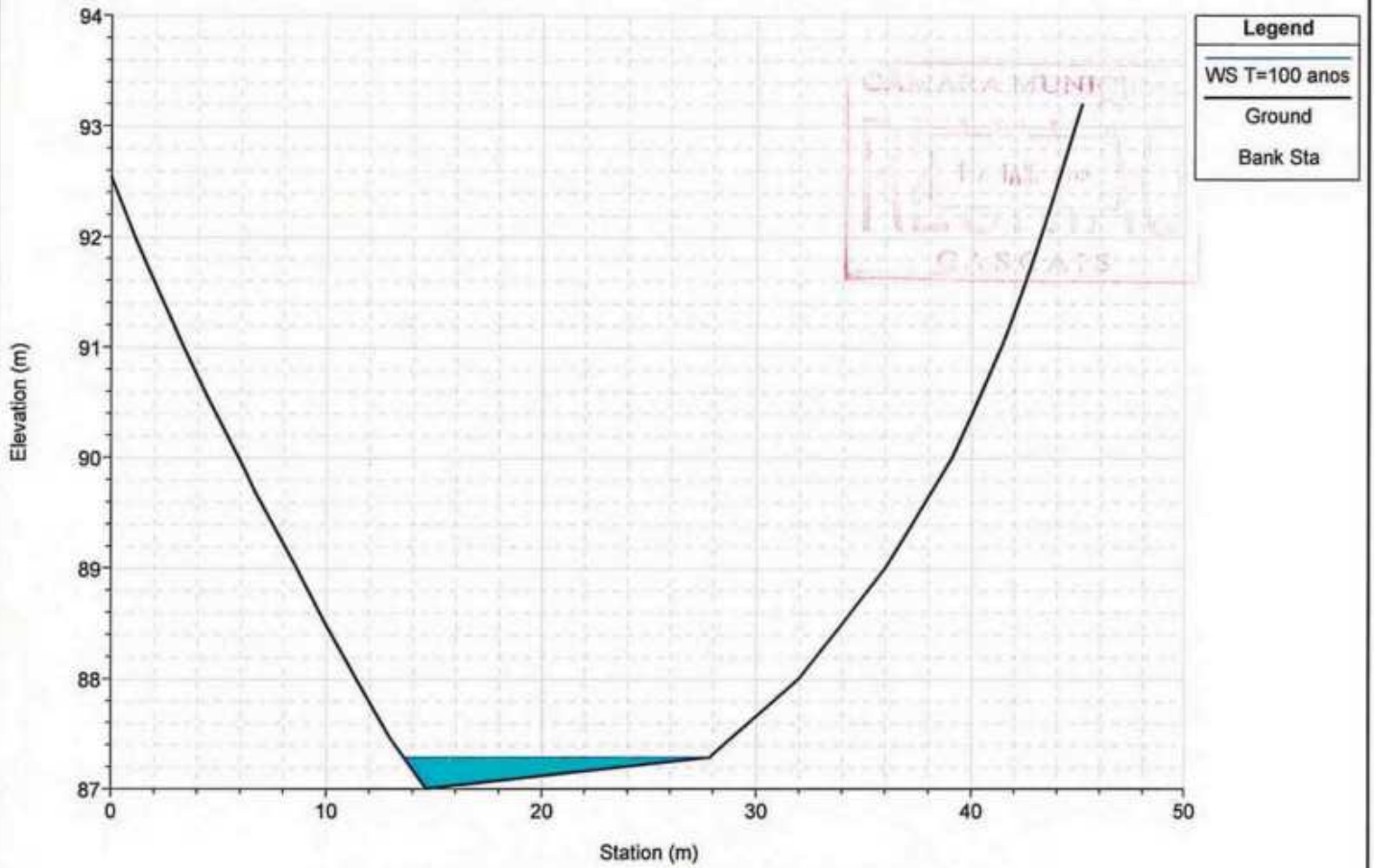
River = ARNEIRO Reach = montante RS = 1754.585



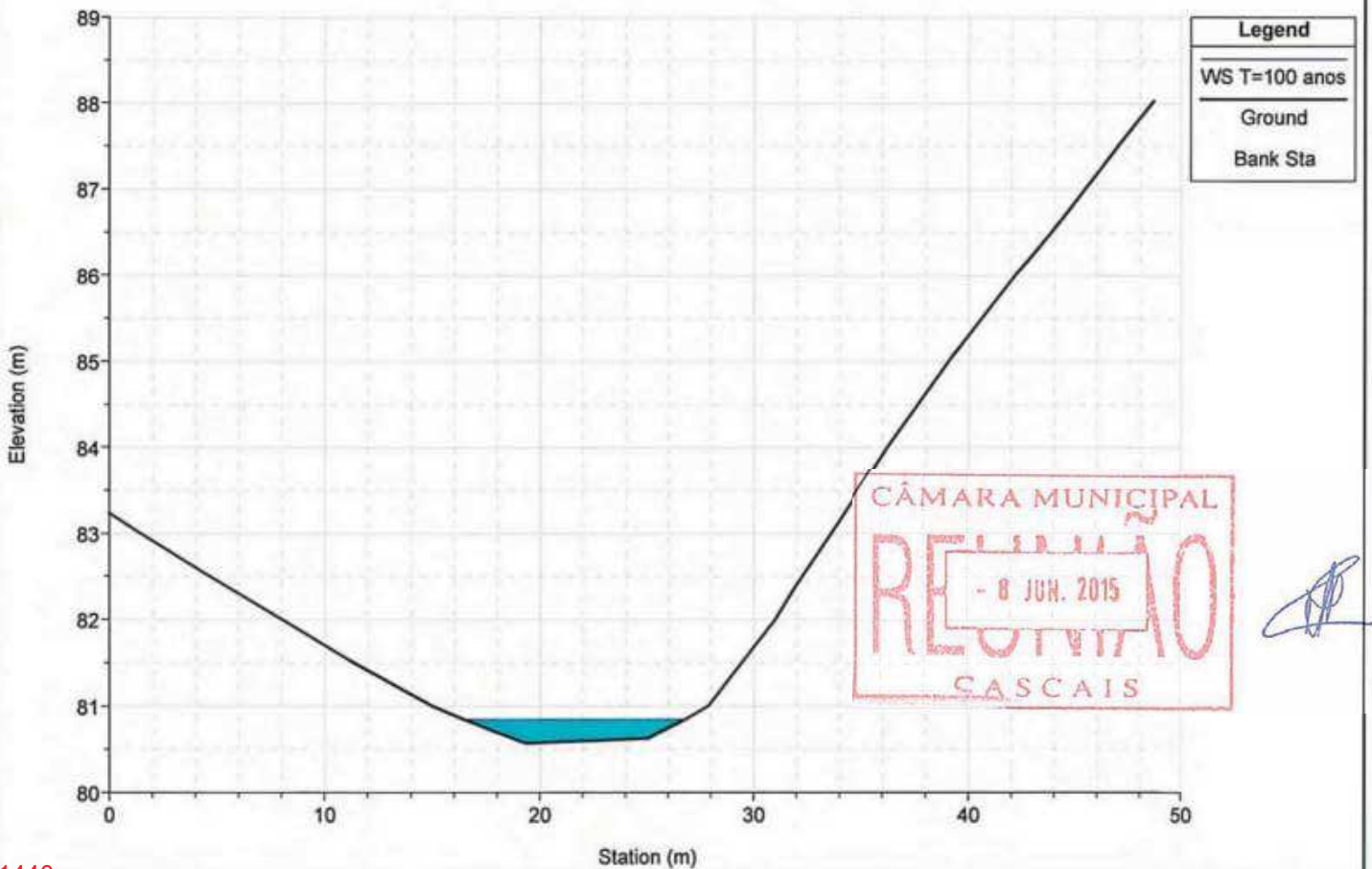
River = ARNEIRO Reach = montante RS = 1627.754



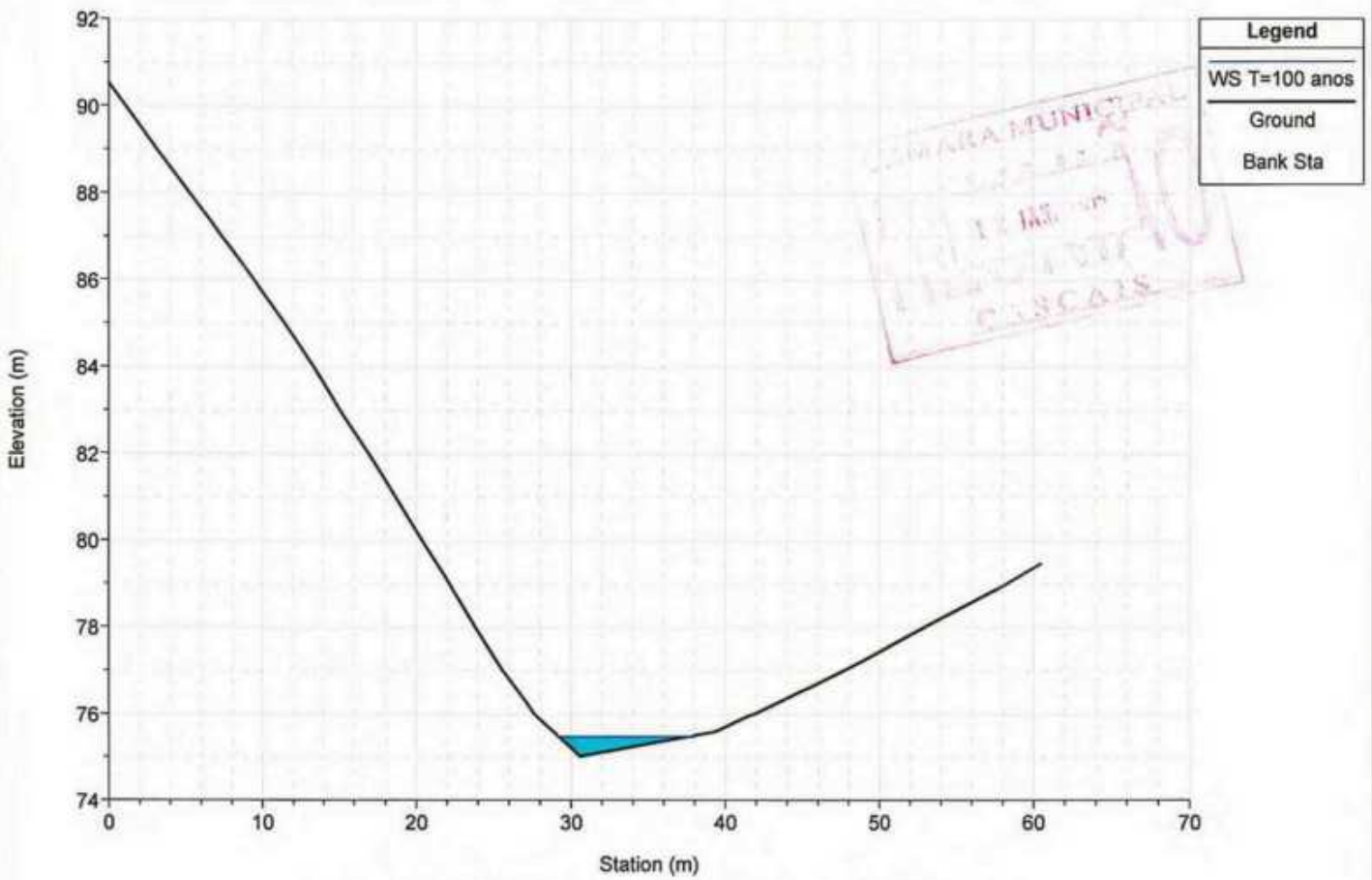
River = ARNEIRO Reach = montante RS = 1511.408



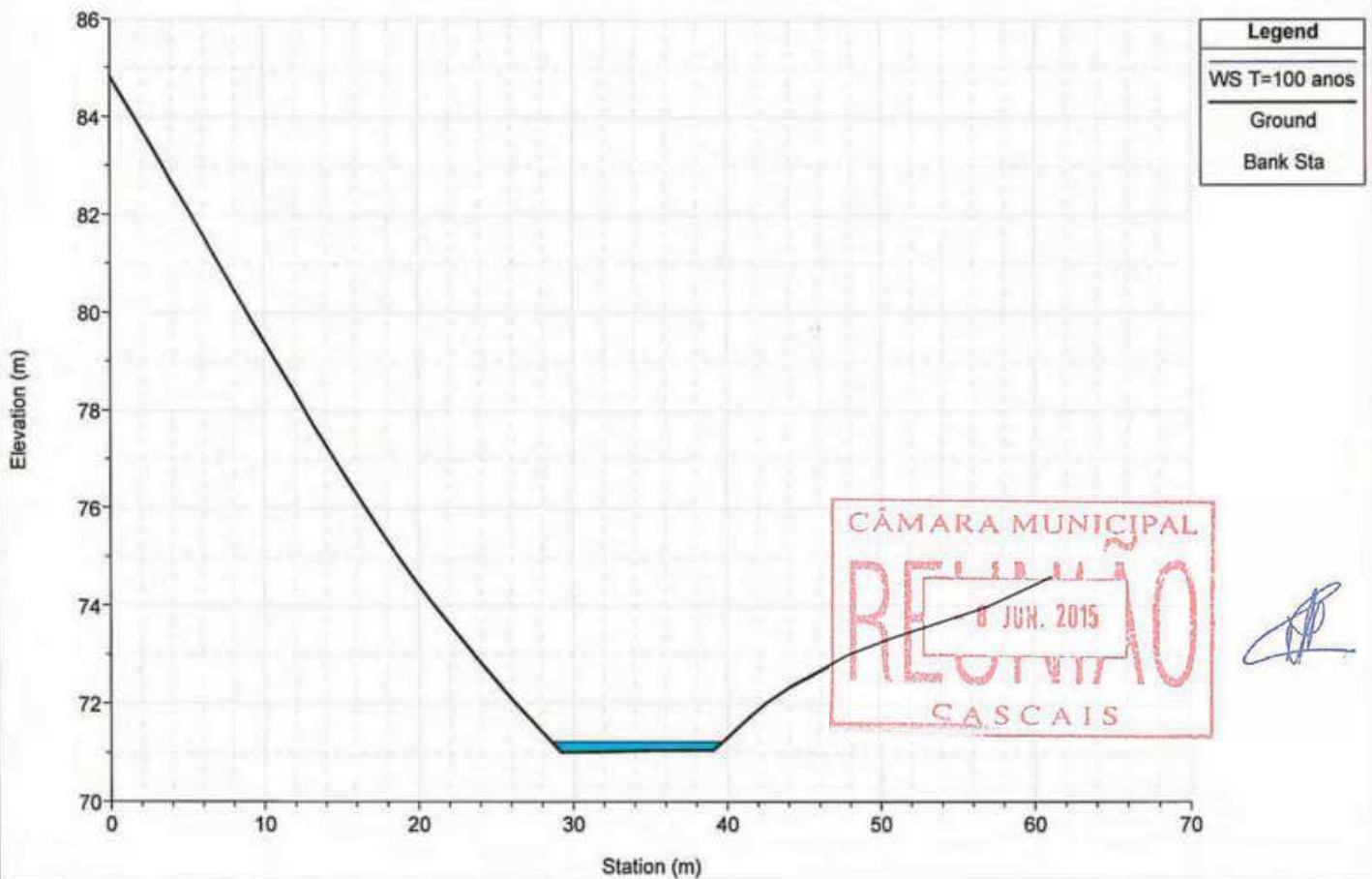
River = ARNEIRO Reach = montante RS = 1399.269



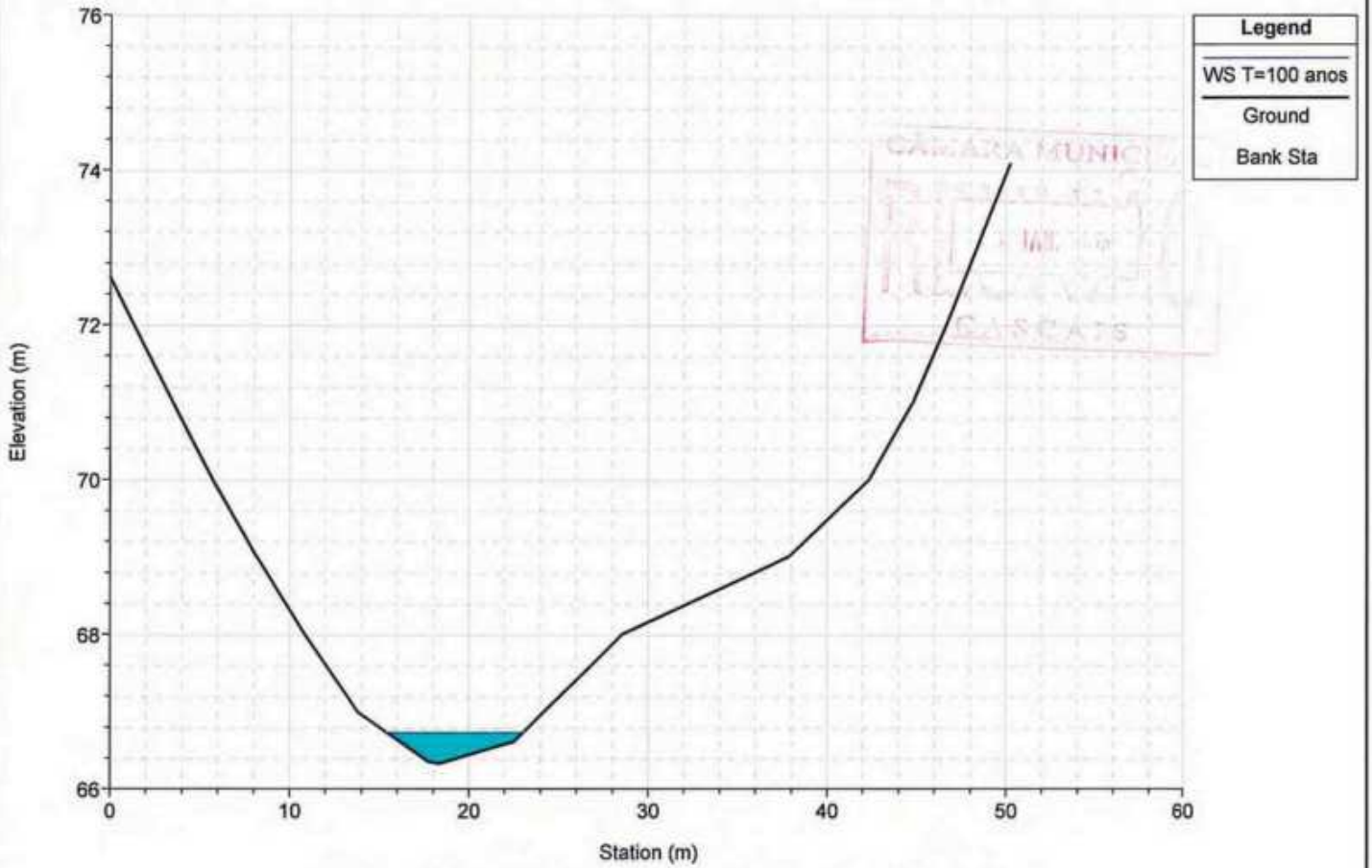
River = ARNEIRO Reach = montante RS = 1275.966



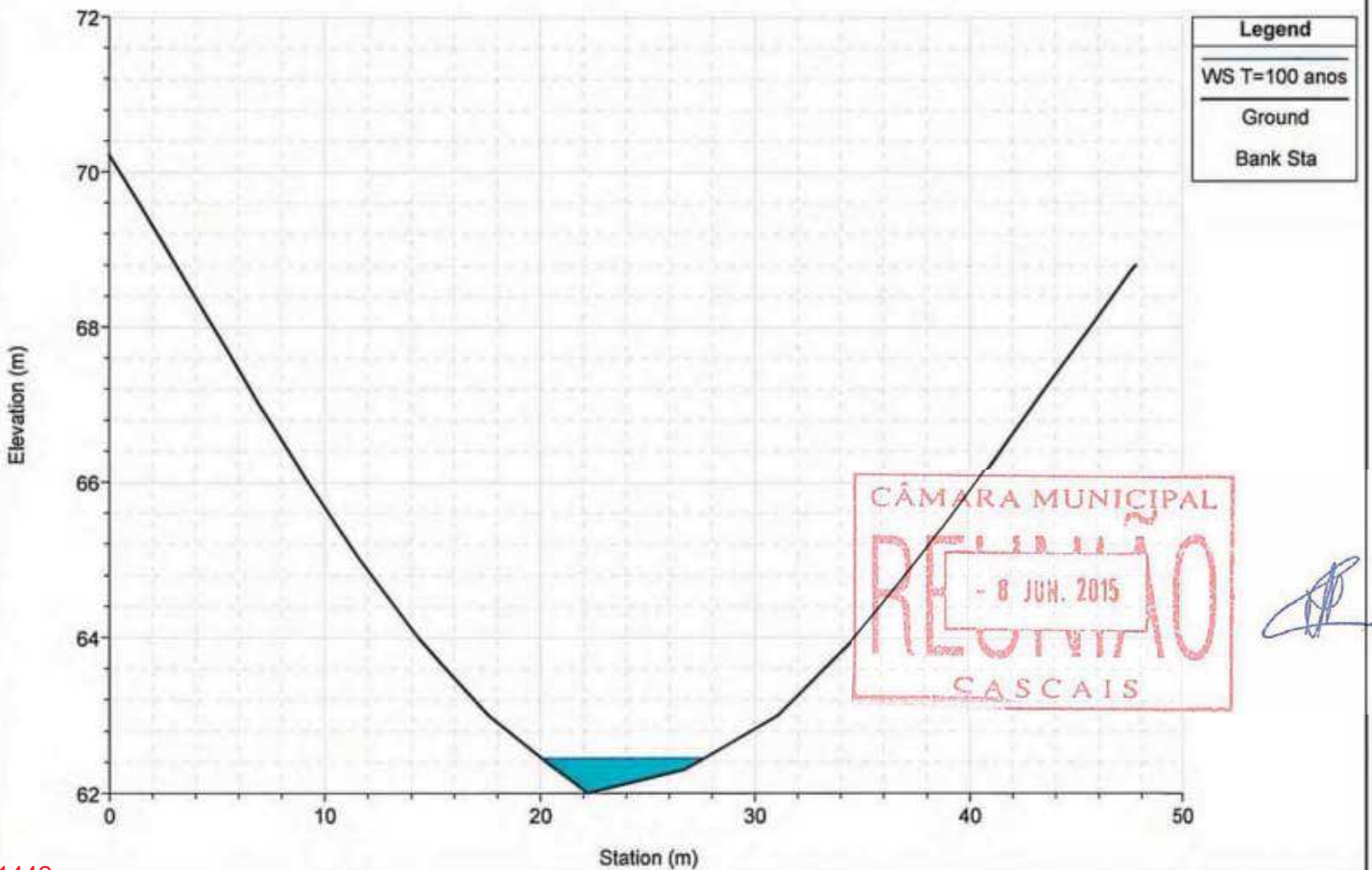
River = ARNEIRO Reach = montante RS = 1164.966



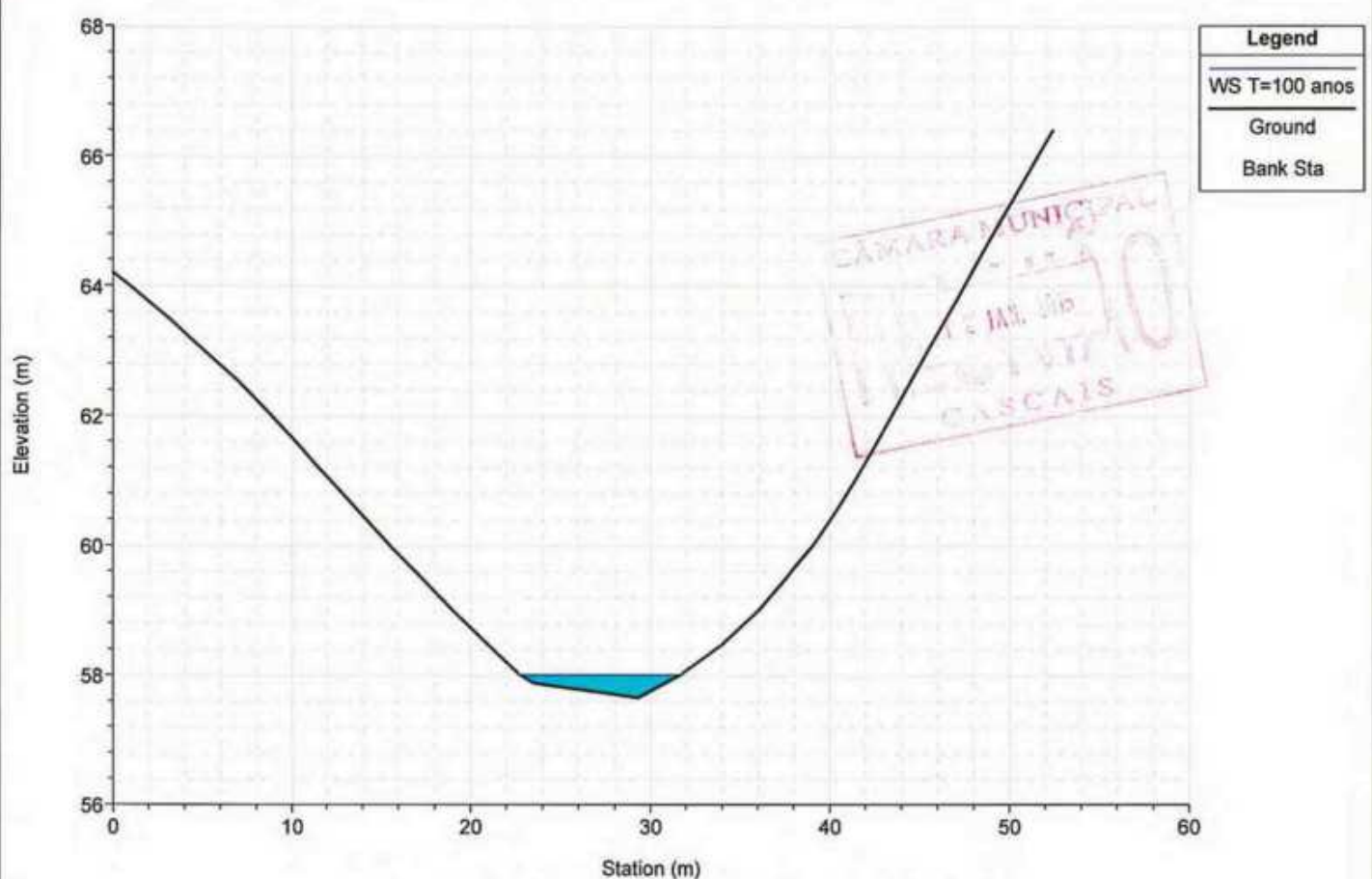
River = ARNEIRO Reach = montante RS = 1062.588



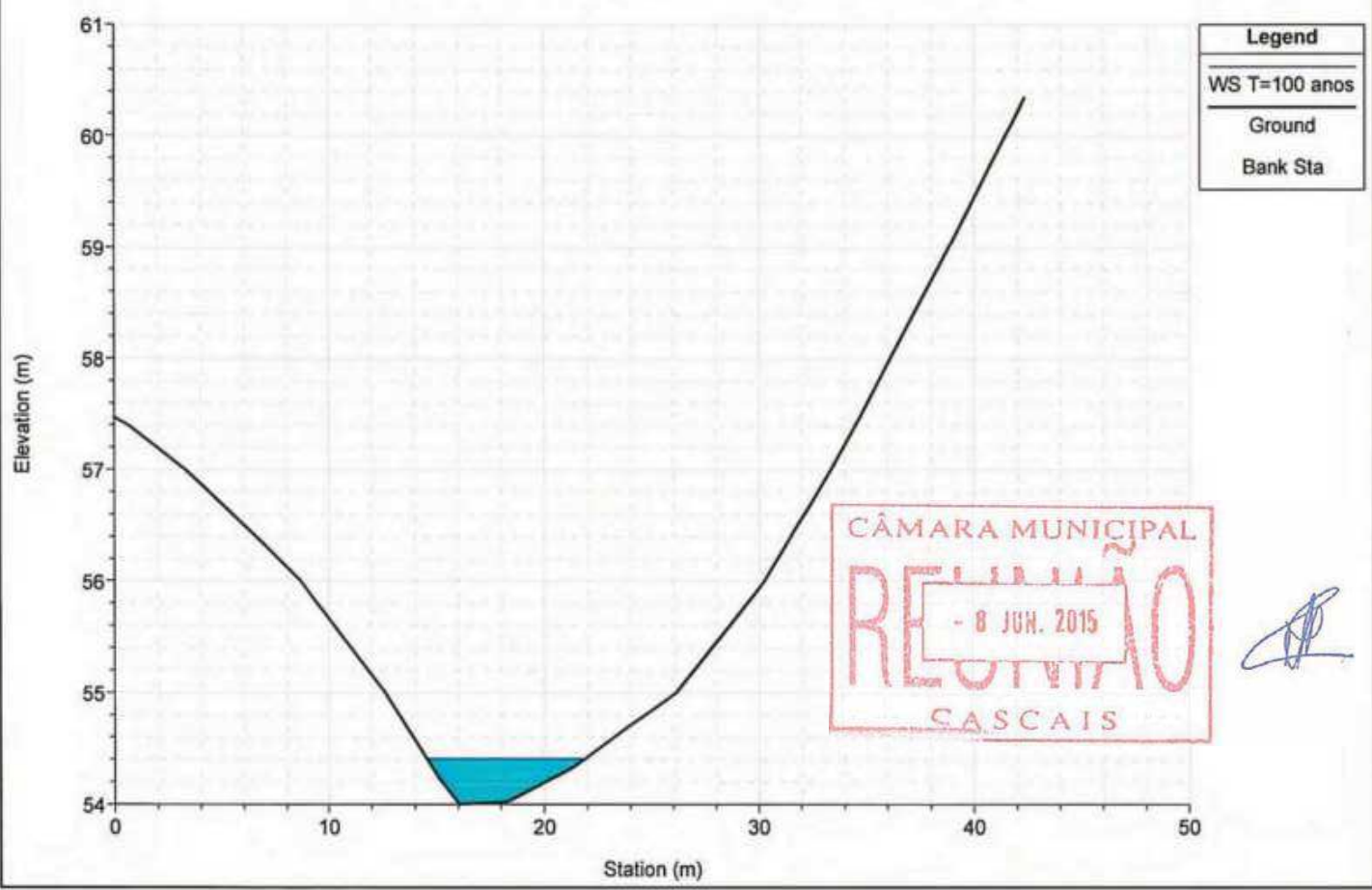
River = ARNEIRO Reach = montante RS = 981.155



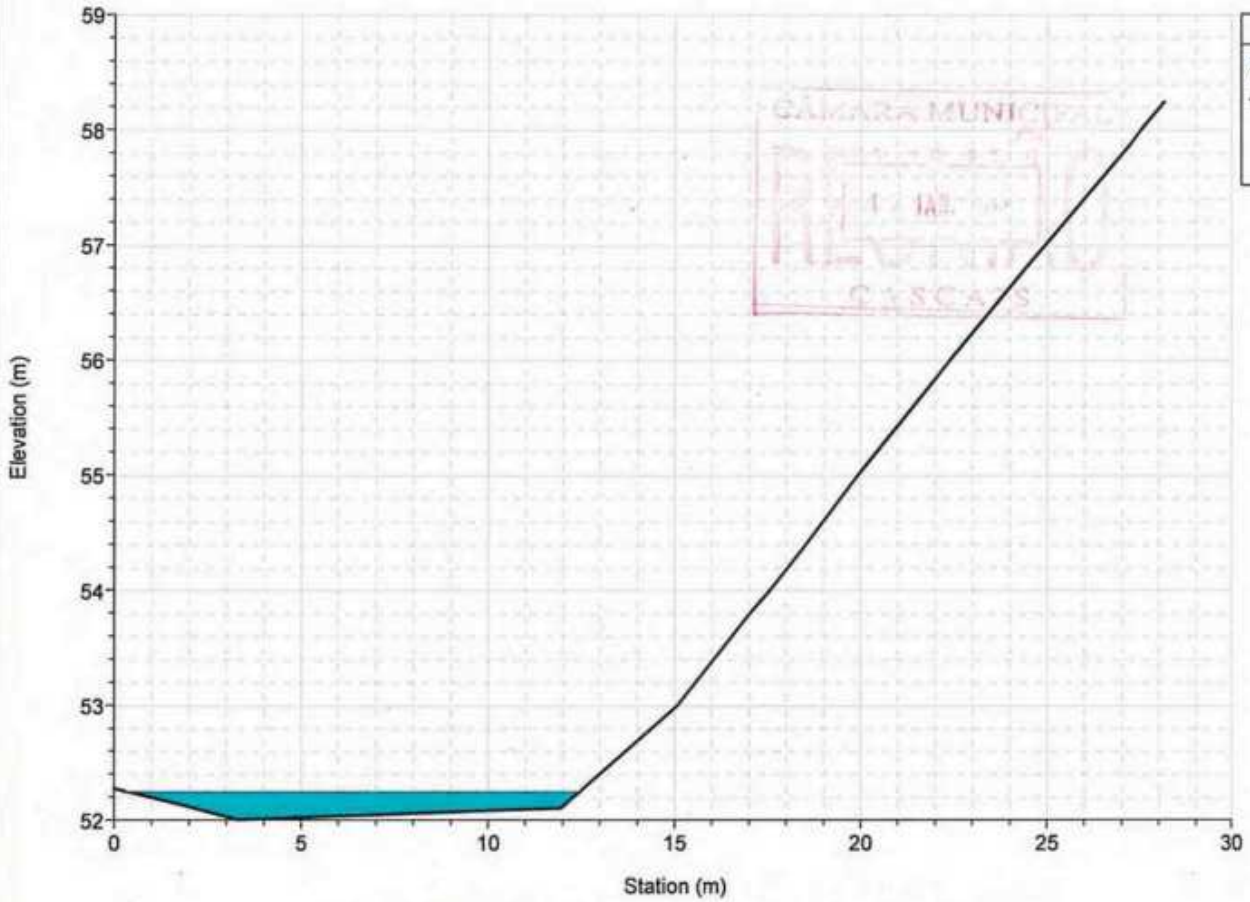
River = ARNEIRO Reach = montante RS = 882.583



River = ARNEIRO Reach = montante RS = 826.439

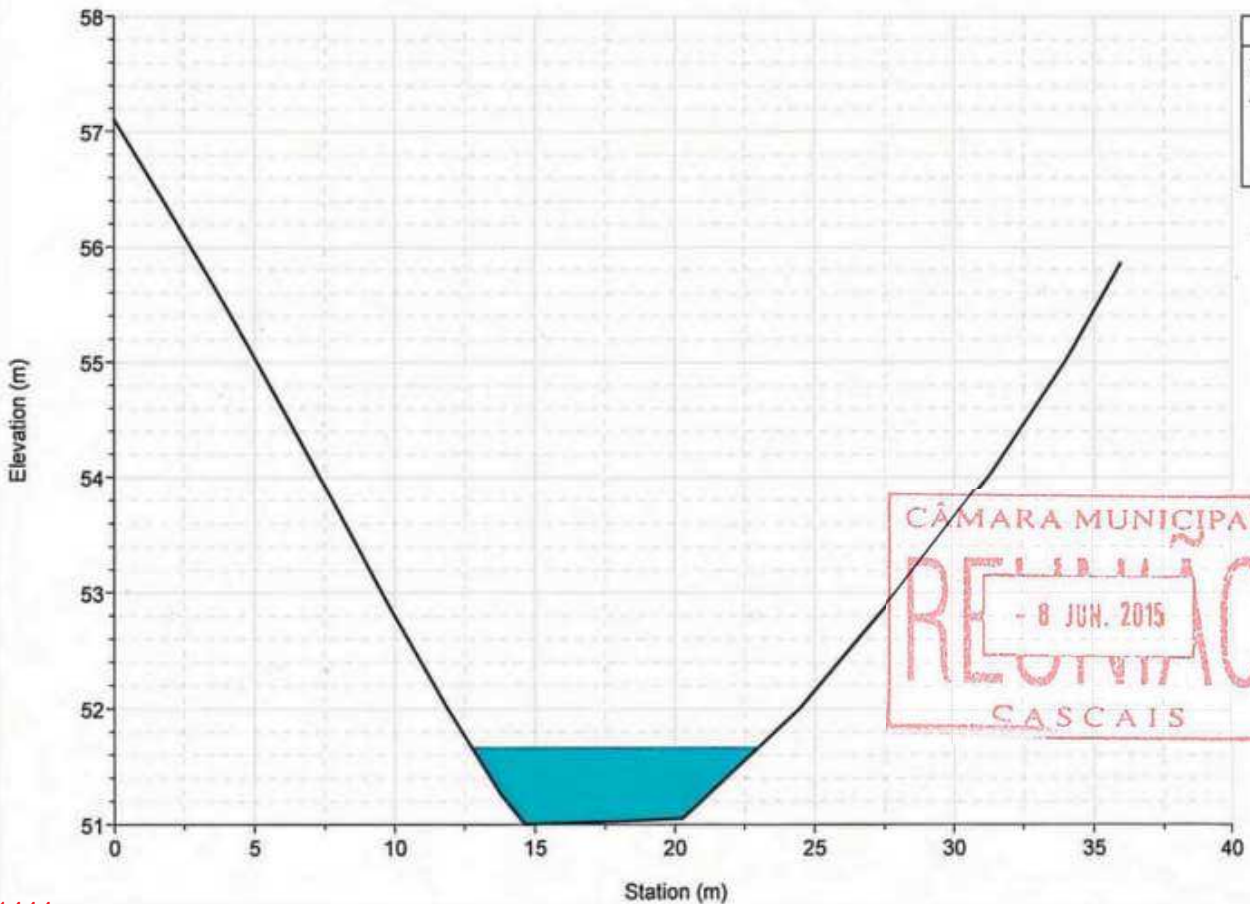


River = ARNEIRO Reach = montante RS = 796.363



Legend	
	WS T=100 anos
	Ground
	Bank Sta

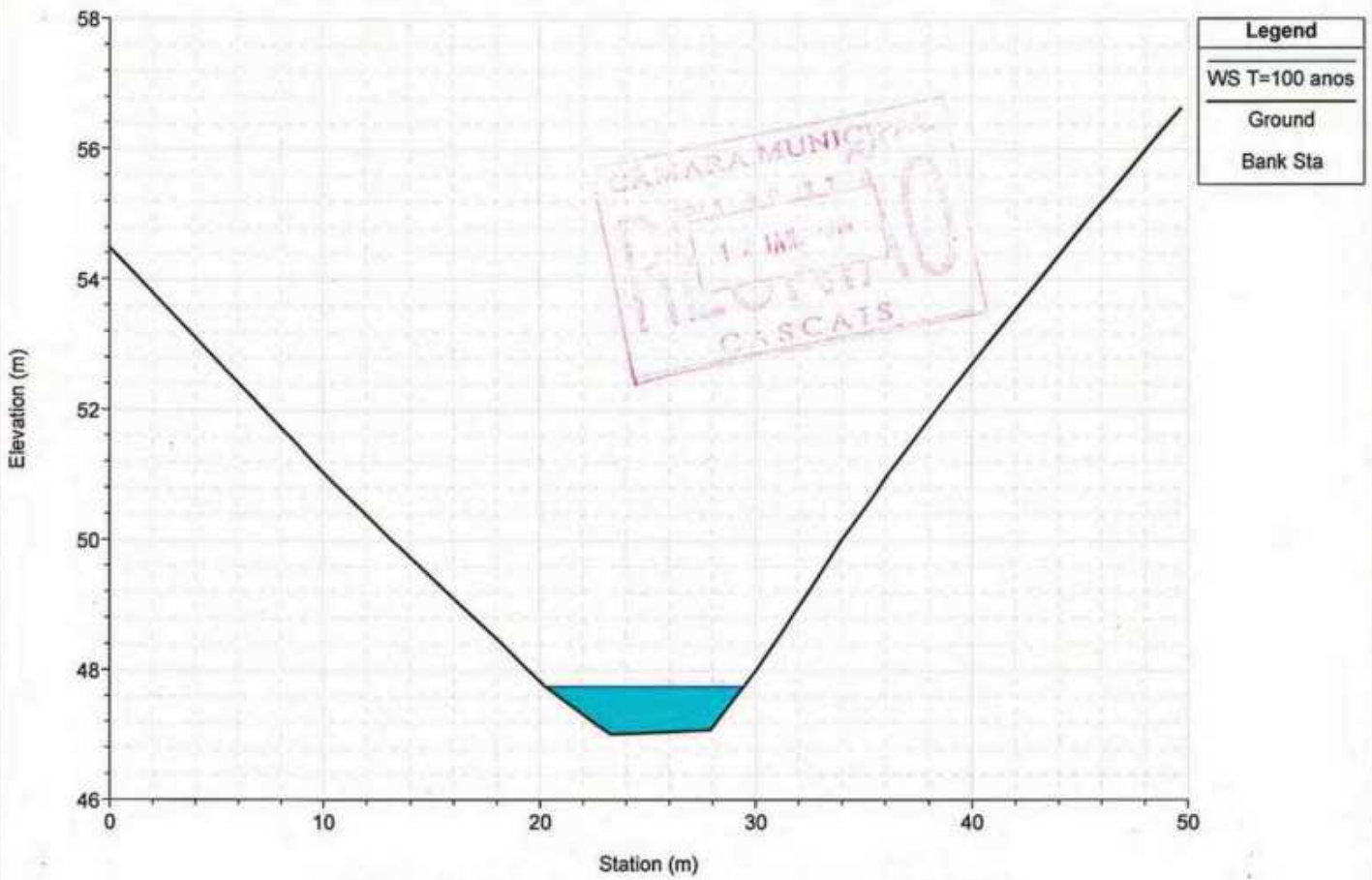
River = ARNEIRO Reach = intermedio RS = 770.020



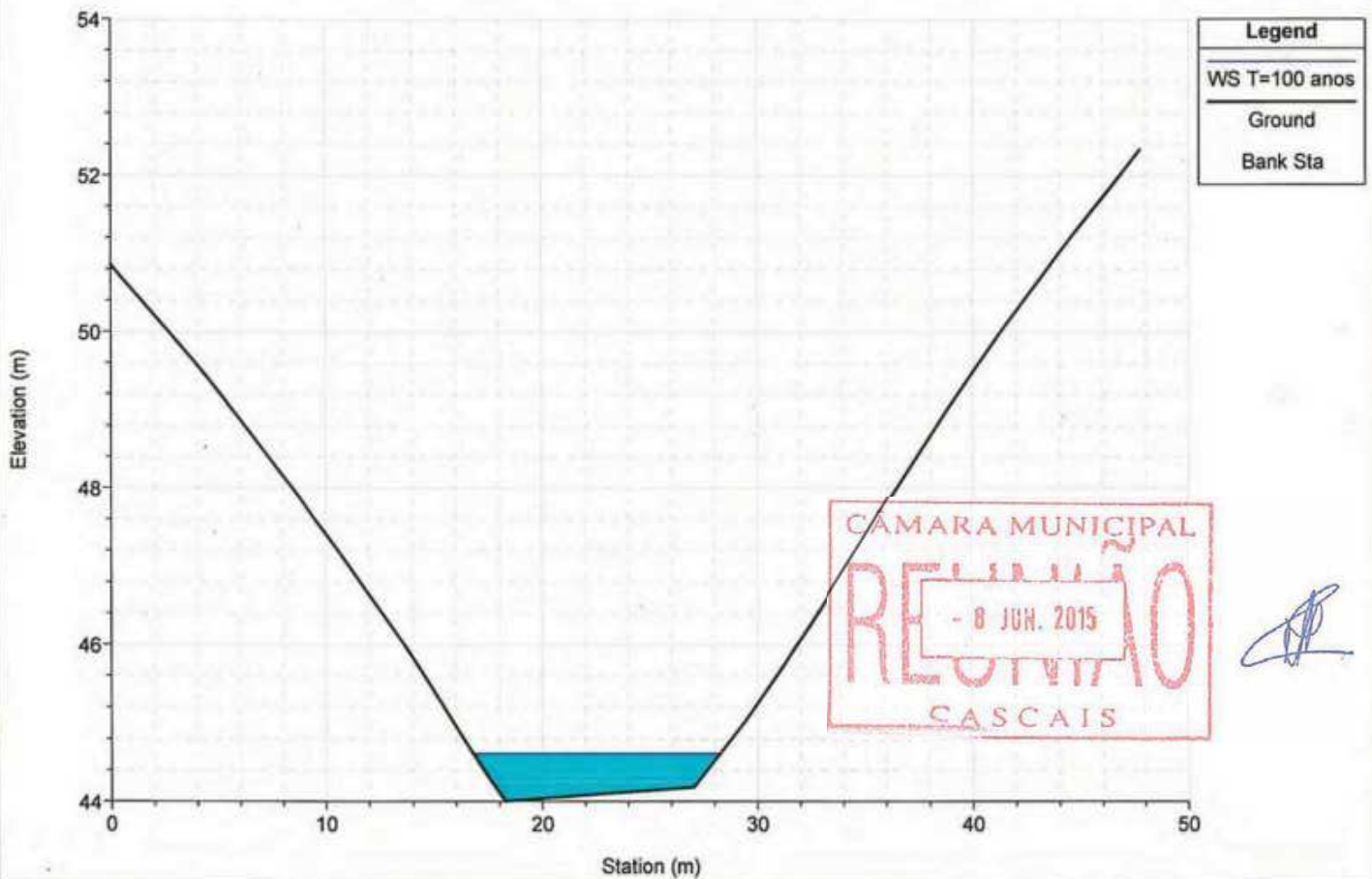
Legend	
	WS T=100 anos
	Ground
	Bank Sta

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River = ARNEIRO Reach = intermedio RS = 679.685

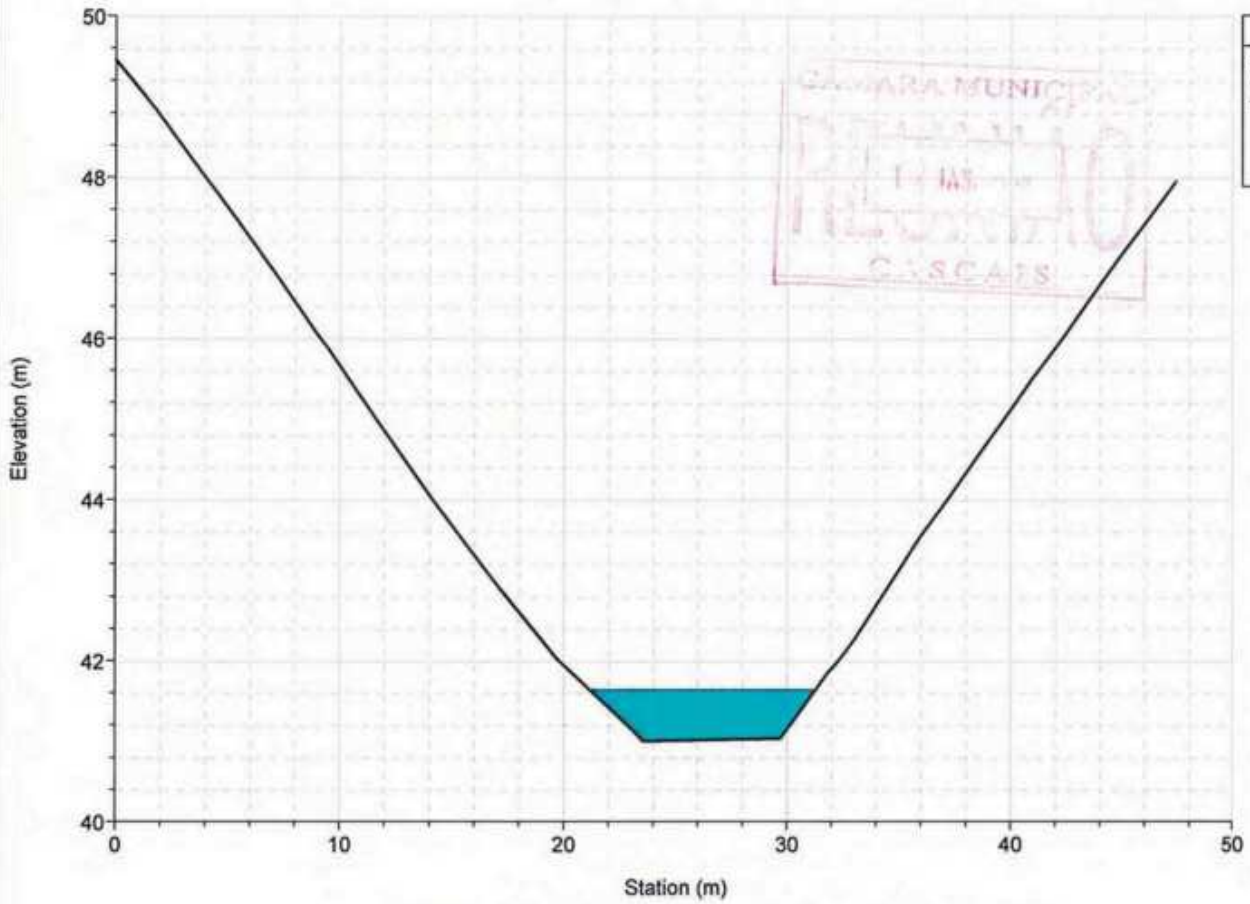


River = ARNEIRO Reach = intermedio RS = 603.967

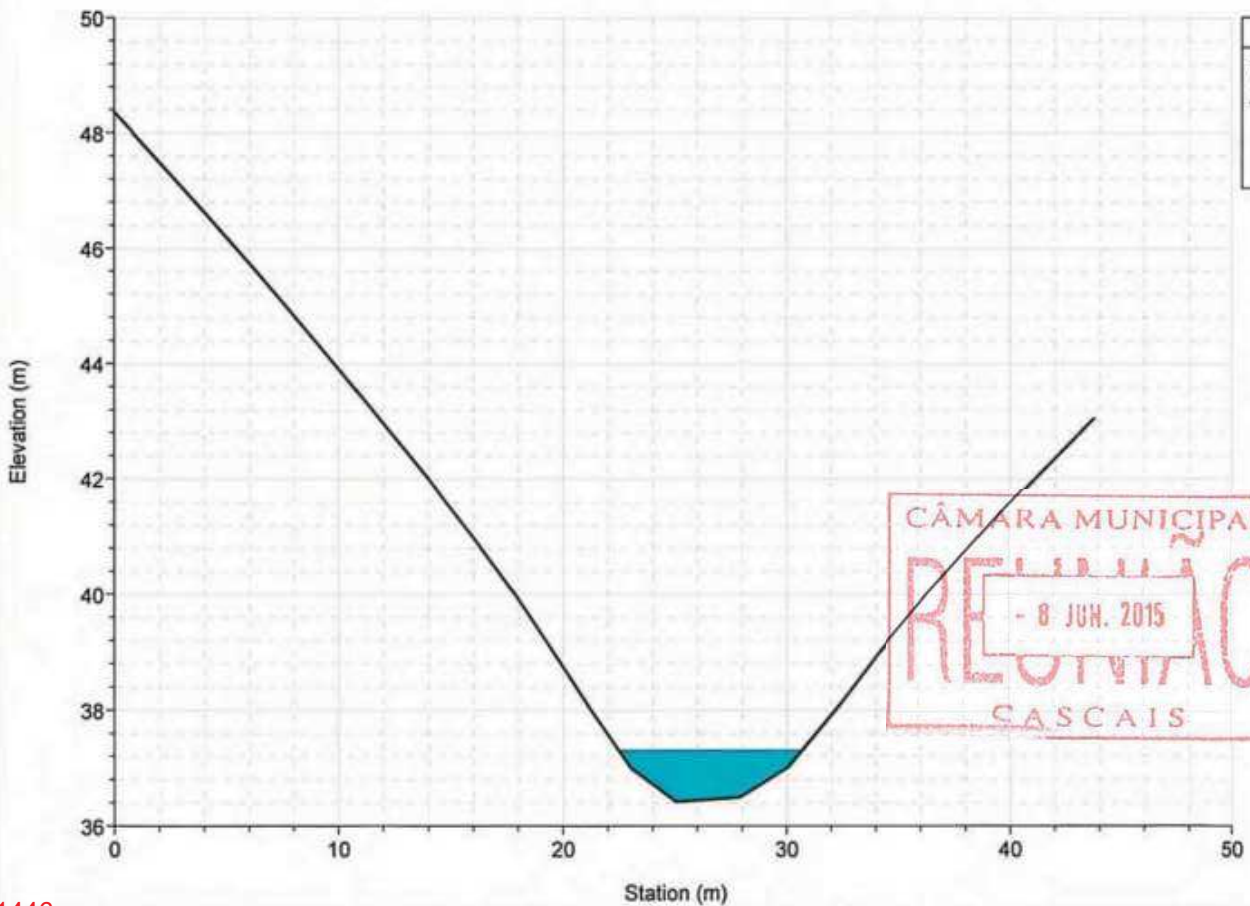




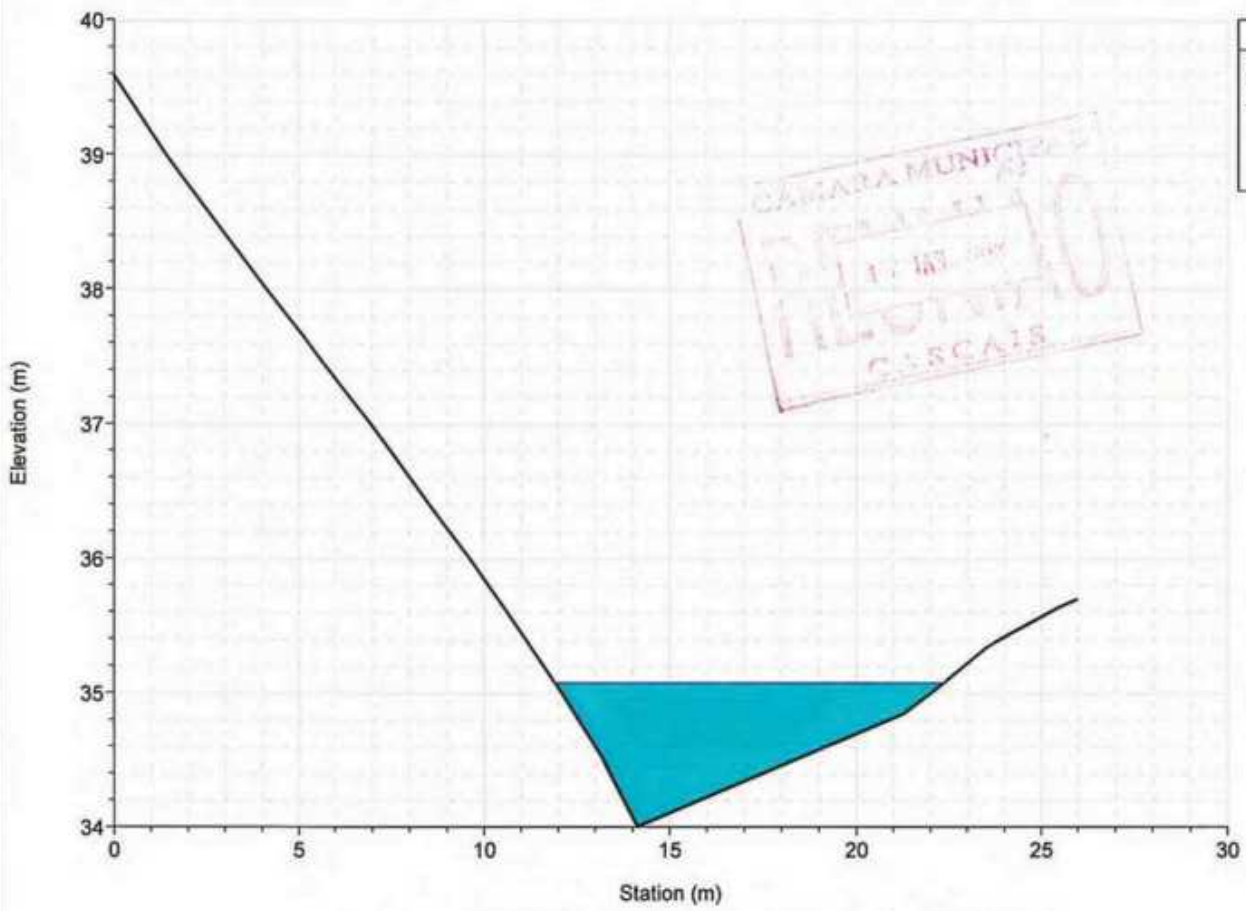
River = ARNEIRO Reach = intermedio RS = 547.585



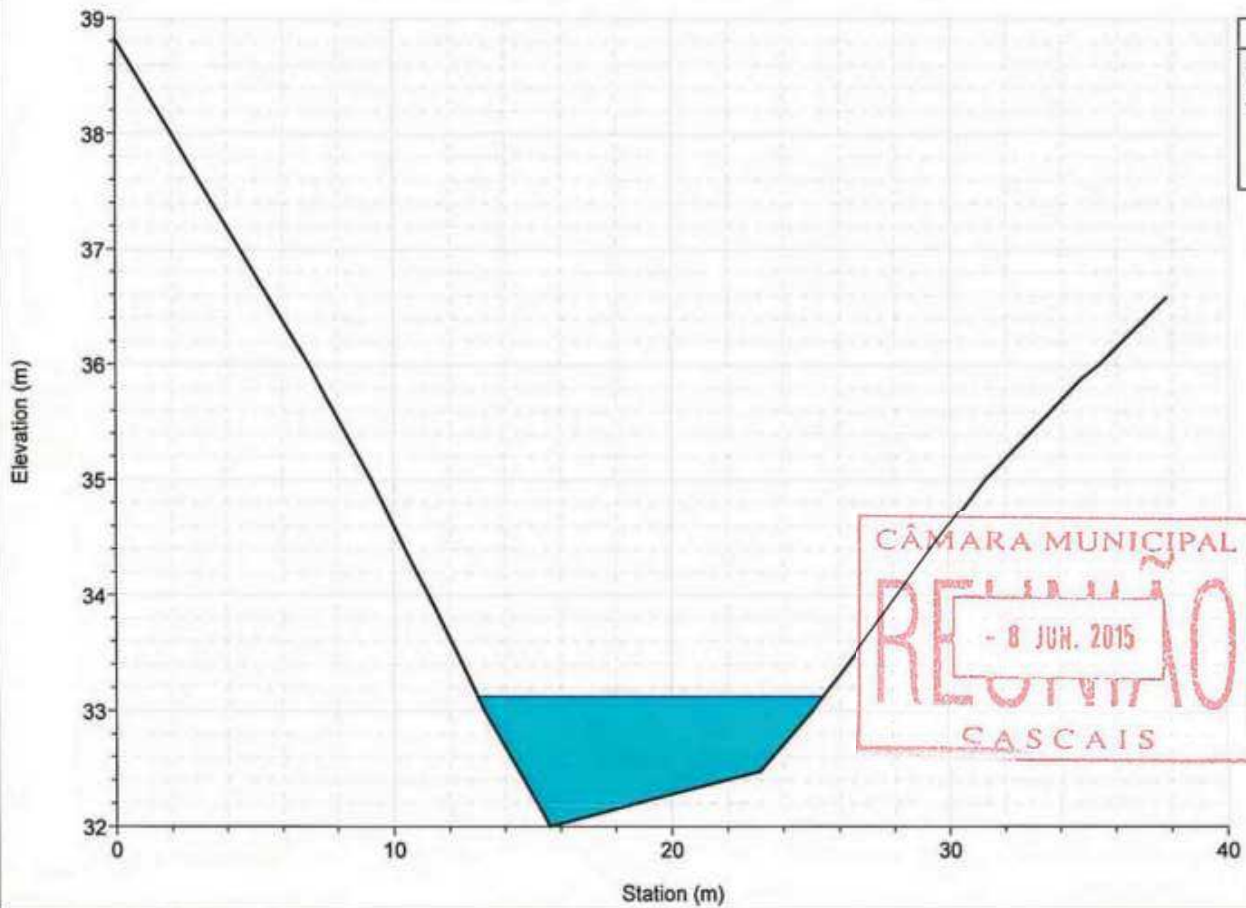
River = ARNEIRO Reach = intermedio RS = 478.492



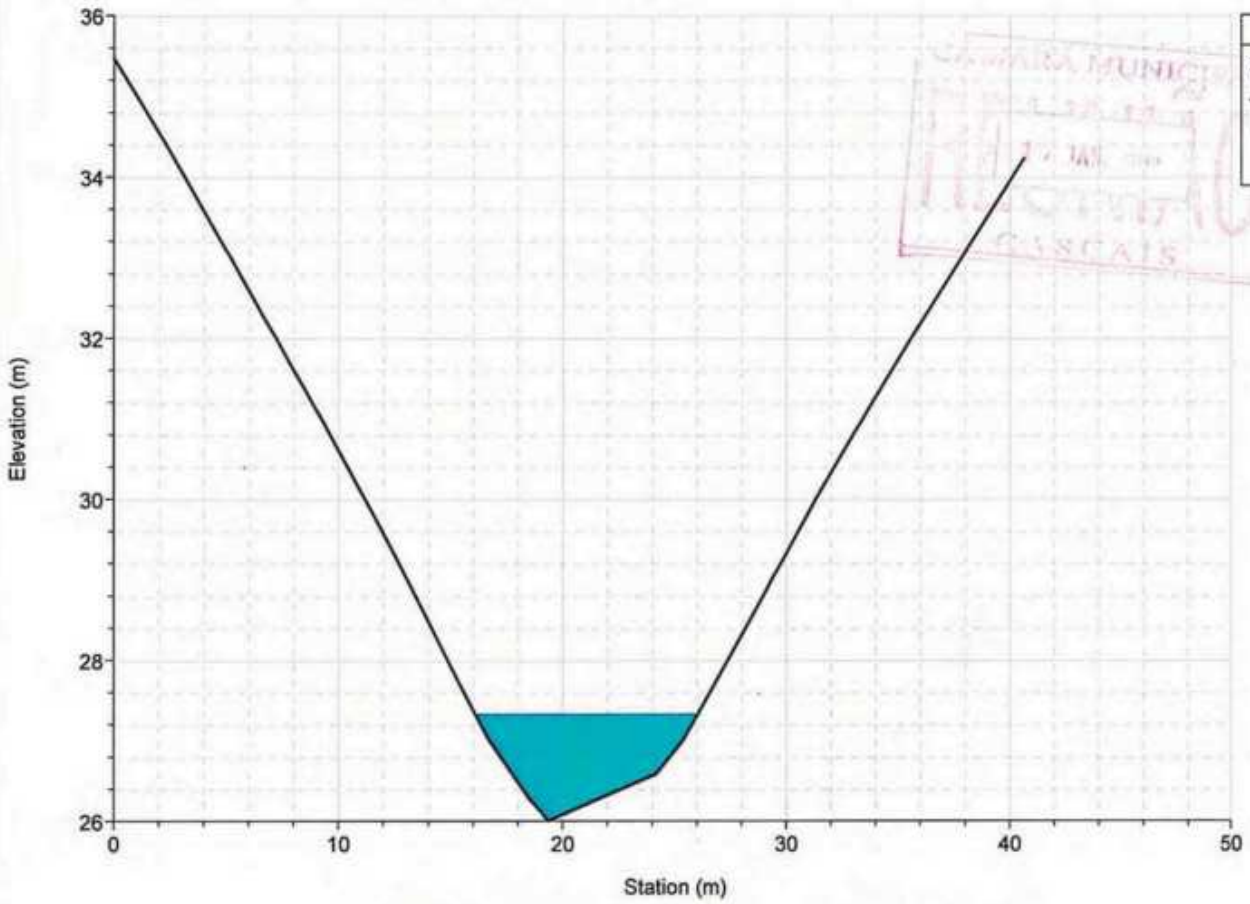
River = ARNEIRO Reach = intermedio RS = 426.405



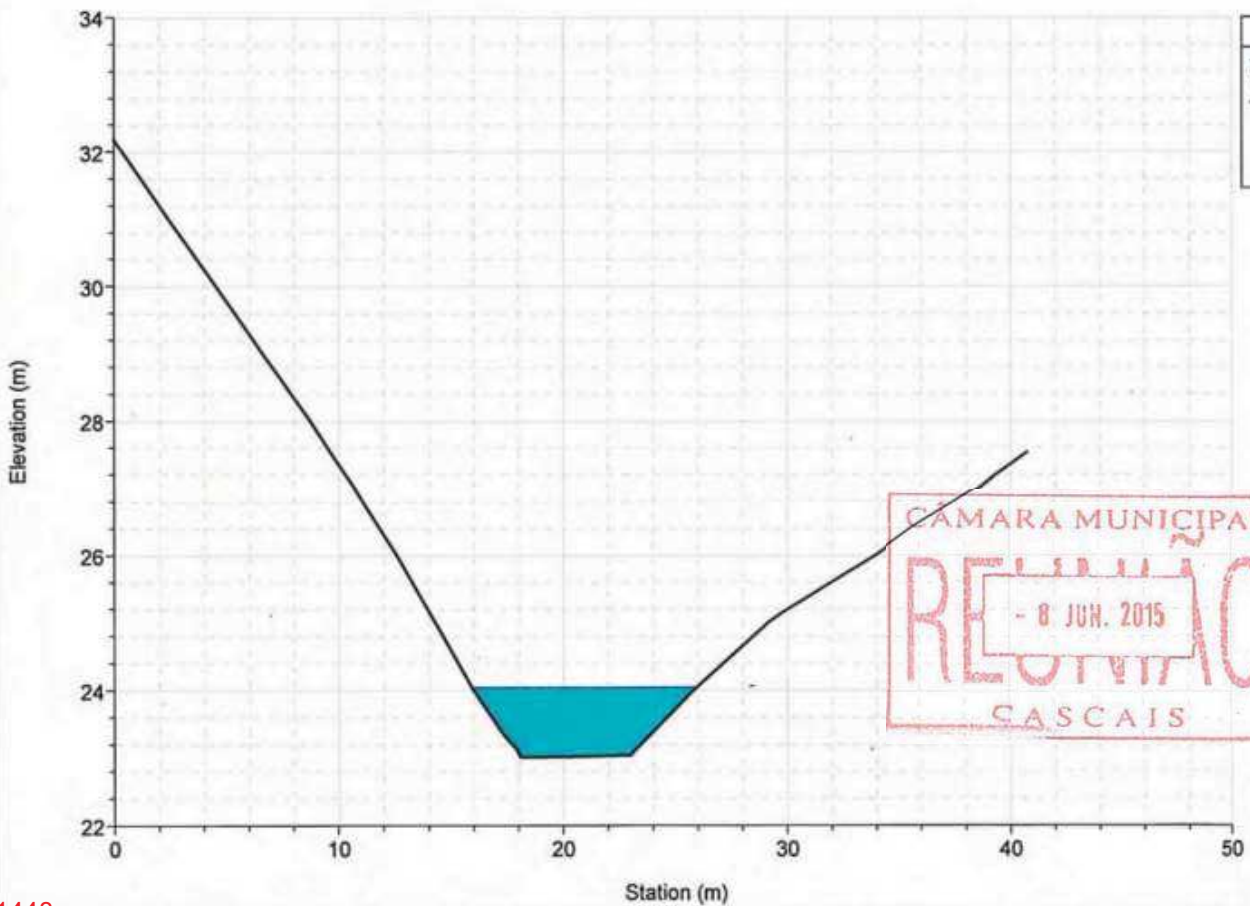
River = ARNEIRO Reach = jusante RS = 392.723



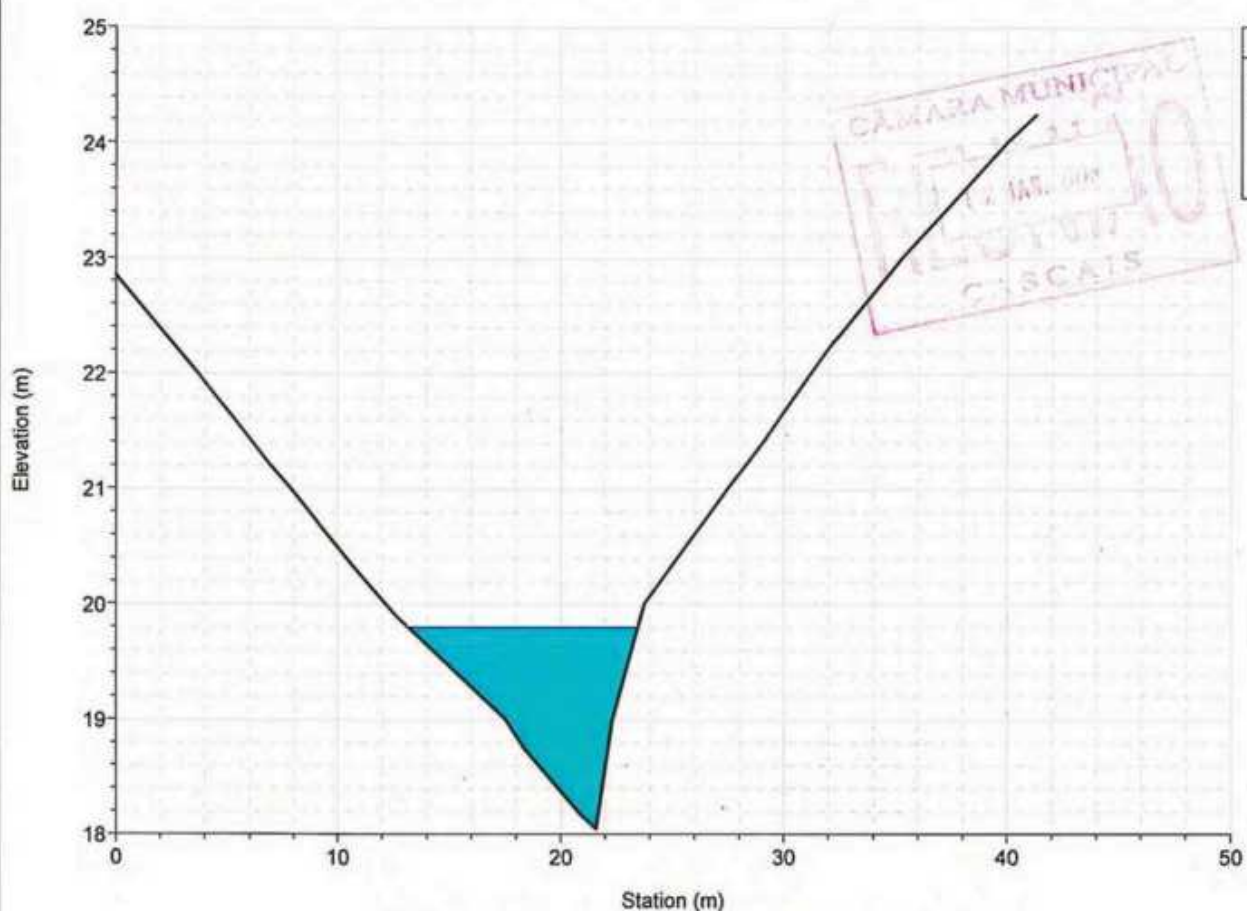
River = ARNEIRO Reach = jusante RS = 266.091



River = ARNEIRO Reach = jusante RS = 189.864

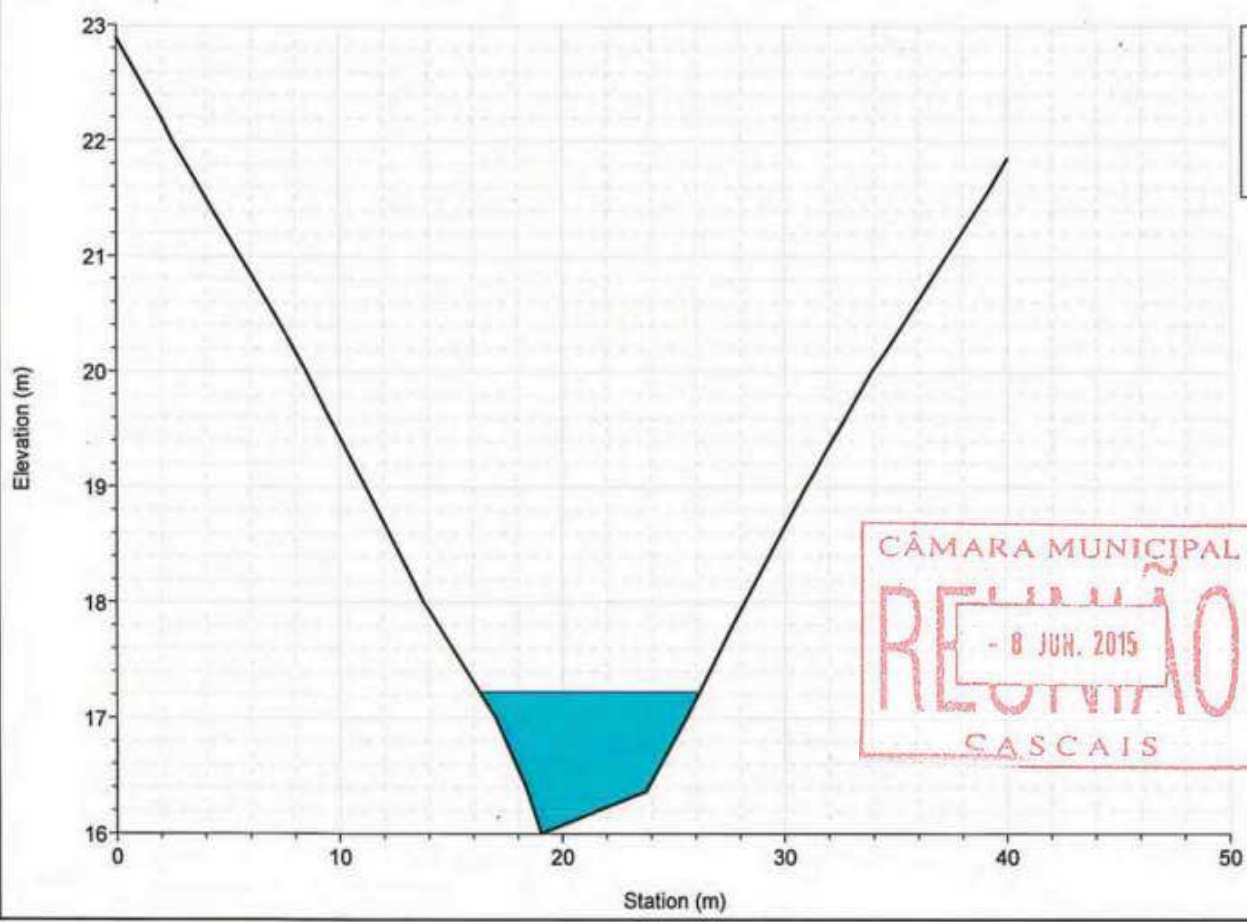


River = ARNEIRO Reach = jusante RS = 117.522



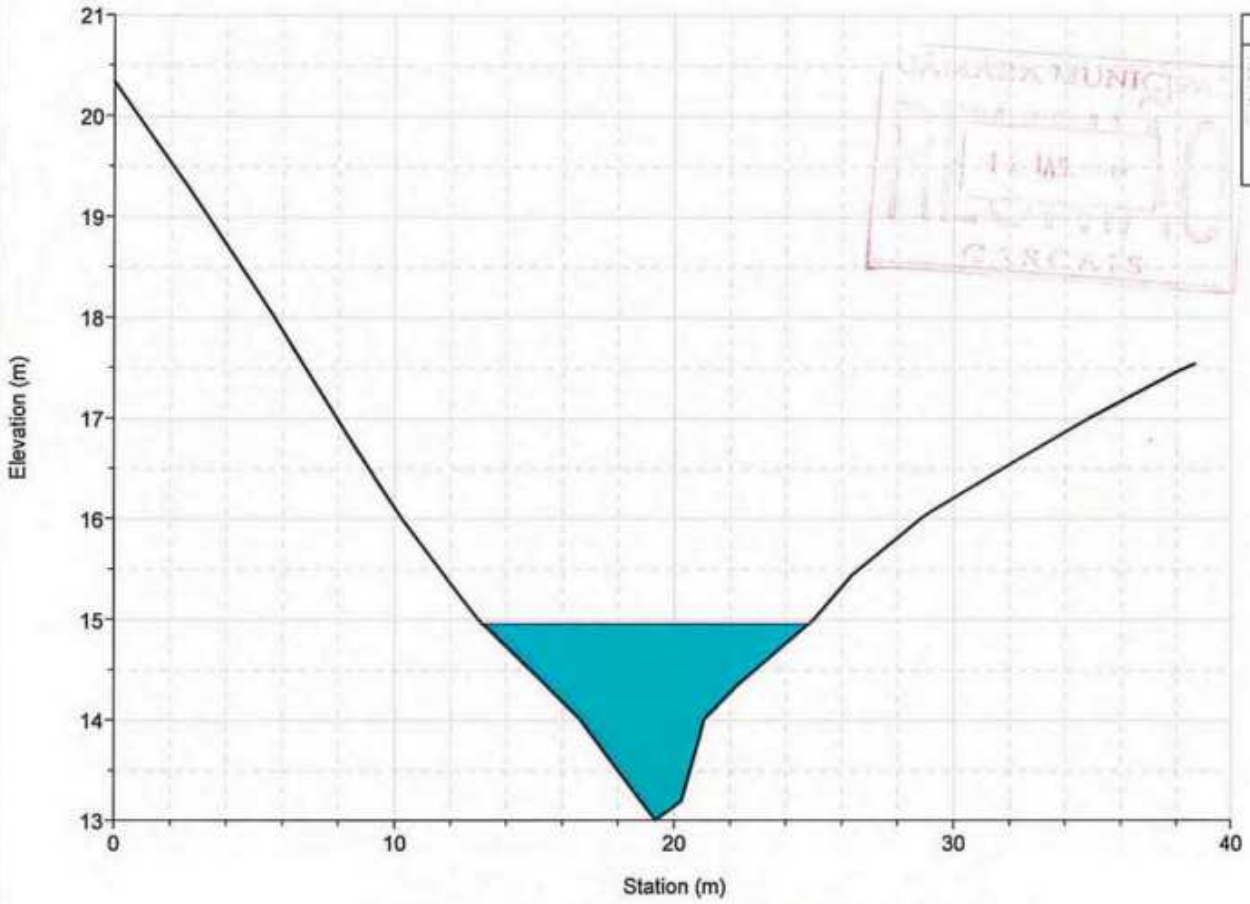
Legend
WS T=100 anos
Ground
Bank Sta

River = ARNEIRO Reach = jusante RS = 58.623



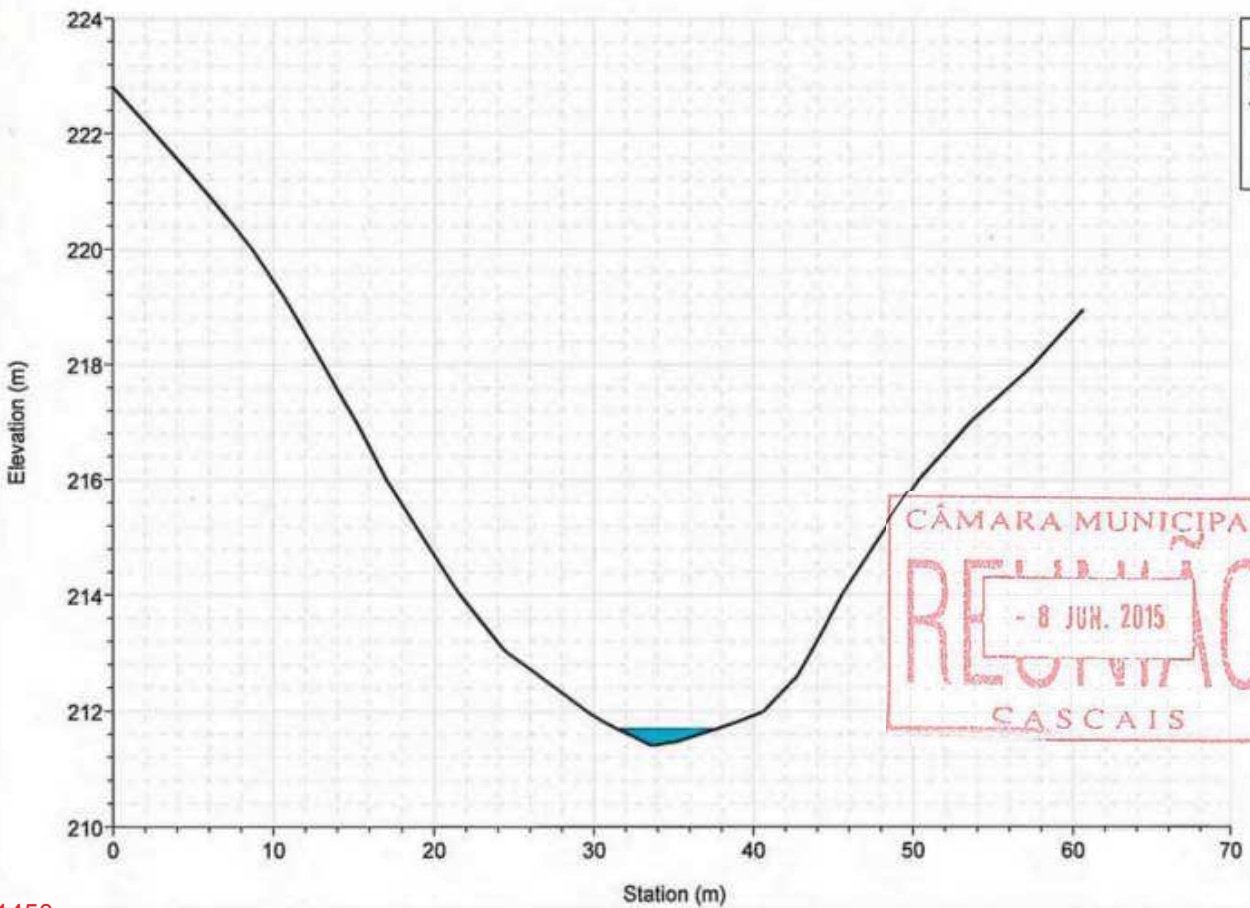
Legend
WS T=100 anos
Ground
Bank Sta

River = ARNEIRO Reach = jusante RS = 5.674



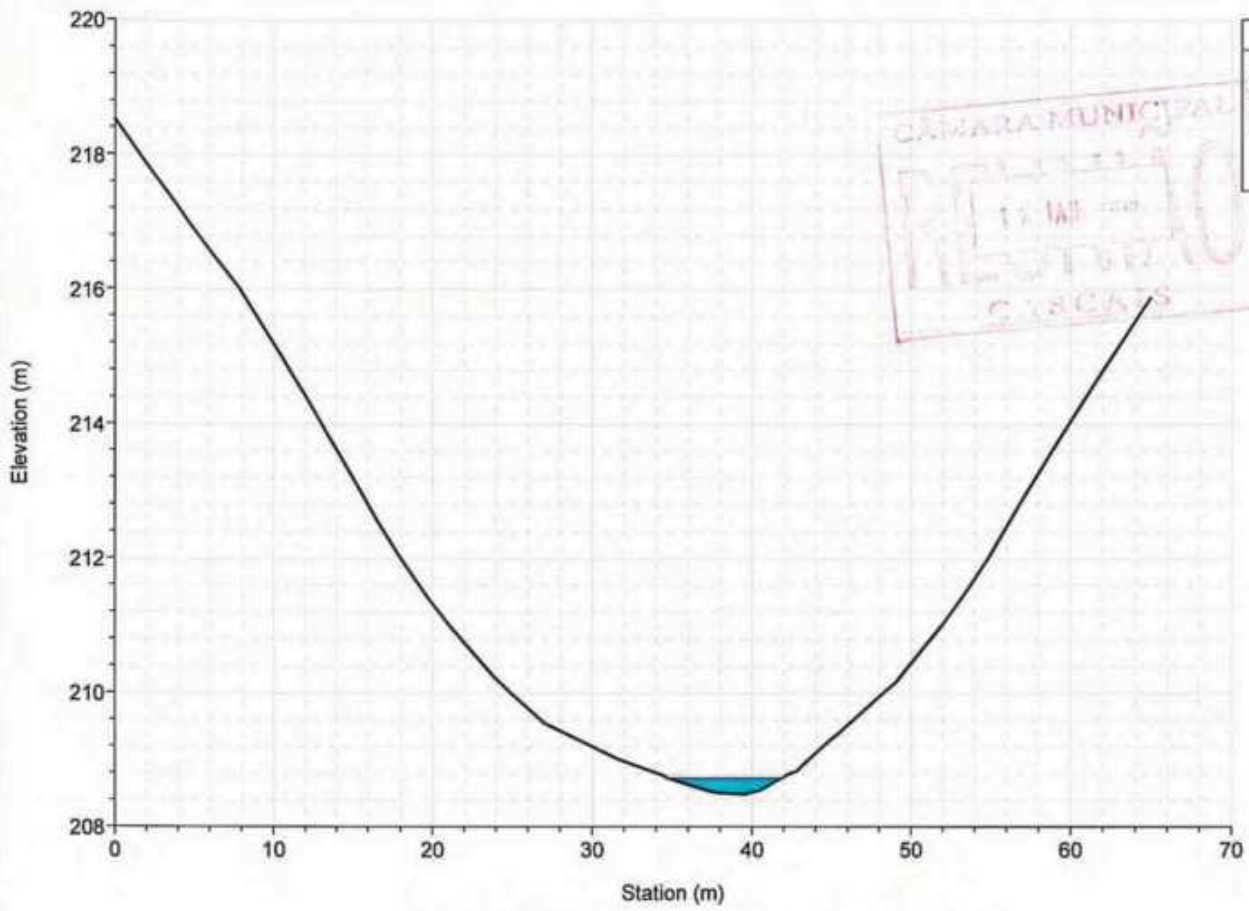
Legend
WS T=100 anos
Ground
Bank Sta

River = MD Reach = afluente RS = 2183.968

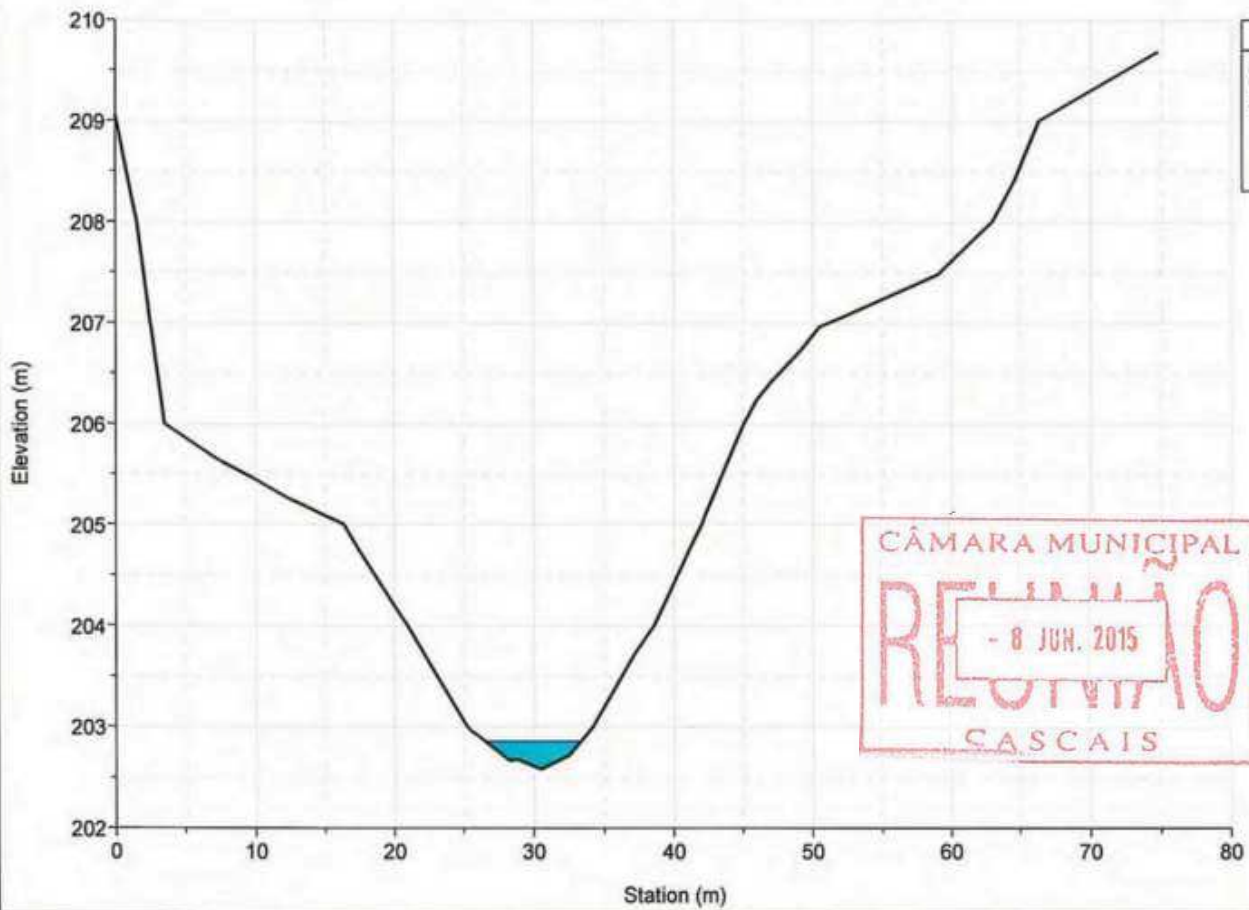


Legend
WS T=100 anos
Ground
Bank Sta

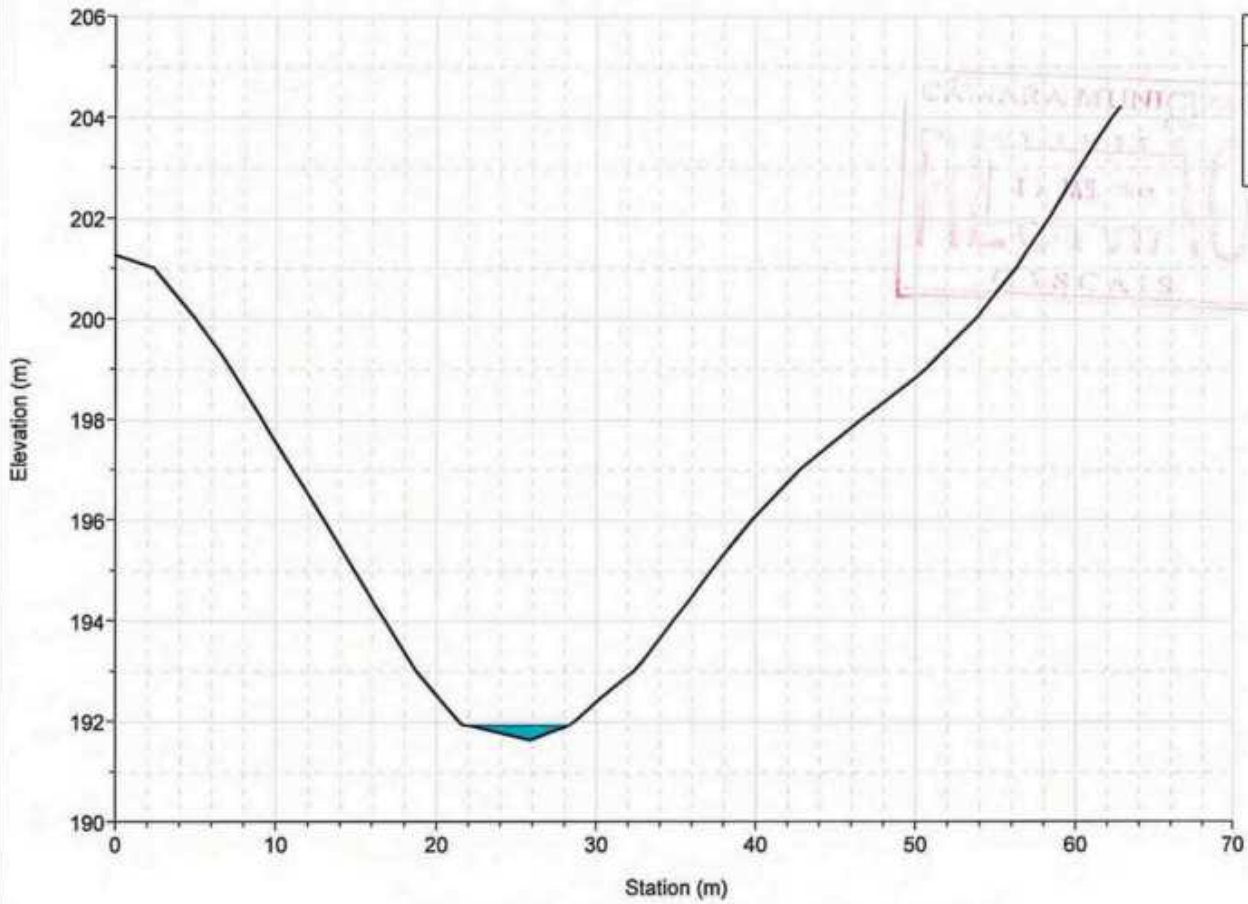
River = MD Reach = afluyente RS = 2155.563



River = MD Reach = afluyente RS = 2119.022

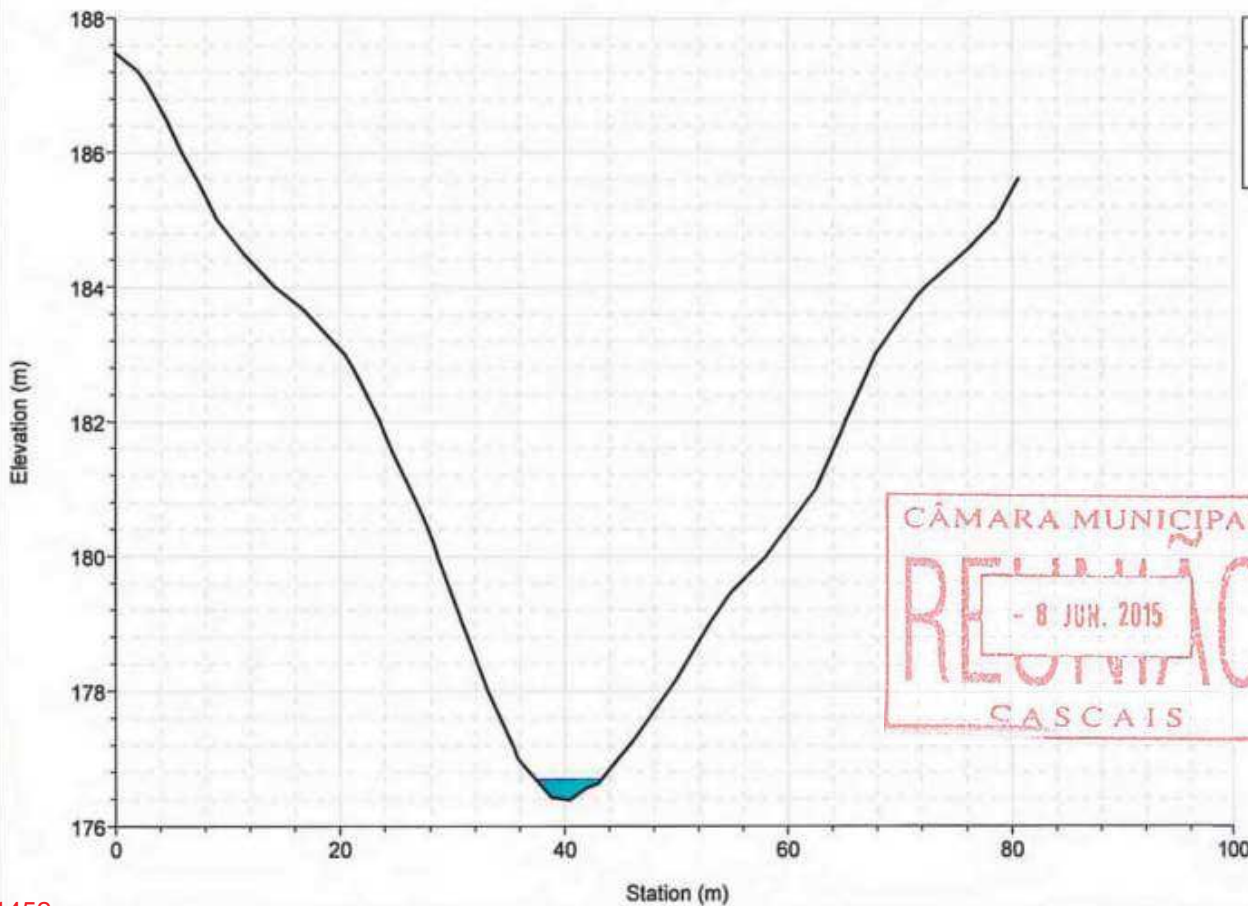


River = MD Reach = afluyente RS = 2047.584



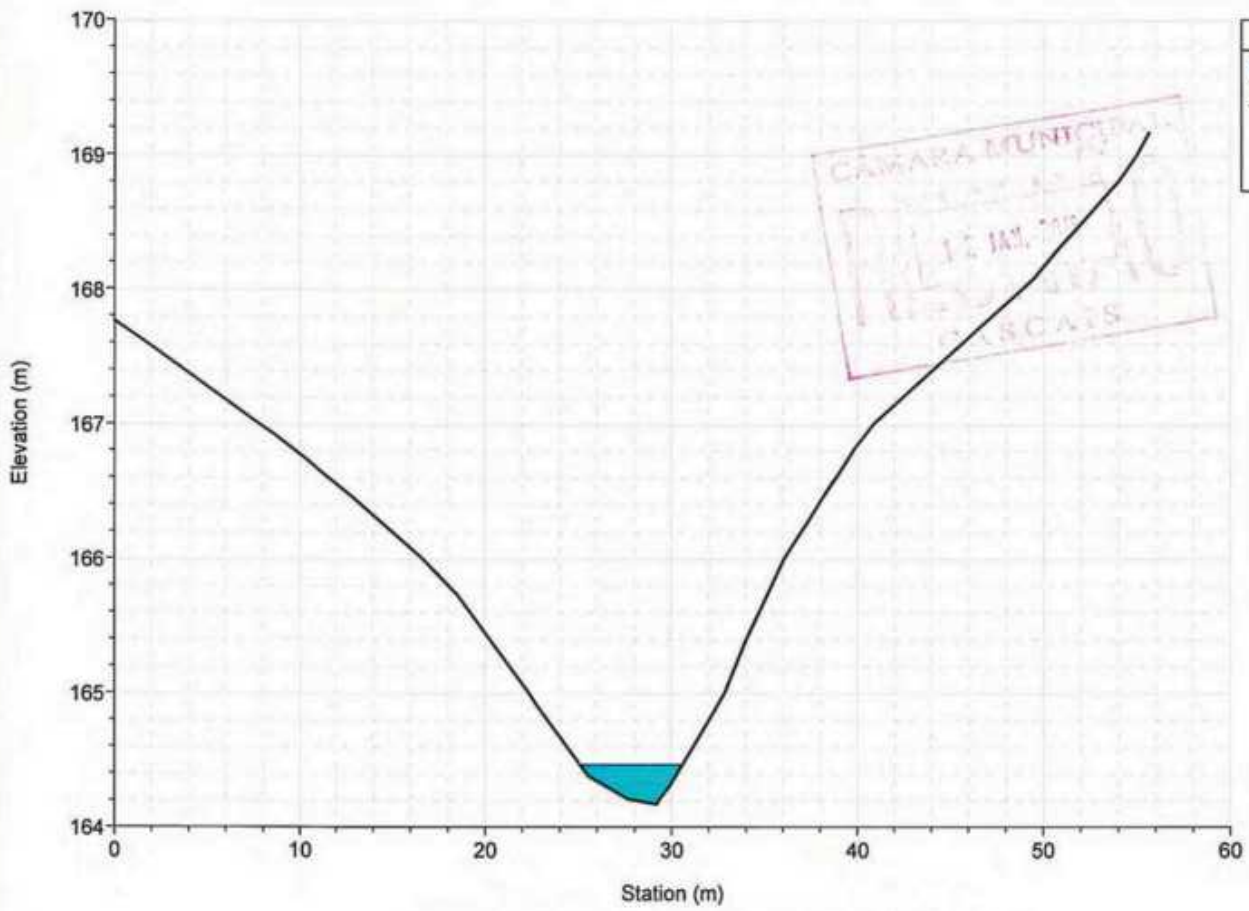
Legend	
WS T=100 anos	
Ground	
Bank Sta	

River = MD Reach = afluyente RS = 1944.423



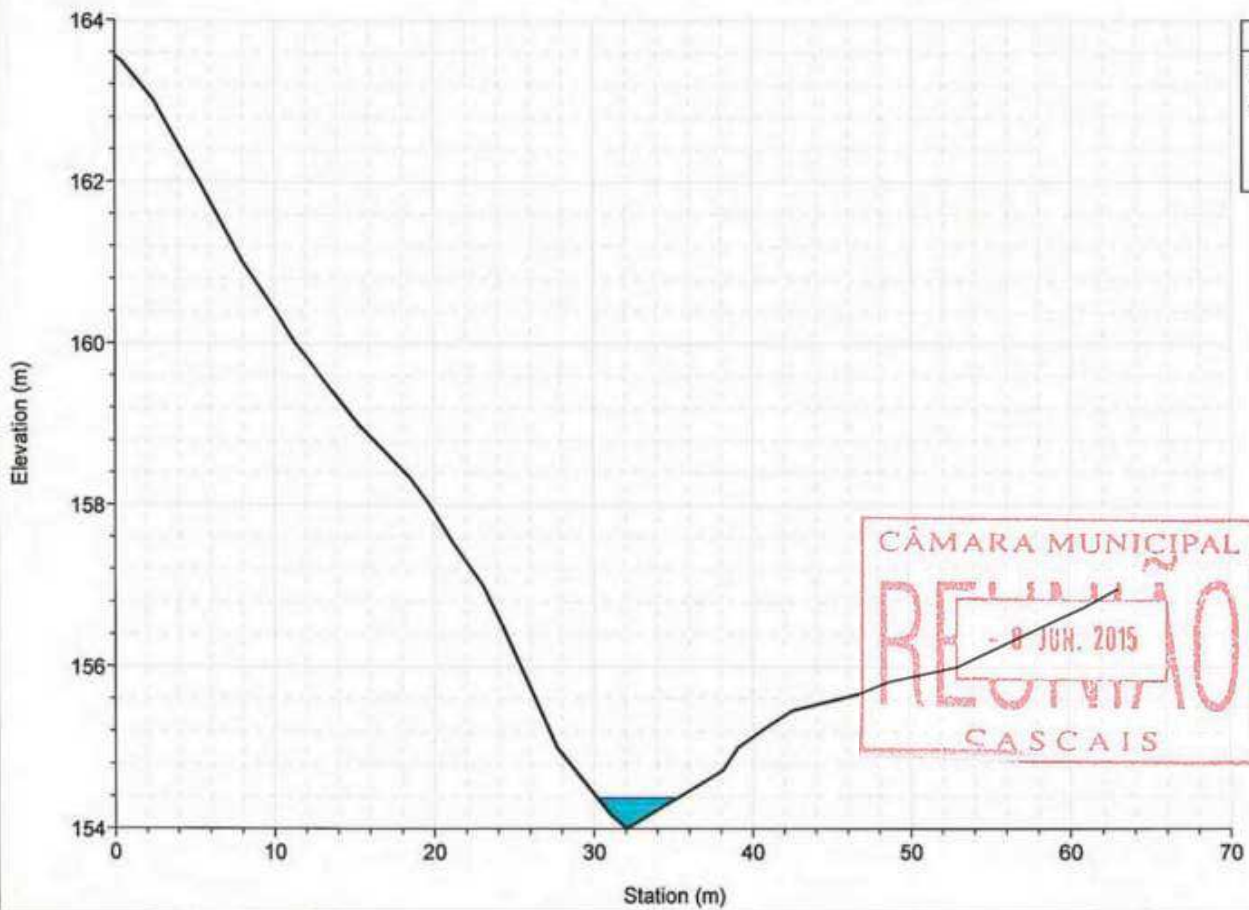
Legend	
WS T=100 anos	
Ground	
Bank Sta	

River = MD Reach = afluente RS = 1843.371



Legend
WS T=100 anos
Ground
Bank Sta

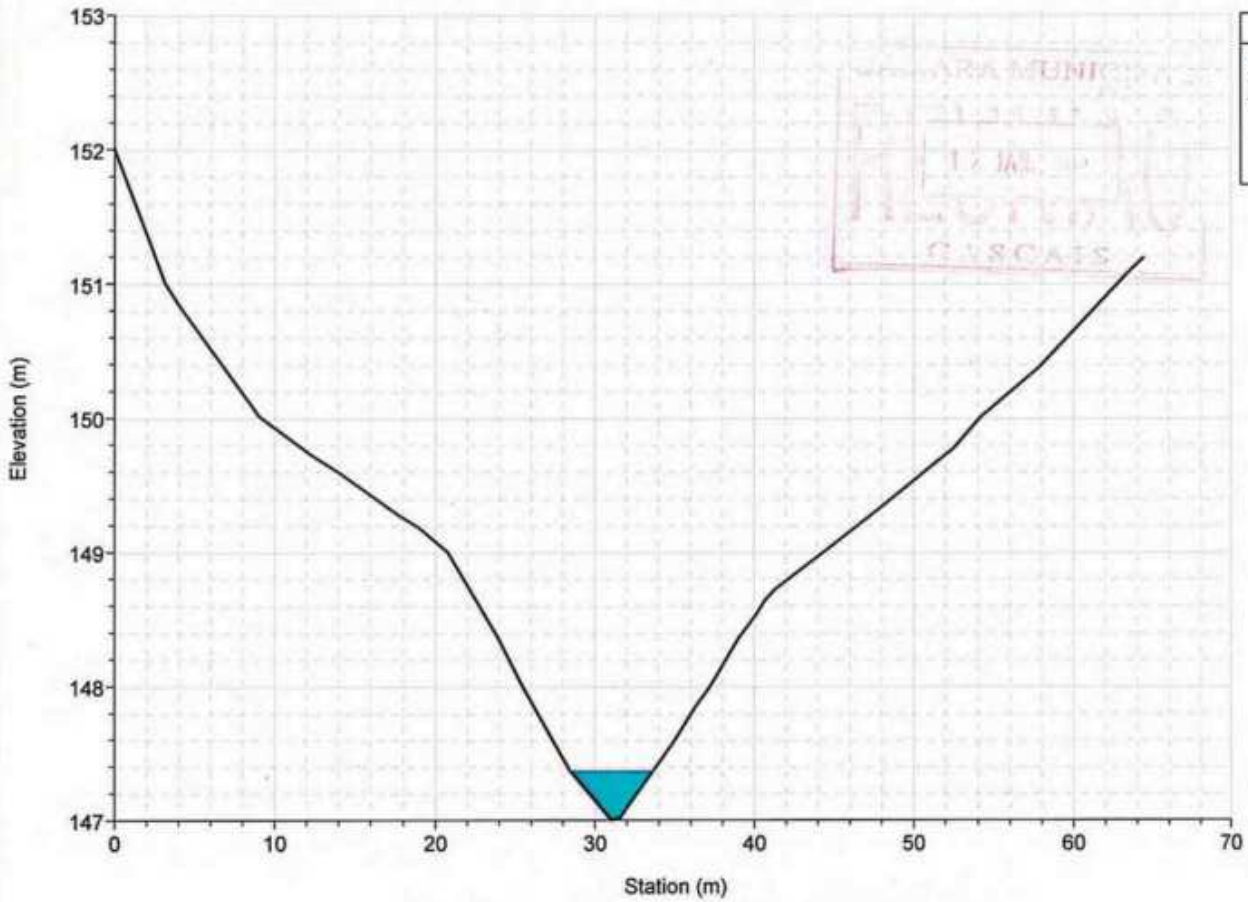
River = MD Reach = afluente RS = 1754.976



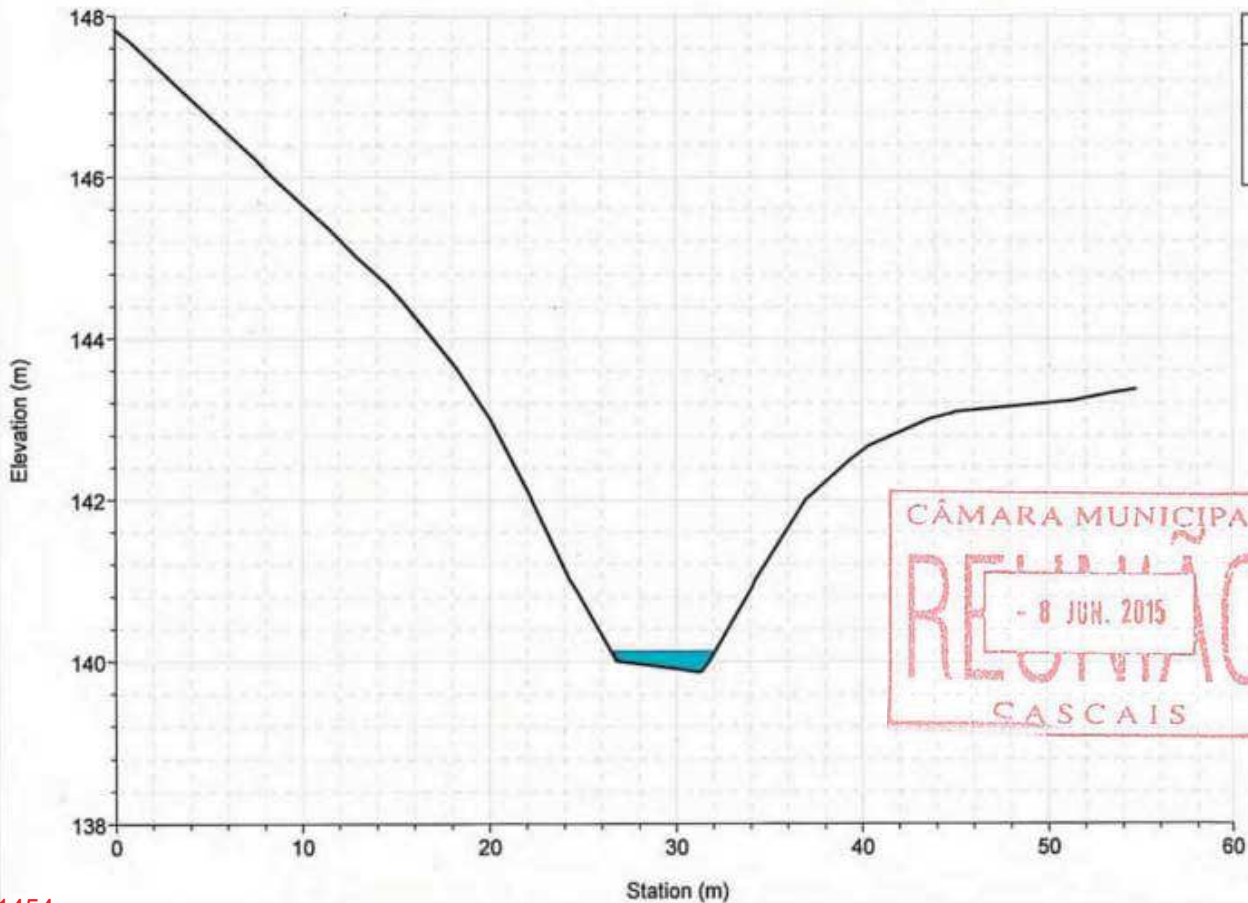
Legend
WS T=100 anos
Ground
Bank Sta

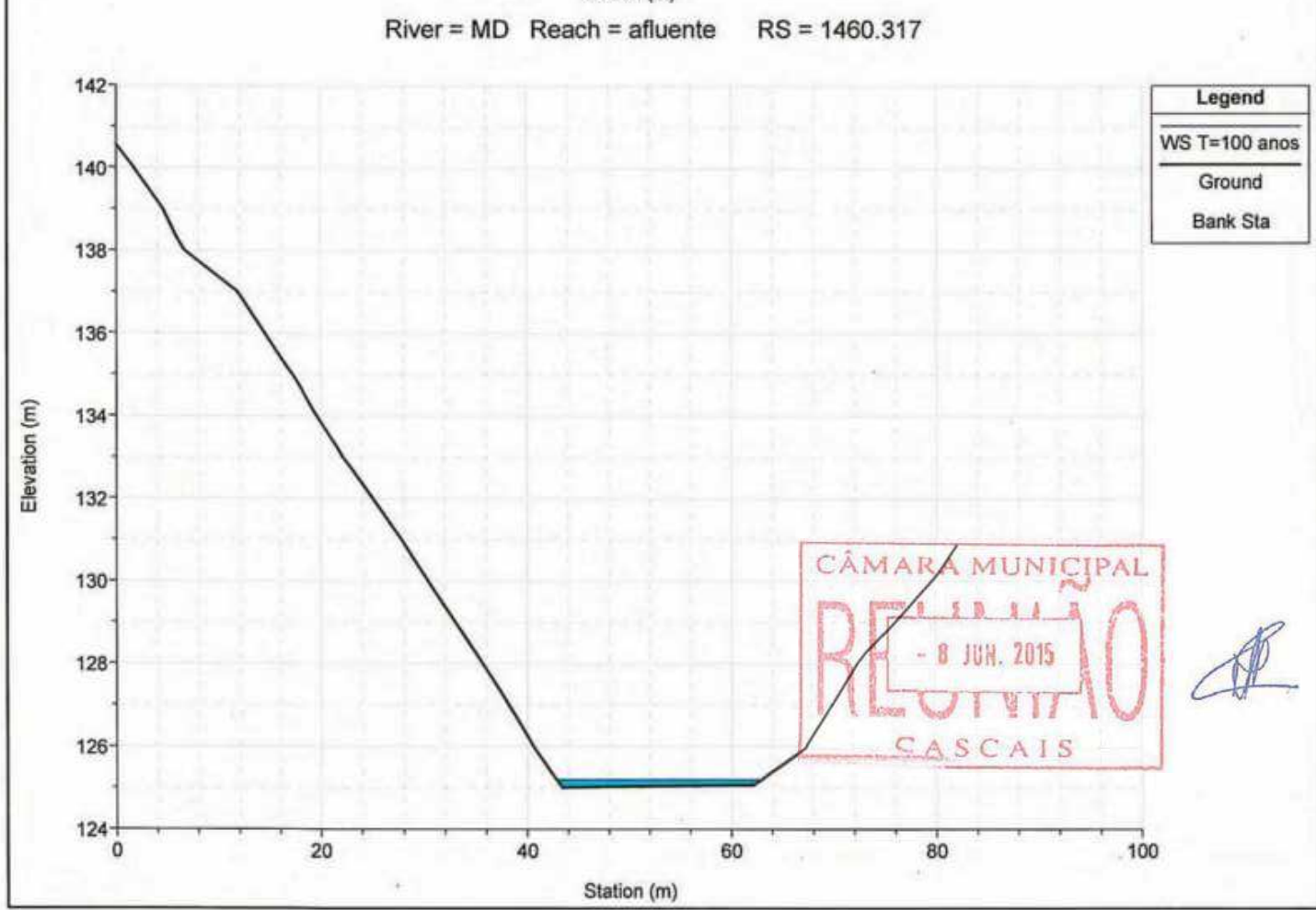
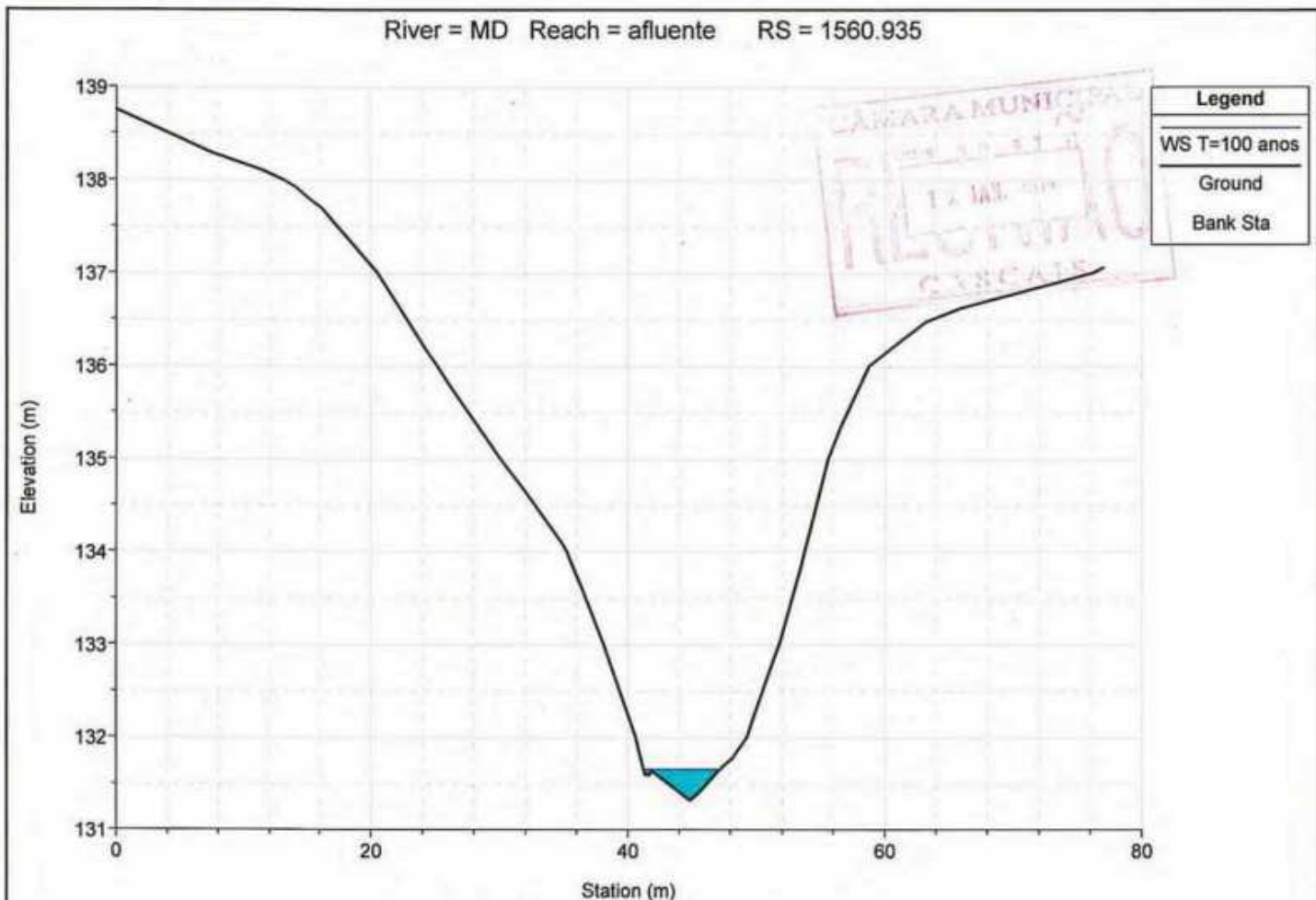


River = MD Reach = afluyente RS = 1688.581

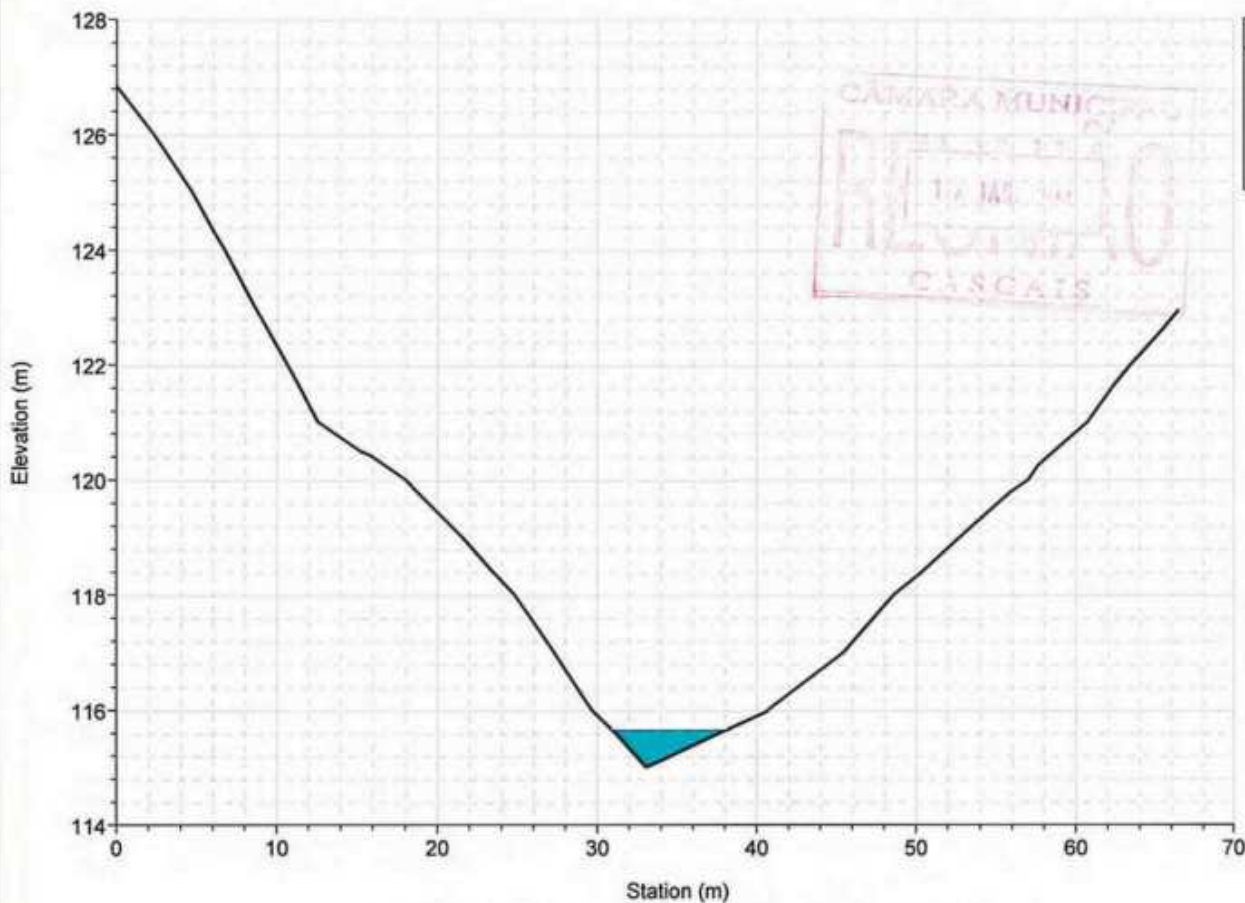


River = MD Reach = afluyente RS = 1630.892



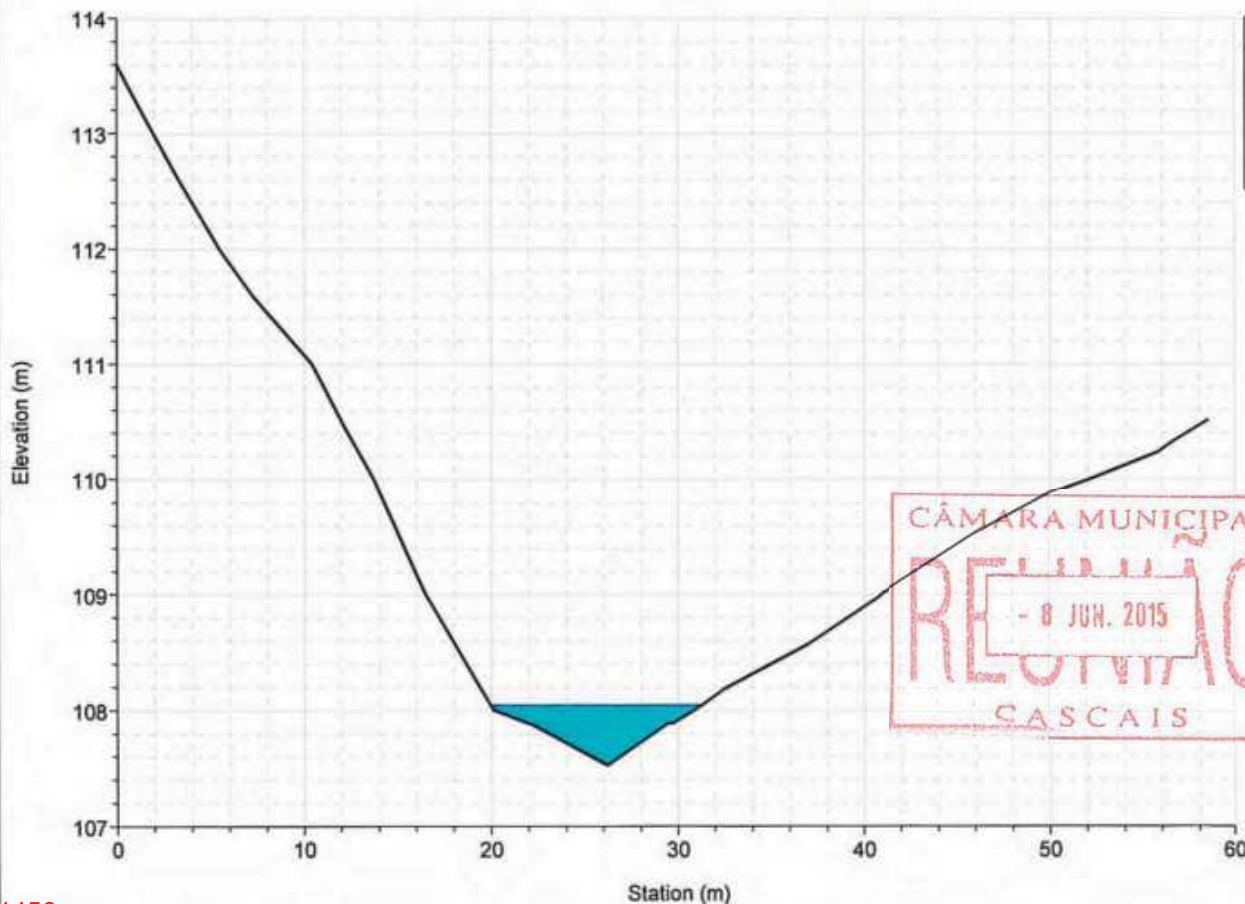


River = MD Reach = afluente RS = 1356.069



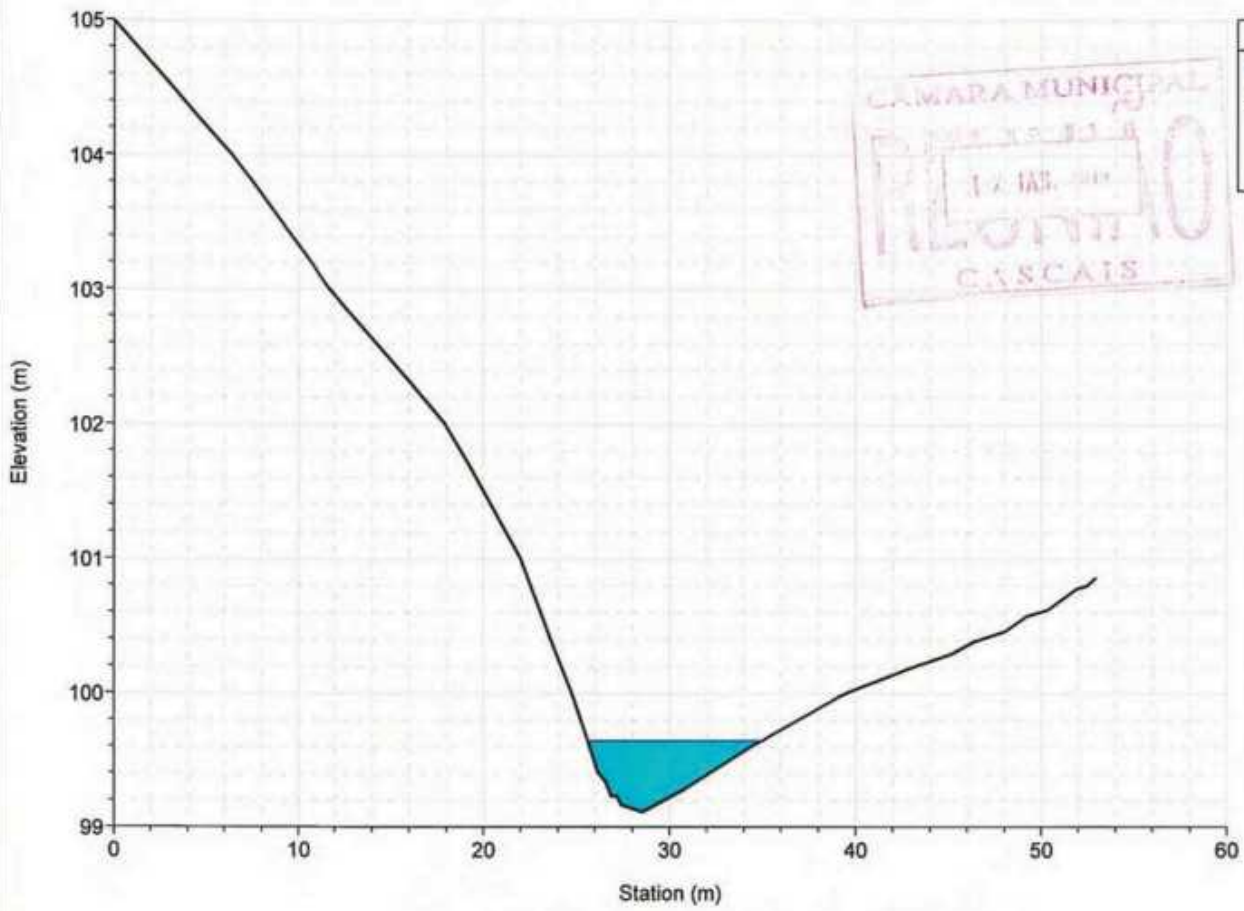
Legend
WS T=100 anos
Ground
Bank Sta

River = MD Reach = afluente RS = 1273.515

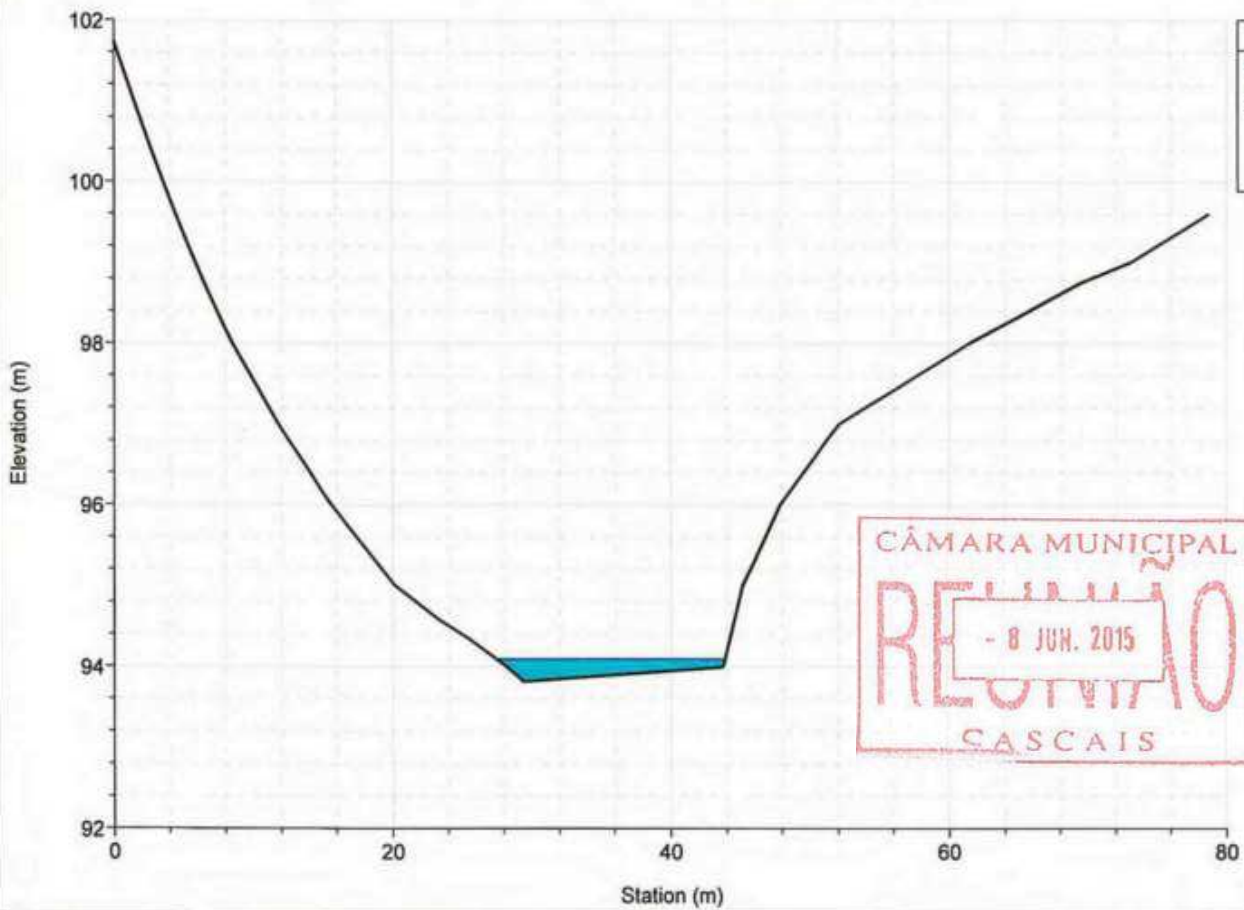


Legend
WS T=100 anos
Ground
Bank Sta

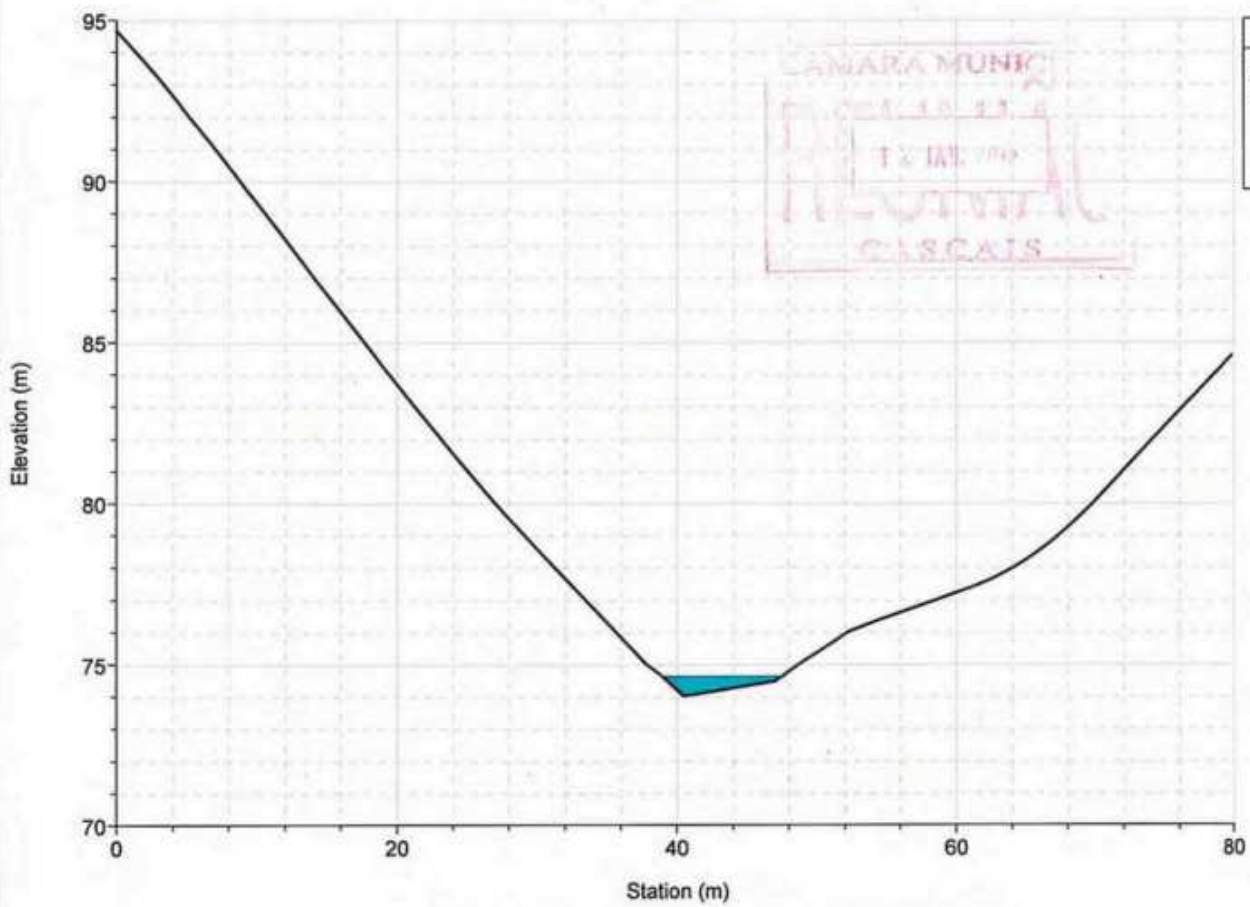
River = MD Reach = afluente RS = 1178.522



River = MD Reach = afluente RS = 1086.847

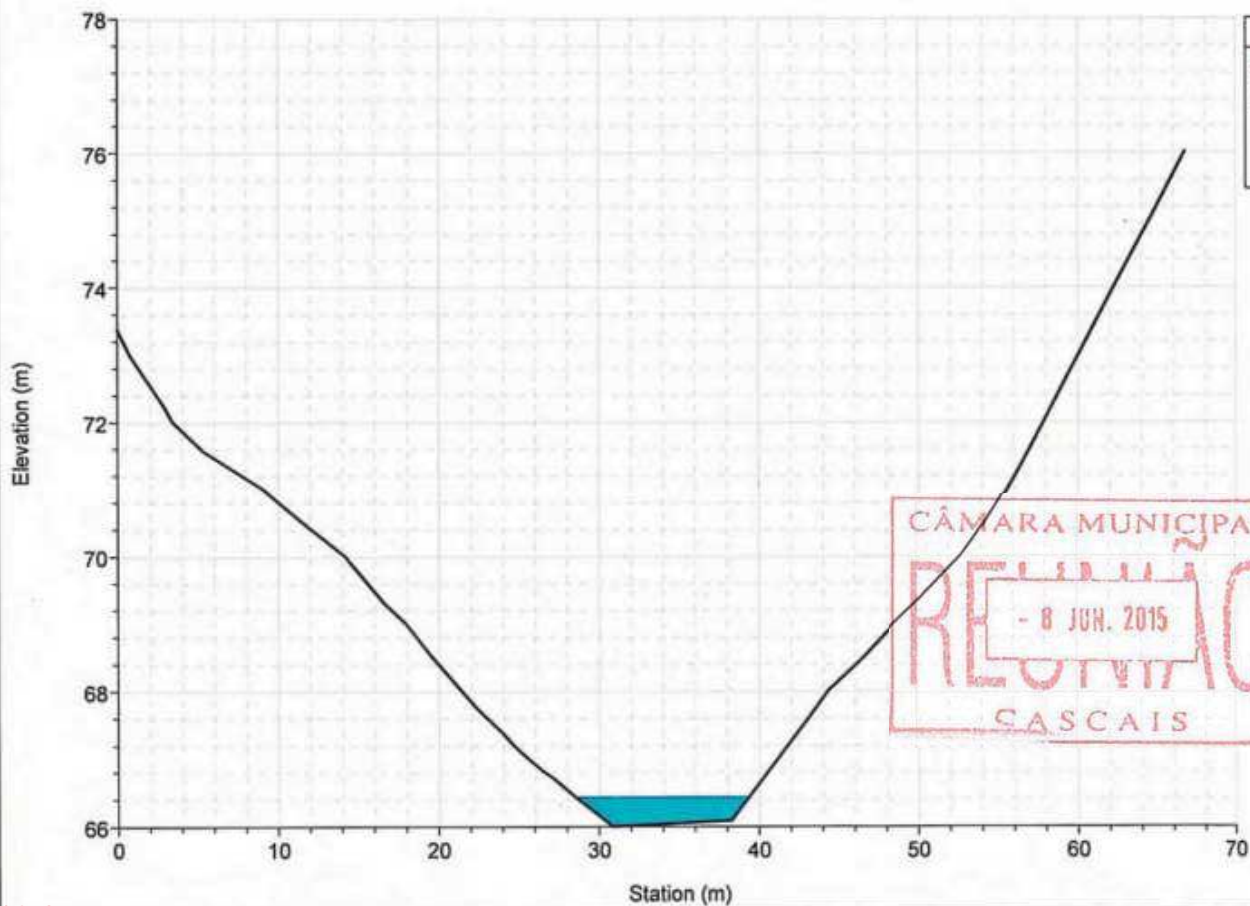


River = MD Reach = afluente RS = 759.582



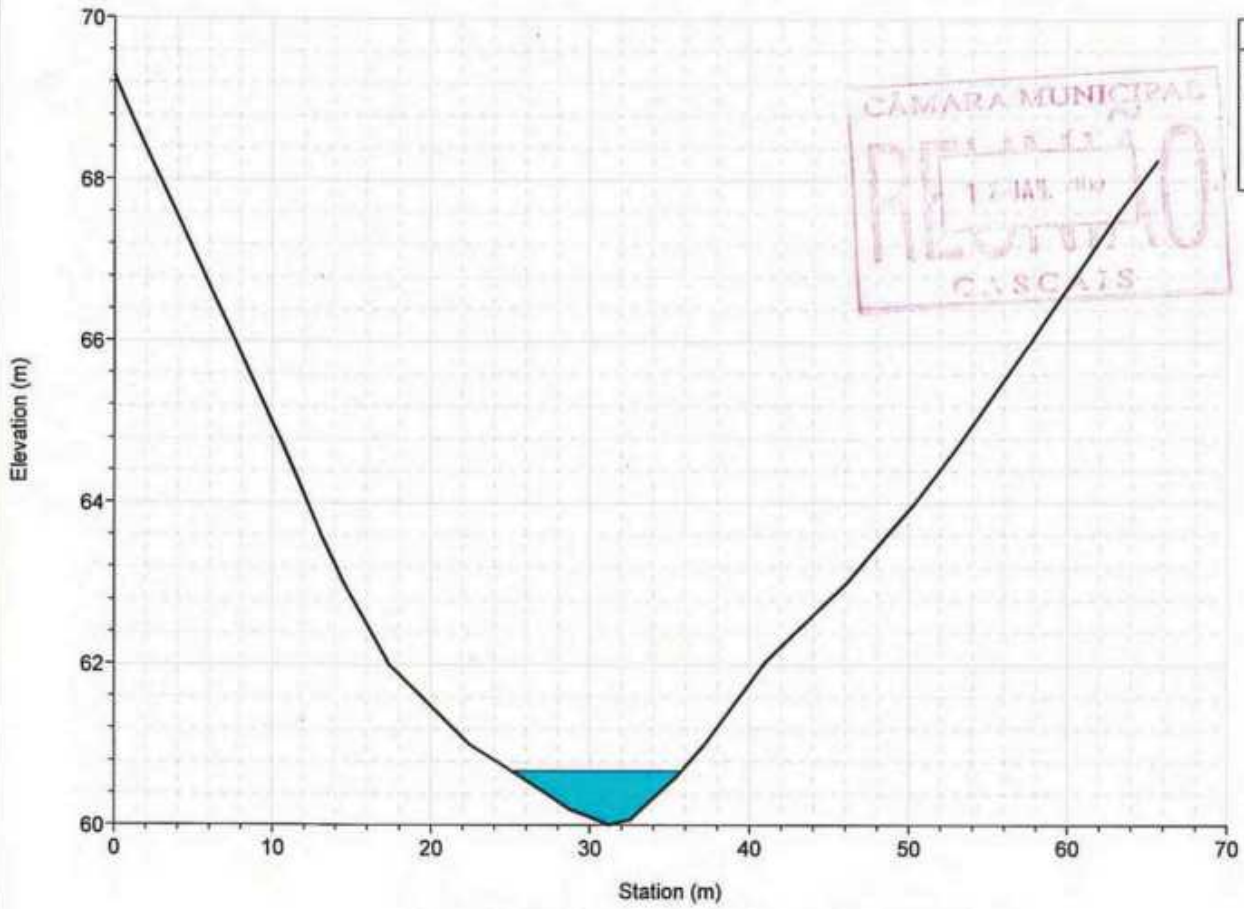
Legend
WS T=100 anos
Ground
Bank Sta

River = MD Reach = afluente RS = 602.117



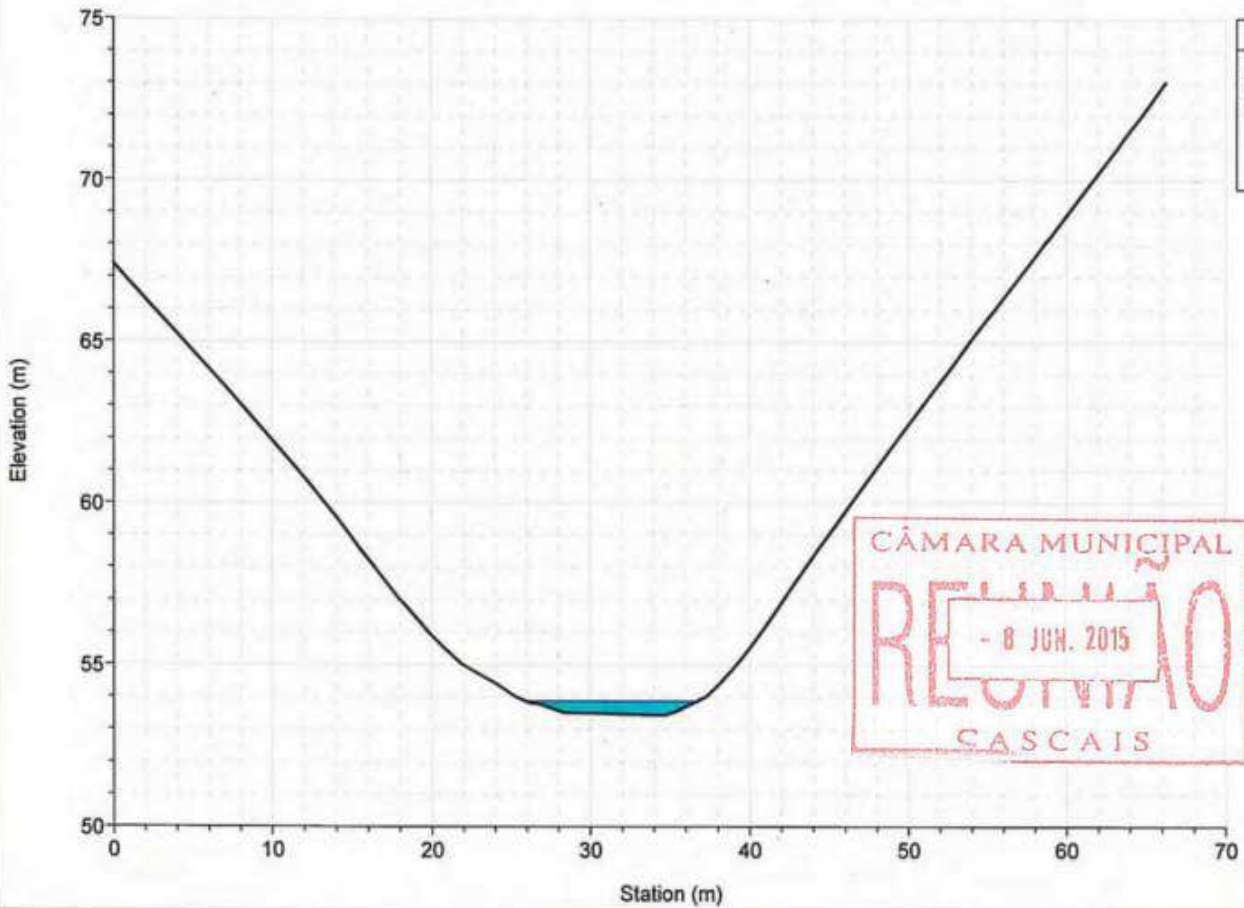
Legend
WS T=100 anos
Ground
Bank Sta

River = MD Reach = afluyente RS = 477.969



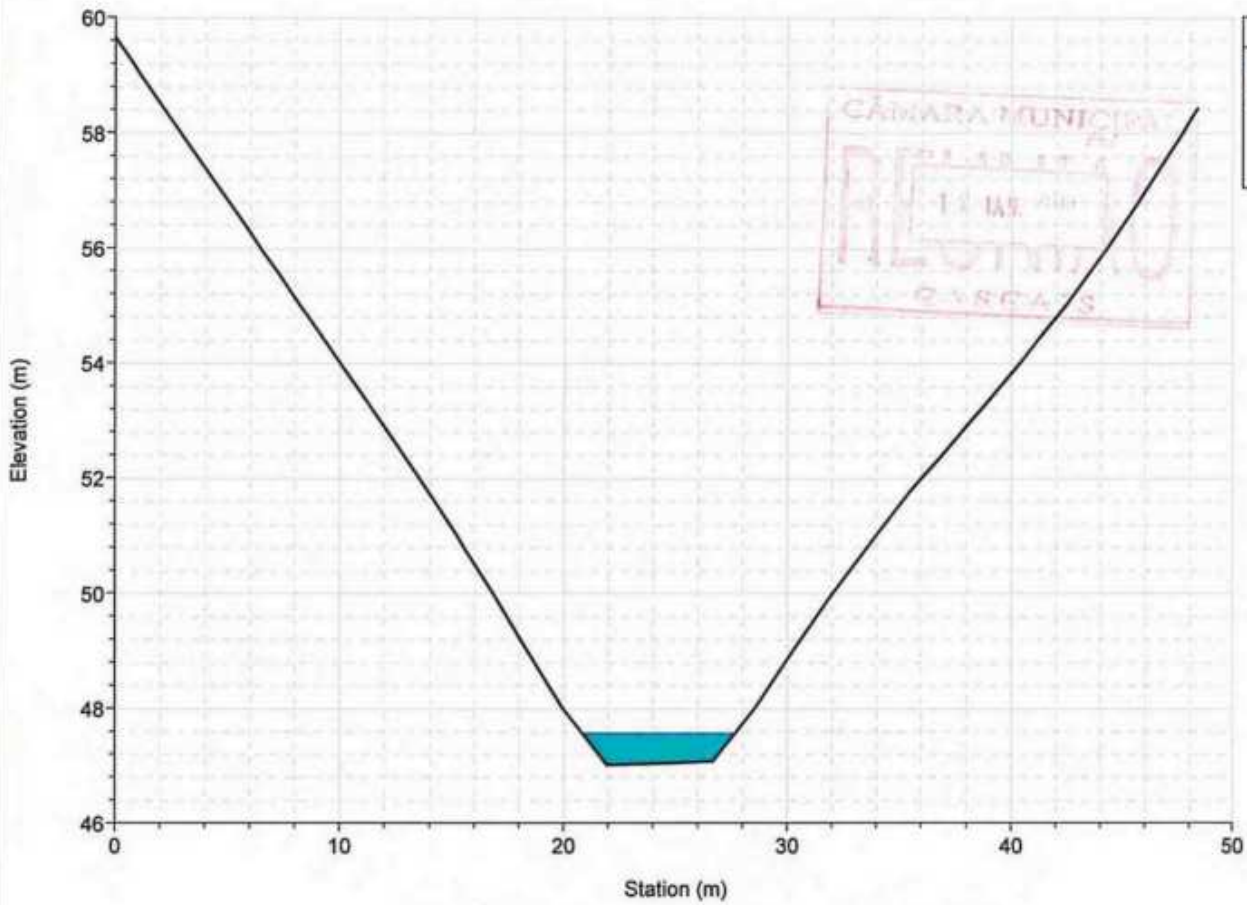
Legend
WS T=100 anos
Ground
Bank Sta

River = MD Reach = afluyente RS = 381.038

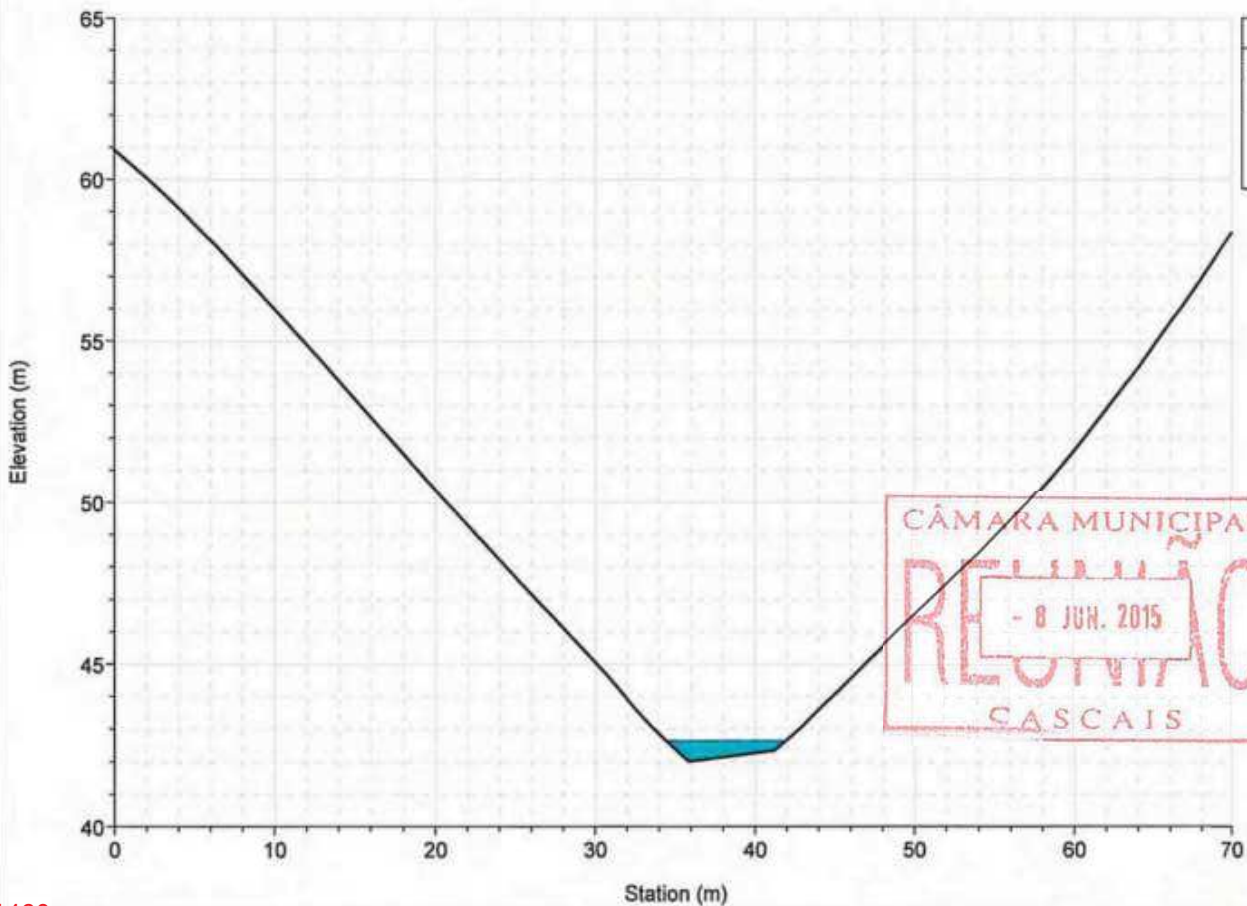


Legend
WS T=100 anos
Ground
Bank Sta

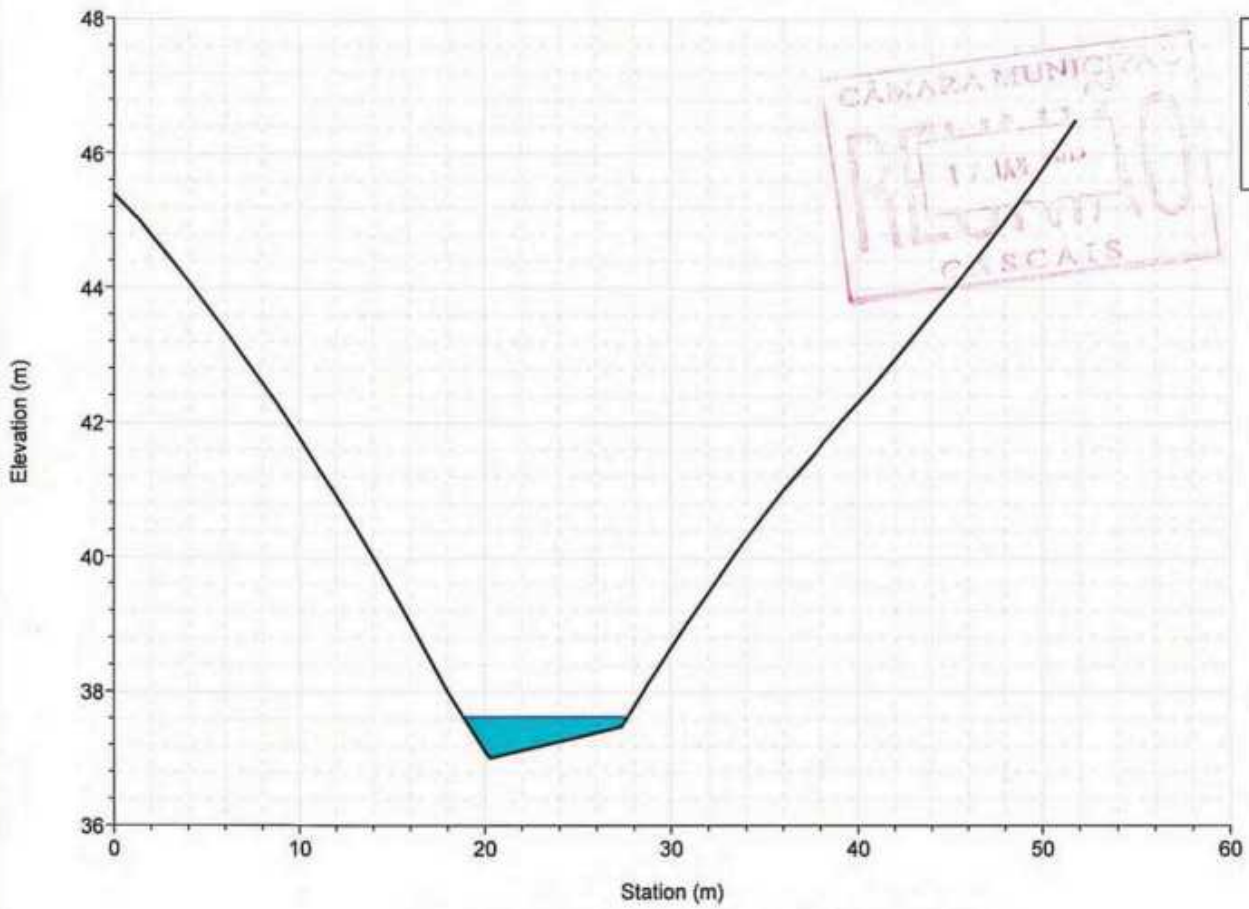
River = MD Reach = afluente RS = 264.315



River = MD Reach = afluente RS = 167.934

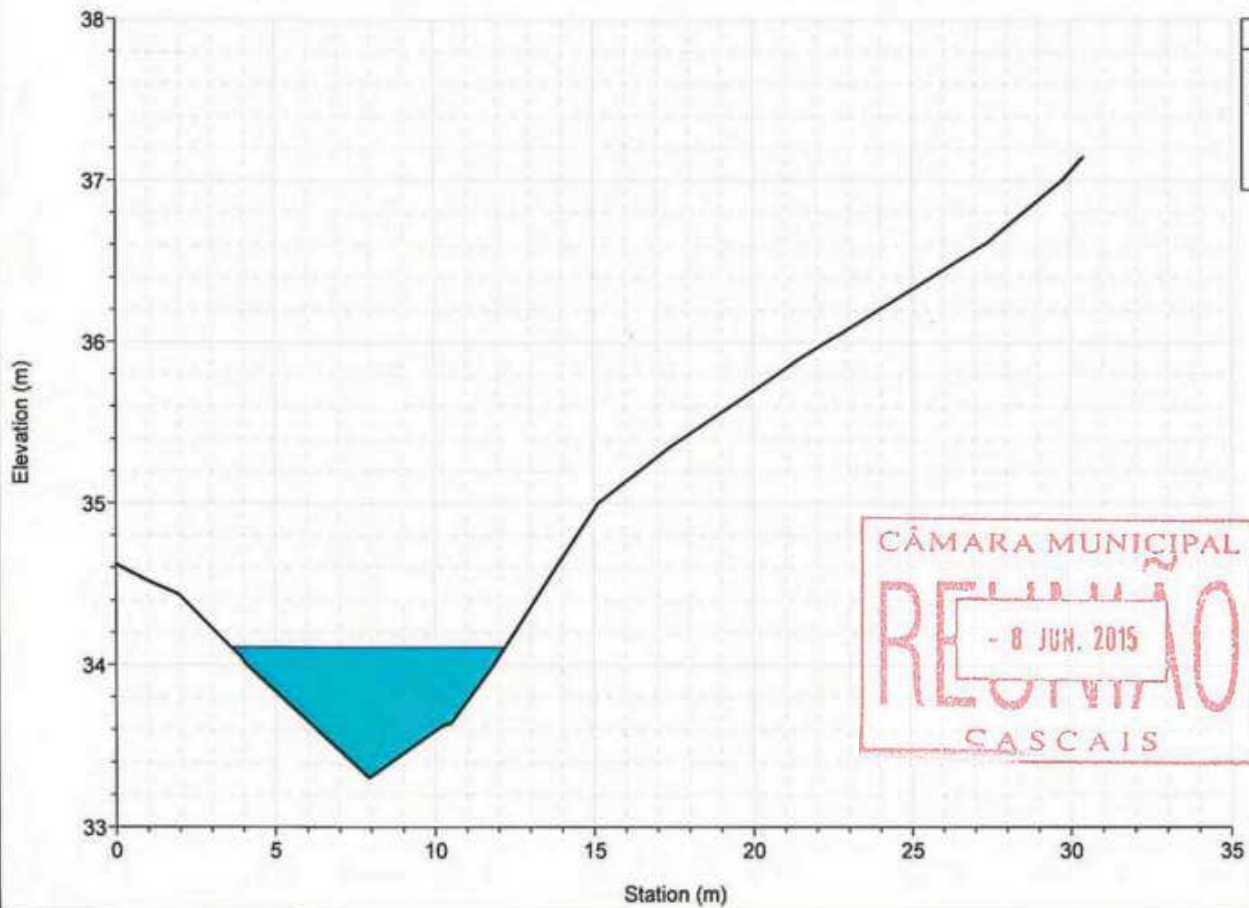


River = MD Reach = afluyente RS = 81.964



Legend
WS T=100 anos
Ground
Bank Sta

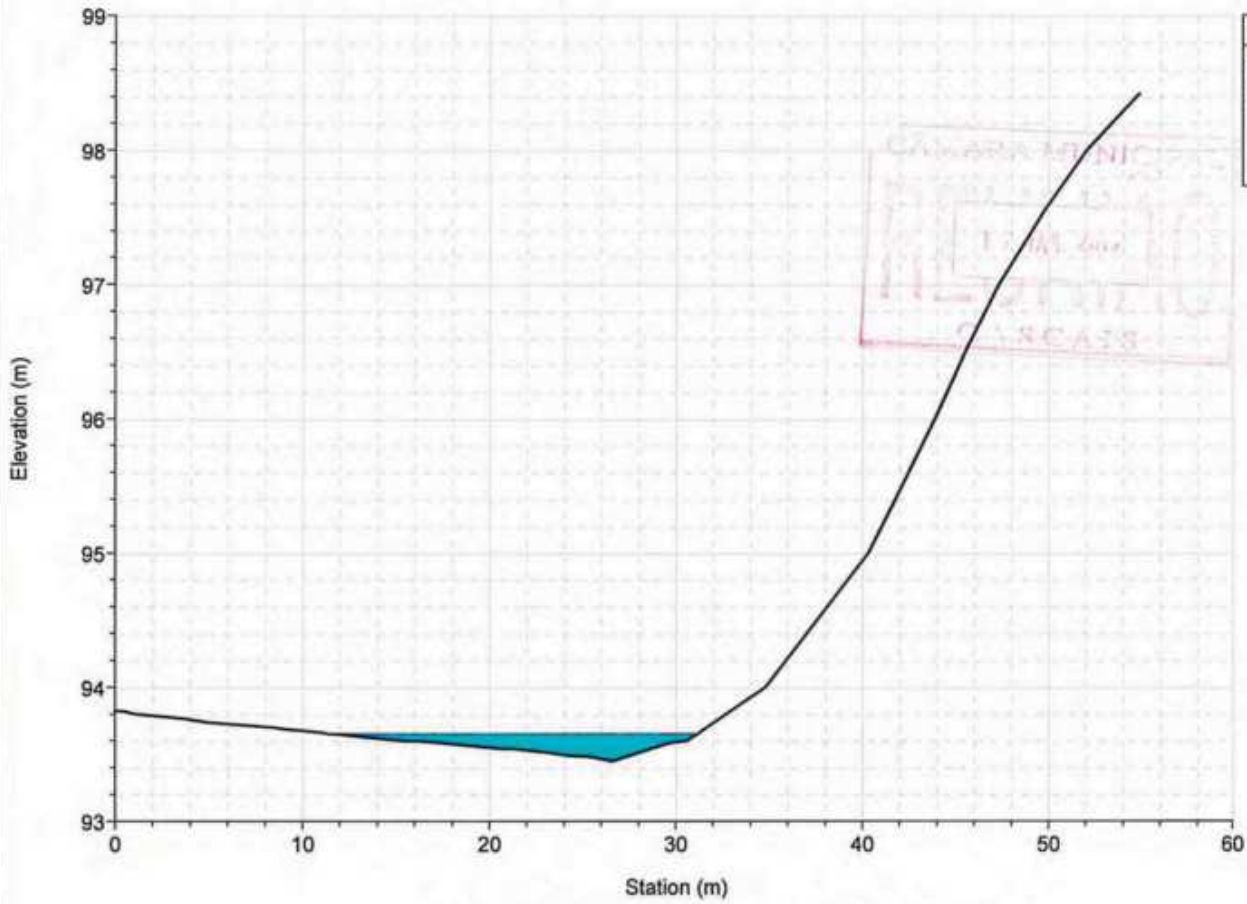
River = MD Reach = afluyente RS = 20.768



Legend
WS T=100 anos
Ground
Bank Sta

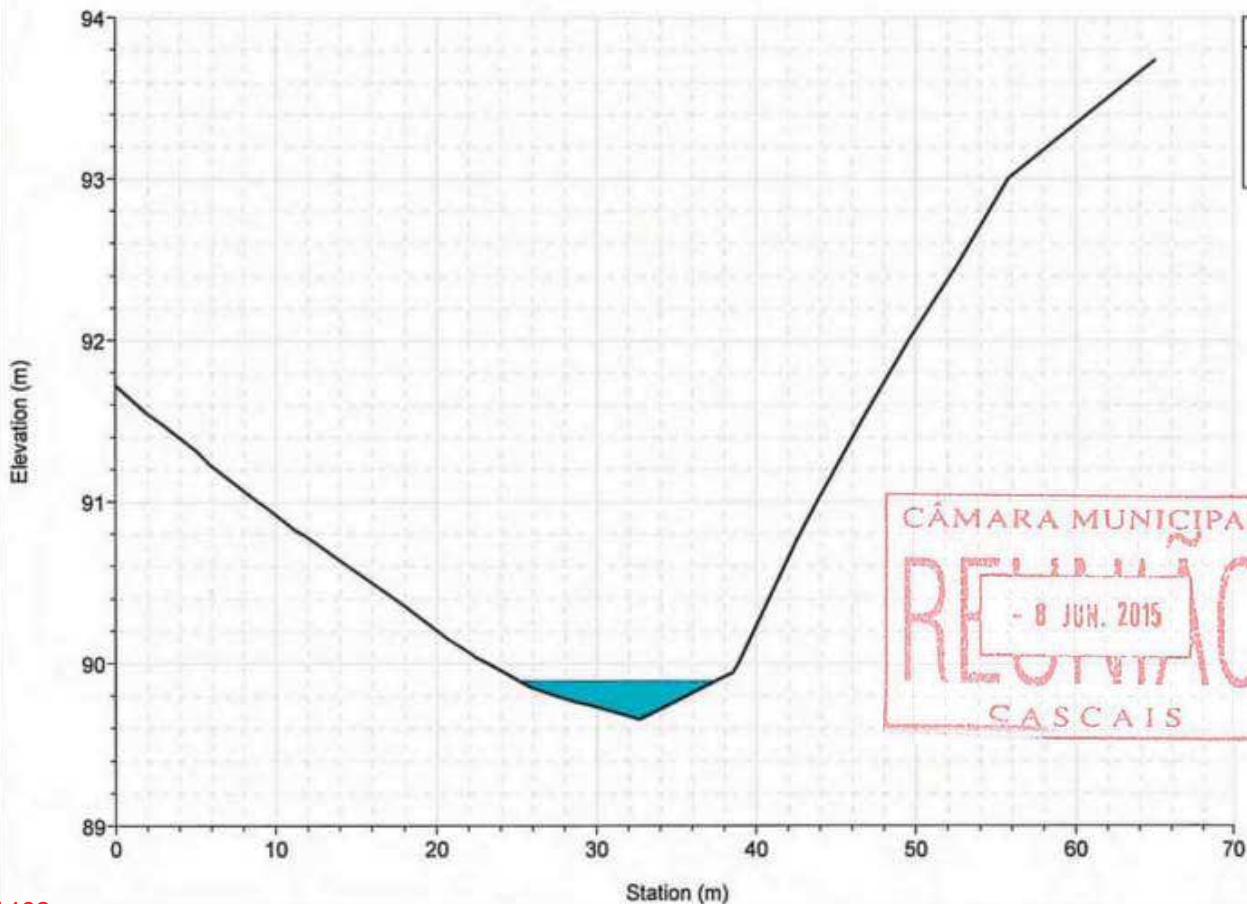


River = ME Reach = afluyente RS = 728.712



Legend
WS T=100 anos
Ground
Bank Sta

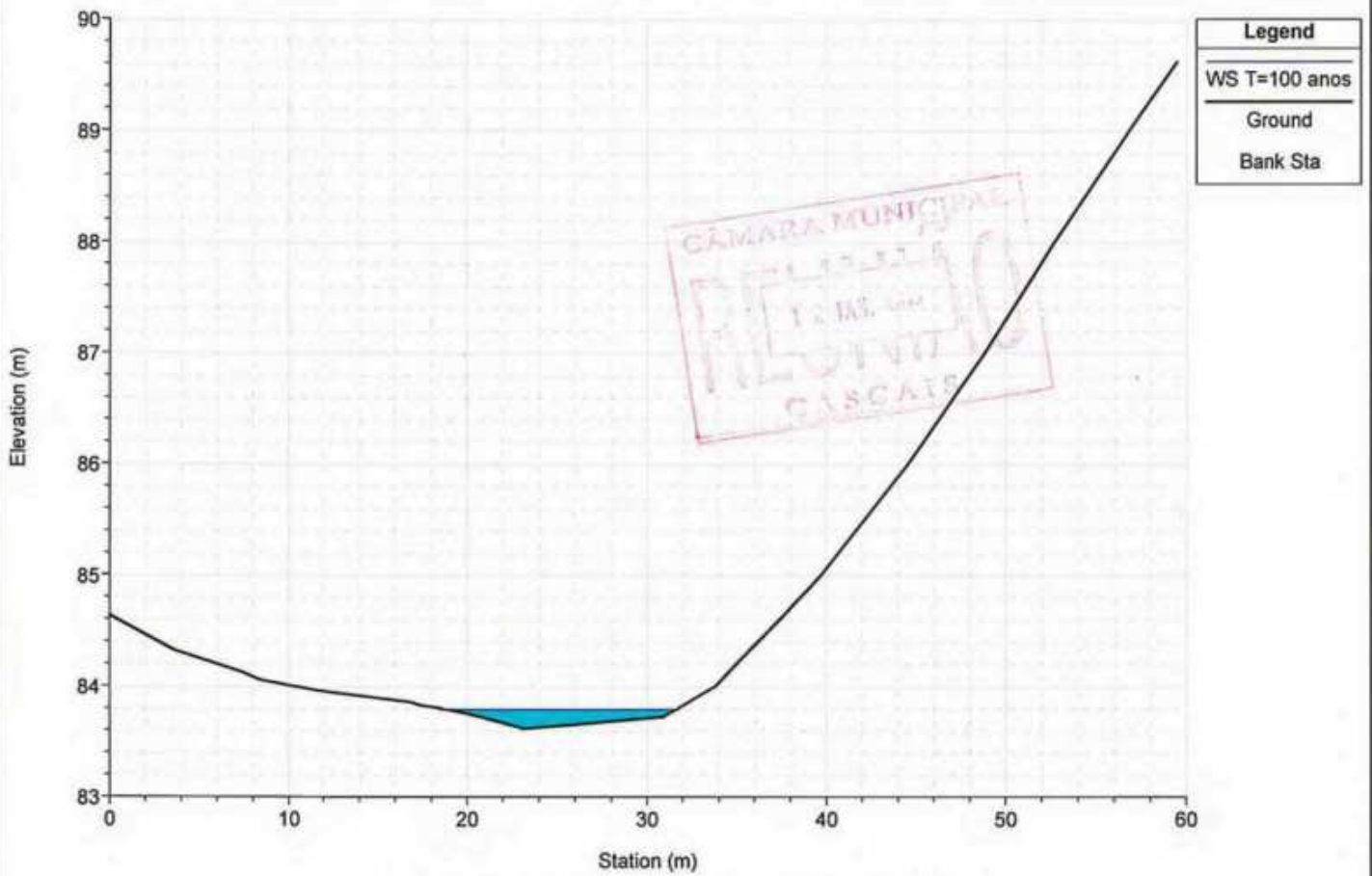
River = ME Reach = afluyente RS = 665.756



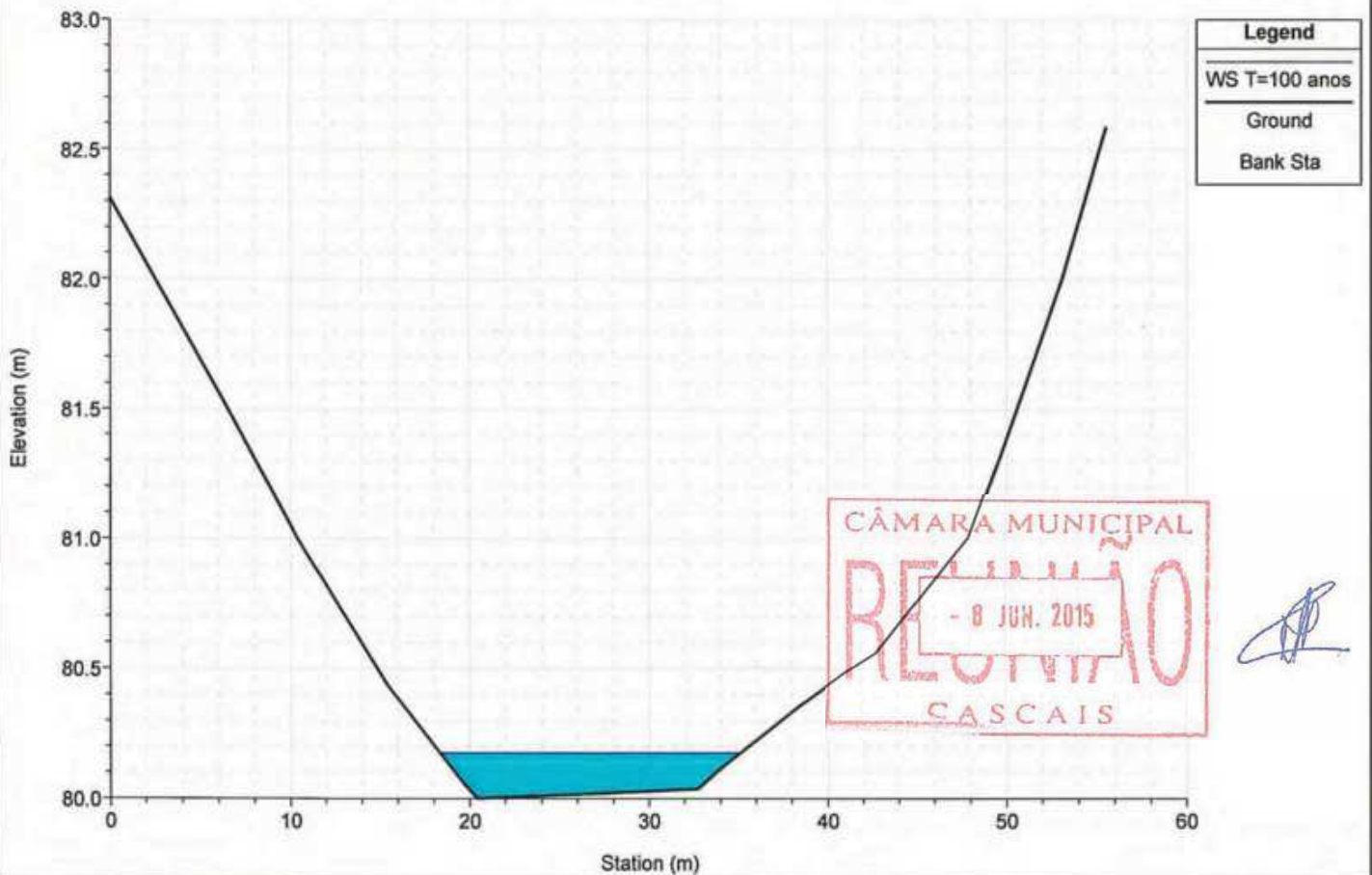
Legend
WS T=100 anos
Ground
Bank Sta

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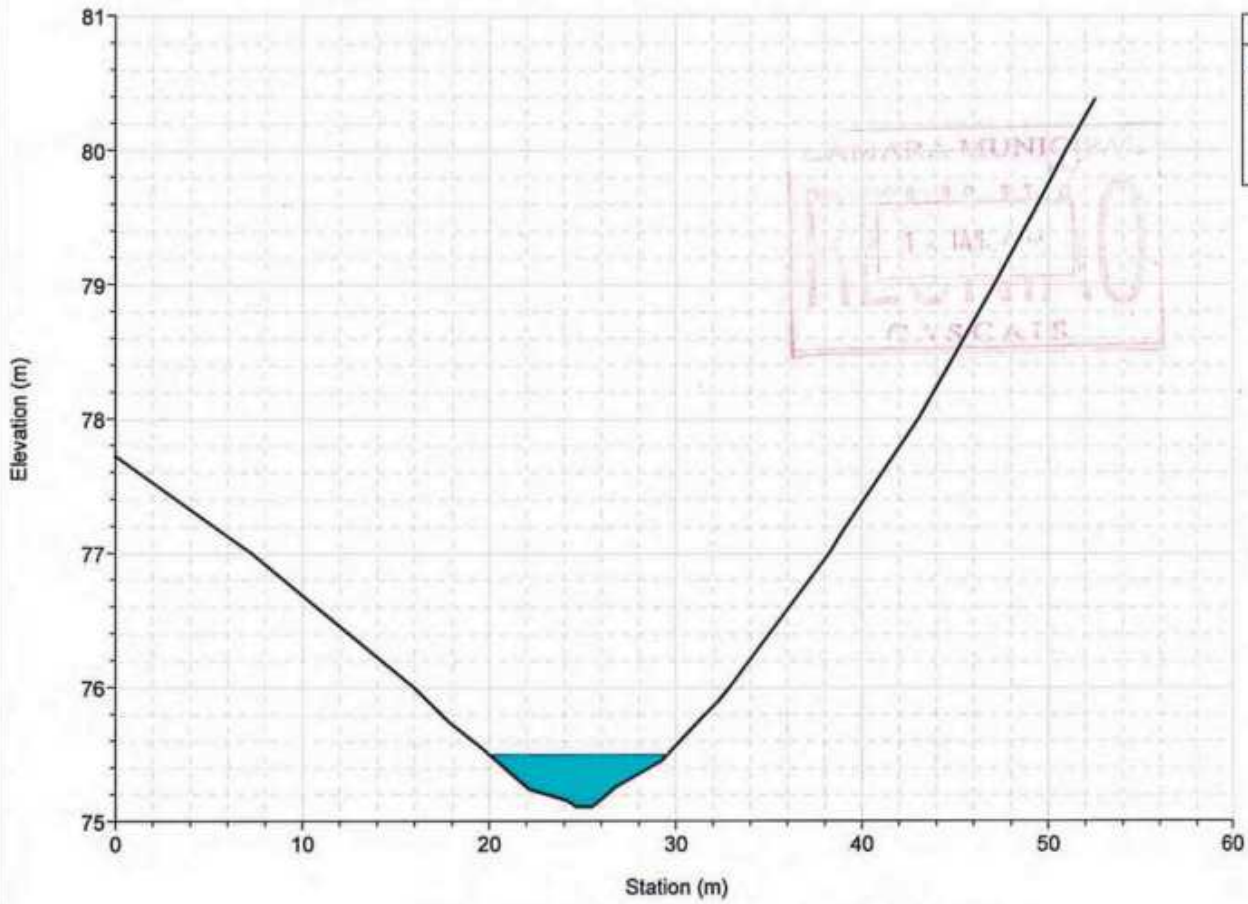
River = ME Reach = afluyente RS = 538.812



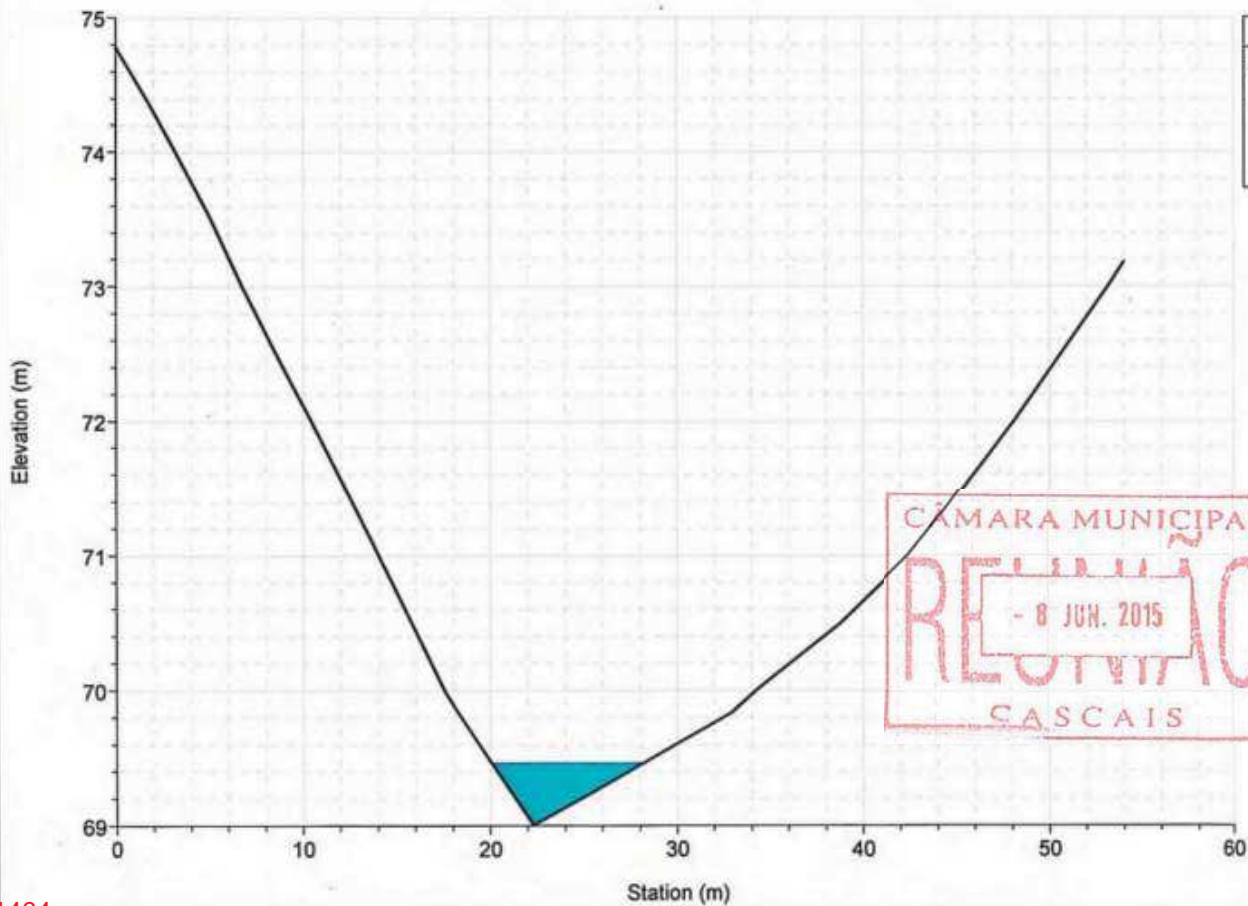
River = ME Reach = afluyente RS = 443.037



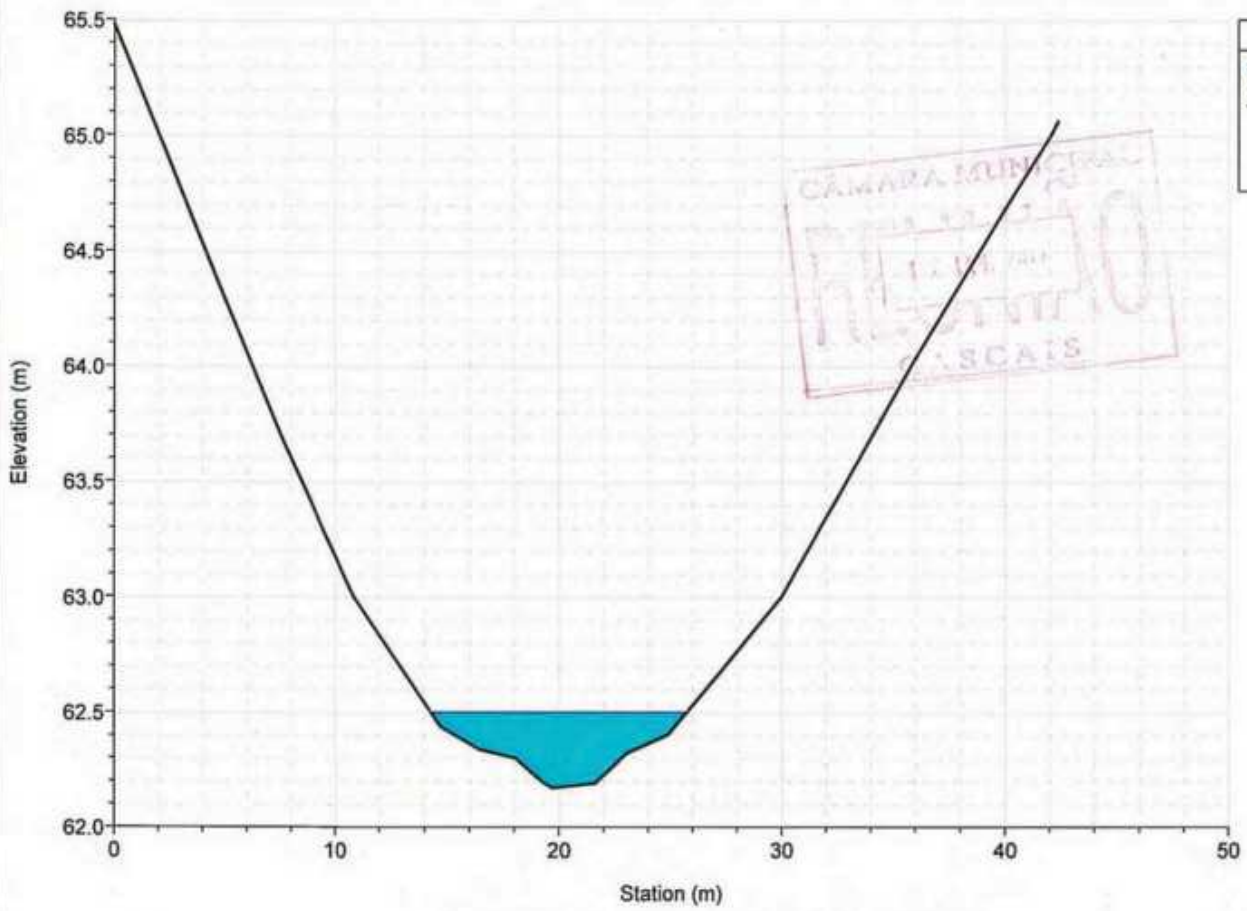
River = ME Reach = afluyente RS = 336.362



River = ME Reach = afluyente RS = 247.804



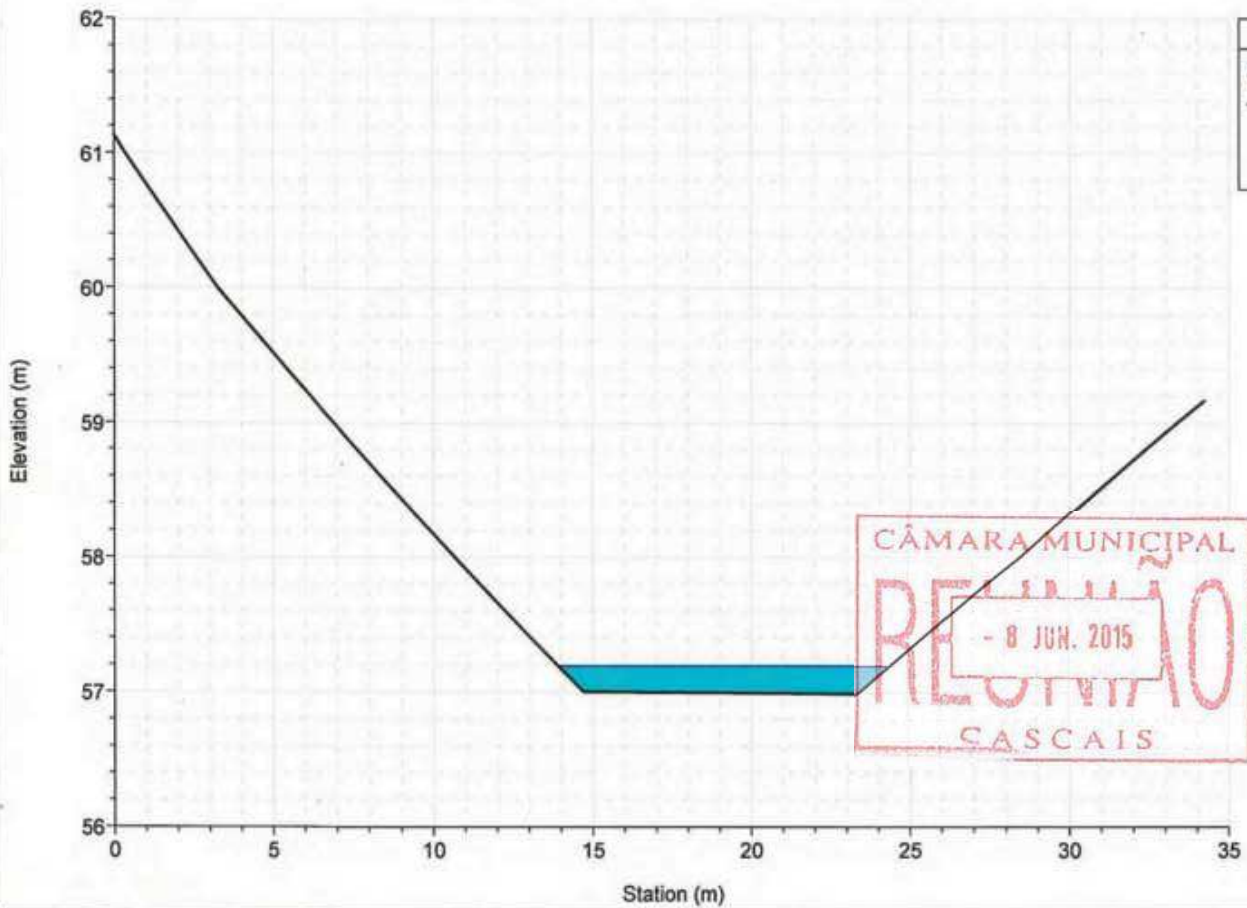
River = ME Reach = afluente RS = 150.149



Legend
WS T=100 anos
Ground
Bank Sta

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- 8 JUN. 2015  
CASCAIS

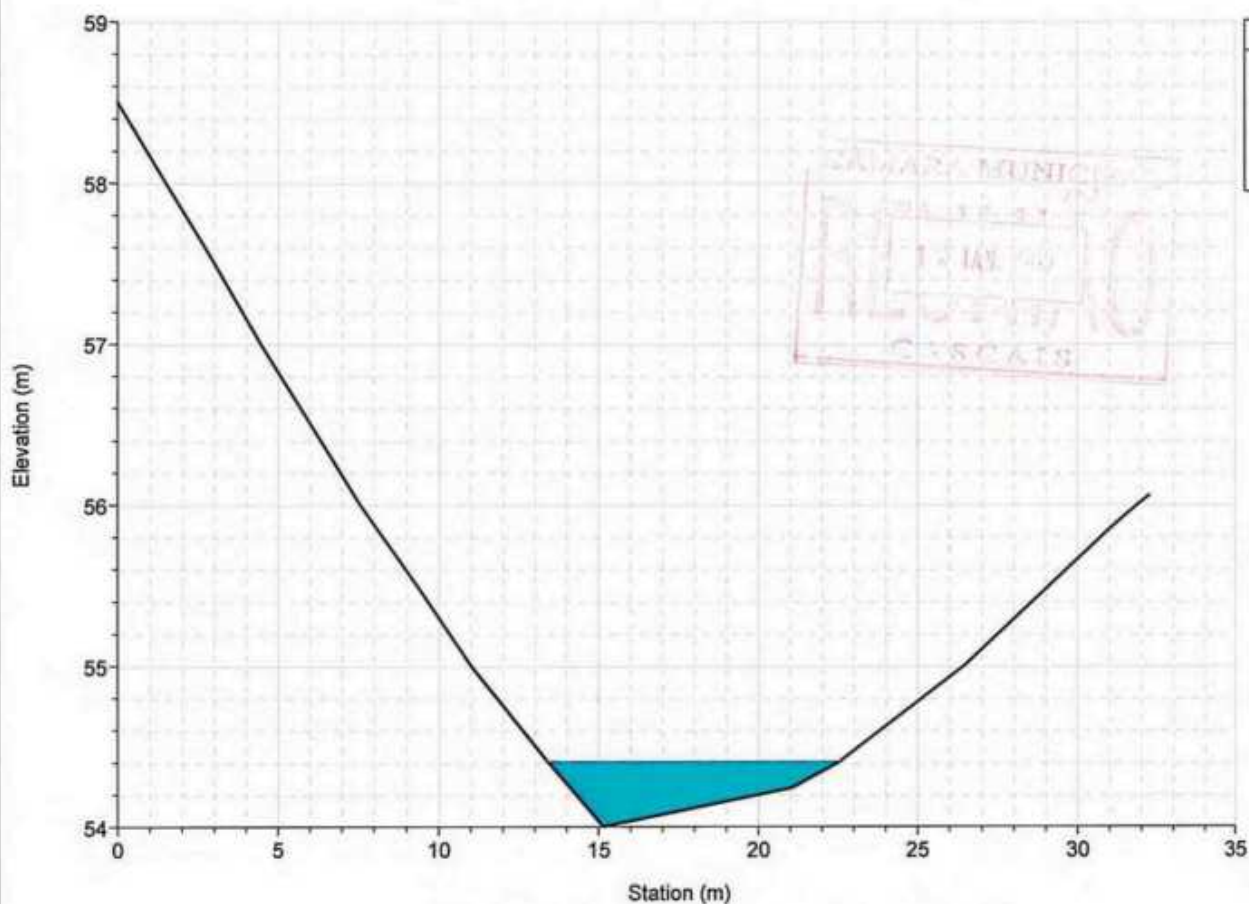
River = ME Reach = afluente RS = 77.277



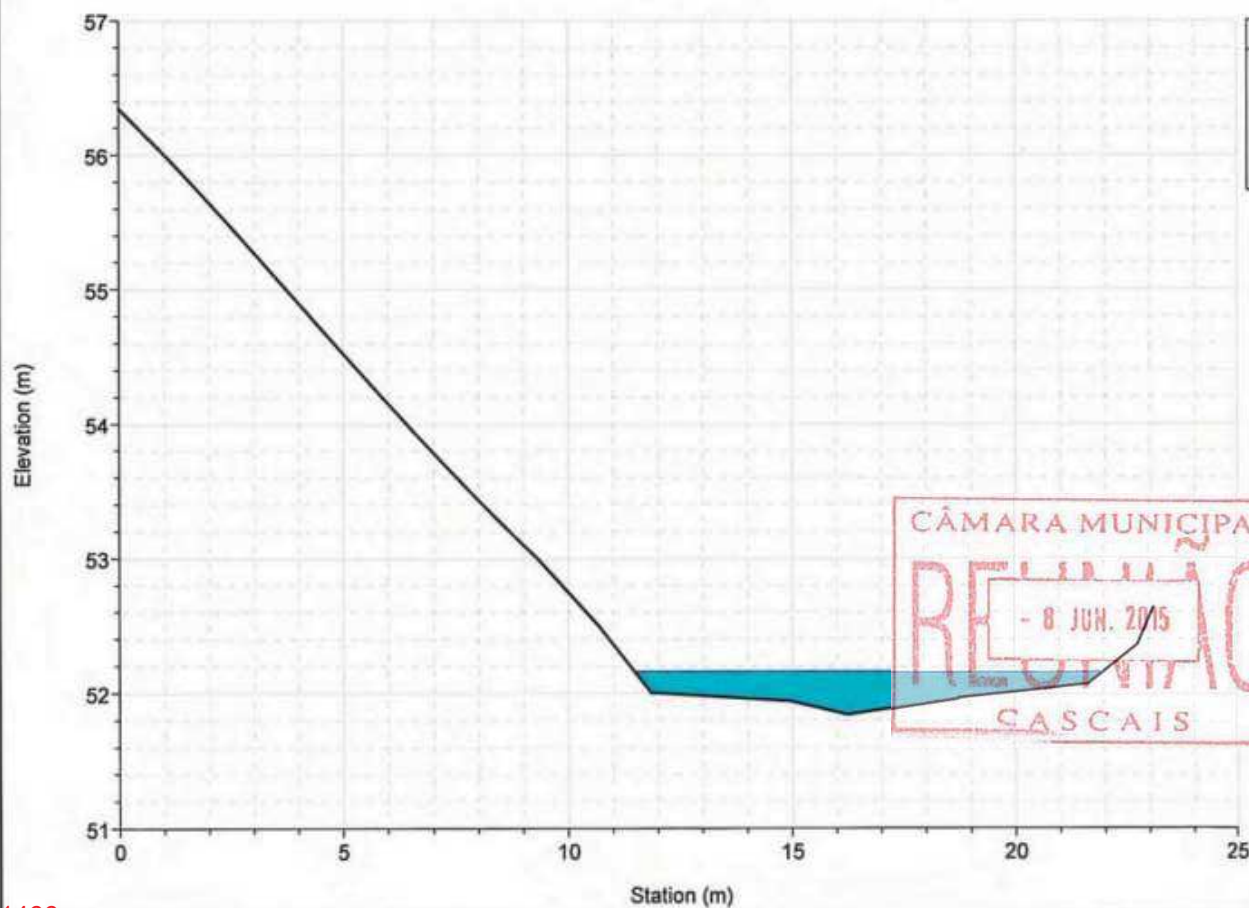
Legend
WS T=100 anos
Ground
Bank Sta

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River = ME Reach = afluyente RS = 39.060

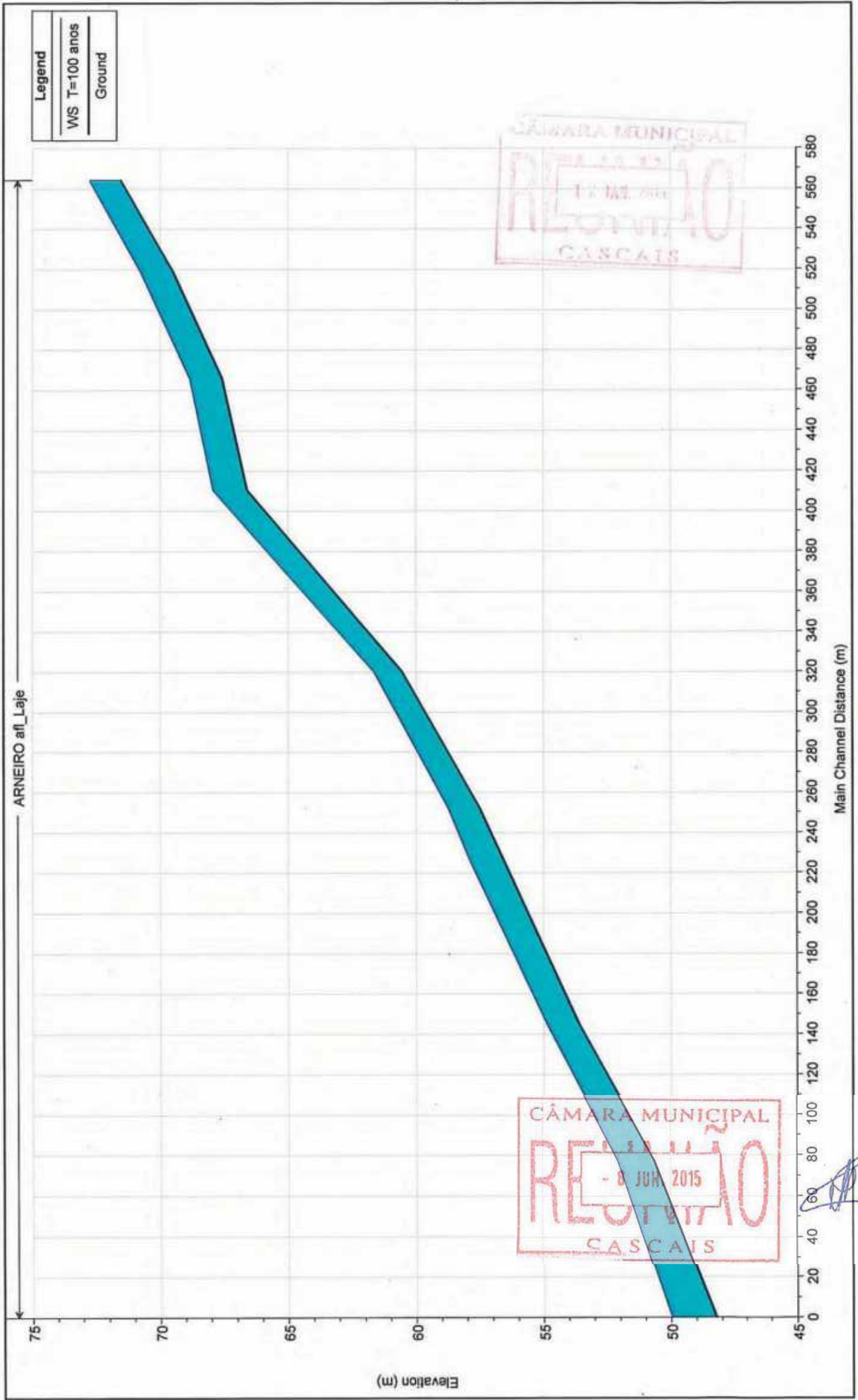


River = ME Reach = afluyente RS = 10.900

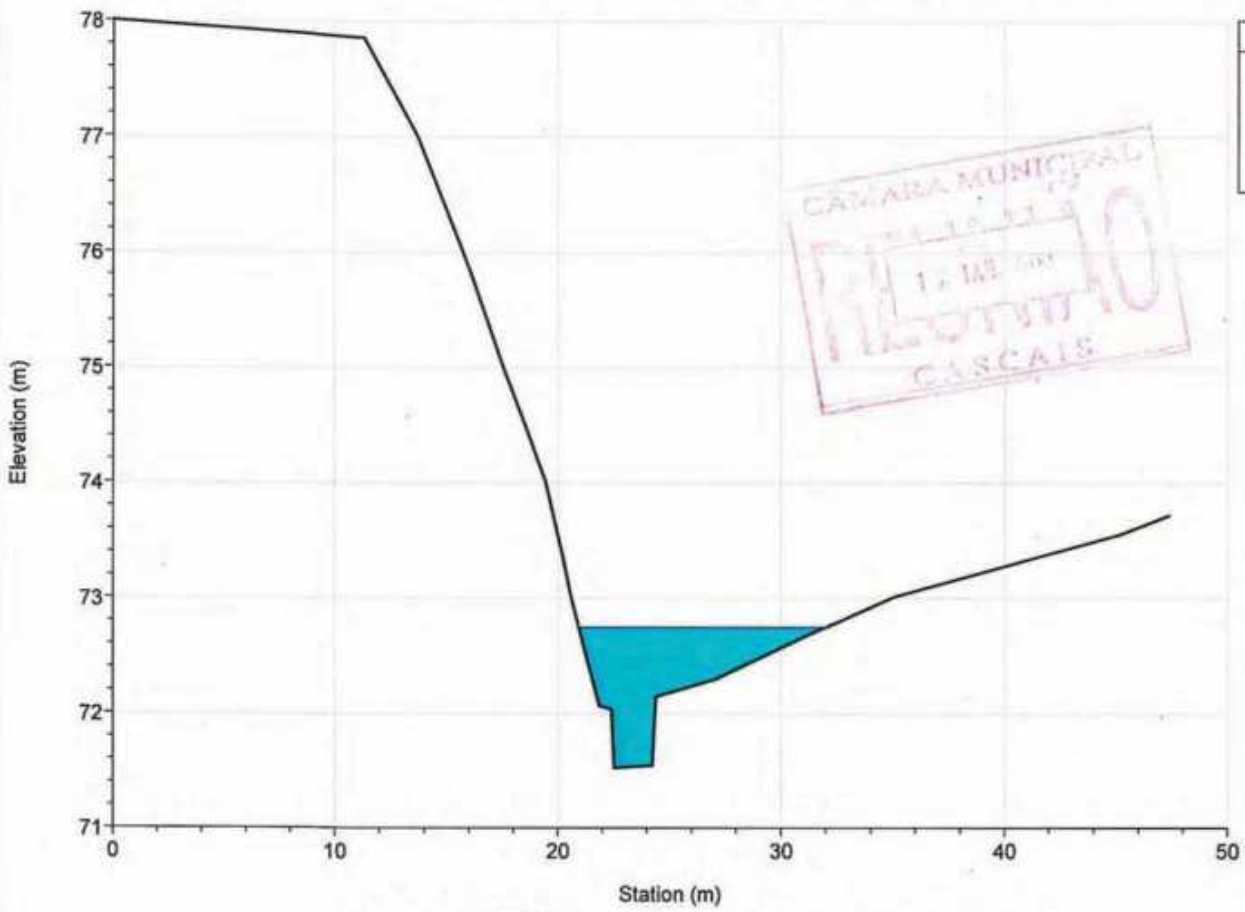




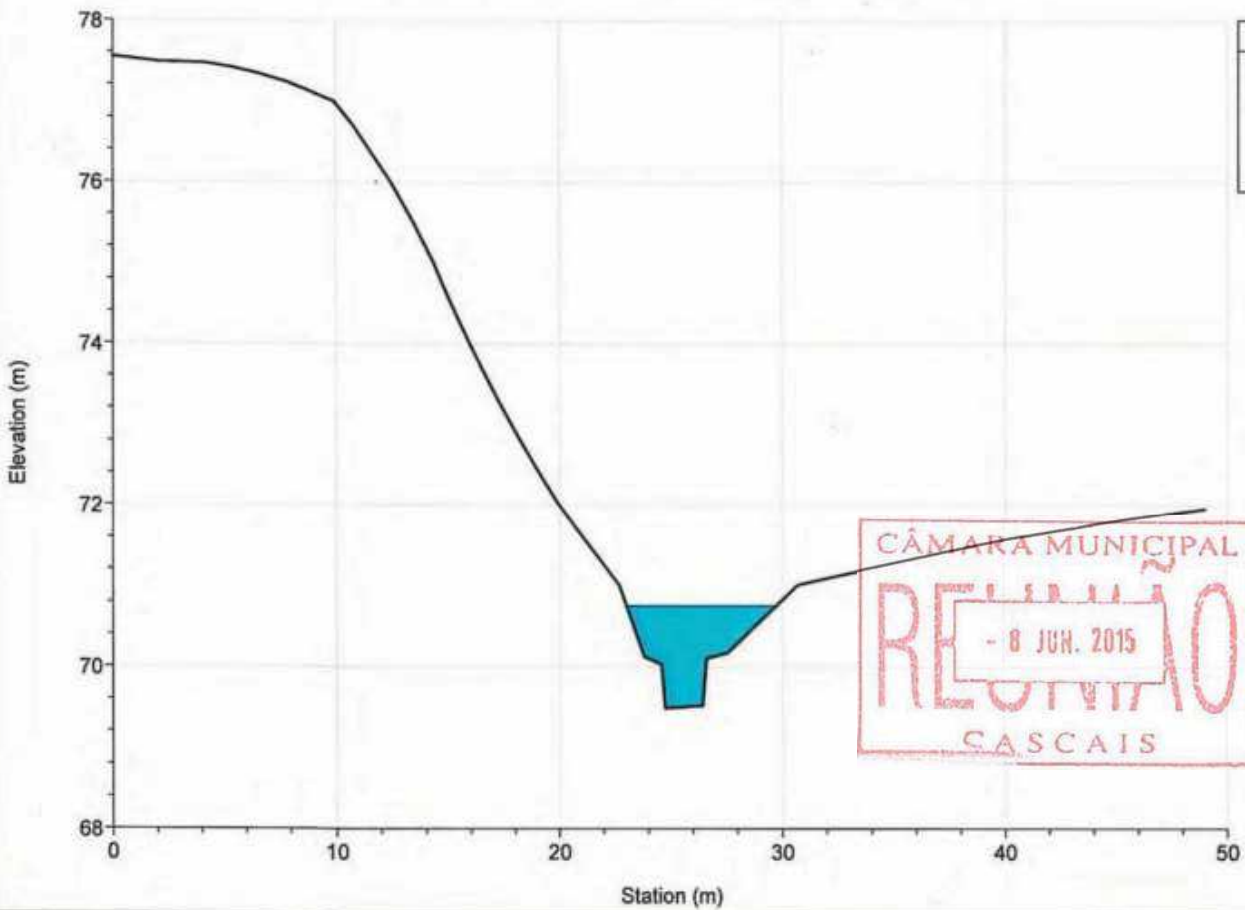
A handwritten signature in blue ink, located to the right of the red stamp.



River = ARNEIRO Reach = afl\_Laje RS = 574.698

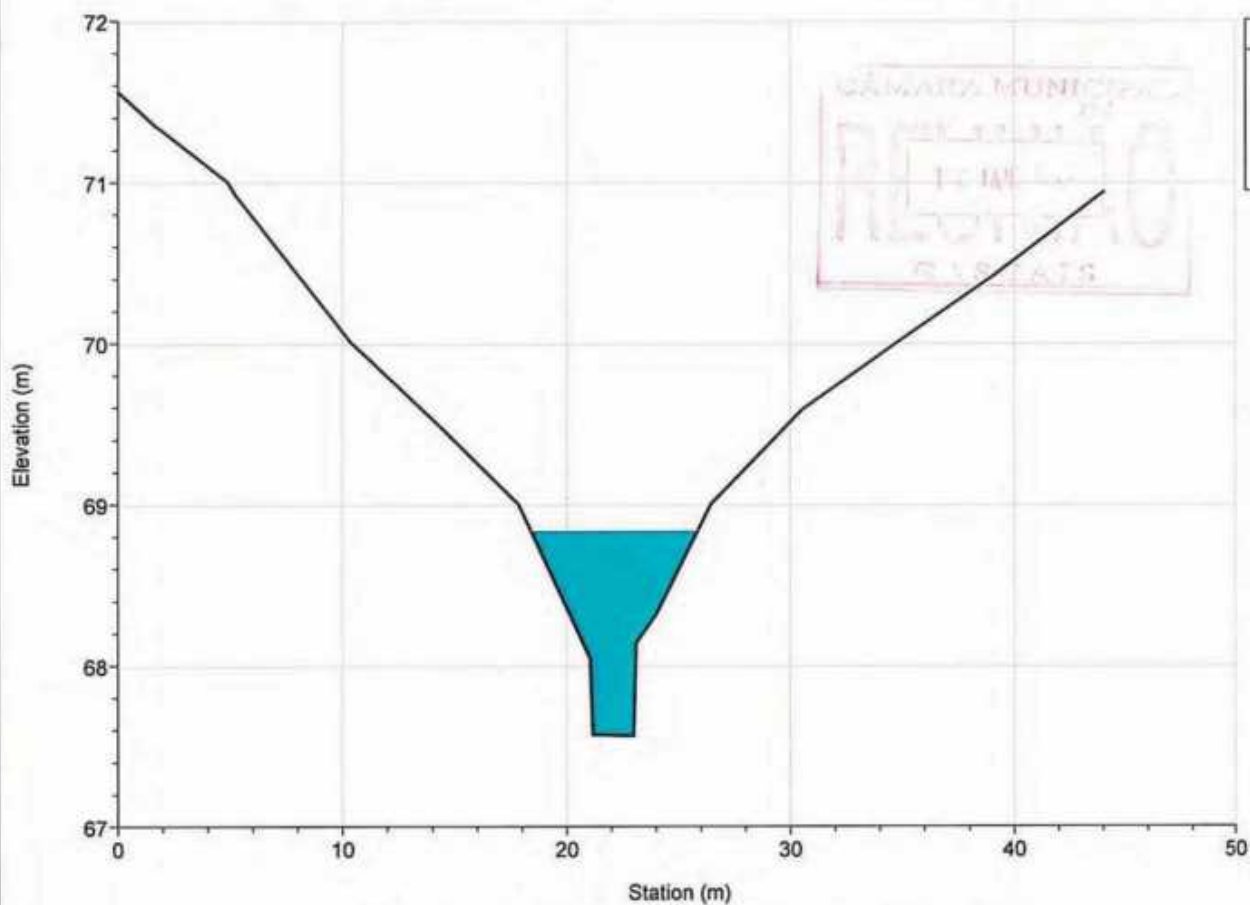


River = ARNEIRO Reach = afl\_Laje RS = 529.445

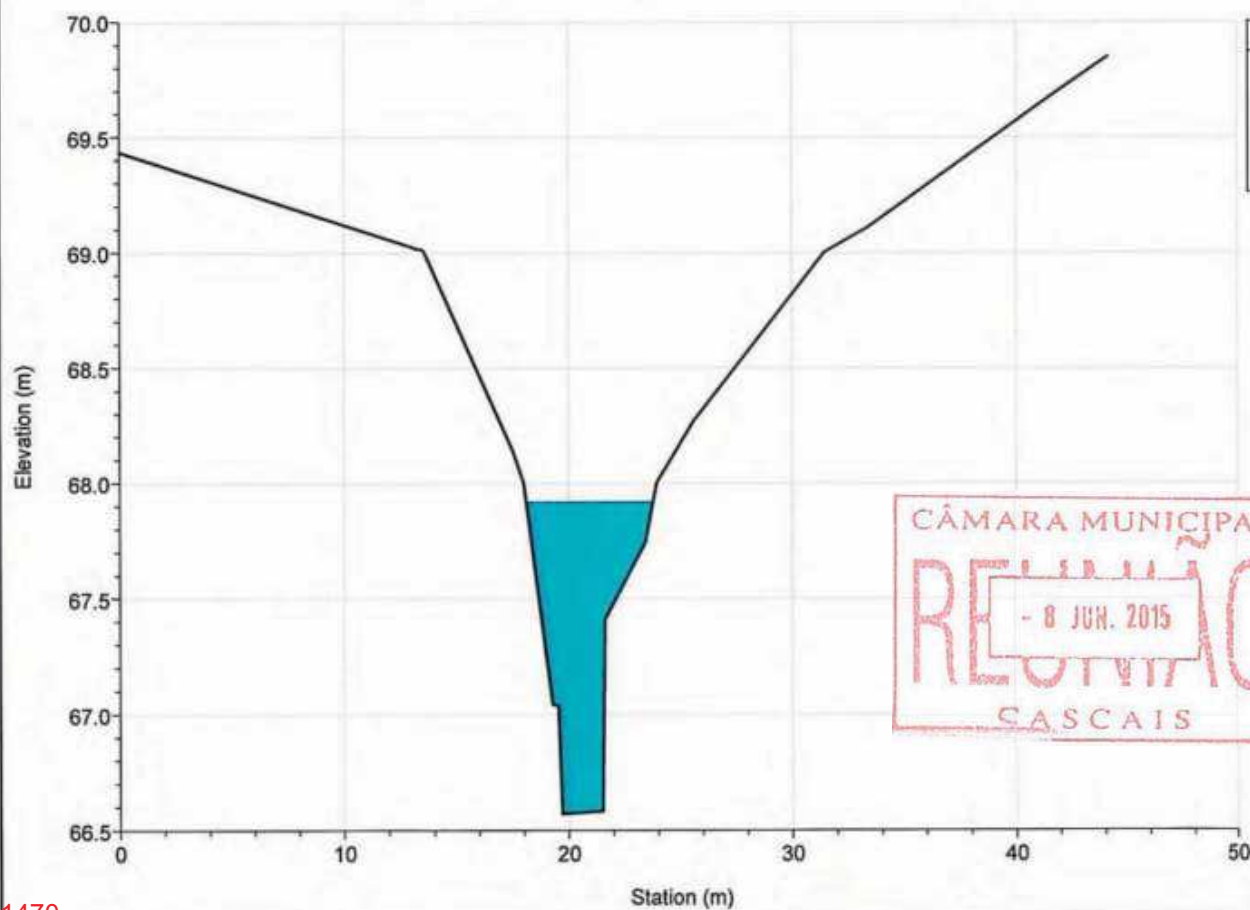




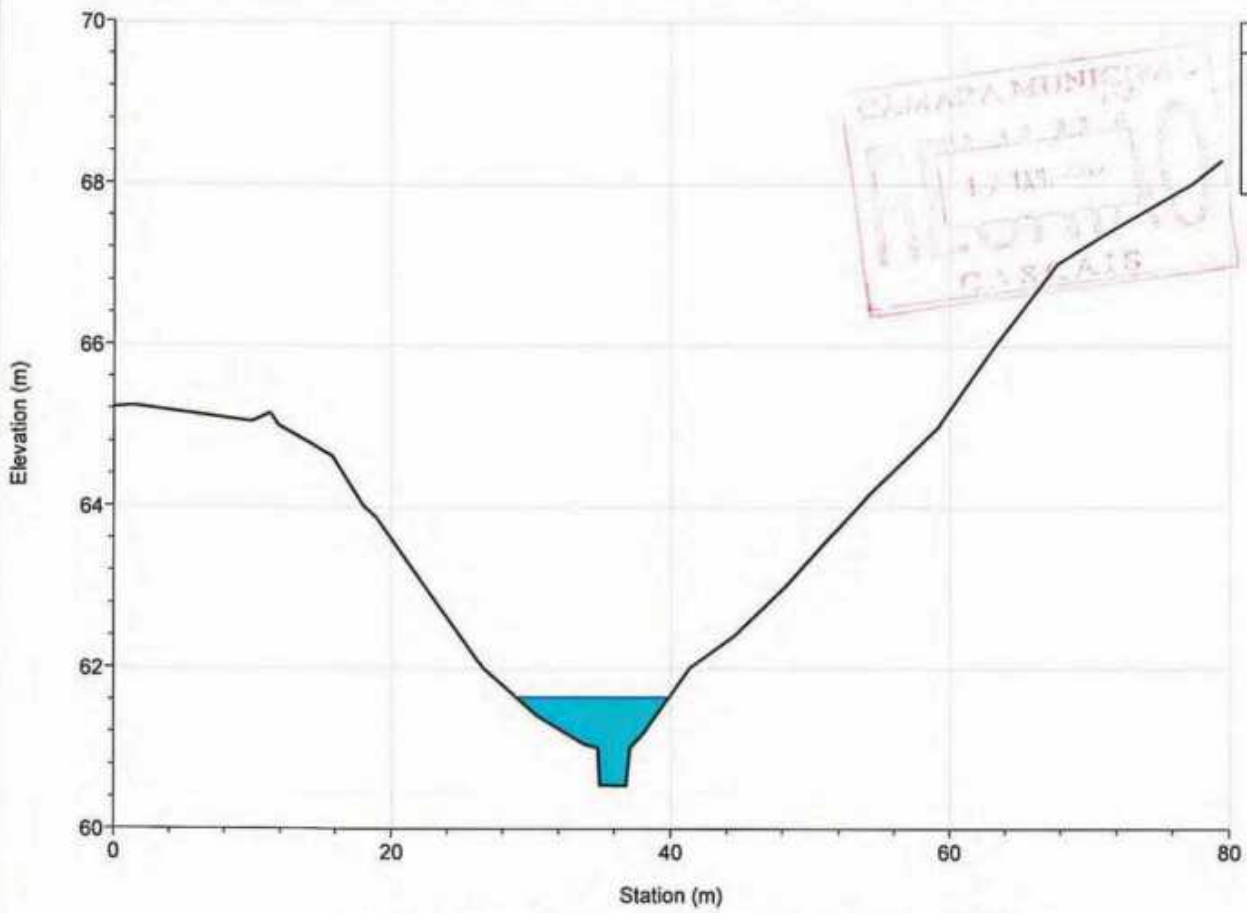
River = ARNEIRO Reach = afl\_Laje RS = 476.569



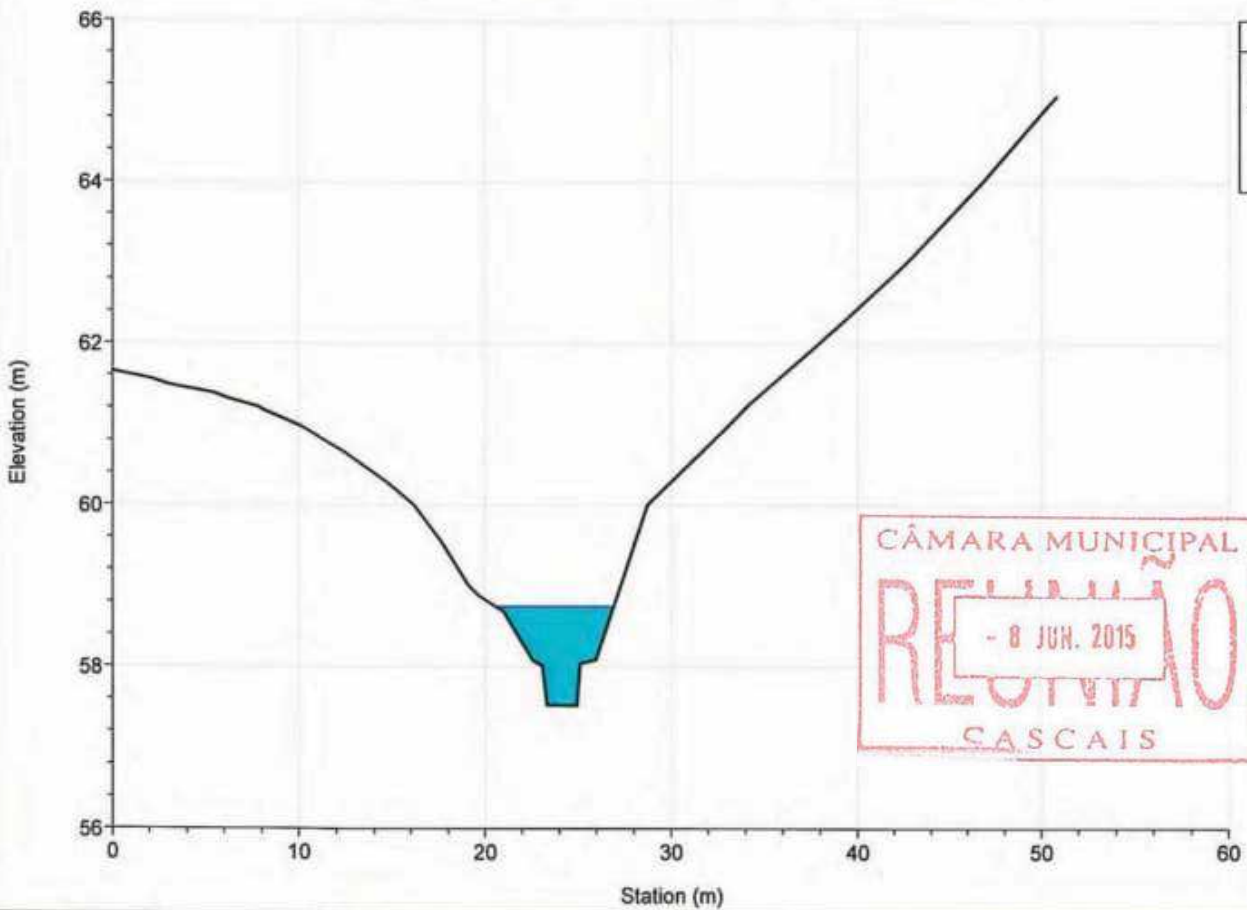
River = ARNEIRO Reach = afl\_Laje RS = 420.933



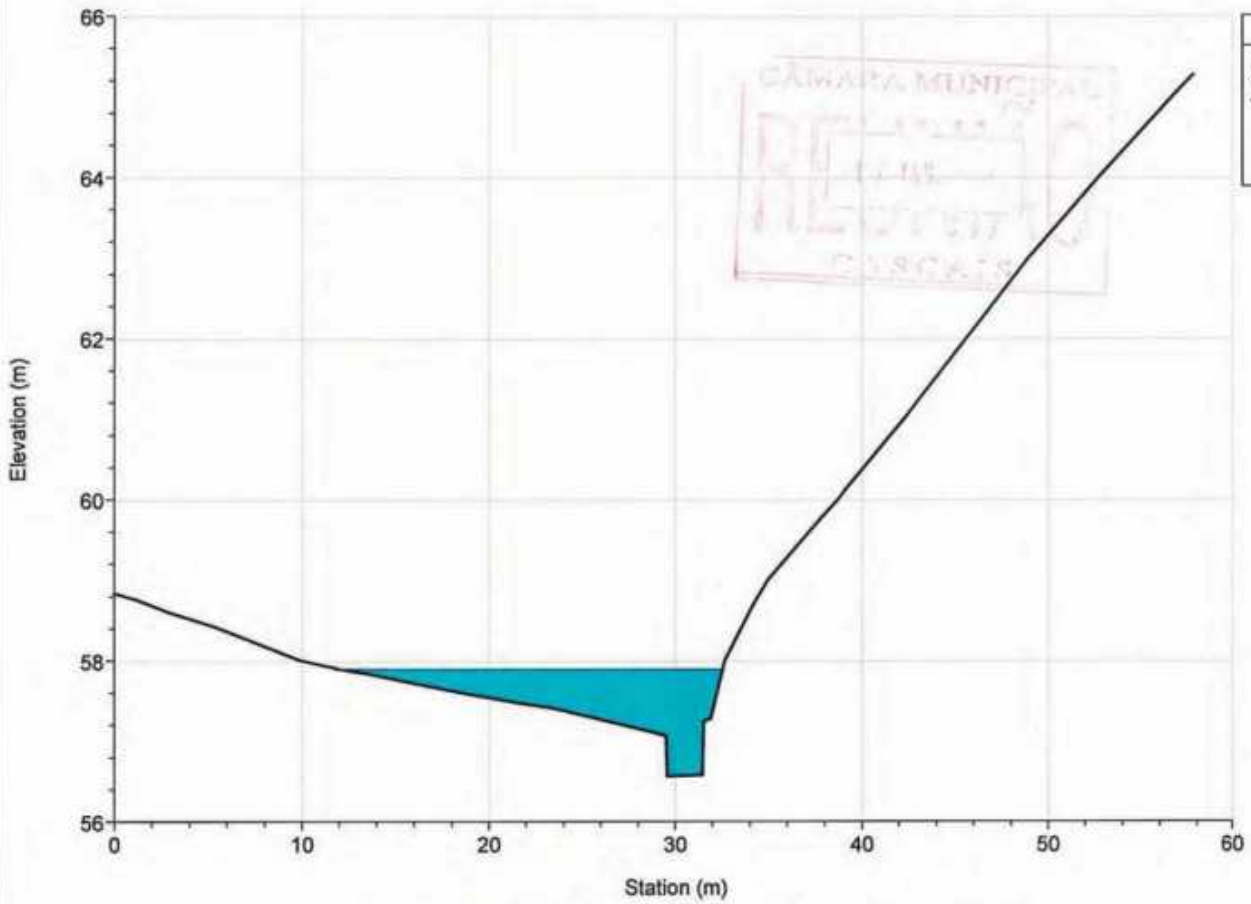
River = ARNEIRO Reach = afl\_Laje RS = 330.845



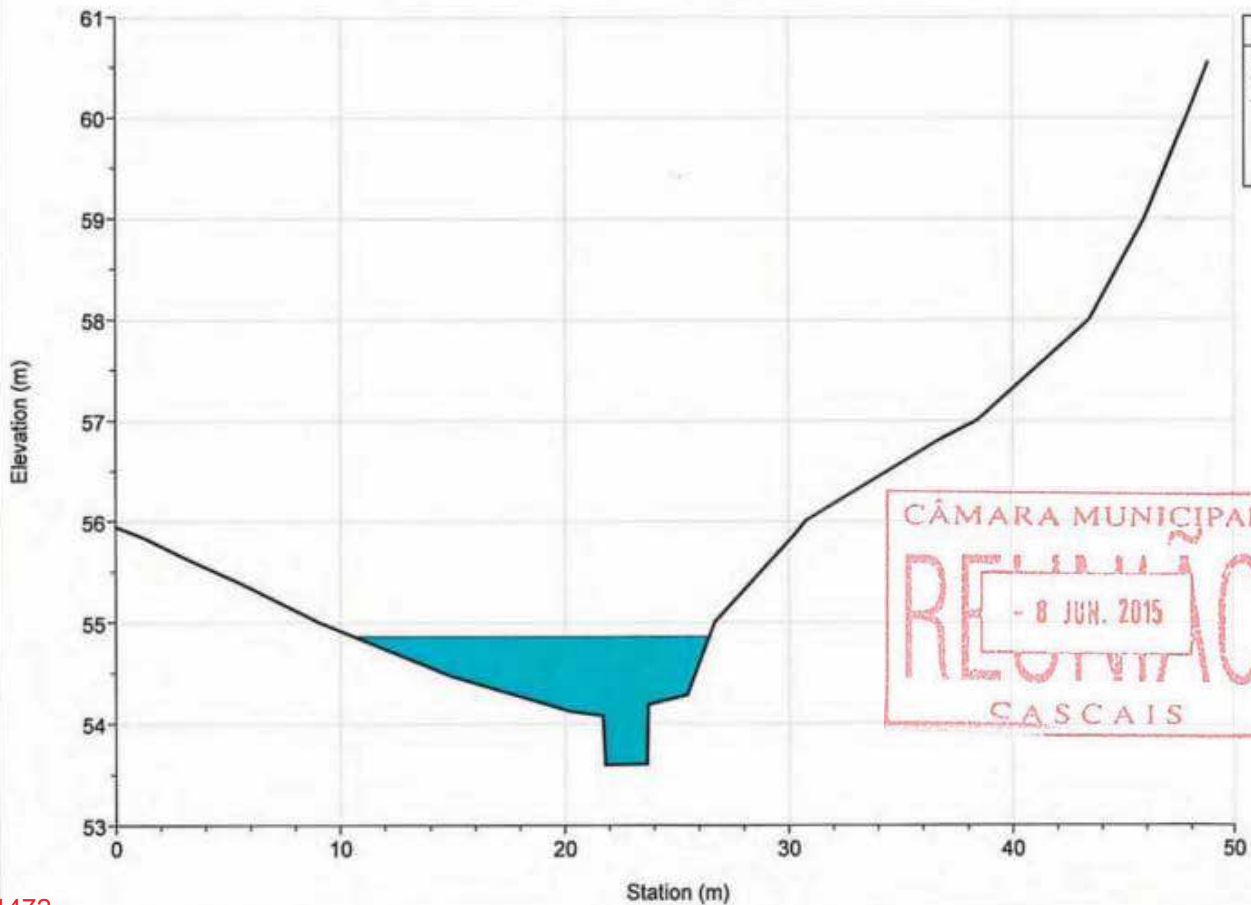
River = ARNEIRO Reach = afl\_Laje RS = 263.183



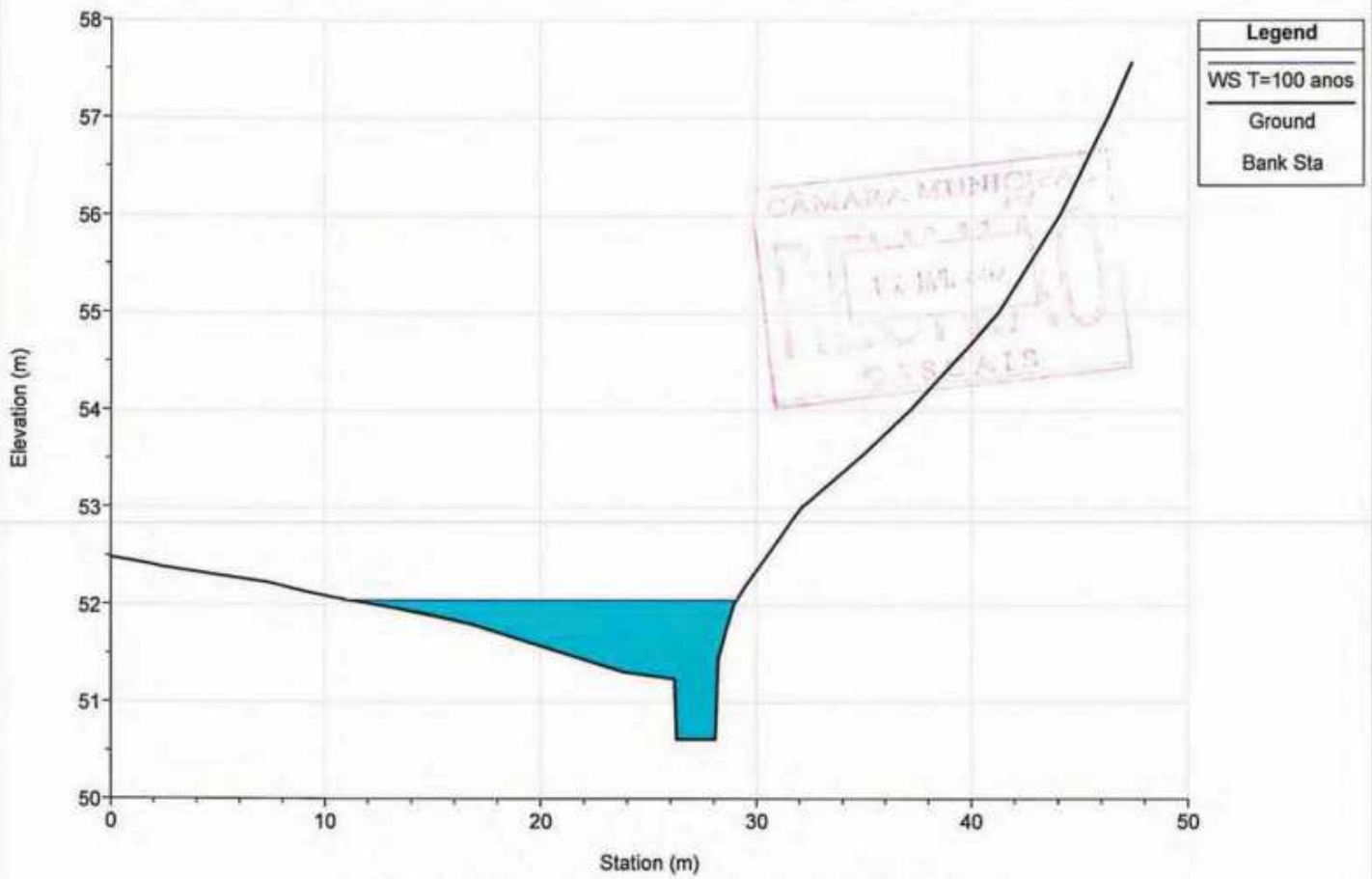
River = ARNEIRO Reach = afl\_Laje RS = 237.180



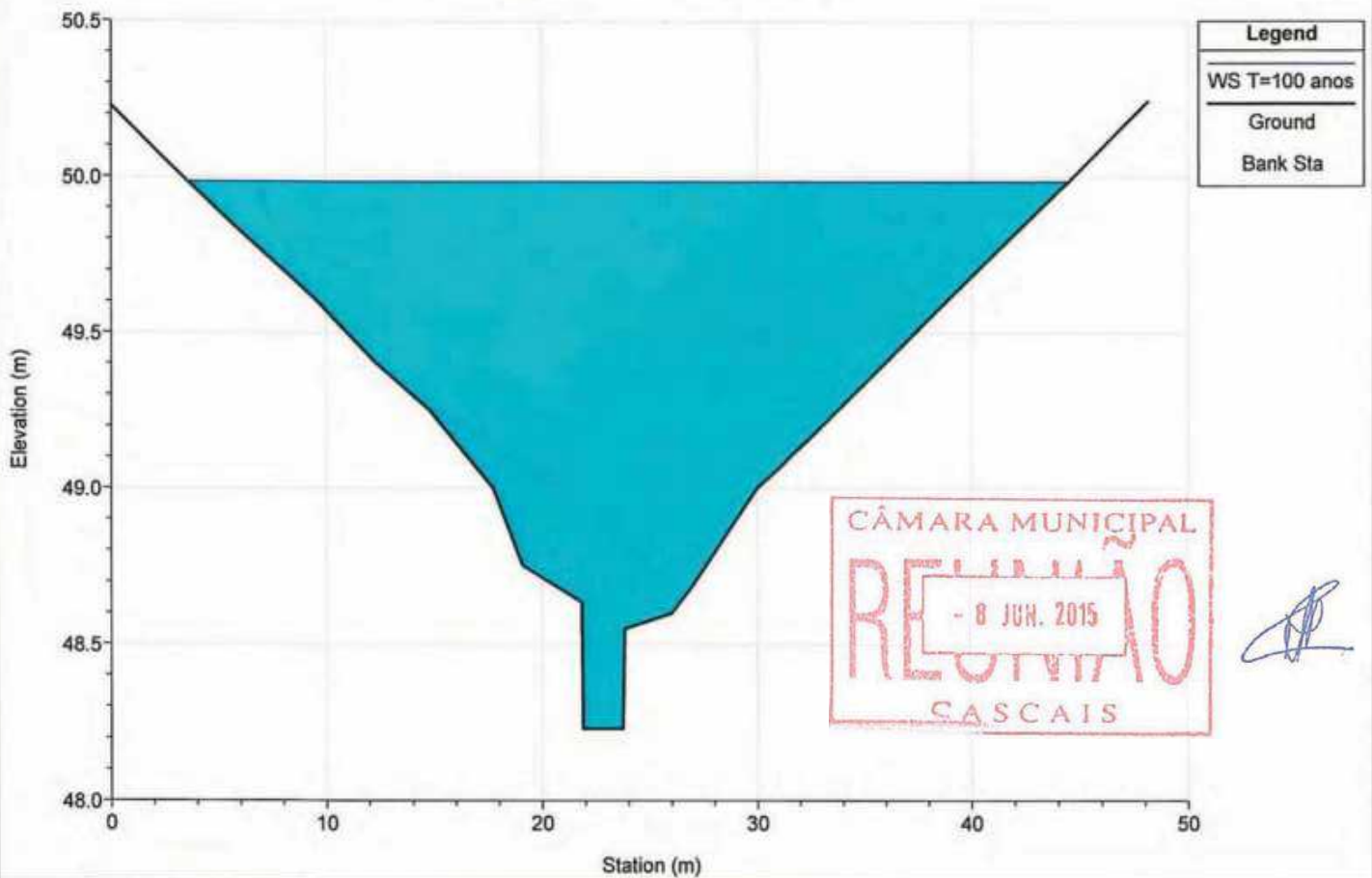
River = ARNEIRO Reach = afl\_Laje RS = 155.651

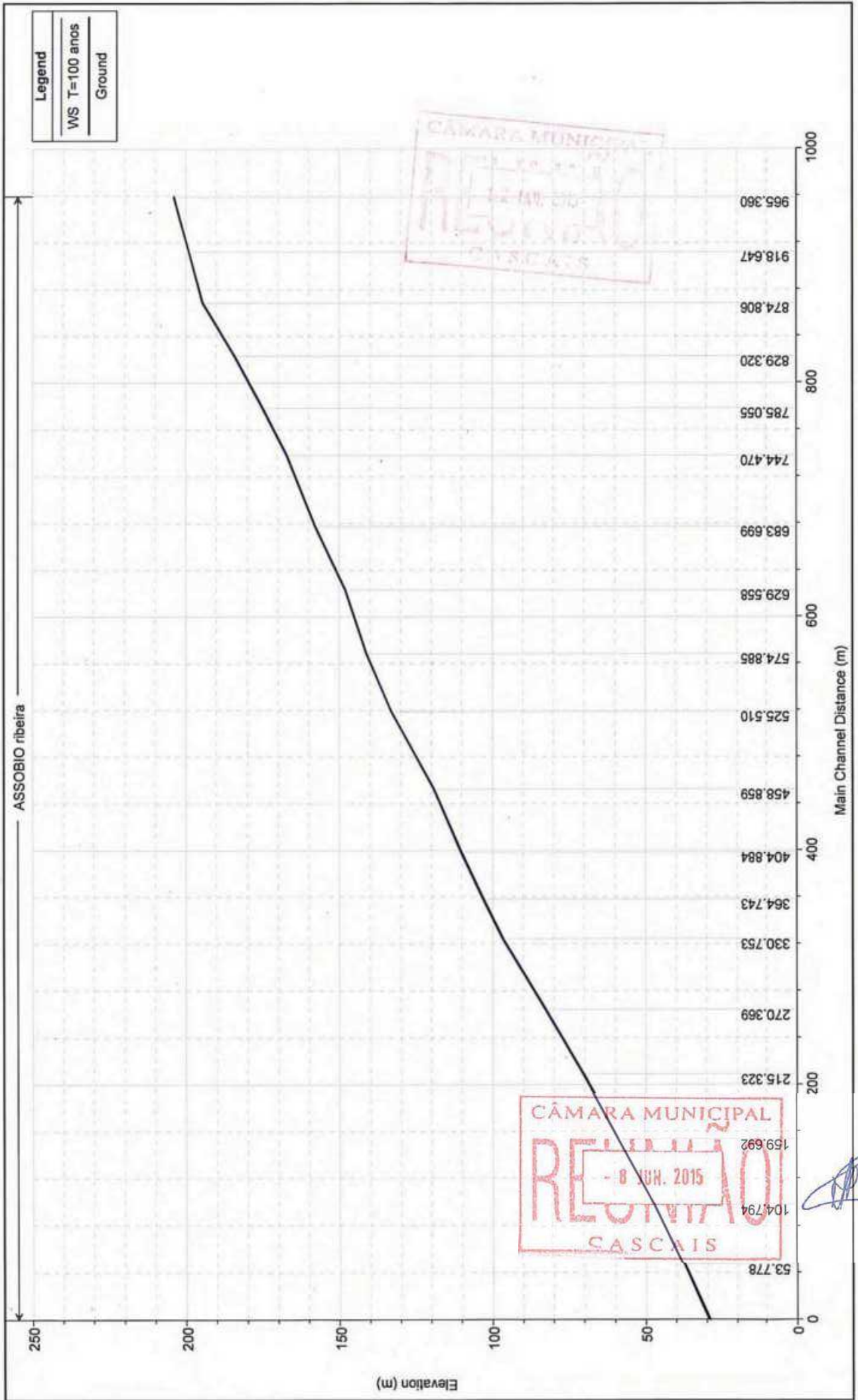


River = ARNEIRO Reach = afl\_Laje RS = 87.935

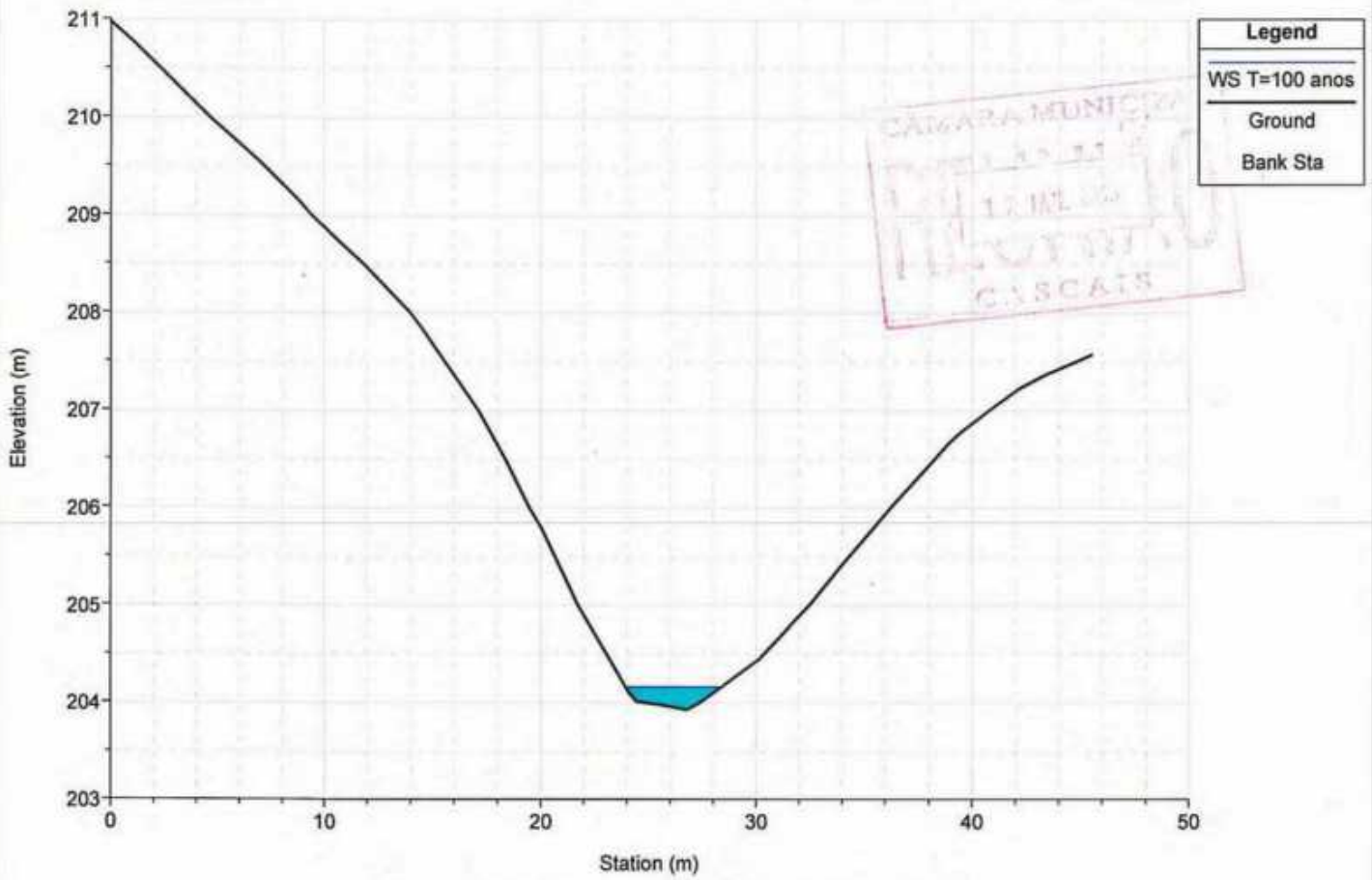


River = ARNEIRO Reach = afl\_Laje RS = 10.768

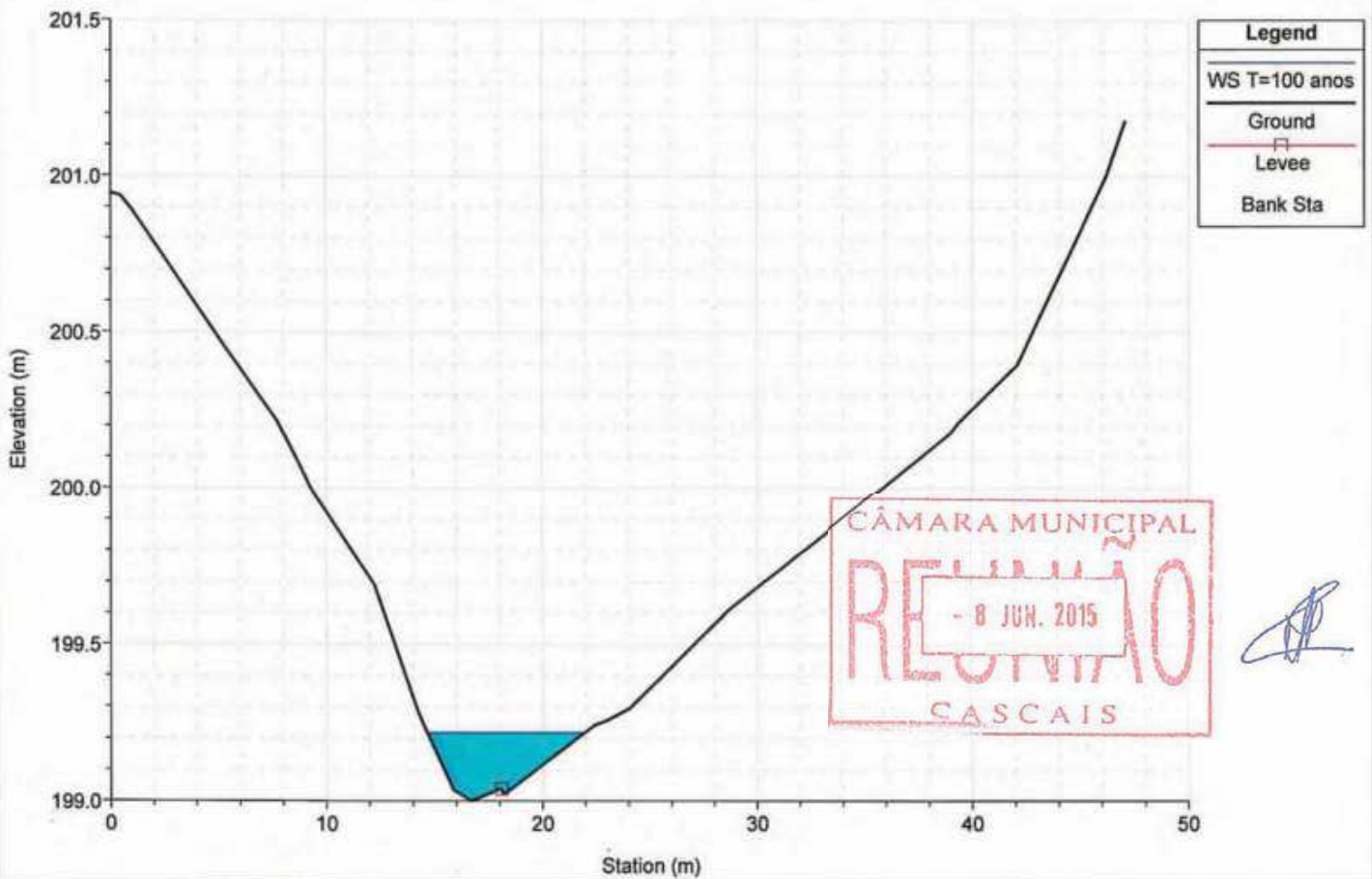




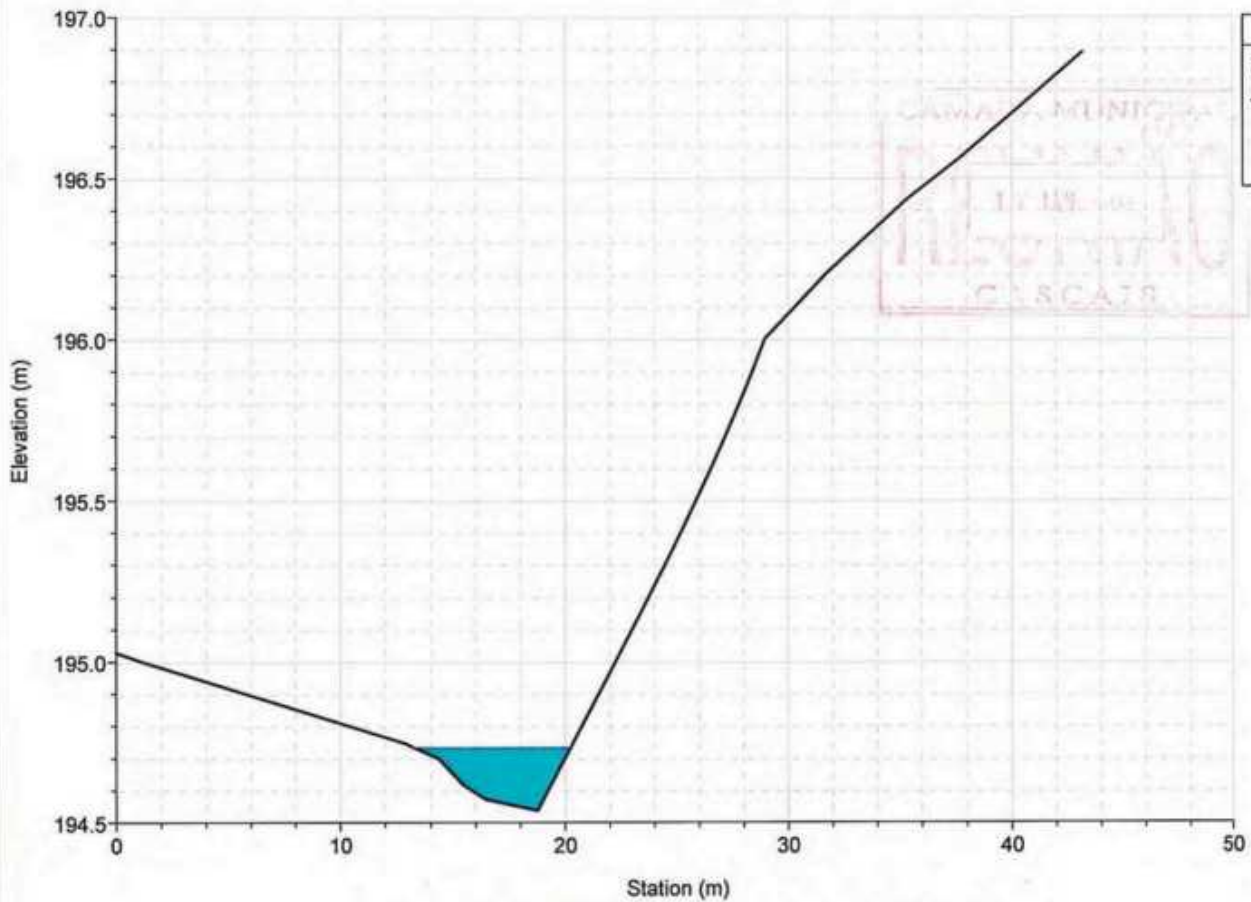
River = ASSOPIO Reach = ribeira RS = 965.360



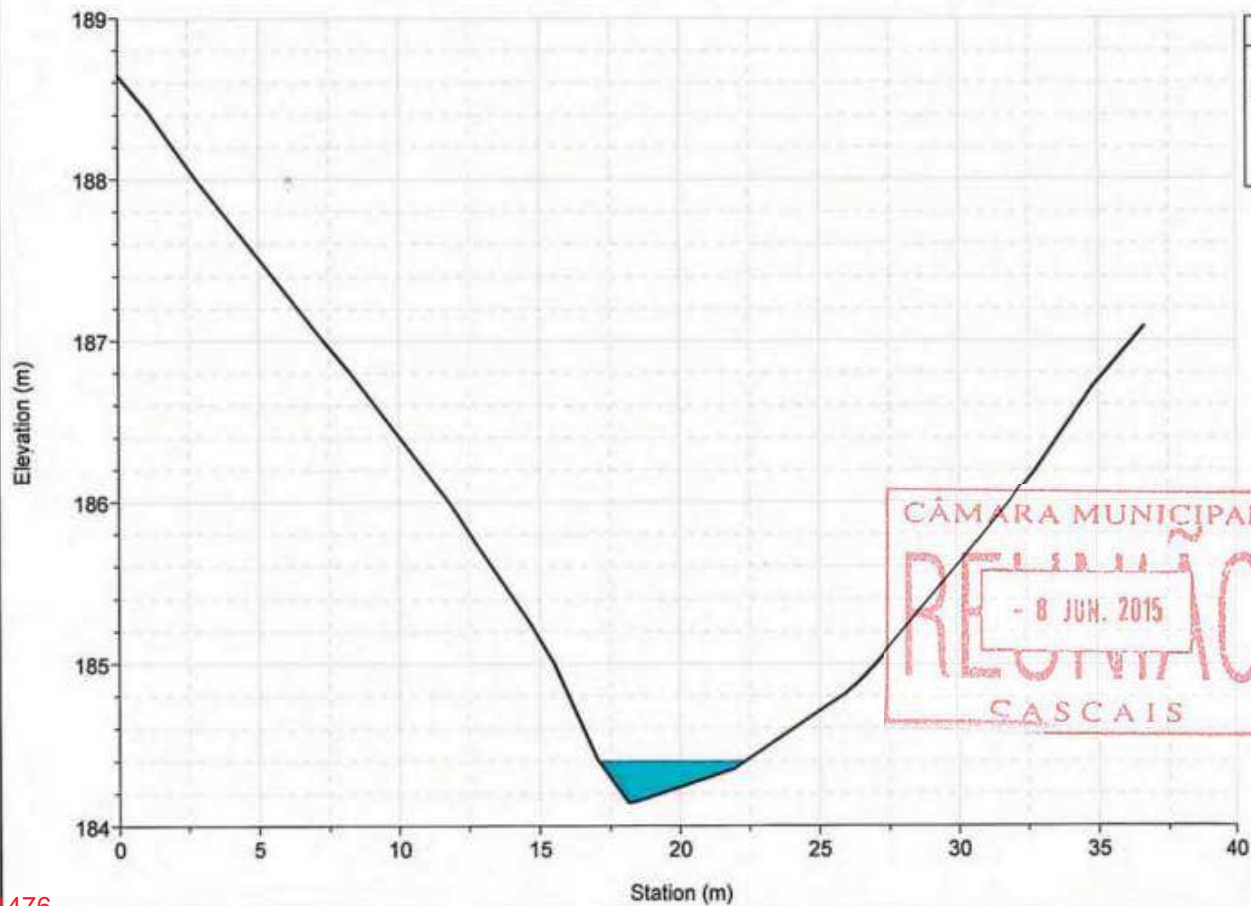
River = ASSOPIO Reach = ribeira RS = 918.647



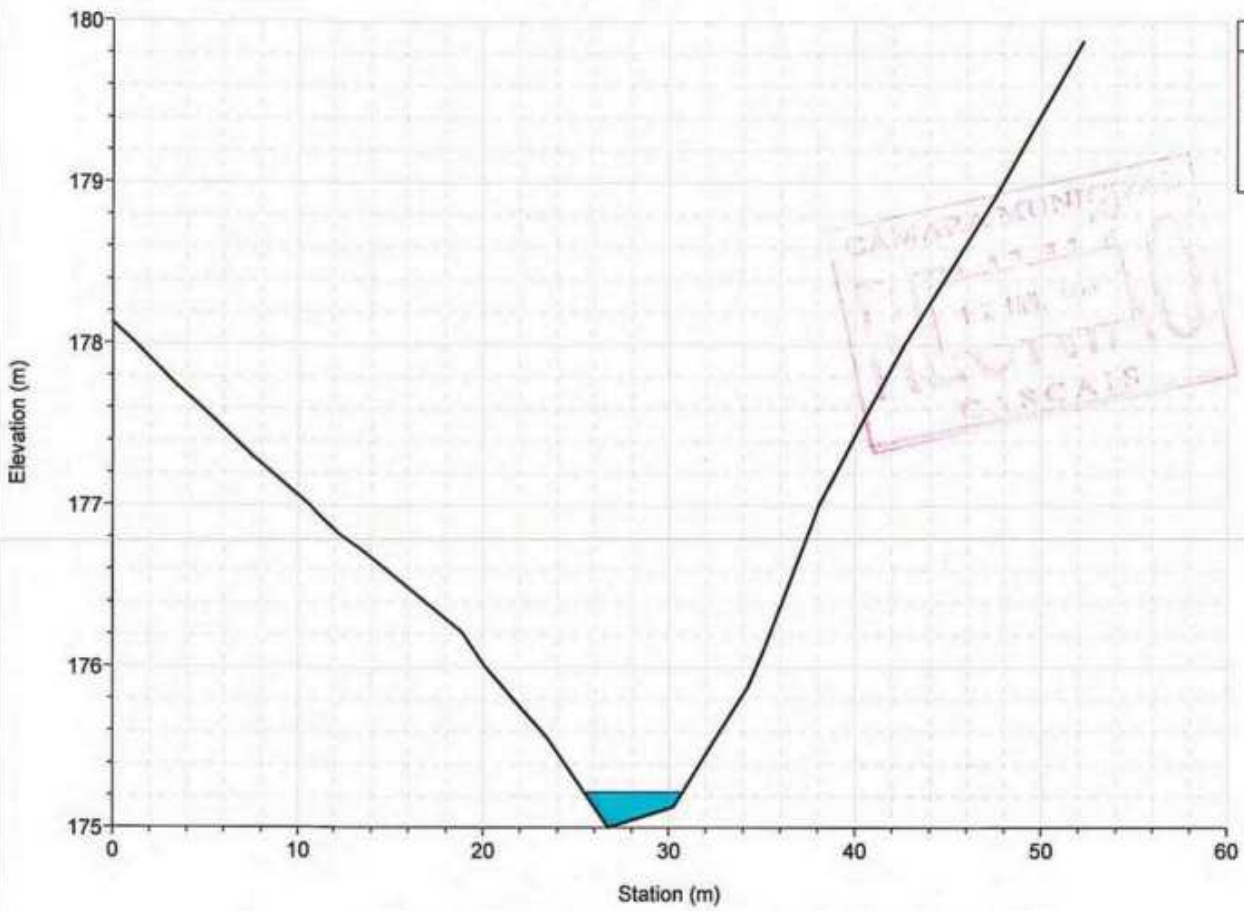
River = ASSOPIO Reach = ribeira RS = 874.806



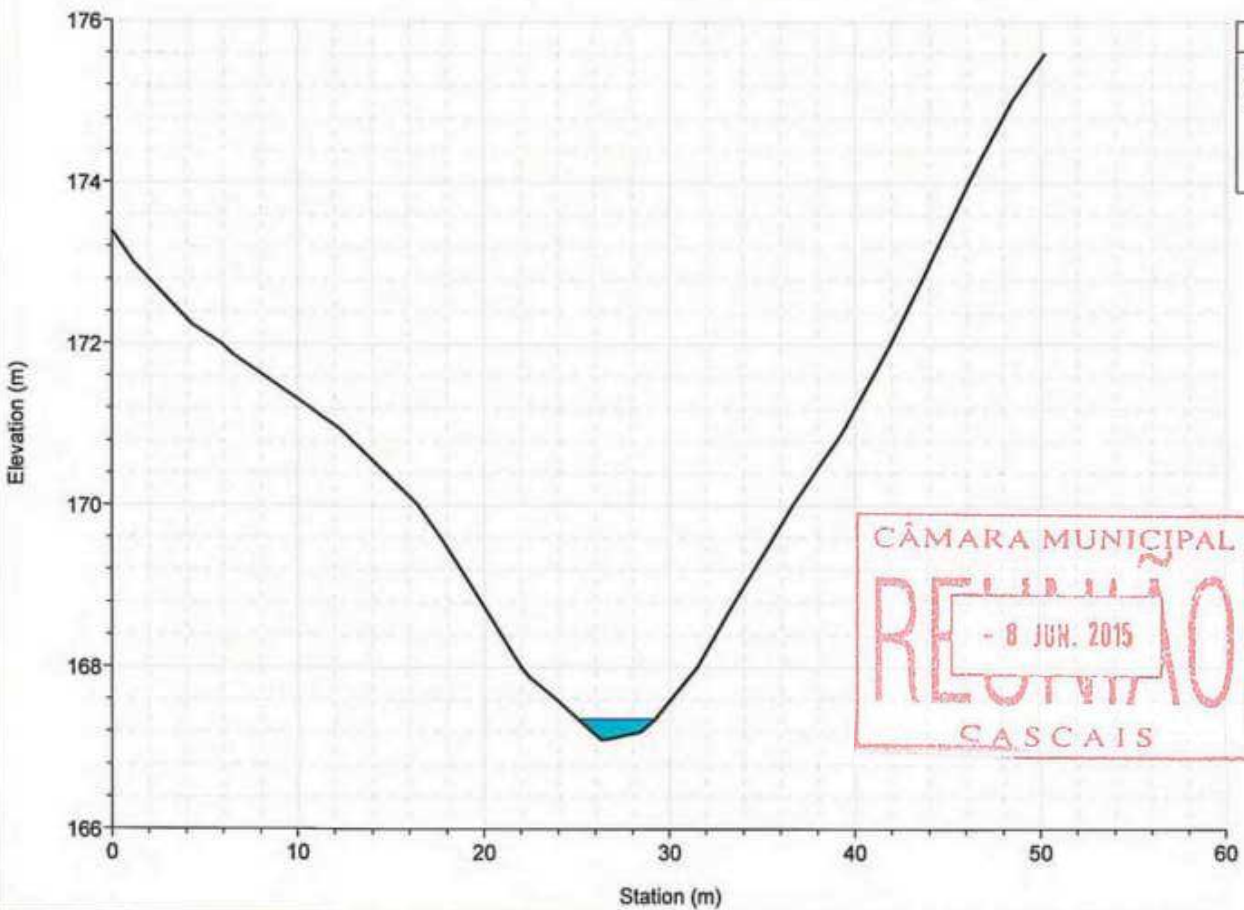
River = ASSOPIO Reach = ribeira RS = 829.320



River = ASSOPIO Reach = ribeira RS = 785.055

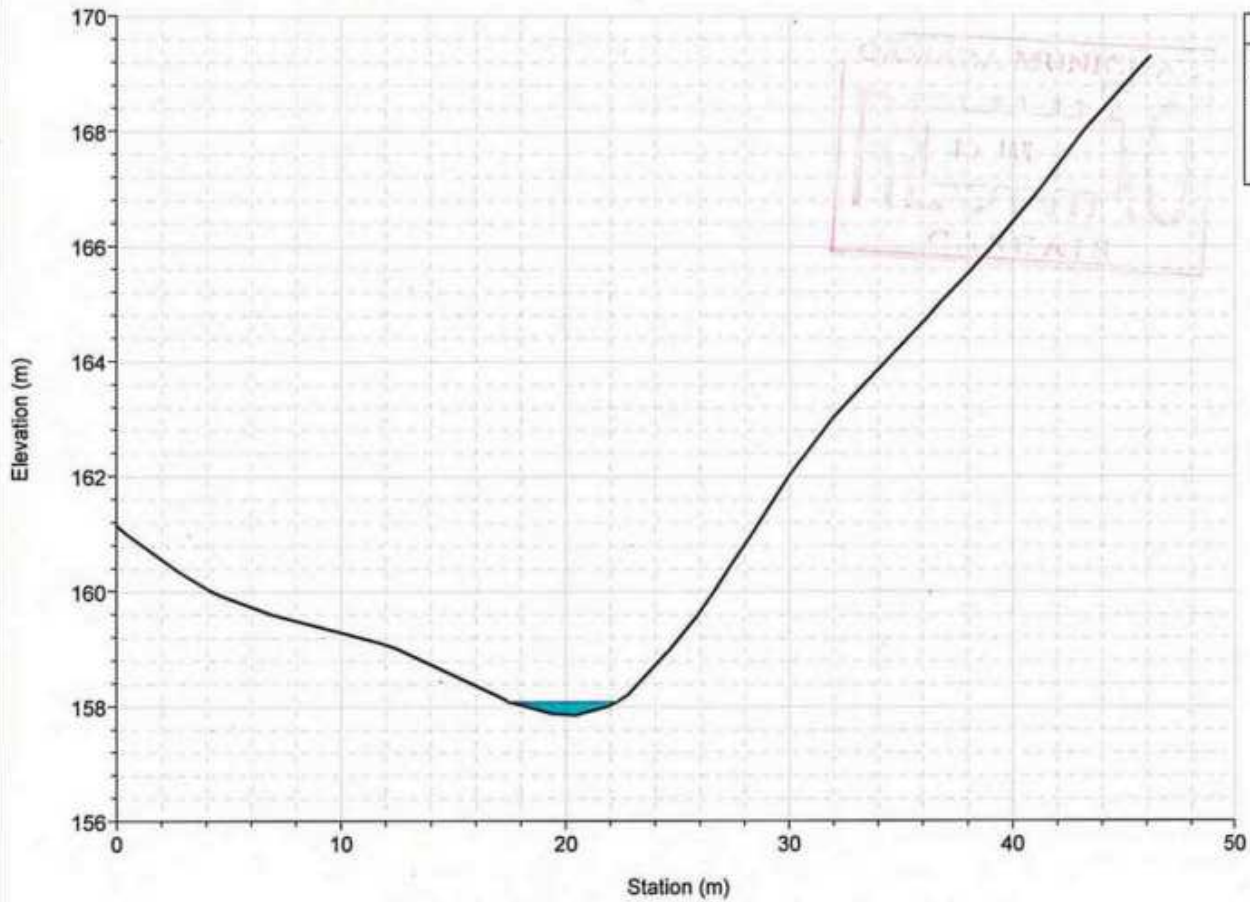


River = ASSOPIO Reach = ribeira RS = 744.470



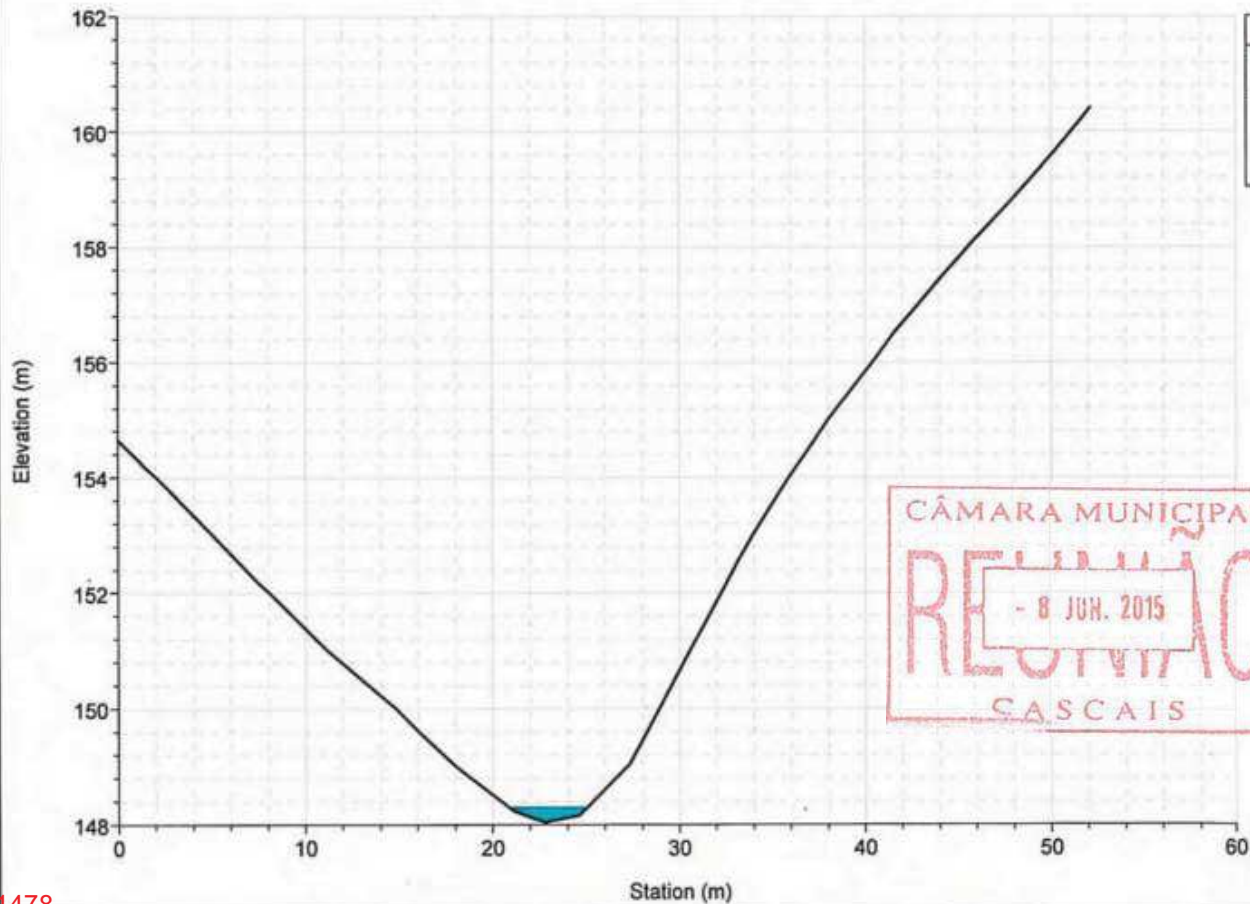


River = ASSOPIO Reach = ribeira RS = 683.699



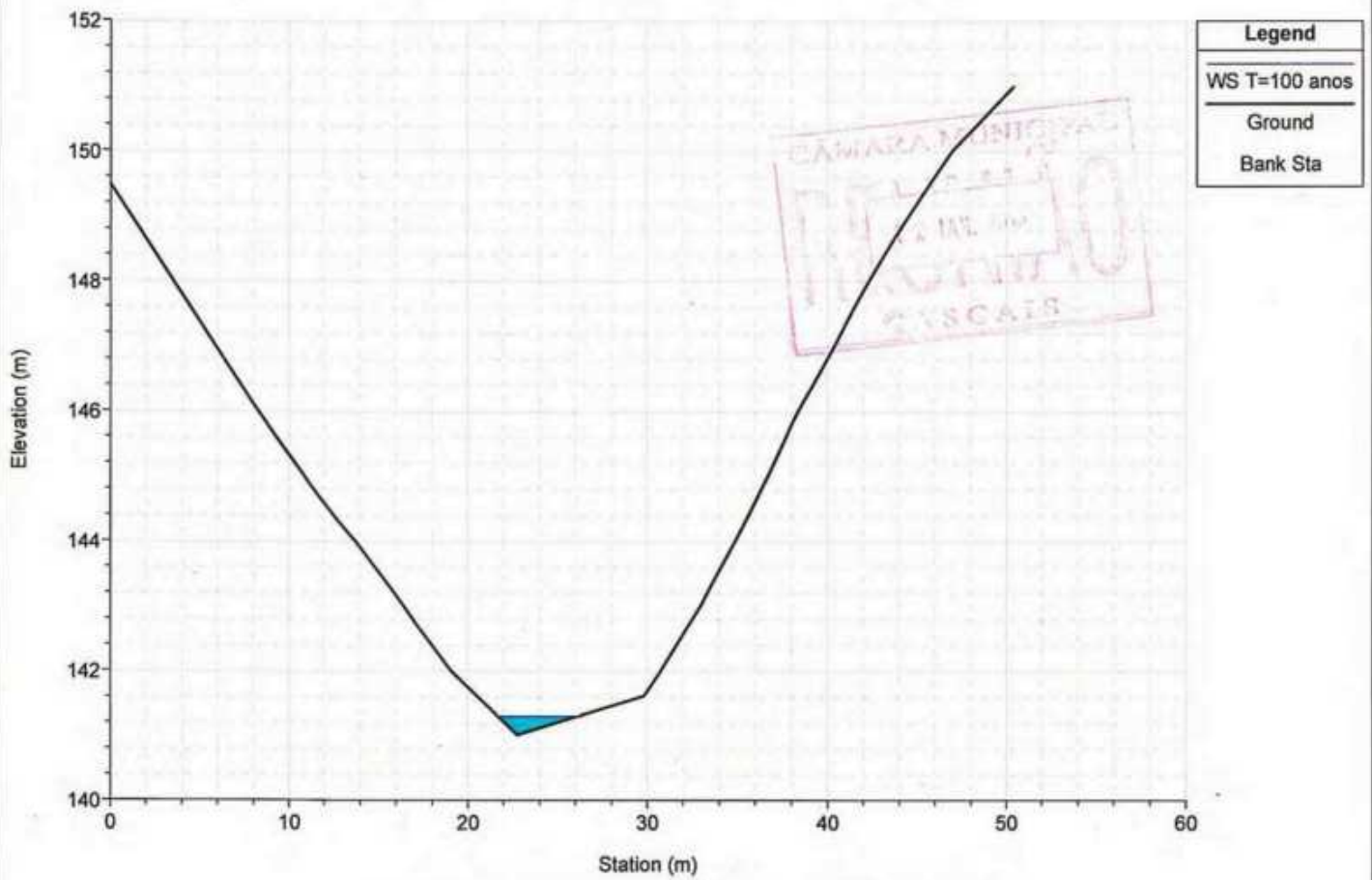
Legend
WS T=100 anos
Ground
Bank Sta

River = ASSOPIO Reach = ribeira RS = 629.558

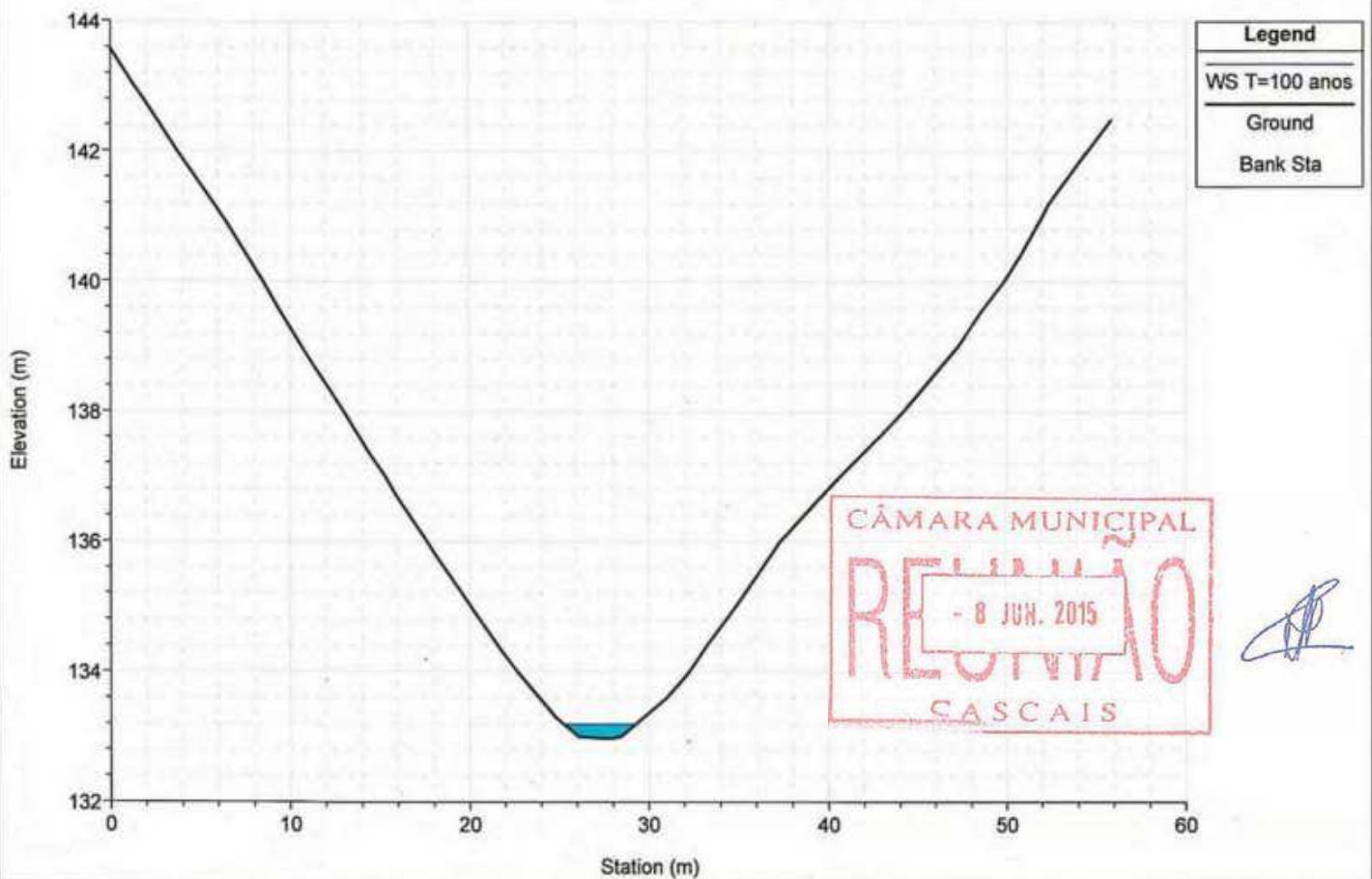


Legend
WS T=100 anos
Ground
Bank Sta

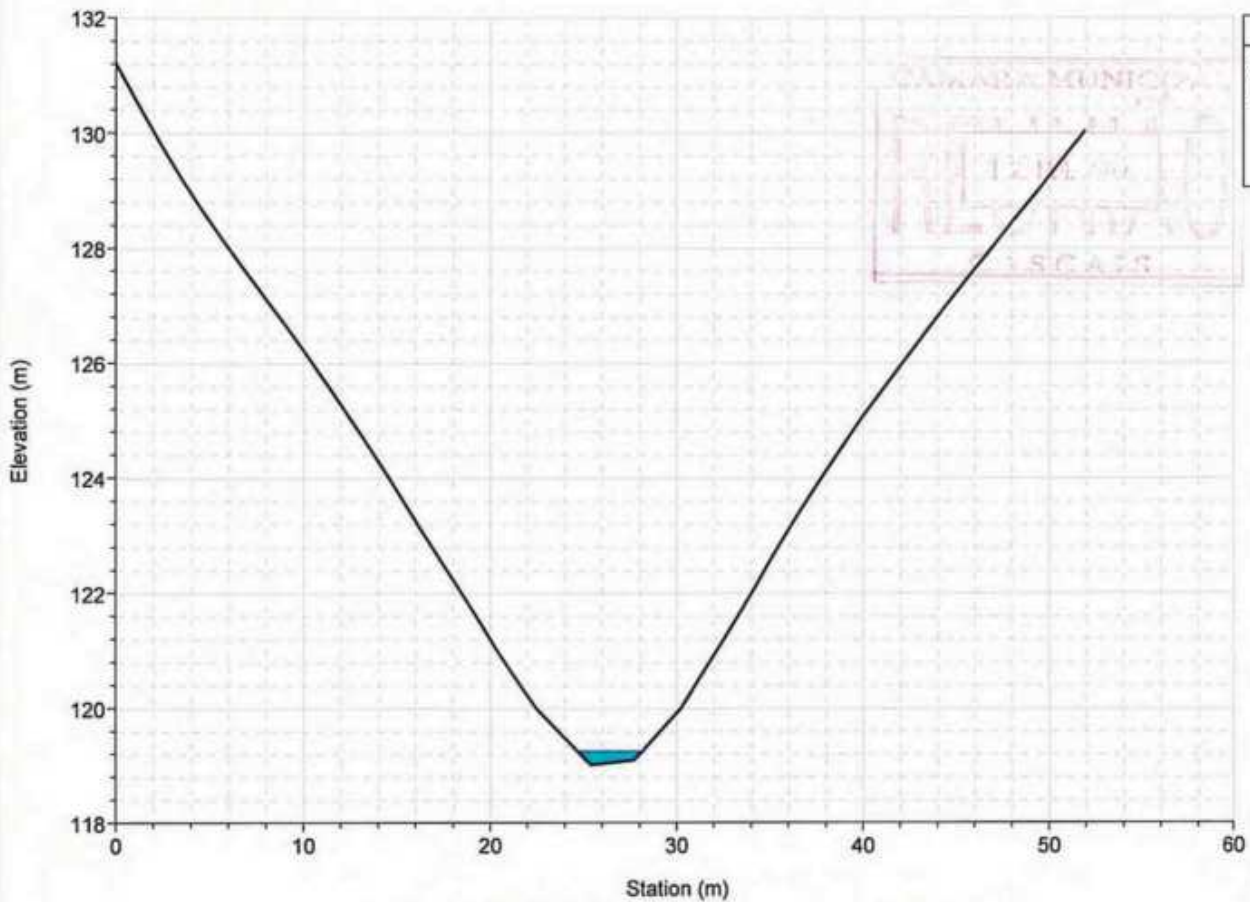
River = ASSOPIO Reach = ribeira RS = 574.885



River = ASSOPIO Reach = ribeira RS = 525.510

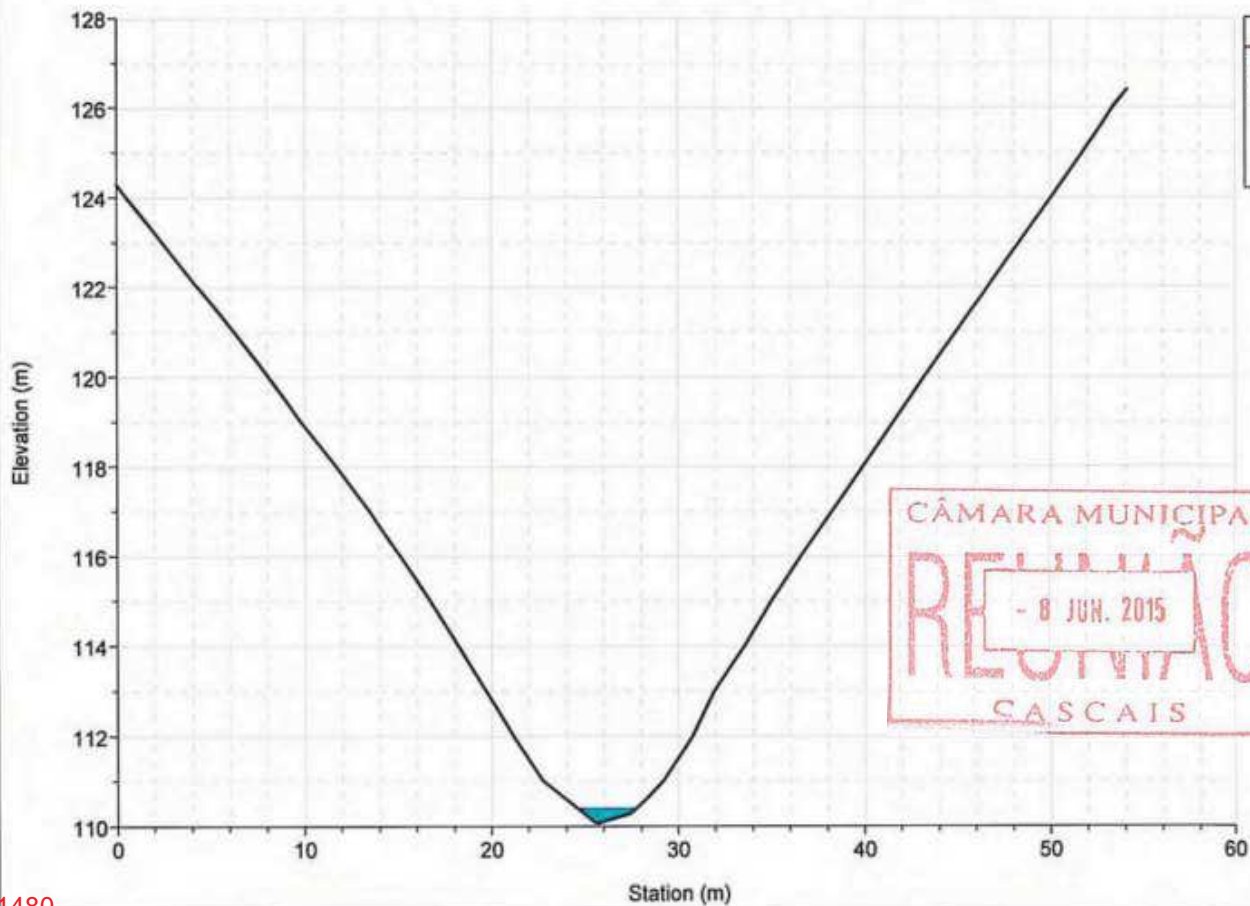


River = ASSOBIO Reach = ribeira RS = 458.859



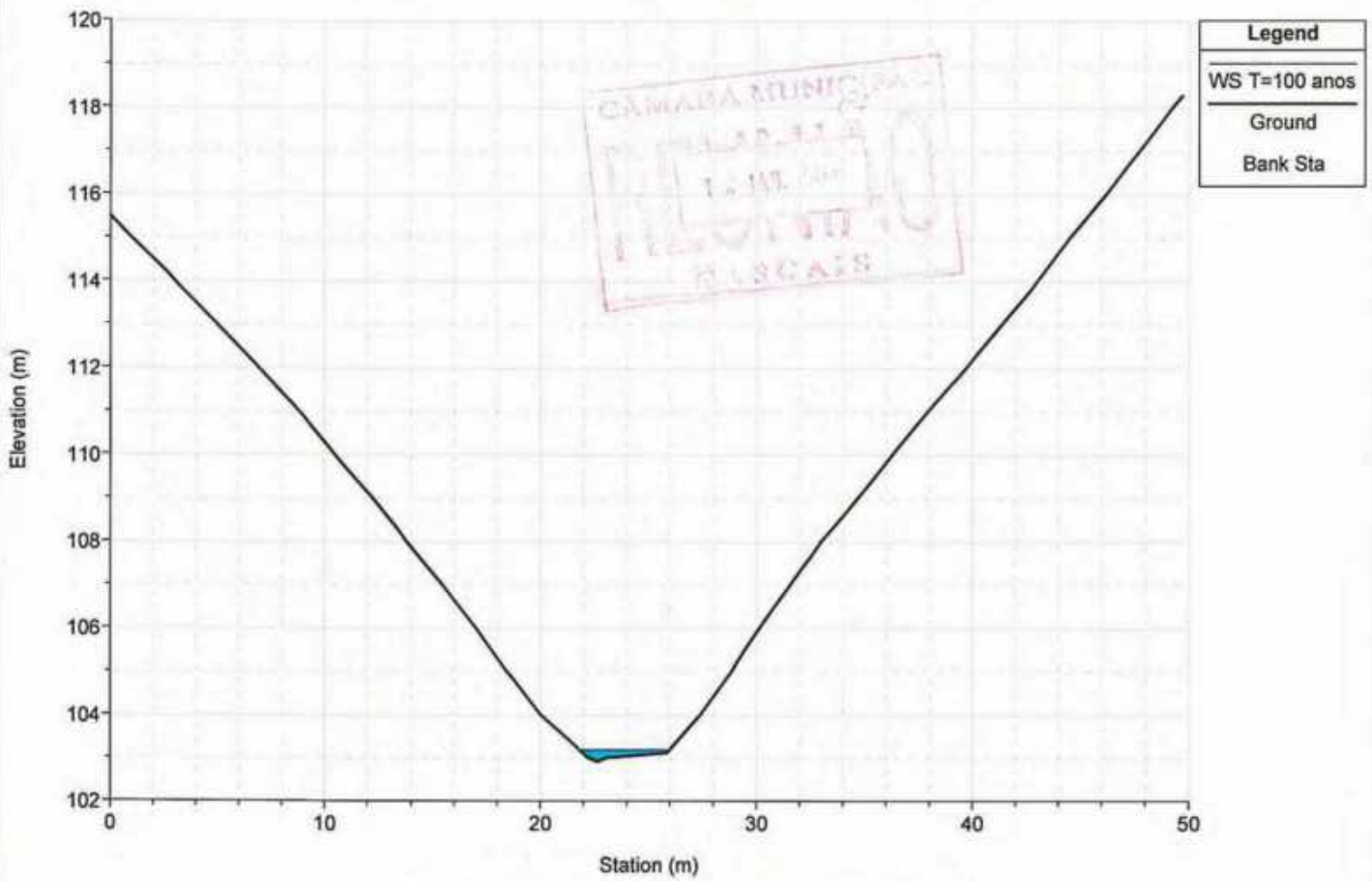
Legend
WS T=100 anos
Ground
Bank Sta

River = ASSOBIO Reach = ribeira RS = 404.884

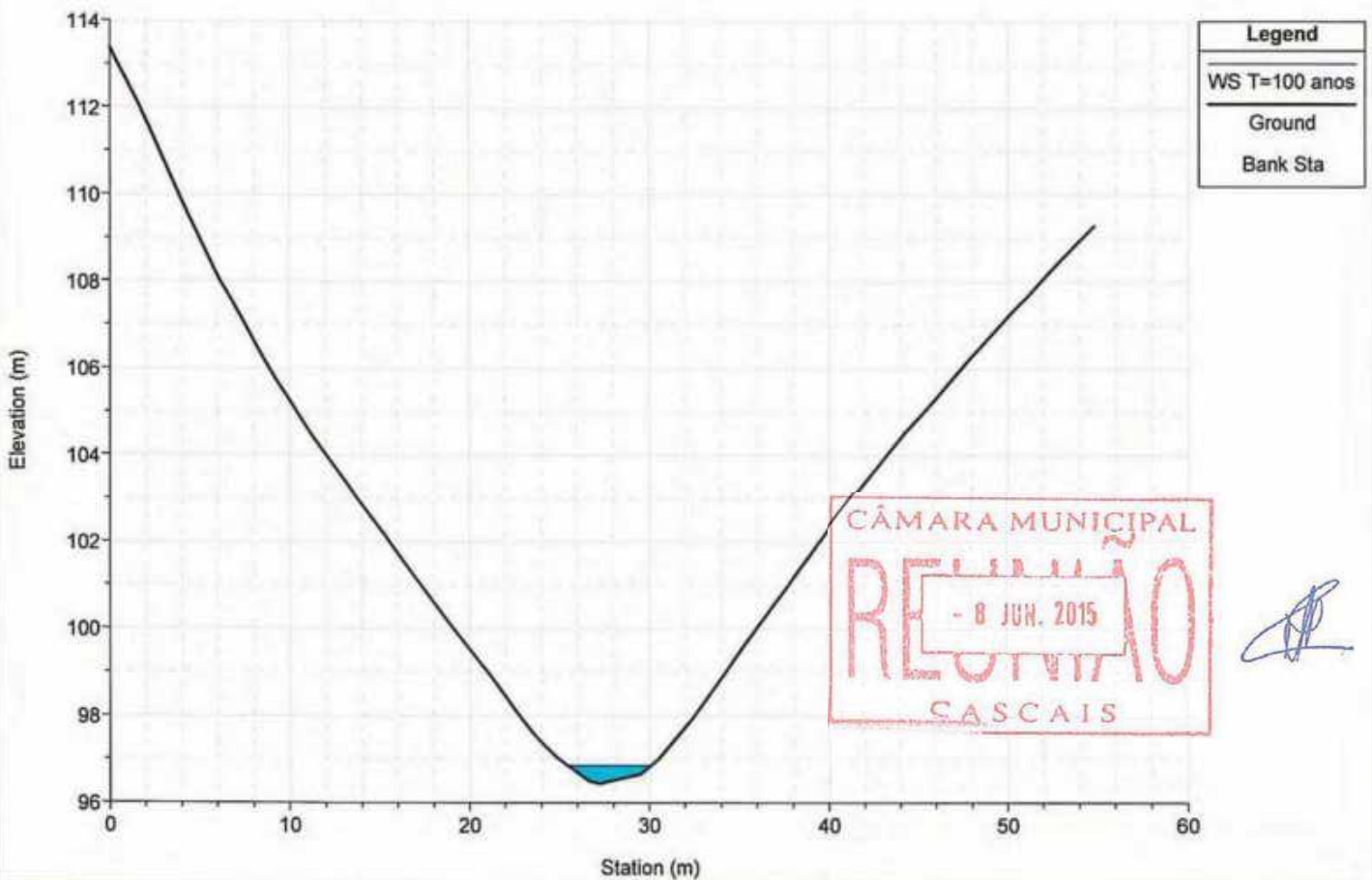


Legend
WS T=100 anos
Ground
Bank Sta

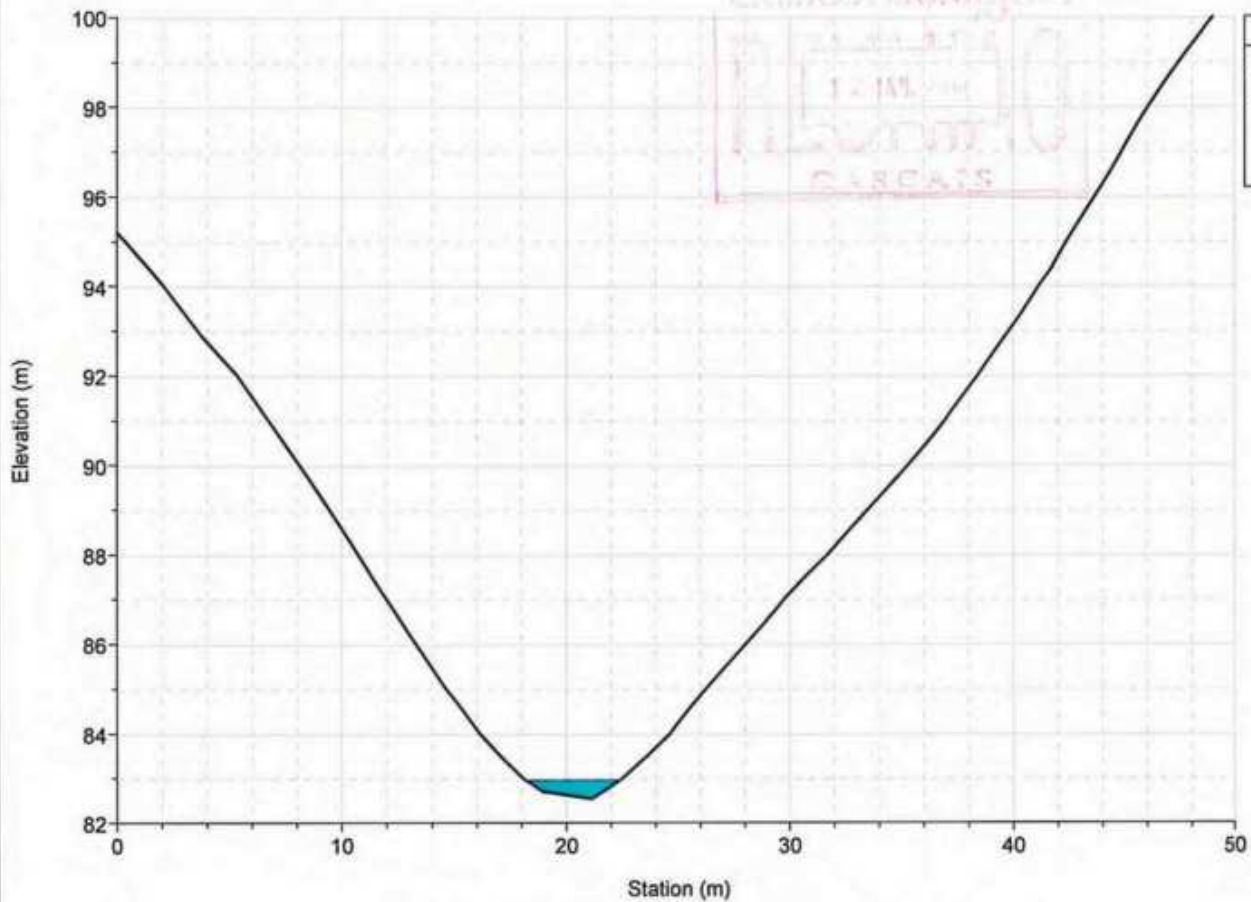
River = ASSOPIO Reach = ribeira RS = 364.743



River = ASSOPIO Reach = ribeira RS = 330.753

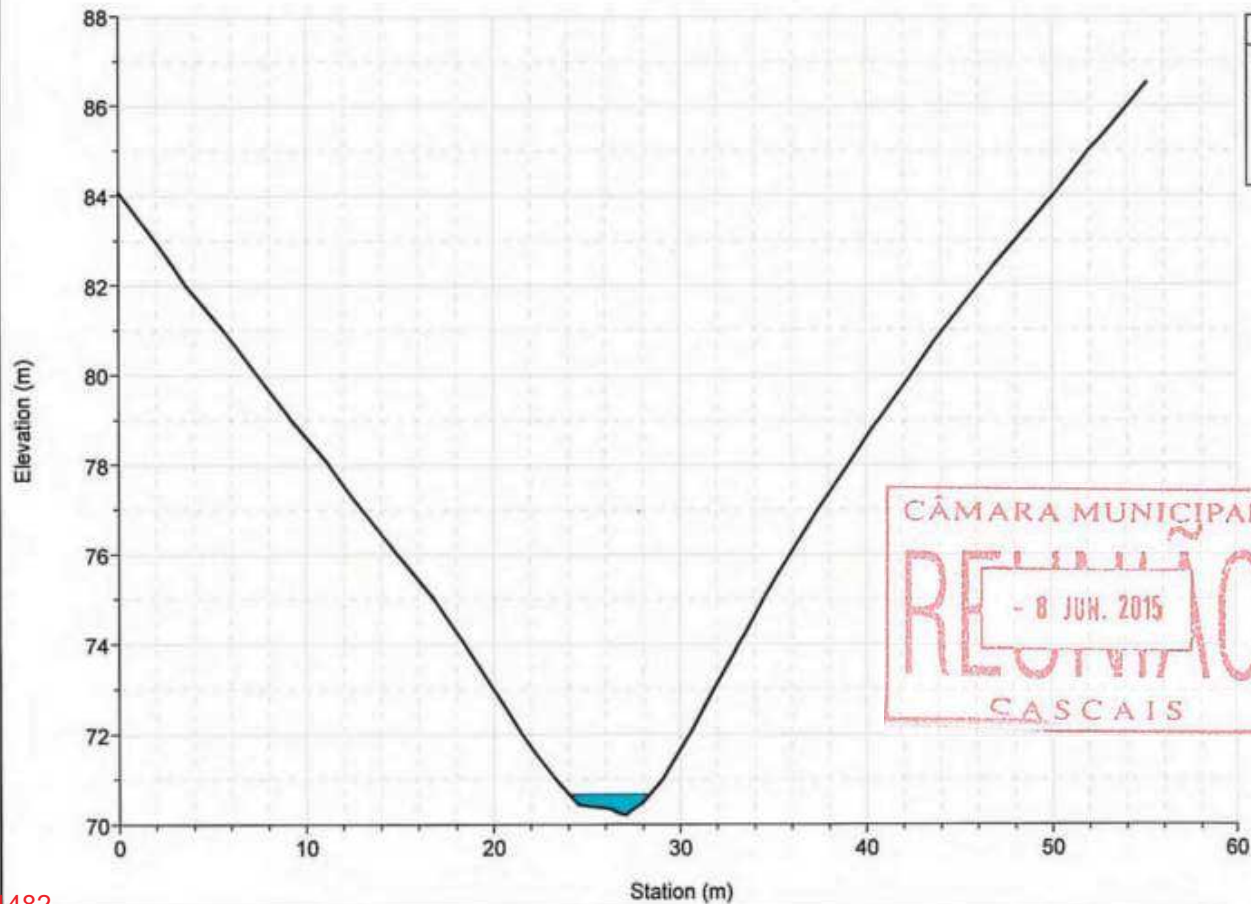


River = ASSOBO Reach = ribeira RS = 270.369



Legend
WS T=100 anos
Ground
Bank Sta

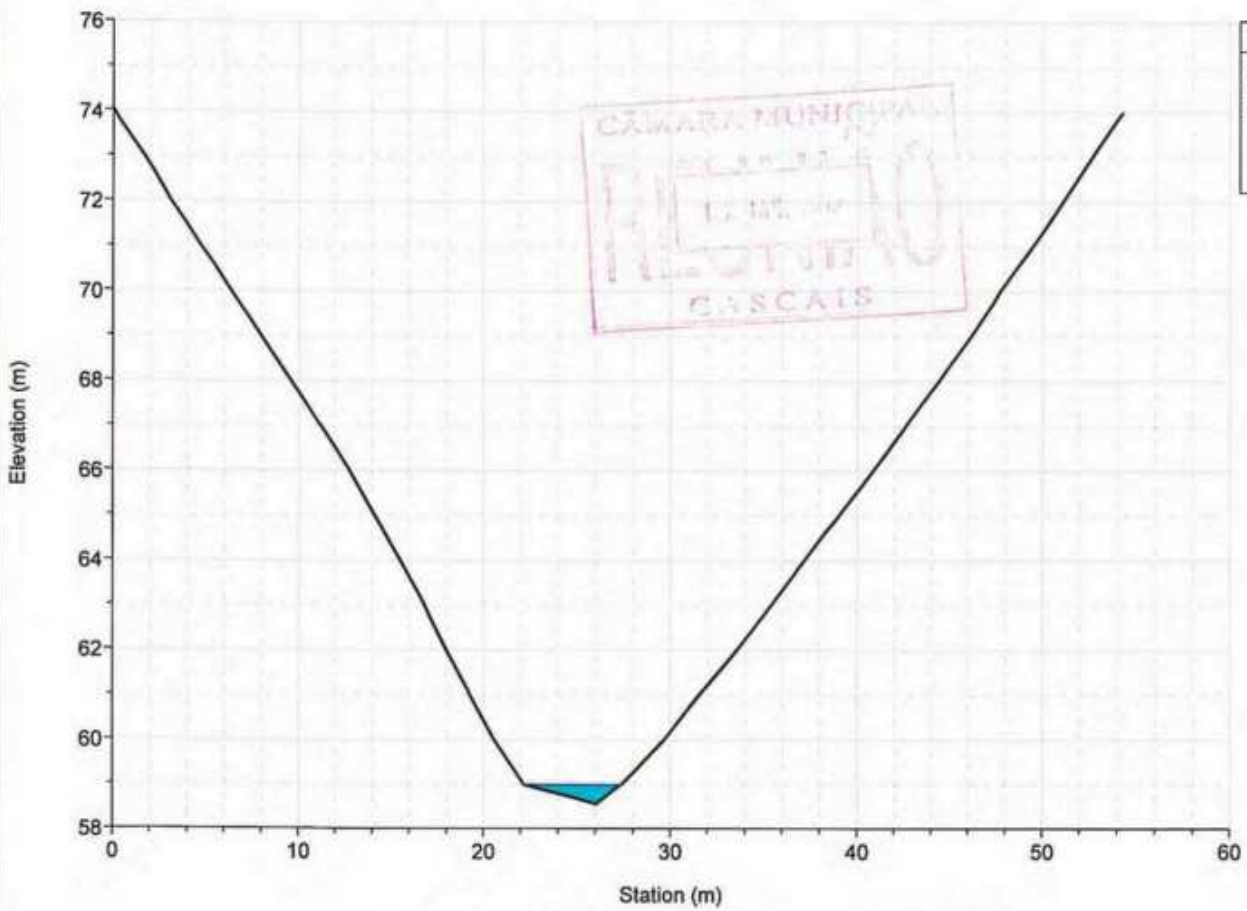
River = ASSOBO Reach = ribeira RS = 215.323



Legend
WS T=100 anos
Ground
Bank Sta

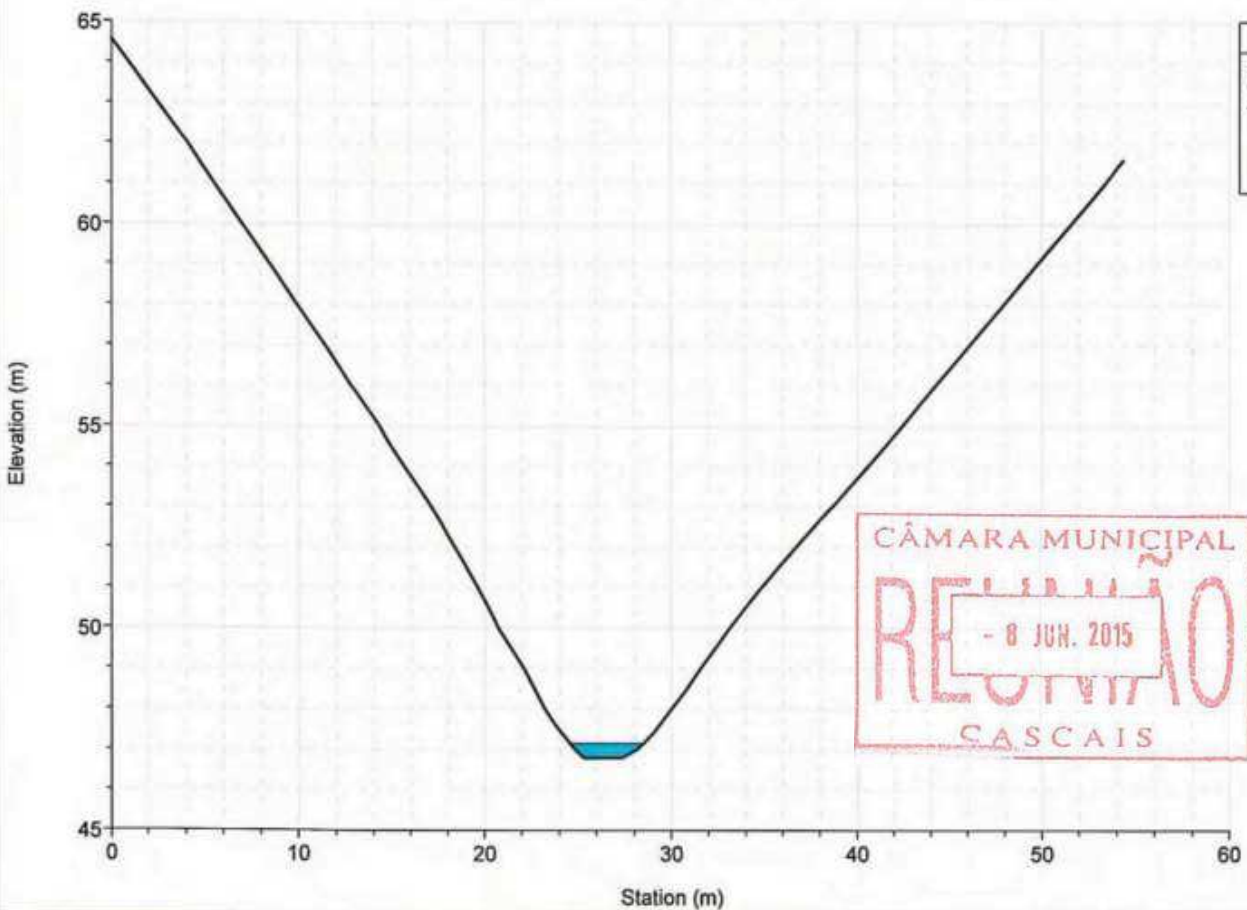
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River = ASSOPIO Reach = ribeira RS = 159.692



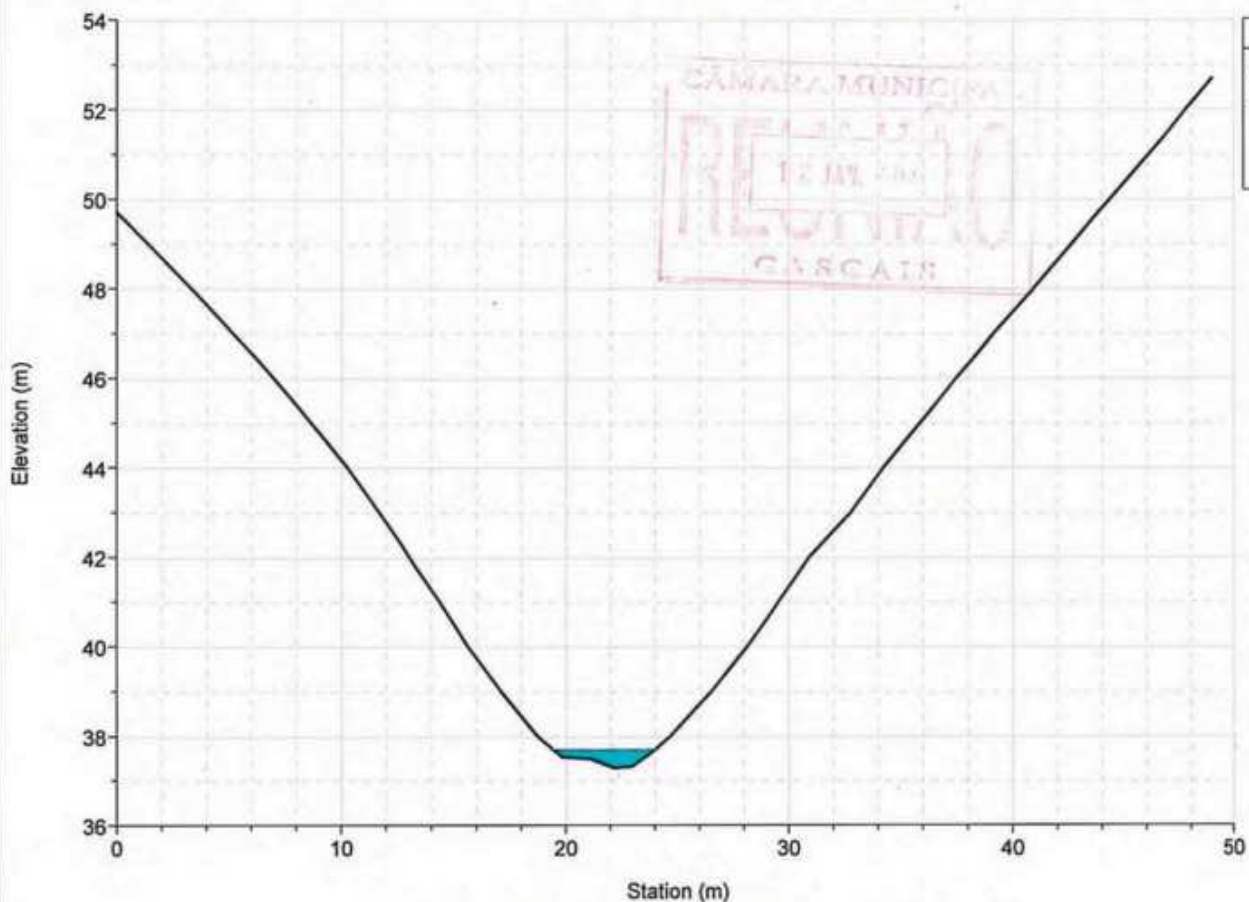
Legend
WS T=100 anos
Ground
Bank Sta

River = ASSOPIO Reach = ribeira RS = 104.794



Legend
WS T=100 anos
Ground
Bank Sta

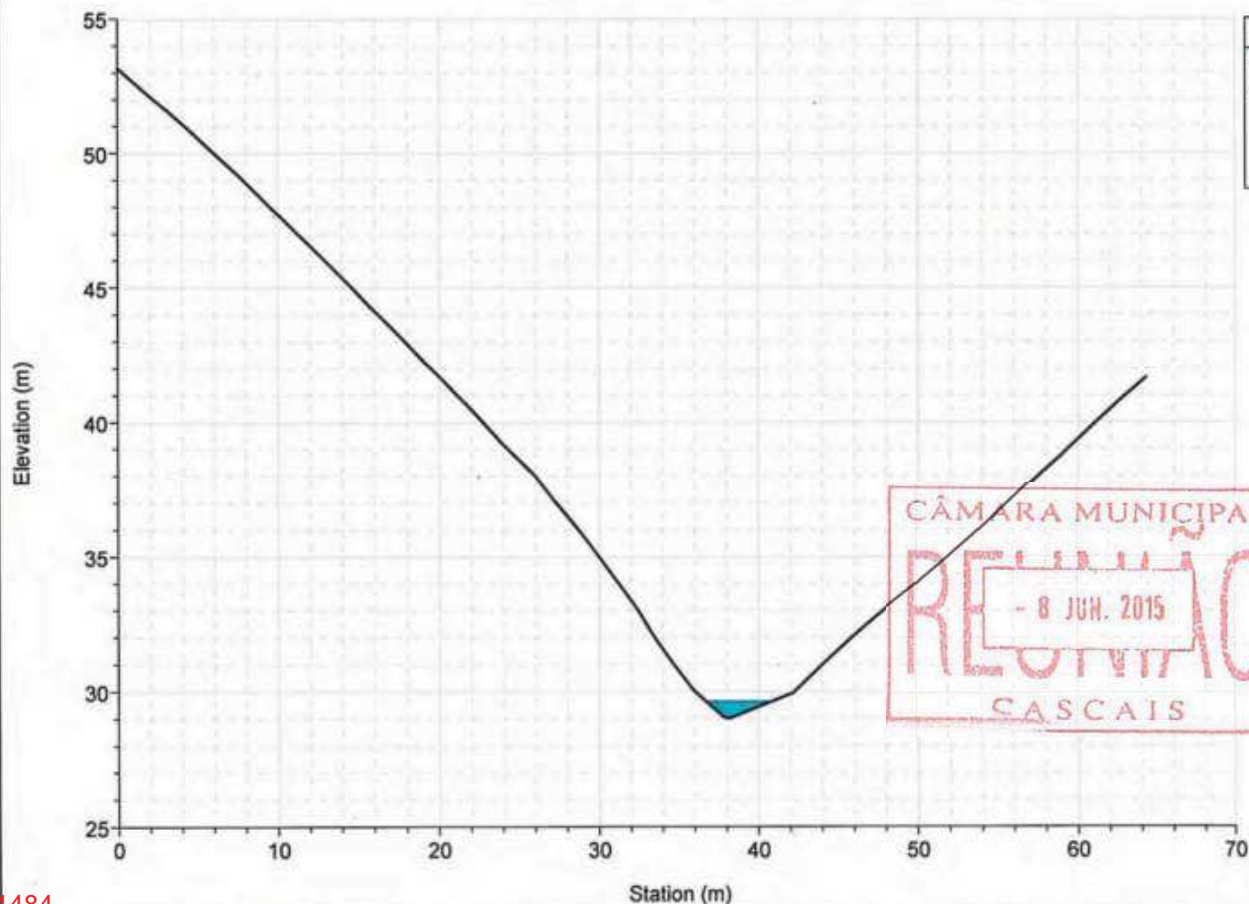
River = ASSOPIO Reach = ribeira RS = 53.778



Legend
WS T=100 anos
Ground
Bank Sta

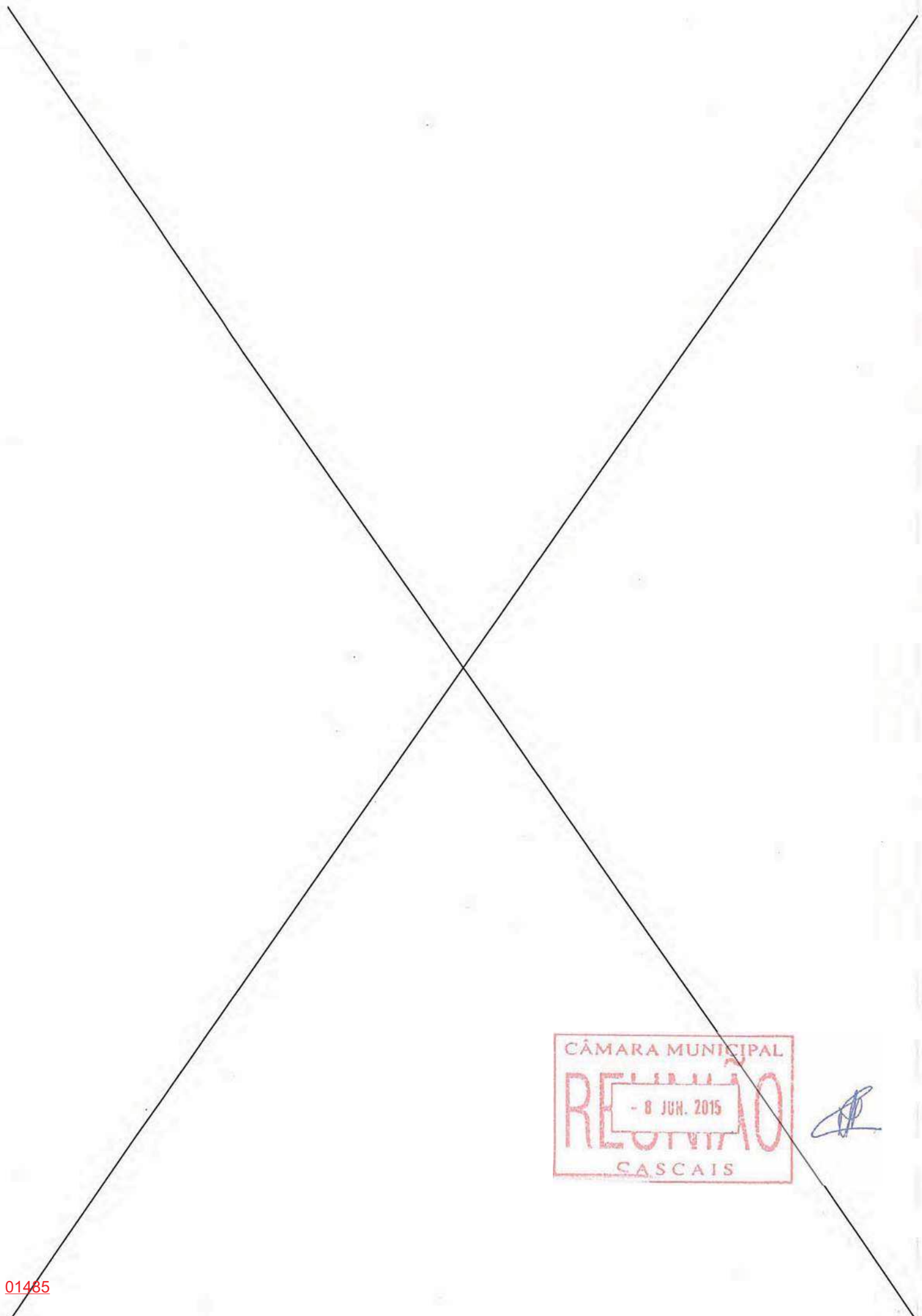
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12 JUN 2015  
CASCAIS

River = ASSOPIO Reach = ribeira RS = 6.416



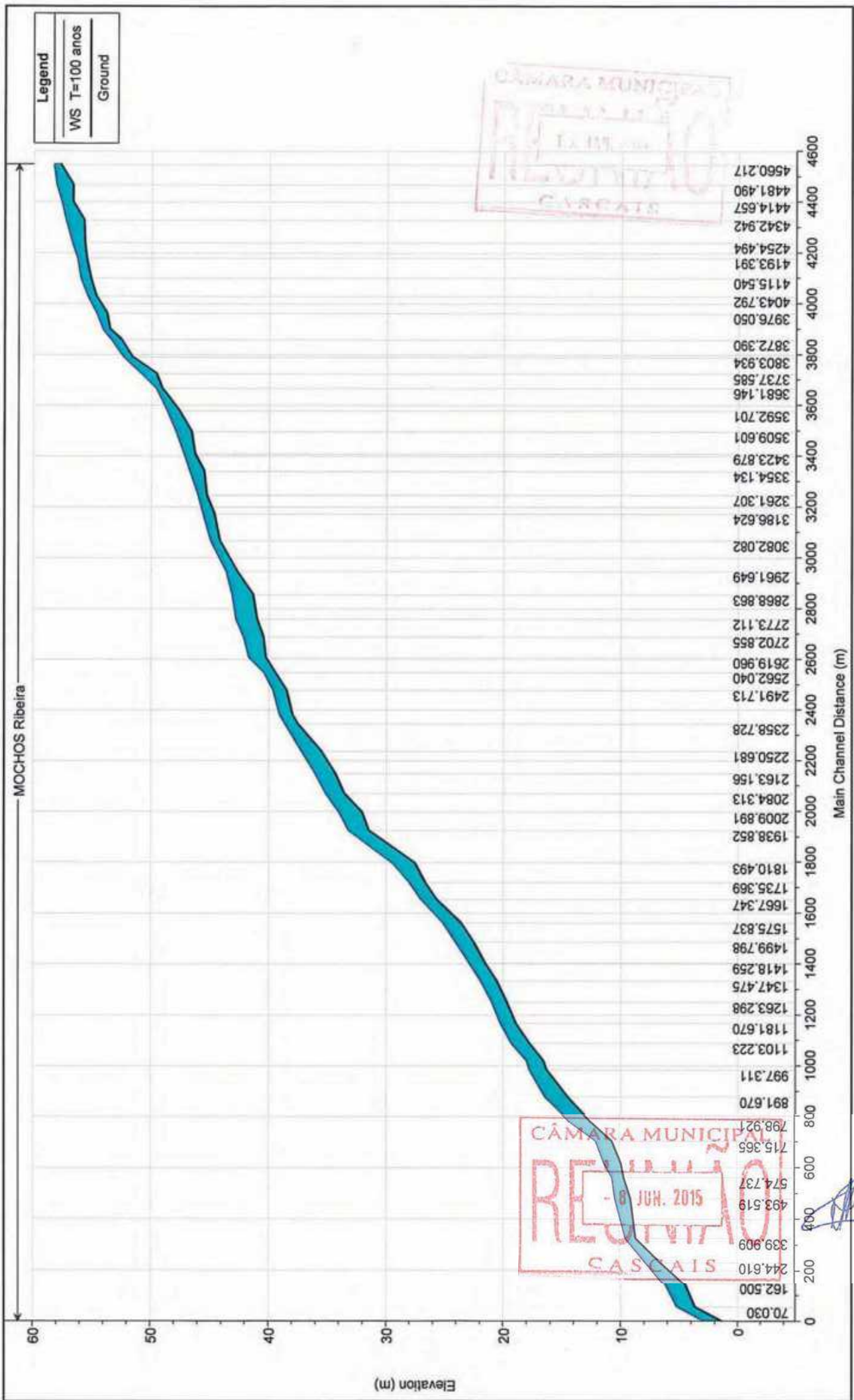
Legend
WS T=100 anos
Ground
Bank Sta

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- 8 JUN. 2015  
CASCAIS

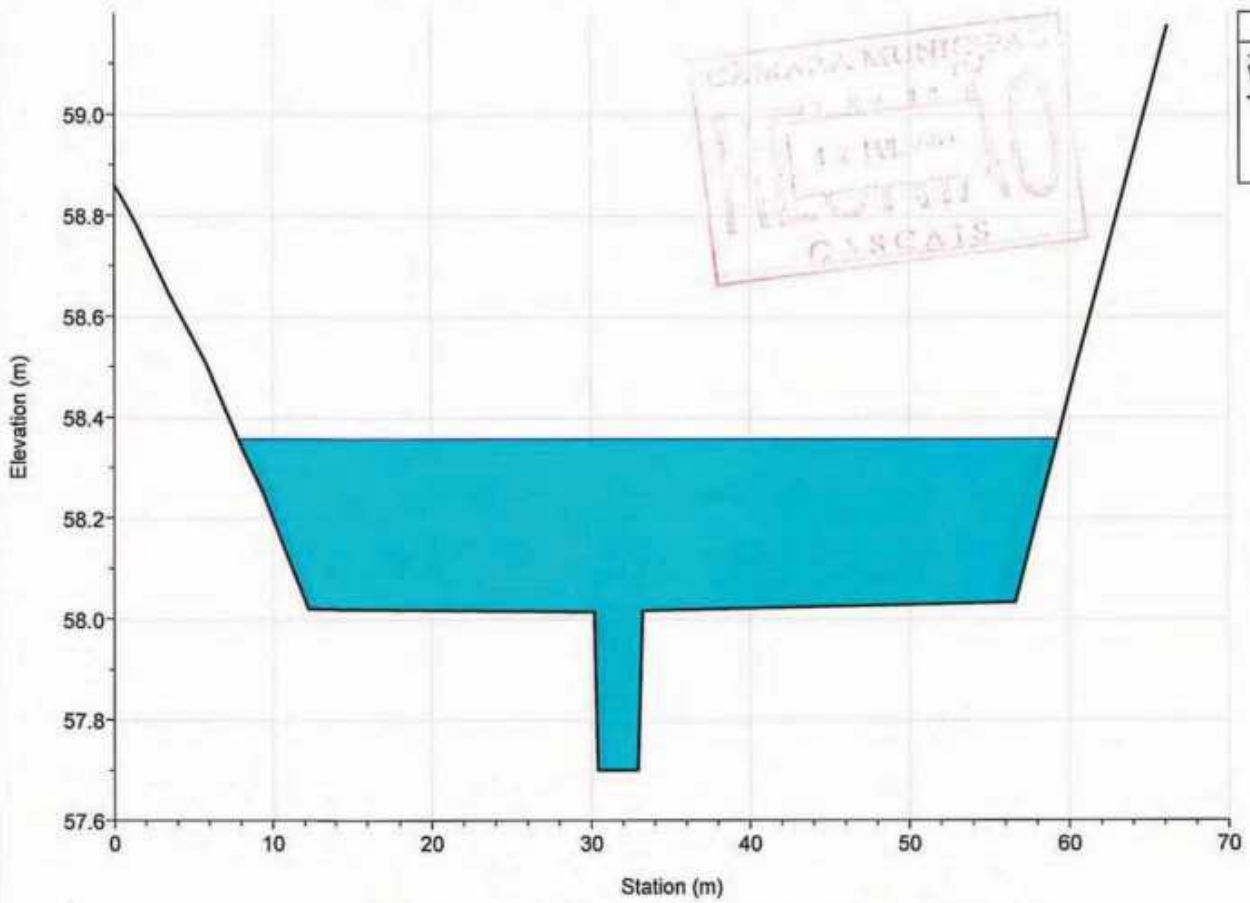


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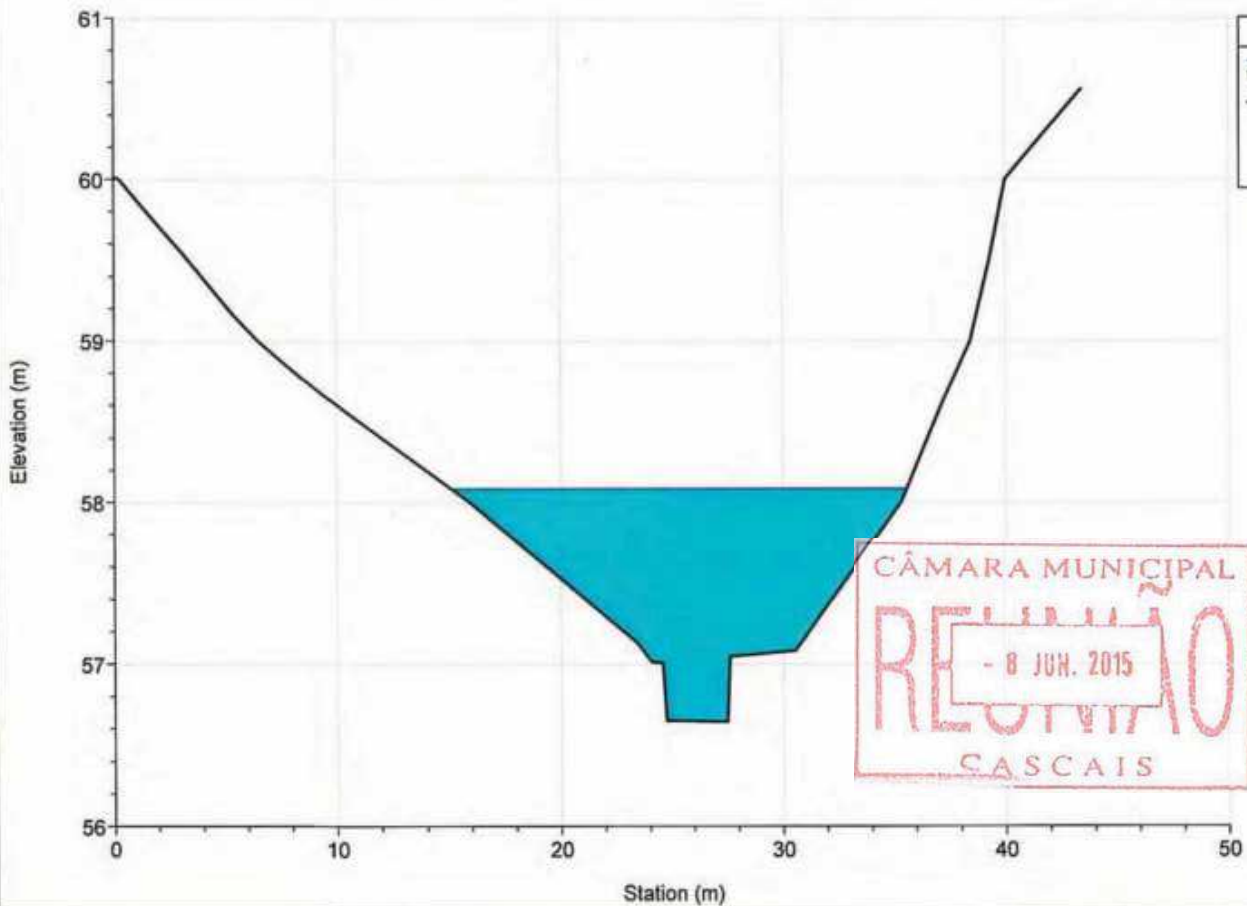




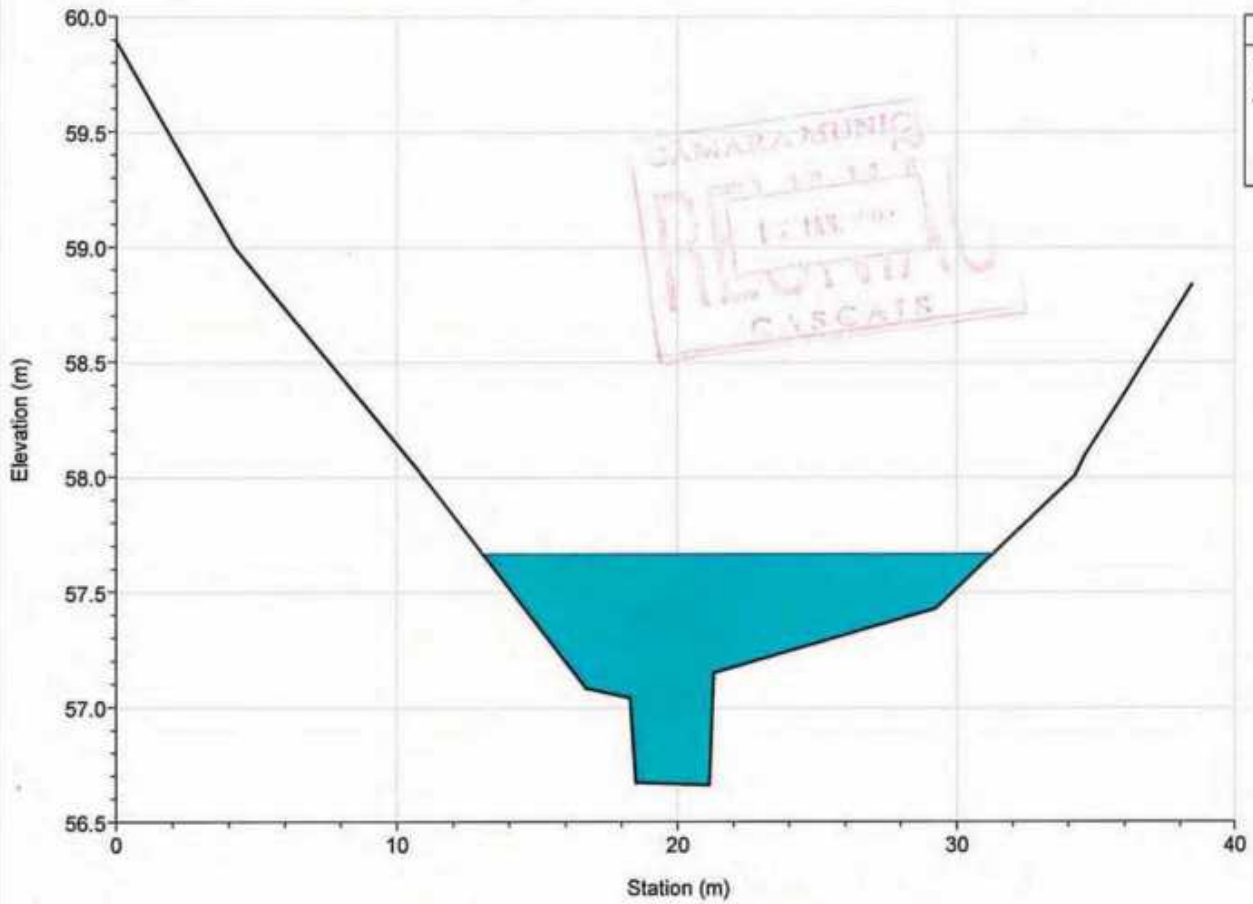
River = MOCHOS Reach = Ribeira RS = 4560.217



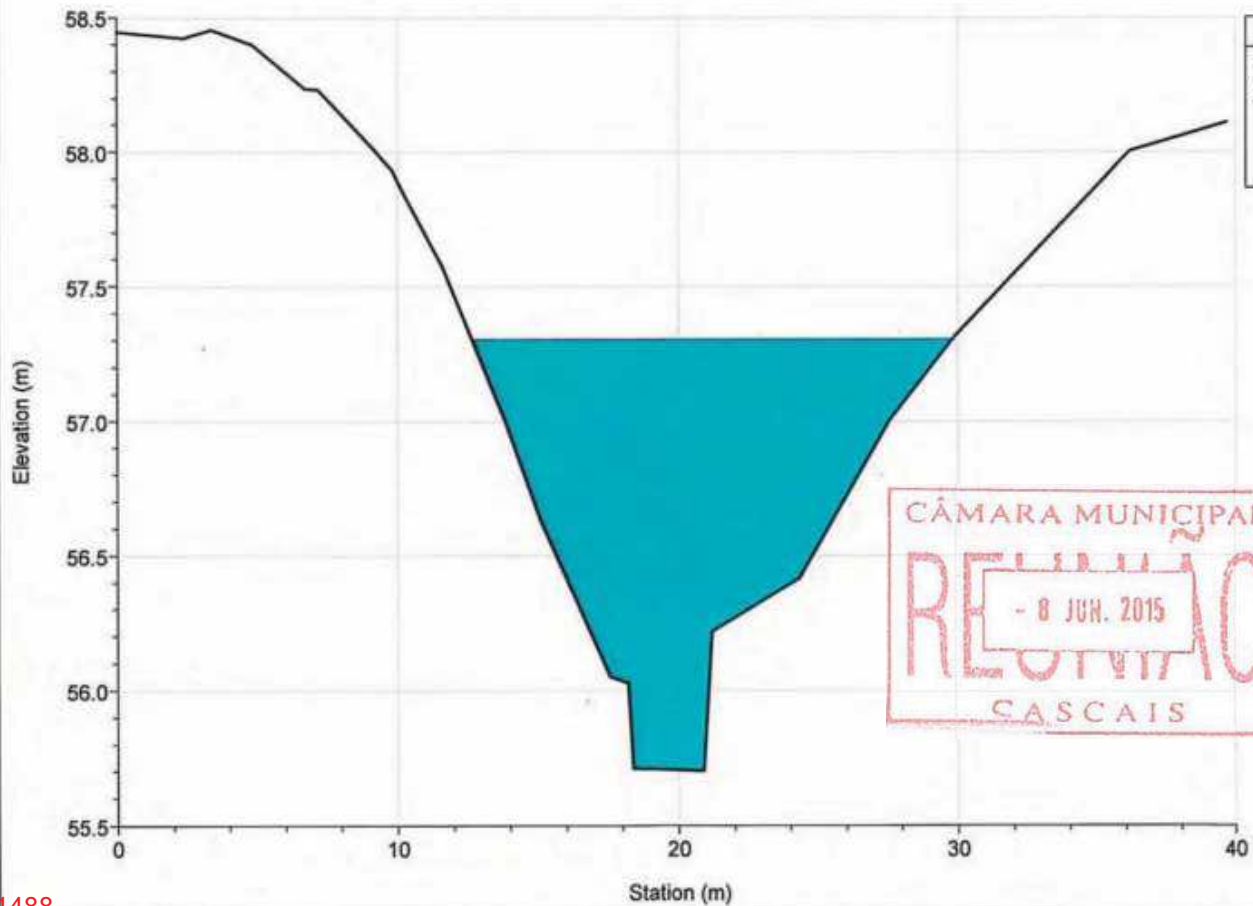
River = MOCHOS Reach = Ribeira RS = 4481.490



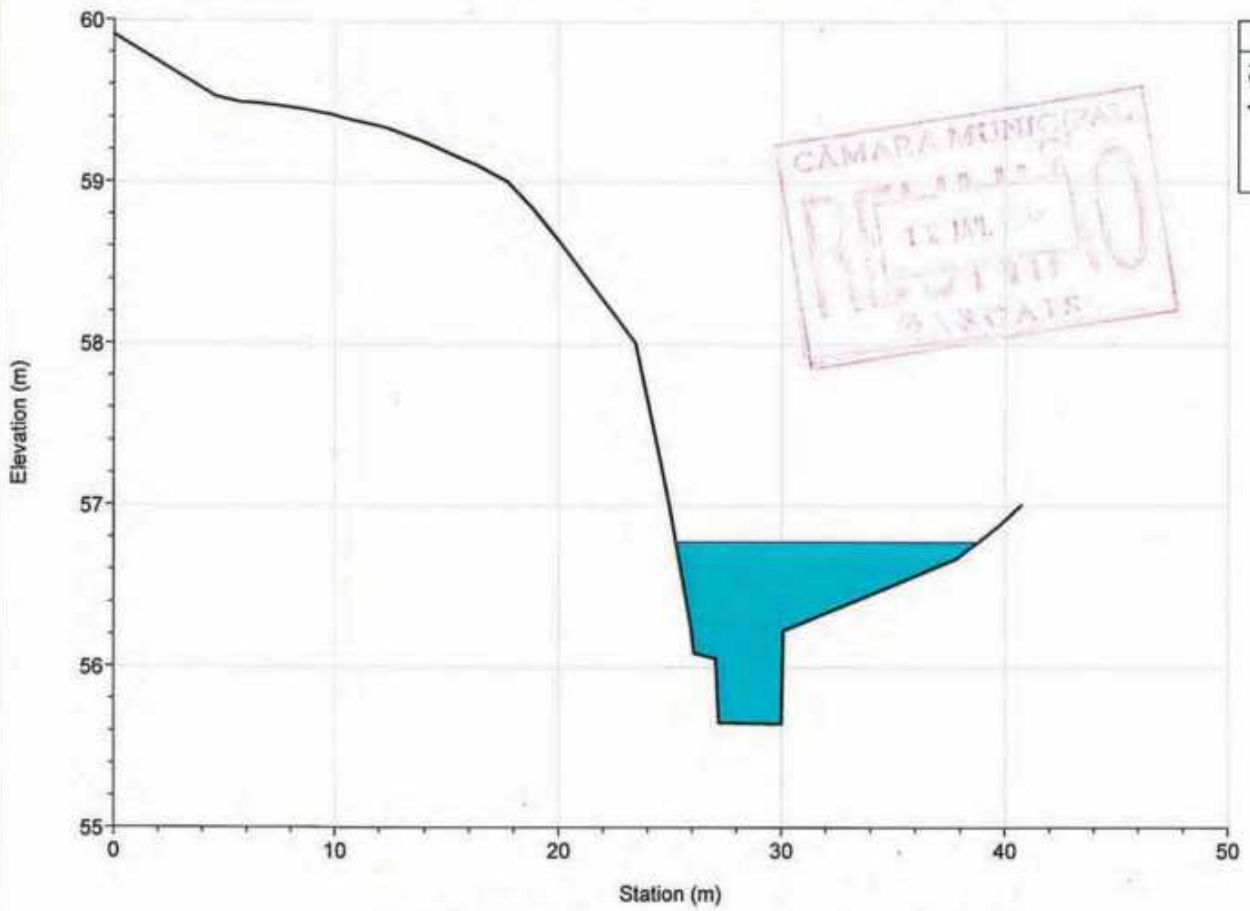
River = MOCHOS Reach = Ribeira RS = 4414.657



River = MOCHOS Reach = Ribeira RS = 4342.942

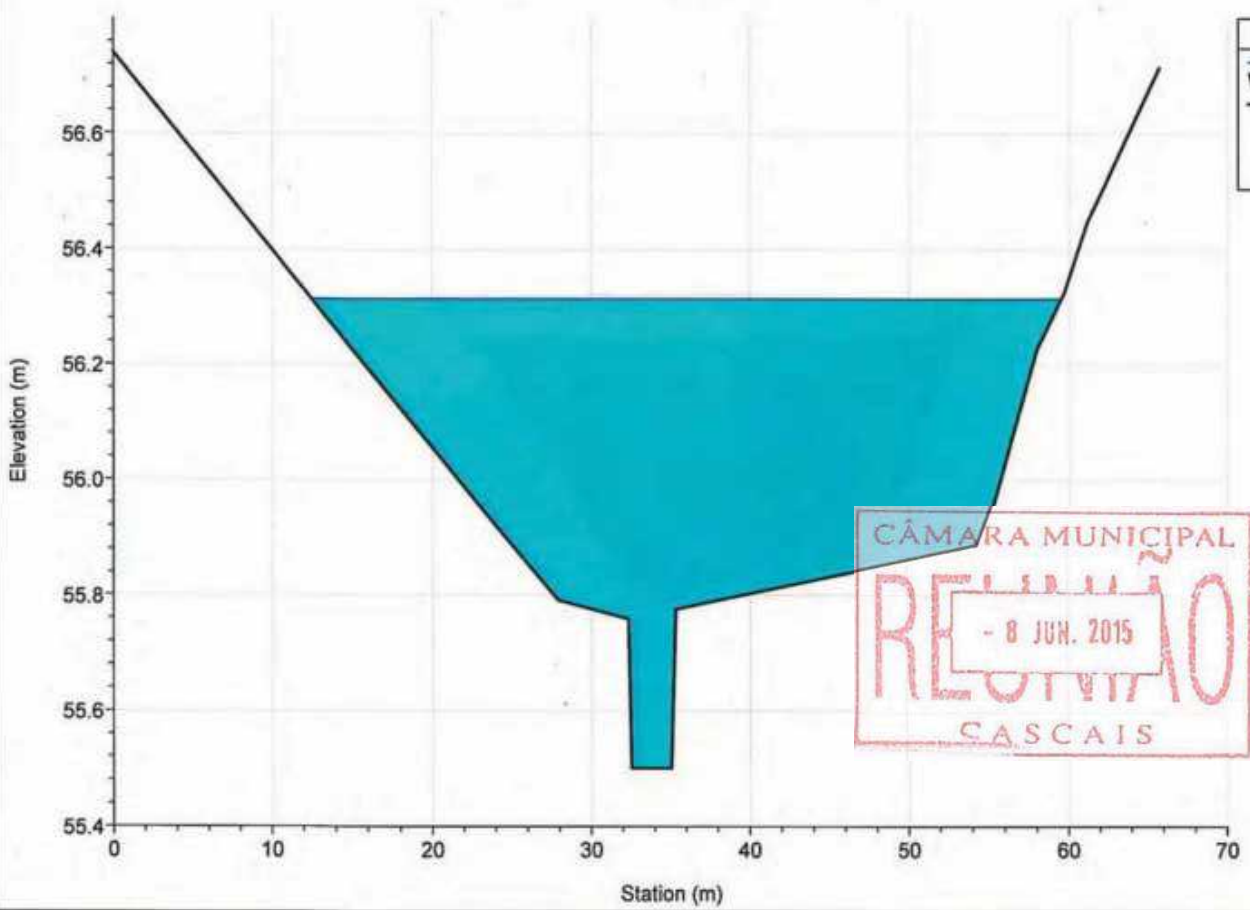


River = MOCHOS Reach = Ribeira RS = 4254.494



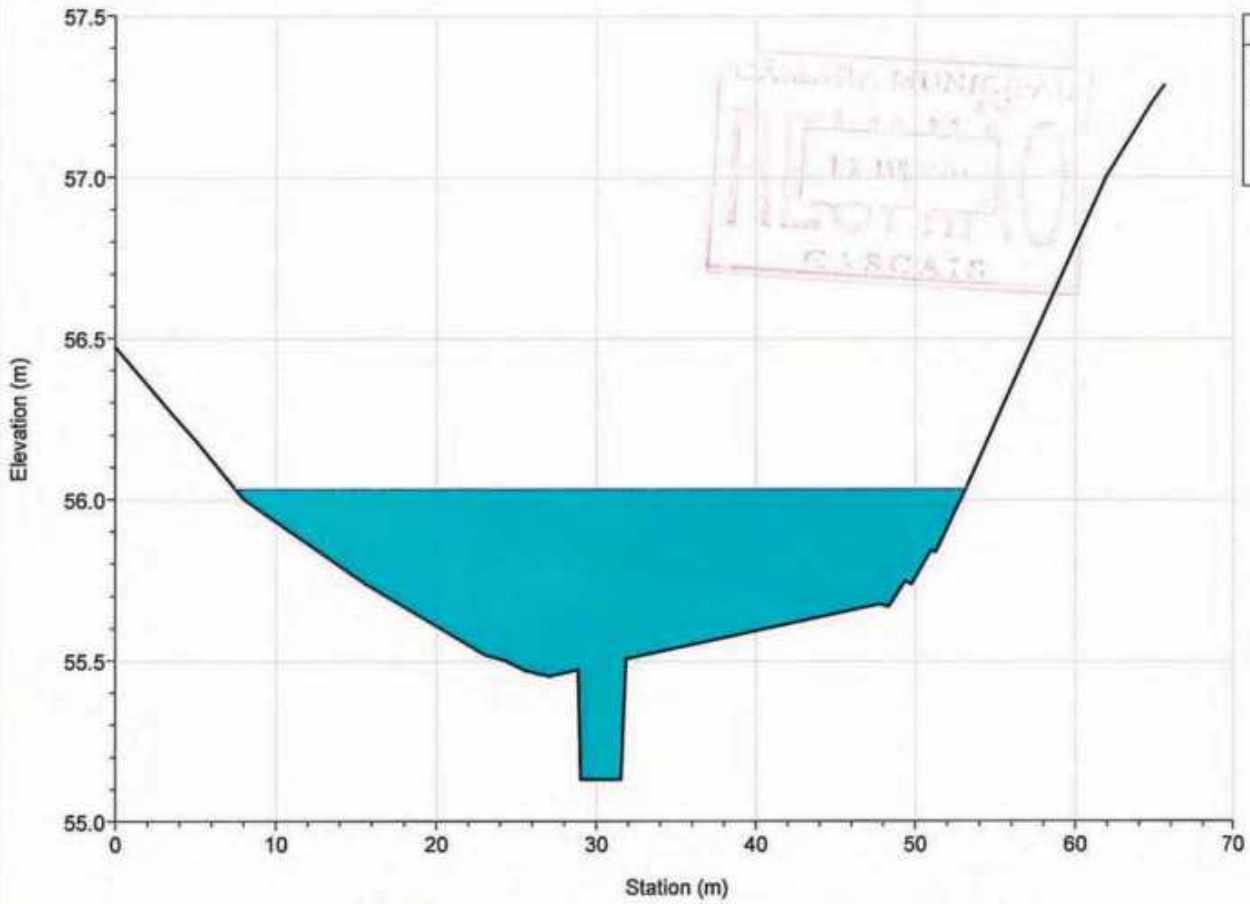
Legend
WS T=100 anos
Ground
Bank Sta

River = MOCHOS Reach = Ribeira RS = 4193.391



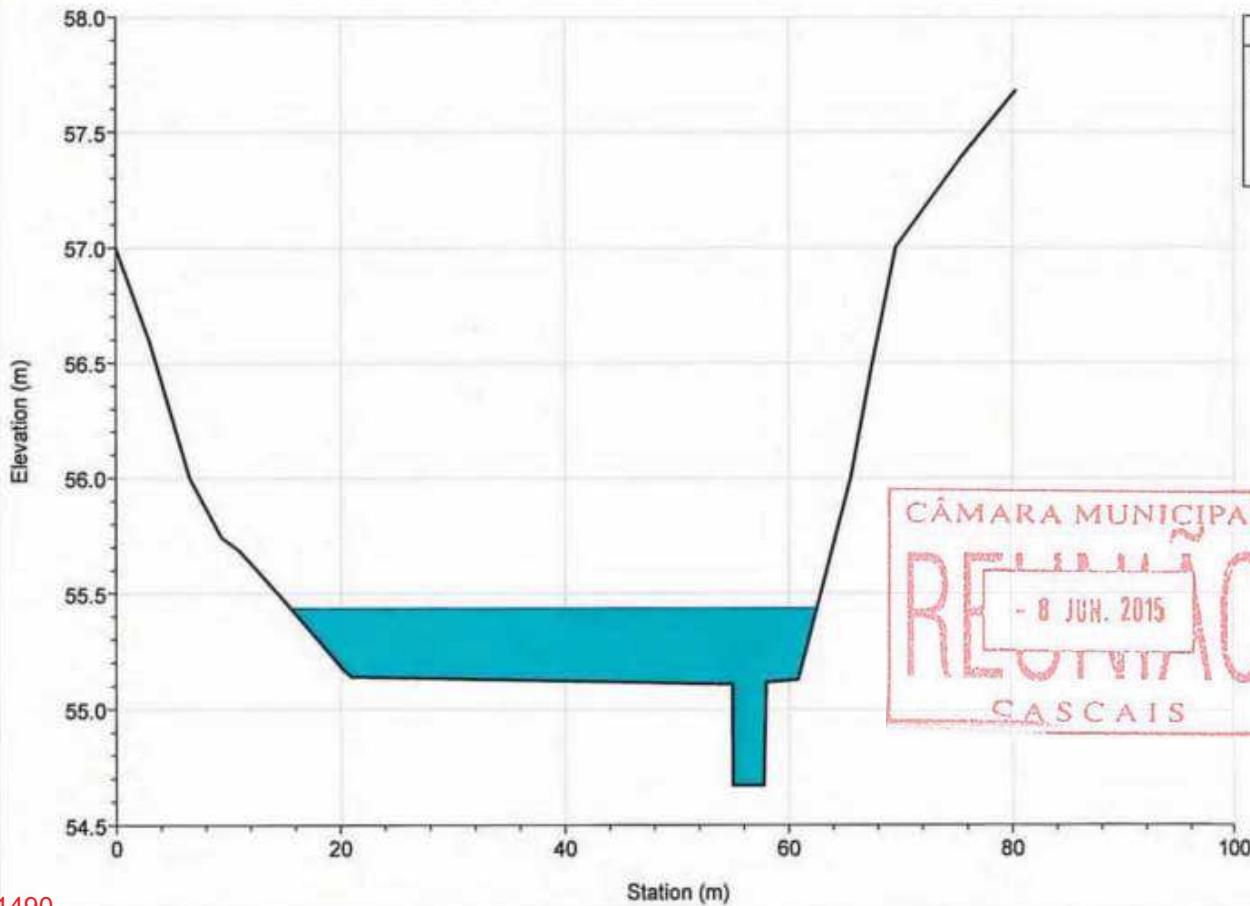
Legend
WS T=100 anos
Ground
Bank Sta

River = MOCHOS Reach = Ribeira RS = 4115.540



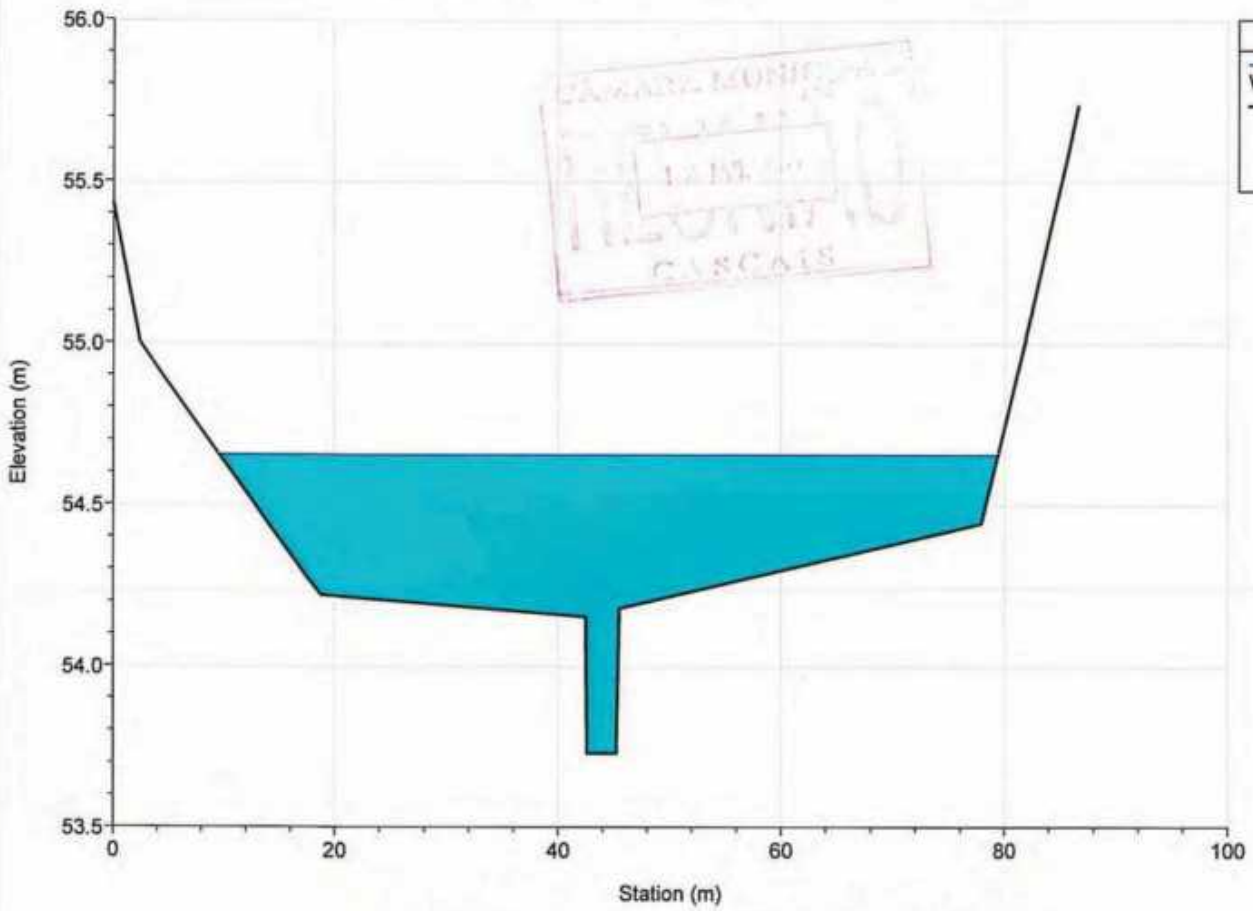
Legend	
WS T=100 anos	(Cyan shaded area)
Ground	(Black line)
Bank Sta	(Vertical line)

River = MOCHOS Reach = Ribeira RS = 4043.792

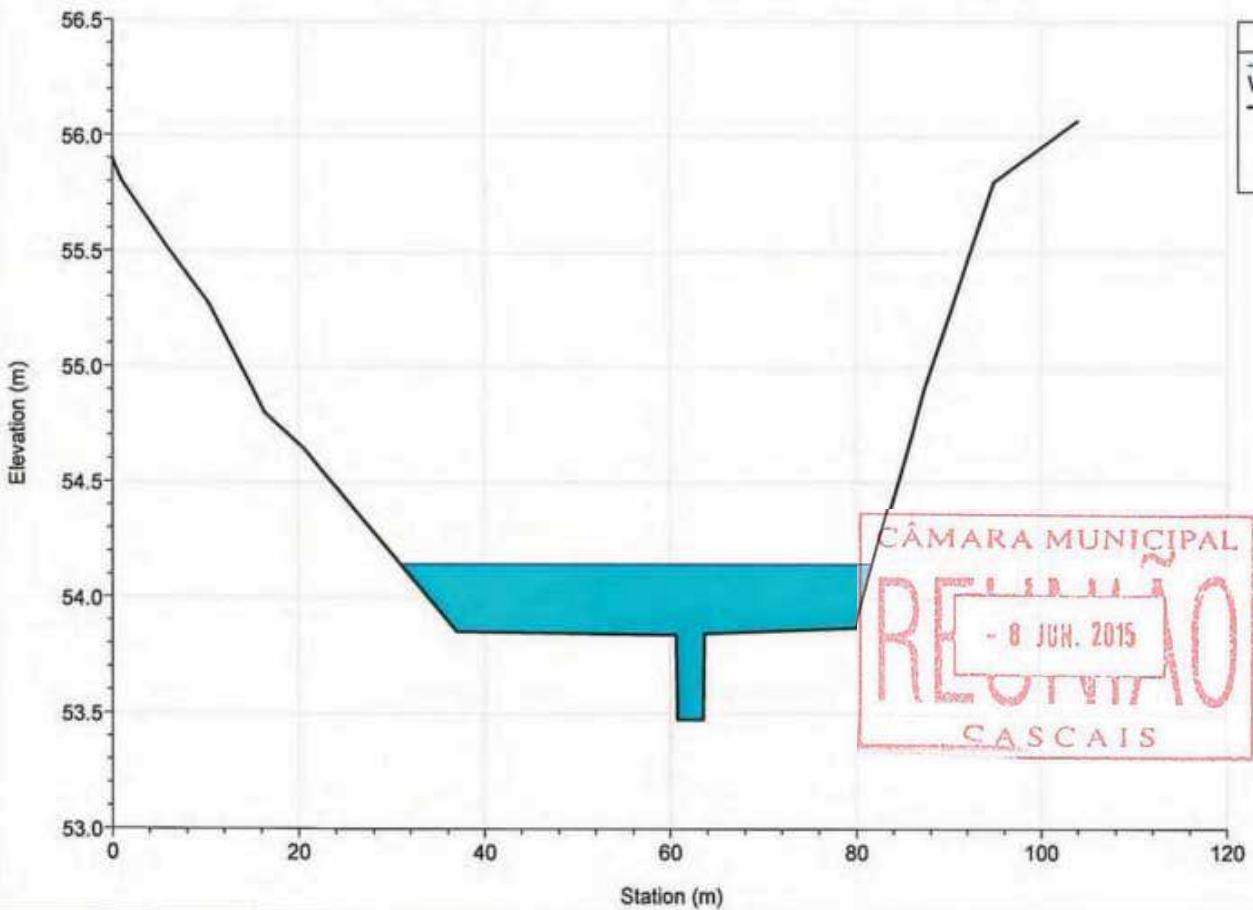


Legend	
WS T=100 anos	(Cyan shaded area)
Ground	(Black line)
Bank Sta	(Vertical line)

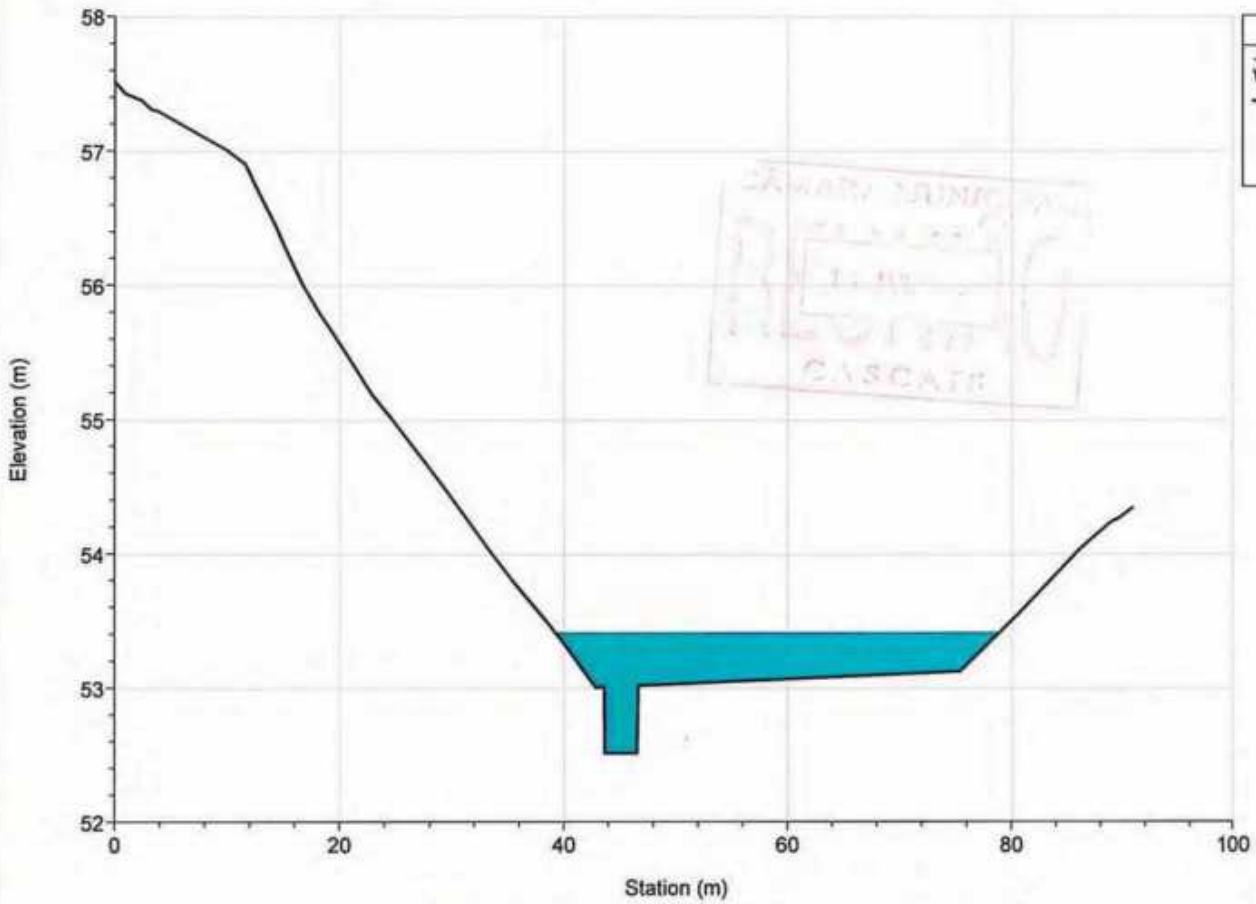
River = MOCHOS Reach = Ribeira RS = 3976.050



River = MOCHOS Reach = Ribeira RS = 3912.782

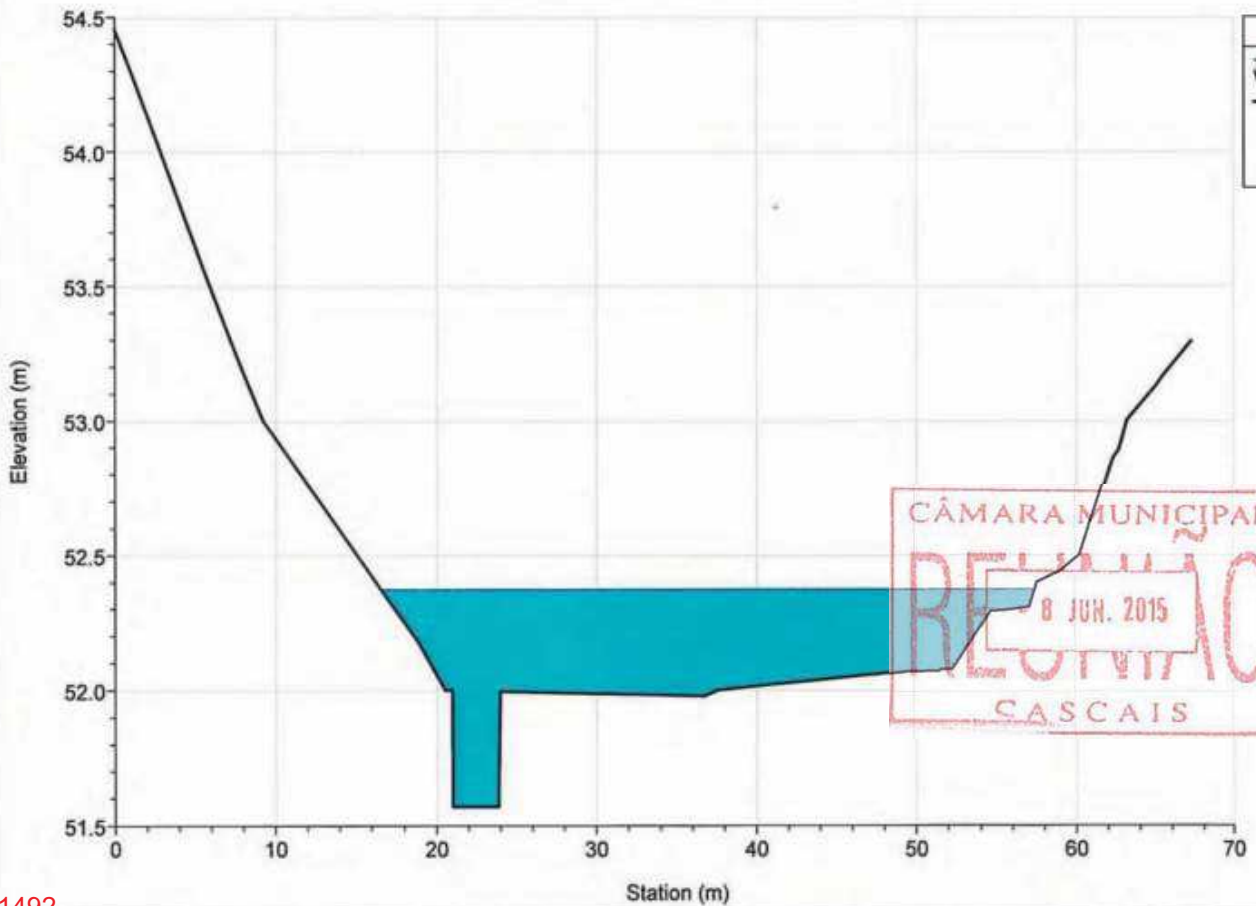


River = MOCHOS Reach = Ribeira RS = 3872.390



Legend
WS T=100 anos
Ground
Bank Sta

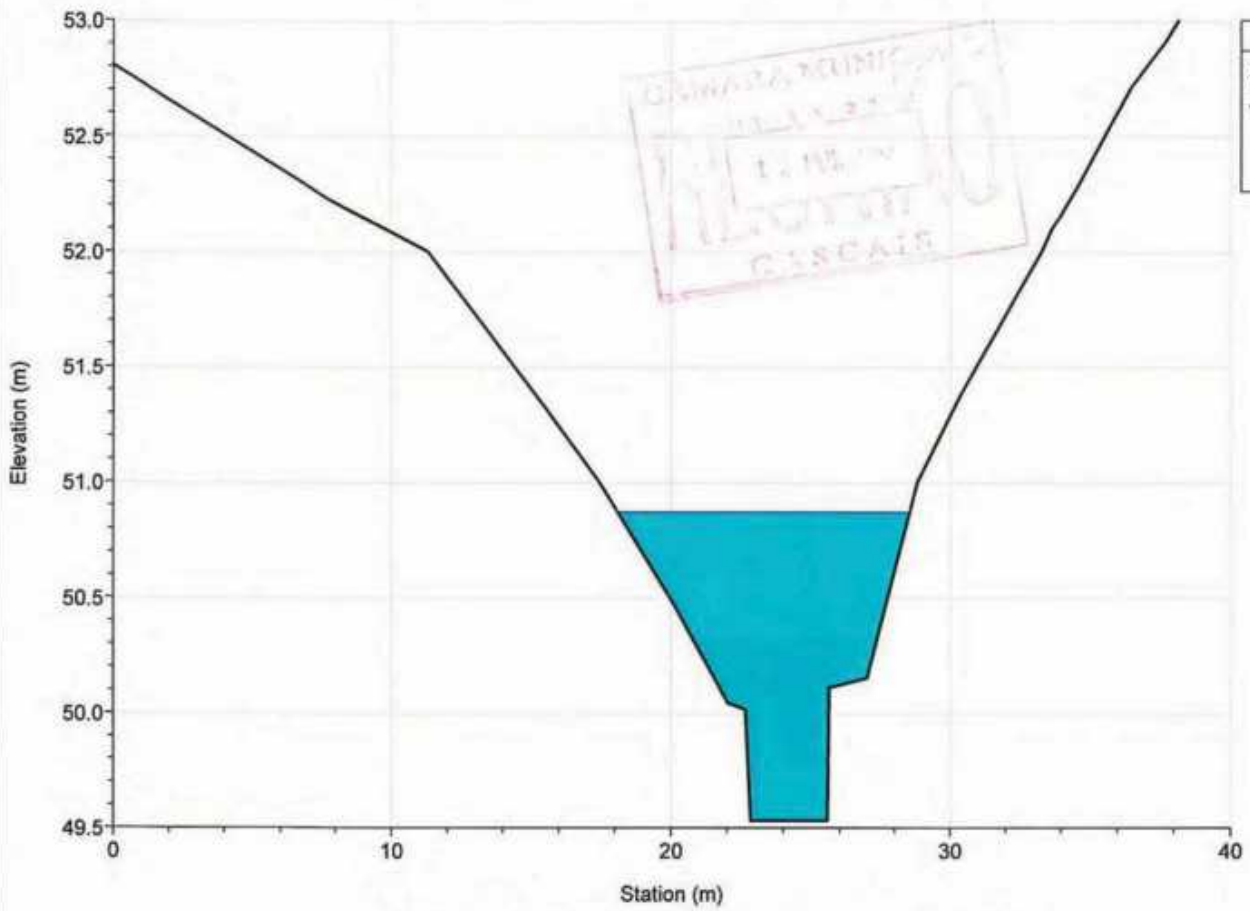
River = MOCHOS Reach = Ribeira RS = 3803.934



Legend
WS T=100 anos
Ground
Bank Sta

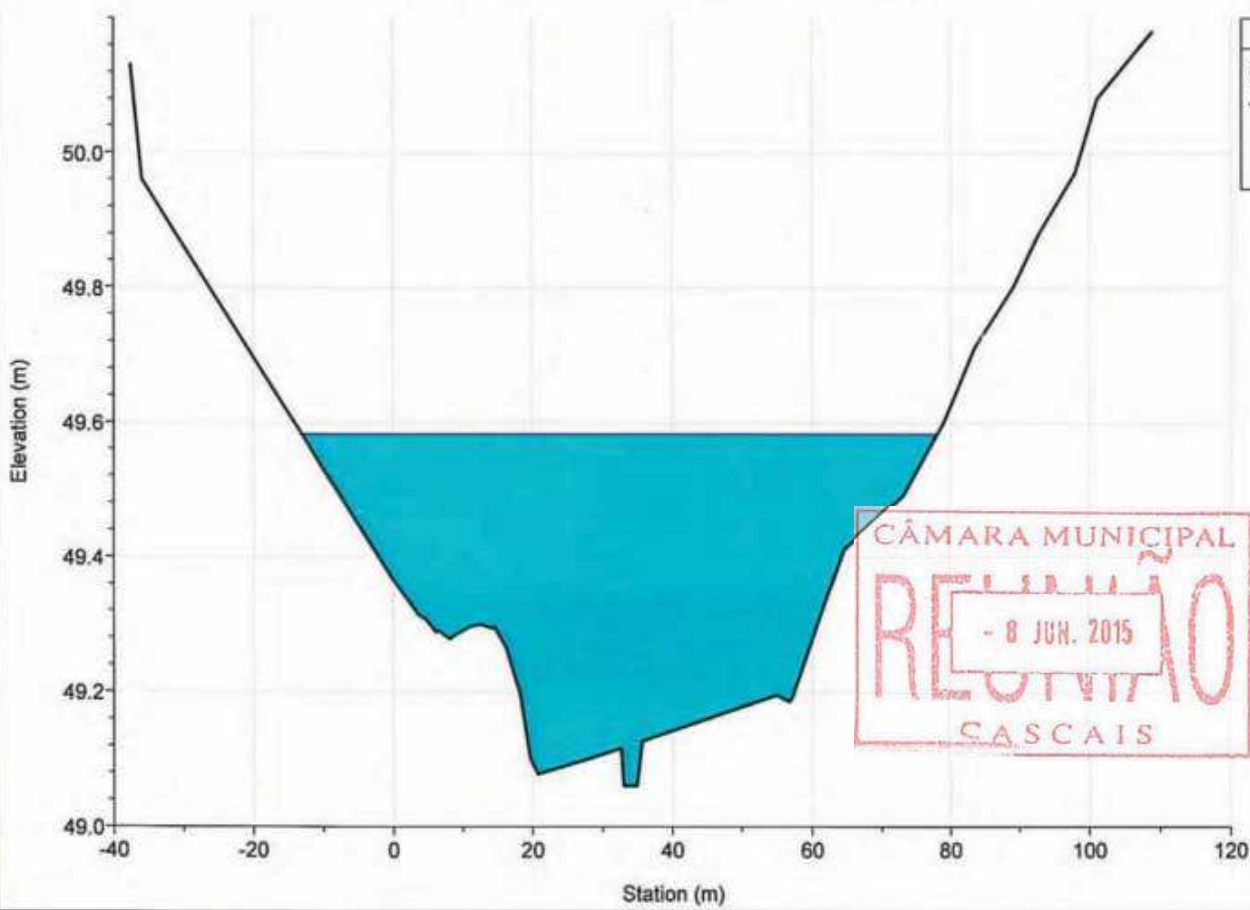
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River = MOCHOS Reach = Ribeira RS = 3737.585



Legend
WS T=100 anos
Ground
Bank Sta

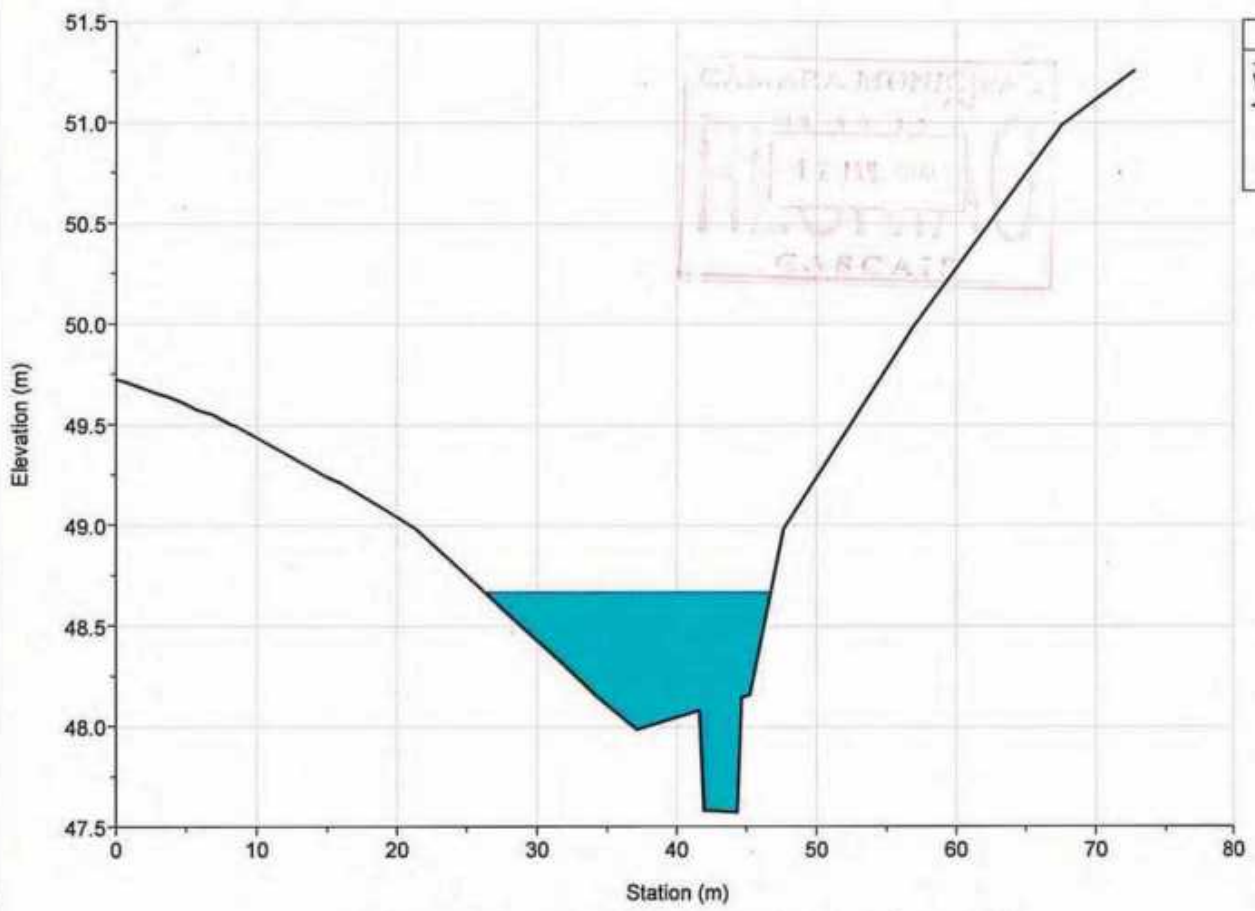
River = MOCHOS Reach = Ribeira RS = 3681.146



Legend
WS T=100 anos
Ground
Bank Sta

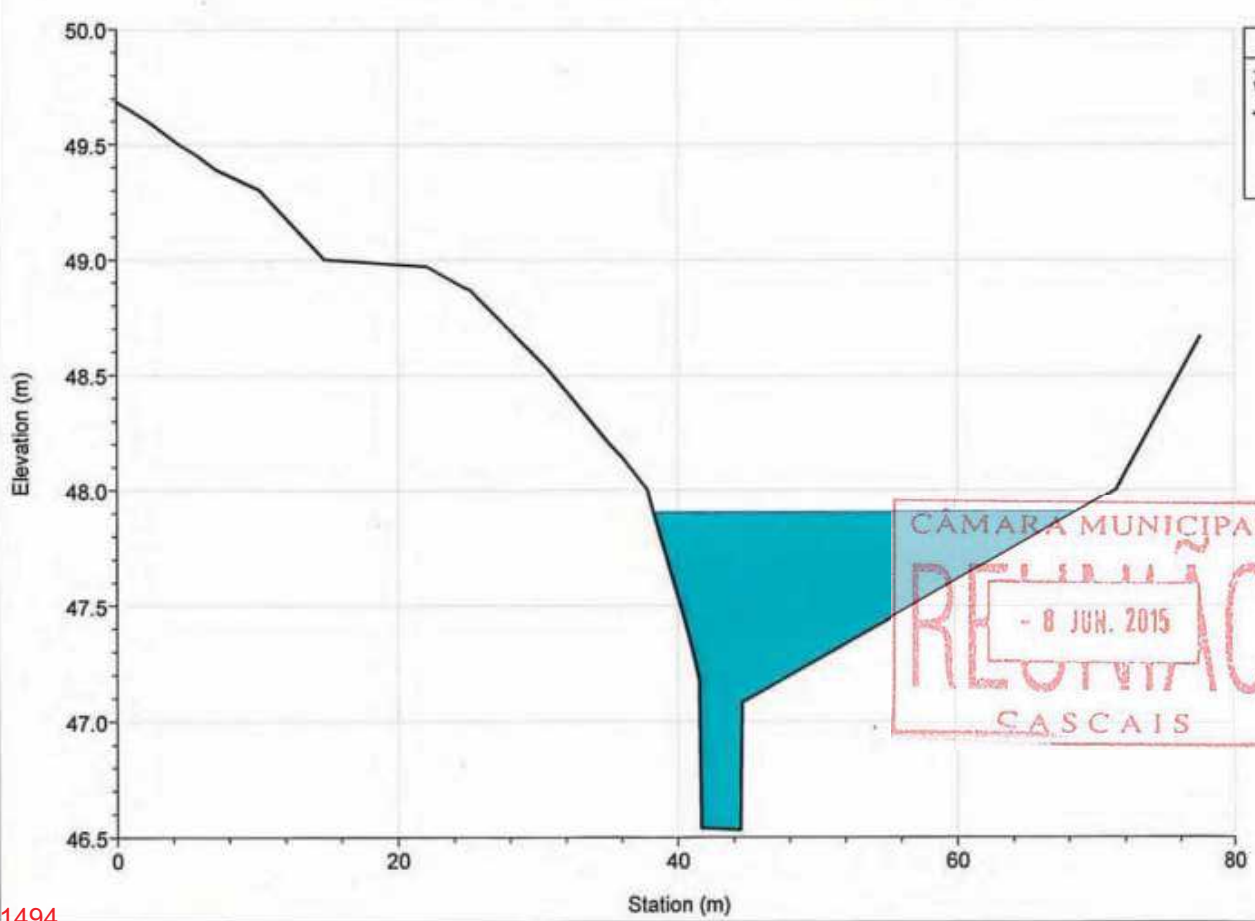


River = MOCHOS Reach = Ribeira RS = 3592.701



Legend
WS T=100 anos
Ground
Bank Sta

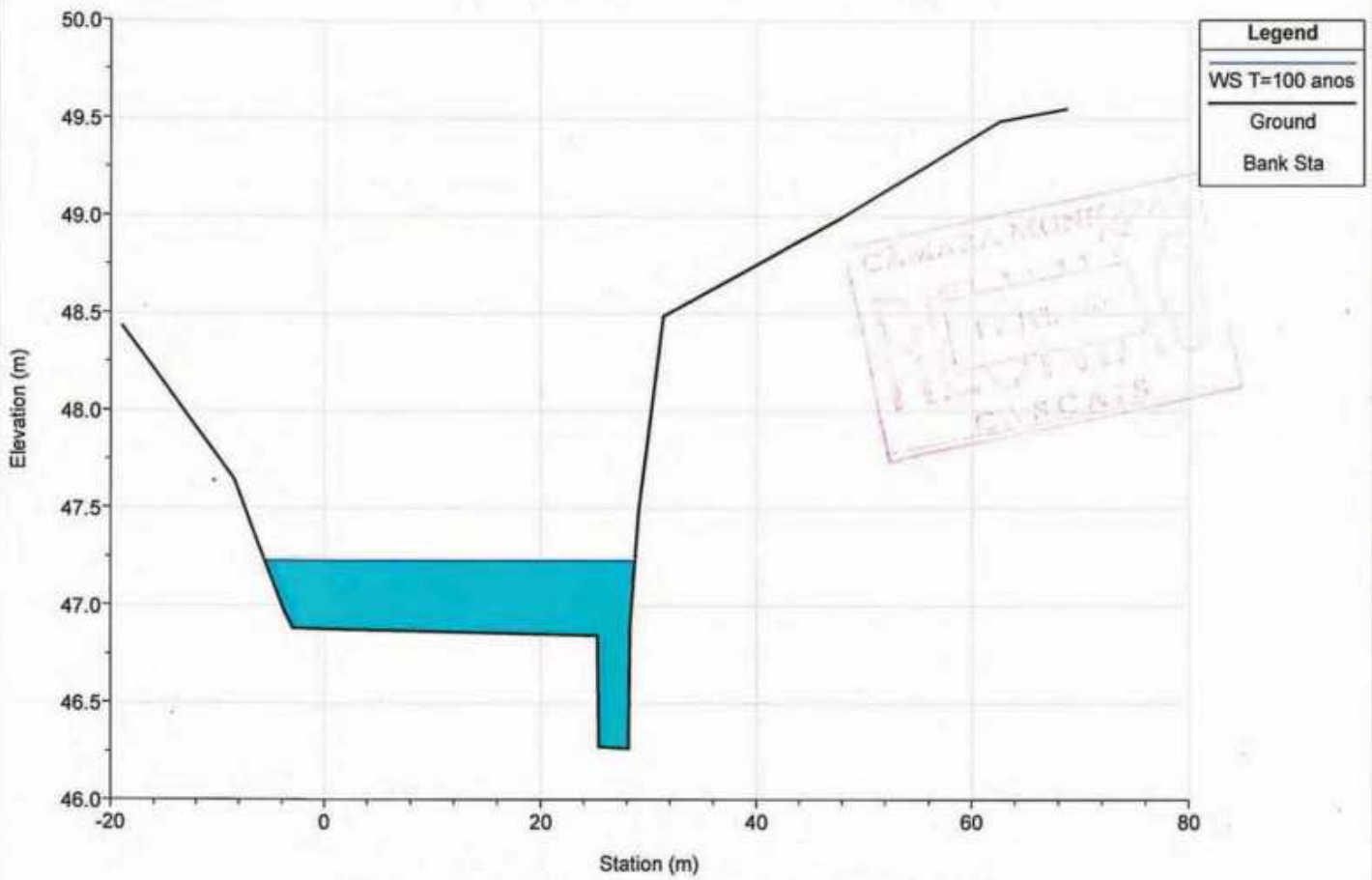
River = MOCHOS Reach = Ribeira RS = 3509.601



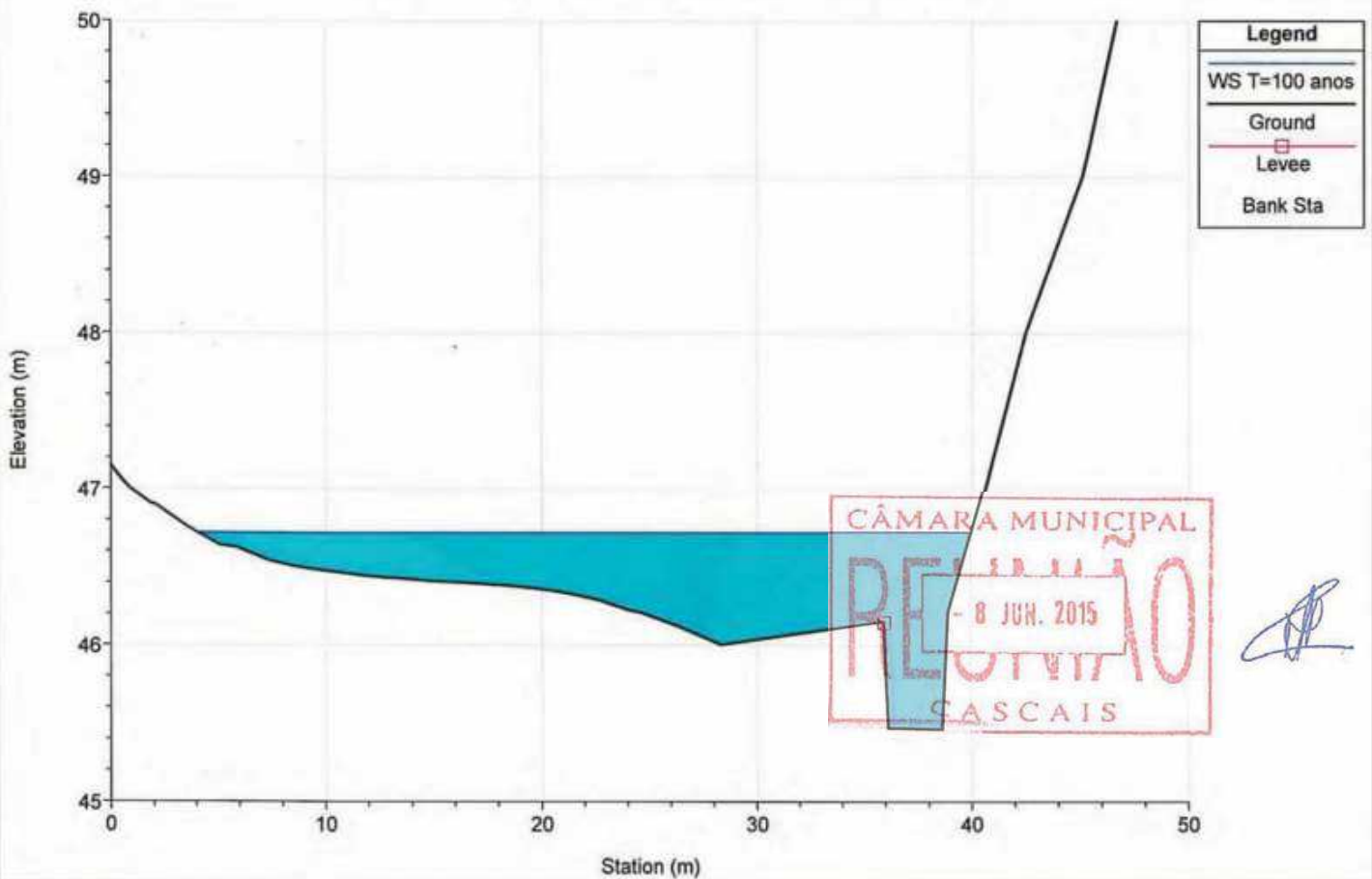
Legend
WS T=100 anos
Ground
Bank Sta

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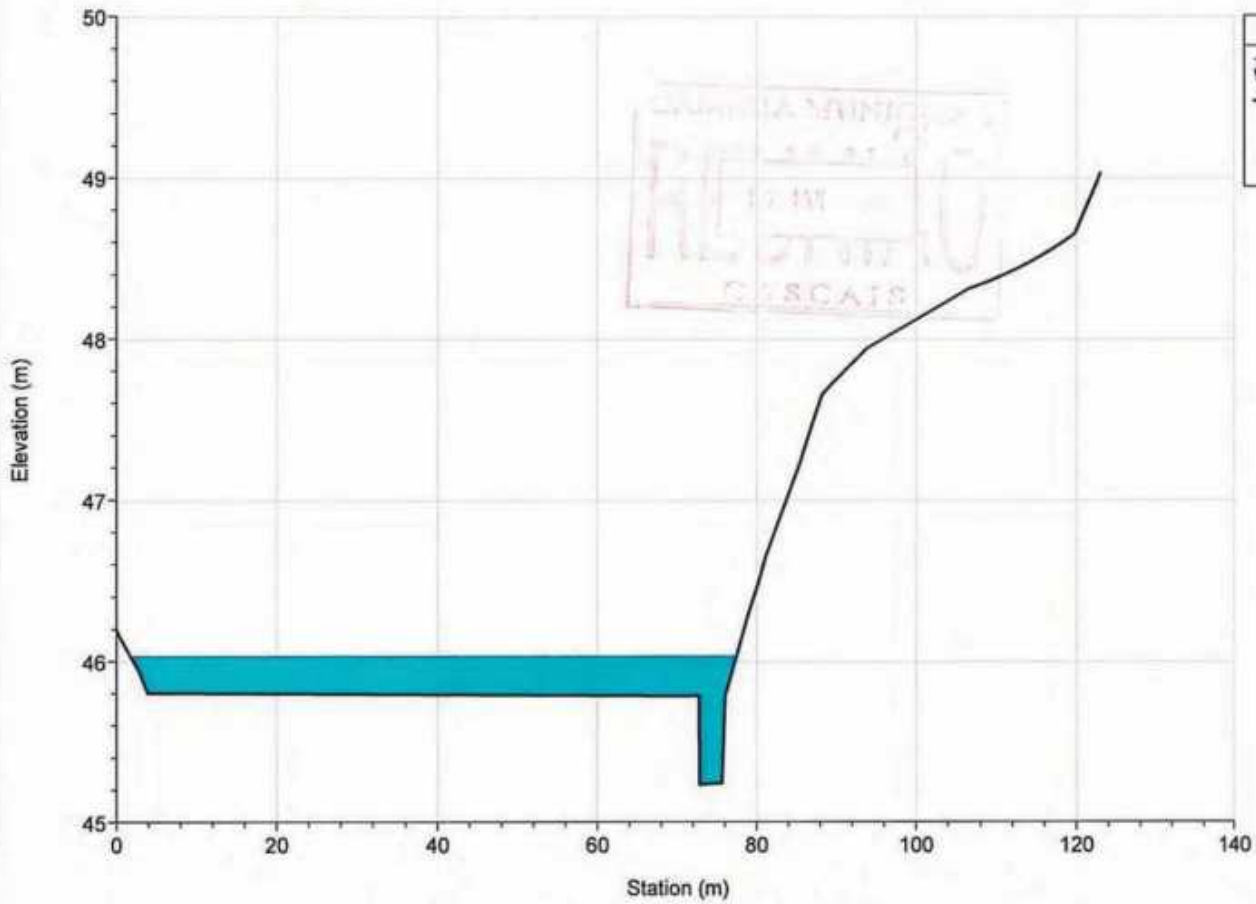
River = MOCHOS Reach = Ribeira RS = 3423.879



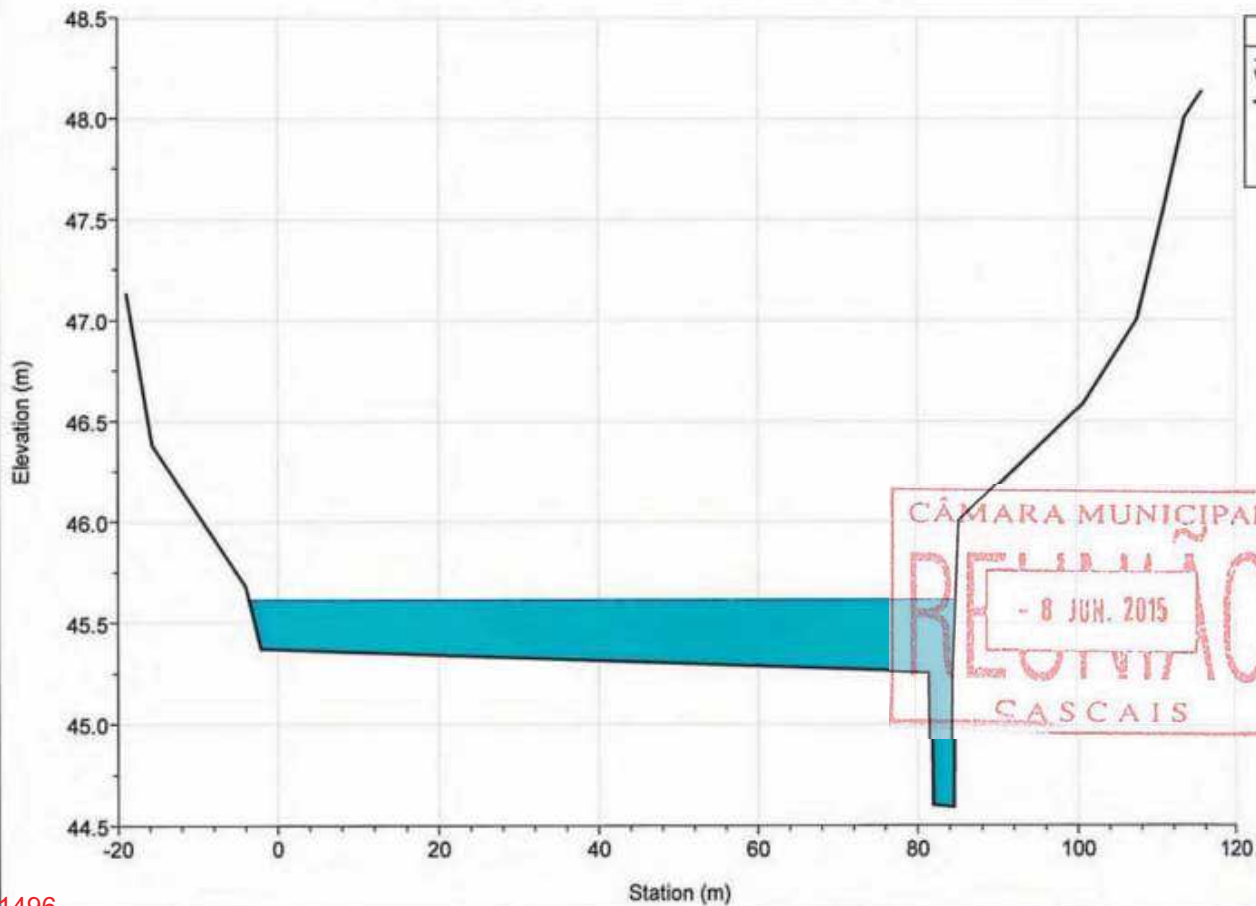
River = MOCHOS Reach = Ribeira RS = 3354.134



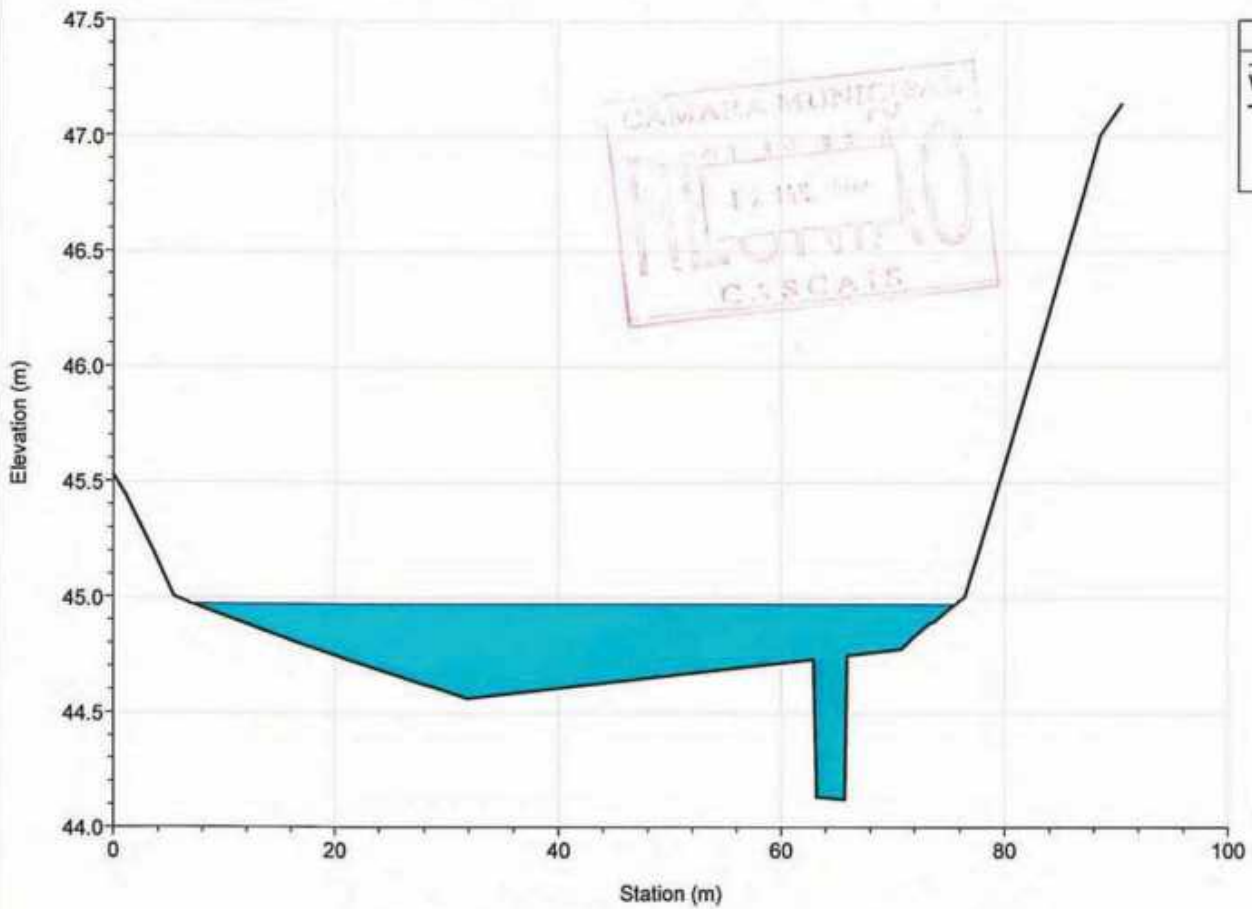
River = MOCHOS Reach = Ribeira RS = 3261.307



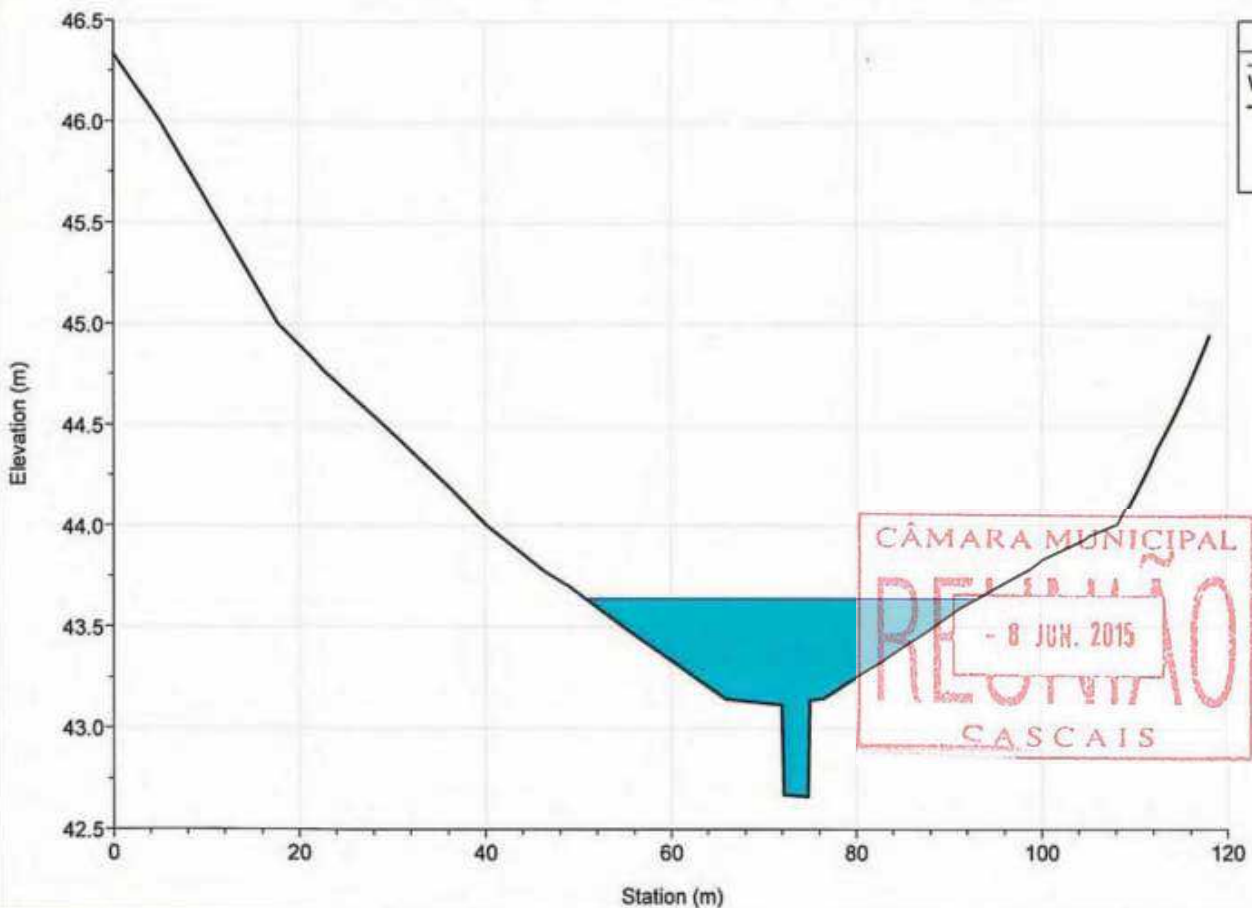
River = MOCHOS Reach = Ribeira RS = 3186.624



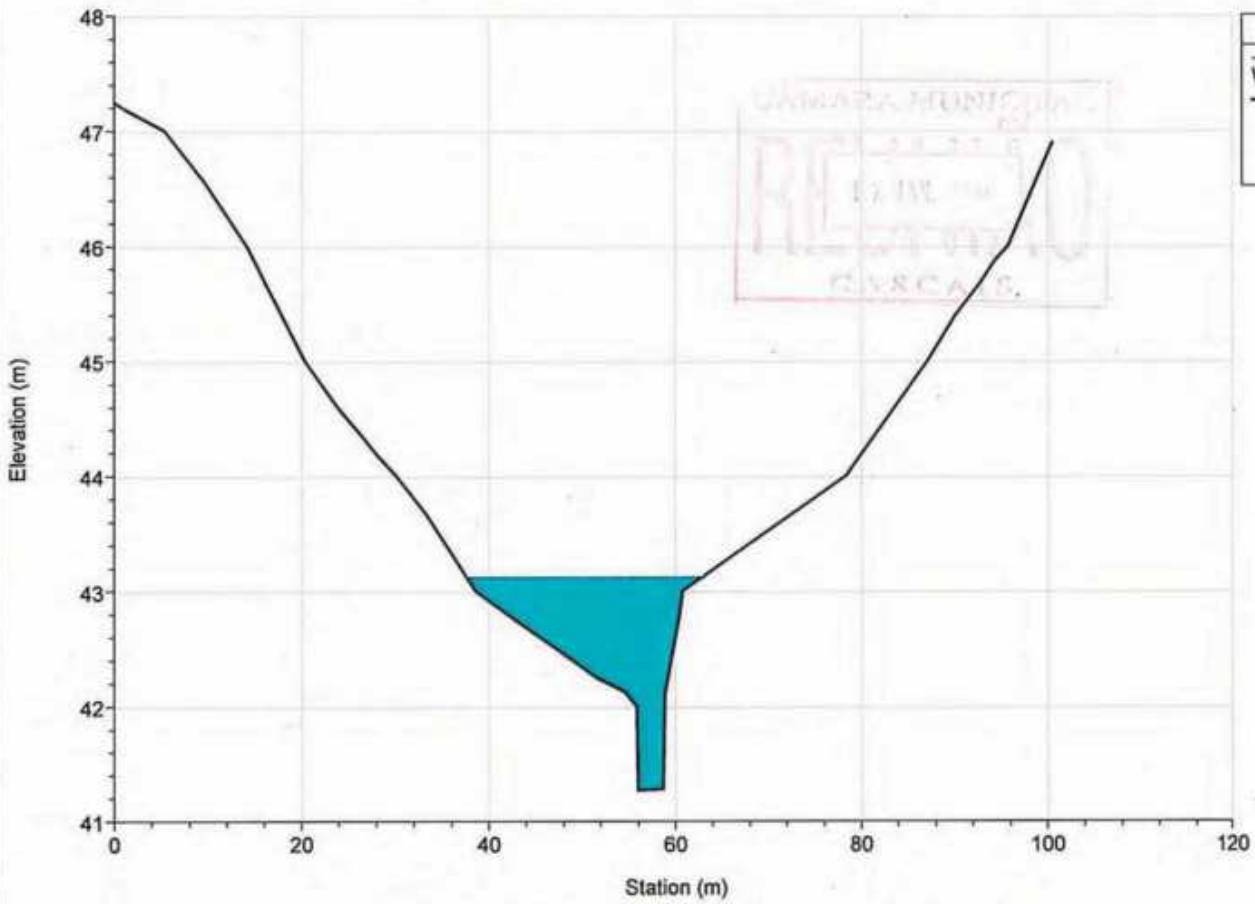
River = MOCHOS Reach = Ribeira RS = 3082.082



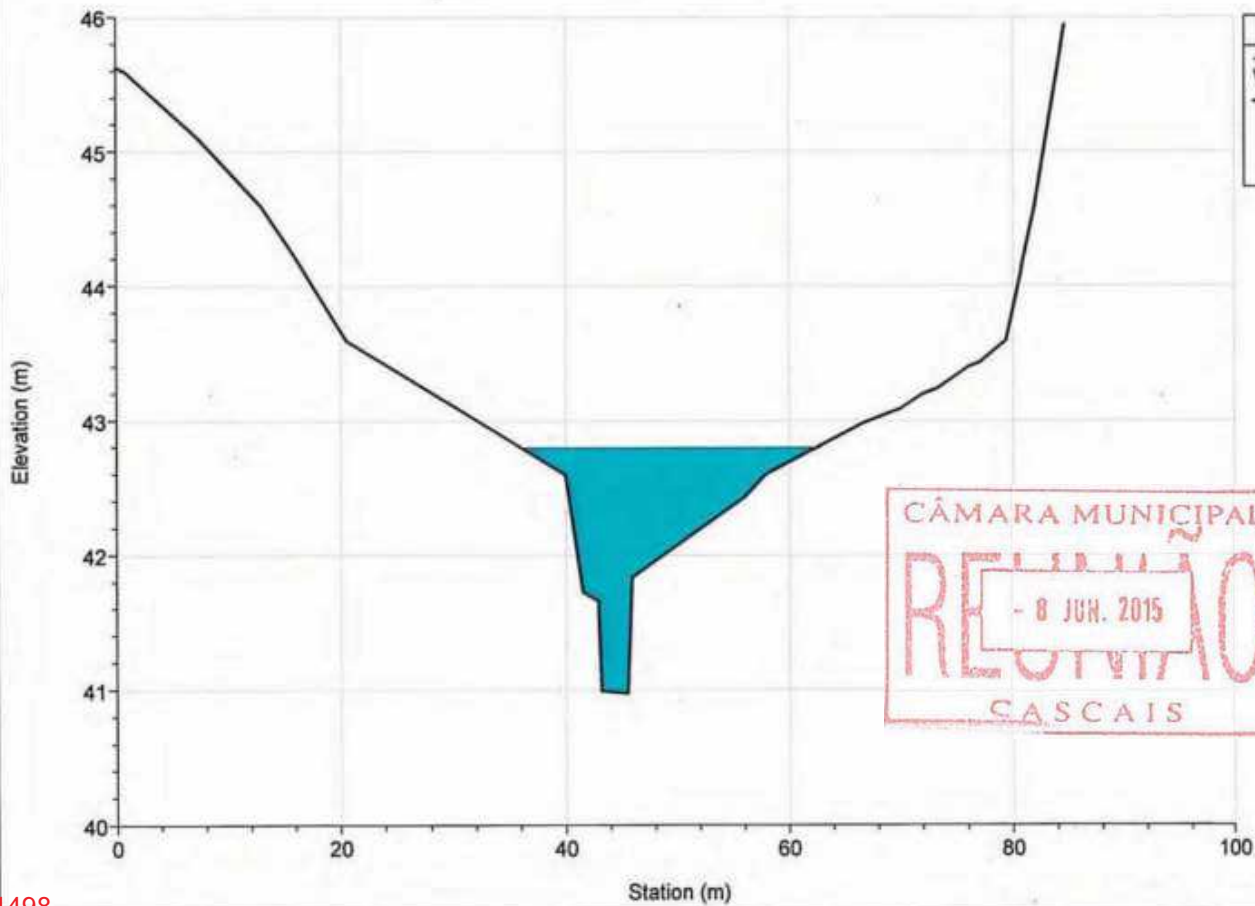
River = MOCHOS Reach = Ribeira RS = 2961.649



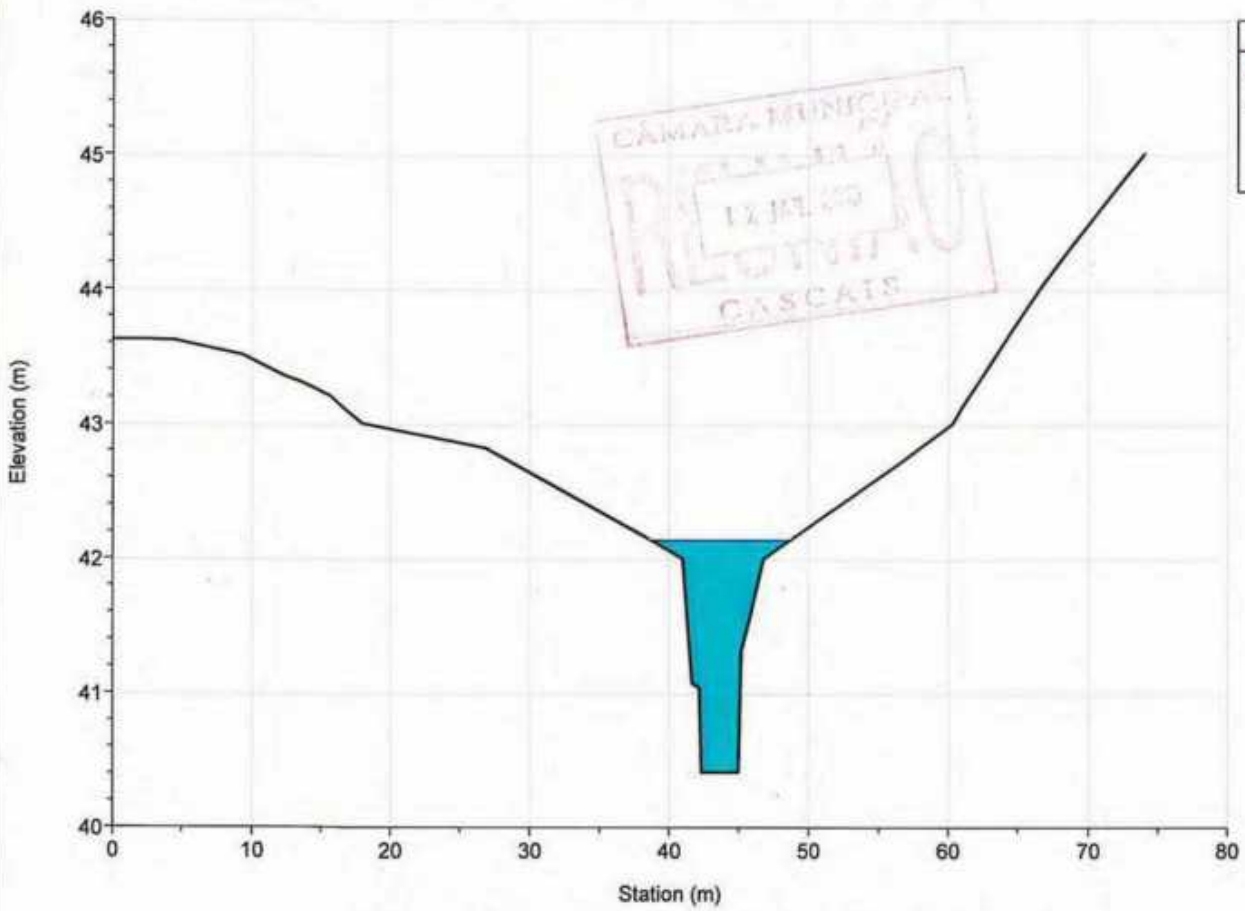
River = MOCHOS Reach = Ribeira RS = 2868.863



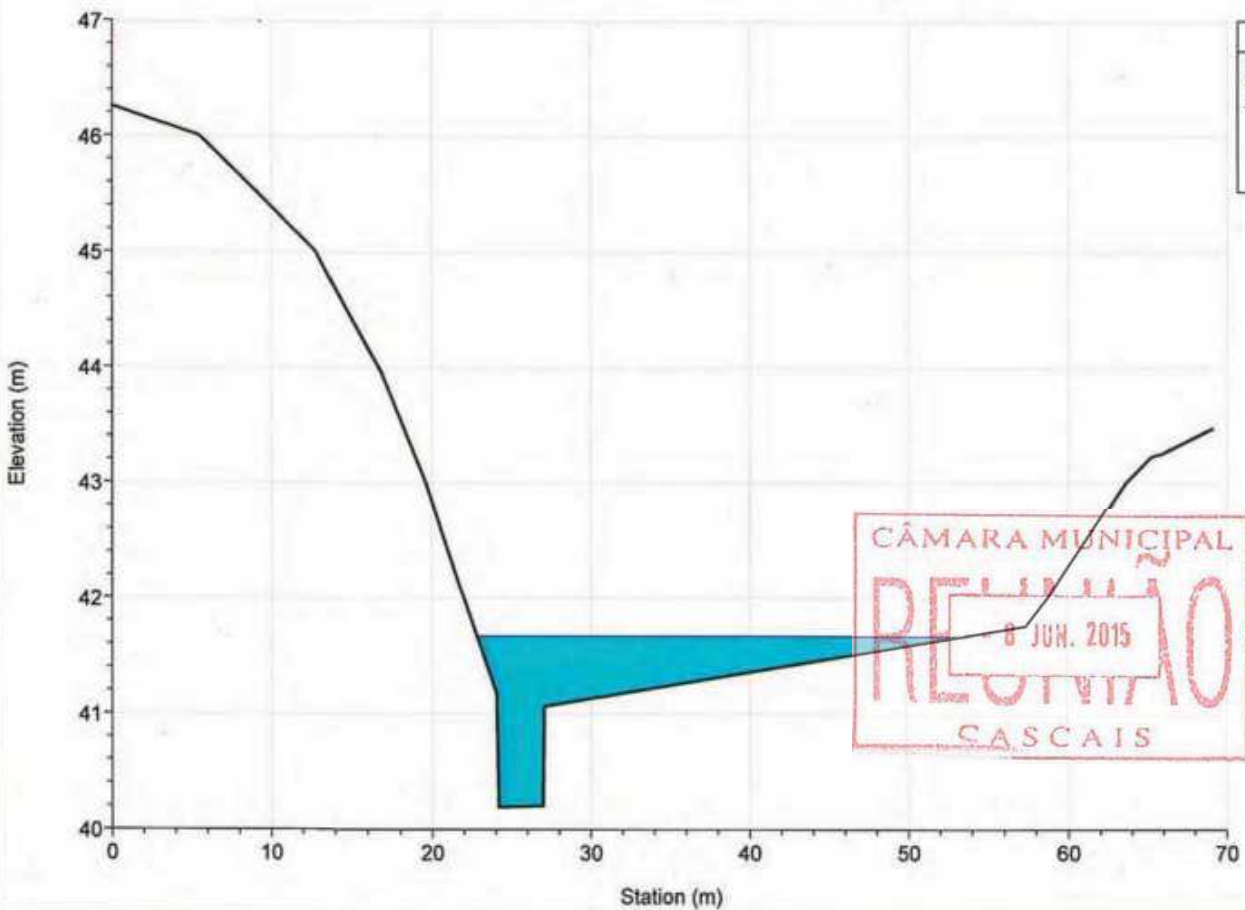
River = MOCHOS Reach = Ribeira RS = 2773.112



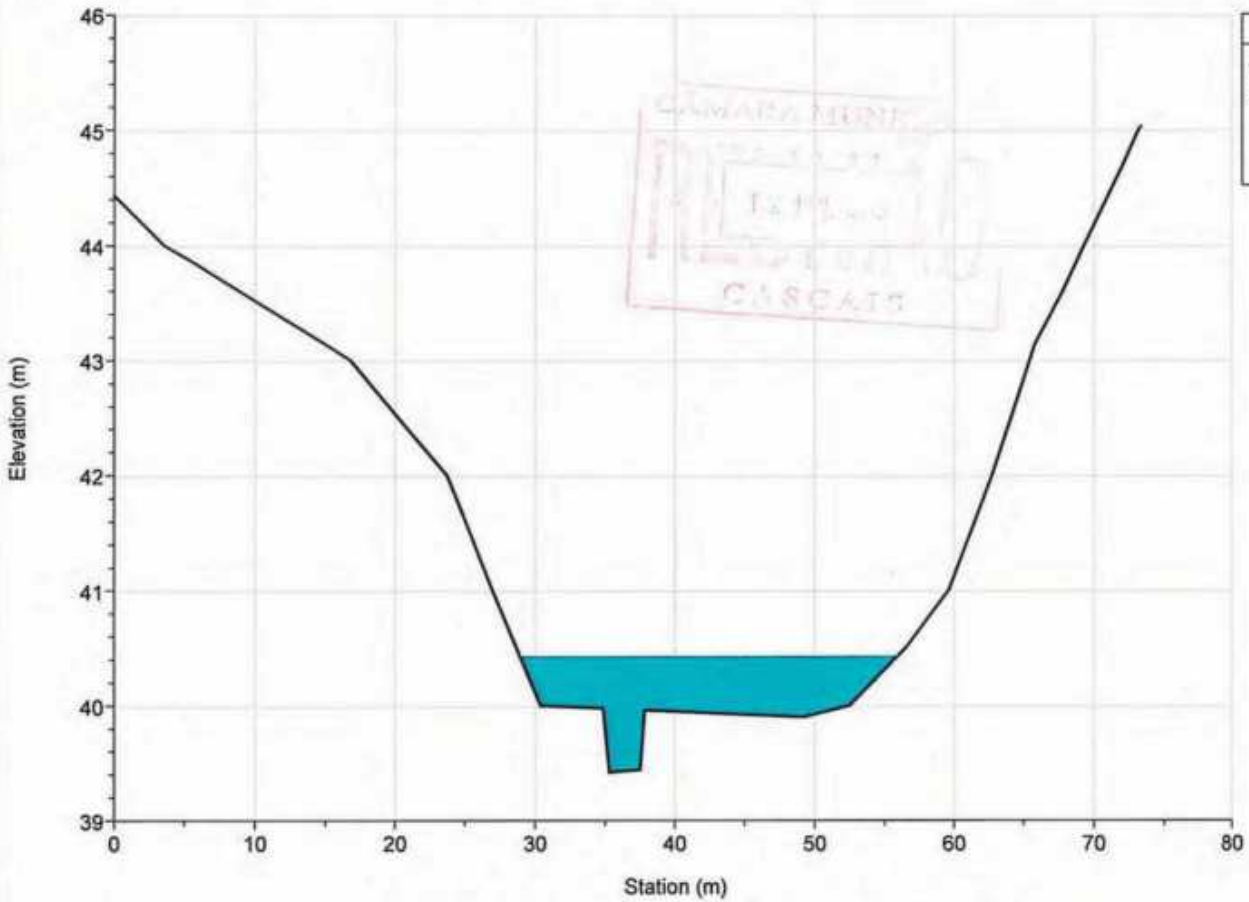
River = MOCHOS Reach = Ribeira RS = 2702.855



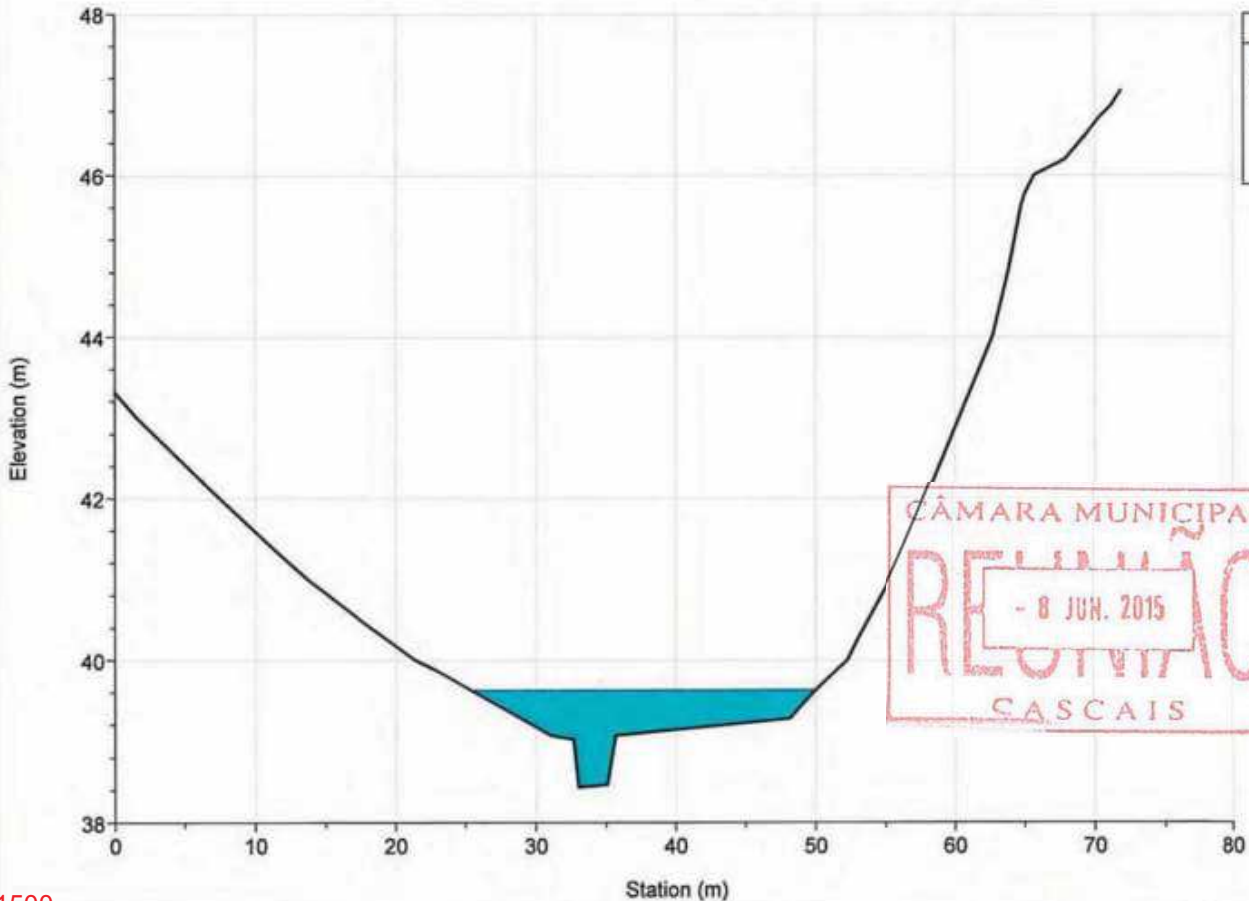
River = MOCHOS Reach = Ribeira RS = 2619.960



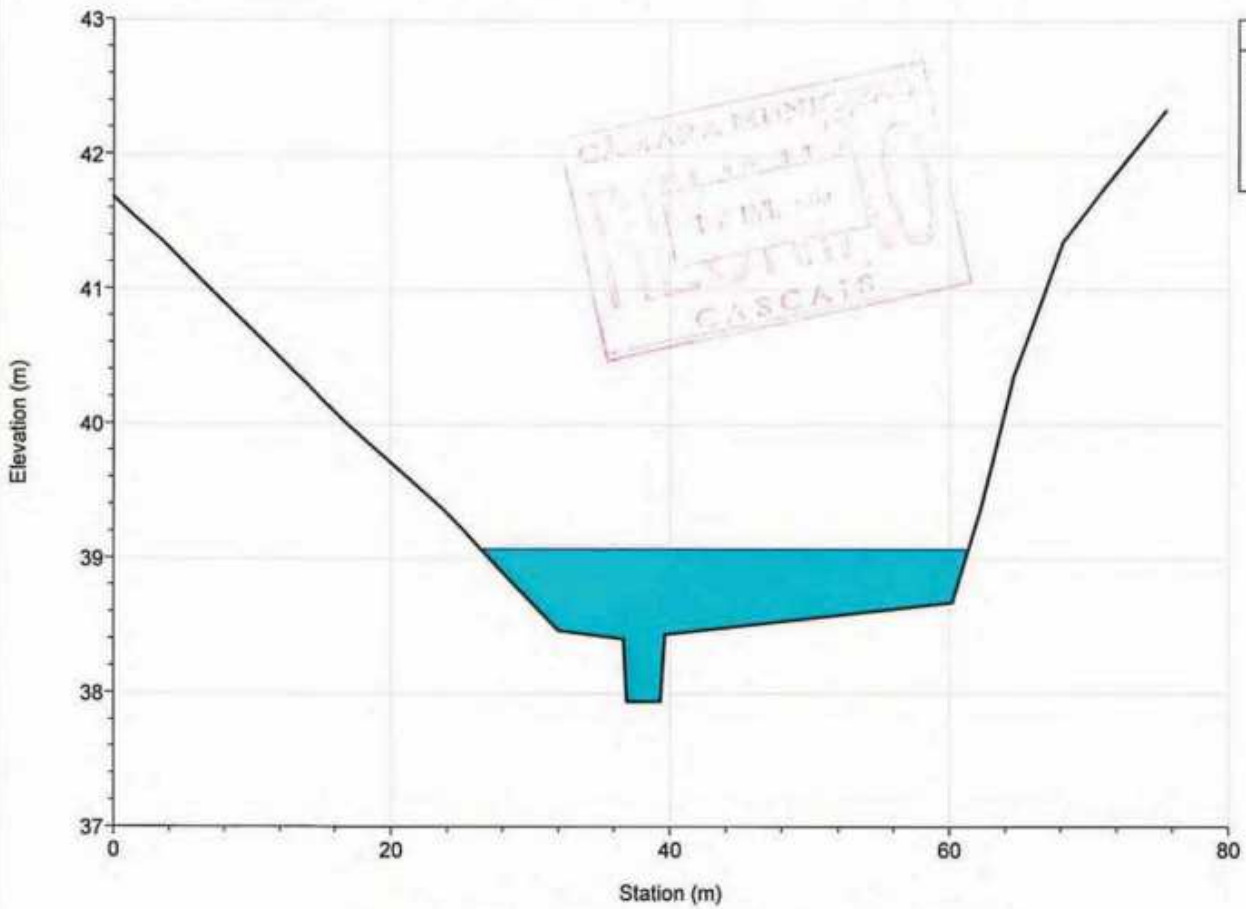
River = MOCHOS Reach = Ribeira RS = 2562.040



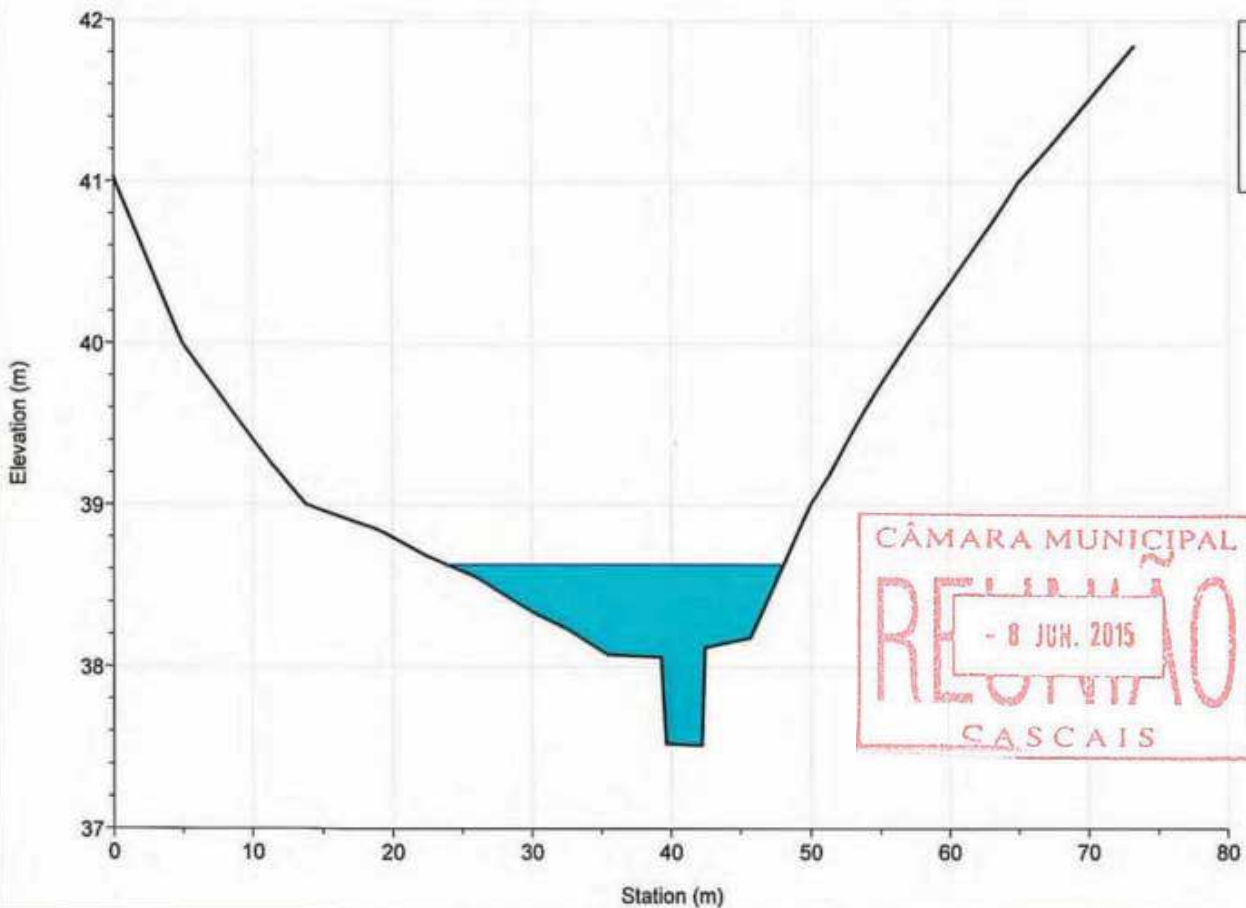
River = MOCHOS Reach = Ribeira RS = 2491.713



River = MOCHOS Reach = Ribeira RS = 2394.030

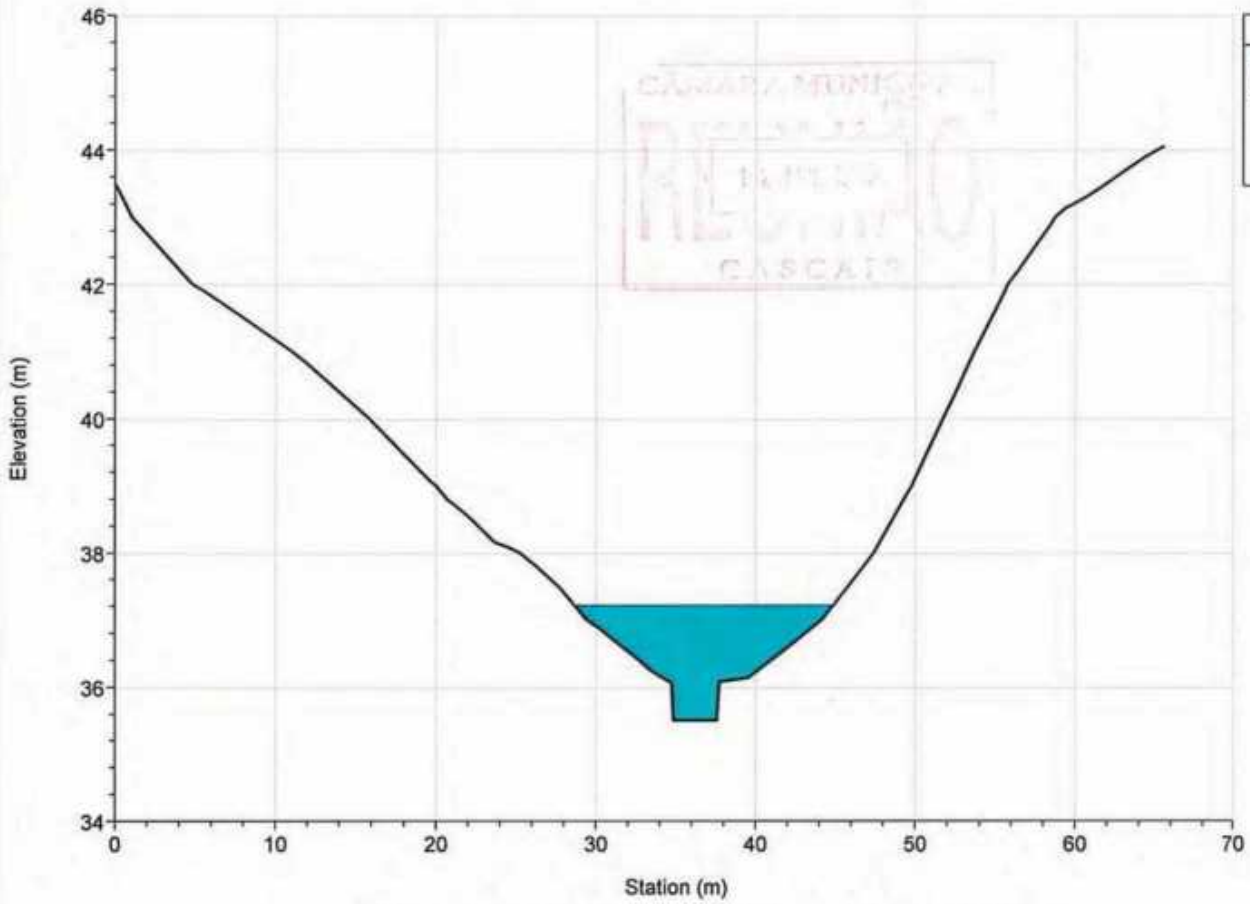


River = MOCHOS Reach = Ribeira RS = 2358.728

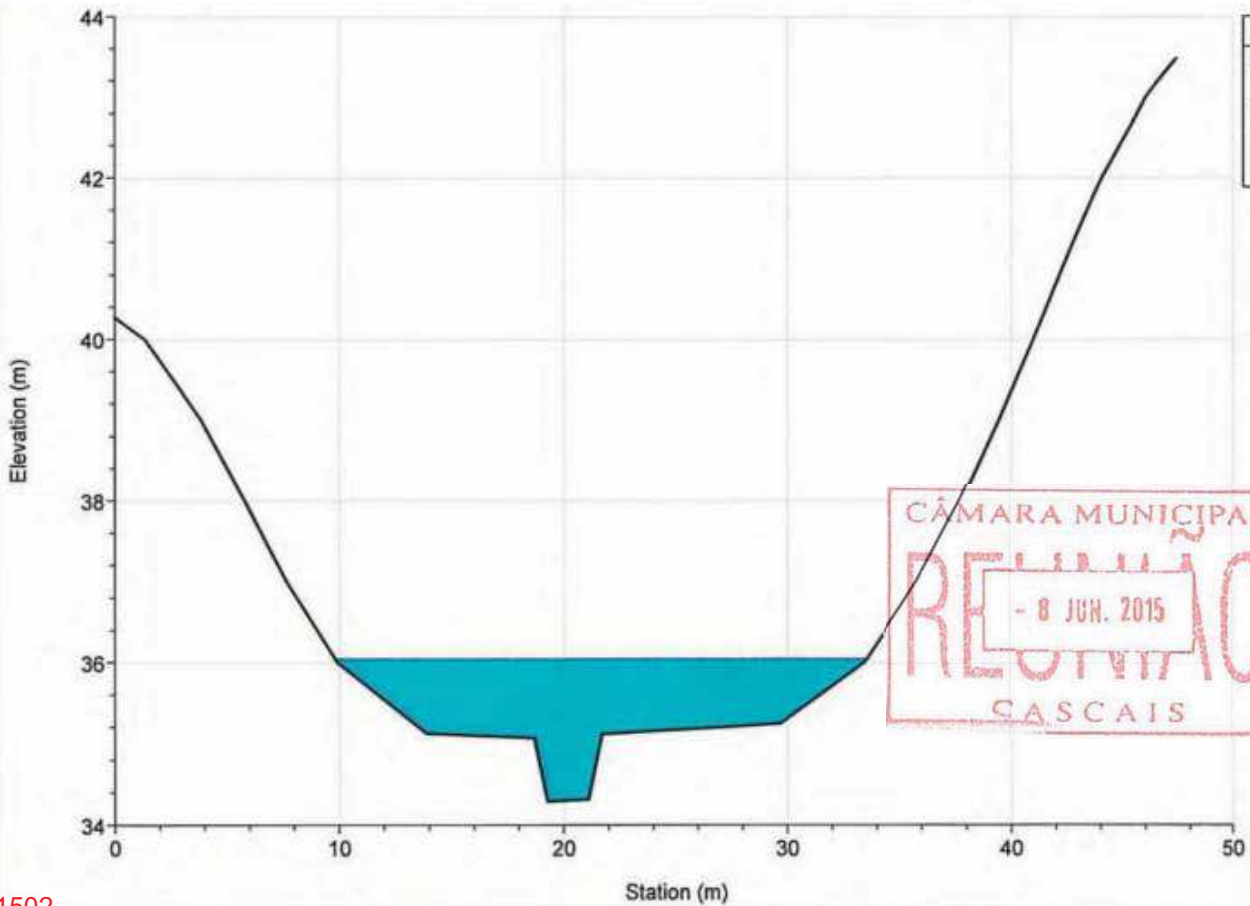




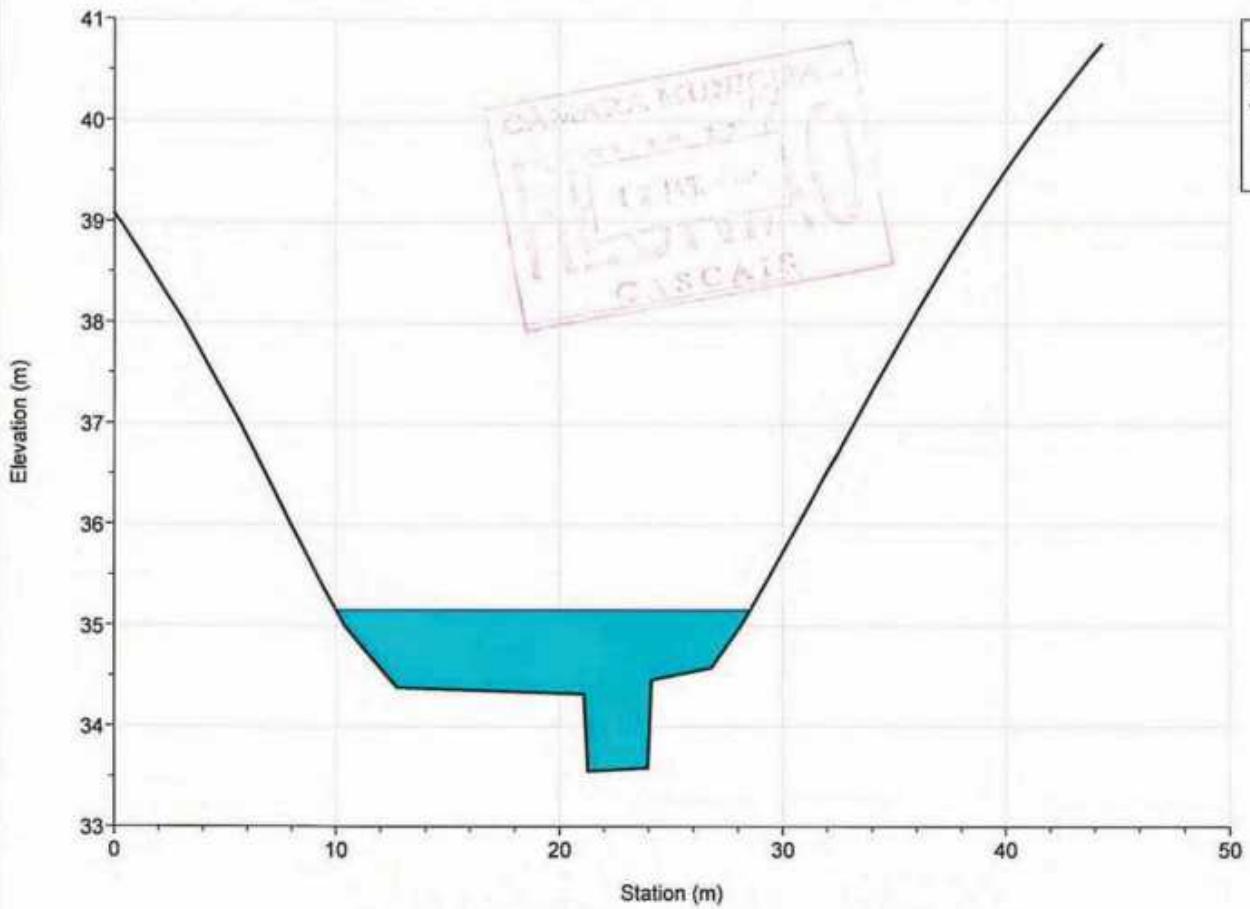
River = MOCHOS Reach = Ribeira RS = 2250.681



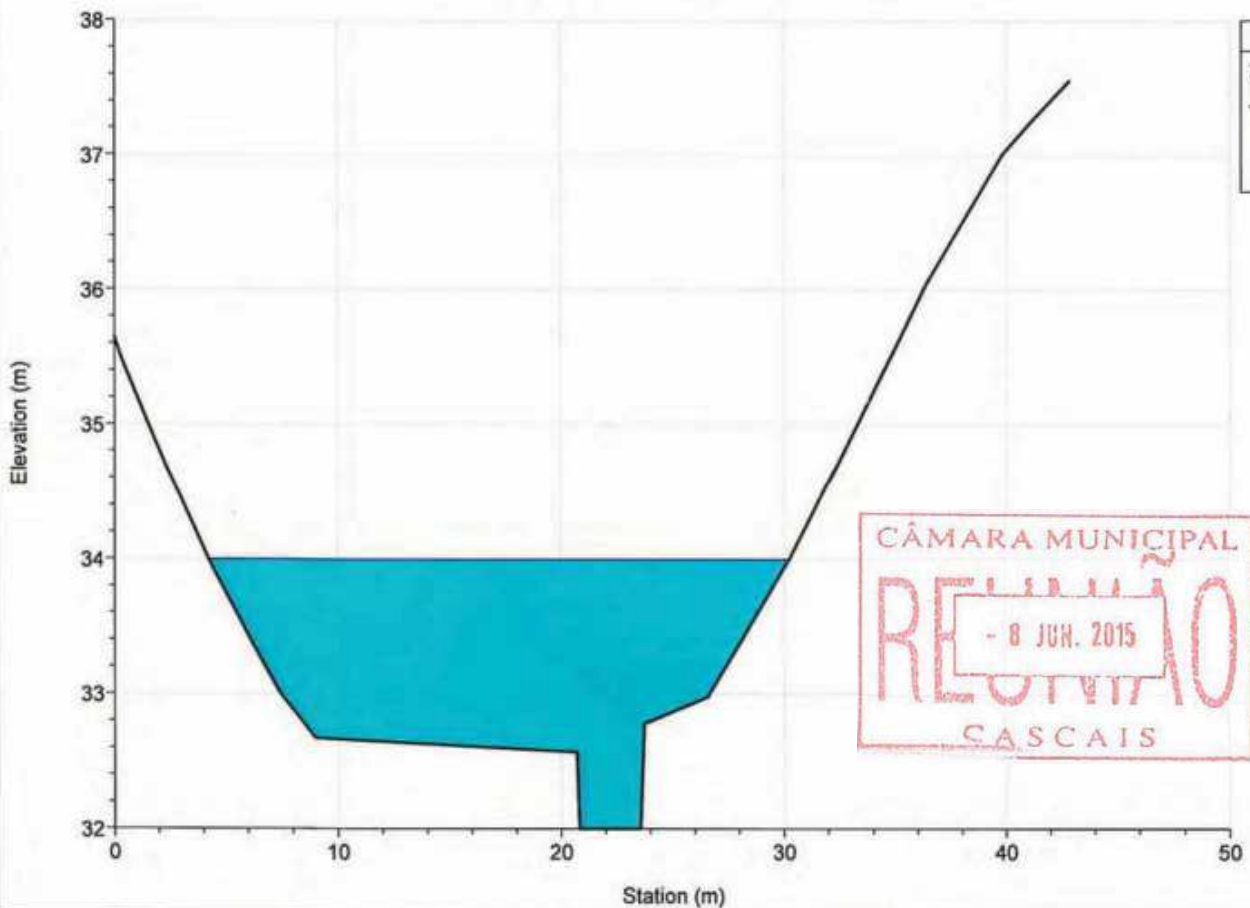
River = MOCHOS Reach = Ribeira RS = 2163.156



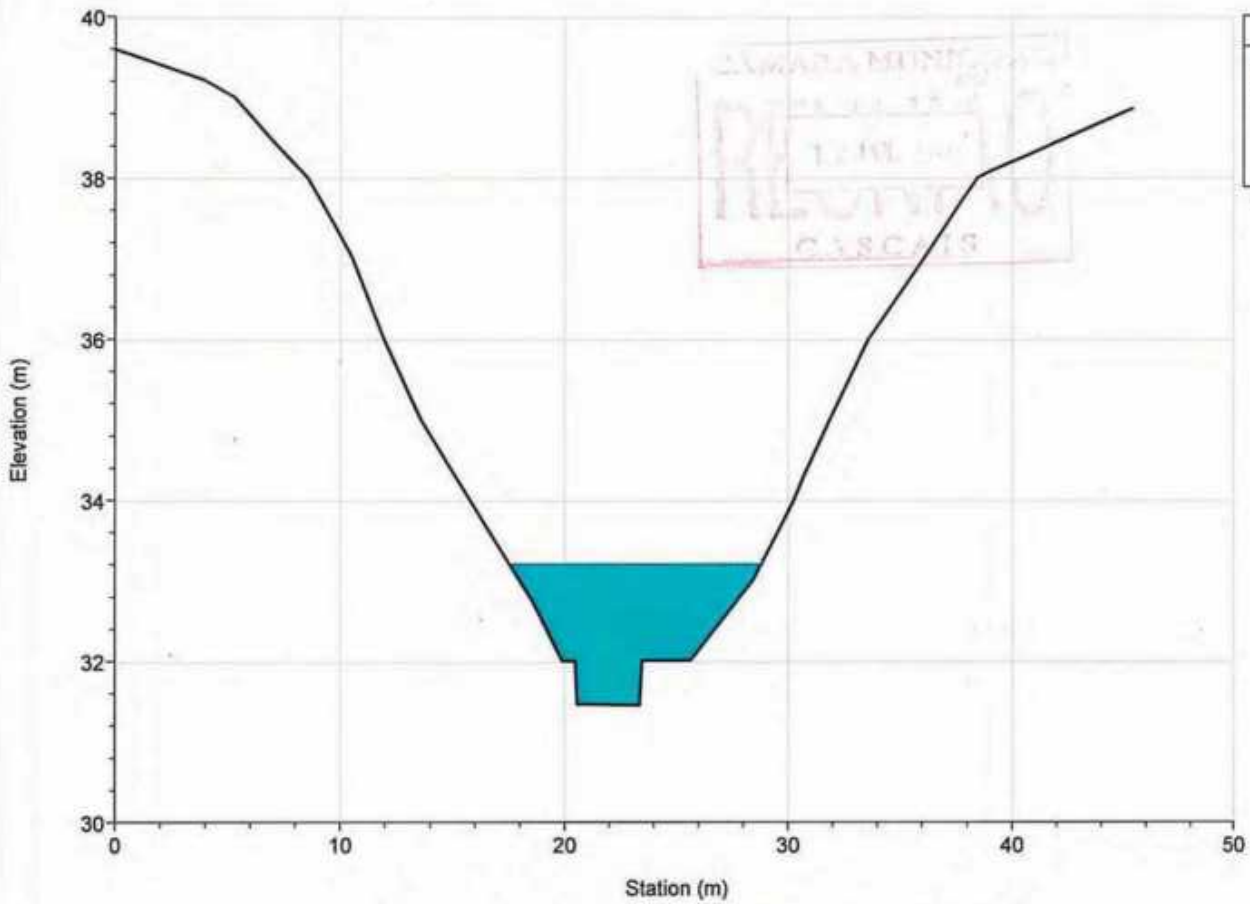
River = MOCHOS Reach = Ribeira RS = 2084.313



River = MOCHOS Reach = Ribeira RS = 2009.891

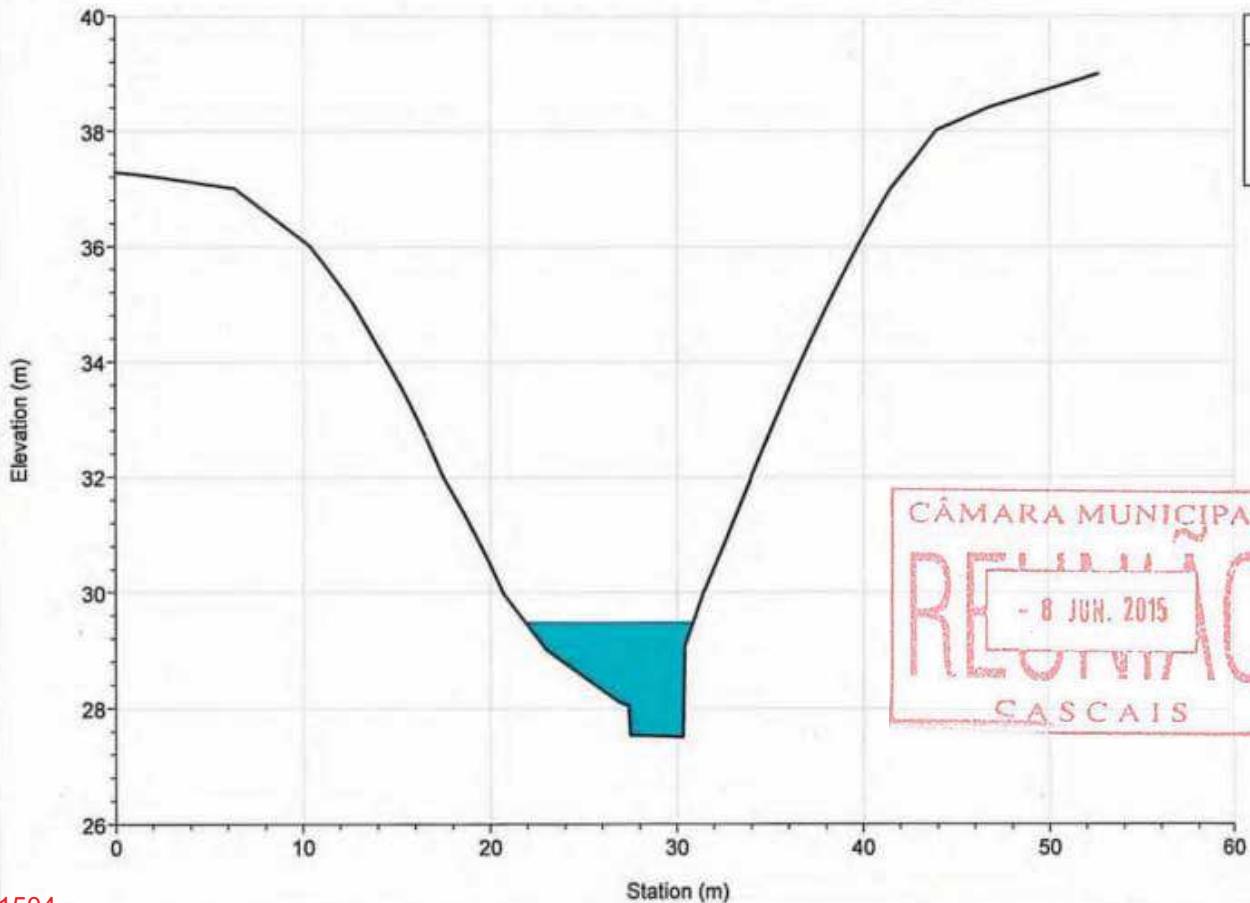


River = MOCHOS Reach = Ribeira RS = 1938.852



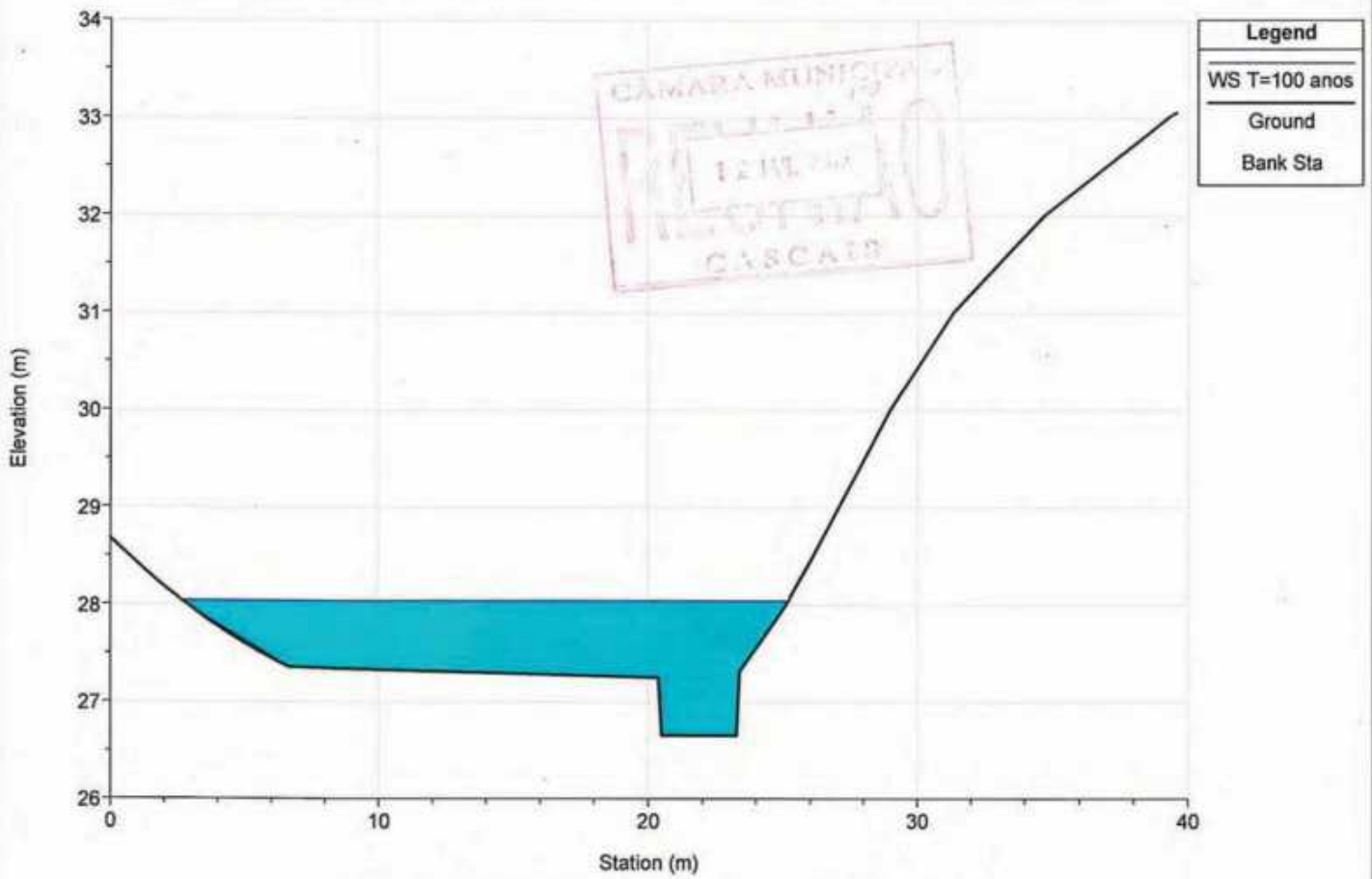
Legend
WS T=100 anos
Ground
Bank Sta

River = MOCHOS Reach = Ribeira RS = 1810.493

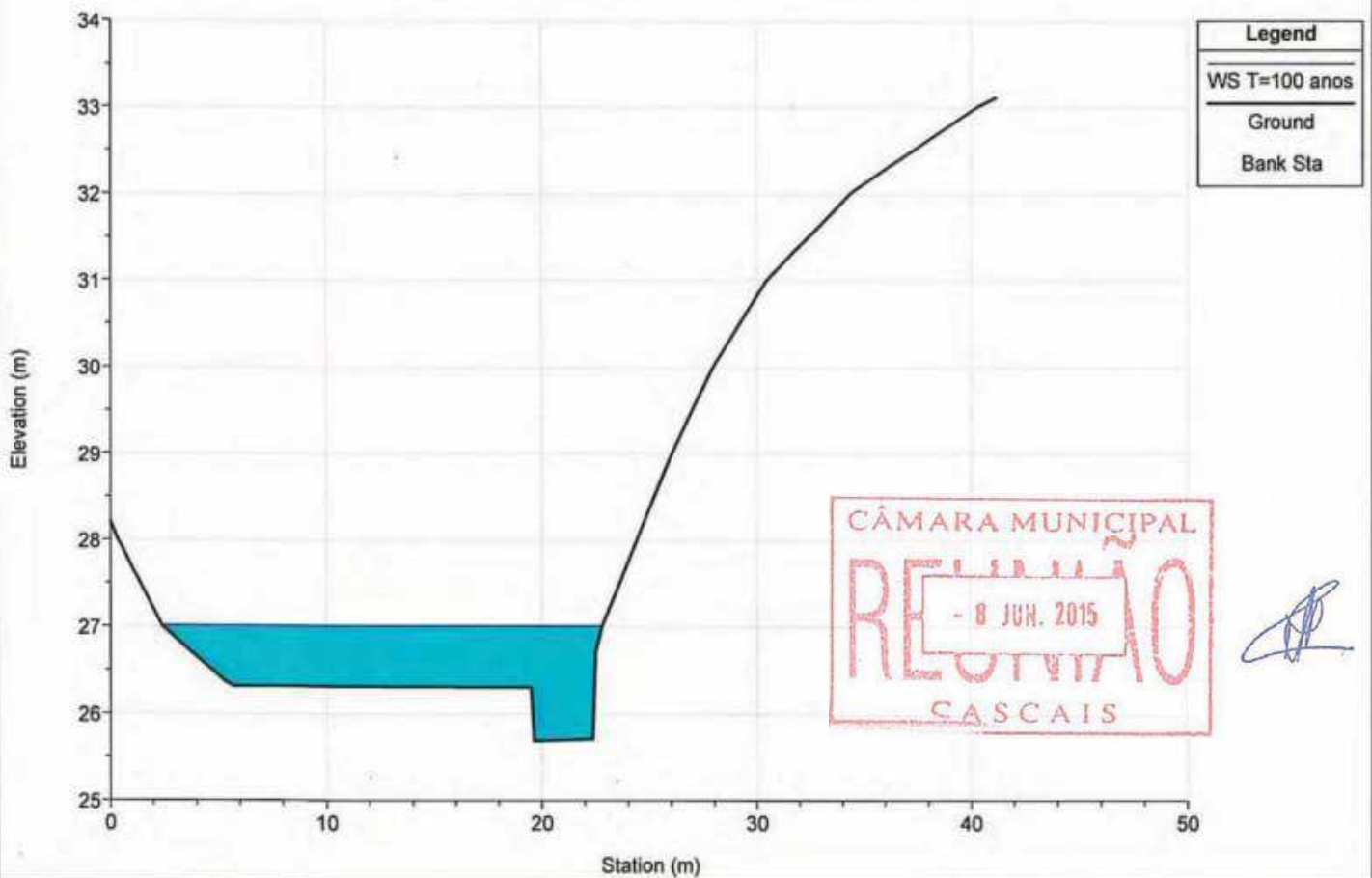


Legend
WS T=100 anos
Ground
Bank Sta

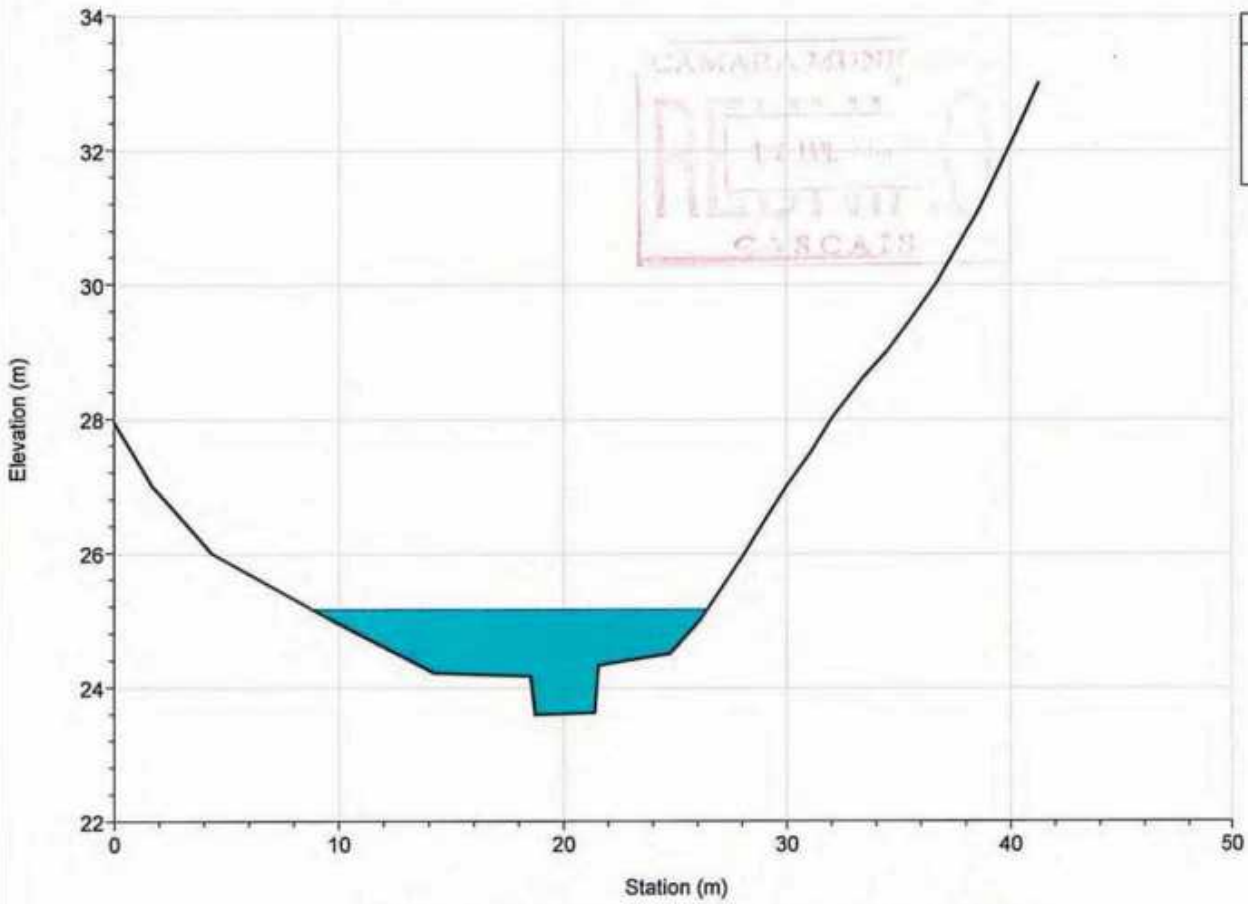
River = MOCHOS Reach = Ribeira RS = 1735.369



River = MOCHOS Reach = Ribeira RS = 1667.347

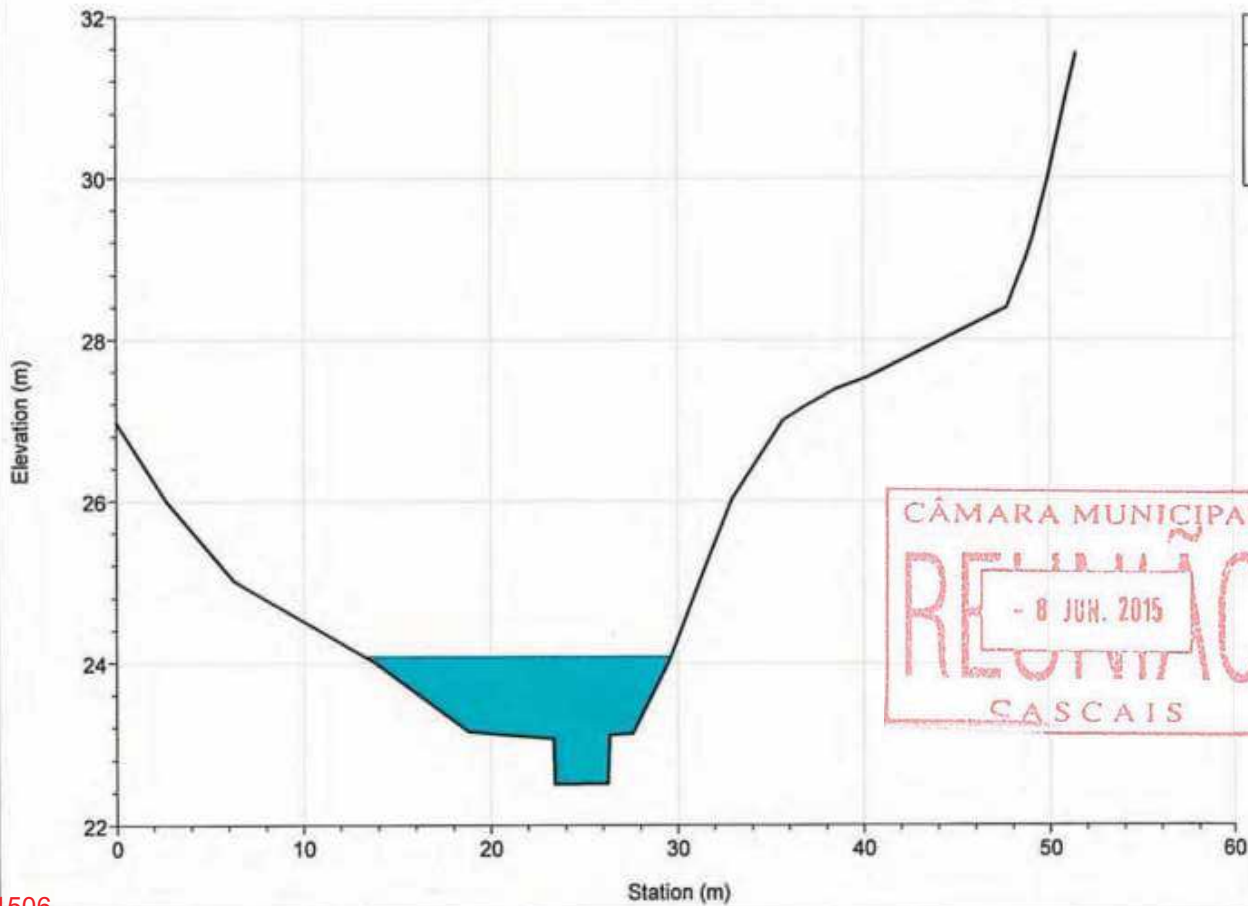


River = MOCHOS Reach = Ribeira RS = 1575.837



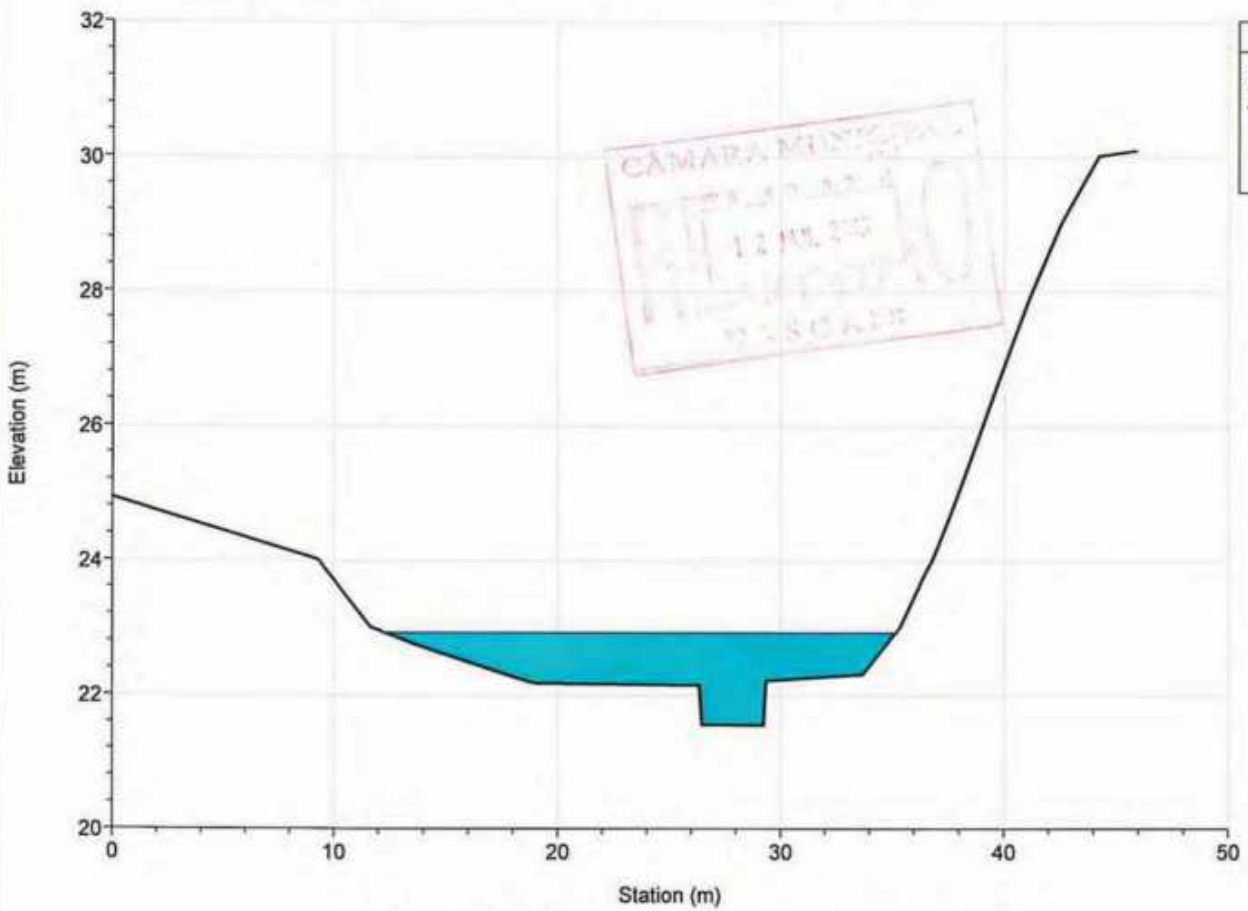
Legend
WS T=100 anos
Ground
Bank Sta

River = MOCHOS Reach = Ribeira RS = 1499.798

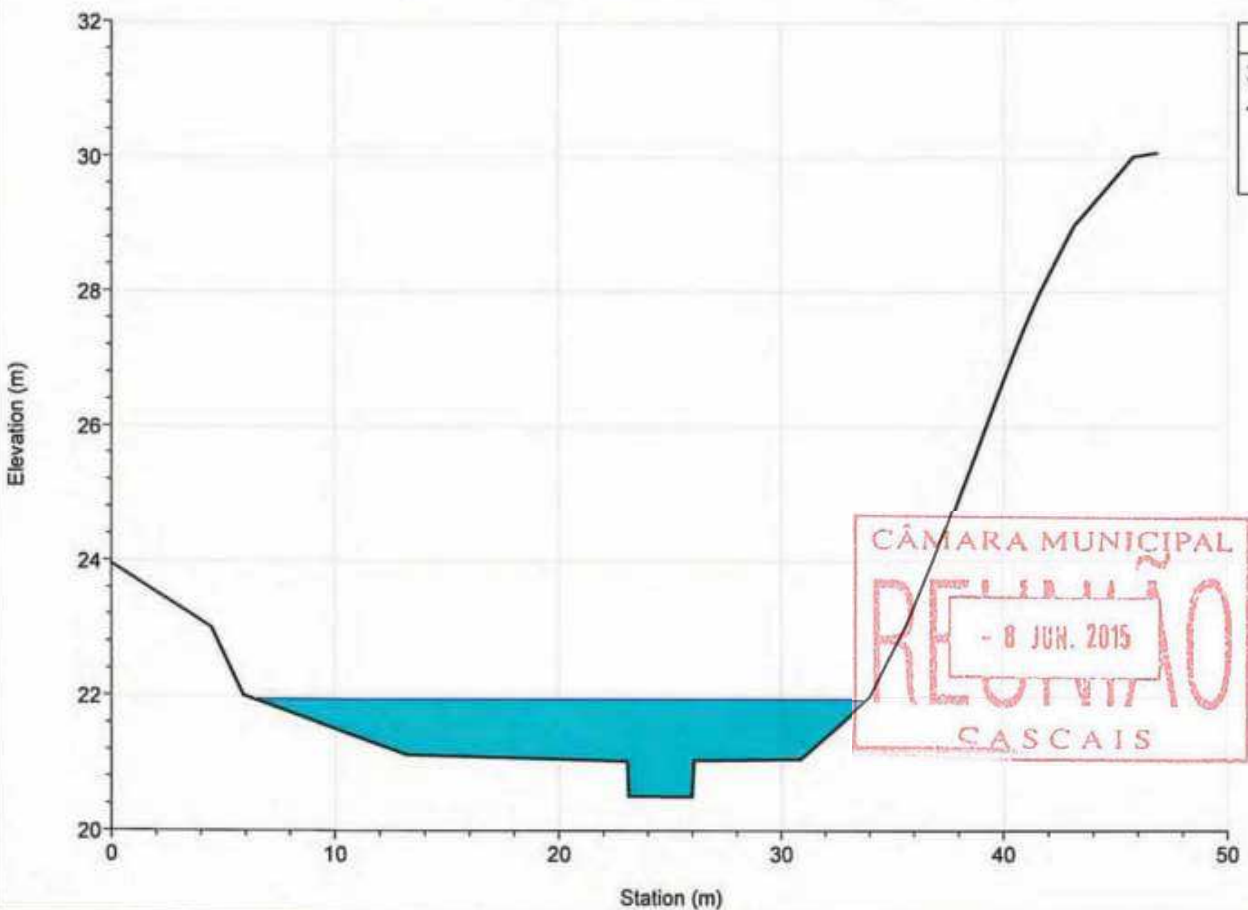


Legend
WS T=100 anos
Ground
Bank Sta

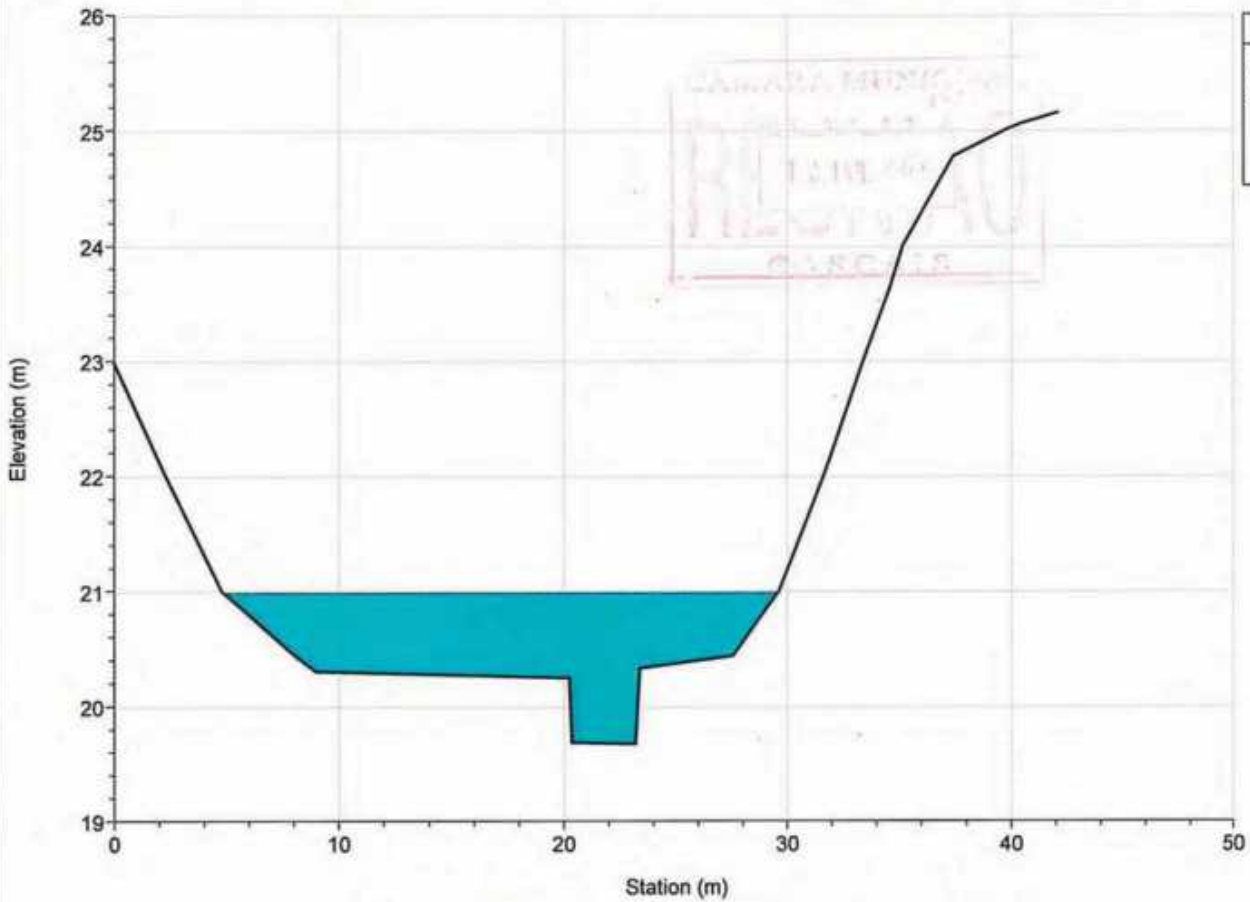
River = MOCHOS Reach = Ribeira RS = 1418.259



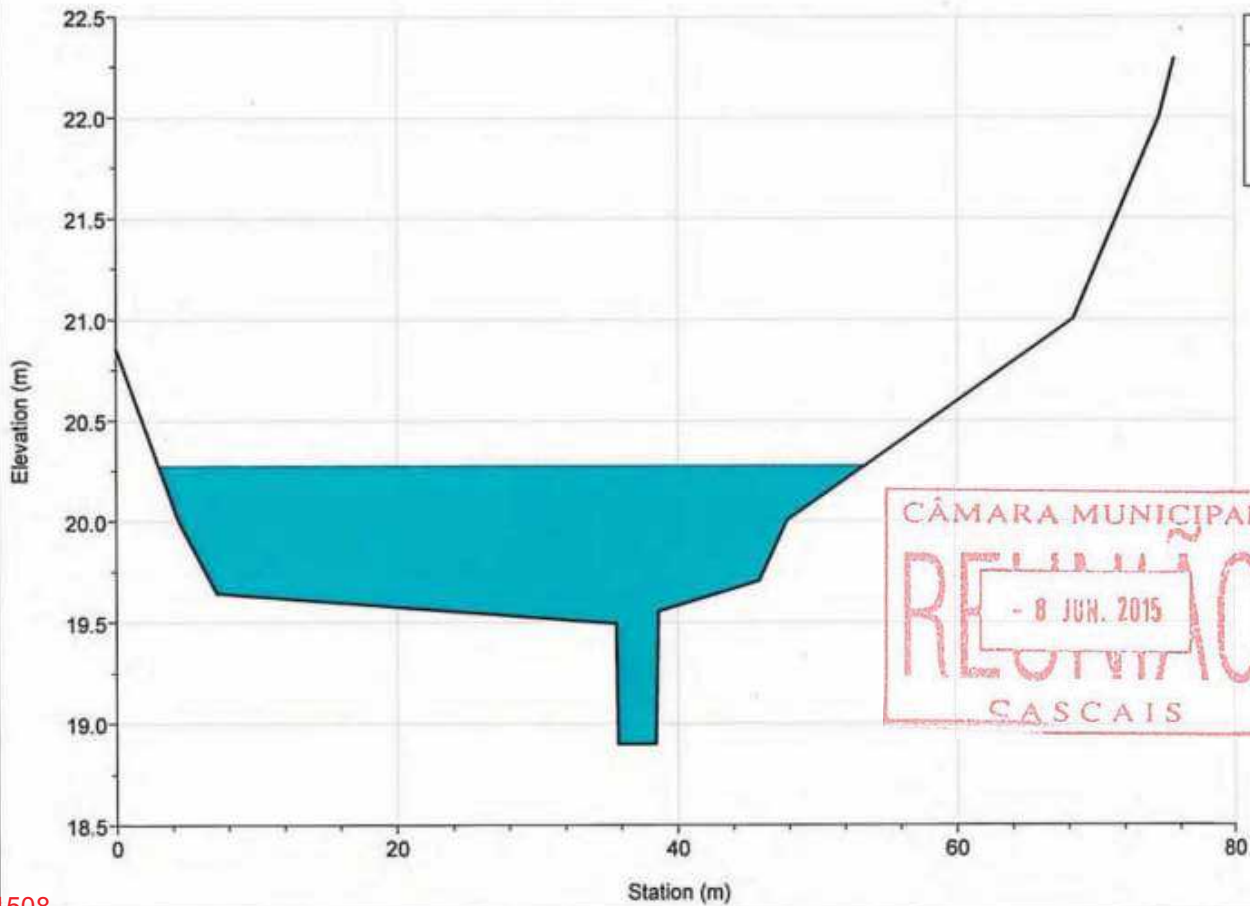
River = MOCHOS Reach = Ribeira RS = 1347.475



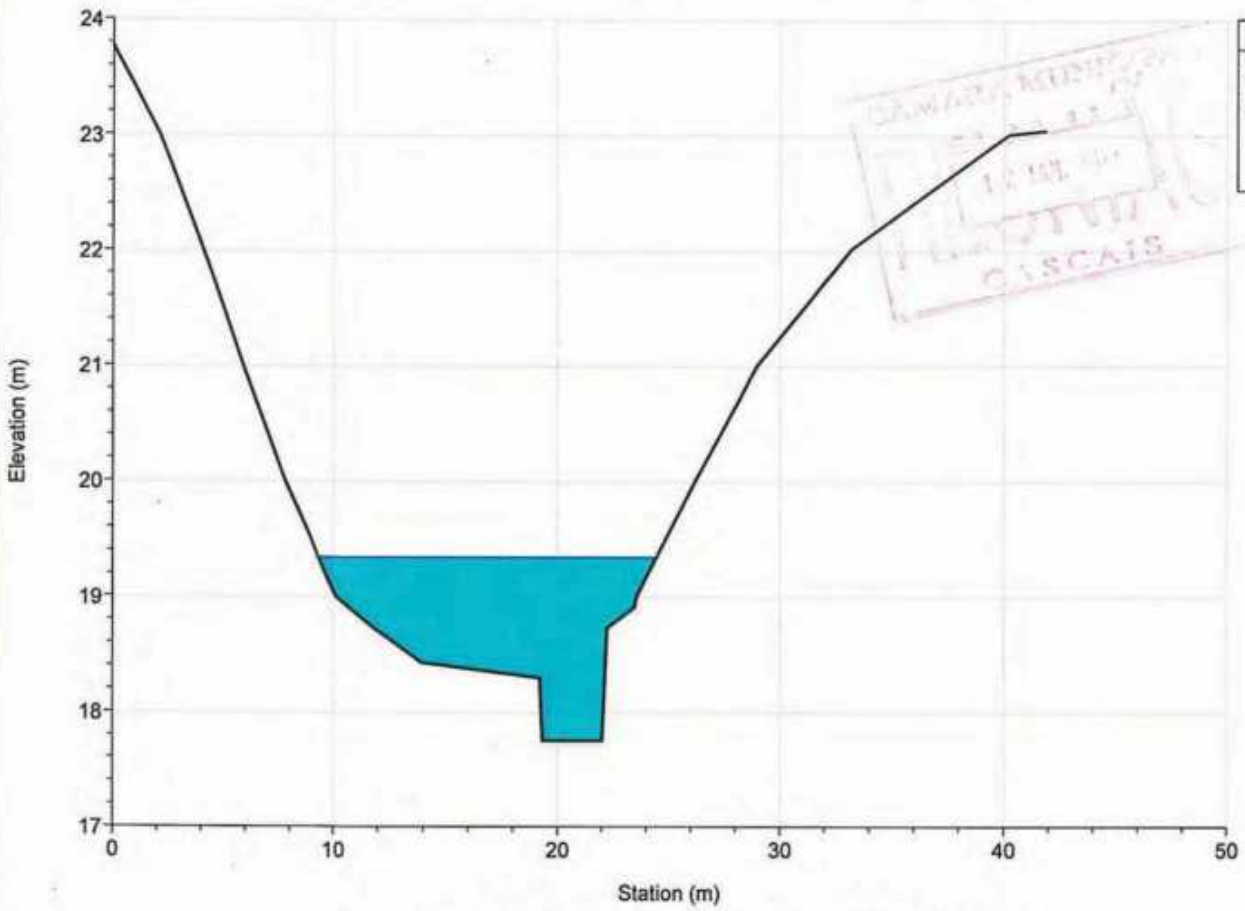
River = MOCHOS Reach = Ribeira RS = 1263.298



River = MOCHOS Reach = Ribeira RS = 1181.670

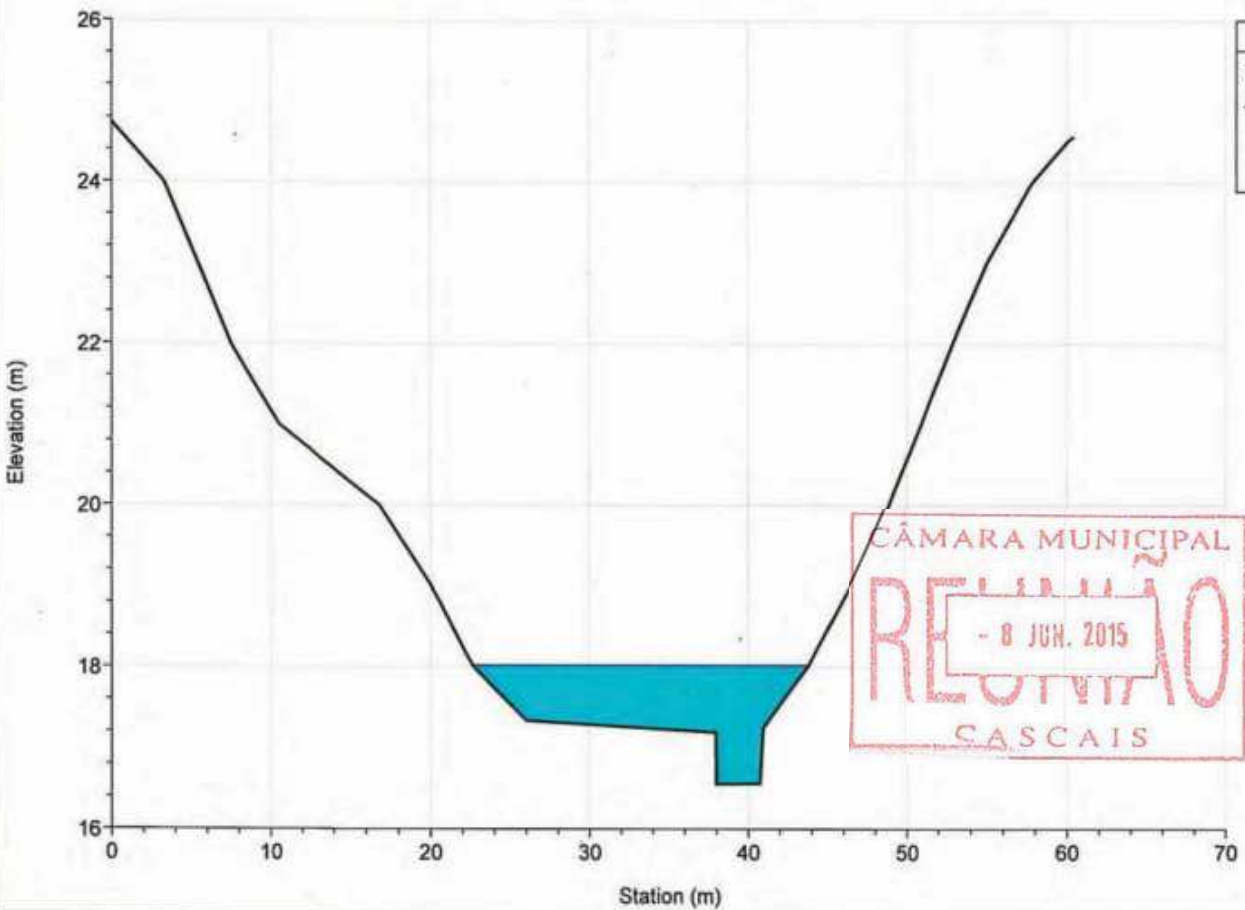


River = MOCHOS Reach = Ribeira RS = 1103.223



Legend
WS T=100 anos
Ground
Bank Sta

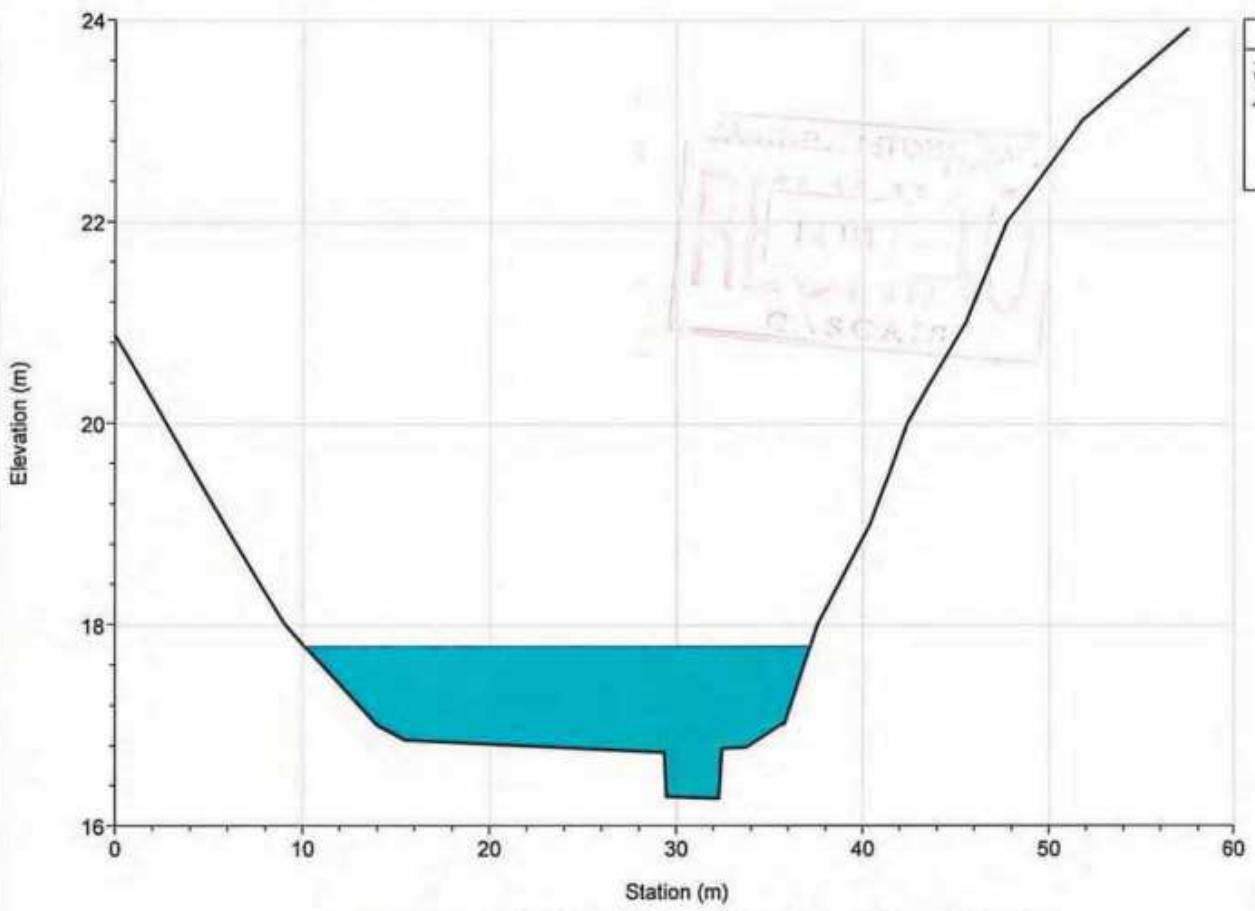
River = MOCHOS Reach = Ribeira RS = 1035.076



Legend
WS T=100 anos
Ground
Bank Sta

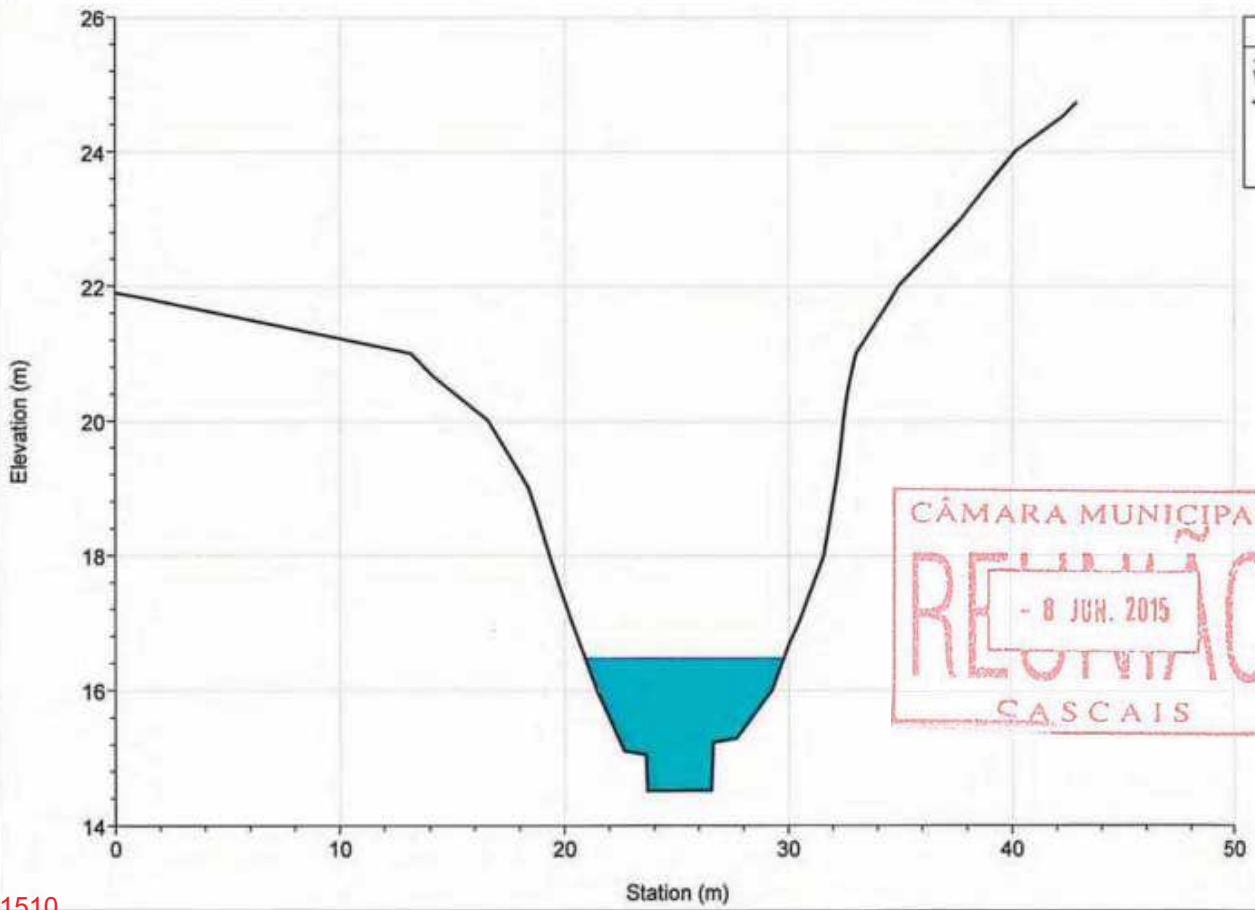


River = MOCHOS Reach = Ribeira RS = 997.311



Legend
WS T=100 anos
Ground
Bank Sta

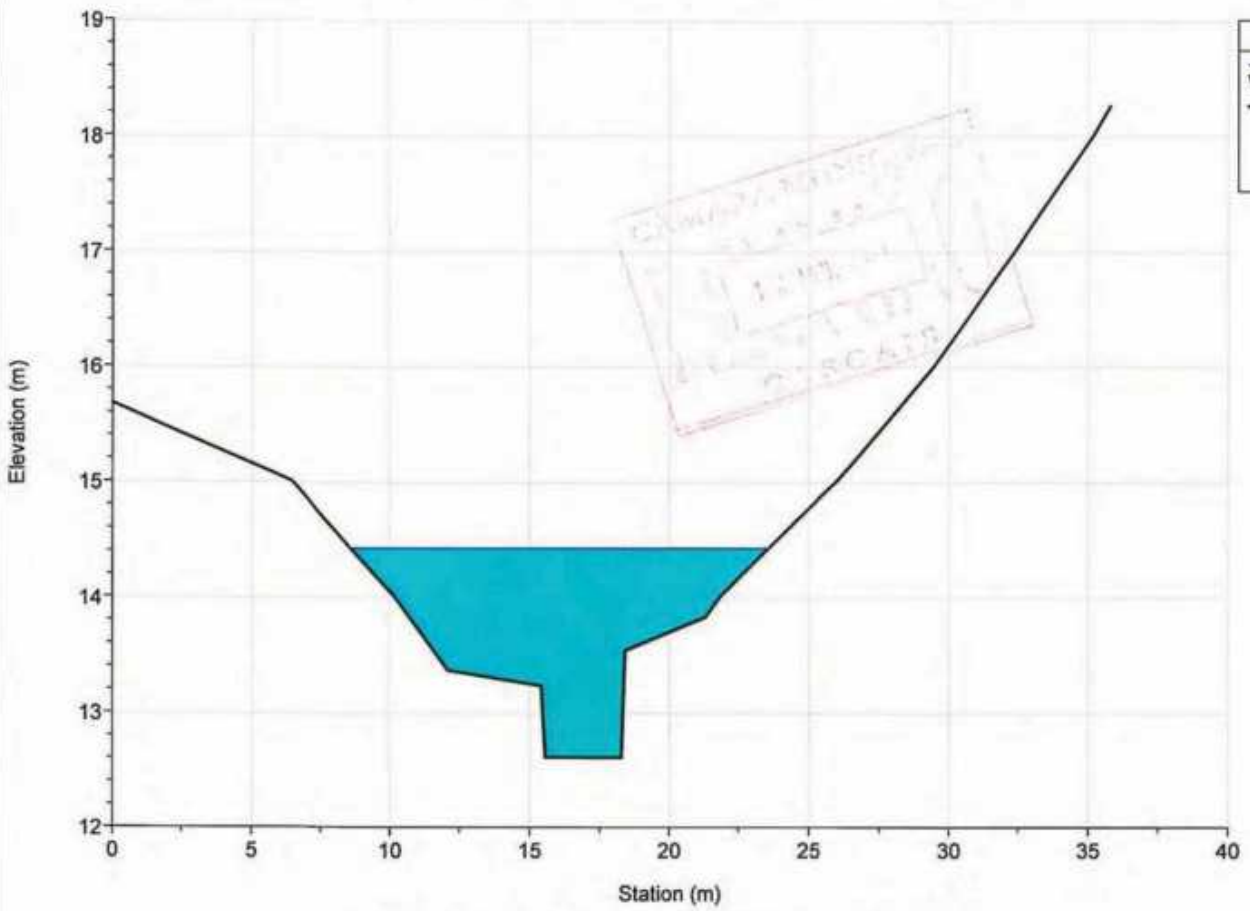
River = MOCHOS Reach = Ribeira RS = 891.670



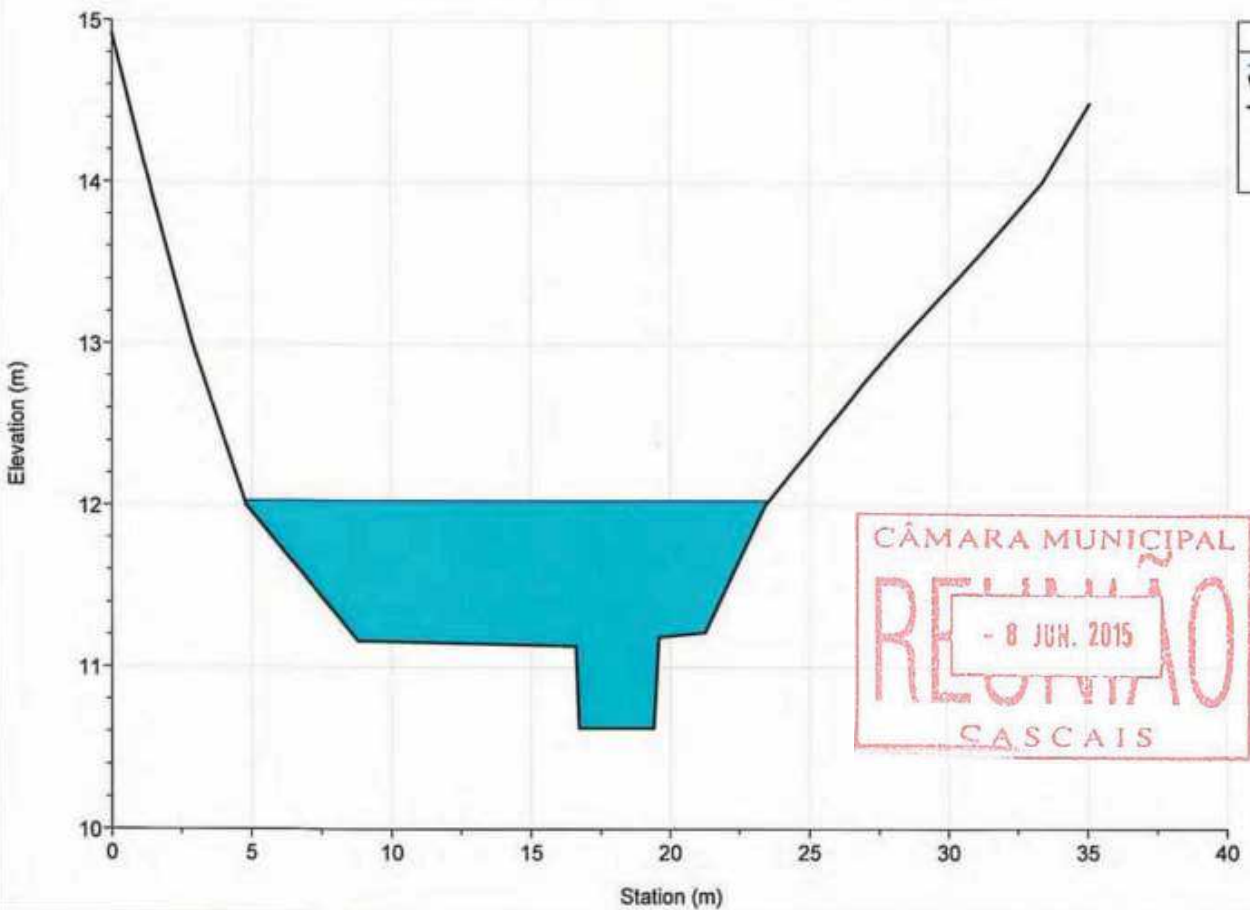
Legend
WS T=100 anos
Ground
Bank Sta

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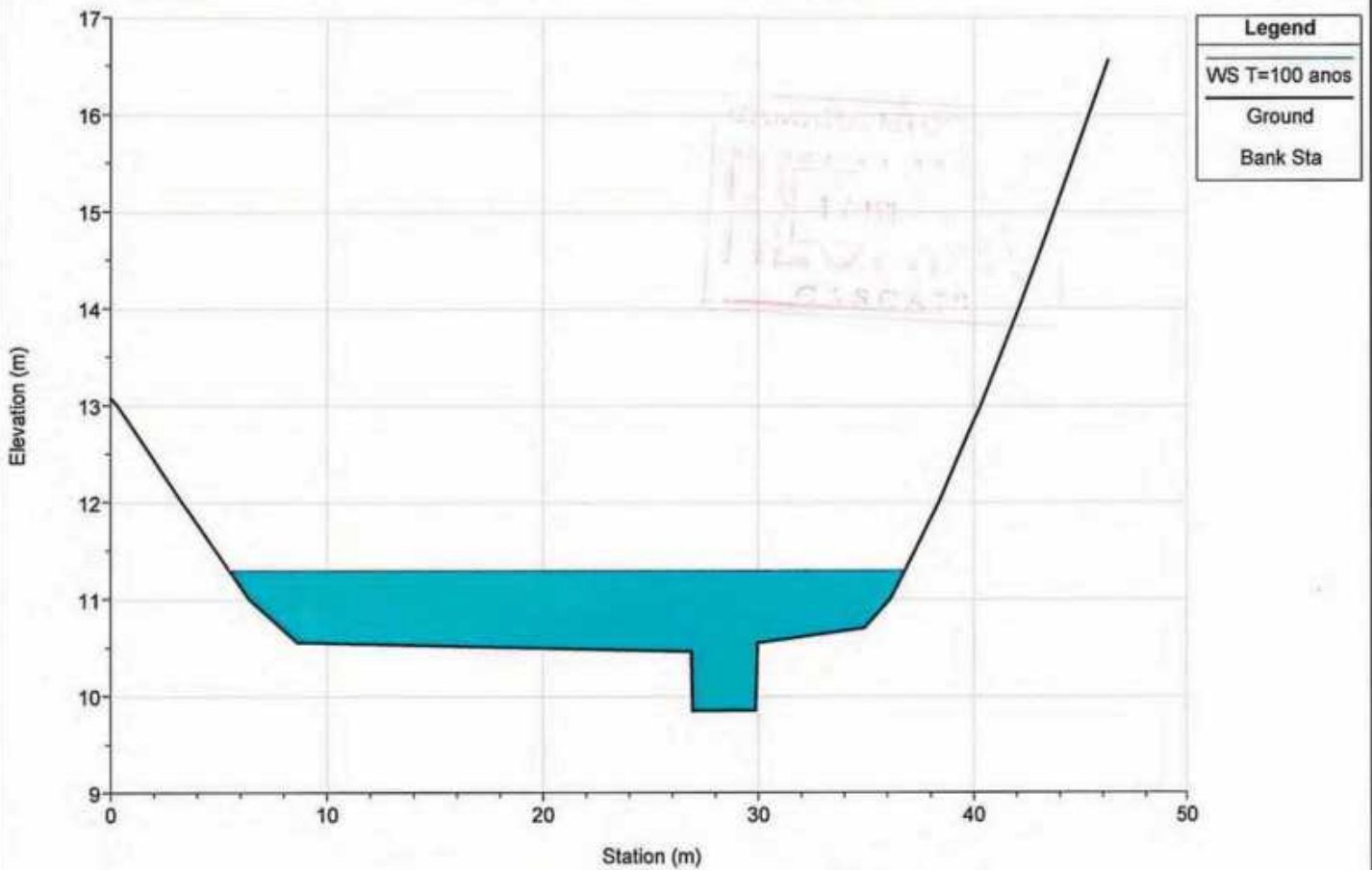
River = MOCHOS Reach = Ribeira RS = 798.921



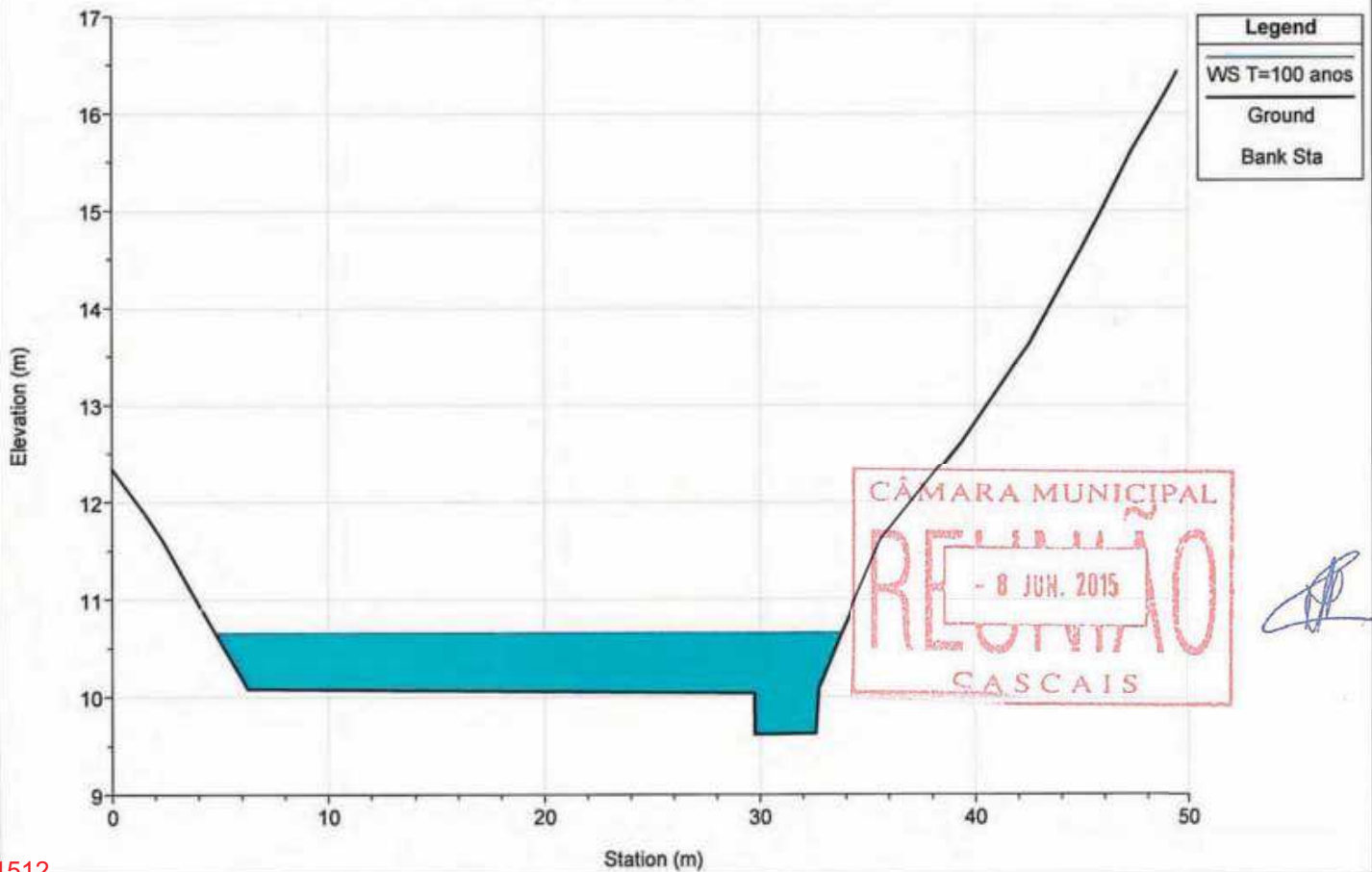
River = MOCHOS Reach = Ribeira RS = 715.365



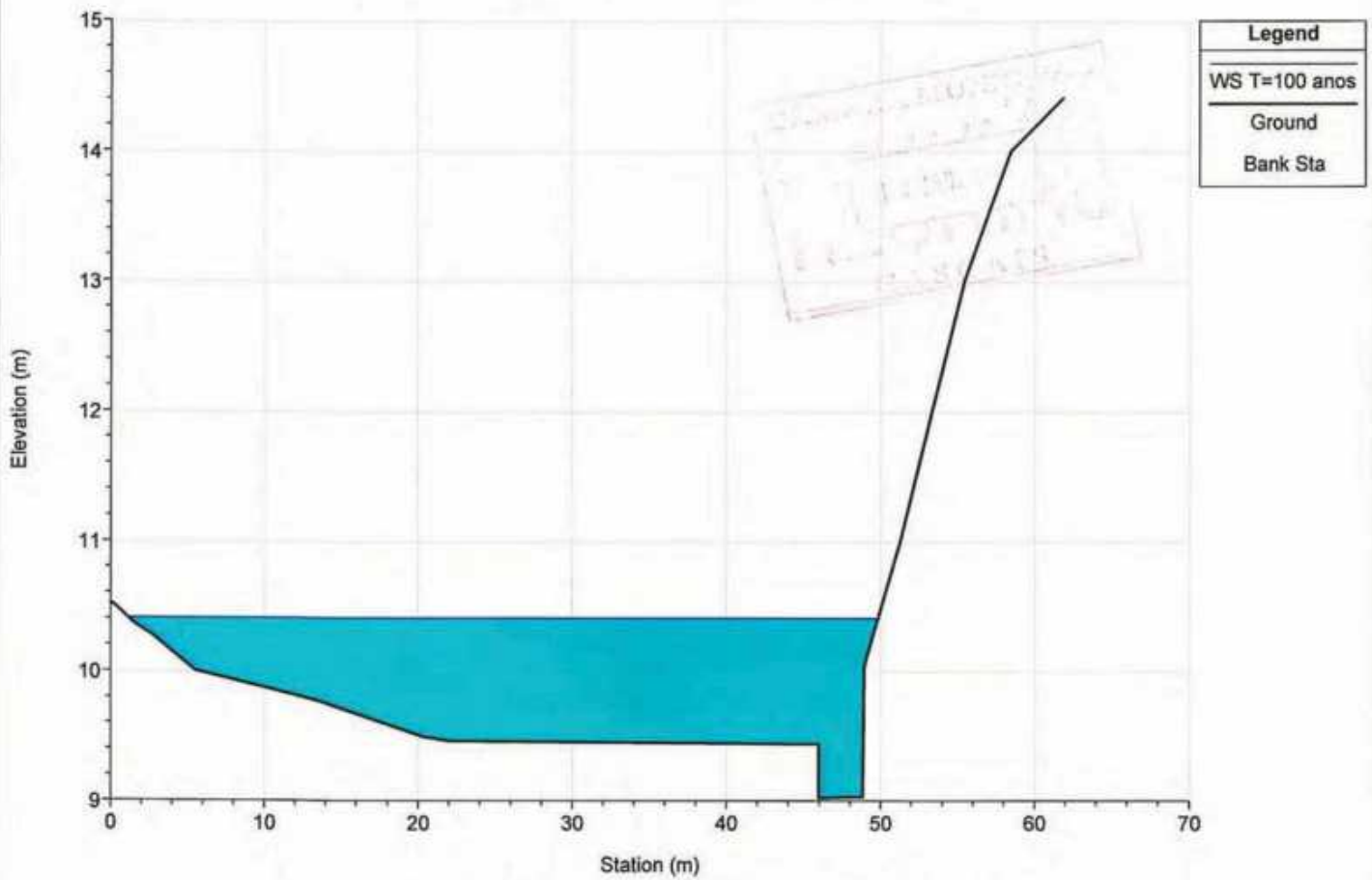
River = MOCHOS Reach = Ribeira RS = 627.993



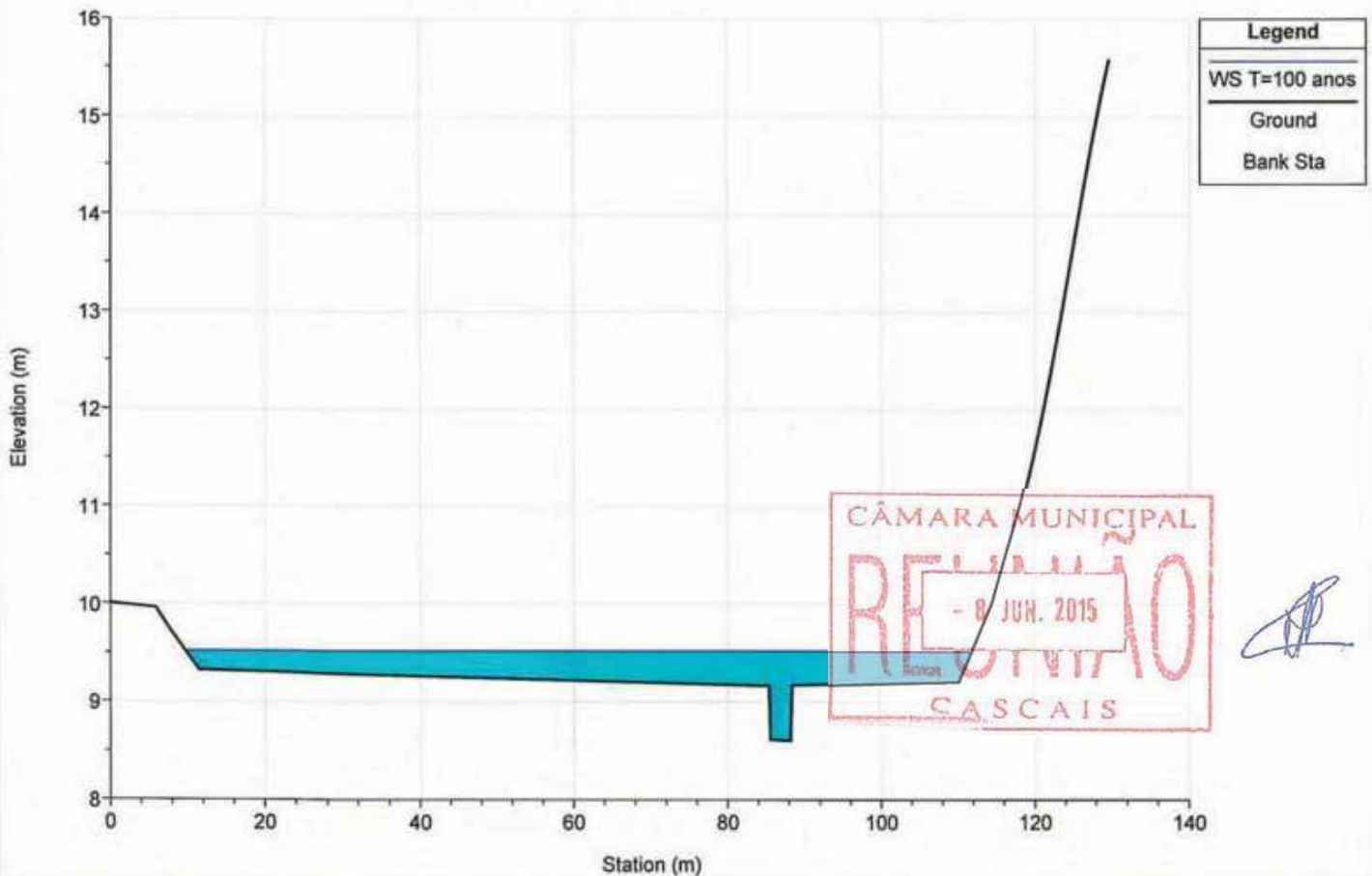
River = MOCHOS Reach = Ribeira RS = 574.737



River = MOCHOS Reach = Ribeira RS = 493.519

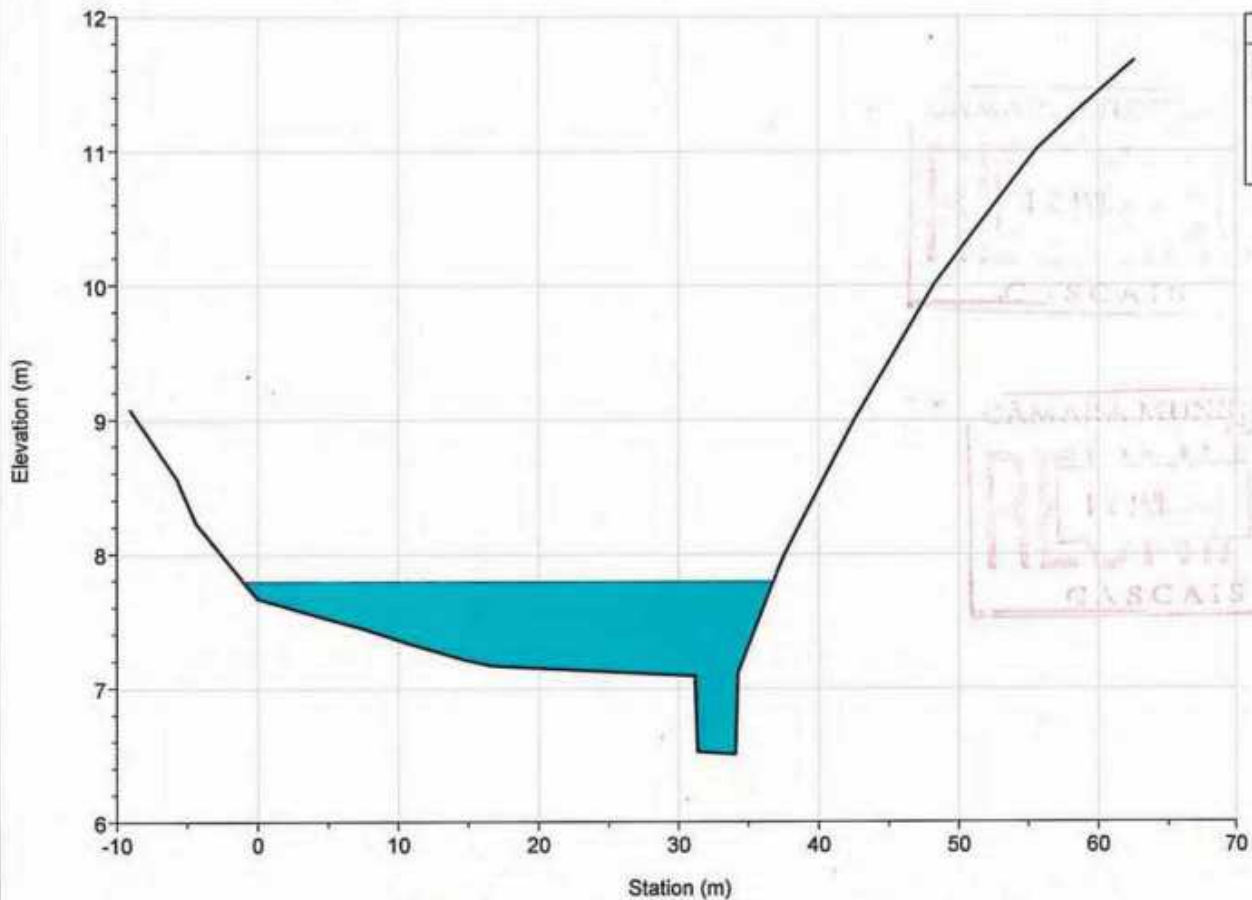


River = MOCHOS Reach = Ribeira RS = 339.909

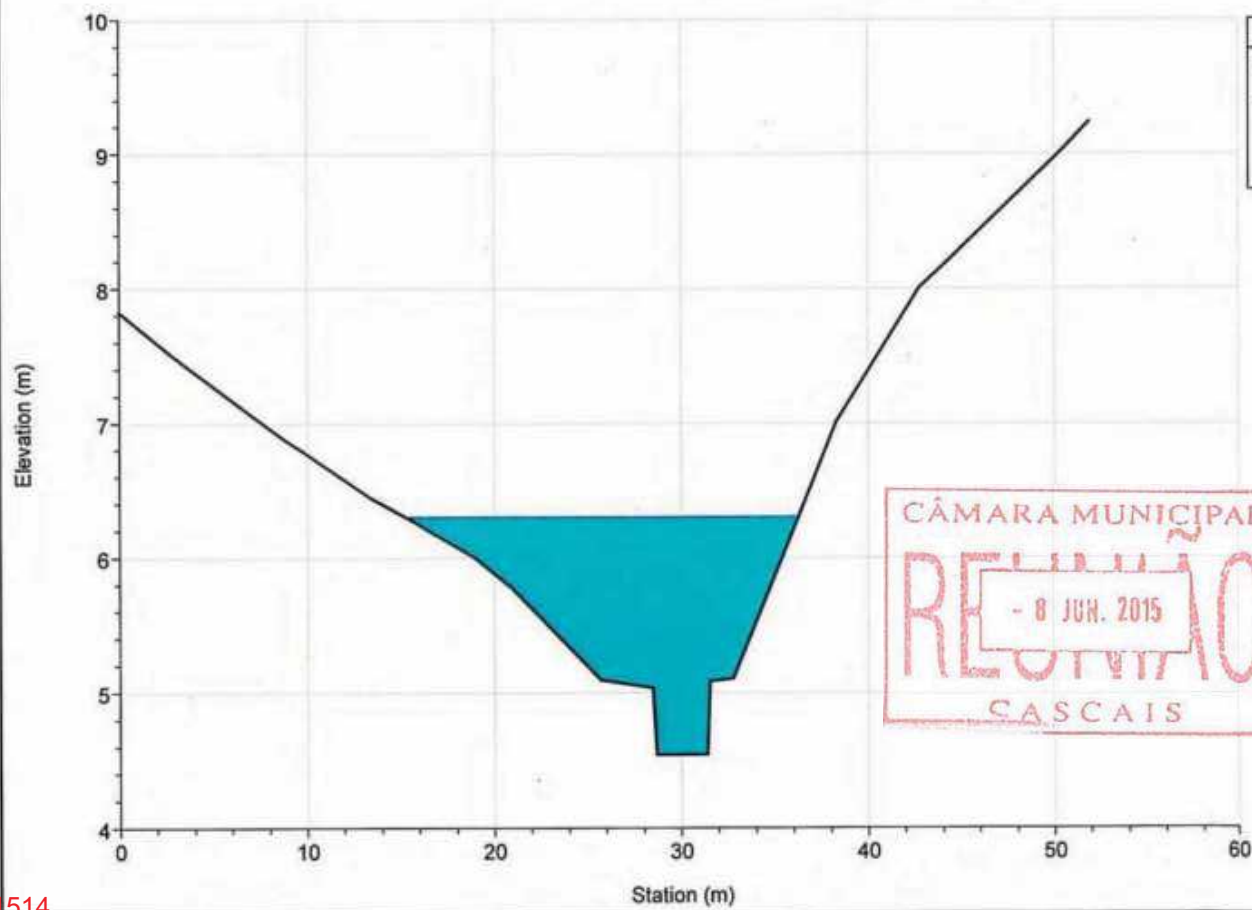


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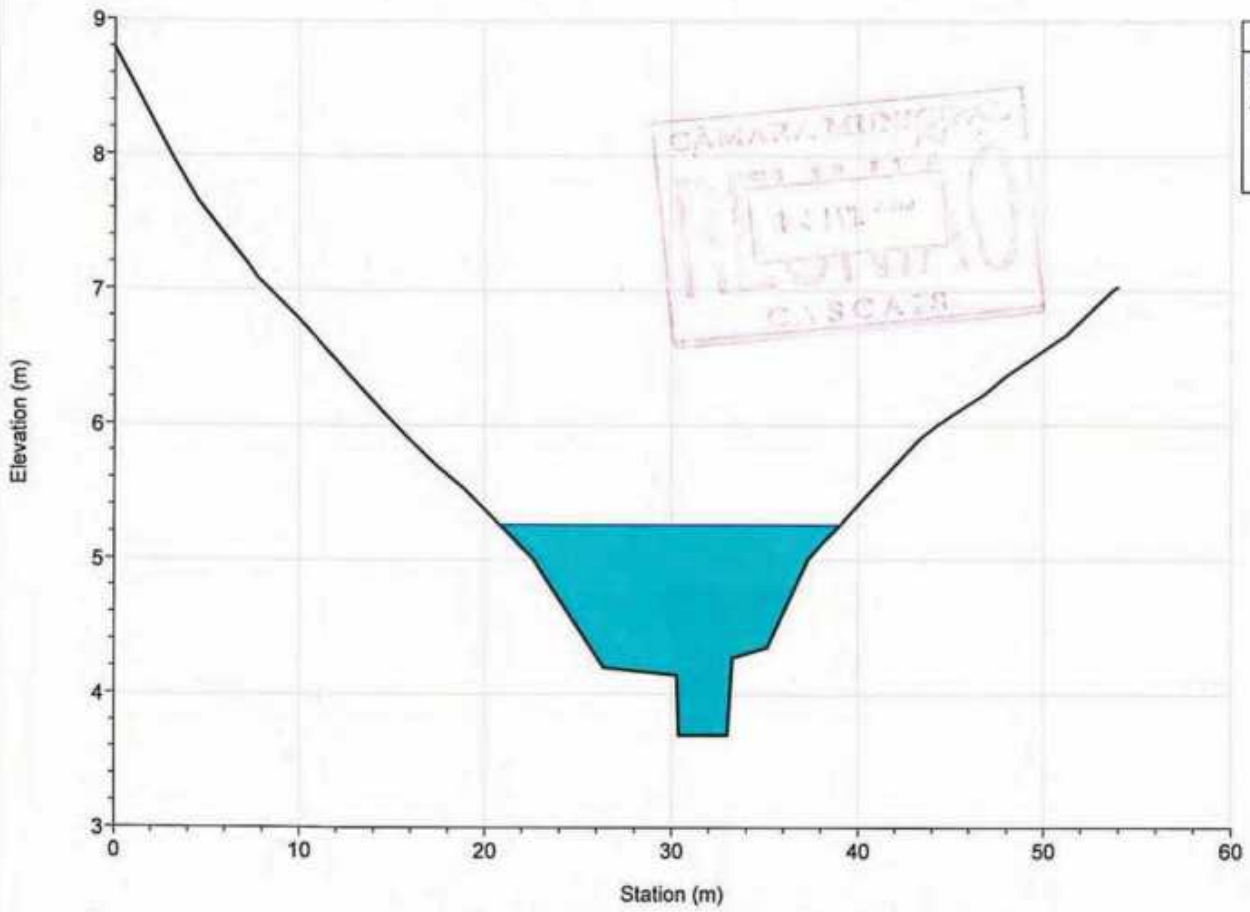
River = MOCHOS Reach = Ribeira RS = 244.610



River = MOCHOS Reach = Ribeira RS = 162.500

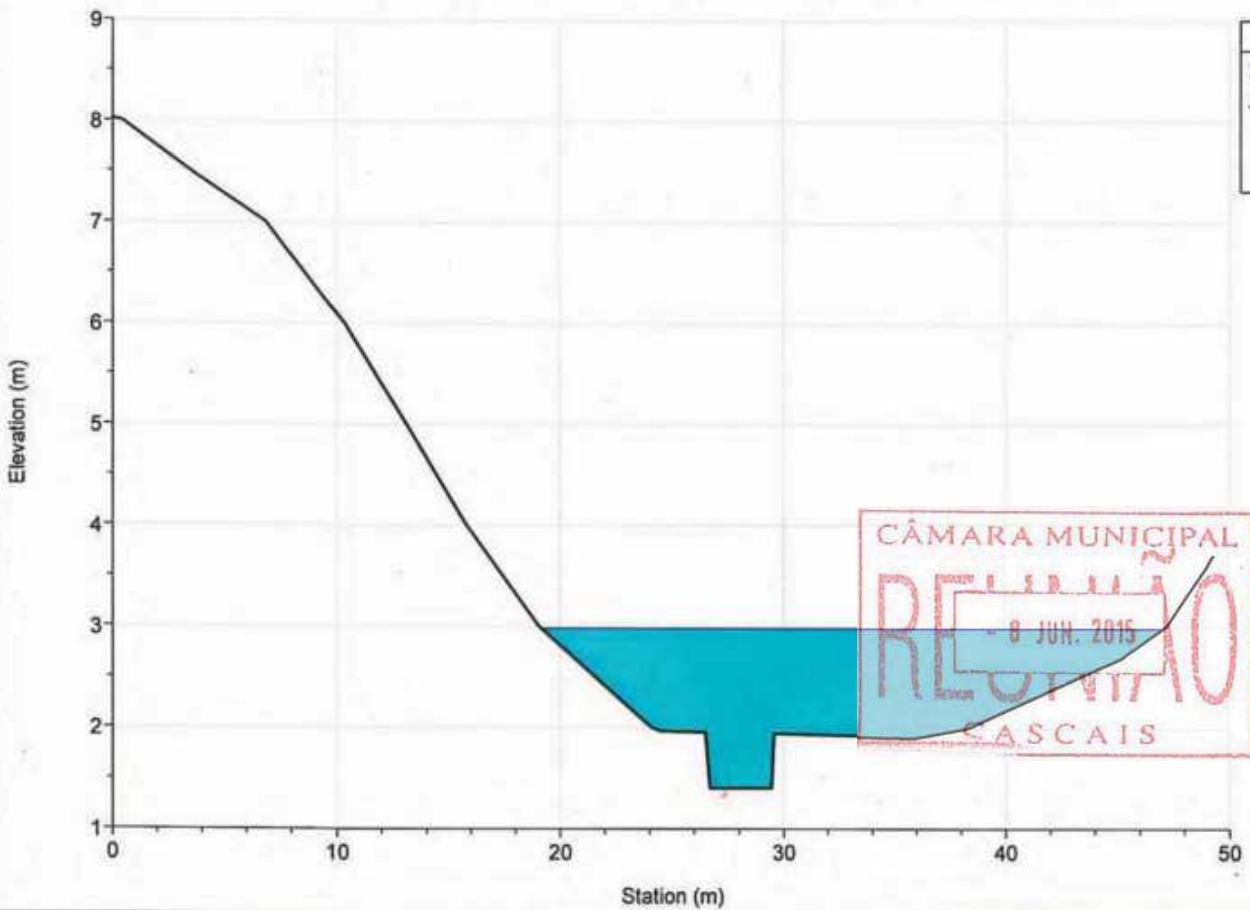


River = MOCHOS Reach = Ribeira RS = 70.030



Legend
WS T=100 anos
Ground
Bank Sta

River = MOCHOS Reach = Ribeira RS = 14.208



Legend
WS T=100 anos
Ground
Bank Sta