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Oggetto:

PROGETTO INTERVENTI PER LA MESSA IN SICUREZZA DEL TERRITORIO
COMUNALE A RISCHIO IDROGEOLOGICO REGIONE GIARONE,
REGIONE CAFRA MANUTENZIONE IDRAULICA RII MINORI,
CONSOLIDAMENTI SPONDALI E MANUTENZIONE
INFRASTRUTTURE ESISTENTI,
IMPORTO COMPLESSIVO €. 1.000.000,00

Rif. CIRCOLARE_MINISTERO_INTERNO_13/07/2023 - decreto-fl-19-05-2023-pnrr, Art. 2, Allegato 3, CODICE Bdap 329742930510530302.

CUP: B97H22000600001 - CIG progettazione A02057ED1D
incarico Determina n. 60 del 26/10/2023

PROGETTO DI FATTIBILITA' TECNICA ED ECONOMICA

Allegato :

08 RELAZIONE IDROLOGICO-IDRAULICA

Scala : <<<<<

DATA: 08/04/2024

DOC. N. **OTTO**

Il R.U.P.:

Geom. Marco DOGLIOTTI

.....

Il Tecnico Incaricato :

Ing. Giovanni GUGLIERI

.....



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1 PREMESSA

Con Determina n. 60 del 26/10/2023 il Comune di Bubbio (AT) ha incaricato il sottoscritto Ing. Giovanni GUGLIERI della redazione del progetto di fattibilità tecnica ed economica per il “PROGETTO INTERVENTI PER LA MESSA IN SICUREZZA DEL TERRITORIO COMUNALE A RISCHIO IDROGEOLOGICO REGIONE GIARONE, REGIONE CAFRA MANUTENZIONE IDRAULICA RII MINORI, CONSOLIDAMENTI SPONDALI E MANUTENZIONE INFRASTRUTTURE ESISTENTI, da realizzare in comune di Bubbio (AT) - importo complessivo €. 1.000.000,00.

Il progetto fa parte di un progetto generale che prevede la realizzazione di un insieme di opere finalizzate alla difesa idraulica dell’abitato in località Giaronetto, lungo il Fiume Bormida e il Rio San Pietro in corrispondenza del territorio comunale di Bubbio.

Il progetto generale risulta suddiviso in diversi lotti funzionali: la presente relazione espone il progetto con particolare riferimento alle opere previste per il Lotto 1C (terzo lotto).

Il progetto inerente al Lotto1A (primo lotto) è già stato approvato.

Il progetto inerente al Lotto1B (secondo lotto) è già stato approvato.

Il presente lavoro viene svolto su incarico dell’Amministrazione Comunale di Bubbio al fine di fornire tutti gli elementi idraulici necessari per definire i lavori di mitigazione del rischio idraulico del Fiume Bormida di Millesimo nei pressi della Strada Provinciale SP25.

2 INQUADRAMENTO GENERALE DELL’AREA DI INTERVENTO

Il Comune di Bubbio è situato a Sud del Capoluogo di Provincia ed è ubicato nel fondovalle del Fiume Bormida di Millesimo; è attraversato dalla Strada Provinciale Acqui Terme - Cortemilia ed è collegato con la Valle Belbo e con la Valle del Bormida di Spigno da due strade provinciali.

Il territorio del Comune di Bubbio è lambito dal tracciato dall’alveo del Fiume Bormida, ramo di Millesimo.

INTERVENTO CODICE AT_A18_622_19_102 – PROGETTO PER LAVORI DI ADEGUAMENTO SEZIONI DI DEFLUSSO FOSSI COLATORI PROVENIENTI DA VERSANTI IN GIARONETTO - ADEGUAMENTO DEI TRATTI DEL FIUME BORMIDA E DEL RIO SAN PIETRO IN CORRISPONDENZA DELLA S.P. 25 - PROGETTO ESECUTIVO – LOTTO 1A

Nelle seguenti figure si riporta la localizzazione dell'area di intervento su un estratto della Base Dati Territoriale di Riferimento Enti (B.D.T.R.E 2022) e su un'immagine satellitare (Google Earth 2021).

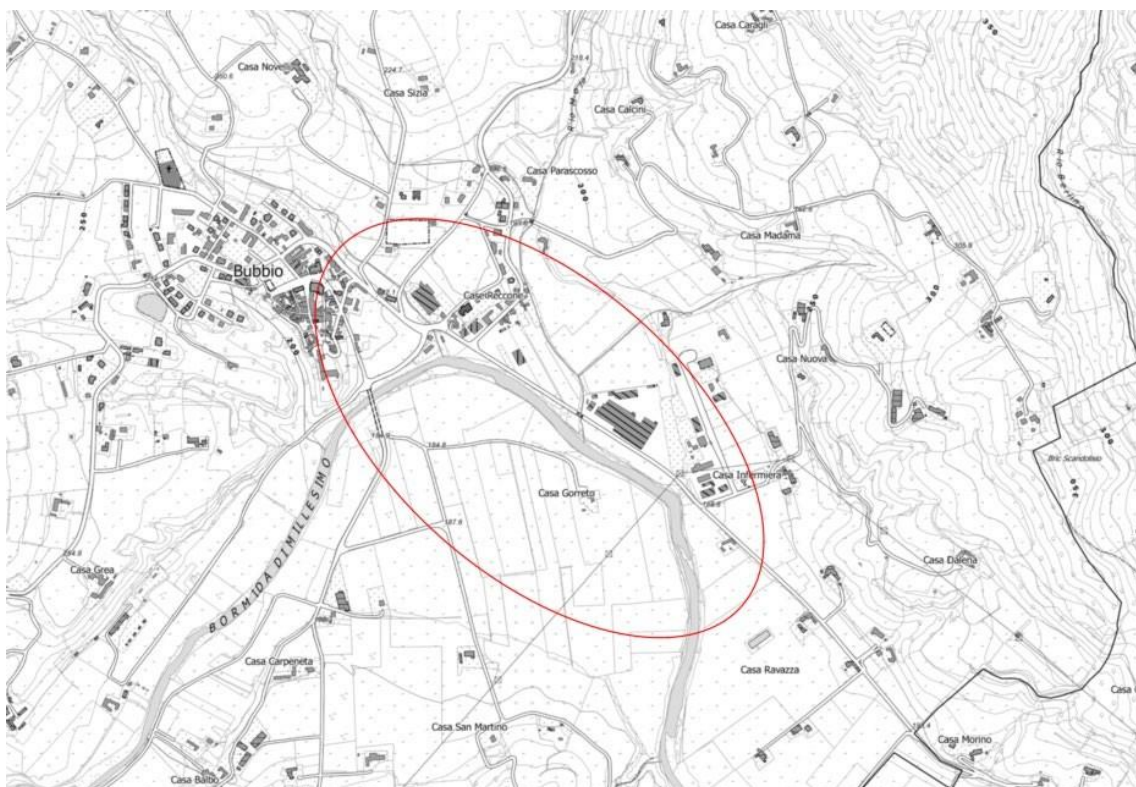


Figura 2.1: Estratto B.D.T.R.E. 2022 con individuazione dell'area di intervento

INTERVENTO CODICE AT_A18_622_19_102 – PROGETTO PER LAVORI DI ADEGUAMENTO SEZIONI DI DEFLUSSO FOSSI COLATORI PROVENIENTI DA VERSANTI IN GIARONETTO - ADEGUAMENTO DEI TRATTI DEL FIUME BORMIDA E DEL RIO SAN PIETRO IN CORRISPONDENZA DELLA S.P. 25 - PROGETTO ESECUTIVO – LOTTO 1A



Figura 2.2: Foto aerea (Google Earth 2021) con individuazione dell'area di intervento

3 CARATTERIZZAZIONE IDROLOGICA DEL BACINO DEL FIUME BORMIDA DI MILLESIMO NELLA SEZIONE DI CHIUSURA A BUBBIO

Nei seguenti paragrafi è stata condotta la caratterizzazione idrologica del bacino del fiume Bormida di Millesimo e la descrizione storica, derivante dai rapporti emessi da Arpa Piemonte e reperibili in rete, dei principali eventi di piena degli ultimi 30 anni, nella fattispecie del 1994 e del 2016.

3.1 VALUTAZIONE DELLE PORTATE MASSIME ANNUE AL COLMO MEDIANTE IL METODO DELLA SIMILITUDINE IDROLOGICA DEL PROF. SORDO

Non essendo disponibili all'interno della "*Direttiva sulla piena di progetto da assumere per le progettazioni e le verifiche di compatibilità idraulica*" pubblicata dall'Autorità di Bacino del Fiume Po nell'ambito del Progetto di Piano Stralcio per l'Assetto Idrogeologico (PAI) valori di portata massima al colmo per il Bormida di Millesimo, si procede alla determinazione delle portate di progetto seguendo il metodo della similitudine idrologica del prof. S. Sordo del Dipartimento di Idraulica, Trasporti e Infrastrutture Civili del Politecnico di Torino.

Per valutare la portata massima annua al colmo Q_{cmx} si procede, quando possibile, con metodi probabilistici per via diretta elaborando i dati storici di portata al colmo registrati negli anni da stazioni di misura in prossimità della sezione in esame.

Quando però questo non è realizzabile si possono adottare metodi per la valutazione della portata Q_{cmx} basati sul concetto della similitudine idrologica che consiste nell'individuare il comportamento di un discreto numero di bacini della stessa regione idrologica a cui appartiene quello in esame, che abbiano caratteristiche idrologiche abbastanza vicine tra loro quali, per esempio, geomorfologia e regime delle precipitazioni di breve durata.

Effettuate le elaborazioni statistiche per tutti i bacini di una medesima regione si ottengono i valori delle portate, nel nostro caso Q_{cmx} , riferiti ad un dato tempo di ritorno T , che devono correlarsi a qualche grandezza caratteristica dei bacini (quale può essere per esempio la superficie, la pendenza media, il tempo di corrivazione e l'altezza di precipitazione di durata pari al tempo di corrivazione del bacino).

Nel caso in esame ci si è pertanto riferiti specificamente ai risultati dello studio "*Valutazione probabilistica delle portate di massima piena dei corsi d'acqua piemontesi*" (1981) effettuato dal Prof. Sebastiano Sordo.

Per ogni bacino considerato nel lavoro si sono riportate in diagramma le portate massime annue al colmo, calcolate in base alla Log - normale a due parametri per assegnati tempi di ritorno T, in funzione delle superfici S dei bacini stessi, e si è notata una tendenza dei punti sperimentali a disporsi lungo una curva regolarmente crescente con S.

Sulla scorta di questa caratteristica che denota, per la maggior parte dei bacini esaminati, un buon grado di affinità per condizioni climatiche e pedologiche, si è allora ricercata la relazione sperimentale $Q = Q(S, T)$.

Esaminando poi la distribuzione dei valori Q e S, riportati negli Annali Idrologici relativi ai bacini piemontesi, fatte alcune eccezioni dovute a singolarità climatiche e pedologiche, si può vedere che le espressioni bene interpretano il fenomeno in esame.

Passando ora al valore della portata relativa al tempo di ritorno in epigrafe si utilizza l'espressione:

$$Q_{c \max} = e^{\sqrt{58.92 \cdot \ln \ln S - 76.00}} \cdot e^{2.886 \sqrt{\ln \left(\frac{T^2}{4T-4} \right)} - (0.0155 \cdot \ln^2 S + 0.6480)}$$

valida per bacini con superficie maggiore a 350 km².

La sezione di chiusura del Bormida di Millesimo considerata si colloca poco a valle dell'abitato di Bubbio, a circa 5 km a monte della confluenza con il Bormida di Spigno, escludendo quindi il contributo del torrente Tatorba in sponda destra e dei piccoli affluenti nel territorio di Monastero Bormida in sponda sinistra: si ricava pertanto una superficie pari a circa 525 km².

Si ricavano pertanto, per i tempi di ritorno di 20, 100, 200 e 500 anni, le seguenti portate:

BORMIDA DI MILLESIMO A BUBBIO	
S = 525 km²	
T_{ritorno} (anni)	Q_c (m³/s)
20	833
100	1265
200	1469
500	1758

Tabella 3.1: Portate al colmo del Fiume Bormida di Millesimo a Bubbio ricavate con l'espressione del prof. S.Sordo

3.2 EVENTO ALLUVIONALE DEL 5-6 NOVEMBRE 1994

L'evento alluvionale, che nei giorni 5 - 6 novembre 1994 ha interessato il sud del Piemonte, ha presentato numerosi aspetti a carattere eccezionale che hanno contribuito al determinarsi di catastrofi al punto che tali singolarità lo differenziano dai precedenti eventi di piena che fanno parte della memoria storica del Piemonte.

Si osserva infatti che tutto il bacino del Fiume Bormida è stato interessato da fenomeni di esondazione e da ostruzione di ponti a causa della fluitazione incontrollata della vegetazione d'alto fusto, con conseguenze assai rilevanti.

Venendo ora ad analizzare il comportamento idrologico-idraulico del bacino del Bormida è evidente che la formazione delle piene è stata conseguente ad un volume di pioggia elevato, continuo e concomitante su una vastissima area.

Laddove detta pioggia ha raggiunto valori eccezionali, sono stati saturati volumi di invaso della rete idrografica, e la capacità di drenaggio dei versanti si è esaurita al punto da mutare l'intera pioggia caduta sul terreno in pioggia efficace.

La conseguenza più evidente degli aspetti citati è che tutta la rete idrografica del Bormida è stata chiamata al deflusso di portate al colmo di piena per le quali non era modellata.

Analizzando il tratto in cui si colloca l'intervento in esame, ovvero il tratto Cortemilia-Monastero Bormida si osserva che a valle di Cortemilia le acque hanno occupato tutto il fondovalle compreso tra la strada statale in sinistra e le pendici dei rilievi in destra.

A Vesime il colmo della piena è stato registrato alle ore 21.00. Qui il fiume forma una stretta ansa a guisa di gomito. Al suo interno, in sponda destra, l'acqua non più contenuta dall'alveo è fuoriuscita fino a raggiungere la scarpata di un terrazzo e ha allagato i capannoni e gli edifici di località C. Bernengo raggiungendo l'altezza di 2 m. In sinistra l'erosione delle difese spondali ha provocato la parziale asportazione della sede stradale.

Poco più a valle dell'abitato le cascate Torron e Potovio sono state allagate da 1.00 m d'acqua. Nella piana sottostante S. Alessandro, l'acqua ha iniziato ad invadere le abitazioni intorno alle 11,00 della mattina di sabato. Negli edifici i livelli idrici raggiunti sono stati ben visibili in relazione ai segni lasciati dall'acqua e dal fango (1,20 m, 2 m).

In sponda sinistra, lungo lo stesso tratto di fiume, sono state erose le difese spondali e allagate due abitazioni e la strada statale. Presso Quartino tutta l'area prospiciente il fiume è stata invasa da 2 m d'acqua. L'impalcato di ferro del ponte che collegava le due sponde è stato travolto dalla piena e trasportato a Bubbio, 3 km più a valle.

A Bubbio la località più colpita è stata C.se Reccone invasa da 1,50 m d'acqua nel giro di 15 minuti tra le 22.30 e le 23.00 di sabato. La strada per Monastero Bormida è stata sommersa da 2 m d'acqua mentre il distributore di benzina è stato completamente distrutto. Probabilmente l'arrivo improvviso dell'onda di piena è imputabile al cedimento del ponte che collegava il centro abitato con alcune frazioni in sponda destra, trasformato in diga dal materiale solido flottante.

A Monastero Bormida le acque hanno invaso la piana a monte del ponte in destra dopo aver eroso difese spondali e terreni.

Le abitazioni che si trovano in sponda destra sono state interessate da 1,20 m di acqua, mentre in sponda sinistra invece gli edifici prossimi al fiume sono stati allagati da ben 4,4 m d'acqua. Il ponte medioevale è stato sormontato e i rilevati di accesso completamente asportati. Altri edifici a valle dell'opera sono stati invasi dall'acqua per più di 2 m.

La piena si è distribuita lungo il limite delle scarpate dei terrazzi fluviali occupando tutta la fascia di pertinenza fluviale.

Gli effetti dell'evento alluvionale, direzione dei flussi, battenti idrici, ecc, sono stati censiti dall'Arpa Piemonte e sono riassunti nella seguente planimetria.

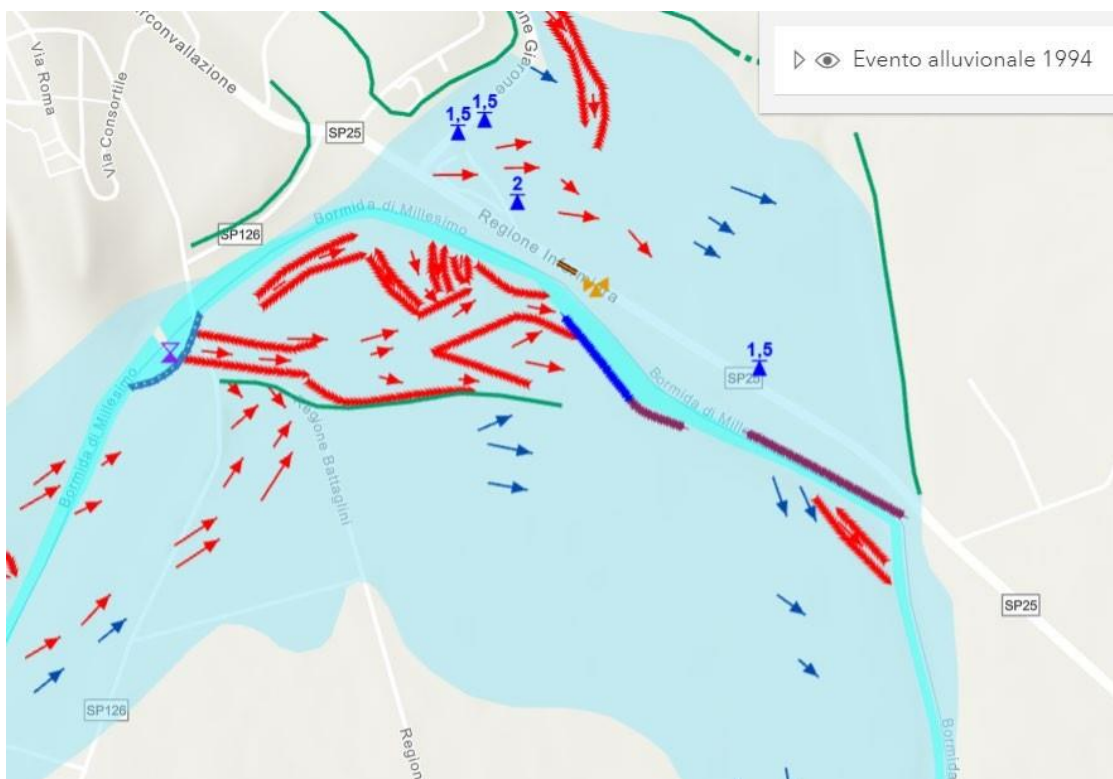


Tabella 3.2: Planimetria con effetti e livelli di piena dell'evento alluvionale del novembre 1994 a Bubbio (AT)

3.3 EVENTO ALLUVIONALE DEL 21-26 NOVEMBRE 2016

L'evento alluvionale del novembre 2016 è stato dopo quello del 1994 quello più intenso che ha interessato il bacino del Bormida.

Le informazioni sono tratte dal Rapporto Preliminare dell'evento del 21-26 novembre 2016 pubblicato da Arpa Piemonte.

Nell'ultima decade del mese di novembre 2016, il Piemonte è stato interessato da un evento alluvionale con caratteristiche meteorologiche comuni con alcuni eventi del passato: una vasta area di bassa pressione nord-atlantica ed un robusto campo di alta pressione sulle zone del Mediterraneo orientale.

L'intera regione è stata interessata da precipitazioni forti e persistenti tra il 21 e il 25 novembre con particolare insistenza, inizialmente nel cuneese ed alessandrino al confine con la Liguria e, successivamente, il 22 e 23 novembre, nelle zone del vercellese, biellese e alto torinese.

Le precipitazioni cadute nel corso dell'evento hanno generato significativi incrementi di livello dei corsi d'acqua del reticolo idrografico piemontese.

Nei settori meridionali della regione i maggiori innalzamenti dei livelli si sono verificati su Belbo, Bormida di Spigno e Bormida di Millesimo.

Il Bormida e i suoi affluenti hanno fatto registrare gli incrementi più significativi a partire dal 24 novembre quando, rapidamente, hanno raggiunto livelli di pericolo sia il Bormida di Spigno che il Bormida di Millesimo rispettivamente a Mombaldone (AT) (6,76 metri massimo storico per la stazione) e a Camerana (CN) (5,72 metri) dove la piena ha sommerso l'area in cui era ubicata la stazione di misura. Anche a Camerana il livello massimo registrato in questo evento è il più alto da quando esiste la stazione automatica.

Sull'asta principale del Bormida, i livelli hanno superato i valori di pericolo a partire dalla tarda serata del 24 novembre; in particolare, a Cassine (AL) si è registrato un massimo di 5,08 metri nelle prime ore del mattino del 25 novembre, dopodiché anche questa stazione è stata sommersa dalla piena.

Ad Alessandria, sezione di chiusura del bacino, il livello di pericolo è stato superato nella mattina del 25 novembre, il colmo è stato molto lungo per effetto del rigurgito di Tanaro e, solo nelle prime ore del 26 novembre, i livelli sono rientrati al di sotto dei valori di pericolo.

Nel seguito si riportano i colmi di piena ed i massimi incrementi di livello espressi in metri registrati durante l'evento e gli idrogrammi di piena per le stazioni idrometriche più significative.

PROGETTO INTERVENTI PER LA MESSA IN SICUREZZA DEL TERRITORIO COMUNALE A RISCHIO IDROGEOLOGICO
 REGIONE GIARONE, REGIONE CAFRA MANUTENZIONE IDRAULICA RII MINORI, CONSOLIDAMENTI SPONDALI E
 MANUTENZIONE INFRASTRUTTURE ESISTENTI, IMPORTO COMPLESSIVO €. 1.000.000,00

Bacino	Comune	Provincia	Stazione	Data e ora (UTC) del colmo	MAX	0,5h	1h	3h	6h	12h	24h	Incremento
TANARO	MURIALDO	SV	MURIALDO BORMIDA DI MILLESIMO	24/11/2016 14:30	4,1	0,71	1,17	2,49	3,01	3,31	3,14	4,18
TANARO	CAMERANA	CN	CAMERANA BORMIDA	24/11/2016 16:00	5,72	0,55	1,06	2,35	3,68	4,33	4,03	5,39
TANARO	MOMBALDONE	AT	MOMBALDONE BORMIDA	24/11/2016 19:30	6,78	0,66	1,26	2,97	4,9	5,12	4,77	6,28
TANARO	CESSOLE	AT	CESSOLE BORMIDA	24/11/2016 21:30	5,83	0,67	1,32	2,85	3,36	5	4,93	6,35
TANARO	CASSINE	AL	CASSINE BORMIDA	25/11/2016 06:00	5,08	0,33	0,62	1,64	2,72	4,21	4,36	5,14
TANARO	ALESSANDRIA	AL	ALESSANDRIA BORMIDA	25/11/2016 19:30	8,3	0,51	0,86	2,26	3,68	4,99	6,88	7,18

Tabella 3.3: Colmi di piena e massimi incrementi di livello [m] del Fiume Bormida registrati durante l'evento per le stazioni più significative. (Fonte: rapporto preliminare Arpa)

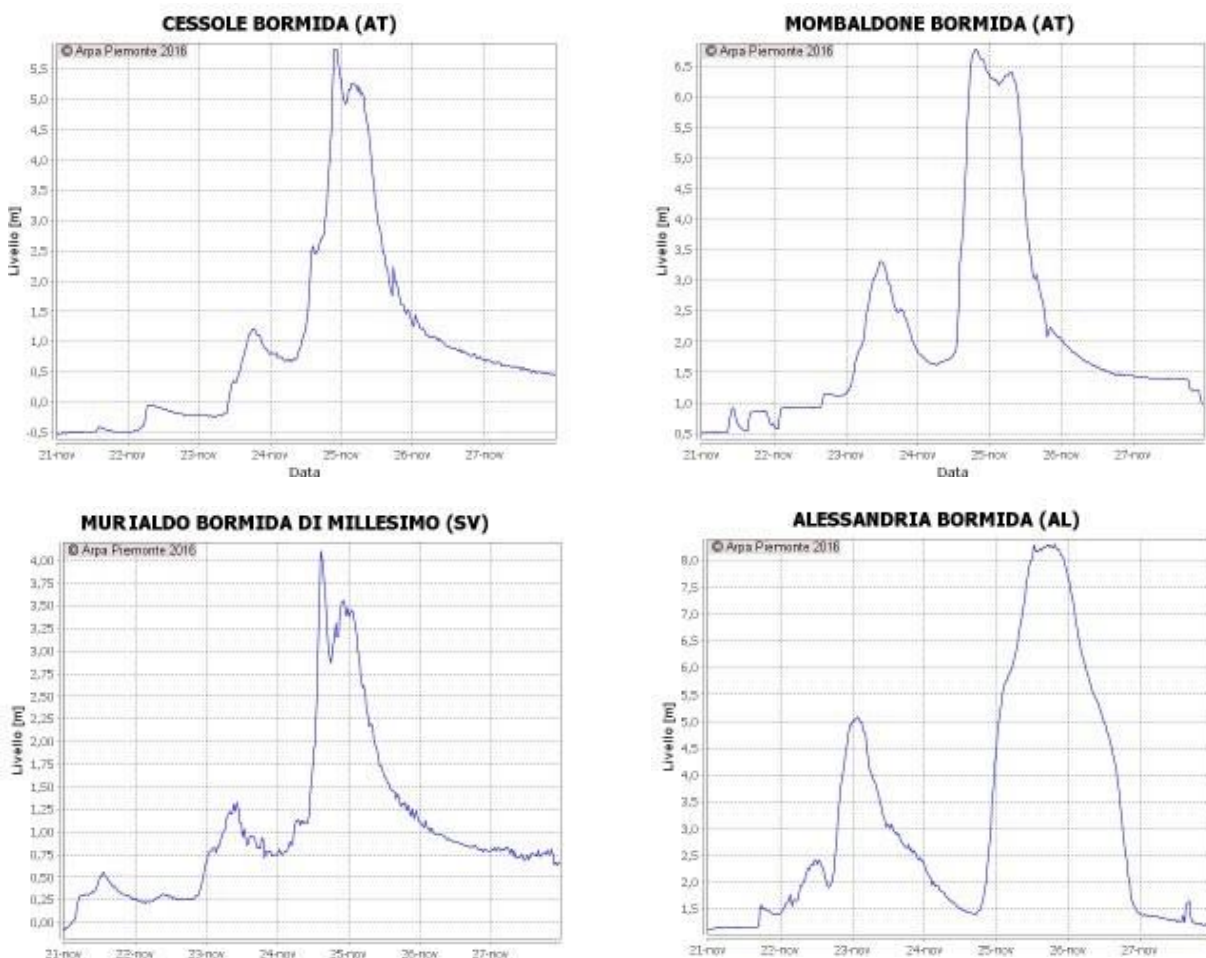


Tabella 3.4: Idrogrammi di piena del Fiume Bormida registrati durante l'evento del novembre 2016 per le stazioni più significative. (Fonte: rapporto preliminare Arpa)

Gli effetti dell'evento alluvionale sono stati censiti dall'Arpa Piemonte e sono riassunti nella seguente planimetria.

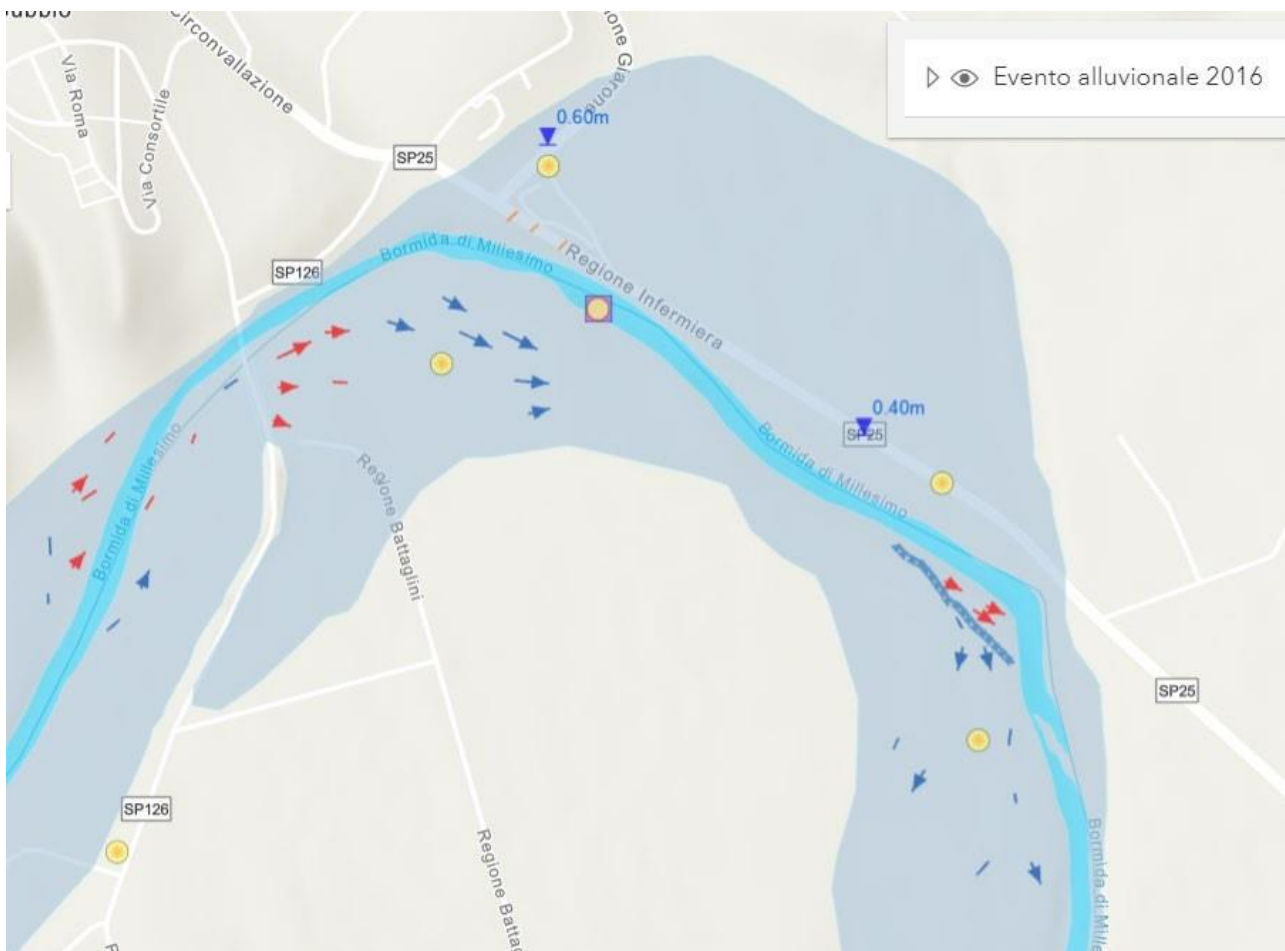


Tabella 3.5: effetti e livelli di piena dell'evento alluvionale del novembre 2016

4 DESCRIZIONE DEI BACINI IDROGRAFICI DEI FOSSI COLATORI AFFLUENTI DEL BORMIDA IN SINISTRA IDRAULICA INTERESSATI DALL'INTERVENTO

Il Bormida di Millesimo nel tratto interessato dagli interventi in progetto all'interno del comune di Bubbio rappresenta il corpo idrico recettore dell'idrografia minore: tali fossi colatori sono quindi fortemente influenzati dalle dinamiche di piena del fiume.

I fossi colatori interessati provengono dai rilievi collinari presenti in sinistra idrografica, i cui bacini idrografici si estendono fino alla linea di spartiacque presente in territorio del comune di Cassinasco. Tali rii minori, per via della loro elevata pendenza media, risultano in regime torrentizio, ovvero in secca per la quasi totalità dell'anno, a esclusione degli eventi di piena che determinano un innalzamento significativo dei livelli all'interno dell'alveo. I tratti terminali di tali rii sono governati dal livello del fiume Bormida, che determina, in caso di piena, fenomeni di rigurgito non trascurabili e accuratamente valutati e analizzati nelle simulazioni idrauliche condotte nei seguenti capitoli.

Di seguito sono riportate le analisi descrittive condotte per ognuno dei fossi colatori individuati. Si riporta per completezza una planimetria con l'individuazione dei bacini indagati:

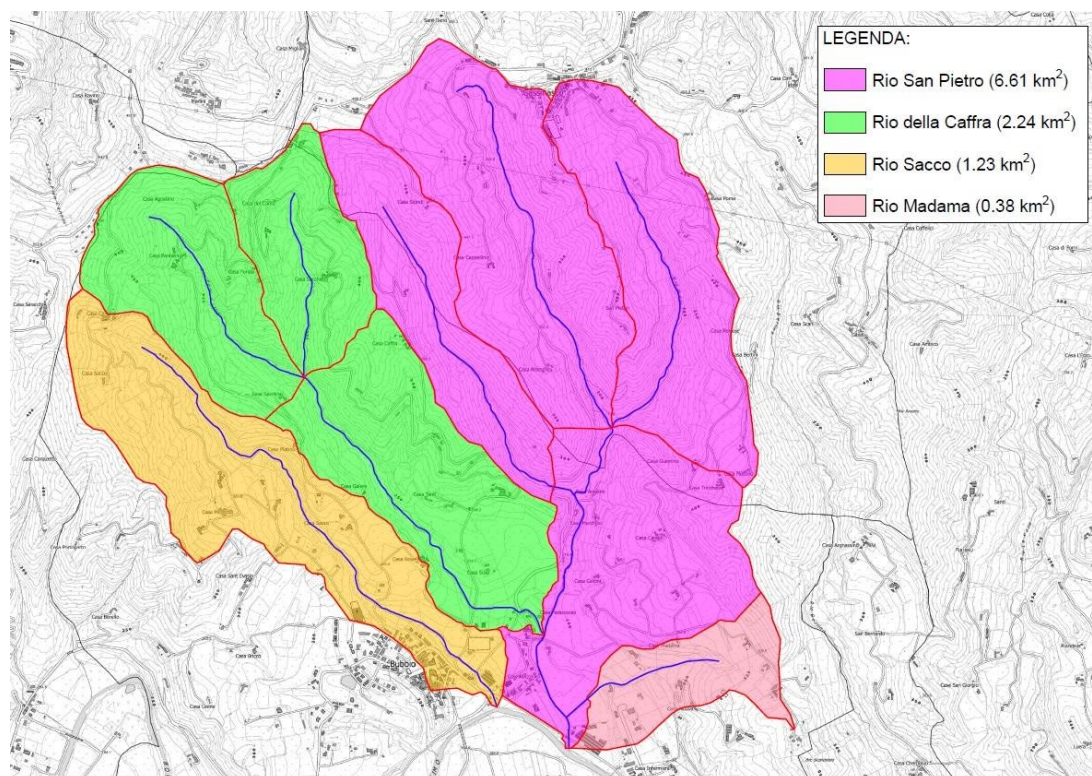


Tabella 4.1: Individuazione bacini idrografici dei fossi colatori si BDTRE Regione Piemonte 2022

4.1 RIO SACCO

Tale fosso colatore è stato nominato “Rio Sacco” facendo riferimento al toponimo “Casa Sacco” della cascina presente nella parte sommitale del bacino.

Tale rio si sviluppa a partire da località casa Sacco, costeggia il concentrico di Bubbio in sponda destra, attraversa un ponte sulla SP25 per poi confluire nel Bormida.

Il tratto di interesse ai fini dell'intervento è limitato tra la confluenza e il ponte della SP 25 e di circa 100 m; infatti, vista l'elevata pendenza media dell'asta, non è necessario prolungare a monte le arginature del Bormida.

4.2 RIO MADAMA

Tale fosso colatore è stato nominato “Rio Madama” facendo riferimento al toponimo “Casa Madama” della cascina presente nella parte sommitale del bacino.

Il bacino è tra quelli dei fossi colatori analizzati il meno esteso: si sviluppa a est dell'abitato di Bubbio, nella parte alta del bacino la pendenza è molto elevata, pari a circa il 15 %, nella parte bassa attraversa un terreno pianeggiante posto nella parte retrostante alla zona industriale con pendenza di circa 1-2 %, per poi confluire nel Rio S. Pietro poco a monte del ponte sulla SP25.

Il rio Madama è interessato dal rigurgito del Bormida nel rio S. Pietro; pertanto, le arginature proseguiranno sulle sponde di tale rio nel tratto pianeggiante per uno sviluppo di circa 200 m, fino ad innestarsi nel rilievo collinare a quota superiore rispetto ai livelli idrici determinati nel seguito.

4.3 RIO DELLA CAFFRA

Il bacino del rio della Caffra si colloca tra il bacino del rio Sacco e del rio S. Pietro, e confluisce in quest'ultimo poco a monte del ponte in Regione Giarone.

Si registrano fenomeni di rigurgito a monte del ponte, che non vengono risolti dagli interventi in progetto, poiché quest'ultimi si fermano a valle del ponte.

In ogni caso, tali fenomeni sono di estensione limitata a monte del ponte e non interessano i terreni a valle, correttamente arginati dagli interventi in progetto.

4.4 RIO SAN PIETRO

Il rio san Pietro è il più esteso fosso colatore tra quelli indagati, e raccoglie le acque provenienti dal rio della Caffra e dal rio Madama, per poi confluire nel fiume Bormida.

Nel tratto analizzato il rio San Pietro è attraversato da due ponti, quello della SP25 e quello in Regione Giarone.

Per via dei suoi affluenti, si è scelto di determinare due portate di progetto, una a monte della confluenza con il rio della Caffra, e una alla confluenza del rio nel Bormida, inglobando di fatto il minimo contributo del rio Madama.

Tra i fossi colatori è quello maggiormente coinvolto dagli interventi di arginatura, visto il forte fenomeno di rigurgito delle acque di piena del Bormida a cui è sottoposto, come evidenziato dalle simulazioni idrauliche.

Tali arginature si estenderanno dalla confluenza del Bormida verso monte per circa 540 m per poi innestarsi poco a valle del ponte in Regione Giarone, dove la quota del piano campagna garantisce il franco minimo sui livelli di piena calcolati.

5 CARATTERIZZAZIONE IDROLOGICA DEI FOSSI COLATORI AFFLUENTI DEL BORMIDA IN SINISTRA IDRAULICA INTERESSATI DALL'INTERVENTO

Nel presente capitolo vengono effettuate i calcoli idrologici con riferimento al reticolo idrografico esistente, al fine di determinare le portate di progetto aventi tempo di ritorno di 20, 100, 200 e 500 anni.

Le valutazioni idrologiche vengono effettuate con riferimento alle sezioni di chiusura dei bacini idrografici relative alle sezioni di intervento individuate.

5.1 DELIMITAZIONE DEI BACINI IDROGRAFICI

La delimitazione dei bacini idrografici di interesse viene effettuata utilizzando come supporto cartografico la Base Dati Territoriale di Riferimento Enti (BDTRE) edizione 2021 ed il DTM ICE della Regione Piemonte griglia 5x5 m.

Inoltre, sono stati effettuati sopralluoghi per individuare quelle opere non indicate sulla BDTRE e non rilevabili sul DTM ICE, ma che comunque sono in grado di modificare la direzione di deflusso delle acque di ruscellamento (es. fossi di scolo, canalette, caditoie, etc). Inoltre, sono state ricavate le caratteristiche morfologiche dei bacini scolanti individuati utili per la determinazione dei parametri idrogeologici.

5.2 DETERMINAZIONE DEL TEMPO DI CORRIVAZIONE

Le durate di pioggia critiche per il bacino ed i relativi sottobacini da considerare nei calcoli idrologici sono quelle corrispondenti ai loro tempi di corrivazione, ovvero il tempo necessario perché tutta la superficie sottesa dalle prefissate sezioni contribuiscano al deflusso.

La determinazione del tempo di corrivazione viene effettuata ricorrendo alle principali formulazioni di tipo empirico riscontrabili nella letteratura scientifica, che vengono scelte in base alle caratteristiche del bacino idrografico analizzato.

Le formulazioni adottate nei calcoli sono le seguenti:

Formula di Giandotti:

$$T_c = \frac{4\sqrt{S} + 1.5L}{0.8 \cdot H_m}$$

Formula di Kirpich:

$$T_c = 0.000325 L^{0.77} i_v^{-0.385} (*)$$

(*) con L in metri

Formula di Pezzoli:

$$T_c = \frac{0.055 \cdot L}{\sqrt{i}}$$

Formula di Puglisi:

$$T_c = 6L^{2/3}(h_{max} - h_{min})^{-1/3}$$

Formula di Ventura:

$$T_c = 0.127 \frac{\sqrt{S}}{\sqrt{i}}$$

Formula di Viparelli:

$$T_c = \frac{L}{S}$$

La simbologia adottata ha i seguenti significati:

- T_c tempo di corrivazione (ore)
- S superficie bacino idrografico (km²)
- L lunghezza asta principale (km)
- h_{min} quota della sezione di chiusura del bacino (m)
- h_{max} quota massima del bacino (m)
- H_m altitudine media riferita alla sezione terminale del bacino (m)
- i pendenza media asta principale (m/m)
- i_v pendenza media del versante (m/m)

Di seguito vengono riportati i tabulati dei calcoli svolti: in base alle caratteristiche dei diversi bacini, vengono indicate le formule più opportune da adottate, mentre il valore del tempo di corrivazione viene determinato come media dei singoli valori ottenuti.

CARATTERISTICHE DEL BACINO IDROGRAFICO (rio Sacco)						
Area del bacino	A_b	1.23	km ²			
Lunghezza asta principale	L	2.80	km			
quota della sezione di chiusura	h_{min}	180	m s.l.m.			
quota massima del bacino	h_{max}	542	m s.l.m.			
Quota massima asta	$h_{max,asta}$	410	m s.l.m.			
quota media del bacino	h_{media}	361	m s.l.m.			
pendenza media dell'asta principale	i	0.082143	-			
CALCOLO DEL TEMPO DI CORRIVAZIONE						
Formula di Giandotti	t_c	0.80	h	NO		
Formula di Kirpich	t_c	0.38	h	SI	0.383783	
Formula di Pezzoli	t_c	0.54	h	SI	0.537323	
Formula di Puglisi	t_c	1.67	h	NO		
Formula di Ventura	t_c	0.49	h	SI	0.491441	
Formula di Viparelli	t_c	2.28	h	NO		
				$t_c =$	0.47	h

CARATTERISTICHE DEL BACINO IDROGRAFICO (rio Madama)						
Area del bacino	A_b	0.38	km ²			
Lunghezza asta principale	L	0.82	km			
quota della sezione di chiusura	h_{min}	184	m s.l.m.			
quota massima del bacino	h_{max}	395	m s.l.m.			
Quota massima asta	$h_{max,asta}$	260	m s.l.m.			
quota media del bacino	h_{media}	289.5	m s.l.m.			
pendenza media dell'asta principale	i	0.09257	-			
CALCOLO DEL TEMPO DI CORRIVAZIONE						
Formula di Giandotti	t_c	0.45	h	NO		
Formula di Kirpich	t_c	0.14	h	SI	0.142507	
Formula di Pezzoli	t_c	0.15	h	SI	0.148413	
Formula di Puglisi	t_c	0.88	h	NO		
Formula di Ventura	t_c	0.26	h	SI	0.257312	
Formula di Viparelli	t_c	2.16	h	NO		
				$t_c =$	0.18	h

CARATTERISTICHE DEL BACINO IDROGRAFICO (rio della Caffra)					
Area del bacino	A_b	2.24	km ²		
Lunghezza asta principale	L	2.35	km		
quota della sezione di chiusura	h_{min}	190	m s.l.m.		
quota massima del bacino	h_{max}	555	m s.l.m.		
Quota massima asta	$h_{max,asta}$	430	m s.l.m.		
quota media del bacino	h_{media}	372.5	m s.l.m.		
pendenza media dell'asta principale	i	0.102128	-		
CALCOLO DEL TEMPO DI CORRIVAZIONE					
Formula di Giandotti	t_c	0.88	h	NO	
Formula di Kirpich	t_c	0.31	h	SI	0.308379
Formula di Pezzoli	t_c	0.40	h	SI	0.404444
Formula di Puglisi	t_c	1.48	h	NO	
Formula di Ventura	t_c	0.59	h	SI	0.59478
Formula di Viparelli	t_c	1.05	h	NO	
				$t_c =$	0.44 h

CARATTERISTICHE DEL BACINO IDROGRAFICO (rio San Pietro monte)					
Area del bacino	A_b	4.00	km ²		
Lunghezza asta principale	L	3.90	km		
quota della sezione di chiusura	h_{min}	180	m s.l.m.		
quota massima del bacino	h_{max}	505	m s.l.m.		
Quota massima asta	$h_{max,asta}$	380	m s.l.m.		
quota media del bacino	h_{media}	342.5	m s.l.m.		
pendenza media dell'asta principale	i	0.051282	-		
CALCOLO DEL TEMPO DI CORRIVAZIONE					
Formula di Giandotti	t_c	1.36	h	NO	
Formula di Kirpich	t_c	0.59	h	SI	0.593836
Formula di Pezzoli	t_c	0.95	h	SI	0.947206
Formula di Puglisi	t_c	2.16	h	NO	
Formula di Ventura	t_c	1.12	h	SI	1.121634
Formula di Viparelli	t_c	0.98	h	NO	
				$t_c =$	0.89 h

CARATTERISTICHE DEL BACINO IDROGRAFICO (rio San Pietro valle)					
Area del bacino	A_b	6.61	km^2		
Lunghezza asta principale	L	3.90	km		
quota della sezione di chiusura	h_{min}	180	m s.l.m.		
quota massima del bacino	h_{max}	505	m s.l.m.		
Quota massima asta	$h_{max,asta}$	380	m s.l.m.		
quota media del bacino	h_{media}	342.5	m s.l.m.		
pendenza media dell'asta principale	i	0.051282	-		
CALCOLO DEL TEMPO DI CORRIVAZIONE					
Formula di Giandotti	t_c	1.58	h	NO	
Formula di Kirpich	t_c	0.59	h	SI	0.593836
Formula di Pezzoli	t_c	0.95	h	SI	0.947206
Formula di Puglisi	t_c	2.16	h	NO	
Formula di Ventura	t_c	1.44	h	SI	1.441856
Formula di Viparelli	t_c	0.59	h	NO	
				$t_c =$	0.99 h

RIASSUNTO DEI TEMPI DI CORRIVAZIONE OTTENUTI		
Bacino	Sezione di chiusura	Tempo di corrivazione [h]
Rio Sacco	Confluenza Bormida	0.47
Rio Madama	Confluenza rio San Pietro	0.18
Rio della Caffra	Confluenza rio San Pietro	0.44
Rio San Pietro monte	Monte confluenza con rio della Caffra	0.89
Rio San Pietro valle	Confluenza Bormida	0.99

5.3 VALUTAZIONE DELL'ALTEZZA DI PIOGGIA CON LE CURVE DI POSSIBILITA' PLUVIOMETRICA

La metodologia per la determinazione dell'altezza di pioggia che è stata adottata è quella presentata nella direttiva sulle piene di progetto Piano stralcio per l'Assetto Idrogeologico (PAI) dell'Autorità di Bacino del Fiume Po.

Lo studio condotto dall'Autorità di Bacino nell'Allegato 3 "Distribuzione spaziale delle precipitazioni intense" permette di ottenere i coefficienti di possibilità pluviometria (a, n) per i tempi di ritorno 20, 100, 200 e 500 anni in tutto il territorio di competenza: i dati vengono riportati in forma tabellare, e sono suddivisi in celle quadrate di lato 2 km.

La zona di interesse è collocata all'interno di un'unica cella contrassegnata nella figura riportata di seguito:

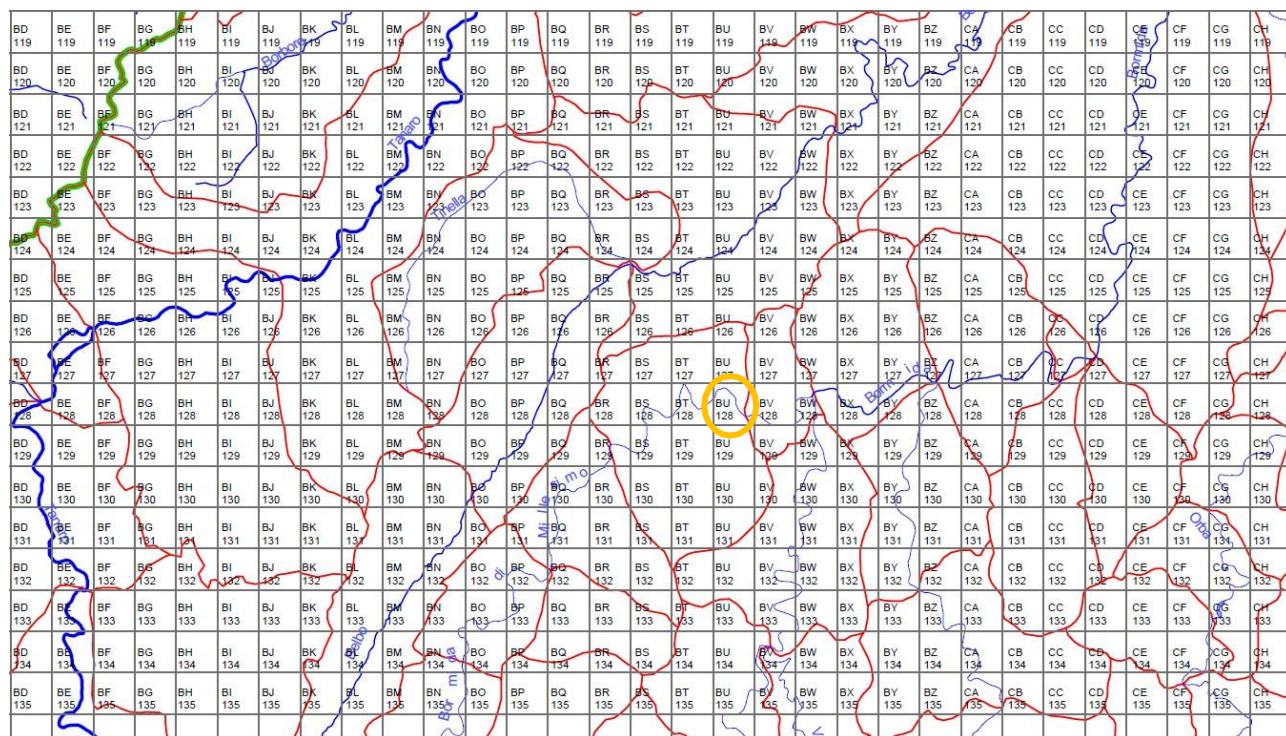


Tabella 5.1: individuazione cella sulla tavola 12 (in arancione)

Le portate da smaltire che si esaminano sono quelle conseguenti all'altezza di pioggia con tempo di ritorno pari a 20-100-200-500 anni:

cella	a20	n20	a100	n100	a200	n200	a500	n500
BU128	37.23	0.389	48.46	0.381	53.25	0.379	59.57	0.376

Tabella 5.2: individuazione coefficienti di possibilità pluviometrici

Applicando le formule delle curve di possibilità pluviometrica, di seguito riportate, con i coefficienti relativi alla zona in esame con il tempo di corrivazione del bacino, calcolato successivamente, e a cui competono le condizioni idrologiche critiche per il bacino stesso, si calcolano le altezze di pioggia e le intensità pluviometriche corrispondenti al caso in esame:

$$h = a \cdot t^n$$

$$j = \frac{h}{t}$$

con:

h = altezza di pioggia

a,n = coefficienti di possibilità pluviometrica per prefissato tempo di ritorno

t = tempo di corrivazione del bacino

La durata da considerare è pari al tempo di corrivazione determinato per ogni bacino al paragrafo precedente.

Si ottengono pertanto i seguenti valori di pioggia in funzione del tempo di ritorno:

TR = 20 anni			
Bacino	Sezione di chiusura	Altezza pioggia (mm)	Intensità di pioggia (mm/h)
Rio Sacco	Confluenza Bormida	27.77	58.99
Rio Madama	Confluenza rio San Pietro	19.22	138.77
Rio della Caffra	Confluenza rio San Pietro	26.95	61.84
Rio San Pietro monte	Monte confluenza con rio della Caffra	35.54	40.04
Rio San Pietro valle	Confluenza Bormida	37.15	37.36

TR = 100 anni			
Bacino	Sezione di chiusura	Altezza pioggia (mm)	Intensità di pioggia (mm/h)
Rio Sacco	Confluenza Bormida	36.37	77.24
Rio Madama	Confluenza rio San Pietro	25.36	138.77
Rio della Caffra	Confluenza rio San Pietro	35.32	81.03
Rio San Pietro monte	Monte confluenza con rio della Caffra	46.31	52.17
Rio San Pietro valle	Confluenza Bormida	48.35	48.63

TR = 200 anni			
Bacino	Sezione di chiusura	Altezza pioggia (mm)	Intensità di pioggia (mm/h)
Rio Sacco	Confluenza Bormida	40.03	85.01
Rio Madama	Confluenza rio San Pietro	27.96	153.01
Rio della Caffra	Confluenza rio San Pietro	38.87	89.18
Rio San Pietro monte	Monte confluenza con rio della Caffra	50.90	57.34
Rio San Pietro valle	Confluenza Bormida	53.13	53.44

TR = 500 anni			
Bacino	Sezione di chiusura	Altezza pioggia (mm)	Intensità di pioggia (mm/h)
Rio Sacco	Confluenza Bormida	44.88	95.31
Rio Madama	Confluenza rio San Pietro	31.44	172.04
Rio della Caffra	Confluenza rio San Pietro	43.59	100.02
Rio San Pietro monte	Monte confluenza con rio della Caffra	56.96	64.17
Rio San Pietro valle	Confluenza Bormida	59.44	59.78

5.4 DETERMINAZIONE DEL COEFFICIENTE MEDIO DI DEFLUSSO

Per quanto riguarda le tipologie di superficie, l'area cui insistono i bacini risulta essere prevalentemente di natura boschiva e agricola.

Si è scelto di adottare un unico coefficiente di deflusso in grado di tenere cautelativamente in considerazione delle diverse tipologie di superficie, e pari a $\phi = 0.50$.

5.5 DETERMINAZIONE DELLE PORTATE MASSIME

Nota l'intensità di precipitazione, per una assegnata superficie scolante S caratterizzata da un coefficiente di deflusso ϕ , la portata defluente è data dall'espressione:

$$Q = \phi S j$$

con:

Q = portata meteorica defluente

ϕ = coefficiente di deflusso

S = superficie esposta alla pioggia

j = intensità di pioggia

Si determinano quindi le portate pluviometriche defluenti nel rio considerando il tempo di pioggia pari al tempo di corrivazione del bacino in esame e supponendo ragionevolmente che l'intensità sia costante durante tale breve periodo.

Si ottengono i seguenti valori:

TR = 20 anni		
Bacino	Sezione di chiusura	Portata [m ³ /s]
Rio Sacco	Confluenza Bormida	10.1
Rio Madama	Confluenza rio San Pietro	5.6
Rio della Caffra	Confluenza rio San Pietro	19.2
Rio San Pietro monte	Monte confluenza con rio della Caffra	22.2
Rio San Pietro valle	Confluenza Bormida	34.3

PROGETTO INTERVENTI PER LA MESSA IN SICUREZZA DEL TERRITORIO COMUNALE A RISCHIO IDROLOGICO
 REGIONE GIARONE, REGIONE CAFRA MANUTENZIONE IDRAULICA RII MINORI, CONSOLIDAMENTI SPONDALI E
 MANUTENZIONE INFRASTRUTTURE ESISTENTI, IMPORTO COMPLESSIVO €. 1.000.000,00

TR = 100 anni		
Bacino	Sezione di chiusura	Portata [m³/s]
Rio Sacco	Confluenza Bormida	13.2
Rio Madama	Confluenza rio San Pietro	7.3
Rio della Caffra	Confluenza rio San Pietro	25.2
Rio San Pietro monte	Monte confluenza con rio della Caffra	29.0
Rio San Pietro valle	Confluenza Bormida	44.6

TR = 200 anni		
Bacino	Sezione di chiusura	Portata [m³/s]
Rio Sacco	Confluenza Bormida	14.5
Rio Madama	Confluenza rio San Pietro	8.1
Rio della Caffra	Confluenza rio San Pietro	27.7
Rio San Pietro monte	Monte confluenza con rio della Caffra	31.9
Rio San Pietro valle	Confluenza Bormida	49.1

TR = 500 anni		
Bacino	Sezione di chiusura	Portata [m³/s]
Rio Sacco	Confluenza Bormida	16.3
Rio Madama	Confluenza rio San Pietro	9.1
Rio della Caffra	Confluenza rio San Pietro	31.1
Rio San Pietro monte	Monte confluenza con rio della Caffra	35.7
Rio San Pietro valle	Confluenza Bormida	54.9

6 ANALISI STORICA DELL'ESONDABILITA' DEI CORPI IDRICI PRESENTI NELL'AREA DI INTERVENTO SITUATA NEL COMUNE DI BUBBIO

Dalla consultazione delle mappe storiche di esondazione disponibili in rete sul portale Arpa Piemonte precedentemente riportate e dall'analisi della morfologia dell'area di intervento, si constatano i seguenti effetti derivanti dagli eventi di piena che interessano i diversi corpi idrici:

Fiume Bormida di Millesimo: l'esondazione del fiume Bormida interessa le aree golenali presenti in sponda destra, che rappresenta la fascia di espansione del corpo idrico, e parte dell'abitato e la zona commerciale di Bubbio in sponda sinistra.

La sponda sinistra si erge dall'alveo fino al livello della strada SP25, che esercita già attualmente la funzione di contenimento dei flussi del Bormida, sebbene per portate con basso tempo di ritorno.

Per valori di portata a tempo di ritorno medio-alto, comunque inferiori di $TR = 200$ anni, si determina l'inondazione del piano campagna retrostante, con gravi danni per le attività residenziali e industriali presenti sul territorio.

Ripercorrendo il tracciato altimetrico della SP25 in direzione di Monastero Bormida, partendo dal ponte sul rio Sacco, si registra una quota della strada pari a circa 192.50 m s.l.m., che va a diminuire con pendenza pari a circa il 6% fino a quota 185.30 m s.l.m. in prossimità dell'incrocio con la SP6.

Proseguendo, con livelletta pari a circa 1% si arriva a valle del piazzale degli autobus al punto più basso della SP25 a quota di circa 183.75 m s.l.m., dove la strada risulta praticamente pianeggiante per tutto il rettilineo, salvo aumentare la pendenza al 4% a valle della zona commerciale, raggiungendo rapidamente quote superiori.

Tale profilo altimetrico della SP25 precedentemente descritto è riportato in Tabella 6.1 ricavata dal DTM di rilievo (si evidenzia la presenza dell'alveo del rio San Pietro in corrispondenza del ponte).

L'area dove attualmente si registra la maggiore esondazione in sponda sinistra coincide approssimativamente alla zona pianeggiante del rettilineo centrale.

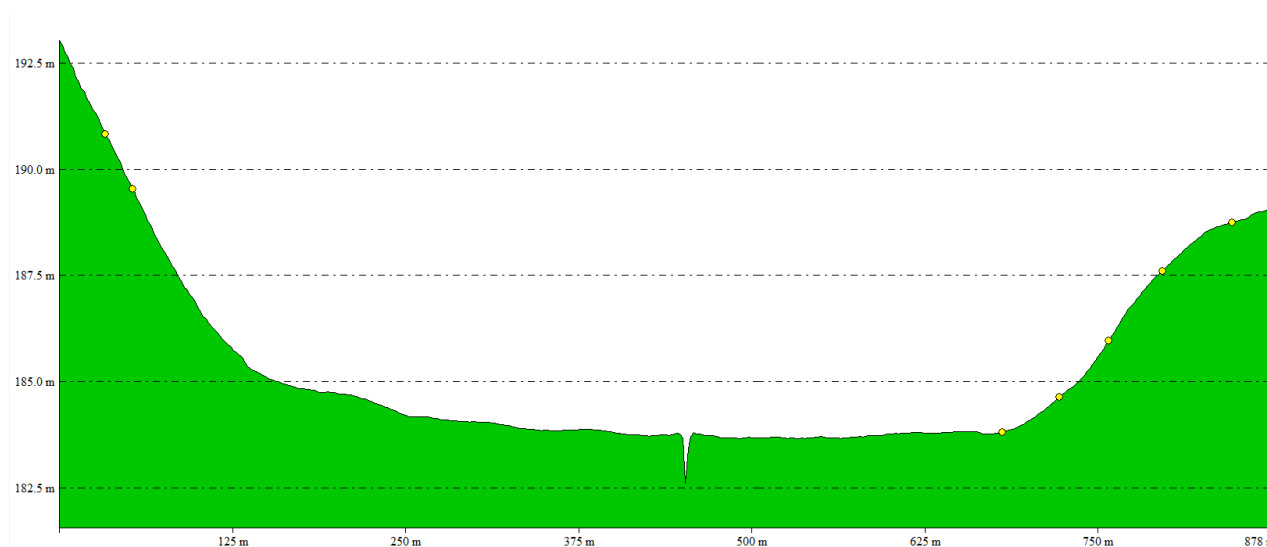


Tabella 6.1: Profilo altimetrico in scala distorta della SP25, da monte verso valle in direzione Monastero Bormida

Rio San Pietro: tra i fossi colatori indagati, risulta essere quello di dimensioni maggiori e quindi maggiormente responsabile dei fenomeni esondativi.

Infatti, il San Pietro risente significativamente del rigurgito del Bormida, che in caso di piena ne determina gli alti tiranti idraulici in prossimità del ponte della SP25.

Il rigurgito del Bormida, unito alla portata defluente nel rio, determina fenomeni di esondazione del rio comunque non trascurabili, connessi anche alla pendenza del fondo, pari a circa 1.50% in questo tratto.

Questo comportamento è chiaramente desumibile dalla ricostruzione dei livelli idraulici degli eventi storici registrati, di seguito dettagliatamente analizzati.

Per quanto riguarda l'evento di piena del 1994, si registra che le esondazioni del rio San Pietro sono interamente determinate dal rigurgito del Bormida, mentre per quanto riguarda l'evento di piena del 2016, di minore entità, i livelli registrati sulla SP6 sono superiori a quelli del Bormida e compatibili con quelli calcolati nelle analisi numeriche relative al rio San Pietro.

Si può quindi riassumere che per tempi di ritorno elevati, l'influenza del Bormida è preponderante, mentre per tempi di ritorno inferiori, il livello idraulico del Bormida sul rio San Pietro determina esondazioni dovute alle portate defluenti nel rio.

Si evidenzia che i volumi d'acqua associati a tali esondazioni sono di entità, comunque, di molto inferiori rispetto a quelli relativi al fiume Bormida.

Rio della Caffra: tale rio si colloca a monte delle aree interessate dai fenomeni esondativi determinati dall'interazione dei fossi colatori con il fiume Bormida; pertanto, non sono disponibili storicamente mappe di esondazione su cui effettuare confronti.

Rio Madama: rio minore affluente di sinistra del San Pietro, subisce l'effetto di rigurgito del Bormida nel San Pietro.

Attualmente, nel suo tratto pianeggiante terminale risulta completamente interessato dai flussi di piena del San Pietro e del Bormida, che di fatto annullano il suo contributo nei riguardi di possibili fenomeni esondativi a lui imputabili.

Si osserva a livello morfologico, dai rilievi in possesso, che tale rio nel tratto pianeggiante terminale risulta essere pensile, ovvero le cui sponde e l'alveo stesso sono ad una quota superiore rispetto al piano campagna circostante, condizione derivante probabilmente da una canalizzazione artificiale avvenuta in passato, che ha determinato uno spostamento dell'alveo originario.

Rio Sacco: dalle mappe storiche di esondazione, tale rio minore, che risulta confluire direttamente nel Bormida dalla sua sinistra, non è affetto da fenomeni consistenti di rigurgito. Questa constatazione è supportata dalle indagini sulla morfologia, da cui è possibile ricavare che la pendenza del rio nei pressi della confluenza è molto elevata, pari a circa il 4%; questa condizione fa sì che la quota di fondo del rio aumenti verso monte, superando in poco più di 100 m i livelli idrici del Bormida.

Il rigurgito risulta pertanto contenuto tra il Bormida ed il ponte sul rio Sacco della SP25, bagnando di fatto le fondazioni e parte del piano seminterrato del fabbricato esistente sulla sponda destra del rio.

7 DESCRIZIONE DEGLI INTERVENTI IN PROGETTO

L'intervento in progetto prevede la realizzazione di arginature in grado di mettere in sicurezza l'abitato di Bubbio attualmente potenzialmente interessato da fenomeni di piena del fiume Bormida di Millesimo e di suoi quattro affluenti minori, ovvero il rio Sacco, rio Madama, Rio della Caffra e Rio San Pietro.

Le arginature, realizzate in tecnologia mista tra rilevati in terra e diaframmi in c.a. in funzione della compatibilità degli ingombri con la morfologia del terreno, vanno ad interessare principalmente il fiume Bormida e secondariamente il rio San Pietro ed i fossi colatori minori, in maniera tale da contenere il rigurgito provocato dal fiume.

Le opere arginali in progetto vanno a proteggere idraulicamente il territorio da eventi di piena con tempo di ritorno pari a 200 anni con un franco idraulico minimo di 1.00 m, come previsto dalla normativa vigente.

Contestualmente, tali opere garantiscono un franco idraulico medio di 0.50 m rispetto al massimo evento di piena storico registrato in tale zona, ovvero quello del novembre 1994, il cui tempo di ritorno è molto più elevato di quello di riferimento.

Il progetto generale è stato suddiviso in diversi lotti funzionali ed autonomi, la cui realizzazione cronologica è stata attentamente valutata in funzione della priorità idrauliche di riduzione del rischio sul territorio interessato.

Si evidenzia che la minimizzazione del rischio idraulico si otterrà solo con il completamento di tutti lotti previsti dal progetto, mentre i lotti intermedi permetteranno di ottenere riduzioni del rischio idraulico parziali ma comunque significative.

In particolare, sono stati giudicati prioritari gli interventi arginali volti a proteggere l'area dall'esonabilità del fiume Bormida, diretta e indiretta.

In base ai criteri precedentemente esposti, sono di seguito riportati in ordine cronologico di realizzazione i lotti previsti nell'ambito del progetto generale:

- **LOTTO 1A:** si prevede la ricalibratura del Bormida in sponda destra con arretramento della sponda di circa 20 m, al fine di ottenere una maggiore sezione di deflusso in alveo finalizzata alla riduzione degli effetti idrodinamici dei flussi di piena.
Contestualmente, il materiale derivante dagli scavi è impiegato per la realizzazione degli argini in terra.

Si precisa che sono previste arginature sul fiume Bormida nei punti più depressi e su di un tratto del rio San Pietro su entrambe le sponde al fine di contenere il rigurgito del Bormida.

È prevista anche la fornitura di una paratoia mobile da installare in caso di emergenza a sbarramento della SP25 in corrispondenza del lato di valle del ponte sul rio San Pietro. Questa soluzione è volta a garantire una sicurezza aggiuntiva all'area commerciale nelle fasi intermedie di realizzazione, dove non sono ancora presenti tutte le opere necessarie a garantire la minimizzazione del rischio idraulico, e risulterà funzionale solo in seguito alla realizzazione dei lotti 1A, 1B e 1C.

- **LOTTO 1B:** si prevede la realizzazione dell'argine in sponda sinistra sul rio Madama e il completamento dell'argine sul rio San Pietro a valle della confluenza con il Madama con il materiale reperito dalla continuazione della ricalibratura iniziata al lotto 1A;
- **LOTTO 1C:** si prevede il completamento delle arginature sul Bormida a monte e a valle del tratto già realizzato al lotto 1A, al fine di completare il contenimento idraulico contro la curva di livello del terreno corrispondente alla quota di coronamento dell'argine, utilizzando il materiale reperito dalla ultimazione della ricalibratura iniziata al lotto 1A;
- **OPERE DI COMPLETAMENTO:** si prevede il completamento delle arginature sul rio San Pietro e sul rio Madama, in grado di contenere la piena del rio determinata a monte del rigurgito provocato dal Bormida, con reperimento del materiale mediante ricalibratura del Bormida in sponda destra con arretramento della sponda di ulteriori 10 m, per un arretramento totale della sponda rispetto alla situazione attuale pari a 30 m.

Tra gli interventi precedentemente elencati, merita un particolare approfondimento il nodo idraulico determinato dall'arginatura prevista sul ponte della SP25 sul rio San Pietro alla confluenza con il fiume Bormida, rientrando nell'ambito dei lavori previsti al lotto 1A.

Al fine di evitare la complicazione plano-altimetrica derivante dall'ipotesi di innalzamento del ponte il cui intradosso viene raggiunto dai deflussi di piena, si è scelto di mantenere invariato il piano viario attuale, realizzando due muri d'argine sui lati in grado di evitare l'esondazione in caso di piena sul piano viabile.

A livello idraulico, al di sotto del ponte si instaura un moto in pressione, assimilabile ad un tombino, che inevitabilmente provoca una perdita di carico sulla linea dell'energia totale, con un innalzamento del profilo idrico sul rio San Pietro a monte.

Tale effetto collaterale è stato opportunamente schematizzato a livello idraulico, e in base ai risultati esposti nei seguenti capitoli, è stato risolto in modo tale da mantenere la validità della scelta progettuale globale fatta, in ragione degli importanti miglioramenti ottenuti sulla minimizzazione del rischio idraulico derivante dal fiume Bormida.

La modellazione idraulica morfologica esposta nel successivo capitolo seguirà le diverse fasi di realizzazione delle arginature, mettendo in risalto quelli che sono i miglioramenti parziali rispetto alla situazione attuale, e la minimizzazione finale del rischio idraulico determinata dalla realizzazione delle opere di completamento.

8 MODELLO IDRAULICO-NUMERICO MONODIMENSIONALE DI MOTO PERMANENTE

La valutazione dei livelli di piena viene effettuata in moto permanente con l'ausilio del software Hec-Ras versione 6.3.1 in quanto questa tipologia rappresenta una buona approssimazione del moto che si manifesta negli alvei naturali dei corsi d'acqua.

Con il modello monodimensionale di moto permanente è stato simulato il comportamento idraulico di un tratto del fiume Bormida di Millesimo di sviluppo pari a circa 1.00 km esteso a monte e a valle del tratto in esame.

Contestualmente sono stati considerati, come già indicato nei capitoli precedenti, i fossi colatori rio Sacco e rio San Pietro, che confluiscono direttamente nel fiume Bormida in sinistra idraulica, ed i fossi colatori rio Madama e rio della Caffra che confluiscono nel rio San Pietro nel tratto di intervento più a monte.

La modellizzazione idraulico-numerica è stata quindi sviluppata considerando anche i fossi colatori interessati dagli interventi previsti in maniera tale da avere un unico modello interconnesso.

Pertanto, la modellizzazione è da ritenersi più completa ed esaustiva come valori idraulici delle tavole progettuali del progetto preliminare generale dove il livello di dettaglio è tale da non considerare le soluzioni locali di minore importanza di questi piccoli corsi d'acqua ma solamente i principali elementi del progetto.

In questo studio idrologico idraulico allegato al progetto, per evidenti ragioni di definizione univoca dei livelli idraulici, tutte le soluzioni vengono esplicitate e modellate in un unico modello idraulico numerico di moto permanente.

Si precisa che per i rii ed i fossi che interferiscono con il progetto di arginatura del fiume Bormida si prevede in fase progettuale arginature spondali che contengano i livelli idraulici derivanti dagli afflussi pluviometrici e dal rigurgito determinato dalle confluenze e come tali sono state modellate nella situazione di progetto.

Il metodo di calcolo adottato permette pertanto una rappresentazione dei livelli di piena nelle sezioni del fiume più raffinata di quanto non lo permetta la schematizzazione del moto uniforme nelle singole sezioni dell'alveo, in quanto con esso è possibile calcolare i livelli tenendo conto anche delle altre sezioni di verifica e delle singolarità idrauliche che ci possono essere nel tratto considerato.

Il problema del tracciamento del profilo di superficie libera di un corso d'acqua naturale in moto permanente con una data portata Q si risolve con procedimenti di calcolo numerico. L'operazione richiede preliminarmente un rilievo dettagliato dell'alveo per suddividere il corso d'acqua in tronchi di lunghezza Δs , tali da poter confondere i valori medi della sezione e della velocità in ciascun tronco con i valori ad un estremo.

Anche la natura dell'alveo deve conservarsi, entro certi limiti, in ciascun tronco.

Eseguita la suddivisione, è necessario il rilievo dettagliato delle caratteristiche geometriche di tutte le sezioni di separazione dei vari tratti.

Siano (i) e (i+1) due sezioni consecutive, distanti Δx in asse, nella prima delle quali siano note tutte le grandezze idrauliche.

La variazione di carico idraulico ΔH tra le due sezioni si può calcolare mediante la seguente relazione alle differenze finite:

$$\Delta H = -[j]_i \cdot \Delta x$$

Si può ottenere così il carico H_{i+1} della sezione i+1 e conseguentemente il carico piezometrico h_{i+1} , che rappresenta la quota del pelo libero rispetto ad un piano di riferimento orizzontale, risolvendo l'equazione:

$$H_{i+1} = h_{i+1} + \frac{Q^2}{2g \cdot \Omega_{i+1}^2}$$

È possibile in questo modo ricavare il carico piezometrico della corrente nelle sezioni di rilievo e da questo calcolare le caratteristiche idrauliche che il fiume ha nel tratto in esame. Questa trattazione teorica relativa ad alvei omogenei è stata generalizzata considerando anche il deflusso golenale che si manifesta per portate al colmo dell'entità di quelle in oggetto.

È stato utilizzato per il calcolo dei livelli e delle principali caratteristiche del moto il software HEC-RAS v.6.3.1 del U.S. Army Corps of Engineers.

Venendo nel dettaglio del modello idraulico-numerico si è compiuta la modellazione del moto permanente del Fiume Bormida di Millesimo lungo un tratto di asta per una lunghezza di circa 1.00 km.

Nel modello idraulico numerico sono inserite 9 sezioni trasversali del Fiume Bormida di Millesimo, come indicato nella planimetria riportata nel seguito, con ulteriori interpolazioni

ogni 25 m, in maniera tale da ottenere una corrispondenza tra gli elaborati grafici prodotti e il modello idraulico.

Le scabrezze adottate hanno un significato globale all'interno della schematizzazione in alveo principale e in aree golenali e sono state dedotte seguendo le indicazioni riportate dalla "Direttiva contenente i criteri per la valutazione della compatibilità idraulica delle infrastrutture pubbliche e di interesse pubblico all'interno delle fasce A e B" approvata con deliberazione del Comitato Istituzionale n.2 dell'11 maggio 1999 – aggiornata con deliberazione n.10 del Comitato Istituzionale del 5 aprile 2006, che al capitolo 4.8.4. Coefficienti di scabrezza, riporta la seguente formula per la determinazione del coefficiente di Manning:

$$n = (n_0 + n_1 + n_2 + n_3 + n_4) \cdot m_5$$

Dove i valori dei diversi coefficienti sono ricavati dalla seguente tabella riportata dalla normativa:

Tabella 1: metodo per il calcolo del coefficiente di scabrezza n nei corsi d'acqua

Condizioni dell'alveo		Valori	
Materiale costituente l'alveo	Terra	n ₀	0.020
	Roccia		0.025
	Alluvione grossolana		0.028
	Alluvione fine		0.024
Irregolarità della superficie della sezione	Trascurabile	n ₁	0.000
	Bassa		0.005
	Moderata		0.010
	Elevata		0.020
Variazione della forma e della dimensione della sezione trasversale	Graduale	n ₂	0.000
	Variazione occasionalmente		0.005
	Variazione frequente		0.010-0.015
Effetto relativo di ostruzioni	Trascurabile	n ₃	0.000
	Modesto		0.010-0.015
	Apprezzabile		0.020-0.030
	Elevato		0.040-0.060
Effetto della vegetazione	Basso	n ₄	0.005-0.010
	Medio		0.010-0.025
	Alto		0.025-0.050
	Molto alto		0.050-0.100
Grado di sinuosità dell'alveo	Modesto	m ₅	1.000
	Apprezzabile		1.150
	Elevato		1.300

La scabrezza dell'alveo attivo è stata determinata mediante la formula riportata dalla normativa, mentre la scabrezza delle zone golenali è stata determinata a partire da valori reperibili in letteratura.

Tali valori sono stati determinati per il Bormida di Millesimo e adottati per tutti i fossi colatori, che presentano condizioni operative molto simili a quelle del fiume; di seguito i valori dei coefficienti parziali individuati per l'alveo attivo:

Condizioni dell'alveo		Coeff.	Valore
Materiale	Terra	n_0	0.020
Irregolarità	Bassa	n_1	0.005
Variazione forma	Graduale	n_2	0.000
Effetto ostruzioni	Trascurabile	n_3	0.000
Effetto vegetazione	Basso	n_4	0.010
Grado di Sinuosità	Modesto	m_5	1.000

Di seguito i valori dei coefficienti di scabrezza adottati per tutti i corpi idrici:

alveo principale:

$C = 28.57 \text{ m/s}^{1/3}$ secondo Gauckler Strickler

$n = 1/C = 0.035$ secondo Manning

aree golenali:

$C = 15.00 \text{ m/ s}^{1/3}$ secondo Gauckler Strickler

$n = 1/C = 0.067$ secondo Manning

Essendo i fossi colatori in regime torrentizio e il fiume Bormida di Millesimo in regime fluviale, è stata compiuta la simulazione in regime di corrente mista, in modo tale da poter meglio modellare eventuali passaggi da corrente veloce a corrente lenta e viceversa.

A proposito delle condizioni al contorno del modello, e cioè del livello dell'acqua nelle sezioni al contorno a monte e a valle, si è imposto per le portate di riferimento che tale livello fosse pari a quello di moto uniforme.

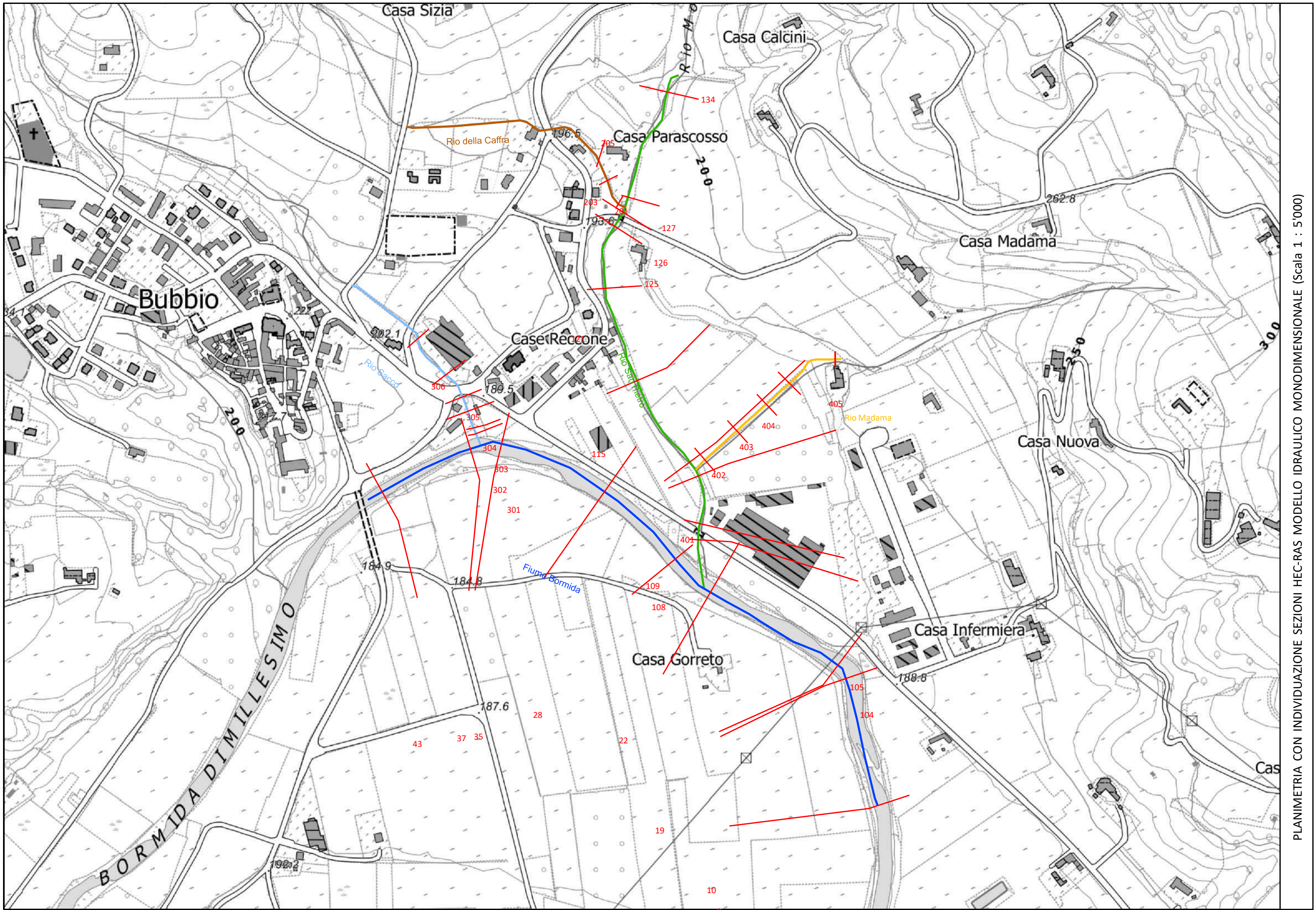
Si precisa comunque che l'ipotesi sul livello di partenza, sebbene importante per le caratteristiche del moto nel tratto in studio, non influenza in modo significativo i livelli dell'acqua nel tratto di fiume di interesse.

Questo perché le sezioni al contorno della simulazione idraulica sono relativamente lontane a monte e a valle, e sono diverse le sezioni d'alveo frapposte tra essa e quelle che sono significative per lo studio delle aree in oggetto; pertanto, in queste condizioni il livello dell'acqua in quella prima sezione ha poca influenza, come si può osservare facilmente facendolo variare all'interno di una tolleranza ragionevole, tale da non cambiare le caratteristiche idrauliche del moto.

Di seguito viene riportata la legenda dei risultati delle simulazioni idrauliche condotte e presentati nei paragrafi successivi:

LEGENDA

River sta.	=	sezione di calcolo
Q total	=	portata in m ³ /s
Min Ch El	=	quota del fondo alveo in m
W.S. Elev.	=	livello del pelo libero dell'acqua in m
Crit W.S.	=	livello di moto critico dell'acqua in m
E.G. Elev	=	livello energetico globale in m
E.G. Slope	=	pendenza motrice
Vel Chnl	=	velocità nell'alveo in m/s
Flow Area	=	area liquida in m ²
Top Width	=	larghezza sezione liquida in sommità in m
Froude # Chl	=	numero di Froude della corrente in alveo



PLANIMETRIA CON INDIVIDUAZIONE SEZIONI HEC-RAS MODELLO IDRAULICO MONODIMENSIONALE (Scala 1 : 5'000)

8.1 VALUTAZIONE DELLA PORTATA DI PIENA DEL FIUME BORMIDA DI MILLESIMO RELATIVA ALL'EVENTO ALLUVIONALE DEL 1994

Dai rapporti storici redatti dalle diverse agenzie, non sono pervenute indicazioni riguardo alla stima del valore di portata al colmo di piena durante l'evento alluvionale del 1994 nei pressi della zona di intervento.

Tali valori di portata vengono di norma ricavati in determinate sezioni precedentemente tarate da cui è possibile ricavare una curva di deflusso in grado di restituire un valore di portata noto il livello idrometrico raggiunto.

Tali presupposti non sono presenti per tutta l'asta del Bormida di Millesimo, e pertanto la stima della portata è stata effettuata con metodologia inversa basandosi sulle simulazioni idrauliche condotte derivanti dalla modellazione numerica con software Hec-Ras 6.3.1 precedentemente esposta.

Per le analisi presenti in questo paragrafo, sono state fissate le seguenti condizioni:

- **Morfologia:** l'area di intervento non ha subito negli anni variazioni plano-altimetriche sostanziali; pertanto, si può assumere che le sezioni di calcolo attuali dedotte dai rilievi siano uguali, a meno di approssimazioni del tutto trascurabili, a quelle del 1994;
- **Scabrezza:** i coefficienti di Manning adottati sono gli stessi precedentemente ricavati seguendo la direttiva.

Fissati i parametri di morfologia del terreno, pari a quella attuale, e di scabrezza, si avvia un processo iterativo che consiste nel variare la portata del Bormida in maniera tale da ottenere la massima corrispondenza tra i livelli idrici simulati e quelli registrati da Arpa Piemonte, ricondotti alle relative sezioni di pertinenza.

Le portate attribuite ai fossi colatori sono state poste pari a quelle ricavate per un tempo di ritorno pari a 20 anni, ipotizzando ragionevolmente che la probabilità composta di avere contemporaneamente due eventi con tempo di ritorno più che cinquecentennale sia di molto superiore al tempo di ritorno indagato dell'evento di piena verificatosi sul Bormida di Millesimo.

Dalle analisi effettuate, il valore di portata che permette di raggiungere la massima convergenza possibile tra i valori misurati e quelli simulati risulta essere pari a $Q_{c,max,1994} = 1900 \text{ m}^3/\text{s}$, che in base all'analisi idrologica condotta al paragrafo 3.1 risulta essere una portata con tempo di ritorno superiore a 500 anni.

L'ottima convergenza del profilo liquido simulato rispetto ai livelli di piena registrati è qualitativamente spiegabile in termini morfologici per via della presenza di una strettoia del

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Bormida in corrispondenza della confluenza con il rio San Pietro, che determina un aumento della velocità in tale sezione e quindi un rigurgito a monte.

Tale restringimento non riguarda l'alveo attivo, che conserva lungo il tracciato una sezione di deflusso pressoché costante, ma bensì la zona golenale destra: infatti, il rigurgito è maggiormente accentuato per le simulazioni con tempi di ritorno che determinano l'esondazione di tale area.

Di seguito, si riportano i risultati dei confronti, che mostrano differenze tra i valori misurati e quelli simulati, in positivo e in negativo, dell'ordine del centimetro, quindi del tutto conformi a quelle che sono le tolleranze di calcolo del modello idraulico-numerico.

Zona	Sez	Quota Terreno (m s.l.m.)	Tirante misurato (m)	Livello misurato (m s.l.m.)	Livello simulato (m s.l.m.)	Differenza (m)
Area Commerciale	17	183.80	1.50	185.30	185.34	+0.04
Piazzale Autobus	30	185.10	2.00	187.10	187.11	+0.01
SP6	33	185.70	1.50	187.20	187.18	-0.02

I risultati della simulazione nella situazione attuale presa come riferimento, nominata nel seguito "1994Borm+TR20rii", sono riportati al paragrafo 8.3.



Tabella 8.1: Individuazione su foto aerea tiranti idraulici registrati da Arpa Piemonte - evento di piena del 1994

8.2 VALUTAZIONE DELLA PORTATA DI PIENA DEL FIUME BORMIDA DI MILLESIMO RELATIVA ALL'EVENTO ALLUVIONALE DEL 2016

Di seguito si riporta la stima della portata di piena del fiume Bormida di Millesimo relativa all'evento alluvionale del 2016, condotta con la medesima metodologia adottata per il 1994 e precedentemente riportata al paragrafo 8.1.

Dalle analisi effettuate, il valore di portata che permette di raggiungere la massima convergenza possibile tra i valori misurati e quelli simulati risulta essere pari a $Q_{c,max,1994} = 1000 \text{ m}^3/\text{s}$, che in base all'analisi idrologica condotta al paragrafo 3.1 risulta essere una portata con tempo di ritorno compreso tra 20 e 100 anni.

Si osserva che il tirante idraulico registrato sul fabbricato a lato della SP6 non è dovuto al Bormida, che nella sezione 33 risulta avere un livello idrico simulato addirittura inferiore al piano campagna nel punto di misura, ma al rio San Pietro, che risulta avere livelli idrici compatibili con quelli calcolati tra le sezioni 116 e 117 (il valore tabellare coincide con la media dei due livelli, essendo il punto di misura collocato in mezzo alle due sezioni).

In base alla precedente puntualizzazione, si riportano i risultati dei confronti, che mostrano differenze tra i valori misurati e quelli simulati dell'ordine del centimetro, quindi del tutto conformi a quelle che sono le tolleranze di calcolo del modello idraulico-numerico.

Zona	Sez	Quota Terreno (m s.l.m.)	Tirante misurato (m)	Livello misurato (m s.l.m.)	Livello simulato (m s.l.m.)	Differenza (m)
Area Commerciale	18	183.80	0.40	184.20	184.24	+0.04
SP6	33	185.70	0.60	186.30	185.09	-1.21
	116	185.70	0.60	186.30	186.36	+0.06
	117					

I risultati della simulazione nella situazione attuale presa come riferimento, nominata nel seguito "2016Borm+TR20rii", sono riportati al paragrafo 8.3.

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Tabella 8.2: Individuazione su foto aerea tiranti idraulici registrati da Arpa Piemonte - evento di piena del 2016

8.3 SIMULAZIONE DEI DIVERSI SCENARI MORFOLOGICI PREVISTI DAI DIVERSI LOTTI FUNZIONALI PER I TEMPI DI RITORNO TECNICI ASSEGNATI

Essendo l'estensione del bacino idrografico del fiume Bormida di differenti ordini di grandezza superiore rispetto a quello dei fossi colatori, per la teoria della probabilità composta risulta molto improbabile che si abbiano contemporaneamente le stesse condizioni di piena catastrofica.

Infatti, l'evento che racchiude la concomitanza di due eventi con tempo di ritorno pari a 200 anni che interessano contemporaneamente il Bormida ed i fossi colatori risulta avere un tempo di ritorno composto superiore di molto al duecentennale.

Al fine di evitare il sovradimensionamento delle arginature previste sui rii minori, si è scelto di assegnare ai bacini di tutti i fossi colatori coinvolti, in concomitanza all'evento di piena duecentennale del Bormida, una portata avente un tempo di ritorno inferiore, posto ragionevolmente pari a 20 anni.

Si ottiene quindi che l'evento di piena considerato per la verifica del franco idraulico minimo, fissato dalla normativa e pari a 1.00 m, risulta quello che prevede per il fiume Bormida di Millesimo un tempo di ritorno pari a 200 anni, mentre per i fossi colatori coinvolti un tempo di ritorno pari a 20 anni.

Per quanto riguarda le arginature del Bormida, fermo restando la verifica del franco minimo imposto da normativa, si è scelto di adottare come criterio aggiuntivo di verificare che le arginature siano in grado di contenere con un franco idraulico medio pari a 0.50 m il massimo evento di piena storicamente registrato, che coincide con l'evento di piena verificatosi nel novembre del 1994.

Oltre alle simulazioni precedentemente introdotte, sono state studiate altre combinazioni di portate, volte a determinare il grado di sicurezza di volta in volta raggiunto con le diverse fasi di realizzazione dell'opera generale di arginatura prevista.

Di seguito sono riassunti in forma tabellare i valori di portata adottati nelle diverse simulazioni condotte per ogni situazione progettuale prevista dalla divisione in lotti funzionali, in funzione della combinazione di tempi di ritorno del Bormida e dei fossi colatori considerata:

INTERVENTO CODICE AT_A18_622_19_102 – PROGETTO PER LAVORI DI ADEGUAMENTO SEZIONI DI DEFLUSSO FOSSI COLATORI PROVENIENTI DA VERSANTI IN GIARONETTO - ADEGUAMENTO DEI TRATTI DEL FIUME BORMIDA E DEL RIO SAN PIETRO IN CORRISPONDENZA DELLA S.P. 25 - PROGETTO ESECUTIVO – LOTTO 1A

CORPO IDRICO	PORTATE DERIVANTI DALLA COMBINAZIONE DEI TEMPI DI RITORNO (m ³ /s)					
	TR20Borm + TR<20rii	TR20Borm + TR20rii	TR20Borm + TR200rii	TR200Borm + TR20rii	2016Borm + TR20rii	1994Borm + TR20rii
Fiume Bormida di Millesimo	833	833	833	1469	1000	1900
Rio della Caffra	5.0	19.2	27.7	19.2	19.2	19.2
Rio Madama	1.0	5.6	8.1	5.6	5.6	5.6
Rio Sacco	10.1	10.1	14.5	10.1	10.1	10.1
Rio San Pietro (a monte della confluenza con rio della Caffra)	5	22.2	31.9	22.2	22.2	22.2
Rio San Pietro (alla confluenza con il Bormida di Millesimo)	8	34.3	49.1	34.3	34.3	34.3

Nelle seguenti pagine i risultati delle simulazioni in funzione del lotto funzionale considerato.

SITUAZIONE ATTUALE

HEC-RAS Plan: Attuale

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	3	134	TR20Borm+TR<20ri	5.00	192.48	193.32	193.32	193.58	0.017108	2.29	2.18	4.13	1.01
Rio San Pietro	3	134	TR20Borm+TR20rii	22.20	192.48	194.13	194.19	194.73	0.017011	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	TR20Borm+TR200ri	31.90	192.48	194.42	194.52	195.14	0.017021	3.74	8.53	7.39	1.11
Rio San Pietro	3	134	TR200Borm+TR20ri	22.20	192.48	194.13	194.20	194.73	0.017012	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	2016Borm+TR20rii	22.20	192.48	194.13	194.19	194.73	0.017011	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	1994Borm+TR20rii	22.20	192.48	194.13	194.20	194.73	0.017012	3.42	6.50	6.49	1.09
Rio San Pietro	3	133.00*	TR20Borm+TR<20ri	5.00	192.00	192.82	192.85	193.12	0.020016	2.43	2.06	4.01	1.09
Rio San Pietro	3	133.00*	TR20Borm+TR20rii	22.20	192.00	193.62	193.73	194.27	0.019320	3.57	6.22	6.43	1.16
Rio San Pietro	3	133.00*	TR20Borm+TR200ri	31.90	192.00	193.90	194.05	194.68	0.019304	3.91	8.16	7.32	1.18
Rio San Pietro	3	133.00*	TR200Borm+TR20ri	22.20	192.00	193.62	193.73	194.27	0.019484	3.58	6.20	6.42	1.16
Rio San Pietro	3	133.00*	2016Borm+TR20rii	22.20	192.00	193.62	193.73	194.27	0.019320	3.57	6.22	6.43	1.16
Rio San Pietro	3	133.00*	1994Borm+TR20rii	22.20	192.00	193.62	193.73	194.27	0.019319	3.57	6.22	6.43	1.16
Rio San Pietro	3	132.00*	TR20Borm+TR<20ri	5.00	191.53	192.38	192.38	192.65	0.017302	2.31	2.16	4.08	1.01
Rio San Pietro	3	132.00*	TR20Borm+TR20rii	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	132.00*	TR20Borm+TR200ri	31.90	191.53	193.44	193.58	194.20	0.019113	3.86	8.26	7.55	1.18
Rio San Pietro	3	132.00*	TR200Borm+TR20ri	22.20	191.53	193.16	193.26	193.79	0.018621	3.51	6.33	6.56	1.14
Rio San Pietro	3	132.00*	2016Borm+TR20rii	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	132.00*	1994Borm+TR20rii	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	131.00*	TR20Borm+TR<20ri	5.00	191.05	191.88	191.91	192.18	0.020188	2.44	2.05	4.00	1.09
Rio San Pietro	3	131.00*	TR20Borm+TR20rii	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	131.00*	TR20Borm+TR200ri	31.90	191.05	192.94	193.10	193.71	0.019784	3.88	8.21	7.68	1.20
Rio San Pietro	3	131.00*	TR200Borm+TR20ri	22.20	191.05	192.67	192.79	193.31	0.019639	3.54	6.26	6.70	1.17
Rio San Pietro	3	131.00*	2016Borm+TR20rii	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	131.00*	1994Borm+TR20rii	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	130.00*	TR20Borm+TR<20ri	5.00	190.58	191.43	191.44	191.71	0.017638	2.32	2.16	4.13	1.02
Rio San Pietro	3	130.00*	TR20Borm+TR20rii	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	130.00*	TR20Borm+TR200ri	31.90	190.58	192.45	192.60	193.22	0.019805	3.88	8.22	7.74	1.20
Rio San Pietro	3	130.00*	TR200Borm+TR20ri	22.20	190.58	192.18	192.31	192.82	0.019894	3.54	6.28	6.85	1.18
Rio San Pietro	3	130.00*	2016Borm+TR20rii	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	130.00*	1994Borm+TR20rii	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	129.00*	TR20Borm+TR<20ri	5.00	190.10	190.92	190.96	191.23	0.020777	2.44	2.05	4.13	1.11
Rio San Pietro	3	129.00*	TR20Borm+TR20rii	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	TR20Borm+TR200ri	31.90	190.10	191.94	192.10	192.72	0.020116	3.90	8.18	7.76	1.21
Rio San Pietro	3	129.00*	TR200Borm+TR20ri	22.20	190.10	191.68	191.80	192.32	0.020086	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	2016Borm+TR20rii	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	1994Borm+TR20rii	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19

HEC-RAS Plan: Attuale (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	3	128.00*	TR20Borm+TR<20ri	5.00	189.63	190.45	190.47	190.73	0.018705	2.32	2.16	4.38	1.05
Rio San Pietro	3	128.00*	TR20Borm+TR20rii	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	TR20Borm+TR200ri	31.90	189.63	191.44	191.62	192.21	0.020379	3.90	8.17	7.86	1.22
Rio San Pietro	3	128.00*	TR200Borm+TR20ri	22.20	189.63	191.18	191.30	191.82	0.020227	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	2016Borm+TR20rii	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	1994Borm+TR20rii	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	127	TR20Borm+TR<20ri	5.00	189.15	190.09	189.97	190.25	0.008760	1.75	2.85	4.97	0.74
Rio San Pietro	3	127	TR20Borm+TR20rii	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	TR20Borm+TR200ri	31.90	189.15	191.61	191.27	191.68	0.001390	1.44	45.13	60.60	0.35
Rio San Pietro	3	127	TR200Borm+TR20ri	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	2016Borm+TR20rii	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	1994Borm+TR20rii	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	2	126	TR20Borm+TR<20ri	8.00	188.92	190.03	189.77	190.16	0.005187	1.61	4.95	6.61	0.60
Rio San Pietro	2	126	TR20Borm+TR20rii	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	TR20Borm+TR200ri	49.10	188.92	191.41	191.30	191.63	0.003468	2.37	40.50	81.15	0.56
Rio San Pietro	2	126	TR200Borm+TR20ri	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	2016Borm+TR20rii	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	1994Borm+TR20rii	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	125.5		Bridge									
Rio San Pietro	2	125	TR20Borm+TR<20ri	8.00	187.78	188.94	188.90	189.24	0.013680	2.43	3.29	4.65	0.92
Rio San Pietro	2	125	TR20Borm+TR20rii	34.30	187.78	189.96	189.96	190.01	0.003089	1.41	41.17	54.90	0.47
Rio San Pietro	2	125	TR20Borm+TR200ri	49.10	187.78	189.96	189.96	190.07	0.006329	2.02	41.17	54.90	0.67
Rio San Pietro	2	125	TR200Borm+TR20ri	34.30	187.78	189.96	189.96	190.01	0.003089	1.41	41.17	54.90	0.47
Rio San Pietro	2	125	2016Borm+TR20rii	34.30	187.78	189.96	189.96	190.01	0.003089	1.41	41.17	54.90	0.47
Rio San Pietro	2	125	1994Borm+TR20rii	34.30	187.78	189.96	189.96	190.01	0.003089	1.41	41.17	54.90	0.47
Rio San Pietro	2	124.00*	TR20Borm+TR<20ri	8.00	187.45	188.61	188.57	188.91	0.013528	2.41	3.32	4.74	0.92
Rio San Pietro	2	124.00*	TR20Borm+TR20rii	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	TR20Borm+TR200ri	49.10	187.45	189.40	189.40	189.50	0.007564	2.06	40.10	54.98	0.72
Rio San Pietro	2	124.00*	TR200Borm+TR20ri	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	2016Borm+TR20rii	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	1994Borm+TR20rii	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	123.00*	TR20Borm+TR<20ri	8.00	187.11	188.27	188.24	188.57	0.013931	2.42	3.30	4.82	0.94
Rio San Pietro	2	123.00*	TR20Borm+TR20rii	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	123.00*	TR20Borm+TR200ri	49.10	187.11	188.83	188.83	188.94	0.009078	2.08	39.03	56.38	0.78
Rio San Pietro	2	123.00*	TR200Borm+TR20ri	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	123.00*	2016Borm+TR20rii	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54

HEC-RAS Plan: Attuale (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	123.00*	1994Borm+TR20rii	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	122.00*	TR20Borm+TR<20ri	8.00	186.78	187.97	187.90	188.24	0.012155	2.28	3.51	5.12	0.88
Rio San Pietro	2	122.00*	TR20Borm+TR20rii	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	TR20Borm+TR200ri	49.10	186.78	188.27	188.27	188.37	0.010860	2.06	37.95	57.70	0.83
Rio San Pietro	2	122.00*	TR200Borm+TR20ri	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	2016Borm+TR20rii	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	1994Borm+TR20rii	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	121	TR20Borm+TR<20ri	8.00	186.44	187.57	187.57	187.89	0.016026	2.49	3.21	5.06	1.00
Rio San Pietro	2	121	TR20Borm+TR20rii	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	TR20Borm+TR200ri	49.10	186.44	187.72	187.70	187.81	0.011893	1.95	37.79	58.99	0.85
Rio San Pietro	2	121	TR200Borm+TR20ri	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	2016Borm+TR20rii	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	1994Borm+TR20rii	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	120.00*	TR20Borm+TR<20ri	8.00	186.05	186.88	186.99	187.30	0.036907	3.21	5.32	48.07	1.46
Rio San Pietro	2	120.00*	TR20Borm+TR20rii	34.30	186.05	187.32	187.21	187.40	0.010131	1.94	33.75	72.93	0.80
Rio San Pietro	2	120.00*	TR20Borm+TR200ri	49.10	186.05	187.43		187.53	0.010552	2.18	41.79	73.64	0.84
Rio San Pietro	2	120.00*	TR200Borm+TR20ri	34.30	186.05	187.32	187.21	187.40	0.010131	1.94	33.75	72.93	0.80
Rio San Pietro	2	120.00*	2016Borm+TR20rii	34.30	186.05	187.32	187.21	187.40	0.010131	1.94	33.75	72.93	0.80
Rio San Pietro	2	120.00*	1994Borm+TR20rii	34.30	186.05	187.31	187.21	187.39	0.010802	1.98	33.07	72.84	0.83
Rio San Pietro	2	119.00*	TR20Borm+TR<20ri	8.00	185.66	186.75	186.77	186.87	0.010600	1.77	9.75	69.54	0.80
Rio San Pietro	2	119.00*	TR20Borm+TR20rii	34.30	185.66	187.07		187.16	0.008735	2.13	35.99	85.89	0.78
Rio San Pietro	2	119.00*	TR20Borm+TR200ri	49.10	185.66	187.17		187.28	0.009319	2.35	44.80	86.85	0.82
Rio San Pietro	2	119.00*	TR200Borm+TR20ri	34.30	185.66	187.07		187.16	0.008735	2.13	35.99	85.89	0.78
Rio San Pietro	2	119.00*	2016Borm+TR20rii	34.30	185.66	187.07		187.16	0.008735	2.13	35.99	85.89	0.78
Rio San Pietro	2	119.00*	1994Borm+TR20rii	34.30	185.66	187.15		187.21	0.005206	1.73	42.83	86.26	0.61
Rio San Pietro	2	118.00*	TR20Borm+TR<20ri	8.00	185.27	186.45	186.50	186.62	0.008569	1.87	5.94	47.64	0.75
Rio San Pietro	2	118.00*	TR20Borm+TR20rii	34.30	185.27	186.80	186.80	186.94	0.008589	2.37	36.07	107.82	0.79
Rio San Pietro	2	118.00*	TR20Borm+TR200ri	49.10	185.27	186.89	186.89	187.04	0.009467	2.60	46.74	123.40	0.84
Rio San Pietro	2	118.00*	TR200Borm+TR20ri	34.30	185.27	186.80	186.80	186.94	0.008589	2.37	36.07	107.82	0.79
Rio San Pietro	2	118.00*	2016Borm+TR20rii	34.30	185.27	186.80	186.80	186.94	0.008589	2.37	36.07	107.82	0.79
Rio San Pietro	2	118.00*	1994Borm+TR20rii	34.30	185.27	187.12		187.14	0.001311	1.06	75.53	132.32	0.32
Rio San Pietro	2	117.00*	TR20Borm+TR<20ri	8.00	184.87	185.81	185.92	186.25	0.027548	2.94	2.72	5.22	1.30
Rio San Pietro	2	117.00*	TR20Borm+TR20rii	34.30	184.87	186.52	186.58	186.72	0.009017	2.61	36.59	138.85	0.83
Rio San Pietro	2	117.00*	TR20Borm+TR200ri	49.10	184.87	186.61	186.64	186.80	0.009912	2.81	48.39	143.60	0.87
Rio San Pietro	2	117.00*	TR200Borm+TR20ri	34.30	184.87	186.52	186.58	186.72	0.009017	2.61	36.59	138.85	0.83
Rio San Pietro	2	117.00*	2016Borm+TR20rii	34.30	184.87	186.52	186.58	186.72	0.009017	2.61	36.59	138.85	0.83

HEC-RAS Plan: Attuale (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	117.00*	1994Borm+TR20rii	34.30	184.87	187.11		187.12	0.000341	0.68	125.47	154.24	0.17
Rio San Pietro	2	116.00*	TR20Borm+TR<20ri	8.00	184.48	185.49	185.49	185.80	0.015946	2.46	3.25	5.35	1.01
Rio San Pietro	2	116.00*	TR20Borm+TR20rii	34.30	184.48	186.19	186.27	186.47	0.010331	2.92	31.19	125.91	0.89
Rio San Pietro	2	116.00*	TR20Borm+TR200ri	49.10	184.48	186.31	186.39	186.55	0.009465	3.00	48.88	164.02	0.87
Rio San Pietro	2	116.00*	TR200Borm+TR20ri	34.30	184.48	186.19	186.27	186.47	0.010331	2.92	31.19	125.91	0.89
Rio San Pietro	2	116.00*	2016Borm+TR20rii	34.30	184.48	186.19	186.27	186.47	0.010331	2.92	31.19	125.91	0.89
Rio San Pietro	2	116.00*	1994Borm+TR20rii	34.30	184.48	187.11		187.11	0.000116	0.46	184.56	171.99	0.10
Rio San Pietro	2	115	TR20Borm+TR<20ri	8.00	184.09	185.10	185.09	185.41	0.014993	2.46	3.25	5.01	0.98
Rio San Pietro	2	115	TR20Borm+TR20rii	34.30	184.09	185.81	185.93	186.18	0.012026	3.24	25.02	112.64	0.96
Rio San Pietro	2	115	TR20Borm+TR200ri	49.10	184.09	185.91	186.04	186.27	0.012220	3.46	37.61	123.30	0.98
Rio San Pietro	2	115	TR200Borm+TR20ri	34.30	184.09	186.28	185.93	186.30	0.000773	1.03	97.26	182.73	0.26
Rio San Pietro	2	115	2016Borm+TR20rii	34.30	184.09	185.81	185.93	186.18	0.012026	3.24	25.02	112.64	0.96
Rio San Pietro	2	115	1994Borm+TR20rii	34.30	184.09	187.11		187.11	0.000048	0.34	252.32	189.74	0.07
Rio San Pietro	2	114.00*	TR20Borm+TR<20ri	8.00	183.67	184.77	184.73	185.05	0.013394	2.34	3.41	5.23	0.93
Rio San Pietro	2	114.00*	TR20Borm+TR20rii	34.30	183.67	185.67	185.73	185.93	0.006786	2.62	27.19	80.86	0.74
Rio San Pietro	2	114.00*	TR20Borm+TR200ri	49.10	183.67	185.83	185.86	186.05	0.006095	2.69	45.36	124.48	0.71
Rio San Pietro	2	114.00*	TR200Borm+TR20ri	34.30	183.67	186.27		186.29	0.000435	0.86	111.18	177.51	0.20
Rio San Pietro	2	114.00*	2016Borm+TR20rii	34.30	183.67	185.67	185.73	185.93	0.006786	2.62	27.19	80.86	0.74
Rio San Pietro	2	114.00*	1994Borm+TR20rii	34.30	183.67	187.11		187.11	0.000037	0.32	275.31	202.93	0.06
Rio San Pietro	2	113.00*	TR20Borm+TR<20ri	8.00	183.26	184.68		184.81	0.004933	1.62	4.94	6.15	0.58
Rio San Pietro	2	113.00*	TR20Borm+TR20rii	34.30	183.26	185.33	185.45	185.71	0.009740	2.99	18.76	43.25	0.87
Rio San Pietro	2	113.00*	TR20Borm+TR200ri	49.10	183.26	185.57	185.61	185.88	0.007331	2.93	34.07	81.73	0.78
Rio San Pietro	2	113.00*	TR200Borm+TR20ri	34.30	183.26	186.27		186.28	0.000245	0.70	131.10	171.99	0.15
Rio San Pietro	2	113.00*	2016Borm+TR20rii	34.30	183.26	185.33	185.45	185.71	0.009740	2.99	18.76	43.25	0.87
Rio San Pietro	2	113.00*	1994Borm+TR20rii	34.30	183.26	187.11		187.11	0.000028	0.29	299.31	211.26	0.05
Rio San Pietro	2	112.00*	TR20Borm+TR<20ri	8.00	182.85	184.66		184.72	0.001817	1.11	7.22	8.95	0.36
Rio San Pietro	2	112.00*	TR20Borm+TR20rii	34.30	182.85	185.04	185.13	185.46	0.010444	3.00	16.23	35.48	0.89
Rio San Pietro	2	112.00*	TR20Borm+TR200ri	49.10	182.85	185.28	185.38	185.68	0.008635	3.10	28.20	56.12	0.83
Rio San Pietro	2	112.00*	TR200Borm+TR20ri	34.30	182.85	186.27		186.27	0.000151	0.58	152.74	180.51	0.12
Rio San Pietro	2	112.00*	2016Borm+TR20rii	34.30	182.85	185.04	185.13	185.46	0.010444	3.00	16.23	35.48	0.89
Rio San Pietro	2	112.00*	1994Borm+TR20rii	34.30	182.85	187.11		187.11	0.000022	0.27	325.02	220.35	0.05
Rio San Pietro	2	111.00*	TR20Borm+TR<20ri	8.00	182.43	184.65		184.68	0.000757	0.79	11.58	25.35	0.24
Rio San Pietro	2	111.00*	TR20Borm+TR20rii	34.30	182.43	184.75	184.84	185.19	0.010405	3.02	14.42	31.66	0.88
Rio San Pietro	2	111.00*	TR20Borm+TR200ri	49.10	182.43	185.02	185.12	185.45	0.009113	3.13	25.65	55.73	0.85
Rio San Pietro	2	111.00*	TR200Borm+TR20ri	34.30	182.43	186.26		186.27	0.000098	0.50	175.54	187.17	0.10
Rio San Pietro	2	111.00*	2016Borm+TR20rii	34.30	182.43	185.15	184.84	185.28	0.002787	1.83	32.67	56.58	0.48

HEC-RAS Plan: Attuale (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	111.00*	1994Borm+TR20rii	34.30	182.43	187.11		187.11	0.000017	0.25	352.31	228.72	0.04
Rio San Pietro	2	110.00*	TR20Borm+TR<20ri	8.00	182.02	184.65		184.67	0.000306	0.56	19.13	33.87	0.15
Rio San Pietro	2	110.00*	TR20Borm+TR20rii	34.30	182.02	184.64	184.44	184.92	0.005852	2.44	18.65	33.47	0.67
Rio San Pietro	2	110.00*	TR20Borm+TR200ri	49.10	182.02	184.68	184.87	185.20	0.010488	3.32	20.26	35.22	0.90
Rio San Pietro	2	110.00*	TR200Borm+TR20ri	34.30	182.02	186.26		186.27	0.000066	0.43	199.55	193.49	0.08
Rio San Pietro	2	110.00*	2016Borm+TR20rii	34.30	182.02	185.15		185.22	0.001235	1.34	46.51	78.39	0.32
Rio San Pietro	2	110.00*	1994Borm+TR20rii	34.30	182.02	187.11		187.11	0.000013	0.23	380.95	231.88	0.04
Rio San Pietro	2	109	TR20Borm+TR<20ri	8.00	181.60	184.65		184.66	0.000142	0.42	29.37	55.51	0.11
Rio San Pietro	2	109	TR20Borm+TR20rii	34.30	181.60	184.63		184.79	0.002799	1.86	28.09	55.44	0.47
Rio San Pietro	2	109	TR20Borm+TR200ri	49.10	181.60	184.60	184.49	184.93	0.005940	2.69	26.48	52.31	0.69
Rio San Pietro	2	109	TR200Borm+TR20ri	34.30	181.60	186.26		186.27	0.000046	0.37	224.78	200.70	0.07
Rio San Pietro	2	109	2016Borm+TR20rii	34.30	181.60	185.15		185.19	0.000623	1.02	62.58	88.14	0.23
Rio San Pietro	2	109	1994Borm+TR20rii	34.30	181.60	187.11		187.11	0.000010	0.21	412.17	238.76	0.03
Rio San Pietro	1	108	TR20Borm+TR<20ri	8.00	180.99	184.65		184.66	0.000069	0.34	40.88	58.31	0.08
Rio San Pietro	1	108	TR20Borm+TR20rii	34.30	180.99	184.65	183.64	184.74	0.001274	1.47	40.85	58.29	0.32
Rio San Pietro	1	108	TR20Borm+TR200ri	49.10	180.99	184.65	184.18	184.83	0.002622	2.10	40.76	58.24	0.46
Rio San Pietro	1	108	TR200Borm+TR20ri	34.30	180.99	186.26		186.26	0.000013	0.21	420.39	263.83	0.04
Rio San Pietro	1	108	2016Borm+TR20rii	34.30	180.99	185.16		185.18	0.000235	0.73	135.43	253.62	0.14
Rio San Pietro	1	108	1994Borm+TR20rii	34.30	180.99	187.11		187.11	0.000003	0.13	643.75	265.61	0.02
Rio San Pietro	1	107.00*	TR20Borm+TR<20ri	8.00	180.57	184.65		184.66	0.000045	0.29	49.99	146.51	0.06
Rio San Pietro	1	107.00*	TR20Borm+TR20rii	34.30	180.57	184.65		184.71	0.000836	1.23	48.94	137.22	0.26
Rio San Pietro	1	107.00*	TR20Borm+TR200ri	49.10	180.57	184.63		184.76	0.001770	1.79	47.30	125.13	0.38
Rio San Pietro	1	107.00*	TR200Borm+TR20ri	34.30	180.57	186.26		186.26	0.000009	0.19	456.40	259.41	0.03
Rio San Pietro	1	107.00*	2016Borm+TR20rii	34.30	180.57	185.16		185.17	0.000133	0.56	173.18	251.69	0.11
Rio San Pietro	1	107.00*	1994Borm+TR20rii	34.30	180.57	187.11		187.11	0.000003	0.12	675.62	260.68	0.02
Rio San Pietro	1	106.00*	TR20Borm+TR<20ri	8.00	180.14	184.65		184.65	0.000026	0.22	85.72	245.69	0.05
Rio San Pietro	1	106.00*	TR20Borm+TR20rii	34.30	180.14	184.65		184.68	0.000483	0.96	84.68	245.01	0.20
Rio San Pietro	1	106.00*	TR20Borm+TR200ri	49.10	180.14	184.64		184.71	0.001022	1.40	82.61	243.23	0.29
Rio San Pietro	1	106.00*	TR200Borm+TR20ri	34.30	180.14	186.26		186.26	0.000007	0.17	492.86	255.38	0.03
Rio San Pietro	1	106.00*	2016Borm+TR20rii	34.30	180.14	185.16		185.17	0.000079	0.45	212.87	252.64	0.08
Rio San Pietro	1	106.00*	1994Borm+TR20rii	34.30	180.14	187.11		187.11	0.000002	0.11	708.93	257.53	0.02
Rio San Pietro	1	105	TR20Borm+TR<20ri	8.00	179.72	184.65	181.18	184.65	0.000013	0.16	130.49	252.40	0.03
Rio San Pietro	1	105	TR20Borm+TR20rii	34.30	179.72	184.65	182.50	184.67	0.000241	0.70	130.71	252.40	0.14
Rio San Pietro	1	105	TR20Borm+TR200ri	49.10	179.72	184.65	182.94	184.68	0.000497	1.00	130.34	252.40	0.20
Rio San Pietro	1	105	TR200Borm+TR20ri	34.30	179.72	186.26	182.50	186.26	0.000006	0.15	536.89	252.40	0.02
Rio San Pietro	1	105	2016Borm+TR20rii	34.30	179.72	185.16	182.50	185.16	0.000047	0.35	258.90	252.40	0.06

HEC-RAS Plan: Attuale (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	1	105	1994Borm+TR20rii	34.30	179.72	187.11	182.50	187.11	0.000002	0.10	749.66	252.40	0.01
Rio San Pietro	1	104.5		Bridge									
Rio San Pietro	1	104	TR20Borm+TR<20ri	8.00	179.17	184.65		184.65	0.000004	0.12	184.34	266.06	0.02
Rio San Pietro	1	104	TR20Borm+TR20rii	34.30	179.17	184.65		184.66	0.000078	0.51	183.27	266.06	0.09
Rio San Pietro	1	104	TR20Borm+TR200ri	49.10	179.17	184.64		184.66	0.000164	0.74	181.42	266.04	0.13
Rio San Pietro	1	104	TR200Borm+TR20ri	34.30	179.17	186.26		186.26	0.000004	0.14	614.34	267.40	0.02
Rio San Pietro	1	104	2016Borm+TR20rii	34.30	179.17	185.16		185.16	0.000022	0.30	319.69	266.98	0.05
Rio San Pietro	1	104	1994Borm+TR20rii	34.30	179.17	187.11		187.11	0.000001	0.10	839.78	267.40	0.01
Rio Sacco	1	306	TR20Borm+TR<20ri	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	TR20Borm+TR20rii	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	TR20Borm+TR200ri	14.50	187.71	189.12	189.31	189.78	0.030031	3.58	4.05	5.84	1.37
Rio Sacco	1	306	TR200Borm+TR20ri	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	2016Borm+TR20rii	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	1994Borm+TR20rii	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	305	TR20Borm+TR<20ri	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	TR20Borm+TR20rii	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	TR20Borm+TR200ri	14.50	185.28	187.58	187.02	187.77	0.004776	1.95	7.45	5.81	0.55
Rio Sacco	1	305	TR200Borm+TR20ri	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	2016Borm+TR20rii	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	1994Borm+TR20rii	10.10	185.28	187.83	186.77	187.89	0.001414	1.13	8.97	6.36	0.30
Rio Sacco	1	304.5		Bridge									
Rio Sacco	1	304	TR20Borm+TR<20ri	10.10	183.36	185.41		185.47	0.001281	1.09	9.30	7.04	0.30
Rio Sacco	1	304	TR20Borm+TR20rii	10.10	183.36	185.41		185.47	0.001283	1.09	9.29	7.04	0.30
Rio Sacco	1	304	TR20Borm+TR200ri	14.50	183.36	185.39		185.52	0.002743	1.58	9.17	7.00	0.44
Rio Sacco	1	304	TR200Borm+TR20ri	10.10	183.36	186.99		187.00	0.000117	0.44	22.78	10.47	0.10
Rio Sacco	1	304	2016Borm+TR20rii	10.10	183.36	185.91		185.94	0.000508	0.77	13.04	8.02	0.19
Rio Sacco	1	304	1994Borm+TR20rii	10.10	183.36	187.83		187.83	0.000045	0.31	32.36	12.24	0.06
Rio Sacco	1	303	TR20Borm+TR<20ri	10.10	182.69	185.40		185.44	0.000676	0.86	11.71	7.32	0.22
Rio Sacco	1	303	TR20Borm+TR20rii	10.10	182.69	185.40		185.44	0.000676	0.86	11.70	7.32	0.22
Rio Sacco	1	303	TR20Borm+TR200ri	14.50	182.69	185.38		185.46	0.001448	1.26	11.52	7.23	0.32
Rio Sacco	1	303	TR200Borm+TR20ri	10.10	182.69	186.99		186.99	0.000081	0.37	27.50	13.19	0.08
Rio Sacco	1	303	2016Borm+TR20rii	10.10	182.69	185.90		185.92	0.000322	0.64	15.78	9.01	0.15
Rio Sacco	1	303	1994Borm+TR20rii	10.10	182.69	187.83		187.83	0.000028	0.25	41.84	26.17	0.05
Rio Sacco	1	302	TR20Borm+TR<20ri	10.10	182.41	185.42		185.43	0.000052	0.32	37.78	27.05	0.07

HEC-RAS Plan: Attuale (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio Sacco	1	302	TR20Borm+TR20rii	10.10	182.41	185.42		185.43	0.000052	0.32	37.76	27.04	0.07
Rio Sacco	1	302	TR20Borm+TR200ri	14.50	182.41	185.42		185.43	0.000108	0.46	37.69	27.03	0.10
Rio Sacco	1	302	TR200Borm+TR20ri	10.10	182.41	186.99		186.99	0.000006	0.16	93.26	55.00	0.03
Rio Sacco	1	302	2016Borm+TR20rii	10.10	182.41	185.91		185.92	0.000023	0.25	51.51	28.88	0.05
Rio Sacco	1	302	1994Borm+TR20rii	10.10	182.41	187.83		187.83	0.000002	0.12	139.48	55.00	0.02
Rio Sacco	1	301	TR20Borm+TR<20ri	10.10	181.63	185.43		185.43	0.000030	0.26	55.64	31.56	0.05
Rio Sacco	1	301	TR20Borm+TR20rii	10.10	181.63	185.42		185.43	0.000030	0.26	55.62	31.56	0.05
Rio Sacco	1	301	TR20Borm+TR200ri	14.50	181.63	185.42		185.43	0.000062	0.37	55.57	31.56	0.08
Rio Sacco	1	301	TR200Borm+TR20ri	10.10	181.63	186.99		186.99	0.000004	0.14	122.57	56.40	0.02
Rio Sacco	1	301	2016Borm+TR20rii	10.10	181.63	185.91		185.92	0.000015	0.21	71.41	33.13	0.04
Rio Sacco	1	301	1994Borm+TR20rii	10.10	181.63	187.83		187.83	0.000002	0.10	169.95	56.40	0.02
Rio Madama	1	405	TR20Borm+TR<20ri	1.00	194.39	194.70	194.82	195.08	0.080108	2.73	0.37	1.70	1.87
Rio Madama	1	405	TR20Borm+TR20rii	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	TR20Borm+TR200ri	8.10	194.39	195.24	195.61	196.41	0.080011	4.79	1.69	3.17	2.10
Rio Madama	1	405	TR200Borm+TR20ri	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	2016Borm+TR20rii	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	1994Borm+TR20rii	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	404	TR20Borm+TR<20ri	1.00	187.14	187.58	187.55	187.69	0.015523	1.48	0.68	2.31	0.87
Rio Madama	1	404	TR20Borm+TR20rii	5.60	187.14	187.77	187.77	187.77	0.000039	0.08	43.18	25.69	0.04
Rio Madama	1	404	TR20Borm+TR200ri	8.10	187.14	187.77	187.77	187.77	0.000081	0.12	43.18	25.69	0.06
Rio Madama	1	404	TR200Borm+TR20ri	5.60	187.14	187.77	187.77	187.77	0.000039	0.08	43.18	25.69	0.04
Rio Madama	1	404	2016Borm+TR20rii	5.60	187.14	187.77	187.77	187.77	0.000039	0.08	43.18	25.69	0.04
Rio Madama	1	404	1994Borm+TR20rii	5.60	187.14	187.77	187.77	187.77	0.000039	0.08	43.18	25.69	0.04
Rio Madama	1	403	TR20Borm+TR<20ri	1.00	186.20	186.65	186.65	186.81	0.022136	1.77	0.57	1.74	0.99
Rio Madama	1	403	TR20Borm+TR20rii	5.60	186.20	186.75	186.75	186.75	0.000170	0.17	26.88	23.66	0.09
Rio Madama	1	403	TR20Borm+TR200ri	8.10	186.20	186.75	186.75	186.75	0.000356	0.24	26.88	23.66	0.13
Rio Madama	1	403	TR200Borm+TR20ri	5.60	186.20	186.75	186.75	186.75	0.000170	0.17	26.88	23.66	0.09
Rio Madama	1	403	2016Borm+TR20rii	5.60	186.20	186.75	186.75	186.75	0.000170	0.17	26.88	23.66	0.09
Rio Madama	1	403	1994Borm+TR20rii	5.60	186.20	187.11	186.75	187.11	0.000071	0.14	35.51	25.07	0.06
Rio Madama	1	402	TR20Borm+TR<20ri	1.00	184.94	185.38	185.38	185.50	0.020727	1.59	0.63	2.45	1.00
Rio Madama	1	402	TR20Borm+TR20rii	5.60	184.94	185.58	185.74	186.61	0.107703	4.49	1.25	3.51	2.41
Rio Madama	1	402	TR20Borm+TR200ri	8.10	184.94	185.74	185.74	185.75	0.001448	0.54	17.74	26.81	0.28
Rio Madama	1	402	TR200Borm+TR20ri	5.60	184.94	186.27	185.74	186.27	0.000056	0.18	46.58	46.00	0.06
Rio Madama	1	402	2016Borm+TR20rii	5.60	184.94	185.58	185.74	186.61	0.107703	4.49	1.25	3.51	2.41
Rio Madama	1	402	1994Borm+TR20rii	5.60	184.94	187.11	185.74	187.11	0.000008	0.11	85.27	46.00	0.03
Rio Madama	1	401	TR20Borm+TR<20ri	1.00	183.68	184.65	184.13	184.66	0.000586	0.43	2.30	4.16	0.19

HEC-RAS Plan: Attuale (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio Madama	1	401	TR20Borm+TR20rii	5.60	183.68	184.67	184.67	184.95	0.017096	2.37	2.37	4.22	1.01
Rio Madama	1	401	TR20Borm+TR200ri	8.10	183.68	184.59	184.99	185.39	0.052834	3.96	2.04	3.92	1.75
Rio Madama	1	401	TR200Borm+TR20ri	5.60	183.68	186.26		186.26	0.000014	0.15	68.21	48.30	0.04
Rio Madama	1	401	2016Borm+TR20rii	5.60	183.68	185.17	184.67	185.19	0.001110	0.68	15.34	48.30	0.27
Rio Madama	1	401	1994Borm+TR20rii	5.60	183.68	187.11		187.11	0.000003	0.09	108.89	48.30	0.02
Rio Caffra	1	205	TR20Borm+TR<20ri	5.00	190.88	191.70	191.54	191.80	0.006656	1.37	3.66	8.42	0.64
Rio Caffra	1	205	TR20Borm+TR20rii	19.20	190.88	192.26	192.11	192.38	0.004193	1.71	17.62	37.78	0.57
Rio Caffra	1	205	TR20Borm+TR200ri	27.70	190.88	192.45	192.26	192.58	0.003695	1.83	25.03	39.34	0.56
Rio Caffra	1	205	TR200Borm+TR20ri	19.20	190.88	192.26	192.11	192.38	0.004193	1.71	17.62	37.78	0.57
Rio Caffra	1	205	2016Borm+TR20rii	19.20	190.88	192.26	192.11	192.38	0.004193	1.71	17.62	37.78	0.57
Rio Caffra	1	205	1994Borm+TR20rii	19.20	190.88	192.26	192.11	192.38	0.004193	1.71	17.62	37.78	0.57
Rio Caffra	1	203	TR20Borm+TR<20ri	5.00	190.29	191.15	191.15	191.40	0.017312	2.22	2.25	4.61	1.01
Rio Caffra	1	203	TR20Borm+TR20rii	19.20	190.29	191.76	191.76	192.10	0.013227	2.78	9.41	17.25	0.97
Rio Caffra	1	203	TR20Borm+TR200ri	27.70	190.29	191.98	191.98	192.33	0.011851	2.91	13.41	19.28	0.94
Rio Caffra	1	203	TR200Borm+TR20ri	19.20	190.29	191.76	191.76	192.10	0.013227	2.78	9.41	17.25	0.97
Rio Caffra	1	203	2016Borm+TR20rii	19.20	190.29	191.76	191.76	192.10	0.013227	2.78	9.41	17.25	0.97
Rio Caffra	1	203	1994Borm+TR20rii	19.20	190.29	191.76	191.76	192.10	0.013227	2.78	9.41	17.25	0.97
Rio Caffra	1	201	TR20Borm+TR<20ri	5.00	189.19	189.92	190.06	190.39	0.042417	3.04	1.64	4.16	1.54
Rio Caffra	1	201	TR20Borm+TR20rii	19.20	189.19	191.44	190.74	191.52	0.001386	1.38	19.60	18.90	0.35
Rio Caffra	1	201	TR20Borm+TR200ri	27.70	189.19	191.57	191.06	191.71	0.002078	1.79	22.17	18.90	0.44
Rio Caffra	1	201	TR200Borm+TR20ri	19.20	189.19	191.44	190.74	191.52	0.001386	1.38	19.60	18.90	0.35
Rio Caffra	1	201	2016Borm+TR20rii	19.20	189.19	191.44	190.74	191.52	0.001386	1.38	19.60	18.90	0.35
Rio Caffra	1	201	1994Borm+TR20rii	19.20	189.19	191.44	190.74	191.52	0.001386	1.38	19.60	18.90	0.35
Bormida	3	43	TR20Borm+TR<20ri	833.00	179.12	185.02	183.40	185.72	0.002254	3.78	270.88	163.00	0.55
Bormida	3	43	TR20Borm+TR20rii	833.00	179.12	185.01	183.40	185.72	0.002256	3.78	270.75	162.73	0.55
Bormida	3	43	TR20Borm+TR200ri	833.00	179.12	185.02	183.39	185.72	0.002254	3.78	270.90	163.03	0.55
Bormida	3	43	TR200Borm+TR20ri	1469.00	179.12	186.49	185.68	187.27	0.002048	4.30	551.27	194.71	0.54
Bormida	3	43	2016Borm+TR20rii	1000.00	179.12	185.45	183.86	186.21	0.002245	3.99	349.67	192.09	0.55
Bormida	3	43	1994Borm+TR20rii	1900.00	179.12	187.31	186.30	188.10	0.001908	4.50	711.30	196.23	0.54
Bormida	3	42.000*	TR20Borm+TR<20ri	833.00	179.09	184.99	183.35	185.65	0.002187	3.66	278.31	184.29	0.54
Bormida	3	42.000*	TR20Borm+TR20rii	833.00	179.09	184.99	183.35	185.65	0.002189	3.66	278.14	184.22	0.54
Bormida	3	42.000*	TR20Borm+TR200ri	833.00	179.09	184.99	183.35	185.65	0.002187	3.66	278.32	184.30	0.54
Bormida	3	42.000*	TR200Borm+TR20ri	1469.00	179.09	186.50		187.19	0.001871	4.07	580.49	204.45	0.52
Bormida	3	42.000*	2016Borm+TR20rii	1000.00	179.09	185.44	183.80	186.13	0.002108	3.82	365.57	200.93	0.54
Bormida	3	42.000*	1994Borm+TR20rii	1900.00	179.09	187.32		188.02	0.001725	4.25	750.07	206.47	0.51
Bormida	3	41.000*	TR20Borm+TR<20ri	833.00	179.06	184.97	183.29	185.59	0.002131	3.54	285.88	196.67	0.53

HEC-RAS Plan: Attuale (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	3	41.000*	TR20Borm+TR20rii	833.00	179.06	184.96	183.29	185.59	0.002133	3.54	285.68	196.65	0.53
Bormida	3	41.000*	TR20Borm+TR200ri	833.00	179.06	184.97	183.29	185.59	0.002131	3.54	285.89	196.67	0.53
Bormida	3	41.000*	TR200Borm+TR20ri	1469.00	179.06	186.50		187.13	0.001731	3.87	608.39	214.24	0.50
Bormida	3	41.000*	2016Borm+TR20rii	1000.00	179.06	185.43		186.07	0.002007	3.67	379.97	209.44	0.52
Bormida	3	41.000*	1994Borm+TR20rii	1900.00	179.06	187.33		187.96	0.001578	4.03	787.83	216.89	0.49
Bormida	3	40.000*	TR20Borm+TR<20ri	833.00	179.04	184.94	183.24	185.53	0.002098	3.44	292.24	206.28	0.52
Bormida	3	40.000*	TR20Borm+TR20rii	833.00	179.04	184.94	183.24	185.53	0.002100	3.45	292.02	206.27	0.52
Bormida	3	40.000*	TR20Borm+TR200ri	833.00	179.04	184.94	183.24	185.53	0.002098	3.44	292.25	206.28	0.52
Bormida	3	40.000*	TR200Borm+TR20ri	1469.00	179.04	186.50		187.07	0.001617	3.70	635.20	224.18	0.48
Bormida	3	40.000*	2016Borm+TR20rii	1000.00	179.04	185.41		186.00	0.001931	3.54	393.01	217.86	0.51
Bormida	3	40.000*	1994Borm+TR20rii	1900.00	179.04	187.34		187.91	0.001456	3.83	824.86	227.19	0.47
Bormida	3	39.000*	TR20Borm+TR<20ri	833.00	179.01	184.90	183.17	185.47	0.002063	3.36	297.17	215.63	0.52
Bormida	3	39.000*	TR20Borm+TR20rii	833.00	179.01	184.90	183.17	185.47	0.002065	3.37	296.93	215.61	0.52
Bormida	3	39.000*	TR20Borm+TR200ri	833.00	179.01	184.90	183.17	185.47	0.002063	3.36	297.18	215.63	0.52
Bormida	3	39.000*	TR200Borm+TR20ri	1469.00	179.01	186.49		187.02	0.001523	3.55	661.10	234.59	0.47
Bormida	3	39.000*	2016Borm+TR20rii	1000.00	179.01	185.39		185.95	0.001878	3.43	404.63	226.82	0.50
Bormida	3	39.000*	1994Borm+TR20rii	1900.00	179.01	187.34		187.86	0.001353	3.66	861.25	237.47	0.45
Bormida	3	38.000*	TR20Borm+TR<20ri	833.00	178.98	184.88		185.41	0.002009	3.27	303.65	188.98	0.51
Bormida	3	38.000*	TR20Borm+TR20rii	833.00	178.98	184.87		185.41	0.002011	3.27	303.44	188.83	0.51
Bormida	3	38.000*	TR20Borm+TR200ri	833.00	178.98	184.88		185.41	0.002009	3.27	303.66	188.98	0.51
Bormida	3	38.000*	TR200Borm+TR20ri	1469.00	178.98	186.49		186.97	0.001443	3.41	686.46	245.65	0.45
Bormida	3	38.000*	2016Borm+TR20rii	1000.00	178.98	185.37		185.89	0.001842	3.34	414.99	235.50	0.50
Bormida	3	38.000*	1994Borm+TR20rii	1900.00	178.98	187.34		187.81	0.001265	3.51	897.38	248.08	0.44
Bormida	3	37	TR20Borm+TR<20ri	833.00	178.95	184.85		185.35	0.001952	3.18	314.74	176.27	0.50
Bormida	3	37	TR20Borm+TR20rii	833.00	178.95	184.85		185.35	0.001955	3.18	314.54	176.15	0.50
Bormida	3	37	TR20Borm+TR200ri	833.00	178.95	184.85		185.35	0.001952	3.18	314.75	176.28	0.50
Bormida	3	37	TR200Borm+TR20ri	1469.00	178.95	186.48		186.92	0.001375	3.29	711.75	256.75	0.44
Bormida	3	37	2016Borm+TR20rii	1000.00	178.95	185.34		185.84	0.001809	3.26	424.05	244.30	0.49
Bormida	3	37	1994Borm+TR20rii	1900.00	178.95	187.34		187.77	0.001189	3.36	933.47	258.24	0.42
Bormida	2	35	TR20Borm+TR<20ri	833.00	178.59	184.71		185.29	0.001929	3.43	295.51	174.00	0.50
Bormida	2	35	TR20Borm+TR20rii	833.00	178.59	184.71		185.29	0.001931	3.43	295.29	173.73	0.50
Bormida	2	35	TR20Borm+TR200ri	833.00	178.59	184.71		185.29	0.001929	3.43	295.52	174.01	0.50
Bormida	2	35	TR200Borm+TR20ri	1469.00	178.59	186.33		186.88	0.001480	3.65	683.24	267.00	0.46
Bormida	2	35	2016Borm+TR20rii	1000.00	178.59	185.17		185.78	0.001865	3.58	393.81	232.85	0.50
Bormida	2	35	1994Borm+TR20rii	1900.00	178.59	187.23		187.73	0.001258	3.68	930.40	276.60	0.44
Bormida	2	34.000*	TR20Borm+TR<20ri	833.00	178.53	184.64	182.88	185.24	0.001989	3.47	291.70	184.91	0.51

HEC-RAS Plan: Attuale (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	2	34.000*	TR20Borm+TR20rii	833.00	178.53	184.64	182.88	185.24	0.001991	3.47	291.44	184.69	0.51
Bormida	2	34.000*	TR20Borm+TR200ri	833.00	178.53	184.64	182.88	185.24	0.001989	3.47	291.71	184.92	0.51
Bormida	2	34.000*	TR200Borm+TR20ri	1469.00	178.53	186.30		186.84	0.001474	3.65	686.17	272.17	0.46
Bormida	2	34.000*	2016Borm+TR20rii	1000.00	178.53	185.13		185.73	0.001849	3.57	398.46	224.71	0.50
Bormida	2	34.000*	1994Borm+TR20rii	1900.00	178.53	187.21		187.70	0.001247	3.67	932.83	272.17	0.43
Bormida	2	33.000*	TR20Borm+TR<20ri	833.00	178.46	184.58	182.84	185.19	0.002037	3.51	293.68	208.33	0.52
Bormida	2	33.000*	TR20Borm+TR20rii	833.00	178.46	184.58	182.84	185.19	0.002040	3.51	293.35	208.31	0.52
Bormida	2	33.000*	TR20Borm+TR200ri	833.00	178.46	184.58	182.84	185.19	0.002037	3.51	293.69	208.34	0.52
Bormida	2	33.000*	TR200Borm+TR20ri	1469.00	178.46	186.27		186.80	0.001459	3.64	692.15	267.74	0.46
Bormida	2	33.000*	2016Borm+TR20rii	1000.00	178.46	185.09		185.69	0.001834	3.56	403.01	218.78	0.50
Bormida	2	33.000*	1994Borm+TR20rii	1900.00	178.46	187.18		187.67	0.001234	3.66	936.17	267.74	0.43
Bormida	2	32.000*	TR20Borm+TR<20ri	833.00	178.40	184.53	182.80	185.14	0.002036	3.51	299.84	199.36	0.52
Bormida	2	32.000*	TR20Borm+TR20rii	833.00	178.40	184.53	182.80	185.14	0.002040	3.51	299.49	199.33	0.52
Bormida	2	32.000*	TR20Borm+TR200ri	833.00	178.40	184.53	182.80	185.14	0.002036	3.51	299.86	199.36	0.52
Bormida	2	32.000*	TR200Borm+TR20ri	1469.00	178.40	186.24		186.77	0.001439	3.62	699.44	263.31	0.46
Bormida	2	32.000*	2016Borm+TR20rii	1000.00	178.40	185.06		185.64	0.001819	3.55	407.28	212.51	0.50
Bormida	2	32.000*	1994Borm+TR20rii	1900.00	178.40	187.16		187.64	0.001219	3.65	940.36	263.31	0.43
Bormida	2	31.000*	TR20Borm+TR<20ri	833.00	178.33	184.49	182.76	185.09	0.002033	3.50	305.41	191.45	0.52
Bormida	2	31.000*	TR20Borm+TR20rii	833.00	178.33	184.49	182.75	185.09	0.002037	3.51	305.05	191.37	0.52
Bormida	2	31.000*	TR20Borm+TR200ri	833.00	178.33	184.49	182.76	185.09	0.002033	3.50	305.43	191.46	0.52
Bormida	2	31.000*	TR200Borm+TR20ri	1469.00	178.33	186.22		186.73	0.001415	3.60	707.76	258.89	0.45
Bormida	2	31.000*	2016Borm+TR20rii	1000.00	178.33	185.02		185.60	0.001804	3.54	412.15	212.50	0.49
Bormida	2	31.000*	1994Borm+TR20rii	1900.00	178.33	187.13		187.61	0.001203	3.63	945.42	258.89	0.43
Bormida	2	30.000*	TR20Borm+TR<20ri	833.00	178.27	184.44		185.04	0.002030	3.50	310.82	187.71	0.52
Bormida	2	30.000*	TR20Borm+TR20rii	833.00	178.27	184.44		185.04	0.002034	3.50	310.45	187.66	0.52
Bormida	2	30.000*	TR20Borm+TR200ri	833.00	178.27	184.44		185.04	0.002030	3.50	310.84	187.71	0.52
Bormida	2	30.000*	TR200Borm+TR20ri	1469.00	178.27	186.19		186.69	0.001388	3.57	717.08	254.46	0.45
Bormida	2	30.000*	2016Borm+TR20rii	1000.00	178.27	184.98		185.55	0.001788	3.53	418.98	219.48	0.49
Bormida	2	30.000*	1994Borm+TR20rii	1900.00	178.27	187.11		187.58	0.001184	3.61	951.28	254.46	0.42
Bormida	2	29.000*	TR20Borm+TR<20ri	833.00	178.20	184.40		184.99	0.002023	3.49	316.33	186.30	0.51
Bormida	2	29.000*	TR20Borm+TR20rii	833.00	178.20	184.40		184.99	0.002027	3.49	315.93	186.17	0.51
Bormida	2	29.000*	TR20Borm+TR200ri	833.00	178.20	184.40		184.99	0.002023	3.49	316.35	186.30	0.51
Bormida	2	29.000*	TR200Borm+TR20ri	1469.00	178.20	186.17		186.65	0.001356	3.54	727.48	250.03	0.44
Bormida	2	29.000*	2016Borm+TR20rii	1000.00	178.20	184.95		185.50	0.001762	3.51	431.42	236.13	0.49
Bormida	2	29.000*	1994Borm+TR20rii	1900.00	178.20	187.09		187.54	0.001164	3.58	958.00	250.03	0.42
Bormida	2	28	TR20Borm+TR<20ri	833.00	178.14	184.36		184.93	0.002014	3.48	323.28	194.00	0.51

HEC-RAS Plan: Attuale (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	2	28	TR20Borm+TR20rii	833.00	178.14	184.36		184.93	0.002019	3.48	322.84	193.80	0.51
Bormida	2	28	TR20Borm+TR200ri	833.00	178.14	184.36		184.93	0.002014	3.48	323.30	194.01	0.51
Bormida	2	28	TR200Borm+TR20ri	1469.00	178.14	186.15		186.62	0.001321	3.49	738.91	245.60	0.44
Bormida	2	28	2016Borm+TR20rii	1000.00	178.14	184.92		185.45	0.001712	3.46	447.86	231.69	0.48
Bormida	2	28	1994Borm+TR20rii	1900.00	178.14	187.07		187.51	0.001141	3.55	965.55	245.60	0.42
Bormida	2	27.000*	TR20Borm+TR<20ri	833.00	178.10	184.30		184.88	0.002006	3.50	310.60	169.41	0.51
Bormida	2	27.000*	TR20Borm+TR20rii	833.00	178.10	184.30		184.88	0.002008	3.50	310.48	169.23	0.51
Bormida	2	27.000*	TR20Borm+TR200ri	833.00	178.10	184.30		184.88	0.002006	3.50	310.62	169.44	0.51
Bormida	2	27.000*	TR200Borm+TR20ri	1469.00	178.10	186.04		186.57	0.001453	3.67	678.02	224.70	0.46
Bormida	2	27.000*	2016Borm+TR20rii	1000.00	178.10	184.83		185.41	0.001793	3.55	417.40	209.76	0.49
Bormida	2	27.000*	1994Borm+TR20rii	1900.00	178.10	186.96		187.48	0.001272	3.75	885.14	224.70	0.44
Bormida	2	26.000*	TR20Borm+TR<20ri	833.00	178.05	184.25		184.83	0.001965	3.49	302.64	146.75	0.51
Bormida	2	26.000*	TR20Borm+TR20rii	833.00	178.05	184.25		184.83	0.001967	3.50	302.53	146.57	0.51
Bormida	2	26.000*	TR20Borm+TR200ri	833.00	178.05	184.25		184.83	0.001965	3.49	302.66	146.77	0.51
Bormida	2	26.000*	TR200Borm+TR20ri	1469.00	178.05	185.91		186.53	0.001614	3.86	616.88	203.80	0.48
Bormida	2	26.000*	2016Borm+TR20rii	1000.00	178.05	184.75		185.36	0.001850	3.62	391.40	186.28	0.50
Bormida	2	26.000*	1994Borm+TR20rii	1900.00	178.05	186.83		187.43	0.001437	3.98	803.48	203.80	0.47
Bormida	2	25.000*	TR20Borm+TR<20ri	833.00	178.01	184.20		184.79	0.001920	3.49	296.26	137.82	0.50
Bormida	2	25.000*	TR20Borm+TR20rii	833.00	178.01	184.20		184.79	0.001922	3.49	296.16	137.72	0.50
Bormida	2	25.000*	TR20Borm+TR200ri	833.00	178.01	184.20		184.79	0.001920	3.49	296.28	137.84	0.50
Bormida	2	25.000*	TR200Borm+TR20ri	1469.00	178.01	185.76		186.48	0.001812	4.08	555.87	182.90	0.51
Bormida	2	25.000*	2016Borm+TR20rii	1000.00	178.01	184.68		185.31	0.001869	3.66	370.92	161.50	0.51
Bormida	2	25.000*	1994Borm+TR20rii	1900.00	178.01	186.66		187.38	0.001653	4.25	720.40	182.90	0.50
Bormida	2	24.000*	TR20Borm+TR<20ri	833.00	177.97	184.15		184.74	0.001872	3.47	290.90	120.74	0.50
Bormida	2	24.000*	TR20Borm+TR20rii	833.00	177.97	184.15		184.74	0.001873	3.47	290.80	120.64	0.50
Bormida	2	24.000*	TR20Borm+TR200ri	833.00	177.97	184.15		184.74	0.001872	3.47	290.92	120.76	0.50
Bormida	2	24.000*	TR200Borm+TR20ri	1469.00	177.97	185.62		186.42	0.001983	4.25	501.52	155.01	0.54
Bormida	2	24.000*	2016Borm+TR20rii	1000.00	177.97	184.62		185.26	0.001877	3.69	353.41	139.58	0.51
Bormida	2	24.000*	1994Borm+TR20rii	1900.00	177.97	186.45		187.32	0.001948	4.57	635.47	162.00	0.54
Bormida	2	23.000*	TR20Borm+TR<20ri	833.00	177.92	184.11		184.69	0.001822	3.46	285.83	107.62	0.49
Bormida	2	23.000*	TR20Borm+TR20rii	833.00	177.92	184.11		184.69	0.001823	3.46	285.74	107.58	0.49
Bormida	2	23.000*	TR20Borm+TR200ri	833.00	177.92	184.11		184.69	0.001822	3.46	285.84	107.63	0.49
Bormida	2	23.000*	TR200Borm+TR20ri	1469.00	177.92	185.45		186.35	0.002212	4.46	448.87	131.55	0.57
Bormida	2	23.000*	2016Borm+TR20rii	1000.00	177.92	184.55		185.21	0.001884	3.72	337.28	119.92	0.51
Bormida	2	23.000*	1994Borm+TR20rii	1900.00	177.92	186.16		187.25	0.002382	4.97	548.31	141.10	0.60
Bormida	2	22	TR20Borm+TR<20ri	833.00	177.88	184.06		184.65	0.001772	3.44	280.61	94.12	0.49

HEC-RAS Plan: Attuale (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	2	22	TR20Borm+TR20rii	833.00	177.88	184.06		184.65	0.001773	3.44	280.53	94.10	0.49
Bormida	2	22	TR20Borm+TR200ri	833.00	177.88	184.06		184.65	0.001771	3.44	280.62	94.12	0.49
Bormida	2	22	TR200Borm+TR20ri	1469.00	177.88	185.29		186.29	0.002400	4.63	405.43	106.32	0.59
Bormida	2	22	2016Borm+TR20rii	1000.00	177.88	184.49		185.16	0.001885	3.75	322.22	101.15	0.51
Bormida	2	22	1994Borm+TR20rii	1900.00	177.88	185.72	184.81	187.15	0.003156	5.55	453.86	120.20	0.68
Bormida	1	19	TR20Borm+TR<20ri	833.00	178.13	183.88		184.51	0.002046	3.51	252.52	94.67	0.52
Bormida	1	19	TR20Borm+TR20rii	833.00	178.13	183.88		184.51	0.002047	3.51	252.44	94.65	0.52
Bormida	1	19	TR20Borm+TR200ri	833.00	178.13	183.88		184.51	0.002047	3.51	252.45	94.65	0.52
Bormida	1	19	TR200Borm+TR20ri	1469.00	178.13	184.96	183.84	186.09	0.002931	4.82	375.82	136.07	0.64
Bormida	1	19	2016Borm+TR20rii	1000.00	178.13	184.27		185.01	0.002210	3.85	291.27	106.28	0.54
Bormida	1	19	1994Borm+TR20rii	1900.00	178.13	185.40	184.81	186.90	0.003639	5.64	459.17	232.75	0.72
Bormida	1	18.000*	TR20Borm+TR<20ri	833.00	177.98	183.85		184.45	0.001956	3.43	254.35	89.73	0.51
Bormida	1	18.000*	TR20Borm+TR20rii	833.00	177.98	183.85		184.45	0.001957	3.43	254.27	89.69	0.51
Bormida	1	18.000*	TR20Borm+TR200ri	833.00	177.98	183.85		184.45	0.001957	3.43	254.27	89.70	0.51
Bormida	1	18.000*	TR200Borm+TR20ri	1469.00	177.98	184.89	183.60	186.01	0.002913	4.79	378.09	194.48	0.64
Bormida	1	18.000*	2016Borm+TR20rii	1000.00	177.98	184.24		184.95	0.002125	3.77	292.13	105.94	0.54
Bormida	1	18.000*	1994Borm+TR20rii	1900.00	177.98	185.34	184.82	186.79	0.003509	5.53	474.84	236.87	0.71
Bormida	1	17.000*	TR20Borm+TR<20ri	833.00	177.84	183.83		184.39	0.001830	3.33	260.68	86.10	0.49
Bormida	1	17.000*	TR20Borm+TR20rii	833.00	177.84	183.83		184.39	0.001831	3.33	260.60	86.07	0.49
Bormida	1	17.000*	TR20Borm+TR200ri	833.00	177.84	183.83		184.39	0.001831	3.33	260.60	86.07	0.49
Bormida	1	17.000*	TR200Borm+TR20ri	1469.00	177.84	184.86	183.46	185.92	0.002725	4.65	398.56	204.66	0.62
Bormida	1	17.000*	2016Borm+TR20rii	1000.00	177.84	184.21		184.89	0.002000	3.67	298.22	111.93	0.52
Bormida	1	17.000*	1994Borm+TR20rii	1900.00	177.84	185.34	184.61	186.67	0.003208	5.32	505.99	241.86	0.68
Bormida	1	16.000*	TR20Borm+TR<20ri	833.00	177.69	183.81		184.34	0.001684	3.22	270.87	92.87	0.47
Bormida	1	16.000*	TR20Borm+TR20rii	833.00	177.69	183.81		184.34	0.001685	3.22	270.78	92.80	0.47
Bormida	1	16.000*	TR20Borm+TR200ri	833.00	177.69	183.81		184.34	0.001685	3.22	270.79	92.81	0.47
Bormida	1	16.000*	TR200Borm+TR20ri	1469.00	177.69	184.87	183.33	185.83	0.002456	4.45	430.08	219.82	0.59
Bormida	1	16.000*	2016Borm+TR20rii	1000.00	177.69	184.19		184.83	0.001839	3.54	310.58	117.27	0.50
Bormida	1	16.000*	1994Borm+TR20rii	1900.00	177.69	185.37	184.65	186.55	0.002814	5.04	549.52	246.33	0.64
Bormida	1	15.000*	TR20Borm+TR<20ri	833.00	177.55	183.80		184.28	0.001522	3.09	285.97	100.06	0.45
Bormida	1	15.000*	TR20Borm+TR20rii	833.00	177.55	183.80		184.28	0.001523	3.09	285.87	100.01	0.45
Bormida	1	15.000*	TR20Borm+TR200ri	833.00	177.55	183.80		184.28	0.001523	3.09	285.88	100.01	0.45
Bormida	1	15.000*	TR200Borm+TR20ri	1469.00	177.55	184.89	183.18	185.74	0.002129	4.19	472.19	222.55	0.55
Bormida	1	15.000*	2016Borm+TR20rii	1000.00	177.55	184.19		184.77	0.001659	3.40	332.73	163.74	0.48
Bormida	1	15.000*	1994Borm+TR20rii	1900.00	177.55	185.42	184.47	186.44	0.002413	4.73	600.52	250.81	0.60
Bormida	1	14.000*	TR20Borm+TR<20ri	833.00	177.40	183.80		184.23	0.001355	2.95	306.66	117.81	0.43

HEC-RAS Plan: Attuale (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	1	14.000*	TR20Borm+TR20rii	833.00	177.40	183.79		184.23	0.001356	2.95	306.55	117.74	0.43
Bormida	1	14.000*	TR20Borm+TR200ri	833.00	177.40	183.79		184.23	0.001356	2.95	306.56	117.74	0.43
Bormida	1	14.000*	TR200Borm+TR20ri	1469.00	177.40	184.92		185.65	0.001826	3.94	520.63	232.93	0.52
Bormida	1	14.000*	2016Borm+TR20rii	1000.00	177.40	184.19		184.71	0.001456	3.22	369.93	182.51	0.45
Bormida	1	14.000*	1994Borm+TR20rii	1900.00	177.40	185.46		186.34	0.002048	4.42	655.98	255.29	0.55
Bormida	1	13.000*	TR20Borm+TR<20ri	833.00	177.26	183.79		184.19	0.001192	2.81	338.11	172.56	0.40
Bormida	1	13.000*	TR20Borm+TR20rii	833.00	177.26	183.79		184.19	0.001193	2.81	337.93	172.51	0.40
Bormida	1	13.000*	TR20Borm+TR200ri	833.00	177.26	183.79		184.19	0.001193	2.81	337.94	172.51	0.40
Bormida	1	13.000*	TR200Borm+TR20ri	1469.00	177.26	184.96		185.58	0.001542	3.67	574.90	236.61	0.48
Bormida	1	13.000*	2016Borm+TR20rii	1000.00	177.26	184.20		184.66	0.001253	3.03	413.62	201.03	0.42
Bormida	1	13.000*	1994Borm+TR20rii	1900.00	177.26	185.51		186.25	0.001733	4.13	714.33	259.77	0.51
Bormida	1	12.000*	TR20Borm+TR<20ri	833.00	177.11	183.80		184.15	0.001015	2.63	380.96	182.51	0.37
Bormida	1	12.000*	TR20Borm+TR20rii	833.00	177.11	183.80		184.15	0.001016	2.63	380.78	182.45	0.37
Bormida	1	12.000*	TR20Borm+TR200ri	833.00	177.11	183.80		184.15	0.001016	2.63	380.79	182.46	0.37
Bormida	1	12.000*	TR200Borm+TR20ri	1469.00	177.11	184.99		185.51	0.001292	3.42	633.67	237.61	0.44
Bormida	1	12.000*	2016Borm+TR20rii	1000.00	177.11	184.22		184.61	0.001057	2.83	463.81	209.11	0.39
Bormida	1	12.000*	1994Borm+TR20rii	1900.00	177.11	185.54		186.18	0.001465	3.85	775.54	264.24	0.47
Bormida	1	11.000*	TR20Borm+TR<20ri	833.00	176.97	183.81		184.11	0.000859	2.46	428.62	203.09	0.35
Bormida	1	11.000*	TR20Borm+TR20rii	833.00	176.97	183.81		184.11	0.000860	2.46	428.41	203.04	0.35
Bormida	1	11.000*	TR20Borm+TR200ri	833.00	176.97	183.81		184.11	0.000860	2.46	428.42	203.04	0.35
Bormida	1	11.000*	TR200Borm+TR20ri	1469.00	176.97	185.01		185.46	0.001085	3.18	695.86	246.72	0.40
Bormida	1	11.000*	2016Borm+TR20rii	1000.00	176.97	184.24		184.57	0.000885	2.63	517.93	215.08	0.35
Bormida	1	11.000*	1994Borm+TR20rii	1900.00	176.97	185.57		186.12	0.001238	3.59	839.64	267.89	0.44
Bormida	1	10	TR20Borm+TR<20ri	833.00	176.82	183.83		184.08	0.000716	2.29	482.38	212.28	0.32
Bormida	1	10	TR20Borm+TR20rii	833.00	176.82	183.83		184.08	0.000716	2.29	482.17	212.26	0.32
Bormida	1	10	TR20Borm+TR200ri	833.00	176.82	183.83		184.08	0.000716	2.29	482.18	212.26	0.32
Bormida	1	10	TR200Borm+TR20ri	1469.00	176.82	185.04		185.42	0.000918	2.97	760.71	254.38	0.37
Bormida	1	10	2016Borm+TR20rii	1000.00	176.82	184.25		184.53	0.000738	2.44	575.36	221.97	0.33
Bormida	1	10	1994Borm+TR20rii	1900.00	176.82	185.60		186.07	0.001045	3.35	907.02	265.99	0.40
Bormida	1	9	TR20Borm+TR<20ri	833.00	176.65	183.83		184.05	0.000593	2.15	507.70	211.33	0.29
Bormida	1	9	TR20Borm+TR20rii	833.00	176.65	183.83		184.05	0.000594	2.15	507.48	211.31	0.29
Bormida	1	9	TR20Borm+TR200ri	833.00	176.65	183.83		184.05	0.000594	2.15	507.50	211.31	0.29
Bormida	1	9	TR200Borm+TR20ri	1469.00	176.65	185.04		185.39	0.000795	2.83	781.48	246.18	0.35
Bormida	1	9	2016Borm+TR20rii	1000.00	176.65	184.26		184.51	0.000623	2.31	600.02	218.52	0.30
Bormida	1	9	1994Borm+TR20rii	1900.00	176.65	185.60		186.04	0.000923	3.21	922.72	251.25	0.38
Bormida	1	8.0000*	TR20Borm+TR<20ri	833.00	176.65	183.79		184.03	0.000668	2.26	491.31	214.21	0.31

HEC-RAS Plan: Attuale (Continued)

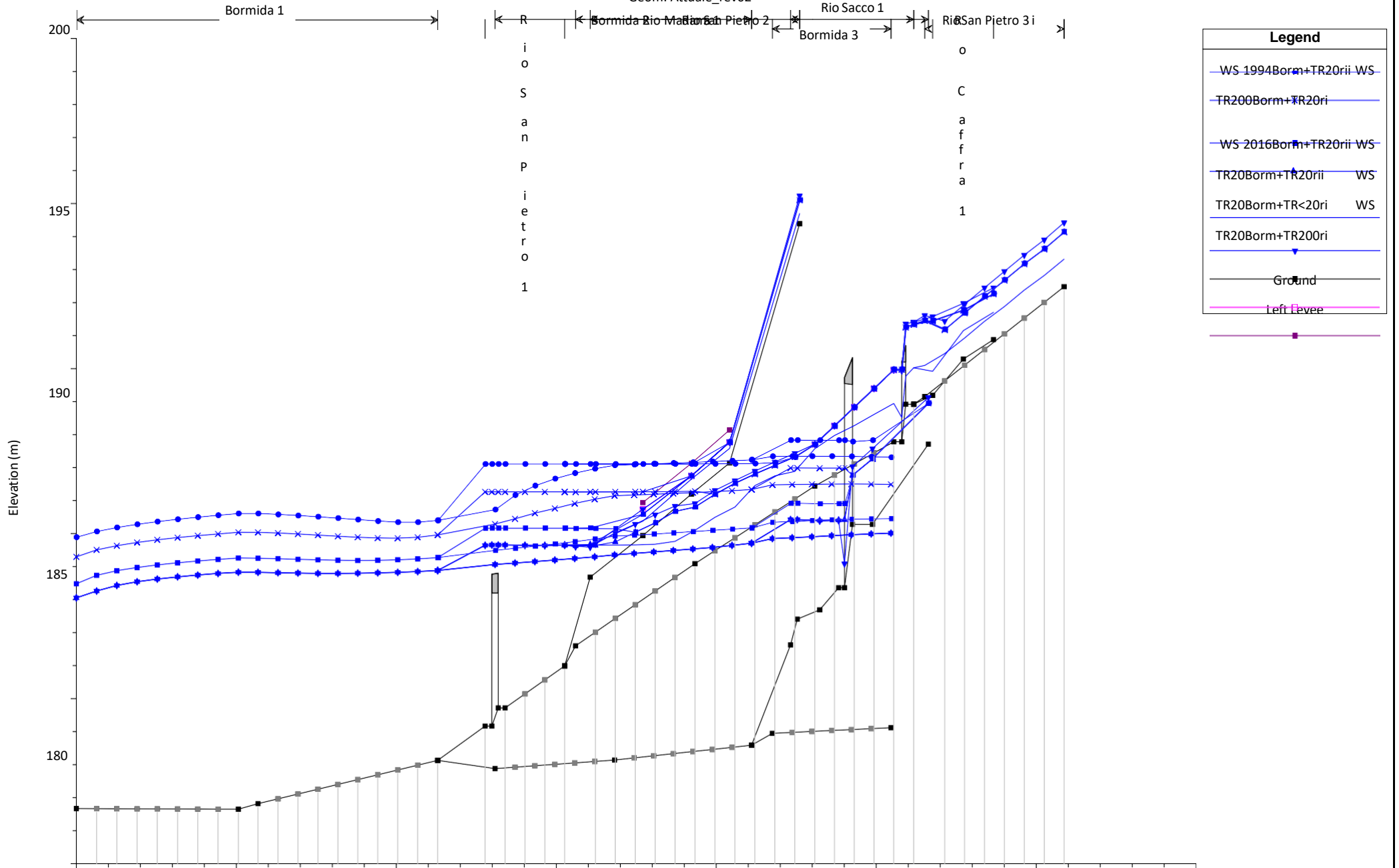
River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	1	8.0000*	TR20Borm+TR20rii	833.00	176.65	183.79		184.03	0.000668	2.26	491.09	214.18	0.31
Bormida	1	8.0000*	TR20Borm+TR200ri	833.00	176.65	183.79		184.03	0.000668	2.26	491.10	214.18	0.31
Bormida	1	8.0000*	TR200Borm+TR20ri	1469.00	176.65	184.99		185.37	0.000879	2.95	767.03	250.13	0.36
Bormida	1	8.0000*	2016Borm+TR20rii	1000.00	176.65	184.22		184.49	0.000695	2.42	584.24	220.88	0.32
Bormida	1	8.0000*	1994Borm+TR20rii	1900.00	176.65	185.55		186.01	0.001010	3.33	908.44	252.83	0.39
Bormida	1	7.0000*	TR20Borm+TR<20ri	833.00	176.66	183.74		184.01	0.000757	2.38	474.18	215.92	0.32
Bormida	1	7.0000*	TR20Borm+TR20rii	833.00	176.66	183.74		184.01	0.000758	2.38	473.94	215.91	0.32
Bormida	1	7.0000*	TR20Borm+TR200ri	833.00	176.66	183.74		184.01	0.000758	2.38	473.96	215.91	0.32
Bormida	1	7.0000*	TR200Borm+TR20ri	1469.00	176.66	184.94		185.34	0.000973	3.08	752.34	251.42	0.38
Bormida	1	7.0000*	2016Borm+TR20rii	1000.00	176.66	184.17		184.47	0.000786	2.55	567.43	228.58	0.33
Bormida	1	7.0000*	1994Borm+TR20rii	1900.00	176.66	185.49		185.98	0.001109	3.47	893.34	254.39	0.41
Bormida	1	6.0000*	TR20Borm+TR<20ri	833.00	176.66	183.69		183.99	0.000868	2.52	455.82	217.07	0.35
Bormida	1	6.0000*	TR20Borm+TR20rii	833.00	176.66	183.69		183.99	0.000869	2.52	455.58	217.05	0.35
Bormida	1	6.0000*	TR20Borm+TR200ri	833.00	176.66	183.69		183.99	0.000869	2.52	455.59	217.05	0.35
Bormida	1	6.0000*	TR200Borm+TR20ri	1469.00	176.66	184.88		185.31	0.001084	3.21	736.51	252.70	0.40
Bormida	1	6.0000*	2016Borm+TR20rii	1000.00	176.66	184.11		184.44	0.000895	2.69	550.02	234.56	0.36
Bormida	1	6.0000*	1994Borm+TR20rii	1900.00	176.66	185.43		185.95	0.001226	3.61	877.16	255.96	0.43
Bormida	1	5.0000*	TR20Borm+TR<20ri	833.00	176.66	183.62		183.96	0.001010	2.68	435.51	218.44	0.37
Bormida	1	5.0000*	TR20Borm+TR20rii	833.00	176.66	183.62		183.96	0.001011	2.68	435.24	218.43	0.37
Bormida	1	5.0000*	TR20Borm+TR200ri	833.00	176.66	183.62		183.96	0.001011	2.68	435.26	218.43	0.37
Bormida	1	5.0000*	TR200Borm+TR20ri	1469.00	176.66	184.81		185.28	0.001219	3.37	719.01	253.91	0.42
Bormida	1	5.0000*	2016Borm+TR20rii	1000.00	176.66	184.05		184.41	0.001025	2.84	531.67	236.19	0.38
Bormida	1	5.0000*	1994Borm+TR20rii	1900.00	176.66	185.36		185.91	0.001365	3.76	859.43	257.51	0.45
Bormida	1	4.0000*	TR20Borm+TR<20ri	833.00	176.66	183.54		183.93	0.001200	2.88	412.12	219.57	0.40
Bormida	1	4.0000*	TR20Borm+TR20rii	833.00	176.66	183.54		183.93	0.001201	2.88	411.82	219.54	0.40
Bormida	1	4.0000*	TR20Borm+TR200ri	833.00	176.66	183.54		183.93	0.001201	2.88	411.84	219.54	0.40
Bormida	1	4.0000*	TR200Borm+TR20ri	1469.00	176.66	184.73		185.24	0.001387	3.55	699.06	255.02	0.45
Bormida	1	4.0000*	2016Borm+TR20rii	1000.00	176.66	183.97		184.38	0.001194	3.03	510.68	237.85	0.41
Bormida	1	4.0000*	1994Borm+TR20rii	1900.00	176.66	185.28		185.87	0.001535	3.94	839.49	259.05	0.48
Bormida	1	3.0000*	TR20Borm+TR<20ri	833.00	176.67	183.43		183.89	0.001470	3.12	383.04	220.86	0.44
Bormida	1	3.0000*	TR20Borm+TR20rii	833.00	176.67	183.43		183.89	0.001472	3.13	382.68	220.77	0.44
Bormida	1	3.0000*	TR20Borm+TR200ri	833.00	176.67	183.43		183.89	0.001472	3.12	382.71	220.77	0.44
Bormida	1	3.0000*	TR200Borm+TR20ri	1469.00	176.67	184.63		185.20	0.001608	3.76	675.14	255.91	0.48
Bormida	1	3.0000*	2016Borm+TR20rii	1000.00	176.67	183.88		184.34	0.001426	3.25	485.19	239.48	0.44
Bormida	1	3.0000*	1994Borm+TR20rii	1900.00	176.67	185.18		185.83	0.001751	4.15	816.16	260.51	0.51
Bormida	1	2.0000*	TR20Borm+TR<20ri	833.00	176.67	183.26	181.38	183.84	0.001903	3.48	341.63	220.10	0.50

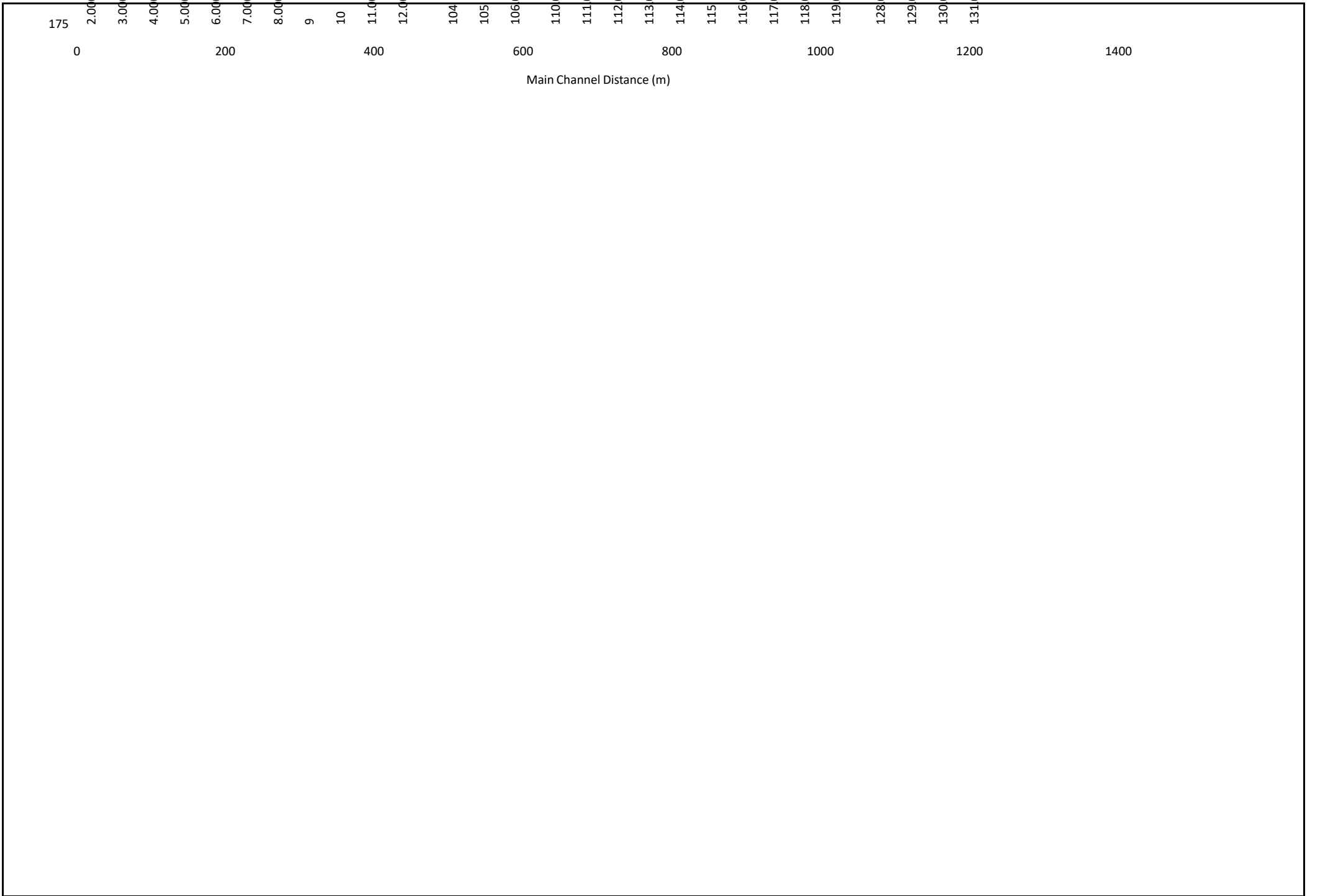
HEC-RAS Plan: Attuale (Continued)

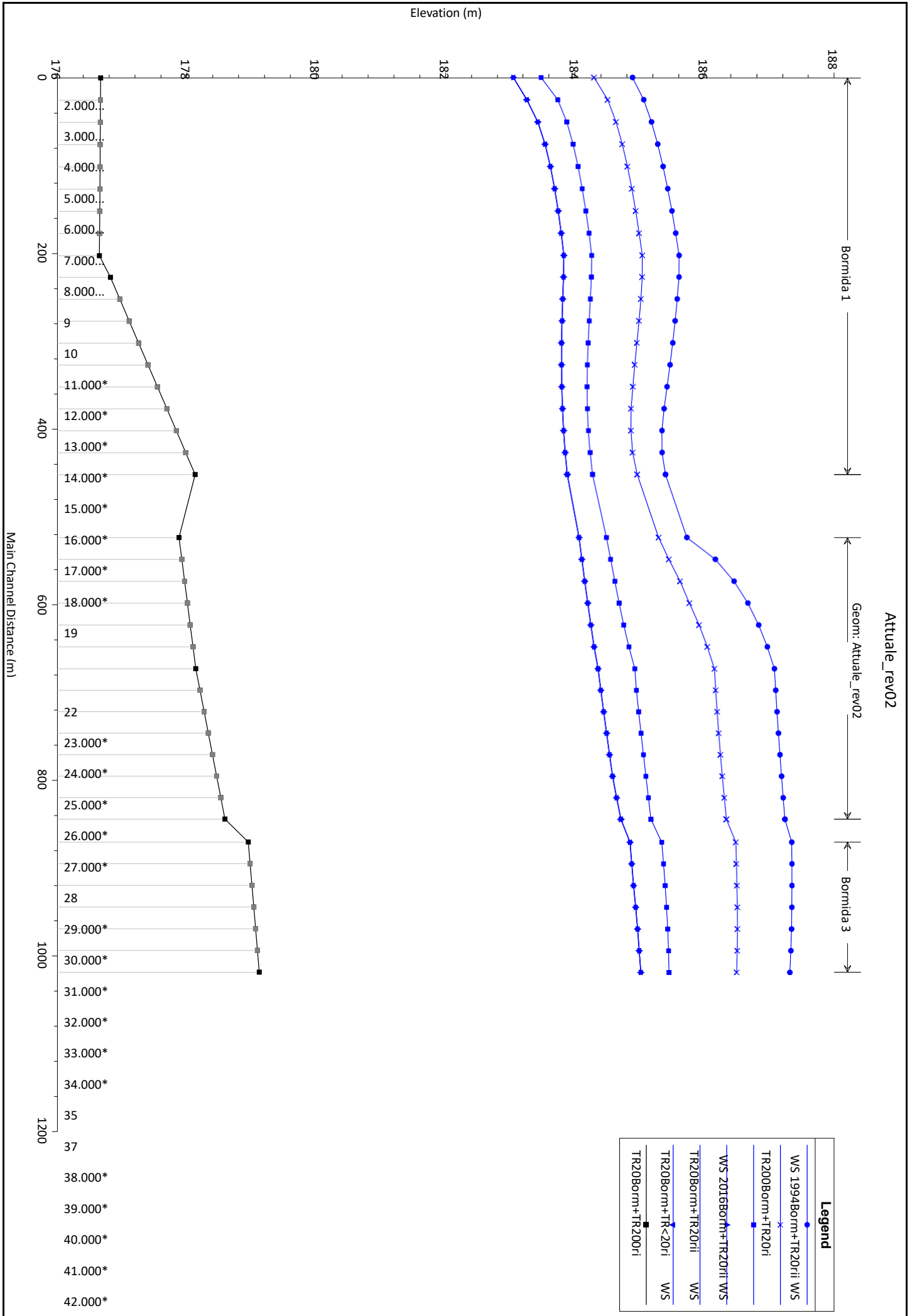
River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	1	2.0000*	TR20Borm+TR20rii	833.00	176.67	183.26	181.38	183.83	0.001907	3.48	341.15	220.03	0.50
Bormida	1	2.0000*	TR20Borm+TR200ri	833.00	176.67	183.26	181.39	183.83	0.001907	3.48	341.18	220.03	0.50
Bormida	1	2.0000*	TR200Borm+TR20ri	1469.00	176.67	184.51		185.15	0.001923	4.02	643.87	256.33	0.52
Bormida	1	2.0000*	2016Borm+TR20rii	1000.00	176.67	183.74		184.29	0.001785	3.54	450.44	240.48	0.49
Bormida	1	2.0000*	1994Borm+TR20rii	1900.00	176.67	185.06		185.77	0.002043	4.39	787.03	261.72	0.54
Bormida	1	1	TR20Borm+TR<20ri	833.00	176.67	183.05	181.53	183.77	0.002502	3.87	293.74	193.36	0.57
Bormida	1	1	TR20Borm+TR20rii	833.00	176.67	183.05	181.53	183.77	0.002502	3.87	293.74	193.36	0.57
Bormida	1	1	TR20Borm+TR200ri	833.00	176.67	183.05	181.51	183.77	0.002502	3.87	293.73	193.33	0.57
Bormida	1	1	TR200Borm+TR20ri	1469.00	176.67	184.30	183.87	185.08	0.002504	4.45	591.61	255.34	0.59
Bormida	1	1	2016Borm+TR20rii	1000.00	176.67	183.48	182.52	184.22	0.002505	4.05	387.98	236.19	0.57
Bormida	1	1	1994Borm+TR20rii	1900.00	176.67	184.89	184.36	185.70	0.002503	4.74	744.60	262.06	0.59

Attuale_rev02

Geom: Attuale_rev02

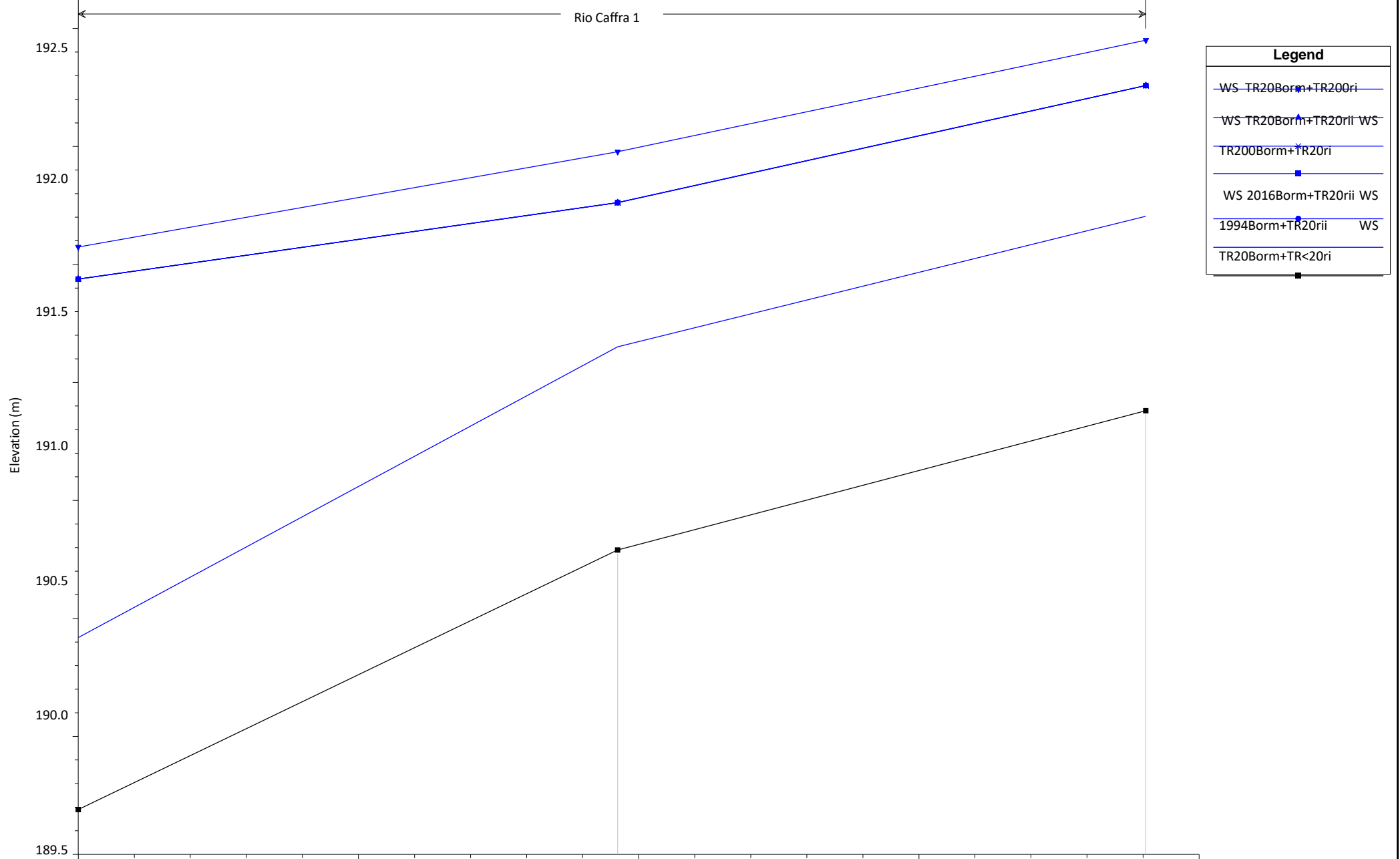






Attuale_rev02

Geom: Attuale_rev02



Legend	
WS_TR20Borm+TR200ri	—▲—
WS_TR20Borm+TR20rii WS	—■—
TR200Borm+TR20ri	—×—
WS_2016Borm+TR20rii WS	—●—
1994Borm+TR20rii WS	—■—
TR20Borm+TR<20ri	—■—

189.0

0

20

203

40

60

205

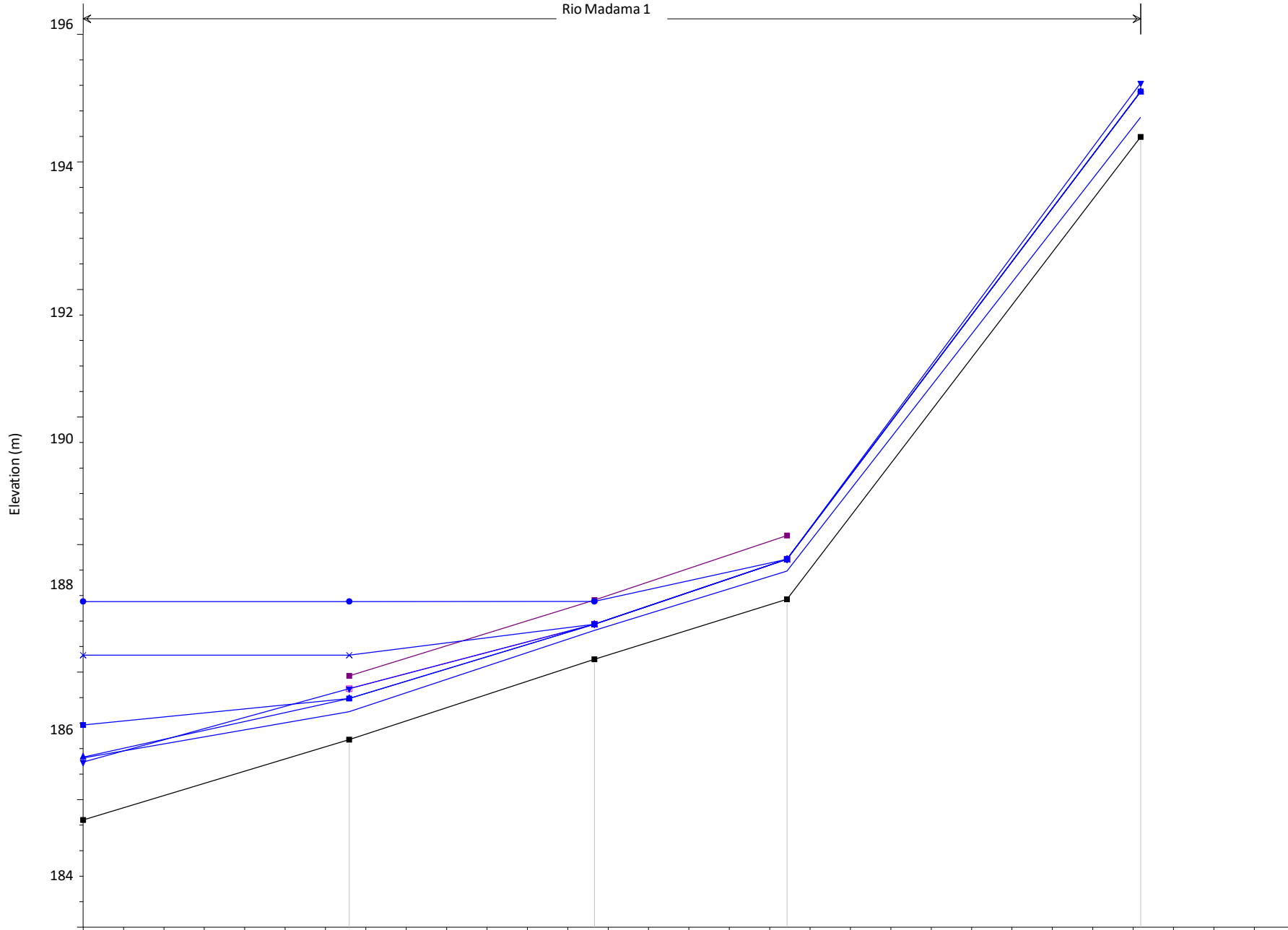
80

Main Channel Distance (m)

Attuale_rev02

Geom: Attuale_rev02

Rio Madama 1



Legend

- WS 1994Borm+TR20rii WS (Blue line with circle marker)
- TR200Borm+TR20ri (Blue line with 'x' marker)
- WS 2016Borm+TR20rii WS (Blue line with triangle marker)
- TR20Borm+TR20rii WS (Blue line with square marker)
- TR20Borm+TR<20ri WS (Blue line with inverted triangle marker)
- TR20Borm+TR200ri (Black line with square marker)
- Ground (Pink line with square marker)
- Left Levee (Purple line with square marker)

182

402

403

404

405

0

50

100

150

200

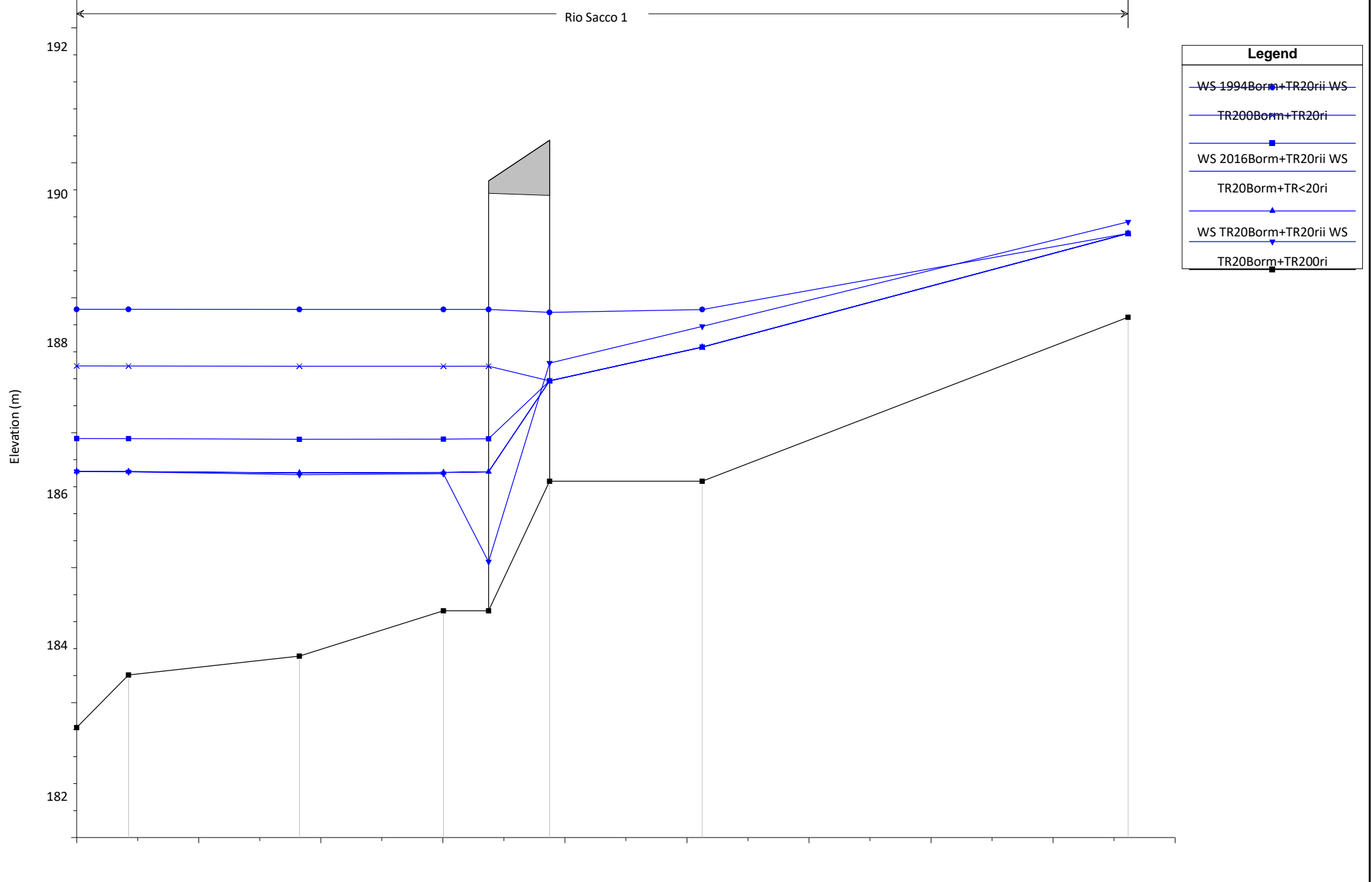
250

300

Main Channel Distance (m)

Attuale_rev02

Geom: Attuale_rev02



180
0 20 40 60 80 100 120 140 160 180
Main Channel Distance (m)

302

303

304

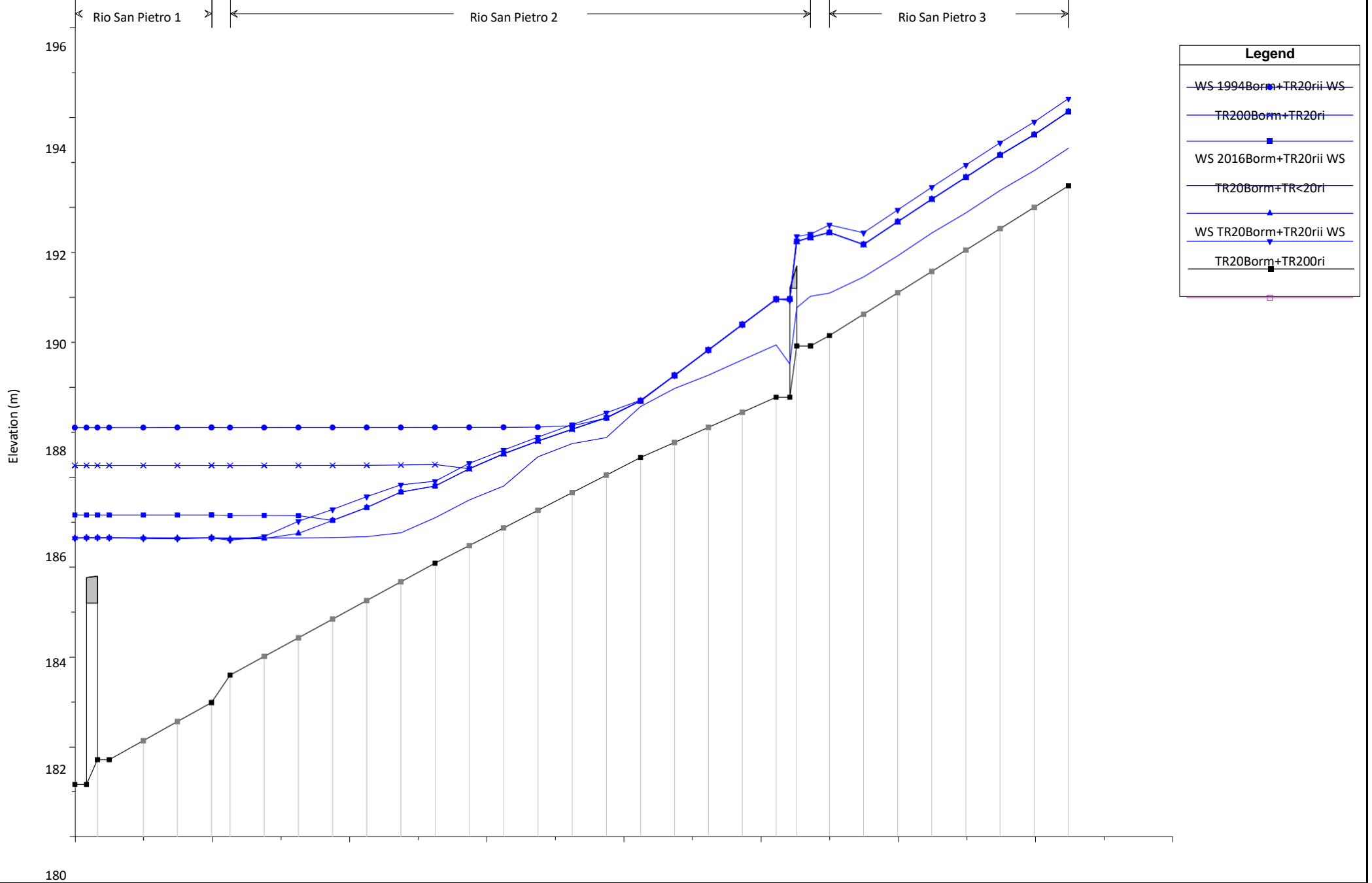
304.5

305

306

Attuale_rev02

Geom: Attuale_rev02

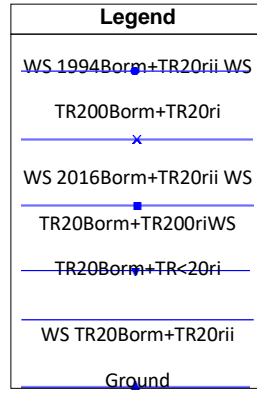
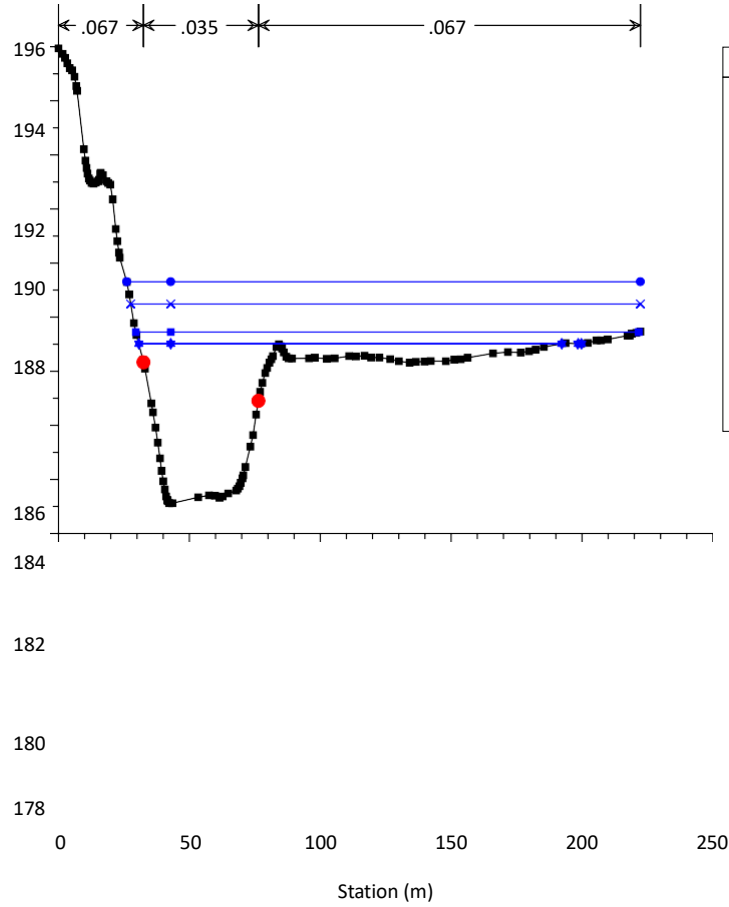


178
0 104.5 106.00* 107.00* 108 110.00* 111.00* 112.00* 113.00* 114.00* 115 116.00* 117.00* 118.00* 119.00* 120.00* 121 122.00* 123.00* 124.00* 125 --- 127 128.00* 129.00* 130.00* 131.00* 132.00* 133.00* 134
100 200 300 400 500 600 700 800
Main Channel Distance (m)

Attuale_rev02

Geom: Attuale_rev02

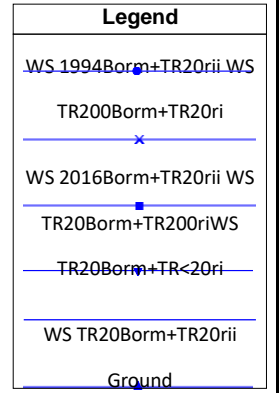
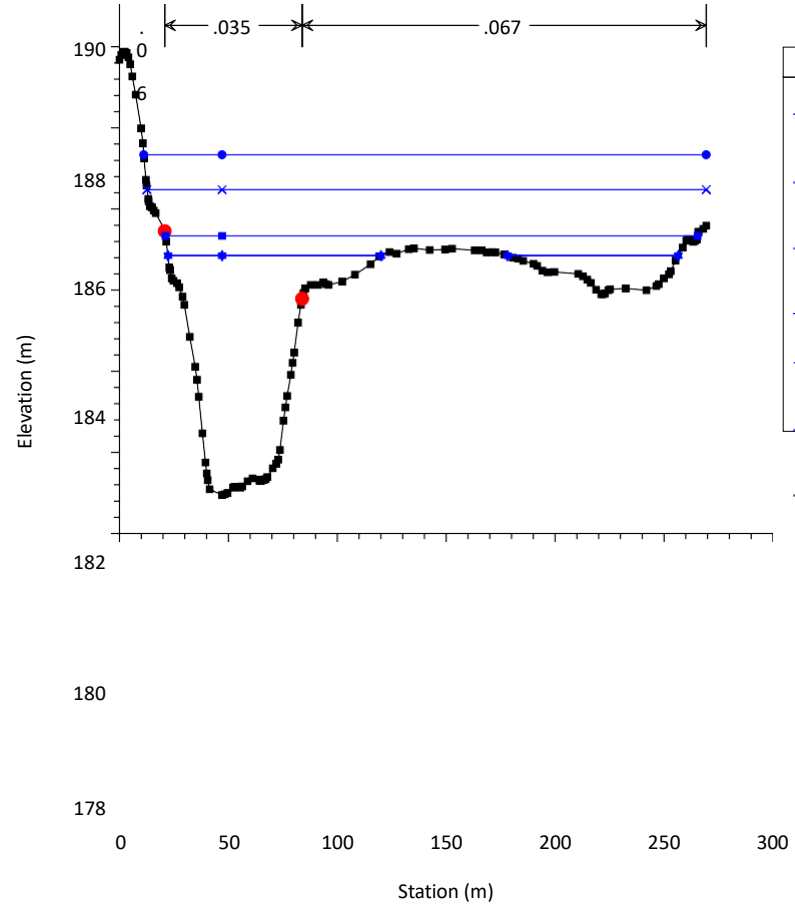
River = Bormida Reach = 3 RS = 43



Attuale_rev02

Geom: Attuale_rev02

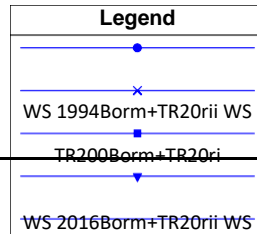
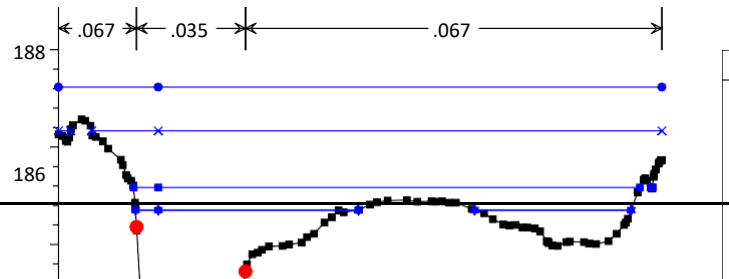
River = Bormida Reach = 3 RS = 37



Attuale_rev02

Geom: Attuale_rev02

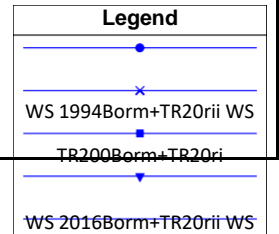
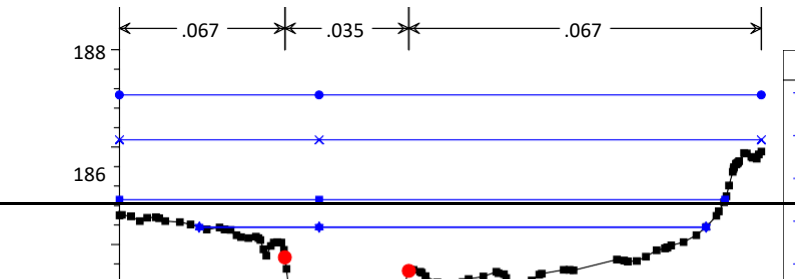
River = Bormida Reach = 2 RS = 35

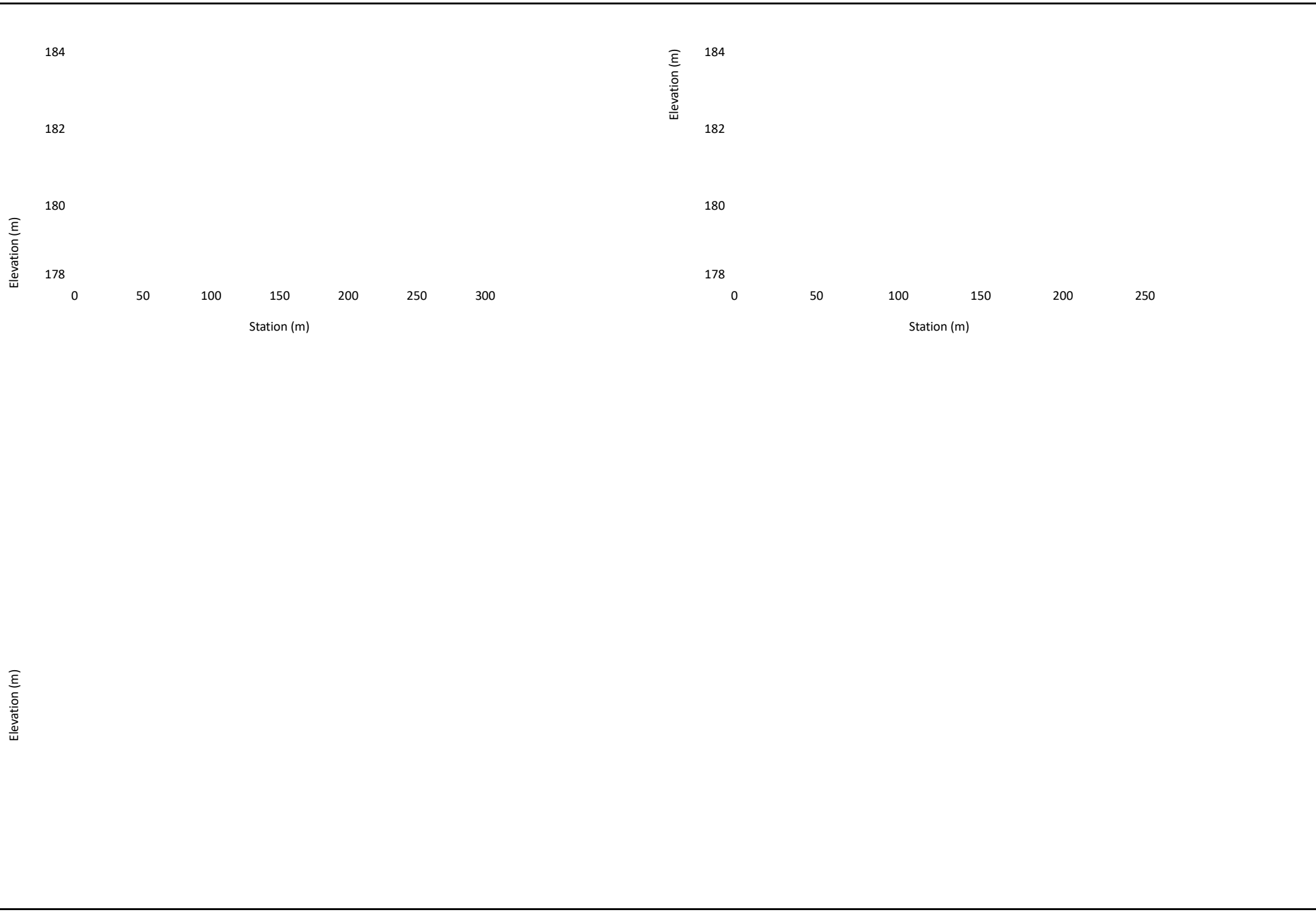


Attuale_rev02

Geom: Attuale_rev02

River = Bormida Reach = 2 RS = 28

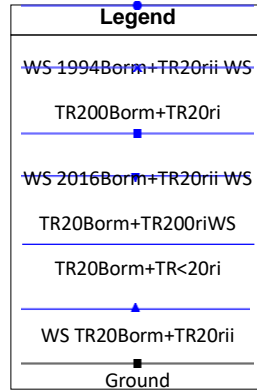
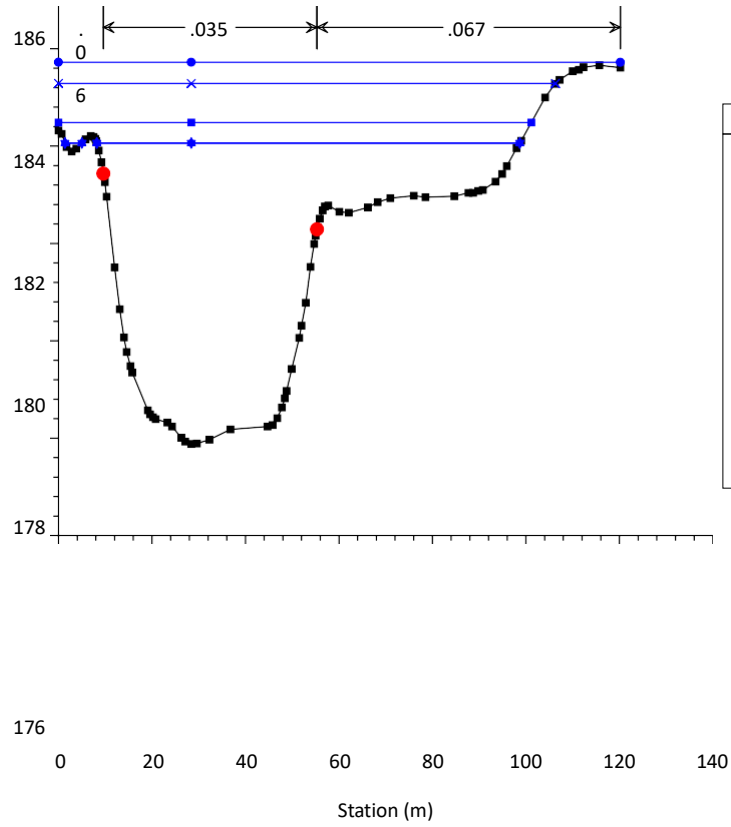




Attuale_rev02

Geom: Attuale_rev02

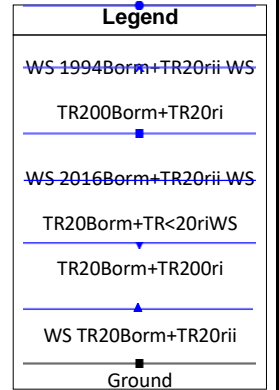
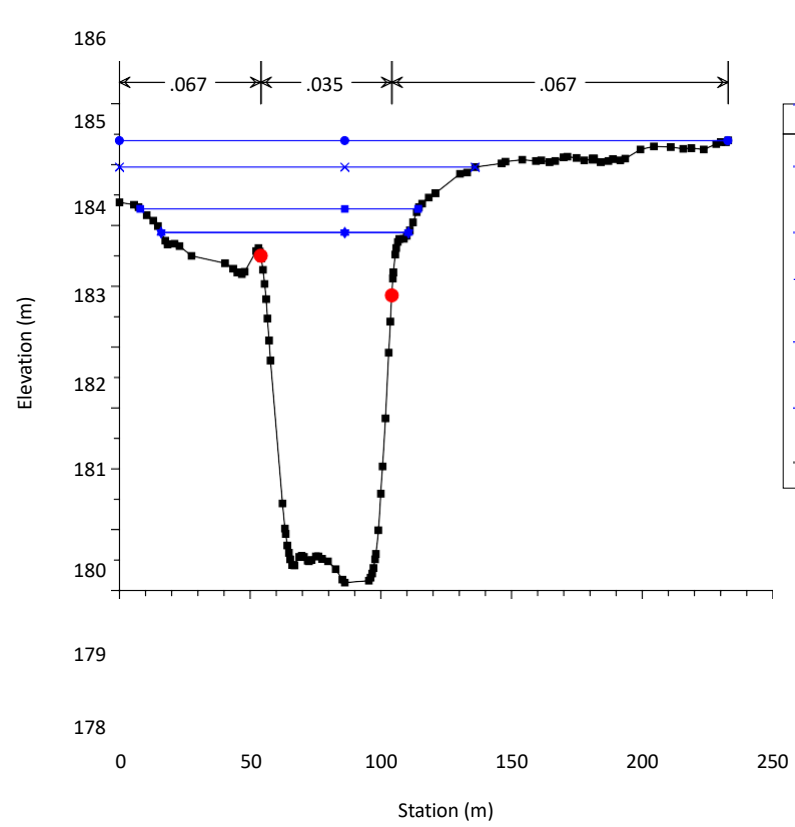
River = Bormida Reach = 2 RS = 22



Attuale_rev02

Geom: Attuale_rev02

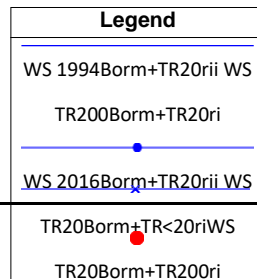
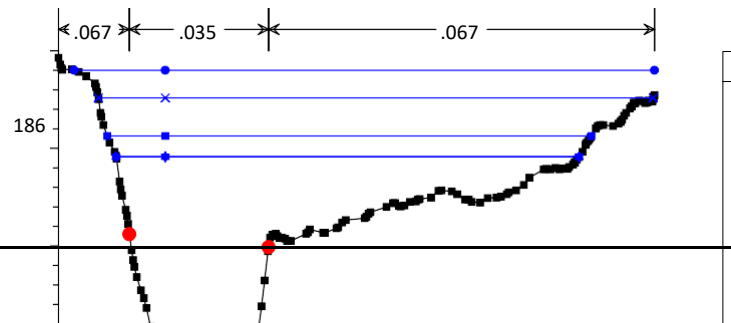
River = Bormida Reach = 1 RS = 19



Attuale_rev02

Geom: Attuale_rev02

River = Bormida Reach = 1 RS = 10

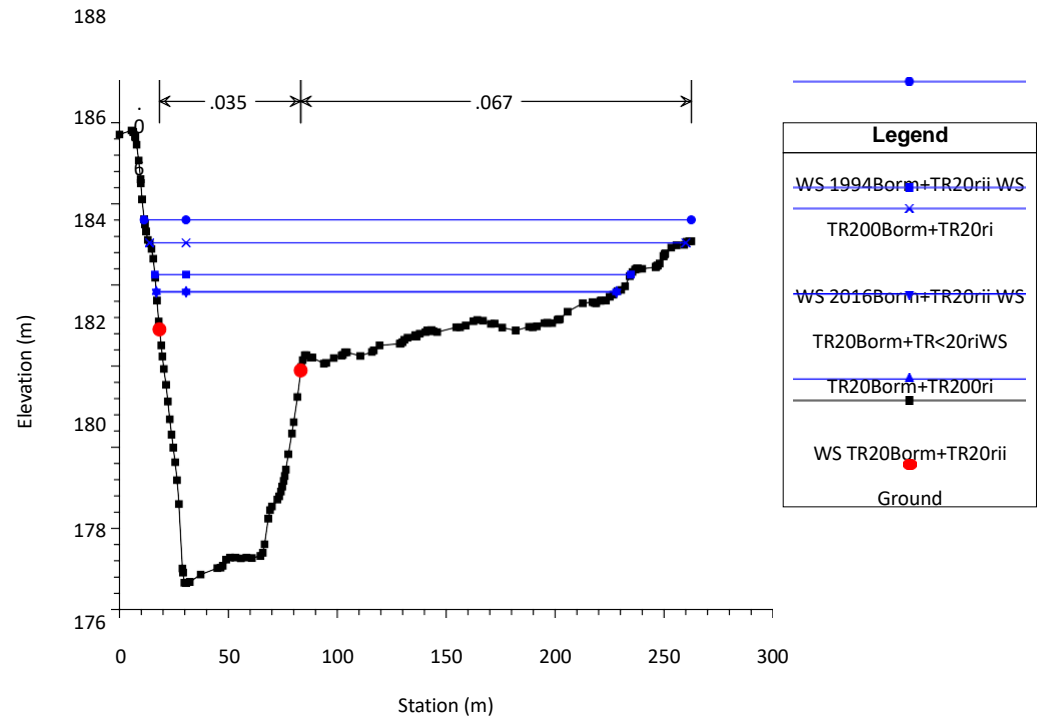
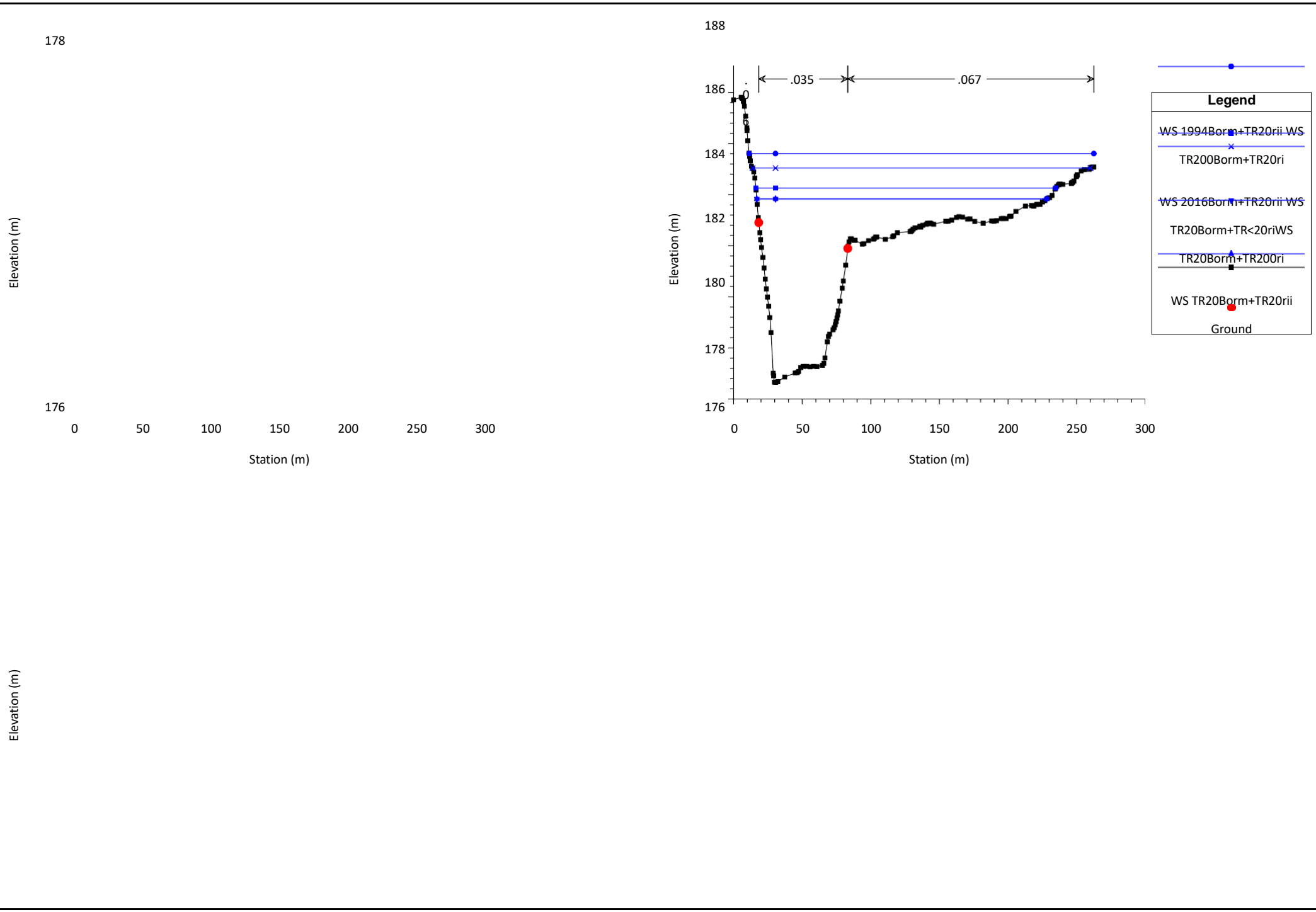


Attuale_rev02

Geom: Attuale_rev02

River = Bormida Reach = 1 RS = 9

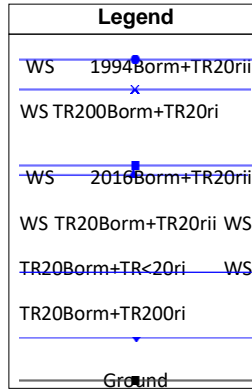
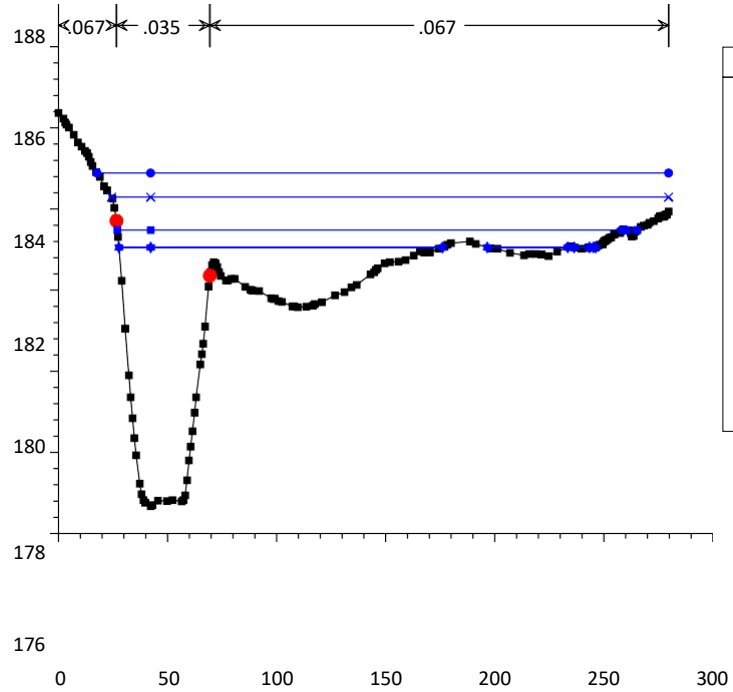




Attuale_rev02

Geom: Attuale_rev02

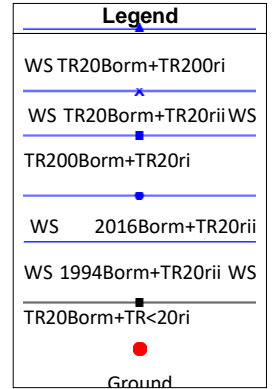
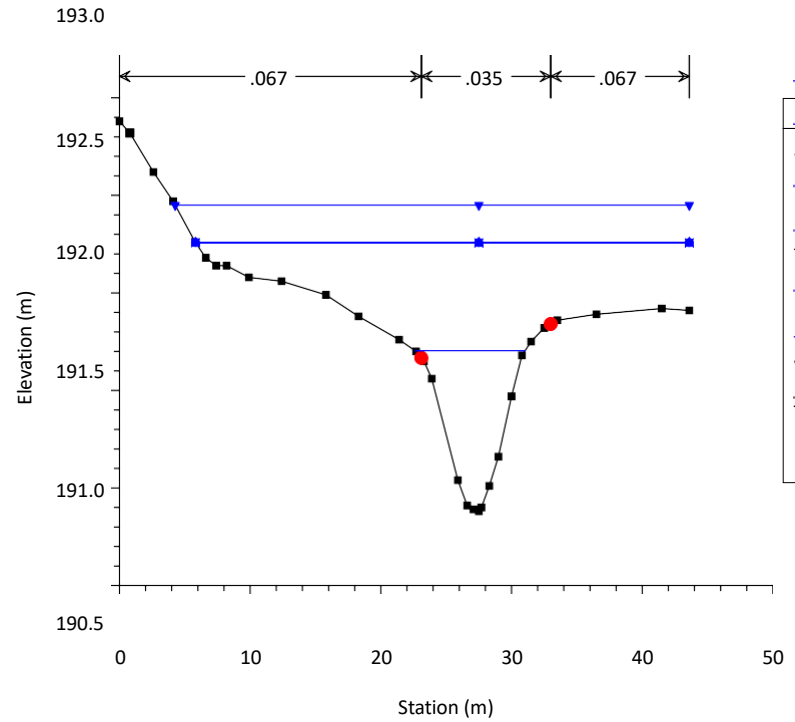
River = Bormida Reach = 1 RS = 1



Attuale_rev02

Geom: Attuale_rev02

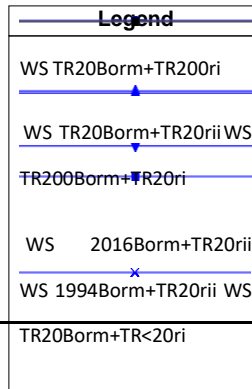
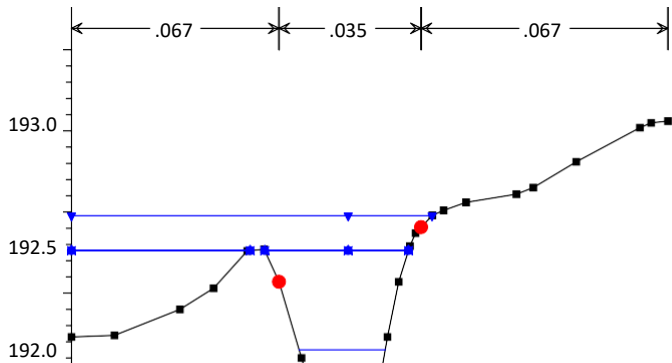
River = Rio Caffra Reach = 1 RS = 205



Attuale_rev02

Geom: Attuale_rev02

River = Rio Caffra Reach = 1 RS = 203

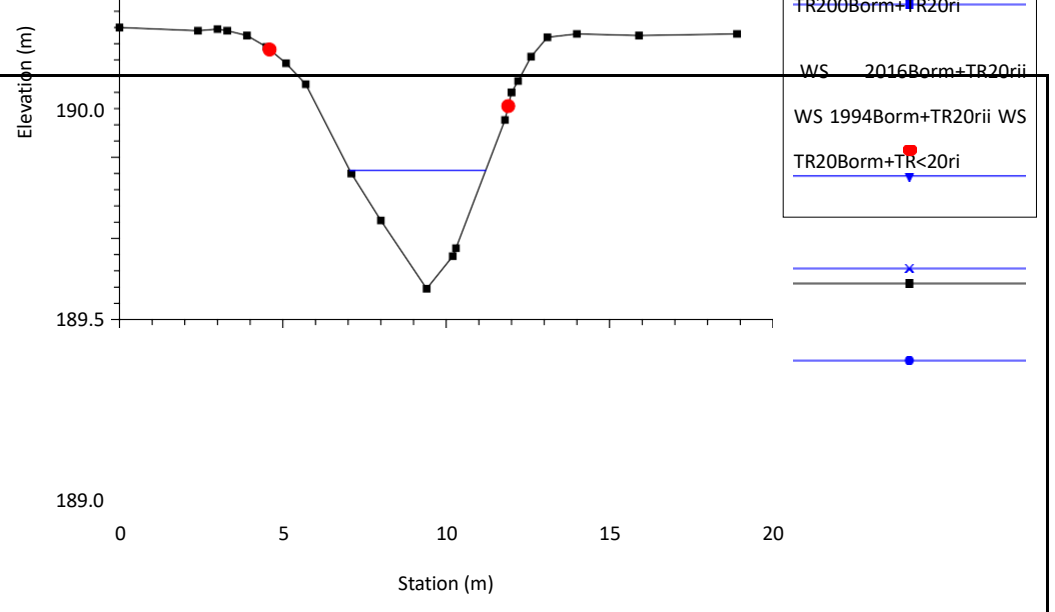
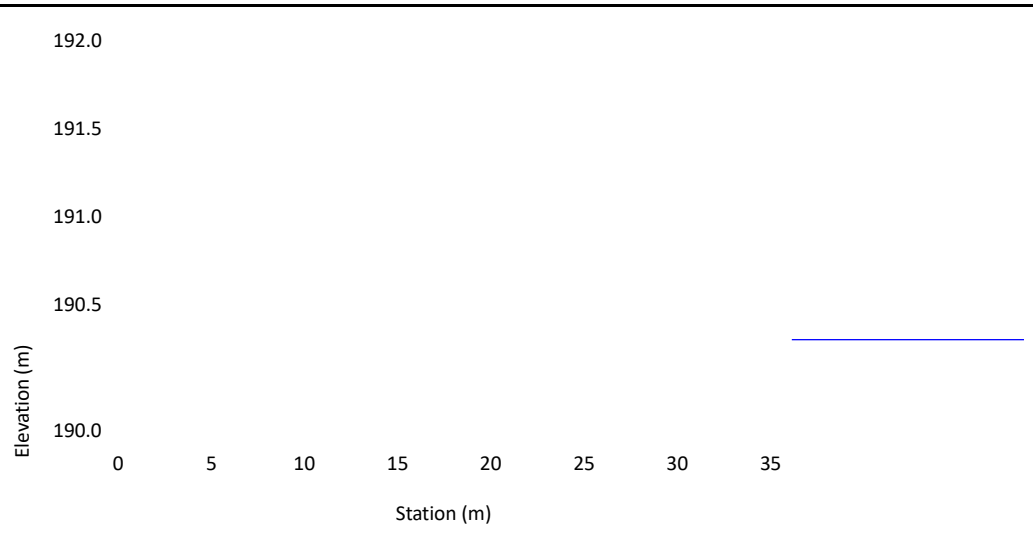


Attuale_rev02

Geom: Attuale_rev02

River = Rio Caffra Reach = 1 RS = 201

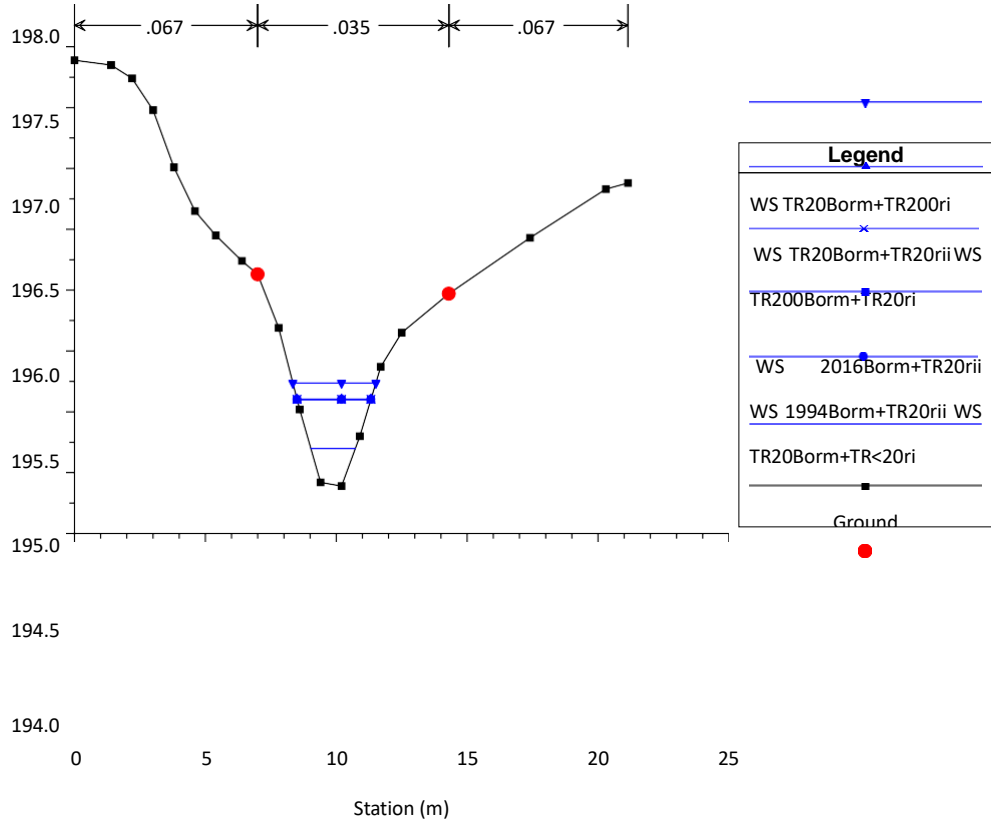




Attuale_rev02

Geom: Attuale_rev02

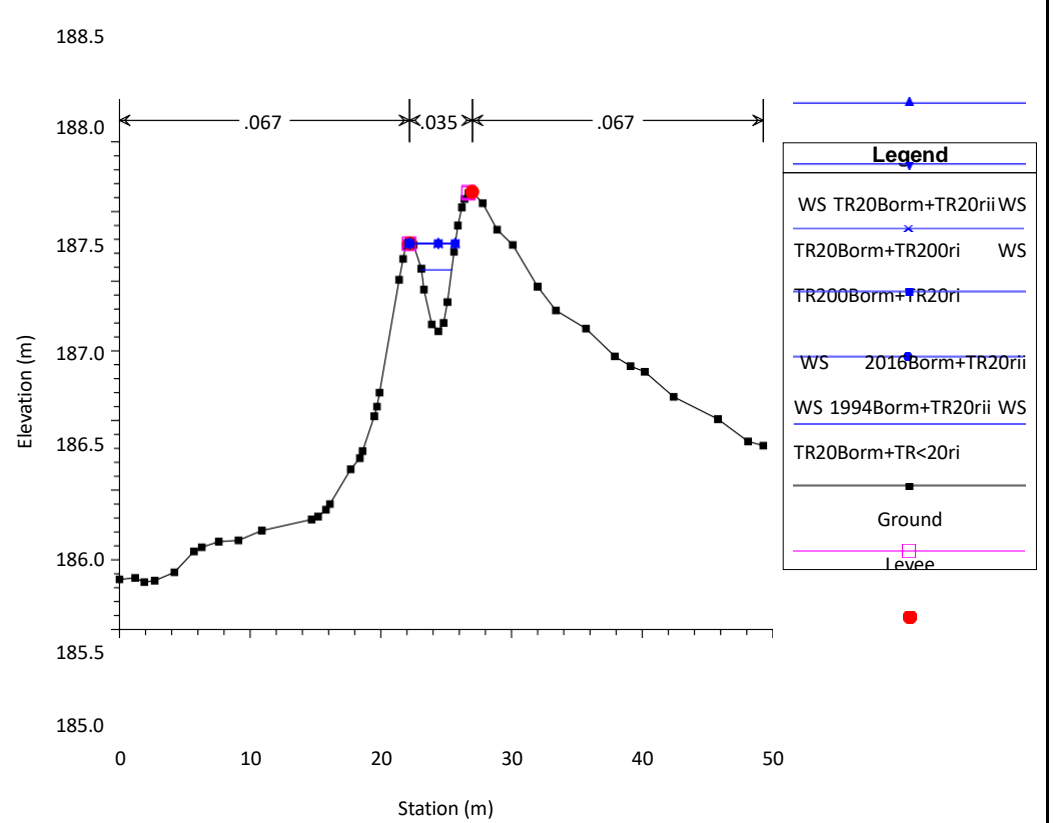
River = Rio Madama Reach = 1 RS = 405



Attuale_rev02

Geom: Attuale_rev02

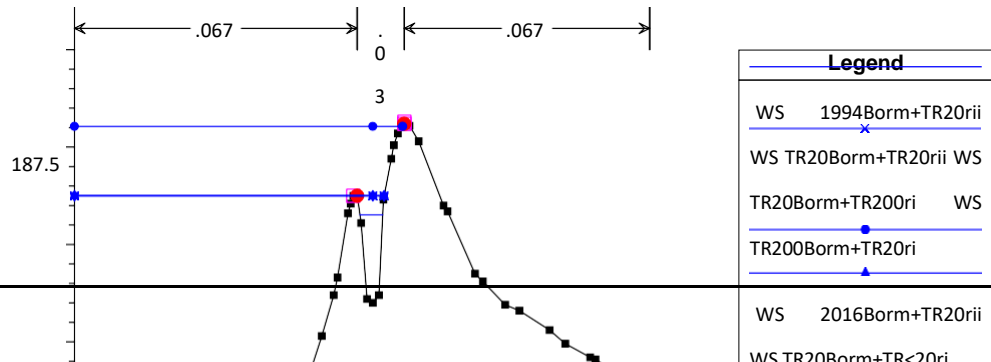
River = Rio Madama Reach = 1 RS = 404



Attuale_rev02

Geom: Attuale_rev02

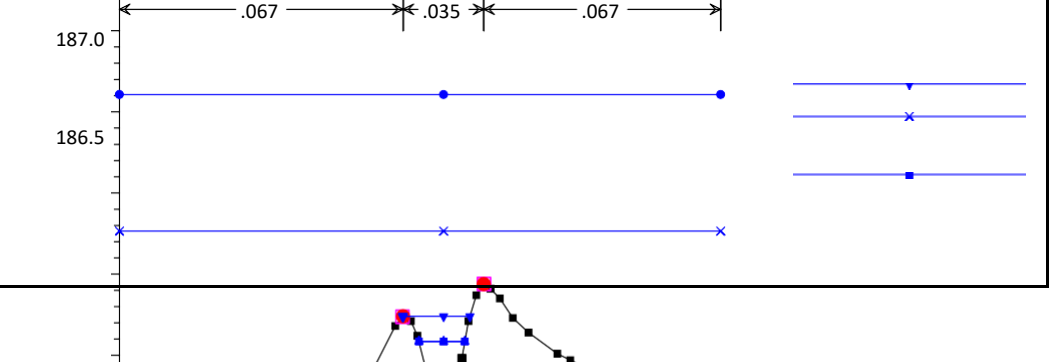
River = Rio Madama Reach = 1 RS = 403

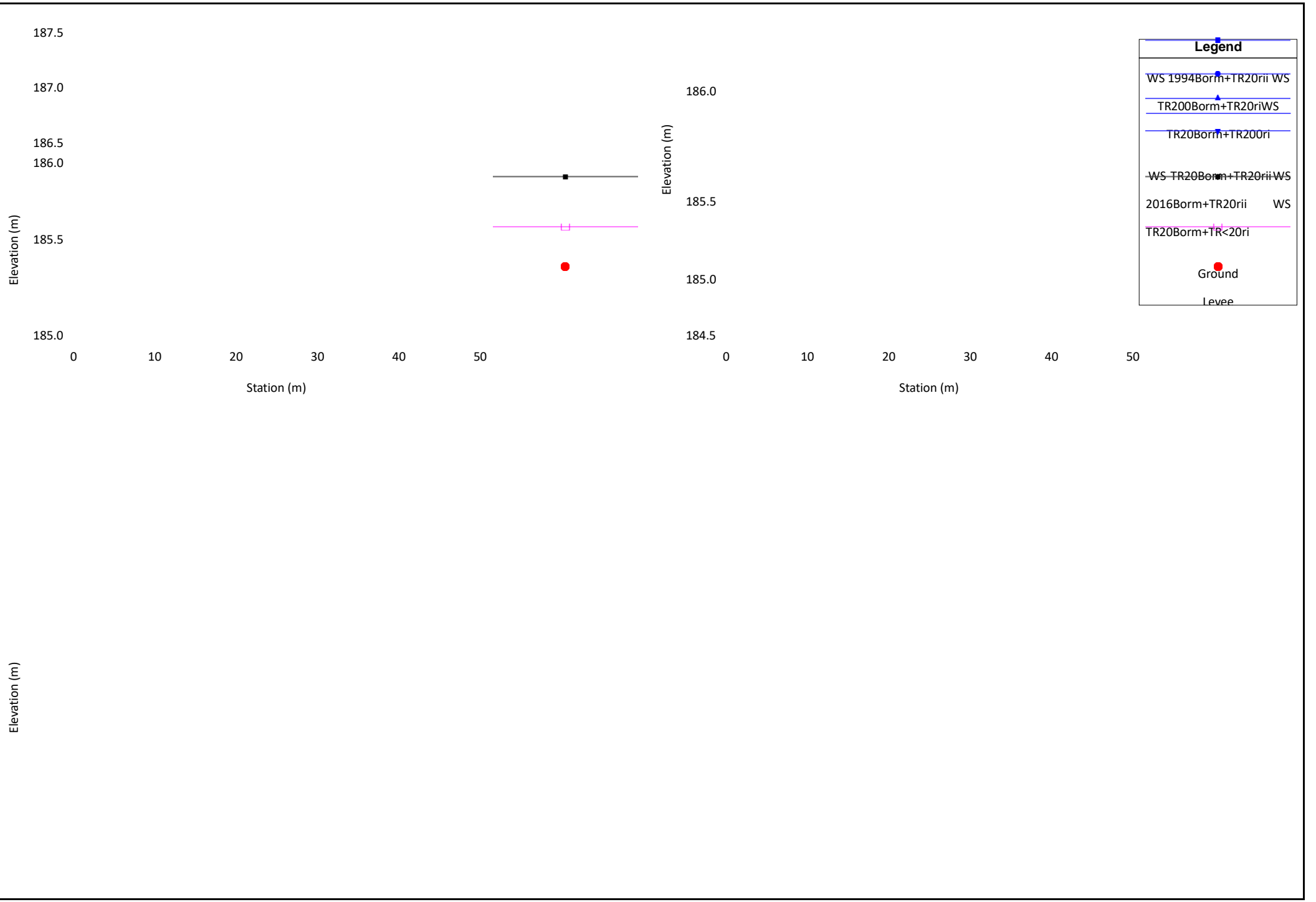


Attuale_rev02

Geom: Attuale_rev02

River = Rio Madama Reach = 1 RS = 402

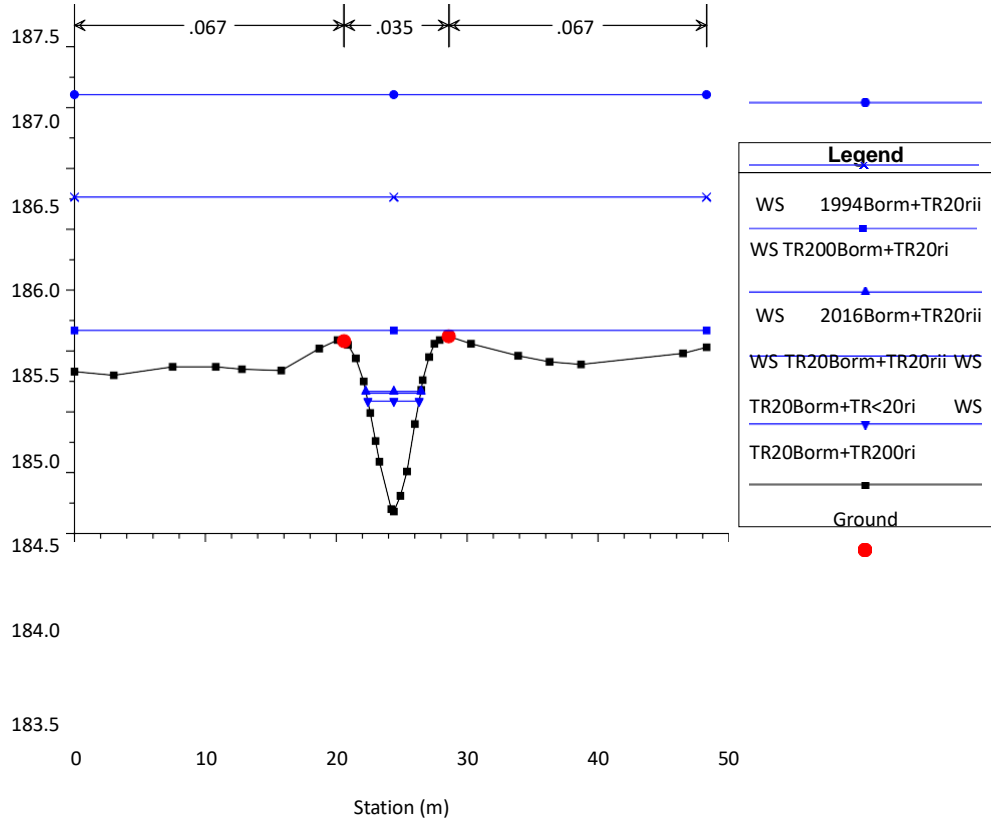




Attuale_rev02

Geom: Attuale_rev02

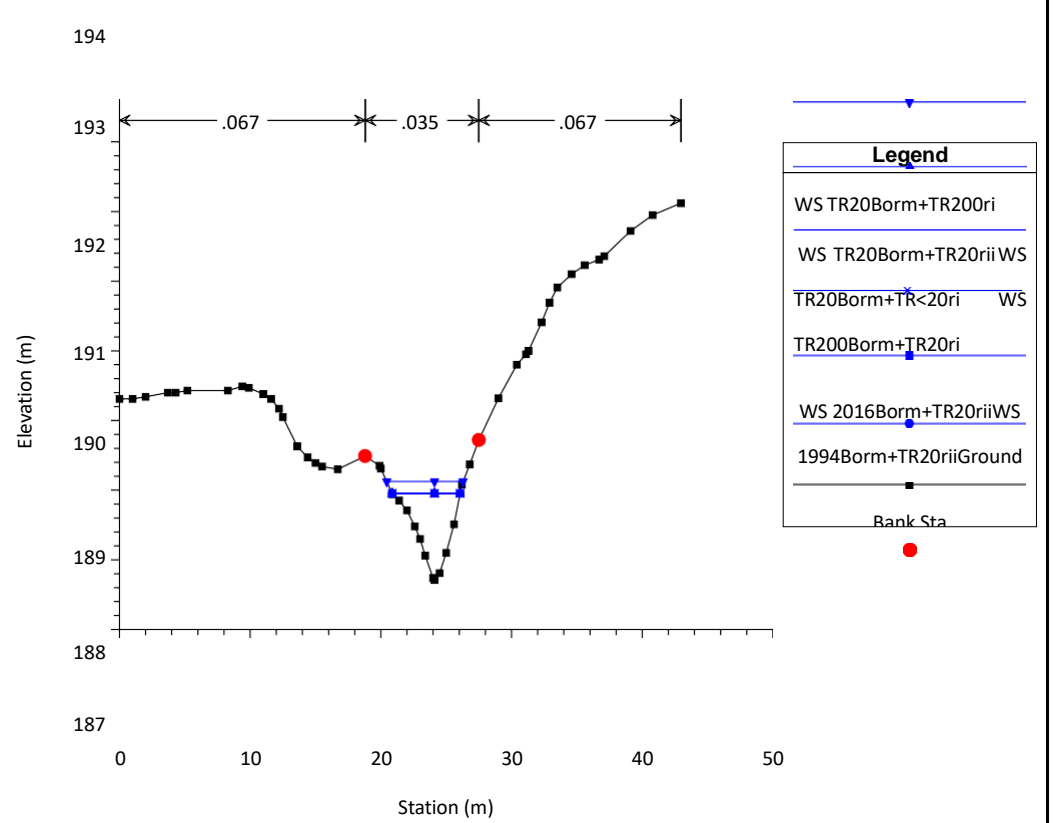
River = Rio Madama Reach = 1 RS = 401



Attuale_rev02

Geom: Attuale_rev02

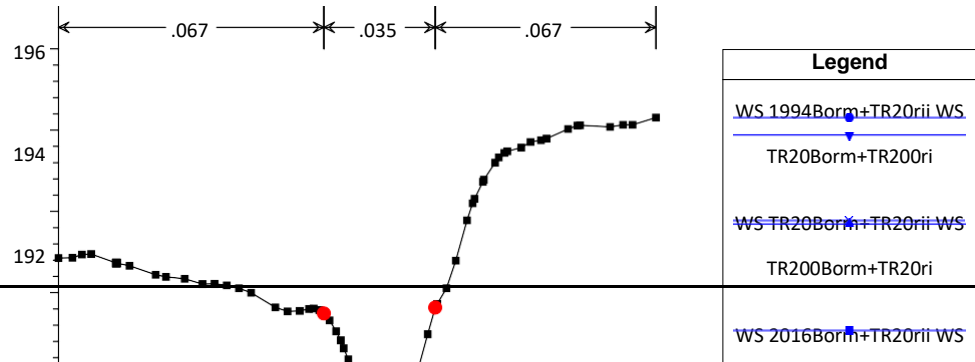
River = Rio Sacco Reach = 1 RS = 306



Attuale_rev02

Geom: Attuale_rev02

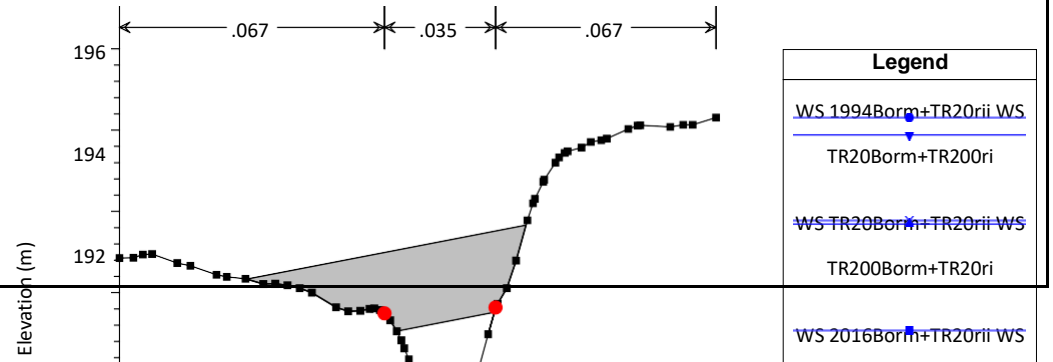
River = Rio Sacco Reach = 1 RS = 305



Attuale_rev02

Geom: Attuale_rev02

River = Rio Sacco Reach = 1 RS = 304.5 BR

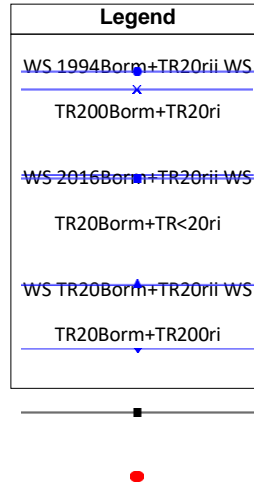
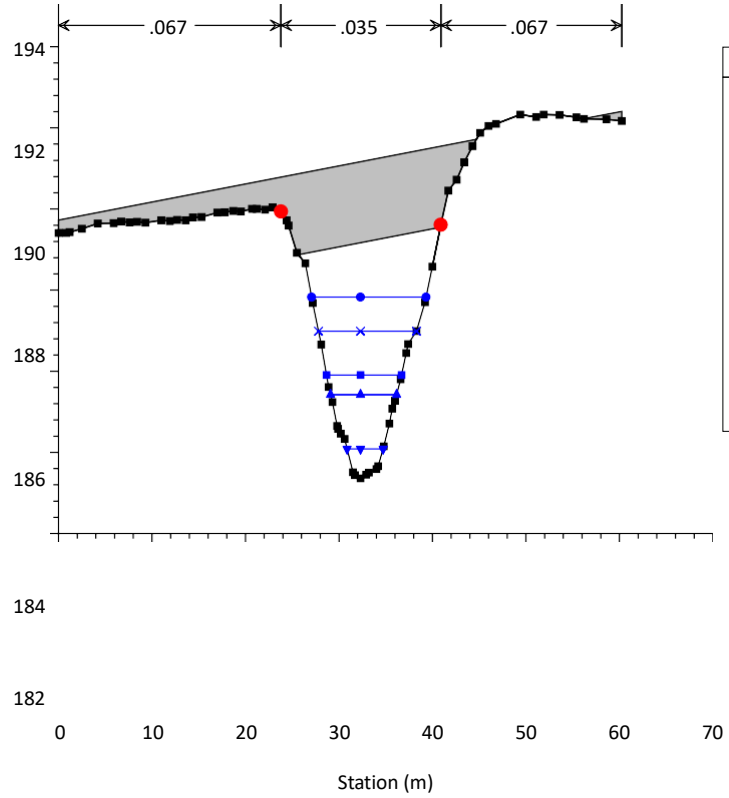




Attuale_rev02

Geom: Attuale_rev02

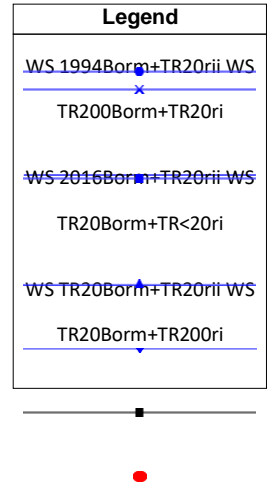
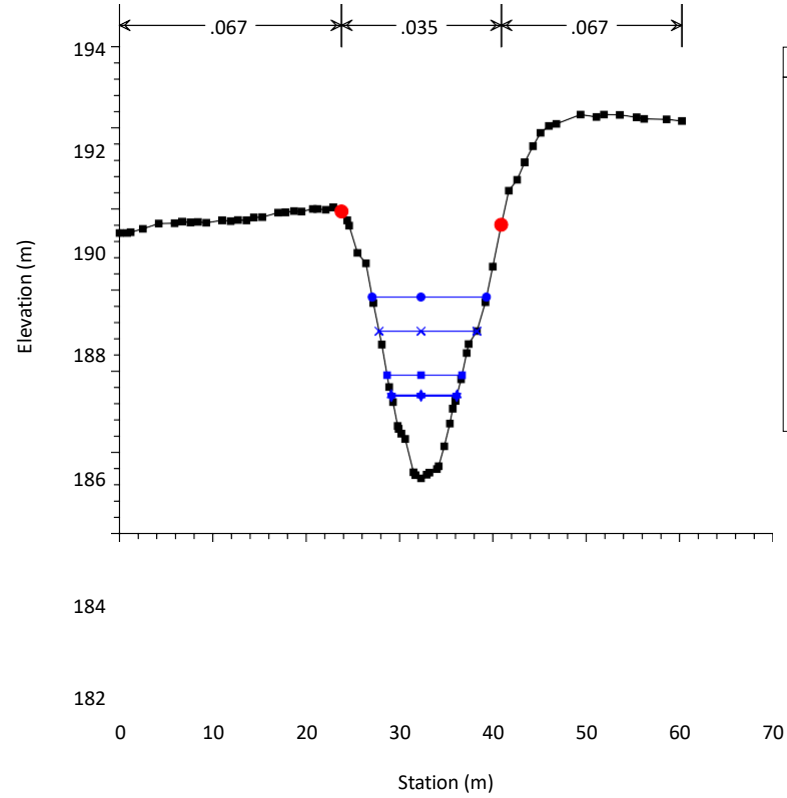
River = Rio Sacco Reach = 1 RS = 304.5 BR



Attuale_rev02

Geom: Attuale_rev02

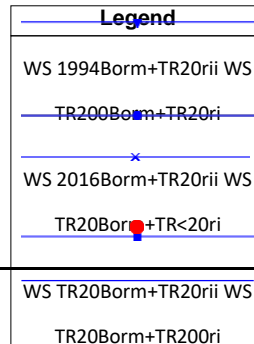
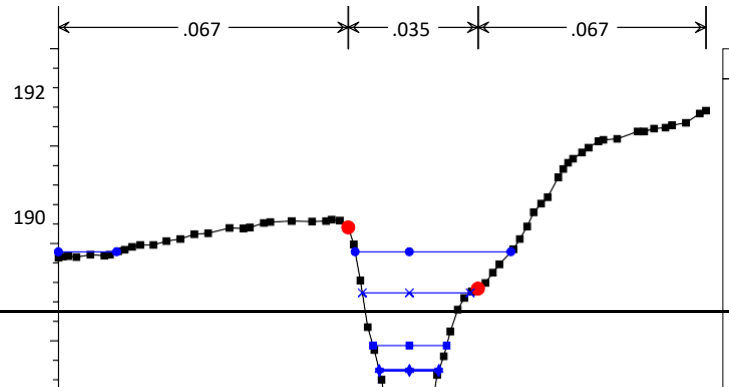
River = Rio Sacco Reach = 1 RS = 304



Attuale_rev02

Geom: Attuale_rev02

River = Rio Sacco Reach = 1 RS = 303

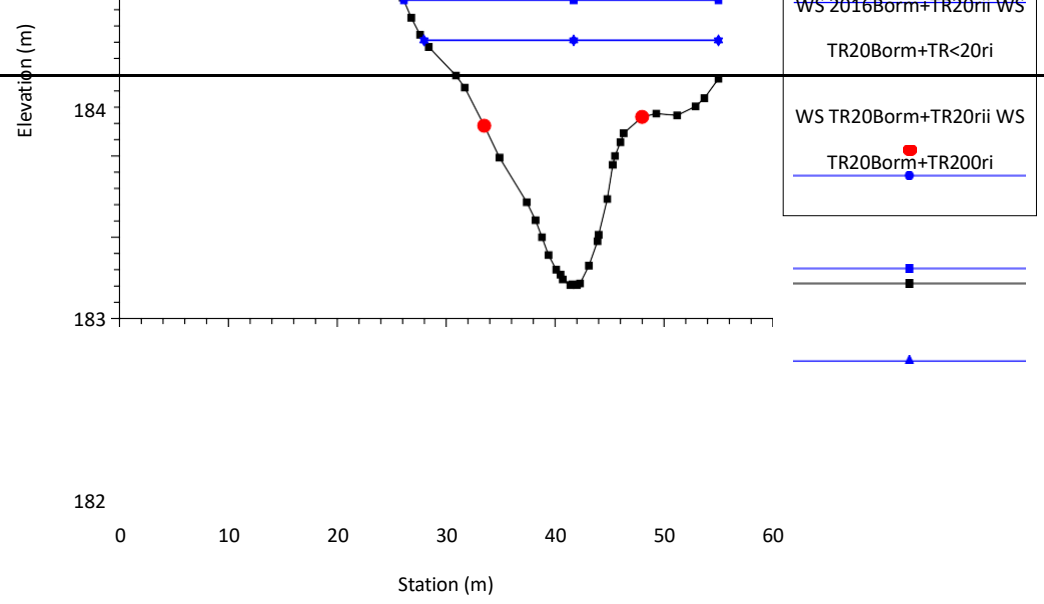
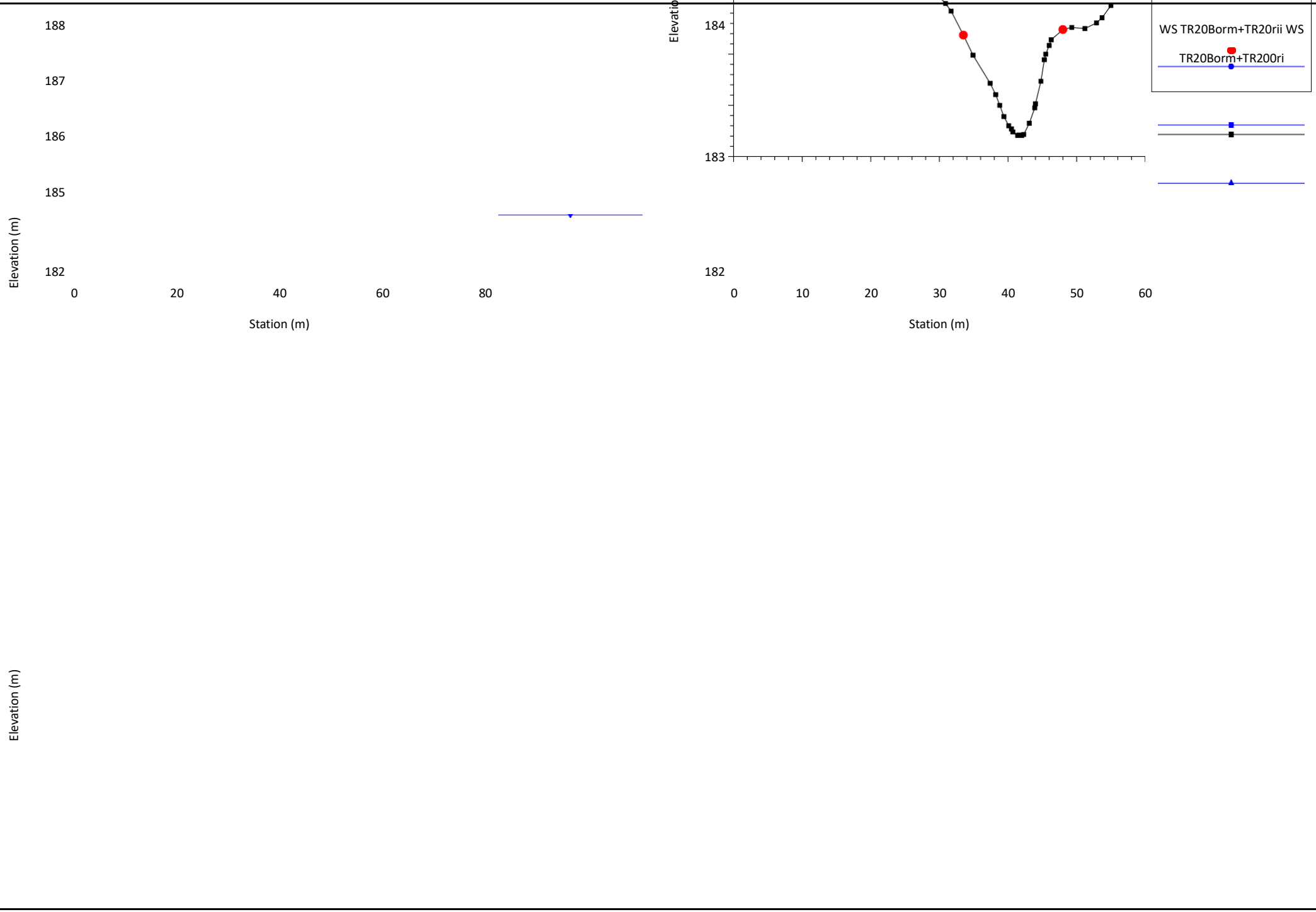


Attuale_rev02

Geom: Attuale_rev02

River = Rio Sacco Reach = 1 RS = 302

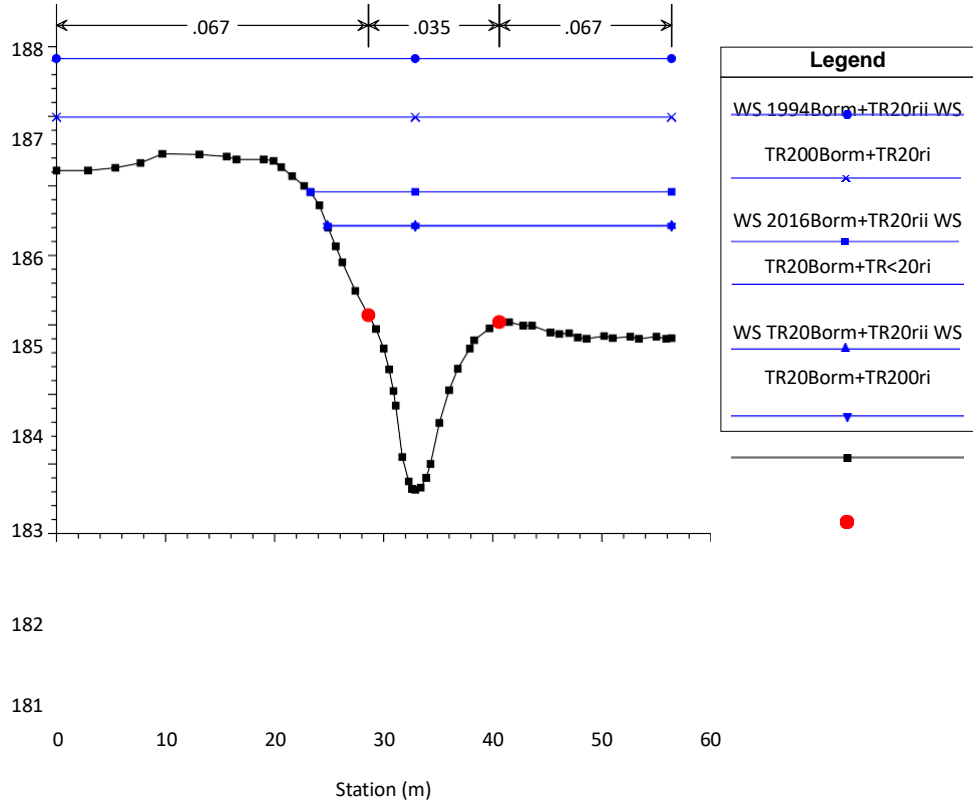




Attuale_rev02

Geom: Attuale_rev02

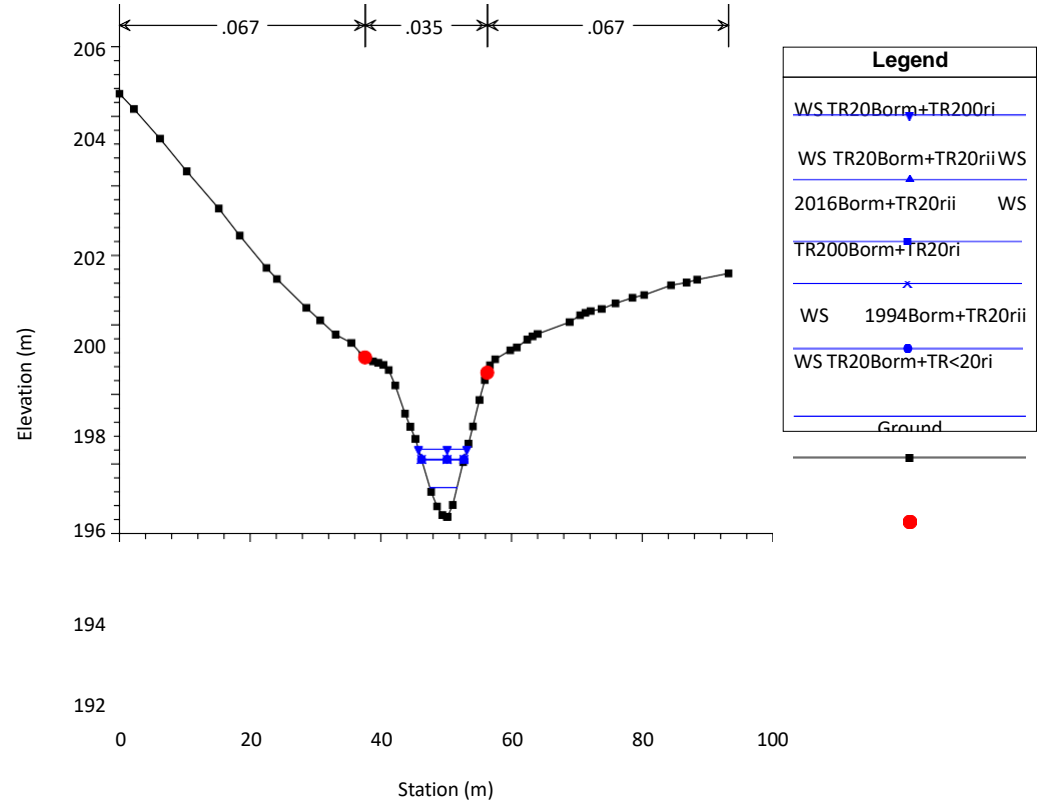
River = Rio Sacco Reach = 1 RS = 301



Attuale_rev02

Geom: Attuale_rev02

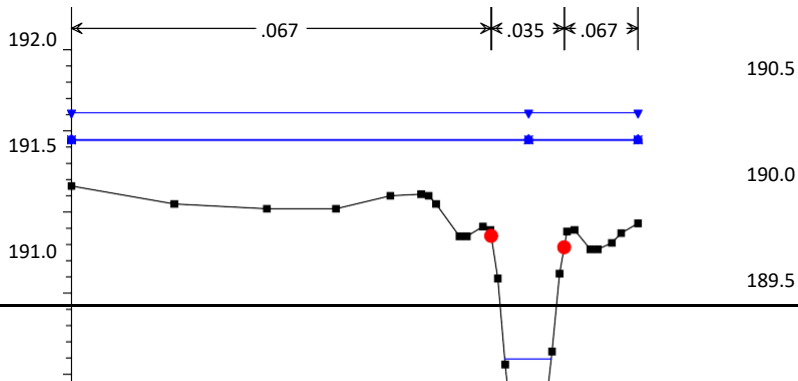
River = Rio San Pietro Reach = 3 RS = 134



Attuale_rev02

Geom: Attuale_rev02

River = Rio San Pietro Reach = 3 RS = 127

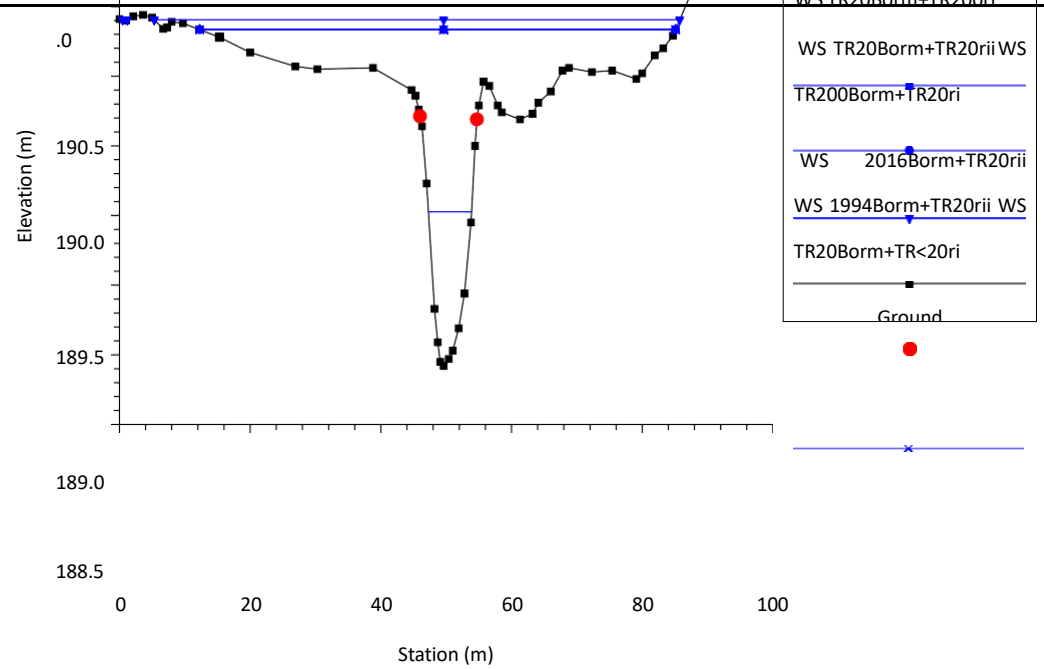
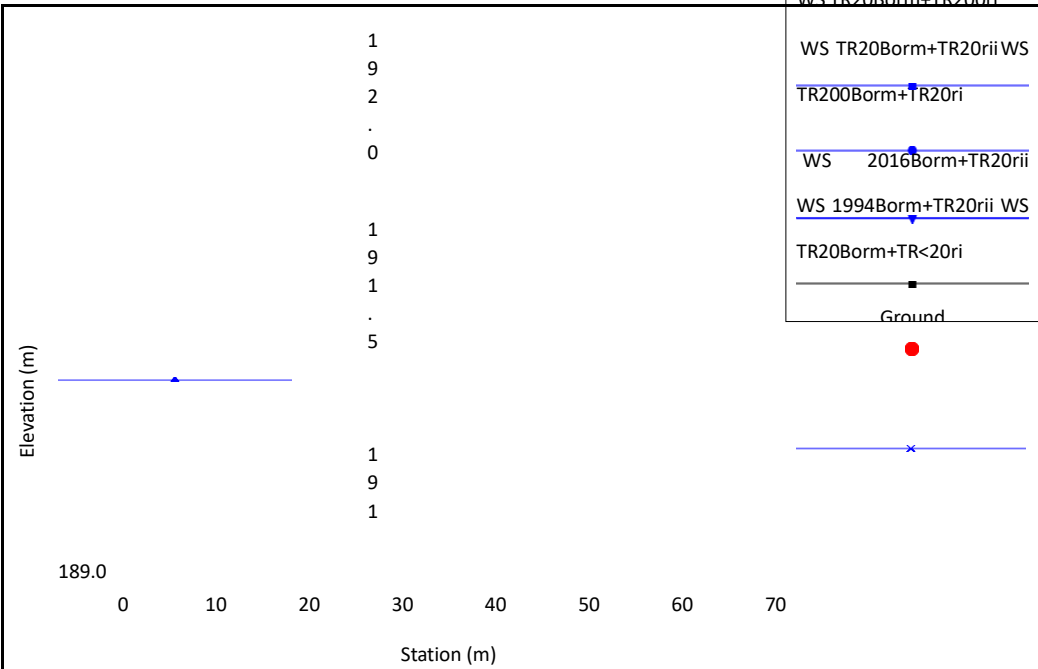


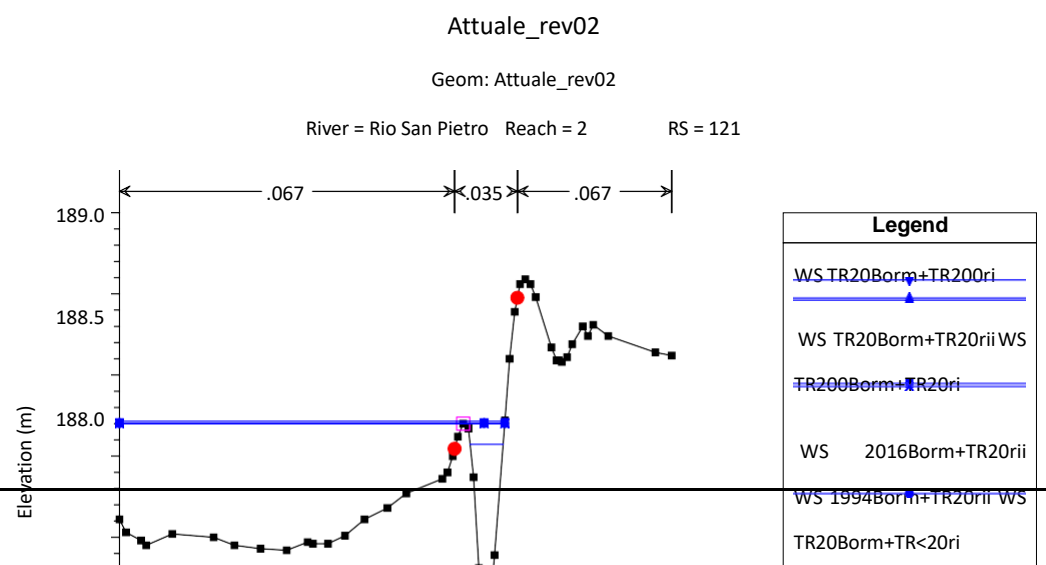
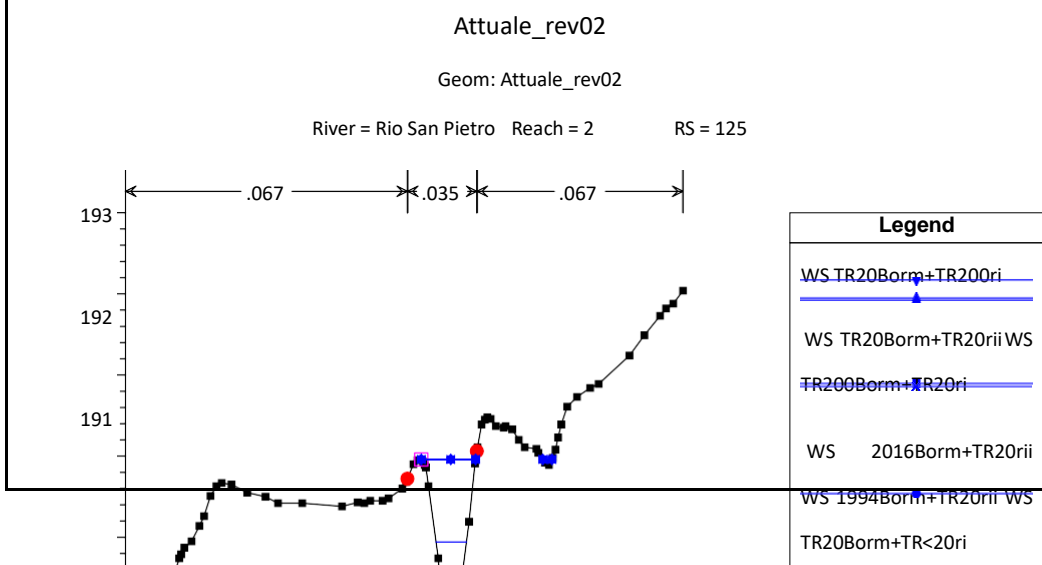
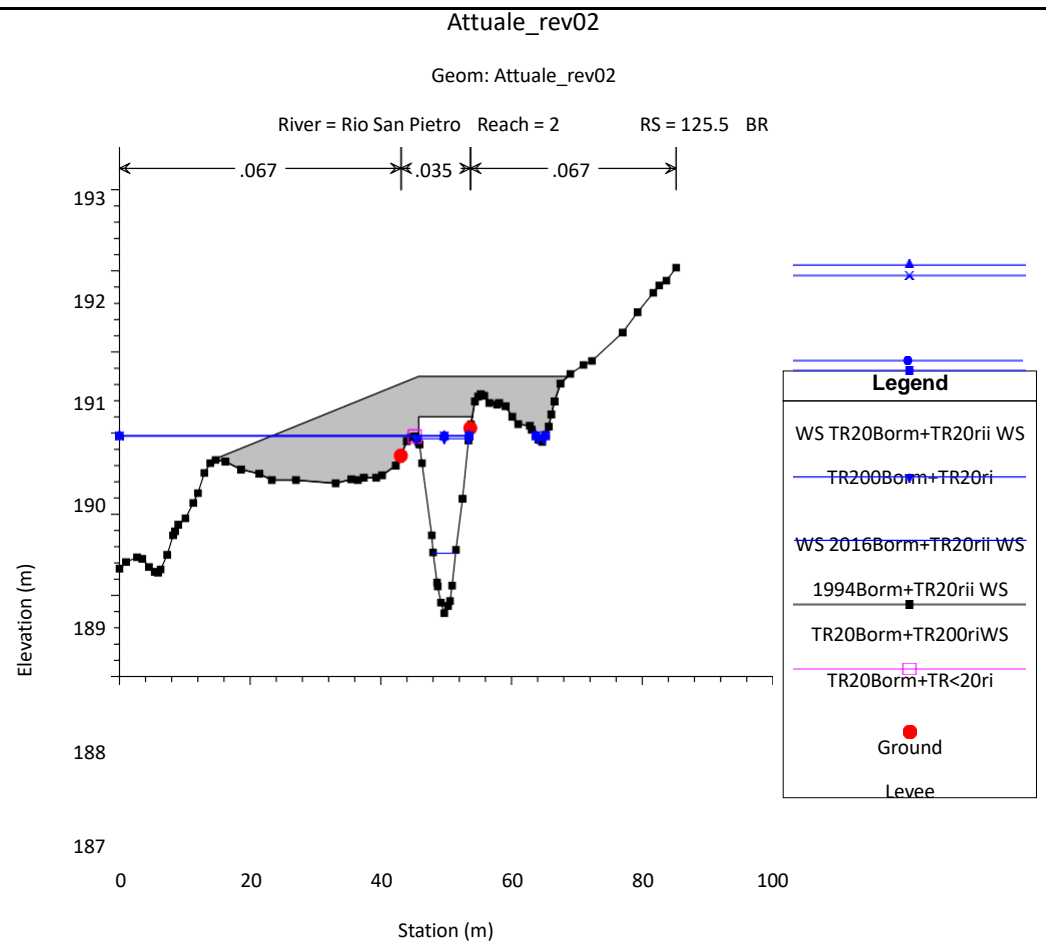
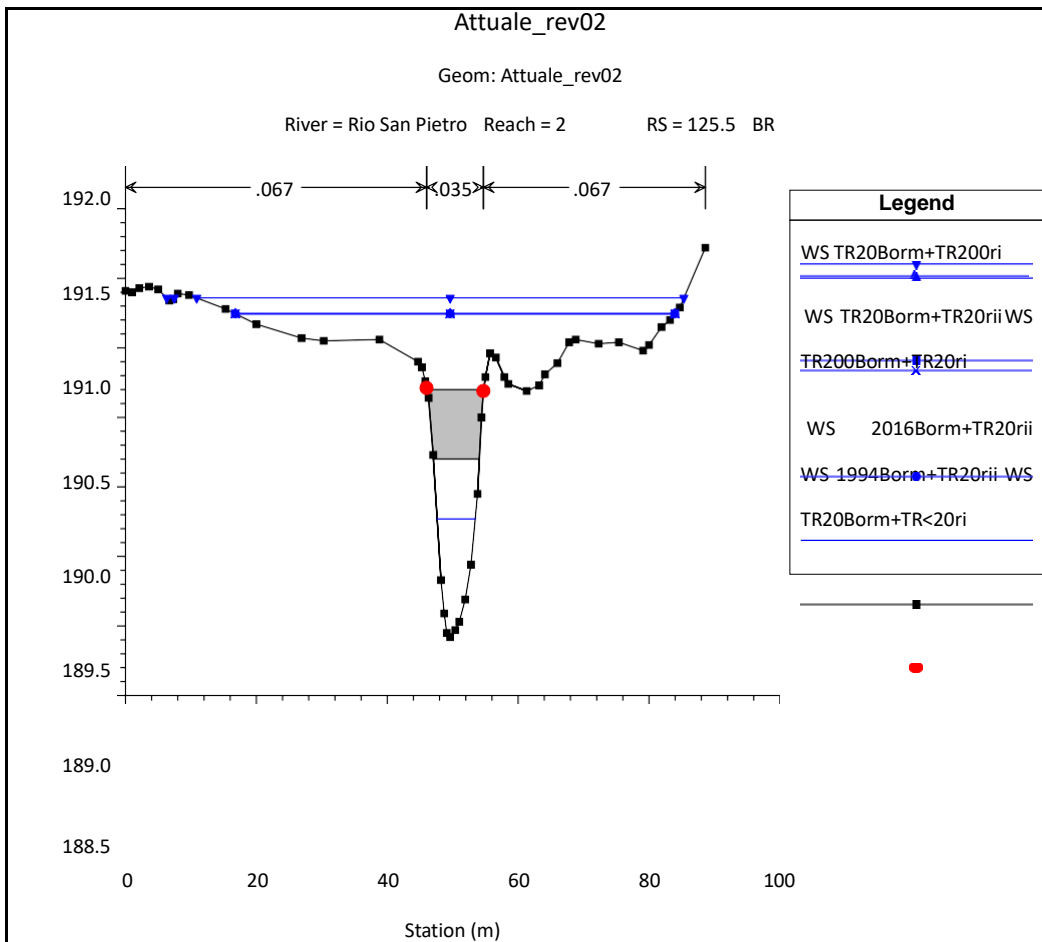
Attuale_rev02

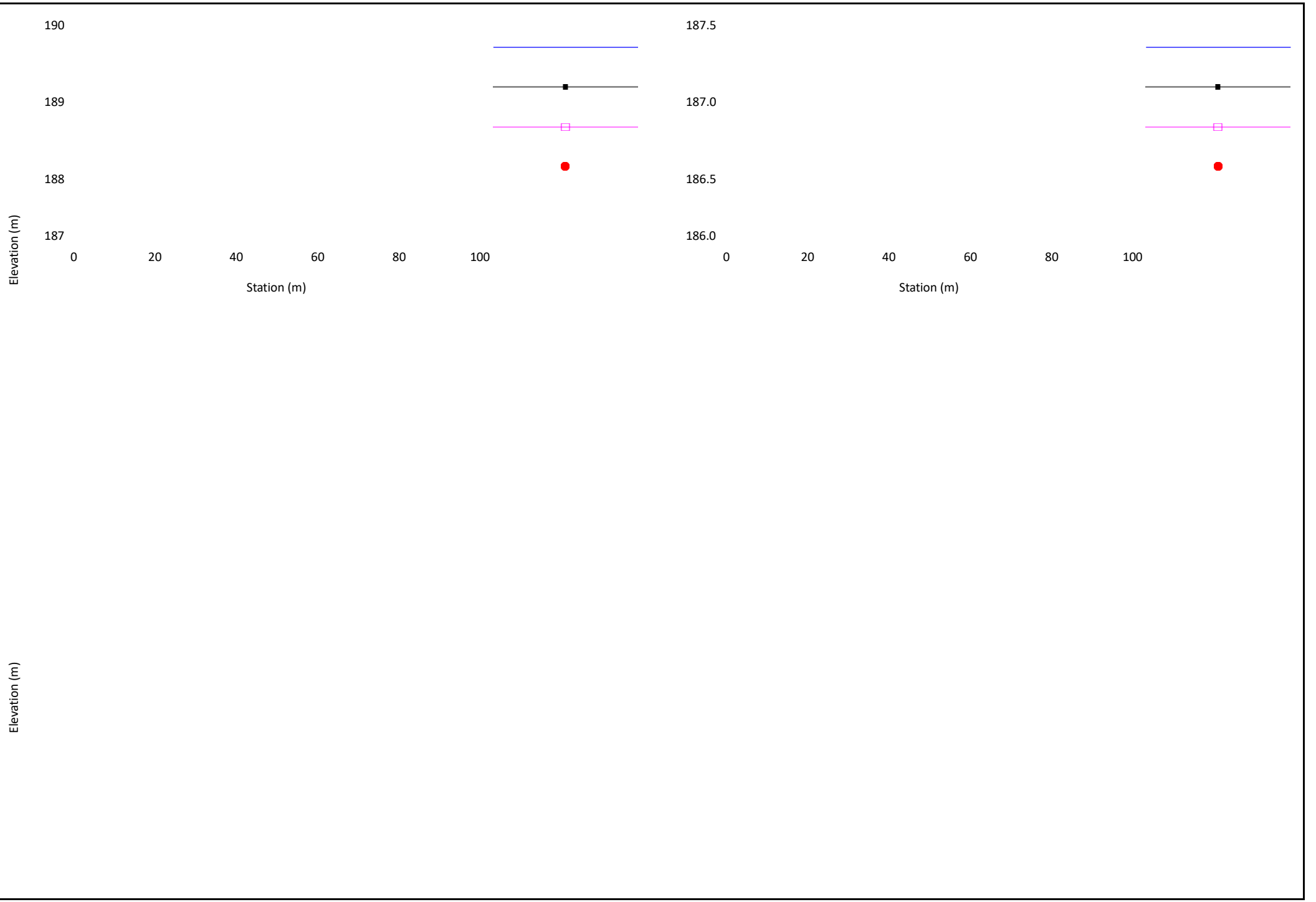
Geom: Attuale_rev02

River = Rio San Pietro Reach = 2 RS = 126





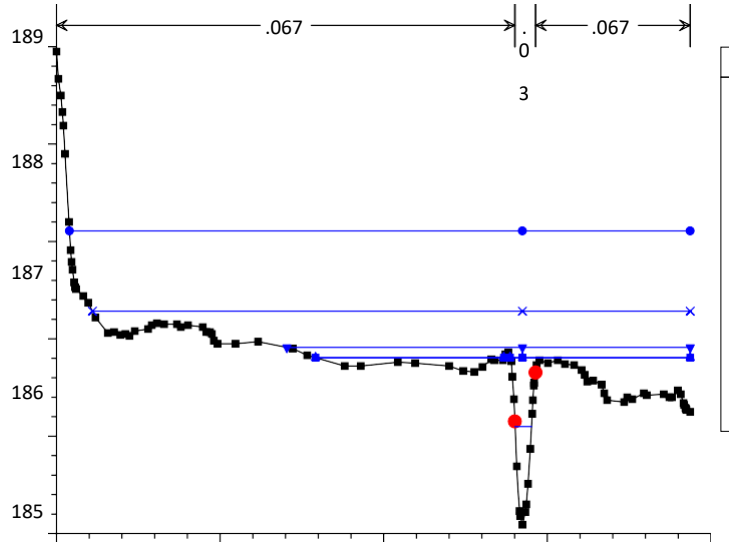




Attuale_rev02

Geom: Attuale_rev02

River = Rio San Pietro Reach = 2 RS = 115

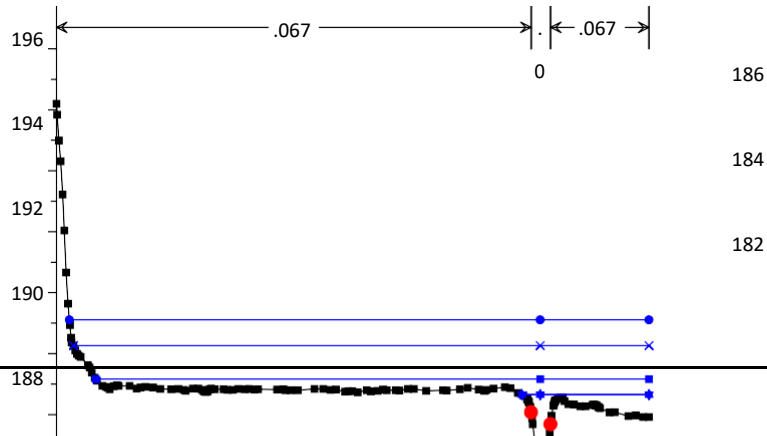


Station (m)

Attuale_rev02

Geom: Attuale_rev02

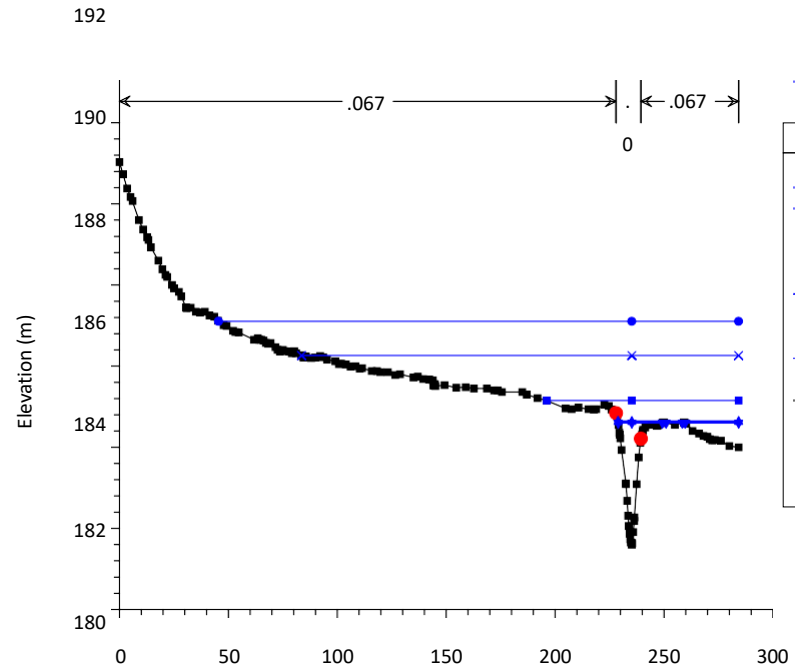
River = Rio San Pietro Reach = 1 RS = 108



Attuale_rev02

Geom: Attuale_rev02

River = Rio San Pietro Reach = 2 RS = 109



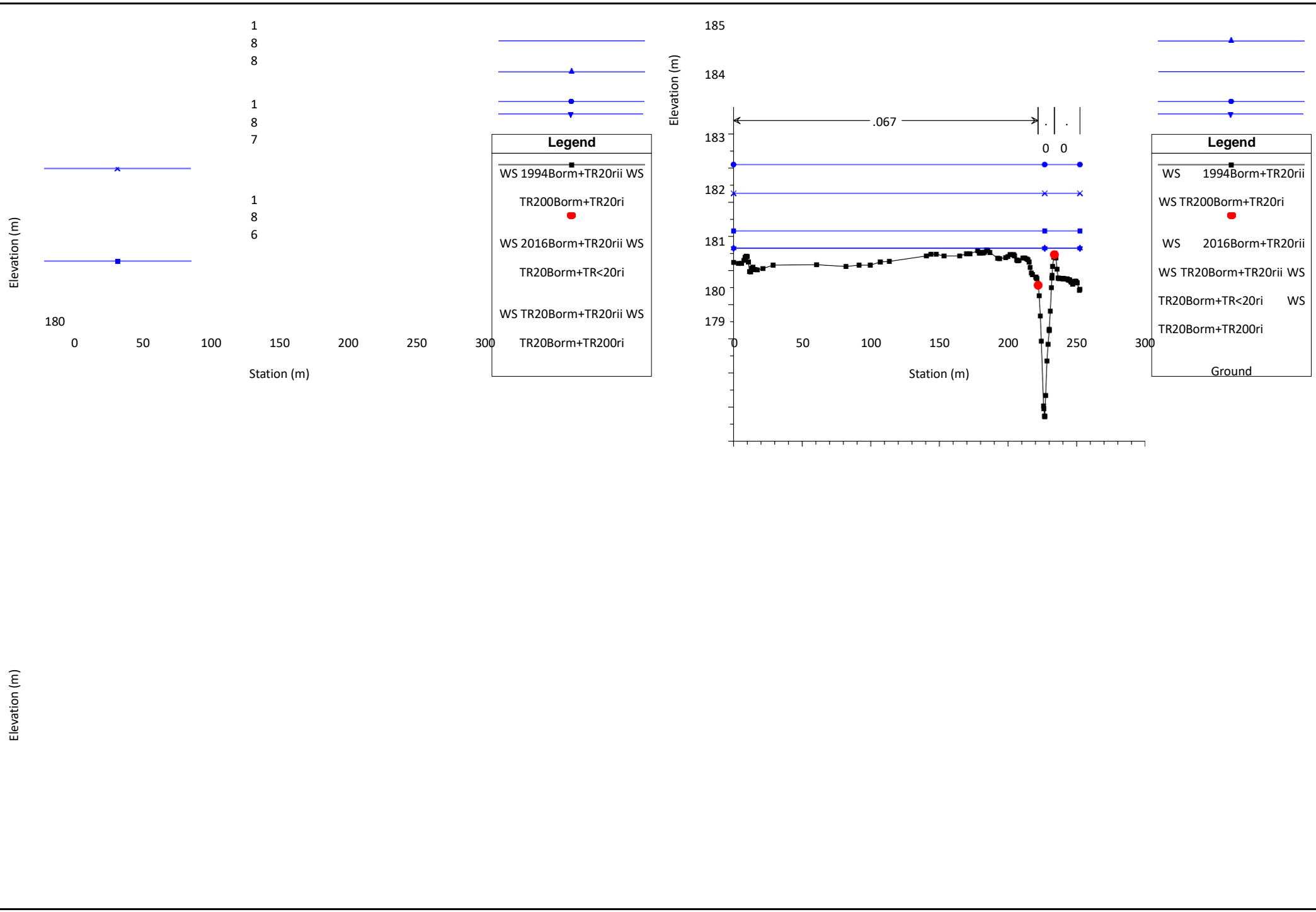
Station (m)

Attuale_rev02

Geom: Attuale_rev02

River = Rio San Pietro Reach = 1 RS = 105

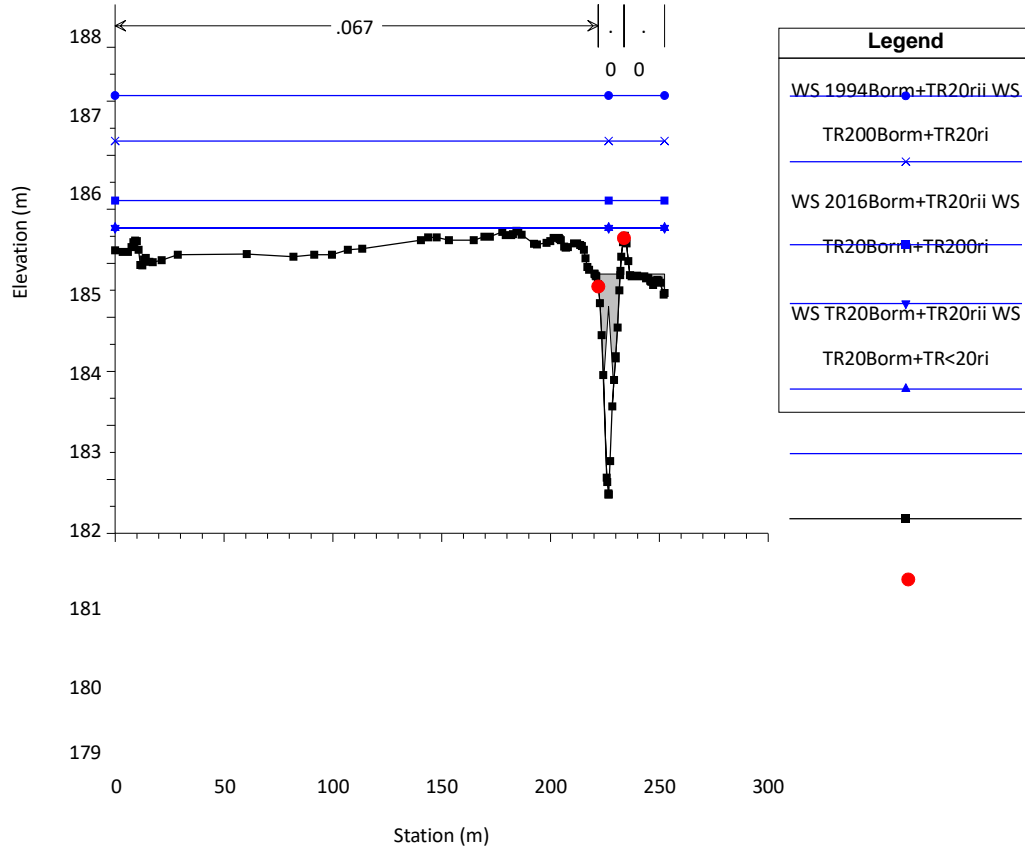




Attuale_rev02

Geom: Attuale_rev02

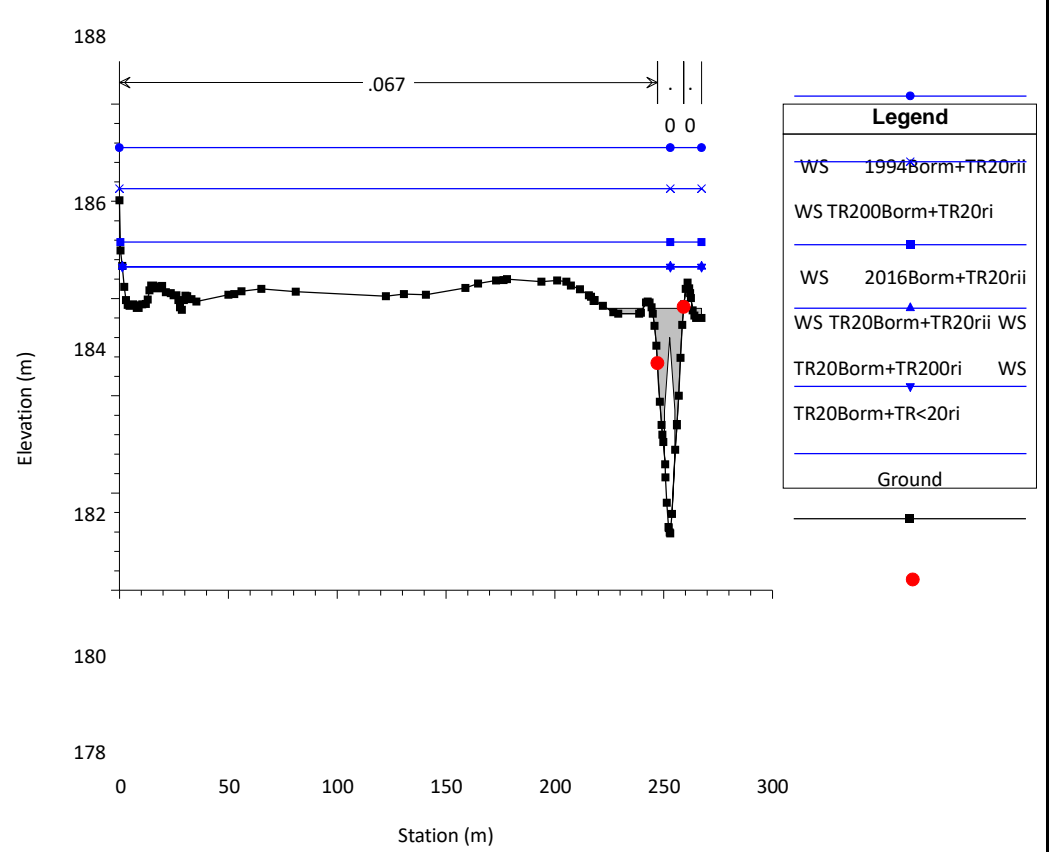
River = Rio San Pietro Reach = 1 RS = 104.5 BR



Attuale_rev02

Geom: Attuale_rev02

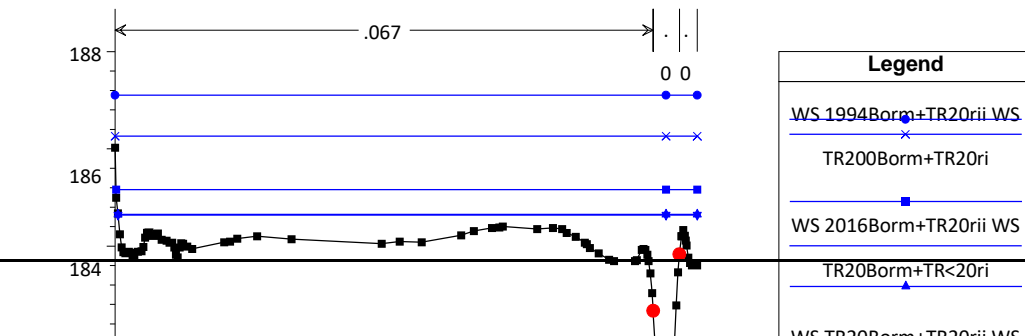
River = Rio San Pietro Reach = 1 RS = 104.5 BR

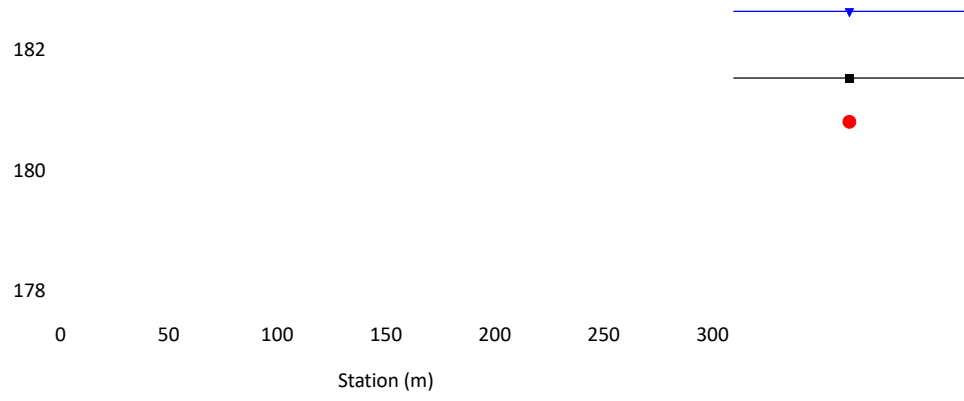


Attuale_rev02

Geom: Attuale_rev02

River = Rio San Pietro Reach = 1 RS = 104





INTERVENTO CODICE AT_A18_622_19_102 – PROGETTO PER LAVORI DI ADEGUAMENTO SEZIONI DI DEFLUSSO FOSSI COLATORI PROVENIENTI DA VERSANTI IN GIARONETTO - ADEGUAMENTO DEI TRATTI DEL FIUME BORMIDA E DEL RIO SAN PIETRO IN CORRISPONDENZA DELLA S.P. 25 - PROGETTO ESECUTIVO – LOTTO 1A

SITUAZIONE AL LOTTO 1A

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	3	134	TR20Borm+TR<20ri	5.00	192.48	193.32	193.32	193.58	0.017108	2.29	2.18	4.13	1.01
Rio San Pietro	3	134	TR20Borm+TR20rii	22.20	192.48	194.13	194.19	194.73	0.017011	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	TR20Borm+TR200ri	31.90	192.48	194.42	194.52	195.14	0.017021	3.74	8.53	7.39	1.11
Rio San Pietro	3	134	TR200Borm+TR20ri	22.20	192.48	194.13	194.20	194.73	0.017012	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	2016Borm+TR20rii	22.20	192.48	194.13	194.19	194.73	0.017011	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	1994Borm+TR20rii	22.20	192.48	194.13	194.20	194.73	0.017012	3.42	6.50	6.49	1.09
Rio San Pietro	3	133.00*	TR20Borm+TR<20ri	5.00	192.00	192.82	192.85	193.12	0.020016	2.43	2.06	4.01	1.09
Rio San Pietro	3	133.00*	TR20Borm+TR20rii	22.20	192.00	193.62	193.73	194.27	0.019320	3.57	6.22	6.43	1.16
Rio San Pietro	3	133.00*	TR20Borm+TR200ri	31.90	192.00	193.90	194.05	194.68	0.019304	3.91	8.16	7.32	1.18
Rio San Pietro	3	133.00*	TR200Borm+TR20ri	22.20	192.00	193.62	193.73	194.27	0.019484	3.58	6.20	6.42	1.16
Rio San Pietro	3	133.00*	2016Borm+TR20rii	22.20	192.00	193.62	193.73	194.27	0.019320	3.57	6.22	6.43	1.16
Rio San Pietro	3	133.00*	1994Borm+TR20rii	22.20	192.00	193.62	193.73	194.27	0.019319	3.57	6.22	6.43	1.16
Rio San Pietro	3	132.00*	TR20Borm+TR<20ri	5.00	191.53	192.38	192.38	192.65	0.017302	2.31	2.16	4.08	1.01
Rio San Pietro	3	132.00*	TR20Borm+TR20rii	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	132.00*	TR20Borm+TR200ri	31.90	191.53	193.44	193.58	194.20	0.019113	3.86	8.26	7.55	1.18
Rio San Pietro	3	132.00*	TR200Borm+TR20ri	22.20	191.53	193.16	193.26	193.79	0.018621	3.51	6.33	6.56	1.14
Rio San Pietro	3	132.00*	2016Borm+TR20rii	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	132.00*	1994Borm+TR20rii	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	131.00*	TR20Borm+TR<20ri	5.00	191.05	191.88	191.91	192.18	0.020188	2.44	2.05	4.00	1.09
Rio San Pietro	3	131.00*	TR20Borm+TR20rii	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	131.00*	TR20Borm+TR200ri	31.90	191.05	192.94	193.10	193.71	0.019784	3.88	8.21	7.68	1.20
Rio San Pietro	3	131.00*	TR200Borm+TR20ri	22.20	191.05	192.67	192.79	193.31	0.019639	3.54	6.26	6.70	1.17
Rio San Pietro	3	131.00*	2016Borm+TR20rii	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	131.00*	1994Borm+TR20rii	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	130.00*	TR20Borm+TR<20ri	5.00	190.58	191.43	191.44	191.71	0.017638	2.32	2.16	4.13	1.02
Rio San Pietro	3	130.00*	TR20Borm+TR20rii	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	130.00*	TR20Borm+TR200ri	31.90	190.58	192.45	192.60	193.22	0.019805	3.88	8.22	7.74	1.20
Rio San Pietro	3	130.00*	TR200Borm+TR20ri	22.20	190.58	192.18	192.31	192.82	0.019894	3.54	6.28	6.85	1.18
Rio San Pietro	3	130.00*	2016Borm+TR20rii	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	130.00*	1994Borm+TR20rii	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	129.00*	TR20Borm+TR<20ri	5.00	190.10	190.92	190.96	191.23	0.020777	2.44	2.05	4.13	1.11
Rio San Pietro	3	129.00*	TR20Borm+TR20rii	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	TR20Borm+TR200ri	31.90	190.10	191.94	192.10	192.72	0.020116	3.90	8.18	7.76	1.21
Rio San Pietro	3	129.00*	TR200Borm+TR20ri	22.20	190.10	191.68	191.80	192.32	0.020086	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	2016Borm+TR20rii	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	1994Borm+TR20rii	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19

HEC-RAS Plan: Lotto1A (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	3	128.00*	TR20Borm+TR<20ri	5.00	189.63	190.45	190.47	190.73	0.018705	2.32	2.16	4.38	1.05
Rio San Pietro	3	128.00*	TR20Borm+TR20rii	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	TR20Borm+TR200ri	31.90	189.63	191.44	191.62	192.21	0.020379	3.90	8.17	7.86	1.22
Rio San Pietro	3	128.00*	TR200Borm+TR20ri	22.20	189.63	191.18	191.30	191.82	0.020227	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	2016Borm+TR20rii	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	1994Borm+TR20rii	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	127	TR20Borm+TR<20ri	5.00	189.15	190.09	189.97	190.25	0.008760	1.75	2.85	4.97	0.74
Rio San Pietro	3	127	TR20Borm+TR20rii	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	TR20Borm+TR200ri	31.90	189.15	191.61	191.27	191.68	0.001390	1.44	45.13	60.60	0.35
Rio San Pietro	3	127	TR200Borm+TR20ri	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	2016Borm+TR20rii	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	1994Borm+TR20rii	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	2	126	TR20Borm+TR<20ri	8.00	188.92	190.03	189.77	190.16	0.005187	1.61	4.95	6.61	0.60
Rio San Pietro	2	126	TR20Borm+TR20rii	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	TR20Borm+TR200ri	49.10	188.92	191.41	191.30	191.63	0.003468	2.37	40.50	81.15	0.56
Rio San Pietro	2	126	TR200Borm+TR20ri	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	2016Borm+TR20rii	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	1994Borm+TR20rii	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	125.5		Bridge									
Rio San Pietro	2	125	TR20Borm+TR<20ri	8.00	187.78	188.94	188.90	189.24	0.013680	2.43	3.29	4.65	0.92
Rio San Pietro	2	125	TR20Borm+TR20rii	34.30	187.78	189.96	189.96	190.01	0.003090	1.41	41.12	53.50	0.47
Rio San Pietro	2	125	TR20Borm+TR200ri	49.10	187.78	189.96	189.96	190.07	0.006331	2.02	41.12	53.50	0.67
Rio San Pietro	2	125	TR200Borm+TR20ri	34.30	187.78	189.96	189.96	190.01	0.003090	1.41	41.12	53.50	0.47
Rio San Pietro	2	125	2016Borm+TR20rii	34.30	187.78	189.96	189.96	190.01	0.003090	1.41	41.12	53.50	0.47
Rio San Pietro	2	125	1994Borm+TR20rii	34.30	187.78	189.96	189.96	190.01	0.003090	1.41	41.12	53.50	0.47
Rio San Pietro	2	124.00*	TR20Borm+TR<20ri	8.00	187.45	188.61	188.57	188.91	0.013528	2.41	3.32	4.74	0.92
Rio San Pietro	2	124.00*	TR20Borm+TR20rii	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	TR20Borm+TR200ri	49.10	187.45	189.40	189.40	189.50	0.007564	2.06	40.10	54.98	0.72
Rio San Pietro	2	124.00*	TR200Borm+TR20ri	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	2016Borm+TR20rii	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	1994Borm+TR20rii	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	123.00*	TR20Borm+TR<20ri	8.00	187.11	188.27	188.24	188.57	0.013931	2.42	3.30	4.82	0.94
Rio San Pietro	2	123.00*	TR20Borm+TR20rii	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	123.00*	TR20Borm+TR200ri	49.10	187.11	188.83	188.83	188.94	0.009078	2.08	39.03	56.38	0.78
Rio San Pietro	2	123.00*	TR200Borm+TR20ri	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	123.00*	2016Borm+TR20rii	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54

HEC-RAS Plan: Lotto1A (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	123.00*	1994Borm+TR20rii	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	122.00*	TR20Borm+TR<20ri	8.00	186.78	187.97	187.90	188.24	0.012155	2.28	3.51	5.12	0.88
Rio San Pietro	2	122.00*	TR20Borm+TR20rii	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	TR20Borm+TR200ri	49.10	186.78	188.27	188.27	188.37	0.010860	2.06	37.95	57.70	0.83
Rio San Pietro	2	122.00*	TR200Borm+TR20ri	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	2016Borm+TR20rii	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	1994Borm+TR20rii	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	121	TR20Borm+TR<20ri	8.00	186.44	187.57	187.57	187.89	0.016026	2.49	3.21	5.06	1.00
Rio San Pietro	2	121	TR20Borm+TR20rii	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	TR20Borm+TR200ri	49.10	186.44	187.72	187.70	187.81	0.011885	1.95	37.80	58.99	0.85
Rio San Pietro	2	121	TR200Borm+TR20ri	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	2016Borm+TR20rii	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	1994Borm+TR20rii	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	120.00*	TR20Borm+TR<20ri	8.00	186.05	186.88	187.00	187.30	0.036907	3.21	5.32	48.07	1.46
Rio San Pietro	2	120.00*	TR20Borm+TR20rii	34.30	186.05	187.33	187.19	187.40	0.009943	1.93	33.96	72.95	0.80
Rio San Pietro	2	120.00*	TR20Borm+TR200ri	49.10	186.05	187.43	187.29	187.53	0.010591	2.18	41.74	73.64	0.84
Rio San Pietro	2	120.00*	TR200Borm+TR20ri	34.30	186.05	187.33	187.19	187.40	0.009943	1.93	33.96	72.95	0.80
Rio San Pietro	2	120.00*	2016Borm+TR20rii	34.30	186.05	187.33	187.19	187.40	0.009943	1.93	33.96	72.95	0.80
Rio San Pietro	2	120.00*	1994Borm+TR20rii	34.30	186.05	187.63	187.19	187.66	0.001962	1.08	56.38	74.00	0.37
Rio San Pietro	2	119.00*	TR20Borm+TR<20ri	8.00	185.66	186.78	186.78	186.86	0.006990	1.49	12.28	76.27	0.66
Rio San Pietro	2	119.00*	TR20Borm+TR20rii	34.30	185.66	187.06	187.02	187.16	0.009167	2.17	35.40	85.86	0.80
Rio San Pietro	2	119.00*	TR20Borm+TR200ri	49.10	185.66	187.17	187.09	187.28	0.009191	2.33	45.01	86.38	0.81
Rio San Pietro	2	119.00*	TR200Borm+TR20ri	34.30	185.66	187.06	187.02	187.16	0.009167	2.17	35.40	85.86	0.80
Rio San Pietro	2	119.00*	2016Borm+TR20rii	34.30	185.66	187.06	187.02	187.16	0.009167	2.17	35.40	85.86	0.80
Rio San Pietro	2	119.00*	1994Borm+TR20rii	34.30	185.66	187.61	187.02	187.63	0.000661	0.77	83.73	89.46	0.23
Rio San Pietro	2	118.00*	TR20Borm+TR<20ri	8.00	185.27	186.40	186.49	186.62	0.011779	2.09	4.31	22.67	0.87
Rio San Pietro	2	118.00*	TR20Borm+TR20rii	34.30	185.27	186.81	186.81	186.94	0.008080	2.31	36.68	99.25	0.77
Rio San Pietro	2	118.00*	TR20Borm+TR200ri	49.10	185.27	186.90	186.89	187.05	0.009203	2.57	45.61	99.91	0.83
Rio San Pietro	2	118.00*	TR200Borm+TR20ri	34.30	185.27	186.81	186.81	186.94	0.008080	2.31	36.68	99.25	0.77
Rio San Pietro	2	118.00*	2016Borm+TR20rii	34.30	185.27	186.81	186.81	186.94	0.008080	2.31	36.68	99.25	0.77
Rio San Pietro	2	118.00*	1994Borm+TR20rii	34.30	185.27	187.61	186.81	187.61	0.000196	0.52	143.01	137.65	0.13
Rio San Pietro	2	117.00*	TR20Borm+TR<20ri	8.00	184.87	185.85	185.92	186.22	0.021701	2.69	2.97	5.45	1.16
Rio San Pietro	2	117.00*	TR20Borm+TR20rii	34.30	184.87	186.55	186.59	186.73	0.008337	2.53	34.91	109.75	0.80
Rio San Pietro	2	117.00*	TR20Borm+TR200ri	49.10	184.87	186.67	186.67	186.83	0.007947	2.61	47.95	113.28	0.79
Rio San Pietro	2	117.00*	TR200Borm+TR20ri	34.30	184.87	186.73	186.59	186.77	0.002108	1.40	67.25	153.08	0.41
Rio San Pietro	2	117.00*	2016Borm+TR20rii	34.30	184.87	186.55	186.59	186.73	0.008337	2.53	34.91	109.75	0.80

HEC-RAS Plan: Lotto1A (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	117.00*	1994Borm+TR20rii	34.30	184.87	187.61	186.59	187.61	0.000076	0.39	202.48	155.24	0.09
Rio San Pietro	2	116.00*	TR20Borm+TR<20ri	8.00	184.48	185.50	185.50	185.80	0.015693	2.45	3.27	5.36	1.00
Rio San Pietro	2	116.00*	TR20Borm+TR20rii	34.30	184.48	186.29	186.29	186.42	0.005272	2.21	44.98	156.32	0.65
Rio San Pietro	2	116.00*	TR20Borm+TR200ri	49.10	184.48	186.27	186.38	186.58	0.011958	3.29	42.47	150.40	0.97
Rio San Pietro	2	116.00*	TR200Borm+TR20ri	34.30	184.48	186.73	186.29	186.74	0.000430	0.78	120.01	171.01	0.19
Rio San Pietro	2	116.00*	2016Borm+TR20rii	34.30	184.48	186.29	186.29	186.42	0.005272	2.21	44.98	156.32	0.65
Rio San Pietro	2	116.00*	1994Borm+TR20rii	34.30	184.48	187.61	186.29	187.61	0.000035	0.29	270.57	172.91	0.06
Rio San Pietro	2	115	TR20Borm+TR<20ri	8.00	184.09	185.10	185.09	185.41	0.014725	2.45	3.27	5.02	0.97
Rio San Pietro	2	115	TR20Borm+TR20rii	34.30	184.09	185.82	185.94	186.21	0.012028	3.26	21.68	55.18	0.96
Rio San Pietro	2	115	TR20Borm+TR200ri	49.10	184.09	186.13	186.04	186.22	0.003392	2.03	69.68	167.69	0.53
Rio San Pietro	2	115	TR200Borm+TR20ri	34.30	184.09	186.73	185.94	186.74	0.000134	0.51	180.99	188.88	0.11
Rio San Pietro	2	115	2016Borm+TR20rii	34.30	184.09	185.82	185.94	186.21	0.012028	3.26	21.68	55.18	0.96
Rio San Pietro	2	115	1994Borm+TR20rii	34.30	184.09	187.61	185.94	187.61	0.000018	0.23	347.25	190.60	0.04
Rio San Pietro	2	114.00*	TR20Borm+TR<20ri	8.00	183.67	184.75	184.73	185.05	0.014092	2.39	3.35	5.19	0.95
Rio San Pietro	2	114.00*	TR20Borm+TR20rii	34.30	183.67	185.64	185.73	185.94	0.008059	2.81	24.49	70.93	0.80
Rio San Pietro	2	114.00*	TR20Borm+TR200ri	49.10	183.67	186.09		186.15	0.001858	1.65	81.12	156.17	0.40
Rio San Pietro	2	114.00*	TR200Borm+TR20ri	34.30	183.67	186.73		186.73	0.000095	0.46	199.50	197.48	0.10
Rio San Pietro	2	114.00*	2016Borm+TR20rii	34.30	183.67	185.79	185.73	185.93	0.003655	2.04	40.47	120.26	0.55
Rio San Pietro	2	114.00*	1994Borm+TR20rii	34.30	183.67	187.61		187.61	0.000014	0.22	377.18	204.47	0.04
Rio San Pietro	2	113.00*	TR20Borm+TR<20ri	8.00	183.26	184.65		184.80	0.005367	1.67	4.79	6.07	0.60
Rio San Pietro	2	113.00*	TR20Borm+TR20rii	34.30	183.26	185.66	185.45	185.76	0.002530	1.79	41.84	115.54	0.46
Rio San Pietro	2	113.00*	TR20Borm+TR200ri	49.10	183.26	186.07		186.11	0.001007	1.32	97.81	163.30	0.30
Rio San Pietro	2	113.00*	TR200Borm+TR20ri	34.30	183.26	186.73		186.73	0.000068	0.42	220.14	205.93	0.08
Rio San Pietro	2	113.00*	2016Borm+TR20rii	34.30	183.26	185.79		185.85	0.001411	1.41	58.24	127.10	0.35
Rio San Pietro	2	113.00*	1994Borm+TR20rii	34.30	183.26	187.61		187.61	0.000011	0.21	406.61	217.44	0.04
Rio San Pietro	2	112.00*	TR20Borm+TR<20ri	8.00	182.85	184.63	183.99	184.70	0.001955	1.14	6.99	7.21	0.37
Rio San Pietro	2	112.00*	TR20Borm+TR20rii	34.30	182.85	185.11	185.03	185.61	0.010605	3.14	11.01	10.33	0.90
Rio San Pietro	2	112.00*	TR20Borm+TR200ri	49.10	182.85	185.60	185.60	186.02	0.006079	2.98	24.40	66.22	0.72
Rio San Pietro	2	112.00*	TR200Borm+TR20ri	34.30	182.85	186.72	185.03	186.73	0.000115	0.57	162.95	167.64	0.11
Rio San Pietro	2	112.00*	2016Borm+TR20rii	34.30	182.85	185.55	185.03	185.78	0.003396	2.18	21.60	48.56	0.54
Rio San Pietro	2	112.00*	1994Borm+TR20rii	34.30	182.85	187.61	185.03	187.61	0.000018	0.27	319.33	182.49	0.05
Rio San Pietro	2	111.00*	TR20Borm+TR<20ri	8.00	182.43	184.62	183.61	184.66	0.000836	0.83	9.69	8.56	0.25
Rio San Pietro	2	111.00*	TR20Borm+TR20rii	34.30	182.43	185.05	184.68	185.37	0.005640	2.50	14.08	11.83	0.67
Rio San Pietro	2	111.00*	TR20Borm+TR200ri	49.10	182.43	185.51	185.04	185.81	0.003918	2.51	28.40	58.35	0.59
Rio San Pietro	2	111.00*	TR200Borm+TR20ri	34.30	182.43	186.72	184.68	186.73	0.000081	0.50	179.95	168.20	0.09
Rio San Pietro	2	111.00*	2016Borm+TR20rii	34.30	182.43	185.56	184.68	185.69	0.001701	1.68	31.55	74.06	0.39

HEC-RAS Plan: Lotto1A (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	111.00*	1994Borm+TR20rii	34.30	182.43	187.61	184.68	187.61	0.000015	0.26	342.84	192.23	0.04
Rio San Pietro	2	110.00*	TR20Borm+TR<20ri	8.00	182.02	184.62	183.20	184.64	0.000383	0.62	12.93	10.43	0.17
Rio San Pietro	2	110.00*	TR20Borm+TR20rii	34.30	182.02	185.03	184.32	185.23	0.003007	1.99	17.93	13.67	0.50
Rio San Pietro	2	110.00*	TR20Borm+TR200ri	49.10	182.02	185.53	184.68	185.71	0.002097	1.98	39.99	82.36	0.44
Rio San Pietro	2	110.00*	TR200Borm+TR20ri	34.30	182.02	186.72	184.32	186.72	0.000059	0.45	199.65	174.67	0.08
Rio San Pietro	2	110.00*	2016Borm+TR20rii	34.30	182.02	185.57	184.32	185.65	0.000923	1.33	43.68	90.44	0.29
Rio San Pietro	2	110.00*	1994Borm+TR20rii	34.30	182.02	187.61	184.32	187.61	0.000012	0.24	369.02	202.04	0.04
Rio San Pietro	2	109	TR20Borm+TR<20ri	8.00	181.60	184.62	182.79	184.63	0.000193	0.49	16.81	12.40	0.12
Rio San Pietro	2	109	TR20Borm+TR20rii	34.30	181.60	185.03	183.95	185.16	0.001678	1.61	23.81	37.37	0.38
Rio San Pietro	2	109	TR20Borm+TR200ri	49.10	181.60	185.53	184.32	185.65	0.001193	1.60	53.39	96.71	0.33
Rio San Pietro	2	109	TR200Borm+TR20ri	34.30	181.60	186.72	183.95	186.72	0.000043	0.40	220.91	182.14	0.07
Rio San Pietro	2	109	2016Borm+TR20rii	34.30	181.60	185.57	183.95	185.62	0.000529	1.07	57.07	96.98	0.22
Rio San Pietro	2	109	1994Borm+TR20rii	34.30	181.60	187.61	183.95	187.61	0.000010	0.22	396.81	212.01	0.03
Rio San Pietro	1	108	TR20Borm+TR<20ri	8.00	180.99	184.62	182.40	184.63	0.000113	0.43	20.11	17.01	0.10
Rio San Pietro	1	108	TR20Borm+TR20rii	34.30	180.99	185.07	183.66	185.12	0.000638	1.17	74.73	212.08	0.24
Rio San Pietro	1	108	TR20Borm+TR200ri	49.10	180.99	185.60	184.02	185.61	0.000202	0.75	188.64	216.59	0.14
Rio San Pietro	1	108	TR200Borm+TR20ri	34.30	180.99	186.72	183.66	186.72	0.000009	0.20	437.60	224.74	0.03
Rio San Pietro	1	108	2016Borm+TR20rii	34.30	180.99	185.60	183.66	185.61	0.000098	0.52	188.96	216.60	0.10
Rio San Pietro	1	108	1994Borm+TR20rii	34.30	180.99	187.61	183.66	187.61	0.000003	0.12	637.20	225.86	0.02
Rio San Pietro	1	107.00*	TR20Borm+TR<20ri	8.00	180.57	184.62	182.00	184.62	0.000073	0.36	24.53	20.45	0.08
Rio San Pietro	1	107.00*	TR20Borm+TR20rii	34.30	180.57	185.03	183.30	185.10	0.000694	1.25	33.54	22.10	0.25
Rio San Pietro	1	107.00*	TR20Borm+TR200ri	49.10	180.57	185.50	183.73	185.59	0.000739	1.44	43.97	22.10	0.26
Rio San Pietro	1	107.00*	TR200Borm+TR20ri	34.30	180.57	186.70	183.30	186.72	0.000102	0.67	70.47	22.10	0.10
Rio San Pietro	1	107.00*	2016Borm+TR20rii	34.30	180.57	185.55	183.30	185.60	0.000337	0.98	45.18	22.10	0.18
Rio San Pietro	1	107.00*	1994Borm+TR20rii	34.30	180.57	187.59	183.30	187.60	0.000051	0.53	90.22	22.10	0.07
Rio San Pietro	1	106.00*	TR20Borm+TR<20ri	8.00	180.14	184.62	181.60	184.62	0.000050	0.31	29.45	21.40	0.06
Rio San Pietro	1	106.00*	TR20Borm+TR20rii	34.30	180.14	185.03	182.90	185.08	0.000493	1.08	38.21	21.40	0.21
Rio San Pietro	1	106.00*	TR20Borm+TR200ri	49.10	180.14	185.50	183.33	185.57	0.000552	1.27	48.30	21.40	0.23
Rio San Pietro	1	106.00*	TR200Borm+TR20ri	34.30	180.14	186.70	182.90	186.72	0.000083	0.61	73.99	21.40	0.09
Rio San Pietro	1	106.00*	2016Borm+TR20rii	34.30	180.14	185.55	182.90	185.59	0.000252	0.87	49.49	21.40	0.15
Rio San Pietro	1	106.00*	1994Borm+TR20rii	34.30	180.14	187.59	182.90	187.60	0.000043	0.49	93.12	21.40	0.07
Rio San Pietro	1	105	TR20Borm+TR<20ri	8.00	179.72	184.62	181.18	184.62	0.000035	0.26	34.61	20.70	0.05
Rio San Pietro	1	105	TR20Borm+TR20rii	34.30	179.72	185.03	182.50	185.07	0.000361	0.94	43.06	20.70	0.18
Rio San Pietro	1	105	TR20Borm+TR200ri	49.10	179.72	185.50	182.94	185.56	0.000421	1.12	52.83	20.70	0.20
Rio San Pietro	1	105	TR200Borm+TR20ri	34.30	179.72	186.70	182.50	186.71	0.000067	0.55	77.69	20.70	0.08
Rio San Pietro	1	105	2016Borm+TR20rii	34.30	179.72	185.55	182.50	185.58	0.000193	0.77	53.99	20.70	0.13

HEC-RAS Plan: Lotto1A (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	1	105	1994Borm+TR20rii	34.30	179.72	187.59	182.50	187.60	0.000036	0.45	96.20	20.70	0.06
Rio San Pietro	1	104.5	Bridge										
Rio San Pietro	1	104	TR20Borm+TR<20ri	8.00	179.17	184.59	180.38	184.60	0.000011	0.19	47.49	18.70	0.03
Rio San Pietro	1	104	TR20Borm+TR20rii	34.30	179.17	184.57	181.58	184.60	0.000199	0.80	46.96	18.70	0.14
Rio San Pietro	1	104	TR20Borm+TR200ri	49.10	179.17	184.53	181.97	184.60	0.000422	1.16	46.32	18.70	0.20
Rio San Pietro	1	104	TR200Borm+TR20ri	34.30	179.17	186.23	181.58	186.25	0.000049	0.52	78.13	18.70	0.07
Rio San Pietro	1	104	2016Borm+TR20rii	34.30	179.17	185.09	181.58	185.11	0.000120	0.68	56.77	18.70	0.11
Rio San Pietro	1	104	1994Borm+TR20rii	34.30	179.17	187.13	181.58	187.13	0.000028	0.44	94.84	18.70	0.06
Rio Sacco	1	306	TR20Borm+TR<20ri	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	TR20Borm+TR20rii	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	TR20Borm+TR200ri	14.50	187.71	189.12	189.31	189.78	0.030031	3.58	4.05	5.84	1.37
Rio Sacco	1	306	TR200Borm+TR20ri	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	2016Borm+TR20rii	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	1994Borm+TR20rii	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	305	TR20Borm+TR<20ri	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	TR20Borm+TR20rii	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	TR20Borm+TR200ri	14.50	185.28	187.58	187.02	187.77	0.004776	1.95	7.45	5.81	0.55
Rio Sacco	1	305	TR200Borm+TR20ri	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	2016Borm+TR20rii	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	1994Borm+TR20rii	10.10	185.28	187.72	186.77	187.80	0.001716	1.21	8.34	6.14	0.33
Rio Sacco	1	304.5	Bridge										
Rio Sacco	1	304	TR20Borm+TR<20ri	10.10	183.36	185.34		185.41	0.001470	1.14	8.84	6.90	0.32
Rio Sacco	1	304	TR20Borm+TR20rii	10.10	183.36	185.34		185.41	0.001470	1.14	8.84	6.90	0.32
Rio Sacco	1	304	TR20Borm+TR200ri	14.50	183.36	185.32		185.47	0.003162	1.67	8.70	6.85	0.47
Rio Sacco	1	304	TR200Borm+TR20ri	10.10	183.36	186.88		186.89	0.000131	0.47	21.69	10.08	0.10
Rio Sacco	1	304	2016Borm+TR20rii	10.10	183.36	185.82		185.86	0.000585	0.82	12.39	7.88	0.21
Rio Sacco	1	304	1994Borm+TR20rii	10.10	183.36	187.72		187.73	0.000051	0.32	31.11	12.06	0.06
Rio Sacco	1	303	TR20Borm+TR<20ri	10.10	182.69	185.34		185.38	0.000746	0.90	11.23	7.08	0.23
Rio Sacco	1	303	TR20Borm+TR20rii	10.10	182.69	185.34		185.38	0.000746	0.90	11.23	7.08	0.23
Rio Sacco	1	303	TR20Borm+TR200ri	14.50	182.69	185.31		185.40	0.001604	1.31	11.03	6.98	0.33
Rio Sacco	1	303	TR200Borm+TR20ri	10.10	182.69	186.88		186.89	0.000089	0.39	26.13	12.36	0.08
Rio Sacco	1	303	2016Borm+TR20rii	10.10	182.69	185.82		185.84	0.000362	0.67	15.06	8.74	0.16
Rio Sacco	1	303	1994Borm+TR20rii	10.10	182.69	187.72		187.73	0.000032	0.26	39.37	19.06	0.05
Rio Sacco	1	302	TR20Borm+TR<20ri	10.10	182.41	185.36		185.36	0.000059	0.33	36.04	26.70	0.08

HEC-RAS Plan: Lotto1A (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio Sacco	1	302	TR20Borm+TR20rii	10.10	182.41	185.36		185.36	0.000059	0.33	36.04	26.70	0.08
Rio Sacco	1	302	TR20Borm+TR200ri	14.50	182.41	185.36		185.37	0.000122	0.48	35.94	26.68	0.11
Rio Sacco	1	302	TR200Borm+TR20ri	10.10	182.41	186.88		186.88	0.000007	0.17	87.40	55.00	0.03
Rio Sacco	1	302	2016Borm+TR20rii	10.10	182.41	185.83		185.84	0.000026	0.26	49.19	28.62	0.05
Rio Sacco	1	302	1994Borm+TR20rii	10.10	182.41	187.73		187.73	0.000003	0.12	133.79	55.00	0.02
Rio Sacco	1	301	TR20Borm+TR<20ri	10.10	181.63	185.36		185.36	0.000033	0.27	53.60	31.40	0.06
Rio Sacco	1	301	TR20Borm+TR20rii	10.10	181.63	185.36		185.36	0.000033	0.27	53.60	31.40	0.06
Rio Sacco	1	301	TR20Borm+TR200ri	14.50	181.63	185.36		185.36	0.000069	0.39	53.53	31.39	0.08
Rio Sacco	1	301	TR200Borm+TR20ri	10.10	181.63	186.88		186.88	0.000005	0.14	116.56	56.40	0.02
Rio Sacco	1	301	2016Borm+TR20rii	10.10	181.63	185.83		185.84	0.000016	0.21	68.74	32.78	0.04
Rio Sacco	1	301	1994Borm+TR20rii	10.10	181.63	187.73		187.73	0.000002	0.11	164.13	56.40	0.02
Rio Madama	1	405	TR20Borm+TR<20ri	1.00	194.39	194.70	194.82	195.08	0.080108	2.73	0.37	1.70	1.87
Rio Madama	1	405	TR20Borm+TR20rii	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	TR20Borm+TR200ri	8.10	194.39	195.24	195.61	196.41	0.080011	4.79	1.69	3.17	2.10
Rio Madama	1	405	TR200Borm+TR20ri	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	2016Borm+TR20rii	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	1994Borm+TR20rii	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	404	TR20Borm+TR<20ri	1.00	187.14	187.58	187.55	187.69	0.015523	1.48	0.68	2.31	0.87
Rio Madama	1	404	TR20Borm+TR20rii	5.60	187.14	187.77	187.77	187.77	0.000039	0.08	43.18	25.69	0.04
Rio Madama	1	404	TR20Borm+TR200ri	8.10	187.14	187.77	187.77	187.77	0.000081	0.12	43.18	25.69	0.06
Rio Madama	1	404	TR200Borm+TR20ri	5.60	187.14	187.77	187.77	187.77	0.000039	0.08	43.18	25.69	0.04
Rio Madama	1	404	2016Borm+TR20rii	5.60	187.14	187.77	187.77	187.77	0.000039	0.08	43.18	25.69	0.04
Rio Madama	1	404	1994Borm+TR20rii	5.60	187.14	187.77	187.77	187.77	0.000039	0.08	43.18	25.69	0.04
Rio Madama	1	403	TR20Borm+TR<20ri	1.00	186.20	186.65	186.65	186.81	0.022136	1.77	0.57	1.74	0.99
Rio Madama	1	403	TR20Borm+TR20rii	5.60	186.20	186.75	186.75	186.75	0.000170	0.17	26.88	23.66	0.09
Rio Madama	1	403	TR20Borm+TR200ri	8.10	186.20	186.75	186.75	186.75	0.000356	0.24	26.88	23.66	0.13
Rio Madama	1	403	TR200Borm+TR20ri	5.60	186.20	186.75	186.75	186.75	0.000170	0.17	26.88	23.66	0.09
Rio Madama	1	403	2016Borm+TR20rii	5.60	186.20	186.75	186.75	186.75	0.000170	0.17	26.88	23.66	0.09
Rio Madama	1	403	1994Borm+TR20rii	5.60	186.20	187.61	186.75	187.61	0.000013	0.09	73.84	43.94	0.03
Rio Madama	1	402	TR20Borm+TR<20ri	1.00	184.94	185.38	185.38	185.50	0.020727	1.59	0.63	2.45	1.00
Rio Madama	1	402	TR20Borm+TR20rii	5.60	184.94	185.58	185.74	186.61	0.107703	4.49	1.25	3.51	2.41
Rio Madama	1	402	TR20Borm+TR200ri	8.10	184.94	185.74	185.74	185.75	0.001448	0.54	17.74	26.81	0.28
Rio Madama	1	402	TR200Borm+TR20ri	5.60	184.94	186.72	185.74	186.72	0.000017	0.13	67.54	46.00	0.04
Rio Madama	1	402	2016Borm+TR20rii	5.60	184.94	185.58	185.74	186.61	0.107703	4.49	1.25	3.51	2.41
Rio Madama	1	402	1994Borm+TR20rii	5.60	184.94	187.61	185.74	187.61	0.000004	0.09	108.26	46.00	0.02
Rio Madama	1	401	TR20Borm+TR<20ri	1.00	183.68	184.62	184.13	184.63	0.000681	0.46	2.18	4.05	0.20

HEC-RAS Plan: Lotto1A (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio Madama	1	401	TR20Borm+TR20rii	5.60	183.68	185.13	184.67	185.15	0.001599	0.78	13.20	48.30	0.32
Rio Madama	1	401	TR20Borm+TR200ri	8.10	183.68	185.61	184.99	185.62	0.000197	0.41	36.83	48.30	0.12
Rio Madama	1	401	TR200Borm+TR20ri	5.60	183.68	186.72		186.72	0.000006	0.11	90.26	48.30	0.02
Rio Madama	1	401	2016Borm+TR20rii	5.60	183.68	185.61	184.67	185.61	0.000097	0.28	36.52	48.30	0.09
Rio Madama	1	401	1994Borm+TR20rii	5.60	183.68	187.61		187.61	0.000002	0.08	133.03	48.30	0.01
Rio Caffra	1	205	TR20Borm+TR<20ri	5.00	190.88	191.70	191.54	191.80	0.006656	1.37	3.66	8.42	0.64
Rio Caffra	1	205	TR20Borm+TR20rii	19.20	190.88	192.26	192.11	192.38	0.004193	1.71	17.62	37.78	0.57
Rio Caffra	1	205	TR20Borm+TR200ri	27.70	190.88	192.45	192.26	192.58	0.003695	1.83	25.03	39.34	0.56
Rio Caffra	1	205	TR200Borm+TR20ri	19.20	190.88	192.26	192.11	192.38	0.004193	1.71	17.62	37.78	0.57
Rio Caffra	1	205	2016Borm+TR20rii	19.20	190.88	192.26	192.11	192.38	0.004193	1.71	17.62	37.78	0.57
Rio Caffra	1	205	1994Borm+TR20rii	19.20	190.88	192.26	192.11	192.38	0.004194	1.71	17.62	37.78	0.57
Rio Caffra	1	203	TR20Borm+TR<20ri	5.00	190.29	191.15	191.15	191.40	0.017312	2.22	2.25	4.61	1.01
Rio Caffra	1	203	TR20Borm+TR20rii	19.20	190.29	191.76	191.76	192.10	0.013227	2.78	9.41	17.25	0.97
Rio Caffra	1	203	TR20Borm+TR200ri	27.70	190.29	191.98	191.98	192.33	0.011851	2.91	13.41	19.28	0.94
Rio Caffra	1	203	TR200Borm+TR20ri	19.20	190.29	191.76	191.76	192.10	0.013227	2.78	9.41	17.25	0.97
Rio Caffra	1	203	2016Borm+TR20rii	19.20	190.29	191.76	191.76	192.10	0.013227	2.78	9.41	17.25	0.97
Rio Caffra	1	203	1994Borm+TR20rii	19.20	190.29	191.76	191.76	192.10	0.013233	2.78	9.41	17.23	0.97
Rio Caffra	1	201	TR20Borm+TR<20ri	5.00	189.19	189.92	190.06	190.39	0.042417	3.04	1.64	4.16	1.54
Rio Caffra	1	201	TR20Borm+TR20rii	19.20	189.19	191.44	190.74	191.52	0.001386	1.38	19.60	18.90	0.35
Rio Caffra	1	201	TR20Borm+TR200ri	27.70	189.19	191.57	191.06	191.71	0.002078	1.79	22.17	18.90	0.44
Rio Caffra	1	201	TR200Borm+TR20ri	19.20	189.19	191.44	190.74	191.52	0.001386	1.38	19.60	18.90	0.35
Rio Caffra	1	201	2016Borm+TR20rii	19.20	189.19	191.44	190.74	191.52	0.001386	1.38	19.60	18.90	0.35
Rio Caffra	1	201	1994Borm+TR20rii	19.20	189.19	191.44	190.74	191.52	0.001386	1.38	19.60	18.90	0.35
Bormida	3	43	TR20Borm+TR<20ri	833.00	179.12	184.93	183.40	185.68	0.002414	3.87	257.79	155.27	0.56
Bormida	3	43	TR20Borm+TR20rii	833.00	179.12	184.93	183.40	185.68	0.002414	3.87	257.79	155.27	0.56
Bormida	3	43	TR20Borm+TR200ri	833.00	179.12	184.93	183.39	185.68	0.002413	3.87	257.81	155.28	0.56
Bormida	3	43	TR200Borm+TR20ri	1469.00	179.12	186.33	185.68	187.20	0.002314	4.49	520.69	194.44	0.58
Bormida	3	43	2016Borm+TR20rii	1000.00	179.12	185.33	183.86	186.15	0.002488	4.14	327.08	188.49	0.58
Bormida	3	43	1994Borm+TR20rii	1900.00	179.12	187.16	186.30	188.02	0.002103	4.66	683.00	195.93	0.56
Bormida	3	42.000*	TR20Borm+TR<20ri	833.00	179.09	184.90	183.35	185.61	0.002369	3.76	261.86	180.36	0.56
Bormida	3	42.000*	TR20Borm+TR20rii	833.00	179.09	184.90	183.35	185.61	0.002370	3.76	261.86	180.36	0.56
Bormida	3	42.000*	TR20Borm+TR200ri	833.00	179.09	184.90	183.35	185.61	0.002369	3.76	261.90	180.37	0.56
Bormida	3	42.000*	TR200Borm+TR20ri	1469.00	179.09	186.34		187.11	0.002118	4.26	548.29	204.15	0.55
Bormida	3	42.000*	2016Borm+TR20rii	1000.00	179.09	185.32	183.81	186.07	0.002355	3.97	340.86	197.83	0.56
Bormida	3	42.000*	1994Borm+TR20rii	1900.00	179.09	187.18		187.94	0.001901	4.40	720.50	206.00	0.53
Bormida	3	41.000*	TR20Borm+TR<20ri	833.00	179.06	184.87	183.29	185.54	0.002327	3.65	267.10	193.73	0.55

HEC-RAS Plan: Lotto1A (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	3	41.000*	TR20Borm+TR20rii	833.00	179.06	184.87	183.29	185.54	0.002327	3.65	267.09	193.72	0.55
Bormida	3	41.000*	TR20Borm+TR200ri	833.00	179.06	184.87	183.29	185.54	0.002327	3.65	267.14	193.74	0.55
Bormida	3	41.000*	TR200Borm+TR20ri	1469.00	179.06	186.34		187.04	0.001965	4.05	574.32	213.90	0.53
Bormida	3	41.000*	2016Borm+TR20rii	1000.00	179.06	185.30	183.76	186.00	0.002261	3.82	352.86	207.03	0.55
Bormida	3	41.000*	1994Borm+TR20rii	1900.00	179.06	187.19		187.87	0.001741	4.17	756.76	216.37	0.51
Bormida	3	40.000*	TR20Borm+TR<20ri	833.00	179.04	184.83	183.24	185.47	0.002302	3.56	271.23	204.64	0.55
Bormida	3	40.000*	TR20Borm+TR20rii	833.00	179.04	184.83	183.24	185.47	0.002302	3.56	271.23	204.64	0.55
Bormida	3	40.000*	TR20Borm+TR200ri	833.00	179.04	184.83	183.24	185.47	0.002301	3.56	271.28	204.65	0.55
Bormida	3	40.000*	TR200Borm+TR20ri	1469.00	179.04	186.34		186.98	0.001842	3.88	599.05	223.72	0.51
Bormida	3	40.000*	2016Borm+TR20rii	1000.00	179.04	185.27	183.69	185.93	0.002197	3.70	363.20	216.03	0.54
Bormida	3	40.000*	1994Borm+TR20rii	1900.00	179.04	187.20		187.81	0.001609	3.97	792.17	226.86	0.49
Bormida	3	39.000*	TR20Borm+TR<20ri	833.00	179.01	184.80	183.17	185.40	0.002256	3.47	275.59	191.13	0.54
Bormida	3	39.000*	TR20Borm+TR20rii	833.00	179.01	184.80	183.17	185.40	0.002256	3.47	275.58	191.13	0.54
Bormida	3	39.000*	TR20Borm+TR200ri	833.00	179.01	184.80	183.17	185.40	0.002256	3.47	275.62	191.18	0.54
Bormida	3	39.000*	TR200Borm+TR20ri	1469.00	179.01	186.33		186.92	0.001742	3.72	622.63	233.76	0.50
Bormida	3	39.000*	2016Borm+TR20rii	1000.00	179.01	185.25	183.62	185.87	0.002154	3.60	372.10	222.51	0.53
Bormida	3	39.000*	1994Borm+TR20rii	1900.00	179.01	187.20		187.76	0.001498	3.80	826.87	237.18	0.47
Bormida	3	38.000*	TR20Borm+TR<20ri	833.00	178.98	184.77		185.34	0.002200	3.38	285.03	166.30	0.53
Bormida	3	38.000*	TR20Borm+TR20rii	833.00	178.98	184.77		185.34	0.002200	3.38	285.02	166.30	0.53
Bormida	3	38.000*	TR20Borm+TR200ri	833.00	178.98	184.77		185.34	0.002199	3.38	285.06	166.33	0.53
Bormida	3	38.000*	TR200Borm+TR20ri	1469.00	178.98	186.32		186.86	0.001659	3.59	645.34	244.69	0.49
Bormida	3	38.000*	2016Borm+TR20rii	1000.00	178.98	185.21		185.81	0.002130	3.51	379.32	229.68	0.53
Bormida	3	38.000*	1994Borm+TR20rii	1900.00	178.98	187.20		187.71	0.001403	3.64	861.19	247.67	0.46
Bormida	3	37	TR20Borm+TR<20ri	833.00	178.95	184.74		185.28	0.002162	3.29	295.42	165.42	0.52
Bormida	3	37	TR20Borm+TR20rii	833.00	178.95	184.74		185.28	0.002162	3.29	295.41	165.42	0.52
Bormida	3	37	TR20Borm+TR200ri	833.00	178.95	184.74		185.28	0.002162	3.29	295.45	165.44	0.52
Bormida	3	37	TR200Borm+TR20ri	1469.00	178.95	186.31		186.81	0.001590	3.47	667.77	256.34	0.47
Bormida	3	37	2016Borm+TR20rii	1000.00	178.95	185.18		185.75	0.002106	3.45	384.92	238.23	0.53
Bormida	3	37	1994Borm+TR20rii	1900.00	178.95	187.19		187.66	0.001321	3.49	895.43	258.01	0.44
Bormida	2	35	TR20Borm+TR<20ri	833.00	178.59	184.65		185.22	0.002179	3.38	286.81	159.31	0.53
Bormida	2	35	TR20Borm+TR20rii	833.00	178.59	184.65		185.22	0.002179	3.38	286.80	159.31	0.53
Bormida	2	35	TR20Borm+TR200ri	833.00	178.59	184.65		185.22	0.002178	3.38	286.85	159.33	0.53
Bormida	2	35	TR200Borm+TR20ri	1469.00	178.59	186.22		186.76	0.001636	3.61	653.20	262.82	0.48
Bormida	2	35	2016Borm+TR20rii	1000.00	178.59	185.08	183.40	185.69	0.002127	3.56	373.42	230.97	0.53
Bormida	2	35	1994Borm+TR20rii	1900.00	178.59	187.13		187.63	0.001337	3.60	903.32	276.60	0.45
Bormida	2	34.000*	TR20Borm+TR<20ri	833.00	178.53	184.59		185.16	0.002167	3.39	285.53	174.46	0.53

HEC-RAS Plan: Lotto1A (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	2	34.000*	TR20Borm+TR20rii	833.00	178.53	184.59		185.16	0.002167	3.39	285.52	174.46	0.53
Bormida	2	34.000*	TR20Borm+TR200ri	833.00	178.53	184.59		185.16	0.002166	3.39	285.56	174.49	0.53
Bormida	2	34.000*	TR200Borm+TR20ri	1469.00	178.53	186.18		186.72	0.001592	3.60	658.37	264.18	0.48
Bormida	2	34.000*	2016Borm+TR20rii	1000.00	178.53	185.04		185.63	0.002046	3.52	381.18	222.33	0.52
Bormida	2	34.000*	1994Borm+TR20rii	1900.00	178.53	187.10		187.59	0.001303	3.59	908.48	272.17	0.44
Bormida	2	33.000*	TR20Borm+TR<20ri	833.00	178.46	184.49	182.83	185.10	0.002359	3.49	277.26	207.09	0.55
Bormida	2	33.000*	TR20Borm+TR20rii	833.00	178.46	184.49	182.84	185.10	0.002359	3.49	277.25	207.09	0.55
Bormida	2	33.000*	TR20Borm+TR200ri	833.00	178.46	184.49	182.83	185.10	0.002358	3.49	277.31	207.09	0.55
Bormida	2	33.000*	TR200Borm+TR20ri	1469.00	178.46	186.14		186.69	0.001616	3.61	660.15	267.74	0.48
Bormida	2	33.000*	2016Borm+TR20rii	1000.00	178.46	184.98		185.58	0.002120	3.56	379.32	216.78	0.53
Bormida	2	33.000*	1994Borm+TR20rii	1900.00	178.46	187.07		187.56	0.001308	3.59	909.76	267.74	0.44
Bormida	2	32.000*	TR20Borm+TR<20ri	833.00	178.40	184.45	182.81	185.04	0.002276	3.46	286.83	197.74	0.54
Bormida	2	32.000*	TR20Borm+TR20rii	833.00	178.40	184.44	182.80	185.04	0.002276	3.46	286.82	197.74	0.54
Bormida	2	32.000*	TR20Borm+TR200ri	833.00	178.40	184.45	182.81	185.04	0.002275	3.46	286.89	197.75	0.54
Bormida	2	32.000*	TR200Borm+TR20ri	1469.00	178.40	186.11		186.64	0.001563	3.58	670.15	263.31	0.47
Bormida	2	32.000*	2016Borm+TR20rii	1000.00	178.40	184.94		185.52	0.002039	3.52	386.87	209.58	0.52
Bormida	2	32.000*	1994Borm+TR20rii	1900.00	178.40	187.05		187.53	0.001272	3.56	916.82	263.31	0.44
Bormida	2	31.000*	TR20Borm+TR<20ri	833.00	178.33	184.43		184.97	0.001986	3.32	306.71	189.24	0.51
Bormida	2	31.000*	TR20Borm+TR20rii	833.00	178.33	184.43		184.97	0.001986	3.32	306.70	189.24	0.51
Bormida	2	31.000*	TR20Borm+TR200ri	833.00	178.33	184.43		184.97	0.001986	3.32	306.76	189.25	0.51
Bormida	2	31.000*	TR200Borm+TR20ri	1469.00	178.33	186.10		186.60	0.001433	3.49	689.26	258.89	0.45
Bormida	2	31.000*	2016Borm+TR20rii	1000.00	178.33	184.92		185.46	0.001811	3.40	404.33	208.53	0.49
Bormida	2	31.000*	1994Borm+TR20rii	1900.00	178.33	187.03		187.49	0.001192	3.51	931.39	258.89	0.42
Bormida	2	30.000*	TR20Borm+TR<20ri	833.00	178.27	184.42	182.60	184.91	0.001757	3.19	325.87	186.45	0.48
Bormida	2	30.000*	TR20Borm+TR20rii	833.00	178.27	184.42	182.60	184.91	0.001757	3.19	325.86	186.45	0.48
Bormida	2	30.000*	TR20Borm+TR200ri	833.00	178.27	184.42	182.60	184.91	0.001756	3.19	325.93	186.46	0.48
Bormida	2	30.000*	TR200Borm+TR20ri	1469.00	178.27	186.04	184.57	186.56	0.001435	3.53	642.95	206.34	0.45
Bormida	2	30.000*	2016Borm+TR20rii	1000.00	178.27	184.91	183.02	185.41	0.001630	3.29	418.89	192.01	0.47
Bormida	2	30.000*	1994Borm+TR20rii	1900.00	178.27	186.92	185.22	187.46	0.001304	3.68	825.95	206.34	0.44
Bormida	2	29.000*	TR20Borm+TR<20ri	833.00	178.20	184.38	182.55	184.87	0.001723	3.17	332.71	174.72	0.47
Bormida	2	29.000*	TR20Borm+TR20rii	833.00	178.20	184.38	182.55	184.87	0.001723	3.17	332.70	174.72	0.47
Bormida	2	29.000*	TR20Borm+TR200ri	833.00	178.20	184.38	182.55	184.87	0.001722	3.17	332.76	174.72	0.47
Bormida	2	29.000*	TR200Borm+TR20ri	1469.00	178.20	185.99	184.48	186.52	0.001463	3.56	628.39	195.67	0.46
Bormida	2	29.000*	2016Borm+TR20rii	1000.00	178.20	184.87	182.96	185.37	0.001608	3.27	420.40	181.29	0.46
Bormida	2	29.000*	1994Borm+TR20rii	1900.00	178.20	186.87	185.14	187.42	0.001349	3.73	800.45	195.67	0.45
Bormida	2	28	TR20Borm+TR<20ri	833.00	178.14	184.35	182.49	184.82	0.001693	3.15	337.98	163.61	0.47

HEC-RAS Plan: Lotto1A (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	2	28	TR20Borm+TR20rii	833.00	178.14	184.35	182.49	184.82	0.001693	3.15	337.96	163.61	0.47
Bormida	2	28	TR20Borm+TR200ri	833.00	178.14	184.35	182.49	184.82	0.001693	3.14	338.02	163.62	0.47
Bormida	2	28	TR200Borm+TR20ri	1469.00	178.14	185.94	184.38	186.49	0.001500	3.60	611.79	185.00	0.46
Bormida	2	28	2016Borm+TR20rii	1000.00	178.14	184.84	182.91	185.33	0.001593	3.26	420.20	170.37	0.46
Bormida	2	28	1994Borm+TR20rii	1900.00	178.14	186.81	185.06	187.39	0.001405	3.80	772.70	185.00	0.46
Bormida	2	27.000*	TR20Borm+TR<20ri	833.00	178.10	184.30	182.43	184.78	0.001670	3.14	327.46	147.07	0.46
Bormida	2	27.000*	TR20Borm+TR20rii	833.00	178.10	184.30	182.43	184.78	0.001671	3.14	327.45	147.07	0.46
Bormida	2	27.000*	TR20Borm+TR200ri	833.00	178.10	184.30	182.43	184.78	0.001670	3.14	327.50	147.08	0.46
Bormida	2	27.000*	TR200Borm+TR20ri	1469.00	178.10	185.84	184.20	186.44	0.001592	3.71	573.08	172.72	0.48
Bormida	2	27.000*	2016Borm+TR20rii	1000.00	178.10	184.78	182.85	185.29	0.001624	3.30	399.76	157.63	0.47
Bormida	2	27.000*	1994Borm+TR20rii	1900.00	178.10	186.70	184.98	187.34	0.001518	3.95	720.98	173.03	0.47
Bormida	2	26.000*	TR20Borm+TR<20ri	833.00	178.05	184.27	182.37	184.74	0.001622	3.11	321.21	130.10	0.46
Bormida	2	26.000*	TR20Borm+TR20rii	833.00	178.05	184.27	182.37	184.74	0.001622	3.11	321.20	130.10	0.46
Bormida	2	26.000*	TR20Borm+TR200ri	833.00	178.05	184.27	182.37	184.74	0.001622	3.11	321.25	130.11	0.46
Bormida	2	26.000*	TR200Borm+TR20ri	1469.00	178.05	185.75	184.10	186.39	0.001660	3.79	537.86	157.44	0.49
Bormida	2	26.000*	2016Borm+TR20rii	1000.00	178.05	184.72	182.78	185.25	0.001624	3.31	383.78	143.06	0.47
Bormida	2	26.000*	1994Borm+TR20rii	1900.00	178.05	186.58	184.87	187.30	0.001638	4.09	671.40	161.07	0.49
Bormida	2	25.000*	TR20Borm+TR<20ri	833.00	178.01	184.23	182.29	184.70	0.001570	3.08	317.05	118.68	0.45
Bormida	2	25.000*	TR20Borm+TR20rii	833.00	178.01	184.23	182.29	184.70	0.001570	3.08	317.03	118.68	0.45
Bormida	2	25.000*	TR20Borm+TR200ri	833.00	178.01	184.23	182.29	184.70	0.001570	3.08	317.08	118.68	0.45
Bormida	2	25.000*	TR200Borm+TR20ri	1469.00	178.01	185.66	183.95	186.35	0.001733	3.87	506.00	142.51	0.50
Bormida	2	25.000*	2016Borm+TR20rii	1000.00	178.01	184.68	182.69	185.21	0.001594	3.30	372.29	126.71	0.46
Bormida	2	25.000*	1994Borm+TR20rii	1900.00	178.01	186.46	184.66	187.25	0.001765	4.23	624.35	149.10	0.51
Bormida	2	24.000*	TR20Borm+TR<20ri	833.00	177.97	184.20	182.20	184.66	0.001512	3.05	314.01	108.98	0.45
Bormida	2	24.000*	TR20Borm+TR20rii	833.00	177.97	184.20	182.20	184.66	0.001512	3.05	314.00	108.98	0.45
Bormida	2	24.000*	TR20Borm+TR200ri	833.00	177.97	184.20	182.20	184.66	0.001512	3.05	314.04	108.99	0.45
Bormida	2	24.000*	TR200Borm+TR20ri	1469.00	177.97	185.58	183.81	186.30	0.001793	3.93	477.71	130.16	0.51
Bormida	2	24.000*	2016Borm+TR20rii	1000.00	177.97	184.65	182.61	185.17	0.001554	3.28	363.76	113.79	0.46
Bormida	2	24.000*	1994Borm+TR20rii	1900.00	177.97	186.33	184.57	187.19	0.001896	4.37	580.38	137.13	0.53
Bormida	2	23.000*	TR20Borm+TR<20ri	833.00	177.92	184.17	182.12	184.62	0.001451	3.01	311.58	100.22	0.44
Bormida	2	23.000*	TR20Borm+TR20rii	833.00	177.92	184.17	182.12	184.62	0.001451	3.01	311.57	100.22	0.44
Bormida	2	23.000*	TR20Borm+TR200ri	833.00	177.92	184.17	182.12	184.62	0.001451	3.01	311.61	100.22	0.44
Bormida	2	23.000*	TR200Borm+TR20ri	1469.00	177.92	185.50	183.68	186.25	0.001832	3.98	453.27	117.35	0.51
Bormida	2	23.000*	2016Borm+TR20rii	1000.00	177.92	184.61	182.51	185.13	0.001511	3.25	356.60	103.71	0.45
Bormida	2	23.000*	1994Borm+TR20rii	1900.00	177.92	186.20	184.46	187.14	0.002024	4.49	540.04	125.17	0.55
Bormida	2	22	TR20Borm+TR<20ri	833.00	177.88	184.14	182.02	184.58	0.001389	2.96	309.28	91.24	0.43

HEC-RAS Plan: Lotto1A (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	2	22	TR20Borm+TR20rii	833.00	177.88	184.14	182.02	184.58	0.001389	2.96	309.26	91.23	0.43
Bormida	2	22	TR20Borm+TR200ri	833.00	177.88	184.14	182.02	184.58	0.001389	2.96	309.30	91.24	0.43
Bormida	2	22	TR200Borm+TR20ri	1469.00	177.88	185.44	183.54	186.21	0.001825	3.98	434.23	101.46	0.51
Bormida	2	22	2016Borm+TR20rii	1000.00	177.88	184.58	182.42	185.09	0.001466	3.22	349.96	94.67	0.45
Bormida	2	22	1994Borm+TR20rii	1900.00	177.88	186.07	184.32	187.08	0.002145	4.60	503.49	113.20	0.56
Bormida	1	19	TR20Borm+TR<20ri	833.00	178.13	183.95	182.14	184.46	0.001866	3.16	263.93	62.38	0.49
Bormida	1	19	TR20Borm+TR20rii	833.00	178.13	183.95	182.14	184.46	0.001867	3.16	263.89	62.37	0.49
Bormida	1	19	TR20Borm+TR200ri	833.00	178.13	183.95	182.14	184.46	0.001866	3.16	263.93	62.38	0.49
Bormida	1	19	TR200Borm+TR20ri	1469.00	178.13	185.01	183.51	186.02	0.002799	4.45	337.57	91.82	0.62
Bormida	1	19	2016Borm+TR20rii	1000.00	178.13	184.34	182.53	184.95	0.002037	3.48	288.52	62.96	0.51
Bormida	1	19	1994Borm+TR20rii	1900.00	178.13	185.43	184.28	186.84	0.003567	5.29	400.03	180.00	0.70
Bormida	1	18.000*	TR20Borm+TR<20ri	833.00	177.98	183.91	182.10	184.41	0.001825	3.13	267.64	65.87	0.48
Bormida	1	18.000*	TR20Borm+TR20rii	833.00	177.98	183.91	182.10	184.41	0.001826	3.13	267.59	65.87	0.48
Bormida	1	18.000*	TR20Borm+TR200ri	833.00	177.98	183.91	182.10	184.41	0.001825	3.13	267.64	65.87	0.48
Bormida	1	18.000*	TR200Borm+TR20ri	1469.00	177.98	184.96	183.45	185.94	0.002703	4.40	358.15	150.35	0.61
Bormida	1	18.000*	2016Borm+TR20rii	1000.00	177.98	184.30	182.48	184.90	0.001979	3.44	293.96	72.72	0.51
Bormida	1	18.000*	1994Borm+TR20rii	1900.00	177.98	185.41	184.23	186.73	0.003352	5.16	433.88	189.68	0.69
Bormida	1	17.000*	TR20Borm+TR<20ri	833.00	177.84	183.87	182.04	184.36	0.001746	3.08	273.84	69.40	0.47
Bormida	1	17.000*	TR20Borm+TR20rii	833.00	177.84	183.87	182.04	184.36	0.001747	3.08	273.78	69.40	0.47
Bormida	1	17.000*	TR20Borm+TR200ri	833.00	177.84	183.87	182.04	184.36	0.001746	3.08	273.84	69.40	0.47
Bormida	1	17.000*	TR200Borm+TR20ri	1469.00	177.84	184.94	183.39	185.86	0.002511	4.28	390.31	172.40	0.59
Bormida	1	17.000*	2016Borm+TR20rii	1000.00	177.84	184.27	182.41	184.85	0.001876	3.38	303.98	84.64	0.50
Bormida	1	17.000*	1994Borm+TR20rii	1900.00	177.84	185.41	184.18	186.61	0.003016	4.96	479.10	199.36	0.66
Bormida	1	16.000*	TR20Borm+TR<20ri	833.00	177.69	183.85	181.94	184.31	0.001628	3.01	282.42	83.19	0.46
Bormida	1	16.000*	TR20Borm+TR20rii	833.00	177.69	183.85	181.94	184.31	0.001629	3.01	282.36	83.16	0.46
Bormida	1	16.000*	TR20Borm+TR200ri	833.00	177.69	183.85	181.94	184.31	0.001628	3.01	282.42	83.19	0.46
Bormida	1	16.000*	TR200Borm+TR20ri	1469.00	177.69	184.94	183.29	185.78	0.002256	4.11	431.26	186.80	0.56
Bormida	1	16.000*	2016Borm+TR20rii	1000.00	177.69	184.24	182.32	184.79	0.001744	3.30	319.18	107.61	0.48
Bormida	1	16.000*	1994Borm+TR20rii	1900.00	177.69	185.44	184.13	186.50	0.002636	4.71	532.24	209.03	0.62
Bormida	1	15.000*	TR20Borm+TR<20ri	833.00	177.55	183.83	181.83	184.26	0.001489	2.93	294.87	100.92	0.44
Bormida	1	15.000*	TR20Borm+TR20rii	833.00	177.55	183.83	181.83	184.26	0.001490	2.93	294.79	100.89	0.44
Bormida	1	15.000*	TR20Borm+TR200ri	833.00	177.55	183.83	181.83	184.26	0.001489	2.93	294.87	100.92	0.44
Bormida	1	15.000*	TR200Borm+TR20ri	1469.00	177.55	184.95	183.15	185.70	0.001989	3.93	477.73	206.39	0.53
Bormida	1	15.000*	2016Borm+TR20rii	1000.00	177.55	184.22	182.20	184.74	0.001587	3.20	343.73	163.96	0.46
Bormida	1	15.000*	1994Borm+TR20rii	1900.00	177.55	185.47	184.05	186.40	0.002268	4.45	590.30	218.71	0.58
Bormida	1	14.000*	TR20Borm+TR<20ri	833.00	177.40	183.81	181.69	184.22	0.001333	2.82	313.50	120.99	0.42

HEC-RAS Plan: Lotto1A (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	1	14.000*	TR20Borm+TR20rii	833.00	177.40	183.81	181.69	184.22	0.001334	2.82	313.40	120.93	0.42
Bormida	1	14.000*	TR20Borm+TR200ri	833.00	177.40	183.81	181.69	184.22	0.001333	2.82	313.50	120.99	0.42
Bormida	1	14.000*	TR200Borm+TR20ri	1469.00	177.40	184.97	183.00	185.62	0.001715	3.72	529.99	217.31	0.50
Bormida	1	14.000*	2016Borm+TR20rii	1000.00	177.40	184.22	182.06	184.69	0.001403	3.07	379.84	181.52	0.44
Bormida	1	14.000*	1994Borm+TR20rii	1900.00	177.40	185.51	183.99	186.31	0.001933	4.19	652.18	228.39	0.53
Bormida	1	13.000*	TR20Borm+TR<20ri	833.00	177.26	183.81	181.53	184.18	0.001168	2.70	344.44	174.52	0.40
Bormida	1	13.000*	TR20Borm+TR20rii	833.00	177.26	183.81	181.53	184.18	0.001169	2.70	344.28	174.46	0.40
Bormida	1	13.000*	TR20Borm+TR200ri	833.00	177.26	183.81	181.53	184.18	0.001168	2.70	344.44	174.52	0.40
Bormida	1	13.000*	TR200Borm+TR20ri	1469.00	177.26	184.99	182.84	185.56	0.001464	3.51	585.27	228.38	0.46
Bormida	1	13.000*	2016Borm+TR20rii	1000.00	177.26	184.22	181.90	184.64	0.001215	2.91	421.36	202.67	0.41
Bormida	1	13.000*	1994Borm+TR20rii	1900.00	177.26	185.54	183.73	186.23	0.001642	3.94	716.14	238.07	0.50
Bormida	1	12.000*	TR20Borm+TR<20ri	833.00	177.11	183.81		184.14	0.000991	2.55	386.55	183.11	0.37
Bormida	1	12.000*	TR20Borm+TR20rii	833.00	177.11	183.81		184.14	0.000991	2.55	386.38	183.06	0.37
Bormida	1	12.000*	TR20Borm+TR200ri	833.00	177.11	183.81		184.14	0.000991	2.55	386.55	183.11	0.37
Bormida	1	12.000*	TR200Borm+TR20ri	1469.00	177.11	185.01		185.50	0.001243	3.30	642.14	238.44	0.43
Bormida	1	12.000*	2016Borm+TR20rii	1000.00	177.11	184.23		184.60	0.001026	2.74	470.32	209.90	0.38
Bormida	1	12.000*	1994Borm+TR20rii	1900.00	177.11	185.56		186.17	0.001404	3.72	785.47	264.24	0.46
Bormida	1	11.000*	TR20Borm+TR<20ri	833.00	176.97	183.82		184.10	0.000831	2.40	434.47	203.67	0.34
Bormida	1	11.000*	TR20Borm+TR20rii	833.00	176.97	183.82		184.10	0.000831	2.40	434.29	203.62	0.34
Bormida	1	11.000*	TR20Borm+TR200ri	833.00	176.97	183.82		184.10	0.000831	2.40	434.47	203.67	0.34
Bormida	1	11.000*	TR200Borm+TR20ri	1469.00	176.97	185.02		185.45	0.001053	3.10	702.81	249.12	0.39
Bormida	1	11.000*	2016Borm+TR20rii	1000.00	176.97	184.25		184.56	0.000854	2.56	524.35	215.55	0.35
Bormida	1	11.000*	1994Borm+TR20rii	1900.00	176.97	185.59		186.11	0.001192	3.50	848.11	267.99	0.43
Bormida	1	10	TR20Borm+TR<20ri	833.00	176.82	183.83		184.07	0.000684	2.23	489.55	212.36	0.31
Bormida	1	10	TR20Borm+TR20rii	833.00	176.82	183.83		184.07	0.000684	2.23	489.36	212.34	0.31
Bormida	1	10	TR20Borm+TR200ri	833.00	176.82	183.83		184.07	0.000684	2.23	489.56	212.36	0.31
Bormida	1	10	TR200Borm+TR20ri	1469.00	176.82	185.04		185.41	0.000881	2.90	768.85	254.46	0.36
Bormida	1	10	2016Borm+TR20rii	1000.00	176.82	184.26		184.52	0.000706	2.39	582.85	222.08	0.32
Bormida	1	10	1994Borm+TR20rii	1900.00	176.82	185.61		186.06	0.001006	3.28	915.60	267.18	0.39
Bormida	1	9	TR20Borm+TR<20ri	833.00	176.65	183.83		184.05	0.000563	2.10	515.11	211.40	0.28
Bormida	1	9	TR20Borm+TR20rii	833.00	176.65	183.83		184.05	0.000563	2.10	514.93	211.38	0.28
Bormida	1	9	TR20Borm+TR200ri	833.00	176.65	183.83		184.05	0.000563	2.10	515.12	211.40	0.28
Bormida	1	9	TR200Borm+TR20ri	1469.00	176.65	185.04		185.39	0.000763	2.78	789.50	246.31	0.34
Bormida	1	9	2016Borm+TR20rii	1000.00	176.65	184.26		184.50	0.000594	2.27	607.68	218.58	0.29
Bormida	1	9	1994Borm+TR20rii	1900.00	176.65	185.61		186.03	0.000889	3.17	930.96	251.27	0.37
Bormida	1	8.0000*	TR20Borm+TR<20ri	833.00	176.65	183.79		184.03	0.000637	2.22	497.77	214.27	0.30

HEC-RAS Plan: Lotto1A (Continued)

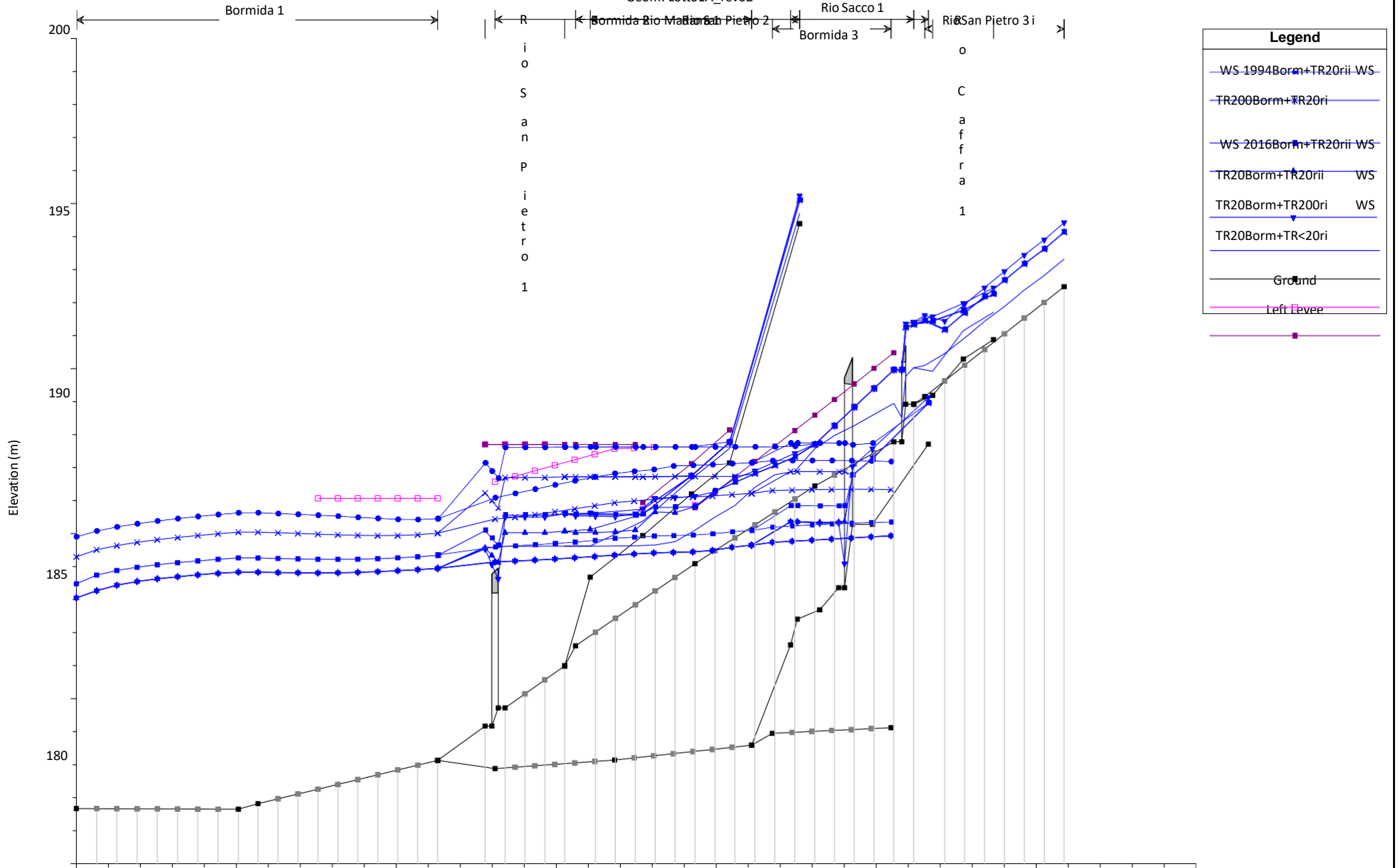
River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	1	8.0000*	TR20Borm+TR20rii	833.00	176.65	183.79		184.03	0.000637	2.22	497.58	214.25	0.30
Bormida	1	8.0000*	TR20Borm+TR200ri	833.00	176.65	183.79		184.03	0.000637	2.22	497.78	214.27	0.30
Bormida	1	8.0000*	TR200Borm+TR20ri	1469.00	176.65	185.00		185.36	0.000846	2.91	774.05	250.19	0.36
Bormida	1	8.0000*	2016Borm+TR20rii	1000.00	176.65	184.22		184.48	0.000665	2.38	590.90	220.98	0.31
Bormida	1	8.0000*	1994Borm+TR20rii	1900.00	176.65	185.56		186.01	0.000976	3.29	915.59	252.84	0.39
Bormida	1	7.0000*	TR20Borm+TR<20ri	833.00	176.66	183.75		184.01	0.000726	2.34	479.77	215.94	0.32
Bormida	1	7.0000*	TR20Borm+TR20rii	833.00	176.66	183.75		184.01	0.000726	2.34	479.56	215.93	0.32
Bormida	1	7.0000*	TR20Borm+TR200ri	833.00	176.66	183.75		184.01	0.000726	2.34	479.77	215.94	0.32
Bormida	1	7.0000*	TR200Borm+TR20ri	1469.00	176.66	184.94		185.34	0.000941	3.04	758.37	251.48	0.37
Bormida	1	7.0000*	2016Borm+TR20rii	1000.00	176.66	184.17		184.46	0.000756	2.51	573.23	228.92	0.33
Bormida	1	7.0000*	1994Borm+TR20rii	1900.00	176.66	185.50		185.98	0.001076	3.43	899.46	254.40	0.41
Bormida	1	6.0000*	TR20Borm+TR<20ri	833.00	176.66	183.70		183.99	0.000836	2.49	460.57	217.11	0.34
Bormida	1	6.0000*	TR20Borm+TR20rii	833.00	176.66	183.69		183.99	0.000837	2.49	460.35	217.10	0.34
Bormida	1	6.0000*	TR20Borm+TR200ri	833.00	176.66	183.70		183.99	0.000836	2.49	460.57	217.11	0.34
Bormida	1	6.0000*	TR200Borm+TR20ri	1469.00	176.66	184.88		185.31	0.001053	3.18	741.55	252.74	0.39
Bormida	1	6.0000*	2016Borm+TR20rii	1000.00	176.66	184.12		184.44	0.000865	2.66	555.03	234.65	0.35
Bormida	1	6.0000*	1994Borm+TR20rii	1900.00	176.66	185.43		185.95	0.001195	3.57	882.24	255.97	0.43
Bormida	1	5.0000*	TR20Borm+TR<20ri	833.00	176.66	183.63		183.96	0.000978	2.65	439.50	218.51	0.37
Bormida	1	5.0000*	TR20Borm+TR20rii	833.00	176.66	183.63		183.96	0.000979	2.65	439.26	218.49	0.37
Bormida	1	5.0000*	TR20Borm+TR200ri	833.00	176.66	183.63		183.96	0.000978	2.65	439.50	218.51	0.37
Bormida	1	5.0000*	TR200Borm+TR20ri	1469.00	176.66	184.81		185.28	0.001189	3.34	723.16	253.95	0.42
Bormida	1	5.0000*	2016Borm+TR20rii	1000.00	176.66	184.06		184.41	0.000995	2.81	535.89	236.26	0.37
Bormida	1	5.0000*	1994Borm+TR20rii	1900.00	176.66	185.36		185.91	0.001336	3.74	863.54	257.53	0.45
Bormida	1	4.0000*	TR20Borm+TR<20ri	833.00	176.66	183.55		183.93	0.001169	2.85	415.38	219.66	0.40
Bormida	1	4.0000*	TR20Borm+TR20rii	833.00	176.66	183.55		183.93	0.001170	2.85	415.11	219.63	0.40
Bormida	1	4.0000*	TR20Borm+TR200ri	833.00	176.66	183.55		183.93	0.001168	2.85	415.39	219.66	0.40
Bormida	1	4.0000*	TR200Borm+TR20ri	1469.00	176.66	184.73		185.24	0.001360	3.52	702.30	255.06	0.44
Bormida	1	4.0000*	2016Borm+TR20rii	1000.00	176.66	183.98		184.38	0.001165	3.00	514.10	237.96	0.40
Bormida	1	4.0000*	1994Borm+TR20rii	1900.00	176.66	185.28		185.87	0.001510	3.92	842.63	259.07	0.47
Bormida	1	3.0000*	TR20Borm+TR<20ri	833.00	176.67	183.44		183.89	0.001441	3.10	385.58	221.19	0.44
Bormida	1	3.0000*	TR20Borm+TR20rii	833.00	176.67	183.44		183.89	0.001443	3.10	385.27	221.11	0.44
Bormida	1	3.0000*	TR20Borm+TR200ri	833.00	176.67	183.44		183.89	0.001441	3.10	385.59	221.20	0.44
Bormida	1	3.0000*	TR200Borm+TR20ri	1469.00	176.67	184.64		185.20	0.001585	3.74	677.46	255.96	0.48
Bormida	1	3.0000*	2016Borm+TR20rii	1000.00	176.67	183.88		184.34	0.001400	3.23	487.84	239.62	0.44
Bormida	1	3.0000*	1994Borm+TR20rii	1900.00	176.67	185.18		185.82	0.001730	4.13	818.31	260.53	0.50
Bormida	1	2.0000*	TR20Borm+TR<20ri	833.00	176.67	183.27	181.38	183.84	0.001879	3.46	343.45	220.26	0.50

HEC-RAS Plan: Lotto1A (Continued)

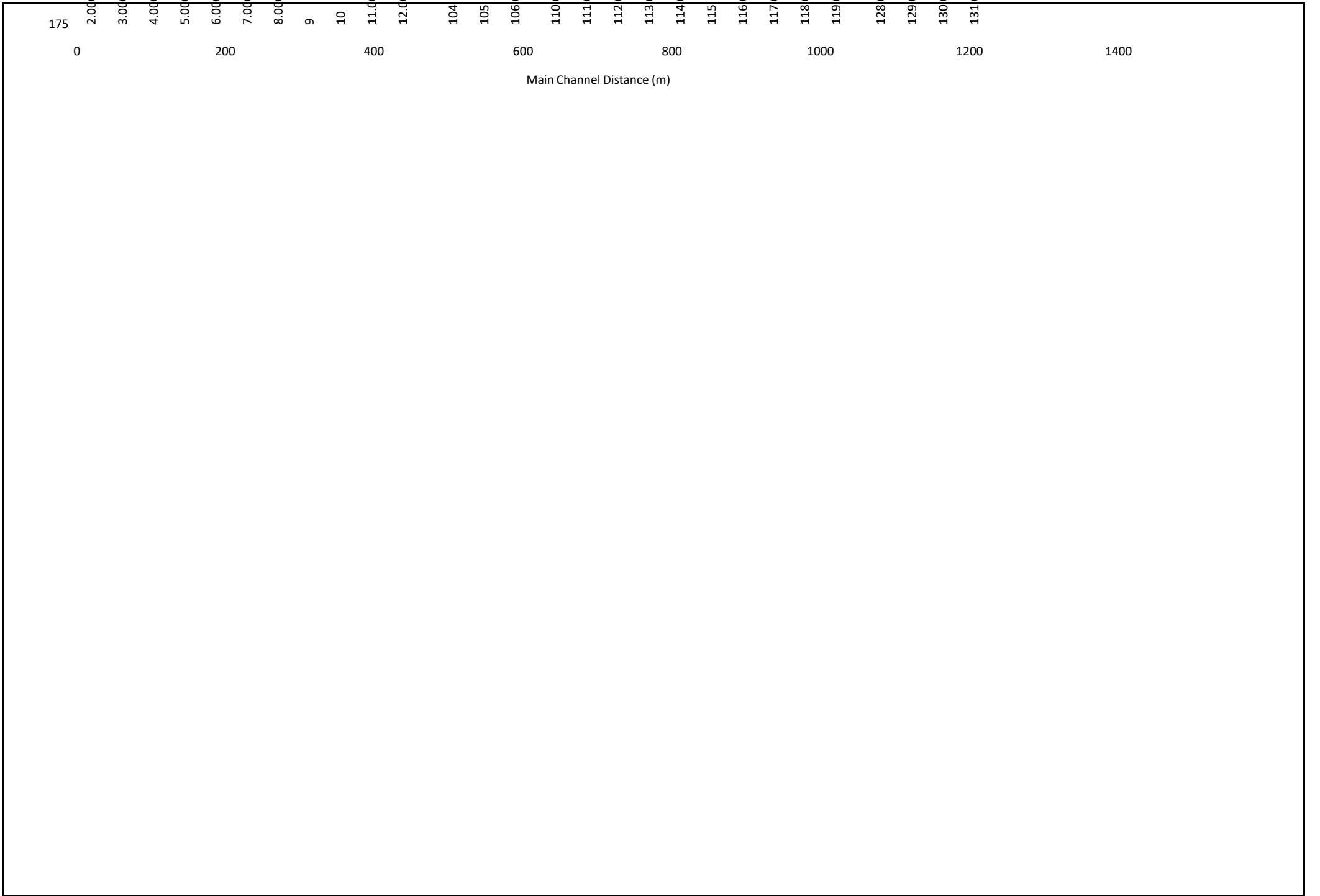
River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	1	2.0000*	TR20Borm+TR20rii	833.00	176.67	183.27	181.38	183.83	0.001882	3.46	343.04	220.20	0.50
Bormida	1	2.0000*	TR20Borm+TR200ri	833.00	176.67	183.27	181.38	183.84	0.001878	3.46	343.47	220.26	0.50
Bormida	1	2.0000*	TR200Borm+TR20ri	1469.00	176.67	184.51		185.15	0.001908	4.01	645.18	256.36	0.52
Bormida	1	2.0000*	2016Borm+TR20rii	1000.00	176.67	183.74		184.29	0.001764	3.53	452.27	240.67	0.49
Bormida	1	2.0000*	1994Borm+TR20rii	1900.00	176.67	185.06		185.77	0.002030	4.38	788.13	261.74	0.54
Bormida	1	1	TR20Borm+TR<20ri	833.00	176.67	183.05	181.53	183.77	0.002502	3.87	293.74	193.36	0.57
Bormida	1	1	TR20Borm+TR20rii	833.00	176.67	183.05	181.53	183.77	0.002502	3.87	293.74	193.36	0.57
Bormida	1	1	TR20Borm+TR200ri	833.00	176.67	183.05	181.54	183.77	0.002502	3.87	293.74	193.36	0.57
Bormida	1	1	TR200Borm+TR20ri	1469.00	176.67	184.30	183.88	185.08	0.002504	4.45	591.60	255.34	0.59
Bormida	1	1	2016Borm+TR20rii	1000.00	176.67	183.48	182.45	184.22	0.002503	4.05	388.18	236.30	0.57
Bormida	1	1	1994Borm+TR20rii	1900.00	176.67	184.89	184.38	185.70	0.002503	4.74	744.58	262.06	0.59

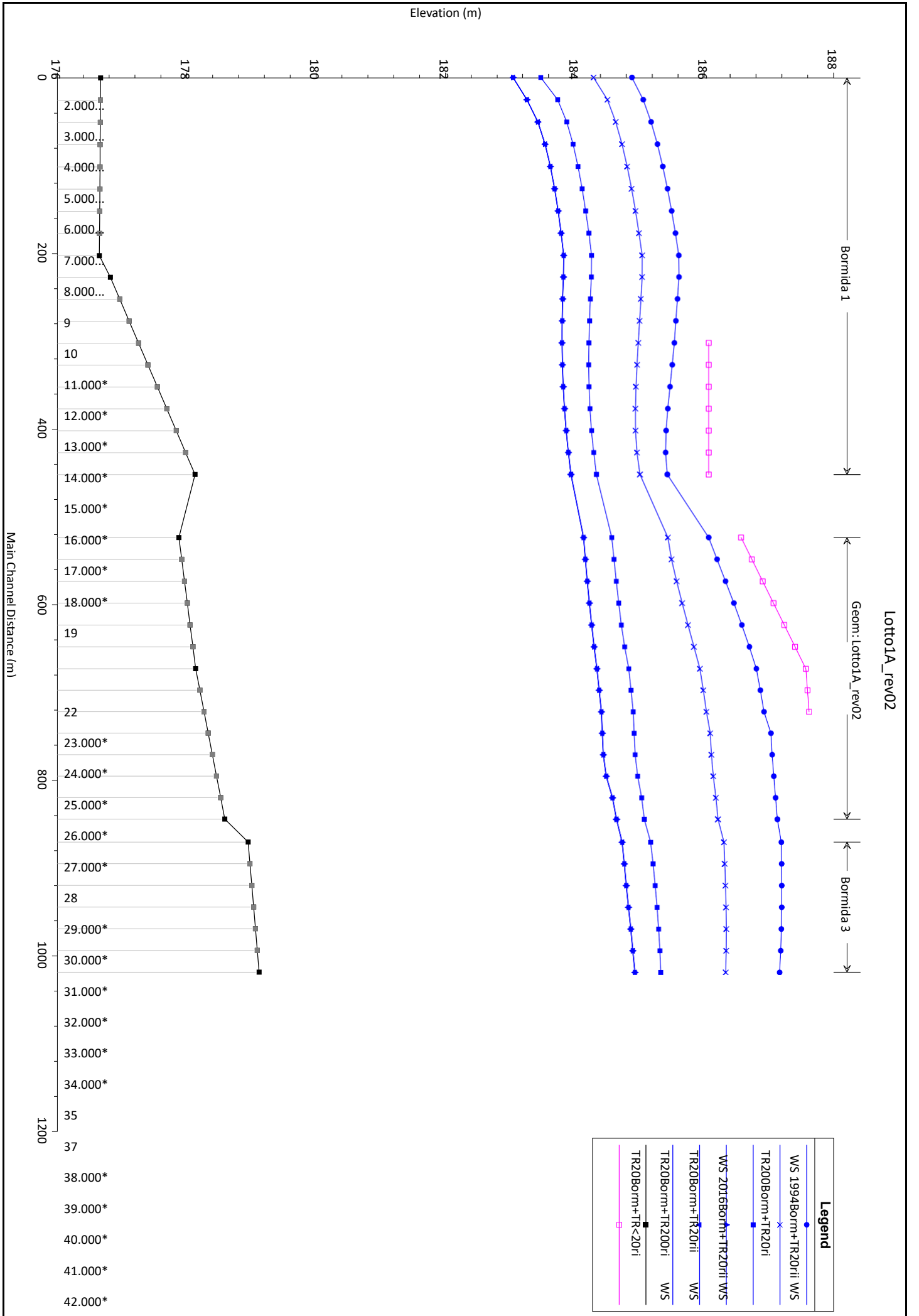
Lotto1A_rev02

Geom: Lotto1A_rev02



Legend	
— WS 1994Borm+TR20rii WS	— WS
— TR200Borm+TR20ri	— WS
— WS 2016Borm+TR20rii WS	— WS
— TR20Borm+TR20rii	— WS
— TR20Borm+TR200ri	— WS
— TR20Borm+TR<20ri	— WS
— Ground	—
— Left Levee	—

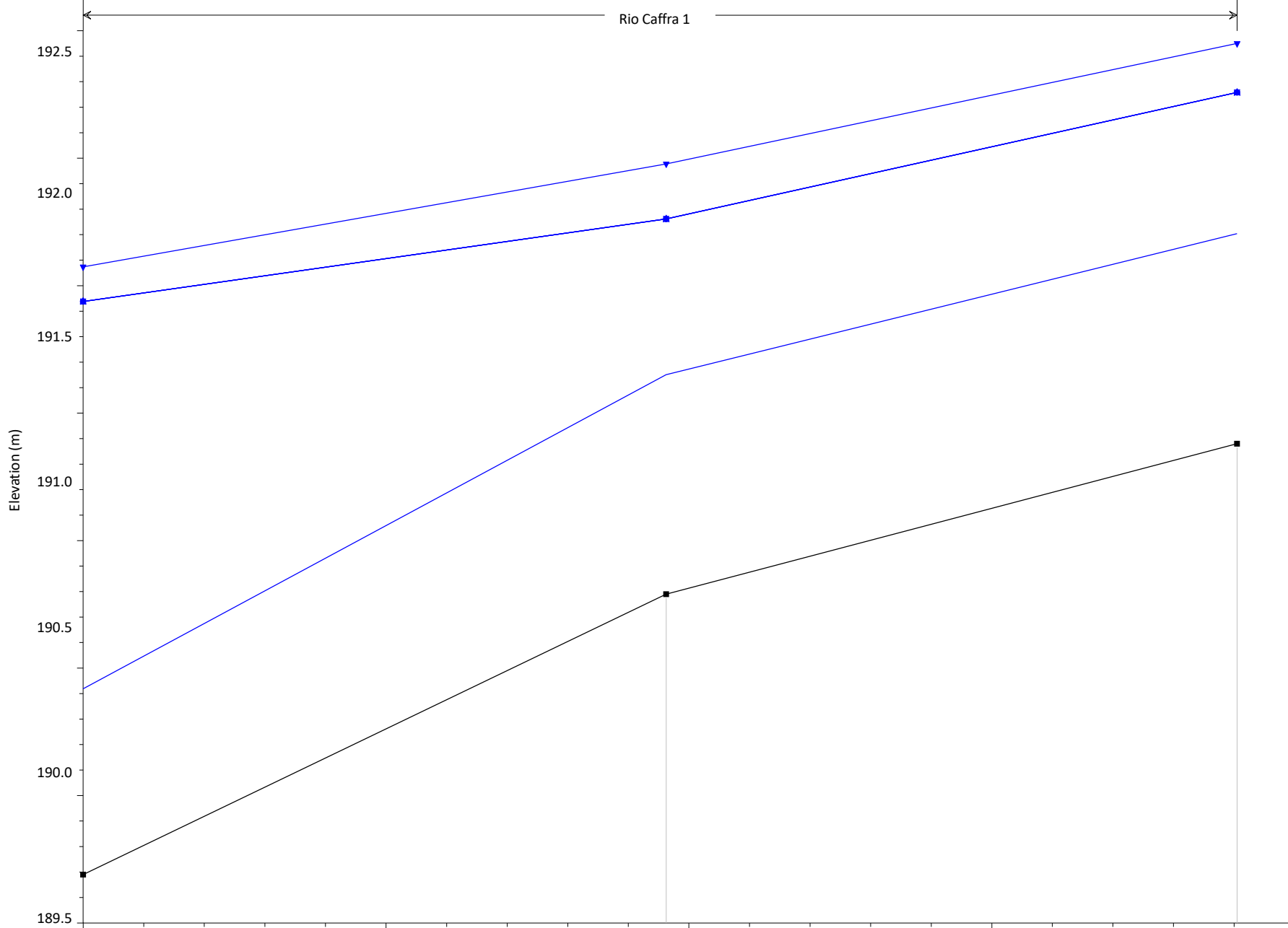




Lotto1A_rev02

Geom: Lotto1A_rev02

Rio Caffra 1



Legend

- WS TR20Borm+TR20ri
- WS TR20Borm+TR20ri WS
- TR200Borm+TR20ri
- WS 2016Borm+TR20ri WS
- 1994Borm+TR20ri WS
- TR20Borm+TR<20ri

189.0

0

20

203

40

60

205

80

Main Channel Distance (m)

Lotto1A_rev02

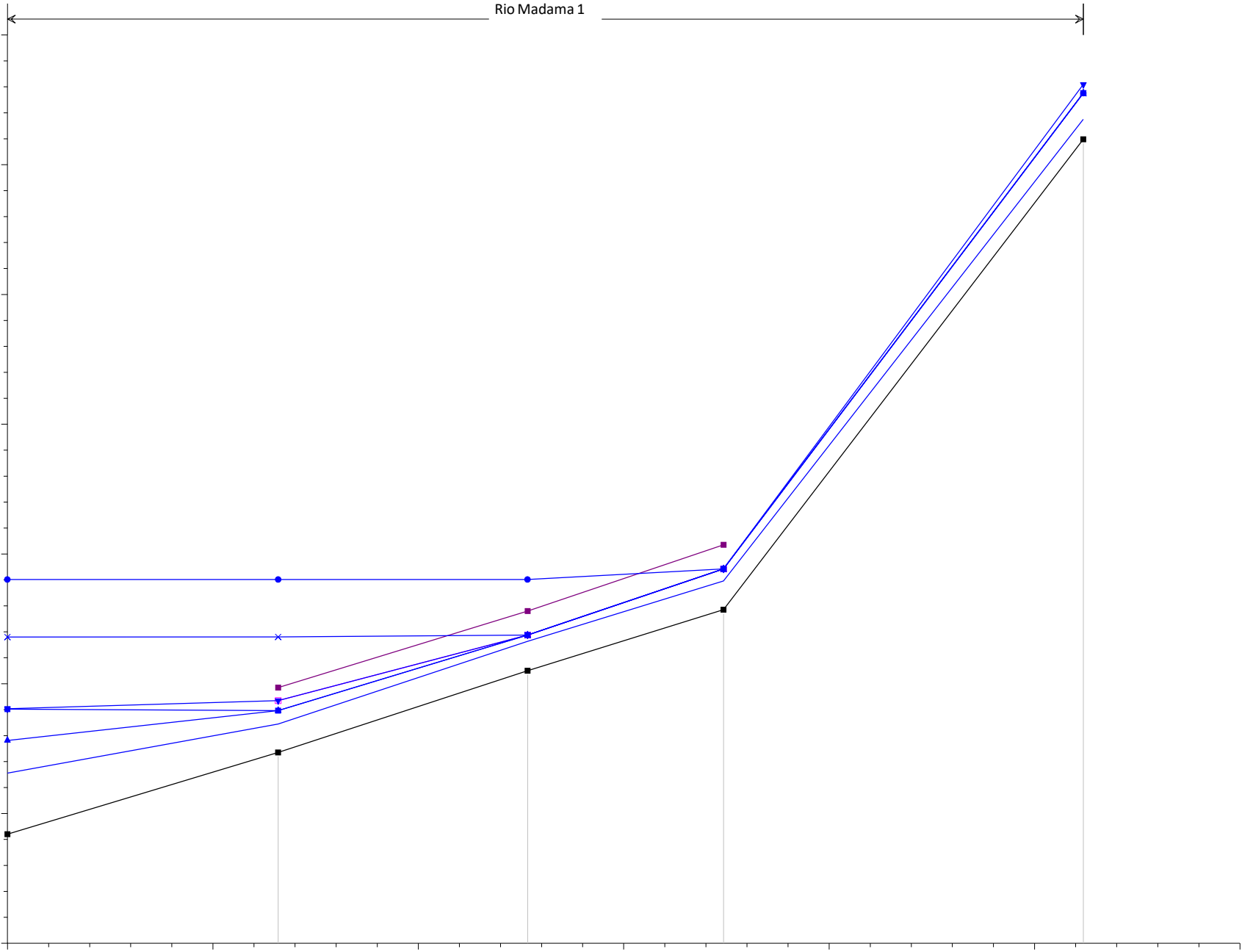
Geom: Lotto1A_rev02

Rio Madama 1

Elevation (m)
196
194
192
190
188
186
184

Legend

- WS 1994Borm+TR20rii WS
- TR200Borm+TR20ri WS
- TR20Borm+TR200ri
- WS 2016Borm+TR20rii WS
- TR20Borm+TR20rii WS
- TR20Borm+TR<20ri
- Ground
- Left Levee



Legend

182

0

50

402

100

403

150

404

200

250

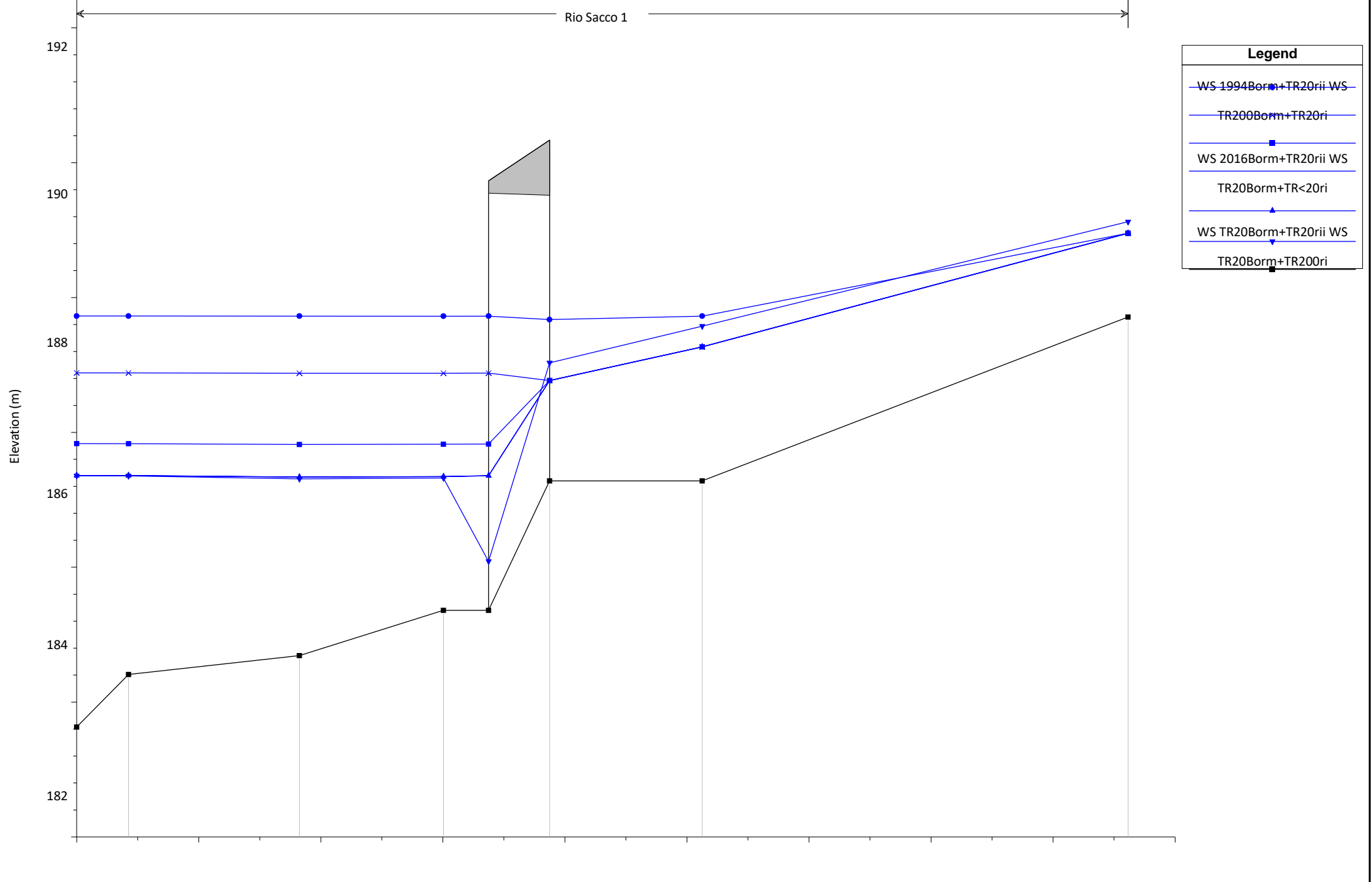
405

300

Main Channel Distance (m)

Lotto1A_rev02

Geom: Lotto1A_rev02



180

302

303

304

304.5

305

306

0

20

40

60

80

100

120

140

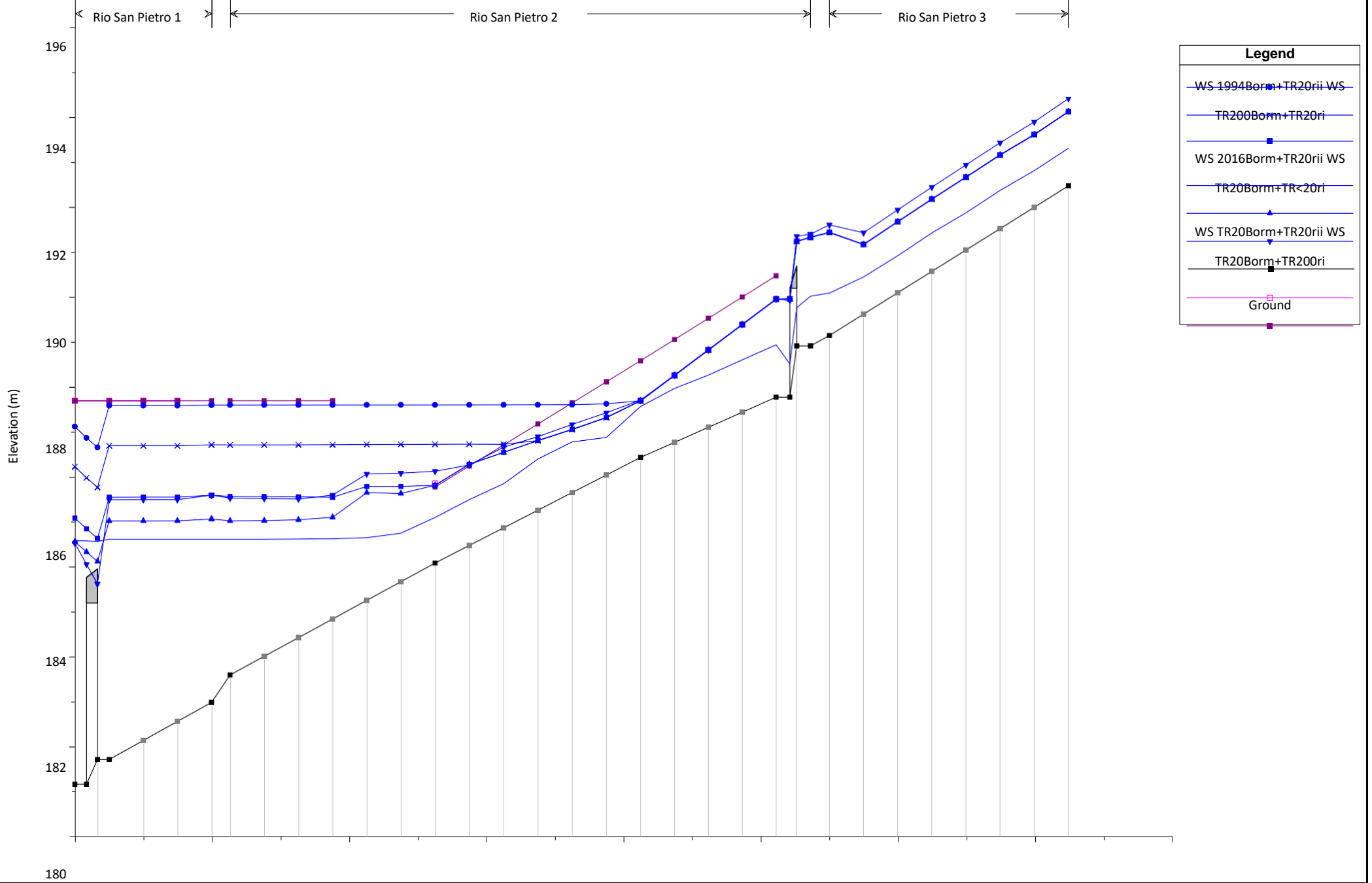
160

180

Main Channel Distance (m)

Lotto1A_rev02

Geom: Lotto1A_rev02

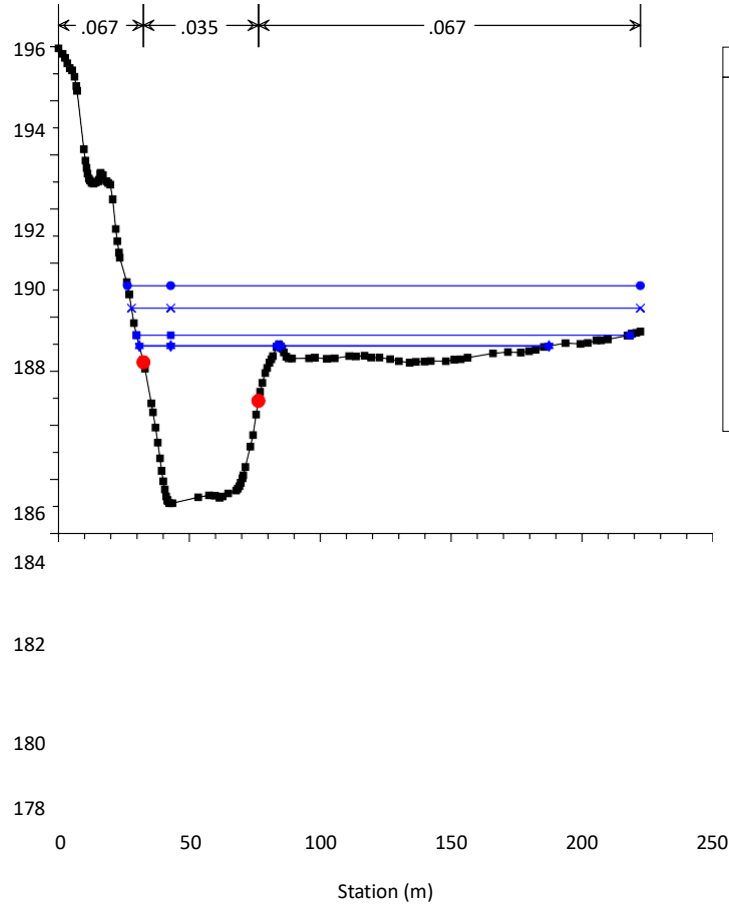


178
0 104.5 106.00* 107.00* 108 110.00* 111.00* 112.00* 113.00* 114.00* 115 116.00* 117.00* 118.00* 119.00* 120.00* 121 122.00* 123.00* 124.00* 125 --- 127 128.00* 129.00* 130.00* 131.00* 132.00* 133.00* 134
100 200 300 400 500 600 700 800
Main Channel Distance (m)

Lotto1A_rev02

Geom: Lotto1A_rev02

River = Bormida Reach = 3 RS = 43

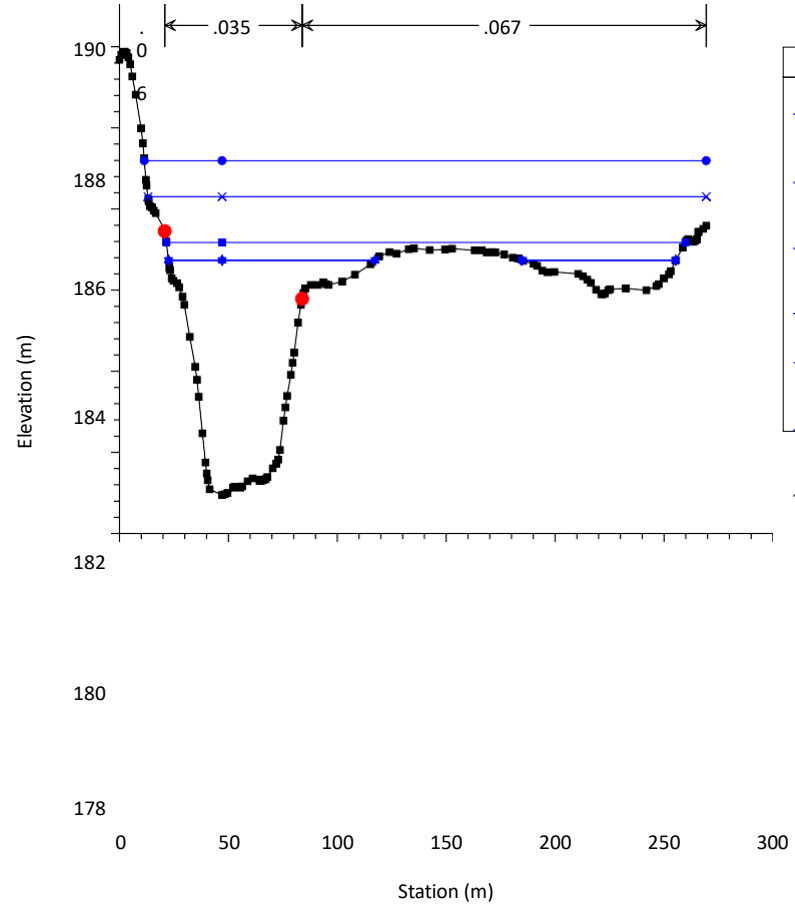


Legend	
WS 1994Borm+TR20ri WS	●
TR200Borm+TR20ri	×
WS 2016Borm+TR20ri WS	■
TR20Borm+TR20ri WS	▲
TR20Borm+TR<20ri	◆
WS TR20Borm+TR20ri	▼
Ground	—

Lotto1A_rev02

Geom: Lotto1A_rev02

River = Bormida Reach = 3 RS = 37

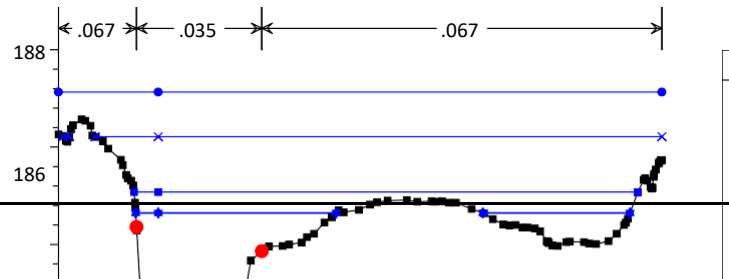


Legend	
WS 1994Borm+TR20ri WS	●
TR200Borm+TR20ri	×
WS 2016Borm+TR20ri WS	■
TR20Borm+TR20ri WS	▲
TR20Borm+TR<20ri	◆
WS TR20Borm+TR20ri	▼
Ground	—

Lotto1A_rev02

Geom: Lotto1A_rev02

River = Bormida Reach = 2 RS = 35

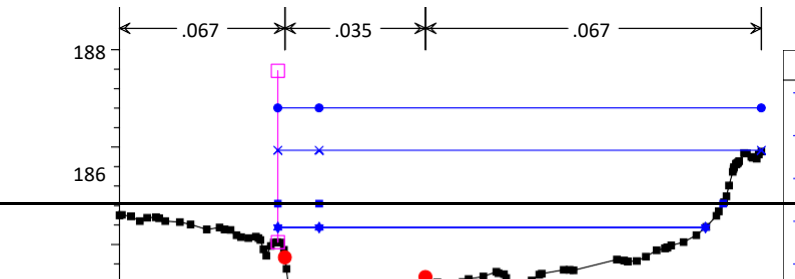


Legend	
WS 1994Borm+TR20ri WS	●
TR200Borm+TR20ri	×
WS 2016Borm+TR20ri WS	■
TR20Borm+TR20ri WS	▲
WS TR20Borm+TR20ri	▼

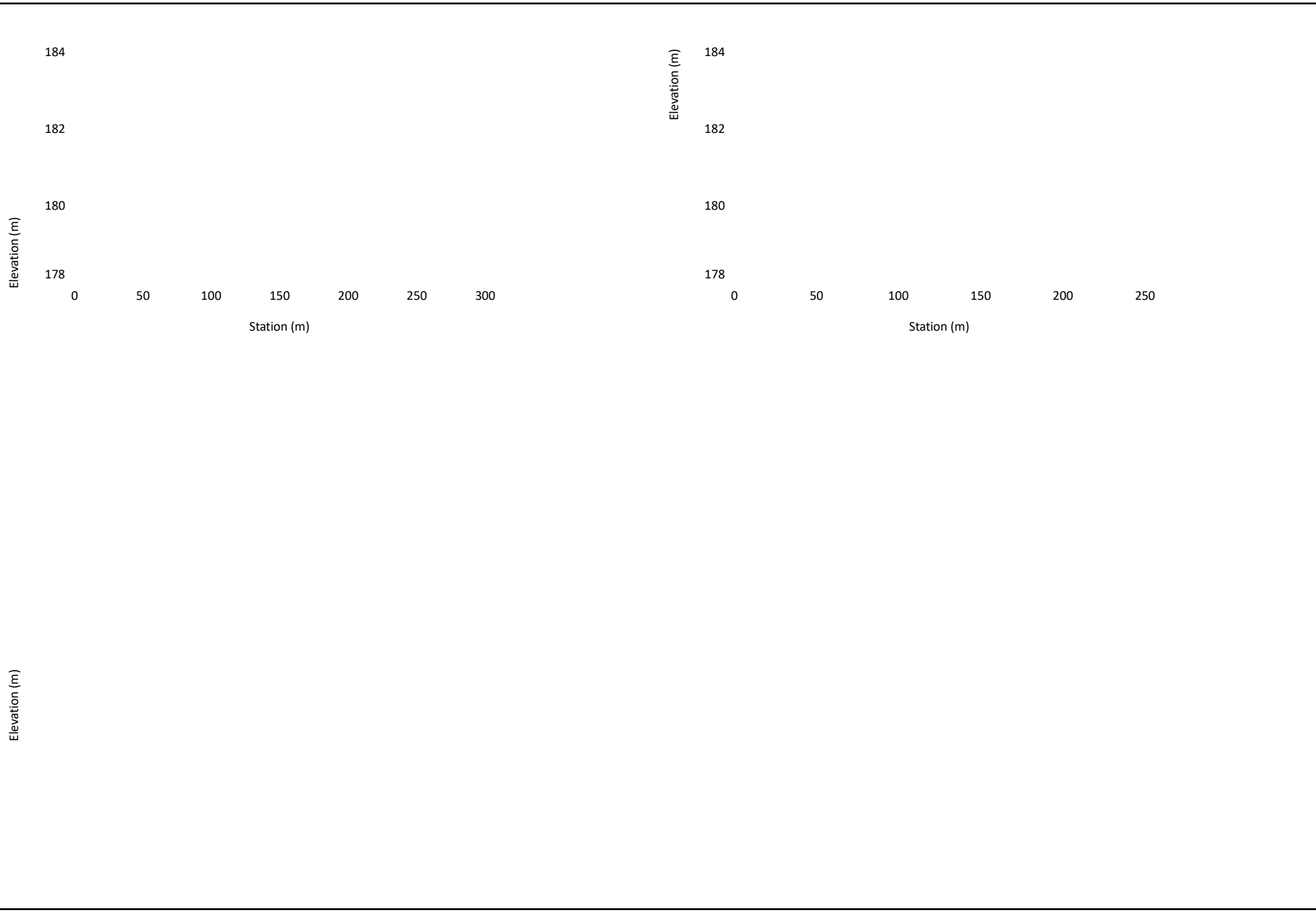
Lotto1A_rev02

Geom: Lotto1A_rev02

River = Bormida Reach = 2 RS = 28



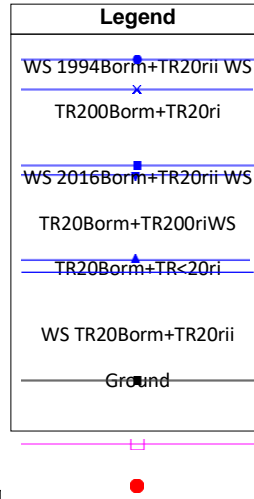
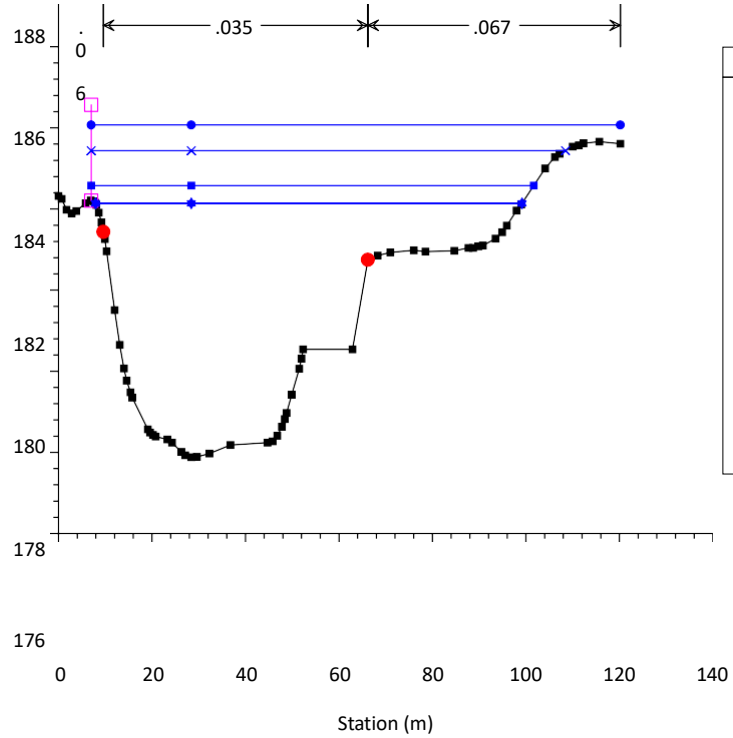
Legend	
WS 1994Borm+TR20ri WS	●
TR200Borm+TR20ri	×
WS 2016Borm+TR20ri WS	■
TR20Borm+TR20ri WS	▲
WS TR20Borm+TR20ri	▼



Lotto1A_rev02

Geom: Lotto1A_rev02

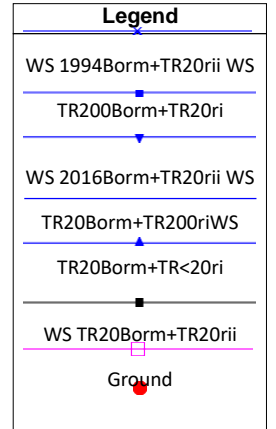
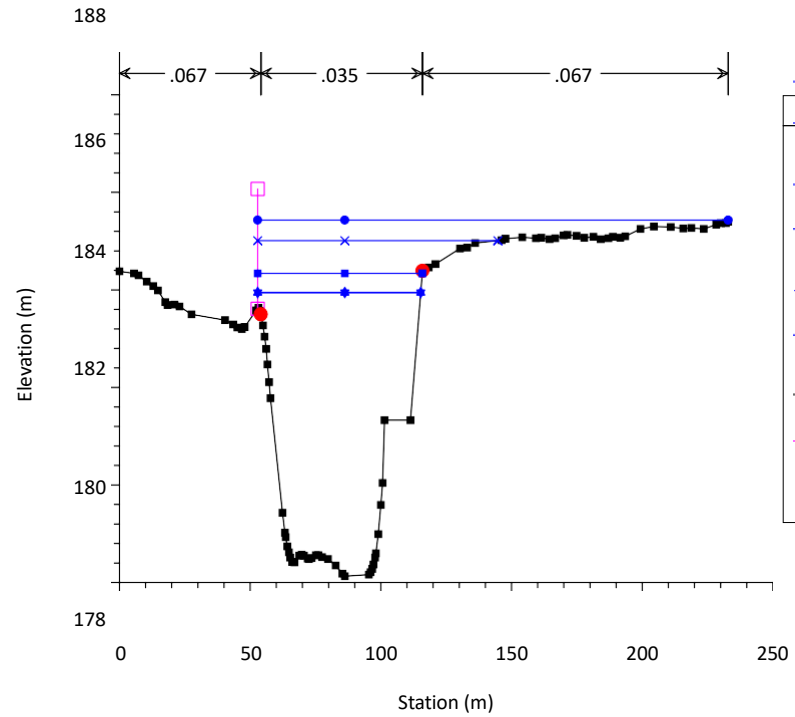
River = Bormida Reach = 2 RS = 22



Lotto1A_rev02

Geom: Lotto1A_rev02

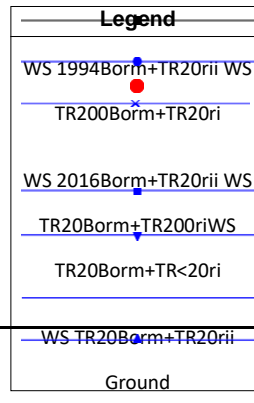
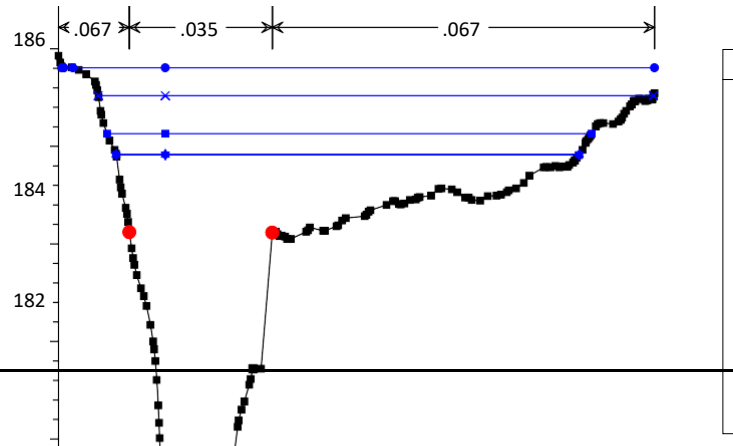
River = Bormida Reach = 1 RS = 19



Lotto1A_rev02

Geom: Lotto1A_rev02

River = Bormida Reach = 1 RS = 10

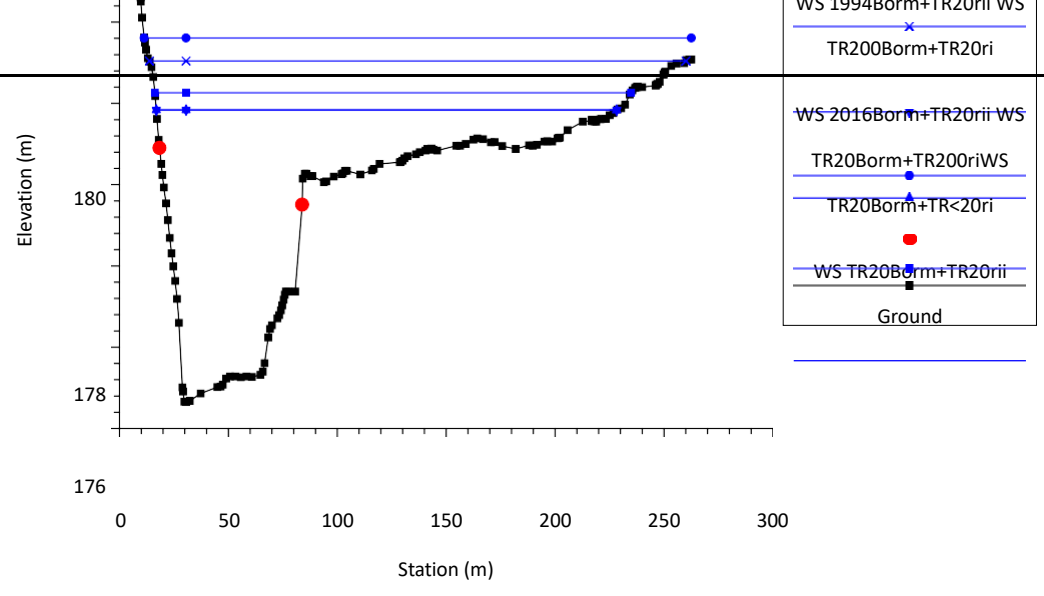
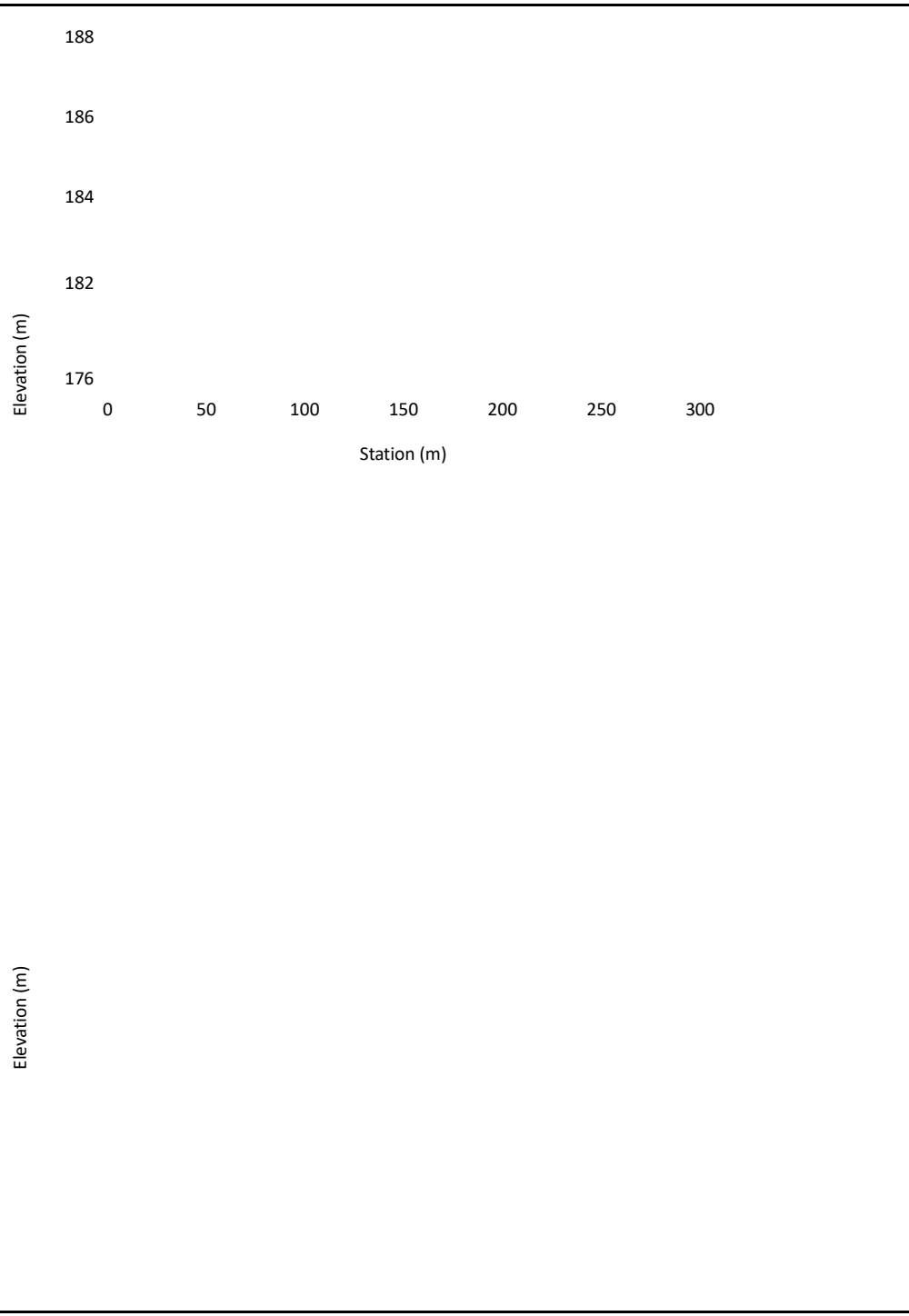


Lotto1A_rev02

Geom: Lotto1A_rev02

River = Bormida Reach = 1 RS = 9

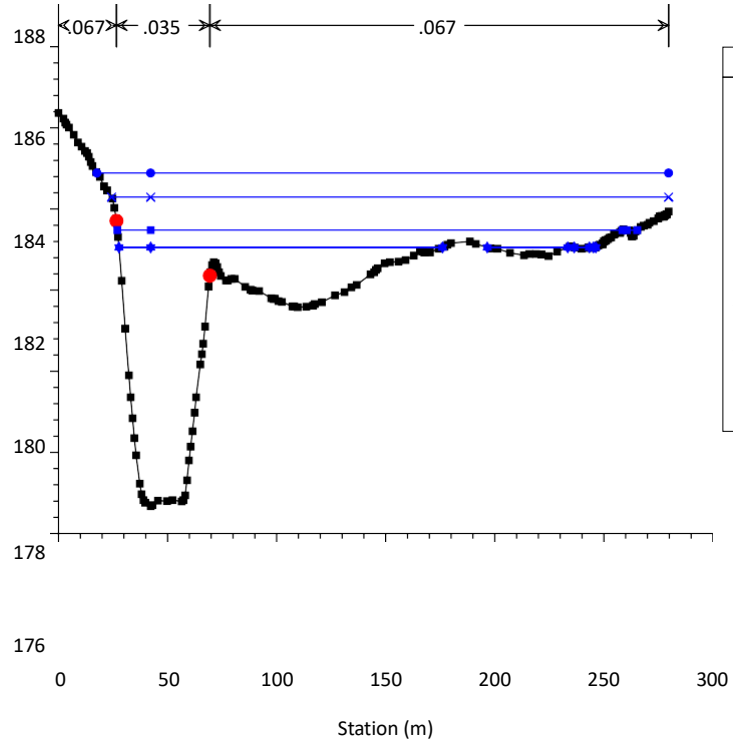




Lotto1A_rev02

Geom: Lotto1A_rev02

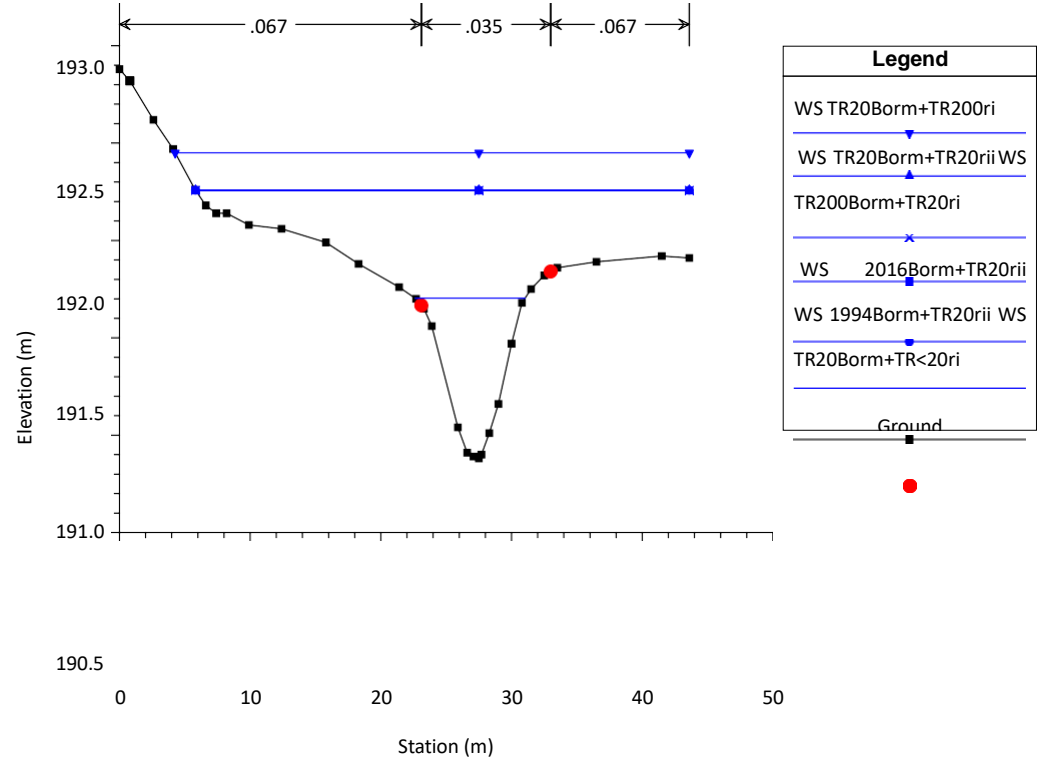
River = Bormida Reach = 1 RS = 1



Lotto1A_rev02

Geom: Lotto1A_rev02

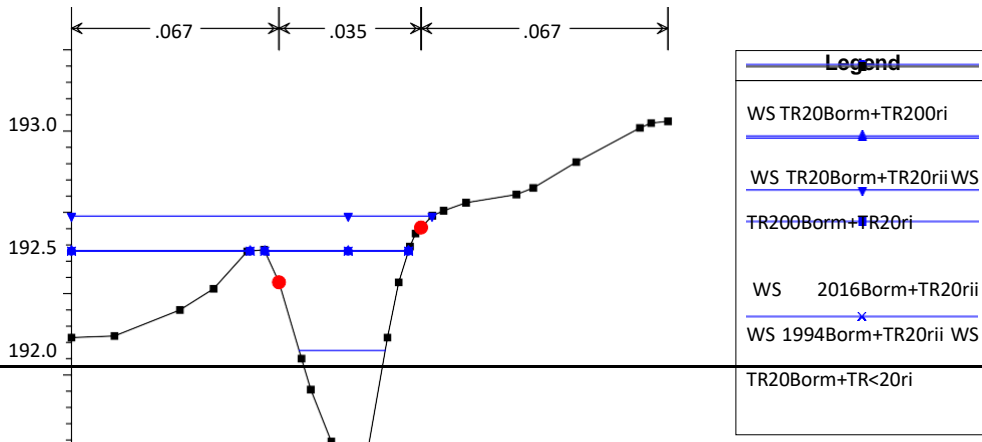
River = Rio Caffra Reach = 1 RS = 205



Lotto1A_rev02

Geom: Lotto1A_rev02

River = Rio Caffra Reach = 1 RS = 203

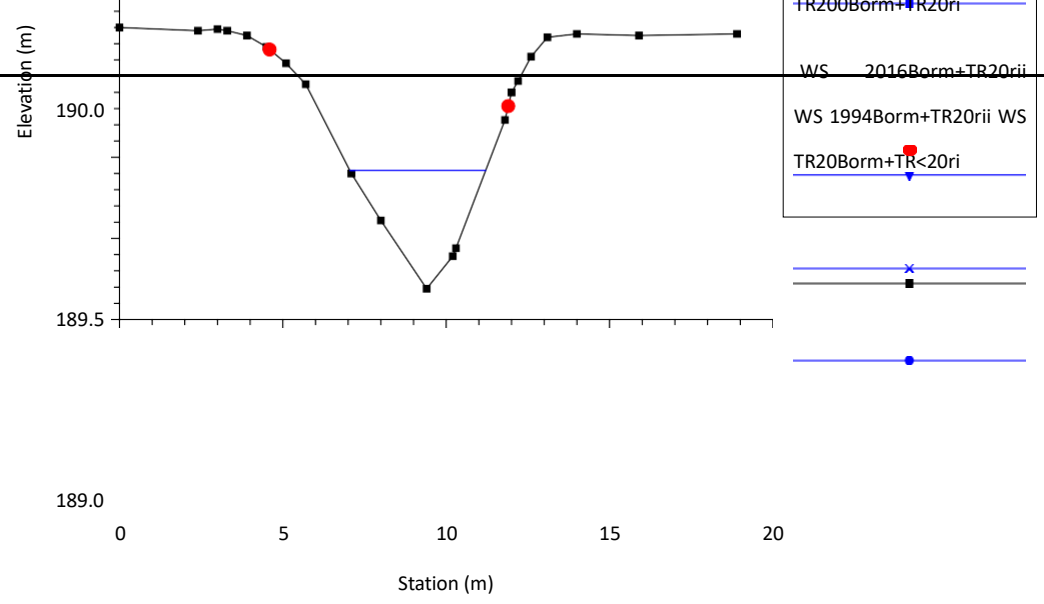
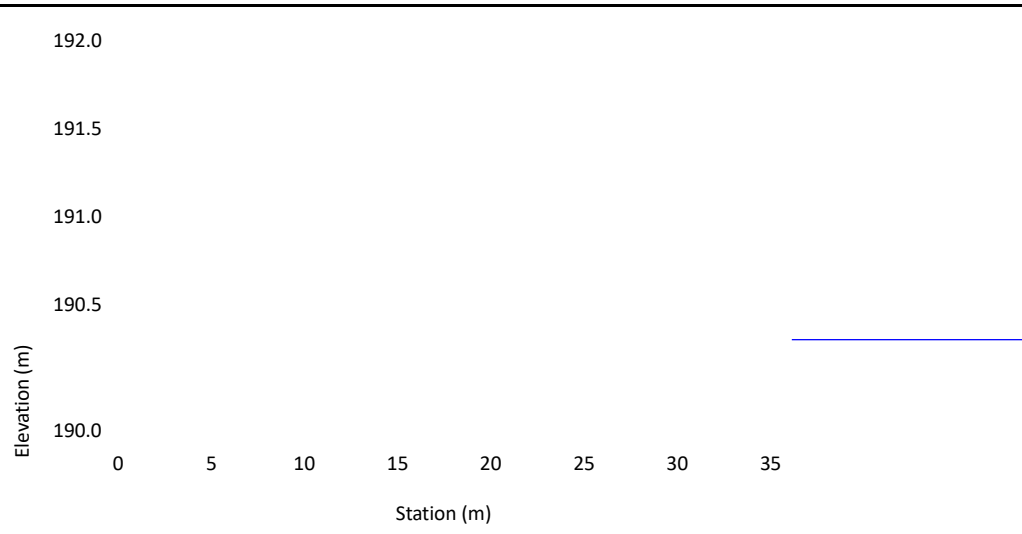


Lotto1A_rev02

Geom: Lotto1A_rev02

River = Rio Caffra Reach = 1 RS = 201



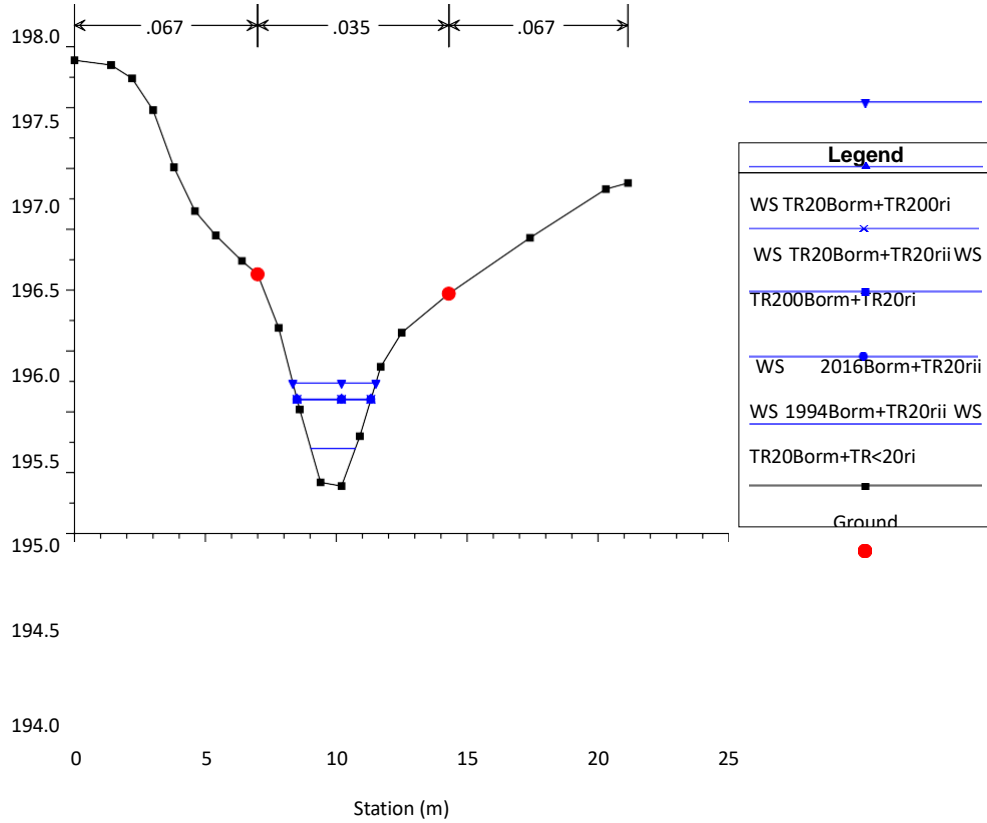


Elevation (m)

Lotto1A_rev02

Geom: Lotto1A_rev02

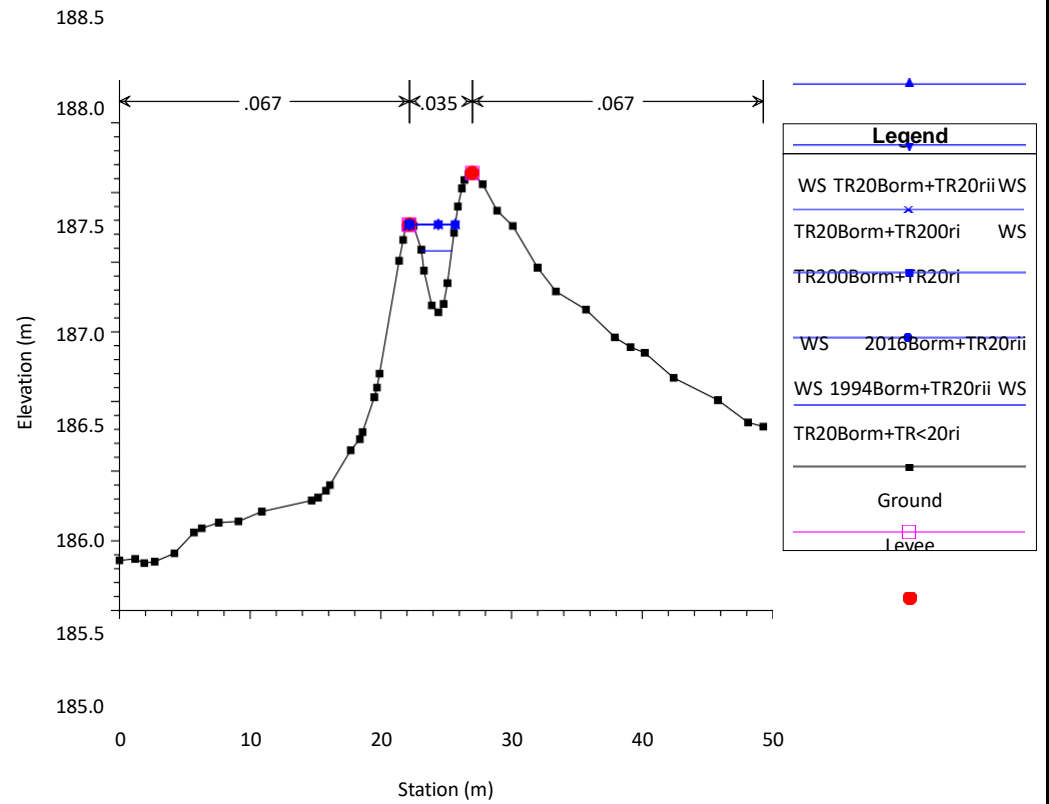
River = Rio Madama Reach = 1 RS = 405



Lotto1A_rev02

Geom: Lotto1A_rev02

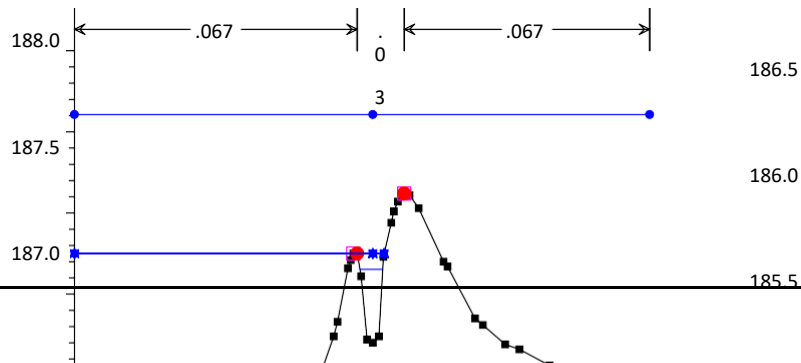
River = Rio Madama Reach = 1 RS = 404



Lotto1A_rev02

Geom: Lotto1A_rev02

River = Rio Madama Reach = 1 RS = 403

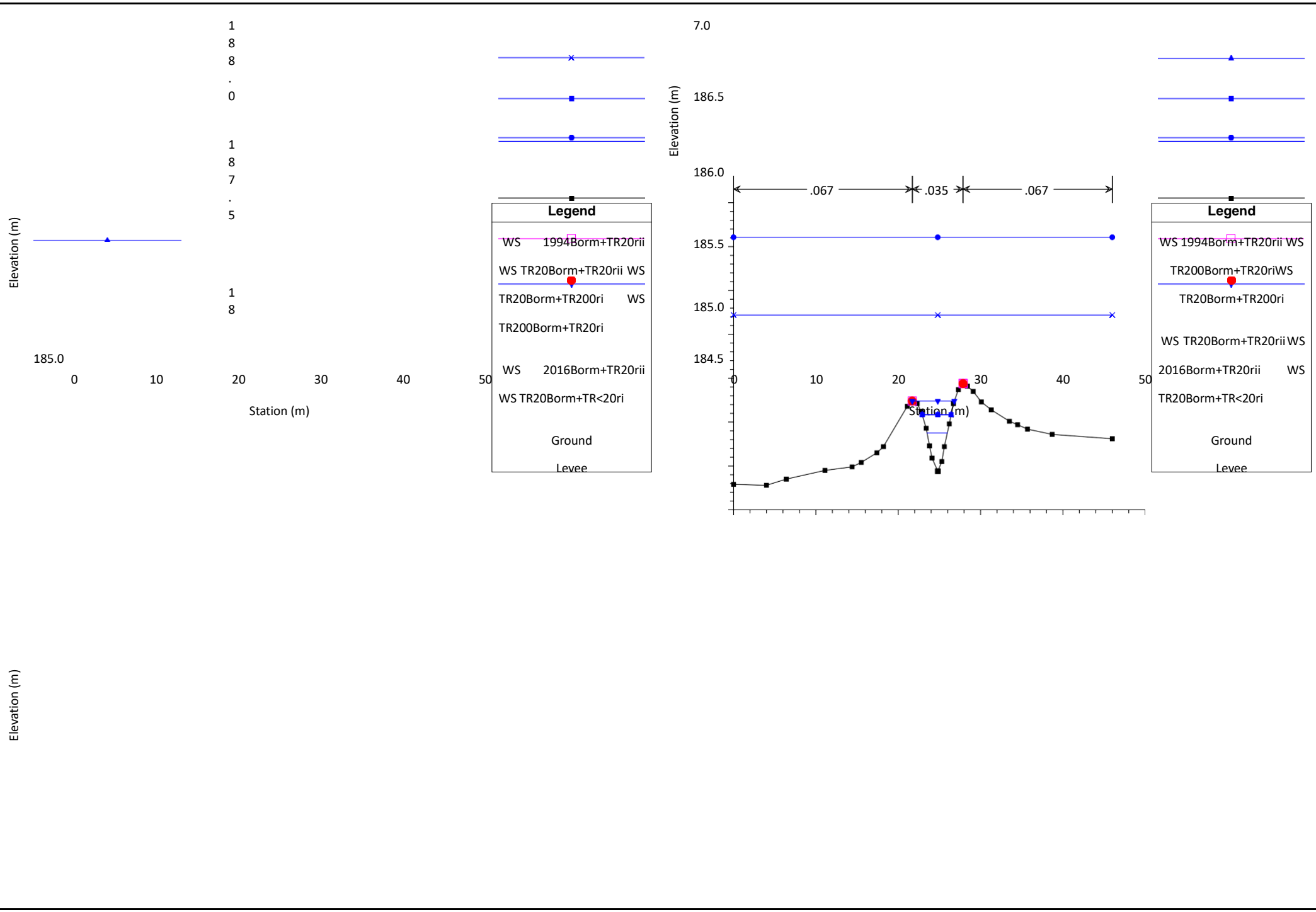


Lotto1A_rev02

Geom: Lotto1A_rev02

River = Rio Madama Reach = 1 RS = 402

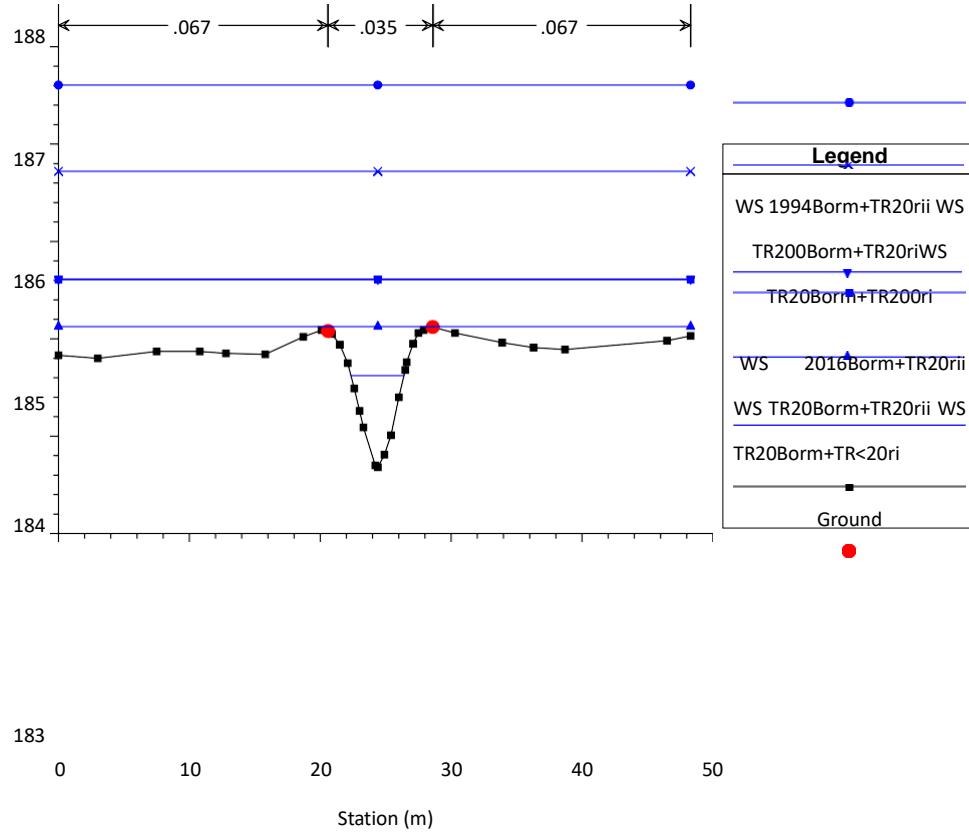




Lotto1A_rev02

Geom: Lotto1A_rev02

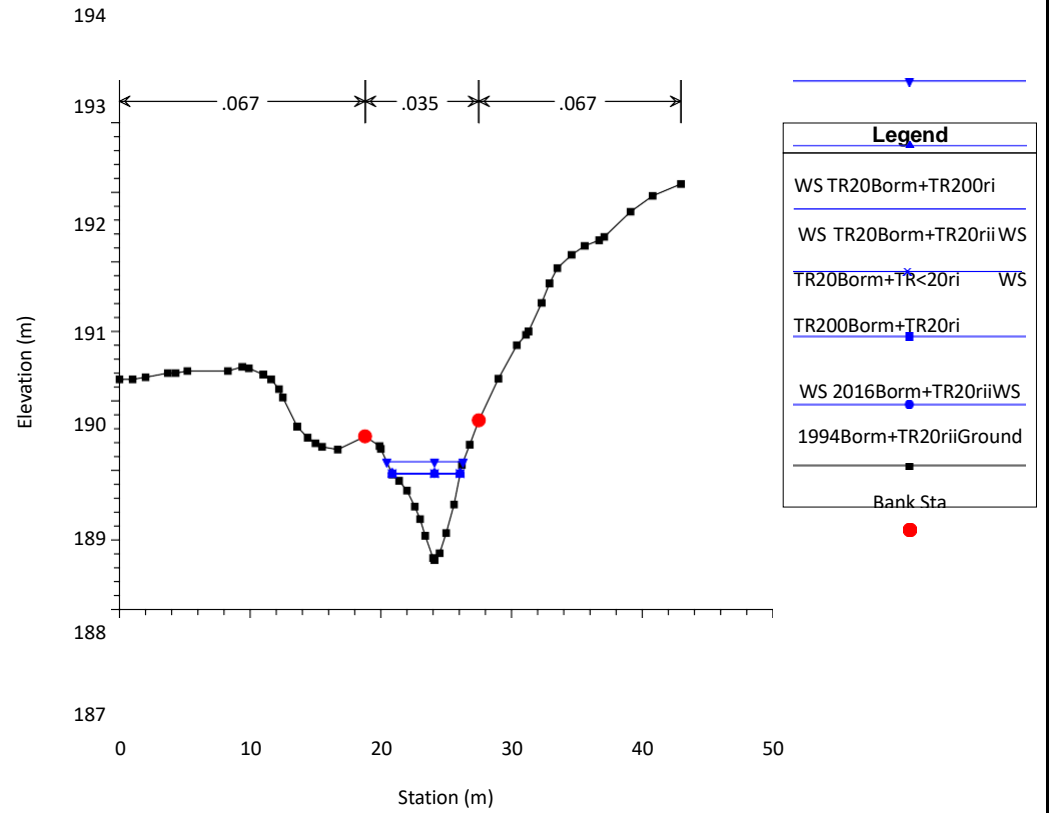
River = Rio Madama Reach = 1 RS = 401



Lotto1A_rev02

Geom: Lotto1A_rev02

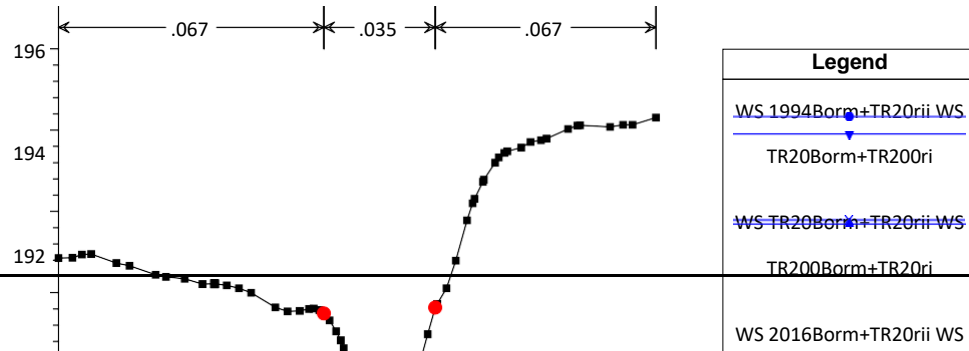
River = Rio Sacco Reach = 1 RS = 306



Lotto1A_rev02

Geom: Lotto1A_rev02

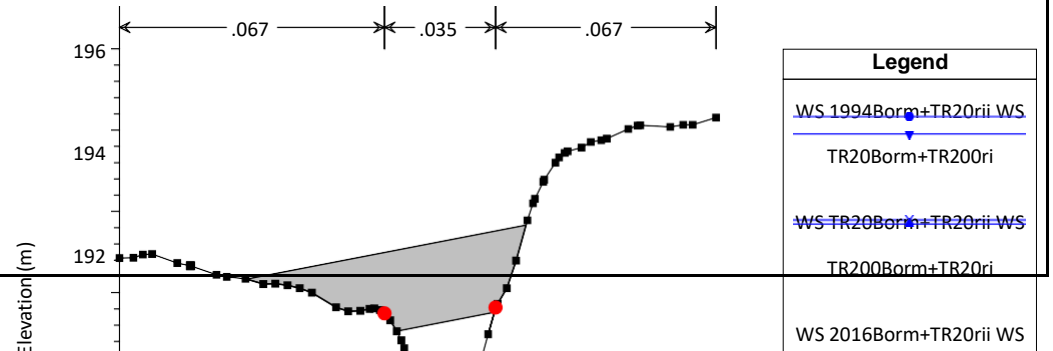
River = Rio Sacco Reach = 1 RS = 305

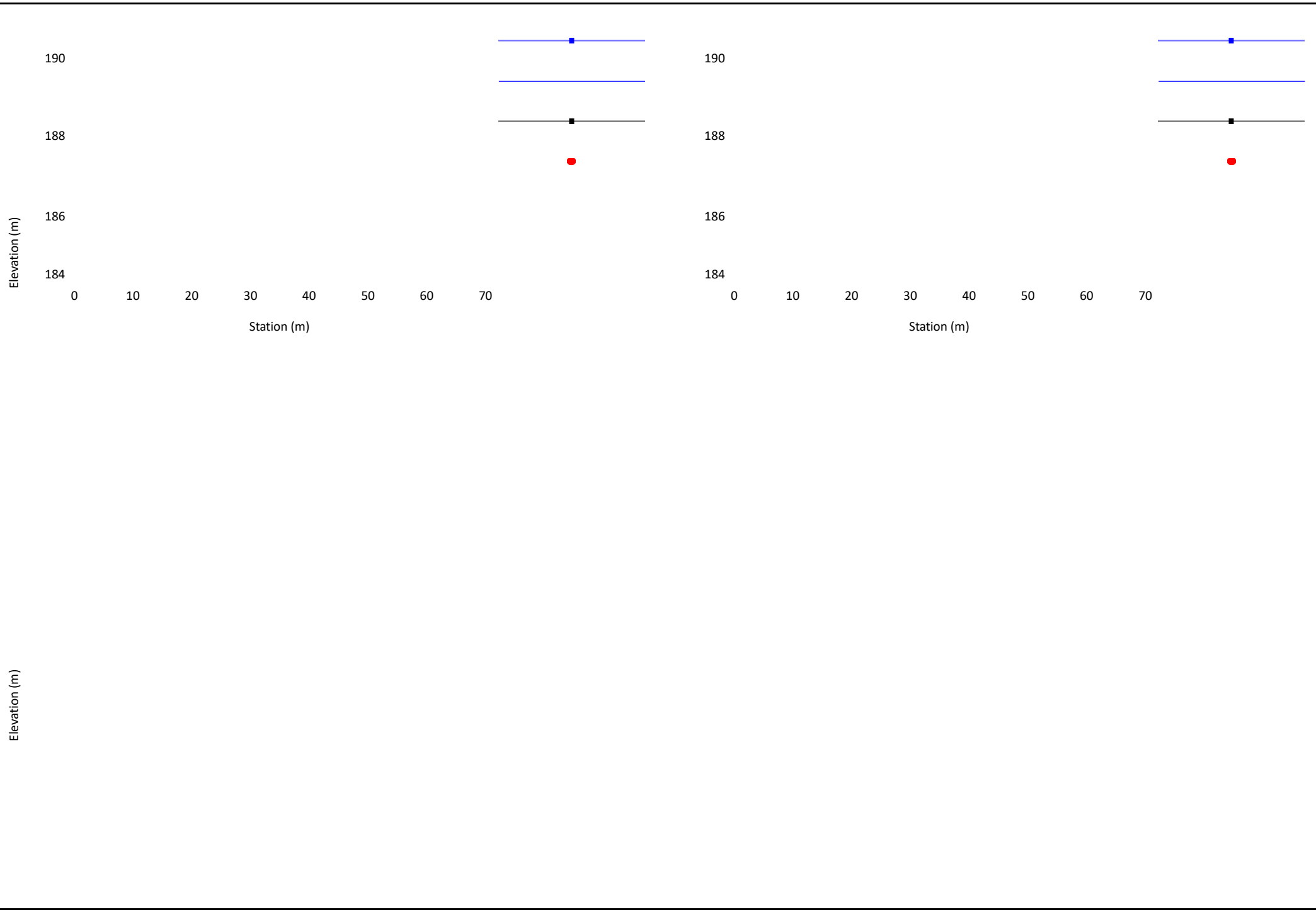


Lotto1A_rev02

Geom: Lotto1A_rev02

River = Rio Sacco Reach = 1 RS = 304.5 BR

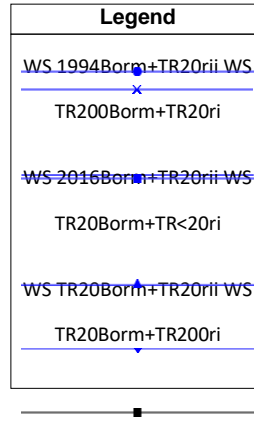
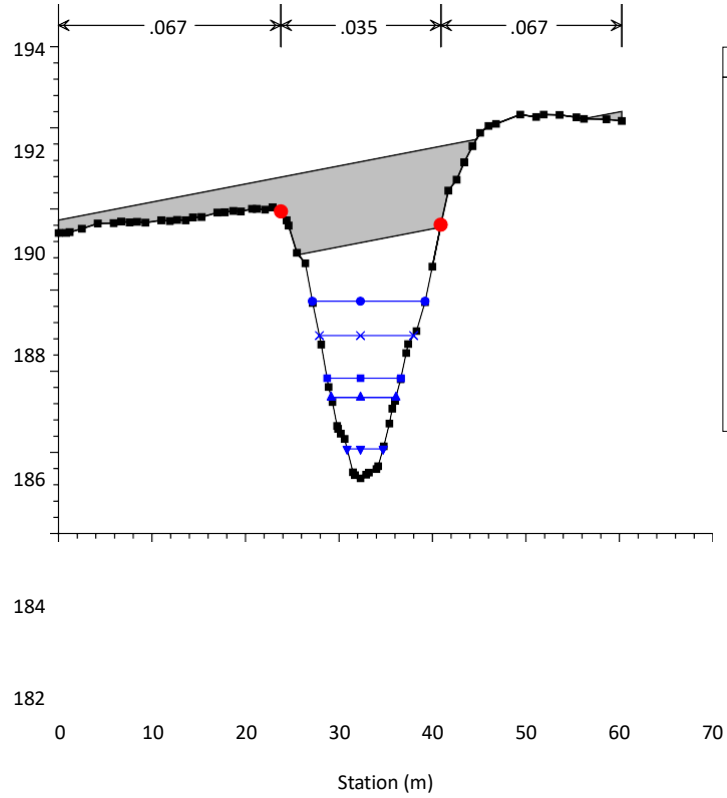




Lotto1A_rev02

Geom: Lotto1A_rev02

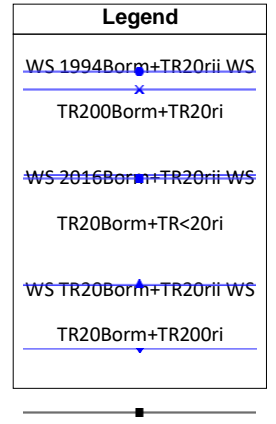
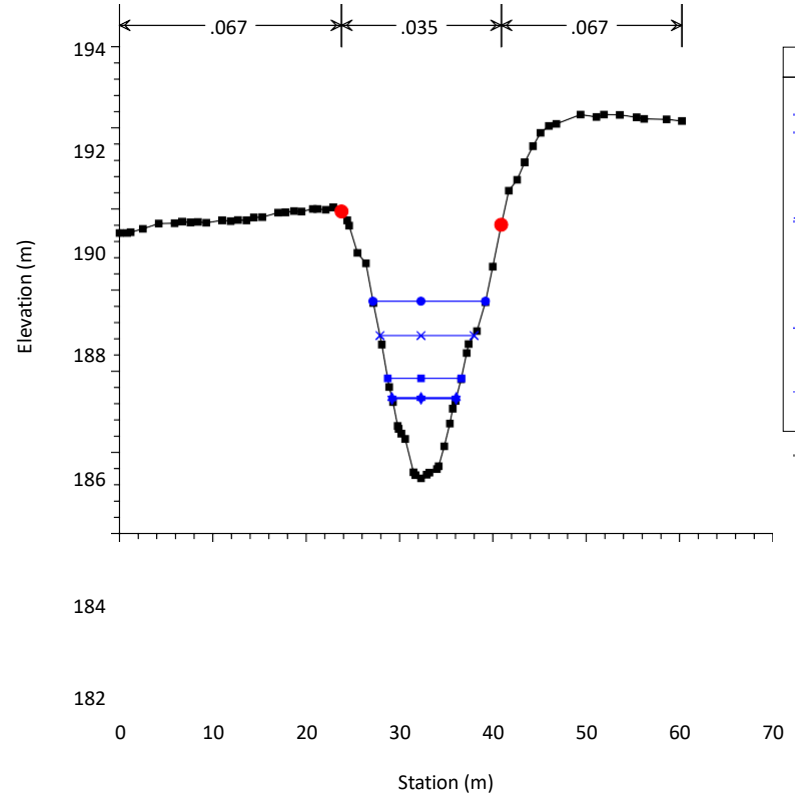
River = Rio Sacco Reach = 1 RS = 304.5 BR



Lotto1A_rev02

Geom: Lotto1A_rev02

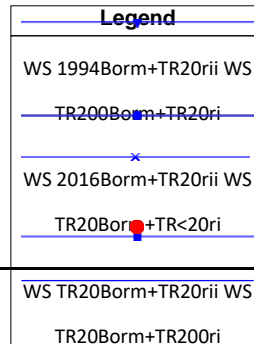
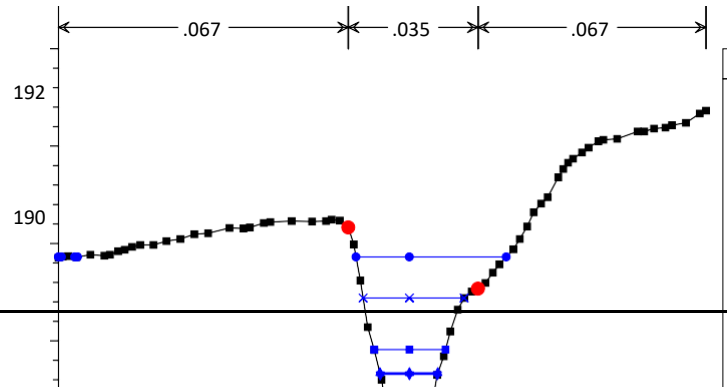
River = Rio Sacco Reach = 1 RS = 304



Lotto1A_rev02

Geom: Lotto1A_rev02

River = Rio Sacco Reach = 1 RS = 303

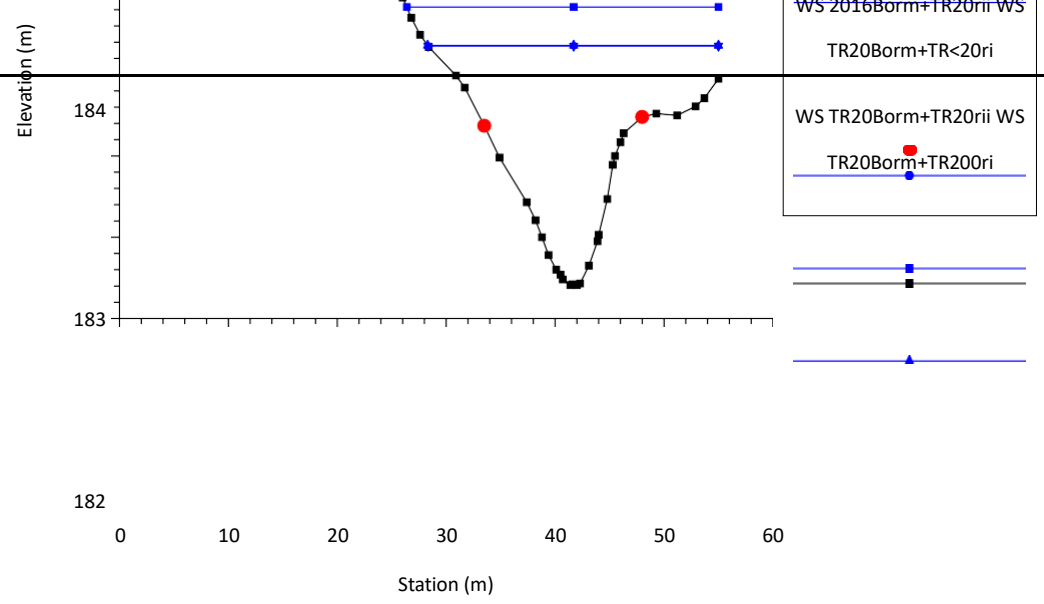
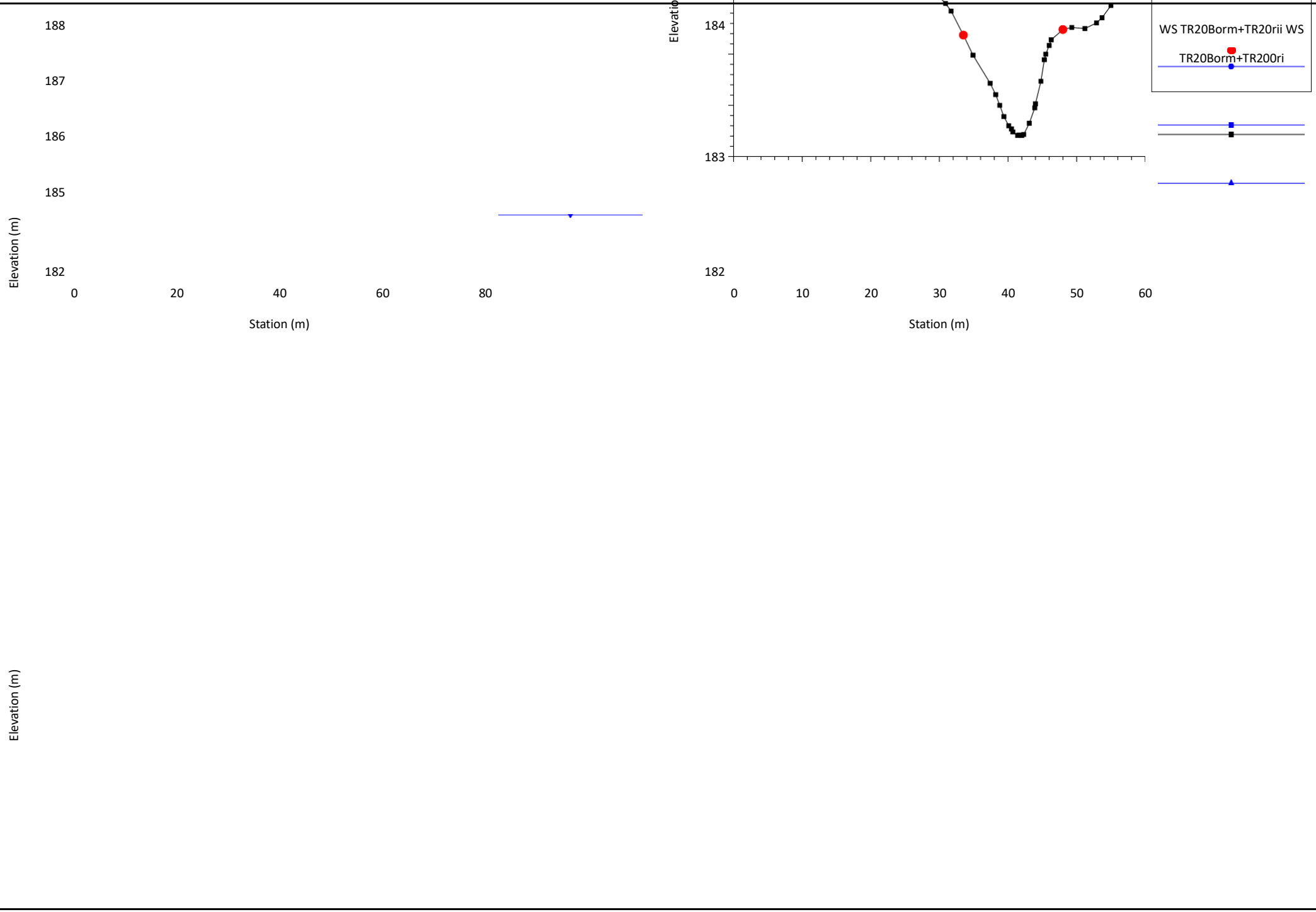


Lotto1A_rev02

Geom: Lotto1A_rev02

River = Rio Sacco Reach = 1 RS = 302

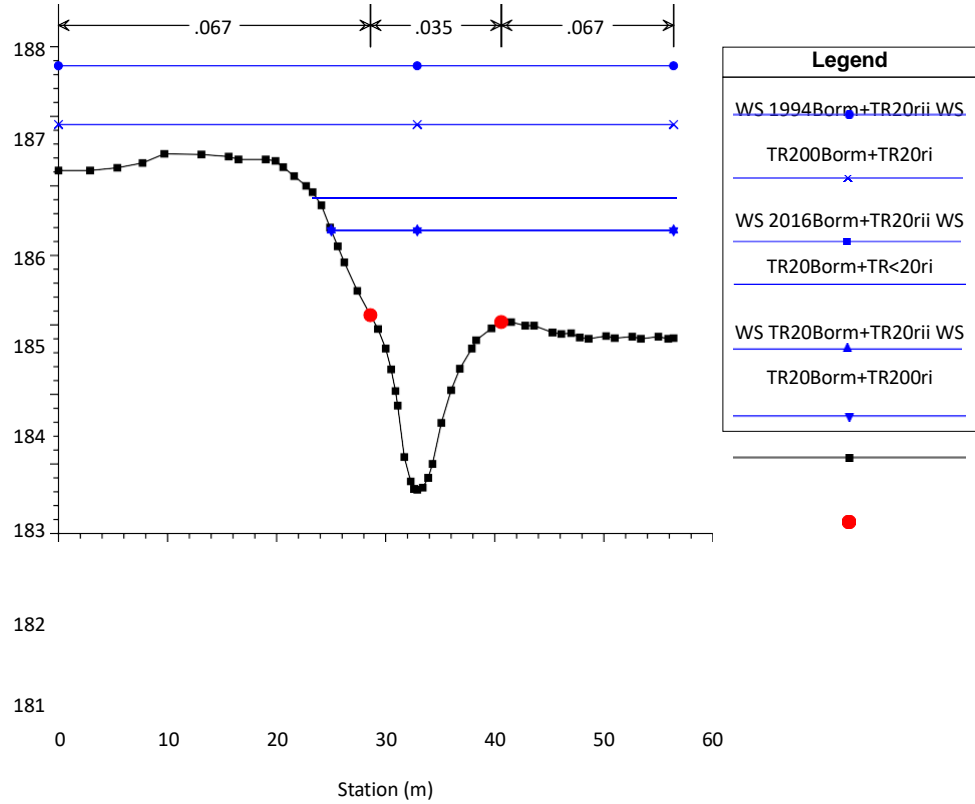




Lotto1A_rev02

Geom: Lotto1A_rev02

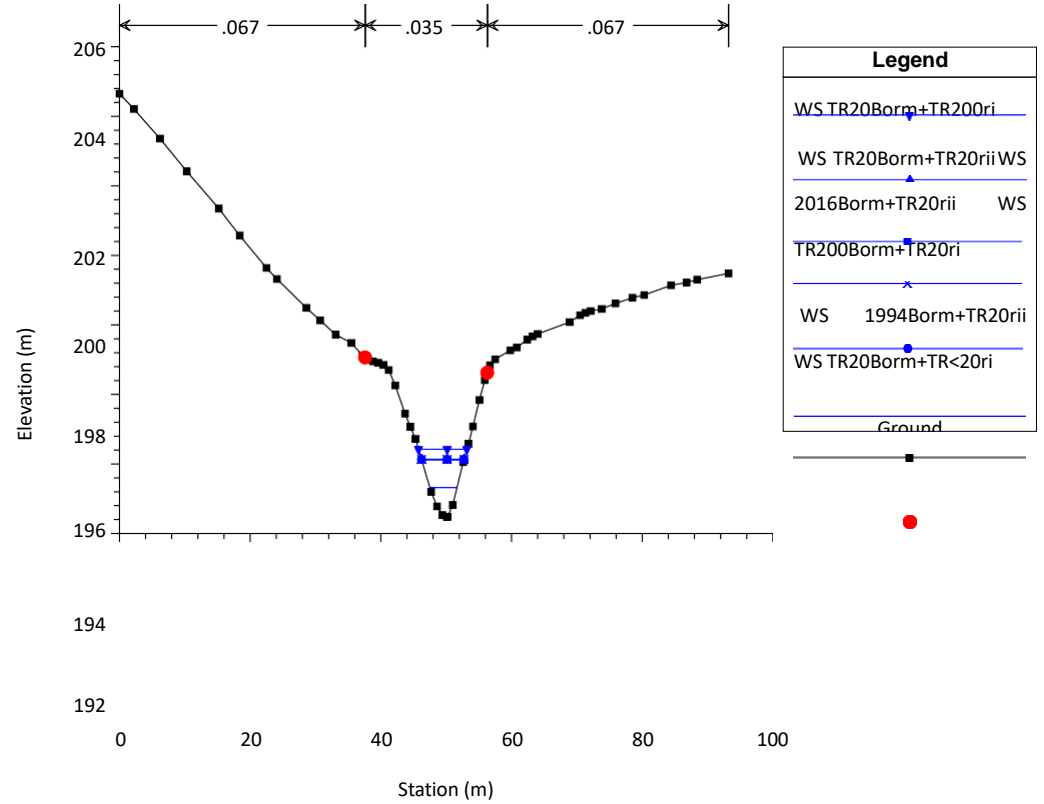
River = Rio Sacco Reach = 1 RS = 301



Lotto1A_rev02

Geom: Lotto1A_rev02

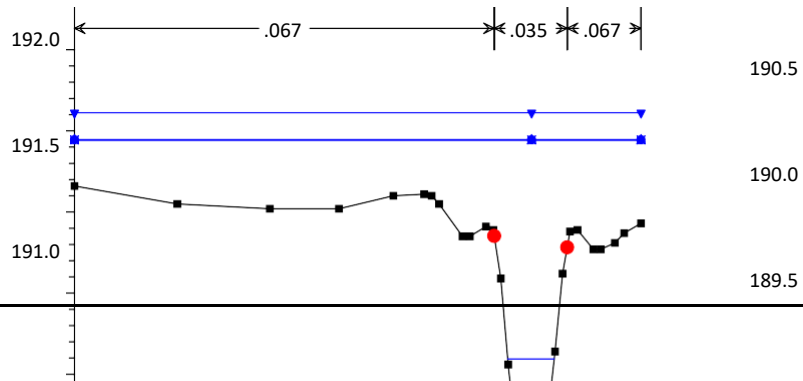
River = Rio San Pietro Reach = 3 RS = 134



Lotto1A_rev02

Geom: Lotto1A_rev02

River = Rio San Pietro Reach = 3 RS = 127

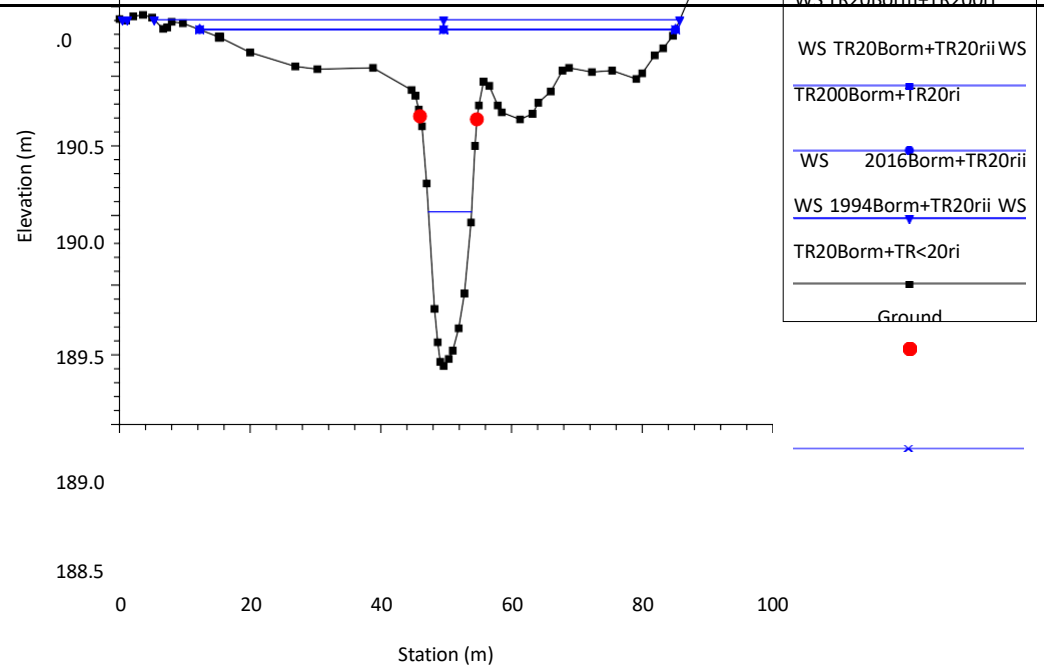
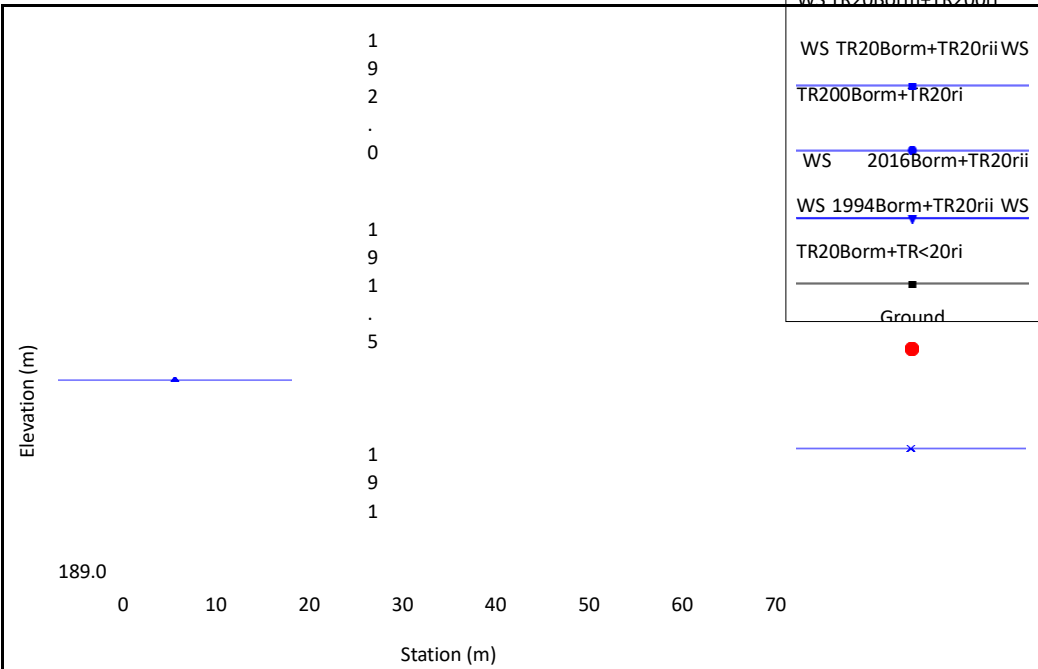


Lotto1A_rev02

Geom: Lotto1A_rev02

River = Rio San Pietro Reach = 2 RS = 126

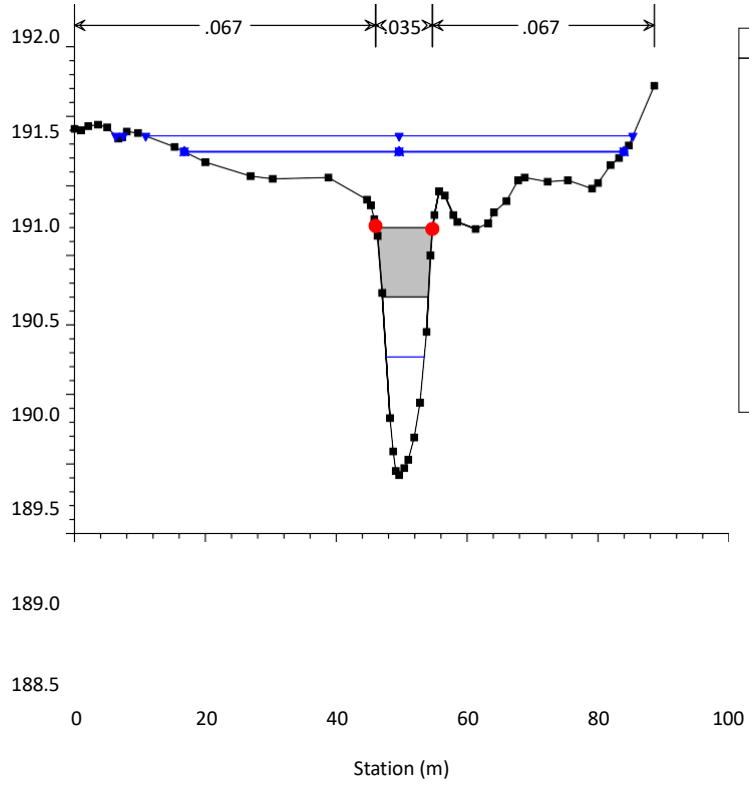




Lotto1A_rev02

Geom: Lotto1A_rev02

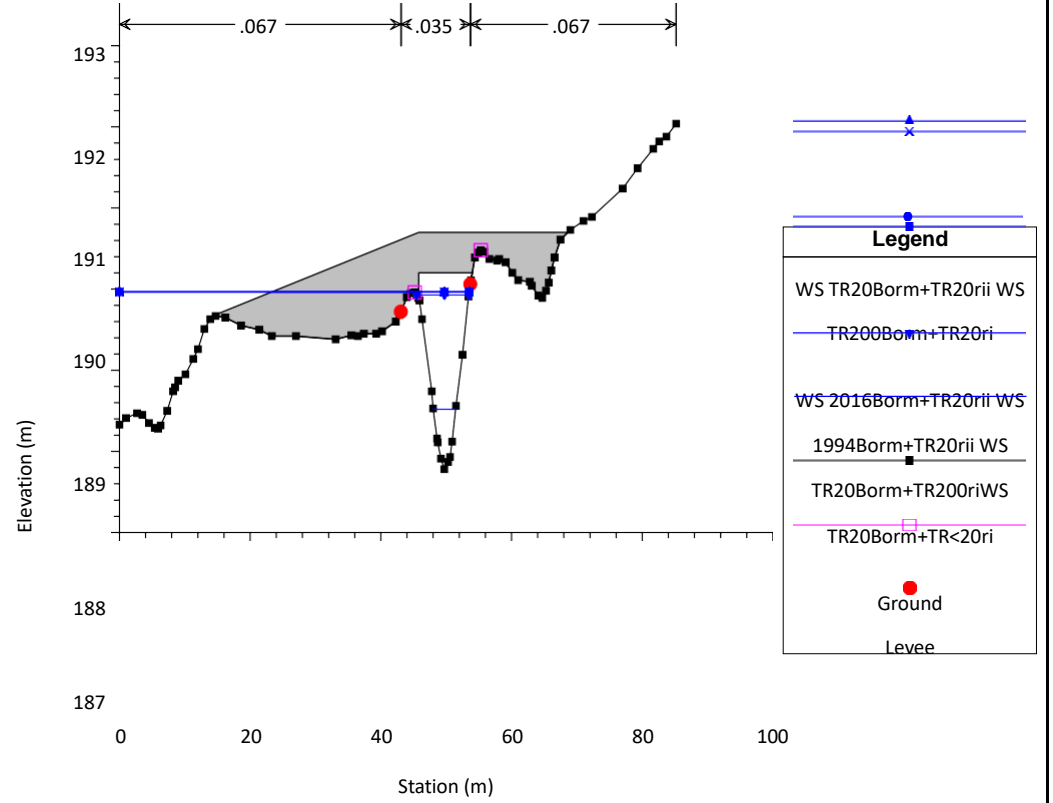
River = Rio San Pietro Reach = 2 RS = 125.5 BR



Lotto1A_rev02

Geom: Lotto1A_rev02

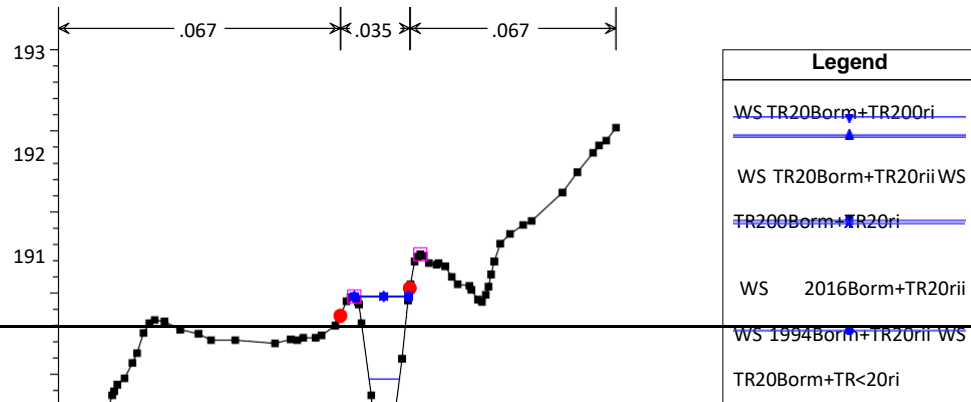
River = Rio San Pietro Reach = 2 RS = 125.5 BR



Lotto1A_rev02

Geom: Lotto1A_rev02

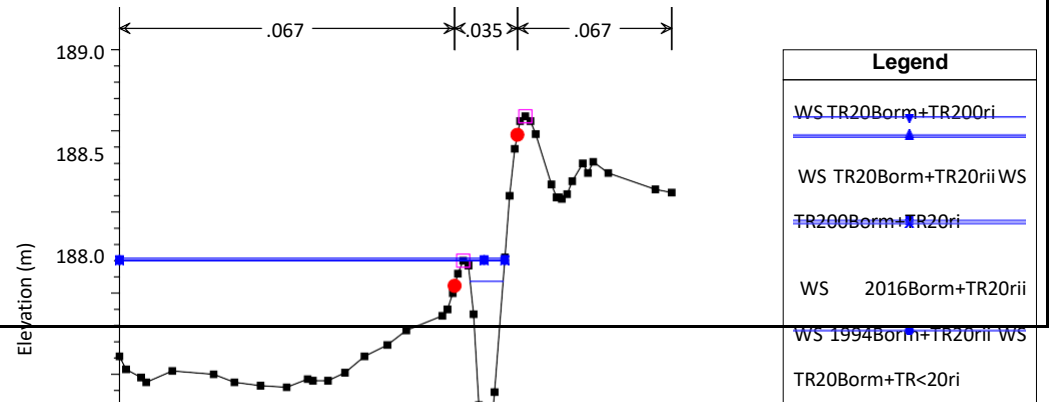
River = Rio San Pietro Reach = 2 RS = 125

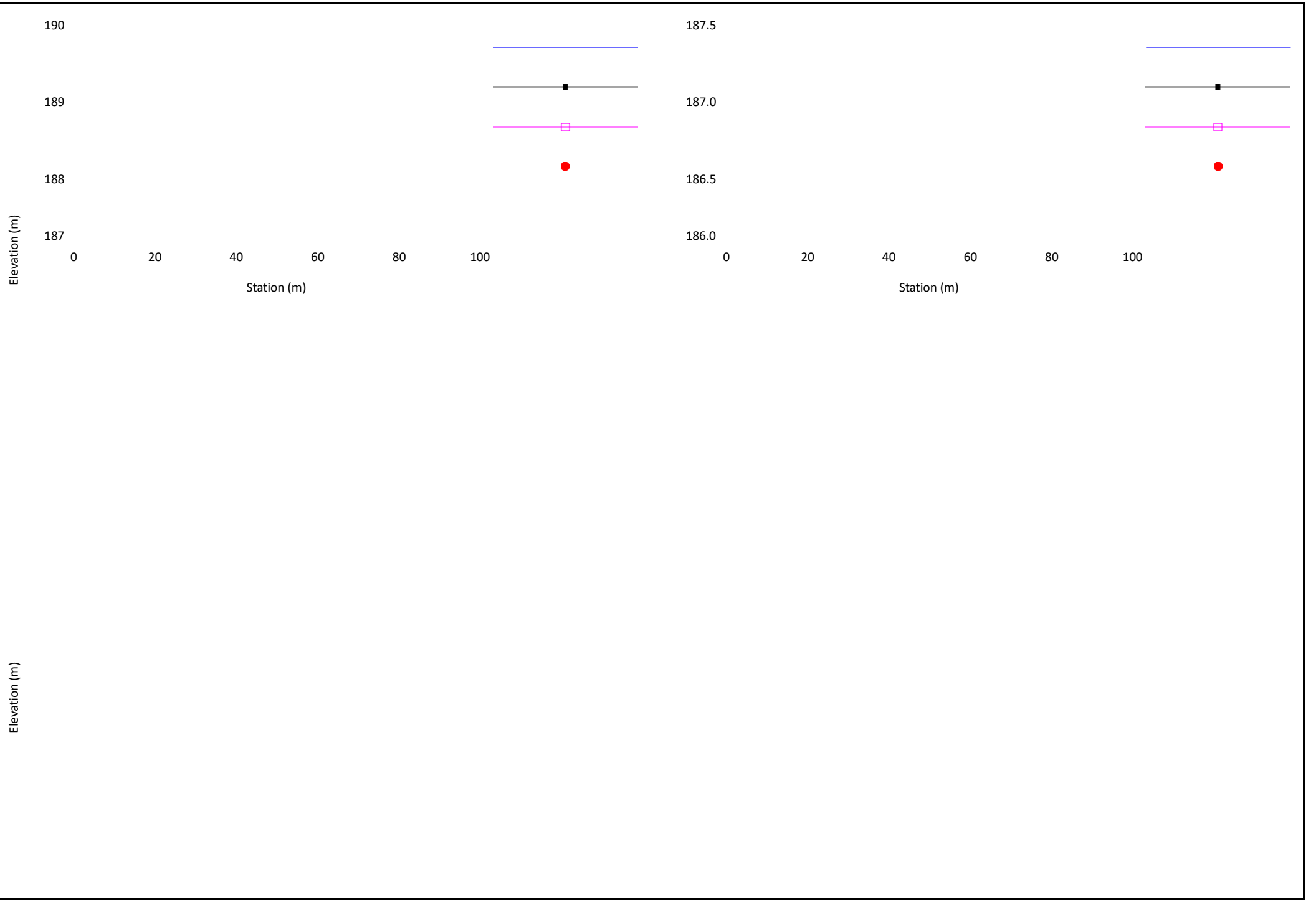


Lotto1A_rev02

Geom: Lotto1A_rev02

River = Rio San Pietro Reach = 2 RS = 121

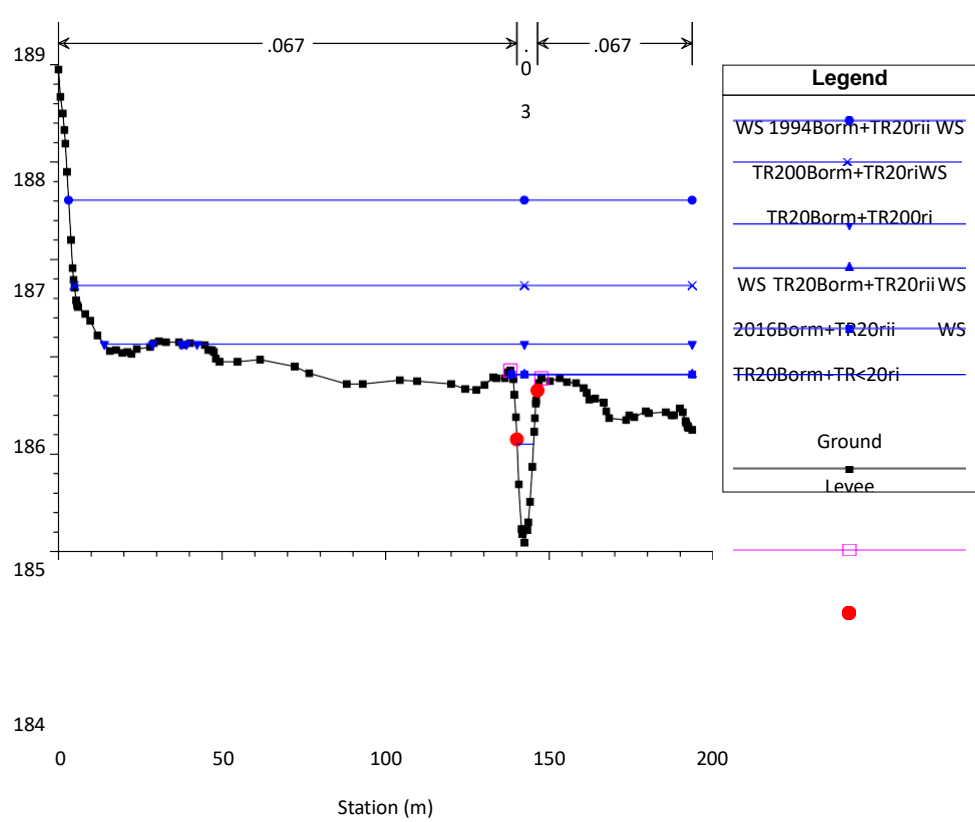




Lotto1A_rev02

Geom: Lotto1A_rev02

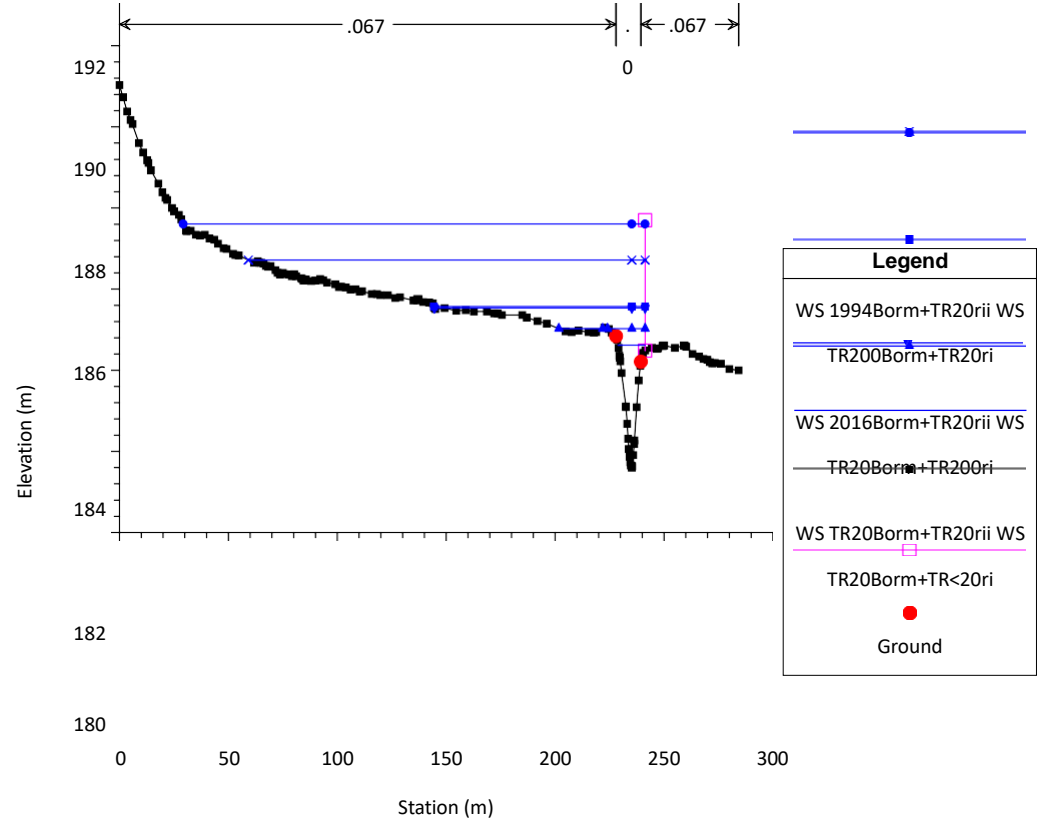
River = Rio San Pietro Reach = 2 RS = 115



Lotto1A_rev02

Geom: Lotto1A_rev02

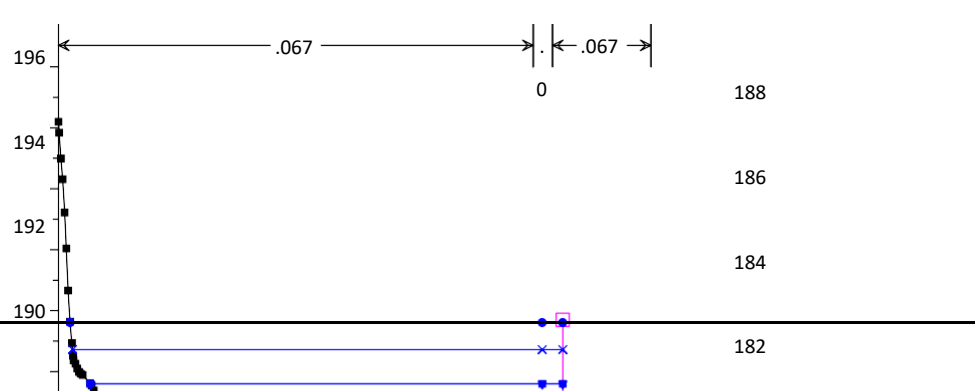
River = Rio San Pietro Reach = 2 RS = 109



Lotto1A_rev02

Geom: Lotto1A_rev02

River = Rio San Pietro Reach = 1 RS = 108

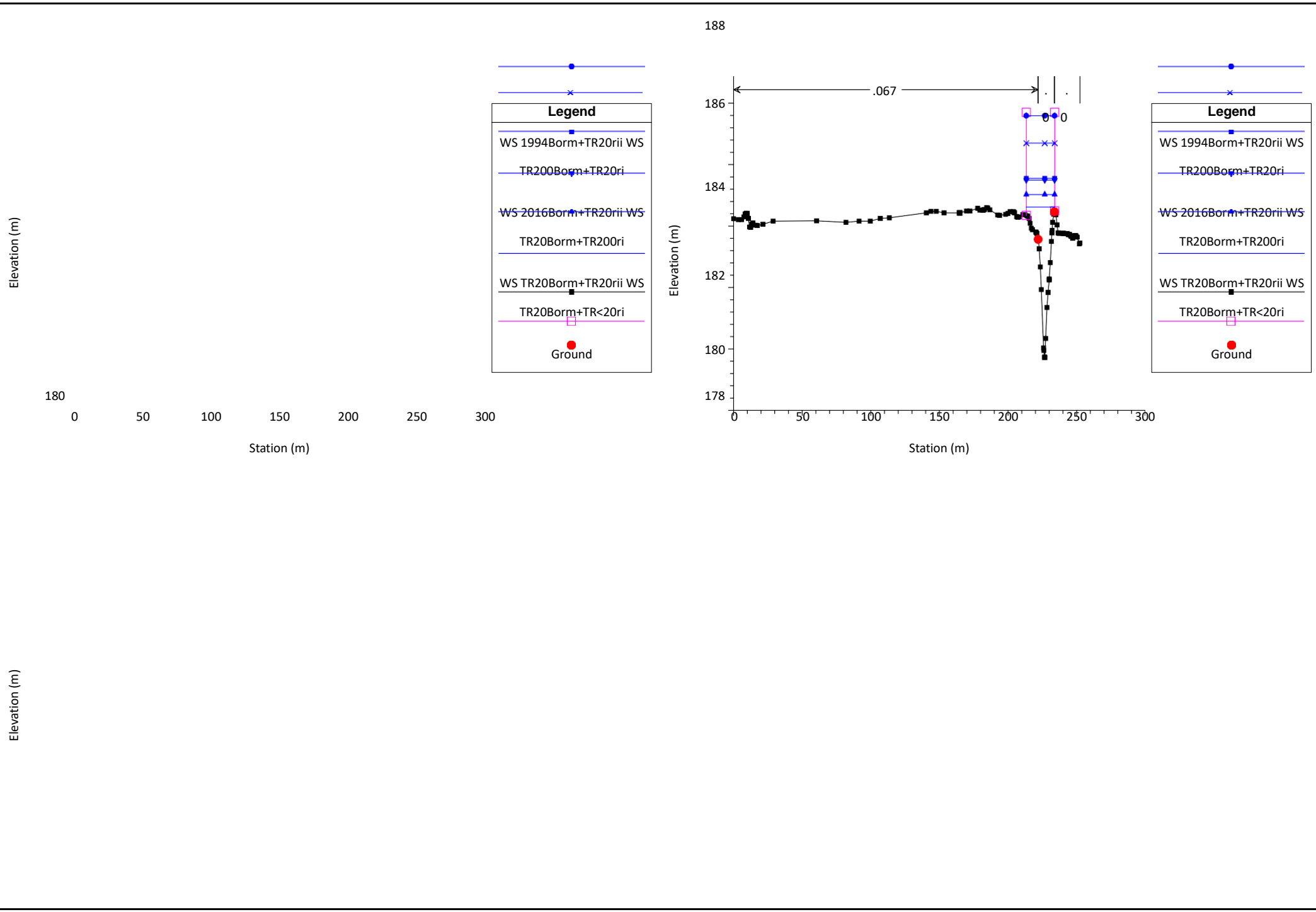


Lotto1A_rev02

Geom: Lotto1A_rev02

River = Rio San Pietro Reach = 1 RS = 105

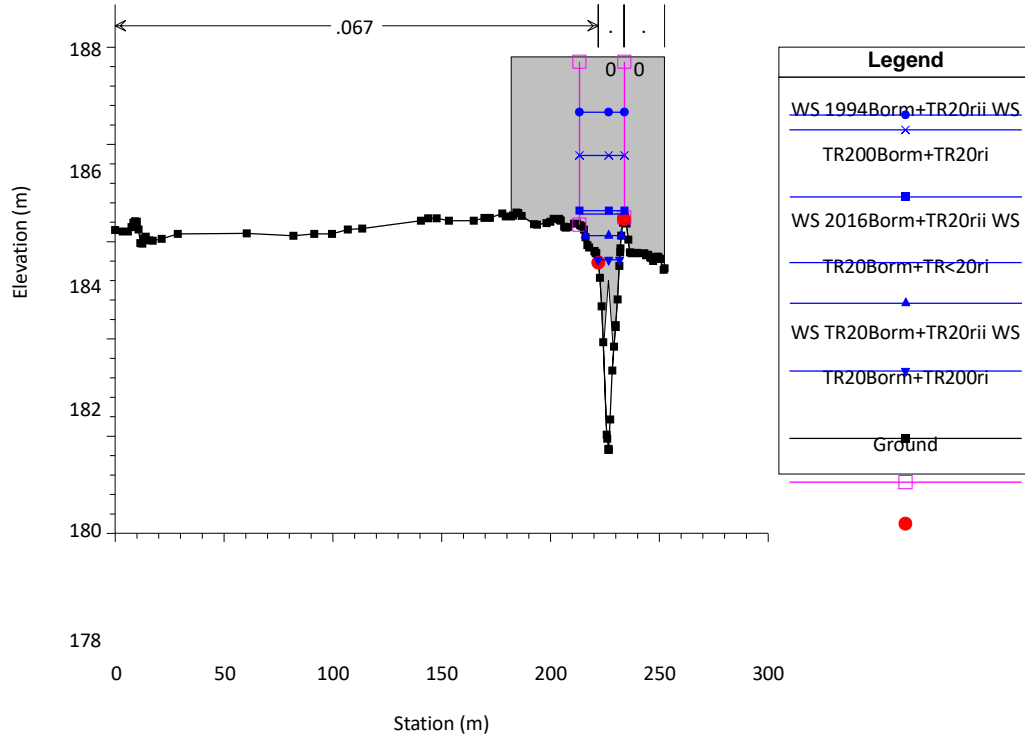




Lotto1A_rev02

Geom: Lotto1A_rev02

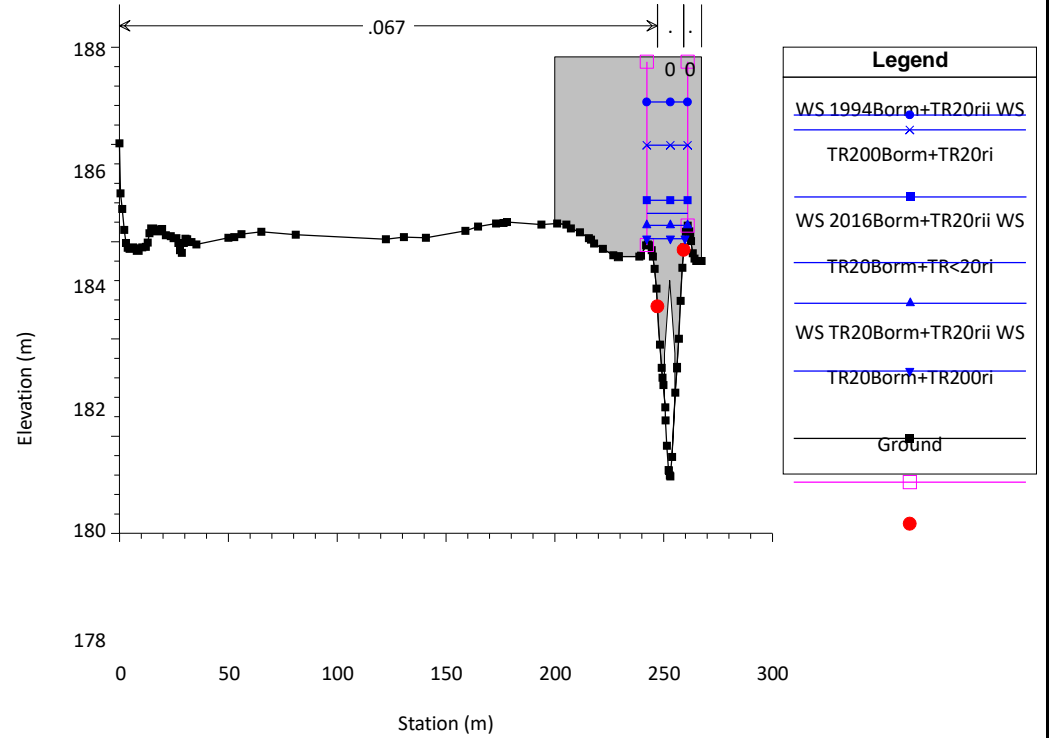
River = Rio San Pietro Reach = 1 RS = 104.5 BR



Lotto1A_rev02

Geom: Lotto1A_rev02

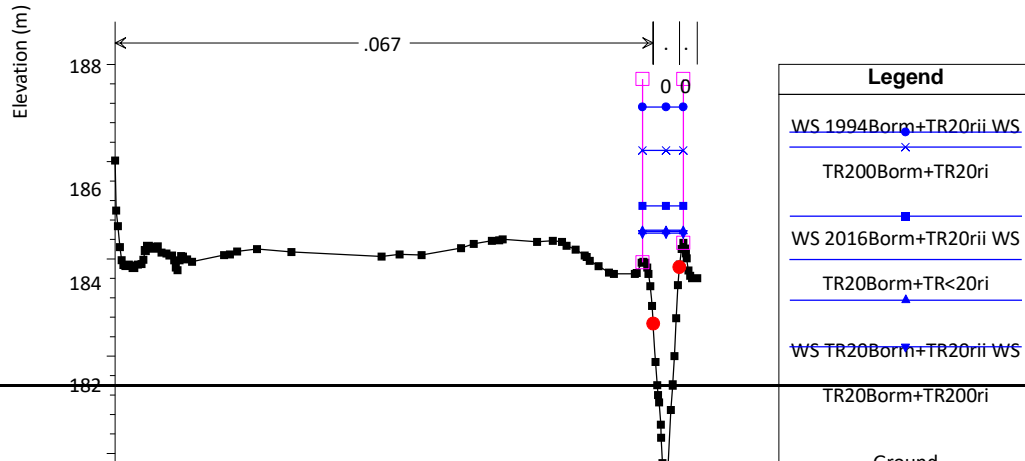
River = Rio San Pietro Reach = 1 RS = 104.5 BR



Lotto1A_rev02

Geom: Lotto1A_rev02

River = Rio San Pietro Reach = 1 RS = 104



180

178

0

50

100

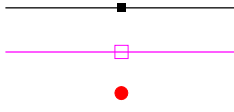
150

200

250

300

Station (m)



INTERVENTO CODICE AT_A18_622_19_102 – PROGETTO PER LAVORI DI ADEGUAMENTO SEZIONI DI DEFLUSSO FOSSI COLATORI PROVENIENTI DA VERSANTI IN GIARONETTO - ADEGUAMENTO DEI TRATTI DEL FIUME BORMIDA E DEL RIO SAN PIETRO IN CORRISPONDENZA DELLA S.P. 25 - PROGETTO ESECUTIVO – LOTTO 1A

SITUAZIONE AL LOTTO 1B

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	3	134	TR20Borm+TR<20ri	5.00	192.48	193.32	193.32	193.58	0.017108	2.29	2.18	4.13	1.01
Rio San Pietro	3	134	TR20Borm+TR20rii	22.20	192.48	194.13	194.19	194.73	0.017011	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	TR20Borm+TR200ri	31.90	192.48	194.42	194.52	195.14	0.017018	3.74	8.53	7.40	1.11
Rio San Pietro	3	134	TR200Borm+TR20ri	22.20	192.48	194.13	194.20	194.73	0.017012	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	2016Borm+TR20rii	22.20	192.48	194.13	194.19	194.73	0.017011	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	1994Borm+TR20rii	22.20	192.48	194.13	194.20	194.73	0.017012	3.42	6.50	6.49	1.09
Rio San Pietro	3	133.00*	TR20Borm+TR<20ri	5.00	192.00	192.82	192.85	193.12	0.020016	2.43	2.06	4.01	1.09
Rio San Pietro	3	133.00*	TR20Borm+TR20rii	22.20	192.00	193.62	193.73	194.27	0.019320	3.57	6.22	6.43	1.16
Rio San Pietro	3	133.00*	TR20Borm+TR200ri	31.90	192.00	193.91	194.05	194.68	0.019164	3.90	8.18	7.33	1.18
Rio San Pietro	3	133.00*	TR200Borm+TR20ri	22.20	192.00	193.62	193.73	194.27	0.019476	3.58	6.20	6.42	1.16
Rio San Pietro	3	133.00*	2016Borm+TR20rii	22.20	192.00	193.62	193.73	194.27	0.019320	3.57	6.22	6.43	1.16
Rio San Pietro	3	133.00*	1994Borm+TR20rii	22.20	192.00	193.62	193.73	194.27	0.019319	3.57	6.22	6.43	1.16
Rio San Pietro	3	132.00*	TR20Borm+TR<20ri	5.00	191.53	192.38	192.38	192.65	0.017302	2.31	2.16	4.08	1.01
Rio San Pietro	3	132.00*	TR20Borm+TR20rii	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	132.00*	TR20Borm+TR200ri	31.90	191.53	193.44	193.58	194.20	0.019256	3.87	8.24	7.53	1.18
Rio San Pietro	3	132.00*	TR200Borm+TR20ri	22.20	191.53	193.16	193.26	193.79	0.018608	3.51	6.33	6.56	1.14
Rio San Pietro	3	132.00*	2016Borm+TR20rii	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	132.00*	1994Borm+TR20rii	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	131.00*	TR20Borm+TR<20ri	5.00	191.05	191.88	191.91	192.18	0.020188	2.44	2.05	4.00	1.09
Rio San Pietro	3	131.00*	TR20Borm+TR20rii	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	131.00*	TR20Borm+TR200ri	31.90	191.05	192.94	193.10	193.71	0.019778	3.88	8.21	7.68	1.20
Rio San Pietro	3	131.00*	TR200Borm+TR20ri	22.20	191.05	192.67	192.79	193.31	0.019641	3.54	6.26	6.70	1.17
Rio San Pietro	3	131.00*	2016Borm+TR20rii	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	131.00*	1994Borm+TR20rii	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	130.00*	TR20Borm+TR<20ri	5.00	190.58	191.43	191.44	191.71	0.017638	2.32	2.16	4.13	1.02
Rio San Pietro	3	130.00*	TR20Borm+TR20rii	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	130.00*	TR20Borm+TR200ri	31.90	190.58	192.45	192.60	193.22	0.019805	3.88	8.22	7.74	1.20
Rio San Pietro	3	130.00*	TR200Borm+TR20ri	22.20	190.58	192.18	192.31	192.82	0.019897	3.54	6.28	6.85	1.18
Rio San Pietro	3	130.00*	2016Borm+TR20rii	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	130.00*	1994Borm+TR20rii	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	129.00*	TR20Borm+TR<20ri	5.00	190.10	190.92	190.96	191.23	0.020777	2.44	2.05	4.13	1.11
Rio San Pietro	3	129.00*	TR20Borm+TR20rii	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	TR20Borm+TR200ri	31.90	190.10	191.94	192.10	192.72	0.020116	3.90	8.18	7.76	1.21
Rio San Pietro	3	129.00*	TR200Borm+TR20ri	22.20	190.10	191.68	191.80	192.32	0.020086	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	2016Borm+TR20rii	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	1994Borm+TR20rii	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19

HEC-RAS Plan: Lotto1B (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	3	128.00*	TR20Borm+TR<20ri	5.00	189.63	190.45	190.47	190.73	0.018705	2.32	2.16	4.38	1.05
Rio San Pietro	3	128.00*	TR20Borm+TR20rii	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	TR20Borm+TR200ri	31.90	189.63	191.44	191.62	192.21	0.020379	3.90	8.17	7.86	1.22
Rio San Pietro	3	128.00*	TR200Borm+TR20ri	22.20	189.63	191.18	191.30	191.82	0.020227	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	2016Borm+TR20rii	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	1994Borm+TR20rii	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	127	TR20Borm+TR<20ri	5.00	189.15	190.09	189.97	190.25	0.008760	1.75	2.85	4.97	0.74
Rio San Pietro	3	127	TR20Borm+TR20rii	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	TR20Borm+TR200ri	31.90	189.15	191.61	191.27	191.68	0.001390	1.44	45.13	60.60	0.35
Rio San Pietro	3	127	TR200Borm+TR20ri	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	2016Borm+TR20rii	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	1994Borm+TR20rii	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	2	126	TR20Borm+TR<20ri	8.00	188.92	190.03	189.77	190.16	0.005187	1.61	4.95	6.61	0.60
Rio San Pietro	2	126	TR20Borm+TR20rii	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	TR20Borm+TR200ri	49.10	188.92	191.41	191.30	191.63	0.003468	2.37	40.50	81.15	0.56
Rio San Pietro	2	126	TR200Borm+TR20ri	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	2016Borm+TR20rii	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	1994Borm+TR20rii	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	125.5		Bridge									
Rio San Pietro	2	125	TR20Borm+TR<20ri	8.00	187.78	188.94	188.90	189.24	0.013680	2.43	3.29	4.65	0.92
Rio San Pietro	2	125	TR20Borm+TR20rii	34.30	187.78	189.96	189.96	190.01	0.003090	1.41	41.12	53.50	0.47
Rio San Pietro	2	125	TR20Borm+TR200ri	49.10	187.78	189.96	189.96	190.07	0.006331	2.02	41.12	53.50	0.67
Rio San Pietro	2	125	TR200Borm+TR20ri	34.30	187.78	189.96	189.96	190.01	0.003090	1.41	41.12	53.50	0.47
Rio San Pietro	2	125	2016Borm+TR20rii	34.30	187.78	189.96	189.96	190.01	0.003090	1.41	41.12	53.50	0.47
Rio San Pietro	2	125	1994Borm+TR20rii	34.30	187.78	189.96	189.96	190.01	0.003090	1.41	41.12	53.50	0.47
Rio San Pietro	2	124.00*	TR20Borm+TR<20ri	8.00	187.45	188.61	188.57	188.91	0.013528	2.41	3.32	4.74	0.92
Rio San Pietro	2	124.00*	TR20Borm+TR20rii	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	TR20Borm+TR200ri	49.10	187.45	189.40	189.40	189.50	0.007564	2.06	40.10	54.98	0.72
Rio San Pietro	2	124.00*	TR200Borm+TR20ri	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	2016Borm+TR20rii	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	1994Borm+TR20rii	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	123.00*	TR20Borm+TR<20ri	8.00	187.11	188.27	188.24	188.57	0.013931	2.42	3.30	4.82	0.94
Rio San Pietro	2	123.00*	TR20Borm+TR20rii	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	123.00*	TR20Borm+TR200ri	49.10	187.11	188.83	188.83	188.94	0.009078	2.08	39.03	56.38	0.78
Rio San Pietro	2	123.00*	TR200Borm+TR20ri	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	123.00*	2016Borm+TR20rii	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54

HEC-RAS Plan: Lotto1B (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	123.00*	1994Borm+TR20rii	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	122.00*	TR20Borm+TR<20ri	8.00	186.78	187.97	187.90	188.24	0.012155	2.28	3.51	5.12	0.88
Rio San Pietro	2	122.00*	TR20Borm+TR20rii	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	TR20Borm+TR200ri	49.10	186.78	188.27	188.27	188.37	0.010860	2.06	37.95	57.70	0.83
Rio San Pietro	2	122.00*	TR200Borm+TR20ri	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	2016Borm+TR20rii	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	1994Borm+TR20rii	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	121	TR20Borm+TR<20ri	8.00	186.44	187.57	187.57	187.89	0.016026	2.49	3.21	5.06	1.00
Rio San Pietro	2	121	TR20Borm+TR20rii	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	TR20Borm+TR200ri	49.10	186.44	187.72	187.70	187.81	0.011885	1.95	37.80	58.99	0.85
Rio San Pietro	2	121	TR200Borm+TR20ri	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	2016Borm+TR20rii	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	1994Borm+TR20rii	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	120.00*	TR20Borm+TR<20ri	8.00	186.05	186.88	187.00	187.30	0.036907	3.21	5.32	48.07	1.46
Rio San Pietro	2	120.00*	TR20Borm+TR20rii	34.30	186.05	187.33	187.19	187.40	0.009943	1.93	33.96	72.95	0.80
Rio San Pietro	2	120.00*	TR20Borm+TR200ri	49.10	186.05	187.43	187.29	187.53	0.010591	2.18	41.74	73.64	0.84
Rio San Pietro	2	120.00*	TR200Borm+TR20ri	34.30	186.05	187.33	187.19	187.40	0.009943	1.93	33.96	72.95	0.80
Rio San Pietro	2	120.00*	2016Borm+TR20rii	34.30	186.05	187.33	187.19	187.40	0.009943	1.93	33.96	72.95	0.80
Rio San Pietro	2	120.00*	1994Borm+TR20rii	34.30	186.05	187.63	187.19	187.66	0.001948	1.08	56.50	74.00	0.37
Rio San Pietro	2	119.00*	TR20Borm+TR<20ri	8.00	185.66	186.78	186.78	186.86	0.006990	1.49	12.28	76.27	0.66
Rio San Pietro	2	119.00*	TR20Borm+TR20rii	34.30	185.66	187.06	187.02	187.16	0.009167	2.17	35.40	85.86	0.80
Rio San Pietro	2	119.00*	TR20Borm+TR200ri	49.10	185.66	187.17	187.09	187.28	0.009191	2.33	45.01	86.38	0.81
Rio San Pietro	2	119.00*	TR200Borm+TR20ri	34.30	185.66	187.06	187.02	187.16	0.009167	2.17	35.40	85.86	0.80
Rio San Pietro	2	119.00*	2016Borm+TR20rii	34.30	185.66	187.06	187.02	187.16	0.009167	2.17	35.40	85.86	0.80
Rio San Pietro	2	119.00*	1994Borm+TR20rii	34.30	185.66	187.61	187.02	187.63	0.000657	0.77	83.88	89.49	0.23
Rio San Pietro	2	118.00*	TR20Borm+TR<20ri	8.00	185.27	186.40	186.49	186.62	0.011779	2.09	4.31	22.67	0.87
Rio San Pietro	2	118.00*	TR20Borm+TR20rii	34.30	185.27	186.81	186.81	186.94	0.008080	2.31	36.68	99.25	0.77
Rio San Pietro	2	118.00*	TR20Borm+TR200ri	49.10	185.27	186.90	186.89	187.05	0.009203	2.57	45.61	99.91	0.83
Rio San Pietro	2	118.00*	TR200Borm+TR20ri	34.30	185.27	186.81	186.81	186.94	0.008080	2.31	36.68	99.25	0.77
Rio San Pietro	2	118.00*	2016Borm+TR20rii	34.30	185.27	186.81	186.81	186.94	0.008080	2.31	36.68	99.25	0.77
Rio San Pietro	2	118.00*	1994Borm+TR20rii	34.30	185.27	187.61	186.81	187.62	0.000195	0.52	143.25	137.65	0.13
Rio San Pietro	2	117.00*	TR20Borm+TR<20ri	8.00	184.87	185.85	185.92	186.22	0.021701	2.69	2.97	5.45	1.16
Rio San Pietro	2	117.00*	TR20Borm+TR20rii	34.30	184.87	186.55	186.59	186.73	0.008337	2.53	34.91	109.75	0.80
Rio San Pietro	2	117.00*	TR20Borm+TR200ri	49.10	184.87	186.67	186.67	186.83	0.007947	2.61	47.95	113.28	0.79
Rio San Pietro	2	117.00*	TR200Borm+TR20ri	34.30	184.87	186.74	186.59	186.78	0.002068	1.39	67.72	153.10	0.41
Rio San Pietro	2	117.00*	2016Borm+TR20rii	34.30	184.87	186.55	186.59	186.73	0.008337	2.53	34.91	109.75	0.80

HEC-RAS Plan: Lotto1B (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	117.00*	1994Borm+TR20rii	34.30	184.87	187.61	186.59	187.61	0.000076	0.38	202.75	155.25	0.09
Rio San Pietro	2	116.00*	TR20Borm+TR<20ri	8.00	184.48	185.50	185.50	185.80	0.015693	2.45	3.27	5.36	1.00
Rio San Pietro	2	116.00*	TR20Borm+TR20rii	34.30	184.48	186.29	186.29	186.42	0.005272	2.21	44.98	156.32	0.65
Rio San Pietro	2	116.00*	TR20Borm+TR200ri	49.10	184.48	186.27	186.38	186.58	0.011958	3.29	42.47	150.40	0.97
Rio San Pietro	2	116.00*	TR200Borm+TR20ri	34.30	184.48	186.74	186.29	186.75	0.000425	0.78	120.51	171.02	0.19
Rio San Pietro	2	116.00*	2016Borm+TR20rii	34.30	184.48	186.29	186.29	186.42	0.005272	2.21	44.98	156.32	0.65
Rio San Pietro	2	116.00*	1994Borm+TR20rii	34.30	184.48	187.61	186.29	187.61	0.000035	0.29	270.87	172.91	0.06
Rio San Pietro	2	115	TR20Borm+TR<20ri	8.00	184.09	185.10	185.09	185.41	0.014725	2.45	3.27	5.02	0.97
Rio San Pietro	2	115	TR20Borm+TR20rii	34.30	184.09	185.82	185.94	186.21	0.012028	3.26	21.68	55.18	0.96
Rio San Pietro	2	115	TR20Borm+TR200ri	49.10	184.09	186.13	186.04	186.22	0.003392	2.03	69.68	167.69	0.53
Rio San Pietro	2	115	TR200Borm+TR20ri	34.30	184.09	186.74	185.94	186.74	0.000133	0.50	181.54	188.89	0.11
Rio San Pietro	2	115	2016Borm+TR20rii	34.30	184.09	185.82	185.94	186.21	0.012028	3.26	21.68	55.18	0.96
Rio San Pietro	2	115	1994Borm+TR20rii	34.30	184.09	187.61	185.94	187.61	0.000017	0.23	347.58	190.60	0.04
Rio San Pietro	2	114.00*	TR20Borm+TR<20ri	8.00	183.67	184.75	184.73	185.05	0.014092	2.39	3.35	5.19	0.95
Rio San Pietro	2	114.00*	TR20Borm+TR20rii	34.30	183.67	185.64	185.73	185.94	0.008059	2.81	24.49	70.93	0.80
Rio San Pietro	2	114.00*	TR20Borm+TR200ri	49.10	183.67	186.09		186.15	0.001858	1.65	81.12	156.17	0.40
Rio San Pietro	2	114.00*	TR200Borm+TR20ri	34.30	183.67	186.73		186.74	0.000094	0.46	200.08	197.52	0.10
Rio San Pietro	2	114.00*	2016Borm+TR20rii	34.30	183.67	185.79	185.73	185.93	0.003688	2.05	40.26	120.09	0.55
Rio San Pietro	2	114.00*	1994Borm+TR20rii	34.30	183.67	187.61		187.61	0.000014	0.22	377.54	204.47	0.04
Rio San Pietro	2	113.00*	TR20Borm+TR<20ri	8.00	183.26	184.65		184.80	0.005367	1.67	4.79	6.07	0.60
Rio San Pietro	2	113.00*	TR20Borm+TR20rii	34.30	183.26	185.66	185.45	185.76	0.002530	1.79	41.84	115.54	0.46
Rio San Pietro	2	113.00*	TR20Borm+TR200ri	49.10	183.26	186.07		186.11	0.001007	1.32	97.81	163.30	0.30
Rio San Pietro	2	113.00*	TR200Borm+TR20ri	34.30	183.26	186.73		186.73	0.000067	0.41	220.74	205.97	0.08
Rio San Pietro	2	113.00*	2016Borm+TR20rii	34.30	183.26	185.79		185.85	0.001420	1.42	58.05	126.96	0.35
Rio San Pietro	2	113.00*	1994Borm+TR20rii	34.30	183.26	187.61		187.61	0.000011	0.21	407.00	217.45	0.04
Rio San Pietro	2	112.00*	TR20Borm+TR<20ri	8.00	182.85	184.63	183.99	184.70	0.001955	1.14	6.99	7.21	0.37
Rio San Pietro	2	112.00*	TR20Borm+TR20rii	34.30	182.85	185.11	185.03	185.61	0.010563	3.14	11.03	10.37	0.90
Rio San Pietro	2	112.00*	TR20Borm+TR200ri	49.10	182.85	185.60	185.60	186.02	0.006079	2.98	24.40	66.22	0.72
Rio San Pietro	2	112.00*	TR200Borm+TR20ri	34.30	182.85	186.72	185.03	186.73	0.000114	0.57	163.45	167.77	0.11
Rio San Pietro	2	112.00*	2016Borm+TR20rii	34.30	182.85	185.55	185.03	185.78	0.003404	2.18	21.52	47.18	0.54
Rio San Pietro	2	112.00*	1994Borm+TR20rii	34.30	182.85	187.61	185.03	187.61	0.000018	0.27	319.65	182.51	0.05
Rio San Pietro	2	111.00*	TR20Borm+TR<20ri	8.00	182.43	184.62	183.61	184.66	0.000836	0.83	9.69	8.56	0.25
Rio San Pietro	2	111.00*	TR20Borm+TR20rii	34.30	182.43	185.05	184.68	185.37	0.005642	2.50	14.08	11.83	0.67
Rio San Pietro	2	111.00*	TR20Borm+TR200ri	49.10	182.43	185.50	185.04	185.81	0.004007	2.53	27.90	57.82	0.59
Rio San Pietro	2	111.00*	TR200Borm+TR20ri	34.30	182.43	186.72	184.68	186.73	0.000080	0.50	180.46	168.45	0.09
Rio San Pietro	2	111.00*	2016Borm+TR20rii	34.30	182.43	185.56	184.68	185.69	0.001710	1.69	31.41	72.66	0.39

HEC-RAS Plan: Lotto1B (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	111.00*	1994Borm+TR20rii	34.30	182.43	187.61	184.68	187.61	0.000015	0.26	343.18	192.25	0.04
Rio San Pietro	2	110.00*	TR20Borm+TR<20ri	8.00	182.02	184.62	183.20	184.64	0.000383	0.62	12.93	10.43	0.17
Rio San Pietro	2	110.00*	TR20Borm+TR20rii	34.30	182.02	185.03	184.32	185.23	0.003008	1.99	17.92	13.67	0.50
Rio San Pietro	2	110.00*	TR20Borm+TR200ri	49.10	182.02	185.52	184.68	185.70	0.002109	1.98	39.54	80.22	0.44
Rio San Pietro	2	110.00*	TR200Borm+TR20ri	34.30	182.02	186.72	184.32	186.73	0.000058	0.45	200.18	175.29	0.08
Rio San Pietro	2	110.00*	2016Borm+TR20rii	34.30	182.02	185.57	184.32	185.65	0.000930	1.34	43.42	90.39	0.29
Rio San Pietro	2	110.00*	1994Borm+TR20rii	34.30	182.02	187.61	184.32	187.61	0.000012	0.24	369.38	202.08	0.04
Rio San Pietro	2	109	TR20Borm+TR<20ri	8.00	181.60	184.62	182.79	184.63	0.000193	0.49	16.81	12.40	0.12
Rio San Pietro	2	109	TR20Borm+TR20rii	34.30	181.60	185.03	183.95	185.16	0.001679	1.61	23.80	37.34	0.38
Rio San Pietro	2	109	TR20Borm+TR200ri	49.10	181.60	185.53	184.32	185.64	0.001203	1.60	52.77	95.99	0.33
Rio San Pietro	2	109	TR200Borm+TR20ri	34.30	181.60	186.72	183.95	186.72	0.000043	0.40	221.47	182.26	0.07
Rio San Pietro	2	109	2016Borm+TR20rii	34.30	181.60	185.57	183.95	185.62	0.000532	1.08	56.79	96.96	0.22
Rio San Pietro	2	109	1994Borm+TR20rii	34.30	181.60	187.61	183.95	187.61	0.000010	0.22	397.18	212.02	0.03
Rio San Pietro	1	108	TR20Borm+TR<20ri	8.00	180.99	184.62	182.40	184.63	0.000113	0.43	20.11	17.01	0.10
Rio San Pietro	1	108	TR20Borm+TR20rii	34.30	180.99	185.03	183.66	185.13	0.001029	1.47	28.82	22.80	0.30
Rio San Pietro	1	108	TR20Borm+TR200ri	49.10	180.99	185.50	184.02	185.63	0.001032	1.65	39.60	22.80	0.31
Rio San Pietro	1	108	TR200Borm+TR20ri	34.30	180.99	186.70	183.66	186.72	0.000130	0.74	66.93	22.80	0.12
Rio San Pietro	1	108	2016Borm+TR20rii	34.30	180.99	185.56	183.66	185.61	0.000467	1.13	40.83	22.80	0.21
Rio San Pietro	1	108	1994Borm+TR20rii	34.30	180.99	187.59	183.66	187.61	0.000062	0.58	87.30	22.80	0.08
Rio San Pietro	1	107.00*	TR20Borm+TR<20ri	8.00	180.57	184.62	182.00	184.62	0.000073	0.36	24.53	20.45	0.08
Rio San Pietro	1	107.00*	TR20Borm+TR20rii	34.30	180.57	185.03	183.30	185.10	0.000694	1.25	33.54	22.10	0.25
Rio San Pietro	1	107.00*	TR20Borm+TR200ri	49.10	180.57	185.50	183.73	185.59	0.000739	1.44	43.97	22.10	0.26
Rio San Pietro	1	107.00*	TR200Borm+TR20ri	34.30	180.57	186.70	183.30	186.72	0.000102	0.67	70.47	22.10	0.10
Rio San Pietro	1	107.00*	2016Borm+TR20rii	34.30	180.57	185.55	183.30	185.60	0.000337	0.98	45.18	22.10	0.18
Rio San Pietro	1	107.00*	1994Borm+TR20rii	34.30	180.57	187.59	183.30	187.60	0.000051	0.53	90.22	22.10	0.07
Rio San Pietro	1	106.00*	TR20Borm+TR<20ri	8.00	180.14	184.62	181.60	184.62	0.000050	0.31	29.45	21.40	0.06
Rio San Pietro	1	106.00*	TR20Borm+TR20rii	34.30	180.14	185.03	182.90	185.08	0.000493	1.08	38.21	21.40	0.21
Rio San Pietro	1	106.00*	TR20Borm+TR200ri	49.10	180.14	185.50	183.33	185.57	0.000552	1.27	48.30	21.40	0.23
Rio San Pietro	1	106.00*	TR200Borm+TR20ri	34.30	180.14	186.70	182.90	186.72	0.000083	0.61	73.99	21.40	0.09
Rio San Pietro	1	106.00*	2016Borm+TR20rii	34.30	180.14	185.55	182.90	185.59	0.000252	0.87	49.49	21.40	0.15
Rio San Pietro	1	106.00*	1994Borm+TR20rii	34.30	180.14	187.59	182.90	187.60	0.000043	0.49	93.12	21.40	0.07
Rio San Pietro	1	105	TR20Borm+TR<20ri	8.00	179.72	184.62	181.18	184.62	0.000035	0.26	34.61	20.70	0.05
Rio San Pietro	1	105	TR20Borm+TR20rii	34.30	179.72	185.03	182.50	185.07	0.000361	0.94	43.06	20.70	0.18
Rio San Pietro	1	105	TR20Borm+TR200ri	49.10	179.72	185.50	182.94	185.56	0.000421	1.12	52.83	20.70	0.20
Rio San Pietro	1	105	TR200Borm+TR20ri	34.30	179.72	186.70	182.50	186.71	0.000067	0.55	77.69	20.70	0.08
Rio San Pietro	1	105	2016Borm+TR20rii	34.30	179.72	185.55	182.50	185.58	0.000193	0.77	53.99	20.70	0.13

HEC-RAS Plan: Lotto1B (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	1	105	1994Borm+TR20rii	34.30	179.72	187.59	182.50	187.60	0.000036	0.45	96.20	20.70	0.06
Rio San Pietro	1	104.5		Bridge									
Rio San Pietro	1	104	TR20Borm+TR<20ri	8.00	179.17	184.59	180.38	184.60	0.000011	0.19	47.49	18.70	0.03
Rio San Pietro	1	104	TR20Borm+TR20rii	34.30	179.17	184.57	181.58	184.60	0.000199	0.80	46.96	18.70	0.14
Rio San Pietro	1	104	TR20Borm+TR200ri	49.10	179.17	184.53	181.97	184.60	0.000422	1.16	46.32	18.70	0.20
Rio San Pietro	1	104	TR200Borm+TR20ri	34.30	179.17	186.23	181.58	186.25	0.000049	0.52	78.13	18.70	0.07
Rio San Pietro	1	104	2016Borm+TR20rii	34.30	179.17	185.09	181.58	185.11	0.000120	0.68	56.77	18.70	0.11
Rio San Pietro	1	104	1994Borm+TR20rii	34.30	179.17	187.13	181.58	187.13	0.000028	0.44	94.84	18.70	0.06
Rio Sacco	1	306	TR20Borm+TR<20ri	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	TR20Borm+TR20rii	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	TR20Borm+TR200ri	14.50	187.71	189.12	189.31	189.78	0.030031	3.58	4.05	5.84	1.37
Rio Sacco	1	306	TR200Borm+TR20ri	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	2016Borm+TR20rii	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	1994Borm+TR20rii	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	305	TR20Borm+TR<20ri	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	TR20Borm+TR20rii	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	TR20Borm+TR200ri	14.50	185.28	187.58	187.02	187.77	0.004776	1.95	7.45	5.81	0.55
Rio Sacco	1	305	TR200Borm+TR20ri	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	2016Borm+TR20rii	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	1994Borm+TR20rii	10.10	185.28	187.71	186.77	187.78	0.001772	1.23	8.24	6.10	0.34
Rio Sacco	1	304.5		Bridge									
Rio Sacco	1	304	TR20Borm+TR<20ri	10.10	183.36	185.26		185.33	0.001776	1.23	8.24	6.70	0.35
Rio Sacco	1	304	TR20Borm+TR20rii	10.10	183.36	185.26		185.33	0.001776	1.23	8.24	6.70	0.35
Rio Sacco	1	304	TR20Borm+TR200ri	14.50	183.36	184.29	184.72	185.67	0.069547	5.19	2.80	4.32	2.06
Rio Sacco	1	304	TR200Borm+TR20ri	10.10	183.36	186.85		186.86	0.000136	0.47	21.38	9.97	0.10
Rio Sacco	1	304	2016Borm+TR20rii	10.10	183.36	185.75		185.79	0.000662	0.85	11.84	7.76	0.22
Rio Sacco	1	304	1994Borm+TR20rii	10.10	183.36	187.71		187.71	0.000052	0.33	30.90	12.03	0.07
Rio Sacco	1	303	TR20Borm+TR<20ri	10.10	182.69	185.25		185.30	0.000858	0.95	10.61	6.82	0.24
Rio Sacco	1	303	TR20Borm+TR20rii	10.10	182.69	185.25		185.30	0.000858	0.95	10.61	6.82	0.24
Rio Sacco	1	303	TR20Borm+TR200ri	14.50	182.69	185.22	184.21	185.32	0.001864	1.39	10.40	6.74	0.36
Rio Sacco	1	303	TR200Borm+TR20ri	10.10	182.69	186.85		186.86	0.000092	0.39	25.76	12.22	0.09
Rio Sacco	1	303	2016Borm+TR20rii	10.10	182.69	185.75		185.78	0.000403	0.70	14.45	8.52	0.17
Rio Sacco	1	303	1994Borm+TR20rii	10.10	182.69	187.71		187.71	0.000032	0.27	39.05	18.26	0.05
Rio Sacco	1	302	TR20Borm+TR<20ri	10.10	182.41	185.27		185.28	0.000069	0.35	33.77	26.12	0.08

HEC-RAS Plan: Lotto1B (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio Sacco	1	302	TR20Borm+TR20rii	10.10	182.41	185.27		185.28	0.000069	0.35	33.77	26.12	0.08
Rio Sacco	1	302	TR20Borm+TR200ri	14.50	182.41	185.27		185.28	0.000144	0.50	33.65	26.09	0.12
Rio Sacco	1	302	TR200Borm+TR20ri	10.10	182.41	186.85		186.85	0.000007	0.17	85.72	55.00	0.03
Rio Sacco	1	302	2016Borm+TR20rii	10.10	182.41	185.76		185.77	0.000029	0.27	47.21	28.40	0.06
Rio Sacco	1	302	1994Borm+TR20rii	10.10	182.41	187.71		187.71	0.000003	0.12	132.86	55.00	0.02
Rio Sacco	1	301	TR20Borm+TR<20ri	10.10	181.63	185.27		185.28	0.000038	0.28	50.92	31.18	0.06
Rio Sacco	1	301	TR20Borm+TR20rii	10.10	181.63	185.27		185.28	0.000038	0.28	50.92	31.18	0.06
Rio Sacco	1	301	TR20Borm+TR200ri	14.50	181.63	185.27		185.28	0.000080	0.41	50.83	31.17	0.09
Rio Sacco	1	301	TR200Borm+TR20ri	10.10	181.63	186.85		186.85	0.000005	0.14	114.84	56.40	0.02
Rio Sacco	1	301	2016Borm+TR20rii	10.10	181.63	185.76		185.77	0.000018	0.22	66.49	32.49	0.04
Rio Sacco	1	301	1994Borm+TR20rii	10.10	181.63	187.71		187.71	0.000002	0.11	163.17	56.40	0.02
Rio Madama	1	405	TR20Borm+TR<20ri	1.00	194.39	194.70	194.82	195.08	0.080108	2.73	0.37	1.70	1.87
Rio Madama	1	405	TR20Borm+TR20rii	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	TR20Borm+TR200ri	8.10	194.39	195.24	195.61	196.41	0.080011	4.79	1.69	3.17	2.10
Rio Madama	1	405	TR200Borm+TR20ri	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	2016Borm+TR20rii	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	1994Borm+TR20rii	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	404	TR20Borm+TR<20ri	1.00	187.14	187.58	187.55	187.69	0.015295	1.47	0.68	2.32	0.87
Rio Madama	1	404	TR20Borm+TR20rii	5.60	187.14	188.08	188.08	188.36	0.016189	2.36	2.38	4.20	1.00
Rio Madama	1	404	TR20Borm+TR200ri	8.10	187.14	187.91	188.14	189.06	0.087864	4.75	1.71	3.76	2.24
Rio Madama	1	404	TR200Borm+TR20ri	5.60	187.14	188.08	188.08	188.36	0.016189	2.36	2.38	4.20	1.00
Rio Madama	1	404	2016Borm+TR20rii	5.60	187.14	188.08	188.08	188.36	0.016189	2.36	2.38	4.20	1.00
Rio Madama	1	404	1994Borm+TR20rii	5.60	187.14	188.08	188.08	188.36	0.016189	2.36	2.38	4.20	1.00
Rio Madama	1	403	TR20Borm+TR<20ri	1.00	186.20	186.65	186.65	186.81	0.022527	1.78	0.56	1.73	1.00
Rio Madama	1	403	TR20Borm+TR20rii	5.60	186.20	187.12	187.12	187.12	0.000517	0.37	18.46	22.64	0.17
Rio Madama	1	403	TR20Borm+TR200ri	8.10	186.20	187.12	187.12	187.13	0.001082	0.53	18.46	22.64	0.24
Rio Madama	1	403	TR200Borm+TR20ri	5.60	186.20	187.12	187.12	187.12	0.000517	0.37	18.46	22.64	0.17
Rio Madama	1	403	2016Borm+TR20rii	5.60	186.20	187.12	187.12	187.12	0.000517	0.37	18.46	22.64	0.17
Rio Madama	1	403	1994Borm+TR20rii	5.60	186.20	187.61	187.12	187.61	0.000109	0.27	29.54	22.64	0.09
Rio Madama	1	402	TR20Borm+TR<20ri	1.00	184.94	185.38	185.38	185.50	0.020276	1.58	0.63	2.46	0.99
Rio Madama	1	402	TR20Borm+TR20rii	5.60	184.94	185.54	185.88	186.88	0.152691	5.13	1.09	3.27	2.84
Rio Madama	1	402	TR20Borm+TR200ri	8.10	184.94	185.71	185.94	186.81	0.099221	4.63	1.75	4.44	2.36
Rio Madama	1	402	TR200Borm+TR20ri	5.60	184.94	186.73	185.88	186.73	0.000080	0.29	30.57	24.34	0.08
Rio Madama	1	402	2016Borm+TR20rii	5.60	184.94	185.54	185.88	186.88	0.152691	5.13	1.09	3.27	2.84
Rio Madama	1	402	1994Borm+TR20rii	5.60	184.94	187.61	185.88	187.61	0.000014	0.17	52.04	24.34	0.04
Rio Madama	1	401	TR20Borm+TR<20ri	1.00	183.68	184.62	184.13	184.63	0.000681	0.46	2.18	4.05	0.20

HEC-RAS Plan: Lotto1B (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio Madama	1	401	TR20Borm+TR20rii	5.60	183.68	185.13	184.67	185.17	0.002472	0.98	8.27	28.20	0.40
Rio Madama	1	401	TR20Borm+TR200ri	8.10	183.68	185.65	184.86	185.66	0.000360	0.56	22.96	28.20	0.17
Rio Madama	1	401	TR200Borm+TR20ri	5.60	183.68	186.73	184.67	186.73	0.000013	0.17	53.23	28.20	0.04
Rio Madama	1	401	2016Borm+TR20rii	5.60	183.68	185.62	184.67	185.63	0.000191	0.40	22.18	28.20	0.12
Rio Madama	1	401	1994Borm+TR20rii	5.60	183.68	187.61	184.67	187.61	0.000004	0.12	78.12	28.20	0.02
Rio Caffra	1	205	TR20Borm+TR<20ri	5.00	190.88	191.70	191.54	191.80	0.006656	1.37	3.66	8.42	0.64
Rio Caffra	1	205	TR20Borm+TR20rii	19.20	190.88	192.26	192.11	192.38	0.004192	1.71	17.62	37.78	0.57
Rio Caffra	1	205	TR20Borm+TR200ri	27.70	190.88	192.45	192.26	192.58	0.003695	1.83	25.03	39.34	0.56
Rio Caffra	1	205	TR200Borm+TR20ri	19.20	190.88	192.26	192.11	192.38	0.004192	1.71	17.62	37.78	0.57
Rio Caffra	1	205	2016Borm+TR20rii	19.20	190.88	192.26	192.11	192.38	0.004192	1.71	17.62	37.78	0.57
Rio Caffra	1	205	1994Borm+TR20rii	19.20	190.88	192.26	192.11	192.38	0.004192	1.71	17.62	37.78	0.57
Rio Caffra	1	203	TR20Borm+TR<20ri	5.00	190.29	191.15	191.15	191.40	0.017312	2.22	2.25	4.61	1.01
Rio Caffra	1	203	TR20Borm+TR20rii	19.20	190.29	191.76	191.76	192.10	0.013221	2.78	9.42	17.27	0.97
Rio Caffra	1	203	TR20Borm+TR200ri	27.70	190.29	191.98	191.98	192.33	0.011851	2.91	13.41	19.28	0.94
Rio Caffra	1	203	TR200Borm+TR20ri	19.20	190.29	191.76	191.76	192.10	0.013221	2.78	9.42	17.27	0.97
Rio Caffra	1	203	2016Borm+TR20rii	19.20	190.29	191.76	191.76	192.10	0.013221	2.78	9.42	17.27	0.97
Rio Caffra	1	203	1994Borm+TR20rii	19.20	190.29	191.76	191.76	192.10	0.013221	2.78	9.42	17.27	0.97
Rio Caffra	1	201	TR20Borm+TR<20ri	5.00	189.19	189.92	190.06	190.39	0.042417	3.04	1.64	4.16	1.54
Rio Caffra	1	201	TR20Borm+TR20rii	19.20	189.19	191.44	190.74	191.52	0.001387	1.38	19.60	18.90	0.35
Rio Caffra	1	201	TR20Borm+TR200ri	27.70	189.19	191.57	191.06	191.71	0.002078	1.79	22.17	18.90	0.44
Rio Caffra	1	201	TR200Borm+TR20ri	19.20	189.19	191.44	190.74	191.52	0.001387	1.38	19.60	18.90	0.35
Rio Caffra	1	201	2016Borm+TR20rii	19.20	189.19	191.44	190.74	191.52	0.001387	1.38	19.60	18.90	0.35
Rio Caffra	1	201	1994Borm+TR20rii	19.20	189.19	191.44	190.74	191.52	0.001387	1.38	19.60	18.90	0.35
Bormida	3	43	TR20Borm+TR<20ri	833.00	179.12	184.87	183.40	185.64	0.002549	3.94	247.87	151.29	0.58
Bormida	3	43	TR20Borm+TR20rii	833.00	179.12	184.87	183.40	185.64	0.002549	3.94	247.87	151.29	0.58
Bormida	3	43	TR20Borm+TR200ri	833.00	179.12	184.87	183.40	185.64	0.002549	3.94	247.88	151.29	0.58
Bormida	3	43	TR200Borm+TR20ri	1469.00	179.12	186.29	185.68	187.18	0.002386	4.54	513.08	194.37	0.58
Bormida	3	43	2016Borm+TR20rii	1000.00	179.12	185.27	183.86	186.13	0.002610	4.21	316.58	184.94	0.59
Bormida	3	43	1994Borm+TR20rii	1900.00	179.12	187.14	186.30	188.01	0.002133	4.68	678.95	195.89	0.56
Bormida	3	42.000*	TR20Borm+TR<20ri	833.00	179.09	184.83	183.35	185.57	0.002503	3.82	250.30	167.15	0.57
Bormida	3	42.000*	TR20Borm+TR20rii	833.00	179.09	184.83	183.35	185.57	0.002503	3.82	250.30	167.15	0.57
Bormida	3	42.000*	TR20Borm+TR200ri	833.00	179.09	184.83	183.35	185.57	0.002502	3.82	250.32	167.15	0.57
Bormida	3	42.000*	TR200Borm+TR20ri	1469.00	179.09	186.30		187.10	0.002185	4.31	540.26	204.08	0.56
Bormida	3	42.000*	2016Borm+TR20rii	1000.00	179.09	185.26	183.81	186.05	0.002479	4.04	329.32	193.96	0.58
Bormida	3	42.000*	1994Borm+TR20rii	1900.00	179.09	187.16		187.93	0.001928	4.42	716.28	205.93	0.54
Bormida	3	41.000*	TR20Borm+TR<20ri	833.00	179.06	184.79	183.29	185.50	0.002490	3.73	252.80	190.66	0.57

HEC-RAS Plan: Lotto1B (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	3	41.000*	TR20Borm+TR20rii	833.00	179.06	184.79	183.29	185.50	0.002490	3.73	252.80	190.66	0.57
Bormida	3	41.000*	TR20Borm+TR200ri	833.00	179.06	184.79	183.29	185.50	0.002490	3.73	252.82	190.67	0.57
Bormida	3	41.000*	TR200Borm+TR20ri	1469.00	179.06	186.30		187.02	0.002029	4.10	565.79	213.81	0.54
Bormida	3	41.000*	2016Borm+TR20rii	1000.00	179.06	185.24	183.76	185.97	0.002390	3.90	340.12	202.79	0.57
Bormida	3	41.000*	1994Borm+TR20rii	1900.00	179.06	187.17		187.86	0.001766	4.19	752.33	216.30	0.51
Bormida	3	40.000*	TR20Borm+TR<20ri	833.00	179.04	184.76	183.24	185.43	0.002456	3.64	255.66	194.11	0.56
Bormida	3	40.000*	TR20Borm+TR20rii	833.00	179.04	184.76	183.24	185.43	0.002456	3.64	255.65	194.09	0.56
Bormida	3	40.000*	TR20Borm+TR200ri	833.00	179.04	184.76	183.24	185.43	0.002456	3.64	255.68	194.16	0.56
Bormida	3	40.000*	TR200Borm+TR20ri	1469.00	179.04	186.30		186.95	0.001904	3.93	589.96	223.61	0.52
Bormida	3	40.000*	2016Borm+TR20rii	1000.00	179.04	185.21	183.69	185.90	0.002335	3.78	349.15	211.52	0.56
Bormida	3	40.000*	1994Borm+TR20rii	1900.00	179.04	187.18		187.80	0.001632	3.99	787.50	226.80	0.49
Bormida	3	39.000*	TR20Borm+TR<20ri	833.00	179.01	184.72	183.17	185.36	0.002406	3.55	262.04	161.29	0.56
Bormida	3	39.000*	TR20Borm+TR20rii	833.00	179.01	184.72	183.17	185.36	0.002406	3.55	262.04	161.27	0.56
Bormida	3	39.000*	TR20Borm+TR200ri	833.00	179.01	184.72	183.17	185.36	0.002406	3.55	262.07	161.33	0.56
Bormida	3	39.000*	TR200Borm+TR20ri	1469.00	179.01	186.29		186.89	0.001803	3.77	612.93	233.61	0.51
Bormida	3	39.000*	2016Borm+TR20rii	1000.00	179.01	185.18	183.62	185.83	0.002307	3.69	356.38	220.00	0.55
Bormida	3	39.000*	1994Borm+TR20rii	1900.00	179.01	187.18		187.74	0.001520	3.82	821.95	237.14	0.48
Bormida	3	38.000*	TR20Borm+TR<20ri	833.00	178.98	184.68		185.29	0.002370	3.46	271.35	156.90	0.55
Bormida	3	38.000*	TR20Borm+TR20rii	833.00	178.98	184.68		185.29	0.002370	3.46	271.35	156.90	0.55
Bormida	3	38.000*	TR20Borm+TR200ri	833.00	178.98	184.68		185.29	0.002369	3.46	271.38	156.91	0.55
Bormida	3	38.000*	TR200Borm+TR20ri	1469.00	178.98	186.28		186.84	0.001720	3.64	634.94	244.42	0.49
Bormida	3	38.000*	2016Borm+TR20rii	1000.00	178.98	185.14	183.55	185.77	0.002288	3.61	361.77	228.59	0.55
Bormida	3	38.000*	1994Borm+TR20rii	1900.00	178.98	187.17		187.69	0.001424	3.66	856.00	247.62	0.46
Bormida	3	37	TR20Borm+TR<20ri	833.00	178.95	184.65		185.22	0.002347	3.39	280.89	157.08	0.55
Bormida	3	37	TR20Borm+TR20rii	833.00	178.95	184.65		185.22	0.002347	3.39	280.88	157.08	0.55
Bormida	3	37	TR20Borm+TR200ri	833.00	178.95	184.65		185.22	0.002346	3.39	280.91	157.09	0.55
Bormida	3	37	TR200Borm+TR20ri	1469.00	178.95	186.26		186.78	0.001651	3.51	656.57	256.23	0.48
Bormida	3	37	2016Borm+TR20rii	1000.00	178.95	185.09	183.47	185.71	0.002282	3.55	365.08	237.26	0.55
Bormida	3	37	1994Borm+TR20rii	1900.00	178.95	187.17		187.65	0.001342	3.51	889.98	257.98	0.45
Bormida	2	35	TR20Borm+TR<20ri	833.00	178.59	184.63		185.15	0.001847	3.21	298.69	158.11	0.49
Bormida	2	35	TR20Borm+TR20rii	833.00	178.59	184.63		185.15	0.001847	3.21	298.68	158.11	0.49
Bormida	2	35	TR20Borm+TR200ri	833.00	178.59	184.63		185.15	0.001847	3.21	298.72	158.13	0.49
Bormida	2	35	TR200Borm+TR20ri	1469.00	178.59	186.22		186.74	0.001460	3.50	669.42	263.40	0.46
Bormida	2	35	2016Borm+TR20rii	1000.00	178.59	185.08		185.64	0.001819	3.39	387.68	230.98	0.49
Bormida	2	35	1994Borm+TR20rii	1900.00	178.59	187.13		187.61	0.001227	3.52	918.68	276.60	0.43
Bormida	2	34.000*	TR20Borm+TR<20ri	833.00	178.53	184.58		185.10	0.001859	3.23	296.82	173.28	0.49

HEC-RAS Plan: Lotto1B (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	2	34.000*	TR20Borm+TR20rii	833.00	178.53	184.58		185.10	0.001859	3.23	296.82	173.28	0.49
Bormida	2	34.000*	TR20Borm+TR200ri	833.00	178.53	184.58		185.10	0.001859	3.23	296.86	173.31	0.49
Bormida	2	34.000*	TR200Borm+TR20ri	1469.00	178.53	186.19		186.71	0.001435	3.49	673.91	264.89	0.45
Bormida	2	34.000*	2016Borm+TR20rii	1000.00	178.53	185.04		185.59	0.001775	3.37	394.81	222.37	0.49
Bormida	2	34.000*	1994Borm+TR20rii	1900.00	178.53	187.11		187.58	0.001206	3.51	922.93	272.17	0.42
Bormida	2	33.000*	TR20Borm+TR<20ri	833.00	178.46	184.53		185.06	0.001861	3.24	300.55	207.62	0.49
Bormida	2	33.000*	TR20Borm+TR20rii	833.00	178.46	184.53		185.06	0.001861	3.24	300.54	207.62	0.49
Bormida	2	33.000*	TR20Borm+TR200ri	833.00	178.46	184.53		185.06	0.001861	3.24	300.59	207.62	0.49
Bormida	2	33.000*	TR200Borm+TR20ri	1469.00	178.46	186.16		186.67	0.001410	3.48	681.42	267.74	0.45
Bormida	2	33.000*	2016Borm+TR20rii	1000.00	178.46	185.01		185.54	0.001734	3.35	401.59	217.34	0.48
Bormida	2	33.000*	1994Borm+TR20rii	1900.00	178.46	187.08		187.55	0.001185	3.50	928.07	267.74	0.42
Bormida	2	32.000*	TR20Borm+TR<20ri	833.00	178.40	184.49		185.01	0.001826	3.23	309.54	198.59	0.49
Bormida	2	32.000*	TR20Borm+TR20rii	833.00	178.40	184.49		185.01	0.001826	3.23	309.54	198.59	0.49
Bormida	2	32.000*	TR20Borm+TR200ri	833.00	178.40	184.49		185.01	0.001826	3.23	309.59	198.60	0.49
Bormida	2	32.000*	TR200Borm+TR20ri	1469.00	178.40	186.14		186.64	0.001380	3.45	690.50	263.31	0.44
Bormida	2	32.000*	2016Borm+TR20rii	1000.00	178.40	184.97		185.50	0.001696	3.33	408.26	210.30	0.48
Bormida	2	32.000*	1994Borm+TR20rii	1900.00	178.40	187.06		187.52	0.001164	3.48	934.00	263.31	0.42
Bormida	2	31.000*	TR20Borm+TR<20ri	833.00	178.33	184.45		184.96	0.001791	3.21	317.88	189.76	0.48
Bormida	2	31.000*	TR20Borm+TR20rii	833.00	178.33	184.45		184.96	0.001791	3.21	317.87	189.76	0.48
Bormida	2	31.000*	TR20Borm+TR200ri	833.00	178.33	184.45		184.96	0.001791	3.21	317.93	189.77	0.48
Bormida	2	31.000*	TR200Borm+TR20ri	1469.00	178.33	186.11		186.60	0.001348	3.43	700.58	258.89	0.44
Bormida	2	31.000*	2016Borm+TR20rii	1000.00	178.33	184.94		185.45	0.001661	3.31	415.02	209.08	0.47
Bormida	2	31.000*	1994Borm+TR20rii	1900.00	178.33	187.04		187.49	0.001142	3.46	940.72	258.89	0.41
Bormida	2	30.000*	TR20Borm+TR<20ri	833.00	178.27	184.42	182.60	184.91	0.001757	3.19	325.87	186.45	0.48
Bormida	2	30.000*	TR20Borm+TR20rii	833.00	178.27	184.42	182.60	184.91	0.001757	3.19	325.86	186.45	0.48
Bormida	2	30.000*	TR20Borm+TR200ri	833.00	178.27	184.42	182.60	184.91	0.001756	3.19	325.93	186.46	0.48
Bormida	2	30.000*	TR200Borm+TR20ri	1469.00	178.27	186.04	184.57	186.56	0.001435	3.53	642.95	206.34	0.45
Bormida	2	30.000*	2016Borm+TR20rii	1000.00	178.27	184.91	183.02	185.41	0.001630	3.29	418.89	192.01	0.47
Bormida	2	30.000*	1994Borm+TR20rii	1900.00	178.27	186.92	185.22	187.46	0.001304	3.68	825.95	206.34	0.44
Bormida	2	29.000*	TR20Borm+TR<20ri	833.00	178.20	184.38	182.55	184.87	0.001723	3.17	332.71	174.72	0.47
Bormida	2	29.000*	TR20Borm+TR20rii	833.00	178.20	184.38	182.55	184.87	0.001723	3.17	332.70	174.72	0.47
Bormida	2	29.000*	TR20Borm+TR200ri	833.00	178.20	184.38	182.55	184.87	0.001722	3.17	332.76	174.72	0.47
Bormida	2	29.000*	TR200Borm+TR20ri	1469.00	178.20	185.99	184.48	186.52	0.001463	3.56	628.39	195.67	0.46
Bormida	2	29.000*	2016Borm+TR20rii	1000.00	178.20	184.87	182.96	185.37	0.001608	3.27	420.40	181.29	0.46
Bormida	2	29.000*	1994Borm+TR20rii	1900.00	178.20	186.87	185.14	187.42	0.001349	3.73	800.45	195.67	0.45
Bormida	2	28	TR20Borm+TR<20ri	833.00	178.14	184.35	182.49	184.82	0.001693	3.15	337.98	163.61	0.47

HEC-RAS Plan: Lotto1B (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	2	28	TR20Borm+TR20rii	833.00	178.14	184.35	182.49	184.82	0.001693	3.15	337.96	163.61	0.47
Bormida	2	28	TR20Borm+TR200ri	833.00	178.14	184.35	182.49	184.82	0.001693	3.14	338.02	163.62	0.47
Bormida	2	28	TR200Borm+TR20ri	1469.00	178.14	185.94	184.38	186.49	0.001500	3.60	611.79	185.00	0.46
Bormida	2	28	2016Borm+TR20rii	1000.00	178.14	184.84	182.91	185.33	0.001593	3.26	420.20	170.37	0.46
Bormida	2	28	1994Borm+TR20rii	1900.00	178.14	186.81	185.06	187.39	0.001405	3.80	772.70	185.00	0.46
Bormida	2	27.000*	TR20Borm+TR<20ri	833.00	178.10	184.30	182.43	184.78	0.001670	3.14	327.46	147.07	0.46
Bormida	2	27.000*	TR20Borm+TR20rii	833.00	178.10	184.30	182.43	184.78	0.001671	3.14	327.45	147.07	0.46
Bormida	2	27.000*	TR20Borm+TR200ri	833.00	178.10	184.30	182.43	184.78	0.001670	3.14	327.50	147.08	0.46
Bormida	2	27.000*	TR200Borm+TR20ri	1469.00	178.10	185.84	184.20	186.44	0.001592	3.71	573.08	172.72	0.48
Bormida	2	27.000*	2016Borm+TR20rii	1000.00	178.10	184.78	182.85	185.29	0.001624	3.30	399.76	157.63	0.47
Bormida	2	27.000*	1994Borm+TR20rii	1900.00	178.10	186.70	184.98	187.34	0.001518	3.95	720.98	173.03	0.47
Bormida	2	26.000*	TR20Borm+TR<20ri	833.00	178.05	184.27	182.37	184.74	0.001622	3.11	321.21	130.10	0.46
Bormida	2	26.000*	TR20Borm+TR20rii	833.00	178.05	184.27	182.37	184.74	0.001622	3.11	321.20	130.10	0.46
Bormida	2	26.000*	TR20Borm+TR200ri	833.00	178.05	184.27	182.37	184.74	0.001622	3.11	321.25	130.11	0.46
Bormida	2	26.000*	TR200Borm+TR20ri	1469.00	178.05	185.75	184.10	186.39	0.001660	3.79	537.86	157.44	0.49
Bormida	2	26.000*	2016Borm+TR20rii	1000.00	178.05	184.72	182.78	185.25	0.001624	3.31	383.78	143.06	0.47
Bormida	2	26.000*	1994Borm+TR20rii	1900.00	178.05	186.58	184.87	187.30	0.001638	4.09	671.40	161.07	0.49
Bormida	2	25.000*	TR20Borm+TR<20ri	833.00	178.01	184.23	182.29	184.70	0.001570	3.08	317.05	118.68	0.45
Bormida	2	25.000*	TR20Borm+TR20rii	833.00	178.01	184.23	182.29	184.70	0.001570	3.08	317.03	118.68	0.45
Bormida	2	25.000*	TR20Borm+TR200ri	833.00	178.01	184.23	182.29	184.70	0.001570	3.08	317.08	118.68	0.45
Bormida	2	25.000*	TR200Borm+TR20ri	1469.00	178.01	185.66	183.95	186.35	0.001733	3.87	506.00	142.51	0.50
Bormida	2	25.000*	2016Borm+TR20rii	1000.00	178.01	184.68	182.69	185.21	0.001594	3.30	372.29	126.71	0.46
Bormida	2	25.000*	1994Borm+TR20rii	1900.00	178.01	186.46	184.66	187.25	0.001765	4.23	624.35	149.10	0.51
Bormida	2	24.000*	TR20Borm+TR<20ri	833.00	177.97	184.20	182.20	184.66	0.001512	3.05	314.01	108.98	0.45
Bormida	2	24.000*	TR20Borm+TR20rii	833.00	177.97	184.20	182.20	184.66	0.001512	3.05	314.00	108.98	0.45
Bormida	2	24.000*	TR20Borm+TR200ri	833.00	177.97	184.20	182.20	184.66	0.001512	3.05	314.04	108.99	0.45
Bormida	2	24.000*	TR200Borm+TR20ri	1469.00	177.97	185.58	183.81	186.30	0.001793	3.93	477.71	130.16	0.51
Bormida	2	24.000*	2016Borm+TR20rii	1000.00	177.97	184.65	182.61	185.17	0.001554	3.28	363.76	113.79	0.46
Bormida	2	24.000*	1994Borm+TR20rii	1900.00	177.97	186.33	184.57	187.19	0.001896	4.37	580.38	137.13	0.53
Bormida	2	23.000*	TR20Borm+TR<20ri	833.00	177.92	184.17	182.12	184.62	0.001451	3.01	311.58	100.22	0.44
Bormida	2	23.000*	TR20Borm+TR20rii	833.00	177.92	184.17	182.12	184.62	0.001451	3.01	311.57	100.22	0.44
Bormida	2	23.000*	TR20Borm+TR200ri	833.00	177.92	184.17	182.12	184.62	0.001451	3.01	311.61	100.22	0.44
Bormida	2	23.000*	TR200Borm+TR20ri	1469.00	177.92	185.50	183.68	186.25	0.001832	3.98	453.27	117.35	0.51
Bormida	2	23.000*	2016Borm+TR20rii	1000.00	177.92	184.61	182.51	185.13	0.001511	3.25	356.60	103.71	0.45
Bormida	2	23.000*	1994Borm+TR20rii	1900.00	177.92	186.20	184.46	187.14	0.002024	4.49	540.03	125.17	0.55
Bormida	2	22	TR20Borm+TR<20ri	833.00	177.88	184.14	182.02	184.58	0.001389	2.96	309.28	91.24	0.43

HEC-RAS Plan: Lotto1B (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	2	22	TR20Borm+TR20rii	833.00	177.88	184.14	182.02	184.58	0.001389	2.96	309.26	91.23	0.43
Bormida	2	22	TR20Borm+TR200ri	833.00	177.88	184.14	182.02	184.58	0.001389	2.96	309.30	91.24	0.43
Bormida	2	22	TR200Borm+TR20ri	1469.00	177.88	185.44	183.54	186.21	0.001825	3.98	434.23	101.46	0.51
Bormida	2	22	2016Borm+TR20rii	1000.00	177.88	184.58	182.42	185.09	0.001466	3.22	349.96	94.67	0.45
Bormida	2	22	1994Borm+TR20rii	1900.00	177.88	186.07	184.32	187.08	0.002145	4.60	503.49	113.20	0.56
Bormida	1	19	TR20Borm+TR<20ri	833.00	178.13	183.95	182.14	184.46	0.001866	3.16	263.93	62.38	0.49
Bormida	1	19	TR20Borm+TR20rii	833.00	178.13	183.95	182.14	184.46	0.001867	3.16	263.89	62.37	0.49
Bormida	1	19	TR20Borm+TR200ri	833.00	178.13	183.95	182.14	184.46	0.001866	3.16	263.93	62.38	0.49
Bormida	1	19	TR200Borm+TR20ri	1469.00	178.13	185.01	183.51	186.02	0.002799	4.45	337.57	91.82	0.62
Bormida	1	19	2016Borm+TR20rii	1000.00	178.13	184.34	182.53	184.95	0.002037	3.48	288.52	62.96	0.51
Bormida	1	19	1994Borm+TR20rii	1900.00	178.13	185.43	184.28	186.84	0.003567	5.29	400.03	180.00	0.70
Bormida	1	18.000*	TR20Borm+TR<20ri	833.00	177.98	183.91	182.10	184.41	0.001825	3.13	267.64	65.87	0.48
Bormida	1	18.000*	TR20Borm+TR20rii	833.00	177.98	183.91	182.10	184.41	0.001826	3.13	267.59	65.87	0.48
Bormida	1	18.000*	TR20Borm+TR200ri	833.00	177.98	183.91	182.10	184.41	0.001825	3.13	267.64	65.87	0.48
Bormida	1	18.000*	TR200Borm+TR20ri	1469.00	177.98	184.96	183.45	185.94	0.002703	4.40	358.15	150.35	0.61
Bormida	1	18.000*	2016Borm+TR20rii	1000.00	177.98	184.30	182.48	184.90	0.001979	3.44	293.96	72.72	0.51
Bormida	1	18.000*	1994Borm+TR20rii	1900.00	177.98	185.41	184.23	186.73	0.003352	5.16	433.88	189.68	0.69
Bormida	1	17.000*	TR20Borm+TR<20ri	833.00	177.84	183.87	182.04	184.36	0.001746	3.08	273.84	69.40	0.47
Bormida	1	17.000*	TR20Borm+TR20rii	833.00	177.84	183.87	182.04	184.36	0.001747	3.08	273.78	69.40	0.47
Bormida	1	17.000*	TR20Borm+TR200ri	833.00	177.84	183.87	182.04	184.36	0.001746	3.08	273.84	69.40	0.47
Bormida	1	17.000*	TR200Borm+TR20ri	1469.00	177.84	184.94	183.39	185.86	0.002511	4.28	390.31	172.40	0.59
Bormida	1	17.000*	2016Borm+TR20rii	1000.00	177.84	184.27	182.41	184.85	0.001876	3.38	303.98	84.64	0.50
Bormida	1	17.000*	1994Borm+TR20rii	1900.00	177.84	185.41	184.18	186.61	0.003016	4.96	479.10	199.36	0.66
Bormida	1	16.000*	TR20Borm+TR<20ri	833.00	177.69	183.85	181.94	184.31	0.001628	3.01	282.42	83.19	0.46
Bormida	1	16.000*	TR20Borm+TR20rii	833.00	177.69	183.85	181.94	184.31	0.001629	3.01	282.36	83.16	0.46
Bormida	1	16.000*	TR20Borm+TR200ri	833.00	177.69	183.85	181.94	184.31	0.001628	3.01	282.42	83.19	0.46
Bormida	1	16.000*	TR200Borm+TR20ri	1469.00	177.69	184.94	183.29	185.78	0.002256	4.11	431.26	186.80	0.56
Bormida	1	16.000*	2016Borm+TR20rii	1000.00	177.69	184.24	182.32	184.79	0.001744	3.30	319.18	107.61	0.48
Bormida	1	16.000*	1994Borm+TR20rii	1900.00	177.69	185.44	184.13	186.50	0.002636	4.71	532.24	209.03	0.62
Bormida	1	15.000*	TR20Borm+TR<20ri	833.00	177.55	183.83	181.83	184.26	0.001489	2.93	294.87	100.92	0.44
Bormida	1	15.000*	TR20Borm+TR20rii	833.00	177.55	183.83	181.83	184.26	0.001490	2.93	294.79	100.89	0.44
Bormida	1	15.000*	TR20Borm+TR200ri	833.00	177.55	183.83	181.83	184.26	0.001489	2.93	294.87	100.92	0.44
Bormida	1	15.000*	TR200Borm+TR20ri	1469.00	177.55	184.95	183.15	185.70	0.001989	3.93	477.73	206.39	0.53
Bormida	1	15.000*	2016Borm+TR20rii	1000.00	177.55	184.22	182.20	184.74	0.001587	3.20	343.73	163.96	0.46
Bormida	1	15.000*	1994Borm+TR20rii	1900.00	177.55	185.47	184.05	186.40	0.002268	4.45	590.30	218.71	0.58
Bormida	1	14.000*	TR20Borm+TR<20ri	833.00	177.40	183.81	181.69	184.22	0.001333	2.82	313.50	120.99	0.42

HEC-RAS Plan: Lotto1B (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	1	14.000*	TR20Borm+TR20rii	833.00	177.40	183.81	181.69	184.22	0.001334	2.82	313.40	120.93	0.42
Bormida	1	14.000*	TR20Borm+TR200ri	833.00	177.40	183.81	181.69	184.22	0.001333	2.82	313.50	120.99	0.42
Bormida	1	14.000*	TR200Borm+TR20ri	1469.00	177.40	184.97	183.00	185.62	0.001715	3.72	529.99	217.31	0.50
Bormida	1	14.000*	2016Borm+TR20rii	1000.00	177.40	184.22	182.06	184.69	0.001403	3.07	379.84	181.52	0.44
Bormida	1	14.000*	1994Borm+TR20rii	1900.00	177.40	185.51	183.99	186.31	0.001933	4.19	652.18	228.39	0.53
Bormida	1	13.000*	TR20Borm+TR<20ri	833.00	177.26	183.81	181.53	184.18	0.001168	2.70	344.44	174.52	0.40
Bormida	1	13.000*	TR20Borm+TR20rii	833.00	177.26	183.81	181.53	184.18	0.001169	2.70	344.28	174.46	0.40
Bormida	1	13.000*	TR20Borm+TR200ri	833.00	177.26	183.81	181.53	184.18	0.001168	2.70	344.44	174.52	0.40
Bormida	1	13.000*	TR200Borm+TR20ri	1469.00	177.26	184.99	182.84	185.56	0.001464	3.51	585.27	228.38	0.46
Bormida	1	13.000*	2016Borm+TR20rii	1000.00	177.26	184.22	181.90	184.64	0.001215	2.91	421.36	202.67	0.41
Bormida	1	13.000*	1994Borm+TR20rii	1900.00	177.26	185.54	183.73	186.23	0.001642	3.94	716.14	238.07	0.50
Bormida	1	12.000*	TR20Borm+TR<20ri	833.00	177.11	183.81		184.14	0.000991	2.55	386.55	183.11	0.37
Bormida	1	12.000*	TR20Borm+TR20rii	833.00	177.11	183.81		184.14	0.000991	2.55	386.38	183.06	0.37
Bormida	1	12.000*	TR20Borm+TR200ri	833.00	177.11	183.81		184.14	0.000991	2.55	386.55	183.11	0.37
Bormida	1	12.000*	TR200Borm+TR20ri	1469.00	177.11	185.01		185.50	0.001243	3.30	642.14	238.44	0.43
Bormida	1	12.000*	2016Borm+TR20rii	1000.00	177.11	184.23		184.60	0.001026	2.74	470.32	209.90	0.38
Bormida	1	12.000*	1994Borm+TR20rii	1900.00	177.11	185.56		186.17	0.001404	3.72	785.47	264.24	0.46
Bormida	1	11.000*	TR20Borm+TR<20ri	833.00	176.97	183.82		184.10	0.000831	2.40	434.47	203.67	0.34
Bormida	1	11.000*	TR20Borm+TR20rii	833.00	176.97	183.82		184.10	0.000831	2.40	434.29	203.62	0.34
Bormida	1	11.000*	TR20Borm+TR200ri	833.00	176.97	183.82		184.10	0.000831	2.40	434.47	203.67	0.34
Bormida	1	11.000*	TR200Borm+TR20ri	1469.00	176.97	185.02		185.45	0.001053	3.10	702.81	249.12	0.39
Bormida	1	11.000*	2016Borm+TR20rii	1000.00	176.97	184.25		184.56	0.000854	2.56	524.35	215.55	0.35
Bormida	1	11.000*	1994Borm+TR20rii	1900.00	176.97	185.59		186.11	0.001192	3.50	848.11	267.99	0.43
Bormida	1	10	TR20Borm+TR<20ri	833.00	176.82	183.83		184.07	0.000684	2.23	489.55	212.36	0.31
Bormida	1	10	TR20Borm+TR20rii	833.00	176.82	183.83		184.07	0.000684	2.23	489.36	212.34	0.31
Bormida	1	10	TR20Borm+TR200ri	833.00	176.82	183.83		184.07	0.000684	2.23	489.56	212.36	0.31
Bormida	1	10	TR200Borm+TR20ri	1469.00	176.82	185.04		185.41	0.000881	2.90	768.85	254.46	0.36
Bormida	1	10	2016Borm+TR20rii	1000.00	176.82	184.26		184.52	0.000706	2.39	582.85	222.08	0.32
Bormida	1	10	1994Borm+TR20rii	1900.00	176.82	185.61		186.06	0.001006	3.28	915.60	267.18	0.39
Bormida	1	9	TR20Borm+TR<20ri	833.00	176.65	183.83		184.05	0.000563	2.10	515.11	211.40	0.28
Bormida	1	9	TR20Borm+TR20rii	833.00	176.65	183.83		184.05	0.000563	2.10	514.93	211.38	0.28
Bormida	1	9	TR20Borm+TR200ri	833.00	176.65	183.83		184.05	0.000563	2.10	515.12	211.40	0.28
Bormida	1	9	TR200Borm+TR20ri	1469.00	176.65	185.04		185.39	0.000763	2.78	789.50	246.31	0.34
Bormida	1	9	2016Borm+TR20rii	1000.00	176.65	184.26		184.50	0.000594	2.27	607.68	218.58	0.29
Bormida	1	9	1994Borm+TR20rii	1900.00	176.65	185.61		186.03	0.000889	3.17	930.96	251.27	0.37
Bormida	1	8.0000*	TR20Borm+TR<20ri	833.00	176.65	183.79		184.03	0.000637	2.22	497.77	214.27	0.30

HEC-RAS Plan: Lotto1B (Continued)

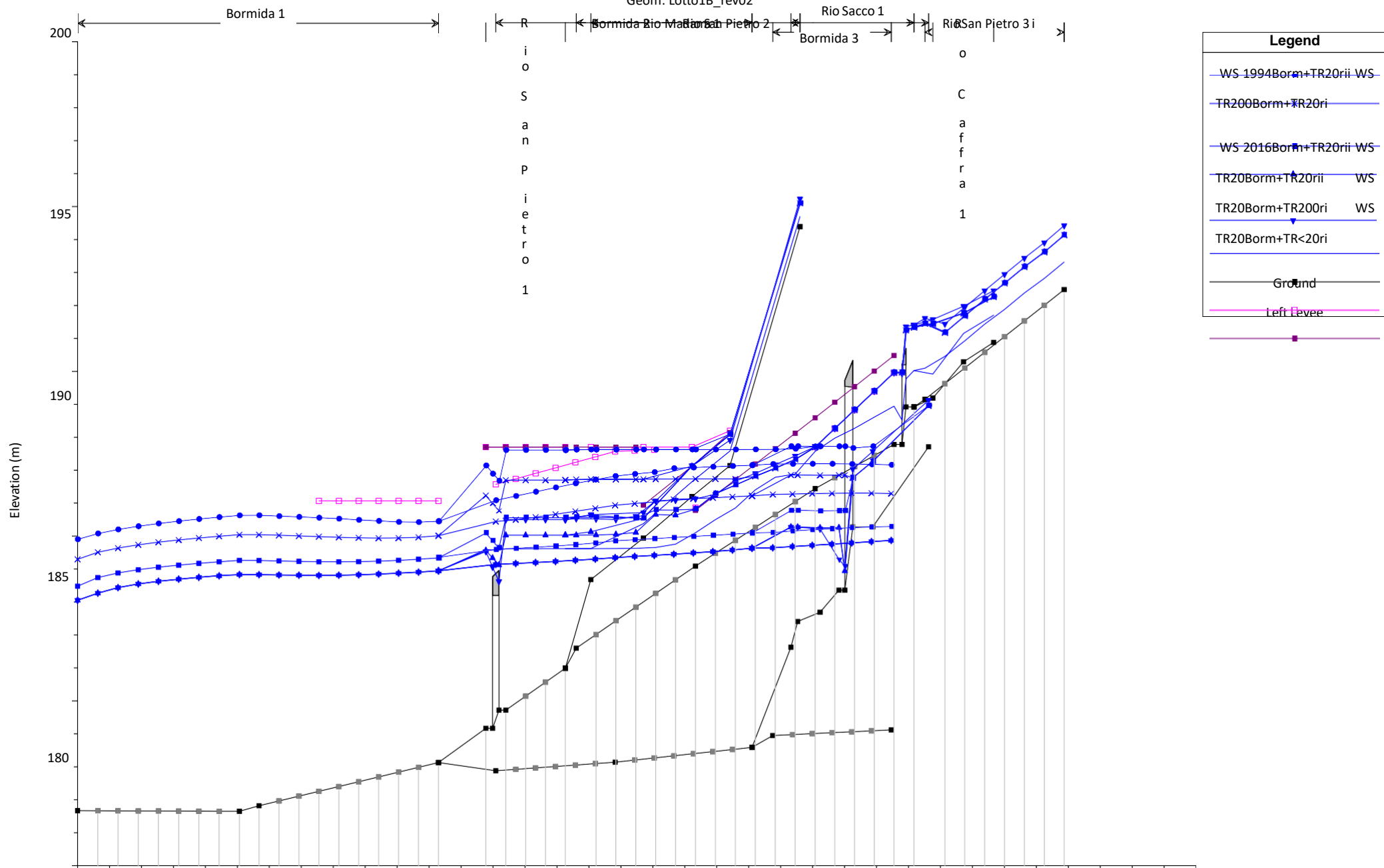
River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	1	8.0000*	TR20Borm+TR20rii	833.00	176.65	183.79		184.03	0.000637	2.22	497.58	214.25	0.30
Bormida	1	8.0000*	TR20Borm+TR200ri	833.00	176.65	183.79		184.03	0.000637	2.22	497.78	214.27	0.30
Bormida	1	8.0000*	TR200Borm+TR20ri	1469.00	176.65	185.00		185.36	0.000846	2.91	774.05	250.19	0.36
Bormida	1	8.0000*	2016Borm+TR20rii	1000.00	176.65	184.22		184.48	0.000665	2.38	590.90	220.98	0.31
Bormida	1	8.0000*	1994Borm+TR20rii	1900.00	176.65	185.56		186.01	0.000976	3.29	915.59	252.84	0.39
Bormida	1	7.0000*	TR20Borm+TR<20ri	833.00	176.66	183.75		184.01	0.000726	2.34	479.77	215.94	0.32
Bormida	1	7.0000*	TR20Borm+TR20rii	833.00	176.66	183.75		184.01	0.000726	2.34	479.56	215.93	0.32
Bormida	1	7.0000*	TR20Borm+TR200ri	833.00	176.66	183.75		184.01	0.000726	2.34	479.77	215.94	0.32
Bormida	1	7.0000*	TR200Borm+TR20ri	1469.00	176.66	184.94		185.34	0.000941	3.04	758.37	251.48	0.37
Bormida	1	7.0000*	2016Borm+TR20rii	1000.00	176.66	184.17		184.46	0.000756	2.51	573.23	228.92	0.33
Bormida	1	7.0000*	1994Borm+TR20rii	1900.00	176.66	185.50		185.98	0.001076	3.43	899.46	254.40	0.41
Bormida	1	6.0000*	TR20Borm+TR<20ri	833.00	176.66	183.70		183.99	0.000836	2.49	460.57	217.11	0.34
Bormida	1	6.0000*	TR20Borm+TR20rii	833.00	176.66	183.69		183.99	0.000837	2.49	460.35	217.10	0.34
Bormida	1	6.0000*	TR20Borm+TR200ri	833.00	176.66	183.70		183.99	0.000836	2.49	460.57	217.11	0.34
Bormida	1	6.0000*	TR200Borm+TR20ri	1469.00	176.66	184.88		185.31	0.001053	3.18	741.55	252.74	0.39
Bormida	1	6.0000*	2016Borm+TR20rii	1000.00	176.66	184.12		184.44	0.000865	2.66	555.03	234.65	0.35
Bormida	1	6.0000*	1994Borm+TR20rii	1900.00	176.66	185.43		185.95	0.001195	3.57	882.24	255.97	0.43
Bormida	1	5.0000*	TR20Borm+TR<20ri	833.00	176.66	183.63		183.96	0.000978	2.65	439.50	218.51	0.37
Bormida	1	5.0000*	TR20Borm+TR20rii	833.00	176.66	183.63		183.96	0.000979	2.65	439.26	218.49	0.37
Bormida	1	5.0000*	TR20Borm+TR200ri	833.00	176.66	183.63		183.96	0.000978	2.65	439.50	218.51	0.37
Bormida	1	5.0000*	TR200Borm+TR20ri	1469.00	176.66	184.81		185.28	0.001189	3.34	723.16	253.95	0.42
Bormida	1	5.0000*	2016Borm+TR20rii	1000.00	176.66	184.06		184.41	0.000995	2.81	535.89	236.26	0.37
Bormida	1	5.0000*	1994Borm+TR20rii	1900.00	176.66	185.36		185.91	0.001336	3.74	863.54	257.53	0.45
Bormida	1	4.0000*	TR20Borm+TR<20ri	833.00	176.66	183.55		183.93	0.001169	2.85	415.38	219.66	0.40
Bormida	1	4.0000*	TR20Borm+TR20rii	833.00	176.66	183.55		183.93	0.001170	2.85	415.11	219.63	0.40
Bormida	1	4.0000*	TR20Borm+TR200ri	833.00	176.66	183.55		183.93	0.001168	2.85	415.39	219.66	0.40
Bormida	1	4.0000*	TR200Borm+TR20ri	1469.00	176.66	184.73		185.24	0.001360	3.52	702.30	255.06	0.44
Bormida	1	4.0000*	2016Borm+TR20rii	1000.00	176.66	183.98		184.38	0.001165	3.00	514.10	237.96	0.40
Bormida	1	4.0000*	1994Borm+TR20rii	1900.00	176.66	185.28		185.87	0.001510	3.92	842.63	259.07	0.47
Bormida	1	3.0000*	TR20Borm+TR<20ri	833.00	176.67	183.44		183.89	0.001441	3.10	385.58	221.19	0.44
Bormida	1	3.0000*	TR20Borm+TR20rii	833.00	176.67	183.44		183.89	0.001443	3.10	385.27	221.11	0.44
Bormida	1	3.0000*	TR20Borm+TR200ri	833.00	176.67	183.44		183.89	0.001441	3.10	385.59	221.20	0.44
Bormida	1	3.0000*	TR200Borm+TR20ri	1469.00	176.67	184.64		185.20	0.001585	3.74	677.46	255.96	0.48
Bormida	1	3.0000*	2016Borm+TR20rii	1000.00	176.67	183.88		184.34	0.001400	3.23	487.84	239.62	0.44
Bormida	1	3.0000*	1994Borm+TR20rii	1900.00	176.67	185.18		185.82	0.001730	4.13	818.31	260.53	0.50
Bormida	1	2.0000*	TR20Borm+TR<20ri	833.00	176.67	183.27	181.38	183.84	0.001879	3.46	343.45	220.26	0.50

HEC-RAS Plan: Lotto1B (Continued)

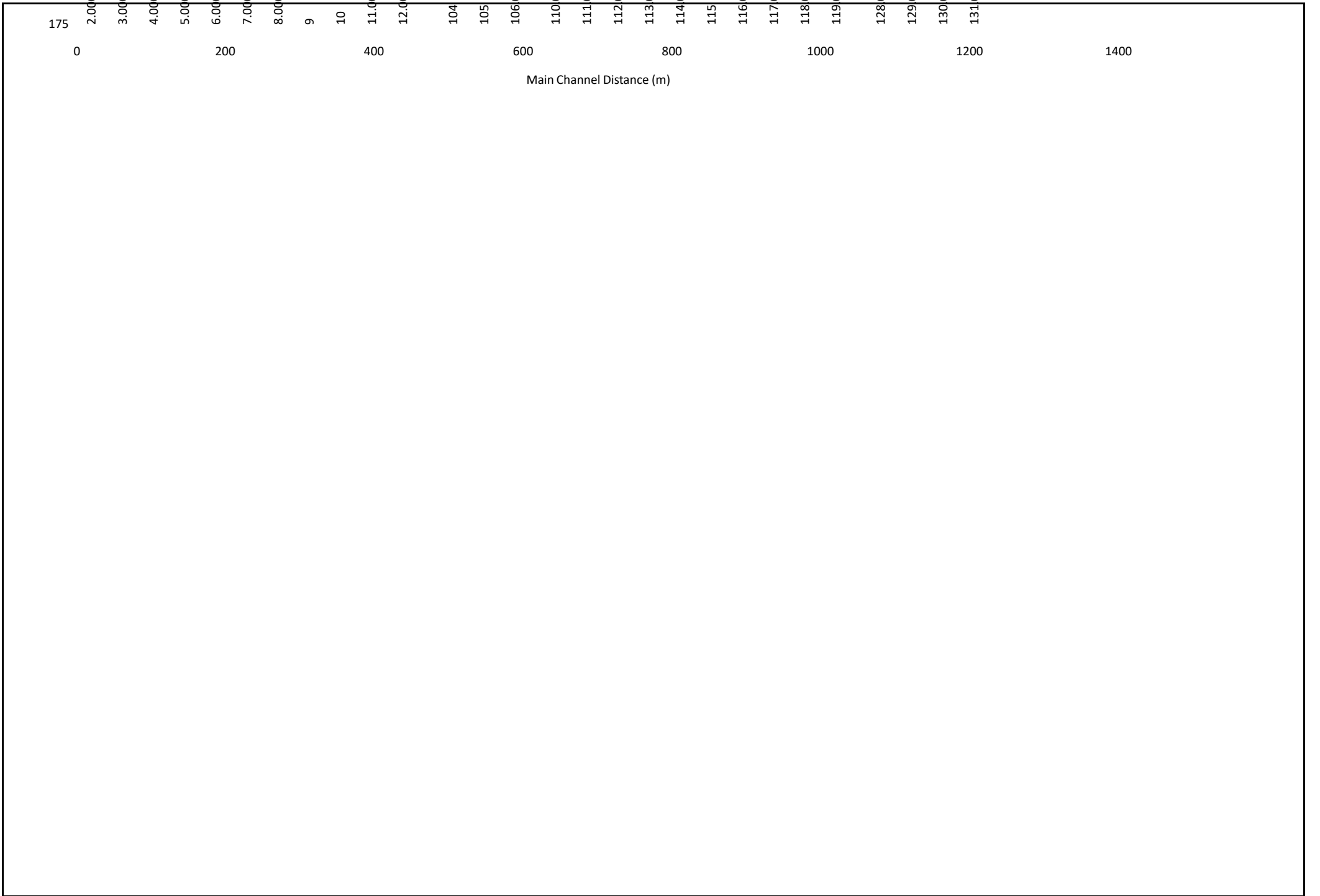
River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	1	2.0000*	TR20Borm+TR20rii	833.00	176.67	183.27	181.38	183.83	0.001882	3.46	343.04	220.20	0.50
Bormida	1	2.0000*	TR20Borm+TR200ri	833.00	176.67	183.27	181.38	183.84	0.001878	3.46	343.47	220.26	0.50
Bormida	1	2.0000*	TR200Borm+TR20ri	1469.00	176.67	184.51		185.15	0.001908	4.01	645.18	256.36	0.52
Bormida	1	2.0000*	2016Borm+TR20rii	1000.00	176.67	183.74		184.29	0.001764	3.53	452.27	240.67	0.49
Bormida	1	2.0000*	1994Borm+TR20rii	1900.00	176.67	185.06		185.77	0.002030	4.38	788.13	261.74	0.54
Bormida	1	1	TR20Borm+TR<20ri	833.00	176.67	183.05	181.53	183.77	0.002502	3.87	293.74	193.36	0.57
Bormida	1	1	TR20Borm+TR20rii	833.00	176.67	183.05	181.53	183.77	0.002502	3.87	293.74	193.36	0.57
Bormida	1	1	TR20Borm+TR200ri	833.00	176.67	183.05	181.54	183.77	0.002502	3.87	293.74	193.36	0.57
Bormida	1	1	TR200Borm+TR20ri	1469.00	176.67	184.30	183.88	185.08	0.002504	4.45	591.60	255.34	0.59
Bormida	1	1	2016Borm+TR20rii	1000.00	176.67	183.48	182.45	184.22	0.002503	4.05	388.18	236.30	0.57
Bormida	1	1	1994Borm+TR20rii	1900.00	176.67	184.89	184.38	185.70	0.002503	4.74	744.58	262.06	0.59

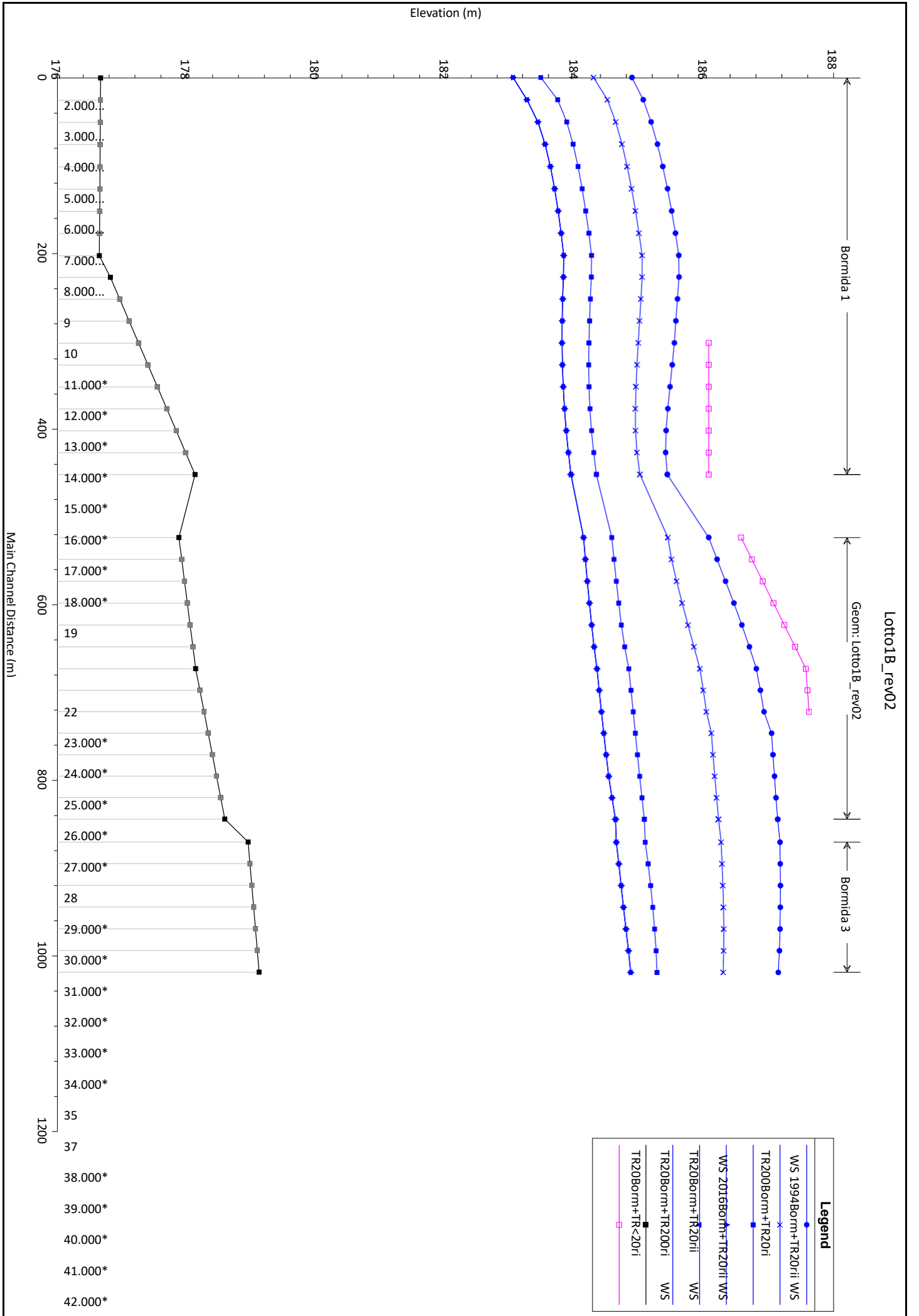
Lotto1B_rev02

Geom: Lotto1B_rev02



Legend	
—●—	WS 1994Borm+TR20rii WS
—●—	TR200Borm+TR20ri
—●—	WS 2016Borm+TR20rii WS
—●—	TR20Borm+TR20rii WS
—●—	TR20Borm+TR200ri WS
—●—	TR20Borm+TR<20ri
—■—	Ground
—■—	Left Levee

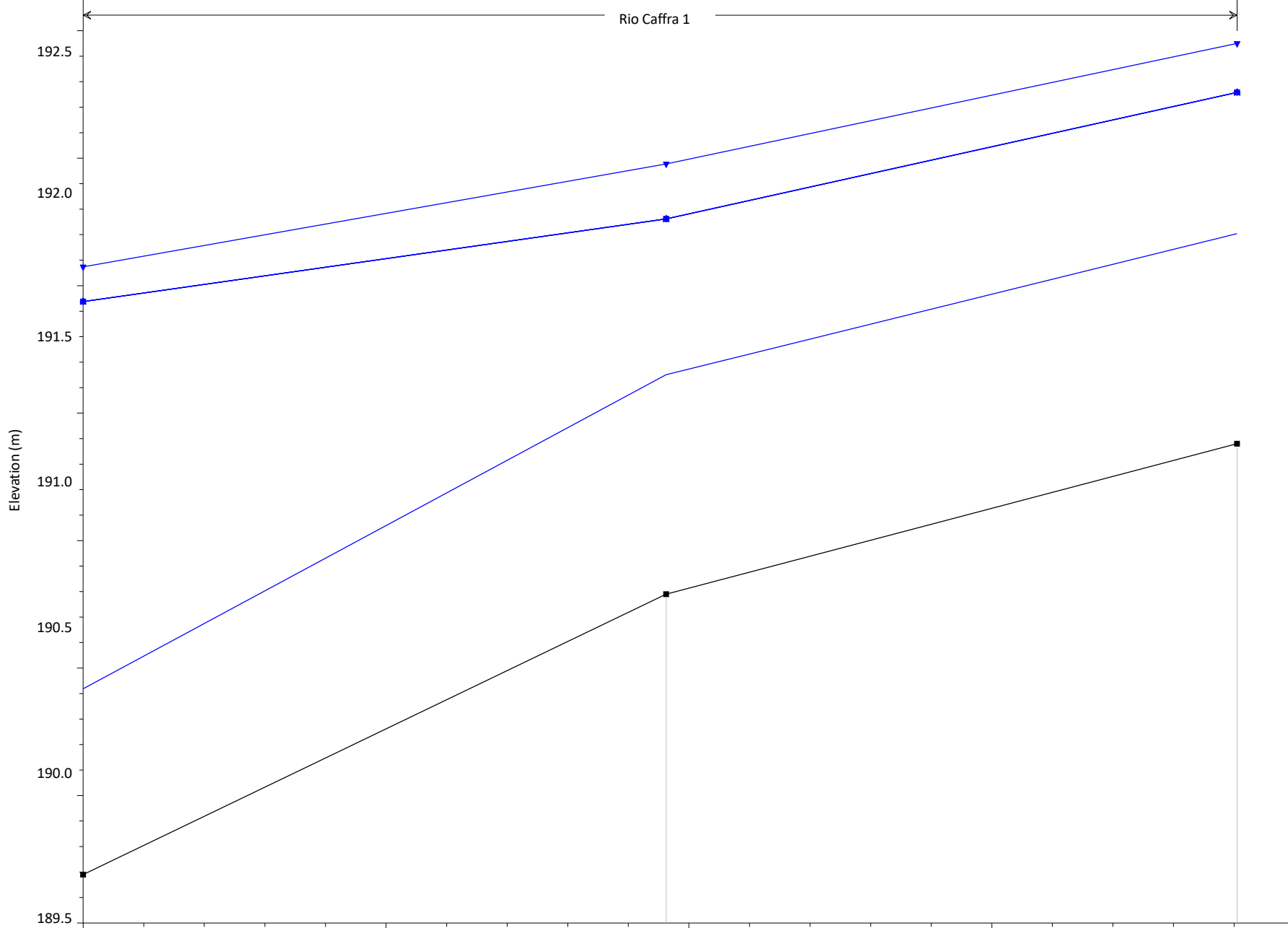




Lotto1B_rev02

Geom: Lotto1B_rev02

Rio Caffra 1



Legend

- WS TR20Borm+TR20ri
- WS TR20Borm+TR20ri WS
- TR200Borm+TR20ri
- WS 2016Borm+TR20ri WS
- 1994Borm+TR20ri WS
- TR20Borm+TR<20ri

189.0

0

20

203

40

60

205

80

Main Channel Distance (m)

Lotto1B_rev02

Geom: Lotto1B_rev02

Rio Madama 1

Elevation (m)

196

194

192

190

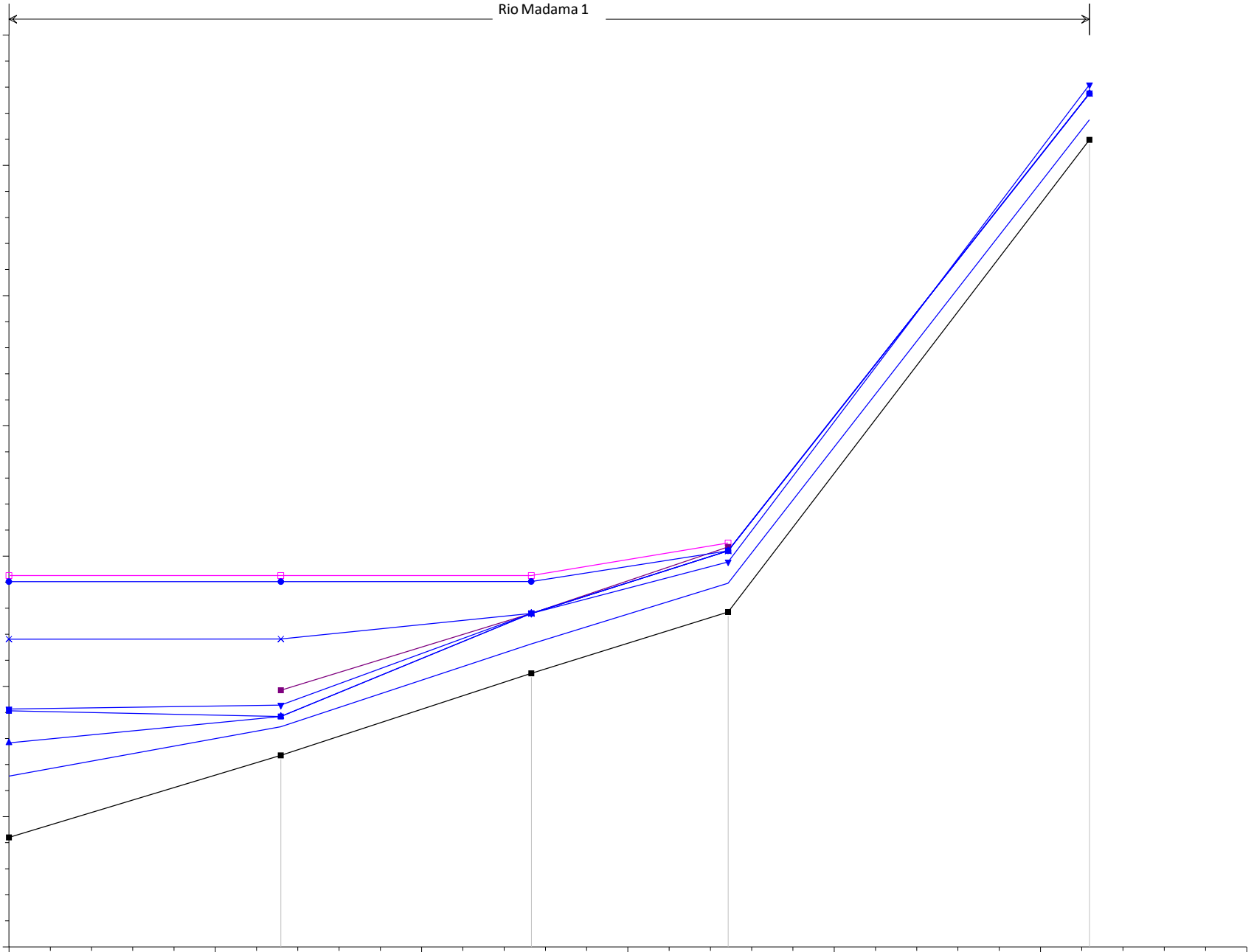
188

186

184

Legend	
WS 1994Borm+TR20rii WS	●
TR200Borm+TR20ri WS	×
TR20Borm+TR200ri	▼
WS 2016Borm+TR20rii WS	▲
TR20Borm+TR20rii WS	■
TR20Borm+TR<20ri	■
Ground	□
Left Levee	■

—■—



182

0

50

402

100

403

150

404

200

250

405

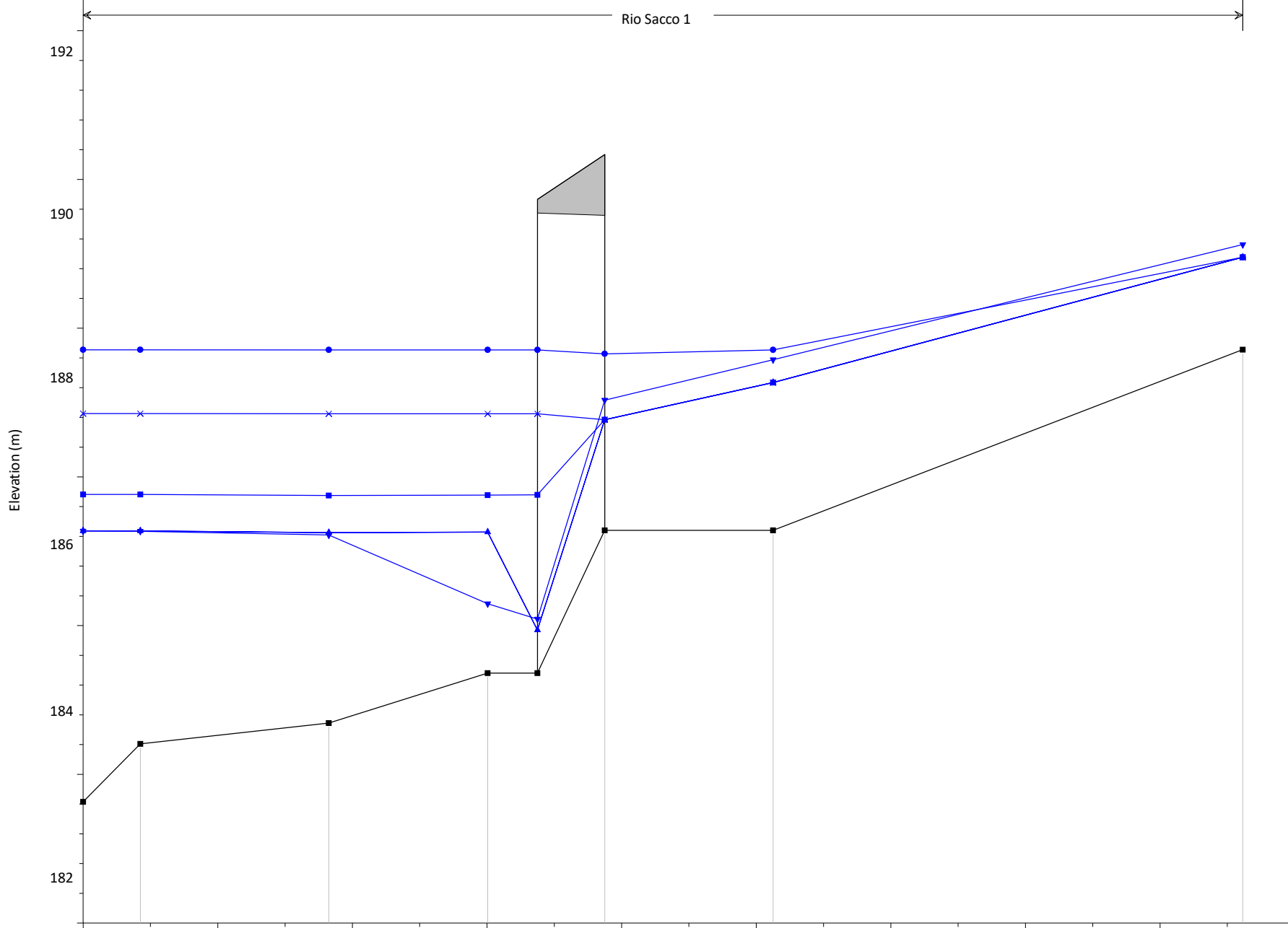
300

Main Channel Distance (m)

Lotto1B_rev02

Geom: Lotto1B_rev02

Rio Sacco 1



Legend

- WS 1994Borm+TR20rii WS
- TR200Borm+TR20ri
- WS 2016Borm+TR20rii WS
- TR20Borm+TR<20ri
- WS TR20Borm+TR20rii WS
- TR20Borm+TR200ri

180
0 20 40 60 80 100 120 140 160 180

302

303

304

304.5

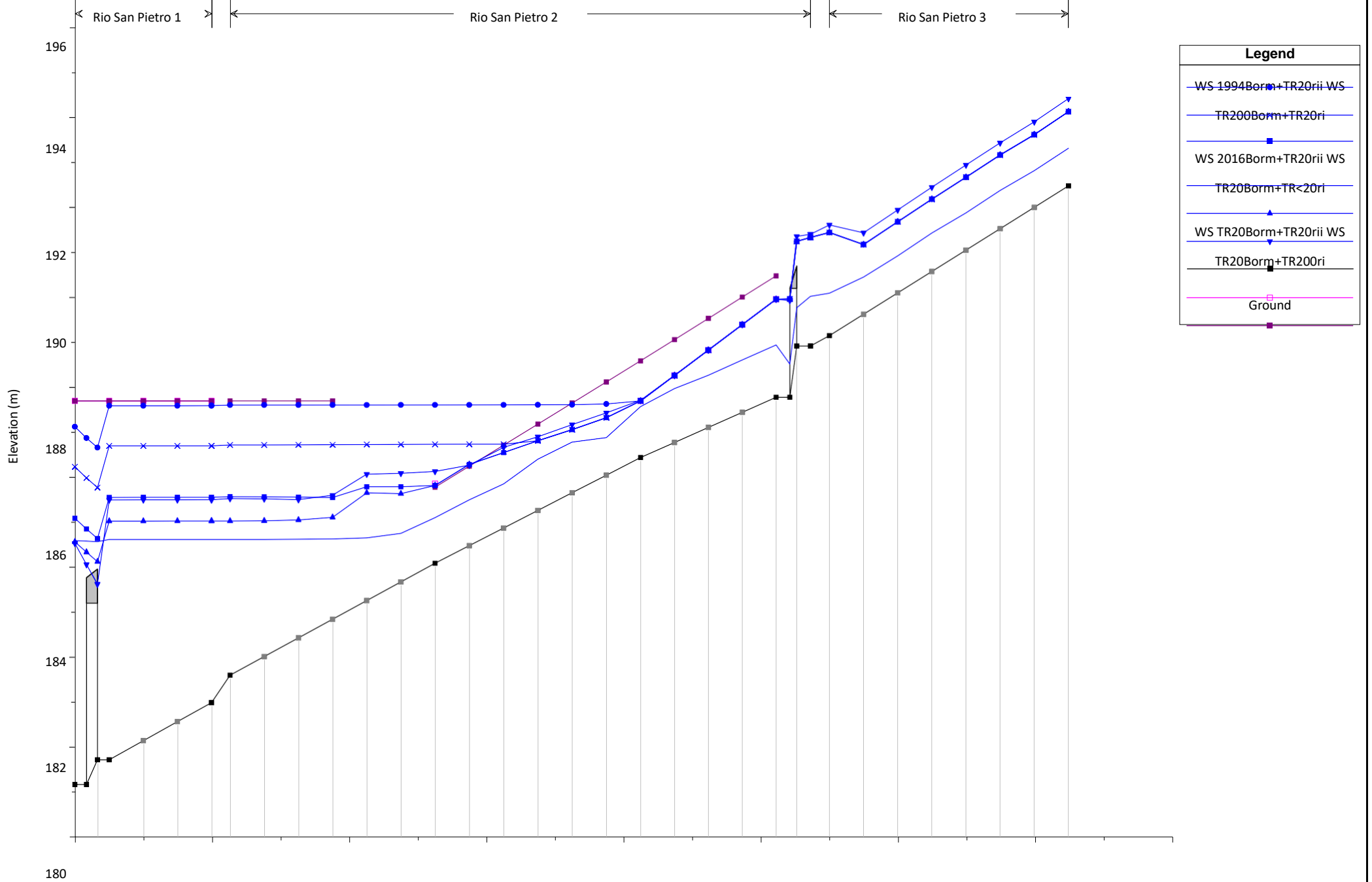
305

306

Main Channel Distance (m)

Lotto1B_rev02

Geom: Lotto1B_rev02

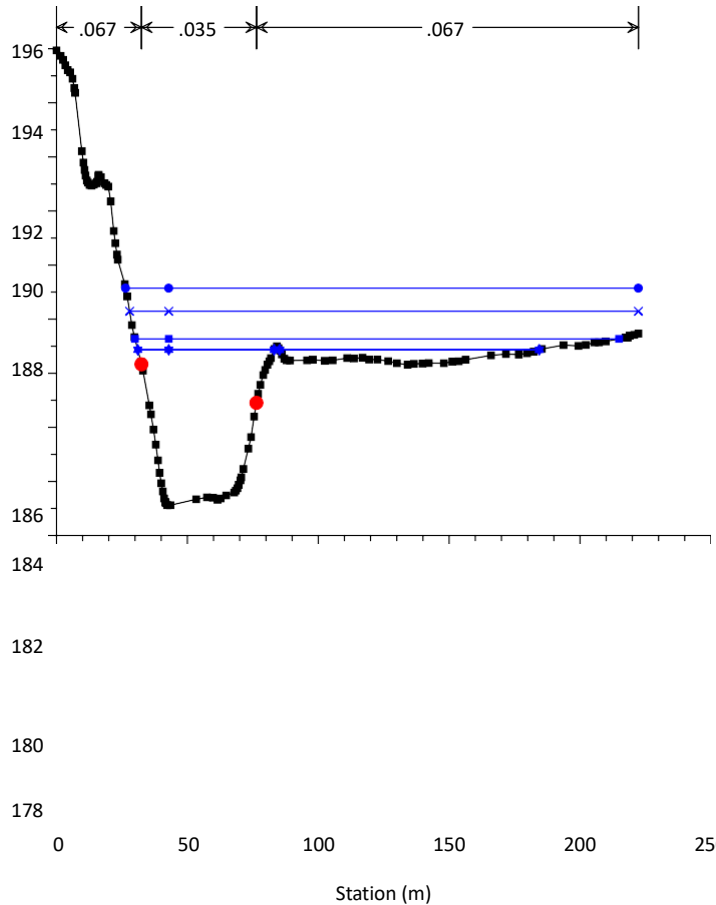


178
0 104.5 106.00* 107.00* 108 110.00* 111.00* 112.00* 113.00* 114.00* 115 116.00* 117.00* 118.00* 119.00* 120.00* 121 122.00* 123.00* 124.00* 125 --- 127 128.00* 129.00* 130.00* 131.00* 132.00* 133.00* 134
100 200 300 400 500 600 700 800
Main Channel Distance (m)

Lotto1B_rev02

Geom: Lotto1B_rev02

River = Bormida Reach = 3 RS = 43

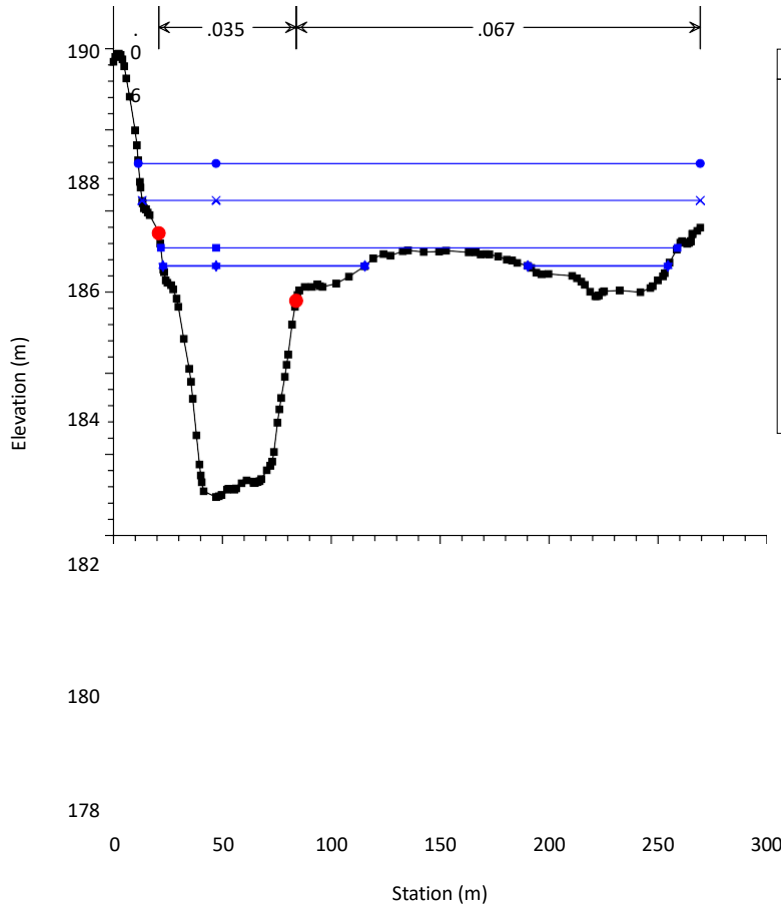


Legend	
WS 1994Borm+TR20rii WS	●
TR200Borm+TR20ri	×
WS 2016Borm+TR20rii WS	■
TR20Borm+TR200ri	▼
WS TR20Borm+TR20rii WS	▲
TR20Borm+TR<20ri	▲
	—
	■

Lotto1B_rev02

Geom: Lotto1B_rev02

River = Bormida Reach = 3 RS = 37

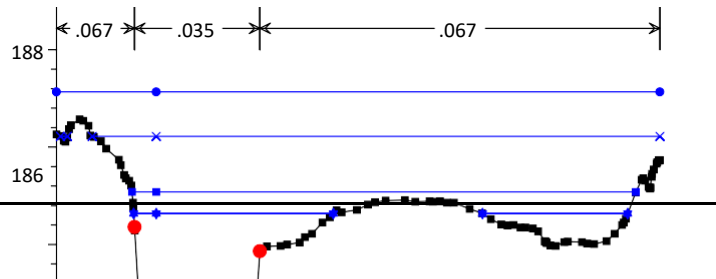


Legend	
WS 1994Borm+TR20rii WS	●
TR200Borm+TR20ri	×
WS 2016Borm+TR20rii WS	■
TR20Borm+TR200riWS	▼
TR20Borm+TR<20ri	▲
WS TR20Borm+TR20rii	▲
	—
	■

Lotto1B_rev02

Geom: Lotto1B_rev02

River = Bormida Reach = 2 RS = 35

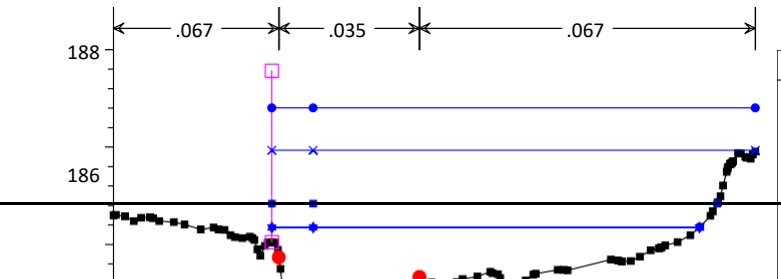


Legend	
WS 1994Borm+TR20rii WS	●
TR200Borm+TR20ri	×
WS 2016Borm+TR20rii WS	■
	▼
	▲
	—
	■

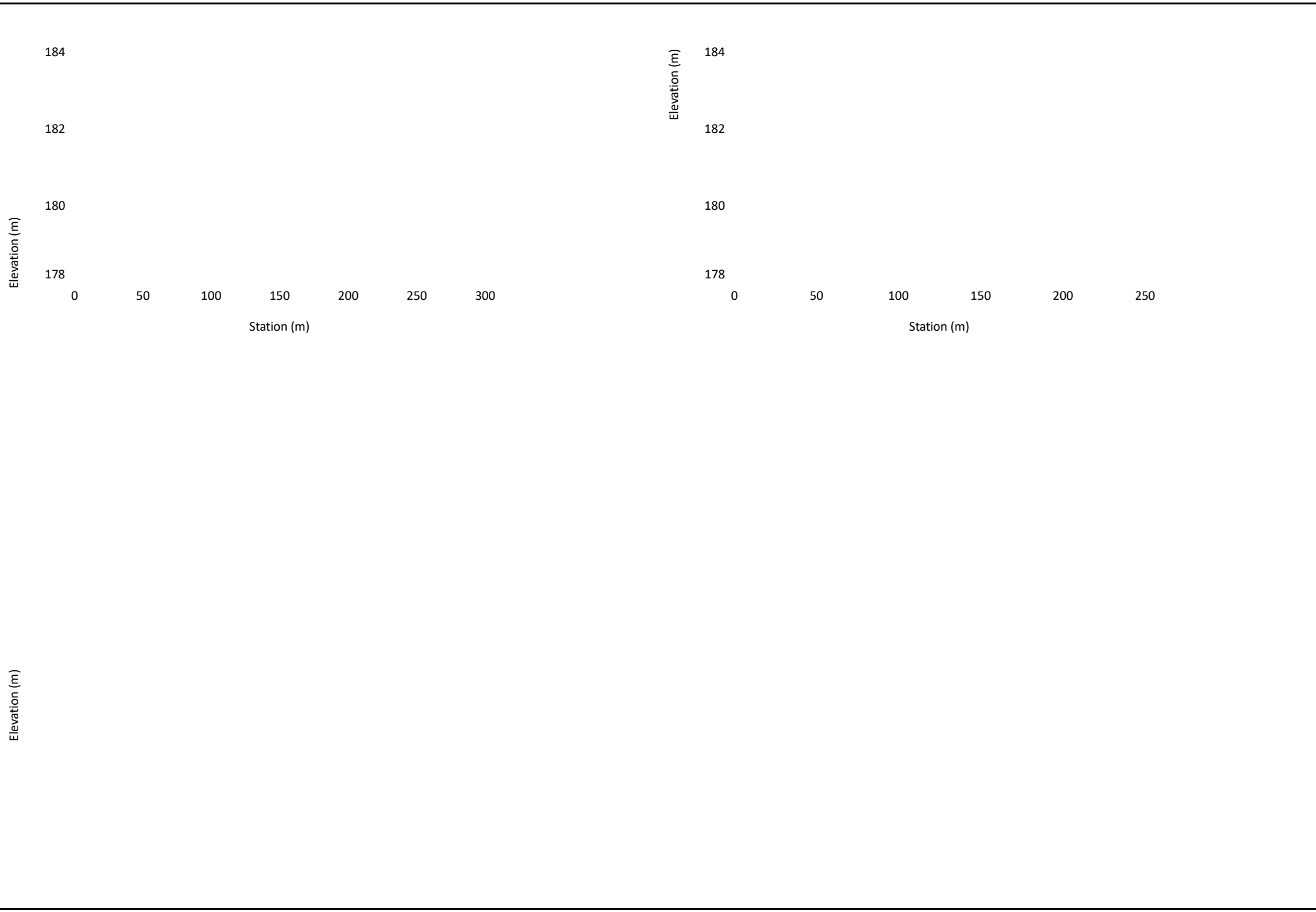
Lotto1B_rev02

Geom: Lotto1B_rev02

River = Bormida Reach = 2 RS = 28



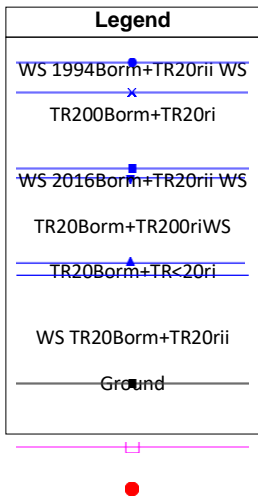
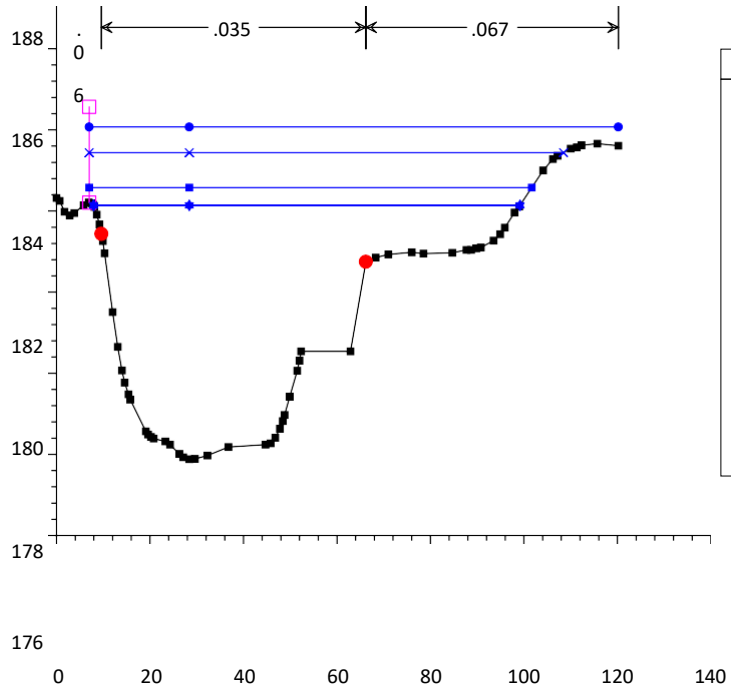
Legend	
WS 1994Borm+TR20rii WS	●
TR200Borm+TR20ri	×
WS 2016Borm+TR20rii WS	■
	▼
	▲
	—
	■



Lotto1B_rev02

Geom: Lotto1B_rev02

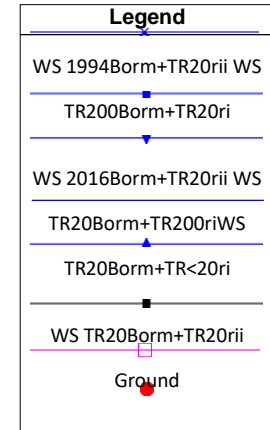
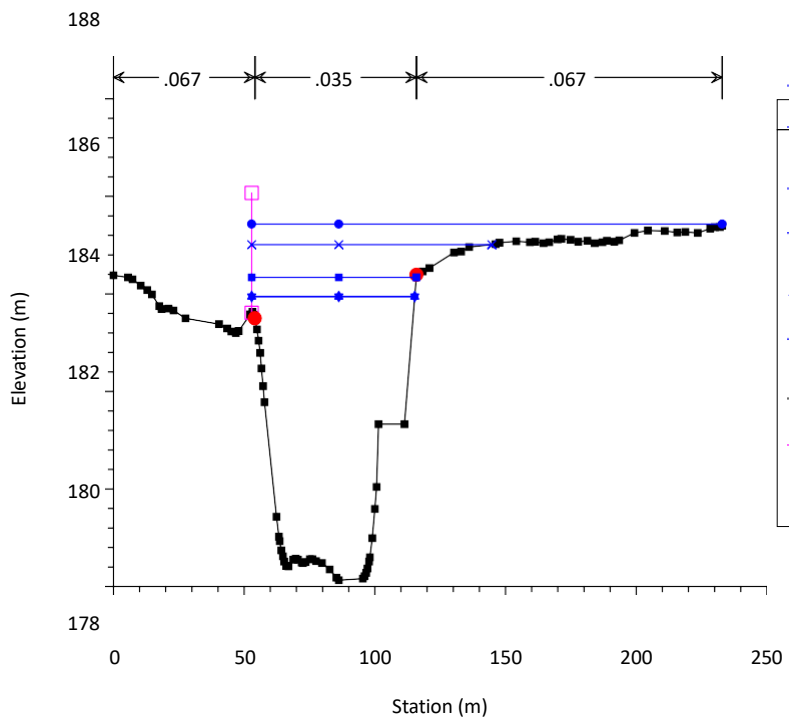
River = Bormida Reach = 2 RS = 22



Lotto1B_rev02

Geom: Lotto1B_rev02

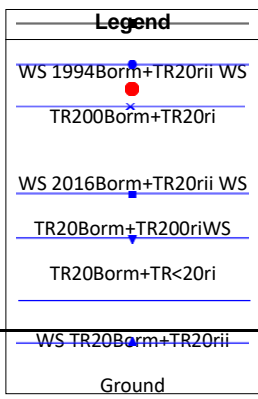
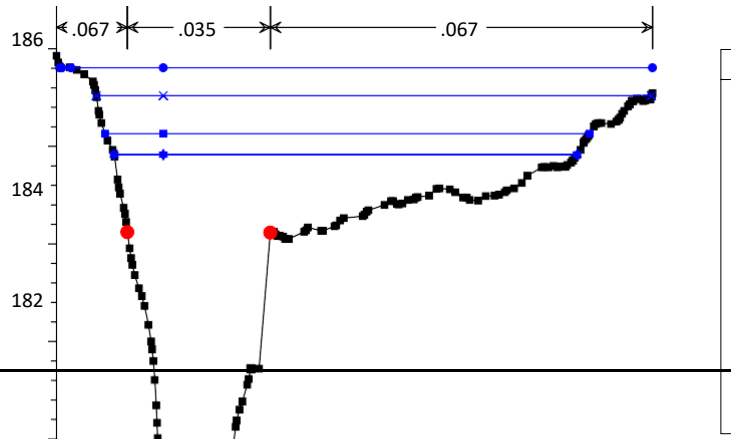
River = Bormida Reach = 1 RS = 19



Lotto1B_rev02

Geom: Lotto1B_rev02

River = Bormida Reach = 1 RS = 10

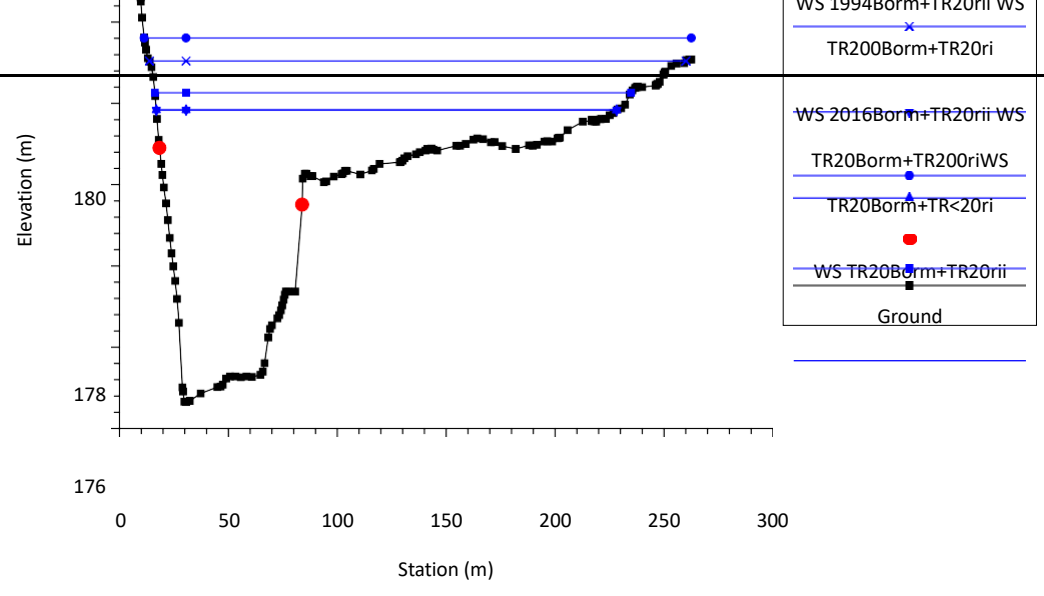
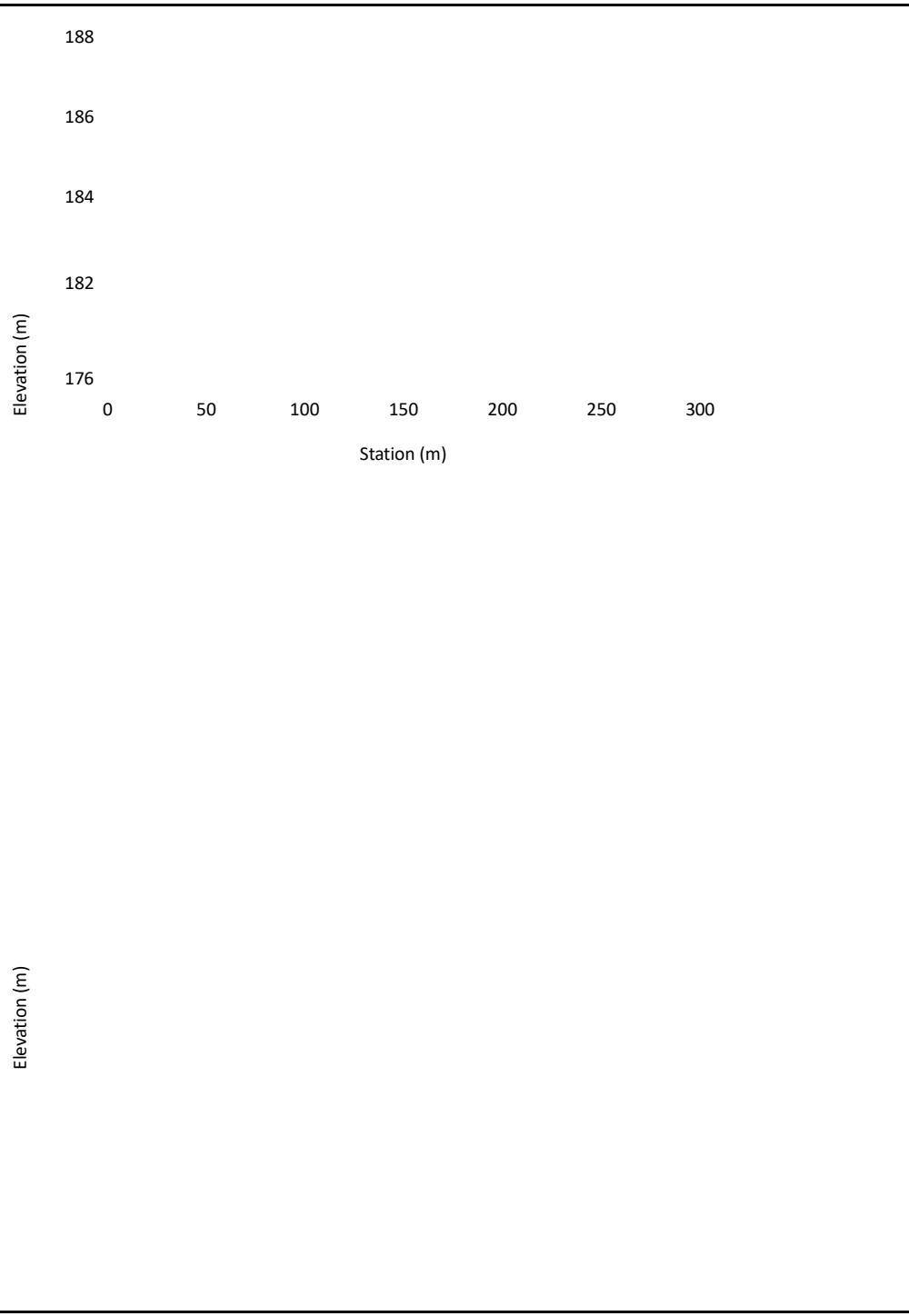


Lotto1B_rev02

Geom: Lotto1B_rev02

River = Bormida Reach = 1 RS = 9

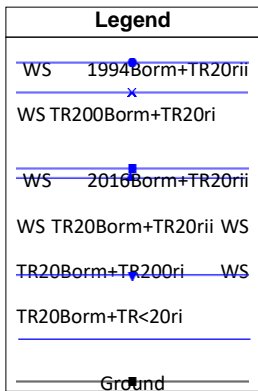
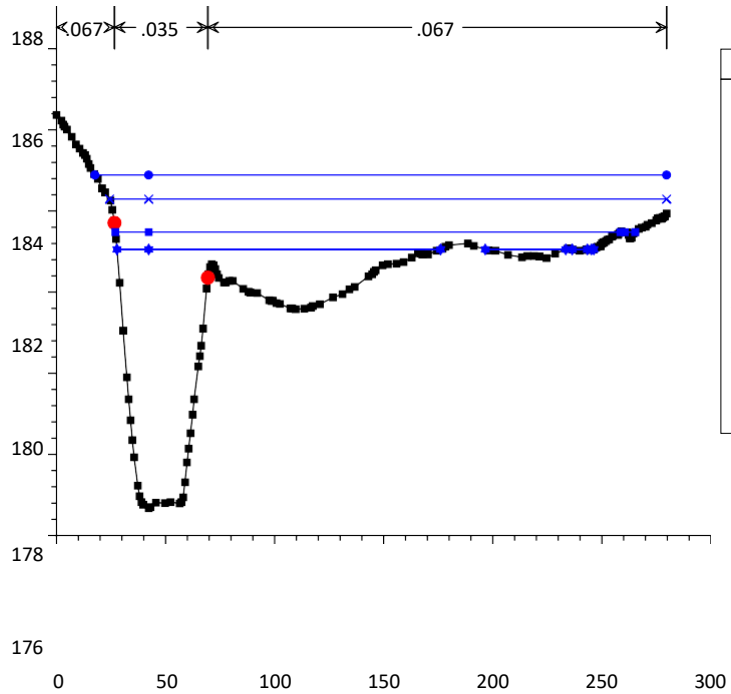




Lotto1B_rev02

Geom: Lotto1B_rev02

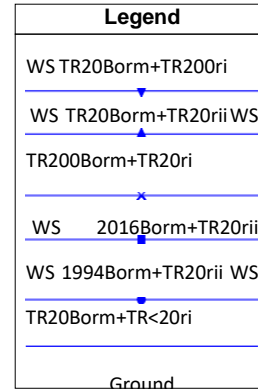
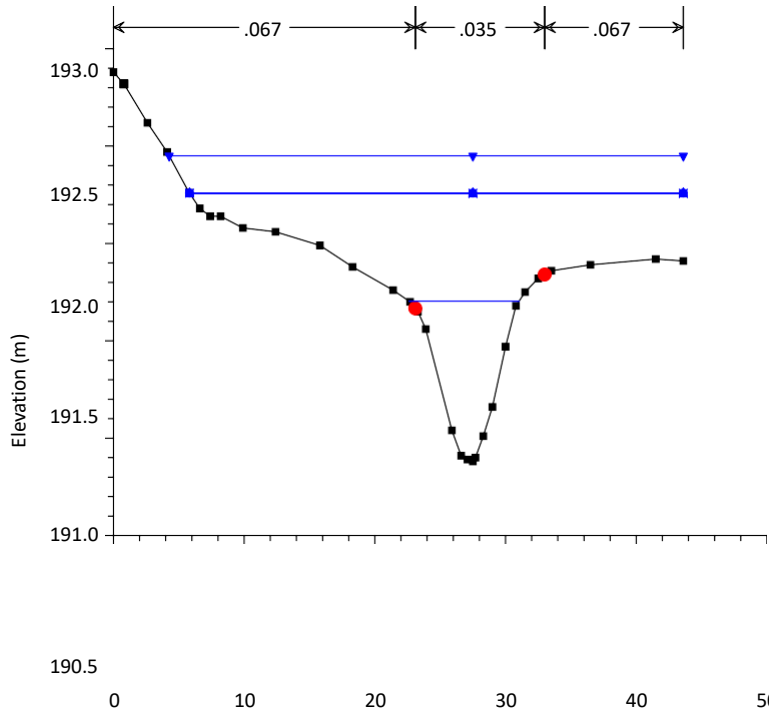
River = Bormida Reach = 1 RS = 1



Lotto1B_rev02

Geom: Lotto1B_rev02

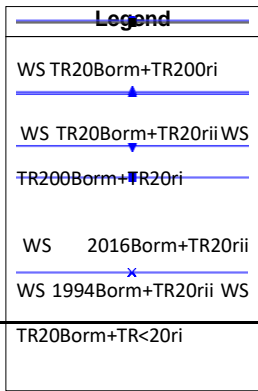
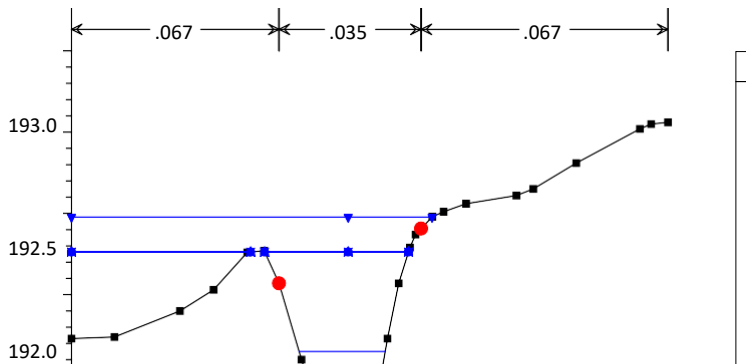
River = Rio Caffra Reach = 1 RS = 205



Lotto1B_rev02

Geom: Lotto1B_rev02

River = Rio Caffra Reach = 1 RS = 203

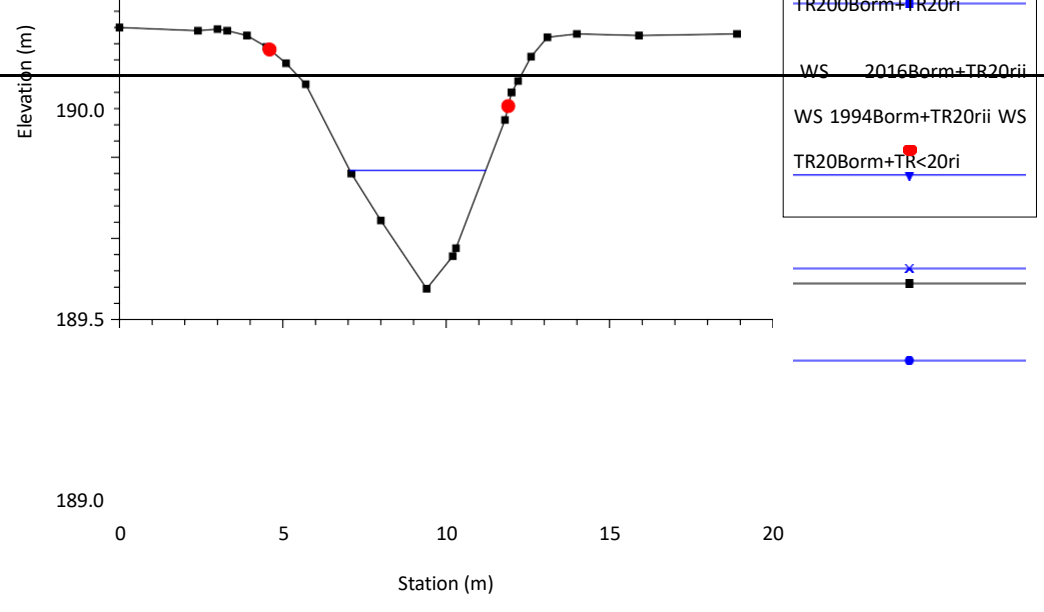
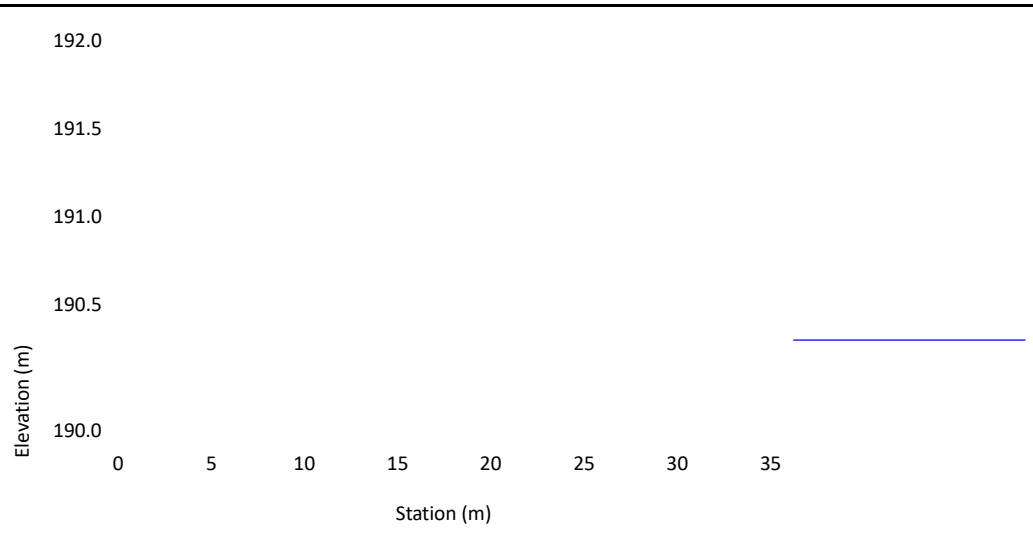


Lotto1B_rev02

Geom: Lotto1B_rev02

River = Rio Caffra Reach = 1 RS = 201



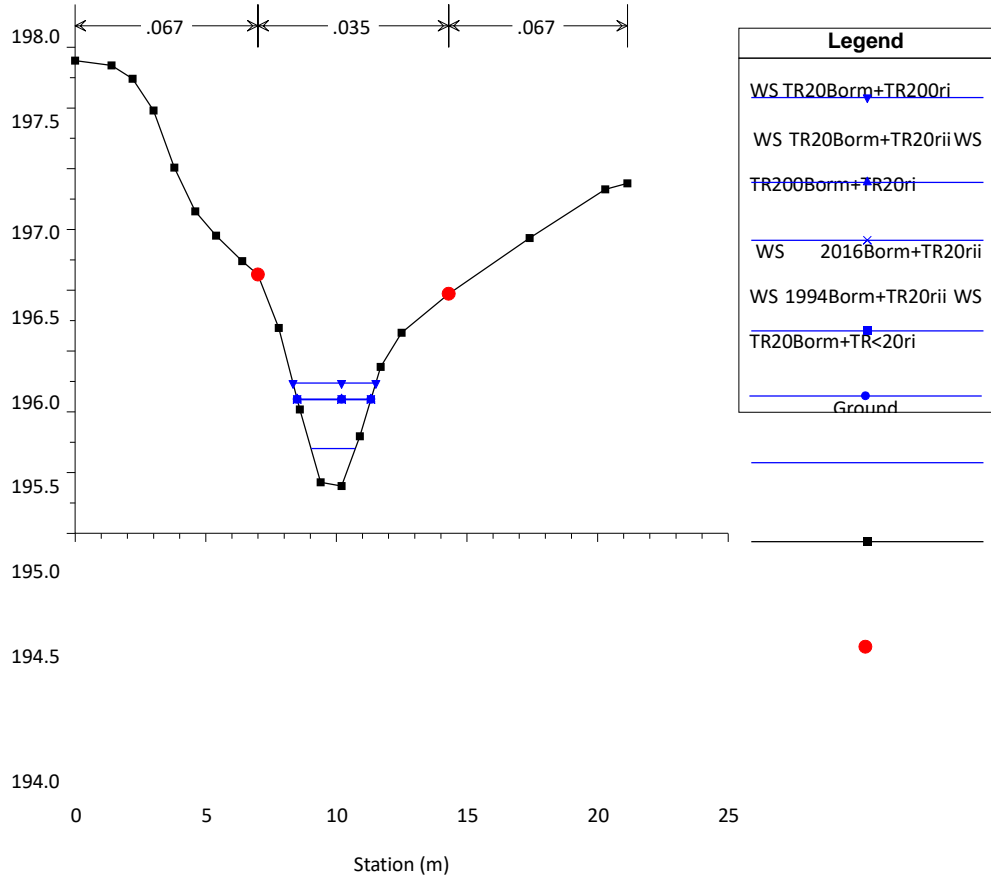


Elevation (m)

Lotto1B_rev02

Geom: Lotto1B_rev02

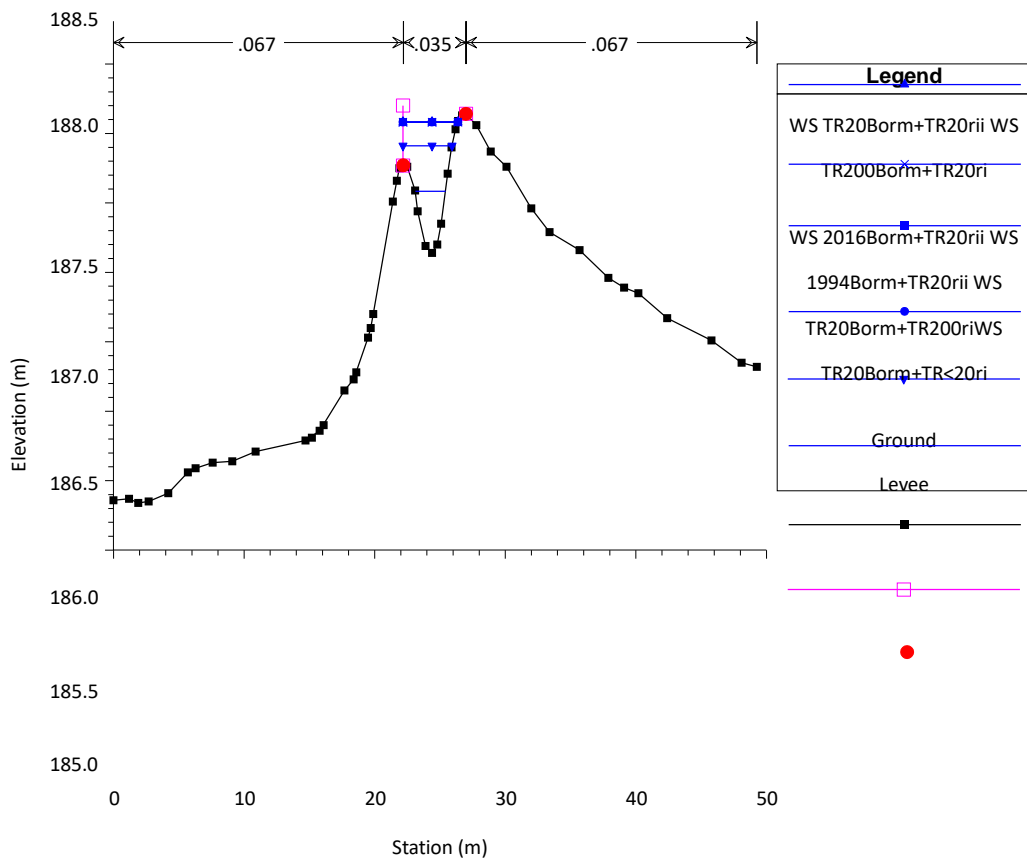
River = Rio Madama Reach = 1 RS = 405



Lotto1B_rev02

Geom: Lotto1B_rev02

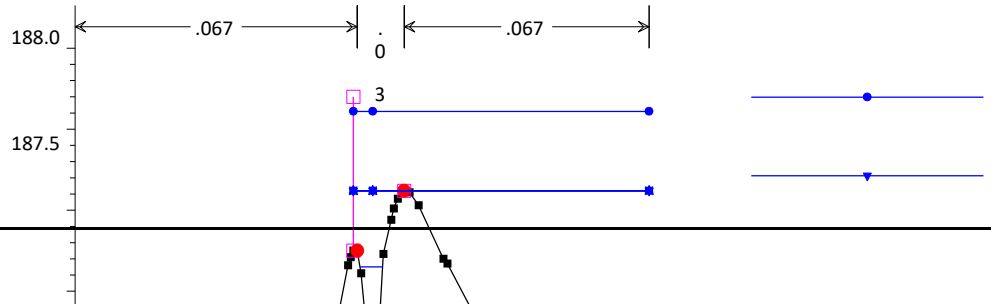
River = Rio Madama Reach = 1 RS = 404



Lotto1B_rev02

Geom: Lotto1B_rev02

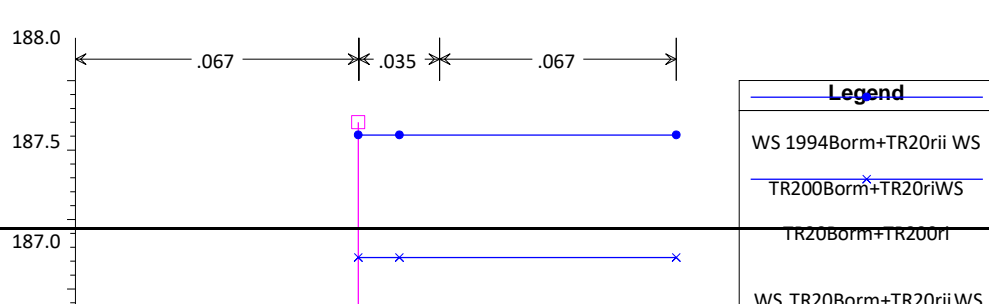
River = Rio Madama Reach = 1 RS = 403

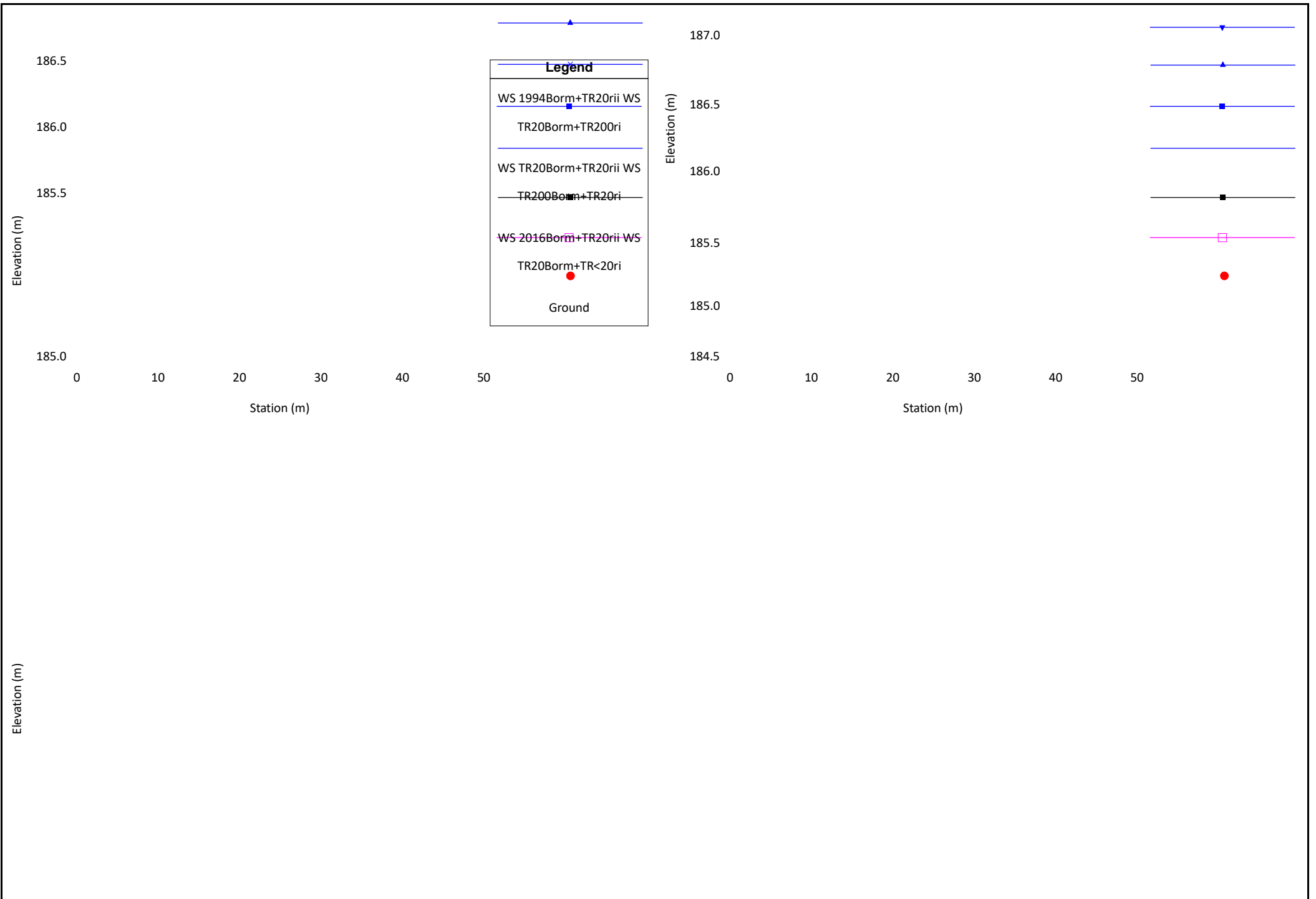


Lotto1B_rev02

Geom: Lotto1B_rev02

River = Rio Madama Reach = 1 RS = 402

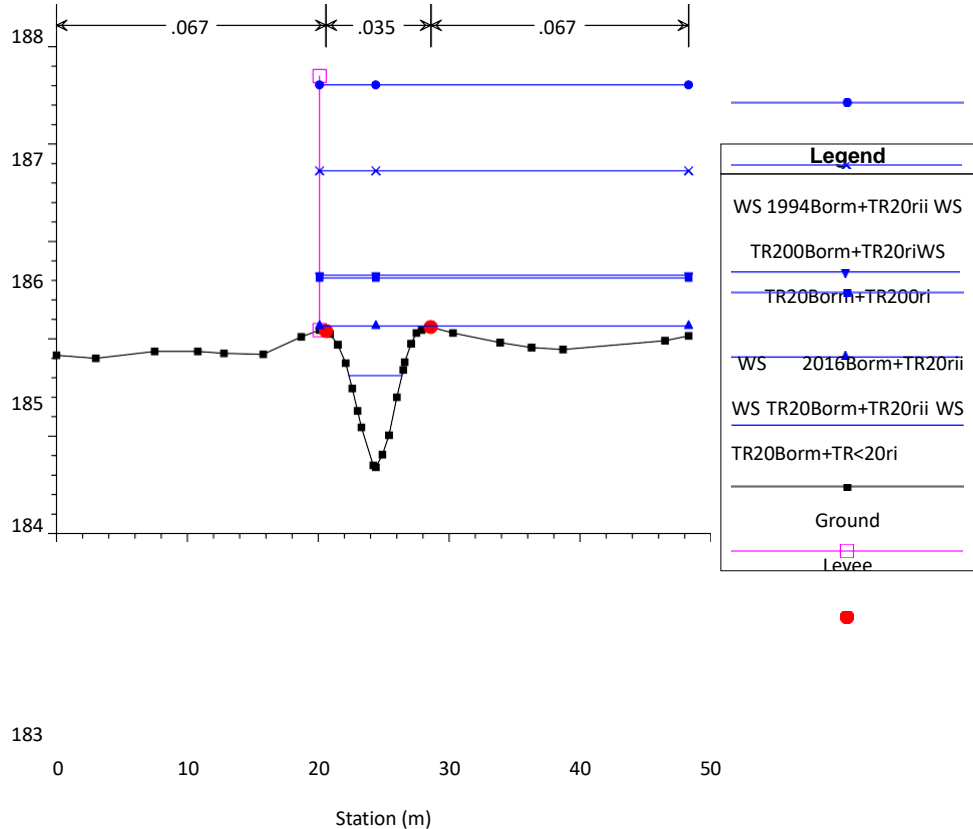




Lotto1B_rev02

Geom: Lotto1B_rev02

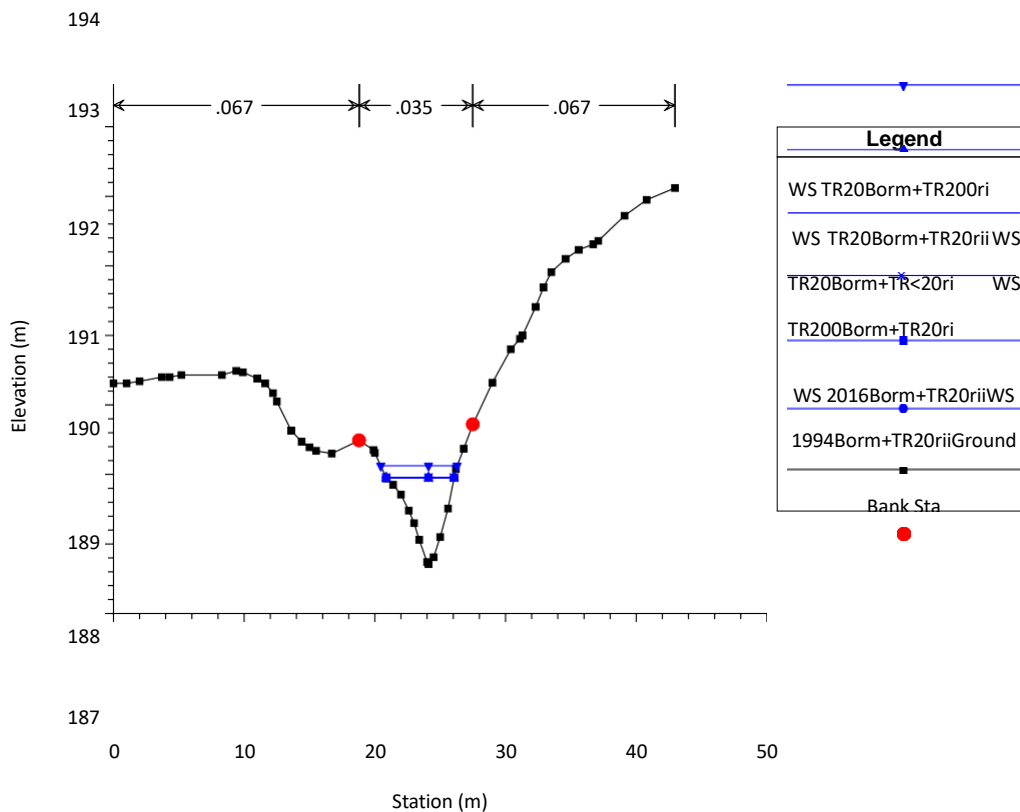
River = Rio Madama Reach = 1 RS = 401



Lotto1B_rev02

Geom: Lotto1B_rev02

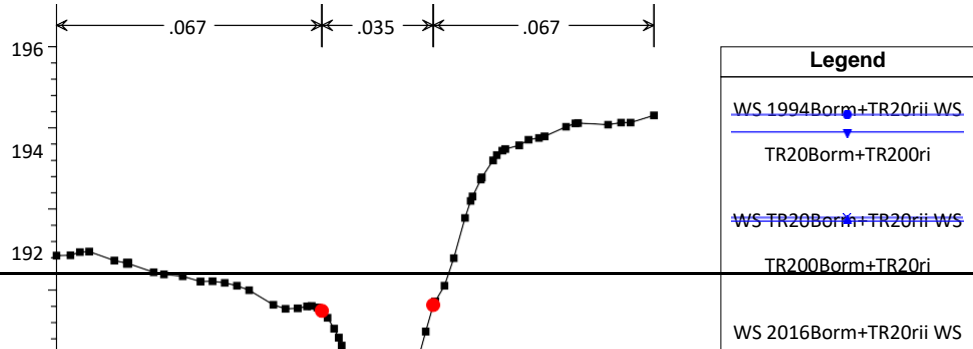
River = Rio Sacco Reach = 1 RS = 306



Lotto1B_rev02

Geom: Lotto1B_rev02

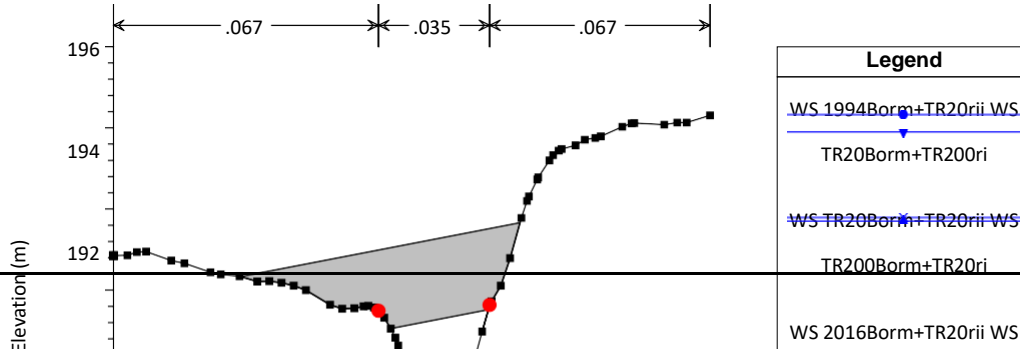
River = Rio Sacco Reach = 1 RS = 305

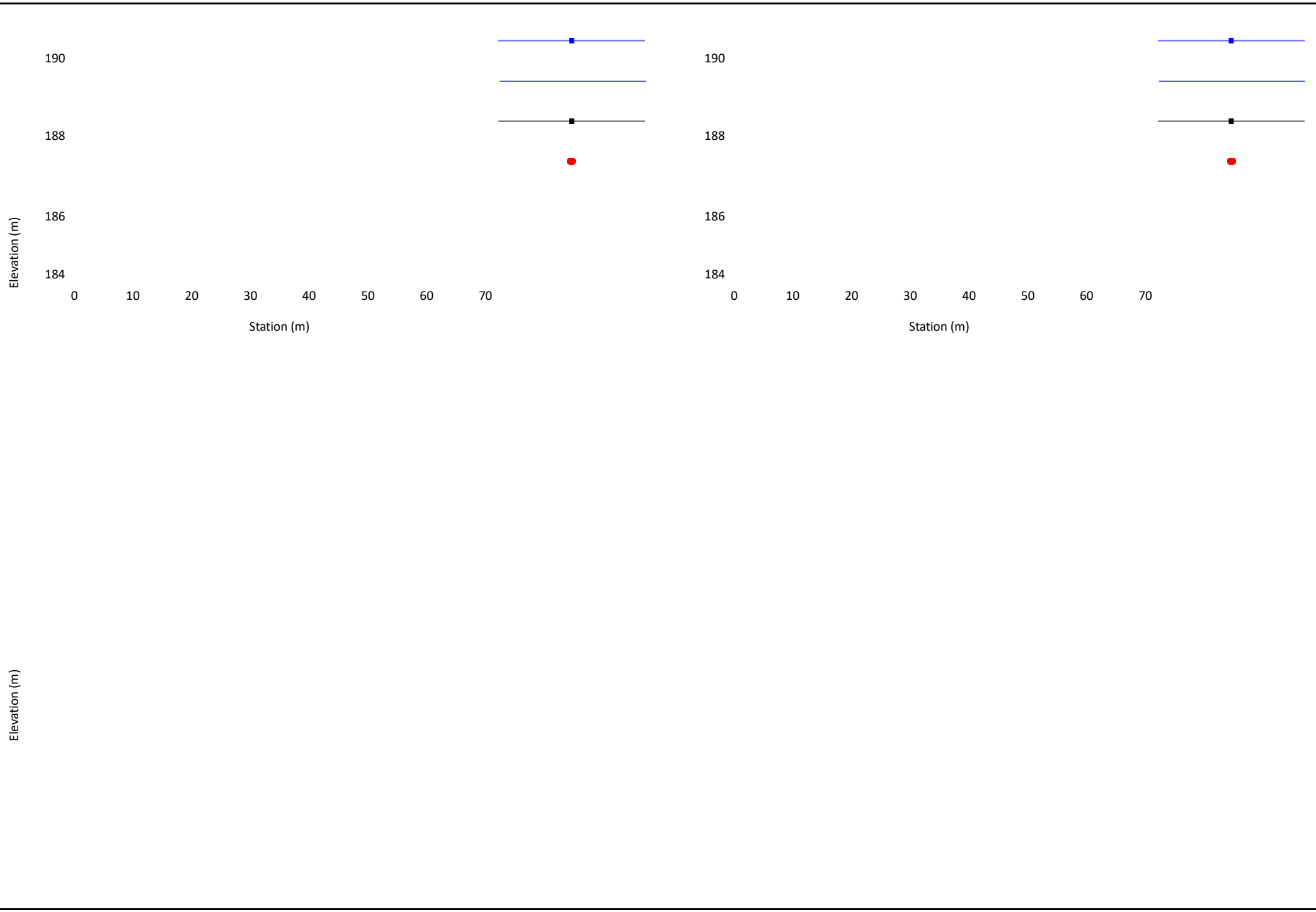


Lotto1B_rev02

Geom: Lotto1B_rev02

River = Rio Sacco Reach = 1 RS = 304.5 BR

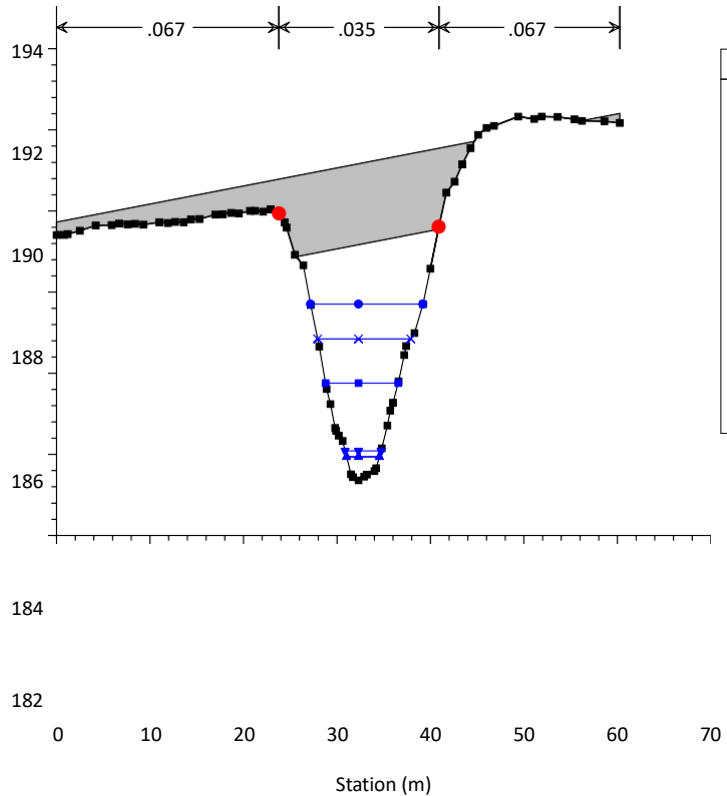




Lotto1B_rev02

Geom: Lotto1B_rev02

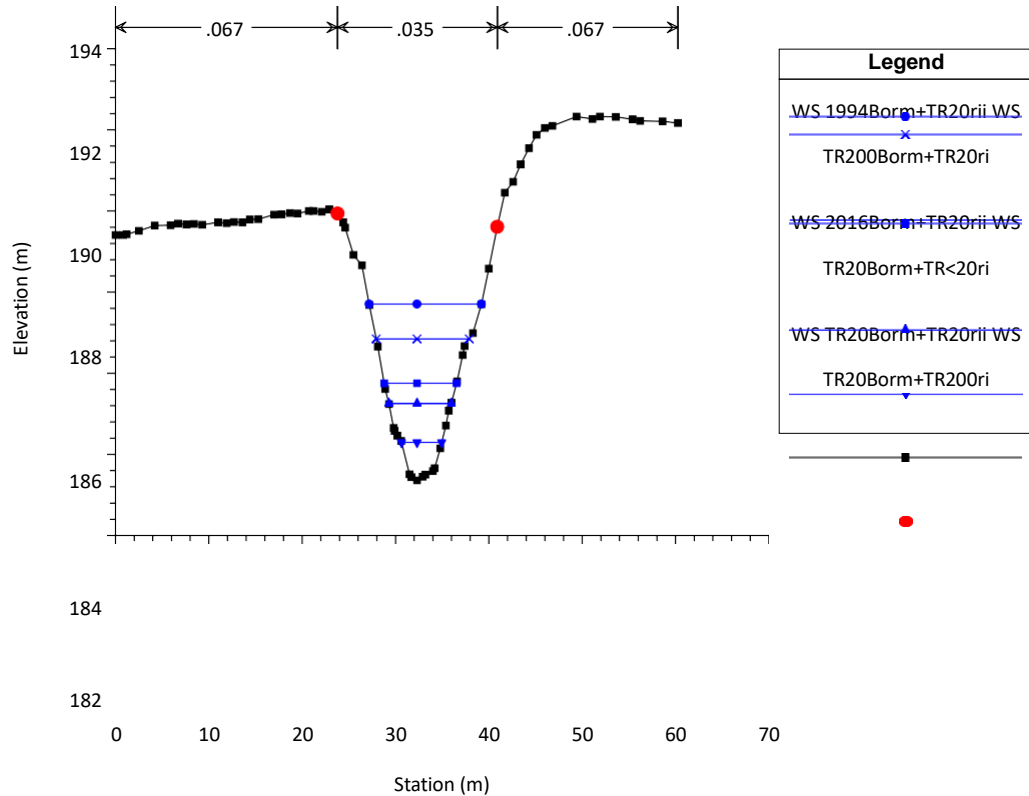
River = Rio Sacco Reach = 1 RS = 304.5 BR



Lotto1B_rev02

Geom: Lotto1B_rev02

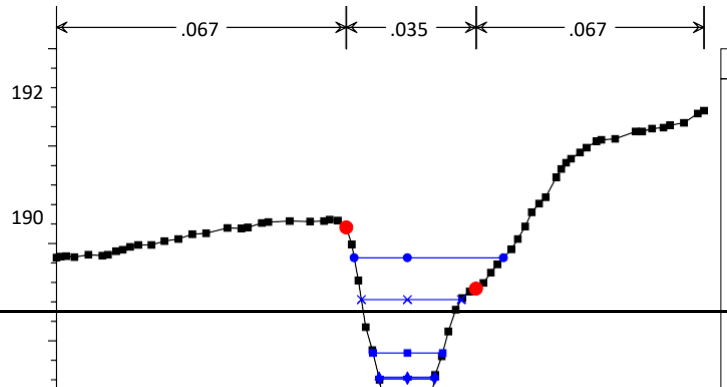
River = Rio Sacco Reach = 1 RS = 304



Lotto1B_rev02

Geom: Lotto1B_rev02

River = Rio Sacco Reach = 1 RS = 303

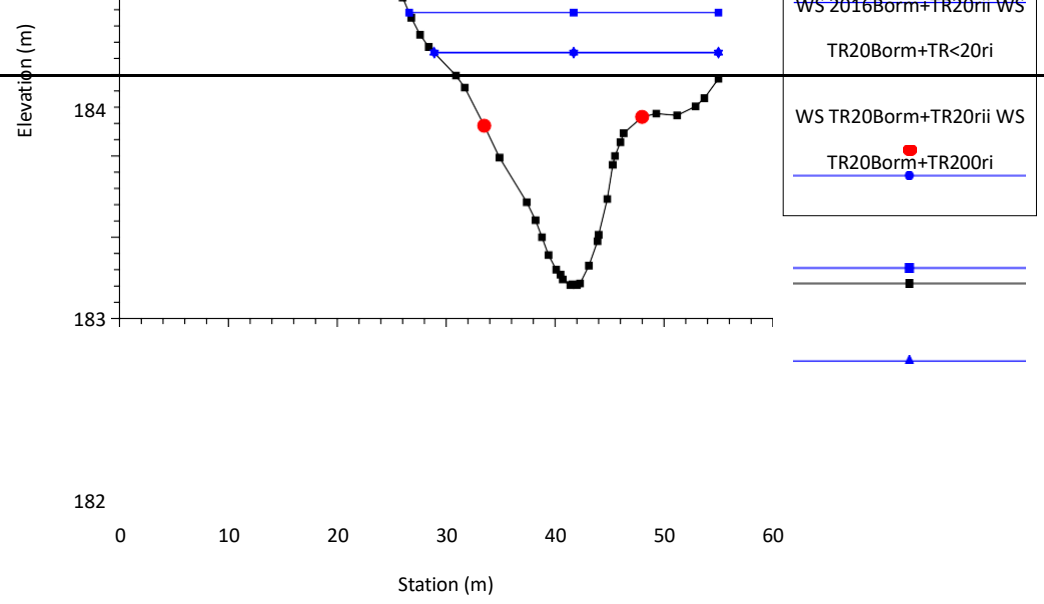
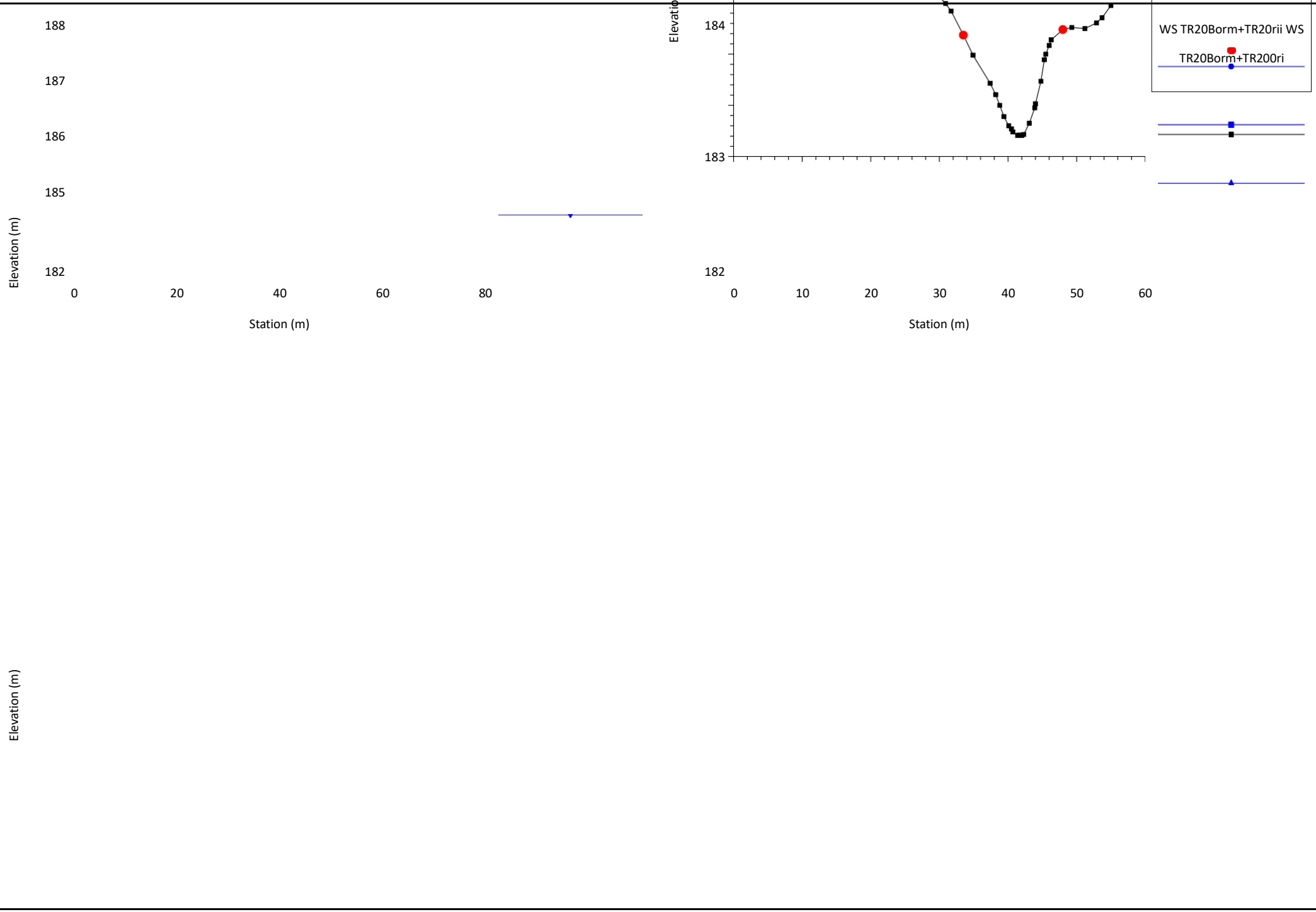


Lotto1B_rev02

Geom: Lotto1B_rev02

River = Rio Sacco Reach = 1 RS = 302

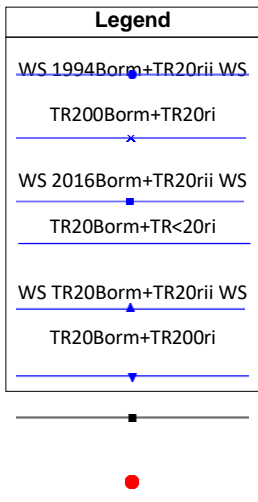
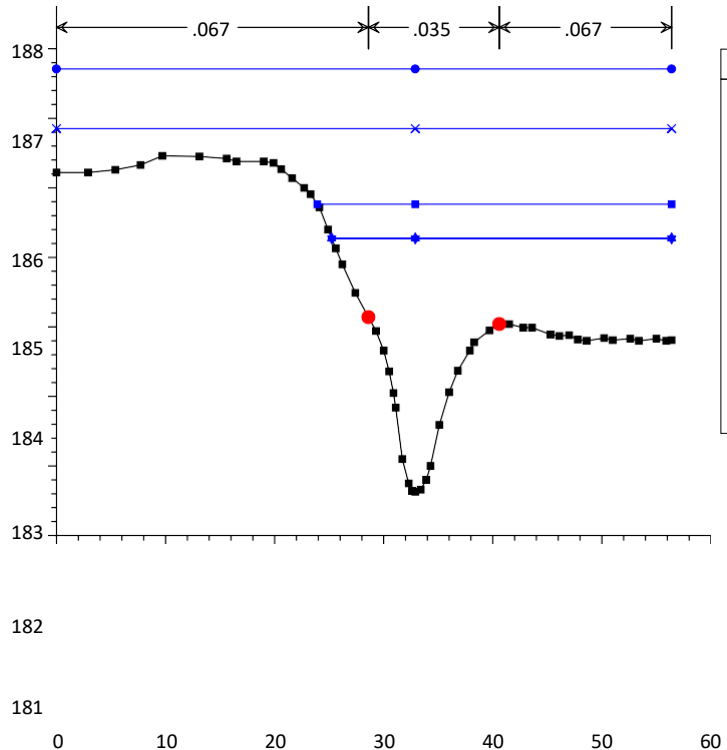




Lotto1B_rev02

Geom: Lotto1B_rev02

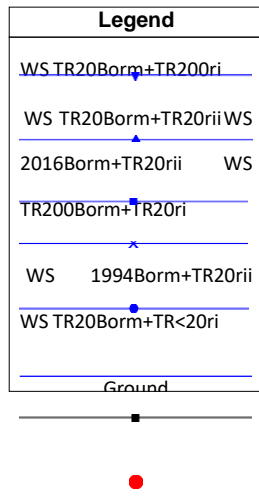
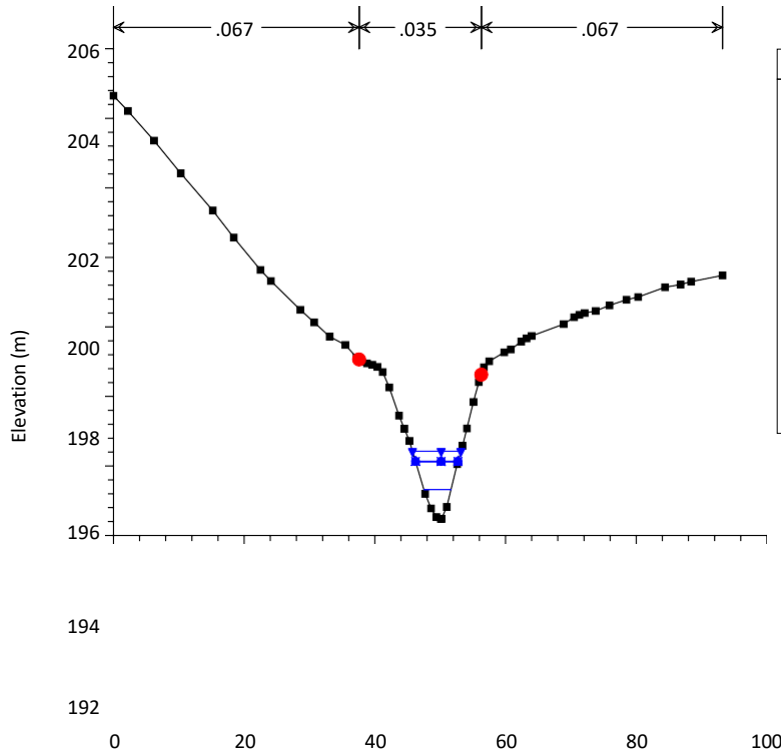
River = Rio Sacco Reach = 1 RS = 301



Lotto1B_rev02

Geom: Lotto1B_rev02

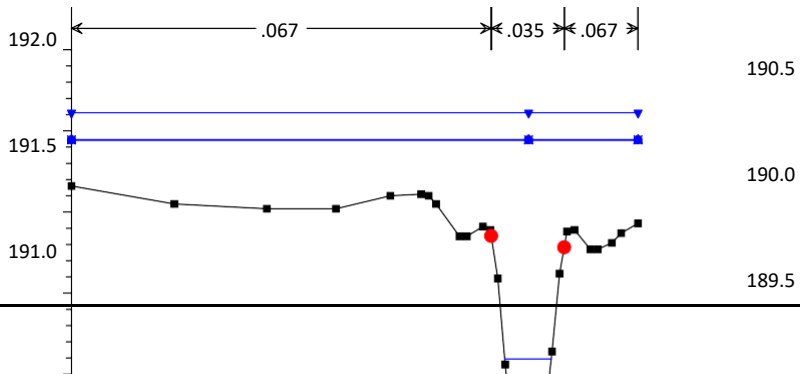
River = Rio San Pietro Reach = 3 RS = 134



Lotto1B_rev02

Geom: Lotto1B_rev02

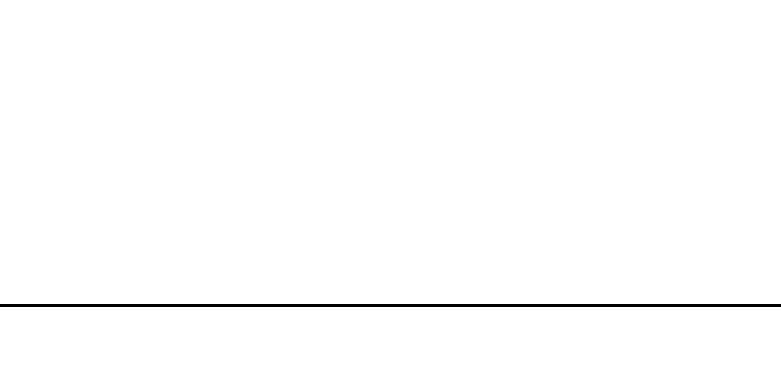
River = Rio San Pietro Reach = 3 RS = 127

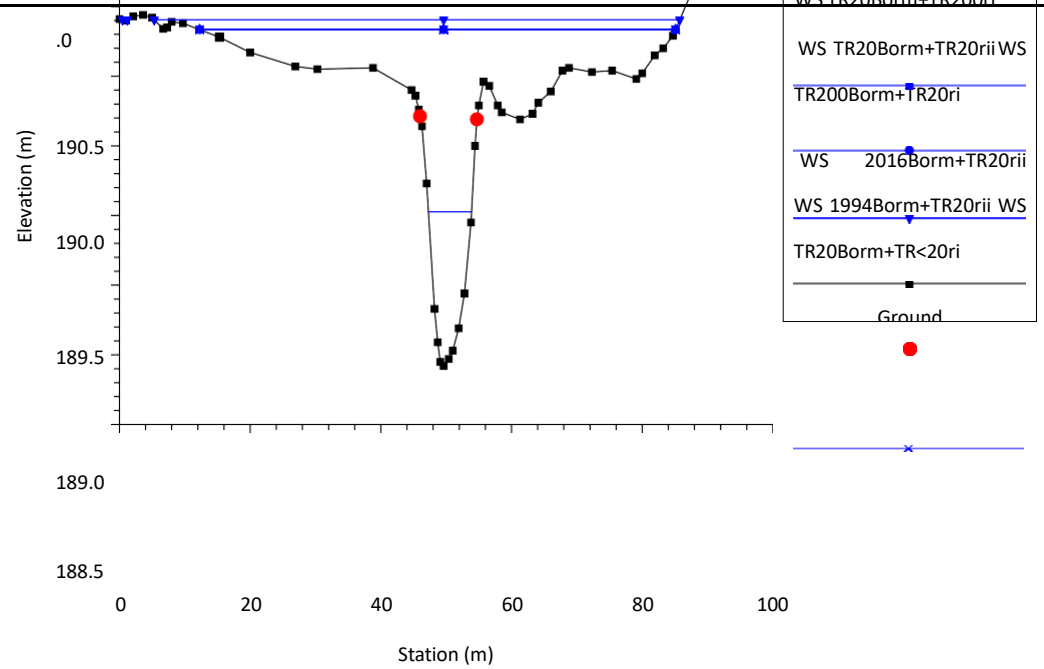
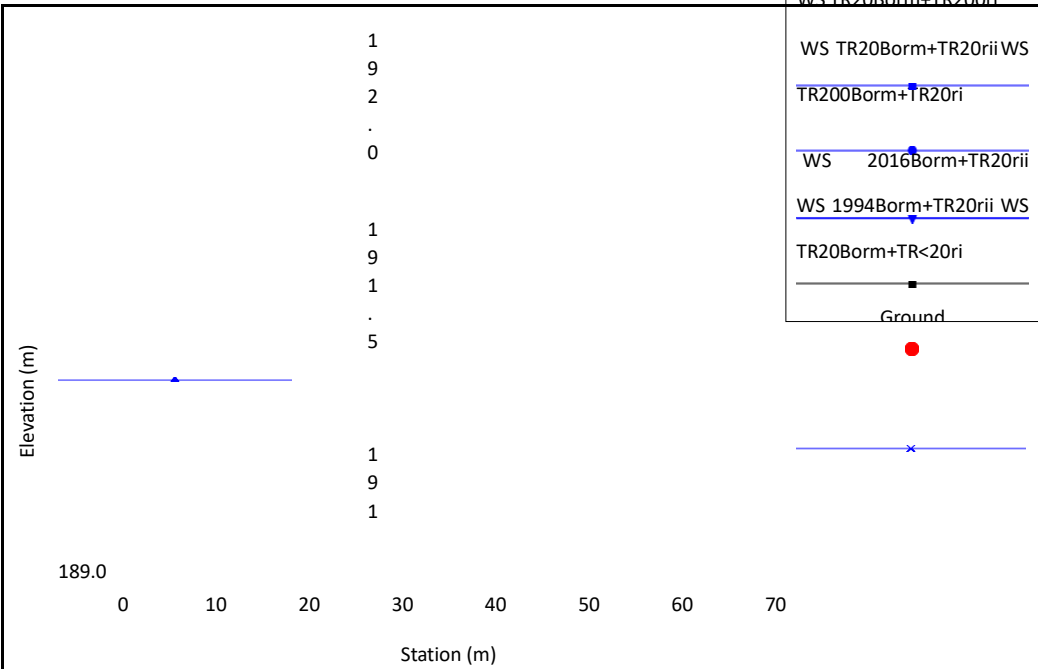


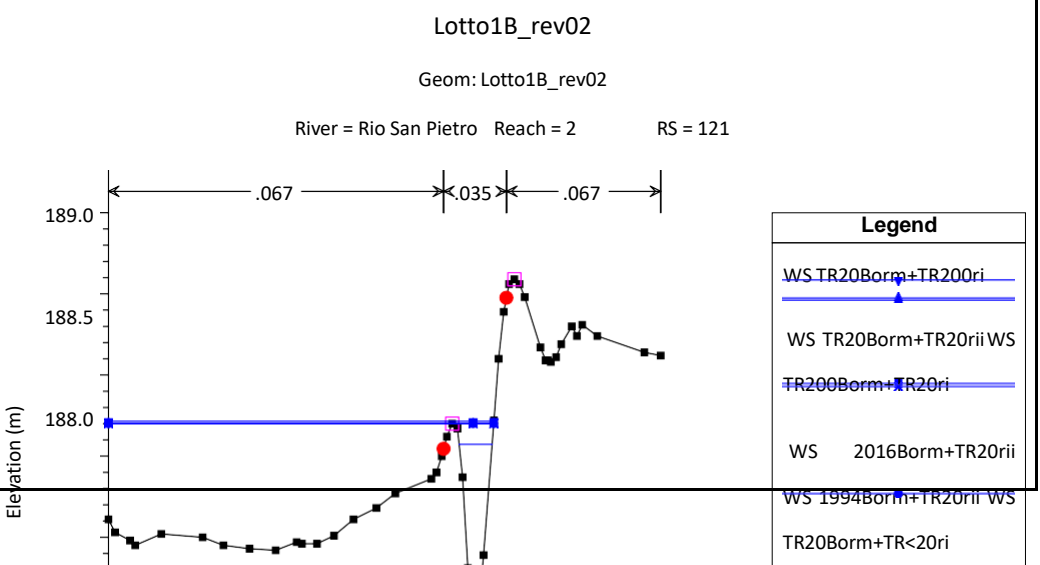
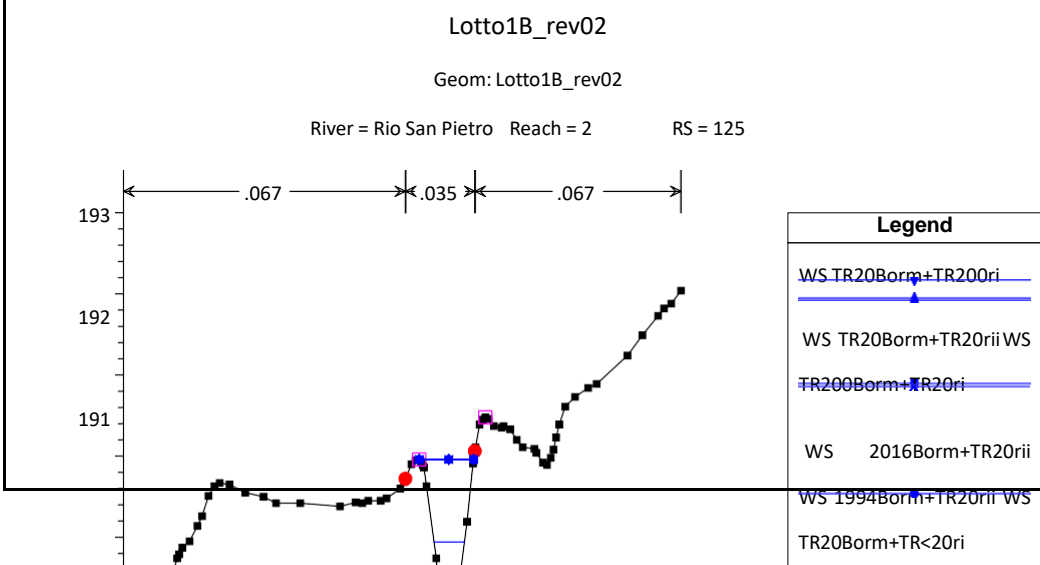
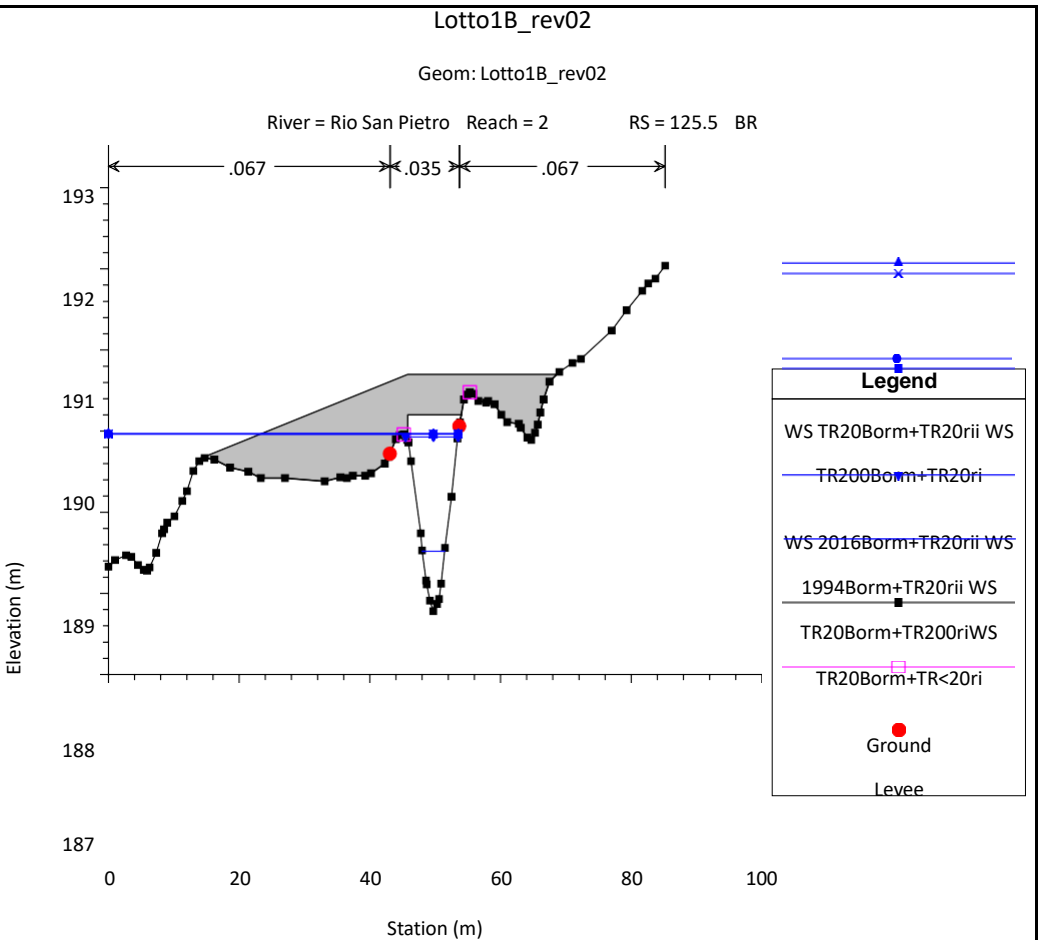
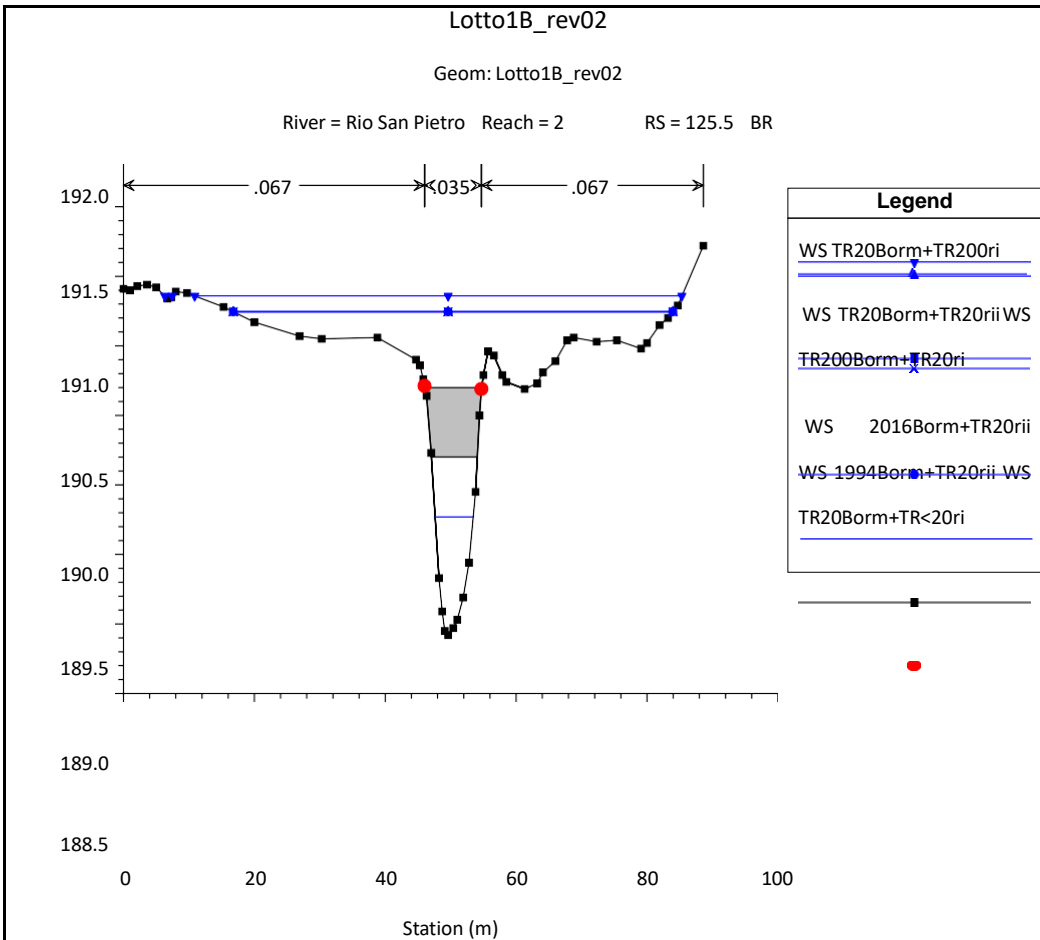
Lotto1B_rev02

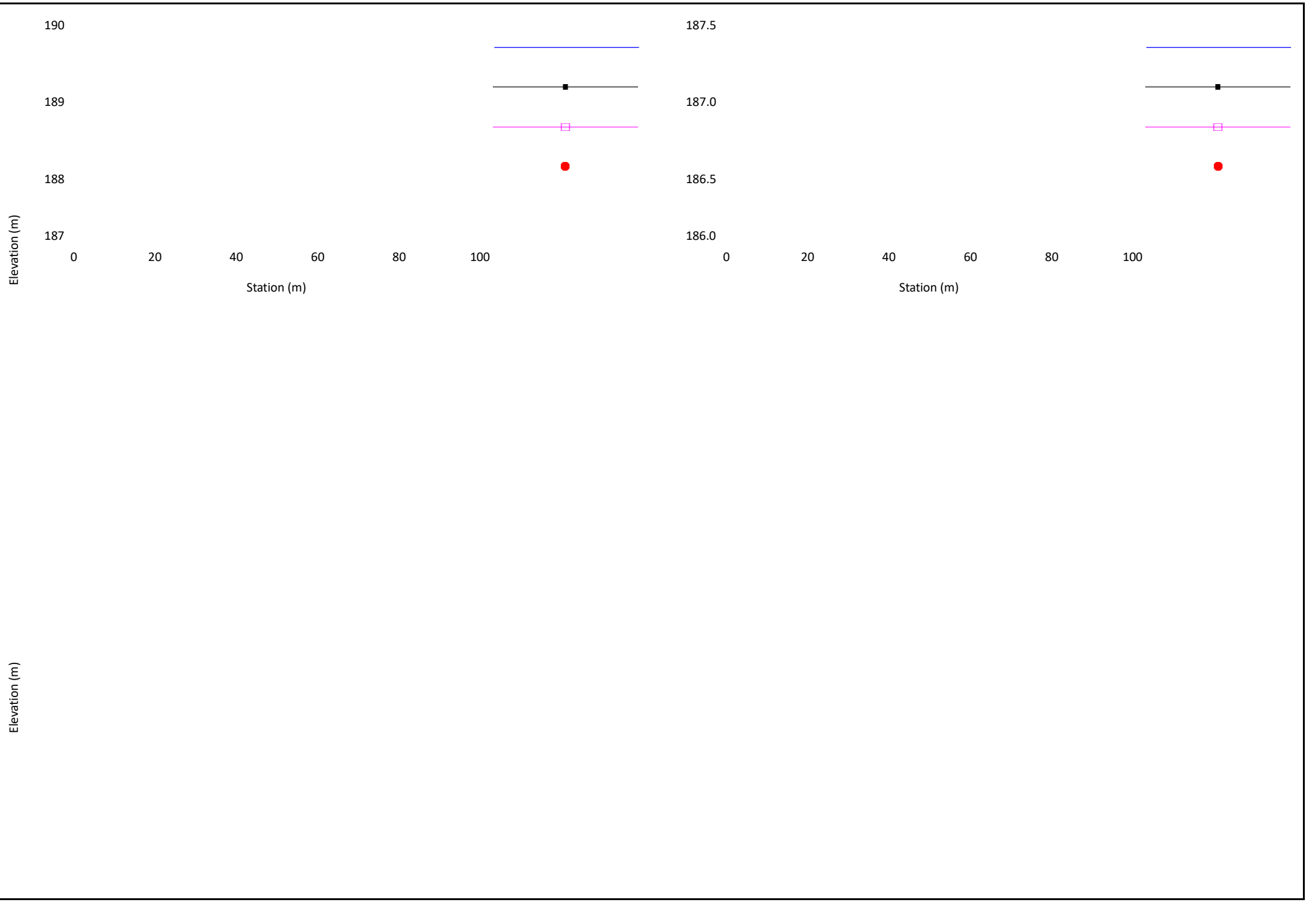
Geom: Lotto1B_rev02

River = Rio San Pietro Reach = 2 RS = 126





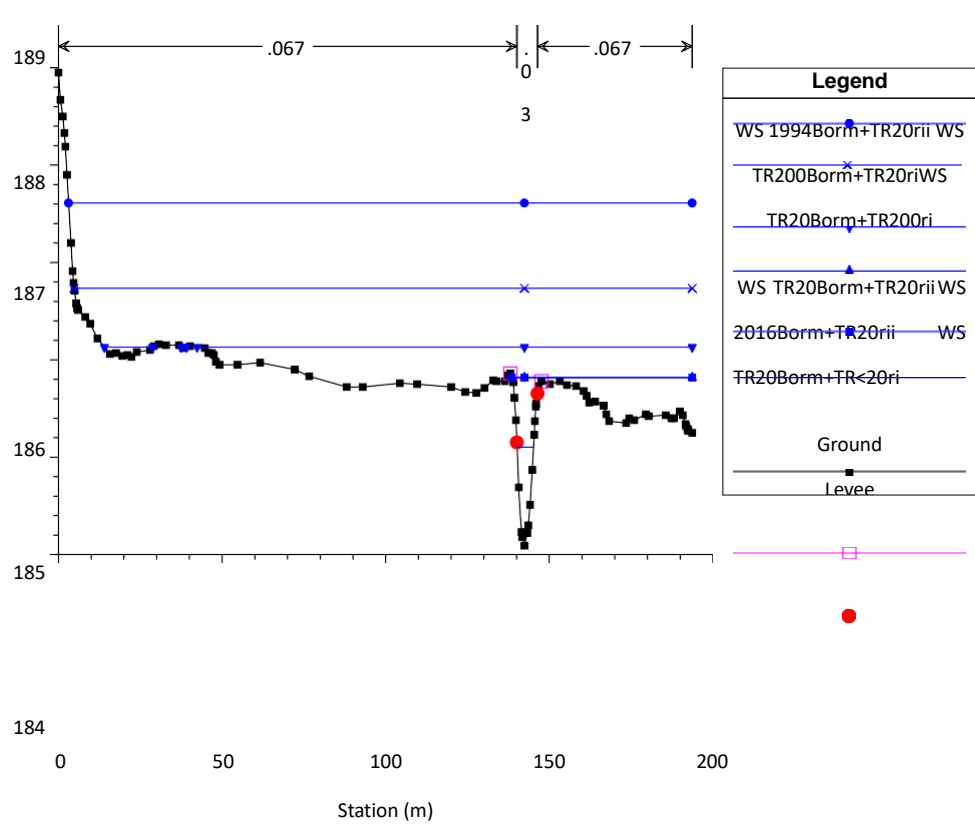




Lotto1B_rev02

Geom: Lotto1B_rev02

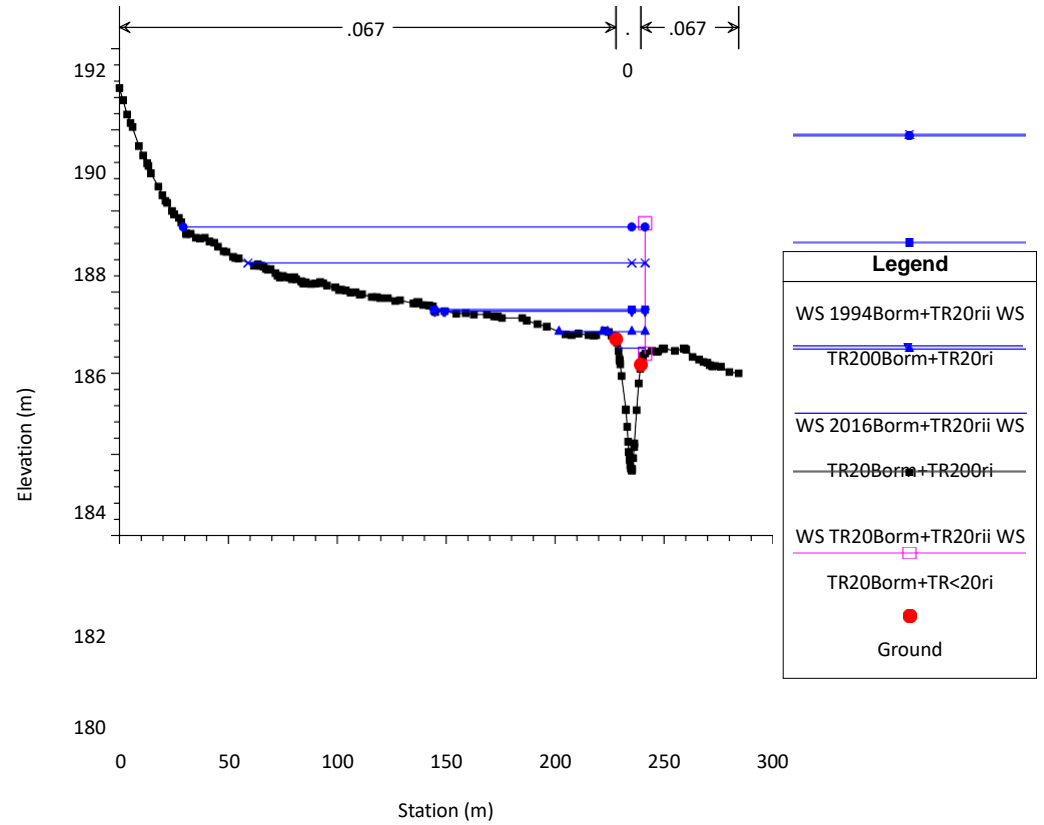
River = Rio San Pietro Reach = 2 RS = 115



Lotto1B_rev02

Geom: Lotto1B_rev02

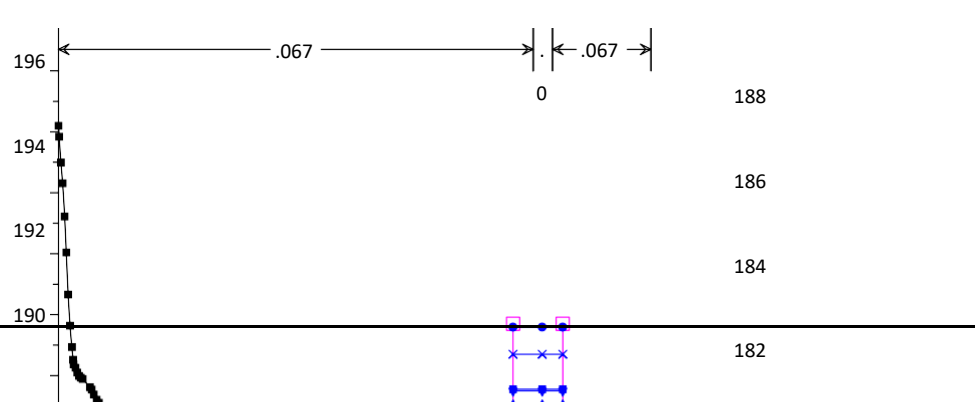
River = Rio San Pietro Reach = 2 RS = 109



Lotto1B_rev02

Geom: Lotto1B_rev02

River = Rio San Pietro Reach = 1 RS = 108

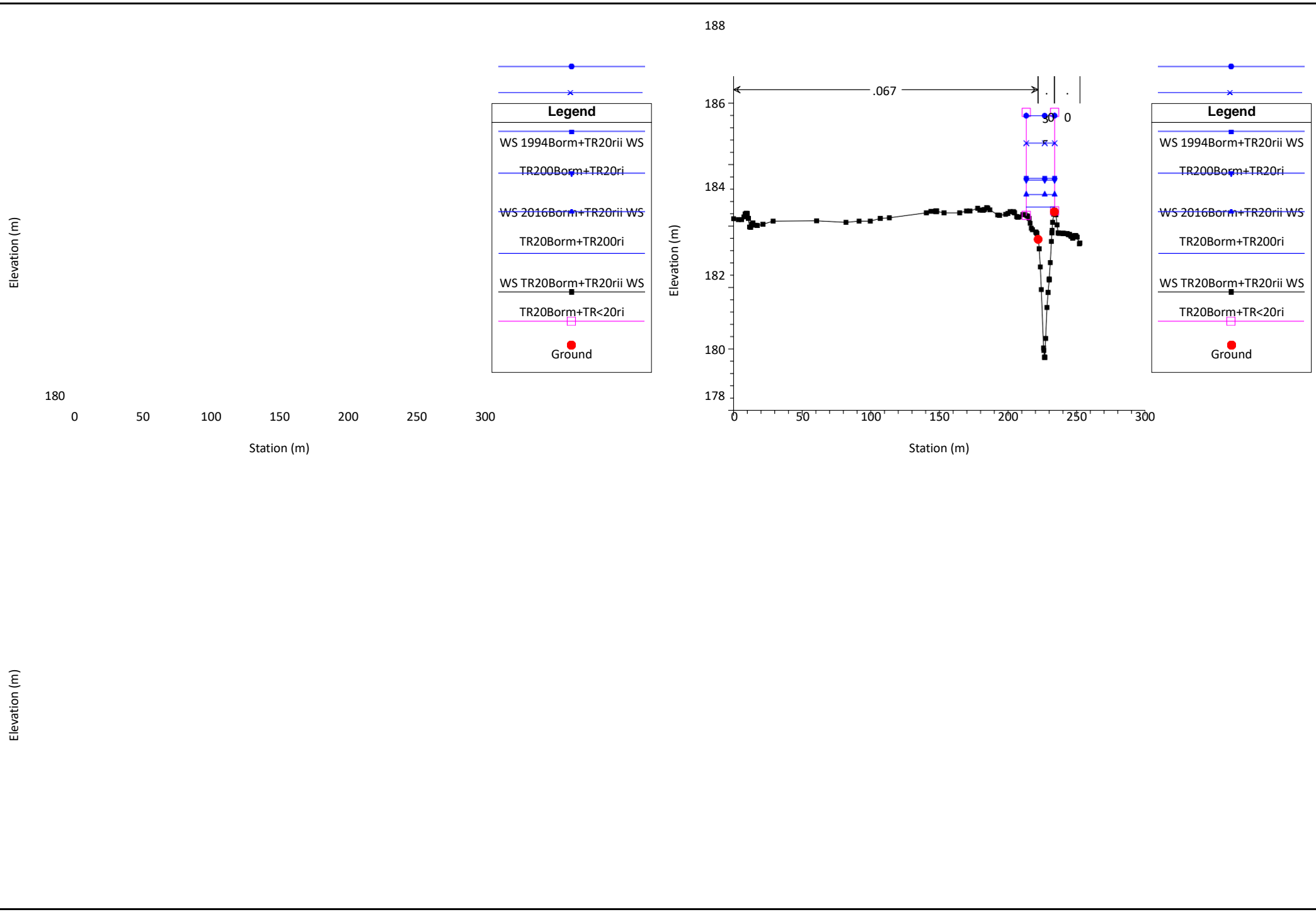


Lotto1B_rev02

Geom: Lotto1B_rev02

River = Rio San Pietro Reach = 1 RS = 105

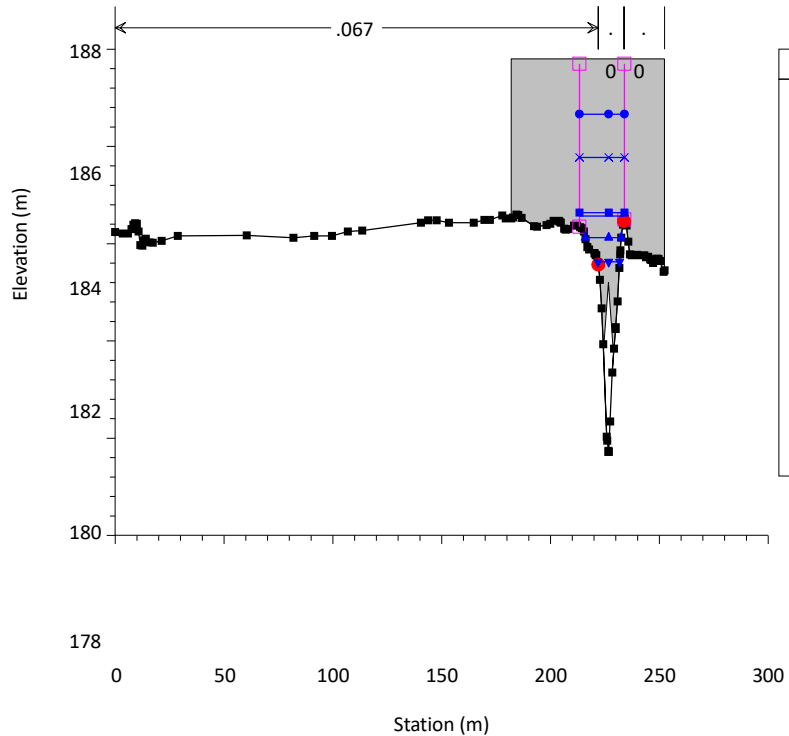




Lotto1B_rev02

Geom: Lotto1B_rev02

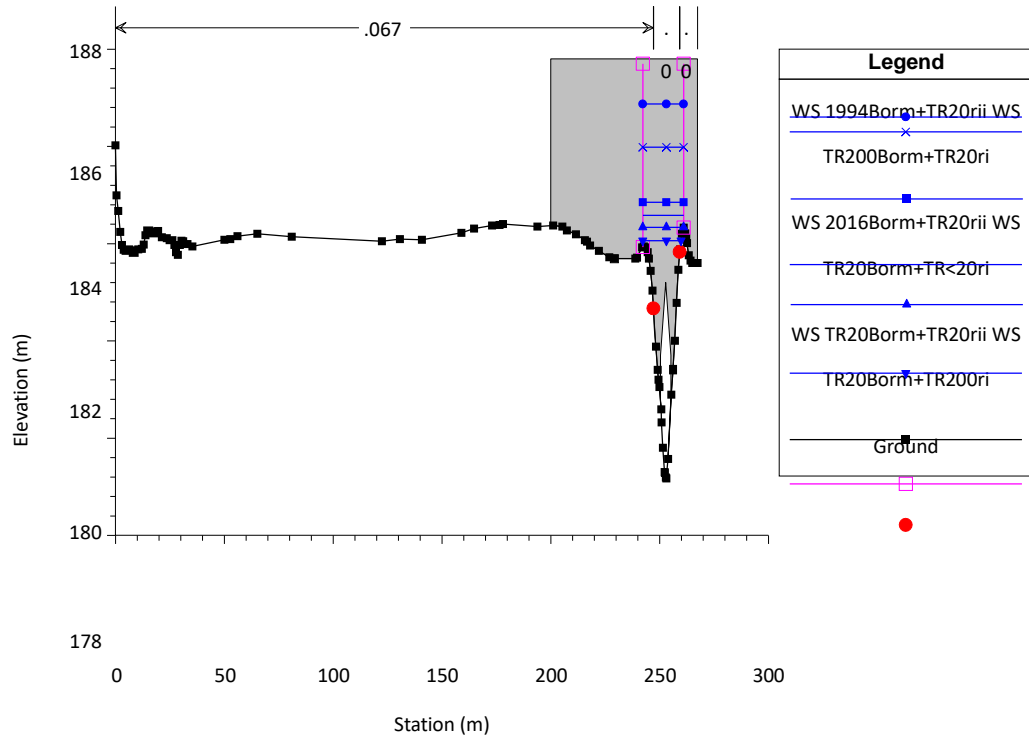
River = Rio San Pietro Reach = 1 RS = 104.5 BR



Lotto1B_rev02

Geom: Lotto1B_rev02

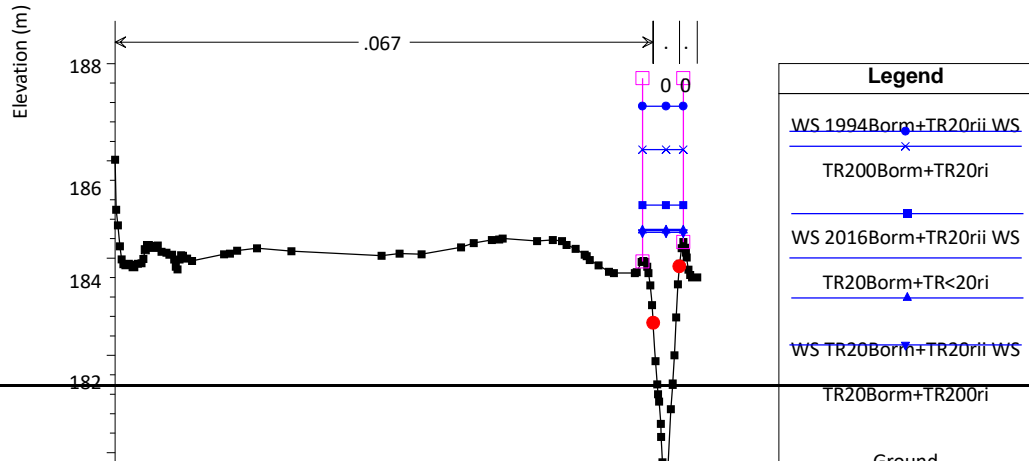
River = Rio San Pietro Reach = 1 RS = 104.5 BR



Lotto1B_rev02

Geom: Lotto1B_rev02

River = Rio San Pietro Reach = 1 RS = 104



180

178

0

50

100

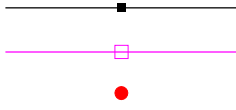
150

200

250

300

Station (m)



INTERVENTO CODICE AT_A18_622_19_102 – PROGETTO PER LAVORI DI ADEGUAMENTO SEZIONI DI DEFLUSSO FOSSI COLATORI PROVENIENTI DA VERSANTI IN GIARONETTO - ADEGUAMENTO DEI TRATTI DEL FIUME BORMIDA E DEL RIO SAN PIETRO IN CORRISPONDENZA DELLA S.P. 25 - PROGETTO ESECUTIVO – LOTTO 1A

SITUAZIONE AL LOTTO 1C

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	3	134	TR20Borm+TR<20ri	5.00	192.48	193.32	193.32	193.58	0.017108	2.29	2.18	4.13	1.01
Rio San Pietro	3	134	TR20Borm+TR20rii	22.20	192.48	194.13	194.19	194.73	0.017011	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	TR20Borm+TR200ri	31.90	192.48	194.42	194.52	195.14	0.017018	3.74	8.53	7.40	1.11
Rio San Pietro	3	134	TR200Borm+TR20ri	22.20	192.48	194.13	194.20	194.73	0.017012	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	2016Borm+TR20rii	22.20	192.48	194.13	194.19	194.73	0.017011	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	1994Borm+TR20rii	22.20	192.48	194.13	194.20	194.73	0.017012	3.42	6.50	6.49	1.09
Rio San Pietro	3	133.00*	TR20Borm+TR<20ri	5.00	192.00	192.82	192.85	193.12	0.020016	2.43	2.06	4.01	1.09
Rio San Pietro	3	133.00*	TR20Borm+TR20rii	22.20	192.00	193.62	193.73	194.27	0.019320	3.57	6.22	6.43	1.16
Rio San Pietro	3	133.00*	TR20Borm+TR200ri	31.90	192.00	193.91	194.05	194.68	0.019164	3.90	8.18	7.33	1.18
Rio San Pietro	3	133.00*	TR200Borm+TR20ri	22.20	192.00	193.62	193.73	194.27	0.019476	3.58	6.20	6.42	1.16
Rio San Pietro	3	133.00*	2016Borm+TR20rii	22.20	192.00	193.62	193.73	194.27	0.019320	3.57	6.22	6.43	1.16
Rio San Pietro	3	133.00*	1994Borm+TR20rii	22.20	192.00	193.62	193.73	194.27	0.019319	3.57	6.22	6.43	1.16
Rio San Pietro	3	132.00*	TR20Borm+TR<20ri	5.00	191.53	192.38	192.38	192.65	0.017302	2.31	2.16	4.08	1.01
Rio San Pietro	3	132.00*	TR20Borm+TR20rii	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	132.00*	TR20Borm+TR200ri	31.90	191.53	193.44	193.58	194.20	0.019256	3.87	8.24	7.53	1.18
Rio San Pietro	3	132.00*	TR200Borm+TR20ri	22.20	191.53	193.16	193.26	193.79	0.018608	3.51	6.33	6.56	1.14
Rio San Pietro	3	132.00*	2016Borm+TR20rii	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	132.00*	1994Borm+TR20rii	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	131.00*	TR20Borm+TR<20ri	5.00	191.05	191.88	191.91	192.18	0.020188	2.44	2.05	4.00	1.09
Rio San Pietro	3	131.00*	TR20Borm+TR20rii	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	131.00*	TR20Borm+TR200ri	31.90	191.05	192.94	193.10	193.71	0.019778	3.88	8.21	7.68	1.20
Rio San Pietro	3	131.00*	TR200Borm+TR20ri	22.20	191.05	192.67	192.79	193.31	0.019641	3.54	6.26	6.70	1.17
Rio San Pietro	3	131.00*	2016Borm+TR20rii	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	131.00*	1994Borm+TR20rii	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	130.00*	TR20Borm+TR<20ri	5.00	190.58	191.43	191.44	191.71	0.017638	2.32	2.16	4.13	1.02
Rio San Pietro	3	130.00*	TR20Borm+TR20rii	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	130.00*	TR20Borm+TR200ri	31.90	190.58	192.45	192.60	193.22	0.019805	3.88	8.22	7.74	1.20
Rio San Pietro	3	130.00*	TR200Borm+TR20ri	22.20	190.58	192.18	192.31	192.82	0.019897	3.54	6.28	6.85	1.18
Rio San Pietro	3	130.00*	2016Borm+TR20rii	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	130.00*	1994Borm+TR20rii	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	129.00*	TR20Borm+TR<20ri	5.00	190.10	190.92	190.96	191.23	0.020777	2.44	2.05	4.13	1.11
Rio San Pietro	3	129.00*	TR20Borm+TR20rii	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	TR20Borm+TR200ri	31.90	190.10	191.94	192.10	192.72	0.020116	3.90	8.18	7.76	1.21
Rio San Pietro	3	129.00*	TR200Borm+TR20ri	22.20	190.10	191.68	191.80	192.32	0.020086	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	2016Borm+TR20rii	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	1994Borm+TR20rii	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19

HEC-RAS Plan: Lotto1C (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	3	128.00*	TR20Borm+TR<20ri	5.00	189.63	190.45	190.47	190.73	0.018705	2.32	2.16	4.38	1.05
Rio San Pietro	3	128.00*	TR20Borm+TR20rii	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	TR20Borm+TR200ri	31.90	189.63	191.44	191.62	192.21	0.020379	3.90	8.17	7.86	1.22
Rio San Pietro	3	128.00*	TR200Borm+TR20ri	22.20	189.63	191.18	191.30	191.82	0.020227	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	2016Borm+TR20rii	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	1994Borm+TR20rii	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	127	TR20Borm+TR<20ri	5.00	189.15	190.09	189.97	190.25	0.008760	1.75	2.85	4.97	0.74
Rio San Pietro	3	127	TR20Borm+TR20rii	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	TR20Borm+TR200ri	31.90	189.15	191.61	191.27	191.68	0.001390	1.44	45.13	60.60	0.35
Rio San Pietro	3	127	TR200Borm+TR20ri	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	2016Borm+TR20rii	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	1994Borm+TR20rii	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	2	126	TR20Borm+TR<20ri	8.00	188.92	190.03	189.77	190.16	0.005187	1.61	4.95	6.61	0.60
Rio San Pietro	2	126	TR20Borm+TR20rii	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	TR20Borm+TR200ri	49.10	188.92	191.41	191.30	191.63	0.003468	2.37	40.50	81.15	0.56
Rio San Pietro	2	126	TR200Borm+TR20ri	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	2016Borm+TR20rii	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	1994Borm+TR20rii	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	125.5		Bridge									
Rio San Pietro	2	125	TR20Borm+TR<20ri	8.00	187.78	188.94	188.90	189.24	0.013680	2.43	3.29	4.65	0.92
Rio San Pietro	2	125	TR20Borm+TR20rii	34.30	187.78	189.96	189.96	190.01	0.003090	1.41	41.12	53.50	0.47
Rio San Pietro	2	125	TR20Borm+TR200ri	49.10	187.78	189.96	189.96	190.07	0.006331	2.02	41.12	53.50	0.67
Rio San Pietro	2	125	TR200Borm+TR20ri	34.30	187.78	189.96	189.96	190.01	0.003090	1.41	41.12	53.50	0.47
Rio San Pietro	2	125	2016Borm+TR20rii	34.30	187.78	189.96	189.96	190.01	0.003090	1.41	41.12	53.50	0.47
Rio San Pietro	2	125	1994Borm+TR20rii	34.30	187.78	189.96	189.96	190.01	0.003090	1.41	41.12	53.50	0.47
Rio San Pietro	2	124.00*	TR20Borm+TR<20ri	8.00	187.45	188.61	188.57	188.91	0.013528	2.41	3.32	4.74	0.92
Rio San Pietro	2	124.00*	TR20Borm+TR20rii	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	TR20Borm+TR200ri	49.10	187.45	189.40	189.40	189.50	0.007564	2.06	40.10	54.98	0.72
Rio San Pietro	2	124.00*	TR200Borm+TR20ri	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	2016Borm+TR20rii	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	1994Borm+TR20rii	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	123.00*	TR20Borm+TR<20ri	8.00	187.11	188.27	188.24	188.57	0.013931	2.42	3.30	4.82	0.94
Rio San Pietro	2	123.00*	TR20Borm+TR20rii	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	123.00*	TR20Borm+TR200ri	49.10	187.11	188.83	188.83	188.94	0.009078	2.08	39.03	56.38	0.78
Rio San Pietro	2	123.00*	TR200Borm+TR20ri	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	123.00*	2016Borm+TR20rii	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54

HEC-RAS Plan: Lotto1C (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	123.00*	1994Borm+TR20rii	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	122.00*	TR20Borm+TR<20ri	8.00	186.78	187.97	187.90	188.24	0.012155	2.28	3.51	5.12	0.88
Rio San Pietro	2	122.00*	TR20Borm+TR20rii	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	TR20Borm+TR200ri	49.10	186.78	188.27	188.27	188.37	0.010860	2.06	37.95	57.70	0.83
Rio San Pietro	2	122.00*	TR200Borm+TR20ri	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	2016Borm+TR20rii	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	1994Borm+TR20rii	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	121	TR20Borm+TR<20ri	8.00	186.44	187.57	187.57	187.89	0.016026	2.49	3.21	5.06	1.00
Rio San Pietro	2	121	TR20Borm+TR20rii	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	TR20Borm+TR200ri	49.10	186.44	187.72	187.70	187.81	0.011885	1.95	37.80	58.99	0.85
Rio San Pietro	2	121	TR200Borm+TR20ri	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	2016Borm+TR20rii	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	1994Borm+TR20rii	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	120.00*	TR20Borm+TR<20ri	8.00	186.05	186.88	187.00	187.30	0.036907	3.21	5.32	48.07	1.46
Rio San Pietro	2	120.00*	TR20Borm+TR20rii	34.30	186.05	187.33	187.19	187.40	0.009943	1.93	33.96	72.95	0.80
Rio San Pietro	2	120.00*	TR20Borm+TR200ri	49.10	186.05	187.43	187.29	187.53	0.010591	2.18	41.74	73.64	0.84
Rio San Pietro	2	120.00*	TR200Borm+TR20ri	34.30	186.05	187.33	187.19	187.40	0.009943	1.93	33.96	72.95	0.80
Rio San Pietro	2	120.00*	2016Borm+TR20rii	34.30	186.05	187.33	187.19	187.40	0.009943	1.93	33.96	72.95	0.80
Rio San Pietro	2	120.00*	1994Borm+TR20rii	34.30	186.05	187.63	187.19	187.66	0.001949	1.08	56.50	74.00	0.37
Rio San Pietro	2	119.00*	TR20Borm+TR<20ri	8.00	185.66	186.78	186.78	186.86	0.006990	1.49	12.28	76.27	0.66
Rio San Pietro	2	119.00*	TR20Borm+TR20rii	34.30	185.66	187.06	187.02	187.16	0.009167	2.17	35.40	85.86	0.80
Rio San Pietro	2	119.00*	TR20Borm+TR200ri	49.10	185.66	187.17	187.09	187.28	0.009191	2.33	45.01	86.38	0.81
Rio San Pietro	2	119.00*	TR200Borm+TR20ri	34.30	185.66	187.06	187.02	187.16	0.009167	2.17	35.40	85.86	0.80
Rio San Pietro	2	119.00*	2016Borm+TR20rii	34.30	185.66	187.06	187.02	187.16	0.009167	2.17	35.40	85.86	0.80
Rio San Pietro	2	119.00*	1994Borm+TR20rii	34.30	185.66	187.61	187.02	187.63	0.000657	0.77	83.88	89.49	0.23
Rio San Pietro	2	118.00*	TR20Borm+TR<20ri	8.00	185.27	186.40	186.49	186.62	0.011779	2.09	4.31	22.67	0.87
Rio San Pietro	2	118.00*	TR20Borm+TR20rii	34.30	185.27	186.81	186.81	186.94	0.008080	2.31	36.68	99.25	0.77
Rio San Pietro	2	118.00*	TR20Borm+TR200ri	49.10	185.27	186.90	186.89	187.05	0.009203	2.57	45.61	99.91	0.83
Rio San Pietro	2	118.00*	TR200Borm+TR20ri	34.30	185.27	186.81	186.81	186.94	0.008080	2.31	36.68	99.25	0.77
Rio San Pietro	2	118.00*	2016Borm+TR20rii	34.30	185.27	186.81	186.81	186.94	0.008080	2.31	36.68	99.25	0.77
Rio San Pietro	2	118.00*	1994Borm+TR20rii	34.30	185.27	187.61	186.81	187.62	0.000195	0.52	143.24	137.65	0.13
Rio San Pietro	2	117.00*	TR20Borm+TR<20ri	8.00	184.87	185.85	185.92	186.22	0.021701	2.69	2.97	5.45	1.16
Rio San Pietro	2	117.00*	TR20Borm+TR20rii	34.30	184.87	186.55	186.59	186.73	0.008337	2.53	34.91	109.75	0.80
Rio San Pietro	2	117.00*	TR20Borm+TR200ri	49.10	184.87	186.67	186.67	186.83	0.007947	2.61	47.95	113.28	0.79
Rio San Pietro	2	117.00*	TR200Borm+TR20ri	34.30	184.87	186.74	186.59	186.78	0.002068	1.39	67.72	153.10	0.41
Rio San Pietro	2	117.00*	2016Borm+TR20rii	34.30	184.87	186.55	186.59	186.73	0.008337	2.53	34.91	109.75	0.80

HEC-RAS Plan: Lotto1C (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	117.00*	1994Borm+TR20rii	34.30	184.87	187.61	186.59	187.61	0.000076	0.38	202.74	155.25	0.09
Rio San Pietro	2	116.00*	TR20Borm+TR<20ri	8.00	184.48	185.50	185.50	185.80	0.015693	2.45	3.27	5.36	1.00
Rio San Pietro	2	116.00*	TR20Borm+TR20rii	34.30	184.48	186.29	186.29	186.42	0.005272	2.21	44.98	156.32	0.65
Rio San Pietro	2	116.00*	TR20Borm+TR200ri	49.10	184.48	186.27	186.38	186.58	0.011958	3.29	42.47	150.40	0.97
Rio San Pietro	2	116.00*	TR200Borm+TR20ri	34.30	184.48	186.74	186.29	186.75	0.000425	0.78	120.51	171.02	0.19
Rio San Pietro	2	116.00*	2016Borm+TR20rii	34.30	184.48	186.29	186.29	186.42	0.005272	2.21	44.98	156.32	0.65
Rio San Pietro	2	116.00*	1994Borm+TR20rii	34.30	184.48	187.61	186.29	187.61	0.000035	0.29	270.86	172.91	0.06
Rio San Pietro	2	115	TR20Borm+TR<20ri	8.00	184.09	185.10	185.09	185.41	0.014725	2.45	3.27	5.02	0.97
Rio San Pietro	2	115	TR20Borm+TR20rii	34.30	184.09	185.82	185.94	186.21	0.012028	3.26	21.68	55.18	0.96
Rio San Pietro	2	115	TR20Borm+TR200ri	49.10	184.09	186.13	186.04	186.22	0.003392	2.03	69.68	167.69	0.53
Rio San Pietro	2	115	TR200Borm+TR20ri	34.30	184.09	186.74	185.94	186.74	0.000133	0.50	181.54	188.89	0.11
Rio San Pietro	2	115	2016Borm+TR20rii	34.30	184.09	185.82	185.94	186.21	0.012028	3.26	21.68	55.18	0.96
Rio San Pietro	2	115	1994Borm+TR20rii	34.30	184.09	187.61	185.94	187.61	0.000017	0.23	347.57	190.60	0.04
Rio San Pietro	2	114.00*	TR20Borm+TR<20ri	8.00	183.67	184.75	184.73	185.05	0.014092	2.39	3.35	5.19	0.95
Rio San Pietro	2	114.00*	TR20Borm+TR20rii	34.30	183.67	185.64	185.73	185.94	0.008059	2.81	24.49	70.93	0.80
Rio San Pietro	2	114.00*	TR20Borm+TR200ri	49.10	183.67	186.09		186.15	0.001858	1.65	81.12	156.17	0.40
Rio San Pietro	2	114.00*	TR200Borm+TR20ri	34.30	183.67	186.73		186.74	0.000094	0.46	200.08	197.52	0.10
Rio San Pietro	2	114.00*	2016Borm+TR20rii	34.30	183.67	185.79	185.73	185.93	0.003688	2.05	40.26	120.09	0.55
Rio San Pietro	2	114.00*	1994Borm+TR20rii	34.30	183.67	187.61		187.61	0.000014	0.22	377.53	204.47	0.04
Rio San Pietro	2	113.00*	TR20Borm+TR<20ri	8.00	183.26	184.65		184.80	0.005367	1.67	4.79	6.07	0.60
Rio San Pietro	2	113.00*	TR20Borm+TR20rii	34.30	183.26	185.66	185.45	185.76	0.002530	1.79	41.84	115.54	0.46
Rio San Pietro	2	113.00*	TR20Borm+TR200ri	49.10	183.26	186.07		186.11	0.001007	1.32	97.81	163.30	0.30
Rio San Pietro	2	113.00*	TR200Borm+TR20ri	34.30	183.26	186.73		186.73	0.000067	0.41	220.74	205.97	0.08
Rio San Pietro	2	113.00*	2016Borm+TR20rii	34.30	183.26	185.79		185.85	0.001420	1.42	58.05	126.96	0.35
Rio San Pietro	2	113.00*	1994Borm+TR20rii	34.30	183.26	187.61		187.61	0.000011	0.21	406.98	217.45	0.04
Rio San Pietro	2	112.00*	TR20Borm+TR<20ri	8.00	182.85	184.63	183.99	184.70	0.001955	1.14	6.99	7.21	0.37
Rio San Pietro	2	112.00*	TR20Borm+TR20rii	34.30	182.85	185.11	185.03	185.61	0.010563	3.14	11.03	10.37	0.90
Rio San Pietro	2	112.00*	TR20Borm+TR200ri	49.10	182.85	185.60	185.60	186.02	0.006079	2.98	24.40	66.22	0.72
Rio San Pietro	2	112.00*	TR200Borm+TR20ri	34.30	182.85	186.72	185.03	186.73	0.000114	0.57	163.45	167.77	0.11
Rio San Pietro	2	112.00*	2016Borm+TR20rii	34.30	182.85	185.55	185.03	185.78	0.003404	2.18	21.52	47.18	0.54
Rio San Pietro	2	112.00*	1994Borm+TR20rii	34.30	182.85	187.61	185.03	187.61	0.000018	0.27	319.64	182.51	0.05
Rio San Pietro	2	111.00*	TR20Borm+TR<20ri	8.00	182.43	184.62	183.61	184.66	0.000836	0.83	9.69	8.56	0.25
Rio San Pietro	2	111.00*	TR20Borm+TR20rii	34.30	182.43	185.05	184.68	185.37	0.005642	2.50	14.08	11.83	0.67
Rio San Pietro	2	111.00*	TR20Borm+TR200ri	49.10	182.43	185.50	185.04	185.81	0.004007	2.53	27.90	57.82	0.59
Rio San Pietro	2	111.00*	TR200Borm+TR20ri	34.30	182.43	186.72	184.68	186.73	0.000080	0.50	180.46	168.45	0.09
Rio San Pietro	2	111.00*	2016Borm+TR20rii	34.30	182.43	185.56	184.68	185.69	0.001710	1.69	31.41	72.66	0.39

HEC-RAS Plan: Lotto1C (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	111.00*	1994Borm+TR20rii	34.30	182.43	187.61	184.68	187.61	0.000015	0.26	343.17	192.25	0.04
Rio San Pietro	2	110.00*	TR20Borm+TR<20ri	8.00	182.02	184.62	183.20	184.64	0.000383	0.62	12.93	10.43	0.17
Rio San Pietro	2	110.00*	TR20Borm+TR20rii	34.30	182.02	185.03	184.32	185.23	0.003008	1.99	17.92	13.67	0.50
Rio San Pietro	2	110.00*	TR20Borm+TR200ri	49.10	182.02	185.52	184.68	185.70	0.002109	1.98	39.54	80.22	0.44
Rio San Pietro	2	110.00*	TR200Borm+TR20ri	34.30	182.02	186.72	184.32	186.73	0.000058	0.45	200.18	175.29	0.08
Rio San Pietro	2	110.00*	2016Borm+TR20rii	34.30	182.02	185.57	184.32	185.65	0.000930	1.34	43.42	90.39	0.29
Rio San Pietro	2	110.00*	1994Borm+TR20rii	34.30	182.02	187.61	184.32	187.61	0.000012	0.24	369.37	202.08	0.04
Rio San Pietro	2	109	TR20Borm+TR<20ri	8.00	181.60	184.62	182.79	184.63	0.000193	0.49	16.81	12.40	0.12
Rio San Pietro	2	109	TR20Borm+TR20rii	34.30	181.60	185.03	183.95	185.16	0.001679	1.61	23.80	37.34	0.38
Rio San Pietro	2	109	TR20Borm+TR200ri	49.10	181.60	185.53	184.32	185.64	0.001203	1.60	52.77	95.99	0.33
Rio San Pietro	2	109	TR200Borm+TR20ri	34.30	181.60	186.72	183.95	186.72	0.000043	0.40	221.47	182.26	0.07
Rio San Pietro	2	109	2016Borm+TR20rii	34.30	181.60	185.57	183.95	185.62	0.000532	1.08	56.79	96.96	0.22
Rio San Pietro	2	109	1994Borm+TR20rii	34.30	181.60	187.61	183.95	187.61	0.000010	0.22	397.17	212.02	0.03
Rio San Pietro	1	108	TR20Borm+TR<20ri	8.00	180.99	184.62	182.40	184.63	0.000113	0.43	20.11	17.01	0.10
Rio San Pietro	1	108	TR20Borm+TR20rii	34.30	180.99	185.03	183.66	185.13	0.001029	1.47	28.82	22.80	0.30
Rio San Pietro	1	108	TR20Borm+TR200ri	49.10	180.99	185.50	184.02	185.63	0.001032	1.65	39.60	22.80	0.31
Rio San Pietro	1	108	TR200Borm+TR20ri	34.30	180.99	186.70	183.66	186.72	0.000130	0.74	66.93	22.80	0.12
Rio San Pietro	1	108	2016Borm+TR20rii	34.30	180.99	185.56	183.66	185.61	0.000467	1.13	40.83	22.80	0.21
Rio San Pietro	1	108	1994Borm+TR20rii	34.30	180.99	187.59	183.66	187.61	0.000062	0.58	87.30	22.80	0.08
Rio San Pietro	1	107.00*	TR20Borm+TR<20ri	8.00	180.57	184.62	182.00	184.62	0.000073	0.36	24.53	20.45	0.08
Rio San Pietro	1	107.00*	TR20Borm+TR20rii	34.30	180.57	185.03	183.30	185.10	0.000694	1.25	33.54	22.10	0.25
Rio San Pietro	1	107.00*	TR20Borm+TR200ri	49.10	180.57	185.50	183.73	185.59	0.000739	1.44	43.97	22.10	0.26
Rio San Pietro	1	107.00*	TR200Borm+TR20ri	34.30	180.57	186.70	183.30	186.72	0.000102	0.67	70.47	22.10	0.10
Rio San Pietro	1	107.00*	2016Borm+TR20rii	34.30	180.57	185.55	183.30	185.60	0.000337	0.98	45.18	22.10	0.18
Rio San Pietro	1	107.00*	1994Borm+TR20rii	34.30	180.57	187.59	183.30	187.60	0.000051	0.53	90.22	22.10	0.07
Rio San Pietro	1	106.00*	TR20Borm+TR<20ri	8.00	180.14	184.62	181.60	184.62	0.000050	0.31	29.45	21.40	0.06
Rio San Pietro	1	106.00*	TR20Borm+TR20rii	34.30	180.14	185.03	182.90	185.08	0.000493	1.08	38.21	21.40	0.21
Rio San Pietro	1	106.00*	TR20Borm+TR200ri	49.10	180.14	185.50	183.33	185.57	0.000552	1.27	48.30	21.40	0.23
Rio San Pietro	1	106.00*	TR200Borm+TR20ri	34.30	180.14	186.70	182.90	186.72	0.000083	0.61	73.99	21.40	0.09
Rio San Pietro	1	106.00*	2016Borm+TR20rii	34.30	180.14	185.55	182.90	185.59	0.000252	0.87	49.49	21.40	0.15
Rio San Pietro	1	106.00*	1994Borm+TR20rii	34.30	180.14	187.59	182.90	187.60	0.000043	0.49	93.12	21.40	0.07
Rio San Pietro	1	105	TR20Borm+TR<20ri	8.00	179.72	184.62	181.18	184.62	0.000035	0.26	34.61	20.70	0.05
Rio San Pietro	1	105	TR20Borm+TR20rii	34.30	179.72	185.03	182.50	185.07	0.000361	0.94	43.06	20.70	0.18
Rio San Pietro	1	105	TR20Borm+TR200ri	49.10	179.72	185.50	182.94	185.56	0.000421	1.12	52.83	20.70	0.20
Rio San Pietro	1	105	TR200Borm+TR20ri	34.30	179.72	186.70	182.50	186.71	0.000067	0.55	77.69	20.70	0.08
Rio San Pietro	1	105	2016Borm+TR20rii	34.30	179.72	185.55	182.50	185.58	0.000193	0.77	53.99	20.70	0.13

HEC-RAS Plan: Lotto1C (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	1	105	1994Borm+TR20rii	34.30	179.72	187.59	182.50	187.60	0.000036	0.45	96.20	20.70	0.06
Rio San Pietro	1	104.5		Bridge									
Rio San Pietro	1	104	TR20Borm+TR<20ri	8.00	179.17	184.59	180.38	184.60	0.000011	0.19	47.49	18.70	0.03
Rio San Pietro	1	104	TR20Borm+TR20rii	34.30	179.17	184.57	181.58	184.60	0.000199	0.80	46.96	18.70	0.14
Rio San Pietro	1	104	TR20Borm+TR200ri	49.10	179.17	184.53	181.97	184.60	0.000422	1.16	46.32	18.70	0.20
Rio San Pietro	1	104	TR200Borm+TR20ri	34.30	179.17	186.23	181.58	186.25	0.000049	0.52	78.13	18.70	0.07
Rio San Pietro	1	104	2016Borm+TR20rii	34.30	179.17	185.09	181.58	185.11	0.000120	0.68	56.77	18.70	0.11
Rio San Pietro	1	104	1994Borm+TR20rii	34.30	179.17	187.13	181.58	187.13	0.000028	0.44	94.84	18.70	0.06
Rio Sacco	1	306	TR20Borm+TR<20ri	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	TR20Borm+TR20rii	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	TR20Borm+TR200ri	14.50	187.71	189.12	189.31	189.78	0.030031	3.58	4.05	5.84	1.37
Rio Sacco	1	306	TR200Borm+TR20ri	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	2016Borm+TR20rii	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	1994Borm+TR20rii	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	305	TR20Borm+TR<20ri	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	TR20Borm+TR20rii	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	TR20Borm+TR200ri	14.50	185.28	187.58	187.02	187.77	0.004776	1.95	7.45	5.81	0.55
Rio Sacco	1	305	TR200Borm+TR20ri	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	2016Borm+TR20rii	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	1994Borm+TR20rii	10.10	185.28	187.71	186.77	187.78	0.001778	1.23	8.23	6.10	0.34
Rio Sacco	1	304.5		Bridge									
Rio Sacco	1	304	TR20Borm+TR<20ri	10.10	183.36	185.26		185.33	0.001776	1.23	8.24	6.70	0.35
Rio Sacco	1	304	TR20Borm+TR20rii	10.10	183.36	185.26		185.33	0.001776	1.23	8.24	6.70	0.35
Rio Sacco	1	304	TR20Borm+TR200ri	14.50	183.36	184.29	184.72	185.67	0.069547	5.19	2.80	4.32	2.06
Rio Sacco	1	304	TR200Borm+TR20ri	10.10	183.36	186.84		186.85	0.000137	0.47	21.33	9.95	0.10
Rio Sacco	1	304	2016Borm+TR20rii	10.10	183.36	185.75		185.79	0.000662	0.85	11.84	7.76	0.22
Rio Sacco	1	304	1994Borm+TR20rii	10.10	183.36	187.70		187.71	0.000052	0.33	30.88	12.02	0.07
Rio Sacco	1	303	TR20Borm+TR<20ri	10.10	182.69	185.25		185.30	0.000858	0.95	10.61	6.82	0.24
Rio Sacco	1	303	TR20Borm+TR20rii	10.10	182.69	185.25		185.30	0.000858	0.95	10.61	6.82	0.24
Rio Sacco	1	303	TR20Borm+TR200ri	14.50	182.69	185.22	184.21	185.32	0.001864	1.39	10.40	6.74	0.36
Rio Sacco	1	303	TR200Borm+TR20ri	10.10	182.69	186.84		186.85	0.000093	0.39	25.69	12.20	0.09
Rio Sacco	1	303	2016Borm+TR20rii	10.10	182.69	185.75		185.78	0.000403	0.70	14.45	8.52	0.17
Rio Sacco	1	303	1994Borm+TR20rii	10.10	182.69	187.71		187.71	0.000032	0.27	39.02	18.24	0.05
Rio Sacco	1	302	TR20Borm+TR<20ri	10.10	182.41	185.27		185.28	0.000069	0.35	33.77	26.12	0.08

HEC-RAS Plan: Lotto1C (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio Sacco	1	302	TR20Borm+TR20rii	10.10	182.41	185.27		185.28	0.000069	0.35	33.77	26.12	0.08
Rio Sacco	1	302	TR20Borm+TR200ri	14.50	182.41	185.27		185.28	0.000144	0.50	33.65	26.09	0.12
Rio Sacco	1	302	TR200Borm+TR20ri	10.10	182.41	186.85		186.85	0.000007	0.17	85.43	55.00	0.03
Rio Sacco	1	302	2016Borm+TR20rii	10.10	182.41	185.76		185.77	0.000029	0.27	47.21	28.40	0.06
Rio Sacco	1	302	1994Borm+TR20rii	10.10	182.41	187.71		187.71	0.000003	0.12	132.76	55.00	0.02
Rio Sacco	1	301	TR20Borm+TR<20ri	10.10	181.63	185.27		185.28	0.000038	0.28	50.92	31.18	0.06
Rio Sacco	1	301	TR20Borm+TR20rii	10.10	181.63	185.27		185.28	0.000038	0.28	50.92	31.18	0.06
Rio Sacco	1	301	TR20Borm+TR200ri	14.50	181.63	185.27		185.28	0.000080	0.41	50.83	31.17	0.09
Rio Sacco	1	301	TR200Borm+TR20ri	10.10	181.63	186.85		186.85	0.000005	0.15	114.54	56.40	0.02
Rio Sacco	1	301	2016Borm+TR20rii	10.10	181.63	185.76		185.77	0.000018	0.22	66.49	32.49	0.04
Rio Sacco	1	301	1994Borm+TR20rii	10.10	181.63	187.71		187.71	0.000002	0.11	163.07	56.40	0.02
Rio Madama	1	405	TR20Borm+TR<20ri	1.00	194.39	194.70	194.82	195.08	0.080108	2.73	0.37	1.70	1.87
Rio Madama	1	405	TR20Borm+TR20rii	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	TR20Borm+TR200ri	8.10	194.39	195.24	195.61	196.41	0.080011	4.79	1.69	3.17	2.10
Rio Madama	1	405	TR200Borm+TR20ri	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	2016Borm+TR20rii	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	1994Borm+TR20rii	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	404	TR20Borm+TR<20ri	1.00	187.14	187.58	187.55	187.69	0.015295	1.47	0.68	2.32	0.87
Rio Madama	1	404	TR20Borm+TR20rii	5.60	187.14	188.08	188.08	188.36	0.016189	2.36	2.38	4.20	1.00
Rio Madama	1	404	TR20Borm+TR200ri	8.10	187.14	187.91	188.14	189.06	0.087864	4.75	1.71	3.76	2.24
Rio Madama	1	404	TR200Borm+TR20ri	5.60	187.14	188.08	188.08	188.36	0.016189	2.36	2.38	4.20	1.00
Rio Madama	1	404	2016Borm+TR20rii	5.60	187.14	188.08	188.08	188.36	0.016189	2.36	2.38	4.20	1.00
Rio Madama	1	404	1994Borm+TR20rii	5.60	187.14	188.08	188.08	188.36	0.016189	2.36	2.38	4.20	1.00
Rio Madama	1	403	TR20Borm+TR<20ri	1.00	186.20	186.65	186.65	186.81	0.022527	1.78	0.56	1.73	1.00
Rio Madama	1	403	TR20Borm+TR20rii	5.60	186.20	187.12	187.12	187.12	0.000517	0.37	18.46	22.64	0.17
Rio Madama	1	403	TR20Borm+TR200ri	8.10	186.20	187.12	187.12	187.13	0.001082	0.53	18.46	22.64	0.24
Rio Madama	1	403	TR200Borm+TR20ri	5.60	186.20	187.12	187.12	187.12	0.000517	0.37	18.46	22.64	0.17
Rio Madama	1	403	2016Borm+TR20rii	5.60	186.20	187.12	187.12	187.12	0.000517	0.37	18.46	22.64	0.17
Rio Madama	1	403	1994Borm+TR20rii	5.60	186.20	187.61	187.12	187.61	0.000109	0.27	29.54	22.64	0.09
Rio Madama	1	402	TR20Borm+TR<20ri	1.00	184.94	185.38	185.38	185.50	0.020276	1.58	0.63	2.46	0.99
Rio Madama	1	402	TR20Borm+TR20rii	5.60	184.94	185.54	185.88	186.88	0.152691	5.13	1.09	3.27	2.84
Rio Madama	1	402	TR20Borm+TR200ri	8.10	184.94	185.71	185.94	186.81	0.099221	4.63	1.75	4.44	2.36
Rio Madama	1	402	TR200Borm+TR20ri	5.60	184.94	186.73	185.88	186.73	0.000080	0.29	30.57	24.34	0.08
Rio Madama	1	402	2016Borm+TR20rii	5.60	184.94	185.54	185.88	186.88	0.152691	5.13	1.09	3.27	2.84
Rio Madama	1	402	1994Borm+TR20rii	5.60	184.94	187.61	185.88	187.61	0.000014	0.17	52.04	24.34	0.04
Rio Madama	1	401	TR20Borm+TR<20ri	1.00	183.68	184.62	184.13	184.63	0.000681	0.46	2.18	4.05	0.20

HEC-RAS Plan: Lotto1C (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio Madama	1	401	TR20Borm+TR20rii	5.60	183.68	185.13	184.67	185.17	0.002472	0.98	8.27	28.20	0.40
Rio Madama	1	401	TR20Borm+TR200ri	8.10	183.68	185.65	184.86	185.66	0.000360	0.56	22.96	28.20	0.17
Rio Madama	1	401	TR200Borm+TR20ri	5.60	183.68	186.73	184.67	186.73	0.000013	0.17	53.23	28.20	0.04
Rio Madama	1	401	2016Borm+TR20rii	5.60	183.68	185.62	184.67	185.63	0.000191	0.40	22.18	28.20	0.12
Rio Madama	1	401	1994Borm+TR20rii	5.60	183.68	187.61	184.67	187.61	0.000004	0.12	78.12	28.20	0.02
Rio Caffra	1	205	TR20Borm+TR<20ri	5.00	190.88	191.70	191.54	191.80	0.006656	1.37	3.66	8.42	0.64
Rio Caffra	1	205	TR20Borm+TR20rii	19.20	190.88	192.26	192.11	192.38	0.004192	1.71	17.62	37.78	0.57
Rio Caffra	1	205	TR20Borm+TR200ri	27.70	190.88	192.45	192.26	192.58	0.003695	1.83	25.03	39.34	0.56
Rio Caffra	1	205	TR200Borm+TR20ri	19.20	190.88	192.26	192.11	192.38	0.004192	1.71	17.62	37.78	0.57
Rio Caffra	1	205	2016Borm+TR20rii	19.20	190.88	192.26	192.11	192.38	0.004192	1.71	17.62	37.78	0.57
Rio Caffra	1	205	1994Borm+TR20rii	19.20	190.88	192.26	192.11	192.38	0.004192	1.71	17.62	37.78	0.57
Rio Caffra	1	203	TR20Borm+TR<20ri	5.00	190.29	191.15	191.15	191.40	0.017312	2.22	2.25	4.61	1.01
Rio Caffra	1	203	TR20Borm+TR20rii	19.20	190.29	191.76	191.76	192.10	0.013221	2.78	9.42	17.27	0.97
Rio Caffra	1	203	TR20Borm+TR200ri	27.70	190.29	191.98	191.98	192.33	0.011851	2.91	13.41	19.28	0.94
Rio Caffra	1	203	TR200Borm+TR20ri	19.20	190.29	191.76	191.76	192.10	0.013221	2.78	9.42	17.27	0.97
Rio Caffra	1	203	2016Borm+TR20rii	19.20	190.29	191.76	191.76	192.10	0.013221	2.78	9.42	17.27	0.97
Rio Caffra	1	203	1994Borm+TR20rii	19.20	190.29	191.76	191.76	192.10	0.013221	2.78	9.42	17.27	0.97
Rio Caffra	1	201	TR20Borm+TR<20ri	5.00	189.19	189.92	190.06	190.39	0.042417	3.04	1.64	4.16	1.54
Rio Caffra	1	201	TR20Borm+TR20rii	19.20	189.19	191.44	190.74	191.52	0.001387	1.38	19.60	18.90	0.35
Rio Caffra	1	201	TR20Borm+TR200ri	27.70	189.19	191.57	191.06	191.71	0.002078	1.79	22.17	18.90	0.44
Rio Caffra	1	201	TR200Borm+TR20ri	19.20	189.19	191.44	190.74	191.52	0.001387	1.38	19.60	18.90	0.35
Rio Caffra	1	201	2016Borm+TR20rii	19.20	189.19	191.44	190.74	191.52	0.001387	1.38	19.60	18.90	0.35
Rio Caffra	1	201	1994Borm+TR20rii	19.20	189.19	191.44	190.74	191.52	0.001387	1.38	19.60	18.90	0.35
Bormida	3	43	TR20Borm+TR<20ri	833.00	179.12	184.98	183.33	185.52	0.002009	3.31	290.71	159.08	0.51
Bormida	3	43	TR20Borm+TR20rii	833.00	179.12	184.98	183.33	185.52	0.002009	3.31	290.72	159.08	0.51
Bormida	3	43	TR20Borm+TR200ri	833.00	179.12	184.98	183.33	185.52	0.002009	3.31	290.74	159.09	0.51
Bormida	3	43	TR200Borm+TR20ri	1469.00	179.12	186.44	185.18	187.07	0.001799	3.80	567.53	194.62	0.50
Bormida	3	43	2016Borm+TR20rii	1000.00	179.12	185.41	183.72	186.00	0.001969	3.50	368.76	190.61	0.51
Bormida	3	43	1994Borm+TR20rii	1900.00	179.12	187.27	185.94	187.92	0.001662	4.00	729.41	196.14	0.50
Bormida	3	42.000*	TR20Borm+TR<20ri	833.00	179.09	184.94		185.47	0.001980	3.25	293.95	181.97	0.50
Bormida	3	42.000*	TR20Borm+TR20rii	833.00	179.09	184.94		185.47	0.001980	3.25	293.95	181.97	0.50
Bormida	3	42.000*	TR20Borm+TR200ri	833.00	179.09	184.94		185.47	0.001980	3.25	293.98	181.98	0.50
Bormida	3	42.000*	TR200Borm+TR20ri	1469.00	179.09	186.43		187.02	0.001686	3.66	591.22	204.31	0.49
Bormida	3	42.000*	2016Borm+TR20rii	1000.00	179.09	185.39		185.95	0.001894	3.40	379.64	198.98	0.50
Bormida	3	42.000*	1994Borm+TR20rii	1900.00	179.09	187.27		187.87	0.001537	3.83	763.10	206.28	0.48
Bormida	3	41.000*	TR20Borm+TR<20ri	833.00	179.06	184.90		185.41	0.001956	3.19	297.73	195.35	0.50

HEC-RAS Plan: Lotto1C (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	3	41.000*	TR20Borm+TR20rii	833.00	179.06	184.90		185.41	0.001956	3.19	297.73	195.35	0.50
Bormida	3	41.000*	TR20Borm+TR200ri	833.00	179.06	184.90		185.41	0.001956	3.19	297.77	195.35	0.50
Bormida	3	41.000*	TR200Borm+TR20ri	1469.00	179.06	186.42		186.96	0.001592	3.54	614.30	214.06	0.47
Bormida	3	41.000*	2016Borm+TR20rii	1000.00	179.06	185.36		185.89	0.001838	3.31	389.58	208.03	0.49
Bormida	3	41.000*	1994Borm+TR20rii	1900.00	179.06	187.26		187.82	0.001433	3.68	796.43	216.64	0.46
Bormida	3	40.000*	TR20Borm+TR<20ri	833.00	179.04	184.87		185.36	0.001943	3.13	300.91	205.36	0.50
Bormida	3	40.000*	TR20Borm+TR20rii	833.00	179.04	184.87		185.36	0.001943	3.13	300.91	205.36	0.50
Bormida	3	40.000*	TR20Borm+TR200ri	833.00	179.04	184.87		185.36	0.001943	3.13	300.94	205.37	0.50
Bormida	3	40.000*	TR200Borm+TR20ri	1469.00	179.04	186.41		186.91	0.001512	3.42	636.83	223.91	0.46
Bormida	3	40.000*	2016Borm+TR20rii	1000.00	179.04	185.33		185.84	0.001797	3.24	398.64	217.07	0.49
Bormida	3	40.000*	1994Borm+TR20rii	1900.00	179.04	187.26		187.77	0.001343	3.55	829.54	227.01	0.45
Bormida	3	39.000*	TR20Borm+TR<20ri	833.00	179.01	184.83		185.31	0.001919	3.08	303.44	205.79	0.49
Bormida	3	39.000*	TR20Borm+TR20rii	833.00	179.01	184.83		185.31	0.001919	3.08	303.43	205.78	0.49
Bormida	3	39.000*	TR20Borm+TR200ri	833.00	179.01	184.83		185.31	0.001919	3.08	303.48	205.83	0.49
Bormida	3	39.000*	TR200Borm+TR20ri	1469.00	179.01	186.39		186.87	0.001445	3.32	658.81	234.02	0.45
Bormida	3	39.000*	2016Borm+TR20rii	1000.00	179.01	185.30		185.79	0.001769	3.17	406.74	225.96	0.48
Bormida	3	39.000*	1994Borm+TR20rii	1900.00	179.01	187.25		187.73	0.001264	3.42	862.44	237.30	0.43
Bormida	3	38.000*	TR20Borm+TR<20ri	833.00	178.98	184.80		185.26	0.001876	3.02	310.88	169.47	0.49
Bormida	3	38.000*	TR20Borm+TR20rii	833.00	178.98	184.80		185.26	0.001876	3.02	310.88	169.46	0.49
Bormida	3	38.000*	TR20Borm+TR200ri	833.00	178.98	184.80		185.26	0.001875	3.02	310.91	169.49	0.49
Bormida	3	38.000*	TR200Borm+TR20ri	1469.00	178.98	186.38		186.83	0.001386	3.22	680.44	245.06	0.44
Bormida	3	38.000*	2016Borm+TR20rii	1000.00	178.98	185.27		185.74	0.001754	3.12	413.87	234.55	0.48
Bormida	3	38.000*	1994Borm+TR20rii	1900.00	178.98	187.25		187.69	0.001196	3.30	895.34	247.82	0.42
Bormida	3	37	TR20Borm+TR<20ri	833.00	178.95	184.77		185.20	0.001842	2.96	320.66	167.62	0.48
Bormida	3	37	TR20Borm+TR20rii	833.00	178.95	184.77		185.20	0.001842	2.96	320.66	167.62	0.48
Bormida	3	37	TR20Borm+TR200ri	833.00	178.95	184.77		185.20	0.001842	2.96	320.69	167.63	0.48
Bormida	3	37	TR200Borm+TR20ri	1469.00	178.95	186.36		186.78	0.001335	3.13	702.24	256.47	0.43
Bormida	3	37	2016Borm+TR20rii	1000.00	178.95	185.24		185.69	0.001725	3.07	420.32	242.21	0.47
Bormida	3	37	1994Borm+TR20rii	1900.00	178.95	187.24		187.65	0.001134	3.20	928.54	258.09	0.41
Bormida	2	35	TR20Borm+TR<20ri	833.00	178.59	184.63	182.89	185.15	0.001847	3.21	298.69	158.11	0.49
Bormida	2	35	TR20Borm+TR20rii	833.00	178.59	184.63	182.89	185.15	0.001847	3.21	298.68	158.11	0.49
Bormida	2	35	TR20Borm+TR200ri	833.00	178.59	184.63	182.89	185.15	0.001847	3.21	298.72	158.13	0.49
Bormida	2	35	TR200Borm+TR20ri	1469.00	178.59	186.21	184.64	186.74	0.001472	3.51	666.77	259.70	0.46
Bormida	2	35	2016Borm+TR20rii	1000.00	178.59	185.08	183.28	185.64	0.001819	3.39	387.67	230.98	0.49
Bormida	2	35	1994Borm+TR20rii	1900.00	178.59	187.12	185.62	187.61	0.001242	3.54	903.39	259.70	0.43
Bormida	2	34.000*	TR20Borm+TR<20ri	833.00	178.53	184.58	182.82	185.10	0.001859	3.23	296.82	173.28	0.49

HEC-RAS Plan: Lotto1C (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	2	34.000*	TR20Borm+TR20rii	833.00	178.53	184.58	182.82	185.10	0.001859	3.23	296.82	173.28	0.49
Bormida	2	34.000*	TR20Borm+TR200ri	833.00	178.53	184.58	182.82	185.10	0.001859	3.23	296.86	173.31	0.49
Bormida	2	34.000*	TR200Borm+TR20ri	1469.00	178.53	186.18	184.46	186.70	0.001446	3.50	668.20	249.03	0.45
Bormida	2	34.000*	2016Borm+TR20rii	1000.00	178.53	185.04	183.23	185.59	0.001775	3.37	394.80	222.37	0.49
Bormida	2	34.000*	1994Borm+TR20rii	1900.00	178.53	187.09	185.54	187.58	0.001236	3.55	894.67	249.03	0.43
Bormida	2	33.000*	TR20Borm+TR<20ri	833.00	178.46	184.53	182.77	185.06	0.001861	3.24	300.55	207.62	0.49
Bormida	2	33.000*	TR20Borm+TR20rii	833.00	178.46	184.53	182.77	185.06	0.001861	3.24	300.54	207.62	0.49
Bormida	2	33.000*	TR20Borm+TR200ri	833.00	178.46	184.53	182.77	185.06	0.001861	3.24	300.59	207.62	0.49
Bormida	2	33.000*	TR200Borm+TR20ri	1469.00	178.46	186.15	184.79	186.67	0.001428	3.49	666.56	238.36	0.45
Bormida	2	33.000*	2016Borm+TR20rii	1000.00	178.46	185.01	183.17	185.54	0.001734	3.35	401.59	217.33	0.48
Bormida	2	33.000*	1994Borm+TR20rii	1900.00	178.46	187.06	185.46	187.55	0.001238	3.57	882.44	238.36	0.43
Bormida	2	32.000*	TR20Borm+TR<20ri	833.00	178.40	184.49	182.72	185.01	0.001826	3.23	309.54	198.59	0.49
Bormida	2	32.000*	TR20Borm+TR20rii	833.00	178.40	184.49	182.72	185.01	0.001826	3.23	309.54	198.59	0.49
Bormida	2	32.000*	TR20Borm+TR200ri	833.00	178.40	184.49	182.72	185.01	0.001826	3.23	309.59	198.60	0.49
Bormida	2	32.000*	TR200Borm+TR20ri	1469.00	178.40	186.12	184.72	186.63	0.001420	3.50	661.86	227.69	0.45
Bormida	2	32.000*	2016Borm+TR20rii	1000.00	178.40	184.97	183.12	185.50	0.001696	3.33	408.25	210.30	0.48
Bormida	2	32.000*	1994Borm+TR20rii	1900.00	178.40	187.02	185.39	187.52	0.001251	3.59	866.81	227.69	0.43
Bormida	2	31.000*	TR20Borm+TR<20ri	833.00	178.33	184.45	182.66	184.96	0.001791	3.21	317.88	189.76	0.48
Bormida	2	31.000*	TR20Borm+TR20rii	833.00	178.33	184.45	182.66	184.96	0.001791	3.21	317.87	189.76	0.48
Bormida	2	31.000*	TR20Borm+TR200ri	833.00	178.33	184.45	182.66	184.96	0.001791	3.21	317.93	189.77	0.48
Bormida	2	31.000*	TR200Borm+TR20ri	1469.00	178.33	186.08	184.66	186.60	0.001422	3.51	654.03	217.01	0.45
Bormida	2	31.000*	2016Borm+TR20rii	1000.00	178.33	184.94	183.07	185.45	0.001661	3.31	414.57	203.02	0.47
Bormida	2	31.000*	1994Borm+TR20rii	1900.00	178.33	186.97	185.29	187.49	0.001272	3.63	848.00	217.01	0.44
Bormida	2	30.000*	TR20Borm+TR<20ri	833.00	178.27	184.42	182.60	184.91	0.001757	3.19	325.87	186.45	0.48
Bormida	2	30.000*	TR20Borm+TR20rii	833.00	178.27	184.42	182.60	184.91	0.001757	3.19	325.86	186.45	0.48
Bormida	2	30.000*	TR20Borm+TR200ri	833.00	178.27	184.42	182.60	184.91	0.001756	3.19	325.93	186.46	0.48
Bormida	2	30.000*	TR200Borm+TR20ri	1469.00	178.27	186.04	184.57	186.56	0.001435	3.53	642.95	206.34	0.45
Bormida	2	30.000*	2016Borm+TR20rii	1000.00	178.27	184.91	183.02	185.41	0.001630	3.29	418.89	192.01	0.47
Bormida	2	30.000*	1994Borm+TR20rii	1900.00	178.27	186.92	185.22	187.46	0.001305	3.68	825.94	206.34	0.44
Bormida	2	29.000*	TR20Borm+TR<20ri	833.00	178.20	184.38	182.55	184.87	0.001723	3.17	332.71	174.72	0.47
Bormida	2	29.000*	TR20Borm+TR20rii	833.00	178.20	184.38	182.55	184.87	0.001723	3.17	332.70	174.72	0.47
Bormida	2	29.000*	TR20Borm+TR200ri	833.00	178.20	184.38	182.55	184.87	0.001722	3.17	332.76	174.72	0.47
Bormida	2	29.000*	TR200Borm+TR20ri	1469.00	178.20	185.99	184.48	186.52	0.001463	3.56	628.39	195.67	0.46
Bormida	2	29.000*	2016Borm+TR20rii	1000.00	178.20	184.87	182.96	185.37	0.001608	3.27	420.40	181.29	0.46
Bormida	2	29.000*	1994Borm+TR20rii	1900.00	178.20	186.87	185.14	187.42	0.001349	3.73	800.43	195.67	0.45
Bormida	2	28	TR20Borm+TR<20ri	833.00	178.14	184.35	182.49	184.82	0.001693	3.15	337.98	163.61	0.47

HEC-RAS Plan: Lotto1C (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	2	28	TR20Borm+TR20rii	833.00	178.14	184.35	182.49	184.82	0.001693	3.15	337.96	163.61	0.47
Bormida	2	28	TR20Borm+TR200ri	833.00	178.14	184.35	182.49	184.82	0.001693	3.14	338.02	163.62	0.47
Bormida	2	28	TR200Borm+TR20ri	1469.00	178.14	185.94	184.38	186.49	0.001500	3.60	611.79	185.00	0.46
Bormida	2	28	2016Borm+TR20rii	1000.00	178.14	184.84	182.91	185.33	0.001593	3.26	420.20	170.37	0.46
Bormida	2	28	1994Borm+TR20rii	1900.00	178.14	186.81	185.06	187.39	0.001405	3.80	772.68	185.00	0.46
Bormida	2	27.000*	TR20Borm+TR<20ri	833.00	178.10	184.30	182.43	184.78	0.001670	3.14	327.46	147.07	0.46
Bormida	2	27.000*	TR20Borm+TR20rii	833.00	178.10	184.30	182.43	184.78	0.001671	3.14	327.45	147.07	0.46
Bormida	2	27.000*	TR20Borm+TR200ri	833.00	178.10	184.30	182.43	184.78	0.001670	3.14	327.50	147.08	0.46
Bormida	2	27.000*	TR200Borm+TR20ri	1469.00	178.10	185.84	184.20	186.44	0.001592	3.71	573.08	172.72	0.48
Bormida	2	27.000*	2016Borm+TR20rii	1000.00	178.10	184.78	182.85	185.29	0.001624	3.30	399.76	157.63	0.47
Bormida	2	27.000*	1994Borm+TR20rii	1900.00	178.10	186.70	184.98	187.34	0.001518	3.95	720.96	173.03	0.47
Bormida	2	26.000*	TR20Borm+TR<20ri	833.00	178.05	184.27	182.37	184.74	0.001622	3.11	321.21	130.10	0.46
Bormida	2	26.000*	TR20Borm+TR20rii	833.00	178.05	184.27	182.37	184.74	0.001622	3.11	321.20	130.10	0.46
Bormida	2	26.000*	TR20Borm+TR200ri	833.00	178.05	184.27	182.37	184.74	0.001622	3.11	321.25	130.11	0.46
Bormida	2	26.000*	TR200Borm+TR20ri	1469.00	178.05	185.75	184.10	186.39	0.001660	3.79	537.86	157.44	0.49
Bormida	2	26.000*	2016Borm+TR20rii	1000.00	178.05	184.72	182.78	185.25	0.001624	3.31	383.78	143.06	0.47
Bormida	2	26.000*	1994Borm+TR20rii	1900.00	178.05	186.58	184.87	187.30	0.001638	4.09	671.38	161.07	0.49
Bormida	2	25.000*	TR20Borm+TR<20ri	833.00	178.01	184.23	182.29	184.70	0.001570	3.08	317.05	118.68	0.45
Bormida	2	25.000*	TR20Borm+TR20rii	833.00	178.01	184.23	182.29	184.70	0.001570	3.08	317.03	118.68	0.45
Bormida	2	25.000*	TR20Borm+TR200ri	833.00	178.01	184.23	182.29	184.70	0.001570	3.08	317.08	118.68	0.45
Bormida	2	25.000*	TR200Borm+TR20ri	1469.00	178.01	185.66	183.95	186.35	0.001733	3.87	506.00	142.51	0.50
Bormida	2	25.000*	2016Borm+TR20rii	1000.00	178.01	184.68	182.69	185.21	0.001594	3.30	372.29	126.71	0.46
Bormida	2	25.000*	1994Borm+TR20rii	1900.00	178.01	186.46	184.66	187.25	0.001765	4.23	624.33	149.10	0.51
Bormida	2	24.000*	TR20Borm+TR<20ri	833.00	177.97	184.20	182.20	184.66	0.001512	3.05	314.01	108.98	0.45
Bormida	2	24.000*	TR20Borm+TR20rii	833.00	177.97	184.20	182.20	184.66	0.001512	3.05	314.00	108.98	0.45
Bormida	2	24.000*	TR20Borm+TR200ri	833.00	177.97	184.20	182.20	184.66	0.001512	3.05	314.04	108.99	0.45
Bormida	2	24.000*	TR200Borm+TR20ri	1469.00	177.97	185.58	183.81	186.30	0.001793	3.93	477.71	130.16	0.51
Bormida	2	24.000*	2016Borm+TR20rii	1000.00	177.97	184.65	182.61	185.17	0.001554	3.28	363.76	113.79	0.46
Bormida	2	24.000*	1994Borm+TR20rii	1900.00	177.97	186.33	184.57	187.19	0.001896	4.37	580.36	137.13	0.53
Bormida	2	23.000*	TR20Borm+TR<20ri	833.00	177.92	184.17	182.12	184.62	0.001451	3.01	311.58	100.22	0.44
Bormida	2	23.000*	TR20Borm+TR20rii	833.00	177.92	184.17	182.12	184.62	0.001451	3.01	311.57	100.22	0.44
Bormida	2	23.000*	TR20Borm+TR200ri	833.00	177.92	184.17	182.12	184.62	0.001451	3.01	311.61	100.22	0.44
Bormida	2	23.000*	TR200Borm+TR20ri	1469.00	177.92	185.50	183.68	186.25	0.001832	3.98	453.27	117.35	0.51
Bormida	2	23.000*	2016Borm+TR20rii	1000.00	177.92	184.61	182.51	185.13	0.001511	3.25	356.60	103.71	0.45
Bormida	2	23.000*	1994Borm+TR20rii	1900.00	177.92	186.20	184.46	187.14	0.002024	4.49	540.02	125.17	0.55
Bormida	2	22	TR20Borm+TR<20ri	833.00	177.88	184.14	182.02	184.58	0.001389	2.96	309.28	91.24	0.43

HEC-RAS Plan: Lotto1C (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	2	22	TR20Borm+TR20rii	833.00	177.88	184.14	182.02	184.58	0.001389	2.96	309.26	91.23	0.43
Bormida	2	22	TR20Borm+TR200ri	833.00	177.88	184.14	182.02	184.58	0.001389	2.96	309.30	91.24	0.43
Bormida	2	22	TR200Borm+TR20ri	1469.00	177.88	185.44	183.54	186.21	0.001825	3.98	434.23	101.46	0.51
Bormida	2	22	2016Borm+TR20rii	1000.00	177.88	184.58	182.42	185.09	0.001466	3.22	349.96	94.67	0.45
Bormida	2	22	1994Borm+TR20rii	1900.00	177.88	186.07	184.32	187.08	0.002146	4.60	503.47	113.20	0.56
Bormida	1	19	TR20Borm+TR<20ri	833.00	178.13	183.95	182.14	184.46	0.001866	3.16	263.93	62.38	0.49
Bormida	1	19	TR20Borm+TR20rii	833.00	178.13	183.95	182.14	184.46	0.001867	3.16	263.89	62.37	0.49
Bormida	1	19	TR20Borm+TR200ri	833.00	178.13	183.95	182.14	184.46	0.001866	3.16	263.93	62.38	0.49
Bormida	1	19	TR200Borm+TR20ri	1469.00	178.13	185.01	183.51	186.02	0.002799	4.45	337.57	91.82	0.62
Bormida	1	19	2016Borm+TR20rii	1000.00	178.13	184.34	182.53	184.95	0.002037	3.48	288.52	62.96	0.51
Bormida	1	19	1994Borm+TR20rii	1900.00	178.13	185.43	184.28	186.84	0.003568	5.29	399.94	180.00	0.70
Bormida	1	18.000*	TR20Borm+TR<20ri	833.00	177.98	183.91	182.10	184.41	0.001825	3.13	267.64	65.87	0.48
Bormida	1	18.000*	TR20Borm+TR20rii	833.00	177.98	183.91	182.10	184.41	0.001826	3.13	267.59	65.87	0.48
Bormida	1	18.000*	TR20Borm+TR200ri	833.00	177.98	183.91	182.10	184.41	0.001825	3.13	267.64	65.87	0.48
Bormida	1	18.000*	TR200Borm+TR20ri	1469.00	177.98	184.96	183.45	185.94	0.002703	4.40	358.15	150.35	0.61
Bormida	1	18.000*	2016Borm+TR20rii	1000.00	177.98	184.30	182.48	184.90	0.001979	3.44	293.96	72.72	0.51
Bormida	1	18.000*	1994Borm+TR20rii	1900.00	177.98	185.40	184.23	186.73	0.003353	5.16	433.77	189.68	0.69
Bormida	1	17.000*	TR20Borm+TR<20ri	833.00	177.84	183.87	182.04	184.36	0.001746	3.08	273.84	69.40	0.47
Bormida	1	17.000*	TR20Borm+TR20rii	833.00	177.84	183.87	182.04	184.36	0.001747	3.08	273.78	69.40	0.47
Bormida	1	17.000*	TR20Borm+TR200ri	833.00	177.84	183.87	182.04	184.36	0.001746	3.08	273.84	69.40	0.47
Bormida	1	17.000*	TR200Borm+TR20ri	1469.00	177.84	184.94	183.39	185.86	0.002511	4.28	390.31	172.40	0.59
Bormida	1	17.000*	2016Borm+TR20rii	1000.00	177.84	184.27	182.41	184.85	0.001876	3.38	303.98	84.64	0.50
Bormida	1	17.000*	1994Borm+TR20rii	1900.00	177.84	185.41	184.18	186.61	0.003017	4.96	478.99	199.36	0.66
Bormida	1	16.000*	TR20Borm+TR<20ri	833.00	177.69	183.85	181.94	184.31	0.001628	3.01	282.42	83.19	0.46
Bormida	1	16.000*	TR20Borm+TR20rii	833.00	177.69	183.85	181.94	184.31	0.001629	3.01	282.36	83.16	0.46
Bormida	1	16.000*	TR20Borm+TR200ri	833.00	177.69	183.85	181.94	184.31	0.001628	3.01	282.42	83.19	0.46
Bormida	1	16.000*	TR200Borm+TR20ri	1469.00	177.69	184.94	183.29	185.78	0.002256	4.11	431.26	186.80	0.56
Bormida	1	16.000*	2016Borm+TR20rii	1000.00	177.69	184.24	182.32	184.79	0.001744	3.30	319.18	107.61	0.48
Bormida	1	16.000*	1994Borm+TR20rii	1900.00	177.69	185.44	184.13	186.50	0.002637	4.72	532.12	209.03	0.62
Bormida	1	15.000*	TR20Borm+TR<20ri	833.00	177.55	183.83	181.83	184.26	0.001489	2.93	294.87	100.92	0.44
Bormida	1	15.000*	TR20Borm+TR20rii	833.00	177.55	183.83	181.83	184.26	0.001490	2.93	294.79	100.89	0.44
Bormida	1	15.000*	TR20Borm+TR200ri	833.00	177.55	183.83	181.83	184.26	0.001489	2.93	294.87	100.92	0.44
Bormida	1	15.000*	TR200Borm+TR20ri	1469.00	177.55	184.95	183.15	185.70	0.001989	3.93	477.73	206.39	0.53
Bormida	1	15.000*	2016Borm+TR20rii	1000.00	177.55	184.22	182.20	184.74	0.001587	3.20	343.73	163.96	0.46
Bormida	1	15.000*	1994Borm+TR20rii	1900.00	177.55	185.47	184.05	186.40	0.002269	4.46	590.19	218.71	0.58
Bormida	1	14.000*	TR20Borm+TR<20ri	833.00	177.40	183.81	181.69	184.22	0.001333	2.82	313.50	120.99	0.42

HEC-RAS Plan: Lotto1C (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	1	14.000*	TR20Borm+TR20rii	833.00	177.40	183.81	181.69	184.22	0.001334	2.82	313.40	120.93	0.42
Bormida	1	14.000*	TR20Borm+TR200ri	833.00	177.40	183.81	181.69	184.22	0.001333	2.82	313.50	120.99	0.42
Bormida	1	14.000*	TR200Borm+TR20ri	1469.00	177.40	184.97	183.00	185.62	0.001715	3.72	529.99	217.31	0.50
Bormida	1	14.000*	2016Borm+TR20rii	1000.00	177.40	184.22	182.06	184.69	0.001403	3.07	379.84	181.52	0.44
Bormida	1	14.000*	1994Borm+TR20rii	1900.00	177.40	185.51	183.99	186.31	0.001934	4.20	652.07	228.39	0.53
Bormida	1	13.000*	TR20Borm+TR<20ri	833.00	177.26	183.81	181.53	184.18	0.001168	2.70	344.44	174.52	0.40
Bormida	1	13.000*	TR20Borm+TR20rii	833.00	177.26	183.81	181.53	184.18	0.001169	2.70	344.28	174.46	0.40
Bormida	1	13.000*	TR20Borm+TR200ri	833.00	177.26	183.81	181.53	184.18	0.001168	2.70	344.44	174.52	0.40
Bormida	1	13.000*	TR200Borm+TR20ri	1469.00	177.26	184.99	182.84	185.56	0.001464	3.51	585.27	228.38	0.46
Bormida	1	13.000*	2016Borm+TR20rii	1000.00	177.26	184.22	181.90	184.64	0.001215	2.91	421.36	202.67	0.41
Bormida	1	13.000*	1994Borm+TR20rii	1900.00	177.26	185.54	183.73	186.23	0.001643	3.95	716.03	238.07	0.50
Bormida	1	12.000*	TR20Borm+TR<20ri	833.00	177.11	183.81	181.33	184.14	0.000991	2.55	386.55	183.11	0.37
Bormida	1	12.000*	TR20Borm+TR20rii	833.00	177.11	183.81	181.33	184.14	0.000991	2.55	386.38	183.06	0.37
Bormida	1	12.000*	TR20Borm+TR200ri	833.00	177.11	183.81	181.33	184.14	0.000991	2.55	386.55	183.11	0.37
Bormida	1	12.000*	TR200Borm+TR20ri	1469.00	177.11	185.01	182.65	185.50	0.001243	3.30	642.14	238.44	0.43
Bormida	1	12.000*	2016Borm+TR20rii	1000.00	177.11	184.23	181.71	184.60	0.001026	2.74	470.32	209.90	0.38
Bormida	1	12.000*	1994Borm+TR20rii	1900.00	177.11	185.57	183.79	186.16	0.001397	3.71	780.71	247.74	0.46
Bormida	1	11.000*	TR20Borm+TR<20ri	833.00	176.97	183.82	181.11	184.10	0.000831	2.40	434.47	203.67	0.34
Bormida	1	11.000*	TR20Borm+TR20rii	833.00	176.97	183.82	181.11	184.10	0.000831	2.40	434.29	203.62	0.34
Bormida	1	11.000*	TR20Borm+TR200ri	833.00	176.97	183.82	181.11	184.10	0.000831	2.40	434.47	203.67	0.34
Bormida	1	11.000*	TR200Borm+TR20ri	1469.00	176.97	185.02	182.45	185.45	0.001053	3.10	702.81	249.12	0.39
Bormida	1	11.000*	2016Borm+TR20rii	1000.00	176.97	184.25	181.50	184.56	0.000854	2.56	524.35	215.55	0.35
Bormida	1	11.000*	1994Borm+TR20rii	1900.00	176.97	185.59	183.59	186.11	0.001186	3.49	847.13	257.42	0.42
Bormida	1	10	TR20Borm+TR<20ri	833.00	176.82	183.83	180.81	184.07	0.000684	2.23	489.55	212.36	0.31
Bormida	1	10	TR20Borm+TR20rii	833.00	176.82	183.83	180.81	184.07	0.000684	2.23	489.36	212.34	0.31
Bormida	1	10	TR20Borm+TR200ri	833.00	176.82	183.83	180.81	184.07	0.000684	2.23	489.56	212.36	0.31
Bormida	1	10	TR200Borm+TR20ri	1469.00	176.82	185.04	182.23	185.41	0.000881	2.90	768.85	254.46	0.36
Bormida	1	10	2016Borm+TR20rii	1000.00	176.82	184.26	181.23	184.52	0.000706	2.39	582.85	222.08	0.32
Bormida	1	10	1994Borm+TR20rii	1900.00	176.82	185.61	183.39	186.06	0.001006	3.28	915.60	266.55	0.39
Bormida	1	9	TR20Borm+TR<20ri	833.00	176.65	183.83		184.05	0.000563	2.10	515.11	211.40	0.28
Bormida	1	9	TR20Borm+TR20rii	833.00	176.65	183.83		184.05	0.000563	2.10	514.93	211.38	0.28
Bormida	1	9	TR20Borm+TR200ri	833.00	176.65	183.83		184.05	0.000563	2.10	515.12	211.40	0.28
Bormida	1	9	TR200Borm+TR20ri	1469.00	176.65	185.04		185.39	0.000763	2.78	789.50	246.31	0.34
Bormida	1	9	2016Borm+TR20rii	1000.00	176.65	184.26		184.50	0.000594	2.27	607.68	218.58	0.29
Bormida	1	9	1994Borm+TR20rii	1900.00	176.65	185.61		186.03	0.000889	3.17	930.96	251.27	0.37
Bormida	1	8.0000*	TR20Borm+TR<20ri	833.00	176.65	183.79		184.03	0.000637	2.22	497.77	214.27	0.30

HEC-RAS Plan: Lotto1C (Continued)

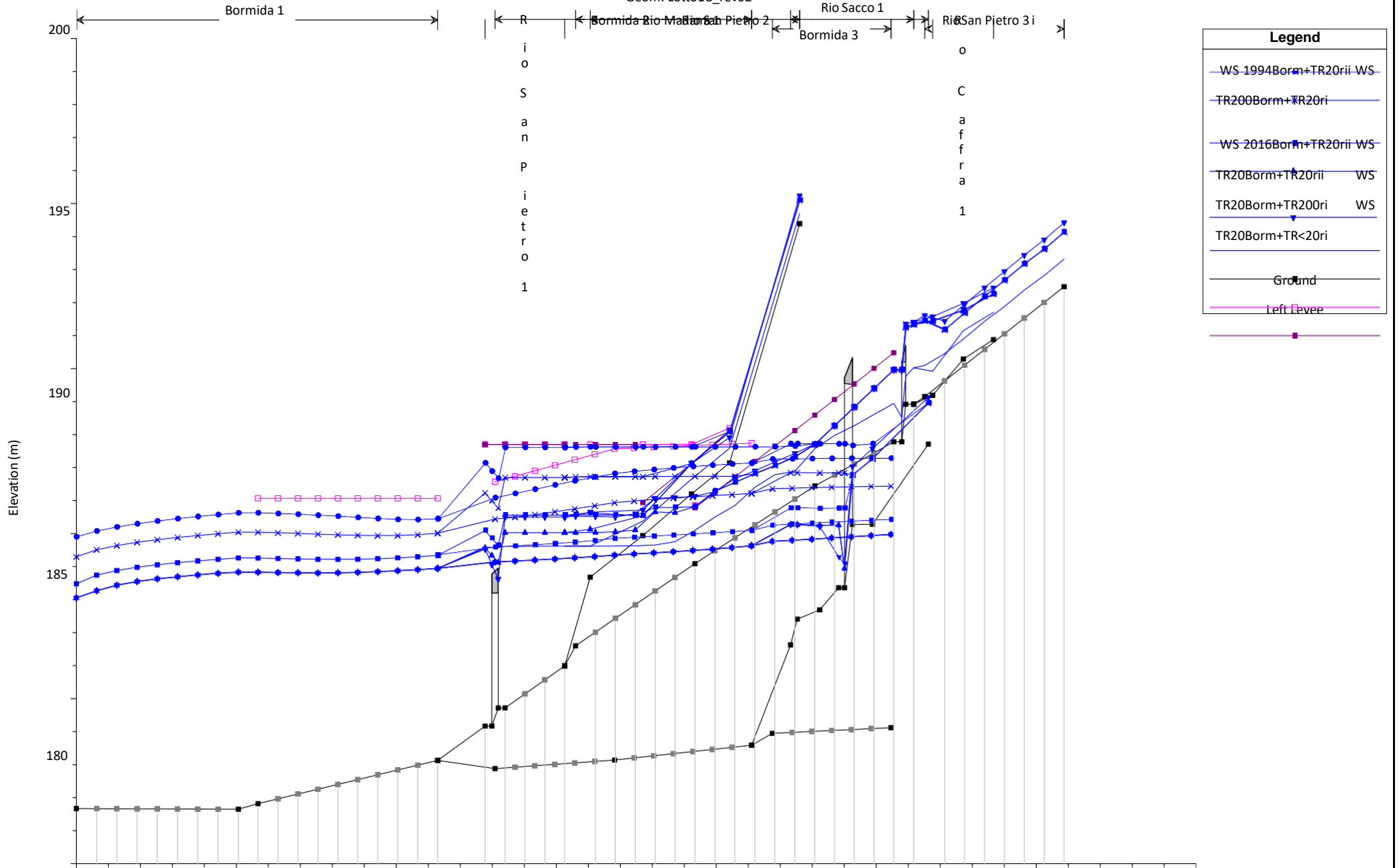
River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	1	8.0000*	TR20Borm+TR20rii	833.00	176.65	183.79		184.03	0.000637	2.22	497.58	214.25	0.30
Bormida	1	8.0000*	TR20Borm+TR200ri	833.00	176.65	183.79		184.03	0.000637	2.22	497.78	214.27	0.30
Bormida	1	8.0000*	TR200Borm+TR20ri	1469.00	176.65	185.00		185.36	0.000846	2.91	774.05	250.19	0.36
Bormida	1	8.0000*	2016Borm+TR20rii	1000.00	176.65	184.22		184.48	0.000665	2.38	590.90	220.98	0.31
Bormida	1	8.0000*	1994Borm+TR20rii	1900.00	176.65	185.56		186.01	0.000976	3.29	915.59	252.84	0.39
Bormida	1	7.0000*	TR20Borm+TR<20ri	833.00	176.66	183.75		184.01	0.000726	2.34	479.77	215.94	0.32
Bormida	1	7.0000*	TR20Borm+TR20rii	833.00	176.66	183.75		184.01	0.000726	2.34	479.56	215.93	0.32
Bormida	1	7.0000*	TR20Borm+TR200ri	833.00	176.66	183.75		184.01	0.000726	2.34	479.77	215.94	0.32
Bormida	1	7.0000*	TR200Borm+TR20ri	1469.00	176.66	184.94		185.34	0.000941	3.04	758.37	251.48	0.37
Bormida	1	7.0000*	2016Borm+TR20rii	1000.00	176.66	184.17		184.46	0.000756	2.51	573.23	228.92	0.33
Bormida	1	7.0000*	1994Borm+TR20rii	1900.00	176.66	185.50		185.98	0.001076	3.43	899.46	254.40	0.41
Bormida	1	6.0000*	TR20Borm+TR<20ri	833.00	176.66	183.70		183.99	0.000836	2.49	460.57	217.11	0.34
Bormida	1	6.0000*	TR20Borm+TR20rii	833.00	176.66	183.69		183.99	0.000837	2.49	460.35	217.10	0.34
Bormida	1	6.0000*	TR20Borm+TR200ri	833.00	176.66	183.70		183.99	0.000836	2.49	460.57	217.11	0.34
Bormida	1	6.0000*	TR200Borm+TR20ri	1469.00	176.66	184.88		185.31	0.001053	3.18	741.55	252.74	0.39
Bormida	1	6.0000*	2016Borm+TR20rii	1000.00	176.66	184.12		184.44	0.000865	2.66	555.03	234.65	0.35
Bormida	1	6.0000*	1994Borm+TR20rii	1900.00	176.66	185.43		185.95	0.001195	3.57	882.24	255.97	0.43
Bormida	1	5.0000*	TR20Borm+TR<20ri	833.00	176.66	183.63		183.96	0.000978	2.65	439.50	218.51	0.37
Bormida	1	5.0000*	TR20Borm+TR20rii	833.00	176.66	183.63		183.96	0.000979	2.65	439.26	218.49	0.37
Bormida	1	5.0000*	TR20Borm+TR200ri	833.00	176.66	183.63		183.96	0.000978	2.65	439.50	218.51	0.37
Bormida	1	5.0000*	TR200Borm+TR20ri	1469.00	176.66	184.81		185.28	0.001189	3.34	723.16	253.95	0.42
Bormida	1	5.0000*	2016Borm+TR20rii	1000.00	176.66	184.06		184.41	0.000995	2.81	535.89	236.26	0.37
Bormida	1	5.0000*	1994Borm+TR20rii	1900.00	176.66	185.36		185.91	0.001336	3.74	863.54	257.53	0.45
Bormida	1	4.0000*	TR20Borm+TR<20ri	833.00	176.66	183.55		183.93	0.001169	2.85	415.38	219.66	0.40
Bormida	1	4.0000*	TR20Borm+TR20rii	833.00	176.66	183.55		183.93	0.001170	2.85	415.11	219.63	0.40
Bormida	1	4.0000*	TR20Borm+TR200ri	833.00	176.66	183.55		183.93	0.001168	2.85	415.39	219.66	0.40
Bormida	1	4.0000*	TR200Borm+TR20ri	1469.00	176.66	184.73		185.24	0.001360	3.52	702.30	255.06	0.44
Bormida	1	4.0000*	2016Borm+TR20rii	1000.00	176.66	183.98		184.38	0.001165	3.00	514.10	237.96	0.40
Bormida	1	4.0000*	1994Borm+TR20rii	1900.00	176.66	185.28		185.87	0.001510	3.92	842.63	259.07	0.47
Bormida	1	3.0000*	TR20Borm+TR<20ri	833.00	176.67	183.44		183.89	0.001441	3.10	385.58	221.19	0.44
Bormida	1	3.0000*	TR20Borm+TR20rii	833.00	176.67	183.44		183.89	0.001443	3.10	385.27	221.11	0.44
Bormida	1	3.0000*	TR20Borm+TR200ri	833.00	176.67	183.44		183.89	0.001441	3.10	385.59	221.20	0.44
Bormida	1	3.0000*	TR200Borm+TR20ri	1469.00	176.67	184.64		185.20	0.001585	3.74	677.46	255.96	0.48
Bormida	1	3.0000*	2016Borm+TR20rii	1000.00	176.67	183.88		184.34	0.001400	3.23	487.84	239.62	0.44
Bormida	1	3.0000*	1994Borm+TR20rii	1900.00	176.67	185.18		185.82	0.001730	4.13	818.31	260.53	0.50
Bormida	1	2.0000*	TR20Borm+TR<20ri	833.00	176.67	183.27	181.38	183.84	0.001879	3.46	343.45	220.26	0.50

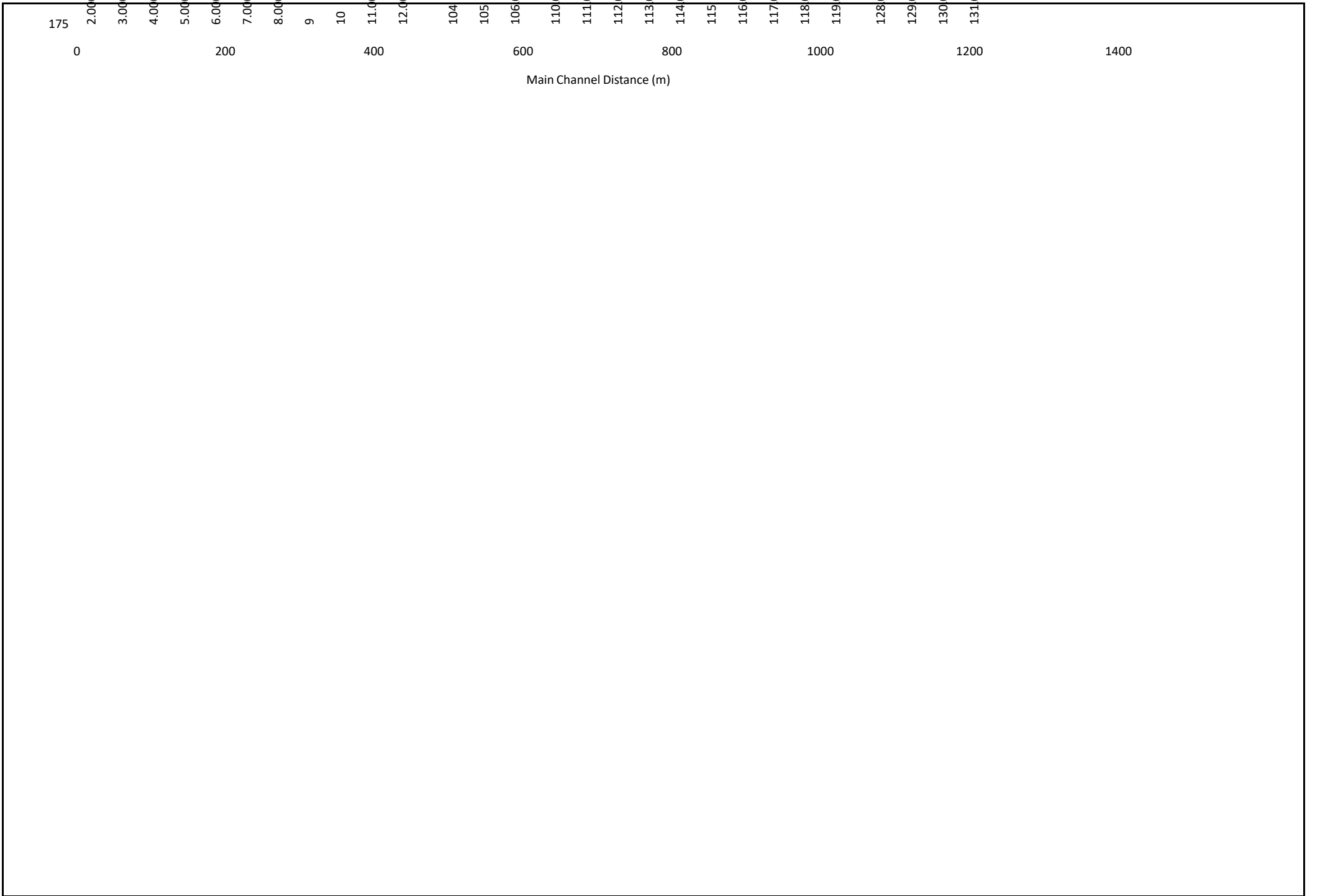
HEC-RAS Plan: Lotto1C (Continued)

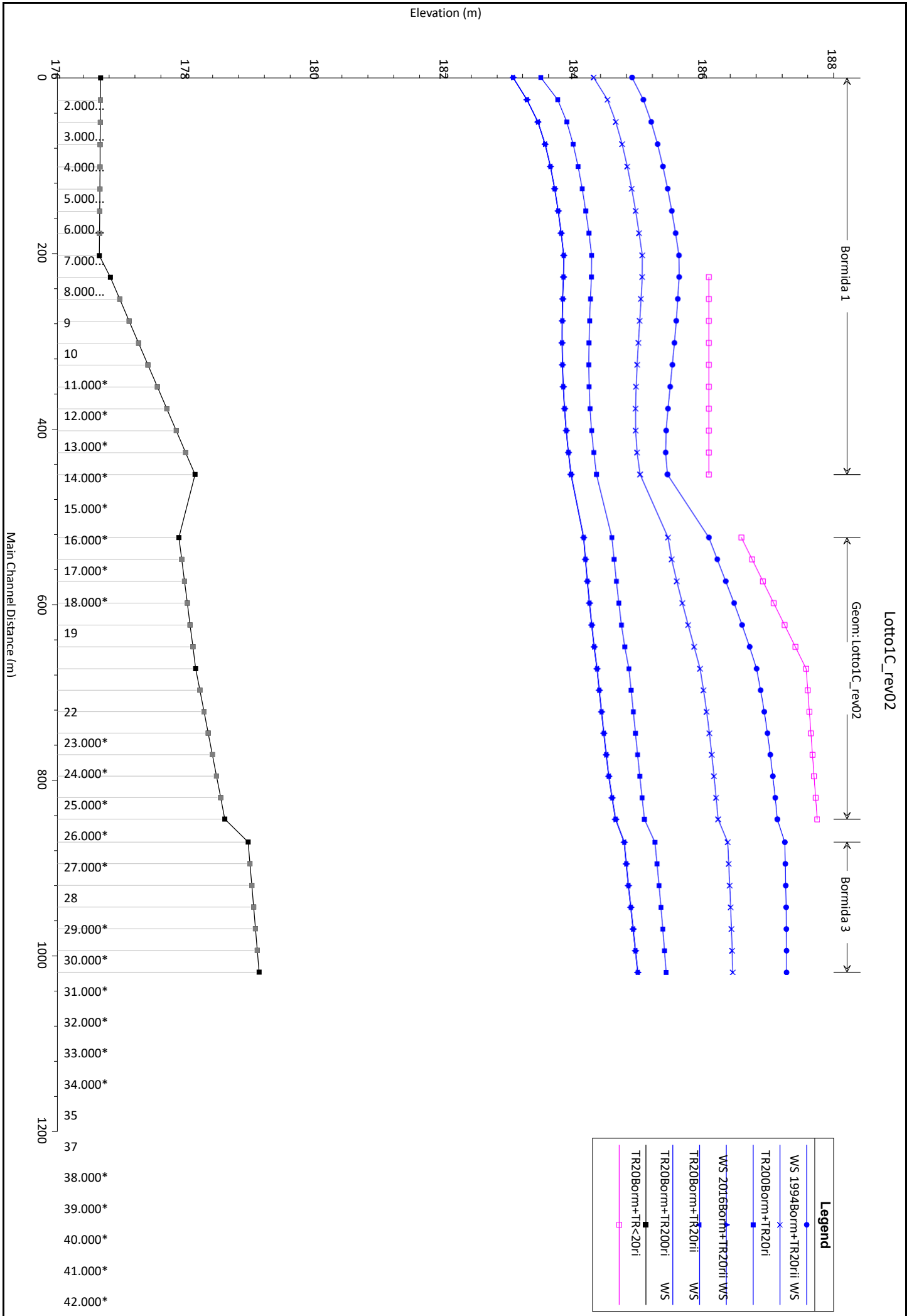
River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	1	2.0000*	TR20Borm+TR20rii	833.00	176.67	183.27	181.38	183.83	0.001882	3.46	343.04	220.20	0.50
Bormida	1	2.0000*	TR20Borm+TR200ri	833.00	176.67	183.27	181.38	183.84	0.001878	3.46	343.47	220.26	0.50
Bormida	1	2.0000*	TR200Borm+TR20ri	1469.00	176.67	184.51		185.15	0.001908	4.01	645.18	256.36	0.52
Bormida	1	2.0000*	2016Borm+TR20rii	1000.00	176.67	183.74		184.29	0.001764	3.53	452.27	240.67	0.49
Bormida	1	2.0000*	1994Borm+TR20rii	1900.00	176.67	185.06		185.77	0.002030	4.38	788.13	261.74	0.54
Bormida	1	1	TR20Borm+TR<20ri	833.00	176.67	183.05	181.53	183.77	0.002502	3.87	293.74	193.36	0.57
Bormida	1	1	TR20Borm+TR20rii	833.00	176.67	183.05	181.53	183.77	0.002502	3.87	293.74	193.36	0.57
Bormida	1	1	TR20Borm+TR200ri	833.00	176.67	183.05	181.54	183.77	0.002502	3.87	293.74	193.36	0.57
Bormida	1	1	TR200Borm+TR20ri	1469.00	176.67	184.30	183.88	185.08	0.002504	4.45	591.60	255.34	0.59
Bormida	1	1	2016Borm+TR20rii	1000.00	176.67	183.48	182.45	184.22	0.002503	4.05	388.18	236.30	0.57
Bormida	1	1	1994Borm+TR20rii	1900.00	176.67	184.89	184.38	185.70	0.002503	4.74	744.58	262.06	0.59

Lotto1C_rev02

Geom: Lotto1C_rev02



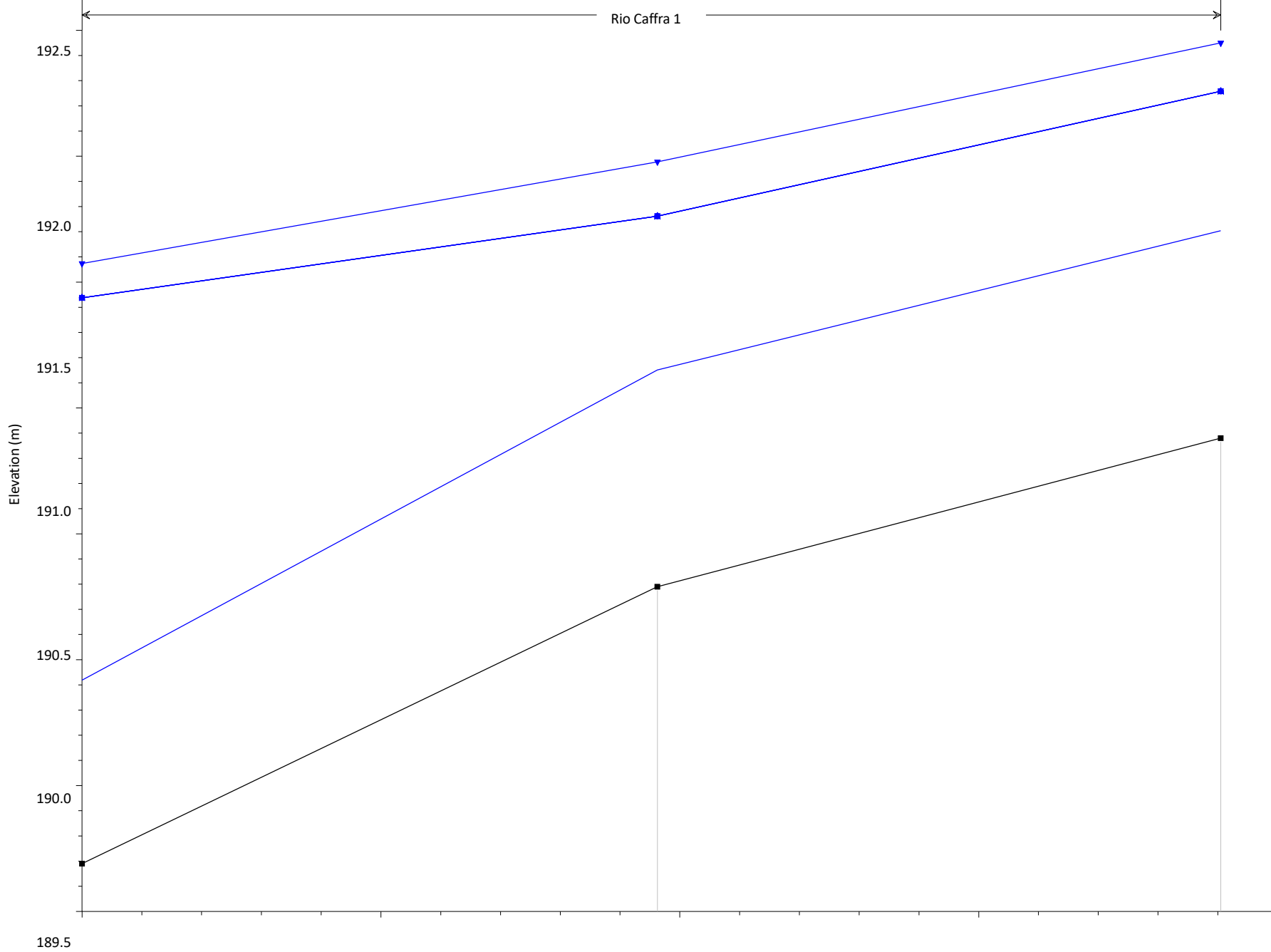




Lotto1C_rev02

Geom: Lotto1C_rev02

Rio Caffra 1



Legend

- WS TR20Borm+TR20ri
- WS TR20Borm+TR20rii WS
- TR200Borm+TR20ri
- WS 2016Borm+TR20rii WS
- 1994Borm+TR20rii WS
- TR20Borm+TR<20ri



189.0

0

20

203

40

60

205

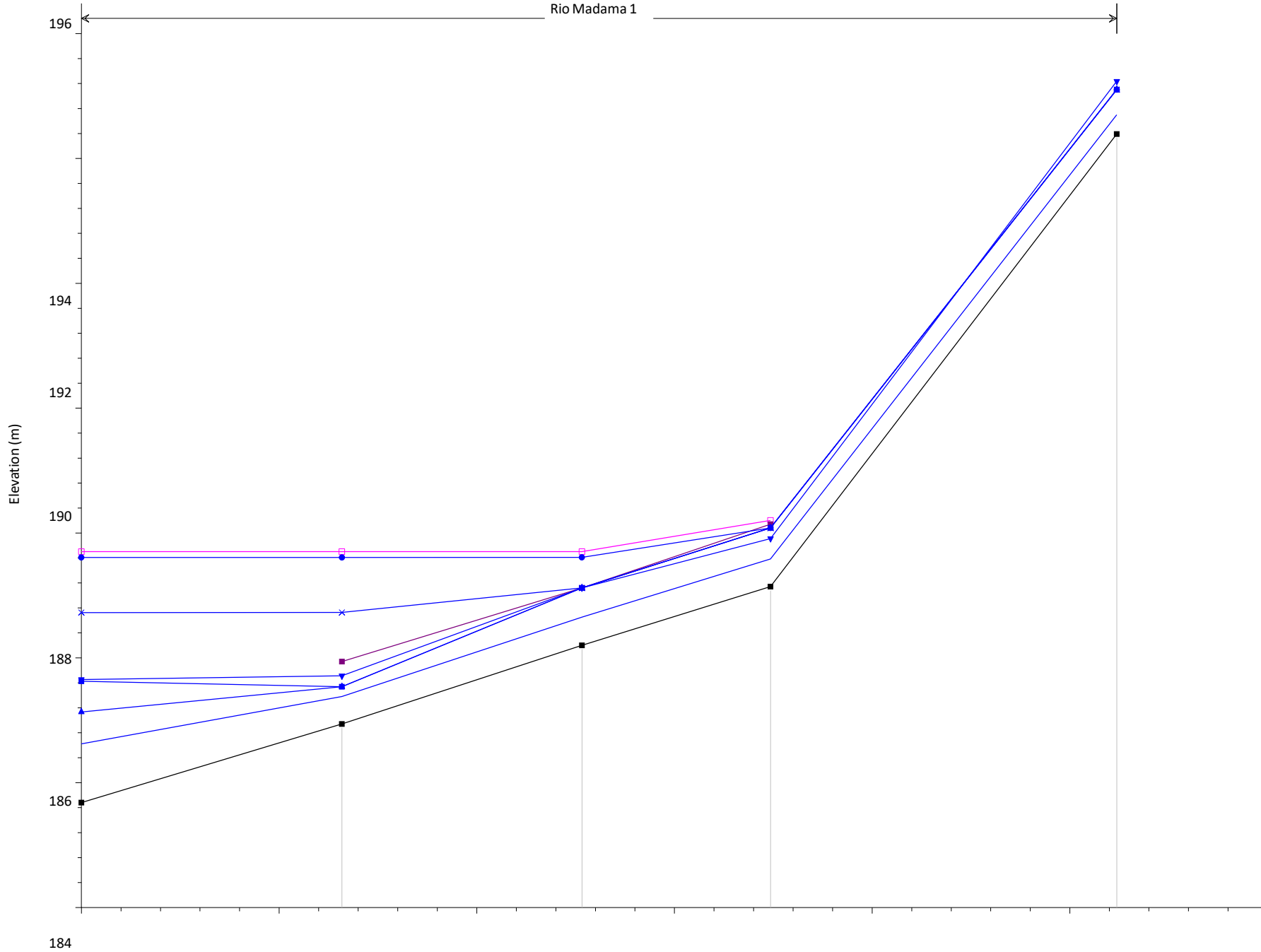
80

Main Channel Distance (m)

Lotto1C_rev02

Geom: Lotto1C_rev02

Rio Madama 1



Legend

- WS 1994Borm+TR20rii WS
- TR200Borm+TR20ri WS
- TR20Borm+TR20ri
- WS 2016Borm+TR20rii WS
- TR20Borm+TR20rii WS
- TR20Borm+TR<20ri
- Ground
- Left Levee



182

0

50

402

100

403

150

404

200

250

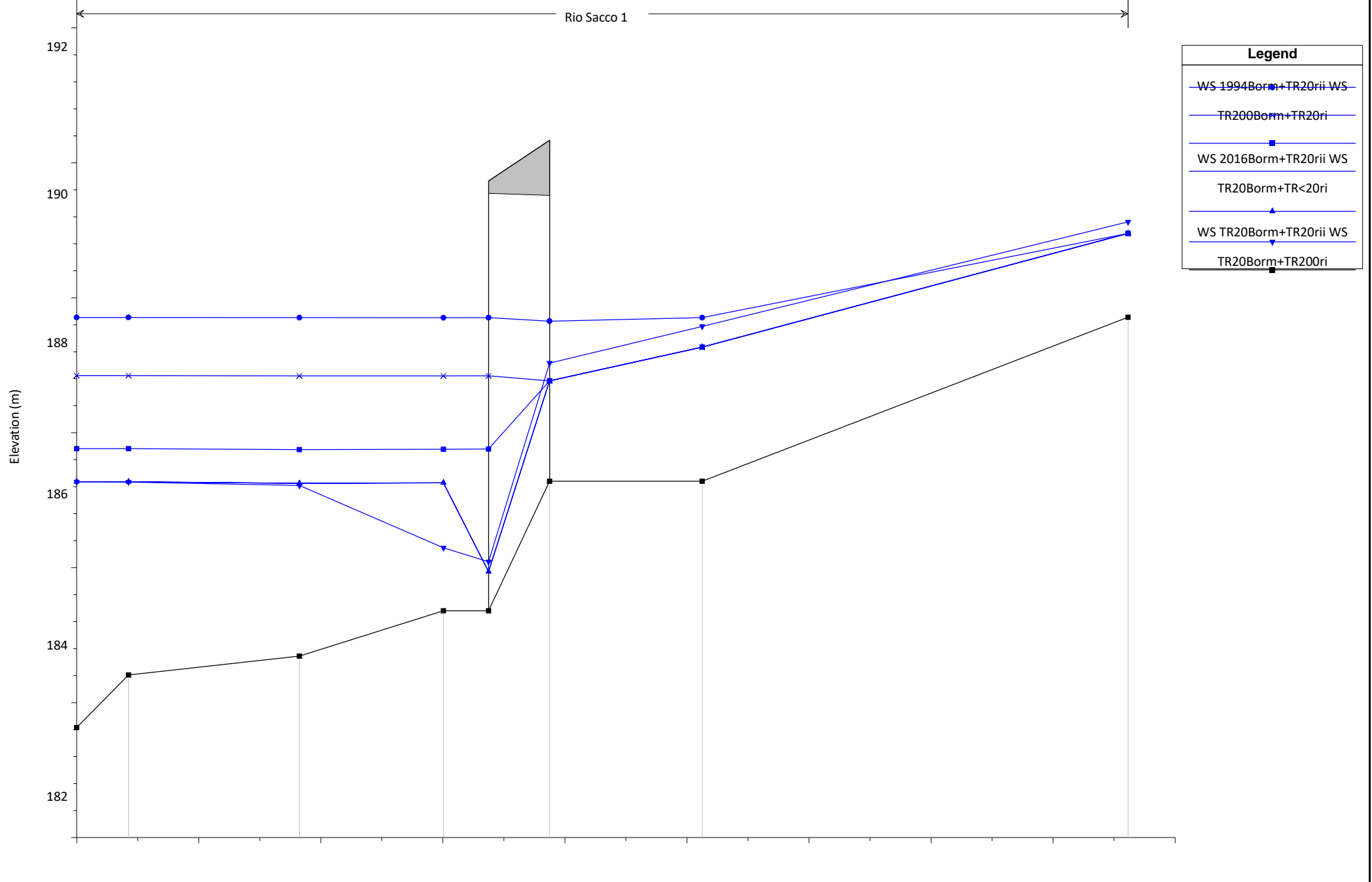
405

300

Main Channel Distance (m)

Lotto1C_rev02

Geom: Lotto1C_rev02



180
0 20 40 60 80 100 120 140 160 180
Main Channel Distance (m)

302

303

304

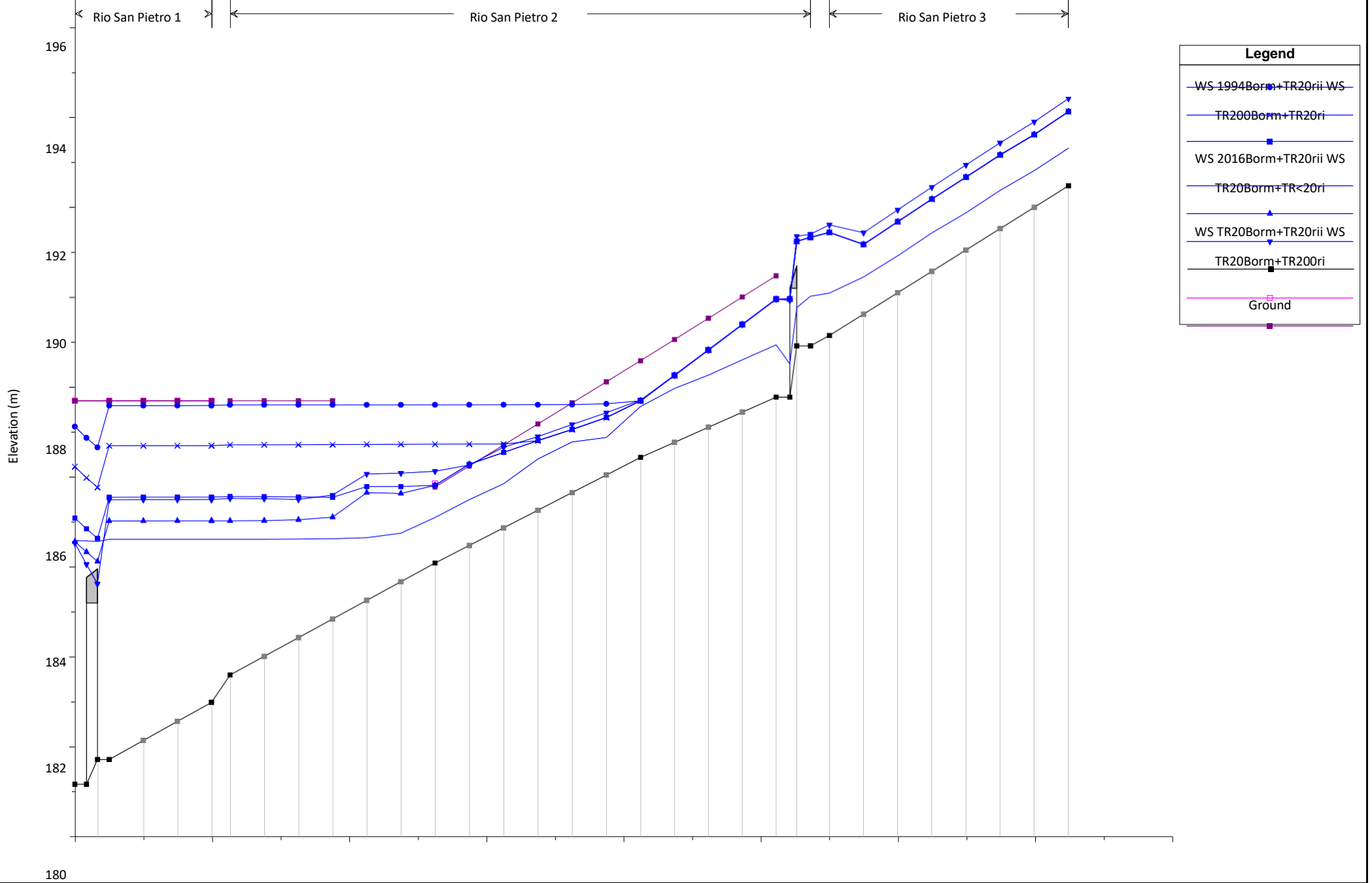
304.5

305

306

Lotto1C_rev02

Geom: Lotto1C_rev02

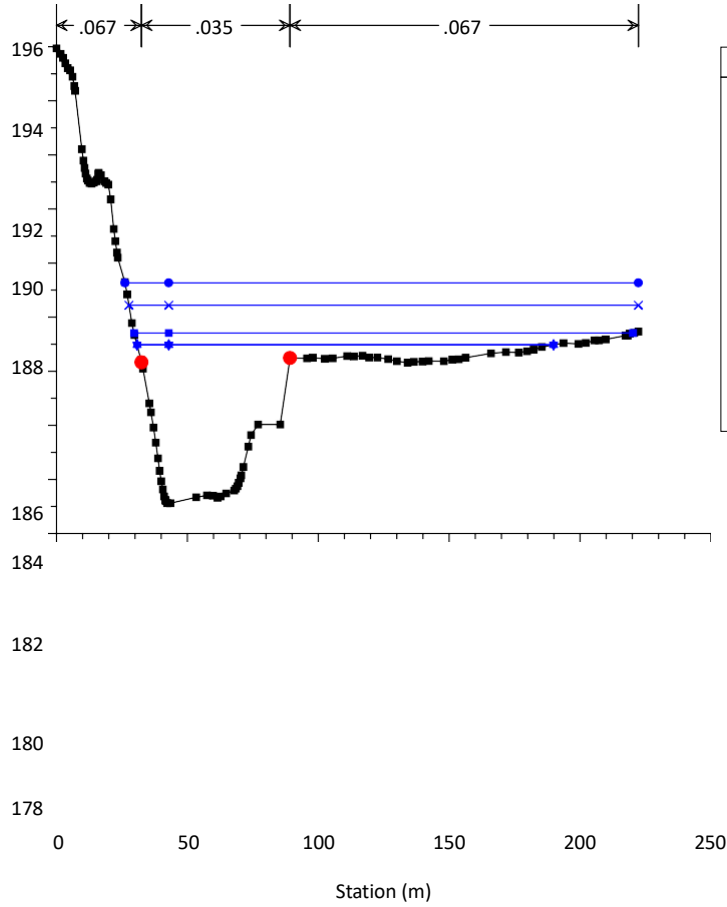


178
0 104.5 106.00* 107.00* 108 110.00* 111.00* 112.00* 113.00* 114.00* 115 116.00* 117.00* 118.00* 119.00* 120.00* 121 122.00* 123.00* 124.00* 125 --- 127 128.00* 129.00* 130.00* 131.00* 132.00* 133.00* 134
100 200 300 400 500 600 700 800
Main Channel Distance (m)

Lotto1C_rev02

Geom: Lotto1C_rev02

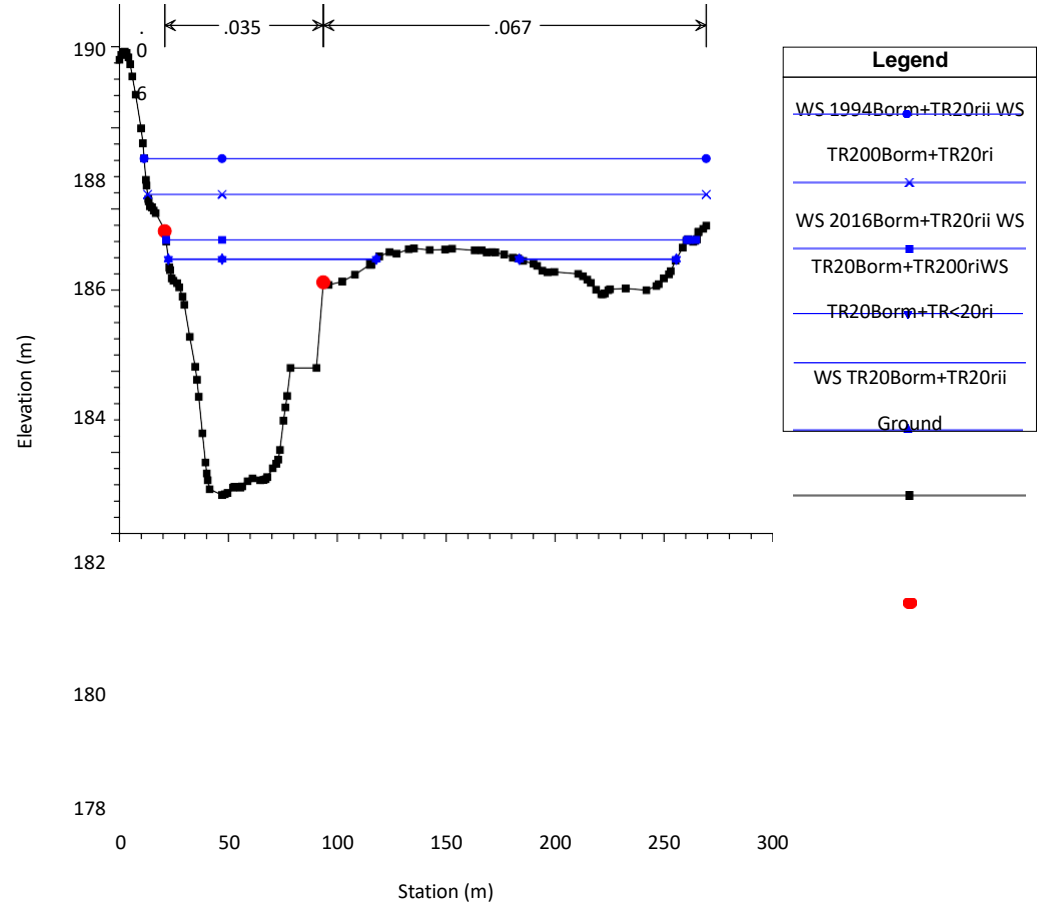
River = Bormida Reach = 3 RS = 43



Lotto1C_rev02

Geom: Lotto1C_rev02

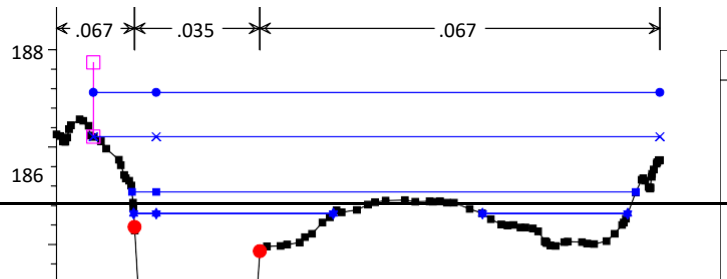
River = Bormida Reach = 3 RS = 37



Lotto1C_rev02

Geom: Lotto1C_rev02

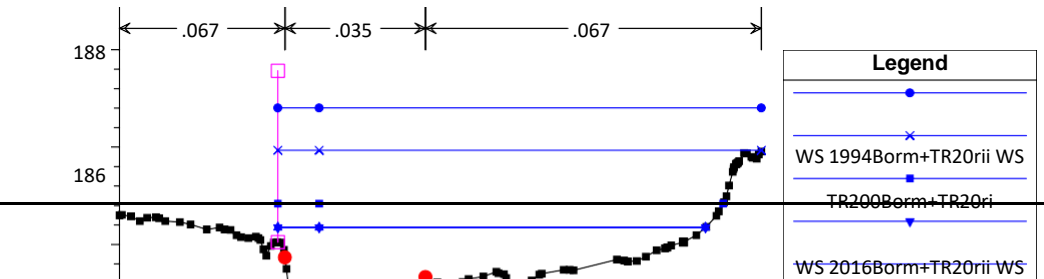
River = Bormida Reach = 2 RS = 35

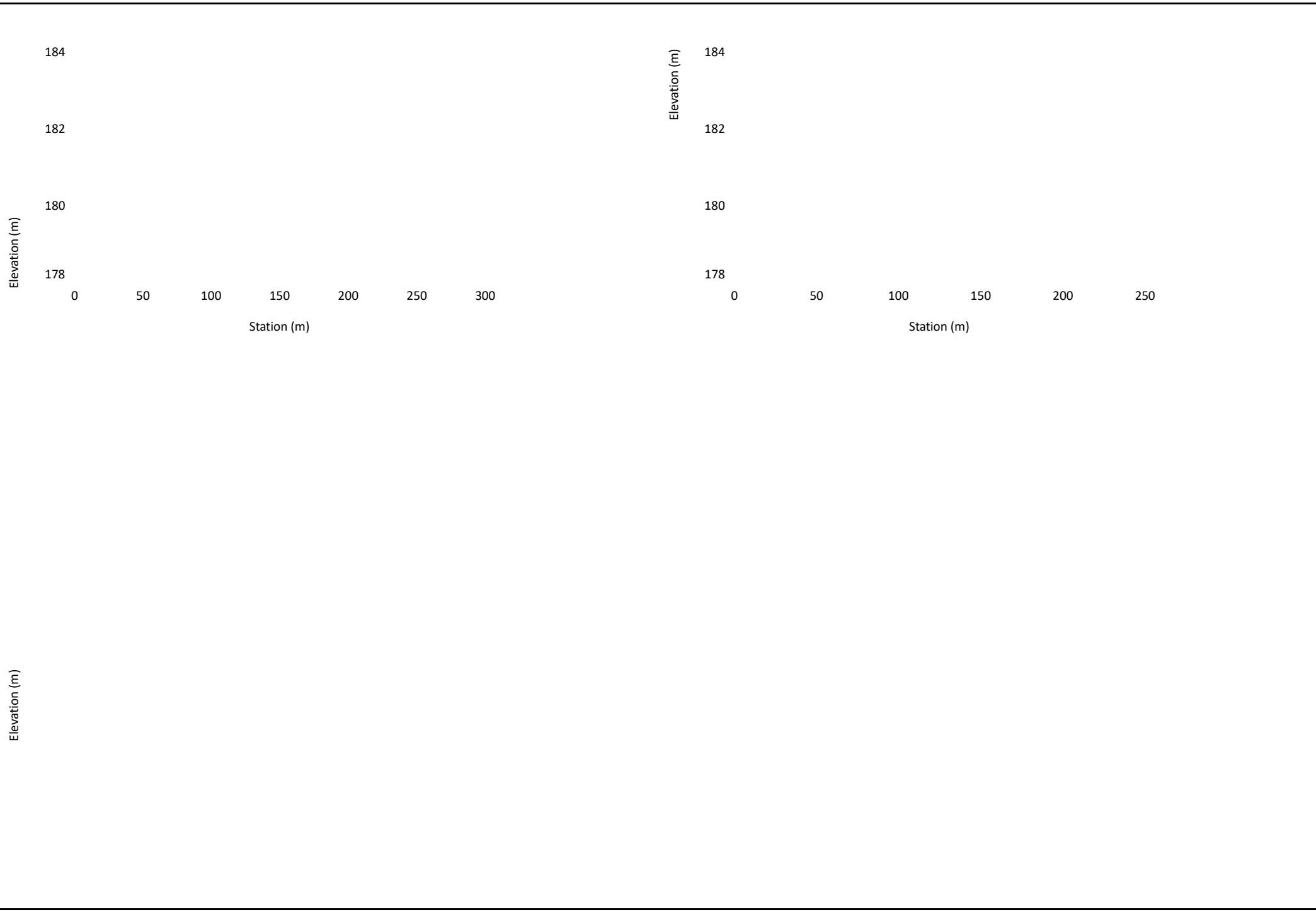


Lotto1C_rev02

Geom: Lotto1C_rev02

River = Bormida Reach = 2 RS = 28

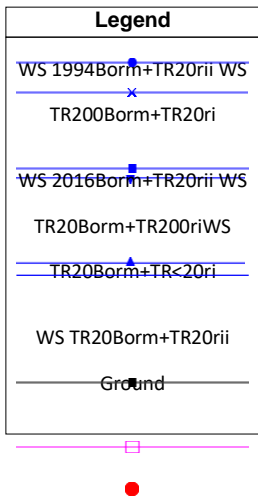
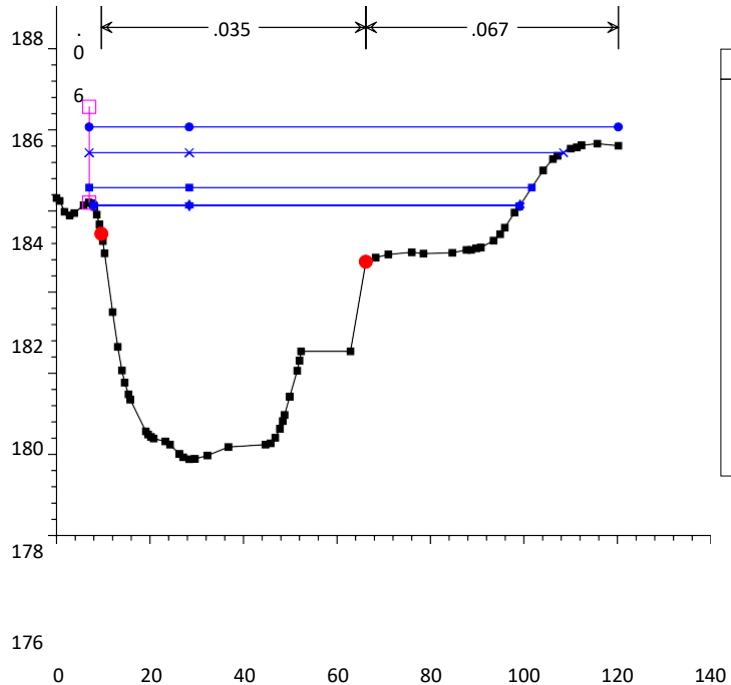




Lotto1C_rev02

Geom: Lotto1C_rev02

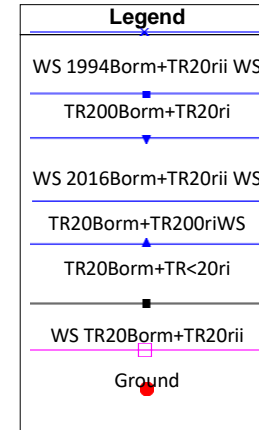
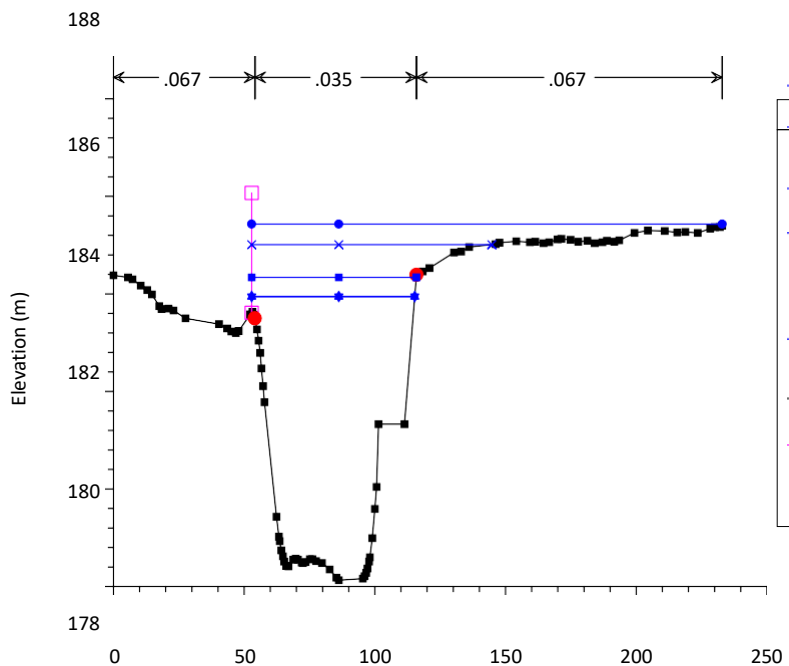
River = Bormida Reach = 2 RS = 22



Lotto1C_rev02

Geom: Lotto1C_rev02

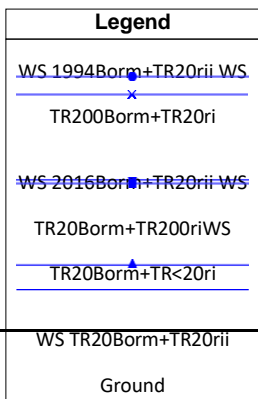
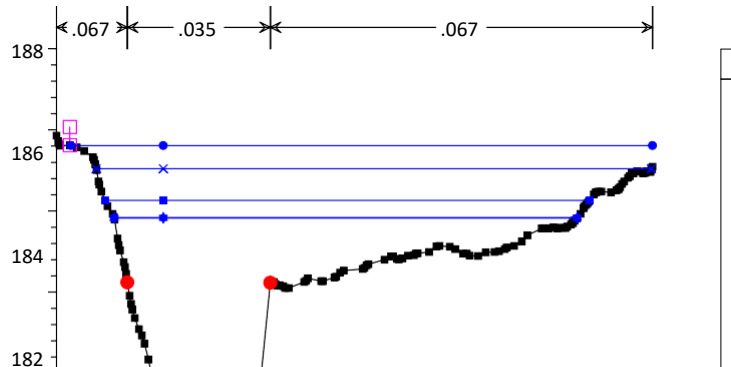
River = Bormida Reach = 1 RS = 19



Lotto1C_rev02

Geom: Lotto1C_rev02

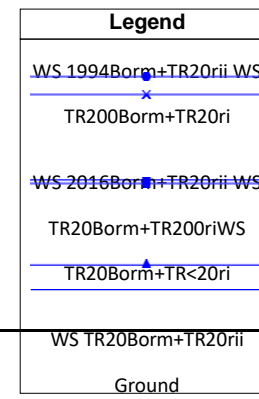
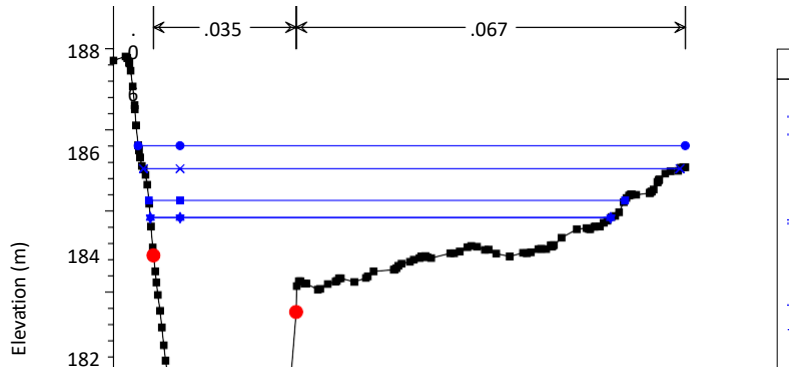
River = Bormida Reach = 1 RS = 10



Lotto1C_rev02

Geom: Lotto1C_rev02

River = Bormida Reach = 1 RS = 9

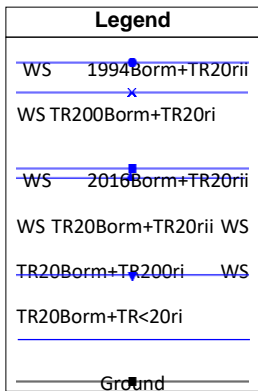
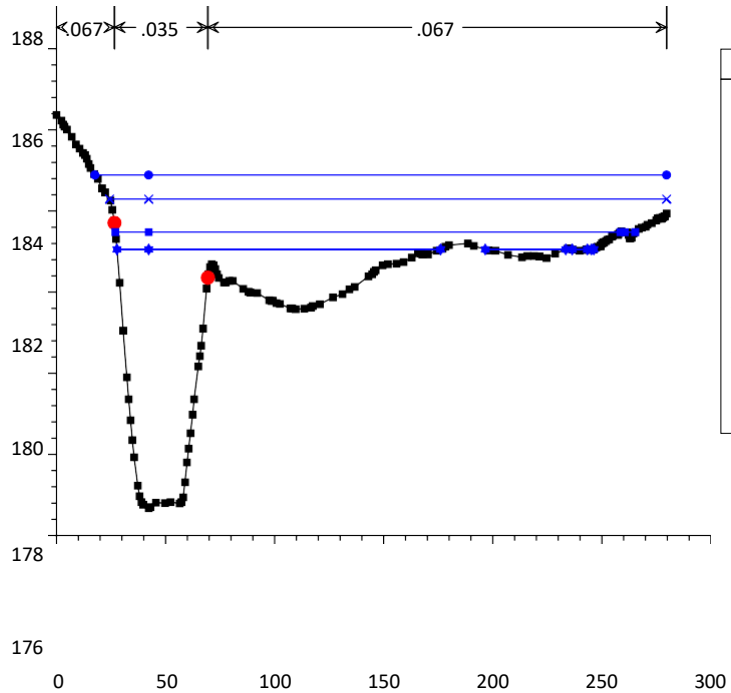




Lotto1C_rev02

Geom: Lotto1C_rev02

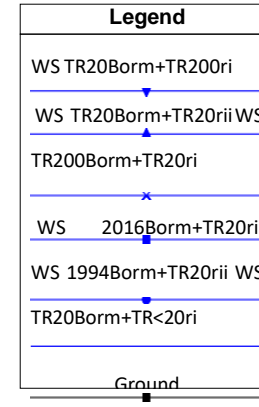
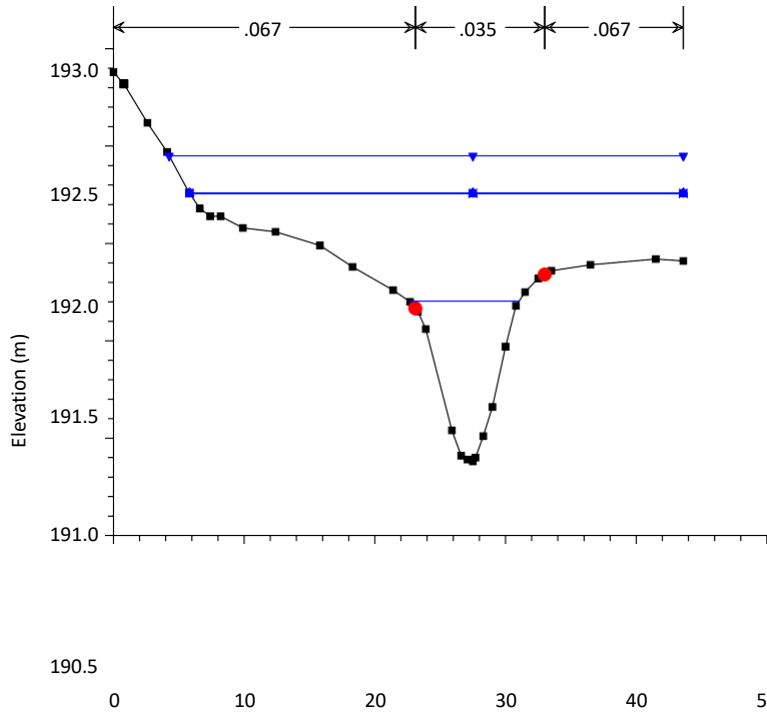
River = Bormida Reach = 1 RS = 1



Lotto1C_rev02

Geom: Lotto1C_rev02

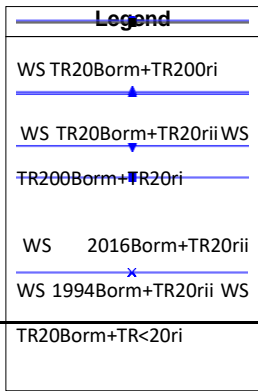
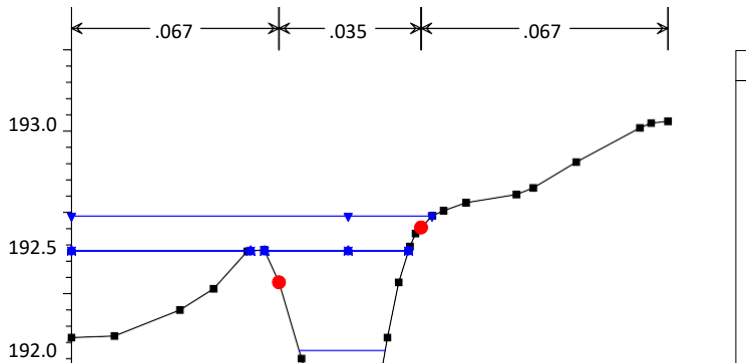
River = Rio Caffra Reach = 1 RS = 205



Lotto1C_rev02

Geom: Lotto1C_rev02

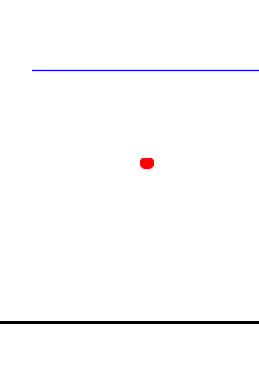
River = Rio Caffra Reach = 1 RS = 203

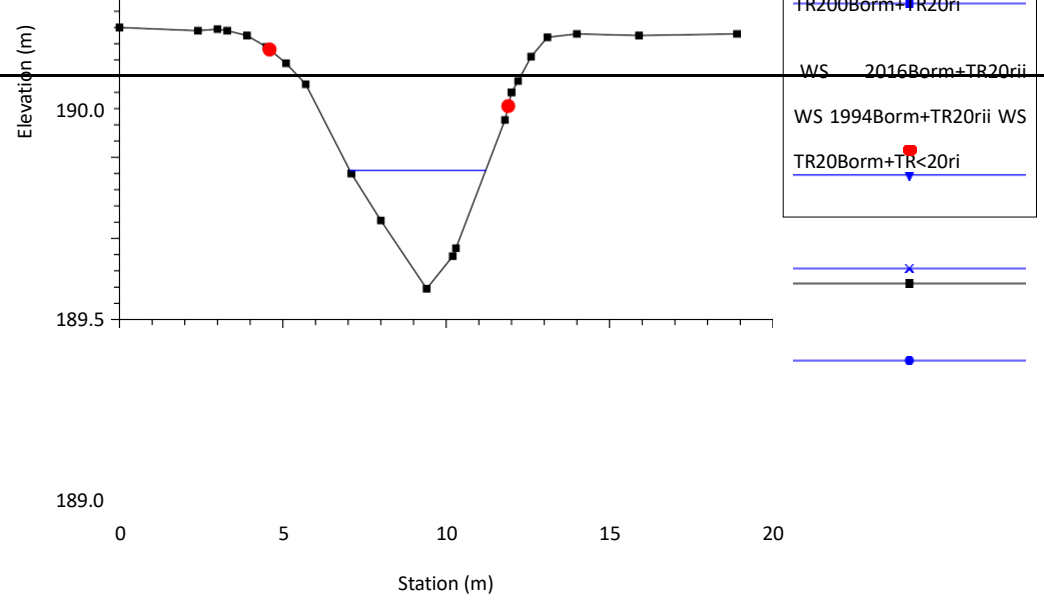
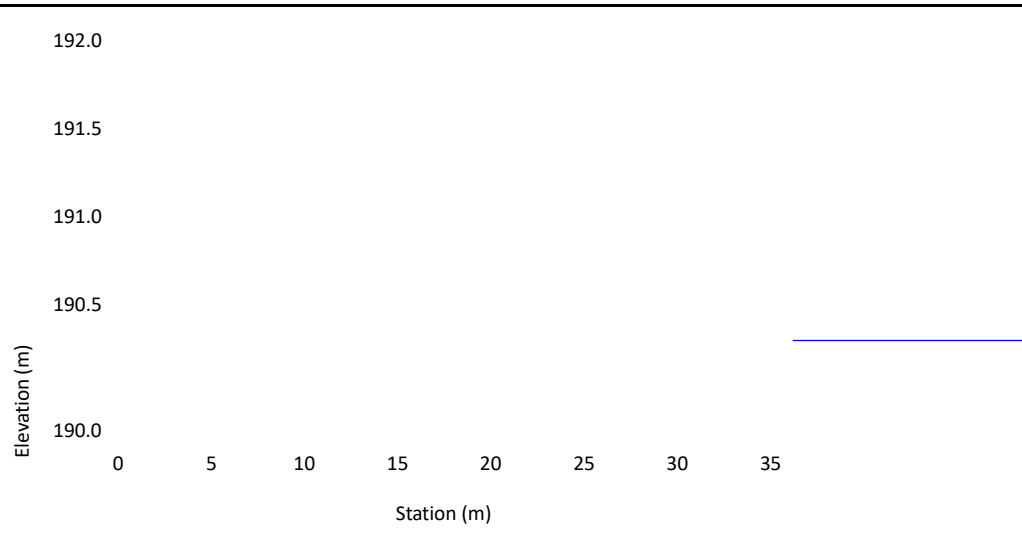


Lotto1C_rev02

Geom: Lotto1C_rev02

River = Rio Caffra Reach = 1 RS = 201

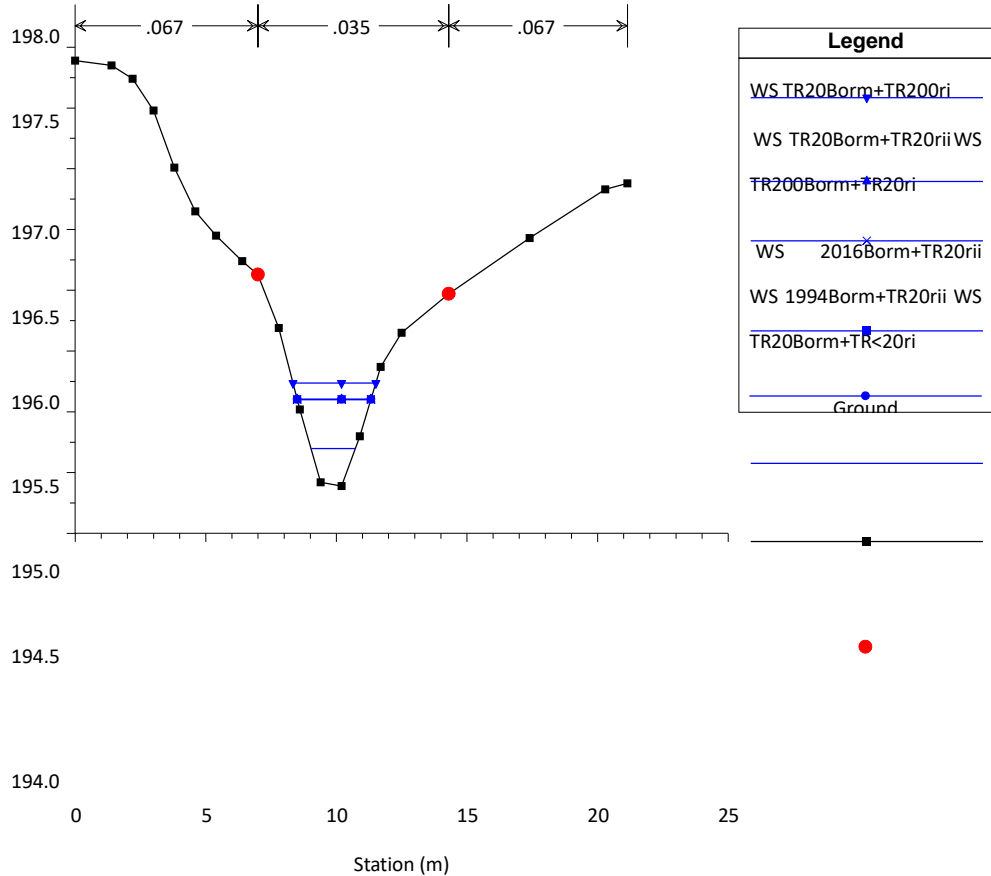




Lotto1C_rev02

Geom: Lotto1C_rev02

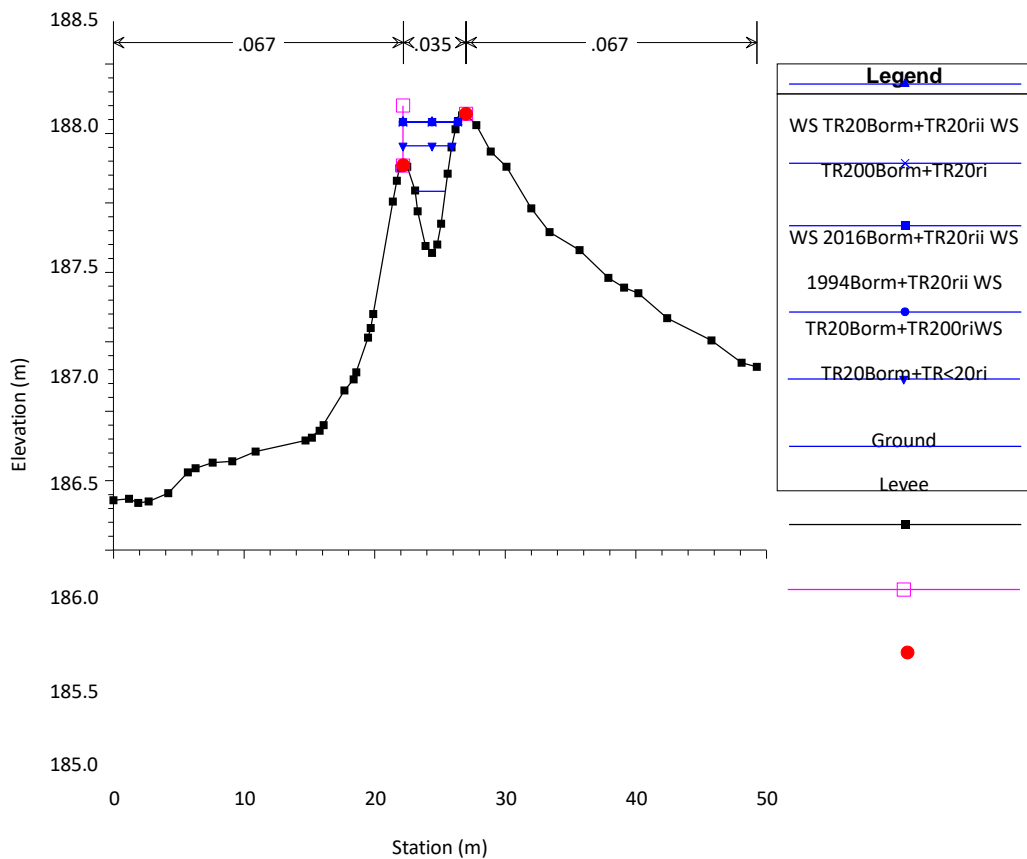
River = Rio Madama Reach = 1 RS = 405



Lotto1C_rev02

Geom: Lotto1C_rev02

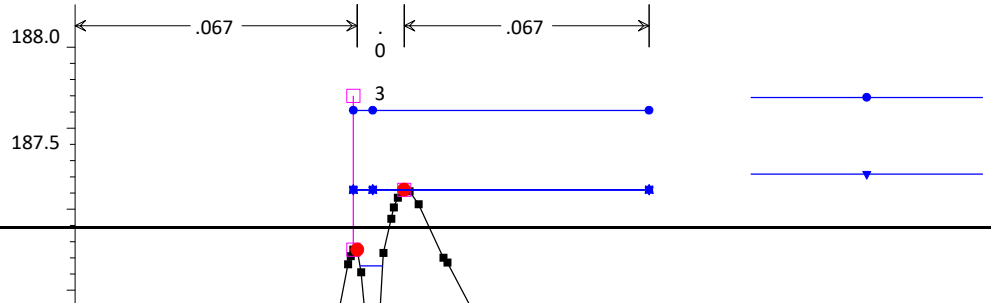
River = Rio Madama Reach = 1 RS = 404



Lotto1C_rev02

Geom: Lotto1C_rev02

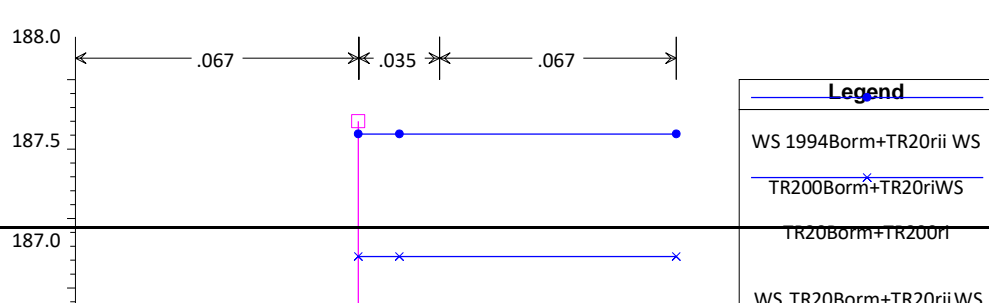
River = Rio Madama Reach = 1 RS = 403

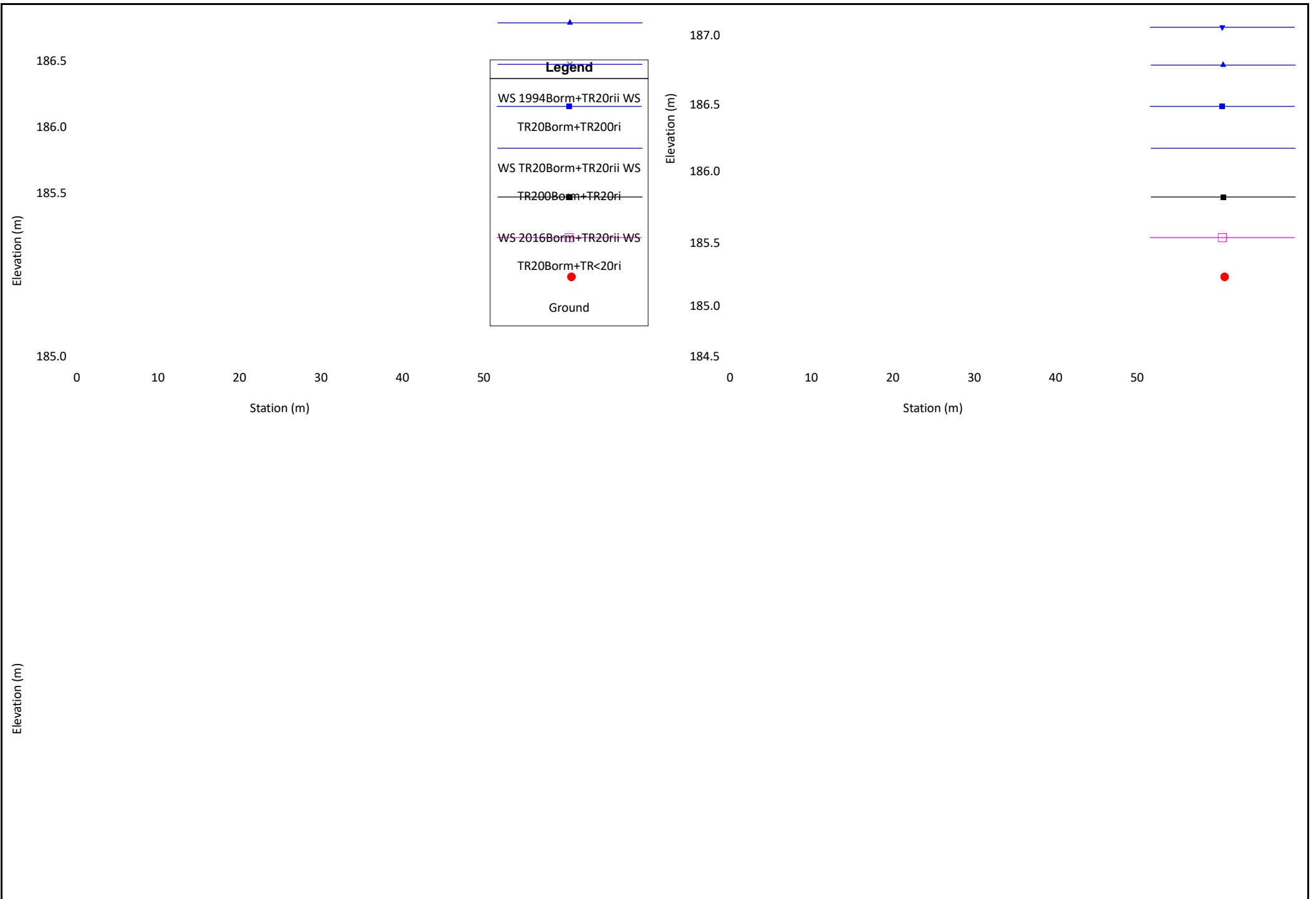


Lotto1C_rev02

Geom: Lotto1C_rev02

River = Rio Madama Reach = 1 RS = 402

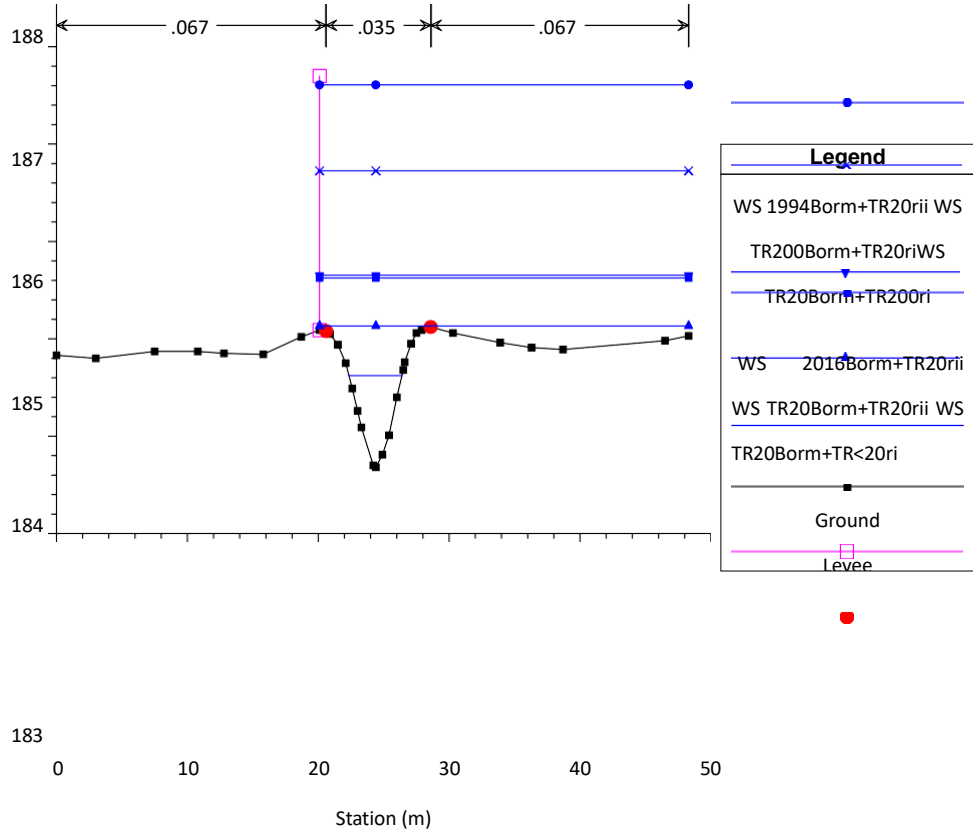




Lotto1C_rev02

Geom: Lotto1C_rev02

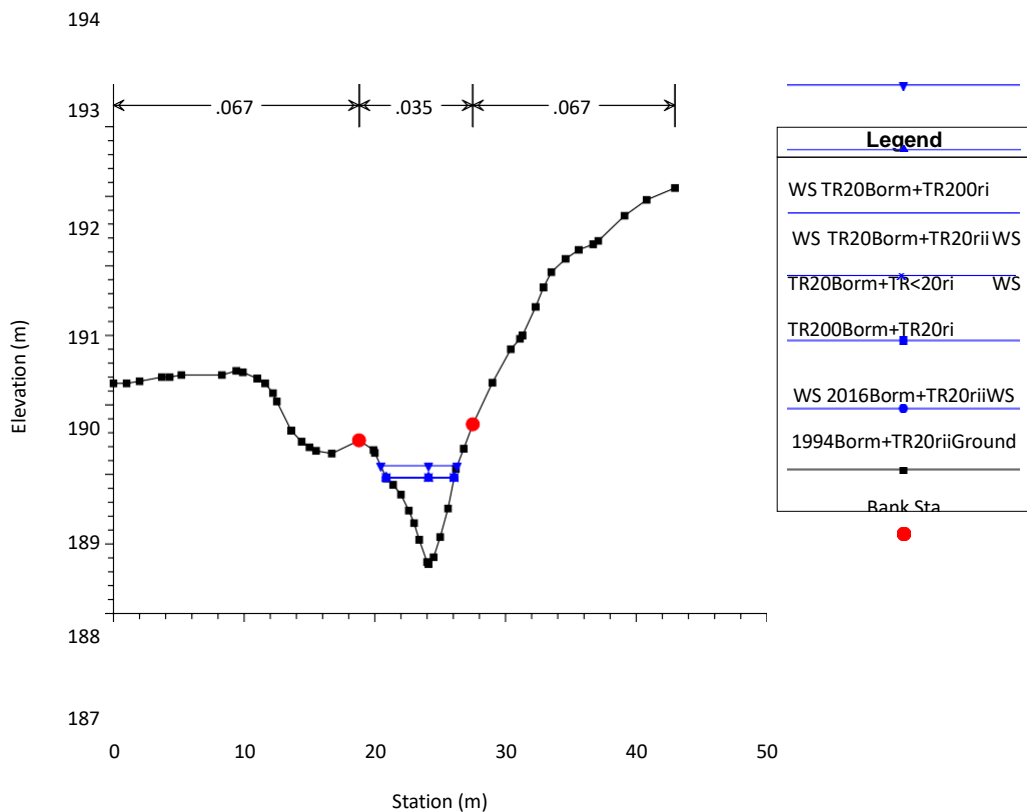
River = Rio Madama Reach = 1 RS = 401



Lotto1C_rev02

Geom: Lotto1C_rev02

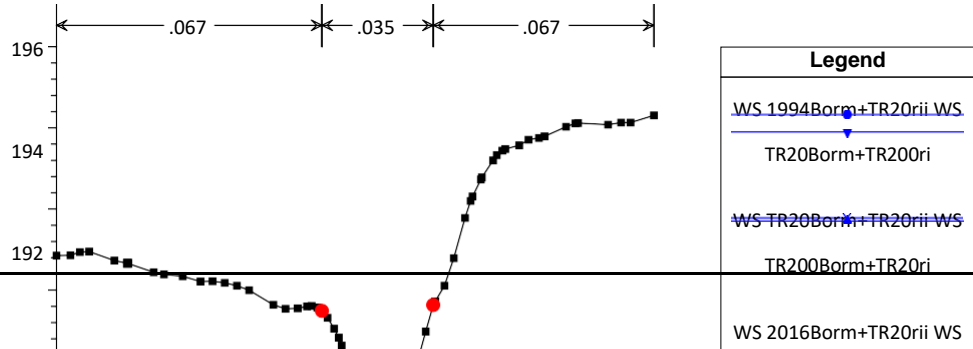
River = Rio Sacco Reach = 1 RS = 306



Lotto1C_rev02

Geom: Lotto1C_rev02

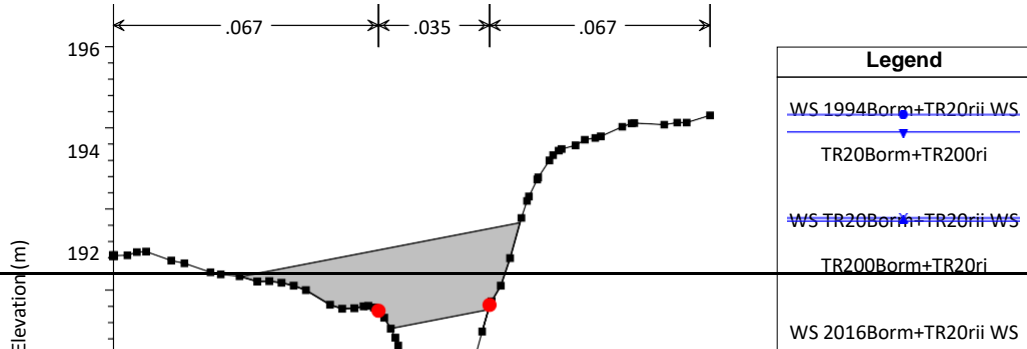
River = Rio Sacco Reach = 1 RS = 305

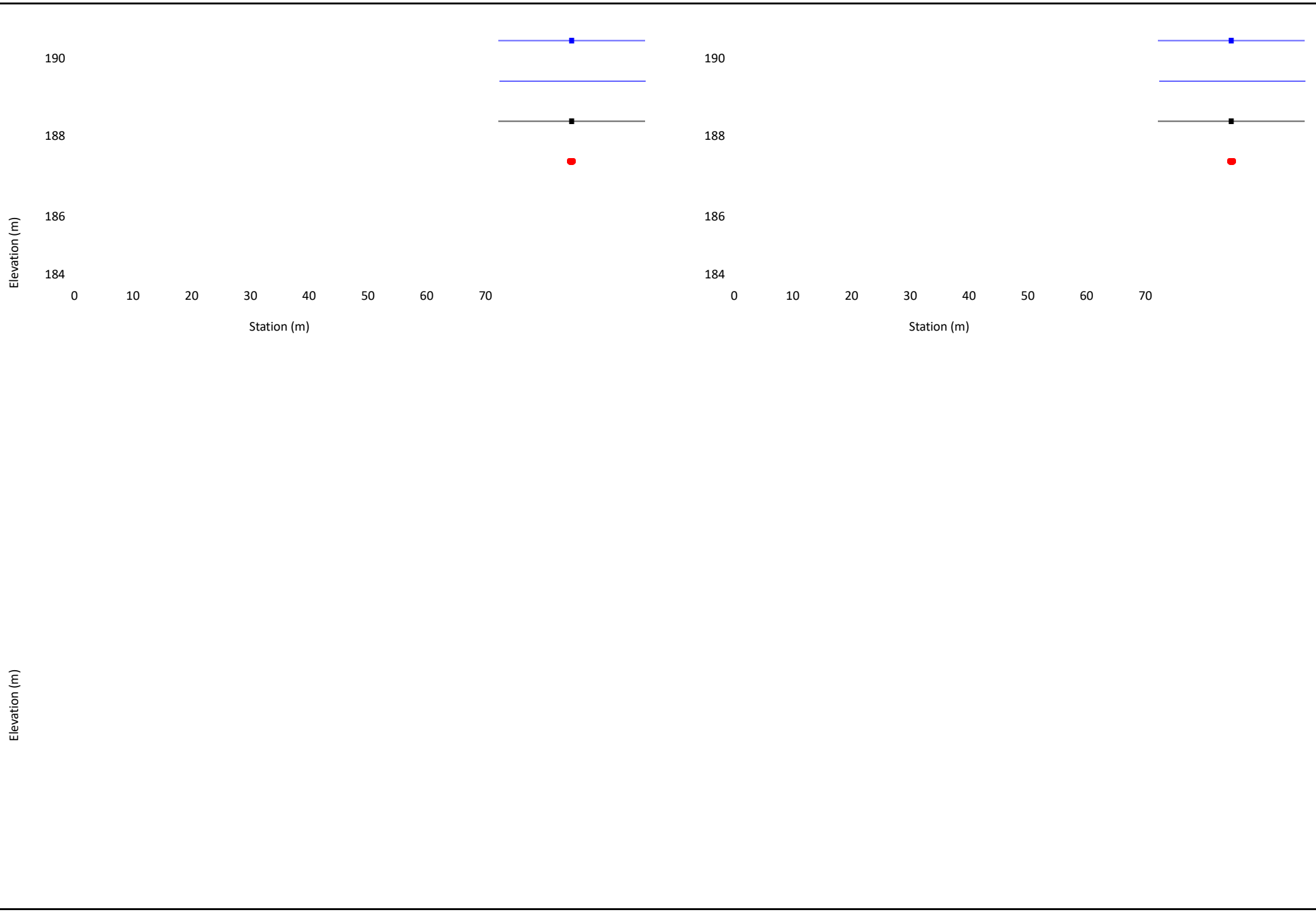


Lotto1C_rev02

Geom: Lotto1C_rev02

River = Rio Sacco Reach = 1 RS = 304.5 BR

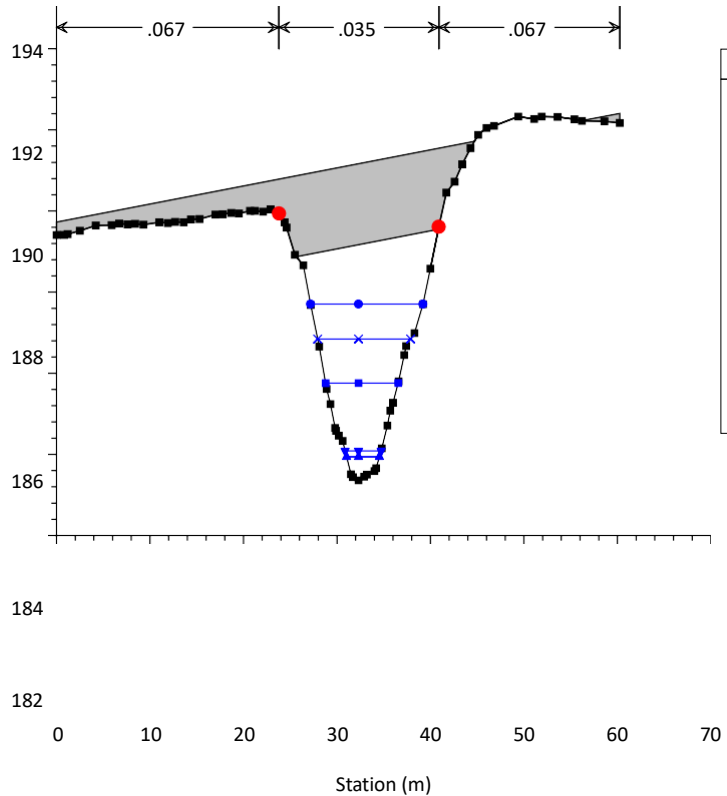




Lotto1C_rev02

Geom: Lotto1C_rev02

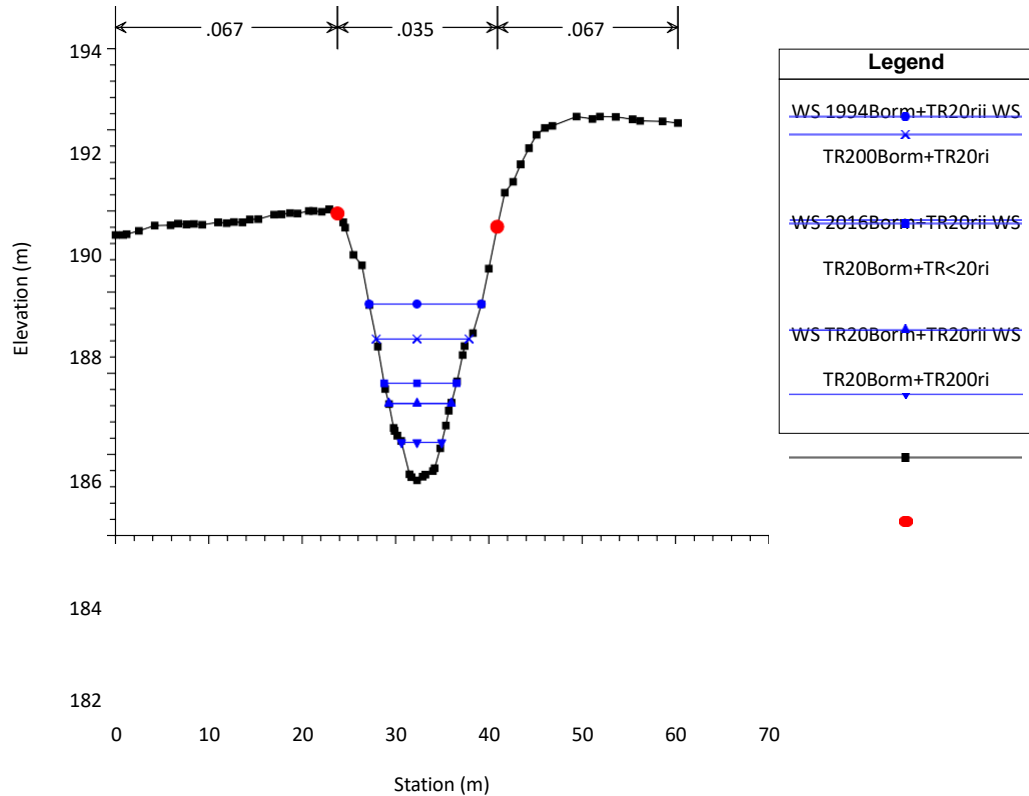
River = Rio Sacco Reach = 1 RS = 304.5 BR



Lotto1C_rev02

Geom: Lotto1C_rev02

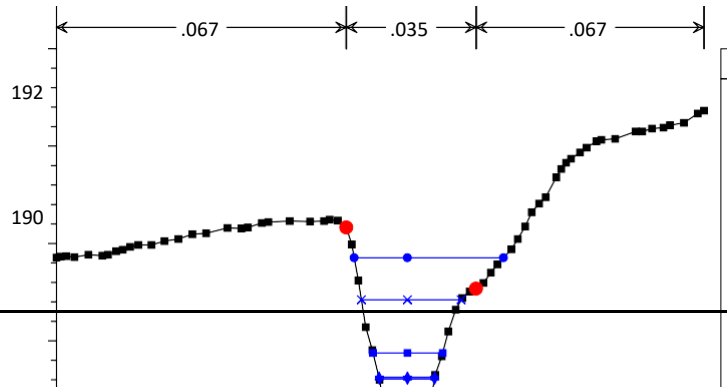
River = Rio Sacco Reach = 1 RS = 304



Lotto1C_rev02

Geom: Lotto1C_rev02

River = Rio Sacco Reach = 1 RS = 303

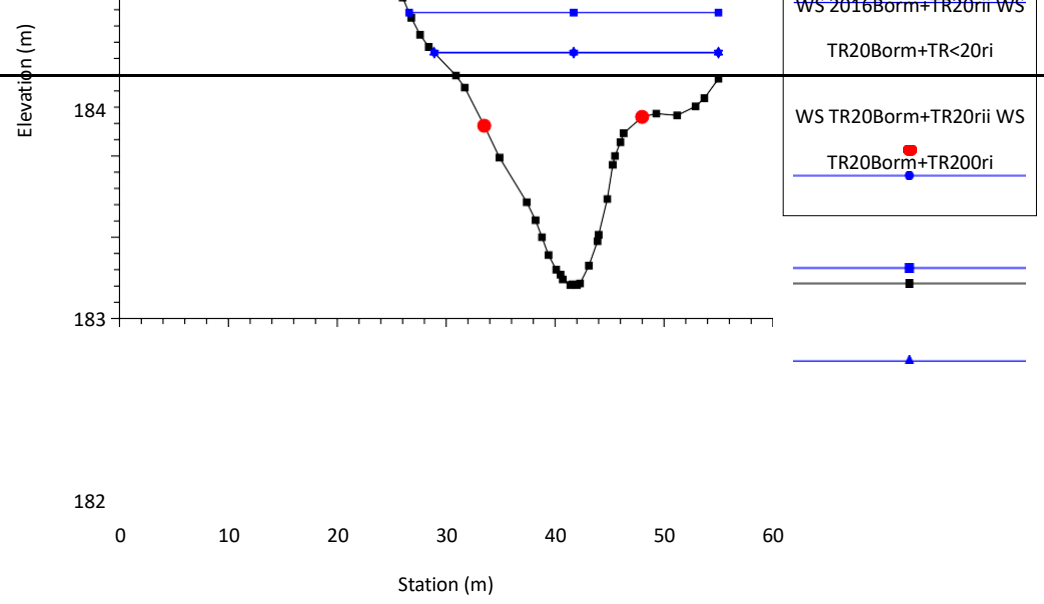
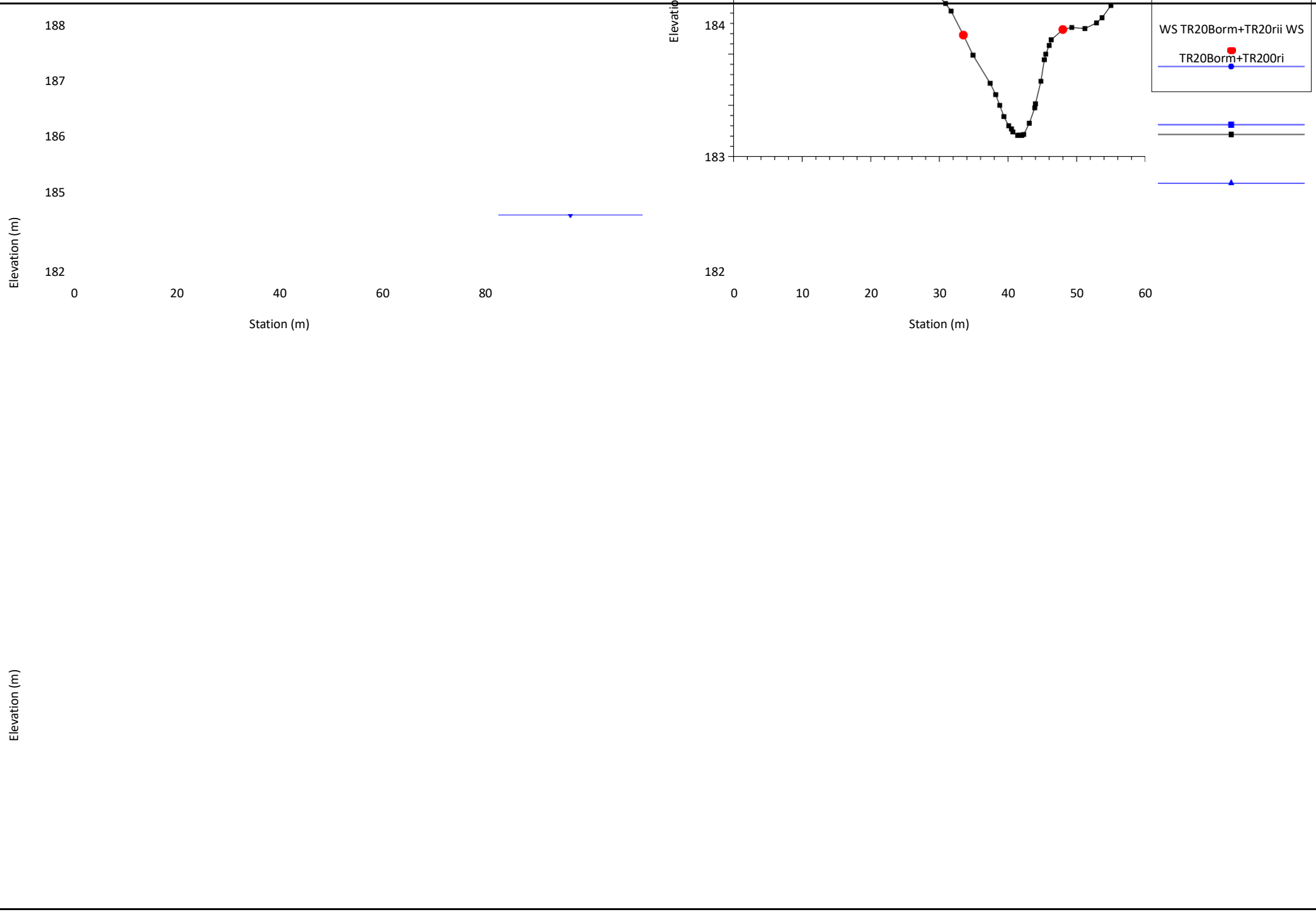


Lotto1C_rev02

Geom: Lotto1C_rev02

River = Rio Sacco Reach = 1 RS = 302

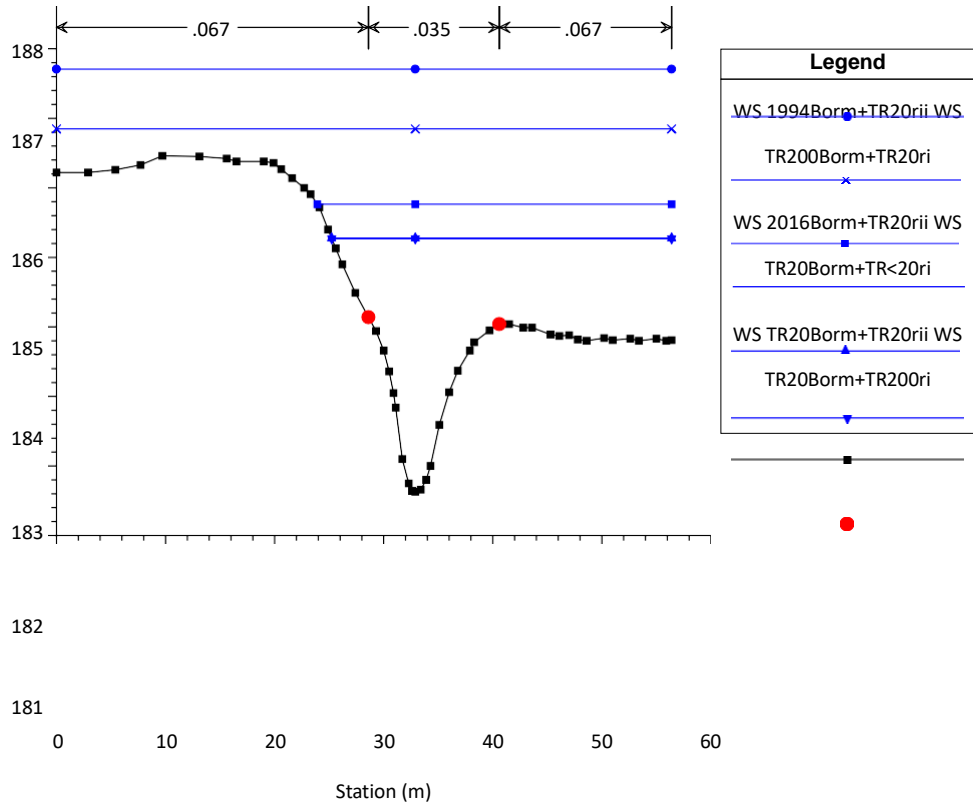




Lotto1C_rev02

Geom: Lotto1C_rev02

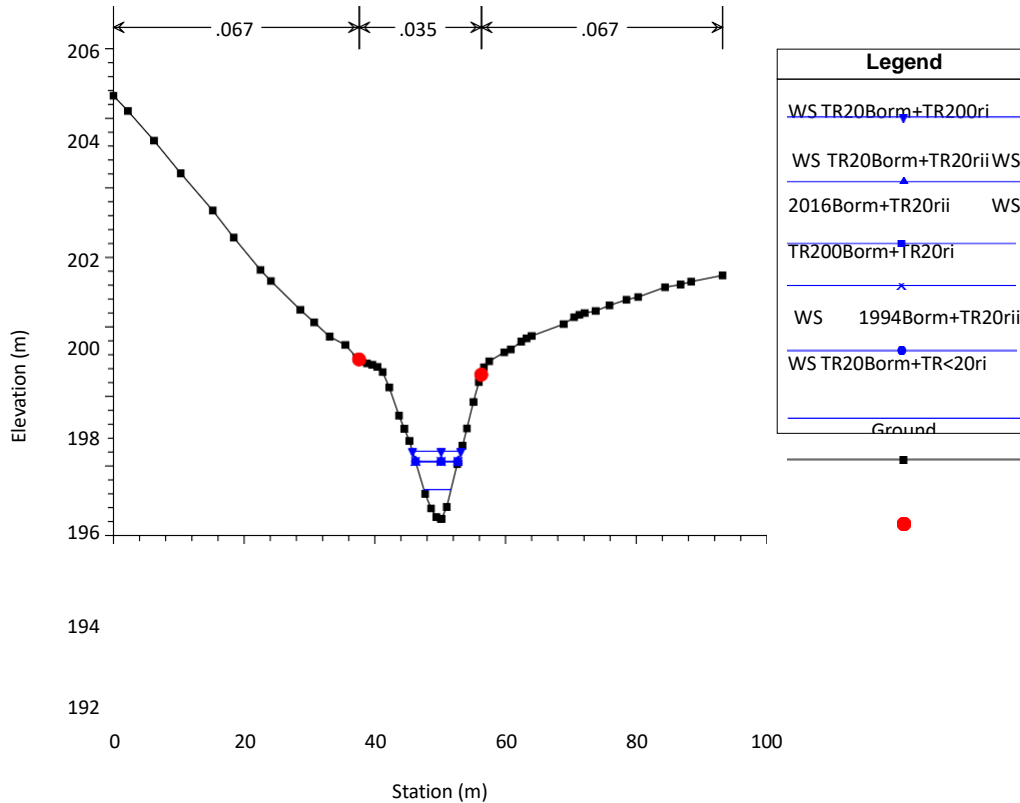
River = Rio Sacco Reach = 1 RS = 301



Lotto1C_rev02

Geom: Lotto1C_rev02

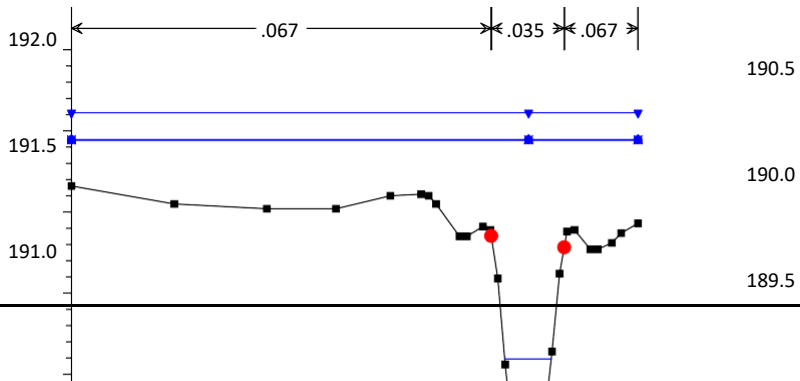
River = Rio San Pietro Reach = 3 RS = 134



Lotto1C_rev02

Geom: Lotto1C_rev02

River = Rio San Pietro Reach = 3 RS = 127

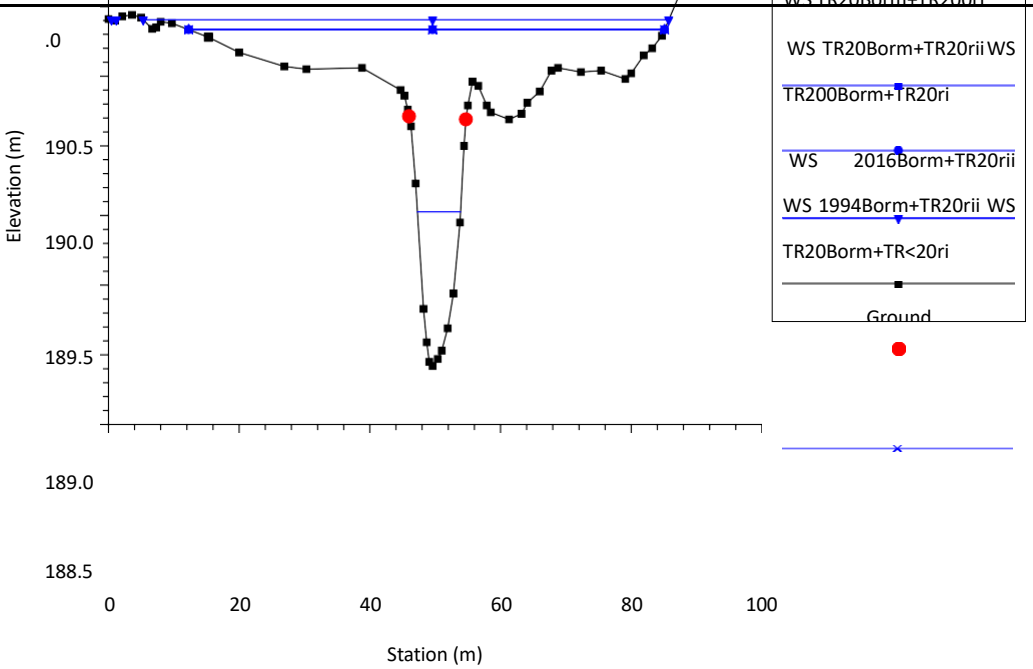
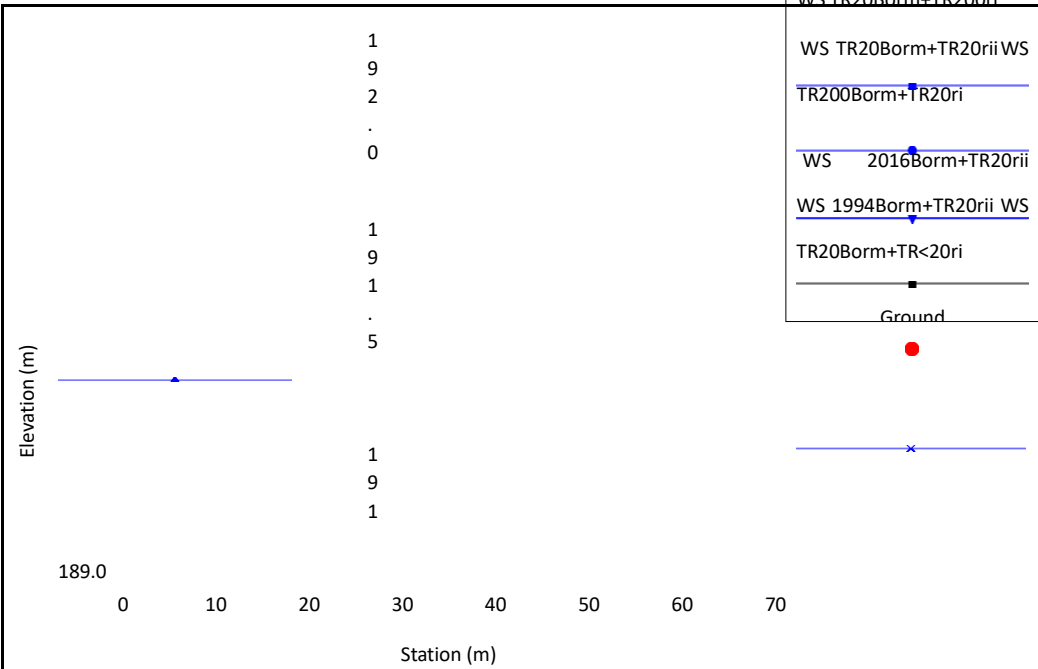


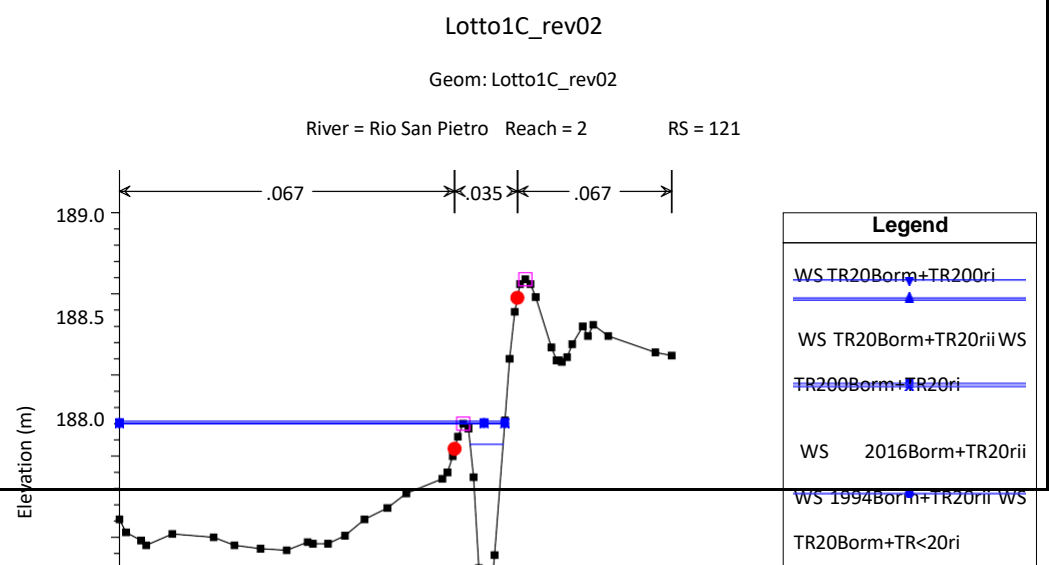
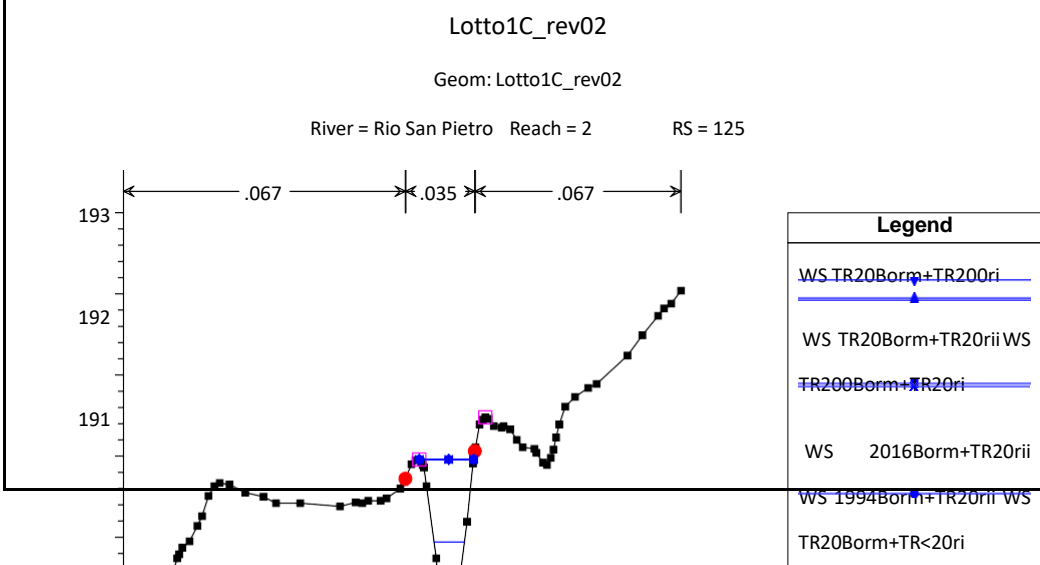
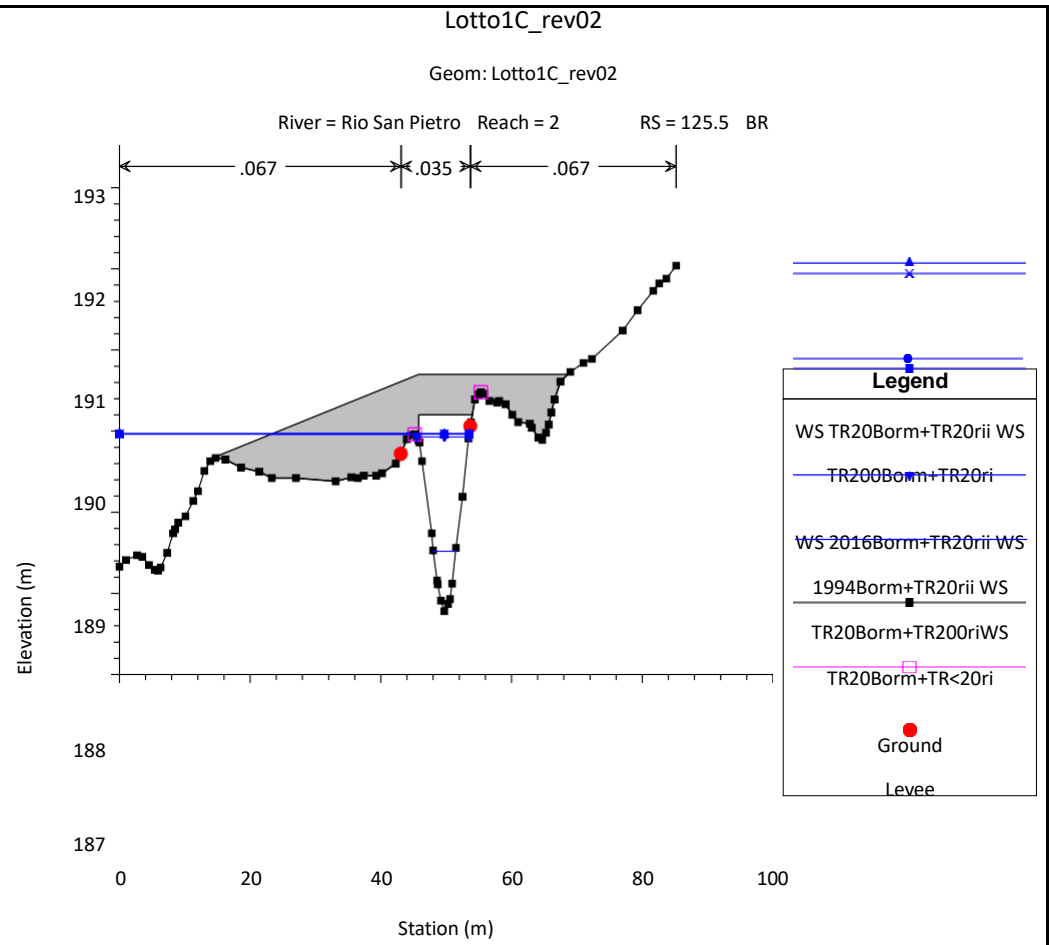
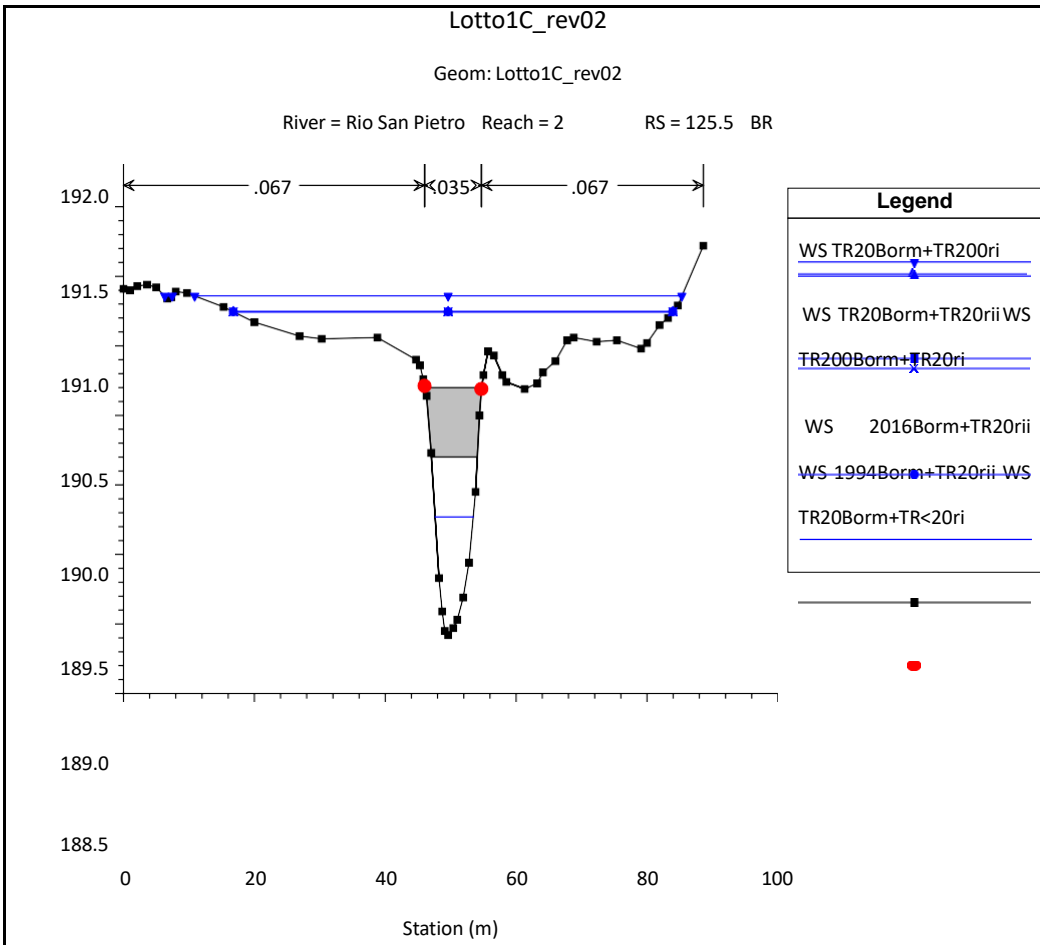
Lotto1C_rev02

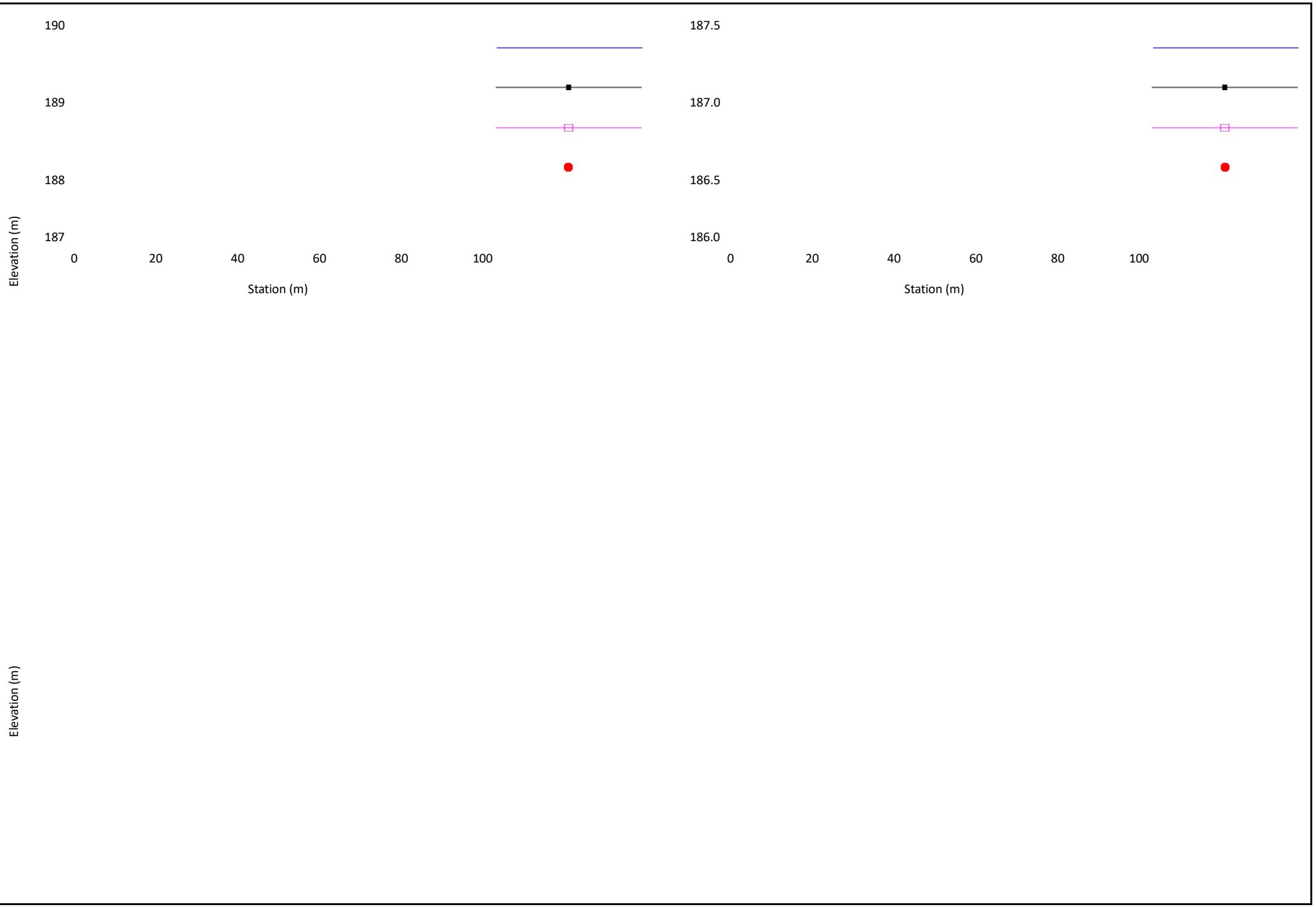
Geom: Lotto1C_rev02

River = Rio San Pietro Reach = 2 RS = 126





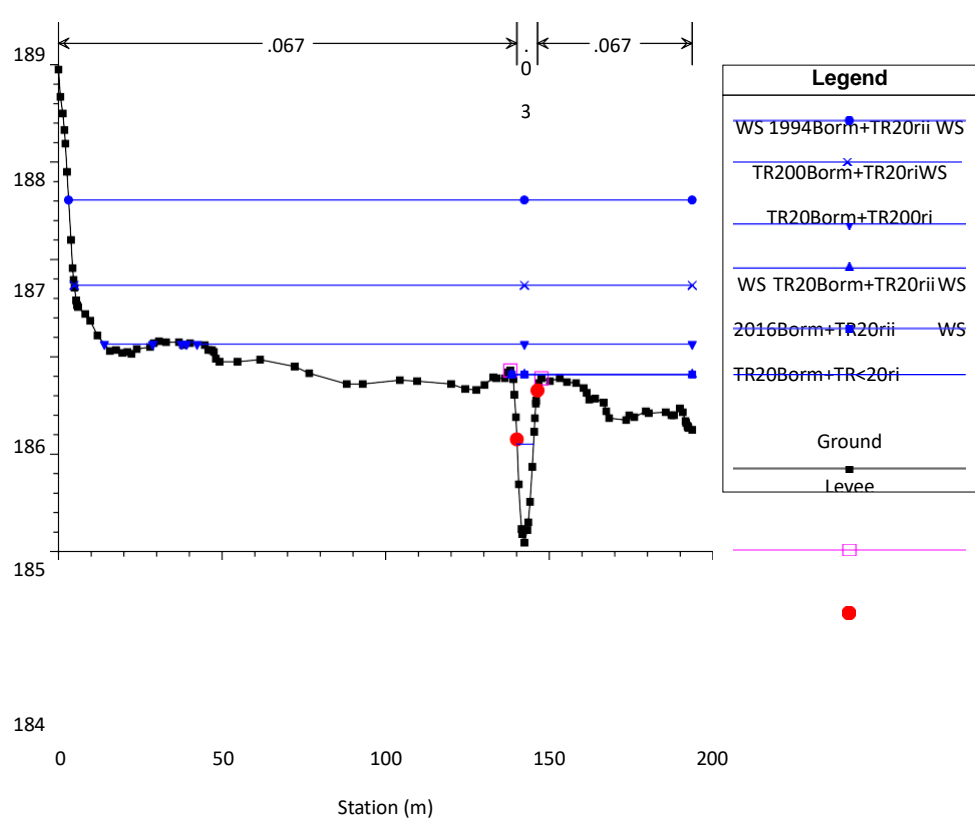




Lotto1C_rev02

Geom: Lotto1C_rev02

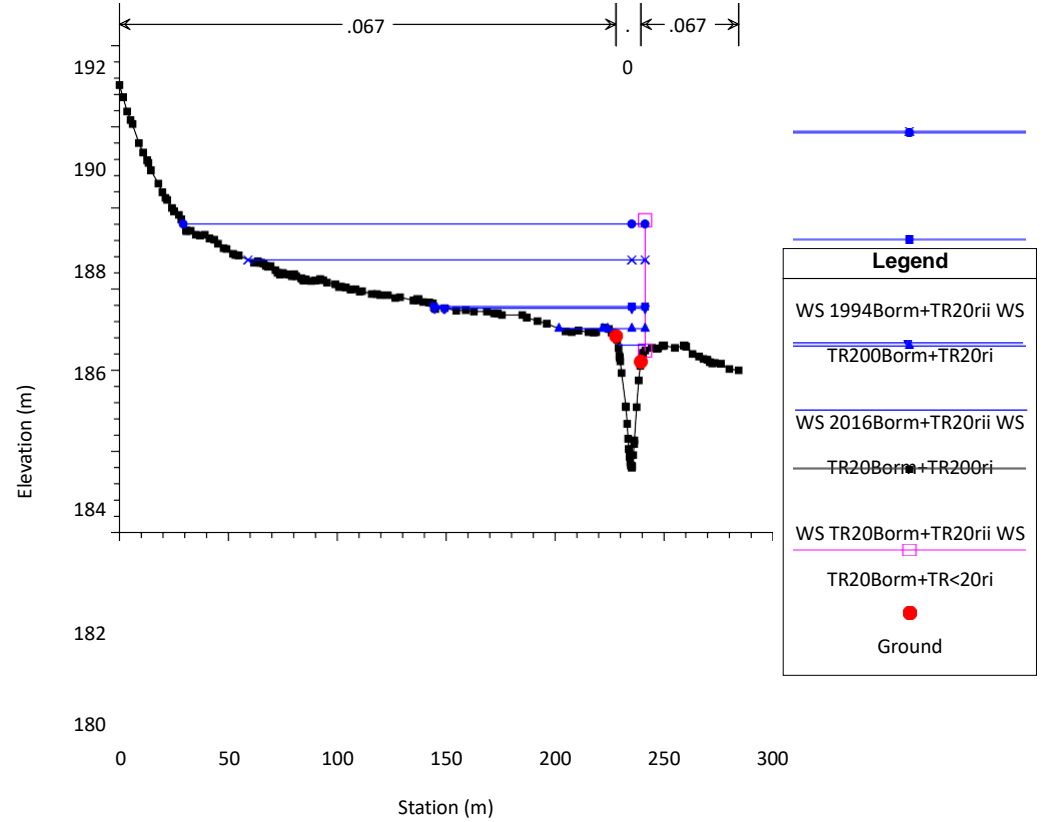
River = Rio San Pietro Reach = 2 RS = 115



Lotto1C_rev02

Geom: Lotto1C_rev02

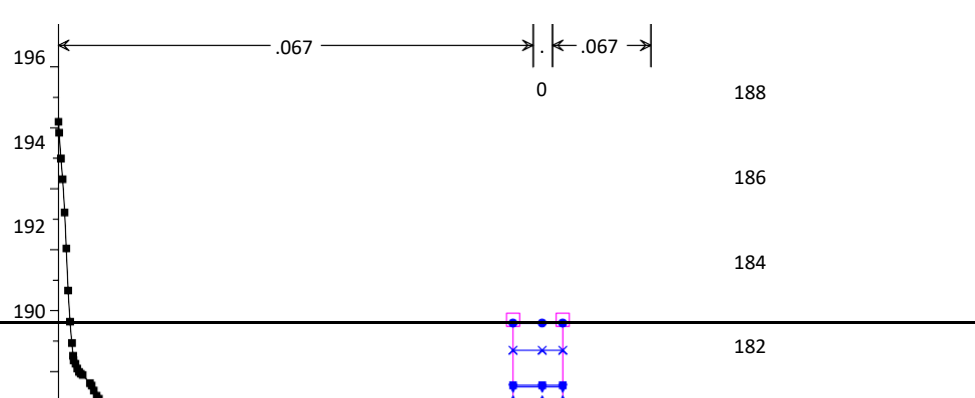
River = Rio San Pietro Reach = 2 RS = 109



Lotto1C_rev02

Geom: Lotto1C_rev02

River = Rio San Pietro Reach = 1 RS = 108

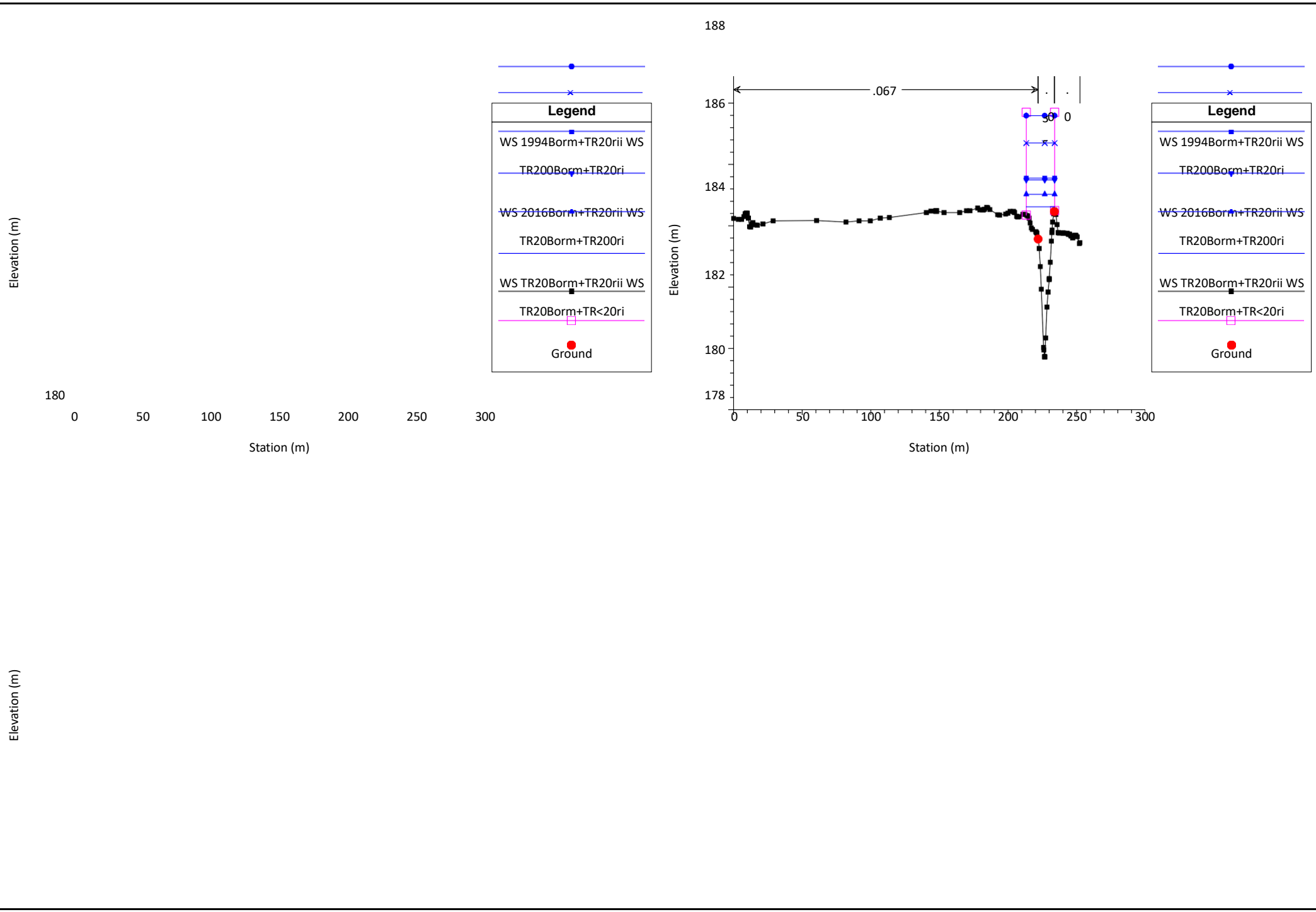


Lotto1C_rev02

Geom: Lotto1C_rev02

River = Rio San Pietro Reach = 1 RS = 105

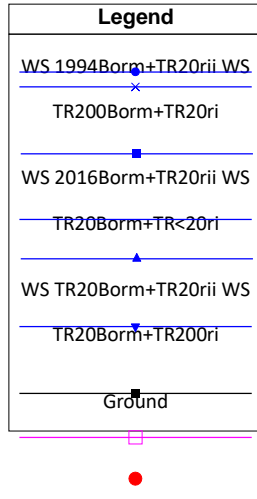
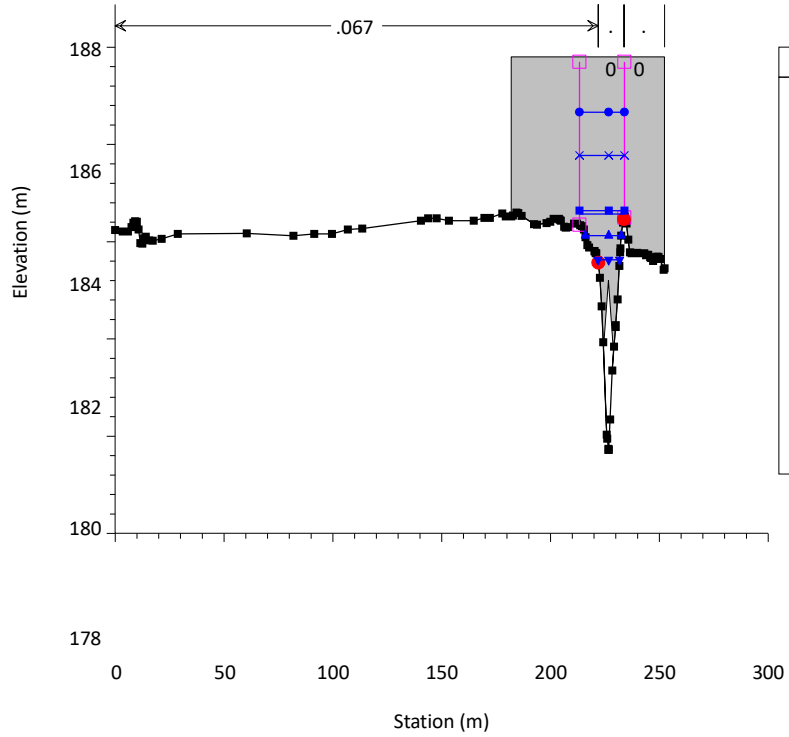




Lotto1C_rev02

Geom: Lotto1C_rev02

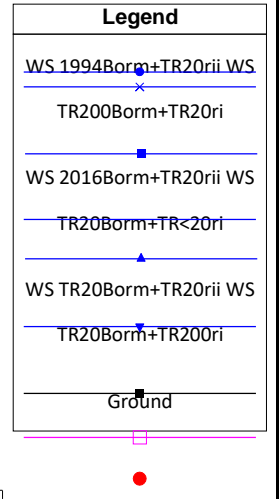
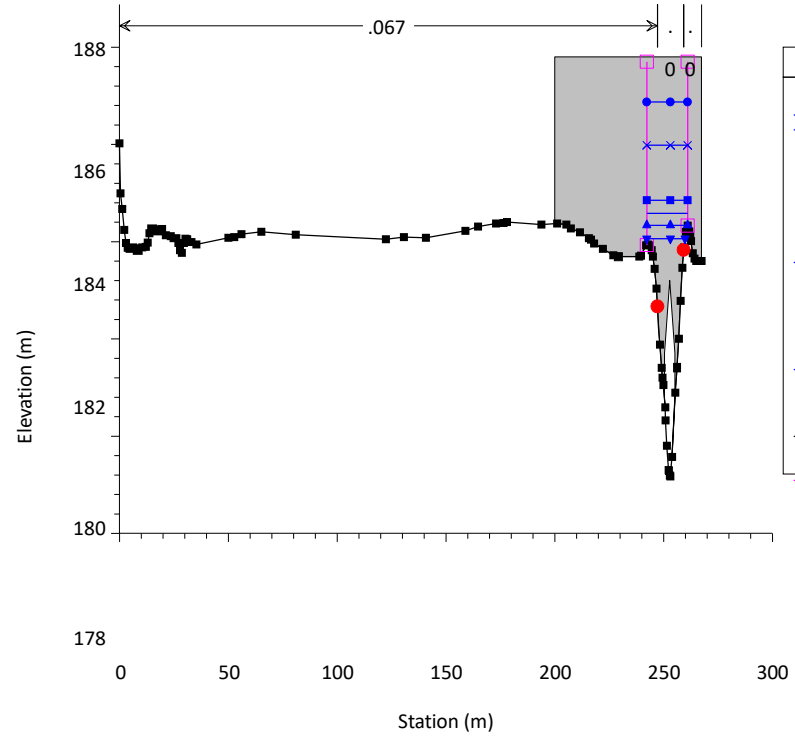
River = Rio San Pietro Reach = 1 RS = 104.5 BR



Lotto1C_rev02

Geom: Lotto1C_rev02

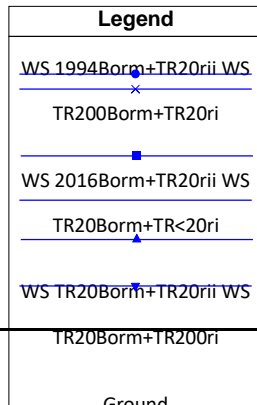
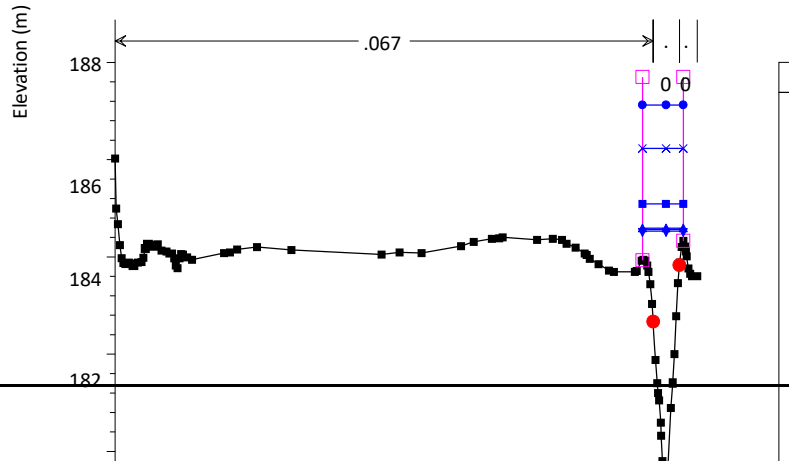
River = Rio San Pietro Reach = 1 RS = 104.5 BR



Lotto1C_rev02

Geom: Lotto1C_rev02

River = Rio San Pietro Reach = 1 RS = 104



180

178

0

50

100

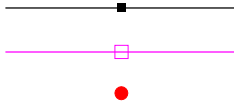
150

200

250

300

Station (m)



INTERVENTO CODICE AT_A18_622_19_102 – PROGETTO PER LAVORI DI ADEGUAMENTO SEZIONI DI DEFLUSSO FOSSI COLATORI PROVENIENTI DA VERSANTI IN GIARONETTO - ADEGUAMENTO DEI TRATTI DEL FIUME BORMIDA E DEL RIO SAN PIETRO IN CORRISPONDENZA DELLA S.P. 25 - PROGETTO ESECUTIVO – LOTTO 1A

SITUAZIONE FINALE

(OPERE DI COMPLETAMENTO)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	3	134	TR20Borm+TR<20ri	5.00	192.48	193.32	193.32	193.58	0.017108	2.29	2.18	4.13	1.01
Rio San Pietro	3	134	TR20Borm+TR20rii	22.20	192.48	194.13	194.19	194.73	0.017011	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	TR20Borm+TR200ri	31.90	192.48	194.42	194.52	195.14	0.017018	3.74	8.53	7.40	1.11
Rio San Pietro	3	134	TR200Borm+TR20ri	22.20	192.48	194.13	194.20	194.73	0.017012	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	2016Borm+TR20rii	22.20	192.48	194.13	194.19	194.73	0.017011	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	1994Borm+TR20rii	22.20	192.48	194.13	194.20	194.73	0.017011	3.42	6.50	6.49	1.09
Rio San Pietro	3	133.00*	TR20Borm+TR<20ri	5.00	192.00	192.82	192.85	193.12	0.020016	2.43	2.06	4.01	1.09
Rio San Pietro	3	133.00*	TR20Borm+TR20rii	22.20	192.00	193.62	193.73	194.27	0.019320	3.57	6.22	6.43	1.16
Rio San Pietro	3	133.00*	TR20Borm+TR200ri	31.90	192.00	193.91	194.05	194.68	0.019164	3.90	8.18	7.33	1.18
Rio San Pietro	3	133.00*	TR200Borm+TR20ri	22.20	192.00	193.62	193.73	194.27	0.019319	3.57	6.22	6.43	1.16
Rio San Pietro	3	133.00*	2016Borm+TR20rii	22.20	192.00	193.62	193.73	194.27	0.019320	3.57	6.22	6.43	1.16
Rio San Pietro	3	133.00*	1994Borm+TR20rii	22.20	192.00	193.62	193.73	194.27	0.019336	3.57	6.22	6.43	1.16
Rio San Pietro	3	132.00*	TR20Borm+TR<20ri	5.00	191.53	192.38	192.38	192.65	0.017302	2.31	2.16	4.08	1.01
Rio San Pietro	3	132.00*	TR20Borm+TR20rii	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	132.00*	TR20Borm+TR200ri	31.90	191.53	193.44	193.58	194.20	0.019256	3.87	8.24	7.53	1.18
Rio San Pietro	3	132.00*	TR200Borm+TR20ri	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	132.00*	2016Borm+TR20rii	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	132.00*	1994Borm+TR20rii	22.20	191.53	193.17	193.26	193.79	0.018393	3.49	6.36	6.58	1.13
Rio San Pietro	3	131.00*	TR20Borm+TR<20ri	5.00	191.05	191.88	191.91	192.18	0.020188	2.44	2.05	4.00	1.09
Rio San Pietro	3	131.00*	TR20Borm+TR20rii	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	131.00*	TR20Borm+TR200ri	31.90	191.05	192.94	193.10	193.71	0.019778	3.88	8.21	7.68	1.20
Rio San Pietro	3	131.00*	TR200Borm+TR20ri	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	131.00*	2016Borm+TR20rii	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	131.00*	1994Borm+TR20rii	22.20	191.05	192.67	192.79	193.31	0.019678	3.55	6.26	6.70	1.17
Rio San Pietro	3	130.00*	TR20Borm+TR<20ri	5.00	190.58	191.43	191.44	191.71	0.017638	2.32	2.16	4.13	1.02
Rio San Pietro	3	130.00*	TR20Borm+TR20rii	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	130.00*	TR20Borm+TR200ri	31.90	190.58	192.45	192.60	193.22	0.019805	3.88	8.22	7.74	1.20
Rio San Pietro	3	130.00*	TR200Borm+TR20ri	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	130.00*	2016Borm+TR20rii	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	130.00*	1994Borm+TR20rii	22.20	190.58	192.18	192.31	192.82	0.019856	3.54	6.28	6.85	1.18
Rio San Pietro	3	129.00*	TR20Borm+TR<20ri	5.00	190.10	190.92	190.96	191.23	0.020777	2.44	2.05	4.13	1.11
Rio San Pietro	3	129.00*	TR20Borm+TR20rii	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	TR20Borm+TR200ri	31.90	190.10	191.94	192.10	192.72	0.020116	3.90	8.18	7.76	1.21
Rio San Pietro	3	129.00*	TR200Borm+TR20ri	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	2016Borm+TR20rii	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	1994Borm+TR20rii	22.20	190.10	191.68	191.80	192.32	0.020097	3.55	6.26	6.89	1.19

HEC-RAS Plan: Finale (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	3	128.00*	TR20Borm+TR<20ri	5.00	189.63	190.45	190.47	190.73	0.018705	2.32	2.16	4.38	1.05
Rio San Pietro	3	128.00*	TR20Borm+TR20rii	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	TR20Borm+TR200ri	31.90	189.63	191.44	191.62	192.21	0.020379	3.90	8.17	7.86	1.22
Rio San Pietro	3	128.00*	TR200Borm+TR20ri	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	2016Borm+TR20rii	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	1994Borm+TR20rii	22.20	189.63	191.18	191.30	191.82	0.020225	3.56	6.24	6.89	1.19
Rio San Pietro	3	127	TR20Borm+TR<20ri	5.00	189.15	190.09	189.97	190.25	0.008760	1.75	2.85	4.97	0.74
Rio San Pietro	3	127	TR20Borm+TR20rii	22.20	189.15	191.45	190.82	191.50	0.001209	1.26	35.09	60.60	0.32
Rio San Pietro	3	127	TR20Borm+TR200ri	31.90	189.15	191.61	191.27	191.68	0.001388	1.44	45.16	60.60	0.35
Rio San Pietro	3	127	TR200Borm+TR20ri	22.20	189.15	191.45	190.82	191.50	0.001209	1.26	35.09	60.60	0.32
Rio San Pietro	3	127	2016Borm+TR20rii	22.20	189.15	191.45	190.82	191.50	0.001209	1.26	35.09	60.60	0.32
Rio San Pietro	3	127	1994Borm+TR20rii	22.20	189.15	191.45	190.82	191.50	0.001209	1.26	35.09	60.60	0.32
Rio San Pietro	2	126	TR20Borm+TR<20ri	8.00	188.92	190.03	189.77	190.16	0.005187	1.61	4.95	6.61	0.60
Rio San Pietro	2	126	TR20Borm+TR20rii	34.30	188.92	191.34	190.73	191.47	0.002112	1.81	35.11	72.91	0.43
Rio San Pietro	2	126	TR20Borm+TR200ri	49.10	188.92	191.41	191.30	191.63	0.003465	2.37	40.52	81.19	0.56
Rio San Pietro	2	126	TR200Borm+TR20ri	34.30	188.92	191.34	190.73	191.47	0.002112	1.81	35.11	72.91	0.43
Rio San Pietro	2	126	2016Borm+TR20rii	34.30	188.92	191.34	190.73	191.47	0.002112	1.81	35.11	72.91	0.43
Rio San Pietro	2	126	1994Borm+TR20rii	34.30	188.92	191.34	190.73	191.47	0.002112	1.81	35.11	72.91	0.43
Rio San Pietro	2	125.5		Bridge									
Rio San Pietro	2	125	TR20Borm+TR<20ri	8.00	187.78	188.94	188.90	189.24	0.013675	2.43	3.29	4.65	0.92
Rio San Pietro	2	125	TR20Borm+TR20rii	34.30	187.78	190.01	190.01	190.60	0.013636	3.42	10.04	8.40	1.00
Rio San Pietro	2	125	TR20Borm+TR200ri	49.10	187.78	190.34	190.34	191.08	0.013122	3.83	12.90	9.08	1.00
Rio San Pietro	2	125	TR200Borm+TR20ri	34.30	187.78	190.01	190.01	190.60	0.013636	3.42	10.04	8.40	1.00
Rio San Pietro	2	125	2016Borm+TR20rii	34.30	187.78	190.01	190.01	190.60	0.013636	3.42	10.04	8.40	1.00
Rio San Pietro	2	125	1994Borm+TR20rii	34.30	187.78	190.01	190.01	190.60	0.013636	3.42	10.04	8.40	1.00
Rio San Pietro	2	124.00*	TR20Borm+TR<20ri	8.00	187.45	188.61	188.57	188.91	0.013550	2.41	3.31	4.74	0.92
Rio San Pietro	2	124.00*	TR20Borm+TR20rii	34.30	187.45	189.57	189.62	190.23	0.015985	3.62	9.49	8.22	1.07
Rio San Pietro	2	124.00*	TR20Borm+TR200ri	49.10	187.45	189.87	189.96	190.72	0.015972	4.08	12.09	8.94	1.09
Rio San Pietro	2	124.00*	TR200Borm+TR20ri	34.30	187.45	189.57	189.62	190.23	0.015985	3.62	9.49	8.22	1.07
Rio San Pietro	2	124.00*	2016Borm+TR20rii	34.30	187.45	189.57	189.62	190.23	0.015985	3.62	9.49	8.22	1.07
Rio San Pietro	2	124.00*	1994Borm+TR20rii	34.30	187.45	189.57	189.62	190.23	0.015985	3.62	9.49	8.22	1.07
Rio San Pietro	2	123.00*	TR20Borm+TR<20ri	8.00	187.11	188.27	188.24	188.57	0.013892	2.42	3.30	4.83	0.93
Rio San Pietro	2	123.00*	TR20Borm+TR20rii	34.30	187.11	189.25	189.26	189.86	0.014388	3.47	9.90	8.34	1.02
Rio San Pietro	2	123.00*	TR20Borm+TR200ri	49.10	187.11	189.59	189.60	190.34	0.013235	3.84	12.97	9.80	0.99
Rio San Pietro	2	123.00*	TR200Borm+TR20ri	34.30	187.11	189.25	189.26	189.86	0.014388	3.47	9.90	8.34	1.02
Rio San Pietro	2	123.00*	2016Borm+TR20rii	34.30	187.11	189.25	189.26	189.86	0.014388	3.47	9.90	8.34	1.02

HEC-RAS Plan: Finale (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	123.00*	1994Borm+TR20rii	34.30	187.11	189.25	189.26	189.86	0.014388	3.47	9.90	8.34	1.02
Rio San Pietro	2	122.00*	TR20Borm+TR<20ri	8.00	186.78	187.97	187.90	188.24	0.012345	2.29	3.49	5.11	0.88
Rio San Pietro	2	122.00*	TR20Borm+TR20rii	34.30	186.78	188.88	188.90	189.50	0.014955	3.49	9.82	8.36	1.03
Rio San Pietro	2	122.00*	TR20Borm+TR200ri	49.10	186.78	189.16	189.24	189.98	0.015479	4.03	12.37	9.65	1.07
Rio San Pietro	2	122.00*	TR200Borm+TR20ri	34.30	186.78	188.88	188.90	189.50	0.014955	3.49	9.82	8.36	1.03
Rio San Pietro	2	122.00*	2016Borm+TR20rii	34.30	186.78	188.88	188.90	189.50	0.014955	3.49	9.82	8.36	1.03
Rio San Pietro	2	122.00*	1994Borm+TR20rii	34.30	186.78	188.88	188.90	189.50	0.014955	3.49	9.82	8.36	1.03
Rio San Pietro	2	121	TR20Borm+TR<20ri	8.00	186.44	187.58	187.57	187.89	0.015708	2.48	3.23	5.08	0.99
Rio San Pietro	2	121	TR20Borm+TR20rii	34.30	186.44	188.53	188.54	189.14	0.014500	3.45	9.94	8.57	1.01
Rio San Pietro	2	121	TR20Borm+TR200ri	49.10	186.44	188.87	188.88	189.62	0.013440	3.83	13.11	9.50	0.99
Rio San Pietro	2	121	TR200Borm+TR20ri	34.30	186.44	188.53	188.54	189.14	0.014500	3.45	9.94	8.57	1.01
Rio San Pietro	2	121	2016Borm+TR20rii	34.30	186.44	188.53	188.54	189.14	0.014500	3.45	9.94	8.57	1.01
Rio San Pietro	2	121	1994Borm+TR20rii	34.30	186.44	188.53	188.54	189.14	0.014500	3.45	9.94	8.57	1.01
Rio San Pietro	2	120.00*	TR20Borm+TR<20ri	8.00	186.05	187.21	187.21	187.47	0.016541	2.30	3.48	6.51	1.00
Rio San Pietro	2	120.00*	TR20Borm+TR20rii	34.30	186.05	187.96	188.09	188.71	0.019793	3.82	8.99	8.25	1.17
Rio San Pietro	2	120.00*	TR20Borm+TR200ri	49.10	186.05	188.24	188.42	189.19	0.019836	4.32	11.51	9.53	1.19
Rio San Pietro	2	120.00*	TR200Borm+TR20ri	34.30	186.05	187.96	188.09	188.71	0.019793	3.82	8.99	8.25	1.17
Rio San Pietro	2	120.00*	2016Borm+TR20rii	34.30	186.05	187.96	188.09	188.71	0.019793	3.82	8.99	8.25	1.17
Rio San Pietro	2	120.00*	1994Borm+TR20rii	34.30	186.05	187.96	188.09	188.71	0.019793	3.82	8.99	8.25	1.17
Rio San Pietro	2	119.00*	TR20Borm+TR<20ri	8.00	185.66	186.77	186.78	187.05	0.017772	2.33	3.43	6.75	1.04
Rio San Pietro	2	119.00*	TR20Borm+TR20rii	34.30	185.66	187.55	187.65	188.25	0.016226	3.69	9.35	8.65	1.13
Rio San Pietro	2	119.00*	TR20Borm+TR200ri	49.10	185.66	187.81	187.97	188.74	0.016451	4.27	11.74	9.57	1.17
Rio San Pietro	2	119.00*	TR200Borm+TR20ri	34.30	185.66	187.55	187.65	188.25	0.016226	3.69	9.35	8.65	1.13
Rio San Pietro	2	119.00*	2016Borm+TR20rii	34.30	185.66	187.55	187.65	188.25	0.016226	3.69	9.35	8.65	1.13
Rio San Pietro	2	119.00*	1994Borm+TR20rii	34.30	185.66	187.55	187.65	188.25	0.016226	3.69	9.35	8.65	1.13
Rio San Pietro	2	118.00*	TR20Borm+TR<20ri	8.00	185.27	186.35	186.35	186.62	0.016206	2.33	3.44	6.29	1.01
Rio San Pietro	2	118.00*	TR20Borm+TR20rii	34.30	185.27	187.14	187.24	187.85	0.015800	3.74	9.55	9.15	1.12
Rio San Pietro	2	118.00*	TR20Borm+TR200ri	49.10	185.27	187.42	187.56	188.34	0.015302	4.26	12.26	9.60	1.14
Rio San Pietro	2	118.00*	TR200Borm+TR20ri	34.30	185.27	187.14	187.24	187.85	0.015800	3.74	9.55	9.15	1.12
Rio San Pietro	2	118.00*	2016Borm+TR20rii	34.30	185.27	187.14	187.24	187.85	0.015800	3.74	9.55	9.15	1.12
Rio San Pietro	2	118.00*	1994Borm+TR20rii	34.30	185.27	187.44	187.24	187.87	0.007219	2.95	12.39	9.60	0.79
Rio San Pietro	2	117.00*	TR20Borm+TR<20ri	8.00	184.87	185.91	185.92	186.21	0.016872	2.45	3.27	5.71	1.03
Rio San Pietro	2	117.00*	TR20Borm+TR20rii	34.30	184.87	186.75	186.85	187.46	0.014925	3.76	9.73	9.63	1.10
Rio San Pietro	2	117.00*	TR20Borm+TR200ri	49.10	184.87	187.04	187.17	187.96	0.014817	4.32	12.45	9.63	1.13
Rio San Pietro	2	117.00*	TR200Borm+TR20ri	34.30	184.87	186.75	186.85	187.46	0.014925	3.76	9.73	9.63	1.10
Rio San Pietro	2	117.00*	2016Borm+TR20rii	34.30	184.87	186.75	186.85	187.46	0.014925	3.76	9.73	9.63	1.10

HEC-RAS Plan: Finale (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	117.00*	1994Borm+TR20rii	34.30	184.87	187.44	186.85	187.71	0.003205	2.35	16.32	9.63	0.55
Rio San Pietro	2	116.00*	TR20Borm+TR<20ri	8.00	184.48	185.49	185.49	185.80	0.015946	2.46	3.25	5.35	1.01
Rio San Pietro	2	116.00*	TR20Borm+TR20rii	34.30	184.48	186.39	186.48	187.10	0.013986	3.79	9.84	9.67	1.07
Rio San Pietro	2	116.00*	TR20Borm+TR200ri	49.10	184.48	186.68	186.81	187.60	0.013821	4.33	12.73	9.67	1.10
Rio San Pietro	2	116.00*	TR200Borm+TR20ri	34.30	184.48	186.54	186.48	187.09	0.009404	3.35	11.33	9.67	0.89
Rio San Pietro	2	116.00*	2016Borm+TR20rii	34.30	184.48	186.39	186.48	187.10	0.013986	3.79	9.84	9.67	1.07
Rio San Pietro	2	116.00*	1994Borm+TR20rii	34.30	184.48	187.43	186.48	187.63	0.001780	2.01	19.98	9.67	0.42
Rio San Pietro	2	115	TR20Borm+TR<20ri	8.00	184.09	185.12	185.08	185.41	0.013589	2.38	3.37	5.08	0.93
Rio San Pietro	2	115	TR20Borm+TR20rii	34.30	184.09	186.04	186.12	186.76	0.013078	3.82	9.91	9.70	1.03
Rio San Pietro	2	115	TR20Borm+TR200ri	49.10	184.09	186.36	186.47	187.27	0.012696	4.33	13.06	9.70	1.05
Rio San Pietro	2	115	TR200Borm+TR20ri	34.30	184.09	186.51	186.12	186.88	0.004609	2.76	14.51	9.70	0.64
Rio San Pietro	2	115	2016Borm+TR20rii	34.30	184.09	186.04	186.12	186.76	0.013078	3.82	9.91	9.70	1.03
Rio San Pietro	2	115	1994Borm+TR20rii	34.30	184.09	187.43	186.12	187.58	0.001146	1.79	23.40	9.70	0.34
Rio San Pietro	2	114.00*	TR20Borm+TR<20ri	8.00	183.67	184.73	184.73	185.04	0.015714	2.48	3.22	5.11	1.00
Rio San Pietro	2	114.00*	TR20Borm+TR20rii	34.30	183.67	185.57	185.75	186.38	0.017639	4.00	8.82	9.03	1.17
Rio San Pietro	2	114.00*	TR20Borm+TR200ri	49.10	183.67	185.85	186.09	186.89	0.017309	4.57	11.69	10.90	1.20
Rio San Pietro	2	114.00*	TR200Borm+TR20ri	34.30	183.67	186.55	185.75	186.76	0.002146	2.08	19.28	10.90	0.45
Rio San Pietro	2	114.00*	2016Borm+TR20rii	34.30	183.67	185.57	185.75	186.38	0.017639	4.00	8.82	9.03	1.17
Rio San Pietro	2	114.00*	1994Borm+TR20rii	34.30	183.67	187.44	185.75	187.54	0.000647	1.44	29.07	10.90	0.26
Rio San Pietro	2	113.00*	TR20Borm+TR<20ri	8.00	183.26	184.58	184.37	184.75	0.007029	1.85	4.33	5.79	0.68
Rio San Pietro	2	113.00*	TR20Borm+TR20rii	34.30	183.26	185.36	185.37	185.96	0.012654	3.46	10.11	9.93	0.99
Rio San Pietro	2	113.00*	TR20Borm+TR200ri	49.10	183.26	185.59	185.73	186.45	0.014270	4.12	12.61	12.10	1.09
Rio San Pietro	2	113.00*	TR200Borm+TR20ri	34.30	183.26	186.56	185.37	186.69	0.001163	1.65	24.35	12.10	0.34
Rio San Pietro	2	113.00*	2016Borm+TR20rii	34.30	183.26	185.46	185.37	185.97	0.009576	3.18	11.18	10.28	0.88
Rio San Pietro	2	113.00*	1994Borm+TR20rii	34.30	183.26	187.45	185.37	187.52	0.000397	1.19	35.14	12.10	0.21
Rio San Pietro	2	112.00*	TR20Borm+TR<20ri	8.00	182.85	184.54	183.99	184.62	0.002485	1.25	6.38	6.87	0.42
Rio San Pietro	2	112.00*	TR20Borm+TR20rii	34.30	182.85	184.97	185.03	185.61	0.015621	3.54	9.69	8.93	1.08
Rio San Pietro	2	112.00*	TR20Borm+TR200ri	49.10	182.85	185.23	185.36	186.08	0.015791	4.08	12.31	11.00	1.12
Rio San Pietro	2	112.00*	TR200Borm+TR20ri	34.30	182.85	186.57	185.03	186.66	0.000690	1.35	29.81	13.30	0.26
Rio San Pietro	2	112.00*	2016Borm+TR20rii	34.30	182.85	185.45	185.03	185.75	0.004611	2.44	14.88	13.30	0.62
Rio San Pietro	2	112.00*	1994Borm+TR20rii	34.30	182.85	187.46	185.03	187.51	0.000258	1.00	41.64	13.30	0.17
Rio San Pietro	2	111.00*	TR20Borm+TR<20ri	8.00	182.43	184.53	183.61	184.58	0.001022	0.89	8.96	8.16	0.27
Rio San Pietro	2	111.00*	TR20Borm+TR20rii	34.30	182.43	184.98	184.68	185.33	0.006794	2.64	13.19	11.31	0.73
Rio San Pietro	2	111.00*	TR20Borm+TR200ri	49.10	182.43	185.40	185.04	185.80	0.005444	2.84	18.59	14.50	0.68
Rio San Pietro	2	111.00*	TR200Borm+TR20ri	34.30	182.43	186.58	184.68	186.64	0.000435	1.13	35.69	14.50	0.21
Rio San Pietro	2	111.00*	2016Borm+TR20rii	34.30	182.43	185.45	184.68	185.63	0.002395	1.92	19.35	14.50	0.46

HEC-RAS Plan: Finale (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	111.00*	1994Borm+TR20rii	34.30	182.43	187.46	184.68	187.50	0.000175	0.85	48.57	14.50	0.14
Rio San Pietro	2	110.00*	TR20Borm+TR<20ri	8.00	182.02	184.53	183.20	184.55	0.000469	0.67	12.03	9.79	0.19
Rio San Pietro	2	110.00*	TR20Borm+TR20rii	34.30	182.02	184.95	184.32	185.17	0.003627	2.11	16.77	12.59	0.54
Rio San Pietro	2	110.00*	TR20Borm+TR200ri	49.10	182.02	185.40	184.69	185.66	0.003043	2.29	23.44	15.70	0.52
Rio San Pietro	2	110.00*	TR200Borm+TR20ri	34.30	182.02	186.58	184.32	186.62	0.000288	0.96	42.00	15.70	0.17
Rio San Pietro	2	110.00*	2016Borm+TR20rii	34.30	182.02	185.45	184.32	185.57	0.001353	1.55	24.27	15.70	0.35
Rio San Pietro	2	110.00*	1994Borm+TR20rii	34.30	182.02	187.47	184.32	187.49	0.000123	0.74	55.93	15.70	0.12
Rio San Pietro	2	109	TR20Borm+TR<20ri	8.00	181.60	184.53	182.79	184.54	0.000229	0.52	15.71	12.16	0.13
Rio San Pietro	2	109	TR20Borm+TR20rii	34.30	181.60	184.94	183.95	185.08	0.002018	1.70	21.02	15.49	0.41
Rio San Pietro	2	109	TR20Borm+TR200ri	49.10	181.60	185.40	184.32	185.58	0.001815	1.89	28.76	16.90	0.41
Rio San Pietro	2	109	TR200Borm+TR20ri	34.30	181.60	186.58	183.95	186.61	0.000197	0.83	48.74	16.90	0.14
Rio San Pietro	2	109	2016Borm+TR20rii	34.30	181.60	185.45	183.95	185.53	0.000816	1.29	29.64	16.90	0.27
Rio San Pietro	2	109	1994Borm+TR20rii	34.30	181.60	187.47	183.95	187.49	0.000089	0.65	63.73	16.90	0.10
Rio San Pietro	1	108	TR20Borm+TR<20ri	8.00	180.99	184.53	182.40	184.54	0.000132	0.45	18.67	14.21	0.10
Rio San Pietro	1	108	TR20Borm+TR20rii	34.30	180.99	184.94	183.66	185.05	0.001200	1.55	26.72	22.80	0.32
Rio San Pietro	1	108	TR20Borm+TR200ri	49.10	180.99	185.41	184.02	185.54	0.001179	1.73	37.44	22.80	0.33
Rio San Pietro	1	108	TR200Borm+TR20ri	34.30	180.99	186.58	183.66	186.61	0.000144	0.76	64.30	22.80	0.12
Rio San Pietro	1	108	2016Borm+TR20rii	34.30	180.99	185.45	183.66	185.52	0.000537	1.18	38.53	22.80	0.22
Rio San Pietro	1	108	1994Borm+TR20rii	34.30	180.99	187.47	183.66	187.48	0.000068	0.60	84.50	22.80	0.09
Rio San Pietro	1	107.00*	TR20Borm+TR<20ri	8.00	180.57	184.53	182.00	184.54	0.000085	0.38	22.76	19.21	0.08
Rio San Pietro	1	107.00*	TR20Borm+TR20rii	34.30	180.57	184.94	183.30	185.02	0.000799	1.31	31.50	22.10	0.26
Rio San Pietro	1	107.00*	TR20Borm+TR200ri	49.10	180.57	185.41	183.73	185.51	0.000835	1.50	41.88	22.10	0.28
Rio San Pietro	1	107.00*	TR200Borm+TR20ri	34.30	180.57	186.58	183.30	186.60	0.000113	0.69	67.93	22.10	0.11
Rio San Pietro	1	107.00*	2016Borm+TR20rii	34.30	180.57	185.45	183.30	185.50	0.000383	1.02	42.95	22.10	0.19
Rio San Pietro	1	107.00*	1994Borm+TR20rii	34.30	180.57	187.47	183.30	187.48	0.000056	0.55	87.51	22.10	0.08
Rio San Pietro	1	106.00*	TR20Borm+TR<20ri	8.00	180.14	184.53	181.60	184.53	0.000058	0.32	27.53	21.40	0.07
Rio San Pietro	1	106.00*	TR20Borm+TR20rii	34.30	180.14	184.93	182.90	185.00	0.000562	1.12	36.23	21.40	0.22
Rio San Pietro	1	106.00*	TR20Borm+TR200ri	49.10	180.14	185.40	183.33	185.48	0.000618	1.31	46.28	21.40	0.24
Rio San Pietro	1	106.00*	TR200Borm+TR20ri	34.30	180.14	186.58	182.90	186.60	0.000091	0.62	71.53	21.40	0.10
Rio San Pietro	1	106.00*	2016Borm+TR20rii	34.30	180.14	185.45	182.90	185.49	0.000284	0.90	47.33	21.40	0.16
Rio San Pietro	1	106.00*	1994Borm+TR20rii	34.30	180.14	187.47	182.90	187.48	0.000046	0.50	90.49	21.40	0.07
Rio San Pietro	1	105	TR20Borm+TR<20ri	8.00	179.72	184.53	181.18	184.53	0.000040	0.28	32.75	20.70	0.06
Rio San Pietro	1	105	TR20Borm+TR20rii	34.30	179.72	184.93	182.50	184.98	0.000408	0.98	41.15	20.70	0.19
Rio San Pietro	1	105	TR20Borm+TR200ri	49.10	179.72	185.40	182.94	185.47	0.000468	1.16	50.87	20.70	0.21
Rio San Pietro	1	105	TR200Borm+TR20ri	34.30	179.72	186.58	182.50	186.60	0.000074	0.57	75.31	20.70	0.09
Rio San Pietro	1	105	2016Borm+TR20rii	34.30	179.72	185.45	182.50	185.48	0.000216	0.80	51.90	20.70	0.14

HEC-RAS Plan: Finale (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	1	105	1994Borm+TR20rii	34.30	179.72	187.47	182.50	187.48	0.000039	0.46	93.65	20.70	0.06
Rio San Pietro	1	104.5		Bridge									
Rio San Pietro	1	104	TR20Borm+TR<20ri	8.00	179.17	184.50	180.38	184.51	0.000012	0.19	45.81	18.70	0.03
Rio San Pietro	1	104	TR20Borm+TR20rii	34.30	179.17	184.47	181.58	184.51	0.000219	0.83	45.25	18.70	0.14
Rio San Pietro	1	104	TR20Borm+TR200ri	49.10	179.17	184.44	181.97	184.51	0.000468	1.20	44.54	18.70	0.21
Rio San Pietro	1	104	TR200Borm+TR20ri	34.30	179.17	186.12	181.58	186.13	0.000053	0.53	75.98	18.70	0.08
Rio San Pietro	1	104	2016Borm+TR20rii	34.30	179.17	184.99	181.58	185.01	0.000131	0.70	54.89	18.70	0.11
Rio San Pietro	1	104	1994Borm+TR20rii	34.30	179.17	187.00	181.58	187.01	0.000030	0.45	92.54	18.70	0.06
Rio Sacco	1	306	TR20Borm+TR<20ri	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	TR20Borm+TR20rii	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	TR20Borm+TR200ri	14.50	187.71	189.12	189.31	189.78	0.030031	3.58	4.05	5.84	1.37
Rio Sacco	1	306	TR200Borm+TR20ri	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	2016Borm+TR20rii	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	1994Borm+TR20rii	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	305	TR20Borm+TR<20ri	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	TR20Borm+TR20rii	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	TR20Borm+TR200ri	14.50	185.28	187.58	187.02	187.77	0.004776	1.95	7.45	5.81	0.55
Rio Sacco	1	305	TR200Borm+TR20ri	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	2016Borm+TR20rii	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	1994Borm+TR20rii	10.10	185.28	187.53	186.77	187.63	0.002549	1.41	7.18	5.71	0.40
Rio Sacco	1	304.5		Bridge									
Rio Sacco	1	304	TR20Borm+TR<20ri	10.10	183.36	185.08		185.18	0.002646	1.42	7.11	6.27	0.43
Rio Sacco	1	304	TR20Borm+TR20rii	10.10	183.36	185.08		185.18	0.002644	1.42	7.11	6.27	0.43
Rio Sacco	1	304	TR20Borm+TR200ri	14.50	183.36	185.05		185.28	0.005856	2.09	6.93	6.22	0.63
Rio Sacco	1	304	TR200Borm+TR20ri	10.10	183.36	186.66		186.68	0.000167	0.52	19.59	9.29	0.11
Rio Sacco	1	304	2016Borm+TR20rii	10.10	183.36	185.58		185.63	0.000907	0.96	10.56	7.43	0.26
Rio Sacco	1	304	1994Borm+TR20rii	10.10	183.36	187.52		187.52	0.000063	0.35	28.67	11.63	0.07
Rio Sacco	1	303	TR20Borm+TR<20ri	10.10	182.69	185.07		185.13	0.001167	1.07	9.44	6.44	0.28
Rio Sacco	1	303	TR20Borm+TR20rii	10.10	182.69	185.07		185.13	0.001167	1.07	9.44	6.44	0.28
Rio Sacco	1	303	TR20Borm+TR200ri	14.50	182.69	185.03		185.16	0.002593	1.58	9.18	6.36	0.42
Rio Sacco	1	303	TR200Borm+TR20ri	10.10	182.69	186.66		186.67	0.000115	0.43	23.55	11.43	0.10
Rio Sacco	1	303	2016Borm+TR20rii	10.10	182.69	185.58		185.61	0.000520	0.77	13.05	7.95	0.19
Rio Sacco	1	303	1994Borm+TR20rii	10.10	182.69	187.52		187.52	0.000041	0.29	35.72	17.06	0.06
Rio Sacco	1	302	TR20Borm+TR<20ri	10.10	182.41	185.10		185.11	0.000098	0.39	29.39	24.90	0.10

HEC-RAS Plan: Finale (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio Sacco	1	302	TR20Borm+TR20rii	10.10	182.41	185.10		185.11	0.000098	0.39	29.40	24.90	0.10
Rio Sacco	1	302	TR20Borm+TR200ri	14.50	182.41	185.10		185.11	0.000205	0.56	29.25	24.86	0.14
Rio Sacco	1	302	TR200Borm+TR20ri	10.10	182.41	186.67		186.67	0.000009	0.18	75.78	48.16	0.03
Rio Sacco	1	302	2016Borm+TR20rii	10.10	182.41	185.60		185.60	0.000038	0.29	42.50	27.80	0.06
Rio Sacco	1	302	1994Borm+TR20rii	10.10	182.41	187.52		187.52	0.000003	0.13	122.48	55.00	0.02
Rio Sacco	1	301	TR20Borm+TR<20ri	10.10	181.63	185.10		185.11	0.000052	0.31	45.62	30.73	0.07
Rio Sacco	1	301	TR20Borm+TR20rii	10.10	181.63	185.10		185.11	0.000052	0.31	45.63	30.73	0.07
Rio Sacco	1	301	TR20Borm+TR200ri	14.50	181.63	185.10		185.11	0.000109	0.45	45.51	30.72	0.10
Rio Sacco	1	301	TR200Borm+TR20ri	10.10	181.63	186.67		186.67	0.000006	0.16	104.37	56.40	0.03
Rio Sacco	1	301	2016Borm+TR20rii	10.10	181.63	185.60		185.60	0.000023	0.24	61.10	31.99	0.05
Rio Sacco	1	301	1994Borm+TR20rii	10.10	181.63	187.52		187.52	0.000002	0.11	152.53	56.40	0.02
Rio Madama	1	405	TR20Borm+TR<20ri	1.00	194.39	194.70	194.82	195.08	0.080108	2.73	0.37	1.70	1.87
Rio Madama	1	405	TR20Borm+TR20rii	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	TR20Borm+TR200ri	8.10	194.39	195.24	195.61	196.41	0.080011	4.79	1.69	3.17	2.10
Rio Madama	1	405	TR200Borm+TR20ri	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	2016Borm+TR20rii	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	1994Borm+TR20rii	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	404	TR20Borm+TR<20ri	1.00	187.14	187.58	187.55	187.69	0.015567	1.48	0.68	2.31	0.87
Rio Madama	1	404	TR20Borm+TR20rii	5.60	187.14	188.08	188.08	188.36	0.015948	2.35	2.40	4.21	0.99
Rio Madama	1	404	TR20Borm+TR200ri	8.10	187.14	187.91	188.20	189.06	0.087843	4.75	1.71	3.76	2.24
Rio Madama	1	404	TR200Borm+TR20ri	5.60	187.14	188.08	188.08	188.36	0.015933	2.34	2.40	4.21	0.99
Rio Madama	1	404	2016Borm+TR20rii	5.60	187.14	188.08	188.08	188.36	0.015948	2.35	2.40	4.21	0.99
Rio Madama	1	404	1994Borm+TR20rii	5.60	187.14	188.08	188.08	188.36	0.016081	2.35	2.39	4.21	1.00
Rio Madama	1	403	TR20Borm+TR<20ri	1.00	186.20	186.65	186.65	186.81	0.022044	1.76	0.57	1.74	0.99
Rio Madama	1	403	TR20Borm+TR20rii	5.60	186.20	187.25	187.25	187.57	0.017485	2.50	2.35	3.91	1.02
Rio Madama	1	403	TR20Borm+TR200ri	8.10	186.20	187.43	187.43	187.82	0.015592	2.80	3.05	3.91	1.01
Rio Madama	1	403	TR200Borm+TR20ri	5.60	186.20	187.25	187.25	187.57	0.017485	2.50	2.35	3.91	1.02
Rio Madama	1	403	2016Borm+TR20rii	5.60	186.20	187.25	187.25	187.57	0.017485	2.50	2.35	3.91	1.02
Rio Madama	1	403	1994Borm+TR20rii	5.60	186.20	187.34	187.25	187.58	0.010946	2.17	2.71	3.91	0.83
Rio Madama	1	402	TR20Borm+TR<20ri	1.00	184.94	185.38	185.38	185.50	0.020833	1.59	0.63	2.45	1.00
Rio Madama	1	402	TR20Borm+TR20rii	5.60	184.94	185.78	185.88	186.15	0.032453	2.68	2.09	5.30	1.36
Rio Madama	1	402	TR20Borm+TR200ri	8.10	184.94	185.86	186.02	186.39	0.039242	3.22	2.52	5.60	1.53
Rio Madama	1	402	TR200Borm+TR20ri	5.60	184.94	186.60	185.88	186.63	0.000684	0.79	7.12	6.23	0.24
Rio Madama	1	402	2016Borm+TR20rii	5.60	184.94	185.78	185.88	186.15	0.032453	2.68	2.09	5.30	1.36
Rio Madama	1	402	1994Borm+TR20rii	5.60	184.94	187.48	185.88	187.49	0.000102	0.45	12.61	6.23	0.10
Rio Madama	1	401	TR20Borm+TR<20ri	1.00	183.68	184.53	184.13	184.55	0.001091	0.55	1.82	3.71	0.25

HEC-RAS Plan: Finale (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio Madama	1	401	TR20Borm+TR20rii	5.60	183.68	185.00	184.67	185.10	0.004652	1.39	4.04	6.12	0.55
Rio Madama	1	401	TR20Borm+TR200ri	8.10	183.68	185.54	184.86	185.59	0.001326	0.98	8.46	8.50	0.31
Rio Madama	1	401	TR200Borm+TR20ri	5.60	183.68	186.61	184.67	186.61	0.000068	0.33	17.53	8.50	0.07
Rio Madama	1	401	2016Borm+TR20rii	5.60	183.68	185.52	184.67	185.54	0.000691	0.69	8.23	8.50	0.22
Rio Madama	1	401	1994Borm+TR20rii	5.60	183.68	187.49	184.67	187.49	0.000024	0.23	24.97	8.50	0.04
Rio Caffra	1	205	TR20Borm+TR<20ri	5.00	190.88	191.70	191.54	191.80	0.006656	1.37	3.66	8.42	0.64
Rio Caffra	1	205	TR20Borm+TR20rii	19.20	190.88	192.26	192.11	192.38	0.004194	1.71	17.62	37.78	0.57
Rio Caffra	1	205	TR20Borm+TR200ri	27.70	190.88	192.45	192.26	192.58	0.003695	1.83	25.03	39.34	0.56
Rio Caffra	1	205	TR200Borm+TR20ri	19.20	190.88	192.26	192.11	192.38	0.004193	1.71	17.62	37.78	0.57
Rio Caffra	1	205	2016Borm+TR20rii	19.20	190.88	192.26	192.11	192.38	0.004194	1.71	17.62	37.78	0.57
Rio Caffra	1	205	1994Borm+TR20rii	19.20	190.88	192.26	192.11	192.38	0.004193	1.71	17.62	37.78	0.57
Rio Caffra	1	203	TR20Borm+TR<20ri	5.00	190.29	191.15	191.15	191.40	0.017312	2.22	2.25	4.61	1.01
Rio Caffra	1	203	TR20Borm+TR20rii	19.20	190.29	191.76	191.76	192.10	0.013230	2.78	9.41	17.24	0.97
Rio Caffra	1	203	TR20Borm+TR200ri	27.70	190.29	191.98	191.98	192.33	0.011851	2.91	13.41	19.28	0.94
Rio Caffra	1	203	TR200Borm+TR20ri	19.20	190.29	191.76	191.76	192.10	0.013227	2.78	9.41	17.25	0.97
Rio Caffra	1	203	2016Borm+TR20rii	19.20	190.29	191.76	191.76	192.10	0.013230	2.78	9.41	17.24	0.97
Rio Caffra	1	203	1994Borm+TR20rii	19.20	190.29	191.76	191.76	192.10	0.013224	2.78	9.41	17.26	0.97
Rio Caffra	1	201	TR20Borm+TR<20ri	5.00	189.19	189.92	190.06	190.39	0.042417	3.04	1.64	4.16	1.54
Rio Caffra	1	201	TR20Borm+TR20rii	19.20	189.19	191.44	190.74	191.52	0.001384	1.38	19.61	18.90	0.35
Rio Caffra	1	201	TR20Borm+TR200ri	27.70	189.19	191.57	191.06	191.71	0.002077	1.79	22.17	18.90	0.44
Rio Caffra	1	201	TR200Borm+TR20ri	19.20	189.19	191.44	190.74	191.52	0.001384	1.38	19.61	18.90	0.35
Rio Caffra	1	201	2016Borm+TR20rii	19.20	189.19	191.44	190.74	191.52	0.001384	1.38	19.61	18.90	0.35
Rio Caffra	1	201	1994Borm+TR20rii	19.20	189.19	191.44	190.74	191.52	0.001384	1.38	19.61	18.90	0.35
Bormida	3	43	TR20Borm+TR<20ri	833.00	179.12	184.86	183.26	185.34	0.001893	3.07	298.03	153.19	0.49
Bormida	3	43	TR20Borm+TR20rii	833.00	179.12	184.86	183.26	185.34	0.001892	3.07	298.06	153.20	0.49
Bormida	3	43	TR20Borm+TR200ri	833.00	179.12	184.86	183.26	185.34	0.001892	3.07	298.04	153.20	0.49
Bormida	3	43	TR200Borm+TR20ri	1469.00	179.12	186.29	184.69	186.88	0.001717	3.58	564.18	194.37	0.49
Bormida	3	43	2016Borm+TR20rii	1000.00	179.12	185.30	183.62	185.82	0.001845	3.24	372.20	186.37	0.49
Bormida	3	43	1994Borm+TR20rii	1900.00	179.12	187.11	185.64	187.72	0.001591	3.78	722.80	195.82	0.48
Bormida	3	42.000*	TR20Borm+TR<20ri	833.00	179.09	184.83		185.29	0.001878	3.02	298.19	166.84	0.49
Bormida	3	42.000*	TR20Borm+TR20rii	833.00	179.09	184.83		185.29	0.001877	3.02	298.24	166.87	0.49
Bormida	3	42.000*	TR20Borm+TR200ri	833.00	179.09	184.83		185.29	0.001878	3.02	298.21	166.85	0.49
Bormida	3	42.000*	TR200Borm+TR20ri	1469.00	179.09	186.28		186.83	0.001628	3.47	584.82	204.03	0.48
Bormida	3	42.000*	2016Borm+TR20rii	1000.00	179.09	185.27		185.77	0.001793	3.17	380.81	194.47	0.48
Bormida	3	42.000*	1994Borm+TR20rii	1900.00	179.09	187.10		187.67	0.001489	3.65	753.31	205.73	0.47
Bormida	3	41.000*	TR20Borm+TR<20ri	833.00	179.06	184.79		185.24	0.001875	2.98	298.94	190.54	0.48

HEC-RAS Plan: Finale (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	3	41.000*	TR20Borm+TR20rii	833.00	179.06	184.79		185.24	0.001874	2.98	298.99	190.55	0.48
Bormida	3	41.000*	TR20Borm+TR200ri	833.00	179.06	184.79		185.24	0.001875	2.98	298.96	190.54	0.48
Bormida	3	41.000*	TR200Borm+TR20ri	1469.00	179.06	186.26		186.78	0.001555	3.37	604.82	213.73	0.47
Bormida	3	41.000*	2016Borm+TR20rii	1000.00	179.06	185.24		185.72	0.001757	3.11	388.51	203.06	0.48
Bormida	3	41.000*	1994Borm+TR20rii	1900.00	179.06	187.09		187.62	0.001401	3.52	783.39	216.01	0.45
Bormida	3	40.000*	TR20Borm+TR<20ri	833.00	179.04	184.75		185.19	0.001865	2.94	299.91	197.43	0.48
Bormida	3	40.000*	TR20Borm+TR20rii	833.00	179.04	184.75		185.19	0.001864	2.94	299.97	197.50	0.48
Bormida	3	40.000*	TR20Borm+TR200ri	833.00	179.04	184.75		185.19	0.001865	2.94	299.93	197.45	0.48
Bormida	3	40.000*	TR200Borm+TR20ri	1469.00	179.04	186.25		186.73	0.001492	3.28	624.29	223.48	0.46
Bormida	3	40.000*	2016Borm+TR20rii	1000.00	179.04	185.21		185.67	0.001734	3.05	395.37	211.69	0.47
Bormida	3	40.000*	1994Borm+TR20rii	1900.00	179.04	187.09		187.58	0.001326	3.41	813.26	226.54	0.44
Bormida	3	39.000*	TR20Borm+TR<20ri	833.00	179.01	184.71		185.14	0.001842	2.90	304.98	157.97	0.48
Bormida	3	39.000*	TR20Borm+TR20rii	833.00	179.01	184.71		185.14	0.001842	2.90	305.03	158.02	0.48
Bormida	3	39.000*	TR20Borm+TR200ri	833.00	179.01	184.71		185.14	0.001842	2.90	305.00	157.99	0.48
Bormida	3	39.000*	TR200Borm+TR20ri	1469.00	179.01	186.23		186.69	0.001440	3.19	643.12	233.39	0.45
Bormida	3	39.000*	2016Borm+TR20rii	1000.00	179.01	185.18		185.62	0.001722	3.01	401.26	220.14	0.47
Bormida	3	39.000*	1994Borm+TR20rii	1900.00	179.01	187.08		187.54	0.001260	3.30	842.94	236.89	0.43
Bormida	3	38.000*	TR20Borm+TR<20ri	833.00	178.98	184.68		185.09	0.001824	2.85	313.26	155.36	0.48
Bormida	3	38.000*	TR20Borm+TR20rii	833.00	178.98	184.68		185.09	0.001824	2.85	313.31	155.40	0.48
Bormida	3	38.000*	TR20Borm+TR200ri	833.00	178.98	184.68		185.09	0.001824	2.85	313.27	155.37	0.48
Bormida	3	38.000*	TR200Borm+TR20ri	1469.00	178.98	186.21		186.64	0.001395	3.12	661.42	243.90	0.44
Bormida	3	38.000*	2016Borm+TR20rii	1000.00	178.98	185.14		185.58	0.001712	2.97	406.02	228.71	0.47
Bormida	3	38.000*	1994Borm+TR20rii	1900.00	178.98	187.07		187.50	0.001201	3.21	872.60	247.38	0.42
Bormida	3	37	TR20Borm+TR<20ri	833.00	178.95	184.64		185.04	0.001812	2.81	321.90	156.73	0.47
Bormida	3	37	TR20Borm+TR20rii	833.00	178.95	184.64		185.04	0.001811	2.81	321.96	156.75	0.47
Bormida	3	37	TR20Borm+TR200ri	833.00	178.95	184.64		185.04	0.001811	2.81	321.92	156.73	0.47
Bormida	3	37	TR200Borm+TR20ri	1469.00	178.95	186.19		186.60	0.001357	3.05	679.65	255.99	0.43
Bormida	3	37	2016Borm+TR20rii	1000.00	178.95	185.10		185.53	0.001705	2.93	409.89	237.41	0.47
Bormida	3	37	1994Borm+TR20rii	1900.00	178.95	187.06		187.46	0.001149	3.12	902.56	257.81	0.41
Bormida	2	35	TR20Borm+TR<20ri	833.00	178.59	184.54	182.85	184.99	0.001740	2.97	306.36	151.93	0.47
Bormida	2	35	TR20Borm+TR20rii	833.00	178.59	184.54	182.85	184.99	0.001739	2.97	306.43	151.96	0.47
Bormida	2	35	TR20Borm+TR200ri	833.00	178.59	184.54	182.85	184.99	0.001740	2.97	306.38	151.93	0.47
Bormida	2	35	TR200Borm+TR20ri	1469.00	178.59	186.06	184.16	186.56	0.001445	3.34	650.07	255.29	0.45
Bormida	2	35	2016Borm+TR20rii	1000.00	178.59	184.99	183.20	185.48	0.001703	3.15	389.09	230.02	0.47
Bormida	2	35	1994Borm+TR20rii	1900.00	178.59	186.95	185.32	187.42	0.001232	3.40	880.16	259.70	0.43
Bormida	2	34.000*	TR20Borm+TR<20ri	833.00	178.53	184.50	182.78	184.95	0.001707	2.97	306.19	160.72	0.47

HEC-RAS Plan: Finale (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	2	34.000*	TR20Borm+TR20rii	833.00	178.53	184.50	182.78	184.95	0.001707	2.97	306.26	160.79	0.47
Bormida	2	34.000*	TR20Borm+TR200ri	833.00	178.53	184.50	182.78	184.95	0.001707	2.97	306.21	160.74	0.47
Bormida	2	34.000*	TR200Borm+TR20ri	1469.00	178.53	186.03	184.03	186.52	0.001410	3.33	653.38	249.03	0.45
Bormida	2	34.000*	2016Borm+TR20rii	1000.00	178.53	184.96	183.13	185.43	0.001643	3.12	398.11	221.38	0.46
Bormida	2	34.000*	1994Borm+TR20rii	1900.00	178.53	186.92	185.24	187.40	0.001215	3.40	874.41	249.03	0.42
Bormida	2	33.000*	TR20Borm+TR<20ri	833.00	178.46	184.46	182.70	184.90	0.001677	2.96	309.70	175.85	0.46
Bormida	2	33.000*	TR20Borm+TR20rii	833.00	178.46	184.46	182.70	184.90	0.001676	2.96	309.78	175.95	0.46
Bormida	2	33.000*	TR20Borm+TR200ri	833.00	178.46	184.46	182.70	184.90	0.001676	2.96	309.72	175.88	0.46
Bormida	2	33.000*	TR200Borm+TR20ri	1469.00	178.46	186.00	183.98	186.49	0.001379	3.31	654.30	238.36	0.44
Bormida	2	33.000*	2016Borm+TR20rii	1000.00	178.46	184.93	183.06	185.39	0.001587	3.09	406.52	214.25	0.46
Bormida	2	33.000*	1994Borm+TR20rii	1900.00	178.46	186.89	185.16	187.37	0.001206	3.41	865.22	238.36	0.42
Bormida	2	32.000*	TR20Borm+TR<20ri	833.00	178.40	184.42	182.63	184.86	0.001633	2.94	319.64	197.25	0.46
Bormida	2	32.000*	TR20Borm+TR20rii	833.00	178.40	184.43	182.63	184.86	0.001632	2.94	319.72	197.26	0.46
Bormida	2	32.000*	TR20Borm+TR200ri	833.00	178.40	184.42	182.63	184.86	0.001633	2.94	319.66	197.25	0.46
Bormida	2	32.000*	TR200Borm+TR20ri	1469.00	178.40	185.97	183.92	186.45	0.001356	3.30	652.36	227.69	0.44
Bormida	2	32.000*	2016Borm+TR20rii	1000.00	178.40	184.90	183.00	185.35	0.001534	3.06	414.99	208.73	0.45
Bormida	2	32.000*	1994Borm+TR20rii	1900.00	178.40	186.85	185.06	187.34	0.001205	3.42	852.82	227.69	0.42
Bormida	2	31.000*	TR20Borm+TR<20ri	833.00	178.33	184.39	182.57	184.82	0.001580	2.92	329.98	188.38	0.45
Bormida	2	31.000*	TR20Borm+TR20rii	833.00	178.33	184.39	182.57	184.82	0.001580	2.92	330.06	188.39	0.45
Bormida	2	31.000*	TR20Borm+TR200ri	833.00	178.33	184.39	182.57	184.82	0.001580	2.92	330.00	188.38	0.45
Bormida	2	31.000*	TR200Borm+TR20ri	1469.00	178.33	185.94	183.88	186.42	0.001340	3.30	647.66	217.01	0.44
Bormida	2	31.000*	2016Borm+TR20rii	1000.00	178.33	184.87	182.93	185.31	0.001484	3.03	423.14	202.34	0.44
Bormida	2	31.000*	1994Borm+TR20rii	1900.00	178.33	186.82	185.00	187.31	0.001212	3.44	837.37	217.01	0.42
Bormida	2	30.000*	TR20Borm+TR<20ri	833.00	178.27	184.36	182.50	184.78	0.001528	2.89	339.77	182.54	0.44
Bormida	2	30.000*	TR20Borm+TR20rii	833.00	178.27	184.36	182.50	184.78	0.001527	2.88	339.86	182.57	0.44
Bormida	2	30.000*	TR20Borm+TR200ri	833.00	178.27	184.36	182.50	184.78	0.001528	2.89	339.79	182.55	0.44
Bormida	2	30.000*	TR200Borm+TR20ri	1469.00	178.27	185.91	183.86	186.39	0.001334	3.30	640.05	206.34	0.43
Bormida	2	30.000*	2016Borm+TR20rii	1000.00	178.27	184.84	182.86	185.27	0.001439	3.00	429.65	191.50	0.44
Bormida	2	30.000*	1994Borm+TR20rii	1900.00	178.27	186.77	184.91	187.28	0.001227	3.47	818.88	206.34	0.43
Bormida	2	29.000*	TR20Borm+TR<20ri	833.00	178.20	184.33	182.43	184.74	0.001478	2.85	348.66	173.70	0.44
Bormida	2	29.000*	TR20Borm+TR20rii	833.00	178.20	184.34	182.43	184.74	0.001477	2.85	348.75	173.71	0.43
Bormida	2	29.000*	TR20Borm+TR200ri	833.00	178.20	184.34	182.43	184.74	0.001477	2.85	348.69	173.70	0.44
Bormida	2	29.000*	TR200Borm+TR20ri	1469.00	178.20	185.87	183.98	186.36	0.001337	3.32	629.26	195.37	0.44
Bormida	2	29.000*	2016Borm+TR20rii	1000.00	178.20	184.81	182.80	185.23	0.001401	2.98	433.36	180.73	0.43
Bormida	2	29.000*	1994Borm+TR20rii	1900.00	178.20	186.73	184.81	187.24	0.001252	3.51	797.14	195.67	0.43
Bormida	2	28	TR20Borm+TR<20ri	833.00	178.14	184.31	182.37	184.70	0.001431	2.82	355.99	162.72	0.43

HEC-RAS Plan: Finale (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	2	28	TR20Borm+TR20rii	833.00	178.14	184.31	182.37	184.70	0.001430	2.82	356.07	162.73	0.43
Bormida	2	28	TR20Borm+TR200ri	833.00	178.14	184.31	182.37	184.70	0.001430	2.82	356.01	162.72	0.43
Bormida	2	28	TR200Borm+TR20ri	1469.00	178.14	185.84	183.90	186.32	0.001323	3.31	618.57	181.69	0.43
Bormida	2	28	2016Borm+TR20rii	1000.00	178.14	184.78	182.74	185.20	0.001368	2.95	435.38	169.79	0.43
Bormida	2	28	1994Borm+TR20rii	1900.00	178.14	186.68	184.71	187.21	0.001283	3.56	773.51	185.00	0.44
Bormida	2	27.000*	TR20Borm+TR<20ri	833.00	178.10	184.27	182.31	184.66	0.001412	2.82	344.78	145.27	0.43
Bormida	2	27.000*	TR20Borm+TR20rii	833.00	178.10	184.27	182.31	184.66	0.001412	2.82	344.85	145.30	0.43
Bormida	2	27.000*	TR20Borm+TR200ri	833.00	178.10	184.27	182.31	184.66	0.001412	2.82	344.80	145.28	0.43
Bormida	2	27.000*	TR200Borm+TR20ri	1469.00	178.10	185.76	183.77	186.29	0.001390	3.39	582.08	168.15	0.44
Bormida	2	27.000*	2016Borm+TR20rii	1000.00	178.10	184.73	182.67	185.16	0.001385	2.98	415.50	157.08	0.43
Bormida	2	27.000*	1994Borm+TR20rii	1900.00	178.10	186.59	184.60	187.17	0.001372	3.67	724.11	173.03	0.45
Bormida	2	26.000*	TR20Borm+TR<20ri	833.00	178.05	184.24	182.25	184.63	0.001372	2.79	338.82	127.92	0.42
Bormida	2	26.000*	TR20Borm+TR20rii	833.00	178.05	184.24	182.25	184.63	0.001372	2.79	338.88	127.94	0.42
Bormida	2	26.000*	TR20Borm+TR200ri	833.00	178.05	184.24	182.25	184.63	0.001372	2.79	338.84	127.93	0.42
Bormida	2	26.000*	TR200Borm+TR20ri	1469.00	178.05	185.69	183.66	186.25	0.001447	3.46	549.46	154.39	0.45
Bormida	2	26.000*	2016Borm+TR20rii	1000.00	178.05	184.69	182.61	185.13	0.001381	2.99	399.98	142.41	0.43
Bormida	2	26.000*	1994Borm+TR20rii	1900.00	178.05	186.49	184.44	187.13	0.001460	3.78	678.14	161.07	0.47
Bormida	2	25.000*	TR20Borm+TR<20ri	833.00	178.01	184.21	182.17	184.59	0.001328	2.77	335.45	116.69	0.42
Bormida	2	25.000*	TR20Borm+TR20rii	833.00	178.01	184.21	182.17	184.59	0.001327	2.77	335.52	116.70	0.42
Bormida	2	25.000*	TR20Borm+TR200ri	833.00	178.01	184.21	182.17	184.59	0.001327	2.77	335.47	116.69	0.42
Bormida	2	25.000*	TR200Borm+TR20ri	1469.00	178.01	185.62	183.55	186.21	0.001489	3.51	520.99	141.94	0.46
Bormida	2	25.000*	2016Borm+TR20rii	1000.00	178.01	184.66	182.53	185.09	0.001351	2.97	389.57	124.99	0.43
Bormida	2	25.000*	1994Borm+TR20rii	1900.00	178.01	186.40	184.33	187.09	0.001543	3.88	635.91	149.10	0.48
Bormida	2	24.000*	TR20Borm+TR<20ri	833.00	177.97	184.18	182.09	184.56	0.001277	2.73	333.64	106.94	0.41
Bormida	2	24.000*	TR20Borm+TR20rii	833.00	177.97	184.18	182.09	184.56	0.001277	2.73	333.70	106.95	0.41
Bormida	2	24.000*	TR20Borm+TR200ri	833.00	177.97	184.18	182.09	184.56	0.001277	2.73	333.66	106.94	0.41
Bormida	2	24.000*	TR200Borm+TR20ri	1469.00	177.97	185.56	183.44	186.17	0.001518	3.55	496.29	130.38	0.47
Bormida	2	24.000*	2016Borm+TR20rii	1000.00	177.97	184.63	182.45	185.06	0.001314	2.95	382.64	112.43	0.42
Bormida	2	24.000*	1994Borm+TR20rii	1900.00	177.97	186.31	184.19	187.05	0.001618	3.97	597.84	137.13	0.49
Bormida	2	23.000*	TR20Borm+TR<20ri	833.00	177.92	184.16	182.01	184.52	0.001225	2.69	332.67	99.02	0.40
Bormida	2	23.000*	TR20Borm+TR20rii	833.00	177.92	184.16	182.01	184.52	0.001225	2.69	332.72	99.03	0.40
Bormida	2	23.000*	TR20Borm+TR200ri	833.00	177.92	184.16	182.01	184.52	0.001225	2.69	332.69	99.02	0.40
Bormida	2	23.000*	TR200Borm+TR20ri	1469.00	177.92	185.51	183.32	186.13	0.001528	3.57	475.71	118.02	0.47
Bormida	2	23.000*	2016Borm+TR20rii	1000.00	177.92	184.60	182.37	185.02	0.001274	2.92	377.40	102.93	0.42
Bormida	2	23.000*	1994Borm+TR20rii	1900.00	177.92	186.22	184.08	187.00	0.001681	4.04	564.11	125.17	0.50
Bormida	2	22	TR20Borm+TR<20ri	833.00	177.88	184.13	181.93	184.49	0.001173	2.66	331.96	91.17	0.39

HEC-RAS Plan: Finale (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	2	22	TR20Borm+TR20rii	833.00	177.88	184.13	181.93	184.49	0.001172	2.65	332.01	91.18	0.39
Bormida	2	22	TR20Borm+TR200ri	833.00	177.88	184.13	181.93	184.49	0.001172	2.66	331.97	91.17	0.39
Bormida	2	22	TR200Borm+TR20ri	1469.00	177.88	185.47	183.20	186.09	0.001505	3.56	460.12	101.86	0.46
Bormida	2	22	2016Borm+TR20rii	1000.00	177.88	184.57	182.27	184.99	0.001232	2.89	372.95	94.66	0.41
Bormida	2	22	1994Borm+TR20rii	1900.00	177.88	186.14	183.95	186.96	0.001728	4.09	534.49	113.20	0.51
Bormida	1	19	TR20Borm+TR<20ri	833.00	178.13	183.92	182.16	184.38	0.001675	3.04	287.51	71.97	0.47
Bormida	1	19	TR20Borm+TR20rii	833.00	178.13	183.92	182.16	184.38	0.001674	3.04	287.54	71.97	0.47
Bormida	1	19	TR20Borm+TR200ri	833.00	178.13	183.92	182.16	184.38	0.001675	3.04	287.52	71.97	0.47
Bormida	1	19	TR200Borm+TR20ri	1469.00	178.13	184.99	183.42	185.92	0.002506	4.31	367.47	89.05	0.59
Bormida	1	19	2016Borm+TR20rii	1000.00	178.13	184.32	182.51	184.87	0.001787	3.33	316.55	72.52	0.49
Bormida	1	19	1994Borm+TR20rii	1900.00	178.13	185.40	184.12	186.74	0.003285	5.17	425.38	179.97	0.68
Bormida	1	18.000*	TR20Borm+TR<20ri	833.00	177.98	183.89	182.10	184.33	0.001583	2.96	295.80	76.95	0.45
Bormida	1	18.000*	TR20Borm+TR20rii	833.00	177.98	183.89	182.10	184.33	0.001582	2.96	295.84	76.95	0.45
Bormida	1	18.000*	TR20Borm+TR200ri	833.00	177.98	183.89	182.10	184.33	0.001582	2.96	295.81	76.95	0.45
Bormida	1	18.000*	TR200Borm+TR20ri	1469.00	177.98	184.96	183.34	185.85	0.002385	4.21	390.94	150.18	0.58
Bormida	1	18.000*	2016Borm+TR20rii	1000.00	177.98	184.30	182.45	184.82	0.001684	3.24	326.98	77.60	0.48
Bormida	1	18.000*	1994Borm+TR20rii	1900.00	177.98	185.42	184.05	186.62	0.002924	4.93	470.23	189.68	0.65
Bormida	1	17.000*	TR20Borm+TR<20ri	833.00	177.84	183.87	182.02	184.29	0.001467	2.88	306.72	82.04	0.44
Bormida	1	17.000*	TR20Borm+TR20rii	833.00	177.84	183.87	182.02	184.29	0.001466	2.88	306.76	82.04	0.44
Bormida	1	17.000*	TR20Borm+TR200ri	833.00	177.84	183.87	182.02	184.29	0.001467	2.88	306.73	82.04	0.44
Bormida	1	17.000*	TR200Borm+TR20ri	1469.00	177.84	184.96	183.25	185.77	0.002137	4.03	428.94	172.49	0.55
Bormida	1	17.000*	2016Borm+TR20rii	1000.00	177.84	184.27	182.37	184.77	0.001573	3.16	340.04	86.46	0.46
Bormida	1	17.000*	1994Borm+TR20rii	1900.00	177.84	185.46	183.96	186.50	0.002534	4.65	523.00	199.36	0.61
Bormida	1	16.000*	TR20Borm+TR<20ri	833.00	177.69	183.86	181.91	184.24	0.001338	2.78	319.04	87.29	0.42
Bormida	1	16.000*	TR20Borm+TR20rii	833.00	177.69	183.86	181.91	184.24	0.001338	2.78	319.08	87.29	0.42
Bormida	1	16.000*	TR20Borm+TR200ri	833.00	177.69	183.86	181.91	184.24	0.001338	2.78	319.05	87.29	0.42
Bormida	1	16.000*	TR200Borm+TR20ri	1469.00	177.69	184.98	183.12	185.69	0.001870	3.81	473.89	187.20	0.52
Bormida	1	16.000*	2016Borm+TR20rii	1000.00	177.69	184.26	182.26	184.73	0.001451	3.06	356.90	107.73	0.44
Bormida	1	16.000*	1994Borm+TR20rii	1900.00	177.69	185.50	183.84	186.40	0.002169	4.36	580.08	209.03	0.57
Bormida	1	15.000*	TR20Borm+TR<20ri	833.00	177.55	183.84	181.77	184.20	0.001217	2.68	332.80	101.18	0.40
Bormida	1	15.000*	TR20Borm+TR20rii	833.00	177.55	183.84	181.77	184.20	0.001217	2.68	332.85	101.20	0.40
Bormida	1	15.000*	TR20Borm+TR200ri	833.00	177.55	183.84	181.77	184.20	0.001217	2.68	332.81	101.18	0.40
Bormida	1	15.000*	TR200Borm+TR20ri	1469.00	177.55	185.00	182.99	185.62	0.001623	3.60	523.00	207.15	0.48
Bormida	1	15.000*	2016Borm+TR20rii	1000.00	177.55	184.25	182.13	184.68	0.001311	2.95	383.22	167.00	0.42
Bormida	1	15.000*	1994Borm+TR20rii	1900.00	177.55	185.54	183.62	186.31	0.001849	4.09	639.55	218.71	0.52
Bormida	1	14.000*	TR20Borm+TR<20ri	833.00	177.40	183.83	181.61	184.17	0.001083	2.57	351.76	124.35	0.38

HEC-RAS Plan: Finale (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	1	14.000*	TR20Borm+TR20rii	833.00	177.40	183.83	181.61	184.17	0.001082	2.57	351.81	124.42	0.38
Bormida	1	14.000*	TR20Borm+TR200ri	833.00	177.40	183.83	181.61	184.17	0.001082	2.57	351.77	124.37	0.38
Bormida	1	14.000*	TR200Borm+TR20ri	1469.00	177.40	185.02	182.83	185.56	0.001391	3.39	575.69	218.44	0.45
Bormida	1	14.000*	2016Borm+TR20rii	1000.00	177.40	184.25	181.96	184.64	0.001140	2.79	420.52	182.62	0.40
Bormida	1	14.000*	1994Borm+TR20rii	1900.00	177.40	185.57	183.35	186.24	0.001573	3.83	701.01	228.39	0.49
Bormida	1	13.000*	TR20Borm+TR<20ri	833.00	177.26	183.83	181.43	184.13	0.000945	2.44	382.90	174.88	0.36
Bormida	1	13.000*	TR20Borm+TR20rii	833.00	177.26	183.83	181.43	184.13	0.000945	2.44	382.98	174.91	0.36
Bormida	1	13.000*	TR20Borm+TR200ri	833.00	177.26	183.83	181.43	184.13	0.000945	2.44	382.91	174.89	0.36
Bormida	1	13.000*	TR200Borm+TR20ri	1469.00	177.26	185.03	182.66	185.51	0.001187	3.18	630.04	229.17	0.42
Bormida	1	13.000*	2016Borm+TR20rii	1000.00	177.26	184.25	181.78	184.60	0.000981	2.63	462.09	203.27	0.37
Bormida	1	13.000*	1994Borm+TR20rii	1900.00	177.26	185.60	183.31	186.17	0.001341	3.59	763.42	238.07	0.45
Bormida	1	12.000*	TR20Borm+TR<20ri	833.00	177.11	183.84	181.23	184.10	0.000801	2.29	423.48	184.34	0.33
Bormida	1	12.000*	TR20Borm+TR20rii	833.00	177.11	183.84	181.23	184.10	0.000801	2.29	423.57	184.37	0.33
Bormida	1	12.000*	TR20Borm+TR200ri	833.00	177.11	183.84	181.23	184.10	0.000801	2.29	423.50	184.35	0.33
Bormida	1	12.000*	TR200Borm+TR20ri	1469.00	177.11	185.05	182.46	185.46	0.001013	2.99	684.95	242.53	0.39
Bormida	1	12.000*	2016Borm+TR20rii	1000.00	177.11	184.26	181.58	184.56	0.000830	2.47	509.18	210.25	0.34
Bormida	1	12.000*	1994Borm+TR20rii	1900.00	177.11	185.62	183.05	186.12	0.001146	3.37	825.72	247.74	0.42
Bormida	1	11.000*	TR20Borm+TR<20ri	833.00	176.97	183.84	181.01	184.07	0.000675	2.15	469.30	204.50	0.31
Bormida	1	11.000*	TR20Borm+TR20rii	833.00	176.97	183.84	181.01	184.07	0.000675	2.15	469.40	204.53	0.31
Bormida	1	11.000*	TR20Borm+TR200ri	833.00	176.97	183.84	181.01	184.07	0.000675	2.15	469.33	204.51	0.31
Bormida	1	11.000*	TR200Borm+TR20ri	1469.00	176.97	185.06	182.23	185.42	0.000863	2.81	742.91	249.66	0.36
Bormida	1	11.000*	2016Borm+TR20rii	1000.00	176.97	184.27	181.36	184.53	0.000697	2.31	560.36	216.29	0.31
Bormida	1	11.000*	1994Borm+TR20rii	1900.00	176.97	185.64	182.94	186.07	0.000981	3.17	889.09	257.42	0.39
Bormida	1	10	TR20Borm+TR<20ri	833.00	176.82	183.85	180.73	184.04	0.000561	2.00	520.93	212.73	0.28
Bormida	1	10	TR20Borm+TR20rii	833.00	176.82	183.85	180.73	184.04	0.000561	2.00	521.04	212.74	0.28
Bormida	1	10	TR20Borm+TR200ri	833.00	176.82	183.85	180.73	184.04	0.000561	2.00	520.96	212.73	0.28
Bormida	1	10	TR200Borm+TR20ri	1469.00	176.82	185.08	181.98	185.39	0.000730	2.63	805.05	254.92	0.33
Bormida	1	10	2016Borm+TR20rii	1000.00	176.82	184.28	181.10	184.50	0.000583	2.15	615.29	222.55	0.29
Bormida	1	10	1994Borm+TR20rii	1900.00	176.82	185.65	182.73	186.03	0.000839	2.98	953.79	267.10	0.36
Bormida	1	9	TR20Borm+TR<20ri	833.00	176.65	183.85		184.03	0.000476	1.90	545.66	211.77	0.26
Bormida	1	9	TR20Borm+TR20rii	833.00	176.65	183.85		184.03	0.000476	1.90	545.77	211.80	0.26
Bormida	1	9	TR20Borm+TR200ri	833.00	176.65	183.85		184.03	0.000476	1.90	545.69	211.78	0.26
Bormida	1	9	TR200Borm+TR20ri	1469.00	176.65	185.08		185.37	0.000646	2.53	824.70	247.88	0.31
Bormida	1	9	2016Borm+TR20rii	1000.00	176.65	184.28		184.48	0.000503	2.05	639.34	218.87	0.27
Bormida	1	9	1994Borm+TR20rii	1900.00	176.65	185.65		186.01	0.000755	2.89	968.28	251.36	0.34
Bormida	1	8.0000*	TR20Borm+TR<20ri	833.00	176.65	183.82		184.01	0.000540	2.01	526.07	214.52	0.27

HEC-RAS Plan: Finale (Continued)

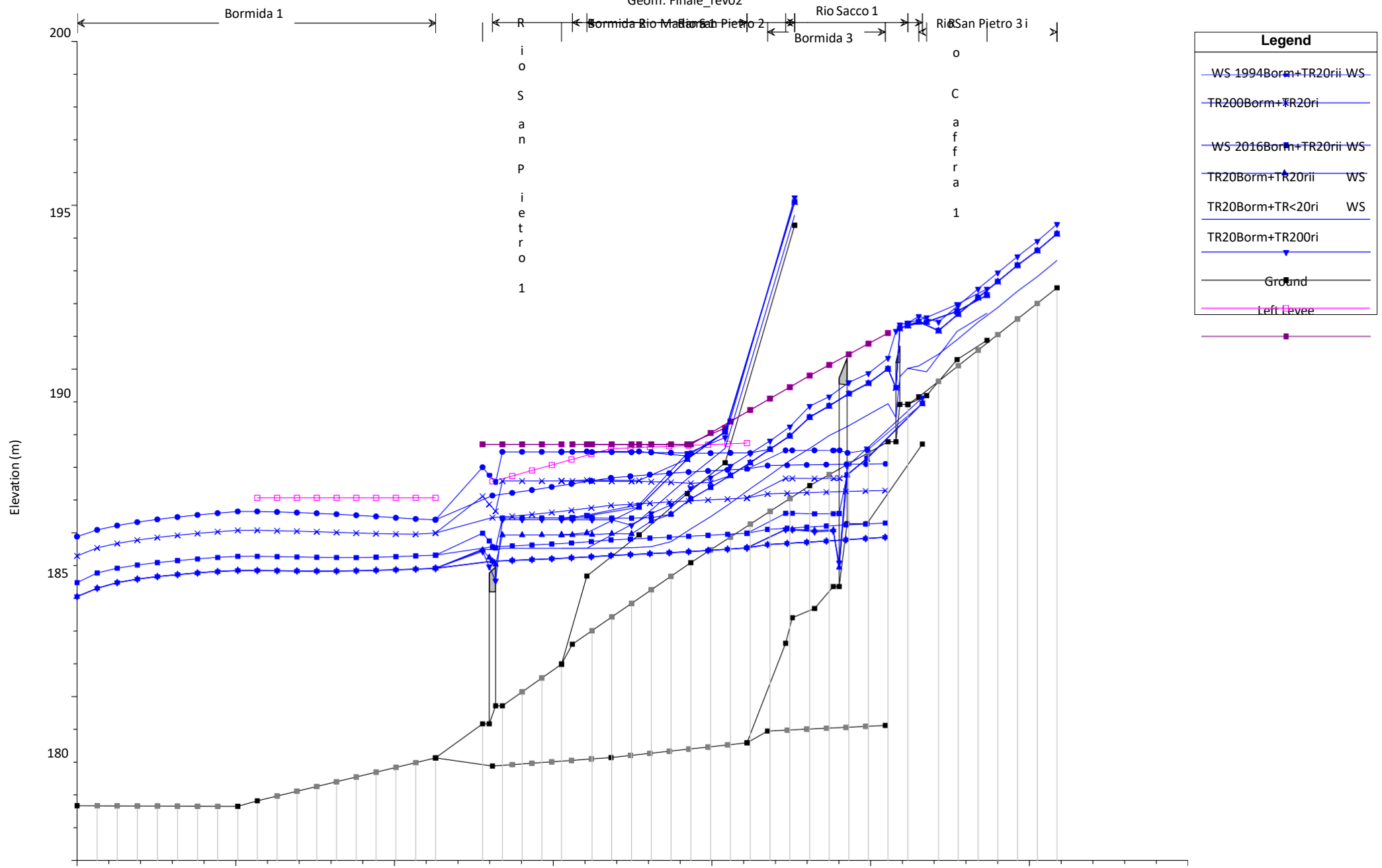
River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	1	8.0000*	TR20Borm+TR20rii	833.00	176.65	183.82		184.01	0.000539	2.01	526.19	214.54	0.27
Bormida	1	8.0000*	TR20Borm+TR200ri	833.00	176.65	183.82		184.01	0.000540	2.01	526.10	214.53	0.27
Bormida	1	8.0000*	TR200Borm+TR20ri	1469.00	176.65	185.03		185.35	0.000719	2.66	807.15	250.58	0.33
Bormida	1	8.0000*	2016Borm+TR20rii	1000.00	176.65	184.25		184.47	0.000566	2.17	620.09	221.79	0.28
Bormida	1	8.0000*	1994Borm+TR20rii	1900.00	176.65	185.60		185.99	0.000834	3.02	950.30	252.93	0.36
Bormida	1	7.0000*	TR20Borm+TR<20ri	833.00	176.66	183.77		183.99	0.000617	2.14	505.78	215.85	0.29
Bormida	1	7.0000*	TR20Borm+TR20rii	833.00	176.66	183.77		183.99	0.000617	2.14	505.89	215.86	0.29
Bormida	1	7.0000*	TR20Borm+TR200ri	833.00	176.66	183.77		183.99	0.000617	2.14	505.81	215.85	0.29
Bormida	1	7.0000*	TR200Borm+TR20ri	1469.00	176.66	184.98		185.32	0.000806	2.79	788.90	251.88	0.35
Bormida	1	7.0000*	2016Borm+TR20rii	1000.00	176.66	184.20		184.45	0.000646	2.30	600.31	230.91	0.30
Bormida	1	7.0000*	1994Borm+TR20rii	1900.00	176.66	185.54		185.96	0.000928	3.16	931.41	254.52	0.38
Bormida	1	6.0000*	TR20Borm+TR<20ri	833.00	176.66	183.73		183.97	0.000716	2.29	484.22	216.87	0.31
Bormida	1	6.0000*	TR20Borm+TR20rii	833.00	176.66	183.73		183.97	0.000716	2.29	484.34	216.88	0.31
Bormida	1	6.0000*	TR20Borm+TR200ri	833.00	176.66	183.73		183.97	0.000716	2.29	484.25	216.87	0.31
Bormida	1	6.0000*	TR200Borm+TR20ri	1469.00	176.66	184.92		185.30	0.000911	2.95	769.34	253.13	0.37
Bormida	1	6.0000*	2016Borm+TR20rii	1000.00	176.66	184.15		184.43	0.000743	2.45	579.96	234.71	0.32
Bormida	1	6.0000*	1994Borm+TR20rii	1900.00	176.66	185.48		185.94	0.001042	3.33	911.17	256.11	0.40
Bormida	1	5.0000*	TR20Borm+TR<20ri	833.00	176.66	183.66		183.95	0.000846	2.46	460.70	218.45	0.34
Bormida	1	5.0000*	TR20Borm+TR20rii	833.00	176.66	183.66		183.95	0.000846	2.46	460.83	218.47	0.34
Bormida	1	5.0000*	TR20Borm+TR200ri	833.00	176.66	183.66		183.95	0.000846	2.46	460.73	218.45	0.34
Bormida	1	5.0000*	TR200Borm+TR20ri	1469.00	176.66	184.86		185.27	0.001043	3.13	747.93	254.28	0.39
Bormida	1	5.0000*	2016Borm+TR20rii	1000.00	176.66	184.09		184.41	0.000866	2.62	558.14	236.77	0.35
Bormida	1	5.0000*	1994Borm+TR20rii	1900.00	176.66	185.41		185.90	0.001181	3.51	889.09	257.70	0.42
Bormida	1	4.0000*	TR20Borm+TR<20ri	833.00	176.66	183.59		183.92	0.001026	2.67	434.04	220.54	0.37
Bormida	1	4.0000*	TR20Borm+TR20rii	833.00	176.66	183.59		183.92	0.001025	2.67	434.18	220.56	0.37
Bormida	1	4.0000*	TR20Borm+TR200ri	833.00	176.66	183.59		183.92	0.001026	2.67	434.07	220.54	0.37
Bormida	1	4.0000*	TR200Borm+TR20ri	1469.00	176.66	184.78		185.24	0.001213	3.33	723.67	255.38	0.42
Bormida	1	4.0000*	2016Borm+TR20rii	1000.00	176.66	184.02		184.38	0.001030	2.82	533.50	238.81	0.38
Bormida	1	4.0000*	1994Borm+TR20rii	1900.00	176.66	185.32		185.87	0.001358	3.72	864.32	259.27	0.45
Bormida	1	3.0000*	TR20Borm+TR<20ri	833.00	176.67	183.48		183.89	0.001293	2.94	401.63	222.35	0.42
Bormida	1	3.0000*	TR20Borm+TR20rii	833.00	176.67	183.48		183.89	0.001292	2.94	401.79	222.36	0.42
Bormida	1	3.0000*	TR20Borm+TR200ri	833.00	176.67	183.48		183.89	0.001293	2.94	401.66	222.35	0.42
Bormida	1	3.0000*	TR200Borm+TR20ri	1469.00	176.67	184.68		185.20	0.001445	3.58	694.78	256.32	0.46
Bormida	1	3.0000*	2016Borm+TR20rii	1000.00	176.67	183.92		184.34	0.001266	3.08	503.86	241.01	0.42
Bormida	1	3.0000*	1994Borm+TR20rii	1900.00	176.67	185.22		185.82	0.001593	3.97	835.31	260.75	0.48
Bormida	1	2.0000*	TR20Borm+TR<20ri	833.00	176.67	183.31		183.84	0.001737	3.34	355.91	222.03	0.48

HEC-RAS Plan: Finale (Continued)

River	Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	1	2.0000*	TR20Borm+TR20rii	833.00	176.67	183.31		183.84	0.001736	3.34	356.12	222.05	0.48
Bormida	1	2.0000*	TR20Borm+TR200ri	833.00	176.67	183.31		183.84	0.001737	3.34	355.95	222.04	0.48
Bormida	1	2.0000*	TR200Borm+TR20ri	1469.00	176.67	184.54		185.15	0.001795	3.91	657.01	256.72	0.50
Bormida	1	2.0000*	2016Borm+TR20rii	1000.00	176.67	183.77		184.30	0.001649	3.43	463.52	242.69	0.47
Bormida	1	2.0000*	1994Borm+TR20rii	1900.00	176.67	185.09		185.77	0.001929	4.29	798.84	261.97	0.53
Bormida	1	1	TR20Borm+TR<20ri	833.00	176.67	183.05	181.53	183.77	0.002502	3.87	293.74	193.36	0.57
Bormida	1	1	TR20Borm+TR20rii	833.00	176.67	183.05	181.53	183.77	0.002502	3.87	293.74	193.36	0.57
Bormida	1	1	TR20Borm+TR200ri	833.00	176.67	183.05	181.54	183.77	0.002502	3.87	293.74	193.35	0.57
Bormida	1	1	TR200Borm+TR20ri	1469.00	176.67	184.30	183.88	185.08	0.002504	4.45	591.61	255.34	0.59
Bormida	1	1	2016Borm+TR20rii	1000.00	176.67	183.48	182.51	184.22	0.002505	4.05	387.99	236.20	0.57
Bormida	1	1	1994Borm+TR20rii	1900.00	176.67	184.89	184.39	185.70	0.002503	4.74	744.58	262.06	0.59

Finale_rev02

Geom: Finale_rev02



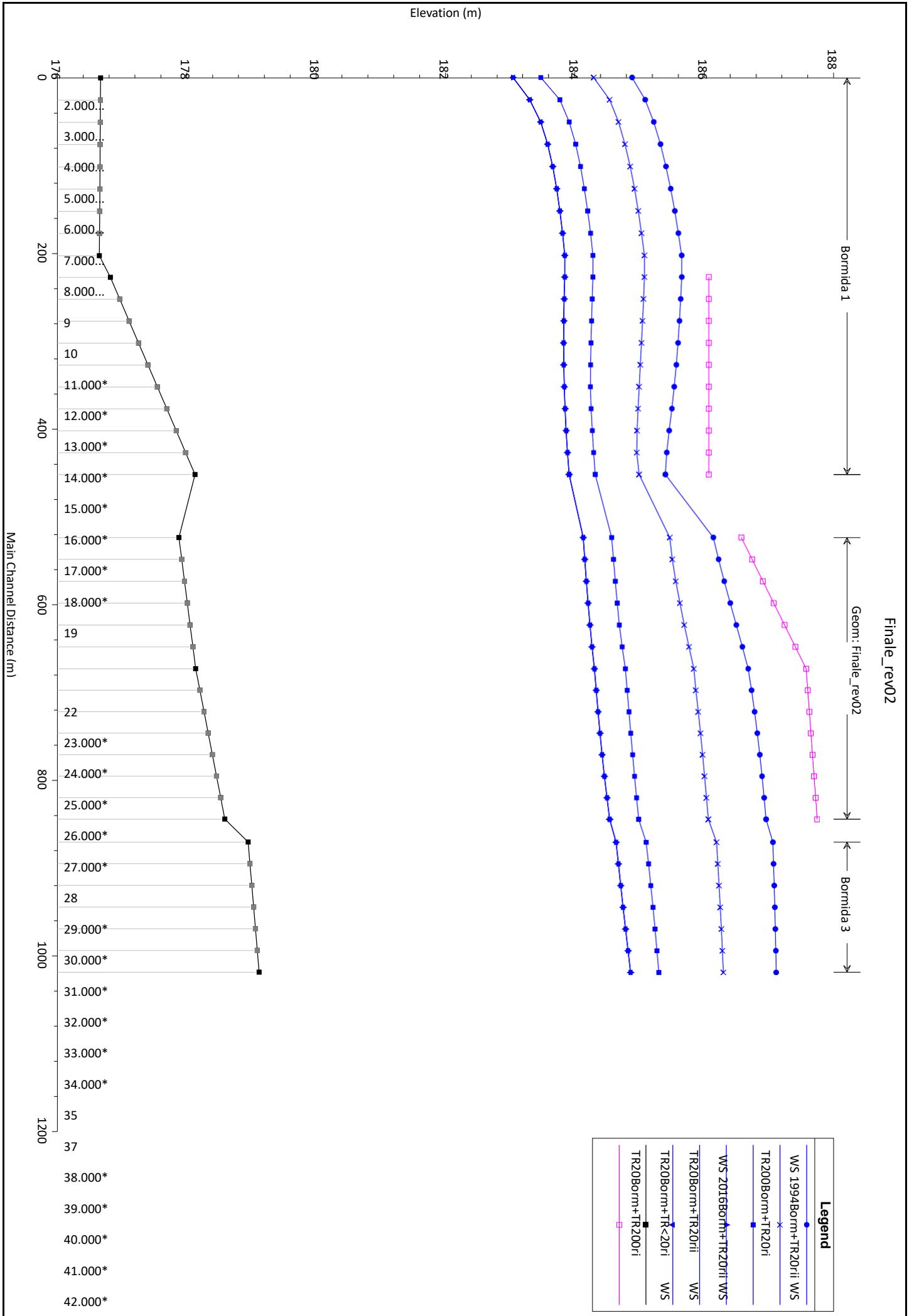
Legend

- WS 1994Borm+TR20rii WS
- TR200Borm+TR20ri
- WS 2016Borm+TR20rii WS
- TR20Borm+TR20rii WS
- TR20Borm+TR<20ri WS
- TR20Borm+TR200ri
- Ground
- Left Levee

175 2.0000... 3.0000... 4.0000... 5.0000... 6.0000... 7.0000... 8.0000... 9 10 11.000* 12.000* 104 105 106.00* 110.00* 111.00* 112.00* 113.00* 114.00* 115 116.00* 117.00* 118.00* 119.00* 128.00* 129.00* 130.00* 131.00*

0 200 400 600 800 1000 1200 1400

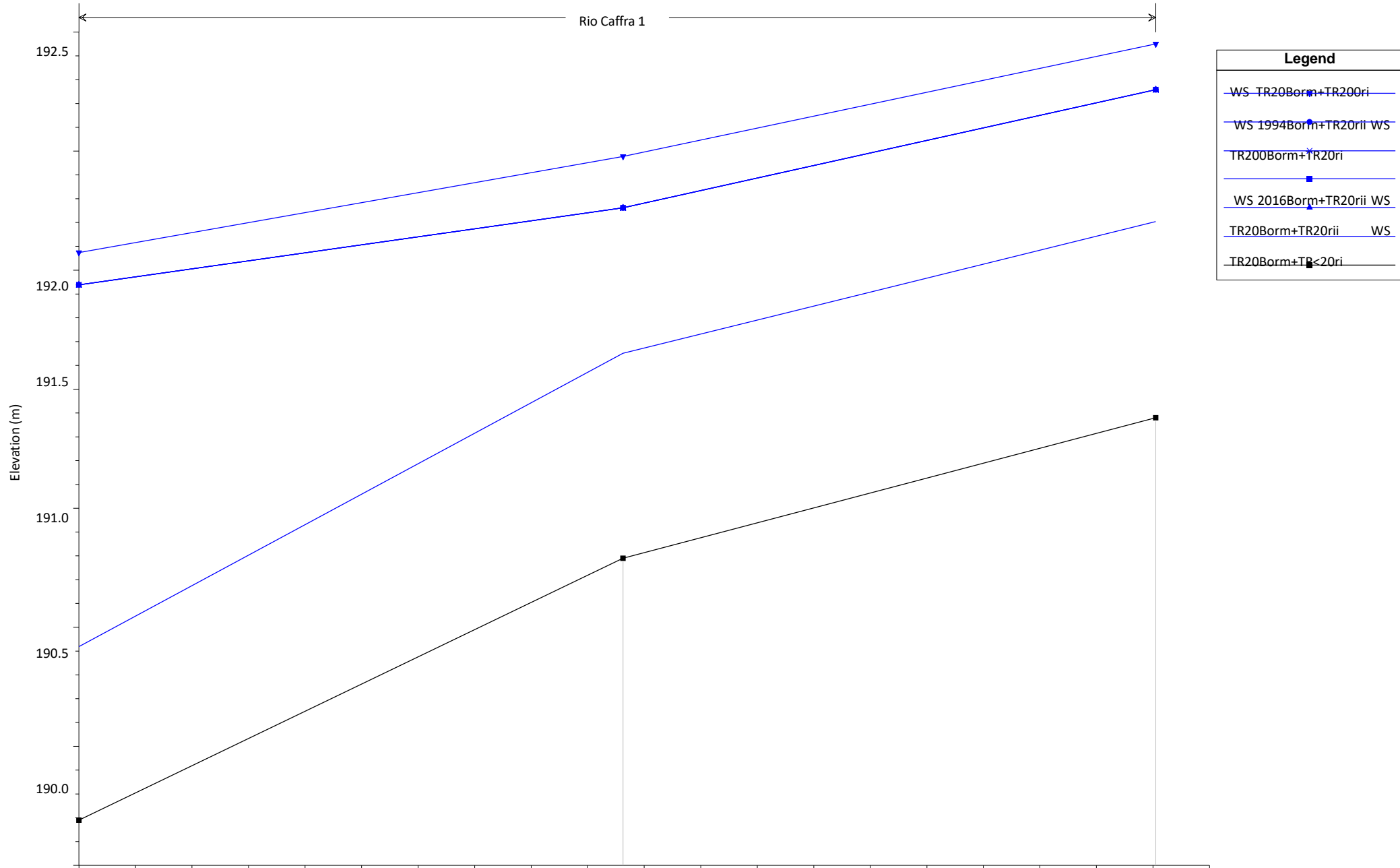
Main Channel Distance (m)



Finale_rev02

Geom: Finale_rev02

Rio Caffra 1



189.0

0

20

203

40

60

205

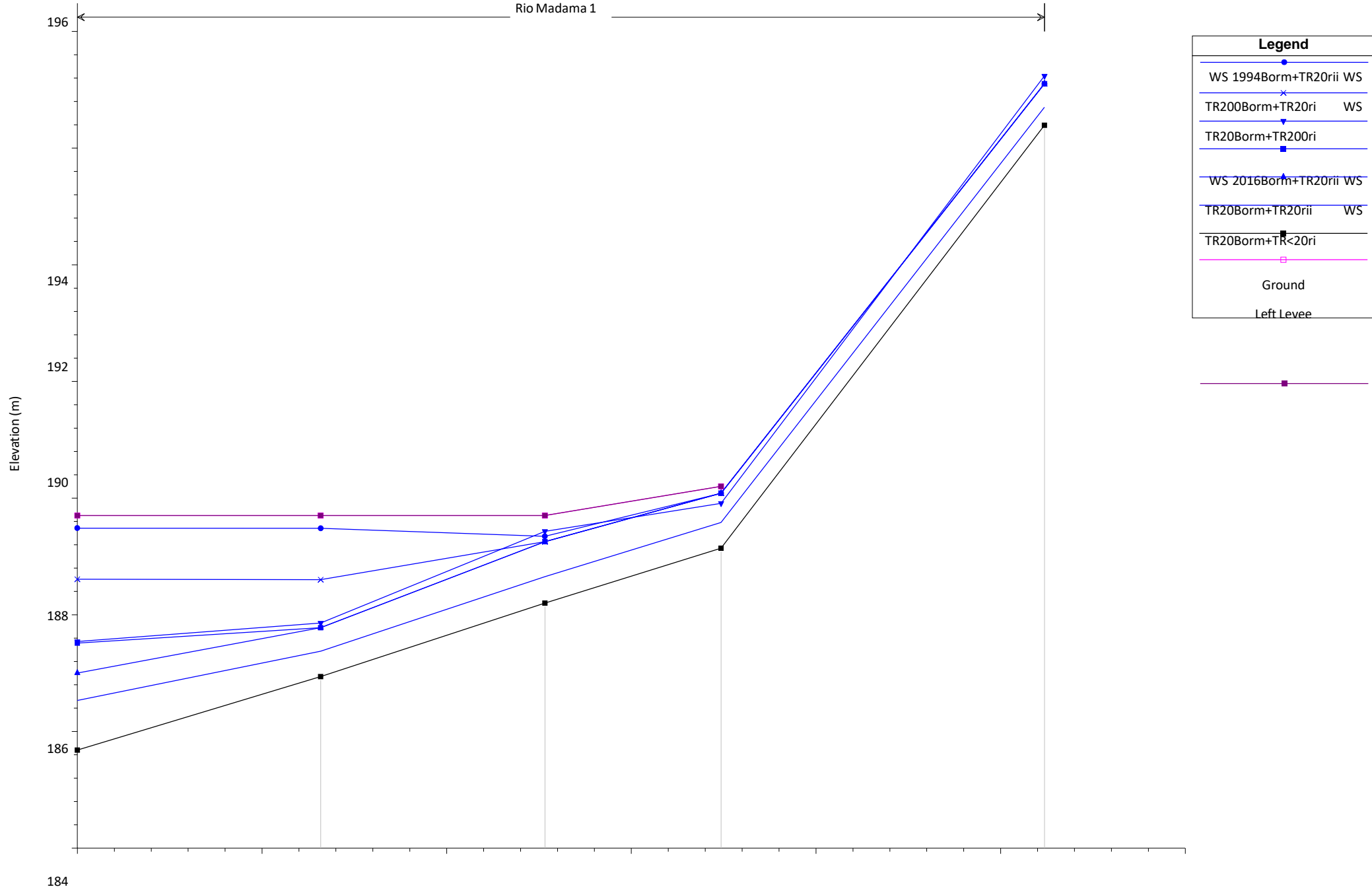
80

Main Channel Distance (m)

Finale_rev02

Geom: Finale_rev02

Rio Madama 1



182

0

50

402

100

403

150

404

200

250

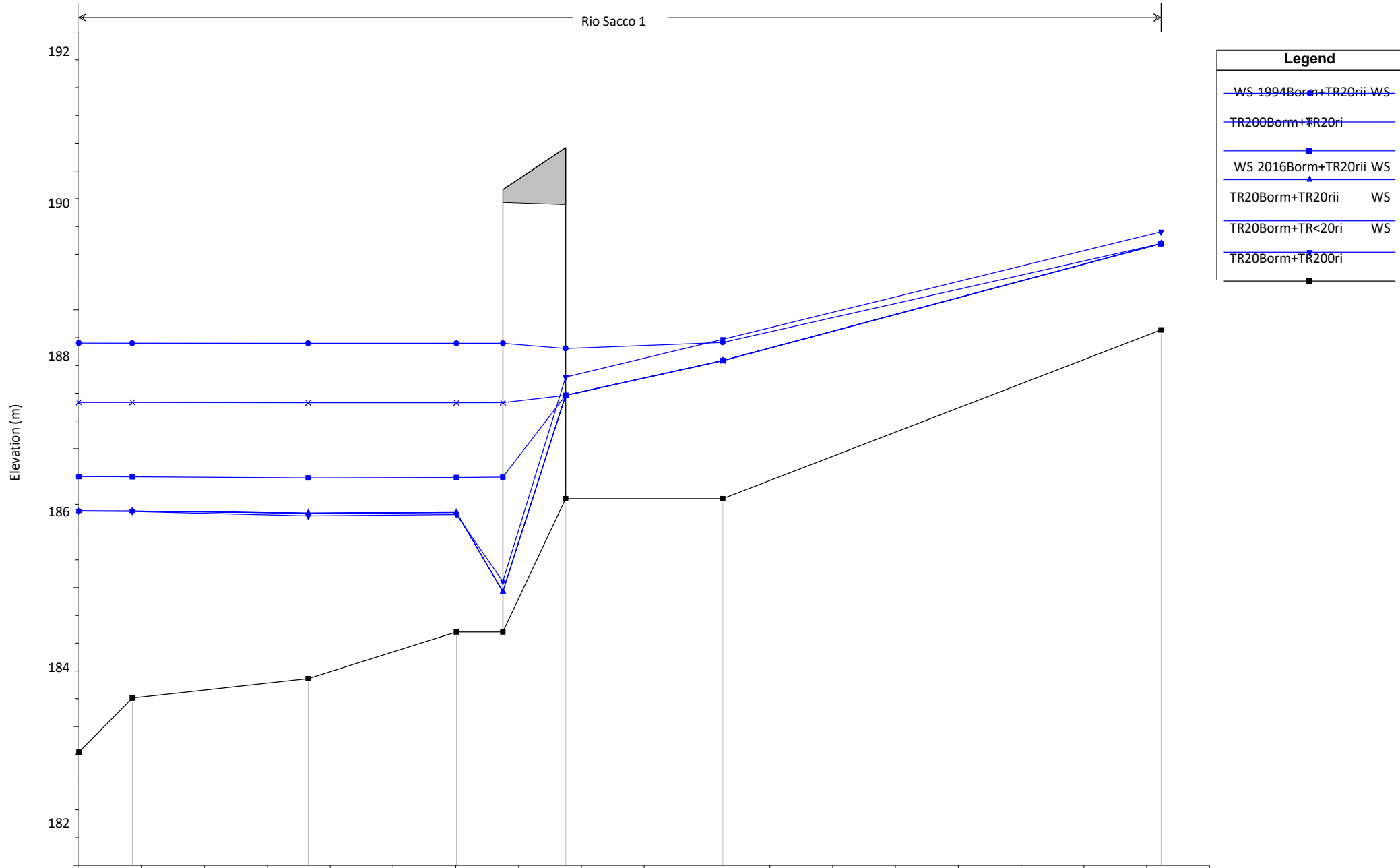
405

300

Main Channel Distance (m)

Finale_rev02

Geom: Finale_rev02



Legend	
WS 1994Borm+TR20ri	WS
TR200Borm+TR20ri	WS
WS 2016Borm+TR20ri	WS
TR20Borm+TR20ri	WS
TR20Borm+TR<20ri	WS
TR20Borm+TR200ri	WS

180

302

303

304

304.5

305

306

0

20

40

60

80

100

120

140

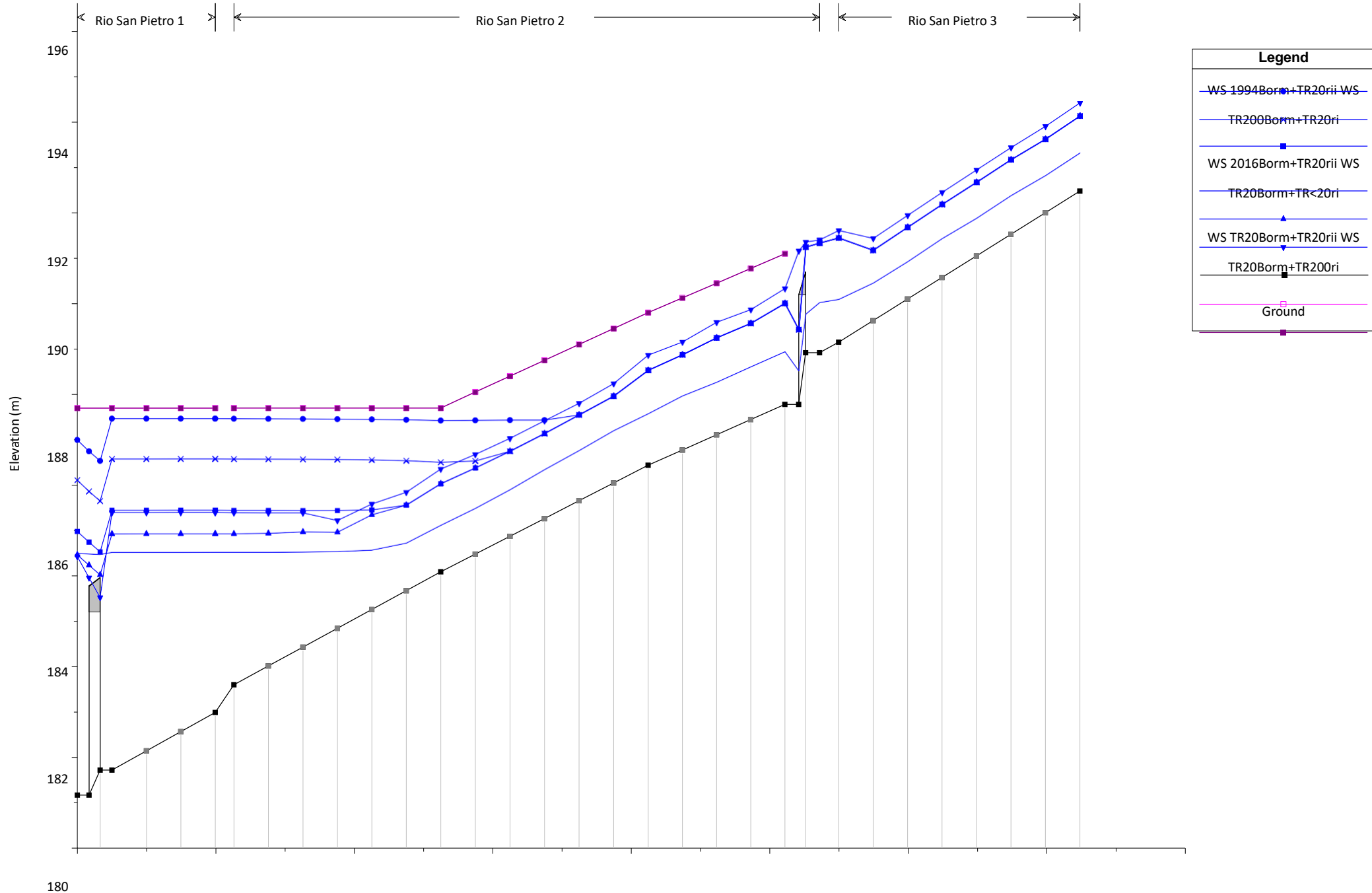
160

180

Main Channel Distance (m)

Finale_rev02

Geom: Finale_rev02



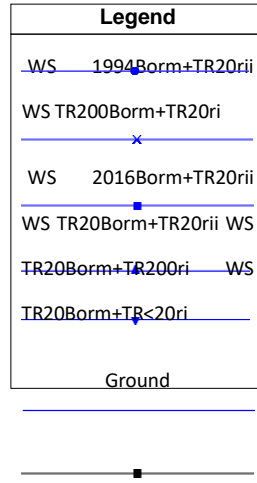
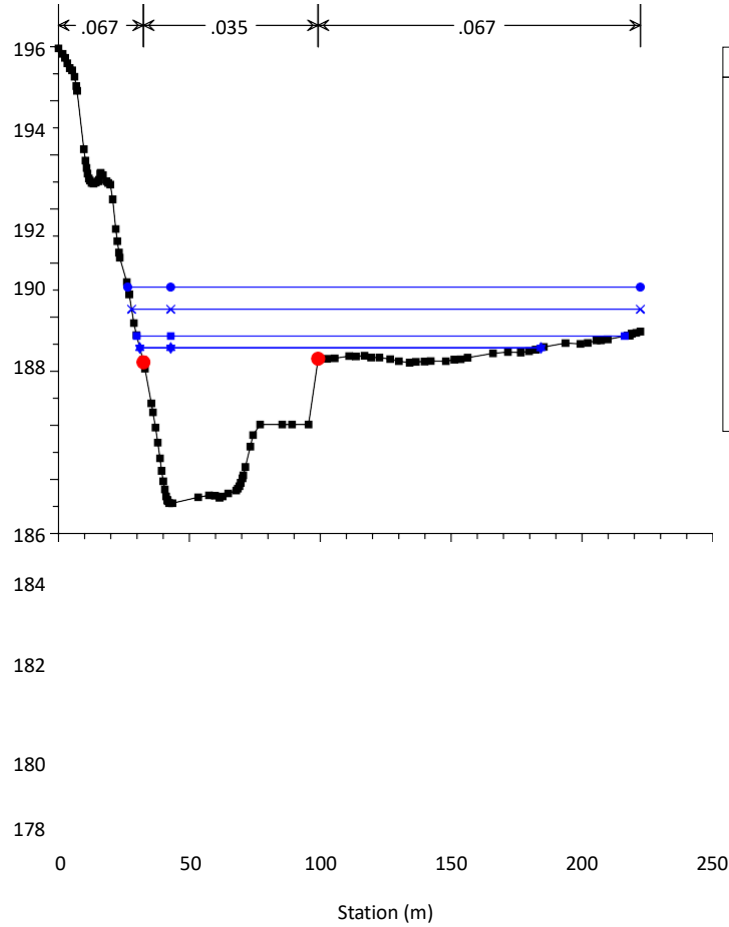
Legend	
WS 1994Borm+TR20rii WS	Blue line with circles
TR200Borm+TR20ri	Blue line with squares
WS 2016Borm+TR20rii WS	Blue line with triangles
TR20Borm+TR<20ri	Blue line with crosses
WS TR20Borm+TR20rii WS	Blue line with inverted triangles
TR20Borm+TR200ri	Black line with squares
Ground	Pink line with squares

178
0 104.5 106.00* 107.00* 108 110.00* 111.00* 112.00* 113.00* 114.00* 115 116.00* 117.00* 118.00* 119.00* 120.00* 121 122.00* 123.00* 124.00* 125 --- 127 128.00* 129.00* 130.00* 131.00* 132.00* 133.00* 134
100 200 300 400 500 600 700 800
Main Channel Distance (m)

Finale_rev02

Geom: Finale_rev02

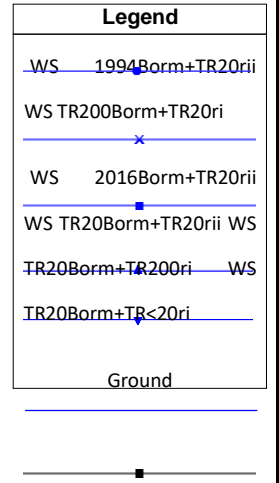
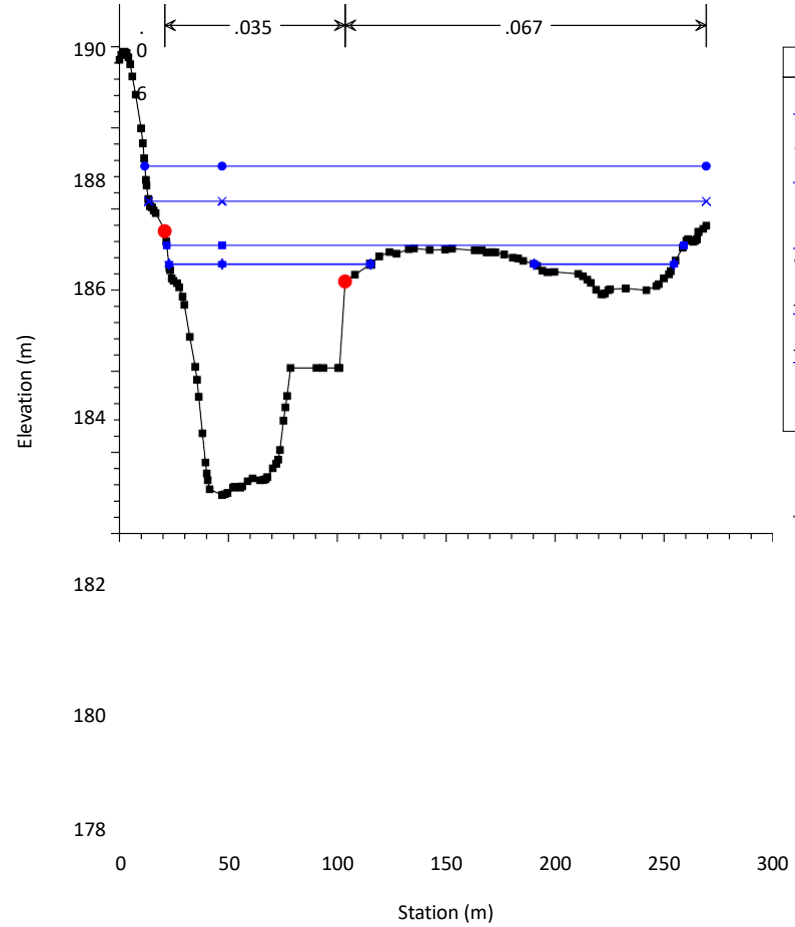
River = Bormida Reach = 3 RS = 43



Finale_rev02

Geom: Finale_rev02

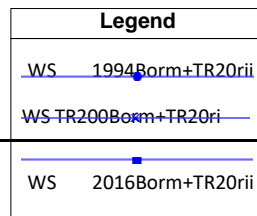
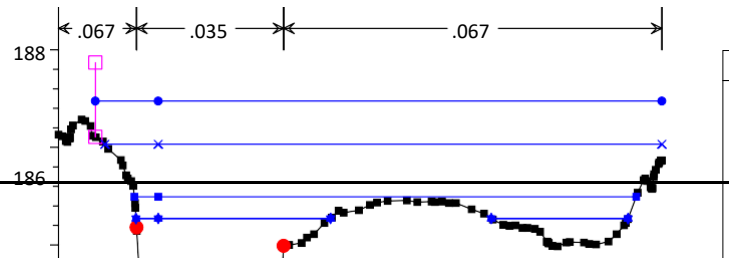
River = Bormida Reach = 3 RS = 37



Finale_rev02

Geom: Finale_rev02

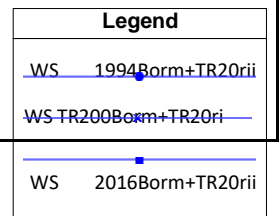
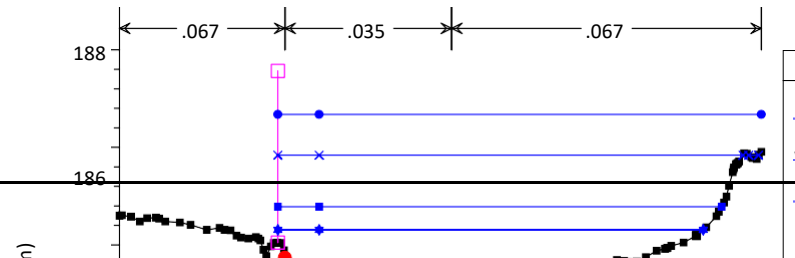
River = Bormida Reach = 2 RS = 35

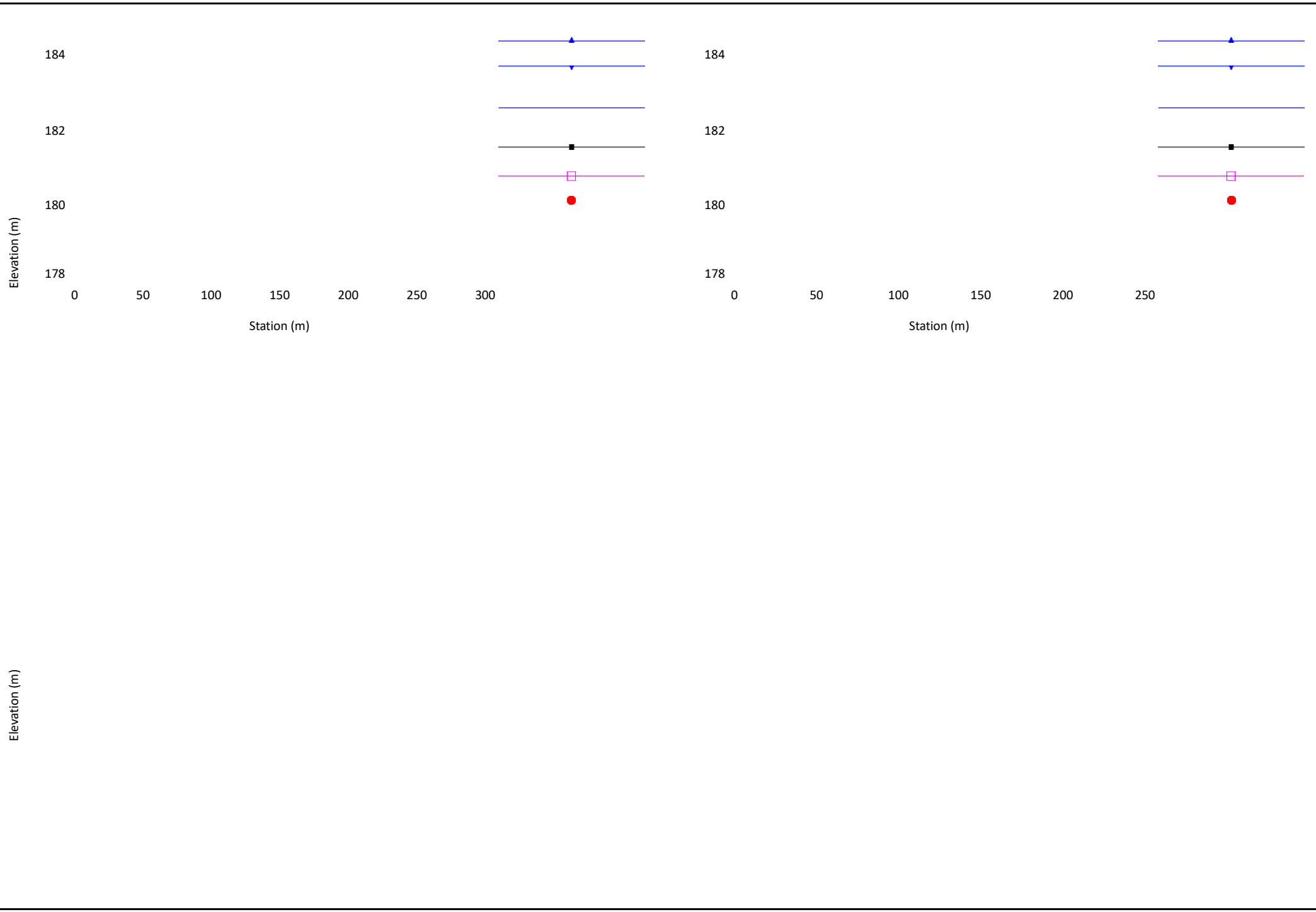


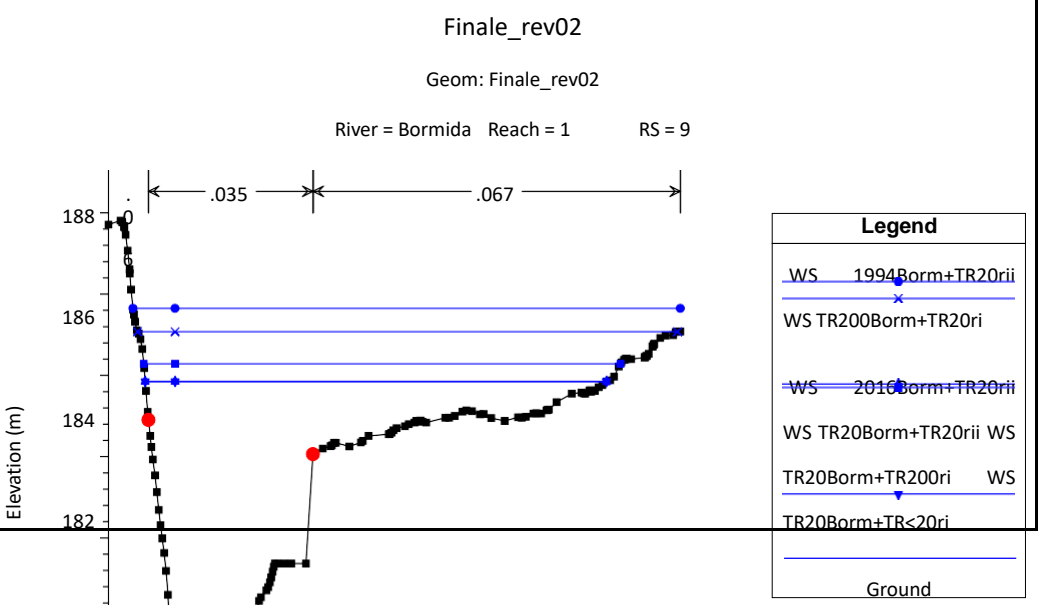
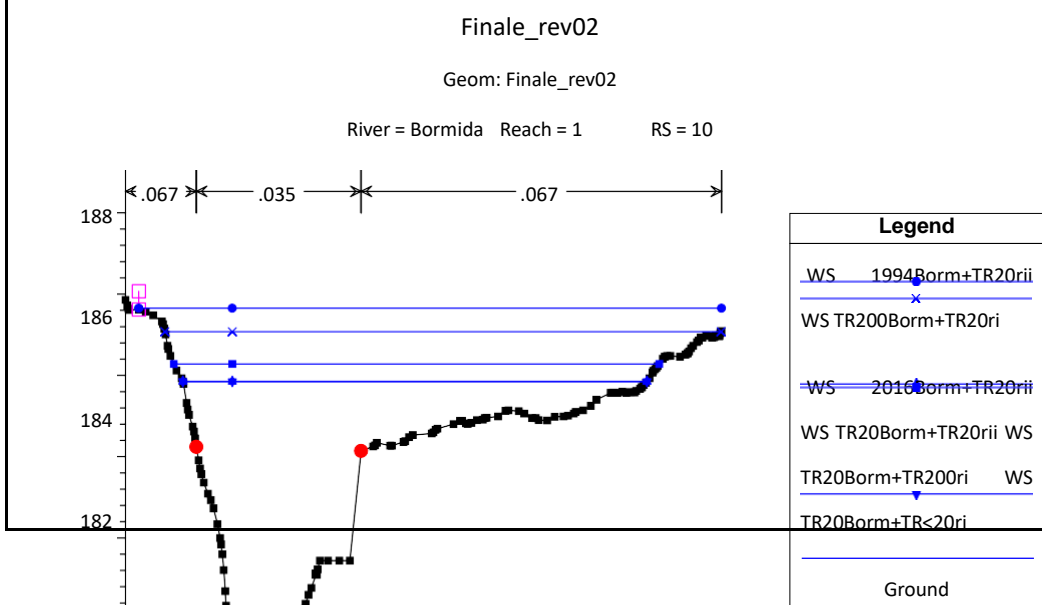
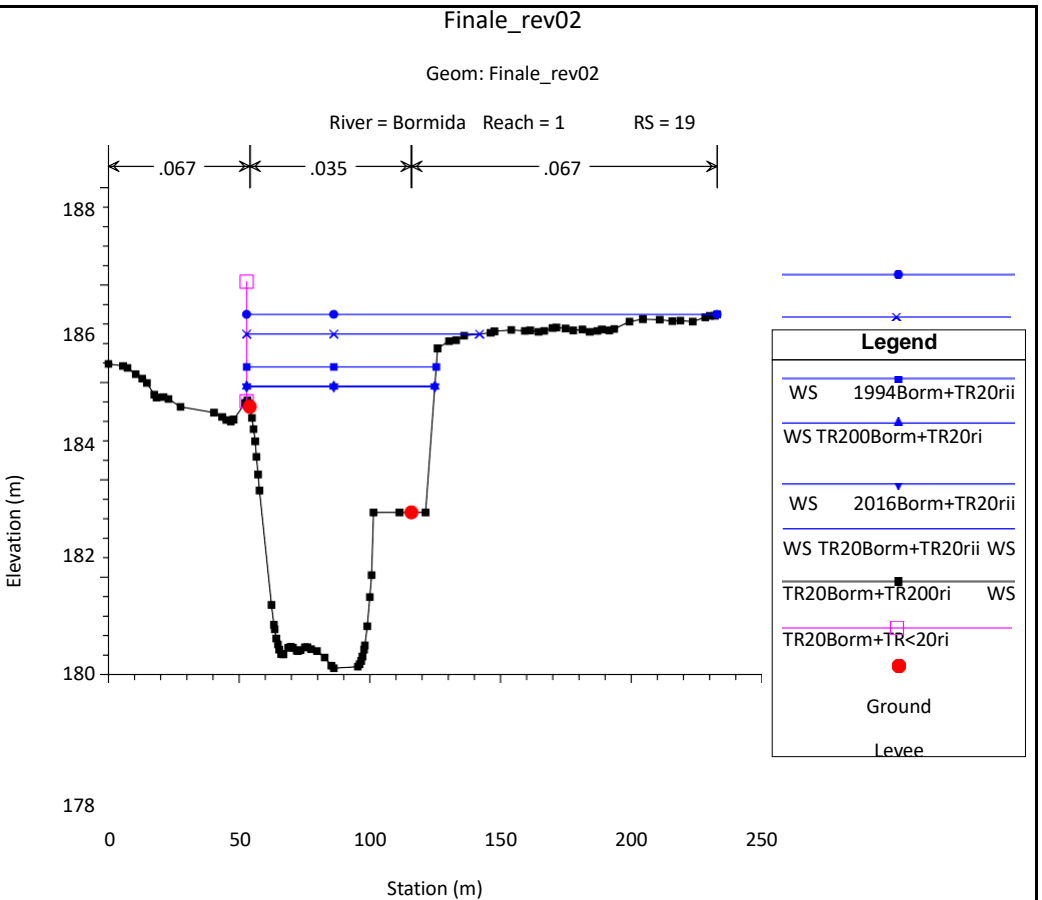
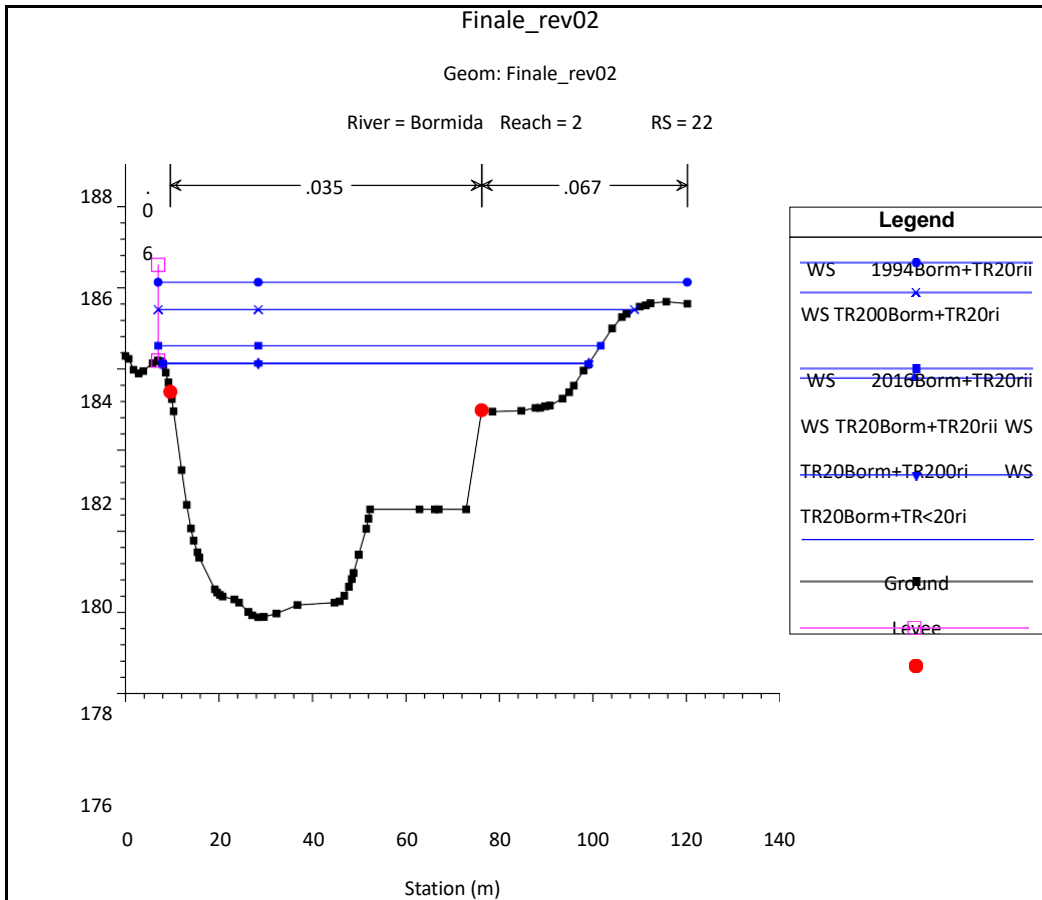
Finale_rev02

Geom: Finale_rev02

River = Bormida Reach = 2 RS = 28





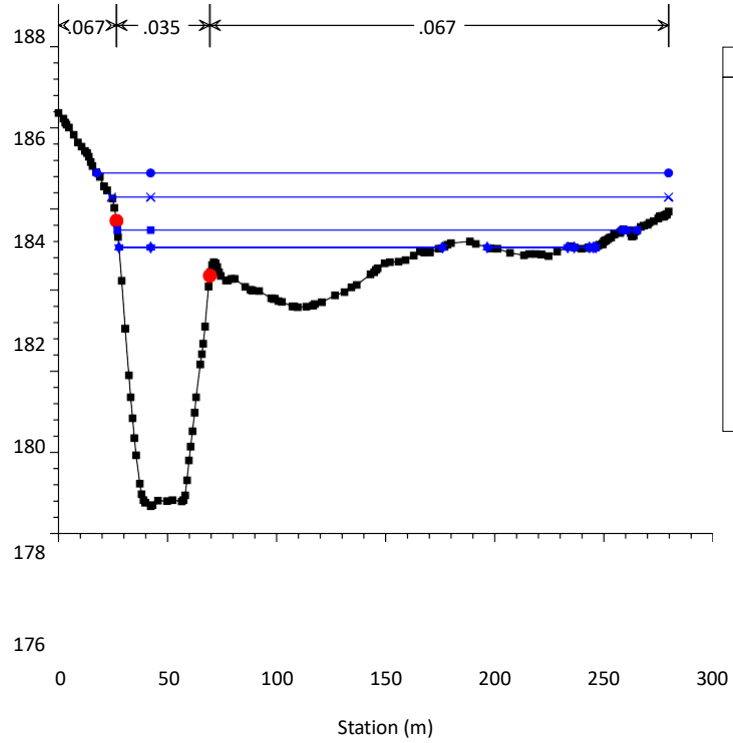




Finale_rev02

Geom: Finale_rev02

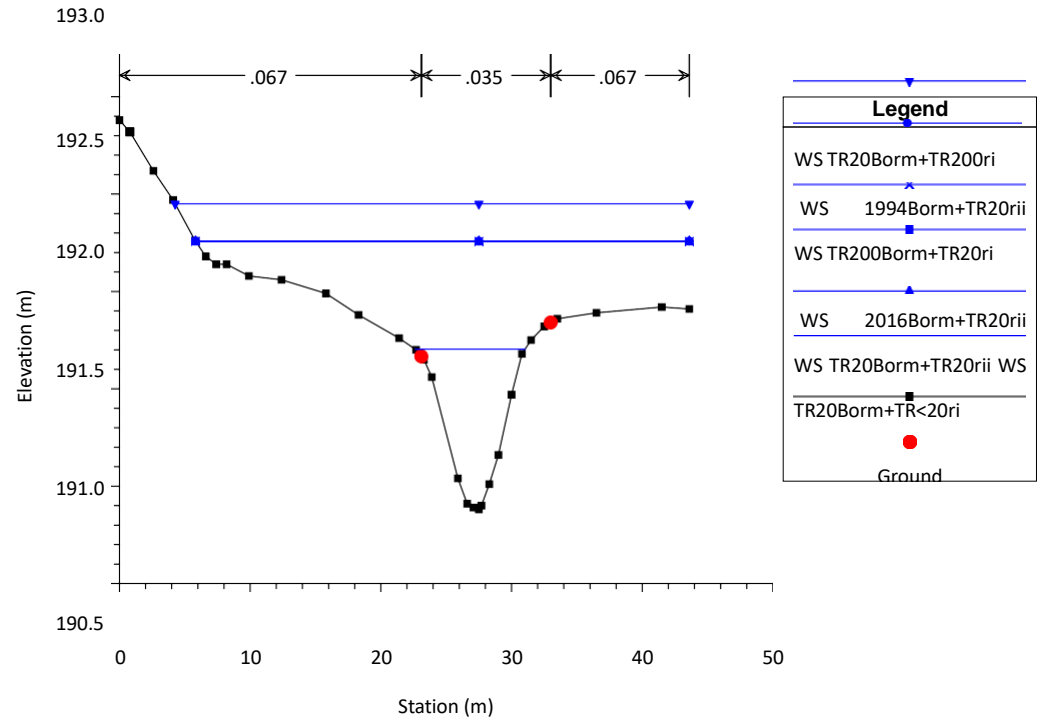
River = Bormida Reach = 1 RS = 1



Finale_rev02

Geom: Finale_rev02

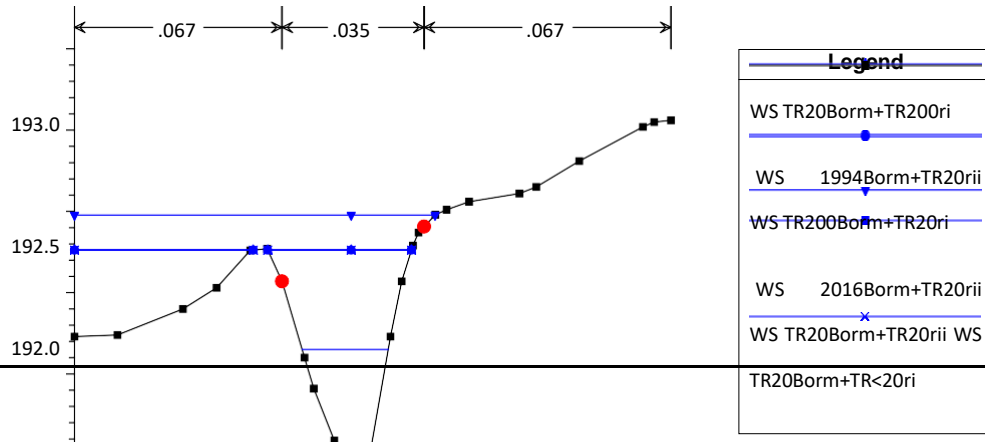
River = Rio Caffra Reach = 1 RS = 205



Finale_rev02

Geom: Finale_rev02

River = Rio Caffra Reach = 1 RS = 203

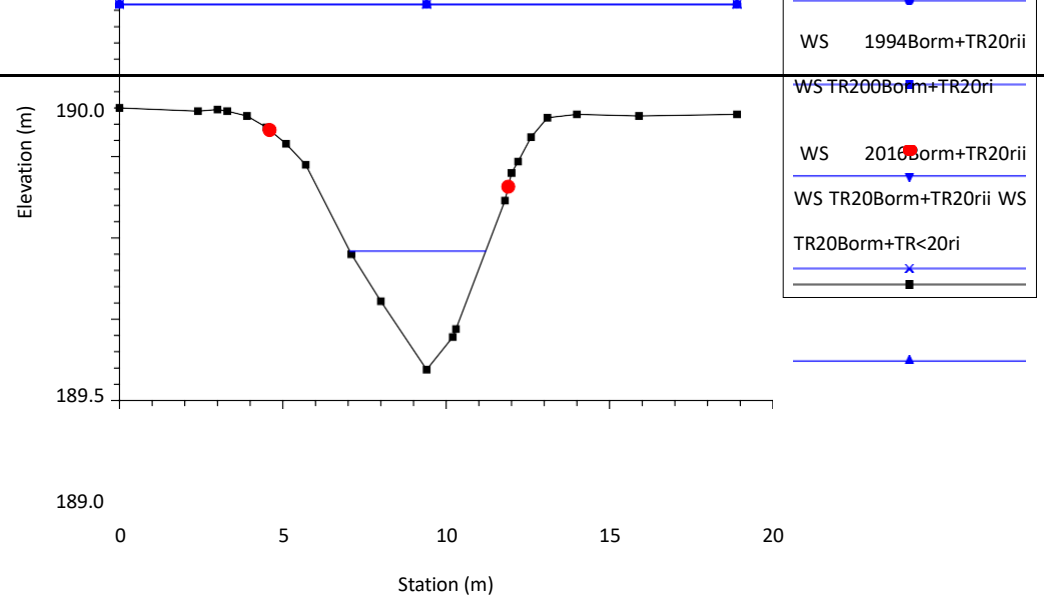
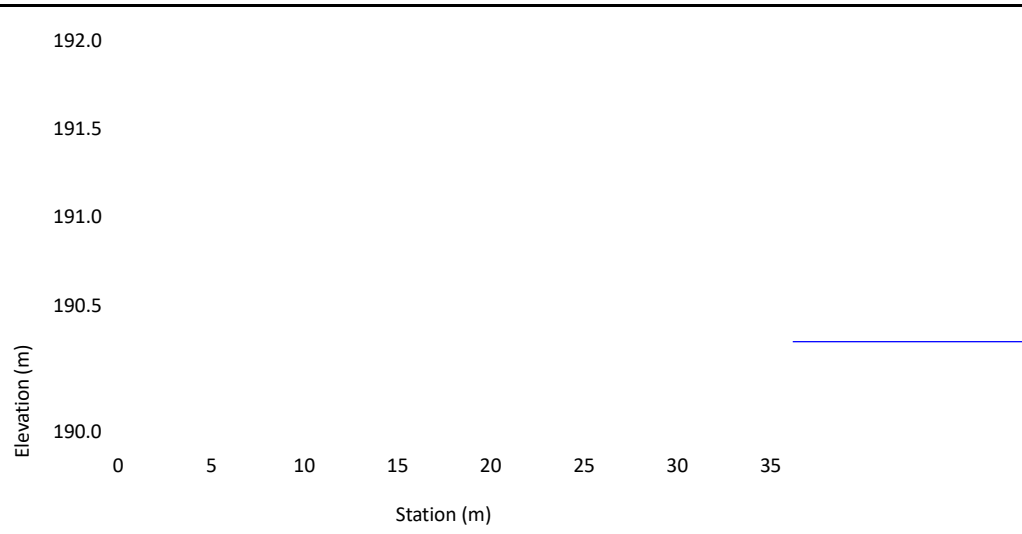


Finale_rev02

Geom: Finale_rev02

River = Rio Caffra Reach = 1 RS = 201



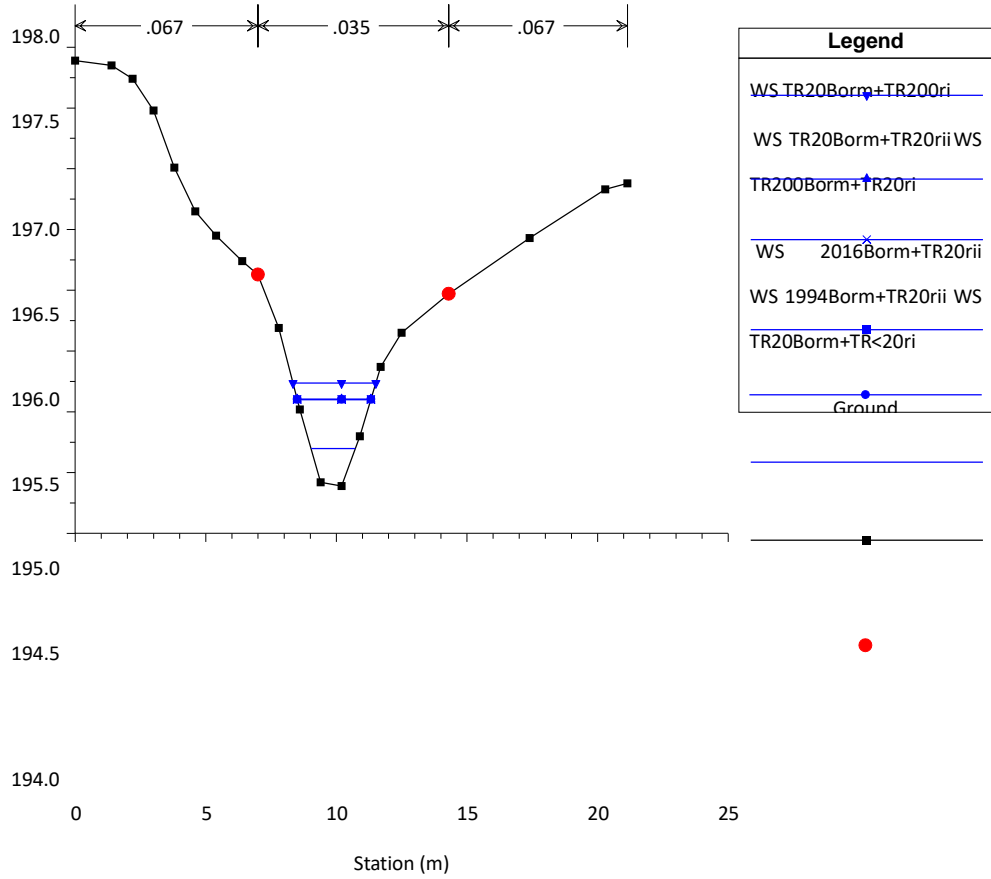


Elevation (m)

Finale_rev02

Geom: Finale_rev02

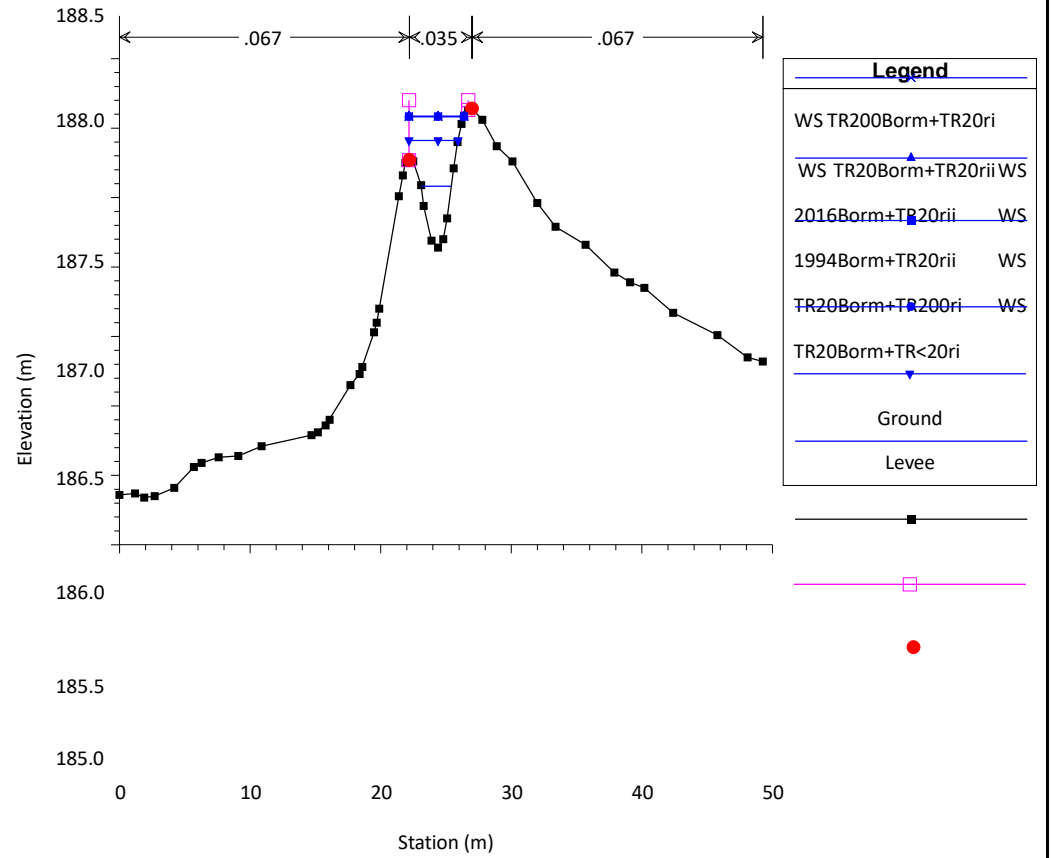
River = Rio Madama Reach = 1 RS = 405



Finale_rev02

Geom: Finale_rev02

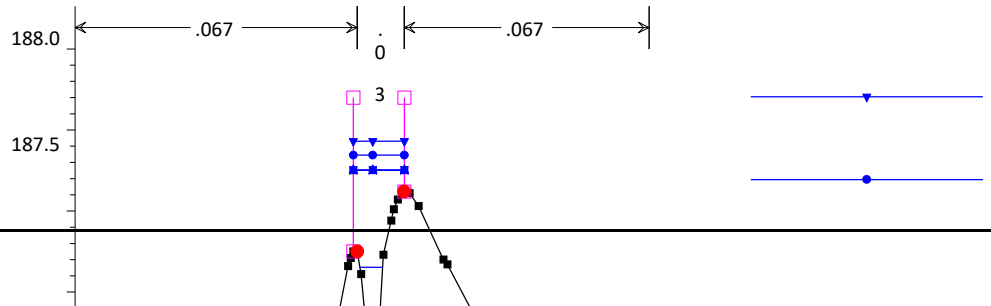
River = Rio Madama Reach = 1 RS = 404



Finale_rev02

Geom: Finale_rev02

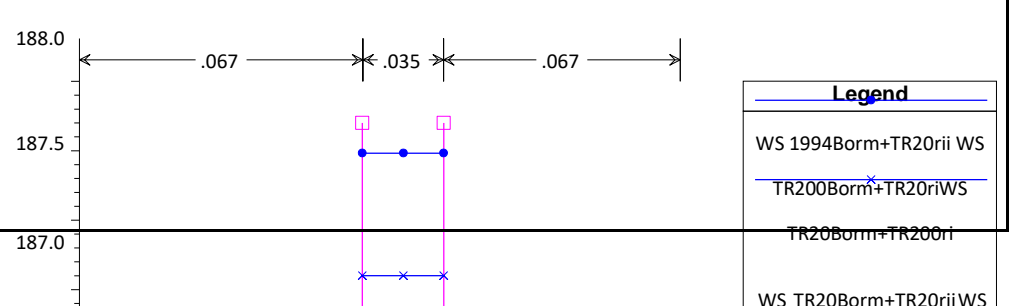
River = Rio Madama Reach = 1 RS = 403

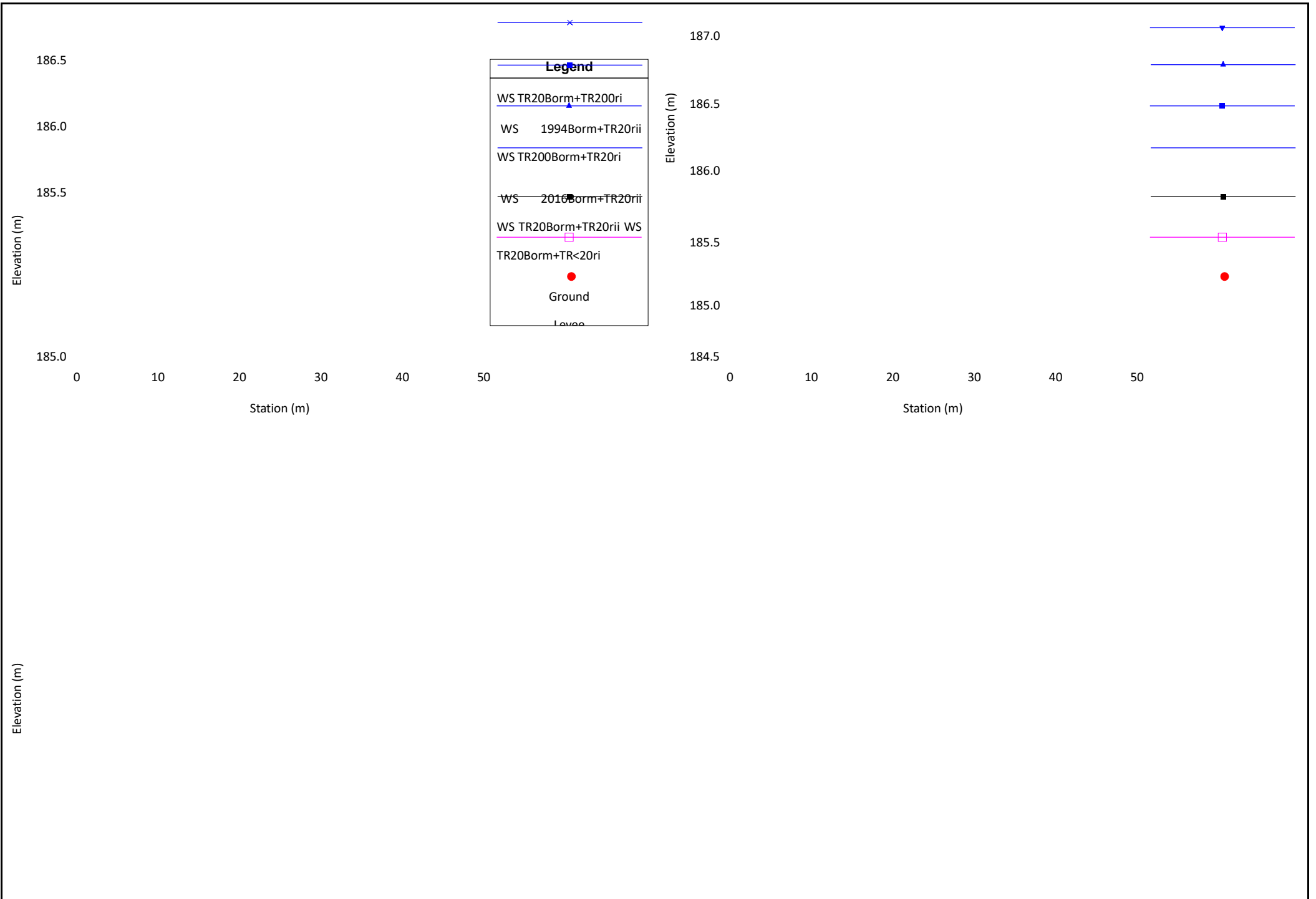


Finale_rev02

Geom: Finale_rev02

River = Rio Madama Reach = 1 RS = 402

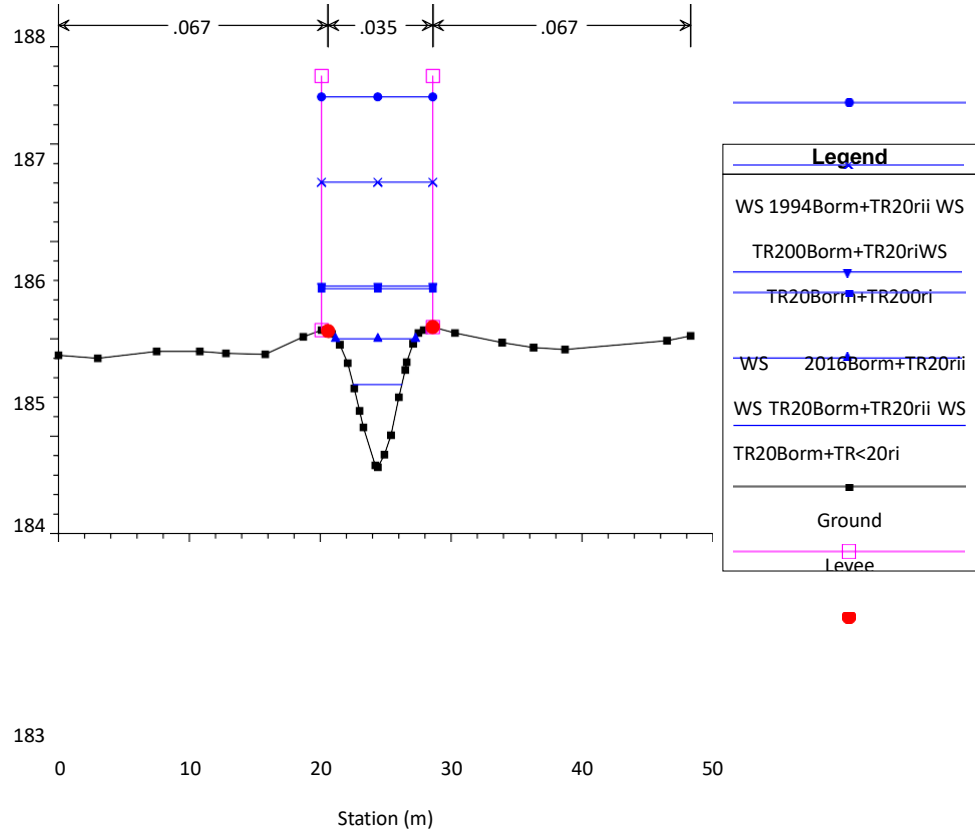




Finale_rev02

Geom: Finale_rev02

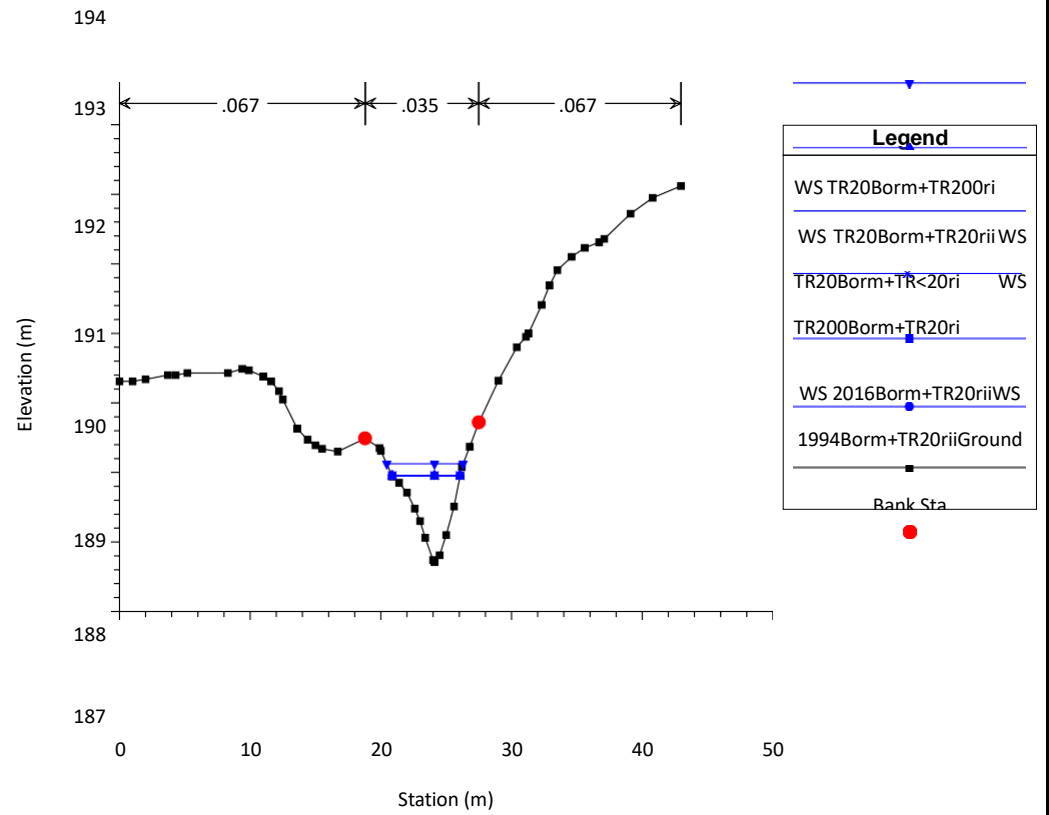
River = Rio Madama Reach = 1 RS = 401



Finale_rev02

Geom: Finale_rev02

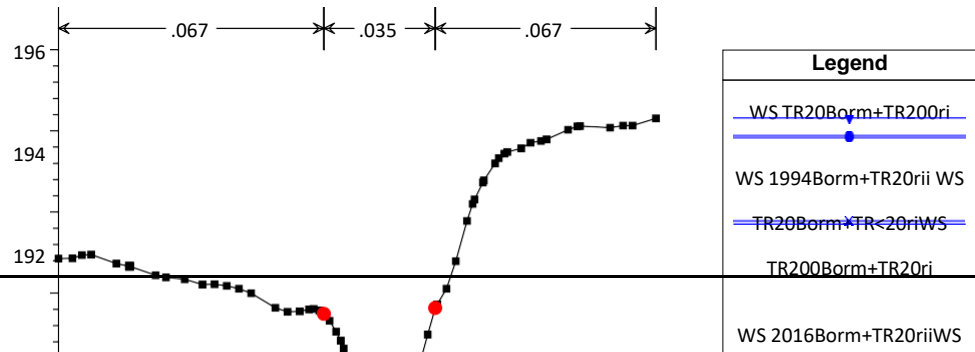
River = Rio Sacco Reach = 1 RS = 306



Finale_rev02

Geom: Finale_rev02

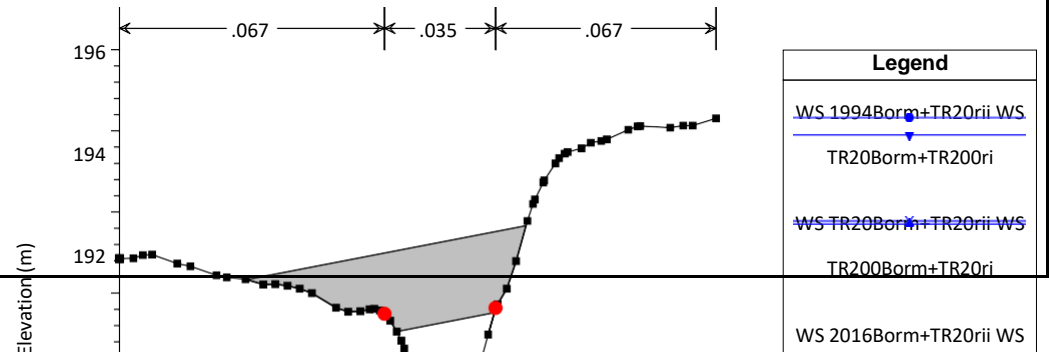
River = Rio Sacco Reach = 1 RS = 305

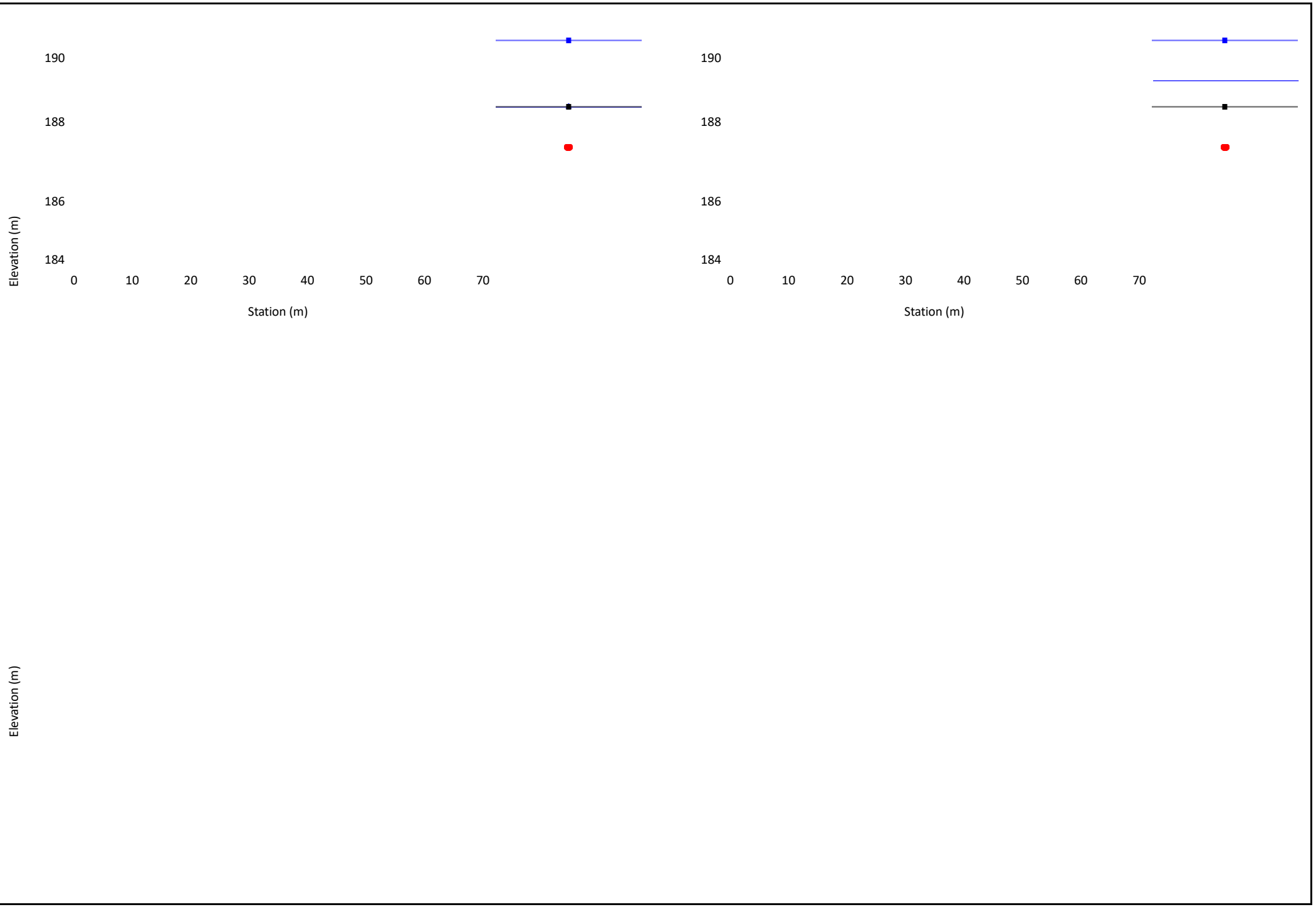


Finale_rev02

Geom: Finale_rev02

River = Rio Sacco Reach = 1 RS = 304.5 BR

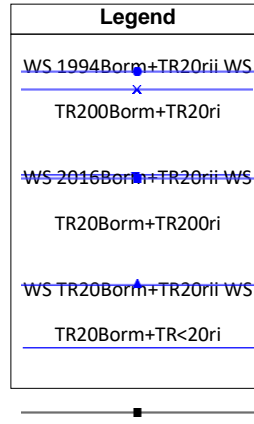
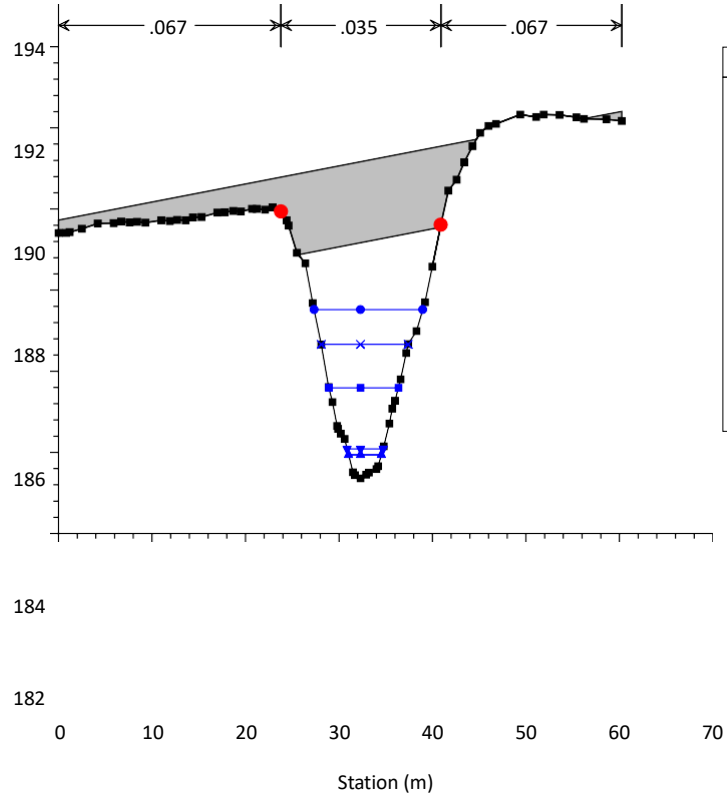




Finale_rev02

Geom: Finale_rev02

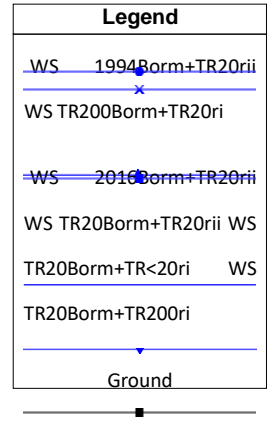
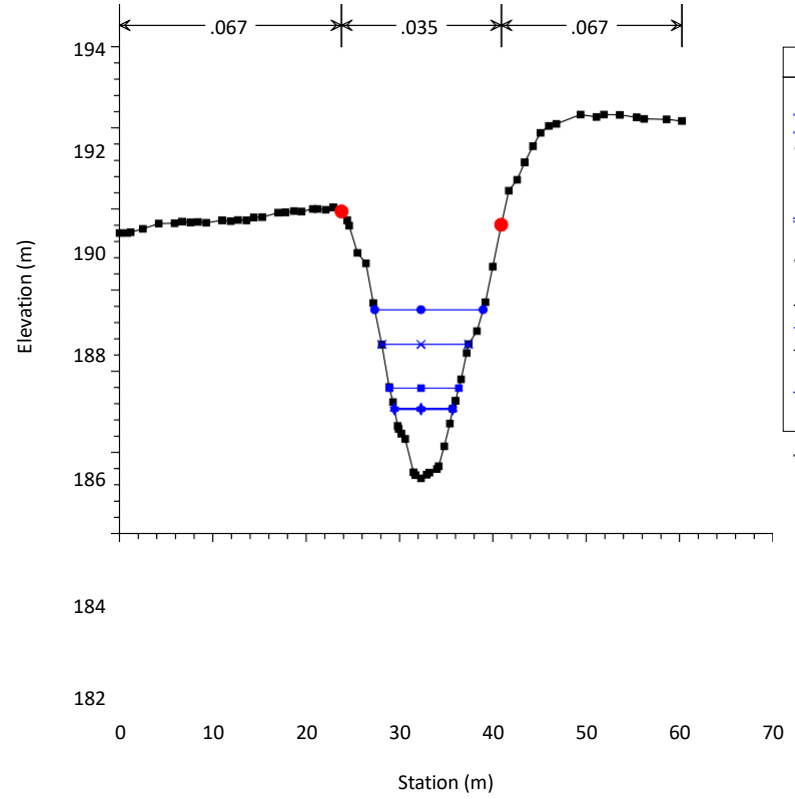
River = Rio Sacco Reach = 1 RS = 304.5 BR



Finale_rev02

Geom: Finale_rev02

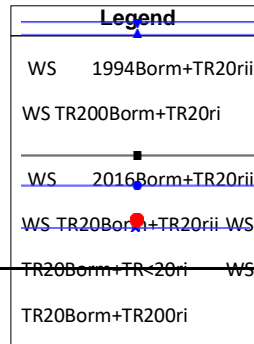
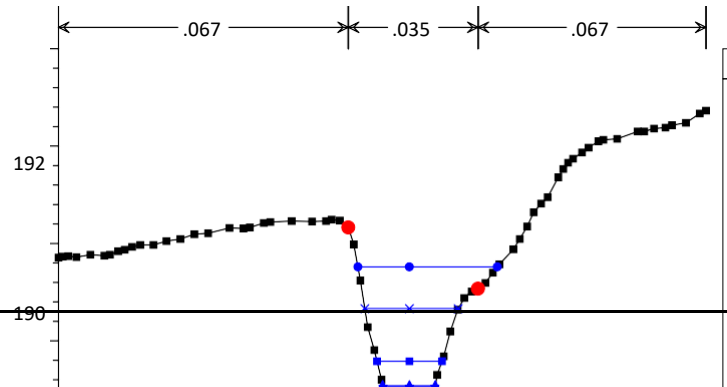
River = Rio Sacco Reach = 1 RS = 304



Finale_rev02

Geom: Finale_rev02

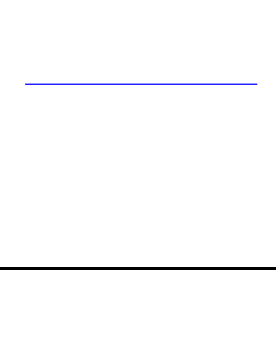
River = Rio Sacco Reach = 1 RS = 303

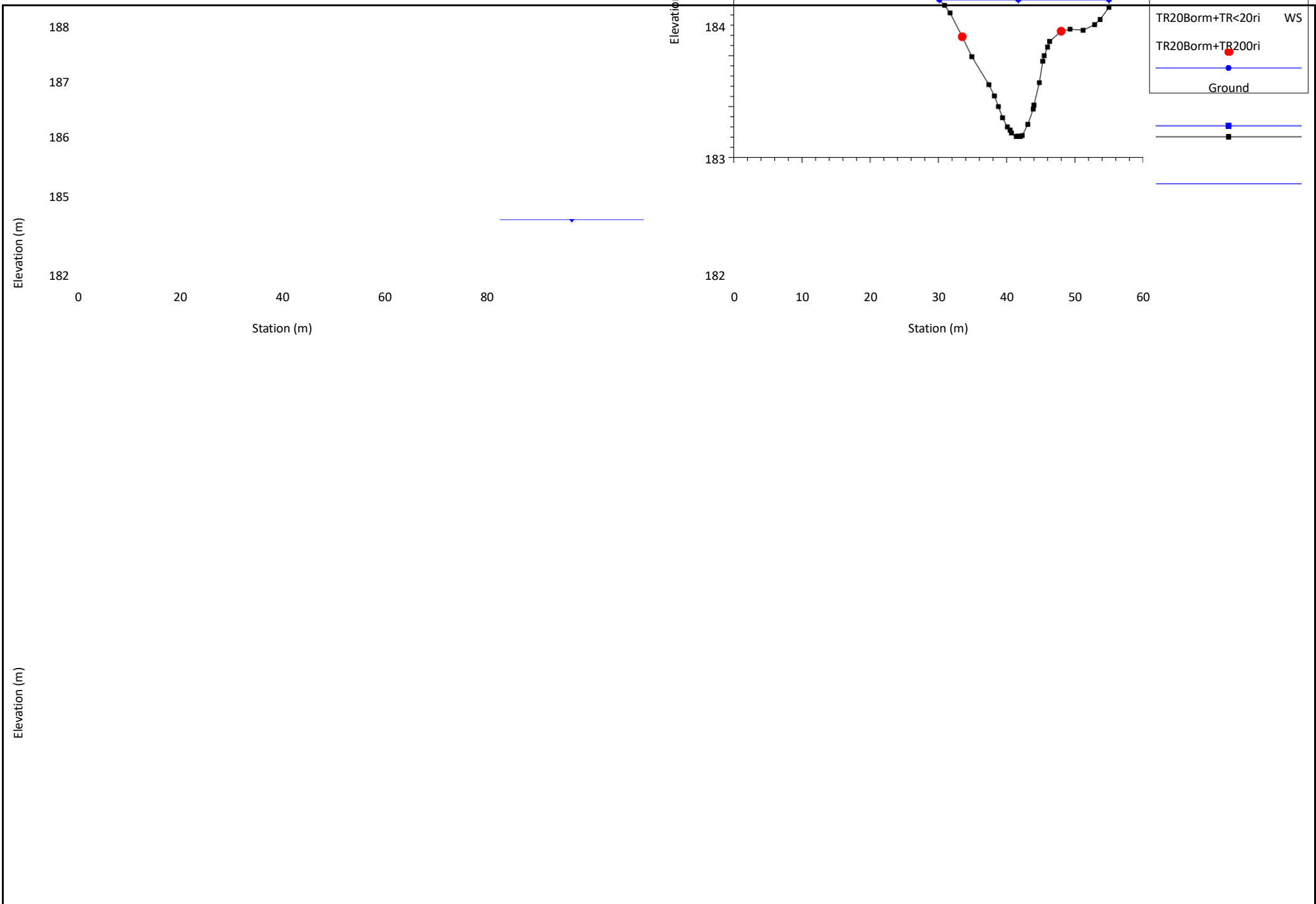


Finale_rev02

Geom: Finale_rev02

River = Rio Sacco Reach = 1 RS = 302

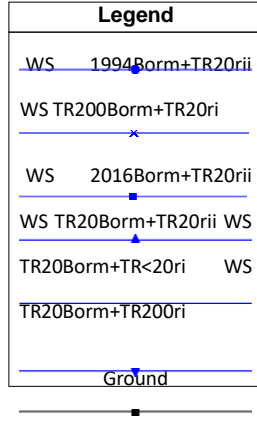
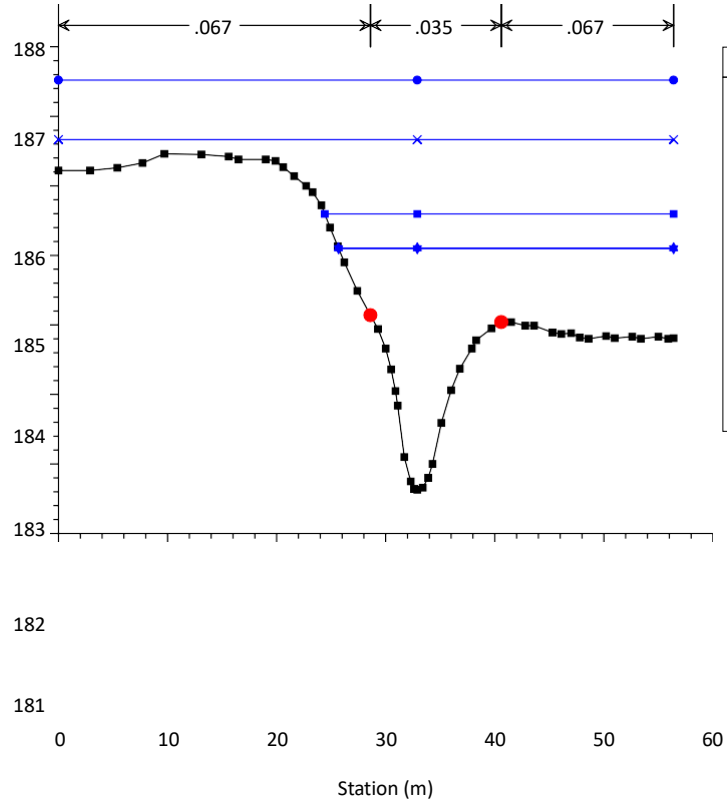




Finale_rev02

Geom: Finale_rev02

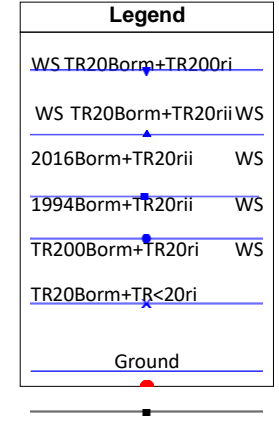
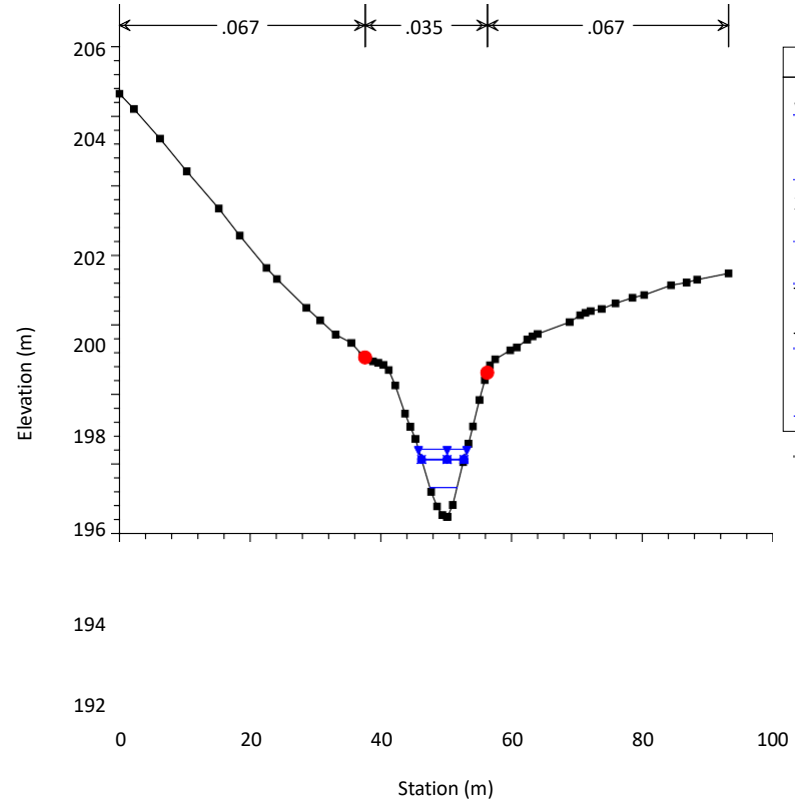
River = Rio Sacco Reach = 1 RS = 301



Finale_rev02

Geom: Finale_rev02

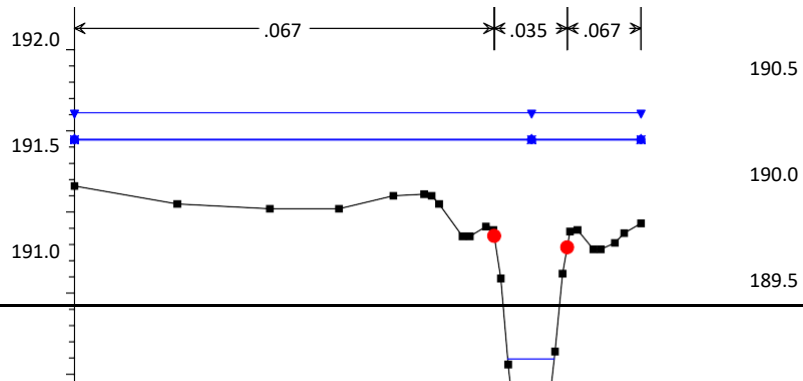
River = Rio San Pietro Reach = 3 RS = 134



Finale_rev02

Geom: Finale_rev02

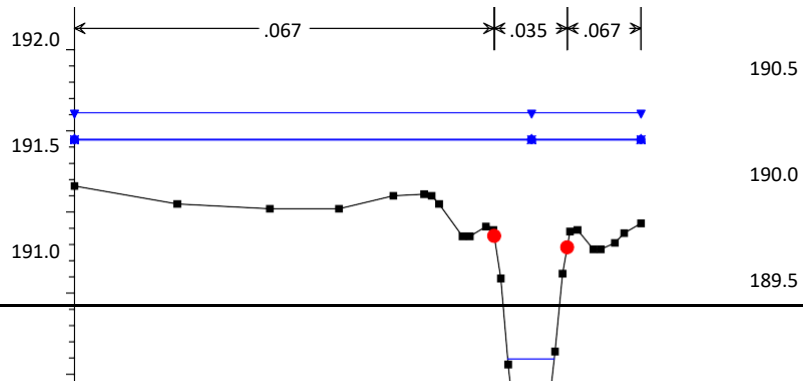
River = Rio San Pietro Reach = 3 RS = 127

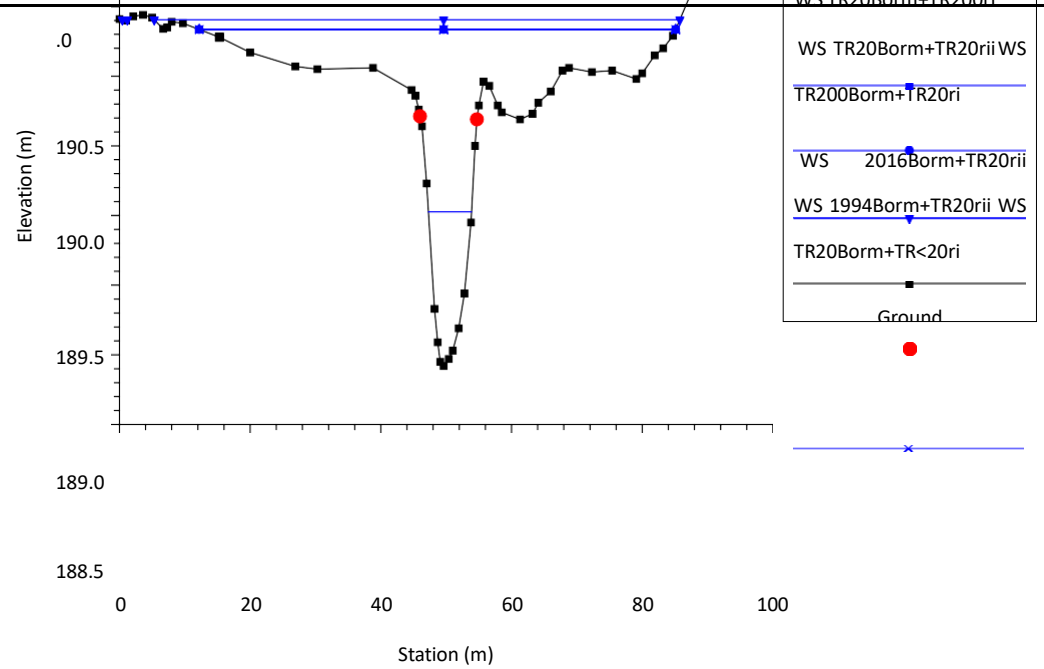
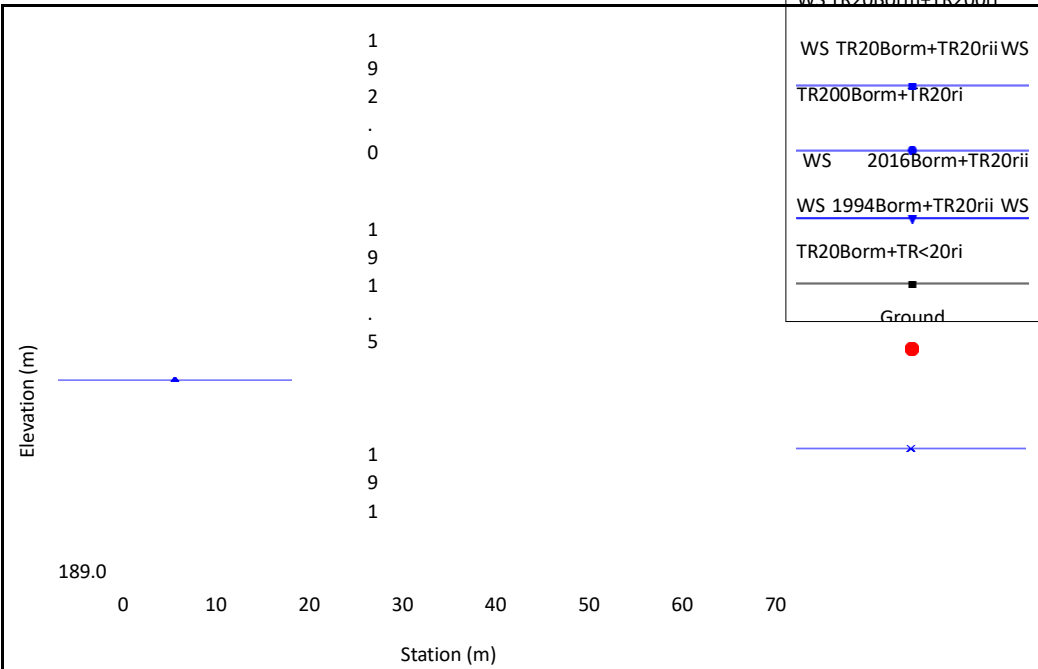


Finale_rev02

Geom: Finale_rev02

River = Rio San Pietro Reach = 2 RS = 126

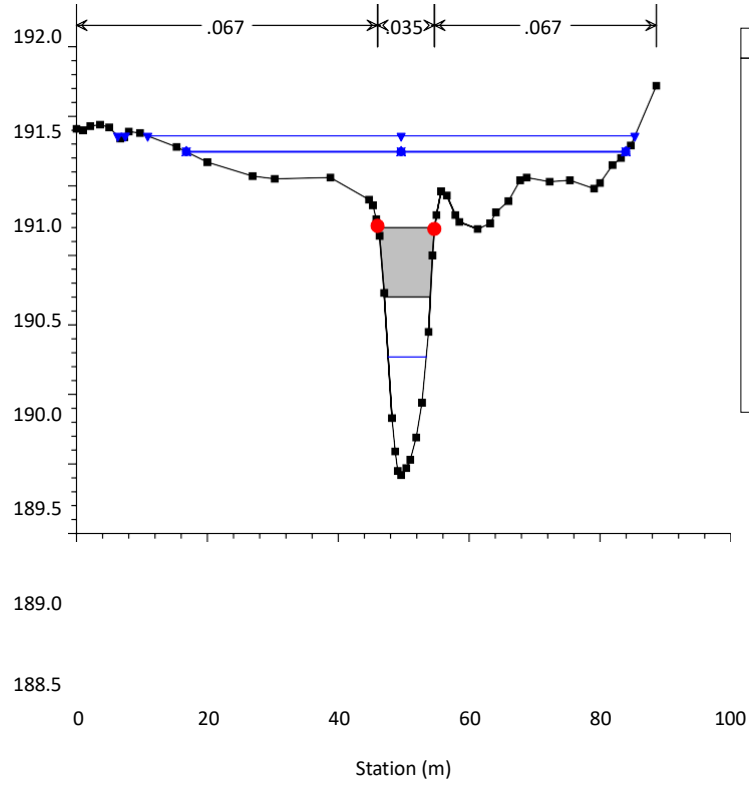




Finale_rev02

Geom: Finale_rev02

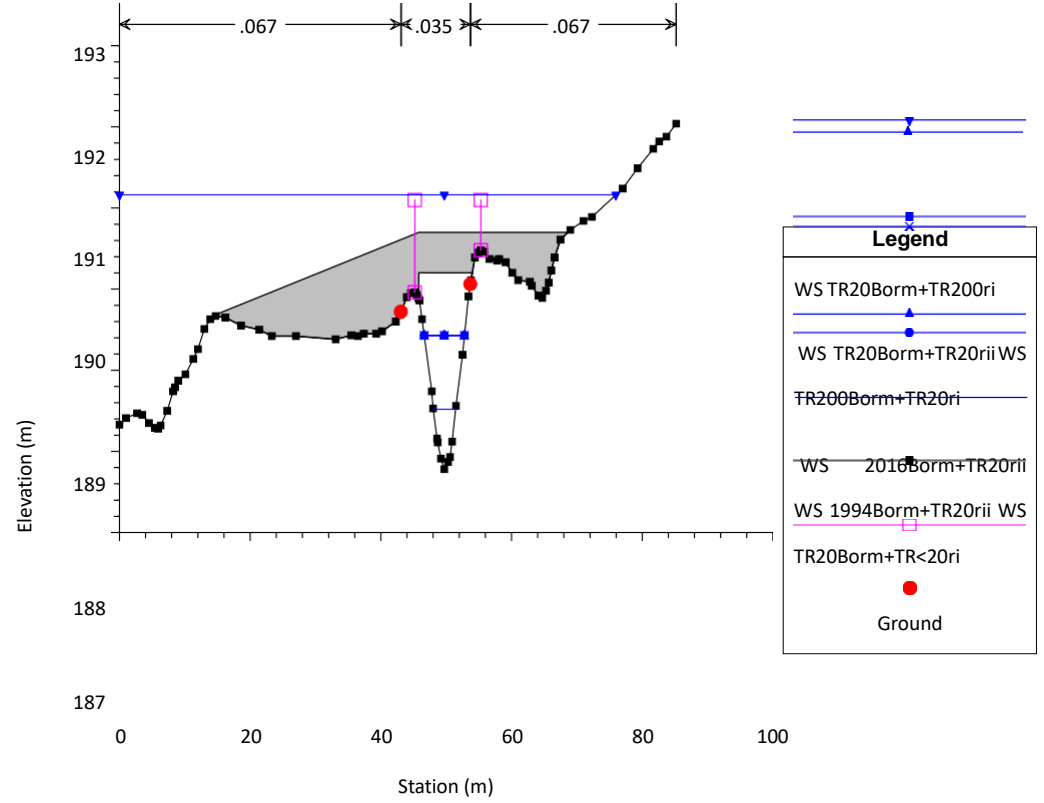
River = Rio San Pietro Reach = 2 RS = 125.5 BR



Finale_rev02

Geom: Finale_rev02

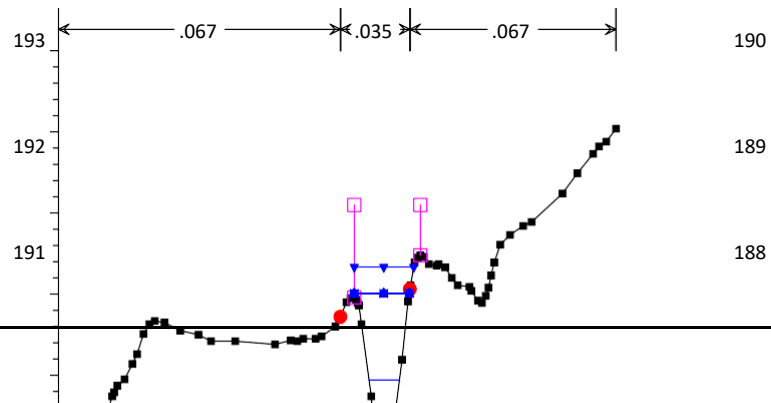
River = Rio San Pietro Reach = 2 RS = 125.5 BR



Finale_rev02

Geom: Finale_rev02

River = Rio San Pietro Reach = 2 RS = 125

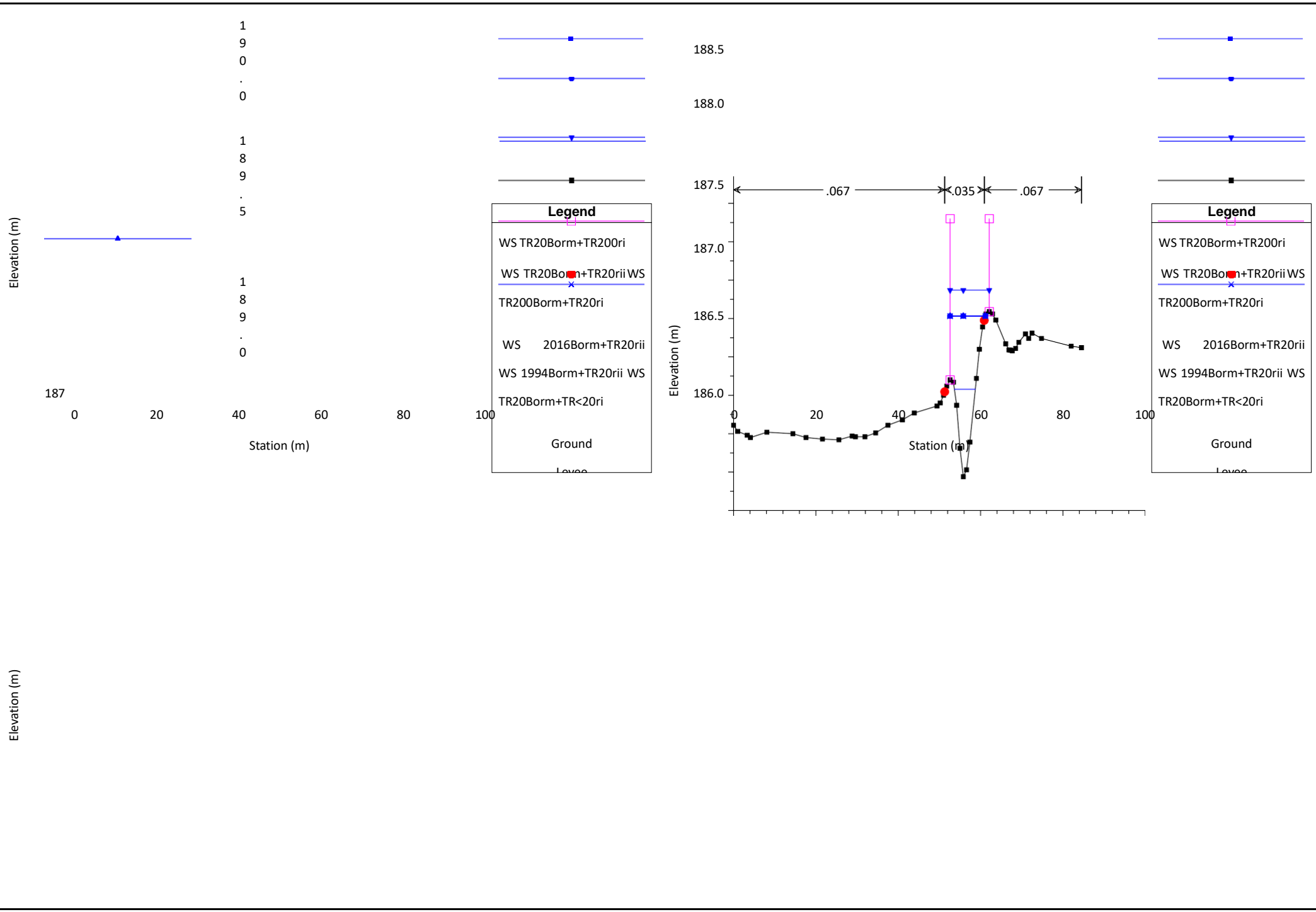


Finale_rev02

Geom: Finale_rev02

River = Rio San Pietro Reach = 2 RS = 121

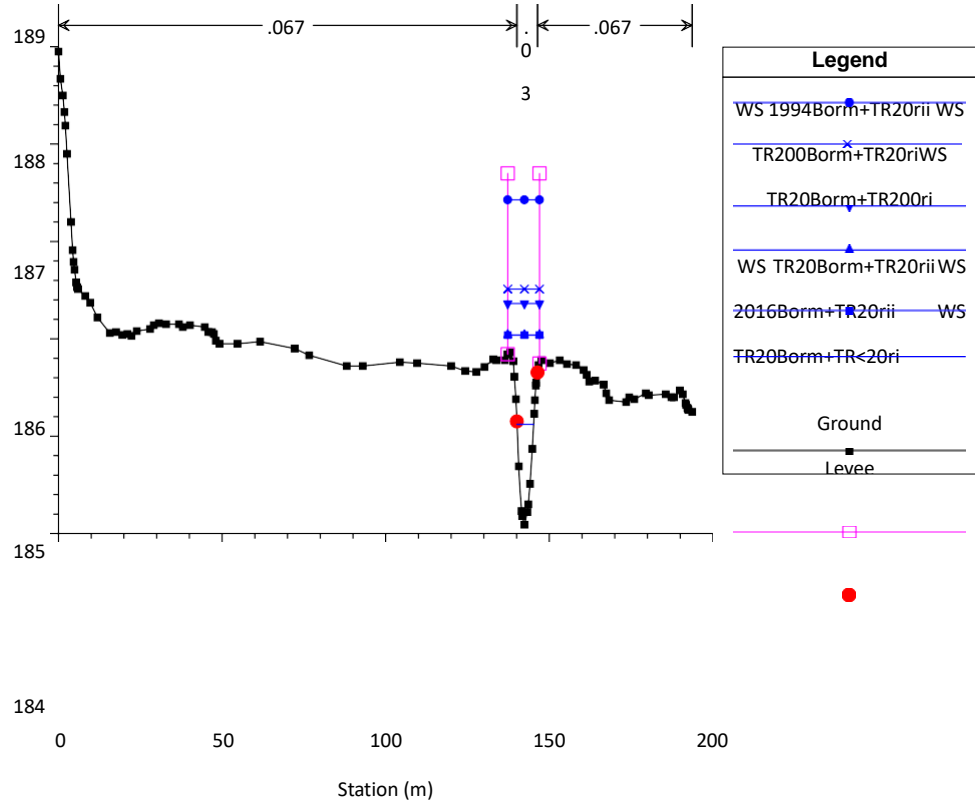




Finale_rev02

Geom: Finale_rev02

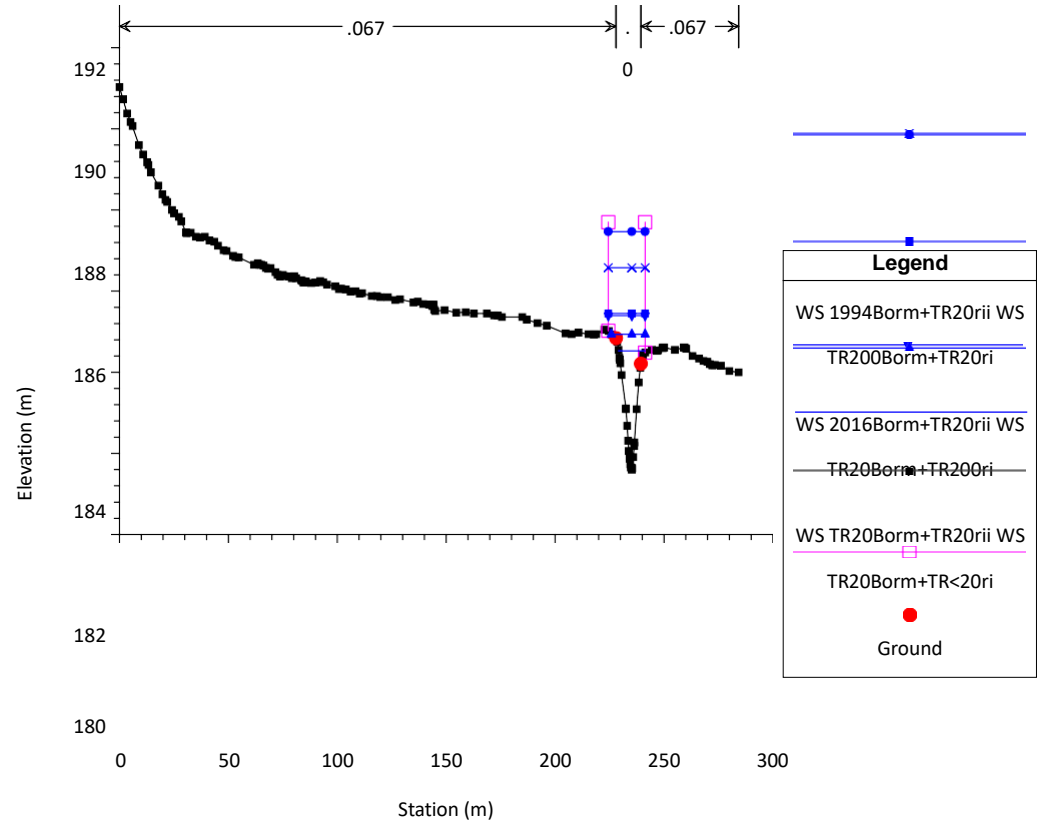
River = Rio San Pietro Reach = 2 RS = 115



Finale_rev02

Geom: Finale_rev02

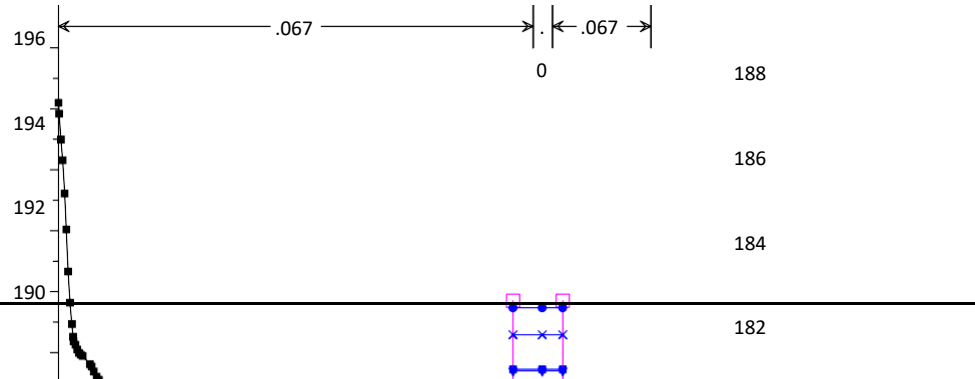
River = Rio San Pietro Reach = 2 RS = 109



Finale_rev02

Geom: Finale_rev02

River = Rio San Pietro Reach = 1 RS = 108

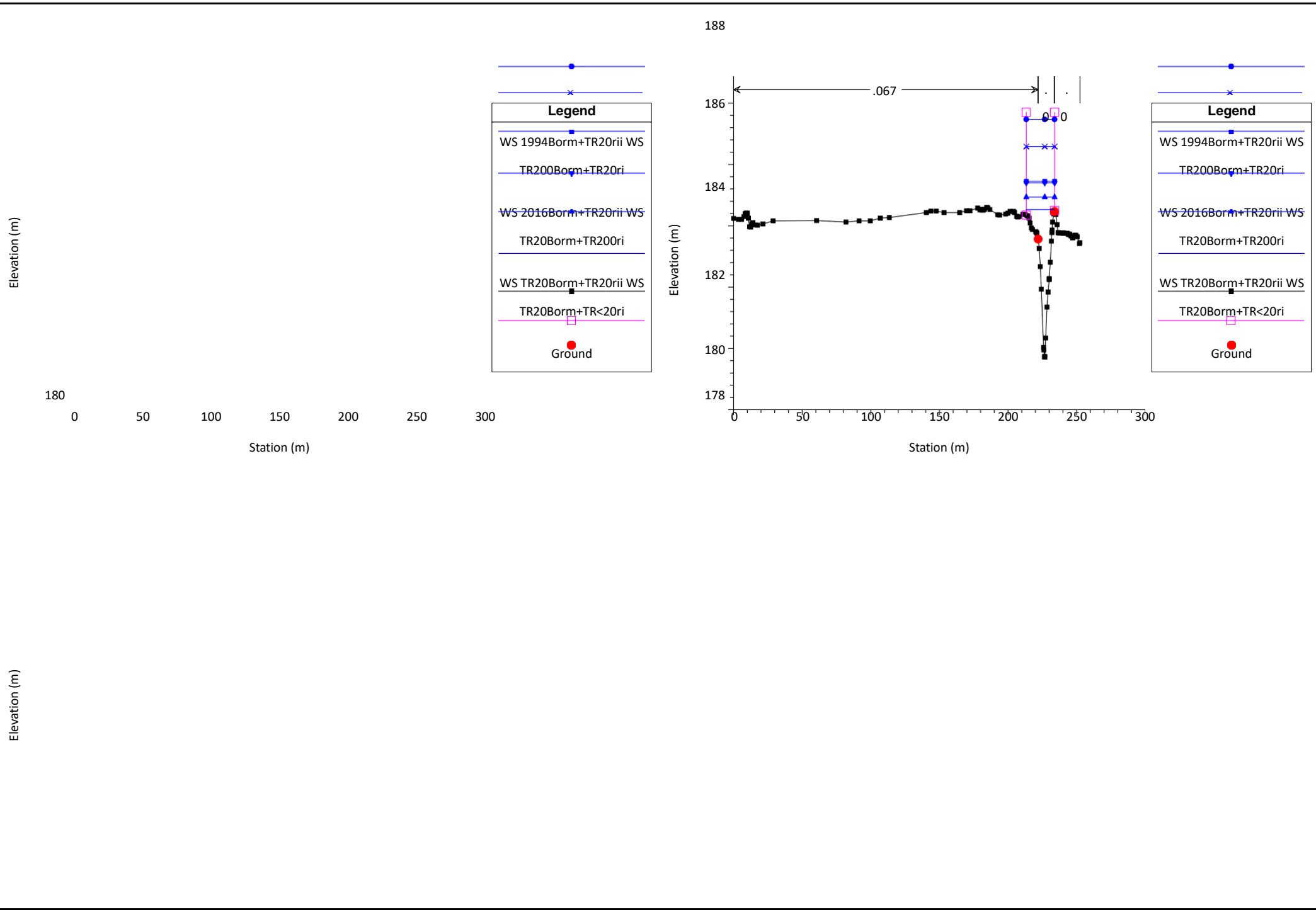


Finale_rev02

Geom: Finale_rev02

River = Rio San Pietro Reach = 1 RS = 105

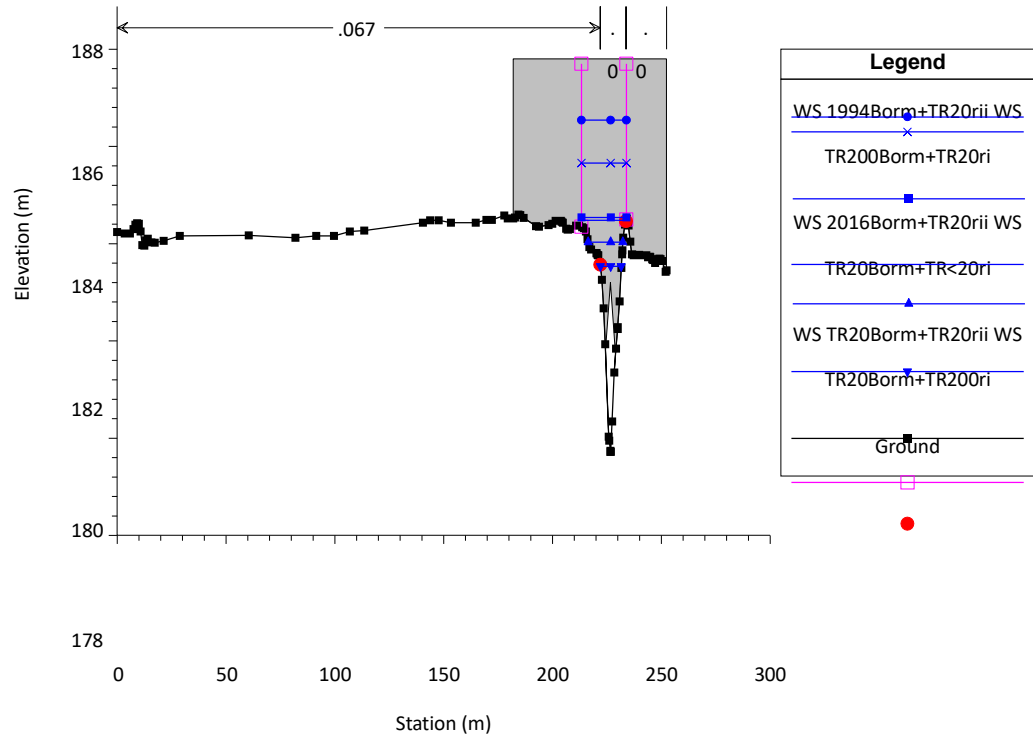




Finale_rev02

Geom: Finale_rev02

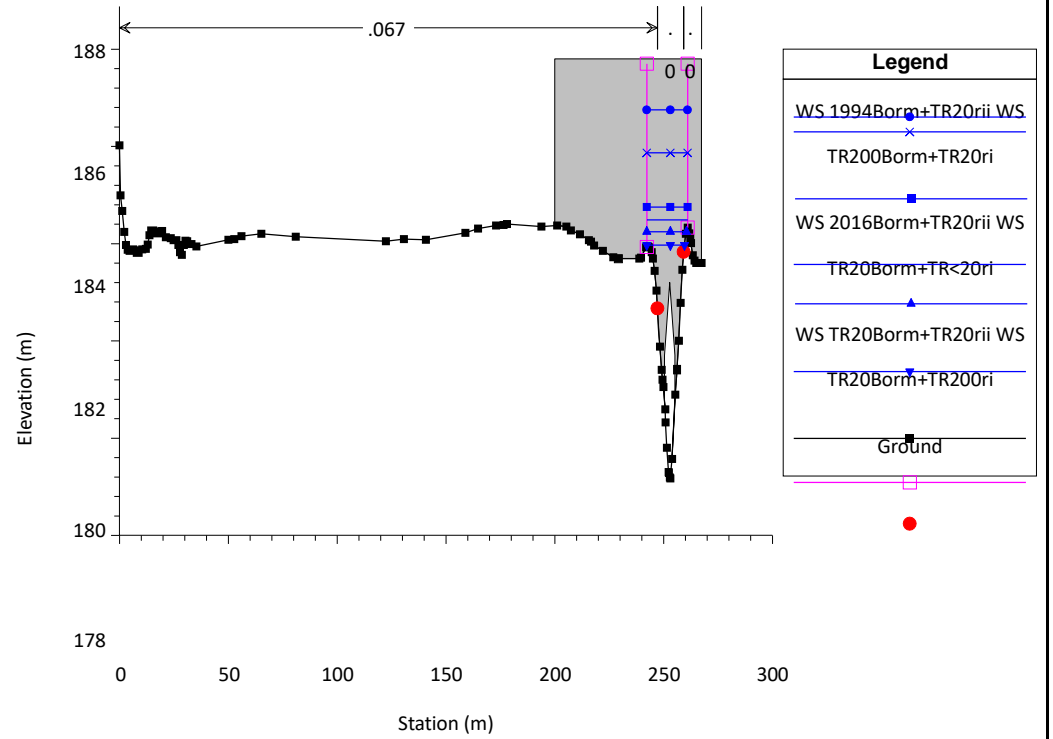
River = Rio San Pietro Reach = 1 RS = 104.5 BR



Finale_rev02

Geom: Finale_rev02

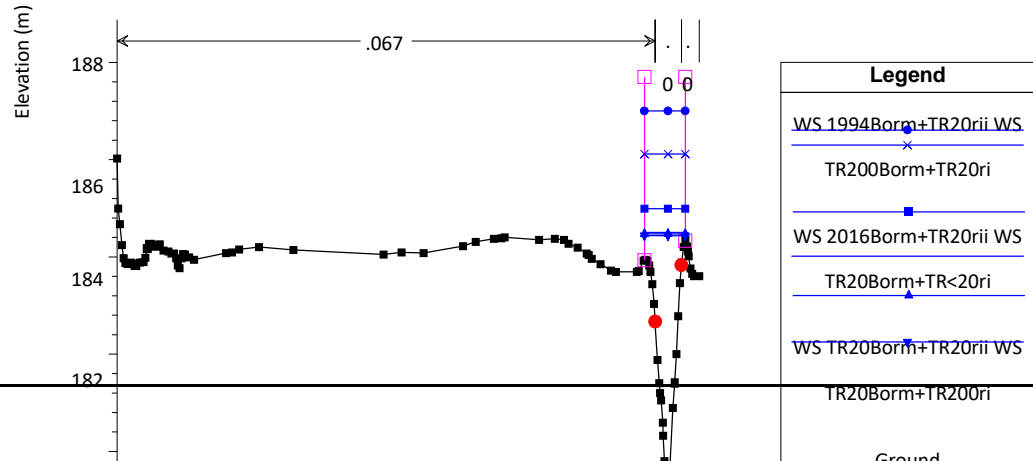
River = Rio San Pietro Reach = 1 RS = 104.5 BR



Finale_rev02

Geom: Finale_rev02

River = Rio San Pietro Reach = 1 RS = 104



180

178

0

50

100

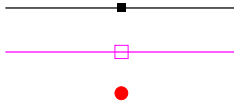
150

200

250

300

Station (m)



8.4 CONFRONTO TRA I DIVERSI LOTTI FUNZIONALI E LA SITUAZIONE ATTUALE IN FUNZIONE DEL TEMPO DI RITORNO TECNICO ASSEGNATO

Nelle seguenti pagine sono riportati, per ognuna delle simulazioni condotte in funzione delle combinazioni di tempi di ritorno individuati, i confronti tra le varie situazioni progettuali previste dai vari lotti funzionali, in ordine di realizzazione.

CONFRONTO 1
TR20Borm+TR<20rii

Corso d'acqua	Portata al colmo [m³/s]	Tempo di ritorno [anni]
Rio Sacco	10.1	20
Rio Madama	1.0	<20
Rio della Caffra	5.0	<20
Rio San Pietro monte	5.0	<20
Rio San Pietro valle	8.0	<20
Bormida di Millesimo a Bubbio	833	20

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	3	134	TR20Borm+TR<20ri	Attuale	5.00	192.48	193.32	193.32	193.58	0.017108	2.29	2.18	4.13	1.01
Rio San Pietro	3	134	TR20Borm+TR<20ri	Lotto1A	5.00	192.48	193.32	193.32	193.58	0.017108	2.29	2.18	4.13	1.01
Rio San Pietro	3	134	TR20Borm+TR<20ri	Lotto1B	5.00	192.48	193.32	193.32	193.58	0.017108	2.29	2.18	4.13	1.01
Rio San Pietro	3	134	TR20Borm+TR<20ri	Lotto1C	5.00	192.48	193.32	193.32	193.58	0.017108	2.29	2.18	4.13	1.01
Rio San Pietro	3	134	TR20Borm+TR<20ri	Finale	5.00	192.48	193.32	193.32	193.58	0.017108	2.29	2.18	4.13	1.01
Rio San Pietro	3	133.00*	TR20Borm+TR<20ri	Attuale	5.00	192.00	192.82	192.85	193.12	0.020016	2.43	2.06	4.01	1.09
Rio San Pietro	3	133.00*	TR20Borm+TR<20ri	Lotto1A	5.00	192.00	192.82	192.85	193.12	0.020016	2.43	2.06	4.01	1.09
Rio San Pietro	3	133.00*	TR20Borm+TR<20ri	Lotto1B	5.00	192.00	192.82	192.85	193.12	0.020016	2.43	2.06	4.01	1.09
Rio San Pietro	3	133.00*	TR20Borm+TR<20ri	Lotto1C	5.00	192.00	192.82	192.85	193.12	0.020016	2.43	2.06	4.01	1.09
Rio San Pietro	3	133.00*	TR20Borm+TR<20ri	Finale	5.00	192.00	192.82	192.85	193.12	0.020016	2.43	2.06	4.01	1.09
Rio San Pietro	3	132.00*	TR20Borm+TR<20ri	Attuale	5.00	191.53	192.38	192.38	192.65	0.017302	2.31	2.16	4.08	1.01
Rio San Pietro	3	132.00*	TR20Borm+TR<20ri	Lotto1A	5.00	191.53	192.38	192.38	192.65	0.017302	2.31	2.16	4.08	1.01
Rio San Pietro	3	132.00*	TR20Borm+TR<20ri	Lotto1B	5.00	191.53	192.38	192.38	192.65	0.017302	2.31	2.16	4.08	1.01
Rio San Pietro	3	132.00*	TR20Borm+TR<20ri	Lotto1C	5.00	191.53	192.38	192.38	192.65	0.017302	2.31	2.16	4.08	1.01
Rio San Pietro	3	132.00*	TR20Borm+TR<20ri	Finale	5.00	191.53	192.38	192.38	192.65	0.017302	2.31	2.16	4.08	1.01
Rio San Pietro	3	131.00*	TR20Borm+TR<20ri	Attuale	5.00	191.05	191.88	191.91	192.18	0.020188	2.44	2.05	4.00	1.09
Rio San Pietro	3	131.00*	TR20Borm+TR<20ri	Lotto1A	5.00	191.05	191.88	191.91	192.18	0.020188	2.44	2.05	4.00	1.09
Rio San Pietro	3	131.00*	TR20Borm+TR<20ri	Lotto1B	5.00	191.05	191.88	191.91	192.18	0.020188	2.44	2.05	4.00	1.09
Rio San Pietro	3	131.00*	TR20Borm+TR<20ri	Lotto1C	5.00	191.05	191.88	191.91	192.18	0.020188	2.44	2.05	4.00	1.09
Rio San Pietro	3	131.00*	TR20Borm+TR<20ri	Finale	5.00	191.05	191.88	191.91	192.18	0.020188	2.44	2.05	4.00	1.09
Rio San Pietro	3	130.00*	TR20Borm+TR<20ri	Attuale	5.00	190.58	191.43	191.44	191.71	0.017638	2.32	2.16	4.13	1.02
Rio San Pietro	3	130.00*	TR20Borm+TR<20ri	Lotto1A	5.00	190.58	191.43	191.44	191.71	0.017638	2.32	2.16	4.13	1.02
Rio San Pietro	3	130.00*	TR20Borm+TR<20ri	Lotto1B	5.00	190.58	191.43	191.44	191.71	0.017638	2.32	2.16	4.13	1.02
Rio San Pietro	3	130.00*	TR20Borm+TR<20ri	Lotto1C	5.00	190.58	191.43	191.44	191.71	0.017638	2.32	2.16	4.13	1.02
Rio San Pietro	3	130.00*	TR20Borm+TR<20ri	Finale	5.00	190.58	191.43	191.44	191.71	0.017638	2.32	2.16	4.13	1.02
Rio San Pietro	3	129.00*	TR20Borm+TR<20ri	Attuale	5.00	190.10	190.92	190.96	191.23	0.020777	2.44	2.05	4.13	1.11
Rio San Pietro	3	129.00*	TR20Borm+TR<20ri	Lotto1A	5.00	190.10	190.92	190.96	191.23	0.020777	2.44	2.05	4.13	1.11
Rio San Pietro	3	129.00*	TR20Borm+TR<20ri	Lotto1B	5.00	190.10	190.92	190.96	191.23	0.020777	2.44	2.05	4.13	1.11
Rio San Pietro	3	129.00*	TR20Borm+TR<20ri	Lotto1C	5.00	190.10	190.92	190.96	191.23	0.020777	2.44	2.05	4.13	1.11
Rio San Pietro	3	129.00*	TR20Borm+TR<20ri	Finale	5.00	190.10	190.92	190.96	191.23	0.020777	2.44	2.05	4.13	1.11
Rio San Pietro	3	128.00*	TR20Borm+TR<20ri	Attuale	5.00	189.63	190.45	190.47	190.73	0.018705	2.32	2.16	4.38	1.05
Rio San Pietro	3	128.00*	TR20Borm+TR<20ri	Lotto1A	5.00	189.63	190.45	190.47	190.73	0.018705	2.32	2.16	4.38	1.05
Rio San Pietro	3	128.00*	TR20Borm+TR<20ri	Lotto1B	5.00	189.63	190.45	190.47	190.73	0.018705	2.32	2.16	4.38	1.05
Rio San Pietro	3	128.00*	TR20Borm+TR<20ri	Lotto1C	5.00	189.63	190.45	190.47	190.73	0.018705	2.32	2.16	4.38	1.05
Rio San Pietro	3	128.00*	TR20Borm+TR<20ri	Finale	5.00	189.63	190.45	190.47	190.73	0.018705	2.32	2.16	4.38	1.05
Rio San Pietro	3	127	TR20Borm+TR<20ri	Attuale	5.00	189.15	190.09	189.97	190.25	0.008760	1.75	2.85	4.97	0.74
Rio San Pietro	3	127	TR20Borm+TR<20ri	Lotto1A	5.00	189.15	190.09	189.97	190.25	0.008760	1.75	2.85	4.97	0.74
Rio San Pietro	3	127	TR20Borm+TR<20ri	Lotto1B	5.00	189.15	190.09	189.97	190.25	0.008760	1.75	2.85	4.97	0.74
Rio San Pietro	3	127	TR20Borm+TR<20ri	Lotto1C	5.00	189.15	190.09	189.97	190.25	0.008760	1.75	2.85	4.97	0.74
Rio San Pietro	3	127	TR20Borm+TR<20ri	Finale	5.00	189.15	190.09	189.97	190.25	0.008760	1.75	2.85	4.97	0.74

HEC-RAS Profile: TR20Borm+TR<20ri (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	126	TR20Borm+TR<20ri	Attuale	8.00	188.92	190.03	189.77	190.16	0.005187	1.61	4.95	6.61	0.60
Rio San Pietro	2	126	TR20Borm+TR<20ri	Lotto1A	8.00	188.92	190.03	189.77	190.16	0.005187	1.61	4.95	6.61	0.60
Rio San Pietro	2	126	TR20Borm+TR<20ri	Lotto1B	8.00	188.92	190.03	189.77	190.16	0.005187	1.61	4.95	6.61	0.60
Rio San Pietro	2	126	TR20Borm+TR<20ri	Lotto1C	8.00	188.92	190.03	189.77	190.16	0.005187	1.61	4.95	6.61	0.60
Rio San Pietro	2	126	TR20Borm+TR<20ri	Finale	8.00	188.92	190.03	189.77	190.16	0.005187	1.61	4.95	6.61	0.60
Rio San Pietro	2	125.5			Bridge									
Rio San Pietro	2	125	TR20Borm+TR<20ri	Attuale	8.00	187.78	188.94	188.90	189.24	0.013680	2.43	3.29	4.65	0.92
Rio San Pietro	2	125	TR20Borm+TR<20ri	Lotto1A	8.00	187.78	188.94	188.90	189.24	0.013680	2.43	3.29	4.65	0.92
Rio San Pietro	2	125	TR20Borm+TR<20ri	Lotto1B	8.00	187.78	188.94	188.90	189.24	0.013680	2.43	3.29	4.65	0.92
Rio San Pietro	2	125	TR20Borm+TR<20ri	Lotto1C	8.00	187.78	188.94	188.90	189.24	0.013680	2.43	3.29	4.65	0.92
Rio San Pietro	2	125	TR20Borm+TR<20ri	Finale	8.00	187.78	188.94	188.90	189.24	0.013675	2.43	3.29	4.65	0.92
Rio San Pietro	2	124.00*	TR20Borm+TR<20ri	Attuale	8.00	187.45	188.61	188.57	188.91	0.013528	2.41	3.32	4.74	0.92
Rio San Pietro	2	124.00*	TR20Borm+TR<20ri	Lotto1A	8.00	187.45	188.61	188.57	188.91	0.013528	2.41	3.32	4.74	0.92
Rio San Pietro	2	124.00*	TR20Borm+TR<20ri	Lotto1B	8.00	187.45	188.61	188.57	188.91	0.013528	2.41	3.32	4.74	0.92
Rio San Pietro	2	124.00*	TR20Borm+TR<20ri	Lotto1C	8.00	187.45	188.61	188.57	188.91	0.013528	2.41	3.32	4.74	0.92
Rio San Pietro	2	124.00*	TR20Borm+TR<20ri	Finale	8.00	187.45	188.61	188.57	188.91	0.013550	2.41	3.31	4.74	0.92
Rio San Pietro	2	123.00*	TR20Borm+TR<20ri	Attuale	8.00	187.11	188.27	188.24	188.57	0.013931	2.42	3.30	4.82	0.94
Rio San Pietro	2	123.00*	TR20Borm+TR<20ri	Lotto1A	8.00	187.11	188.27	188.24	188.57	0.013931	2.42	3.30	4.82	0.94
Rio San Pietro	2	123.00*	TR20Borm+TR<20ri	Lotto1B	8.00	187.11	188.27	188.24	188.57	0.013931	2.42	3.30	4.82	0.94
Rio San Pietro	2	123.00*	TR20Borm+TR<20ri	Lotto1C	8.00	187.11	188.27	188.24	188.57	0.013931	2.42	3.30	4.82	0.94
Rio San Pietro	2	123.00*	TR20Borm+TR<20ri	Finale	8.00	187.11	188.27	188.24	188.57	0.013892	2.42	3.30	4.83	0.93
Rio San Pietro	2	122.00*	TR20Borm+TR<20ri	Attuale	8.00	186.78	187.97	187.90	188.24	0.012155	2.28	3.51	5.12	0.88
Rio San Pietro	2	122.00*	TR20Borm+TR<20ri	Lotto1A	8.00	186.78	187.97	187.90	188.24	0.012155	2.28	3.51	5.12	0.88
Rio San Pietro	2	122.00*	TR20Borm+TR<20ri	Lotto1B	8.00	186.78	187.97	187.90	188.24	0.012155	2.28	3.51	5.12	0.88
Rio San Pietro	2	122.00*	TR20Borm+TR<20ri	Lotto1C	8.00	186.78	187.97	187.90	188.24	0.012155	2.28	3.51	5.12	0.88
Rio San Pietro	2	122.00*	TR20Borm+TR<20ri	Finale	8.00	186.78	187.97	187.90	188.24	0.012345	2.29	3.49	5.11	0.88
Rio San Pietro	2	121	TR20Borm+TR<20ri	Attuale	8.00	186.44	187.57	187.57	187.89	0.016026	2.49	3.21	5.06	1.00
Rio San Pietro	2	121	TR20Borm+TR<20ri	Lotto1A	8.00	186.44	187.57	187.57	187.89	0.016026	2.49	3.21	5.06	1.00
Rio San Pietro	2	121	TR20Borm+TR<20ri	Lotto1B	8.00	186.44	187.57	187.57	187.89	0.016026	2.49	3.21	5.06	1.00
Rio San Pietro	2	121	TR20Borm+TR<20ri	Lotto1C	8.00	186.44	187.57	187.57	187.89	0.016026	2.49	3.21	5.06	1.00
Rio San Pietro	2	121	TR20Borm+TR<20ri	Finale	8.00	186.44	187.58	187.57	187.89	0.015708	2.48	3.23	5.08	0.99
Rio San Pietro	2	120.00*	TR20Borm+TR<20ri	Attuale	8.00	186.05	186.88	186.99	187.30	0.036907	3.21	5.32	48.07	1.46
Rio San Pietro	2	120.00*	TR20Borm+TR<20ri	Lotto1A	8.00	186.05	186.88	187.00	187.30	0.036907	3.21	5.32	48.07	1.46
Rio San Pietro	2	120.00*	TR20Borm+TR<20ri	Lotto1B	8.00	186.05	186.88	187.00	187.30	0.036907	3.21	5.32	48.07	1.46
Rio San Pietro	2	120.00*	TR20Borm+TR<20ri	Lotto1C	8.00	186.05	186.88	187.00	187.30	0.036907	3.21	5.32	48.07	1.46
Rio San Pietro	2	120.00*	TR20Borm+TR<20ri	Finale	8.00	186.05	187.21	187.21	187.47	0.016541	2.30	3.48	6.51	1.00
Rio San Pietro	2	119.00*	TR20Borm+TR<20ri	Attuale	8.00	185.66	186.75	186.77	186.87	0.010600	1.77	9.75	69.54	0.80
Rio San Pietro	2	119.00*	TR20Borm+TR<20ri	Lotto1A	8.00	185.66	186.78	186.78	186.86	0.006990	1.49	12.28	76.27	0.66

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	119.00*	TR20Borm+TR<20ri	Lotto1B	8.00	185.66	186.78	186.78	186.86	0.006990	1.49	12.28	76.27	0.66
Rio San Pietro	2	119.00*	TR20Borm+TR<20ri	Lotto1C	8.00	185.66	186.78	186.78	186.86	0.006990	1.49	12.28	76.27	0.66
Rio San Pietro	2	119.00*	TR20Borm+TR<20ri	Finale	8.00	185.66	186.77	186.78	187.05	0.017772	2.33	3.43	6.75	1.04
Rio San Pietro	2	118.00*	TR20Borm+TR<20ri	Attuale	8.00	185.27	186.45	186.50	186.62	0.008569	1.87	5.94	47.64	0.75
Rio San Pietro	2	118.00*	TR20Borm+TR<20ri	Lotto1A	8.00	185.27	186.40	186.49	186.62	0.011779	2.09	4.31	22.67	0.87
Rio San Pietro	2	118.00*	TR20Borm+TR<20ri	Lotto1B	8.00	185.27	186.40	186.49	186.62	0.011779	2.09	4.31	22.67	0.87
Rio San Pietro	2	118.00*	TR20Borm+TR<20ri	Lotto1C	8.00	185.27	186.40	186.49	186.62	0.011779	2.09	4.31	22.67	0.87
Rio San Pietro	2	118.00*	TR20Borm+TR<20ri	Finale	8.00	185.27	186.35	186.35	186.62	0.016206	2.33	3.44	6.29	1.01
Rio San Pietro	2	117.00*	TR20Borm+TR<20ri	Attuale	8.00	184.87	185.81	185.92	186.25	0.027548	2.94	2.72	5.22	1.30
Rio San Pietro	2	117.00*	TR20Borm+TR<20ri	Lotto1A	8.00	184.87	185.85	185.92	186.22	0.021701	2.69	2.97	5.45	1.16
Rio San Pietro	2	117.00*	TR20Borm+TR<20ri	Lotto1B	8.00	184.87	185.85	185.92	186.22	0.021701	2.69	2.97	5.45	1.16
Rio San Pietro	2	117.00*	TR20Borm+TR<20ri	Lotto1C	8.00	184.87	185.85	185.92	186.22	0.021701	2.69	2.97	5.45	1.16
Rio San Pietro	2	117.00*	TR20Borm+TR<20ri	Finale	8.00	184.87	185.91	185.92	186.21	0.016872	2.45	3.27	5.71	1.03
Rio San Pietro	2	116.00*	TR20Borm+TR<20ri	Attuale	8.00	184.48	185.49	185.49	185.80	0.015946	2.46	3.25	5.35	1.01
Rio San Pietro	2	116.00*	TR20Borm+TR<20ri	Lotto1A	8.00	184.48	185.50	185.50	185.80	0.015693	2.45	3.27	5.36	1.00
Rio San Pietro	2	116.00*	TR20Borm+TR<20ri	Lotto1B	8.00	184.48	185.50	185.50	185.80	0.015693	2.45	3.27	5.36	1.00
Rio San Pietro	2	116.00*	TR20Borm+TR<20ri	Lotto1C	8.00	184.48	185.50	185.50	185.80	0.015693	2.45	3.27	5.36	1.00
Rio San Pietro	2	116.00*	TR20Borm+TR<20ri	Finale	8.00	184.48	185.49	185.49	185.80	0.015946	2.46	3.25	5.35	1.01
Rio San Pietro	2	115	TR20Borm+TR<20ri	Attuale	8.00	184.09	185.10	185.09	185.41	0.014993	2.46	3.25	5.01	0.98
Rio San Pietro	2	115	TR20Borm+TR<20ri	Lotto1A	8.00	184.09	185.10	185.09	185.41	0.014725	2.45	3.27	5.02	0.97
Rio San Pietro	2	115	TR20Borm+TR<20ri	Lotto1B	8.00	184.09	185.10	185.09	185.41	0.014725	2.45	3.27	5.02	0.97
Rio San Pietro	2	115	TR20Borm+TR<20ri	Lotto1C	8.00	184.09	185.10	185.09	185.41	0.014725	2.45	3.27	5.02	0.97
Rio San Pietro	2	115	TR20Borm+TR<20ri	Finale	8.00	184.09	185.12	185.08	185.41	0.013589	2.38	3.37	5.08	0.93
Rio San Pietro	2	114.00*	TR20Borm+TR<20ri	Attuale	8.00	183.67	184.77	184.73	185.05	0.013394	2.34	3.41	5.23	0.93
Rio San Pietro	2	114.00*	TR20Borm+TR<20ri	Lotto1A	8.00	183.67	184.75	184.73	185.05	0.014092	2.39	3.35	5.19	0.95
Rio San Pietro	2	114.00*	TR20Borm+TR<20ri	Lotto1B	8.00	183.67	184.75	184.73	185.05	0.014092	2.39	3.35	5.19	0.95
Rio San Pietro	2	114.00*	TR20Borm+TR<20ri	Lotto1C	8.00	183.67	184.75	184.73	185.05	0.014092	2.39	3.35	5.19	0.95
Rio San Pietro	2	114.00*	TR20Borm+TR<20ri	Finale	8.00	183.67	184.73	184.73	185.04	0.015714	2.48	3.22	5.11	1.00
Rio San Pietro	2	113.00*	TR20Borm+TR<20ri	Attuale	8.00	183.26	184.68		184.81	0.004933	1.62	4.94	6.15	0.58
Rio San Pietro	2	113.00*	TR20Borm+TR<20ri	Lotto1A	8.00	183.26	184.65		184.80	0.005367	1.67	4.79	6.07	0.60
Rio San Pietro	2	113.00*	TR20Borm+TR<20ri	Lotto1B	8.00	183.26	184.65		184.80	0.005367	1.67	4.79	6.07	0.60
Rio San Pietro	2	113.00*	TR20Borm+TR<20ri	Lotto1C	8.00	183.26	184.65		184.80	0.005367	1.67	4.79	6.07	0.60
Rio San Pietro	2	113.00*	TR20Borm+TR<20ri	Finale	8.00	183.26	184.58	184.37	184.75	0.007029	1.85	4.33	5.79	0.68
Rio San Pietro	2	112.00*	TR20Borm+TR<20ri	Attuale	8.00	182.85	184.66		184.72	0.001817	1.11	7.22	8.95	0.36
Rio San Pietro	2	112.00*	TR20Borm+TR<20ri	Lotto1A	8.00	182.85	184.63	183.99	184.70	0.001955	1.14	6.99	7.21	0.37
Rio San Pietro	2	112.00*	TR20Borm+TR<20ri	Lotto1B	8.00	182.85	184.63	183.99	184.70	0.001955	1.14	6.99	7.21	0.37
Rio San Pietro	2	112.00*	TR20Borm+TR<20ri	Lotto1C	8.00	182.85	184.63	183.99	184.70	0.001955	1.14	6.99	7.21	0.37
Rio San Pietro	2	112.00*	TR20Borm+TR<20ri	Finale	8.00	182.85	184.54	183.99	184.62	0.002485	1.25	6.38	6.87	0.42
Rio San Pietro	2	111.00*	TR20Borm+TR<20ri	Attuale	8.00	182.43	184.65		184.68	0.000757	0.79	11.58	25.35	0.24

HEC-RAS Profile: TR20Borm+TR<20ri (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	111.00*	TR20Borm+TR<20ri	Lotto1A	8.00	182.43	184.62	183.61	184.66	0.000836	0.83	9.69	8.56	0.25
Rio San Pietro	2	111.00*	TR20Borm+TR<20ri	Lotto1B	8.00	182.43	184.62	183.61	184.66	0.000836	0.83	9.69	8.56	0.25
Rio San Pietro	2	111.00*	TR20Borm+TR<20ri	Lotto1C	8.00	182.43	184.62	183.61	184.66	0.000836	0.83	9.69	8.56	0.25
Rio San Pietro	2	111.00*	TR20Borm+TR<20ri	Finale	8.00	182.43	184.53	183.61	184.58	0.001022	0.89	8.96	8.16	0.27
Rio San Pietro	2	110.00*	TR20Borm+TR<20ri	Attuale	8.00	182.02	184.65		184.67	0.000306	0.56	19.13	33.87	0.15
Rio San Pietro	2	110.00*	TR20Borm+TR<20ri	Lotto1A	8.00	182.02	184.62	183.20	184.64	0.000383	0.62	12.93	10.43	0.17
Rio San Pietro	2	110.00*	TR20Borm+TR<20ri	Lotto1B	8.00	182.02	184.62	183.20	184.64	0.000383	0.62	12.93	10.43	0.17
Rio San Pietro	2	110.00*	TR20Borm+TR<20ri	Lotto1C	8.00	182.02	184.62	183.20	184.64	0.000383	0.62	12.93	10.43	0.17
Rio San Pietro	2	110.00*	TR20Borm+TR<20ri	Finale	8.00	182.02	184.53	183.20	184.55	0.000469	0.67	12.03	9.79	0.19
Rio San Pietro	2	109	TR20Borm+TR<20ri	Attuale	8.00	181.60	184.65		184.66	0.000142	0.42	29.37	55.51	0.11
Rio San Pietro	2	109	TR20Borm+TR<20ri	Lotto1A	8.00	181.60	184.62	182.79	184.63	0.000193	0.49	16.81	12.40	0.12
Rio San Pietro	2	109	TR20Borm+TR<20ri	Lotto1B	8.00	181.60	184.62	182.79	184.63	0.000193	0.49	16.81	12.40	0.12
Rio San Pietro	2	109	TR20Borm+TR<20ri	Lotto1C	8.00	181.60	184.62	182.79	184.63	0.000193	0.49	16.81	12.40	0.12
Rio San Pietro	2	109	TR20Borm+TR<20ri	Finale	8.00	181.60	184.53	182.79	184.54	0.000229	0.52	15.71	12.16	0.13
Rio San Pietro	1	108	TR20Borm+TR<20ri	Attuale	8.00	180.99	184.65		184.66	0.000069	0.34	40.88	58.31	0.08
Rio San Pietro	1	108	TR20Borm+TR<20ri	Lotto1A	8.00	180.99	184.62	182.40	184.63	0.000113	0.43	20.11	17.01	0.10
Rio San Pietro	1	108	TR20Borm+TR<20ri	Lotto1B	8.00	180.99	184.62	182.40	184.63	0.000113	0.43	20.11	17.01	0.10
Rio San Pietro	1	108	TR20Borm+TR<20ri	Lotto1C	8.00	180.99	184.62	182.40	184.63	0.000113	0.43	20.11	17.01	0.10
Rio San Pietro	1	108	TR20Borm+TR<20ri	Finale	8.00	180.99	184.53	182.40	184.54	0.000132	0.45	18.67	14.21	0.10
Rio San Pietro	1	107.00*	TR20Borm+TR<20ri	Attuale	8.00	180.57	184.65		184.66	0.000045	0.29	49.99	146.51	0.06
Rio San Pietro	1	107.00*	TR20Borm+TR<20ri	Lotto1A	8.00	180.57	184.62	182.00	184.62	0.000073	0.36	24.53	20.45	0.08
Rio San Pietro	1	107.00*	TR20Borm+TR<20ri	Lotto1B	8.00	180.57	184.62	182.00	184.62	0.000073	0.36	24.53	20.45	0.08
Rio San Pietro	1	107.00*	TR20Borm+TR<20ri	Lotto1C	8.00	180.57	184.62	182.00	184.62	0.000073	0.36	24.53	20.45	0.08
Rio San Pietro	1	107.00*	TR20Borm+TR<20ri	Finale	8.00	180.57	184.53	182.00	184.54	0.000085	0.38	22.76	19.21	0.08
Rio San Pietro	1	106.00*	TR20Borm+TR<20ri	Attuale	8.00	180.14	184.65		184.65	0.000026	0.22	85.72	245.69	0.05
Rio San Pietro	1	106.00*	TR20Borm+TR<20ri	Lotto1A	8.00	180.14	184.62	181.60	184.62	0.000050	0.31	29.45	21.40	0.06
Rio San Pietro	1	106.00*	TR20Borm+TR<20ri	Lotto1B	8.00	180.14	184.62	181.60	184.62	0.000050	0.31	29.45	21.40	0.06
Rio San Pietro	1	106.00*	TR20Borm+TR<20ri	Lotto1C	8.00	180.14	184.62	181.60	184.62	0.000050	0.31	29.45	21.40	0.06
Rio San Pietro	1	106.00*	TR20Borm+TR<20ri	Finale	8.00	180.14	184.53	181.60	184.53	0.000058	0.32	27.53	21.40	0.07
Rio San Pietro	1	105	TR20Borm+TR<20ri	Attuale	8.00	179.72	184.65	181.18	184.65	0.000013	0.16	130.49	252.40	0.03
Rio San Pietro	1	105	TR20Borm+TR<20ri	Lotto1A	8.00	179.72	184.62	181.18	184.62	0.000035	0.26	34.61	20.70	0.05
Rio San Pietro	1	105	TR20Borm+TR<20ri	Lotto1B	8.00	179.72	184.62	181.18	184.62	0.000035	0.26	34.61	20.70	0.05
Rio San Pietro	1	105	TR20Borm+TR<20ri	Lotto1C	8.00	179.72	184.62	181.18	184.62	0.000035	0.26	34.61	20.70	0.05
Rio San Pietro	1	105	TR20Borm+TR<20ri	Finale	8.00	179.72	184.53	181.18	184.53	0.000040	0.28	32.75	20.70	0.06
Rio San Pietro	1	104.5			Bridge									
Rio San Pietro	1	104	TR20Borm+TR<20ri	Attuale	8.00	179.17	184.65		184.65	0.000004	0.12	184.34	266.06	0.02
Rio San Pietro	1	104	TR20Borm+TR<20ri	Lotto1A	8.00	179.17	184.59	180.38	184.60	0.000011	0.19	47.49	18.70	0.03
Rio San Pietro	1	104	TR20Borm+TR<20ri	Lotto1B	8.00	179.17	184.59	180.38	184.60	0.000011	0.19	47.49	18.70	0.03
Rio San Pietro	1	104	TR20Borm+TR<20ri	Lotto1C	8.00	179.17	184.59	180.38	184.60	0.000011	0.19	47.49	18.70	0.03

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	1	104	TR20Borm+TR<20ri	Finale	8.00	179.17	184.50	180.38	184.51	0.000012	0.19	45.81	18.70	0.03
Rio Sacco	1	306	TR20Borm+TR<20ri	Attuale	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	TR20Borm+TR<20ri	Lotto1A	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	TR20Borm+TR<20ri	Lotto1B	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	TR20Borm+TR<20ri	Lotto1C	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	TR20Borm+TR<20ri	Finale	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	305	TR20Borm+TR<20ri	Attuale	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	TR20Borm+TR<20ri	Lotto1A	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	TR20Borm+TR<20ri	Lotto1B	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	TR20Borm+TR<20ri	Lotto1C	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	TR20Borm+TR<20ri	Finale	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	304.5			Bridge									
Rio Sacco	1	304	TR20Borm+TR<20ri	Attuale	10.10	183.36	185.41		185.47	0.001281	1.09	9.30	7.04	0.30
Rio Sacco	1	304	TR20Borm+TR<20ri	Lotto1A	10.10	183.36	185.34		185.41	0.001470	1.14	8.84	6.90	0.32
Rio Sacco	1	304	TR20Borm+TR<20ri	Lotto1B	10.10	183.36	185.26		185.33	0.001776	1.23	8.24	6.70	0.35
Rio Sacco	1	304	TR20Borm+TR<20ri	Lotto1C	10.10	183.36	185.26		185.33	0.001776	1.23	8.24	6.70	0.35
Rio Sacco	1	304	TR20Borm+TR<20ri	Finale	10.10	183.36	185.08		185.18	0.002646	1.42	7.11	6.27	0.43
Rio Sacco	1	303	TR20Borm+TR<20ri	Attuale	10.10	182.69	185.40		185.44	0.000676	0.86	11.71	7.32	0.22
Rio Sacco	1	303	TR20Borm+TR<20ri	Lotto1A	10.10	182.69	185.34		185.38	0.000746	0.90	11.23	7.08	0.23
Rio Sacco	1	303	TR20Borm+TR<20ri	Lotto1B	10.10	182.69	185.25		185.30	0.000858	0.95	10.61	6.82	0.24
Rio Sacco	1	303	TR20Borm+TR<20ri	Lotto1C	10.10	182.69	185.25		185.30	0.000858	0.95	10.61	6.82	0.24
Rio Sacco	1	303	TR20Borm+TR<20ri	Finale	10.10	182.69	185.07		185.13	0.001167	1.07	9.44	6.44	0.28
Rio Sacco	1	302	TR20Borm+TR<20ri	Attuale	10.10	182.41	185.42		185.43	0.000052	0.32	37.78	27.05	0.07
Rio Sacco	1	302	TR20Borm+TR<20ri	Lotto1A	10.10	182.41	185.36		185.36	0.000059	0.33	36.04	26.70	0.08
Rio Sacco	1	302	TR20Borm+TR<20ri	Lotto1B	10.10	182.41	185.27		185.28	0.000069	0.35	33.77	26.12	0.08
Rio Sacco	1	302	TR20Borm+TR<20ri	Lotto1C	10.10	182.41	185.27		185.28	0.000069	0.35	33.77	26.12	0.08
Rio Sacco	1	302	TR20Borm+TR<20ri	Finale	10.10	182.41	185.10		185.11	0.000098	0.39	29.39	24.90	0.10
Rio Sacco	1	301	TR20Borm+TR<20ri	Attuale	10.10	181.63	185.43		185.43	0.000030	0.26	55.64	31.56	0.05
Rio Sacco	1	301	TR20Borm+TR<20ri	Lotto1A	10.10	181.63	185.36		185.36	0.000033	0.27	53.60	31.40	0.06
Rio Sacco	1	301	TR20Borm+TR<20ri	Lotto1B	10.10	181.63	185.27		185.28	0.000038	0.28	50.92	31.18	0.06
Rio Sacco	1	301	TR20Borm+TR<20ri	Lotto1C	10.10	181.63	185.27		185.28	0.000038	0.28	50.92	31.18	0.06
Rio Sacco	1	301	TR20Borm+TR<20ri	Finale	10.10	181.63	185.10		185.11	0.000052	0.31	45.62	30.73	0.07
Rio Madama	1	405	TR20Borm+TR<20ri	Attuale	1.00	194.39	194.70	194.82	195.08	0.080108	2.73	0.37	1.70	1.87
Rio Madama	1	405	TR20Borm+TR<20ri	Lotto1A	1.00	194.39	194.70	194.82	195.08	0.080108	2.73	0.37	1.70	1.87
Rio Madama	1	405	TR20Borm+TR<20ri	Lotto1B	1.00	194.39	194.70	194.82	195.08	0.080108	2.73	0.37	1.70	1.87
Rio Madama	1	405	TR20Borm+TR<20ri	Lotto1C	1.00	194.39	194.70	194.82	195.08	0.080108	2.73	0.37	1.70	1.87
Rio Madama	1	405	TR20Borm+TR<20ri	Finale	1.00	194.39	194.70	194.82	195.08	0.080108	2.73	0.37	1.70	1.87
Rio Madama	1	404	TR20Borm+TR<20ri	Attuale	1.00	187.14	187.58	187.55	187.69	0.015523	1.48	0.68	2.31	0.87

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio Madama	1	404	TR20Borm+TR<20ri	Lotto1A	1.00	187.14	187.58	187.55	187.69	0.015523	1.48	0.68	2.31	0.87
Rio Madama	1	404	TR20Borm+TR<20ri	Lotto1B	1.00	187.14	187.58	187.55	187.69	0.015295	1.47	0.68	2.32	0.87
Rio Madama	1	404	TR20Borm+TR<20ri	Lotto1C	1.00	187.14	187.58	187.55	187.69	0.015295	1.47	0.68	2.32	0.87
Rio Madama	1	404	TR20Borm+TR<20ri	Finale	1.00	187.14	187.58	187.55	187.69	0.015567	1.48	0.68	2.31	0.87
Rio Madama	1	403	TR20Borm+TR<20ri	Attuale	1.00	186.20	186.65	186.65	186.81	0.022136	1.77	0.57	1.74	0.99
Rio Madama	1	403	TR20Borm+TR<20ri	Lotto1A	1.00	186.20	186.65	186.65	186.81	0.022136	1.77	0.57	1.74	0.99
Rio Madama	1	403	TR20Borm+TR<20ri	Lotto1B	1.00	186.20	186.65	186.65	186.81	0.022527	1.78	0.56	1.73	1.00
Rio Madama	1	403	TR20Borm+TR<20ri	Lotto1C	1.00	186.20	186.65	186.65	186.81	0.022527	1.78	0.56	1.73	1.00
Rio Madama	1	403	TR20Borm+TR<20ri	Finale	1.00	186.20	186.65	186.65	186.81	0.022044	1.76	0.57	1.74	0.99
Rio Madama	1	402	TR20Borm+TR<20ri	Attuale	1.00	184.94	185.38	185.38	185.50	0.020727	1.59	0.63	2.45	1.00
Rio Madama	1	402	TR20Borm+TR<20ri	Lotto1A	1.00	184.94	185.38	185.38	185.50	0.020727	1.59	0.63	2.45	1.00
Rio Madama	1	402	TR20Borm+TR<20ri	Lotto1B	1.00	184.94	185.38	185.38	185.50	0.020276	1.58	0.63	2.46	0.99
Rio Madama	1	402	TR20Borm+TR<20ri	Lotto1C	1.00	184.94	185.38	185.38	185.50	0.020276	1.58	0.63	2.46	0.99
Rio Madama	1	402	TR20Borm+TR<20ri	Finale	1.00	184.94	185.38	185.38	185.50	0.020833	1.59	0.63	2.45	1.00
Rio Madama	1	401	TR20Borm+TR<20ri	Attuale	1.00	183.68	184.65	184.13	184.66	0.000586	0.43	2.30	4.16	0.19
Rio Madama	1	401	TR20Borm+TR<20ri	Lotto1A	1.00	183.68	184.62	184.13	184.63	0.000681	0.46	2.18	4.05	0.20
Rio Madama	1	401	TR20Borm+TR<20ri	Lotto1B	1.00	183.68	184.62	184.13	184.63	0.000681	0.46	2.18	4.05	0.20
Rio Madama	1	401	TR20Borm+TR<20ri	Lotto1C	1.00	183.68	184.62	184.13	184.63	0.000681	0.46	2.18	4.05	0.20
Rio Madama	1	401	TR20Borm+TR<20ri	Finale	1.00	183.68	184.53	184.13	184.55	0.001091	0.55	1.82	3.71	0.25
Rio Caffra	1	205	TR20Borm+TR<20ri	Attuale	5.00	190.88	191.70	191.54	191.80	0.006656	1.37	3.66	8.42	0.64
Rio Caffra	1	205	TR20Borm+TR<20ri	Lotto1A	5.00	190.88	191.70	191.54	191.80	0.006656	1.37	3.66	8.42	0.64
Rio Caffra	1	205	TR20Borm+TR<20ri	Lotto1B	5.00	190.88	191.70	191.54	191.80	0.006656	1.37	3.66	8.42	0.64
Rio Caffra	1	205	TR20Borm+TR<20ri	Lotto1C	5.00	190.88	191.70	191.54	191.80	0.006656	1.37	3.66	8.42	0.64
Rio Caffra	1	205	TR20Borm+TR<20ri	Finale	5.00	190.88	191.70	191.54	191.80	0.006656	1.37	3.66	8.42	0.64
Rio Caffra	1	203	TR20Borm+TR<20ri	Attuale	5.00	190.29	191.15	191.15	191.40	0.017312	2.22	2.25	4.61	1.01
Rio Caffra	1	203	TR20Borm+TR<20ri	Lotto1A	5.00	190.29	191.15	191.15	191.40	0.017312	2.22	2.25	4.61	1.01
Rio Caffra	1	203	TR20Borm+TR<20ri	Lotto1B	5.00	190.29	191.15	191.15	191.40	0.017312	2.22	2.25	4.61	1.01
Rio Caffra	1	203	TR20Borm+TR<20ri	Lotto1C	5.00	190.29	191.15	191.15	191.40	0.017312	2.22	2.25	4.61	1.01
Rio Caffra	1	203	TR20Borm+TR<20ri	Finale	5.00	190.29	191.15	191.15	191.40	0.017312	2.22	2.25	4.61	1.01
Rio Caffra	1	201	TR20Borm+TR<20ri	Attuale	5.00	189.19	189.92	190.06	190.39	0.042417	3.04	1.64	4.16	1.54
Rio Caffra	1	201	TR20Borm+TR<20ri	Lotto1A	5.00	189.19	189.92	190.06	190.39	0.042417	3.04	1.64	4.16	1.54
Rio Caffra	1	201	TR20Borm+TR<20ri	Lotto1B	5.00	189.19	189.92	190.06	190.39	0.042417	3.04	1.64	4.16	1.54
Rio Caffra	1	201	TR20Borm+TR<20ri	Lotto1C	5.00	189.19	189.92	190.06	190.39	0.042417	3.04	1.64	4.16	1.54
Rio Caffra	1	201	TR20Borm+TR<20ri	Finale	5.00	189.19	189.92	190.06	190.39	0.042417	3.04	1.64	4.16	1.54
Bormida	3	43	TR20Borm+TR<20ri	Attuale	833.00	179.12	185.02	183.40	185.72	0.002254	3.78	270.88	163.00	0.55
Bormida	3	43	TR20Borm+TR<20ri	Lotto1A	833.00	179.12	184.93	183.40	185.68	0.002414	3.87	257.79	155.27	0.56
Bormida	3	43	TR20Borm+TR<20ri	Lotto1B	833.00	179.12	184.87	183.40	185.64	0.002549	3.94	247.87	151.29	0.58
Bormida	3	43	TR20Borm+TR<20ri	Lotto1C	833.00	179.12	184.98	183.33	185.52	0.002009	3.31	290.71	159.08	0.51
Bormida	3	43	TR20Borm+TR<20ri	Finale	833.00	179.12	184.86	183.26	185.34	0.001893	3.07	298.03	153.19	0.49

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	3	42.000*	TR20Borm+TR<20ri	Attuale	833.00	179.09	184.99	183.35	185.65	0.002187	3.66	278.31	184.29	0.54
Bormida	3	42.000*	TR20Borm+TR<20ri	Lotto1A	833.00	179.09	184.90	183.35	185.61	0.002369	3.76	261.86	180.36	0.56
Bormida	3	42.000*	TR20Borm+TR<20ri	Lotto1B	833.00	179.09	184.83	183.35	185.57	0.002503	3.82	250.30	167.15	0.57
Bormida	3	42.000*	TR20Borm+TR<20ri	Lotto1C	833.00	179.09	184.94		185.47	0.001980	3.25	293.95	181.97	0.50
Bormida	3	42.000*	TR20Borm+TR<20ri	Finale	833.00	179.09	184.83		185.29	0.001878	3.02	298.19	166.84	0.49
Bormida	3	41.000*	TR20Borm+TR<20ri	Attuale	833.00	179.06	184.97	183.29	185.59	0.002131	3.54	285.88	196.67	0.53
Bormida	3	41.000*	TR20Borm+TR<20ri	Lotto1A	833.00	179.06	184.87	183.29	185.54	0.002327	3.65	267.10	193.73	0.55
Bormida	3	41.000*	TR20Borm+TR<20ri	Lotto1B	833.00	179.06	184.79	183.29	185.50	0.002490	3.73	252.80	190.66	0.57
Bormida	3	41.000*	TR20Borm+TR<20ri	Lotto1C	833.00	179.06	184.90		185.41	0.001956	3.19	297.73	195.35	0.50
Bormida	3	41.000*	TR20Borm+TR<20ri	Finale	833.00	179.06	184.79		185.24	0.001875	2.98	298.94	190.54	0.48
Bormida	3	40.000*	TR20Borm+TR<20ri	Attuale	833.00	179.04	184.94	183.24	185.53	0.002098	3.44	292.24	206.28	0.52
Bormida	3	40.000*	TR20Borm+TR<20ri	Lotto1A	833.00	179.04	184.83	183.24	185.47	0.002302	3.56	271.23	204.64	0.55
Bormida	3	40.000*	TR20Borm+TR<20ri	Lotto1B	833.00	179.04	184.76	183.24	185.43	0.002456	3.64	255.66	194.11	0.56
Bormida	3	40.000*	TR20Borm+TR<20ri	Lotto1C	833.00	179.04	184.87		185.36	0.001943	3.13	300.91	205.36	0.50
Bormida	3	40.000*	TR20Borm+TR<20ri	Finale	833.00	179.04	184.75		185.19	0.001865	2.94	299.91	197.43	0.48
Bormida	3	39.000*	TR20Borm+TR<20ri	Attuale	833.00	179.01	184.90	183.17	185.47	0.002063	3.36	297.17	215.63	0.52
Bormida	3	39.000*	TR20Borm+TR<20ri	Lotto1A	833.00	179.01	184.80	183.17	185.40	0.002256	3.47	275.59	191.13	0.54
Bormida	3	39.000*	TR20Borm+TR<20ri	Lotto1B	833.00	179.01	184.72	183.17	185.36	0.002406	3.55	262.04	161.29	0.56
Bormida	3	39.000*	TR20Borm+TR<20ri	Lotto1C	833.00	179.01	184.83		185.31	0.001919	3.08	303.44	205.79	0.49
Bormida	3	39.000*	TR20Borm+TR<20ri	Finale	833.00	179.01	184.71		185.14	0.001842	2.90	304.98	157.97	0.48
Bormida	3	38.000*	TR20Borm+TR<20ri	Attuale	833.00	178.98	184.88		185.41	0.002009	3.27	303.65	188.98	0.51
Bormida	3	38.000*	TR20Borm+TR<20ri	Lotto1A	833.00	178.98	184.77		185.34	0.002200	3.38	285.03	166.30	0.53
Bormida	3	38.000*	TR20Borm+TR<20ri	Lotto1B	833.00	178.98	184.68		185.29	0.002370	3.46	271.35	156.90	0.55
Bormida	3	38.000*	TR20Borm+TR<20ri	Lotto1C	833.00	178.98	184.80		185.26	0.001876	3.02	310.88	169.47	0.49
Bormida	3	38.000*	TR20Borm+TR<20ri	Finale	833.00	178.98	184.68		185.09	0.001824	2.85	313.26	155.36	0.48
Bormida	3	37	TR20Borm+TR<20ri	Attuale	833.00	178.95	184.85		185.35	0.001952	3.18	314.74	176.27	0.50
Bormida	3	37	TR20Borm+TR<20ri	Lotto1A	833.00	178.95	184.74		185.28	0.002162	3.29	295.42	165.42	0.52
Bormida	3	37	TR20Borm+TR<20ri	Lotto1B	833.00	178.95	184.65		185.22	0.002347	3.39	280.89	157.08	0.55
Bormida	3	37	TR20Borm+TR<20ri	Lotto1C	833.00	178.95	184.77		185.20	0.001842	2.96	320.66	167.62	0.48
Bormida	3	37	TR20Borm+TR<20ri	Finale	833.00	178.95	184.64		185.04	0.001812	2.81	321.90	156.73	0.47
Bormida	2	35	TR20Borm+TR<20ri	Attuale	833.00	178.59	184.71		185.29	0.001929	3.43	295.51	174.00	0.50
Bormida	2	35	TR20Borm+TR<20ri	Lotto1A	833.00	178.59	184.65		185.22	0.002179	3.38	286.81	159.31	0.53
Bormida	2	35	TR20Borm+TR<20ri	Lotto1B	833.00	178.59	184.63		185.15	0.001847	3.21	298.69	158.11	0.49
Bormida	2	35	TR20Borm+TR<20ri	Lotto1C	833.00	178.59	184.63	182.89	185.15	0.001847	3.21	298.69	158.11	0.49
Bormida	2	35	TR20Borm+TR<20ri	Finale	833.00	178.59	184.54	182.85	184.99	0.001740	2.97	306.36	151.93	0.47
Bormida	2	34.000*	TR20Borm+TR<20ri	Attuale	833.00	178.53	184.64	182.88	185.24	0.001989	3.47	291.70	184.91	0.51
Bormida	2	34.000*	TR20Borm+TR<20ri	Lotto1A	833.00	178.53	184.59		185.16	0.002167	3.39	285.53	174.46	0.53
Bormida	2	34.000*	TR20Borm+TR<20ri	Lotto1B	833.00	178.53	184.58		185.10	0.001859	3.23	296.82	173.28	0.49
Bormida	2	34.000*	TR20Borm+TR<20ri	Lotto1C	833.00	178.53	184.58	182.82	185.10	0.001859	3.23	296.82	173.28	0.49
Bormida	2	34.000*	TR20Borm+TR<20ri	Finale	833.00	178.53	184.50	182.78	184.95	0.001707	2.97	306.19	160.72	0.47

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	2	33.000*	TR20Borm+TR<20ri	Attuale	833.00	178.46	184.58	182.84	185.19	0.002037	3.51	293.68	208.33	0.52
Bormida	2	33.000*	TR20Borm+TR<20ri	Lotto1A	833.00	178.46	184.49	182.83	185.10	0.002359	3.49	277.26	207.09	0.55
Bormida	2	33.000*	TR20Borm+TR<20ri	Lotto1B	833.00	178.46	184.53		185.06	0.001861	3.24	300.55	207.62	0.49
Bormida	2	33.000*	TR20Borm+TR<20ri	Lotto1C	833.00	178.46	184.53	182.77	185.06	0.001861	3.24	300.55	207.62	0.49
Bormida	2	33.000*	TR20Borm+TR<20ri	Finale	833.00	178.46	184.46	182.70	184.90	0.001677	2.96	309.70	175.85	0.46
Bormida	2	32.000*	TR20Borm+TR<20ri	Attuale	833.00	178.40	184.53	182.80	185.14	0.002036	3.51	299.84	199.36	0.52
Bormida	2	32.000*	TR20Borm+TR<20ri	Lotto1A	833.00	178.40	184.45	182.81	185.04	0.002276	3.46	286.83	197.74	0.54
Bormida	2	32.000*	TR20Borm+TR<20ri	Lotto1B	833.00	178.40	184.49		185.01	0.001826	3.23	309.54	198.59	0.49
Bormida	2	32.000*	TR20Borm+TR<20ri	Lotto1C	833.00	178.40	184.49	182.72	185.01	0.001826	3.23	309.54	198.59	0.49
Bormida	2	32.000*	TR20Borm+TR<20ri	Finale	833.00	178.40	184.42	182.63	184.86	0.001633	2.94	319.64	197.25	0.46
Bormida	2	31.000*	TR20Borm+TR<20ri	Attuale	833.00	178.33	184.49	182.76	185.09	0.002033	3.50	305.41	191.45	0.52
Bormida	2	31.000*	TR20Borm+TR<20ri	Lotto1A	833.00	178.33	184.43		184.97	0.001986	3.32	306.71	189.24	0.51
Bormida	2	31.000*	TR20Borm+TR<20ri	Lotto1B	833.00	178.33	184.45		184.96	0.001791	3.21	317.88	189.76	0.48
Bormida	2	31.000*	TR20Borm+TR<20ri	Lotto1C	833.00	178.33	184.45	182.66	184.96	0.001791	3.21	317.88	189.76	0.48
Bormida	2	31.000*	TR20Borm+TR<20ri	Finale	833.00	178.33	184.39	182.57	184.82	0.001580	2.92	329.98	188.38	0.45
Bormida	2	30.000*	TR20Borm+TR<20ri	Attuale	833.00	178.27	184.44		185.04	0.002030	3.50	310.82	187.71	0.52
Bormida	2	30.000*	TR20Borm+TR<20ri	Lotto1A	833.00	178.27	184.42	182.60	184.91	0.001757	3.19	325.87	186.45	0.48
Bormida	2	30.000*	TR20Borm+TR<20ri	Lotto1B	833.00	178.27	184.42	182.60	184.91	0.001757	3.19	325.87	186.45	0.48
Bormida	2	30.000*	TR20Borm+TR<20ri	Lotto1C	833.00	178.27	184.42	182.60	184.91	0.001757	3.19	325.87	186.45	0.48
Bormida	2	30.000*	TR20Borm+TR<20ri	Finale	833.00	178.27	184.36	182.50	184.78	0.001528	2.89	339.77	182.54	0.44
Bormida	2	29.000*	TR20Borm+TR<20ri	Attuale	833.00	178.20	184.40		184.99	0.002023	3.49	316.33	186.30	0.51
Bormida	2	29.000*	TR20Borm+TR<20ri	Lotto1A	833.00	178.20	184.38	182.55	184.87	0.001723	3.17	332.71	174.72	0.47
Bormida	2	29.000*	TR20Borm+TR<20ri	Lotto1B	833.00	178.20	184.38	182.55	184.87	0.001723	3.17	332.71	174.72	0.47
Bormida	2	29.000*	TR20Borm+TR<20ri	Lotto1C	833.00	178.20	184.38	182.55	184.87	0.001723	3.17	332.71	174.72	0.47
Bormida	2	29.000*	TR20Borm+TR<20ri	Finale	833.00	178.20	184.33	182.43	184.74	0.001478	2.85	348.66	173.70	0.44
Bormida	2	28	TR20Borm+TR<20ri	Attuale	833.00	178.14	184.36		184.93	0.002014	3.48	323.28	194.00	0.51
Bormida	2	28	TR20Borm+TR<20ri	Lotto1A	833.00	178.14	184.35	182.49	184.82	0.001693	3.15	337.98	163.61	0.47
Bormida	2	28	TR20Borm+TR<20ri	Lotto1B	833.00	178.14	184.35	182.49	184.82	0.001693	3.15	337.98	163.61	0.47
Bormida	2	28	TR20Borm+TR<20ri	Lotto1C	833.00	178.14	184.35	182.49	184.82	0.001693	3.15	337.98	163.61	0.47
Bormida	2	28	TR20Borm+TR<20ri	Finale	833.00	178.14	184.31	182.37	184.70	0.001431	2.82	355.99	162.72	0.43
Bormida	2	27.000*	TR20Borm+TR<20ri	Attuale	833.00	178.10	184.30		184.88	0.002006	3.50	310.60	169.41	0.51
Bormida	2	27.000*	TR20Borm+TR<20ri	Lotto1A	833.00	178.10	184.30	182.43	184.78	0.001670	3.14	327.46	147.07	0.46
Bormida	2	27.000*	TR20Borm+TR<20ri	Lotto1B	833.00	178.10	184.30	182.43	184.78	0.001670	3.14	327.46	147.07	0.46
Bormida	2	27.000*	TR20Borm+TR<20ri	Lotto1C	833.00	178.10	184.30	182.43	184.78	0.001670	3.14	327.46	147.07	0.46
Bormida	2	27.000*	TR20Borm+TR<20ri	Finale	833.00	178.10	184.27	182.31	184.66	0.001412	2.82	344.78	145.27	0.43
Bormida	2	26.000*	TR20Borm+TR<20ri	Attuale	833.00	178.05	184.25		184.83	0.001965	3.49	302.64	146.75	0.51
Bormida	2	26.000*	TR20Borm+TR<20ri	Lotto1A	833.00	178.05	184.27	182.37	184.74	0.001622	3.11	321.21	130.10	0.46
Bormida	2	26.000*	TR20Borm+TR<20ri	Lotto1B	833.00	178.05	184.27	182.37	184.74	0.001622	3.11	321.21	130.10	0.46
Bormida	2	26.000*	TR20Borm+TR<20ri	Lotto1C	833.00	178.05	184.27	182.37	184.74	0.001622	3.11	321.21	130.10	0.46

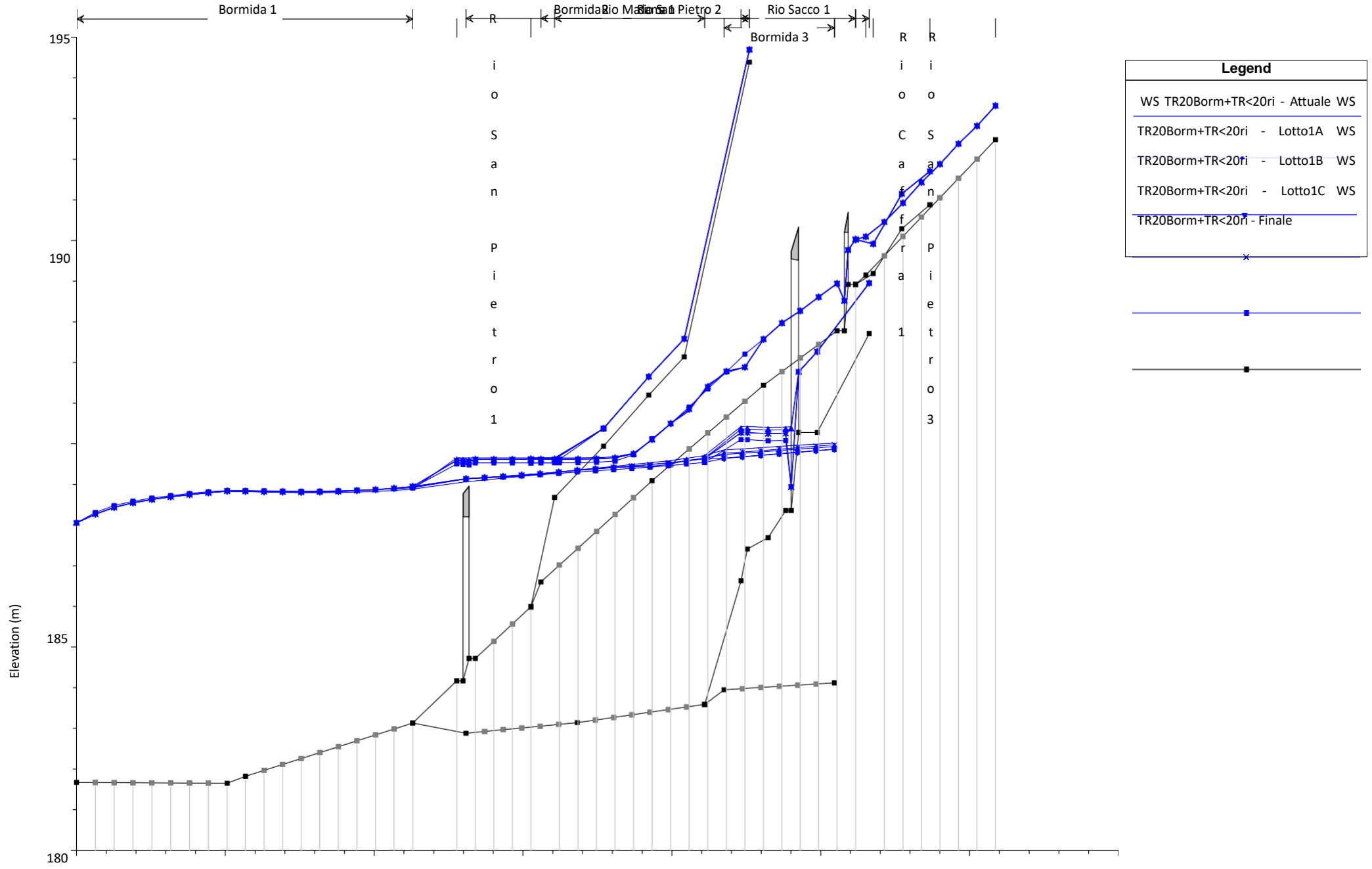
River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	2	26.000*	TR20Borm+TR<20ri	Finale	833.00	178.05	184.24	182.25	184.63	0.001372	2.79	338.82	127.92	0.42
Bormida	2	25.000*	TR20Borm+TR<20ri	Attuale	833.00	178.01	184.20		184.79	0.001920	3.49	296.26	137.82	0.50
Bormida	2	25.000*	TR20Borm+TR<20ri	Lotto1A	833.00	178.01	184.23	182.29	184.70	0.001570	3.08	317.05	118.68	0.45
Bormida	2	25.000*	TR20Borm+TR<20ri	Lotto1B	833.00	178.01	184.23	182.29	184.70	0.001570	3.08	317.05	118.68	0.45
Bormida	2	25.000*	TR20Borm+TR<20ri	Lotto1C	833.00	178.01	184.23	182.29	184.70	0.001570	3.08	317.05	118.68	0.45
Bormida	2	25.000*	TR20Borm+TR<20ri	Finale	833.00	178.01	184.21	182.17	184.59	0.001328	2.77	335.45	116.69	0.42
Bormida	2	24.000*	TR20Borm+TR<20ri	Attuale	833.00	177.97	184.15		184.74	0.001872	3.47	290.90	120.74	0.50
Bormida	2	24.000*	TR20Borm+TR<20ri	Lotto1A	833.00	177.97	184.20	182.20	184.66	0.001512	3.05	314.01	108.98	0.45
Bormida	2	24.000*	TR20Borm+TR<20ri	Lotto1B	833.00	177.97	184.20	182.20	184.66	0.001512	3.05	314.01	108.98	0.45
Bormida	2	24.000*	TR20Borm+TR<20ri	Lotto1C	833.00	177.97	184.20	182.20	184.66	0.001512	3.05	314.01	108.98	0.45
Bormida	2	24.000*	TR20Borm+TR<20ri	Finale	833.00	177.97	184.18	182.09	184.56	0.001277	2.73	333.64	106.94	0.41
Bormida	2	23.000*	TR20Borm+TR<20ri	Attuale	833.00	177.92	184.11		184.69	0.001822	3.46	285.83	107.62	0.49
Bormida	2	23.000*	TR20Borm+TR<20ri	Lotto1A	833.00	177.92	184.17	182.12	184.62	0.001451	3.01	311.58	100.22	0.44
Bormida	2	23.000*	TR20Borm+TR<20ri	Lotto1B	833.00	177.92	184.17	182.12	184.62	0.001451	3.01	311.58	100.22	0.44
Bormida	2	23.000*	TR20Borm+TR<20ri	Lotto1C	833.00	177.92	184.17	182.12	184.62	0.001451	3.01	311.58	100.22	0.44
Bormida	2	23.000*	TR20Borm+TR<20ri	Finale	833.00	177.92	184.16	182.01	184.52	0.001225	2.69	332.67	99.02	0.40
Bormida	2	22	TR20Borm+TR<20ri	Attuale	833.00	177.88	184.06		184.65	0.001772	3.44	280.61	94.12	0.49
Bormida	2	22	TR20Borm+TR<20ri	Lotto1A	833.00	177.88	184.14	182.02	184.58	0.001389	2.96	309.28	91.24	0.43
Bormida	2	22	TR20Borm+TR<20ri	Lotto1B	833.00	177.88	184.14	182.02	184.58	0.001389	2.96	309.28	91.24	0.43
Bormida	2	22	TR20Borm+TR<20ri	Lotto1C	833.00	177.88	184.14	182.02	184.58	0.001389	2.96	309.28	91.24	0.43
Bormida	2	22	TR20Borm+TR<20ri	Finale	833.00	177.88	184.13	181.93	184.49	0.001173	2.66	331.96	91.17	0.39
Bormida	1	19	TR20Borm+TR<20ri	Attuale	833.00	178.13	183.88		184.51	0.002046	3.51	252.52	94.67	0.52
Bormida	1	19	TR20Borm+TR<20ri	Lotto1A	833.00	178.13	183.95	182.14	184.46	0.001866	3.16	263.93	62.38	0.49
Bormida	1	19	TR20Borm+TR<20ri	Lotto1B	833.00	178.13	183.95	182.14	184.46	0.001866	3.16	263.93	62.38	0.49
Bormida	1	19	TR20Borm+TR<20ri	Lotto1C	833.00	178.13	183.95	182.14	184.46	0.001866	3.16	263.93	62.38	0.49
Bormida	1	19	TR20Borm+TR<20ri	Finale	833.00	178.13	183.92	182.16	184.38	0.001675	3.04	287.51	71.97	0.47
Bormida	1	18.000*	TR20Borm+TR<20ri	Attuale	833.00	177.98	183.85		184.45	0.001956	3.43	254.35	89.73	0.51
Bormida	1	18.000*	TR20Borm+TR<20ri	Lotto1A	833.00	177.98	183.91	182.10	184.41	0.001825	3.13	267.64	65.87	0.48
Bormida	1	18.000*	TR20Borm+TR<20ri	Lotto1B	833.00	177.98	183.91	182.10	184.41	0.001825	3.13	267.64	65.87	0.48
Bormida	1	18.000*	TR20Borm+TR<20ri	Lotto1C	833.00	177.98	183.91	182.10	184.41	0.001825	3.13	267.64	65.87	0.48
Bormida	1	18.000*	TR20Borm+TR<20ri	Finale	833.00	177.98	183.89	182.10	184.33	0.001583	2.96	295.80	76.95	0.45
Bormida	1	17.000*	TR20Borm+TR<20ri	Attuale	833.00	177.84	183.83		184.39	0.001830	3.33	260.68	86.10	0.49
Bormida	1	17.000*	TR20Borm+TR<20ri	Lotto1A	833.00	177.84	183.87	182.04	184.36	0.001746	3.08	273.84	69.40	0.47
Bormida	1	17.000*	TR20Borm+TR<20ri	Lotto1B	833.00	177.84	183.87	182.04	184.36	0.001746	3.08	273.84	69.40	0.47
Bormida	1	17.000*	TR20Borm+TR<20ri	Lotto1C	833.00	177.84	183.87	182.04	184.36	0.001746	3.08	273.84	69.40	0.47
Bormida	1	17.000*	TR20Borm+TR<20ri	Finale	833.00	177.84	183.87	182.02	184.29	0.001467	2.88	306.72	82.04	0.44
Bormida	1	16.000*	TR20Borm+TR<20ri	Attuale	833.00	177.69	183.81		184.34	0.001684	3.22	270.87	92.87	0.47
Bormida	1	16.000*	TR20Borm+TR<20ri	Lotto1A	833.00	177.69	183.85	181.94	184.31	0.001628	3.01	282.42	83.19	0.46
Bormida	1	16.000*	TR20Borm+TR<20ri	Lotto1B	833.00	177.69	183.85	181.94	184.31	0.001628	3.01	282.42	83.19	0.46

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	1	16.000*	TR20Borm+TR<20ri	Lotto1C	833.00	177.69	183.85	181.94	184.31	0.001628	3.01	282.42	83.19	0.46
Bormida	1	16.000*	TR20Borm+TR<20ri	Finale	833.00	177.69	183.86	181.91	184.24	0.001338	2.78	319.04	87.29	0.42
Bormida	1	15.000*	TR20Borm+TR<20ri	Attuale	833.00	177.55	183.80		184.28	0.001522	3.09	285.97	100.06	0.45
Bormida	1	15.000*	TR20Borm+TR<20ri	Lotto1A	833.00	177.55	183.83	181.83	184.26	0.001489	2.93	294.87	100.92	0.44
Bormida	1	15.000*	TR20Borm+TR<20ri	Lotto1B	833.00	177.55	183.83	181.83	184.26	0.001489	2.93	294.87	100.92	0.44
Bormida	1	15.000*	TR20Borm+TR<20ri	Lotto1C	833.00	177.55	183.83	181.83	184.26	0.001489	2.93	294.87	100.92	0.44
Bormida	1	15.000*	TR20Borm+TR<20ri	Finale	833.00	177.55	183.84	181.77	184.20	0.001217	2.68	332.80	101.18	0.40
Bormida	1	14.000*	TR20Borm+TR<20ri	Attuale	833.00	177.40	183.80		184.23	0.001355	2.95	306.66	117.81	0.43
Bormida	1	14.000*	TR20Borm+TR<20ri	Lotto1A	833.00	177.40	183.81	181.69	184.22	0.001333	2.82	313.50	120.99	0.42
Bormida	1	14.000*	TR20Borm+TR<20ri	Lotto1B	833.00	177.40	183.81	181.69	184.22	0.001333	2.82	313.50	120.99	0.42
Bormida	1	14.000*	TR20Borm+TR<20ri	Lotto1C	833.00	177.40	183.81	181.69	184.22	0.001333	2.82	313.50	120.99	0.42
Bormida	1	14.000*	TR20Borm+TR<20ri	Finale	833.00	177.40	183.83	181.61	184.17	0.001083	2.57	351.76	124.35	0.38
Bormida	1	13.000*	TR20Borm+TR<20ri	Attuale	833.00	177.26	183.79		184.19	0.001192	2.81	338.11	172.56	0.40
Bormida	1	13.000*	TR20Borm+TR<20ri	Lotto1A	833.00	177.26	183.81	181.53	184.18	0.001168	2.70	344.44	174.52	0.40
Bormida	1	13.000*	TR20Borm+TR<20ri	Lotto1B	833.00	177.26	183.81	181.53	184.18	0.001168	2.70	344.44	174.52	0.40
Bormida	1	13.000*	TR20Borm+TR<20ri	Lotto1C	833.00	177.26	183.81	181.53	184.18	0.001168	2.70	344.44	174.52	0.40
Bormida	1	13.000*	TR20Borm+TR<20ri	Finale	833.00	177.26	183.83	181.43	184.13	0.000945	2.44	382.90	174.88	0.36
Bormida	1	12.000*	TR20Borm+TR<20ri	Attuale	833.00	177.11	183.80		184.15	0.001015	2.63	380.96	182.51	0.37
Bormida	1	12.000*	TR20Borm+TR<20ri	Lotto1A	833.00	177.11	183.81		184.14	0.000991	2.55	386.55	183.11	0.37
Bormida	1	12.000*	TR20Borm+TR<20ri	Lotto1B	833.00	177.11	183.81		184.14	0.000991	2.55	386.55	183.11	0.37
Bormida	1	12.000*	TR20Borm+TR<20ri	Lotto1C	833.00	177.11	183.81	181.33	184.14	0.000991	2.55	386.55	183.11	0.37
Bormida	1	12.000*	TR20Borm+TR<20ri	Finale	833.00	177.11	183.84	181.23	184.10	0.000801	2.29	423.48	184.34	0.33
Bormida	1	11.000*	TR20Borm+TR<20ri	Attuale	833.00	176.97	183.81		184.11	0.000859	2.46	428.62	203.09	0.35
Bormida	1	11.000*	TR20Borm+TR<20ri	Lotto1A	833.00	176.97	183.82		184.10	0.000831	2.40	434.47	203.67	0.34
Bormida	1	11.000*	TR20Borm+TR<20ri	Lotto1B	833.00	176.97	183.82		184.10	0.000831	2.40	434.47	203.67	0.34
Bormida	1	11.000*	TR20Borm+TR<20ri	Lotto1C	833.00	176.97	183.82	181.11	184.10	0.000831	2.40	434.47	203.67	0.34
Bormida	1	11.000*	TR20Borm+TR<20ri	Finale	833.00	176.97	183.84	181.01	184.07	0.000675	2.15	469.30	204.50	0.31
Bormida	1	10	TR20Borm+TR<20ri	Attuale	833.00	176.82	183.83		184.08	0.000716	2.29	482.38	212.28	0.32
Bormida	1	10	TR20Borm+TR<20ri	Lotto1A	833.00	176.82	183.83		184.07	0.000684	2.23	489.55	212.36	0.31
Bormida	1	10	TR20Borm+TR<20ri	Lotto1B	833.00	176.82	183.83		184.07	0.000684	2.23	489.55	212.36	0.31
Bormida	1	10	TR20Borm+TR<20ri	Lotto1C	833.00	176.82	183.83	180.81	184.07	0.000684	2.23	489.55	212.36	0.31
Bormida	1	10	TR20Borm+TR<20ri	Finale	833.00	176.82	183.85	180.73	184.04	0.000561	2.00	520.93	212.73	0.28
Bormida	1	9	TR20Borm+TR<20ri	Attuale	833.00	176.65	183.83		184.05	0.000593	2.15	507.70	211.33	0.29
Bormida	1	9	TR20Borm+TR<20ri	Lotto1A	833.00	176.65	183.83		184.05	0.000563	2.10	515.11	211.40	0.28
Bormida	1	9	TR20Borm+TR<20ri	Lotto1B	833.00	176.65	183.83		184.05	0.000563	2.10	515.11	211.40	0.28
Bormida	1	9	TR20Borm+TR<20ri	Lotto1C	833.00	176.65	183.83		184.05	0.000563	2.10	515.11	211.40	0.28
Bormida	1	9	TR20Borm+TR<20ri	Finale	833.00	176.65	183.85		184.03	0.000476	1.90	545.66	211.77	0.26
Bormida	1	8.0000*	TR20Borm+TR<20ri	Attuale	833.00	176.65	183.79		184.03	0.000668	2.26	491.31	214.21	0.31
Bormida	1	8.0000*	TR20Borm+TR<20ri	Lotto1A	833.00	176.65	183.79		184.03	0.000637	2.22	497.77	214.27	0.30

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	1	8.0000*	TR20Borm+TR<20ri	Lotto1B	833.00	176.65	183.79		184.03	0.000637	2.22	497.77	214.27	0.30
Bormida	1	8.0000*	TR20Borm+TR<20ri	Lotto1C	833.00	176.65	183.79		184.03	0.000637	2.22	497.77	214.27	0.30
Bormida	1	8.0000*	TR20Borm+TR<20ri	Finale	833.00	176.65	183.82		184.01	0.000540	2.01	526.07	214.52	0.27
Bormida	1	7.0000*	TR20Borm+TR<20ri	Attuale	833.00	176.66	183.74		184.01	0.000757	2.38	474.18	215.92	0.32
Bormida	1	7.0000*	TR20Borm+TR<20ri	Lotto1A	833.00	176.66	183.75		184.01	0.000726	2.34	479.77	215.94	0.32
Bormida	1	7.0000*	TR20Borm+TR<20ri	Lotto1B	833.00	176.66	183.75		184.01	0.000726	2.34	479.77	215.94	0.32
Bormida	1	7.0000*	TR20Borm+TR<20ri	Lotto1C	833.00	176.66	183.75		184.01	0.000726	2.34	479.77	215.94	0.32
Bormida	1	7.0000*	TR20Borm+TR<20ri	Finale	833.00	176.66	183.77		183.99	0.000617	2.14	505.78	215.85	0.29
Bormida	1	6.0000*	TR20Borm+TR<20ri	Attuale	833.00	176.66	183.69		183.99	0.000868	2.52	455.82	217.07	0.35
Bormida	1	6.0000*	TR20Borm+TR<20ri	Lotto1A	833.00	176.66	183.70		183.99	0.000836	2.49	460.57	217.11	0.34
Bormida	1	6.0000*	TR20Borm+TR<20ri	Lotto1B	833.00	176.66	183.70		183.99	0.000836	2.49	460.57	217.11	0.34
Bormida	1	6.0000*	TR20Borm+TR<20ri	Lotto1C	833.00	176.66	183.70		183.99	0.000836	2.49	460.57	217.11	0.34
Bormida	1	6.0000*	TR20Borm+TR<20ri	Finale	833.00	176.66	183.73		183.97	0.000716	2.29	484.22	216.87	0.31
Bormida	1	5.0000*	TR20Borm+TR<20ri	Attuale	833.00	176.66	183.62		183.96	0.001010	2.68	435.51	218.44	0.37
Bormida	1	5.0000*	TR20Borm+TR<20ri	Lotto1A	833.00	176.66	183.63		183.96	0.000978	2.65	439.50	218.51	0.37
Bormida	1	5.0000*	TR20Borm+TR<20ri	Lotto1B	833.00	176.66	183.63		183.96	0.000978	2.65	439.50	218.51	0.37
Bormida	1	5.0000*	TR20Borm+TR<20ri	Lotto1C	833.00	176.66	183.63		183.96	0.000978	2.65	439.50	218.51	0.37
Bormida	1	5.0000*	TR20Borm+TR<20ri	Finale	833.00	176.66	183.66		183.95	0.000846	2.46	460.70	218.45	0.34
Bormida	1	4.0000*	TR20Borm+TR<20ri	Attuale	833.00	176.66	183.54		183.93	0.001200	2.88	412.12	219.57	0.40
Bormida	1	4.0000*	TR20Borm+TR<20ri	Lotto1A	833.00	176.66	183.55		183.93	0.001169	2.85	415.38	219.66	0.40
Bormida	1	4.0000*	TR20Borm+TR<20ri	Lotto1B	833.00	176.66	183.55		183.93	0.001169	2.85	415.38	219.66	0.40
Bormida	1	4.0000*	TR20Borm+TR<20ri	Lotto1C	833.00	176.66	183.55		183.93	0.001169	2.85	415.38	219.66	0.40
Bormida	1	4.0000*	TR20Borm+TR<20ri	Finale	833.00	176.66	183.59		183.92	0.001026	2.67	434.04	220.54	0.37
Bormida	1	3.0000*	TR20Borm+TR<20ri	Attuale	833.00	176.67	183.43		183.89	0.001470	3.12	383.04	220.86	0.44
Bormida	1	3.0000*	TR20Borm+TR<20ri	Lotto1A	833.00	176.67	183.44		183.89	0.001441	3.10	385.58	221.19	0.44
Bormida	1	3.0000*	TR20Borm+TR<20ri	Lotto1B	833.00	176.67	183.44		183.89	0.001441	3.10	385.58	221.19	0.44
Bormida	1	3.0000*	TR20Borm+TR<20ri	Lotto1C	833.00	176.67	183.44		183.89	0.001441	3.10	385.58	221.19	0.44
Bormida	1	3.0000*	TR20Borm+TR<20ri	Finale	833.00	176.67	183.48		183.89	0.001293	2.94	401.63	222.35	0.42
Bormida	1	2.0000*	TR20Borm+TR<20ri	Attuale	833.00	176.67	183.26	181.38	183.84	0.001903	3.48	341.63	220.10	0.50
Bormida	1	2.0000*	TR20Borm+TR<20ri	Lotto1A	833.00	176.67	183.27	181.38	183.84	0.001879	3.46	343.45	220.26	0.50
Bormida	1	2.0000*	TR20Borm+TR<20ri	Lotto1B	833.00	176.67	183.27	181.38	183.84	0.001879	3.46	343.45	220.26	0.50
Bormida	1	2.0000*	TR20Borm+TR<20ri	Lotto1C	833.00	176.67	183.27	181.38	183.84	0.001879	3.46	343.45	220.26	0.50
Bormida	1	2.0000*	TR20Borm+TR<20ri	Finale	833.00	176.67	183.31		183.84	0.001737	3.34	355.91	222.03	0.48
Bormida	1	1	TR20Borm+TR<20ri	Attuale	833.00	176.67	183.05	181.53	183.77	0.002502	3.87	293.74	193.36	0.57
Bormida	1	1	TR20Borm+TR<20ri	Lotto1A	833.00	176.67	183.05	181.53	183.77	0.002502	3.87	293.74	193.36	0.57
Bormida	1	1	TR20Borm+TR<20ri	Lotto1B	833.00	176.67	183.05	181.53	183.77	0.002502	3.87	293.74	193.36	0.57
Bormida	1	1	TR20Borm+TR<20ri	Lotto1C	833.00	176.67	183.05	181.53	183.77	0.002502	3.87	293.74	193.36	0.57
Bormida	1	1	TR20Borm+TR<20ri	Finale	833.00	176.67	183.05	181.53	183.77	0.002502	3.87	293.74	193.36	0.57

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02



Legend	
WS TR20Borm+TR<20ri - Attuale WS	
TR20Borm+TR<20ri - Lotto1A WS	
TR20Borm+TR<20ri - Lotto1B WS	
TR20Borm+TR<20ri - Lotto1C WS	
TR20Borm+TR<20ri - Finale	x

Elevation (m)

195

190

185

180

Bormida 1

Bormida 2

Bormida 3

Rio Sacco 1

Rio Sacco 2

i
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1

R
R
C
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f
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e
1
t
r
o
3

175
0 2.0000* 3.0000* 4.0000* 5.0000* 6.0000* 7.0000* 8.0000* 9 10 11.0000*
104 105 106.00* 107.00* 108 110.00* 111.00* 112.00* 113.00* 114.00* 115 116.00* 117.00* 118.00* 119.00* 120.00* 121
200 400 600 800 1000 1200 1400
Main Channel Distance (m)

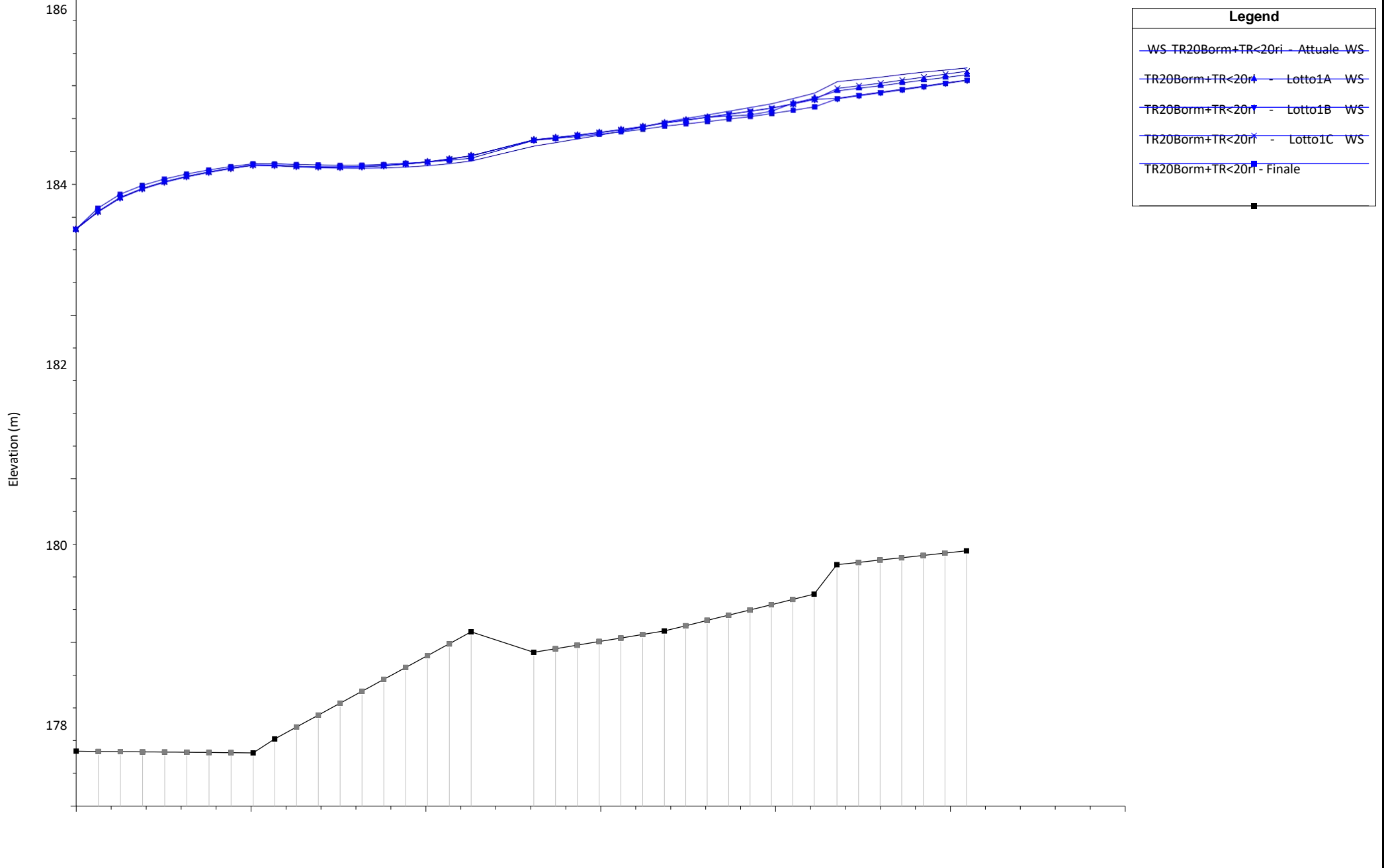
1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

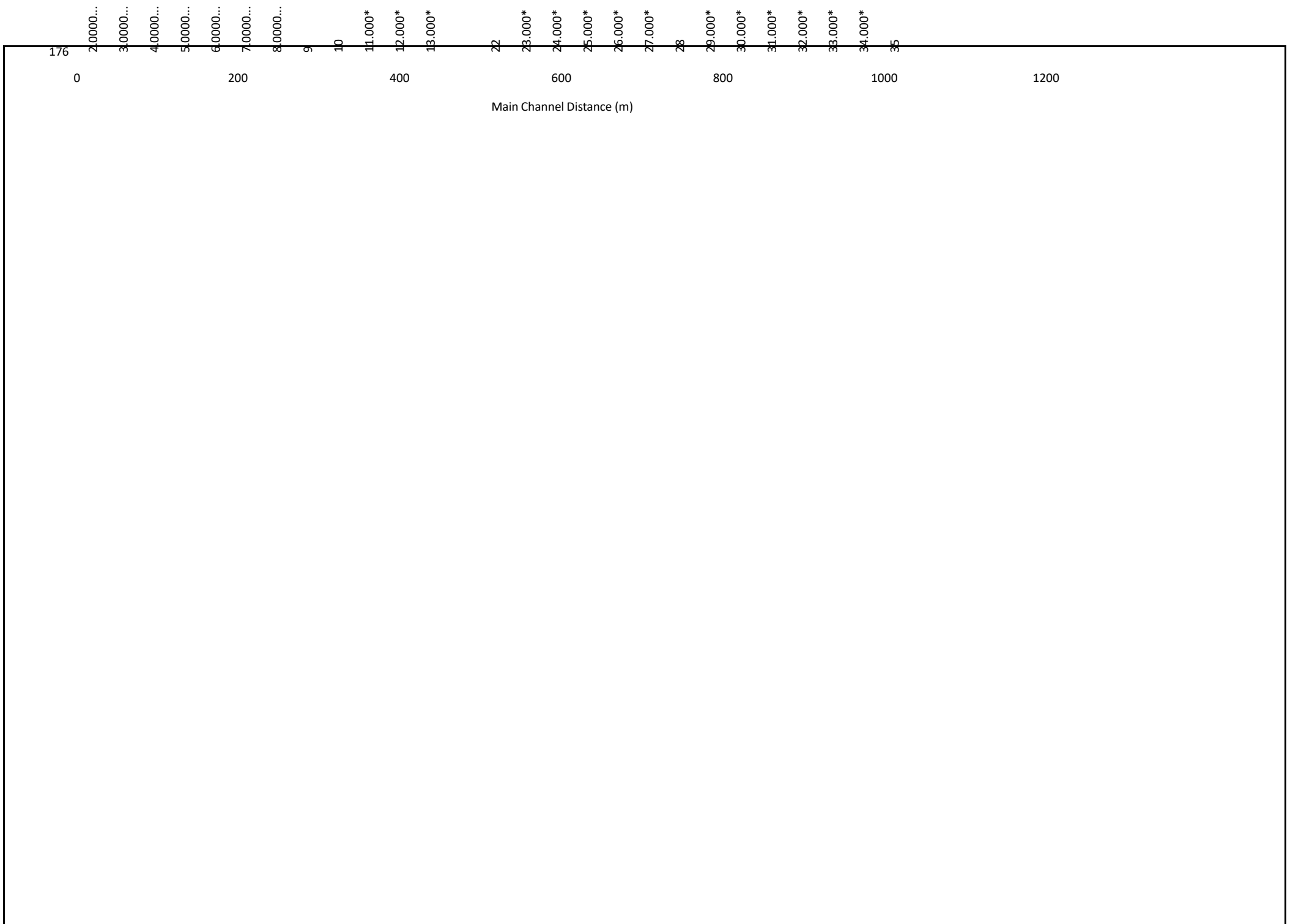
Geom: Finale_rev02

Bormida 1

Bormida 2

Bormida 3

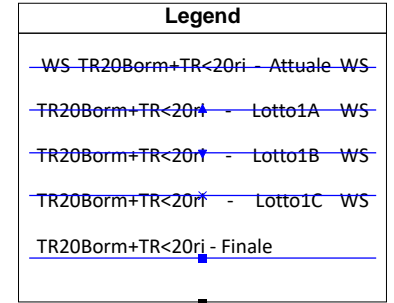
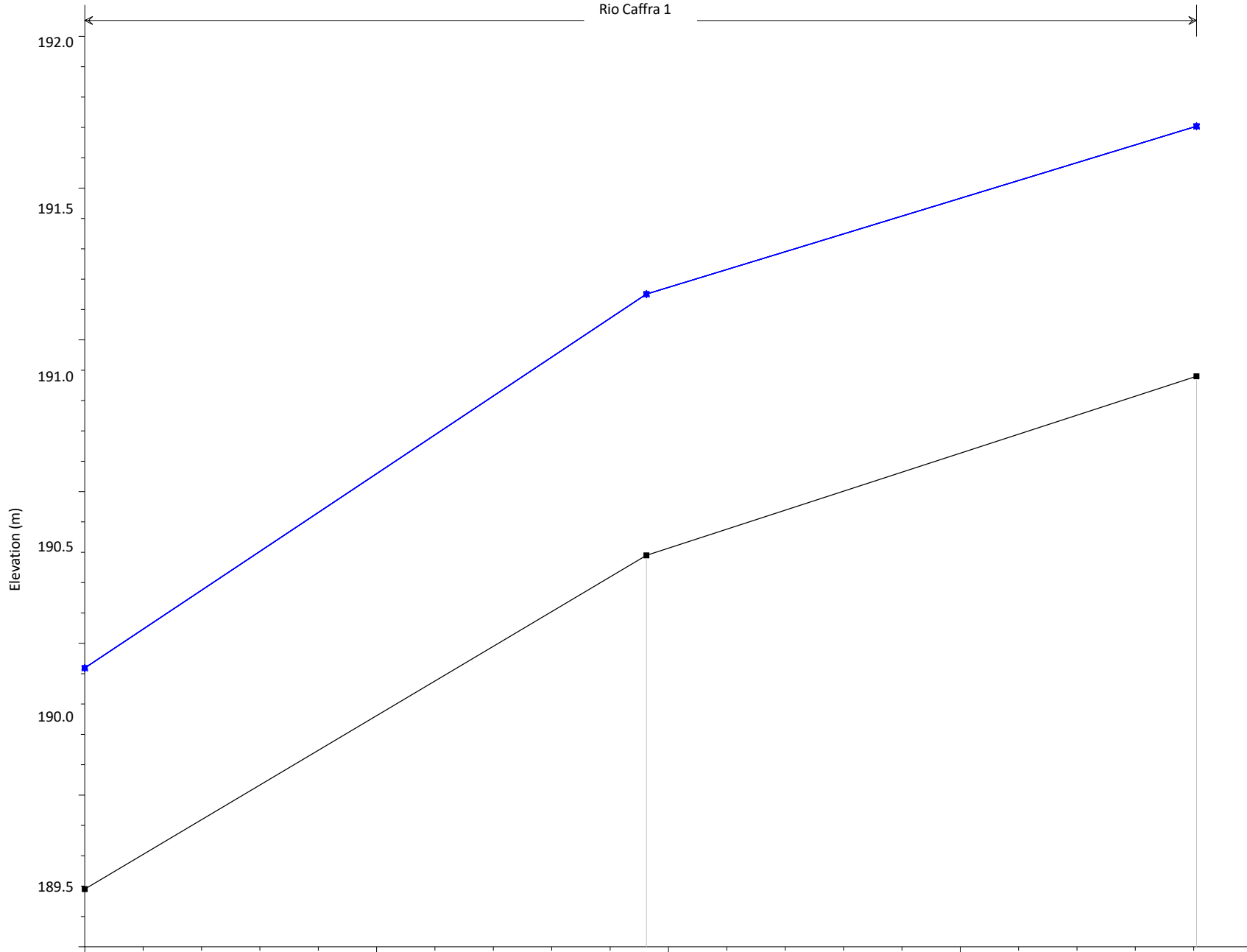




1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02

Rio Caffra 1



189.0

0

20

203

40

60

205

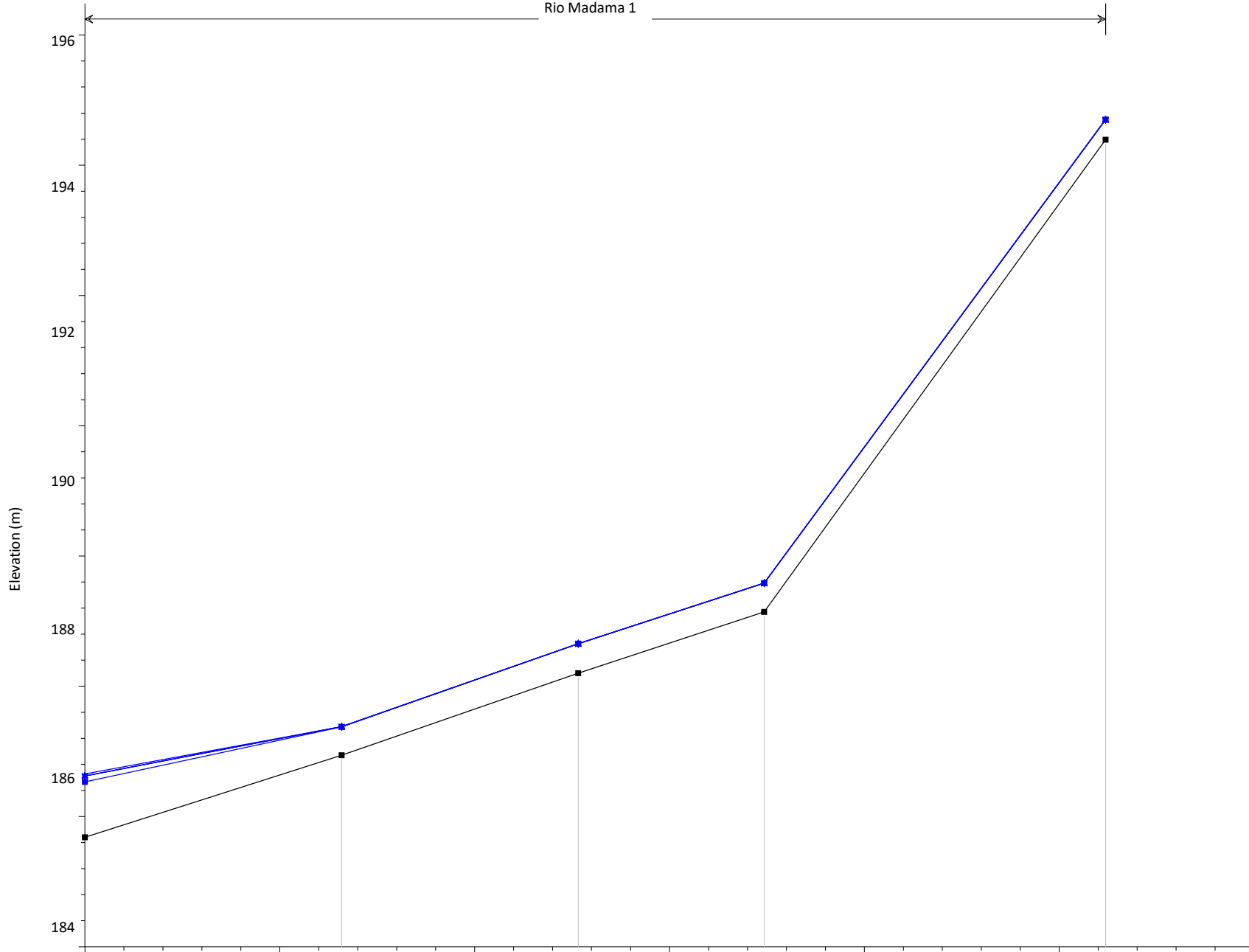
80

Main Channel Distance (m)

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02

Rio Madama 1



Legend

- WS TR20Borm+TR<20ri - Attuale WS
- TR20Borm+TR<20ri - Lotto1A WS
- TR20Borm+TR<20ri - Lotto1B WS
- TR20Borm+TR<20ri - Lotto1C WS
- TR20Borm+TR<20ri - Finale

182

0

50

402

100

403

150

404

200

250

405

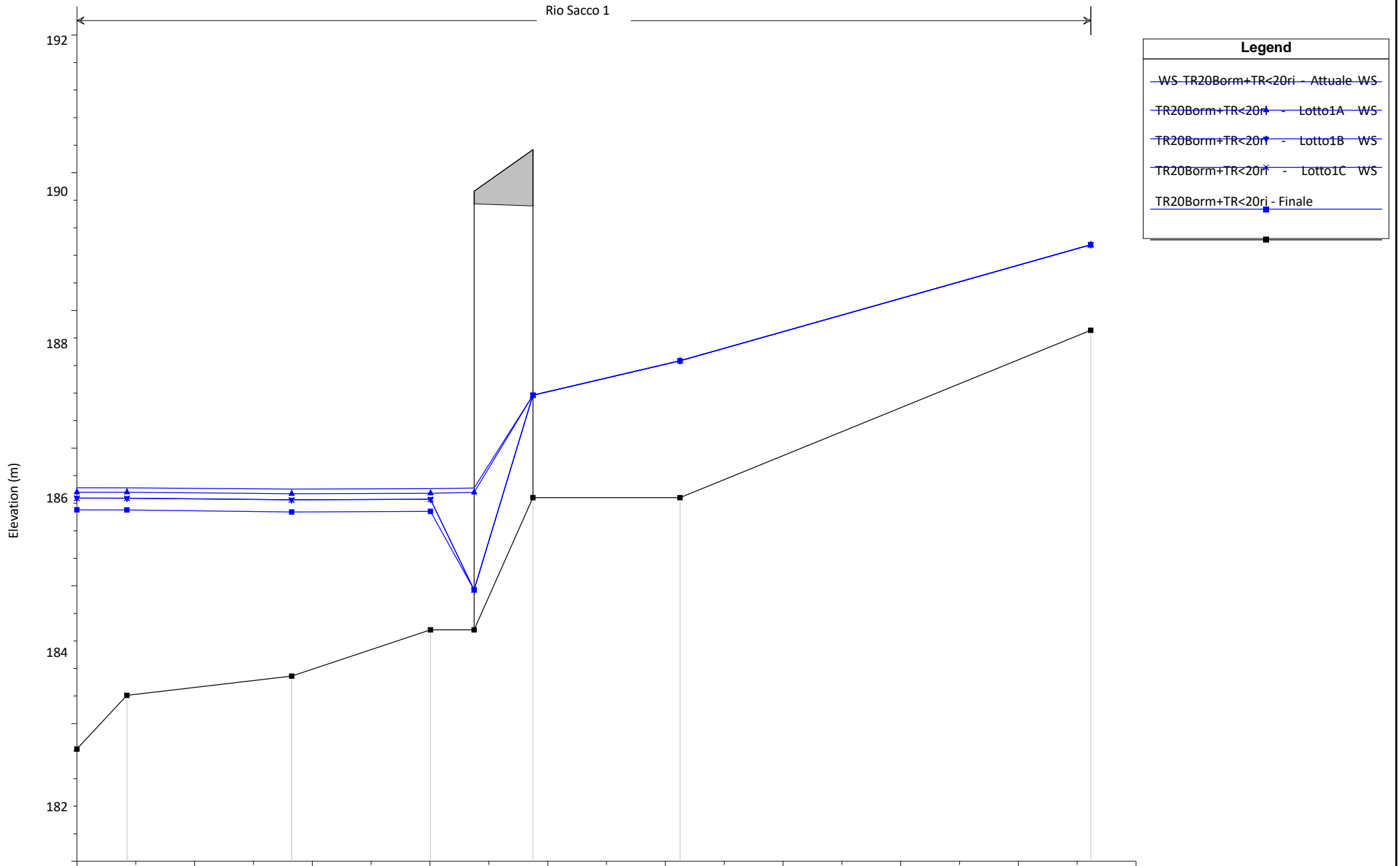
300

Main Channel Distance (m)

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02

Rio Sacco 1



180

302

303

304

304.5

305

306

0

20

40

60

80

100

120

140

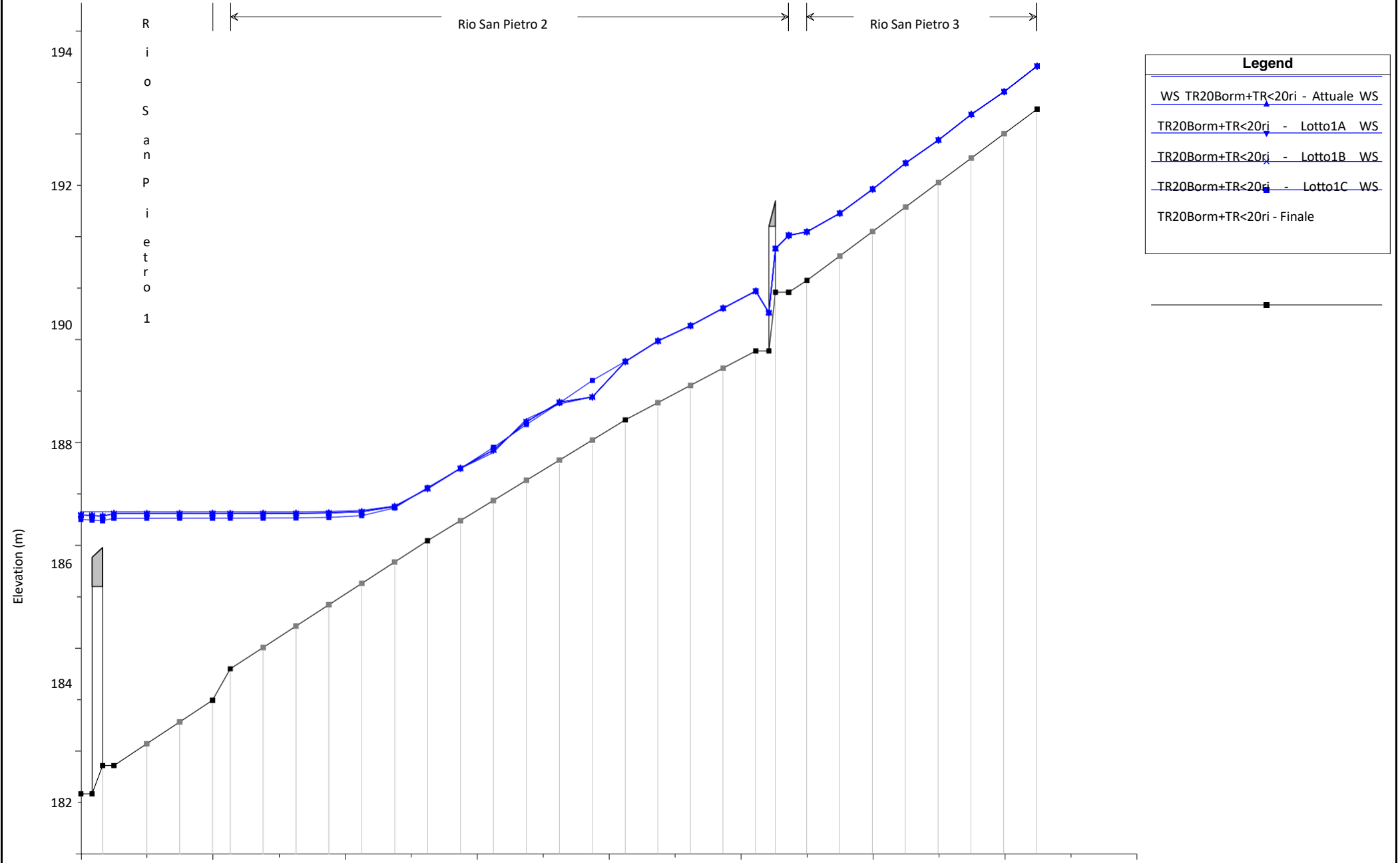
160

180

Main Channel Distance (m)

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02



Legend

- WS TR20Borm+TR<20ri - Attuale WS
- TR20Borm+TR<20ri - Lotto1A WS
- TR20Borm+TR<20ri - Lotto1B WS
- TR20Borm+TR<20ri - Lotto1C WS
- TR20Borm+TR<20ri - Finale

178

0	104.5	106.00*	107.00*	108	110.00*	111.00*	112.00*	113.00*	114.00*	115	116.00*	117.00*	118.00*	119.00*	120.00*	121	122.00*	123.00*	124.00*	125	127	128.00*	129.00*	130.00*	131.00*	132.00*	133.00*	134	800
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Main Channel Distance (m)

INTERVENTO CODICE AT_A18_622_19_102 – PROGETTO PER LAVORI DI ADEGUAMENTO SEZIONI DI DEFLUSSO FOSSI COLATORI PROVENIENTI DA VERSANTI IN GIARONETTO - ADEGUAMENTO DEI TRATTI DEL FIUME BORMIDA E DEL RIO SAN PIETRO IN CORRISPONDENZA DELLA S.P. 25 - PROGETTO ESECUTIVO – LOTTO 1A

CONFRONTO 2

TR20Borm+TR20rii

Corso d'acqua	Portata al colmo [m ³ /s]	Tempo di ritorno [anni]
Rio Sacco	10.1	20
Rio Madama	5.6	20
Rio della Caffra	19.2	20
Rio San Pietro monte	22.2	20
Rio San Pietro valle	34.3	20
Bormida di Millesimo a Bubbio	833	20

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Rio San Pietro	3	134	TR20Borm+TR20rii	Attuale	22.20	192.48	194.13	194.19	194.73	0.017011	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	TR20Borm+TR20rii	Lotto1A	22.20	192.48	194.13	194.19	194.73	0.017011	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	TR20Borm+TR20rii	Lotto1B	22.20	192.48	194.13	194.19	194.73	0.017011	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	TR20Borm+TR20rii	Lotto1C	22.20	192.48	194.13	194.19	194.73	0.017011	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	TR20Borm+TR20rii	Finale	22.20	192.48	194.13	194.19	194.73	0.017011	3.42	6.50	6.49	1.09
Rio San Pietro	3	133.00*	TR20Borm+TR20rii	Attuale	22.20	192.00	193.62	193.73	194.27	0.019320	3.57	6.22	6.43	1.16
Rio San Pietro	3	133.00*	TR20Borm+TR20rii	Lotto1A	22.20	192.00	193.62	193.73	194.27	0.019320	3.57	6.22	6.43	1.16
Rio San Pietro	3	133.00*	TR20Borm+TR20rii	Lotto1B	22.20	192.00	193.62	193.73	194.27	0.019320	3.57	6.22	6.43	1.16
Rio San Pietro	3	133.00*	TR20Borm+TR20rii	Lotto1C	22.20	192.00	193.62	193.73	194.27	0.019320	3.57	6.22	6.43	1.16
Rio San Pietro	3	133.00*	TR20Borm+TR20rii	Finale	22.20	192.00	193.62	193.73	194.27	0.019320	3.57	6.22	6.43	1.16
Rio San Pietro	3	132.00*	TR20Borm+TR20rii	Attuale	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	132.00*	TR20Borm+TR20rii	Lotto1A	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	132.00*	TR20Borm+TR20rii	Lotto1B	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	132.00*	TR20Borm+TR20rii	Lotto1C	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	132.00*	TR20Borm+TR20rii	Finale	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	131.00*	TR20Borm+TR20rii	Attuale	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	131.00*	TR20Borm+TR20rii	Lotto1A	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	131.00*	TR20Borm+TR20rii	Lotto1B	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	131.00*	TR20Borm+TR20rii	Lotto1C	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	131.00*	TR20Borm+TR20rii	Finale	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	130.00*	TR20Borm+TR20rii	Attuale	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	130.00*	TR20Borm+TR20rii	Lotto1A	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	130.00*	TR20Borm+TR20rii	Lotto1B	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	130.00*	TR20Borm+TR20rii	Lotto1C	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	130.00*	TR20Borm+TR20rii	Finale	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	129.00*	TR20Borm+TR20rii	Attuale	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	TR20Borm+TR20rii	Lotto1A	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	TR20Borm+TR20rii	Lotto1B	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	TR20Borm+TR20rii	Lotto1C	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	TR20Borm+TR20rii	Finale	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19
Rio San Pietro	3	128.00*	TR20Borm+TR20rii	Attuale	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	TR20Borm+TR20rii	Lotto1A	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	TR20Borm+TR20rii	Lotto1B	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	TR20Borm+TR20rii	Lotto1C	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	TR20Borm+TR20rii	Finale	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	127	TR20Borm+TR20rii	Attuale	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	TR20Borm+TR20rii	Lotto1A	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	TR20Borm+TR20rii	Lotto1B	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	TR20Borm+TR20rii	Lotto1C	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	TR20Borm+TR20rii	Finale	22.20	189.15	191.45	190.82	191.50	0.001209	1.26	35.09	60.60	0.32

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	126	TR20Borm+TR20rii	Attuale	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	TR20Borm+TR20rii	Lotto1A	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	TR20Borm+TR20rii	Lotto1B	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	TR20Borm+TR20rii	Lotto1C	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	TR20Borm+TR20rii	Finale	34.30	188.92	191.34	190.73	191.47	0.002112	1.81	35.11	72.91	0.43
Rio San Pietro	2	125.5			Bridge									
Rio San Pietro	2	125	TR20Borm+TR20rii	Attuale	34.30	187.78	189.96	189.96	190.01	0.003089	1.41	41.17	54.90	0.47
Rio San Pietro	2	125	TR20Borm+TR20rii	Lotto1A	34.30	187.78	189.96	189.96	190.01	0.003090	1.41	41.12	53.50	0.47
Rio San Pietro	2	125	TR20Borm+TR20rii	Lotto1B	34.30	187.78	189.96	189.96	190.01	0.003090	1.41	41.12	53.50	0.47
Rio San Pietro	2	125	TR20Borm+TR20rii	Lotto1C	34.30	187.78	189.96	189.96	190.01	0.003090	1.41	41.12	53.50	0.47
Rio San Pietro	2	125	TR20Borm+TR20rii	Finale	34.30	187.78	190.01	190.01	190.60	0.013636	3.42	10.04	8.40	1.00
Rio San Pietro	2	124.00*	TR20Borm+TR20rii	Attuale	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	TR20Borm+TR20rii	Lotto1A	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	TR20Borm+TR20rii	Lotto1B	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	TR20Borm+TR20rii	Lotto1C	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	TR20Borm+TR20rii	Finale	34.30	187.45	189.57	189.62	190.23	0.015985	3.62	9.49	8.22	1.07
Rio San Pietro	2	123.00*	TR20Borm+TR20rii	Attuale	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	123.00*	TR20Borm+TR20rii	Lotto1A	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	123.00*	TR20Borm+TR20rii	Lotto1B	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	123.00*	TR20Borm+TR20rii	Lotto1C	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	123.00*	TR20Borm+TR20rii	Finale	34.30	187.11	189.25	189.26	189.86	0.014388	3.47	9.90	8.34	1.02
Rio San Pietro	2	122.00*	TR20Borm+TR20rii	Attuale	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	TR20Borm+TR20rii	Lotto1A	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	TR20Borm+TR20rii	Lotto1B	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	TR20Borm+TR20rii	Lotto1C	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	TR20Borm+TR20rii	Finale	34.30	186.78	188.88	188.90	189.50	0.014955	3.49	9.82	8.36	1.03
Rio San Pietro	2	121	TR20Borm+TR20rii	Attuale	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	TR20Borm+TR20rii	Lotto1A	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	TR20Borm+TR20rii	Lotto1B	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	TR20Borm+TR20rii	Lotto1C	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	TR20Borm+TR20rii	Finale	34.30	186.44	188.53	188.54	189.14	0.014500	3.45	9.94	8.57	1.01
Rio San Pietro	2	120.00*	TR20Borm+TR20rii	Attuale	34.30	186.05	187.32	187.21	187.40	0.010131	1.94	33.75	72.93	0.80
Rio San Pietro	2	120.00*	TR20Borm+TR20rii	Lotto1A	34.30	186.05	187.33	187.19	187.40	0.009943	1.93	33.96	72.95	0.80
Rio San Pietro	2	120.00*	TR20Borm+TR20rii	Lotto1B	34.30	186.05	187.33	187.19	187.40	0.009943	1.93	33.96	72.95	0.80
Rio San Pietro	2	120.00*	TR20Borm+TR20rii	Lotto1C	34.30	186.05	187.33	187.19	187.40	0.009943	1.93	33.96	72.95	0.80
Rio San Pietro	2	120.00*	TR20Borm+TR20rii	Finale	34.30	186.05	187.96	188.09	188.71	0.019793	3.82	8.99	8.25	1.17
Rio San Pietro	2	119.00*	TR20Borm+TR20rii	Attuale	34.30	185.66	187.07		187.16	0.008735	2.13	35.99	85.89	0.78
Rio San Pietro	2	119.00*	TR20Borm+TR20rii	Lotto1A	34.30	185.66	187.06	187.02	187.16	0.009167	2.17	35.40	85.86	0.80

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	119.00*	TR20Borm+TR20rii	Lotto1B	34.30	185.66	187.06	187.02	187.16	0.009167	2.17	35.40	85.86	0.80
Rio San Pietro	2	119.00*	TR20Borm+TR20rii	Lotto1C	34.30	185.66	187.06	187.02	187.16	0.009167	2.17	35.40	85.86	0.80
Rio San Pietro	2	119.00*	TR20Borm+TR20rii	Finale	34.30	185.66	187.55	187.65	188.25	0.016226	3.69	9.35	8.65	1.13
Rio San Pietro	2	118.00*	TR20Borm+TR20rii	Attuale	34.30	185.27	186.80	186.80	186.94	0.008589	2.37	36.07	107.82	0.79
Rio San Pietro	2	118.00*	TR20Borm+TR20rii	Lotto1A	34.30	185.27	186.81	186.81	186.94	0.008080	2.31	36.68	99.25	0.77
Rio San Pietro	2	118.00*	TR20Borm+TR20rii	Lotto1B	34.30	185.27	186.81	186.81	186.94	0.008080	2.31	36.68	99.25	0.77
Rio San Pietro	2	118.00*	TR20Borm+TR20rii	Lotto1C	34.30	185.27	186.81	186.81	186.94	0.008080	2.31	36.68	99.25	0.77
Rio San Pietro	2	118.00*	TR20Borm+TR20rii	Finale	34.30	185.27	187.14	187.24	187.85	0.015800	3.74	9.55	9.15	1.12
Rio San Pietro	2	117.00*	TR20Borm+TR20rii	Attuale	34.30	184.87	186.52	186.58	186.72	0.009017	2.61	36.59	138.85	0.83
Rio San Pietro	2	117.00*	TR20Borm+TR20rii	Lotto1A	34.30	184.87	186.55	186.59	186.73	0.008337	2.53	34.91	109.75	0.80
Rio San Pietro	2	117.00*	TR20Borm+TR20rii	Lotto1B	34.30	184.87	186.55	186.59	186.73	0.008337	2.53	34.91	109.75	0.80
Rio San Pietro	2	117.00*	TR20Borm+TR20rii	Lotto1C	34.30	184.87	186.55	186.59	186.73	0.008337	2.53	34.91	109.75	0.80
Rio San Pietro	2	117.00*	TR20Borm+TR20rii	Finale	34.30	184.87	186.75	186.85	187.46	0.014925	3.76	9.73	9.63	1.10
Rio San Pietro	2	116.00*	TR20Borm+TR20rii	Attuale	34.30	184.48	186.19	186.27	186.47	0.010331	2.92	31.19	125.91	0.89
Rio San Pietro	2	116.00*	TR20Borm+TR20rii	Lotto1A	34.30	184.48	186.29	186.29	186.42	0.005272	2.21	44.98	156.32	0.65
Rio San Pietro	2	116.00*	TR20Borm+TR20rii	Lotto1B	34.30	184.48	186.29	186.29	186.42	0.005272	2.21	44.98	156.32	0.65
Rio San Pietro	2	116.00*	TR20Borm+TR20rii	Lotto1C	34.30	184.48	186.29	186.29	186.42	0.005272	2.21	44.98	156.32	0.65
Rio San Pietro	2	116.00*	TR20Borm+TR20rii	Finale	34.30	184.48	186.39	186.48	187.10	0.013986	3.79	9.84	9.67	1.07
Rio San Pietro	2	115	TR20Borm+TR20rii	Attuale	34.30	184.09	185.81	185.93	186.18	0.012026	3.24	25.02	112.64	0.96
Rio San Pietro	2	115	TR20Borm+TR20rii	Lotto1A	34.30	184.09	185.82	185.94	186.21	0.012028	3.26	21.68	55.18	0.96
Rio San Pietro	2	115	TR20Borm+TR20rii	Lotto1B	34.30	184.09	185.82	185.94	186.21	0.012028	3.26	21.68	55.18	0.96
Rio San Pietro	2	115	TR20Borm+TR20rii	Lotto1C	34.30	184.09	185.82	185.94	186.21	0.012028	3.26	21.68	55.18	0.96
Rio San Pietro	2	115	TR20Borm+TR20rii	Finale	34.30	184.09	186.04	186.12	186.76	0.013078	3.82	9.91	9.70	1.03
Rio San Pietro	2	114.00*	TR20Borm+TR20rii	Attuale	34.30	183.67	185.67	185.73	185.93	0.006786	2.62	27.19	80.86	0.74
Rio San Pietro	2	114.00*	TR20Borm+TR20rii	Lotto1A	34.30	183.67	185.64	185.73	185.94	0.008059	2.81	24.49	70.93	0.80
Rio San Pietro	2	114.00*	TR20Borm+TR20rii	Lotto1B	34.30	183.67	185.64	185.73	185.94	0.008059	2.81	24.49	70.93	0.80
Rio San Pietro	2	114.00*	TR20Borm+TR20rii	Lotto1C	34.30	183.67	185.64	185.73	185.94	0.008059	2.81	24.49	70.93	0.80
Rio San Pietro	2	114.00*	TR20Borm+TR20rii	Finale	34.30	183.67	185.57	185.75	186.38	0.017639	4.00	8.82	9.03	1.17
Rio San Pietro	2	113.00*	TR20Borm+TR20rii	Attuale	34.30	183.26	185.33	185.45	185.71	0.009740	2.99	18.76	43.25	0.87
Rio San Pietro	2	113.00*	TR20Borm+TR20rii	Lotto1A	34.30	183.26	185.66	185.45	185.76	0.002530	1.79	41.84	115.54	0.46
Rio San Pietro	2	113.00*	TR20Borm+TR20rii	Lotto1B	34.30	183.26	185.66	185.45	185.76	0.002530	1.79	41.84	115.54	0.46
Rio San Pietro	2	113.00*	TR20Borm+TR20rii	Lotto1C	34.30	183.26	185.66	185.45	185.76	0.002530	1.79	41.84	115.54	0.46
Rio San Pietro	2	113.00*	TR20Borm+TR20rii	Finale	34.30	183.26	185.36	185.37	185.96	0.012654	3.46	10.11	9.93	0.99
Rio San Pietro	2	112.00*	TR20Borm+TR20rii	Attuale	34.30	182.85	185.04	185.13	185.46	0.010444	3.00	16.23	35.48	0.89
Rio San Pietro	2	112.00*	TR20Borm+TR20rii	Lotto1A	34.30	182.85	185.11	185.03	185.61	0.010605	3.14	11.01	10.33	0.90
Rio San Pietro	2	112.00*	TR20Borm+TR20rii	Lotto1B	34.30	182.85	185.11	185.03	185.61	0.010563	3.14	11.03	10.37	0.90
Rio San Pietro	2	112.00*	TR20Borm+TR20rii	Lotto1C	34.30	182.85	185.11	185.03	185.61	0.010563	3.14	11.03	10.37	0.90
Rio San Pietro	2	112.00*	TR20Borm+TR20rii	Finale	34.30	182.85	184.97	185.03	185.61	0.015621	3.54	9.69	8.93	1.08
Rio San Pietro	2	111.00*	TR20Borm+TR20rii	Attuale	34.30	182.43	184.75	184.84	185.19	0.010405	3.02	14.42	31.66	0.88

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Rio San Pietro	2	111.00*	TR20Borm+TR20rii	Lotto1A	34.30	182.43	185.05	184.68	185.37	0.005640	2.50	14.08	11.83	0.67
Rio San Pietro	2	111.00*	TR20Borm+TR20rii	Lotto1B	34.30	182.43	185.05	184.68	185.37	0.005642	2.50	14.08	11.83	0.67
Rio San Pietro	2	111.00*	TR20Borm+TR20rii	Lotto1C	34.30	182.43	185.05	184.68	185.37	0.005642	2.50	14.08	11.83	0.67
Rio San Pietro	2	111.00*	TR20Borm+TR20rii	Finale	34.30	182.43	184.98	184.68	185.33	0.006794	2.64	13.19	11.31	0.73
Rio San Pietro	2	110.00*	TR20Borm+TR20rii	Attuale	34.30	182.02	184.64	184.44	184.92	0.005852	2.44	18.65	33.47	0.67
Rio San Pietro	2	110.00*	TR20Borm+TR20rii	Lotto1A	34.30	182.02	185.03	184.32	185.23	0.003007	1.99	17.93	13.67	0.50
Rio San Pietro	2	110.00*	TR20Borm+TR20rii	Lotto1B	34.30	182.02	185.03	184.32	185.23	0.003008	1.99	17.92	13.67	0.50
Rio San Pietro	2	110.00*	TR20Borm+TR20rii	Lotto1C	34.30	182.02	185.03	184.32	185.23	0.003008	1.99	17.92	13.67	0.50
Rio San Pietro	2	110.00*	TR20Borm+TR20rii	Finale	34.30	182.02	184.95	184.32	185.17	0.003627	2.11	16.77	12.59	0.54
Rio San Pietro	2	109	TR20Borm+TR20rii	Attuale	34.30	181.60	184.63		184.79	0.002799	1.86	28.09	55.44	0.47
Rio San Pietro	2	109	TR20Borm+TR20rii	Lotto1A	34.30	181.60	185.03	183.95	185.16	0.001678	1.61	23.81	37.37	0.38
Rio San Pietro	2	109	TR20Borm+TR20rii	Lotto1B	34.30	181.60	185.03	183.95	185.16	0.001679	1.61	23.80	37.34	0.38
Rio San Pietro	2	109	TR20Borm+TR20rii	Lotto1C	34.30	181.60	185.03	183.95	185.16	0.001679	1.61	23.80	37.34	0.38
Rio San Pietro	2	109	TR20Borm+TR20rii	Finale	34.30	181.60	184.94	183.95	185.08	0.002018	1.70	21.02	15.49	0.41
Rio San Pietro	1	108	TR20Borm+TR20rii	Attuale	34.30	180.99	184.65	183.64	184.74	0.001274	1.47	40.85	58.29	0.32
Rio San Pietro	1	108	TR20Borm+TR20rii	Lotto1A	34.30	180.99	185.07	183.66	185.12	0.000638	1.17	74.73	212.08	0.24
Rio San Pietro	1	108	TR20Borm+TR20rii	Lotto1B	34.30	180.99	185.03	183.66	185.13	0.001029	1.47	28.82	22.80	0.30
Rio San Pietro	1	108	TR20Borm+TR20rii	Lotto1C	34.30	180.99	185.03	183.66	185.13	0.001029	1.47	28.82	22.80	0.30
Rio San Pietro	1	108	TR20Borm+TR20rii	Finale	34.30	180.99	184.94	183.66	185.05	0.001200	1.55	26.72	22.80	0.32
Rio San Pietro	1	107.00*	TR20Borm+TR20rii	Attuale	34.30	180.57	184.65		184.71	0.000836	1.23	48.94	137.22	0.26
Rio San Pietro	1	107.00*	TR20Borm+TR20rii	Lotto1A	34.30	180.57	185.03	183.30	185.10	0.000694	1.25	33.54	22.10	0.25
Rio San Pietro	1	107.00*	TR20Borm+TR20rii	Lotto1B	34.30	180.57	185.03	183.30	185.10	0.000694	1.25	33.54	22.10	0.25
Rio San Pietro	1	107.00*	TR20Borm+TR20rii	Lotto1C	34.30	180.57	185.03	183.30	185.10	0.000694	1.25	33.54	22.10	0.25
Rio San Pietro	1	107.00*	TR20Borm+TR20rii	Finale	34.30	180.57	184.94	183.30	185.02	0.000799	1.31	31.50	22.10	0.26
Rio San Pietro	1	106.00*	TR20Borm+TR20rii	Attuale	34.30	180.14	184.65		184.68	0.000483	0.96	84.68	245.01	0.20
Rio San Pietro	1	106.00*	TR20Borm+TR20rii	Lotto1A	34.30	180.14	185.03	182.90	185.08	0.000493	1.08	38.21	21.40	0.21
Rio San Pietro	1	106.00*	TR20Borm+TR20rii	Lotto1B	34.30	180.14	185.03	182.90	185.08	0.000493	1.08	38.21	21.40	0.21
Rio San Pietro	1	106.00*	TR20Borm+TR20rii	Lotto1C	34.30	180.14	185.03	182.90	185.08	0.000493	1.08	38.21	21.40	0.21
Rio San Pietro	1	106.00*	TR20Borm+TR20rii	Finale	34.30	180.14	184.93	182.90	185.00	0.000562	1.12	36.23	21.40	0.22
Rio San Pietro	1	105	TR20Borm+TR20rii	Attuale	34.30	179.72	184.65	182.50	184.67	0.000241	0.70	130.71	252.40	0.14
Rio San Pietro	1	105	TR20Borm+TR20rii	Lotto1A	34.30	179.72	185.03	182.50	185.07	0.000361	0.94	43.06	20.70	0.18
Rio San Pietro	1	105	TR20Borm+TR20rii	Lotto1B	34.30	179.72	185.03	182.50	185.07	0.000361	0.94	43.06	20.70	0.18
Rio San Pietro	1	105	TR20Borm+TR20rii	Lotto1C	34.30	179.72	185.03	182.50	185.07	0.000361	0.94	43.06	20.70	0.18
Rio San Pietro	1	105	TR20Borm+TR20rii	Finale	34.30	179.72	184.93	182.50	184.98	0.000408	0.98	41.15	20.70	0.19
Rio San Pietro	1	104.5			Bridge									
Rio San Pietro	1	104	TR20Borm+TR20rii	Attuale	34.30	179.17	184.65		184.66	0.000078	0.51	183.27	266.06	0.09
Rio San Pietro	1	104	TR20Borm+TR20rii	Lotto1A	34.30	179.17	184.57	181.58	184.60	0.000199	0.80	46.96	18.70	0.14
Rio San Pietro	1	104	TR20Borm+TR20rii	Lotto1B	34.30	179.17	184.57	181.58	184.60	0.000199	0.80	46.96	18.70	0.14
Rio San Pietro	1	104	TR20Borm+TR20rii	Lotto1C	34.30	179.17	184.57	181.58	184.60	0.000199	0.80	46.96	18.70	0.14

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	1	104	TR20Borm+TR20rii	Finale	34.30	179.17	184.47	181.58	184.51	0.000219	0.83	45.25	18.70	0.14
Rio Sacco	1	306	TR20Borm+TR20rii	Attuale	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	TR20Borm+TR20rii	Lotto1A	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	TR20Borm+TR20rii	Lotto1B	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	TR20Borm+TR20rii	Lotto1C	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	TR20Borm+TR20rii	Finale	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	305	TR20Borm+TR20rii	Attuale	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	TR20Borm+TR20rii	Lotto1A	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	TR20Borm+TR20rii	Lotto1B	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	TR20Borm+TR20rii	Lotto1C	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	TR20Borm+TR20rii	Finale	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	304.5			Bridge									
Rio Sacco	1	304	TR20Borm+TR20rii	Attuale	10.10	183.36	185.41		185.47	0.001283	1.09	9.29	7.04	0.30
Rio Sacco	1	304	TR20Borm+TR20rii	Lotto1A	10.10	183.36	185.34		185.41	0.001470	1.14	8.84	6.90	0.32
Rio Sacco	1	304	TR20Borm+TR20rii	Lotto1B	10.10	183.36	185.26		185.33	0.001776	1.23	8.24	6.70	0.35
Rio Sacco	1	304	TR20Borm+TR20rii	Lotto1C	10.10	183.36	185.26		185.33	0.001776	1.23	8.24	6.70	0.35
Rio Sacco	1	304	TR20Borm+TR20rii	Finale	10.10	183.36	185.08		185.18	0.002644	1.42	7.11	6.27	0.43
Rio Sacco	1	303	TR20Borm+TR20rii	Attuale	10.10	182.69	185.40		185.44	0.000676	0.86	11.70	7.32	0.22
Rio Sacco	1	303	TR20Borm+TR20rii	Lotto1A	10.10	182.69	185.34		185.38	0.000746	0.90	11.23	7.08	0.23
Rio Sacco	1	303	TR20Borm+TR20rii	Lotto1B	10.10	182.69	185.25		185.30	0.000858	0.95	10.61	6.82	0.24
Rio Sacco	1	303	TR20Borm+TR20rii	Lotto1C	10.10	182.69	185.25		185.30	0.000858	0.95	10.61	6.82	0.24
Rio Sacco	1	303	TR20Borm+TR20rii	Finale	10.10	182.69	185.07		185.13	0.001167	1.07	9.44	6.44	0.28
Rio Sacco	1	302	TR20Borm+TR20rii	Attuale	10.10	182.41	185.42		185.43	0.000052	0.32	37.76	27.04	0.07
Rio Sacco	1	302	TR20Borm+TR20rii	Lotto1A	10.10	182.41	185.36		185.36	0.000059	0.33	36.04	26.70	0.08
Rio Sacco	1	302	TR20Borm+TR20rii	Lotto1B	10.10	182.41	185.27		185.28	0.000069	0.35	33.77	26.12	0.08
Rio Sacco	1	302	TR20Borm+TR20rii	Lotto1C	10.10	182.41	185.27		185.28	0.000069	0.35	33.77	26.12	0.08
Rio Sacco	1	302	TR20Borm+TR20rii	Finale	10.10	182.41	185.10		185.11	0.000098	0.39	29.40	24.90	0.10
Rio Sacco	1	301	TR20Borm+TR20rii	Attuale	10.10	181.63	185.42		185.43	0.000030	0.26	55.62	31.56	0.05
Rio Sacco	1	301	TR20Borm+TR20rii	Lotto1A	10.10	181.63	185.36		185.36	0.000033	0.27	53.60	31.40	0.06
Rio Sacco	1	301	TR20Borm+TR20rii	Lotto1B	10.10	181.63	185.27		185.28	0.000038	0.28	50.92	31.18	0.06
Rio Sacco	1	301	TR20Borm+TR20rii	Lotto1C	10.10	181.63	185.27		185.28	0.000038	0.28	50.92	31.18	0.06
Rio Sacco	1	301	TR20Borm+TR20rii	Finale	10.10	181.63	185.10		185.11	0.000052	0.31	45.63	30.73	0.07
Rio Madama	1	405	TR20Borm+TR20rii	Attuale	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	TR20Borm+TR20rii	Lotto1A	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	TR20Borm+TR20rii	Lotto1B	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	TR20Borm+TR20rii	Lotto1C	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	TR20Borm+TR20rii	Finale	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	404	TR20Borm+TR20rii	Attuale	5.60	187.14	187.77	187.77	187.77	0.000039	0.08	43.18	25.69	0.04

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Rio Madama	1	404	TR20Borm+TR20rii	Lotto1A	5.60	187.14	187.77	187.77	187.77	0.000039	0.08	43.18	25.69	0.04
Rio Madama	1	404	TR20Borm+TR20rii	Lotto1B	5.60	187.14	188.08	188.08	188.36	0.016189	2.36	2.38	4.20	1.00
Rio Madama	1	404	TR20Borm+TR20rii	Lotto1C	5.60	187.14	188.08	188.08	188.36	0.016189	2.36	2.38	4.20	1.00
Rio Madama	1	404	TR20Borm+TR20rii	Finale	5.60	187.14	188.08	188.08	188.36	0.015948	2.35	2.40	4.21	0.99
Rio Madama	1	403	TR20Borm+TR20rii	Attuale	5.60	186.20	186.75	186.75	186.75	0.000170	0.17	26.88	23.66	0.09
Rio Madama	1	403	TR20Borm+TR20rii	Lotto1A	5.60	186.20	186.75	186.75	186.75	0.000170	0.17	26.88	23.66	0.09
Rio Madama	1	403	TR20Borm+TR20rii	Lotto1B	5.60	186.20	187.12	187.12	187.12	0.000517	0.37	18.46	22.64	0.17
Rio Madama	1	403	TR20Borm+TR20rii	Lotto1C	5.60	186.20	187.12	187.12	187.12	0.000517	0.37	18.46	22.64	0.17
Rio Madama	1	403	TR20Borm+TR20rii	Finale	5.60	186.20	187.25	187.25	187.57	0.017485	2.50	2.35	3.91	1.02
Rio Madama	1	402	TR20Borm+TR20rii	Attuale	5.60	184.94	185.58	185.74	186.61	0.107703	4.49	1.25	3.51	2.41
Rio Madama	1	402	TR20Borm+TR20rii	Lotto1A	5.60	184.94	185.58	185.74	186.61	0.107703	4.49	1.25	3.51	2.41
Rio Madama	1	402	TR20Borm+TR20rii	Lotto1B	5.60	184.94	185.54	185.88	186.88	0.152691	5.13	1.09	3.27	2.84
Rio Madama	1	402	TR20Borm+TR20rii	Lotto1C	5.60	184.94	185.54	185.88	186.88	0.152691	5.13	1.09	3.27	2.84
Rio Madama	1	402	TR20Borm+TR20rii	Finale	5.60	184.94	185.78	185.88	186.15	0.032453	2.68	2.09	5.30	1.36
Rio Madama	1	401	TR20Borm+TR20rii	Attuale	5.60	183.68	184.67	184.67	184.95	0.017096	2.37	2.37	4.22	1.01
Rio Madama	1	401	TR20Borm+TR20rii	Lotto1A	5.60	183.68	185.13	184.67	185.15	0.001599	0.78	13.20	48.30	0.32
Rio Madama	1	401	TR20Borm+TR20rii	Lotto1B	5.60	183.68	185.13	184.67	185.17	0.002472	0.98	8.27	28.20	0.40
Rio Madama	1	401	TR20Borm+TR20rii	Lotto1C	5.60	183.68	185.13	184.67	185.17	0.002472	0.98	8.27	28.20	0.40
Rio Madama	1	401	TR20Borm+TR20rii	Finale	5.60	183.68	185.00	184.67	185.10	0.004652	1.39	4.04	6.12	0.55
Rio Caffra	1	205	TR20Borm+TR20rii	Attuale	19.20	190.88	192.26	192.11	192.38	0.004193	1.71	17.62	37.78	0.57
Rio Caffra	1	205	TR20Borm+TR20rii	Lotto1A	19.20	190.88	192.26	192.11	192.38	0.004193	1.71	17.62	37.78	0.57
Rio Caffra	1	205	TR20Borm+TR20rii	Lotto1B	19.20	190.88	192.26	192.11	192.38	0.004192	1.71	17.62	37.78	0.57
Rio Caffra	1	205	TR20Borm+TR20rii	Lotto1C	19.20	190.88	192.26	192.11	192.38	0.004192	1.71	17.62	37.78	0.57
Rio Caffra	1	205	TR20Borm+TR20rii	Finale	19.20	190.88	192.26	192.11	192.38	0.004194	1.71	17.62	37.78	0.57
Rio Caffra	1	203	TR20Borm+TR20rii	Attuale	19.20	190.29	191.76	191.76	192.10	0.013227	2.78	9.41	17.25	0.97
Rio Caffra	1	203	TR20Borm+TR20rii	Lotto1A	19.20	190.29	191.76	191.76	192.10	0.013227	2.78	9.41	17.25	0.97
Rio Caffra	1	203	TR20Borm+TR20rii	Lotto1B	19.20	190.29	191.76	191.76	192.10	0.013221	2.78	9.42	17.27	0.97
Rio Caffra	1	203	TR20Borm+TR20rii	Lotto1C	19.20	190.29	191.76	191.76	192.10	0.013221	2.78	9.42	17.27	0.97
Rio Caffra	1	203	TR20Borm+TR20rii	Finale	19.20	190.29	191.76	191.76	192.10	0.013230	2.78	9.41	17.24	0.97
Rio Caffra	1	201	TR20Borm+TR20rii	Attuale	19.20	189.19	191.44	190.74	191.52	0.001386	1.38	19.60	18.90	0.35
Rio Caffra	1	201	TR20Borm+TR20rii	Lotto1A	19.20	189.19	191.44	190.74	191.52	0.001386	1.38	19.60	18.90	0.35
Rio Caffra	1	201	TR20Borm+TR20rii	Lotto1B	19.20	189.19	191.44	190.74	191.52	0.001387	1.38	19.60	18.90	0.35
Rio Caffra	1	201	TR20Borm+TR20rii	Lotto1C	19.20	189.19	191.44	190.74	191.52	0.001387	1.38	19.60	18.90	0.35
Rio Caffra	1	201	TR20Borm+TR20rii	Finale	19.20	189.19	191.44	190.74	191.52	0.001384	1.38	19.61	18.90	0.35
Bormida	3	43	TR20Borm+TR20rii	Attuale	833.00	179.12	185.01	183.40	185.72	0.002256	3.78	270.75	162.73	0.55
Bormida	3	43	TR20Borm+TR20rii	Lotto1A	833.00	179.12	184.93	183.40	185.68	0.002414	3.87	257.79	155.27	0.56
Bormida	3	43	TR20Borm+TR20rii	Lotto1B	833.00	179.12	184.87	183.40	185.64	0.002549	3.94	247.87	151.29	0.58
Bormida	3	43	TR20Borm+TR20rii	Lotto1C	833.00	179.12	184.98	183.33	185.52	0.002009	3.31	290.72	159.08	0.51
Bormida	3	43	TR20Borm+TR20rii	Finale	833.00	179.12	184.86	183.26	185.34	0.001892	3.07	298.06	153.20	0.49

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Bormida	3	42.000*	TR20Borm+TR20rii	Attuale	833.00	179.09	184.99	183.35	185.65	0.002189	3.66	278.14	184.22	0.54
Bormida	3	42.000*	TR20Borm+TR20rii	Lotto1A	833.00	179.09	184.90	183.35	185.61	0.002370	3.76	261.86	180.36	0.56
Bormida	3	42.000*	TR20Borm+TR20rii	Lotto1B	833.00	179.09	184.83	183.35	185.57	0.002503	3.82	250.30	167.15	0.57
Bormida	3	42.000*	TR20Borm+TR20rii	Lotto1C	833.00	179.09	184.94		185.47	0.001980	3.25	293.95	181.97	0.50
Bormida	3	42.000*	TR20Borm+TR20rii	Finale	833.00	179.09	184.83		185.29	0.001877	3.02	298.24	166.87	0.49
Bormida	3	41.000*	TR20Borm+TR20rii	Attuale	833.00	179.06	184.96	183.29	185.59	0.002133	3.54	285.68	196.65	0.53
Bormida	3	41.000*	TR20Borm+TR20rii	Lotto1A	833.00	179.06	184.87	183.29	185.54	0.002327	3.65	267.09	193.72	0.55
Bormida	3	41.000*	TR20Borm+TR20rii	Lotto1B	833.00	179.06	184.79	183.29	185.50	0.002490	3.73	252.80	190.66	0.57
Bormida	3	41.000*	TR20Borm+TR20rii	Lotto1C	833.00	179.06	184.90		185.41	0.001956	3.19	297.73	195.35	0.50
Bormida	3	41.000*	TR20Borm+TR20rii	Finale	833.00	179.06	184.79		185.24	0.001874	2.98	298.99	190.55	0.48
Bormida	3	40.000*	TR20Borm+TR20rii	Attuale	833.00	179.04	184.94	183.24	185.53	0.002100	3.45	292.02	206.27	0.52
Bormida	3	40.000*	TR20Borm+TR20rii	Lotto1A	833.00	179.04	184.83	183.24	185.47	0.002302	3.56	271.23	204.64	0.55
Bormida	3	40.000*	TR20Borm+TR20rii	Lotto1B	833.00	179.04	184.76	183.24	185.43	0.002456	3.64	255.65	194.09	0.56
Bormida	3	40.000*	TR20Borm+TR20rii	Lotto1C	833.00	179.04	184.87		185.36	0.001943	3.13	300.91	205.36	0.50
Bormida	3	40.000*	TR20Borm+TR20rii	Finale	833.00	179.04	184.75		185.19	0.001864	2.94	299.97	197.50	0.48
Bormida	3	39.000*	TR20Borm+TR20rii	Attuale	833.00	179.01	184.90	183.17	185.47	0.002065	3.37	296.93	215.61	0.52
Bormida	3	39.000*	TR20Borm+TR20rii	Lotto1A	833.00	179.01	184.80	183.17	185.40	0.002256	3.47	275.58	191.13	0.54
Bormida	3	39.000*	TR20Borm+TR20rii	Lotto1B	833.00	179.01	184.72	183.17	185.36	0.002406	3.55	262.04	161.27	0.56
Bormida	3	39.000*	TR20Borm+TR20rii	Lotto1C	833.00	179.01	184.83		185.31	0.001919	3.08	303.43	205.78	0.49
Bormida	3	39.000*	TR20Borm+TR20rii	Finale	833.00	179.01	184.71		185.14	0.001842	2.90	305.03	158.02	0.48
Bormida	3	38.000*	TR20Borm+TR20rii	Attuale	833.00	178.98	184.87		185.41	0.002011	3.27	303.44	188.83	0.51
Bormida	3	38.000*	TR20Borm+TR20rii	Lotto1A	833.00	178.98	184.77		185.34	0.002200	3.38	285.02	166.30	0.53
Bormida	3	38.000*	TR20Borm+TR20rii	Lotto1B	833.00	178.98	184.68		185.29	0.002370	3.46	271.35	156.90	0.55
Bormida	3	38.000*	TR20Borm+TR20rii	Lotto1C	833.00	178.98	184.80		185.26	0.001876	3.02	310.88	169.46	0.49
Bormida	3	38.000*	TR20Borm+TR20rii	Finale	833.00	178.98	184.68		185.09	0.001824	2.85	313.31	155.40	0.48
Bormida	3	37	TR20Borm+TR20rii	Attuale	833.00	178.95	184.85		185.35	0.001955	3.18	314.54	176.15	0.50
Bormida	3	37	TR20Borm+TR20rii	Lotto1A	833.00	178.95	184.74		185.28	0.002162	3.29	295.41	165.42	0.52
Bormida	3	37	TR20Borm+TR20rii	Lotto1B	833.00	178.95	184.65		185.22	0.002347	3.39	280.88	157.08	0.55
Bormida	3	37	TR20Borm+TR20rii	Lotto1C	833.00	178.95	184.77		185.20	0.001842	2.96	320.66	167.62	0.48
Bormida	3	37	TR20Borm+TR20rii	Finale	833.00	178.95	184.64		185.04	0.001811	2.81	321.96	156.75	0.47
Bormida	2	35	TR20Borm+TR20rii	Attuale	833.00	178.59	184.71		185.29	0.001931	3.43	295.29	173.73	0.50
Bormida	2	35	TR20Borm+TR20rii	Lotto1A	833.00	178.59	184.65		185.22	0.002179	3.38	286.80	159.31	0.53
Bormida	2	35	TR20Borm+TR20rii	Lotto1B	833.00	178.59	184.63		185.15	0.001847	3.21	298.68	158.11	0.49
Bormida	2	35	TR20Borm+TR20rii	Lotto1C	833.00	178.59	184.63	182.89	185.15	0.001847	3.21	298.68	158.11	0.49
Bormida	2	35	TR20Borm+TR20rii	Finale	833.00	178.59	184.54	182.85	184.99	0.001739	2.97	306.43	151.96	0.47
Bormida	2	34.000*	TR20Borm+TR20rii	Attuale	833.00	178.53	184.64	182.88	185.24	0.001991	3.47	291.44	184.69	0.51
Bormida	2	34.000*	TR20Borm+TR20rii	Lotto1A	833.00	178.53	184.59		185.16	0.002167	3.39	285.52	174.46	0.53
Bormida	2	34.000*	TR20Borm+TR20rii	Lotto1B	833.00	178.53	184.58		185.10	0.001859	3.23	296.82	173.28	0.49
Bormida	2	34.000*	TR20Borm+TR20rii	Lotto1C	833.00	178.53	184.58	182.82	185.10	0.001859	3.23	296.82	173.28	0.49
Bormida	2	34.000*	TR20Borm+TR20rii	Finale	833.00	178.53	184.50	182.78	184.95	0.001707	2.97	306.26	160.79	0.47

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	2	33.000*	TR20Borm+TR20rii	Attuale	833.00	178.46	184.58	182.84	185.19	0.002040	3.51	293.35	208.31	0.52
Bormida	2	33.000*	TR20Borm+TR20rii	Lotto1A	833.00	178.46	184.49	182.84	185.10	0.002359	3.49	277.25	207.09	0.55
Bormida	2	33.000*	TR20Borm+TR20rii	Lotto1B	833.00	178.46	184.53		185.06	0.001861	3.24	300.54	207.62	0.49
Bormida	2	33.000*	TR20Borm+TR20rii	Lotto1C	833.00	178.46	184.53	182.77	185.06	0.001861	3.24	300.54	207.62	0.49
Bormida	2	33.000*	TR20Borm+TR20rii	Finale	833.00	178.46	184.46	182.70	184.90	0.001676	2.96	309.78	175.95	0.46
Bormida	2	32.000*	TR20Borm+TR20rii	Attuale	833.00	178.40	184.53	182.80	185.14	0.002040	3.51	299.49	199.33	0.52
Bormida	2	32.000*	TR20Borm+TR20rii	Lotto1A	833.00	178.40	184.44	182.80	185.04	0.002276	3.46	286.82	197.74	0.54
Bormida	2	32.000*	TR20Borm+TR20rii	Lotto1B	833.00	178.40	184.49		185.01	0.001826	3.23	309.54	198.59	0.49
Bormida	2	32.000*	TR20Borm+TR20rii	Lotto1C	833.00	178.40	184.49	182.72	185.01	0.001826	3.23	309.54	198.59	0.49
Bormida	2	32.000*	TR20Borm+TR20rii	Finale	833.00	178.40	184.43	182.63	184.86	0.001632	2.94	319.72	197.26	0.46
Bormida	2	31.000*	TR20Borm+TR20rii	Attuale	833.00	178.33	184.49	182.75	185.09	0.002037	3.51	305.05	191.37	0.52
Bormida	2	31.000*	TR20Borm+TR20rii	Lotto1A	833.00	178.33	184.43		184.97	0.001986	3.32	306.70	189.24	0.51
Bormida	2	31.000*	TR20Borm+TR20rii	Lotto1B	833.00	178.33	184.45		184.96	0.001791	3.21	317.87	189.76	0.48
Bormida	2	31.000*	TR20Borm+TR20rii	Lotto1C	833.00	178.33	184.45	182.66	184.96	0.001791	3.21	317.87	189.76	0.48
Bormida	2	31.000*	TR20Borm+TR20rii	Finale	833.00	178.33	184.39	182.57	184.82	0.001580	2.92	330.06	188.39	0.45
Bormida	2	30.000*	TR20Borm+TR20rii	Attuale	833.00	178.27	184.44		185.04	0.002034	3.50	310.45	187.66	0.52
Bormida	2	30.000*	TR20Borm+TR20rii	Lotto1A	833.00	178.27	184.42	182.60	184.91	0.001757	3.19	325.86	186.45	0.48
Bormida	2	30.000*	TR20Borm+TR20rii	Lotto1B	833.00	178.27	184.42	182.60	184.91	0.001757	3.19	325.86	186.45	0.48
Bormida	2	30.000*	TR20Borm+TR20rii	Lotto1C	833.00	178.27	184.42	182.60	184.91	0.001757	3.19	325.86	186.45	0.48
Bormida	2	30.000*	TR20Borm+TR20rii	Finale	833.00	178.27	184.36	182.50	184.78	0.001527	2.88	339.86	182.57	0.44
Bormida	2	29.000*	TR20Borm+TR20rii	Attuale	833.00	178.20	184.40		184.99	0.002027	3.49	315.93	186.17	0.51
Bormida	2	29.000*	TR20Borm+TR20rii	Lotto1A	833.00	178.20	184.38	182.55	184.87	0.001723	3.17	332.70	174.72	0.47
Bormida	2	29.000*	TR20Borm+TR20rii	Lotto1B	833.00	178.20	184.38	182.55	184.87	0.001723	3.17	332.70	174.72	0.47
Bormida	2	29.000*	TR20Borm+TR20rii	Lotto1C	833.00	178.20	184.38	182.55	184.87	0.001723	3.17	332.70	174.72	0.47
Bormida	2	29.000*	TR20Borm+TR20rii	Finale	833.00	178.20	184.34	182.43	184.74	0.001477	2.85	348.75	173.71	0.43
Bormida	2	28	TR20Borm+TR20rii	Attuale	833.00	178.14	184.36		184.93	0.002019	3.48	322.84	193.80	0.51
Bormida	2	28	TR20Borm+TR20rii	Lotto1A	833.00	178.14	184.35	182.49	184.82	0.001693	3.15	337.96	163.61	0.47
Bormida	2	28	TR20Borm+TR20rii	Lotto1B	833.00	178.14	184.35	182.49	184.82	0.001693	3.15	337.96	163.61	0.47
Bormida	2	28	TR20Borm+TR20rii	Lotto1C	833.00	178.14	184.35	182.49	184.82	0.001693	3.15	337.96	163.61	0.47
Bormida	2	28	TR20Borm+TR20rii	Finale	833.00	178.14	184.31	182.37	184.70	0.001430	2.82	356.07	162.73	0.43
Bormida	2	27.000*	TR20Borm+TR20rii	Attuale	833.00	178.10	184.30		184.88	0.002008	3.50	310.48	169.23	0.51
Bormida	2	27.000*	TR20Borm+TR20rii	Lotto1A	833.00	178.10	184.30	182.43	184.78	0.001671	3.14	327.45	147.07	0.46
Bormida	2	27.000*	TR20Borm+TR20rii	Lotto1B	833.00	178.10	184.30	182.43	184.78	0.001671	3.14	327.45	147.07	0.46
Bormida	2	27.000*	TR20Borm+TR20rii	Lotto1C	833.00	178.10	184.30	182.43	184.78	0.001671	3.14	327.45	147.07	0.46
Bormida	2	27.000*	TR20Borm+TR20rii	Finale	833.00	178.10	184.27	182.31	184.66	0.001412	2.82	344.85	145.30	0.43
Bormida	2	26.000*	TR20Borm+TR20rii	Attuale	833.00	178.05	184.25		184.83	0.001967	3.50	302.53	146.57	0.51
Bormida	2	26.000*	TR20Borm+TR20rii	Lotto1A	833.00	178.05	184.27	182.37	184.74	0.001622	3.11	321.20	130.10	0.46
Bormida	2	26.000*	TR20Borm+TR20rii	Lotto1B	833.00	178.05	184.27	182.37	184.74	0.001622	3.11	321.20	130.10	0.46
Bormida	2	26.000*	TR20Borm+TR20rii	Lotto1C	833.00	178.05	184.27	182.37	184.74	0.001622	3.11	321.20	130.10	0.46

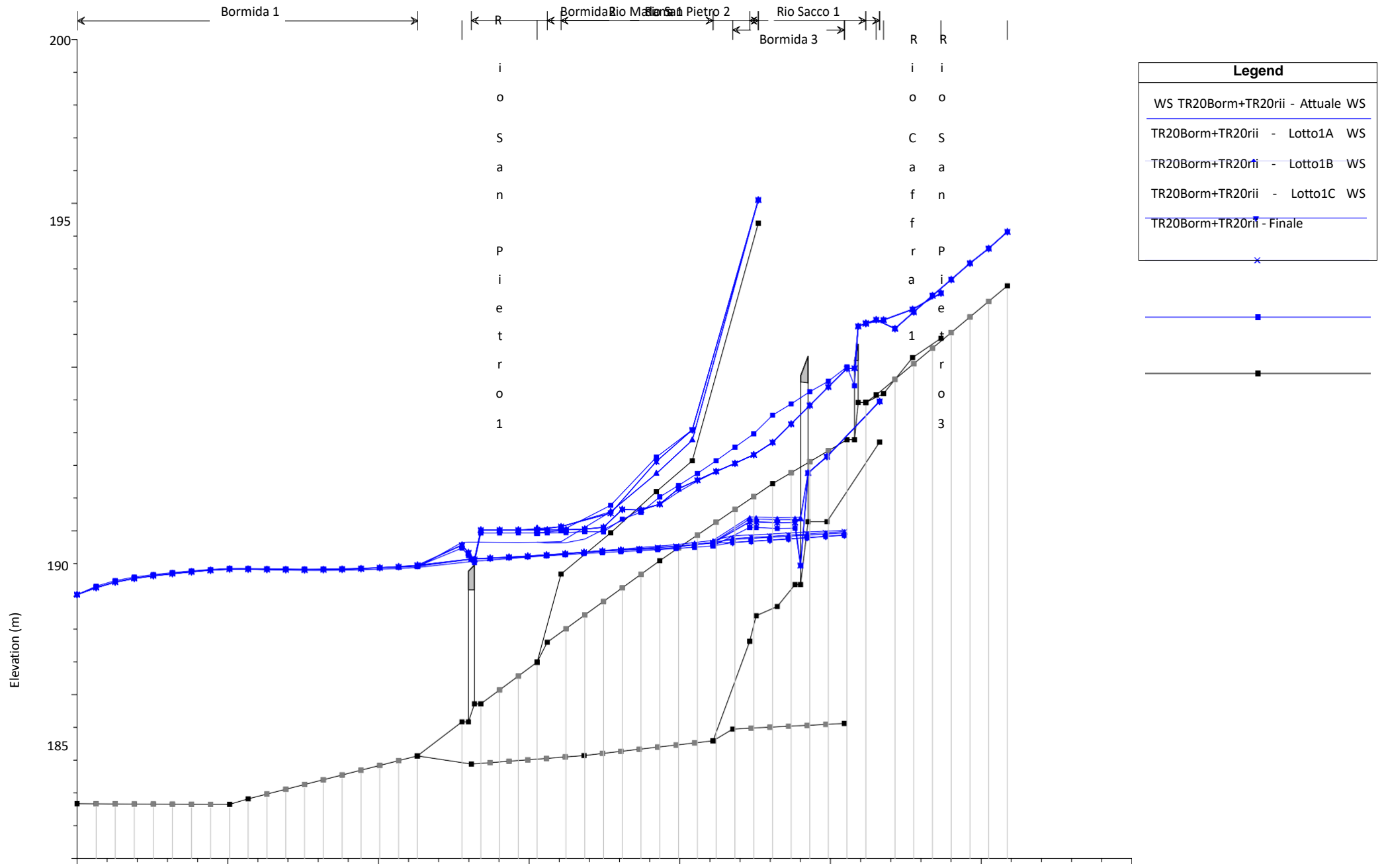
River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	2	26.000*	TR20Borm+TR20rii	Finale	833.00	178.05	184.24	182.25	184.63	0.001372	2.79	338.88	127.94	0.42
Bormida	2	25.000*	TR20Borm+TR20rii	Attuale	833.00	178.01	184.20		184.79	0.001922	3.49	296.16	137.72	0.50
Bormida	2	25.000*	TR20Borm+TR20rii	Lotto1A	833.00	178.01	184.23	182.29	184.70	0.001570	3.08	317.03	118.68	0.45
Bormida	2	25.000*	TR20Borm+TR20rii	Lotto1B	833.00	178.01	184.23	182.29	184.70	0.001570	3.08	317.03	118.68	0.45
Bormida	2	25.000*	TR20Borm+TR20rii	Lotto1C	833.00	178.01	184.23	182.29	184.70	0.001570	3.08	317.03	118.68	0.45
Bormida	2	25.000*	TR20Borm+TR20rii	Finale	833.00	178.01	184.21	182.17	184.59	0.001327	2.77	335.52	116.70	0.42
Bormida	2	24.000*	TR20Borm+TR20rii	Attuale	833.00	177.97	184.15		184.74	0.001873	3.47	290.80	120.64	0.50
Bormida	2	24.000*	TR20Borm+TR20rii	Lotto1A	833.00	177.97	184.20	182.20	184.66	0.001512	3.05	314.00	108.98	0.45
Bormida	2	24.000*	TR20Borm+TR20rii	Lotto1B	833.00	177.97	184.20	182.20	184.66	0.001512	3.05	314.00	108.98	0.45
Bormida	2	24.000*	TR20Borm+TR20rii	Lotto1C	833.00	177.97	184.20	182.20	184.66	0.001512	3.05	314.00	108.98	0.45
Bormida	2	24.000*	TR20Borm+TR20rii	Finale	833.00	177.97	184.18	182.09	184.56	0.001277	2.73	333.70	106.95	0.41
Bormida	2	23.000*	TR20Borm+TR20rii	Attuale	833.00	177.92	184.11		184.69	0.001823	3.46	285.74	107.58	0.49
Bormida	2	23.000*	TR20Borm+TR20rii	Lotto1A	833.00	177.92	184.17	182.12	184.62	0.001451	3.01	311.57	100.22	0.44
Bormida	2	23.000*	TR20Borm+TR20rii	Lotto1B	833.00	177.92	184.17	182.12	184.62	0.001451	3.01	311.57	100.22	0.44
Bormida	2	23.000*	TR20Borm+TR20rii	Lotto1C	833.00	177.92	184.17	182.12	184.62	0.001451	3.01	311.57	100.22	0.44
Bormida	2	23.000*	TR20Borm+TR20rii	Finale	833.00	177.92	184.16	182.01	184.52	0.001225	2.69	332.72	99.03	0.40
Bormida	2	22	TR20Borm+TR20rii	Attuale	833.00	177.88	184.06		184.65	0.001773	3.44	280.53	94.10	0.49
Bormida	2	22	TR20Borm+TR20rii	Lotto1A	833.00	177.88	184.14	182.02	184.58	0.001389	2.96	309.26	91.23	0.43
Bormida	2	22	TR20Borm+TR20rii	Lotto1B	833.00	177.88	184.14	182.02	184.58	0.001389	2.96	309.26	91.23	0.43
Bormida	2	22	TR20Borm+TR20rii	Lotto1C	833.00	177.88	184.14	182.02	184.58	0.001389	2.96	309.26	91.23	0.43
Bormida	2	22	TR20Borm+TR20rii	Finale	833.00	177.88	184.13	181.93	184.49	0.001172	2.65	332.01	91.18	0.39
Bormida	1	19	TR20Borm+TR20rii	Attuale	833.00	178.13	183.88		184.51	0.002047	3.51	252.44	94.65	0.52
Bormida	1	19	TR20Borm+TR20rii	Lotto1A	833.00	178.13	183.95	182.14	184.46	0.001867	3.16	263.89	62.37	0.49
Bormida	1	19	TR20Borm+TR20rii	Lotto1B	833.00	178.13	183.95	182.14	184.46	0.001867	3.16	263.89	62.37	0.49
Bormida	1	19	TR20Borm+TR20rii	Lotto1C	833.00	178.13	183.95	182.14	184.46	0.001867	3.16	263.89	62.37	0.49
Bormida	1	19	TR20Borm+TR20rii	Finale	833.00	178.13	183.92	182.16	184.38	0.001674	3.04	287.54	71.97	0.47
Bormida	1	18.000*	TR20Borm+TR20rii	Attuale	833.00	177.98	183.85		184.45	0.001957	3.43	254.27	89.69	0.51
Bormida	1	18.000*	TR20Borm+TR20rii	Lotto1A	833.00	177.98	183.91	182.10	184.41	0.001826	3.13	267.59	65.87	0.48
Bormida	1	18.000*	TR20Borm+TR20rii	Lotto1B	833.00	177.98	183.91	182.10	184.41	0.001826	3.13	267.59	65.87	0.48
Bormida	1	18.000*	TR20Borm+TR20rii	Lotto1C	833.00	177.98	183.91	182.10	184.41	0.001826	3.13	267.59	65.87	0.48
Bormida	1	18.000*	TR20Borm+TR20rii	Finale	833.00	177.98	183.89	182.10	184.33	0.001582	2.96	295.84	76.95	0.45
Bormida	1	17.000*	TR20Borm+TR20rii	Attuale	833.00	177.84	183.83		184.39	0.001831	3.33	260.60	86.07	0.49
Bormida	1	17.000*	TR20Borm+TR20rii	Lotto1A	833.00	177.84	183.87	182.04	184.36	0.001747	3.08	273.78	69.40	0.47
Bormida	1	17.000*	TR20Borm+TR20rii	Lotto1B	833.00	177.84	183.87	182.04	184.36	0.001747	3.08	273.78	69.40	0.47
Bormida	1	17.000*	TR20Borm+TR20rii	Lotto1C	833.00	177.84	183.87	182.04	184.36	0.001747	3.08	273.78	69.40	0.47
Bormida	1	17.000*	TR20Borm+TR20rii	Finale	833.00	177.84	183.87	182.02	184.29	0.001466	2.88	306.76	82.04	0.44
Bormida	1	16.000*	TR20Borm+TR20rii	Attuale	833.00	177.69	183.81		184.34	0.001685	3.22	270.78	92.80	0.47
Bormida	1	16.000*	TR20Borm+TR20rii	Lotto1A	833.00	177.69	183.85	181.94	184.31	0.001629	3.01	282.36	83.16	0.46
Bormida	1	16.000*	TR20Borm+TR20rii	Lotto1B	833.00	177.69	183.85	181.94	184.31	0.001629	3.01	282.36	83.16	0.46

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Bormida	1	16.000*	TR20Borm+TR20rii	Lotto1C	833.00	177.69	183.85	181.94	184.31	0.001629	3.01	282.36	83.16	0.46
Bormida	1	16.000*	TR20Borm+TR20rii	Finale	833.00	177.69	183.86	181.91	184.24	0.001338	2.78	319.08	87.29	0.42
Bormida	1	15.000*	TR20Borm+TR20rii	Attuale	833.00	177.55	183.80		184.28	0.001523	3.09	285.87	100.01	0.45
Bormida	1	15.000*	TR20Borm+TR20rii	Lotto1A	833.00	177.55	183.83	181.83	184.26	0.001490	2.93	294.79	100.89	0.44
Bormida	1	15.000*	TR20Borm+TR20rii	Lotto1B	833.00	177.55	183.83	181.83	184.26	0.001490	2.93	294.79	100.89	0.44
Bormida	1	15.000*	TR20Borm+TR20rii	Lotto1C	833.00	177.55	183.83	181.83	184.26	0.001490	2.93	294.79	100.89	0.44
Bormida	1	15.000*	TR20Borm+TR20rii	Finale	833.00	177.55	183.84	181.77	184.20	0.001217	2.68	332.85	101.20	0.40
Bormida	1	14.000*	TR20Borm+TR20rii	Attuale	833.00	177.40	183.79		184.23	0.001356	2.95	306.55	117.74	0.43
Bormida	1	14.000*	TR20Borm+TR20rii	Lotto1A	833.00	177.40	183.81	181.69	184.22	0.001334	2.82	313.40	120.93	0.42
Bormida	1	14.000*	TR20Borm+TR20rii	Lotto1B	833.00	177.40	183.81	181.69	184.22	0.001334	2.82	313.40	120.93	0.42
Bormida	1	14.000*	TR20Borm+TR20rii	Lotto1C	833.00	177.40	183.81	181.69	184.22	0.001334	2.82	313.40	120.93	0.42
Bormida	1	14.000*	TR20Borm+TR20rii	Finale	833.00	177.40	183.83	181.61	184.17	0.001082	2.57	351.81	124.42	0.38
Bormida	1	13.000*	TR20Borm+TR20rii	Attuale	833.00	177.26	183.79		184.19	0.001193	2.81	337.93	172.51	0.40
Bormida	1	13.000*	TR20Borm+TR20rii	Lotto1A	833.00	177.26	183.81	181.53	184.18	0.001169	2.70	344.28	174.46	0.40
Bormida	1	13.000*	TR20Borm+TR20rii	Lotto1B	833.00	177.26	183.81	181.53	184.18	0.001169	2.70	344.28	174.46	0.40
Bormida	1	13.000*	TR20Borm+TR20rii	Lotto1C	833.00	177.26	183.81	181.53	184.18	0.001169	2.70	344.28	174.46	0.40
Bormida	1	13.000*	TR20Borm+TR20rii	Finale	833.00	177.26	183.83	181.43	184.13	0.000945	2.44	382.98	174.91	0.36
Bormida	1	12.000*	TR20Borm+TR20rii	Attuale	833.00	177.11	183.80		184.15	0.001016	2.63	380.78	182.45	0.37
Bormida	1	12.000*	TR20Borm+TR20rii	Lotto1A	833.00	177.11	183.81		184.14	0.000991	2.55	386.38	183.06	0.37
Bormida	1	12.000*	TR20Borm+TR20rii	Lotto1B	833.00	177.11	183.81		184.14	0.000991	2.55	386.38	183.06	0.37
Bormida	1	12.000*	TR20Borm+TR20rii	Lotto1C	833.00	177.11	183.81	181.33	184.14	0.000991	2.55	386.38	183.06	0.37
Bormida	1	12.000*	TR20Borm+TR20rii	Finale	833.00	177.11	183.84	181.23	184.10	0.000801	2.29	423.57	184.37	0.33
Bormida	1	11.000*	TR20Borm+TR20rii	Attuale	833.00	176.97	183.81		184.11	0.000860	2.46	428.41	203.04	0.35
Bormida	1	11.000*	TR20Borm+TR20rii	Lotto1A	833.00	176.97	183.82		184.10	0.000831	2.40	434.29	203.62	0.34
Bormida	1	11.000*	TR20Borm+TR20rii	Lotto1B	833.00	176.97	183.82		184.10	0.000831	2.40	434.29	203.62	0.34
Bormida	1	11.000*	TR20Borm+TR20rii	Lotto1C	833.00	176.97	183.82	181.11	184.10	0.000831	2.40	434.29	203.62	0.34
Bormida	1	11.000*	TR20Borm+TR20rii	Finale	833.00	176.97	183.84	181.01	184.07	0.000675	2.15	469.40	204.53	0.31
Bormida	1	10	TR20Borm+TR20rii	Attuale	833.00	176.82	183.83		184.08	0.000716	2.29	482.17	212.26	0.32
Bormida	1	10	TR20Borm+TR20rii	Lotto1A	833.00	176.82	183.83		184.07	0.000684	2.23	489.36	212.34	0.31
Bormida	1	10	TR20Borm+TR20rii	Lotto1B	833.00	176.82	183.83		184.07	0.000684	2.23	489.36	212.34	0.31
Bormida	1	10	TR20Borm+TR20rii	Lotto1C	833.00	176.82	183.83	180.81	184.07	0.000684	2.23	489.36	212.34	0.31
Bormida	1	10	TR20Borm+TR20rii	Finale	833.00	176.82	183.85	180.73	184.04	0.000561	2.00	521.04	212.74	0.28
Bormida	1	9	TR20Borm+TR20rii	Attuale	833.00	176.65	183.83		184.05	0.000594	2.15	507.48	211.31	0.29
Bormida	1	9	TR20Borm+TR20rii	Lotto1A	833.00	176.65	183.83		184.05	0.000563	2.10	514.93	211.38	0.28
Bormida	1	9	TR20Borm+TR20rii	Lotto1B	833.00	176.65	183.83		184.05	0.000563	2.10	514.93	211.38	0.28
Bormida	1	9	TR20Borm+TR20rii	Lotto1C	833.00	176.65	183.83		184.05	0.000563	2.10	514.93	211.38	0.28
Bormida	1	9	TR20Borm+TR20rii	Finale	833.00	176.65	183.85		184.03	0.000476	1.90	545.77	211.80	0.26
Bormida	1	8.0000*	TR20Borm+TR20rii	Attuale	833.00	176.65	183.79		184.03	0.000668	2.26	491.09	214.18	0.31
Bormida	1	8.0000*	TR20Borm+TR20rii	Lotto1A	833.00	176.65	183.79		184.03	0.000637	2.22	497.58	214.25	0.30

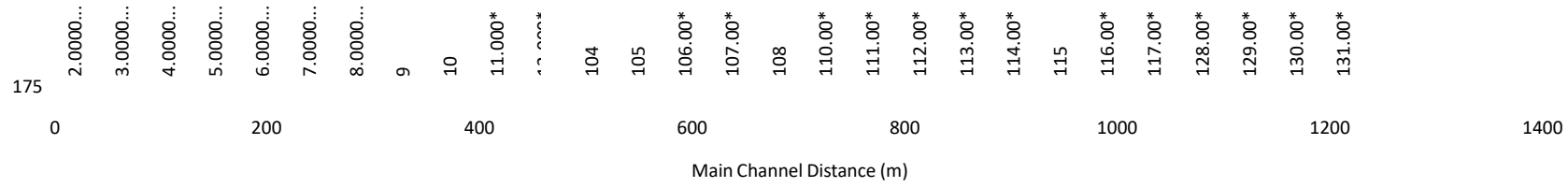
River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	1	8.0000*	TR20Borm+TR20rii	Lotto1B	833.00	176.65	183.79		184.03	0.000637	2.22	497.58	214.25	0.30
Bormida	1	8.0000*	TR20Borm+TR20rii	Lotto1C	833.00	176.65	183.79		184.03	0.000637	2.22	497.58	214.25	0.30
Bormida	1	8.0000*	TR20Borm+TR20rii	Finale	833.00	176.65	183.82		184.01	0.000539	2.01	526.19	214.54	0.27
Bormida	1	7.0000*	TR20Borm+TR20rii	Attuale	833.00	176.66	183.74		184.01	0.000758	2.38	473.94	215.91	0.32
Bormida	1	7.0000*	TR20Borm+TR20rii	Lotto1A	833.00	176.66	183.75		184.01	0.000726	2.34	479.56	215.93	0.32
Bormida	1	7.0000*	TR20Borm+TR20rii	Lotto1B	833.00	176.66	183.75		184.01	0.000726	2.34	479.56	215.93	0.32
Bormida	1	7.0000*	TR20Borm+TR20rii	Lotto1C	833.00	176.66	183.75		184.01	0.000726	2.34	479.56	215.93	0.32
Bormida	1	7.0000*	TR20Borm+TR20rii	Finale	833.00	176.66	183.77		183.99	0.000617	2.14	505.89	215.86	0.29
Bormida	1	6.0000*	TR20Borm+TR20rii	Attuale	833.00	176.66	183.69		183.99	0.000869	2.52	455.58	217.05	0.35
Bormida	1	6.0000*	TR20Borm+TR20rii	Lotto1A	833.00	176.66	183.69		183.99	0.000837	2.49	460.35	217.10	0.34
Bormida	1	6.0000*	TR20Borm+TR20rii	Lotto1B	833.00	176.66	183.69		183.99	0.000837	2.49	460.35	217.10	0.34
Bormida	1	6.0000*	TR20Borm+TR20rii	Lotto1C	833.00	176.66	183.69		183.99	0.000837	2.49	460.35	217.10	0.34
Bormida	1	6.0000*	TR20Borm+TR20rii	Finale	833.00	176.66	183.73		183.97	0.000716	2.29	484.34	216.88	0.31
Bormida	1	5.0000*	TR20Borm+TR20rii	Attuale	833.00	176.66	183.62		183.96	0.001011	2.68	435.24	218.43	0.37
Bormida	1	5.0000*	TR20Borm+TR20rii	Lotto1A	833.00	176.66	183.63		183.96	0.000979	2.65	439.26	218.49	0.37
Bormida	1	5.0000*	TR20Borm+TR20rii	Lotto1B	833.00	176.66	183.63		183.96	0.000979	2.65	439.26	218.49	0.37
Bormida	1	5.0000*	TR20Borm+TR20rii	Lotto1C	833.00	176.66	183.63		183.96	0.000979	2.65	439.26	218.49	0.37
Bormida	1	5.0000*	TR20Borm+TR20rii	Finale	833.00	176.66	183.66		183.95	0.000846	2.46	460.83	218.47	0.34
Bormida	1	4.0000*	TR20Borm+TR20rii	Attuale	833.00	176.66	183.54		183.93	0.001201	2.88	411.82	219.54	0.40
Bormida	1	4.0000*	TR20Borm+TR20rii	Lotto1A	833.00	176.66	183.55		183.93	0.001170	2.85	415.11	219.63	0.40
Bormida	1	4.0000*	TR20Borm+TR20rii	Lotto1B	833.00	176.66	183.55		183.93	0.001170	2.85	415.11	219.63	0.40
Bormida	1	4.0000*	TR20Borm+TR20rii	Lotto1C	833.00	176.66	183.55		183.93	0.001170	2.85	415.11	219.63	0.40
Bormida	1	4.0000*	TR20Borm+TR20rii	Finale	833.00	176.66	183.59		183.92	0.001025	2.67	434.18	220.56	0.37
Bormida	1	3.0000*	TR20Borm+TR20rii	Attuale	833.00	176.67	183.43		183.89	0.001472	3.13	382.68	220.77	0.44
Bormida	1	3.0000*	TR20Borm+TR20rii	Lotto1A	833.00	176.67	183.44		183.89	0.001443	3.10	385.27	221.11	0.44
Bormida	1	3.0000*	TR20Borm+TR20rii	Lotto1B	833.00	176.67	183.44		183.89	0.001443	3.10	385.27	221.11	0.44
Bormida	1	3.0000*	TR20Borm+TR20rii	Lotto1C	833.00	176.67	183.44		183.89	0.001443	3.10	385.27	221.11	0.44
Bormida	1	3.0000*	TR20Borm+TR20rii	Finale	833.00	176.67	183.48		183.89	0.001292	2.94	401.79	222.36	0.42
Bormida	1	2.0000*	TR20Borm+TR20rii	Attuale	833.00	176.67	183.26	181.38	183.83	0.001907	3.48	341.15	220.03	0.50
Bormida	1	2.0000*	TR20Borm+TR20rii	Lotto1A	833.00	176.67	183.27	181.38	183.83	0.001882	3.46	343.04	220.20	0.50
Bormida	1	2.0000*	TR20Borm+TR20rii	Lotto1B	833.00	176.67	183.27	181.38	183.83	0.001882	3.46	343.04	220.20	0.50
Bormida	1	2.0000*	TR20Borm+TR20rii	Lotto1C	833.00	176.67	183.27	181.38	183.83	0.001882	3.46	343.04	220.20	0.50
Bormida	1	2.0000*	TR20Borm+TR20rii	Finale	833.00	176.67	183.31		183.84	0.001736	3.34	356.12	222.05	0.48
Bormida	1	1	TR20Borm+TR20rii	Attuale	833.00	176.67	183.05	181.53	183.77	0.002502	3.87	293.74	193.36	0.57
Bormida	1	1	TR20Borm+TR20rii	Lotto1A	833.00	176.67	183.05	181.53	183.77	0.002502	3.87	293.74	193.36	0.57
Bormida	1	1	TR20Borm+TR20rii	Lotto1B	833.00	176.67	183.05	181.53	183.77	0.002502	3.87	293.74	193.36	0.57
Bormida	1	1	TR20Borm+TR20rii	Lotto1C	833.00	176.67	183.05	181.53	183.77	0.002502	3.87	293.74	193.36	0.57
Bormida	1	1	TR20Borm+TR20rii	Finale	833.00	176.67	183.05	181.53	183.77	0.002502	3.87	293.74	193.36	0.57

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

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1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

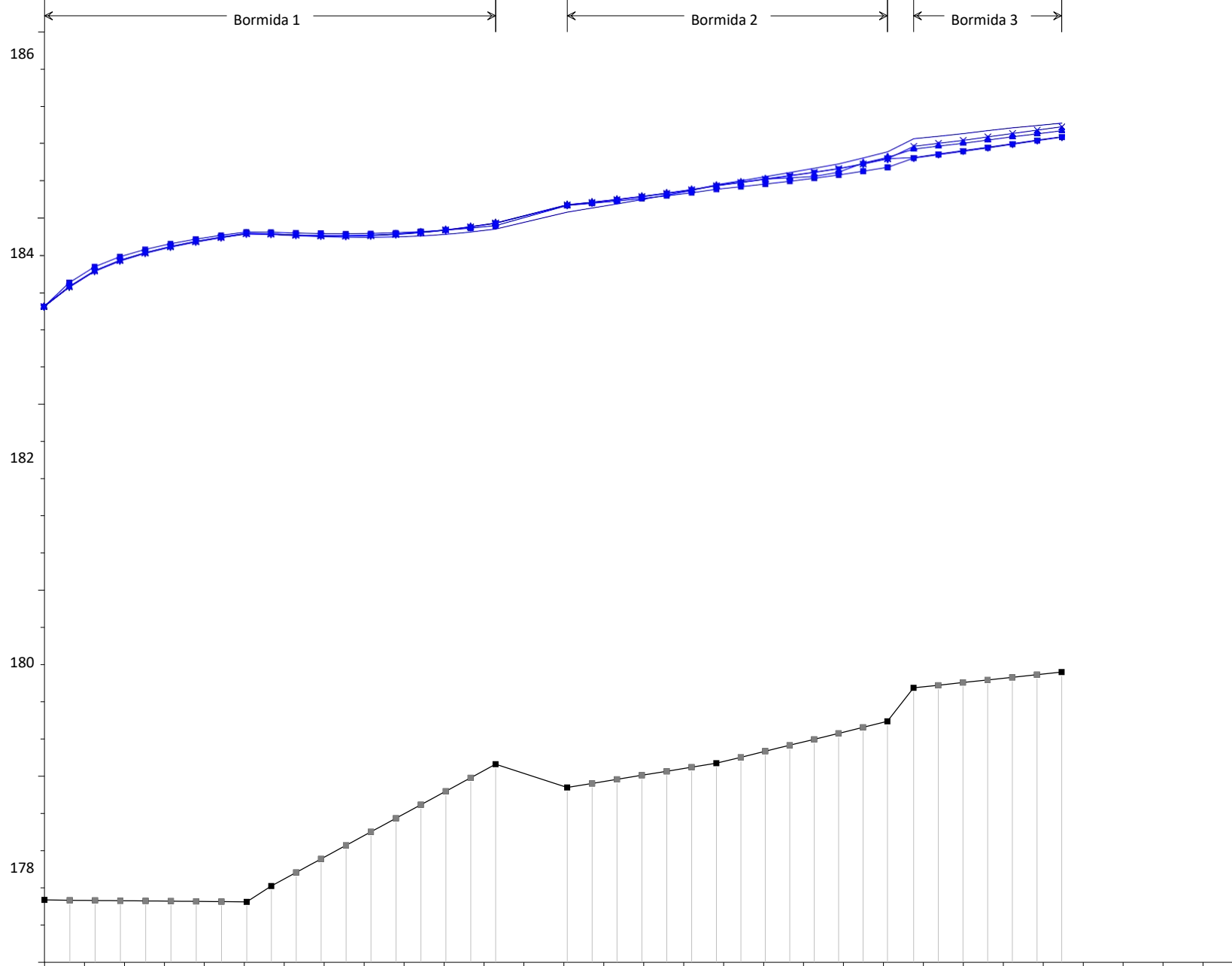
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Bormida 1

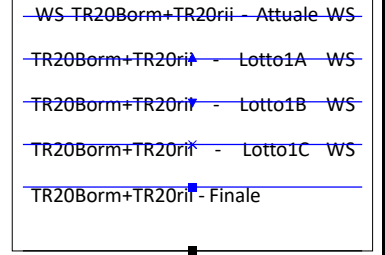
Bormida 2

Bormida 3

Elevation (m)



Legend



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7.0000...
8.0000...
9
10
11.000*
12.000*
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22
23.000*
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25.000*
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29.000*
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34.000*
35

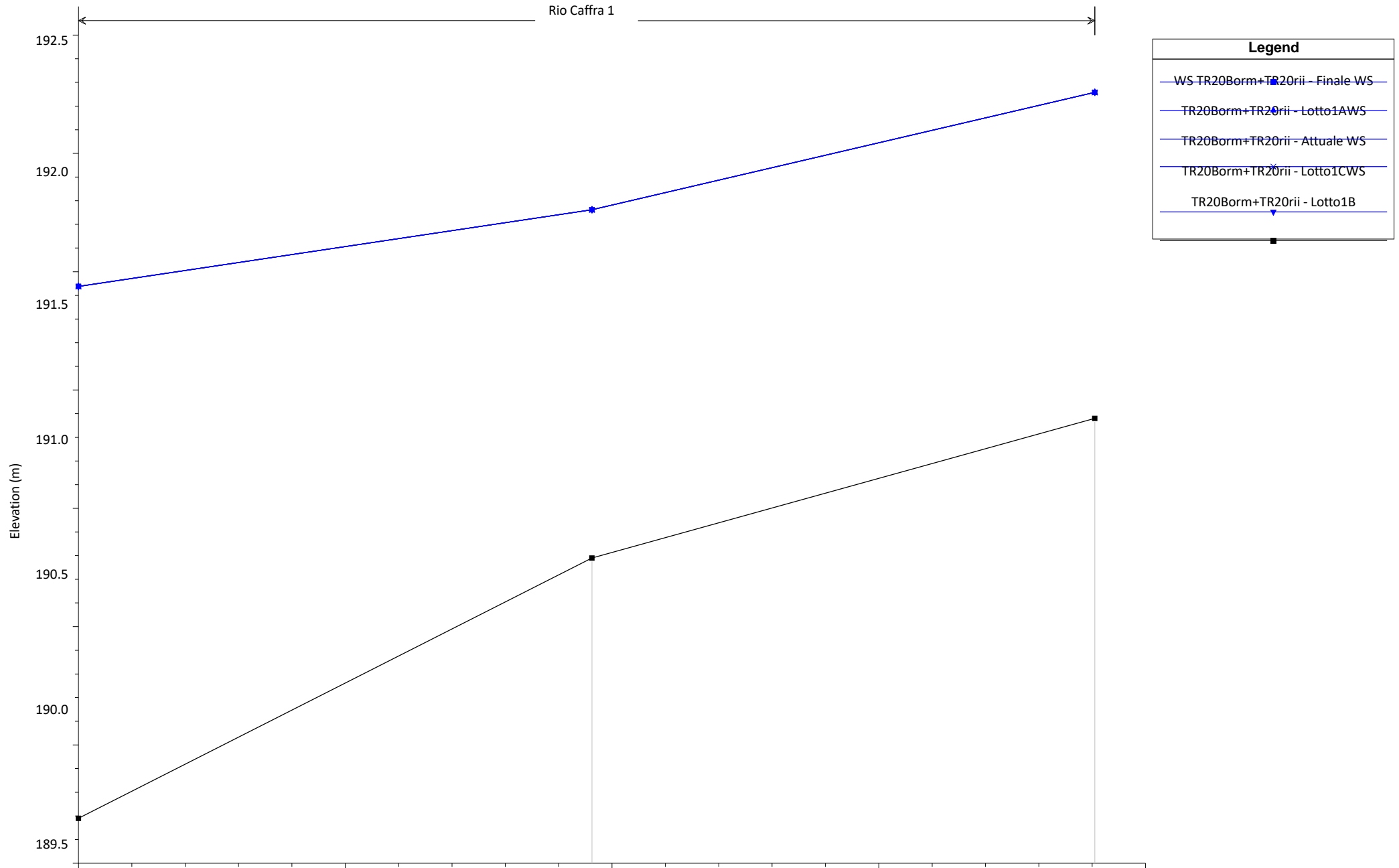
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Main Channel Distance (m)

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02

Rio Caffra 1



Legend

- WS TR20Borm+TR20rii - Finale WS
- TR20Borm+TR20rii - Lotto1AWS
- TR20Borm+TR20rii - Attuale WS
- TR20Borm+TR20rii - Lotto1CWS
- TR20Borm+TR20rii - Lotto1B

189.0

0

20

203

40

60

205

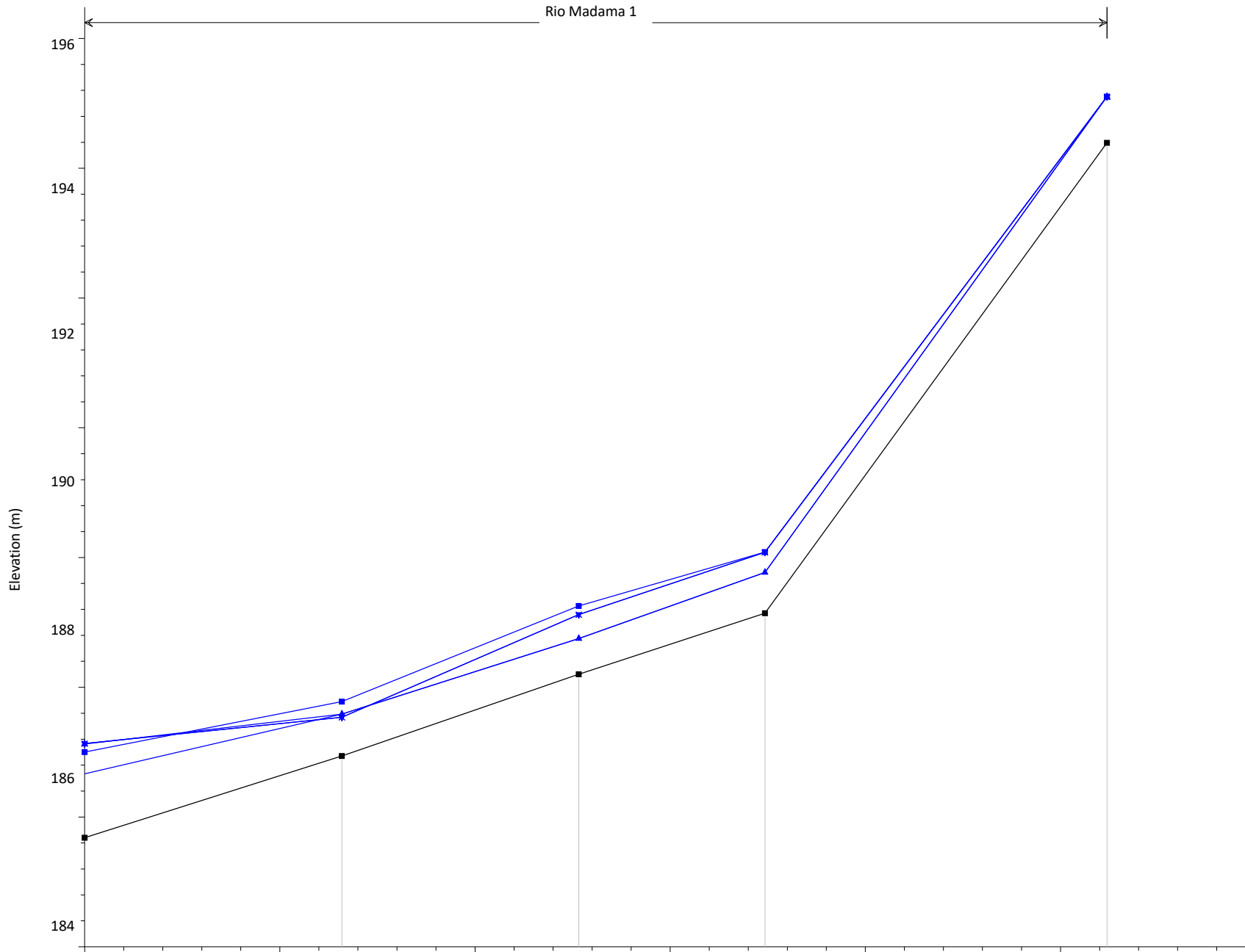
80

Main Channel Distance (m)

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02

Rio Madama 1



Legend

- WS TR20Borm+TR20rii - Lotto1BWS
- TR20Borm+TR20rii - Lotto1CWS
- TR20Borm+TR20rii - Lotto1AWS
- TR20Borm+TR20rii - Finale WS
- TR20Borm+TR20rii - Attuale

182

0

50

402

100

403

150

404

200

250

405

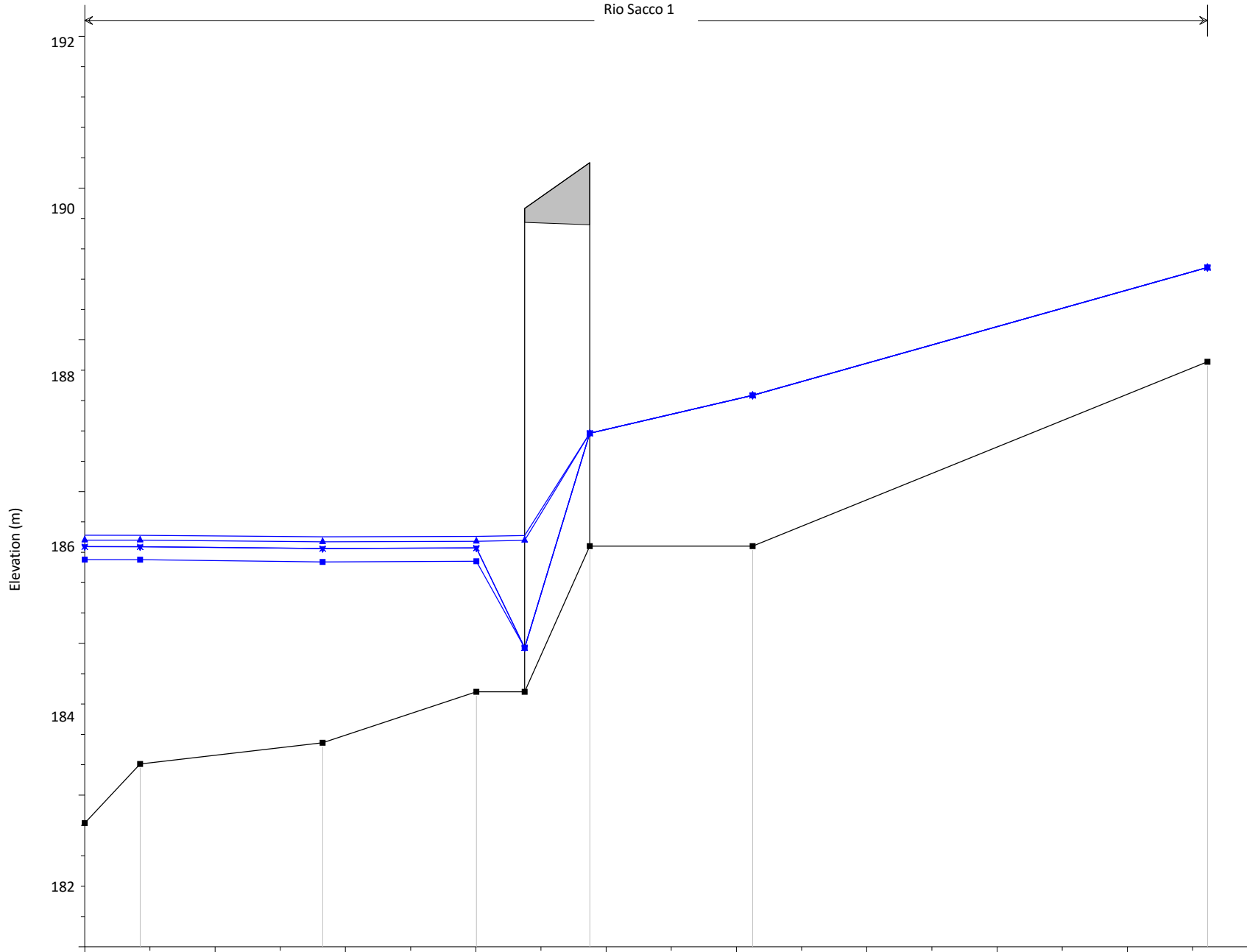
300

Main Channel Distance (m)

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02

Rio Sacco 1



Legend

- WS - TR20Borm+TR20rij - Attuale - WS
- TR20Borm+TR20rij - Lotto1A - WS
- TR20Borm+TR20rij - Lotto1B - WS
- TR20Borm+TR20rij - Lotto1C - WS
- TR20Borm+TR20rij - Finale

180

302

303

304

304.5

305

306

0

20

40

60

80

100

120

140

160

180

Main Channel Distance (m)

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02

R
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1

Rio San Pietro 2

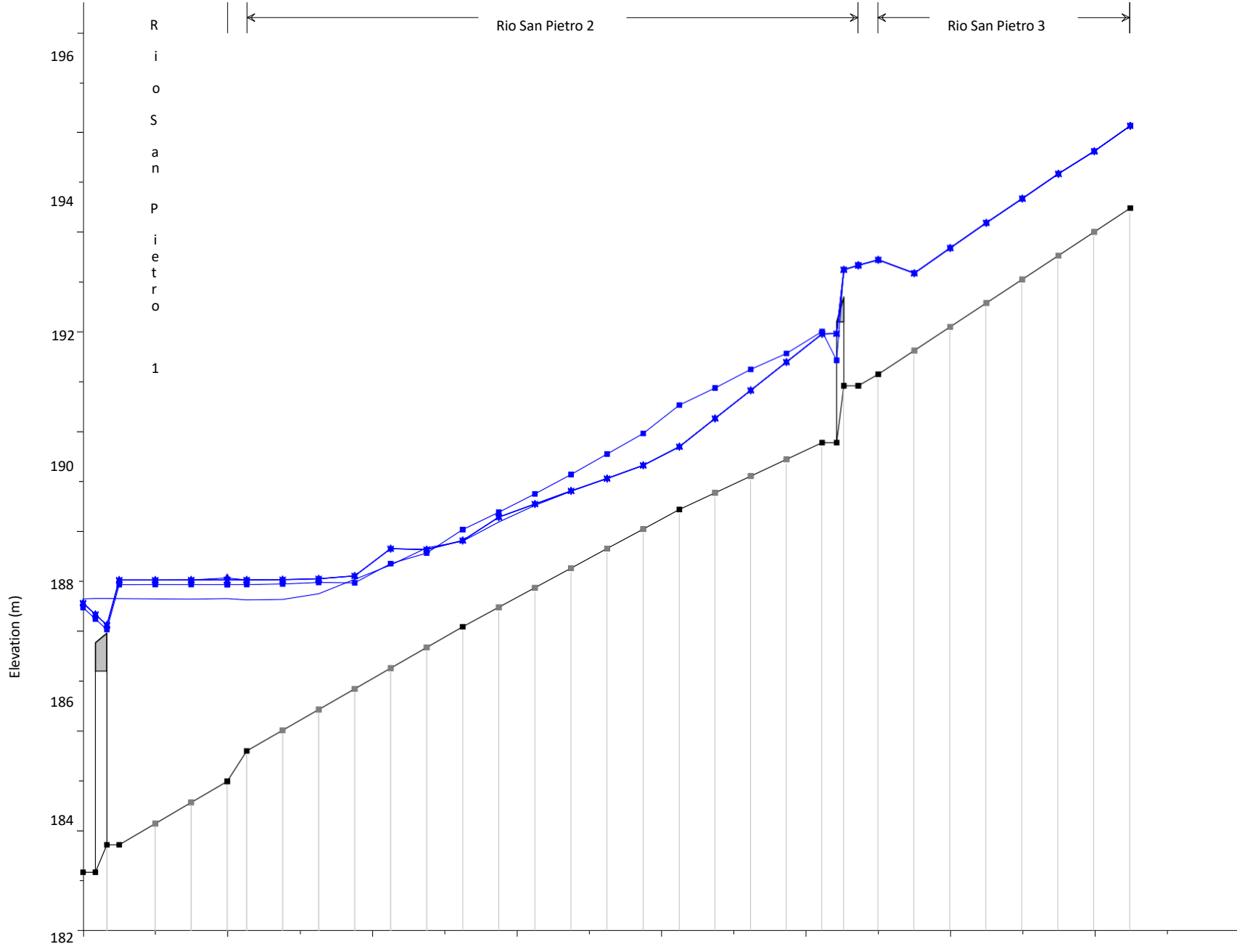
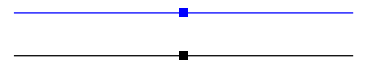
Rio San Pietro 3

Elevation (m)

196
194
192
190
188
186
184
182

Legend

- WS TR20Borm+TR20rii - Attuale WS
- TR20Borm+TR20rij - Lotto1A WS
- TR20Borm+TR20rij - Lotto1B WS
- TR20Borm+TR20rii - Lotto1C WS
- TR20Borm+TR20rii - Finale



180

178

0

100

200

300

400

500

600

700

800

Main Channel Distance (m)

104.5

106.00*

107.00*

108

110.00*

111.00*

112.00*

113.00*

114.00*

115

116.00*

117.00*

118.00*

119.00*

120.00*

121

122.00*

123.00*

124.00*

125

126

127

128.00*

129.00*

130.00*

131.00*

132.00*

133.00*

134

INTERVENTO CODICE AT_A18_622_19_102 – PROGETTO PER LAVORI DI ADEGUAMENTO SEZIONI DI DEFLUSSO FOSSI COLATORI PROVENIENTI DA VERSANTI IN GIARONETTO - ADEGUAMENTO DEI TRATTI DEL FIUME BORMIDA E DEL RIO SAN PIETRO IN CORRISPONDENZA DELLA S.P. 25 - PROGETTO ESECUTIVO – LOTTO 1A

CONFRONTO 3 TR20Borm+TR200rii

Corso d'acqua	Portata al colmo [m³/s]	Tempo di ritorno [anni]
Rio Sacco	14.5	200
Rio Madama	8.1	200
Rio della Caffra	27.7	200
Rio San Pietro monte	31.9	200
Rio San Pietro valle	49.1	200
Bormida di Millesimo a Bubbio	833	20

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	3	134	TR20Borm+TR200ri	Attuale	31.90	192.48	194.42	194.52	195.14	0.017021	3.74	8.53	7.39	1.11
Rio San Pietro	3	134	TR20Borm+TR200ri	Lotto1A	31.90	192.48	194.42	194.52	195.14	0.017021	3.74	8.53	7.39	1.11
Rio San Pietro	3	134	TR20Borm+TR200ri	Lotto1B	31.90	192.48	194.42	194.52	195.14	0.017018	3.74	8.53	7.40	1.11
Rio San Pietro	3	134	TR20Borm+TR200ri	Lotto1C	31.90	192.48	194.42	194.52	195.14	0.017018	3.74	8.53	7.40	1.11
Rio San Pietro	3	134	TR20Borm+TR200ri	Finale	31.90	192.48	194.42	194.52	195.14	0.017018	3.74	8.53	7.40	1.11
Rio San Pietro	3	133.00*	TR20Borm+TR200ri	Attuale	31.90	192.00	193.90	194.05	194.68	0.019304	3.91	8.16	7.32	1.18
Rio San Pietro	3	133.00*	TR20Borm+TR200ri	Lotto1A	31.90	192.00	193.90	194.05	194.68	0.019304	3.91	8.16	7.32	1.18
Rio San Pietro	3	133.00*	TR20Borm+TR200ri	Lotto1B	31.90	192.00	193.91	194.05	194.68	0.019164	3.90	8.18	7.33	1.18
Rio San Pietro	3	133.00*	TR20Borm+TR200ri	Lotto1C	31.90	192.00	193.91	194.05	194.68	0.019164	3.90	8.18	7.33	1.18
Rio San Pietro	3	133.00*	TR20Borm+TR200ri	Finale	31.90	192.00	193.91	194.05	194.68	0.019164	3.90	8.18	7.33	1.18
Rio San Pietro	3	132.00*	TR20Borm+TR200ri	Attuale	31.90	191.53	193.44	193.58	194.20	0.019113	3.86	8.26	7.55	1.18
Rio San Pietro	3	132.00*	TR20Borm+TR200ri	Lotto1A	31.90	191.53	193.44	193.58	194.20	0.019113	3.86	8.26	7.55	1.18
Rio San Pietro	3	132.00*	TR20Borm+TR200ri	Lotto1B	31.90	191.53	193.44	193.58	194.20	0.019256	3.87	8.24	7.53	1.18
Rio San Pietro	3	132.00*	TR20Borm+TR200ri	Lotto1C	31.90	191.53	193.44	193.58	194.20	0.019256	3.87	8.24	7.53	1.18
Rio San Pietro	3	132.00*	TR20Borm+TR200ri	Finale	31.90	191.53	193.44	193.58	194.20	0.019256	3.87	8.24	7.53	1.18
Rio San Pietro	3	131.00*	TR20Borm+TR200ri	Attuale	31.90	191.05	192.94	193.10	193.71	0.019784	3.88	8.21	7.68	1.20
Rio San Pietro	3	131.00*	TR20Borm+TR200ri	Lotto1A	31.90	191.05	192.94	193.10	193.71	0.019784	3.88	8.21	7.68	1.20
Rio San Pietro	3	131.00*	TR20Borm+TR200ri	Lotto1B	31.90	191.05	192.94	193.10	193.71	0.019778	3.88	8.21	7.68	1.20
Rio San Pietro	3	131.00*	TR20Borm+TR200ri	Lotto1C	31.90	191.05	192.94	193.10	193.71	0.019778	3.88	8.21	7.68	1.20
Rio San Pietro	3	131.00*	TR20Borm+TR200ri	Finale	31.90	191.05	192.94	193.10	193.71	0.019778	3.88	8.21	7.68	1.20
Rio San Pietro	3	130.00*	TR20Borm+TR200ri	Attuale	31.90	190.58	192.45	192.60	193.22	0.019805	3.88	8.22	7.74	1.20
Rio San Pietro	3	130.00*	TR20Borm+TR200ri	Lotto1A	31.90	190.58	192.45	192.60	193.22	0.019805	3.88	8.22	7.74	1.20
Rio San Pietro	3	130.00*	TR20Borm+TR200ri	Lotto1B	31.90	190.58	192.45	192.60	193.22	0.019805	3.88	8.22	7.74	1.20
Rio San Pietro	3	130.00*	TR20Borm+TR200ri	Lotto1C	31.90	190.58	192.45	192.60	193.22	0.019805	3.88	8.22	7.74	1.20
Rio San Pietro	3	130.00*	TR20Borm+TR200ri	Finale	31.90	190.58	192.45	192.60	193.22	0.019805	3.88	8.22	7.74	1.20
Rio San Pietro	3	129.00*	TR20Borm+TR200ri	Attuale	31.90	190.10	191.94	192.10	192.72	0.020116	3.90	8.18	7.76	1.21
Rio San Pietro	3	129.00*	TR20Borm+TR200ri	Lotto1A	31.90	190.10	191.94	192.10	192.72	0.020116	3.90	8.18	7.76	1.21
Rio San Pietro	3	129.00*	TR20Borm+TR200ri	Lotto1B	31.90	190.10	191.94	192.10	192.72	0.020116	3.90	8.18	7.76	1.21
Rio San Pietro	3	129.00*	TR20Borm+TR200ri	Lotto1C	31.90	190.10	191.94	192.10	192.72	0.020116	3.90	8.18	7.76	1.21
Rio San Pietro	3	129.00*	TR20Borm+TR200ri	Finale	31.90	190.10	191.94	192.10	192.72	0.020116	3.90	8.18	7.76	1.21
Rio San Pietro	3	128.00*	TR20Borm+TR200ri	Attuale	31.90	189.63	191.44	191.62	192.21	0.020379	3.90	8.17	7.86	1.22
Rio San Pietro	3	128.00*	TR20Borm+TR200ri	Lotto1A	31.90	189.63	191.44	191.62	192.21	0.020379	3.90	8.17	7.86	1.22
Rio San Pietro	3	128.00*	TR20Borm+TR200ri	Lotto1B	31.90	189.63	191.44	191.62	192.21	0.020379	3.90	8.17	7.86	1.22
Rio San Pietro	3	128.00*	TR20Borm+TR200ri	Lotto1C	31.90	189.63	191.44	191.62	192.21	0.020379	3.90	8.17	7.86	1.22
Rio San Pietro	3	128.00*	TR20Borm+TR200ri	Finale	31.90	189.63	191.44	191.62	192.21	0.020379	3.90	8.17	7.86	1.22
Rio San Pietro	3	127	TR20Borm+TR200ri	Attuale	31.90	189.15	191.61	191.27	191.68	0.001390	1.44	45.13	60.60	0.35
Rio San Pietro	3	127	TR20Borm+TR200ri	Lotto1A	31.90	189.15	191.61	191.27	191.68	0.001390	1.44	45.13	60.60	0.35
Rio San Pietro	3	127	TR20Borm+TR200ri	Lotto1B	31.90	189.15	191.61	191.27	191.68	0.001390	1.44	45.13	60.60	0.35
Rio San Pietro	3	127	TR20Borm+TR200ri	Lotto1C	31.90	189.15	191.61	191.27	191.68	0.001390	1.44	45.13	60.60	0.35
Rio San Pietro	3	127	TR20Borm+TR200ri	Finale	31.90	189.15	191.61	191.27	191.68	0.001388	1.44	45.16	60.60	0.35

HEC-RAS Profile: TR20Borm+TR200ri (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	126	TR20Borm+TR200ri	Attuale	49.10	188.92	191.41	191.30	191.63	0.003468	2.37	40.50	81.15	0.56
Rio San Pietro	2	126	TR20Borm+TR200ri	Lotto1A	49.10	188.92	191.41	191.30	191.63	0.003468	2.37	40.50	81.15	0.56
Rio San Pietro	2	126	TR20Borm+TR200ri	Lotto1B	49.10	188.92	191.41	191.30	191.63	0.003468	2.37	40.50	81.15	0.56
Rio San Pietro	2	126	TR20Borm+TR200ri	Lotto1C	49.10	188.92	191.41	191.30	191.63	0.003468	2.37	40.50	81.15	0.56
Rio San Pietro	2	126	TR20Borm+TR200ri	Finale	49.10	188.92	191.41	191.30	191.63	0.003465	2.37	40.52	81.19	0.56
Rio San Pietro	2	125.5			Bridge									
Rio San Pietro	2	125	TR20Borm+TR200ri	Attuale	49.10	187.78	189.96	189.96	190.07	0.006329	2.02	41.17	54.90	0.67
Rio San Pietro	2	125	TR20Borm+TR200ri	Lotto1A	49.10	187.78	189.96	189.96	190.07	0.006331	2.02	41.12	53.50	0.67
Rio San Pietro	2	125	TR20Borm+TR200ri	Lotto1B	49.10	187.78	189.96	189.96	190.07	0.006331	2.02	41.12	53.50	0.67
Rio San Pietro	2	125	TR20Borm+TR200ri	Lotto1C	49.10	187.78	189.96	189.96	190.07	0.006331	2.02	41.12	53.50	0.67
Rio San Pietro	2	125	TR20Borm+TR200ri	Finale	49.10	187.78	190.34	190.34	191.08	0.013122	3.83	12.90	9.08	1.00
Rio San Pietro	2	124.00*	TR20Borm+TR200ri	Attuale	49.10	187.45	189.40	189.40	189.50	0.007564	2.06	40.10	54.98	0.72
Rio San Pietro	2	124.00*	TR20Borm+TR200ri	Lotto1A	49.10	187.45	189.40	189.40	189.50	0.007564	2.06	40.10	54.98	0.72
Rio San Pietro	2	124.00*	TR20Borm+TR200ri	Lotto1B	49.10	187.45	189.40	189.40	189.50	0.007564	2.06	40.10	54.98	0.72
Rio San Pietro	2	124.00*	TR20Borm+TR200ri	Lotto1C	49.10	187.45	189.40	189.40	189.50	0.007564	2.06	40.10	54.98	0.72
Rio San Pietro	2	124.00*	TR20Borm+TR200ri	Finale	49.10	187.45	189.87	189.96	190.72	0.015972	4.08	12.09	8.94	1.09
Rio San Pietro	2	123.00*	TR20Borm+TR200ri	Attuale	49.10	187.11	188.83	188.83	188.94	0.009078	2.08	39.03	56.38	0.78
Rio San Pietro	2	123.00*	TR20Borm+TR200ri	Lotto1A	49.10	187.11	188.83	188.83	188.94	0.009078	2.08	39.03	56.38	0.78
Rio San Pietro	2	123.00*	TR20Borm+TR200ri	Lotto1B	49.10	187.11	188.83	188.83	188.94	0.009078	2.08	39.03	56.38	0.78
Rio San Pietro	2	123.00*	TR20Borm+TR200ri	Lotto1C	49.10	187.11	188.83	188.83	188.94	0.009078	2.08	39.03	56.38	0.78
Rio San Pietro	2	123.00*	TR20Borm+TR200ri	Finale	49.10	187.11	189.59	189.60	190.34	0.013235	3.84	12.97	9.80	0.99
Rio San Pietro	2	122.00*	TR20Borm+TR200ri	Attuale	49.10	186.78	188.27	188.27	188.37	0.010860	2.06	37.95	57.70	0.83
Rio San Pietro	2	122.00*	TR20Borm+TR200ri	Lotto1A	49.10	186.78	188.27	188.27	188.37	0.010860	2.06	37.95	57.70	0.83
Rio San Pietro	2	122.00*	TR20Borm+TR200ri	Lotto1B	49.10	186.78	188.27	188.27	188.37	0.010860	2.06	37.95	57.70	0.83
Rio San Pietro	2	122.00*	TR20Borm+TR200ri	Lotto1C	49.10	186.78	188.27	188.27	188.37	0.010860	2.06	37.95	57.70	0.83
Rio San Pietro	2	122.00*	TR20Borm+TR200ri	Finale	49.10	186.78	189.16	189.24	189.98	0.015479	4.03	12.37	9.65	1.07
Rio San Pietro	2	121	TR20Borm+TR200ri	Attuale	49.10	186.44	187.72	187.70	187.81	0.011893	1.95	37.79	58.99	0.85
Rio San Pietro	2	121	TR20Borm+TR200ri	Lotto1A	49.10	186.44	187.72	187.70	187.81	0.011885	1.95	37.80	58.99	0.85
Rio San Pietro	2	121	TR20Borm+TR200ri	Lotto1B	49.10	186.44	187.72	187.70	187.81	0.011885	1.95	37.80	58.99	0.85
Rio San Pietro	2	121	TR20Borm+TR200ri	Lotto1C	49.10	186.44	187.72	187.70	187.81	0.011885	1.95	37.80	58.99	0.85
Rio San Pietro	2	121	TR20Borm+TR200ri	Finale	49.10	186.44	188.87	188.88	189.62	0.013440	3.83	13.11	9.50	0.99
Rio San Pietro	2	120.00*	TR20Borm+TR200ri	Attuale	49.10	186.05	187.43		187.53	0.010552	2.18	41.79	73.64	0.84
Rio San Pietro	2	120.00*	TR20Borm+TR200ri	Lotto1A	49.10	186.05	187.43	187.29	187.53	0.010591	2.18	41.74	73.64	0.84
Rio San Pietro	2	120.00*	TR20Borm+TR200ri	Lotto1B	49.10	186.05	187.43	187.29	187.53	0.010591	2.18	41.74	73.64	0.84
Rio San Pietro	2	120.00*	TR20Borm+TR200ri	Lotto1C	49.10	186.05	187.43	187.29	187.53	0.010591	2.18	41.74	73.64	0.84
Rio San Pietro	2	120.00*	TR20Borm+TR200ri	Finale	49.10	186.05	188.24	188.42	189.19	0.019836	4.32	11.51	9.53	1.19
Rio San Pietro	2	119.00*	TR20Borm+TR200ri	Attuale	49.10	185.66	187.17		187.28	0.009319	2.35	44.80	86.85	0.82
Rio San Pietro	2	119.00*	TR20Borm+TR200ri	Lotto1A	49.10	185.66	187.17	187.09	187.28	0.009191	2.33	45.01	86.38	0.81

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	119.00*	TR20Borm+TR200ri	Lotto1B	49.10	185.66	187.17	187.09	187.28	0.009191	2.33	45.01	86.38	0.81
Rio San Pietro	2	119.00*	TR20Borm+TR200ri	Lotto1C	49.10	185.66	187.17	187.09	187.28	0.009191	2.33	45.01	86.38	0.81
Rio San Pietro	2	119.00*	TR20Borm+TR200ri	Finale	49.10	185.66	187.81	187.97	188.74	0.016451	4.27	11.74	9.57	1.17
Rio San Pietro	2	118.00*	TR20Borm+TR200ri	Attuale	49.10	185.27	186.89	186.89	187.04	0.009467	2.60	46.74	123.40	0.84
Rio San Pietro	2	118.00*	TR20Borm+TR200ri	Lotto1A	49.10	185.27	186.90	186.89	187.05	0.009203	2.57	45.61	99.91	0.83
Rio San Pietro	2	118.00*	TR20Borm+TR200ri	Lotto1B	49.10	185.27	186.90	186.89	187.05	0.009203	2.57	45.61	99.91	0.83
Rio San Pietro	2	118.00*	TR20Borm+TR200ri	Lotto1C	49.10	185.27	186.90	186.89	187.05	0.009203	2.57	45.61	99.91	0.83
Rio San Pietro	2	118.00*	TR20Borm+TR200ri	Finale	49.10	185.27	187.42	187.56	188.34	0.015302	4.26	12.26	9.60	1.14
Rio San Pietro	2	117.00*	TR20Borm+TR200ri	Attuale	49.10	184.87	186.61	186.64	186.80	0.009912	2.81	48.39	143.60	0.87
Rio San Pietro	2	117.00*	TR20Borm+TR200ri	Lotto1A	49.10	184.87	186.67	186.67	186.83	0.007947	2.61	47.95	113.28	0.79
Rio San Pietro	2	117.00*	TR20Borm+TR200ri	Lotto1B	49.10	184.87	186.67	186.67	186.83	0.007947	2.61	47.95	113.28	0.79
Rio San Pietro	2	117.00*	TR20Borm+TR200ri	Lotto1C	49.10	184.87	186.67	186.67	186.83	0.007947	2.61	47.95	113.28	0.79
Rio San Pietro	2	117.00*	TR20Borm+TR200ri	Finale	49.10	184.87	187.04	187.17	187.96	0.014817	4.32	12.45	9.63	1.13
Rio San Pietro	2	116.00*	TR20Borm+TR200ri	Attuale	49.10	184.48	186.31	186.39	186.55	0.009465	3.00	48.88	164.02	0.87
Rio San Pietro	2	116.00*	TR20Borm+TR200ri	Lotto1A	49.10	184.48	186.27	186.38	186.58	0.011958	3.29	42.47	150.40	0.97
Rio San Pietro	2	116.00*	TR20Borm+TR200ri	Lotto1B	49.10	184.48	186.27	186.38	186.58	0.011958	3.29	42.47	150.40	0.97
Rio San Pietro	2	116.00*	TR20Borm+TR200ri	Lotto1C	49.10	184.48	186.27	186.38	186.58	0.011958	3.29	42.47	150.40	0.97
Rio San Pietro	2	116.00*	TR20Borm+TR200ri	Finale	49.10	184.48	186.68	186.81	187.60	0.013821	4.33	12.73	9.67	1.10
Rio San Pietro	2	115	TR20Borm+TR200ri	Attuale	49.10	184.09	185.91	186.04	186.27	0.012220	3.46	37.61	123.30	0.98
Rio San Pietro	2	115	TR20Borm+TR200ri	Lotto1A	49.10	184.09	186.13	186.04	186.22	0.003392	2.03	69.68	167.69	0.53
Rio San Pietro	2	115	TR20Borm+TR200ri	Lotto1B	49.10	184.09	186.13	186.04	186.22	0.003392	2.03	69.68	167.69	0.53
Rio San Pietro	2	115	TR20Borm+TR200ri	Lotto1C	49.10	184.09	186.13	186.04	186.22	0.003392	2.03	69.68	167.69	0.53
Rio San Pietro	2	115	TR20Borm+TR200ri	Finale	49.10	184.09	186.36	186.47	187.27	0.012696	4.33	13.06	9.70	1.05
Rio San Pietro	2	114.00*	TR20Borm+TR200ri	Attuale	49.10	183.67	185.83	185.86	186.05	0.006095	2.69	45.36	124.48	0.71
Rio San Pietro	2	114.00*	TR20Borm+TR200ri	Lotto1A	49.10	183.67	186.09		186.15	0.001858	1.65	81.12	156.17	0.40
Rio San Pietro	2	114.00*	TR20Borm+TR200ri	Lotto1B	49.10	183.67	186.09		186.15	0.001858	1.65	81.12	156.17	0.40
Rio San Pietro	2	114.00*	TR20Borm+TR200ri	Lotto1C	49.10	183.67	186.09		186.15	0.001858	1.65	81.12	156.17	0.40
Rio San Pietro	2	114.00*	TR20Borm+TR200ri	Finale	49.10	183.67	185.85	186.09	186.89	0.017309	4.57	11.69	10.90	1.20
Rio San Pietro	2	113.00*	TR20Borm+TR200ri	Attuale	49.10	183.26	185.57	185.61	185.88	0.007331	2.93	34.07	81.73	0.78
Rio San Pietro	2	113.00*	TR20Borm+TR200ri	Lotto1A	49.10	183.26	186.07		186.11	0.001007	1.32	97.81	163.30	0.30
Rio San Pietro	2	113.00*	TR20Borm+TR200ri	Lotto1B	49.10	183.26	186.07		186.11	0.001007	1.32	97.81	163.30	0.30
Rio San Pietro	2	113.00*	TR20Borm+TR200ri	Lotto1C	49.10	183.26	186.07		186.11	0.001007	1.32	97.81	163.30	0.30
Rio San Pietro	2	113.00*	TR20Borm+TR200ri	Finale	49.10	183.26	185.59	185.73	186.45	0.014270	4.12	12.61	12.10	1.09
Rio San Pietro	2	112.00*	TR20Borm+TR200ri	Attuale	49.10	182.85	185.28	185.38	185.68	0.008635	3.10	28.20	56.12	0.83
Rio San Pietro	2	112.00*	TR20Borm+TR200ri	Lotto1A	49.10	182.85	185.60	185.60	186.02	0.006079	2.98	24.40	66.22	0.72
Rio San Pietro	2	112.00*	TR20Borm+TR200ri	Lotto1B	49.10	182.85	185.60	185.60	186.02	0.006079	2.98	24.40	66.22	0.72
Rio San Pietro	2	112.00*	TR20Borm+TR200ri	Lotto1C	49.10	182.85	185.60	185.60	186.02	0.006079	2.98	24.40	66.22	0.72
Rio San Pietro	2	112.00*	TR20Borm+TR200ri	Finale	49.10	182.85	185.23	185.36	186.08	0.015791	4.08	12.31	11.00	1.12
Rio San Pietro	2	111.00*	TR20Borm+TR200ri	Attuale	49.10	182.43	185.02	185.12	185.45	0.009113	3.13	25.65	55.73	0.85

HEC-RAS Profile: TR20Borm+TR200ri (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	111.00*	TR20Borm+TR200ri	Lotto1A	49.10	182.43	185.51	185.04	185.81	0.003918	2.51	28.40	58.35	0.59
Rio San Pietro	2	111.00*	TR20Borm+TR200ri	Lotto1B	49.10	182.43	185.50	185.04	185.81	0.004007	2.53	27.90	57.82	0.59
Rio San Pietro	2	111.00*	TR20Borm+TR200ri	Lotto1C	49.10	182.43	185.50	185.04	185.81	0.004007	2.53	27.90	57.82	0.59
Rio San Pietro	2	111.00*	TR20Borm+TR200ri	Finale	49.10	182.43	185.40	185.04	185.80	0.005444	2.84	18.59	14.50	0.68
Rio San Pietro	2	110.00*	TR20Borm+TR200ri	Attuale	49.10	182.02	184.68	184.87	185.20	0.010488	3.32	20.26	35.22	0.90
Rio San Pietro	2	110.00*	TR20Borm+TR200ri	Lotto1A	49.10	182.02	185.53	184.68	185.71	0.002097	1.98	39.99	82.36	0.44
Rio San Pietro	2	110.00*	TR20Borm+TR200ri	Lotto1B	49.10	182.02	185.52	184.68	185.70	0.002109	1.98	39.54	80.22	0.44
Rio San Pietro	2	110.00*	TR20Borm+TR200ri	Lotto1C	49.10	182.02	185.52	184.68	185.70	0.002109	1.98	39.54	80.22	0.44
Rio San Pietro	2	110.00*	TR20Borm+TR200ri	Finale	49.10	182.02	185.40	184.69	185.66	0.003043	2.29	23.44	15.70	0.52
Rio San Pietro	2	109	TR20Borm+TR200ri	Attuale	49.10	181.60	184.60	184.49	184.93	0.005940	2.69	26.48	52.31	0.69
Rio San Pietro	2	109	TR20Borm+TR200ri	Lotto1A	49.10	181.60	185.53	184.32	185.65	0.001193	1.60	53.39	96.71	0.33
Rio San Pietro	2	109	TR20Borm+TR200ri	Lotto1B	49.10	181.60	185.53	184.32	185.64	0.001203	1.60	52.77	95.99	0.33
Rio San Pietro	2	109	TR20Borm+TR200ri	Lotto1C	49.10	181.60	185.53	184.32	185.64	0.001203	1.60	52.77	95.99	0.33
Rio San Pietro	2	109	TR20Borm+TR200ri	Finale	49.10	181.60	185.40	184.32	185.58	0.001815	1.89	28.76	16.90	0.41
Rio San Pietro	1	108	TR20Borm+TR200ri	Attuale	49.10	180.99	184.65	184.18	184.83	0.002622	2.10	40.76	58.24	0.46
Rio San Pietro	1	108	TR20Borm+TR200ri	Lotto1A	49.10	180.99	185.60	184.02	185.61	0.000202	0.75	188.64	216.59	0.14
Rio San Pietro	1	108	TR20Borm+TR200ri	Lotto1B	49.10	180.99	185.50	184.02	185.63	0.001032	1.65	39.60	22.80	0.31
Rio San Pietro	1	108	TR20Borm+TR200ri	Lotto1C	49.10	180.99	185.50	184.02	185.63	0.001032	1.65	39.60	22.80	0.31
Rio San Pietro	1	108	TR20Borm+TR200ri	Finale	49.10	180.99	185.41	184.02	185.54	0.001179	1.73	37.44	22.80	0.33
Rio San Pietro	1	107.00*	TR20Borm+TR200ri	Attuale	49.10	180.57	184.63		184.76	0.001770	1.79	47.30	125.13	0.38
Rio San Pietro	1	107.00*	TR20Borm+TR200ri	Lotto1A	49.10	180.57	185.50	183.73	185.59	0.000739	1.44	43.97	22.10	0.26
Rio San Pietro	1	107.00*	TR20Borm+TR200ri	Lotto1B	49.10	180.57	185.50	183.73	185.59	0.000739	1.44	43.97	22.10	0.26
Rio San Pietro	1	107.00*	TR20Borm+TR200ri	Lotto1C	49.10	180.57	185.50	183.73	185.59	0.000739	1.44	43.97	22.10	0.26
Rio San Pietro	1	107.00*	TR20Borm+TR200ri	Finale	49.10	180.57	185.41	183.73	185.51	0.000835	1.50	41.88	22.10	0.28
Rio San Pietro	1	106.00*	TR20Borm+TR200ri	Attuale	49.10	180.14	184.64		184.71	0.001022	1.40	82.61	243.23	0.29
Rio San Pietro	1	106.00*	TR20Borm+TR200ri	Lotto1A	49.10	180.14	185.50	183.33	185.57	0.000552	1.27	48.30	21.40	0.23
Rio San Pietro	1	106.00*	TR20Borm+TR200ri	Lotto1B	49.10	180.14	185.50	183.33	185.57	0.000552	1.27	48.30	21.40	0.23
Rio San Pietro	1	106.00*	TR20Borm+TR200ri	Lotto1C	49.10	180.14	185.50	183.33	185.57	0.000552	1.27	48.30	21.40	0.23
Rio San Pietro	1	106.00*	TR20Borm+TR200ri	Finale	49.10	180.14	185.40	183.33	185.48	0.000618	1.31	46.28	21.40	0.24
Rio San Pietro	1	105	TR20Borm+TR200ri	Attuale	49.10	179.72	184.65	182.94	184.68	0.000497	1.00	130.34	252.40	0.20
Rio San Pietro	1	105	TR20Borm+TR200ri	Lotto1A	49.10	179.72	185.50	182.94	185.56	0.000421	1.12	52.83	20.70	0.20
Rio San Pietro	1	105	TR20Borm+TR200ri	Lotto1B	49.10	179.72	185.50	182.94	185.56	0.000421	1.12	52.83	20.70	0.20
Rio San Pietro	1	105	TR20Borm+TR200ri	Lotto1C	49.10	179.72	185.50	182.94	185.56	0.000421	1.12	52.83	20.70	0.20
Rio San Pietro	1	105	TR20Borm+TR200ri	Finale	49.10	179.72	185.40	182.94	185.47	0.000468	1.16	50.87	20.70	0.21
Rio San Pietro	1	104.5			Bridge									
Rio San Pietro	1	104	TR20Borm+TR200ri	Attuale	49.10	179.17	184.64		184.66	0.000164	0.74	181.42	266.04	0.13
Rio San Pietro	1	104	TR20Borm+TR200ri	Lotto1A	49.10	179.17	184.53	181.97	184.60	0.000422	1.16	46.32	18.70	0.20
Rio San Pietro	1	104	TR20Borm+TR200ri	Lotto1B	49.10	179.17	184.53	181.97	184.60	0.000422	1.16	46.32	18.70	0.20
Rio San Pietro	1	104	TR20Borm+TR200ri	Lotto1C	49.10	179.17	184.53	181.97	184.60	0.000422	1.16	46.32	18.70	0.20

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	1	104	TR20Borm+TR200ri	Finale	49.10	179.17	184.44	181.97	184.51	0.000468	1.20	44.54	18.70	0.21
Rio Sacco	1	306	TR20Borm+TR200ri	Attuale	14.50	187.71	189.12	189.31	189.78	0.030031	3.58	4.05	5.84	1.37
Rio Sacco	1	306	TR20Borm+TR200ri	Lotto1A	14.50	187.71	189.12	189.31	189.78	0.030031	3.58	4.05	5.84	1.37
Rio Sacco	1	306	TR20Borm+TR200ri	Lotto1B	14.50	187.71	189.12	189.31	189.78	0.030031	3.58	4.05	5.84	1.37
Rio Sacco	1	306	TR20Borm+TR200ri	Lotto1C	14.50	187.71	189.12	189.31	189.78	0.030031	3.58	4.05	5.84	1.37
Rio Sacco	1	306	TR20Borm+TR200ri	Finale	14.50	187.71	189.12	189.31	189.78	0.030031	3.58	4.05	5.84	1.37
Rio Sacco	1	305	TR20Borm+TR200ri	Attuale	14.50	185.28	187.58	187.02	187.77	0.004776	1.95	7.45	5.81	0.55
Rio Sacco	1	305	TR20Borm+TR200ri	Lotto1A	14.50	185.28	187.58	187.02	187.77	0.004776	1.95	7.45	5.81	0.55
Rio Sacco	1	305	TR20Borm+TR200ri	Lotto1B	14.50	185.28	187.58	187.02	187.77	0.004776	1.95	7.45	5.81	0.55
Rio Sacco	1	305	TR20Borm+TR200ri	Lotto1C	14.50	185.28	187.58	187.02	187.77	0.004776	1.95	7.45	5.81	0.55
Rio Sacco	1	305	TR20Borm+TR200ri	Finale	14.50	185.28	187.58	187.02	187.77	0.004776	1.95	7.45	5.81	0.55
Rio Sacco	1	304.5			Bridge									
Rio Sacco	1	304	TR20Borm+TR200ri	Attuale	14.50	183.36	185.39		185.52	0.002743	1.58	9.17	7.00	0.44
Rio Sacco	1	304	TR20Borm+TR200ri	Lotto1A	14.50	183.36	185.32		185.47	0.003162	1.67	8.70	6.85	0.47
Rio Sacco	1	304	TR20Borm+TR200ri	Lotto1B	14.50	183.36	184.29	184.72	185.67	0.069547	5.19	2.80	4.32	2.06
Rio Sacco	1	304	TR20Borm+TR200ri	Lotto1C	14.50	183.36	184.29	184.72	185.67	0.069547	5.19	2.80	4.32	2.06
Rio Sacco	1	304	TR20Borm+TR200ri	Finale	14.50	183.36	185.05		185.28	0.005856	2.09	6.93	6.22	0.63
Rio Sacco	1	303	TR20Borm+TR200ri	Attuale	14.50	182.69	185.38		185.46	0.001448	1.26	11.52	7.23	0.32
Rio Sacco	1	303	TR20Borm+TR200ri	Lotto1A	14.50	182.69	185.31		185.40	0.001604	1.31	11.03	6.98	0.33
Rio Sacco	1	303	TR20Borm+TR200ri	Lotto1B	14.50	182.69	185.22	184.21	185.32	0.001864	1.39	10.40	6.74	0.36
Rio Sacco	1	303	TR20Borm+TR200ri	Lotto1C	14.50	182.69	185.22	184.21	185.32	0.001864	1.39	10.40	6.74	0.36
Rio Sacco	1	303	TR20Borm+TR200ri	Finale	14.50	182.69	185.03		185.16	0.002593	1.58	9.18	6.36	0.42
Rio Sacco	1	302	TR20Borm+TR200ri	Attuale	14.50	182.41	185.42		185.43	0.000108	0.46	37.69	27.03	0.10
Rio Sacco	1	302	TR20Borm+TR200ri	Lotto1A	14.50	182.41	185.36		185.37	0.000122	0.48	35.94	26.68	0.11
Rio Sacco	1	302	TR20Borm+TR200ri	Lotto1B	14.50	182.41	185.27		185.28	0.000144	0.50	33.65	26.09	0.12
Rio Sacco	1	302	TR20Borm+TR200ri	Lotto1C	14.50	182.41	185.27		185.28	0.000144	0.50	33.65	26.09	0.12
Rio Sacco	1	302	TR20Borm+TR200ri	Finale	14.50	182.41	185.10		185.11	0.000205	0.56	29.25	24.86	0.14
Rio Sacco	1	301	TR20Borm+TR200ri	Attuale	14.50	181.63	185.42		185.43	0.000062	0.37	55.57	31.56	0.08
Rio Sacco	1	301	TR20Borm+TR200ri	Lotto1A	14.50	181.63	185.36		185.36	0.000069	0.39	53.53	31.39	0.08
Rio Sacco	1	301	TR20Borm+TR200ri	Lotto1B	14.50	181.63	185.27		185.28	0.000080	0.41	50.83	31.17	0.09
Rio Sacco	1	301	TR20Borm+TR200ri	Lotto1C	14.50	181.63	185.27		185.28	0.000080	0.41	50.83	31.17	0.09
Rio Sacco	1	301	TR20Borm+TR200ri	Finale	14.50	181.63	185.10		185.11	0.000109	0.45	45.51	30.72	0.10
Rio Madama	1	405	TR20Borm+TR200ri	Attuale	8.10	194.39	195.24	195.61	196.41	0.080011	4.79	1.69	3.17	2.10
Rio Madama	1	405	TR20Borm+TR200ri	Lotto1A	8.10	194.39	195.24	195.61	196.41	0.080011	4.79	1.69	3.17	2.10
Rio Madama	1	405	TR20Borm+TR200ri	Lotto1B	8.10	194.39	195.24	195.61	196.41	0.080011	4.79	1.69	3.17	2.10
Rio Madama	1	405	TR20Borm+TR200ri	Lotto1C	8.10	194.39	195.24	195.61	196.41	0.080011	4.79	1.69	3.17	2.10
Rio Madama	1	405	TR20Borm+TR200ri	Finale	8.10	194.39	195.24	195.61	196.41	0.080011	4.79	1.69	3.17	2.10
Rio Madama	1	404	TR20Borm+TR200ri	Attuale	8.10	187.14	187.77	187.77	187.77	0.000081	0.12	43.18	25.69	0.06

HEC-RAS Profile: TR20Borm+TR200ri (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio Madama	1	404	TR20Borm+TR200ri	Lotto1A	8.10	187.14	187.77	187.77	187.77	0.000081	0.12	43.18	25.69	0.06
Rio Madama	1	404	TR20Borm+TR200ri	Lotto1B	8.10	187.14	187.91	188.14	189.06	0.087864	4.75	1.71	3.76	2.24
Rio Madama	1	404	TR20Borm+TR200ri	Lotto1C	8.10	187.14	187.91	188.14	189.06	0.087864	4.75	1.71	3.76	2.24
Rio Madama	1	404	TR20Borm+TR200ri	Finale	8.10	187.14	187.91	188.20	189.06	0.087843	4.75	1.71	3.76	2.24
Rio Madama	1	403	TR20Borm+TR200ri	Attuale	8.10	186.20	186.75	186.75	186.75	0.000356	0.24	26.88	23.66	0.13
Rio Madama	1	403	TR20Borm+TR200ri	Lotto1A	8.10	186.20	186.75	186.75	186.75	0.000356	0.24	26.88	23.66	0.13
Rio Madama	1	403	TR20Borm+TR200ri	Lotto1B	8.10	186.20	187.12	187.12	187.13	0.001082	0.53	18.46	22.64	0.24
Rio Madama	1	403	TR20Borm+TR200ri	Lotto1C	8.10	186.20	187.12	187.12	187.13	0.001082	0.53	18.46	22.64	0.24
Rio Madama	1	403	TR20Borm+TR200ri	Finale	8.10	186.20	187.43	187.43	187.82	0.015592	2.80	3.05	3.91	1.01
Rio Madama	1	402	TR20Borm+TR200ri	Attuale	8.10	184.94	185.74	185.74	185.75	0.001448	0.54	17.74	26.81	0.28
Rio Madama	1	402	TR20Borm+TR200ri	Lotto1A	8.10	184.94	185.74	185.74	185.75	0.001448	0.54	17.74	26.81	0.28
Rio Madama	1	402	TR20Borm+TR200ri	Lotto1B	8.10	184.94	185.71	185.94	186.81	0.099221	4.63	1.75	4.44	2.36
Rio Madama	1	402	TR20Borm+TR200ri	Lotto1C	8.10	184.94	185.71	185.94	186.81	0.099221	4.63	1.75	4.44	2.36
Rio Madama	1	402	TR20Borm+TR200ri	Finale	8.10	184.94	185.86	186.02	186.39	0.039242	3.22	2.52	5.60	1.53
Rio Madama	1	401	TR20Borm+TR200ri	Attuale	8.10	183.68	184.59	184.99	185.39	0.052834	3.96	2.04	3.92	1.75
Rio Madama	1	401	TR20Borm+TR200ri	Lotto1A	8.10	183.68	185.61	184.99	185.62	0.000197	0.41	36.83	48.30	0.12
Rio Madama	1	401	TR20Borm+TR200ri	Lotto1B	8.10	183.68	185.65	184.86	185.66	0.000360	0.56	22.96	28.20	0.17
Rio Madama	1	401	TR20Borm+TR200ri	Lotto1C	8.10	183.68	185.65	184.86	185.66	0.000360	0.56	22.96	28.20	0.17
Rio Madama	1	401	TR20Borm+TR200ri	Finale	8.10	183.68	185.54	184.86	185.59	0.001326	0.98	8.46	8.50	0.31
Rio Caffra	1	205	TR20Borm+TR200ri	Attuale	27.70	190.88	192.45	192.26	192.58	0.003695	1.83	25.03	39.34	0.56
Rio Caffra	1	205	TR20Borm+TR200ri	Lotto1A	27.70	190.88	192.45	192.26	192.58	0.003695	1.83	25.03	39.34	0.56
Rio Caffra	1	205	TR20Borm+TR200ri	Lotto1B	27.70	190.88	192.45	192.26	192.58	0.003695	1.83	25.03	39.34	0.56
Rio Caffra	1	205	TR20Borm+TR200ri	Lotto1C	27.70	190.88	192.45	192.26	192.58	0.003695	1.83	25.03	39.34	0.56
Rio Caffra	1	205	TR20Borm+TR200ri	Finale	27.70	190.88	192.45	192.26	192.58	0.003695	1.83	25.03	39.34	0.56
Rio Caffra	1	203	TR20Borm+TR200ri	Attuale	27.70	190.29	191.98	191.98	192.33	0.011851	2.91	13.41	19.28	0.94
Rio Caffra	1	203	TR20Borm+TR200ri	Lotto1A	27.70	190.29	191.98	191.98	192.33	0.011851	2.91	13.41	19.28	0.94
Rio Caffra	1	203	TR20Borm+TR200ri	Lotto1B	27.70	190.29	191.98	191.98	192.33	0.011851	2.91	13.41	19.28	0.94
Rio Caffra	1	203	TR20Borm+TR200ri	Lotto1C	27.70	190.29	191.98	191.98	192.33	0.011851	2.91	13.41	19.28	0.94
Rio Caffra	1	203	TR20Borm+TR200ri	Finale	27.70	190.29	191.98	191.98	192.33	0.011851	2.91	13.41	19.28	0.94
Rio Caffra	1	201	TR20Borm+TR200ri	Attuale	27.70	189.19	191.57	191.06	191.71	0.002078	1.79	22.17	18.90	0.44
Rio Caffra	1	201	TR20Borm+TR200ri	Lotto1A	27.70	189.19	191.57	191.06	191.71	0.002078	1.79	22.17	18.90	0.44
Rio Caffra	1	201	TR20Borm+TR200ri	Lotto1B	27.70	189.19	191.57	191.06	191.71	0.002078	1.79	22.17	18.90	0.44
Rio Caffra	1	201	TR20Borm+TR200ri	Lotto1C	27.70	189.19	191.57	191.06	191.71	0.002078	1.79	22.17	18.90	0.44
Rio Caffra	1	201	TR20Borm+TR200ri	Finale	27.70	189.19	191.57	191.06	191.71	0.002077	1.79	22.17	18.90	0.44
Bormida	3	43	TR20Borm+TR200ri	Attuale	833.00	179.12	185.02	183.39	185.72	0.002254	3.78	270.90	163.03	0.55
Bormida	3	43	TR20Borm+TR200ri	Lotto1A	833.00	179.12	184.93	183.39	185.68	0.002413	3.87	257.81	155.28	0.56
Bormida	3	43	TR20Borm+TR200ri	Lotto1B	833.00	179.12	184.87	183.40	185.64	0.002549	3.94	247.88	151.29	0.58
Bormida	3	43	TR20Borm+TR200ri	Lotto1C	833.00	179.12	184.98	183.33	185.52	0.002009	3.31	290.74	159.09	0.51
Bormida	3	43	TR20Borm+TR200ri	Finale	833.00	179.12	184.86	183.26	185.34	0.001892	3.07	298.04	153.20	0.49

HEC-RAS Profile: TR20Borm+TR200ri (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	3	42.000*	TR20Borm+TR200ri	Attuale	833.00	179.09	184.99	183.35	185.65	0.002187	3.66	278.32	184.30	0.54
Bormida	3	42.000*	TR20Borm+TR200ri	Lotto1A	833.00	179.09	184.90	183.35	185.61	0.002369	3.76	261.90	180.37	0.56
Bormida	3	42.000*	TR20Borm+TR200ri	Lotto1B	833.00	179.09	184.83	183.35	185.57	0.002502	3.82	250.32	167.15	0.57
Bormida	3	42.000*	TR20Borm+TR200ri	Lotto1C	833.00	179.09	184.94		185.47	0.001980	3.25	293.98	181.98	0.50
Bormida	3	42.000*	TR20Borm+TR200ri	Finale	833.00	179.09	184.83		185.29	0.001878	3.02	298.21	166.85	0.49
Bormida	3	41.000*	TR20Borm+TR200ri	Attuale	833.00	179.06	184.97	183.29	185.59	0.002131	3.54	285.89	196.67	0.53
Bormida	3	41.000*	TR20Borm+TR200ri	Lotto1A	833.00	179.06	184.87	183.29	185.54	0.002327	3.65	267.14	193.74	0.55
Bormida	3	41.000*	TR20Borm+TR200ri	Lotto1B	833.00	179.06	184.79	183.29	185.50	0.002490	3.73	252.82	190.67	0.57
Bormida	3	41.000*	TR20Borm+TR200ri	Lotto1C	833.00	179.06	184.90		185.41	0.001956	3.19	297.77	195.35	0.50
Bormida	3	41.000*	TR20Borm+TR200ri	Finale	833.00	179.06	184.79		185.24	0.001875	2.98	298.96	190.54	0.48
Bormida	3	40.000*	TR20Borm+TR200ri	Attuale	833.00	179.04	184.94	183.24	185.53	0.002098	3.44	292.25	206.28	0.52
Bormida	3	40.000*	TR20Borm+TR200ri	Lotto1A	833.00	179.04	184.83	183.24	185.47	0.002301	3.56	271.28	204.65	0.55
Bormida	3	40.000*	TR20Borm+TR200ri	Lotto1B	833.00	179.04	184.76	183.24	185.43	0.002456	3.64	255.68	194.16	0.56
Bormida	3	40.000*	TR20Borm+TR200ri	Lotto1C	833.00	179.04	184.87		185.36	0.001943	3.13	300.94	205.37	0.50
Bormida	3	40.000*	TR20Borm+TR200ri	Finale	833.00	179.04	184.75		185.19	0.001865	2.94	299.93	197.45	0.48
Bormida	3	39.000*	TR20Borm+TR200ri	Attuale	833.00	179.01	184.90	183.17	185.47	0.002063	3.36	297.18	215.63	0.52
Bormida	3	39.000*	TR20Borm+TR200ri	Lotto1A	833.00	179.01	184.80	183.17	185.40	0.002256	3.47	275.62	191.18	0.54
Bormida	3	39.000*	TR20Borm+TR200ri	Lotto1B	833.00	179.01	184.72	183.17	185.36	0.002406	3.55	262.07	161.33	0.56
Bormida	3	39.000*	TR20Borm+TR200ri	Lotto1C	833.00	179.01	184.83		185.31	0.001919	3.08	303.48	205.83	0.49
Bormida	3	39.000*	TR20Borm+TR200ri	Finale	833.00	179.01	184.71		185.14	0.001842	2.90	305.00	157.99	0.48
Bormida	3	38.000*	TR20Borm+TR200ri	Attuale	833.00	178.98	184.88		185.41	0.002009	3.27	303.66	188.98	0.51
Bormida	3	38.000*	TR20Borm+TR200ri	Lotto1A	833.00	178.98	184.77		185.34	0.002199	3.38	285.06	166.33	0.53
Bormida	3	38.000*	TR20Borm+TR200ri	Lotto1B	833.00	178.98	184.68		185.29	0.002369	3.46	271.38	156.91	0.55
Bormida	3	38.000*	TR20Borm+TR200ri	Lotto1C	833.00	178.98	184.80		185.26	0.001875	3.02	310.91	169.49	0.49
Bormida	3	38.000*	TR20Borm+TR200ri	Finale	833.00	178.98	184.68		185.09	0.001824	2.85	313.27	155.37	0.48
Bormida	3	37	TR20Borm+TR200ri	Attuale	833.00	178.95	184.85		185.35	0.001952	3.18	314.75	176.28	0.50
Bormida	3	37	TR20Borm+TR200ri	Lotto1A	833.00	178.95	184.74		185.28	0.002162	3.29	295.45	165.44	0.52
Bormida	3	37	TR20Borm+TR200ri	Lotto1B	833.00	178.95	184.65		185.22	0.002346	3.39	280.91	157.09	0.55
Bormida	3	37	TR20Borm+TR200ri	Lotto1C	833.00	178.95	184.77		185.20	0.001842	2.96	320.69	167.63	0.48
Bormida	3	37	TR20Borm+TR200ri	Finale	833.00	178.95	184.64		185.04	0.001811	2.81	321.92	156.73	0.47
Bormida	2	35	TR20Borm+TR200ri	Attuale	833.00	178.59	184.71		185.29	0.001929	3.43	295.52	174.01	0.50
Bormida	2	35	TR20Borm+TR200ri	Lotto1A	833.00	178.59	184.65		185.22	0.002178	3.38	286.85	159.33	0.53
Bormida	2	35	TR20Borm+TR200ri	Lotto1B	833.00	178.59	184.63		185.15	0.001847	3.21	298.72	158.13	0.49
Bormida	2	35	TR20Borm+TR200ri	Lotto1C	833.00	178.59	184.63	182.89	185.15	0.001847	3.21	298.72	158.13	0.49
Bormida	2	35	TR20Borm+TR200ri	Finale	833.00	178.59	184.54	182.85	184.99	0.001740	2.97	306.38	151.93	0.47
Bormida	2	34.000*	TR20Borm+TR200ri	Attuale	833.00	178.53	184.64	182.88	185.24	0.001989	3.47	291.71	184.92	0.51
Bormida	2	34.000*	TR20Borm+TR200ri	Lotto1A	833.00	178.53	184.59		185.16	0.002166	3.39	285.56	174.49	0.53
Bormida	2	34.000*	TR20Borm+TR200ri	Lotto1B	833.00	178.53	184.58		185.10	0.001859	3.23	296.86	173.31	0.49
Bormida	2	34.000*	TR20Borm+TR200ri	Lotto1C	833.00	178.53	184.58	182.82	185.10	0.001859	3.23	296.86	173.31	0.49
Bormida	2	34.000*	TR20Borm+TR200ri	Finale	833.00	178.53	184.50	182.78	184.95	0.001707	2.97	306.21	160.74	0.47

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	2	33.000*	TR20Borm+TR200ri	Attuale	833.00	178.46	184.58	182.84	185.19	0.002037	3.51	293.69	208.34	0.52
Bormida	2	33.000*	TR20Borm+TR200ri	Lotto1A	833.00	178.46	184.49	182.83	185.10	0.002358	3.49	277.31	207.09	0.55
Bormida	2	33.000*	TR20Borm+TR200ri	Lotto1B	833.00	178.46	184.53		185.06	0.001861	3.24	300.59	207.62	0.49
Bormida	2	33.000*	TR20Borm+TR200ri	Lotto1C	833.00	178.46	184.53	182.77	185.06	0.001861	3.24	300.59	207.62	0.49
Bormida	2	33.000*	TR20Borm+TR200ri	Finale	833.00	178.46	184.46	182.70	184.90	0.001676	2.96	309.72	175.88	0.46
Bormida	2	32.000*	TR20Borm+TR200ri	Attuale	833.00	178.40	184.53	182.80	185.14	0.002036	3.51	299.86	199.36	0.52
Bormida	2	32.000*	TR20Borm+TR200ri	Lotto1A	833.00	178.40	184.45	182.81	185.04	0.002275	3.46	286.89	197.75	0.54
Bormida	2	32.000*	TR20Borm+TR200ri	Lotto1B	833.00	178.40	184.49		185.01	0.001826	3.23	309.59	198.60	0.49
Bormida	2	32.000*	TR20Borm+TR200ri	Lotto1C	833.00	178.40	184.49	182.72	185.01	0.001826	3.23	309.59	198.60	0.49
Bormida	2	32.000*	TR20Borm+TR200ri	Finale	833.00	178.40	184.42	182.63	184.86	0.001633	2.94	319.66	197.25	0.46
Bormida	2	31.000*	TR20Borm+TR200ri	Attuale	833.00	178.33	184.49	182.76	185.09	0.002033	3.50	305.43	191.46	0.52
Bormida	2	31.000*	TR20Borm+TR200ri	Lotto1A	833.00	178.33	184.43		184.97	0.001986	3.32	306.76	189.25	0.51
Bormida	2	31.000*	TR20Borm+TR200ri	Lotto1B	833.00	178.33	184.45		184.96	0.001791	3.21	317.93	189.77	0.48
Bormida	2	31.000*	TR20Borm+TR200ri	Lotto1C	833.00	178.33	184.45	182.66	184.96	0.001791	3.21	317.93	189.77	0.48
Bormida	2	31.000*	TR20Borm+TR200ri	Finale	833.00	178.33	184.39	182.57	184.82	0.001580	2.92	330.00	188.38	0.45
Bormida	2	30.000*	TR20Borm+TR200ri	Attuale	833.00	178.27	184.44		185.04	0.002030	3.50	310.84	187.71	0.52
Bormida	2	30.000*	TR20Borm+TR200ri	Lotto1A	833.00	178.27	184.42	182.60	184.91	0.001756	3.19	325.93	186.46	0.48
Bormida	2	30.000*	TR20Borm+TR200ri	Lotto1B	833.00	178.27	184.42	182.60	184.91	0.001756	3.19	325.93	186.46	0.48
Bormida	2	30.000*	TR20Borm+TR200ri	Lotto1C	833.00	178.27	184.42	182.60	184.91	0.001756	3.19	325.93	186.46	0.48
Bormida	2	30.000*	TR20Borm+TR200ri	Finale	833.00	178.27	184.36	182.50	184.78	0.001528	2.89	339.79	182.55	0.44
Bormida	2	29.000*	TR20Borm+TR200ri	Attuale	833.00	178.20	184.40		184.99	0.002023	3.49	316.35	186.30	0.51
Bormida	2	29.000*	TR20Borm+TR200ri	Lotto1A	833.00	178.20	184.38	182.55	184.87	0.001722	3.17	332.76	174.72	0.47
Bormida	2	29.000*	TR20Borm+TR200ri	Lotto1B	833.00	178.20	184.38	182.55	184.87	0.001722	3.17	332.76	174.72	0.47
Bormida	2	29.000*	TR20Borm+TR200ri	Lotto1C	833.00	178.20	184.38	182.55	184.87	0.001722	3.17	332.76	174.72	0.47
Bormida	2	29.000*	TR20Borm+TR200ri	Finale	833.00	178.20	184.34	182.43	184.74	0.001477	2.85	348.69	173.70	0.44
Bormida	2	28	TR20Borm+TR200ri	Attuale	833.00	178.14	184.36		184.93	0.002014	3.48	323.30	194.01	0.51
Bormida	2	28	TR20Borm+TR200ri	Lotto1A	833.00	178.14	184.35	182.49	184.82	0.001693	3.14	338.02	163.62	0.47
Bormida	2	28	TR20Borm+TR200ri	Lotto1B	833.00	178.14	184.35	182.49	184.82	0.001693	3.14	338.02	163.62	0.47
Bormida	2	28	TR20Borm+TR200ri	Lotto1C	833.00	178.14	184.35	182.49	184.82	0.001693	3.14	338.02	163.62	0.47
Bormida	2	28	TR20Borm+TR200ri	Finale	833.00	178.14	184.31	182.37	184.70	0.001430	2.82	356.01	162.72	0.43
Bormida	2	27.000*	TR20Borm+TR200ri	Attuale	833.00	178.10	184.30		184.88	0.002006	3.50	310.62	169.44	0.51
Bormida	2	27.000*	TR20Borm+TR200ri	Lotto1A	833.00	178.10	184.30	182.43	184.78	0.001670	3.14	327.50	147.08	0.46
Bormida	2	27.000*	TR20Borm+TR200ri	Lotto1B	833.00	178.10	184.30	182.43	184.78	0.001670	3.14	327.50	147.08	0.46
Bormida	2	27.000*	TR20Borm+TR200ri	Lotto1C	833.00	178.10	184.30	182.43	184.78	0.001670	3.14	327.50	147.08	0.46
Bormida	2	27.000*	TR20Borm+TR200ri	Finale	833.00	178.10	184.27	182.31	184.66	0.001412	2.82	344.80	145.28	0.43
Bormida	2	26.000*	TR20Borm+TR200ri	Attuale	833.00	178.05	184.25		184.83	0.001965	3.49	302.66	146.77	0.51
Bormida	2	26.000*	TR20Borm+TR200ri	Lotto1A	833.00	178.05	184.27	182.37	184.74	0.001622	3.11	321.25	130.11	0.46
Bormida	2	26.000*	TR20Borm+TR200ri	Lotto1B	833.00	178.05	184.27	182.37	184.74	0.001622	3.11	321.25	130.11	0.46
Bormida	2	26.000*	TR20Borm+TR200ri	Lotto1C	833.00	178.05	184.27	182.37	184.74	0.001622	3.11	321.25	130.11	0.46

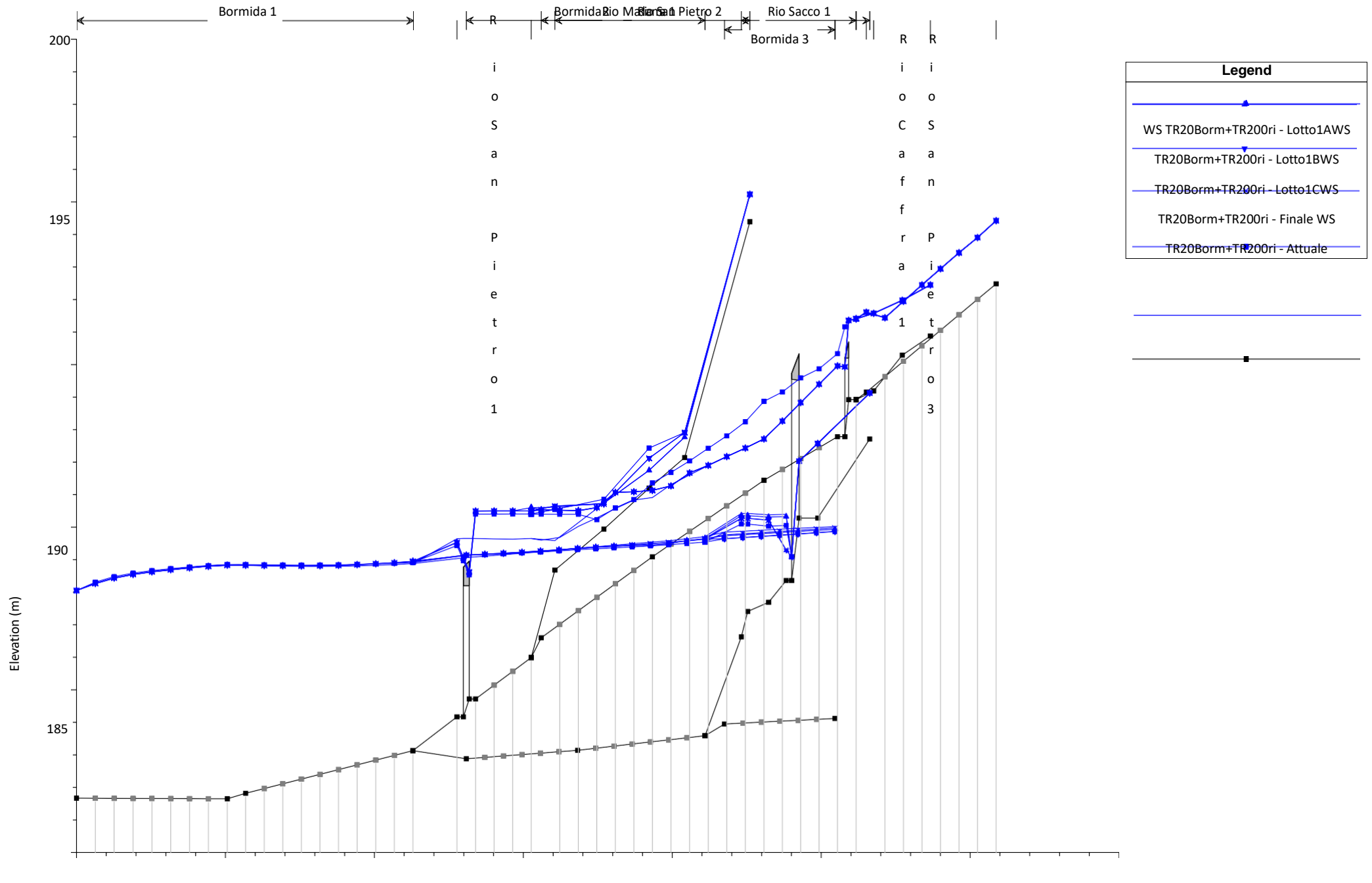
River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	2	26.000*	TR20Borm+TR200ri	Finale	833.00	178.05	184.24	182.25	184.63	0.001372	2.79	338.84	127.93	0.42
Bormida	2	25.000*	TR20Borm+TR200ri	Attuale	833.00	178.01	184.20		184.79	0.001920	3.49	296.28	137.84	0.50
Bormida	2	25.000*	TR20Borm+TR200ri	Lotto1A	833.00	178.01	184.23	182.29	184.70	0.001570	3.08	317.08	118.68	0.45
Bormida	2	25.000*	TR20Borm+TR200ri	Lotto1B	833.00	178.01	184.23	182.29	184.70	0.001570	3.08	317.08	118.68	0.45
Bormida	2	25.000*	TR20Borm+TR200ri	Lotto1C	833.00	178.01	184.23	182.29	184.70	0.001570	3.08	317.08	118.68	0.45
Bormida	2	25.000*	TR20Borm+TR200ri	Finale	833.00	178.01	184.21	182.17	184.59	0.001327	2.77	335.47	116.69	0.42
Bormida	2	24.000*	TR20Borm+TR200ri	Attuale	833.00	177.97	184.15		184.74	0.001872	3.47	290.92	120.76	0.50
Bormida	2	24.000*	TR20Borm+TR200ri	Lotto1A	833.00	177.97	184.20	182.20	184.66	0.001512	3.05	314.04	108.99	0.45
Bormida	2	24.000*	TR20Borm+TR200ri	Lotto1B	833.00	177.97	184.20	182.20	184.66	0.001512	3.05	314.04	108.99	0.45
Bormida	2	24.000*	TR20Borm+TR200ri	Lotto1C	833.00	177.97	184.20	182.20	184.66	0.001512	3.05	314.04	108.99	0.45
Bormida	2	24.000*	TR20Borm+TR200ri	Finale	833.00	177.97	184.18	182.09	184.56	0.001277	2.73	333.66	106.94	0.41
Bormida	2	23.000*	TR20Borm+TR200ri	Attuale	833.00	177.92	184.11		184.69	0.001822	3.46	285.84	107.63	0.49
Bormida	2	23.000*	TR20Borm+TR200ri	Lotto1A	833.00	177.92	184.17	182.12	184.62	0.001451	3.01	311.61	100.22	0.44
Bormida	2	23.000*	TR20Borm+TR200ri	Lotto1B	833.00	177.92	184.17	182.12	184.62	0.001451	3.01	311.61	100.22	0.44
Bormida	2	23.000*	TR20Borm+TR200ri	Lotto1C	833.00	177.92	184.17	182.12	184.62	0.001451	3.01	311.61	100.22	0.44
Bormida	2	23.000*	TR20Borm+TR200ri	Finale	833.00	177.92	184.16	182.01	184.52	0.001225	2.69	332.69	99.02	0.40
Bormida	2	22	TR20Borm+TR200ri	Attuale	833.00	177.88	184.06		184.65	0.001771	3.44	280.62	94.12	0.49
Bormida	2	22	TR20Borm+TR200ri	Lotto1A	833.00	177.88	184.14	182.02	184.58	0.001389	2.96	309.30	91.24	0.43
Bormida	2	22	TR20Borm+TR200ri	Lotto1B	833.00	177.88	184.14	182.02	184.58	0.001389	2.96	309.30	91.24	0.43
Bormida	2	22	TR20Borm+TR200ri	Lotto1C	833.00	177.88	184.14	182.02	184.58	0.001389	2.96	309.30	91.24	0.43
Bormida	2	22	TR20Borm+TR200ri	Finale	833.00	177.88	184.13	181.93	184.49	0.001172	2.66	331.97	91.17	0.39
Bormida	1	19	TR20Borm+TR200ri	Attuale	833.00	178.13	183.88		184.51	0.002047	3.51	252.45	94.65	0.52
Bormida	1	19	TR20Borm+TR200ri	Lotto1A	833.00	178.13	183.95	182.14	184.46	0.001866	3.16	263.93	62.38	0.49
Bormida	1	19	TR20Borm+TR200ri	Lotto1B	833.00	178.13	183.95	182.14	184.46	0.001866	3.16	263.93	62.38	0.49
Bormida	1	19	TR20Borm+TR200ri	Lotto1C	833.00	178.13	183.95	182.14	184.46	0.001866	3.16	263.93	62.38	0.49
Bormida	1	19	TR20Borm+TR200ri	Finale	833.00	178.13	183.92	182.16	184.38	0.001675	3.04	287.52	71.97	0.47
Bormida	1	18.000*	TR20Borm+TR200ri	Attuale	833.00	177.98	183.85		184.45	0.001957	3.43	254.27	89.70	0.51
Bormida	1	18.000*	TR20Borm+TR200ri	Lotto1A	833.00	177.98	183.91	182.10	184.41	0.001825	3.13	267.64	65.87	0.48
Bormida	1	18.000*	TR20Borm+TR200ri	Lotto1B	833.00	177.98	183.91	182.10	184.41	0.001825	3.13	267.64	65.87	0.48
Bormida	1	18.000*	TR20Borm+TR200ri	Lotto1C	833.00	177.98	183.91	182.10	184.41	0.001825	3.13	267.64	65.87	0.48
Bormida	1	18.000*	TR20Borm+TR200ri	Finale	833.00	177.98	183.89	182.10	184.33	0.001582	2.96	295.81	76.95	0.45
Bormida	1	17.000*	TR20Borm+TR200ri	Attuale	833.00	177.84	183.83		184.39	0.001831	3.33	260.60	86.07	0.49
Bormida	1	17.000*	TR20Borm+TR200ri	Lotto1A	833.00	177.84	183.87	182.04	184.36	0.001746	3.08	273.84	69.40	0.47
Bormida	1	17.000*	TR20Borm+TR200ri	Lotto1B	833.00	177.84	183.87	182.04	184.36	0.001746	3.08	273.84	69.40	0.47
Bormida	1	17.000*	TR20Borm+TR200ri	Lotto1C	833.00	177.84	183.87	182.04	184.36	0.001746	3.08	273.84	69.40	0.47
Bormida	1	17.000*	TR20Borm+TR200ri	Finale	833.00	177.84	183.87	182.02	184.29	0.001467	2.88	306.73	82.04	0.44
Bormida	1	16.000*	TR20Borm+TR200ri	Attuale	833.00	177.69	183.81		184.34	0.001685	3.22	270.79	92.81	0.47
Bormida	1	16.000*	TR20Borm+TR200ri	Lotto1A	833.00	177.69	183.85	181.94	184.31	0.001628	3.01	282.42	83.19	0.46
Bormida	1	16.000*	TR20Borm+TR200ri	Lotto1B	833.00	177.69	183.85	181.94	184.31	0.001628	3.01	282.42	83.19	0.46

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	1	16.000*	TR20Borm+TR200ri	Lotto1C	833.00	177.69	183.85	181.94	184.31	0.001628	3.01	282.42	83.19	0.46
Bormida	1	16.000*	TR20Borm+TR200ri	Finale	833.00	177.69	183.86	181.91	184.24	0.001338	2.78	319.05	87.29	0.42
Bormida	1	15.000*	TR20Borm+TR200ri	Attuale	833.00	177.55	183.80		184.28	0.001523	3.09	285.88	100.01	0.45
Bormida	1	15.000*	TR20Borm+TR200ri	Lotto1A	833.00	177.55	183.83	181.83	184.26	0.001489	2.93	294.87	100.92	0.44
Bormida	1	15.000*	TR20Borm+TR200ri	Lotto1B	833.00	177.55	183.83	181.83	184.26	0.001489	2.93	294.87	100.92	0.44
Bormida	1	15.000*	TR20Borm+TR200ri	Lotto1C	833.00	177.55	183.83	181.83	184.26	0.001489	2.93	294.87	100.92	0.44
Bormida	1	15.000*	TR20Borm+TR200ri	Finale	833.00	177.55	183.84	181.77	184.20	0.001217	2.68	332.81	101.18	0.40
Bormida	1	14.000*	TR20Borm+TR200ri	Attuale	833.00	177.40	183.79		184.23	0.001356	2.95	306.56	117.74	0.43
Bormida	1	14.000*	TR20Borm+TR200ri	Lotto1A	833.00	177.40	183.81	181.69	184.22	0.001333	2.82	313.50	120.99	0.42
Bormida	1	14.000*	TR20Borm+TR200ri	Lotto1B	833.00	177.40	183.81	181.69	184.22	0.001333	2.82	313.50	120.99	0.42
Bormida	1	14.000*	TR20Borm+TR200ri	Lotto1C	833.00	177.40	183.81	181.69	184.22	0.001333	2.82	313.50	120.99	0.42
Bormida	1	14.000*	TR20Borm+TR200ri	Finale	833.00	177.40	183.83	181.61	184.17	0.001082	2.57	351.77	124.37	0.38
Bormida	1	13.000*	TR20Borm+TR200ri	Attuale	833.00	177.26	183.79		184.19	0.001193	2.81	337.94	172.51	0.40
Bormida	1	13.000*	TR20Borm+TR200ri	Lotto1A	833.00	177.26	183.81	181.53	184.18	0.001168	2.70	344.44	174.52	0.40
Bormida	1	13.000*	TR20Borm+TR200ri	Lotto1B	833.00	177.26	183.81	181.53	184.18	0.001168	2.70	344.44	174.52	0.40
Bormida	1	13.000*	TR20Borm+TR200ri	Lotto1C	833.00	177.26	183.81	181.53	184.18	0.001168	2.70	344.44	174.52	0.40
Bormida	1	13.000*	TR20Borm+TR200ri	Finale	833.00	177.26	183.83	181.43	184.13	0.000945	2.44	382.91	174.89	0.36
Bormida	1	12.000*	TR20Borm+TR200ri	Attuale	833.00	177.11	183.80		184.15	0.001016	2.63	380.79	182.46	0.37
Bormida	1	12.000*	TR20Borm+TR200ri	Lotto1A	833.00	177.11	183.81		184.14	0.000991	2.55	386.55	183.11	0.37
Bormida	1	12.000*	TR20Borm+TR200ri	Lotto1B	833.00	177.11	183.81		184.14	0.000991	2.55	386.55	183.11	0.37
Bormida	1	12.000*	TR20Borm+TR200ri	Lotto1C	833.00	177.11	183.81	181.33	184.14	0.000991	2.55	386.55	183.11	0.37
Bormida	1	12.000*	TR20Borm+TR200ri	Finale	833.00	177.11	183.84	181.23	184.10	0.000801	2.29	423.50	184.35	0.33
Bormida	1	11.000*	TR20Borm+TR200ri	Attuale	833.00	176.97	183.81		184.11	0.000860	2.46	428.42	203.04	0.35
Bormida	1	11.000*	TR20Borm+TR200ri	Lotto1A	833.00	176.97	183.82		184.10	0.000831	2.40	434.47	203.67	0.34
Bormida	1	11.000*	TR20Borm+TR200ri	Lotto1B	833.00	176.97	183.82		184.10	0.000831	2.40	434.47	203.67	0.34
Bormida	1	11.000*	TR20Borm+TR200ri	Lotto1C	833.00	176.97	183.82	181.11	184.10	0.000831	2.40	434.47	203.67	0.34
Bormida	1	11.000*	TR20Borm+TR200ri	Finale	833.00	176.97	183.84	181.01	184.07	0.000675	2.15	469.33	204.51	0.31
Bormida	1	10	TR20Borm+TR200ri	Attuale	833.00	176.82	183.83		184.08	0.000716	2.29	482.18	212.26	0.32
Bormida	1	10	TR20Borm+TR200ri	Lotto1A	833.00	176.82	183.83		184.07	0.000684	2.23	489.56	212.36	0.31
Bormida	1	10	TR20Borm+TR200ri	Lotto1B	833.00	176.82	183.83		184.07	0.000684	2.23	489.56	212.36	0.31
Bormida	1	10	TR20Borm+TR200ri	Lotto1C	833.00	176.82	183.83	180.81	184.07	0.000684	2.23	489.56	212.36	0.31
Bormida	1	10	TR20Borm+TR200ri	Finale	833.00	176.82	183.85	180.73	184.04	0.000561	2.00	520.96	212.73	0.28
Bormida	1	9	TR20Borm+TR200ri	Attuale	833.00	176.65	183.83		184.05	0.000594	2.15	507.50	211.31	0.29
Bormida	1	9	TR20Borm+TR200ri	Lotto1A	833.00	176.65	183.83		184.05	0.000563	2.10	515.12	211.40	0.28
Bormida	1	9	TR20Borm+TR200ri	Lotto1B	833.00	176.65	183.83		184.05	0.000563	2.10	515.12	211.40	0.28
Bormida	1	9	TR20Borm+TR200ri	Lotto1C	833.00	176.65	183.83		184.05	0.000563	2.10	515.12	211.40	0.28
Bormida	1	9	TR20Borm+TR200ri	Finale	833.00	176.65	183.85		184.03	0.000476	1.90	545.69	211.78	0.26
Bormida	1	8.0000*	TR20Borm+TR200ri	Attuale	833.00	176.65	183.79		184.03	0.000668	2.26	491.10	214.18	0.31
Bormida	1	8.0000*	TR20Borm+TR200ri	Lotto1A	833.00	176.65	183.79		184.03	0.000637	2.22	497.78	214.27	0.30

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	1	8.0000*	TR20Borm+TR200ri	Lotto1B	833.00	176.65	183.79		184.03	0.000637	2.22	497.78	214.27	0.30
Bormida	1	8.0000*	TR20Borm+TR200ri	Lotto1C	833.00	176.65	183.79		184.03	0.000637	2.22	497.78	214.27	0.30
Bormida	1	8.0000*	TR20Borm+TR200ri	Finale	833.00	176.65	183.82		184.01	0.000540	2.01	526.10	214.53	0.27
Bormida	1	7.0000*	TR20Borm+TR200ri	Attuale	833.00	176.66	183.74		184.01	0.000758	2.38	473.96	215.91	0.32
Bormida	1	7.0000*	TR20Borm+TR200ri	Lotto1A	833.00	176.66	183.75		184.01	0.000726	2.34	479.77	215.94	0.32
Bormida	1	7.0000*	TR20Borm+TR200ri	Lotto1B	833.00	176.66	183.75		184.01	0.000726	2.34	479.77	215.94	0.32
Bormida	1	7.0000*	TR20Borm+TR200ri	Lotto1C	833.00	176.66	183.75		184.01	0.000726	2.34	479.77	215.94	0.32
Bormida	1	7.0000*	TR20Borm+TR200ri	Finale	833.00	176.66	183.77		183.99	0.000617	2.14	505.81	215.85	0.29
Bormida	1	6.0000*	TR20Borm+TR200ri	Attuale	833.00	176.66	183.69		183.99	0.000869	2.52	455.59	217.05	0.35
Bormida	1	6.0000*	TR20Borm+TR200ri	Lotto1A	833.00	176.66	183.70		183.99	0.000836	2.49	460.57	217.11	0.34
Bormida	1	6.0000*	TR20Borm+TR200ri	Lotto1B	833.00	176.66	183.70		183.99	0.000836	2.49	460.57	217.11	0.34
Bormida	1	6.0000*	TR20Borm+TR200ri	Lotto1C	833.00	176.66	183.70		183.99	0.000836	2.49	460.57	217.11	0.34
Bormida	1	6.0000*	TR20Borm+TR200ri	Finale	833.00	176.66	183.73		183.97	0.000716	2.29	484.25	216.87	0.31
Bormida	1	5.0000*	TR20Borm+TR200ri	Attuale	833.00	176.66	183.62		183.96	0.001011	2.68	435.26	218.43	0.37
Bormida	1	5.0000*	TR20Borm+TR200ri	Lotto1A	833.00	176.66	183.63		183.96	0.000978	2.65	439.50	218.51	0.37
Bormida	1	5.0000*	TR20Borm+TR200ri	Lotto1B	833.00	176.66	183.63		183.96	0.000978	2.65	439.50	218.51	0.37
Bormida	1	5.0000*	TR20Borm+TR200ri	Lotto1C	833.00	176.66	183.63		183.96	0.000978	2.65	439.50	218.51	0.37
Bormida	1	5.0000*	TR20Borm+TR200ri	Finale	833.00	176.66	183.66		183.95	0.000846	2.46	460.73	218.45	0.34
Bormida	1	4.0000*	TR20Borm+TR200ri	Attuale	833.00	176.66	183.54		183.93	0.001201	2.88	411.84	219.54	0.40
Bormida	1	4.0000*	TR20Borm+TR200ri	Lotto1A	833.00	176.66	183.55		183.93	0.001168	2.85	415.39	219.66	0.40
Bormida	1	4.0000*	TR20Borm+TR200ri	Lotto1B	833.00	176.66	183.55		183.93	0.001168	2.85	415.39	219.66	0.40
Bormida	1	4.0000*	TR20Borm+TR200ri	Lotto1C	833.00	176.66	183.55		183.93	0.001168	2.85	415.39	219.66	0.40
Bormida	1	4.0000*	TR20Borm+TR200ri	Finale	833.00	176.66	183.59		183.92	0.001026	2.67	434.07	220.54	0.37
Bormida	1	3.0000*	TR20Borm+TR200ri	Attuale	833.00	176.67	183.43		183.89	0.001472	3.12	382.71	220.77	0.44
Bormida	1	3.0000*	TR20Borm+TR200ri	Lotto1A	833.00	176.67	183.44		183.89	0.001441	3.10	385.59	221.20	0.44
Bormida	1	3.0000*	TR20Borm+TR200ri	Lotto1B	833.00	176.67	183.44		183.89	0.001441	3.10	385.59	221.20	0.44
Bormida	1	3.0000*	TR20Borm+TR200ri	Lotto1C	833.00	176.67	183.44		183.89	0.001441	3.10	385.59	221.20	0.44
Bormida	1	3.0000*	TR20Borm+TR200ri	Finale	833.00	176.67	183.48		183.89	0.001293	2.94	401.66	222.35	0.42
Bormida	1	2.0000*	TR20Borm+TR200ri	Attuale	833.00	176.67	183.26	181.39	183.83	0.001907	3.48	341.18	220.03	0.50
Bormida	1	2.0000*	TR20Borm+TR200ri	Lotto1A	833.00	176.67	183.27	181.38	183.84	0.001878	3.46	343.47	220.26	0.50
Bormida	1	2.0000*	TR20Borm+TR200ri	Lotto1B	833.00	176.67	183.27	181.38	183.84	0.001878	3.46	343.47	220.26	0.50
Bormida	1	2.0000*	TR20Borm+TR200ri	Lotto1C	833.00	176.67	183.27	181.38	183.84	0.001878	3.46	343.47	220.26	0.50
Bormida	1	2.0000*	TR20Borm+TR200ri	Finale	833.00	176.67	183.31		183.84	0.001737	3.34	355.95	222.04	0.48
Bormida	1	1	TR20Borm+TR200ri	Attuale	833.00	176.67	183.05	181.51	183.77	0.002502	3.87	293.73	193.33	0.57
Bormida	1	1	TR20Borm+TR200ri	Lotto1A	833.00	176.67	183.05	181.54	183.77	0.002502	3.87	293.74	193.36	0.57
Bormida	1	1	TR20Borm+TR200ri	Lotto1B	833.00	176.67	183.05	181.54	183.77	0.002502	3.87	293.74	193.36	0.57
Bormida	1	1	TR20Borm+TR200ri	Lotto1C	833.00	176.67	183.05	181.54	183.77	0.002502	3.87	293.74	193.36	0.57
Bormida	1	1	TR20Borm+TR200ri	Finale	833.00	176.67	183.05	181.54	183.77	0.002502	3.87	293.74	193.35	0.57

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02



Bormida 1

Bormida 2

Rio Sacco 1

Bormida 3

Elevation (m)

Legend

- WS TR20Borm+TR200ri - Lotto1AWS
- TR20Borm+TR200ri - Lotto1BWS
- TR20Borm+TR200ri - Lotto1CWS
- TR20Borm+TR200ri - Finale WS
- TR20Borm+TR200ri - Attuale

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Main Channel Distance (m)

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

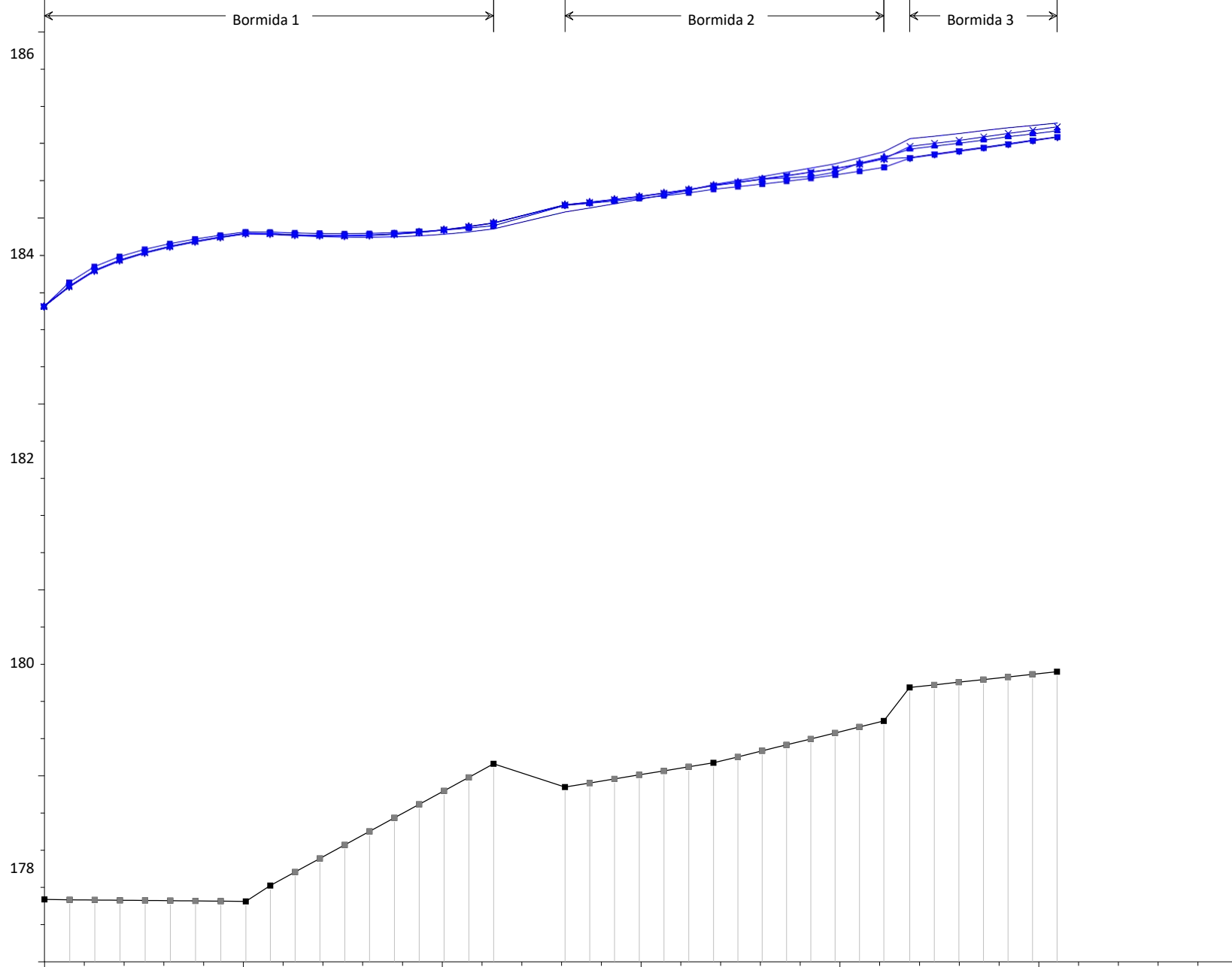
Geom: Finale_rev02

Bormida 1

Bormida 2

Bormida 3

Elevation (m)



Legend

- WS TR20Borm+TR200ri - Lotto1AWS
- TR20Borm+TR200ri - Lotto1BWS
- TR20Borm+TR200ri - Lotto1CWS
- TR20Borm+TR200ri - Finale WS
- TR20Borm+TR200ri - Attuale

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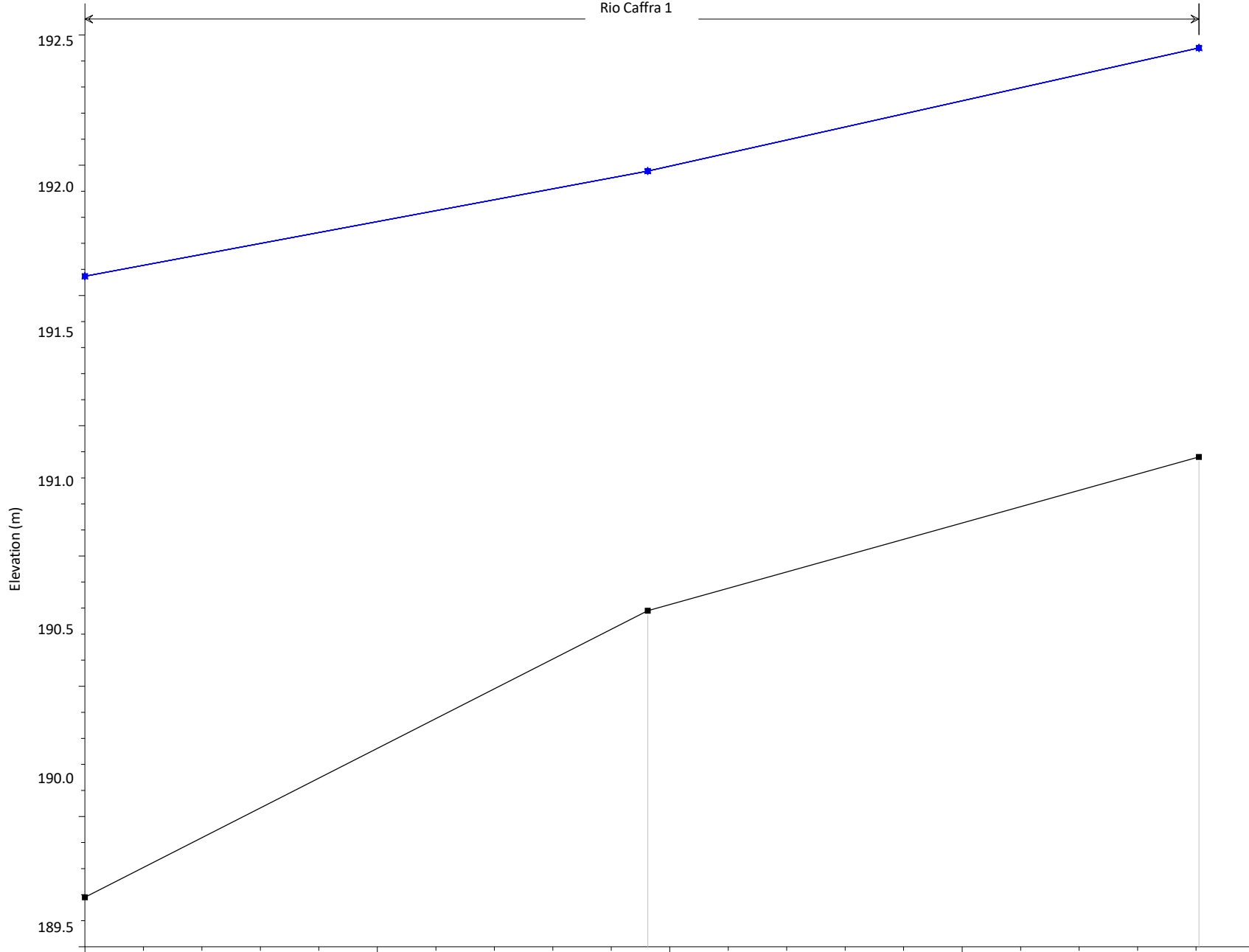
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Main Channel Distance (m)

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02

Rio Caffra 1



Legend

- WS TR20Borm+TR200ri - Finale WS
- TR20Borm+TR200ri - Lotto1AWS
- TR20Borm+TR200ri - Lotto1BWS
- TR20Borm+TR200ri - Lotto1CWS
- TR20Borm+TR200ri - Attuale

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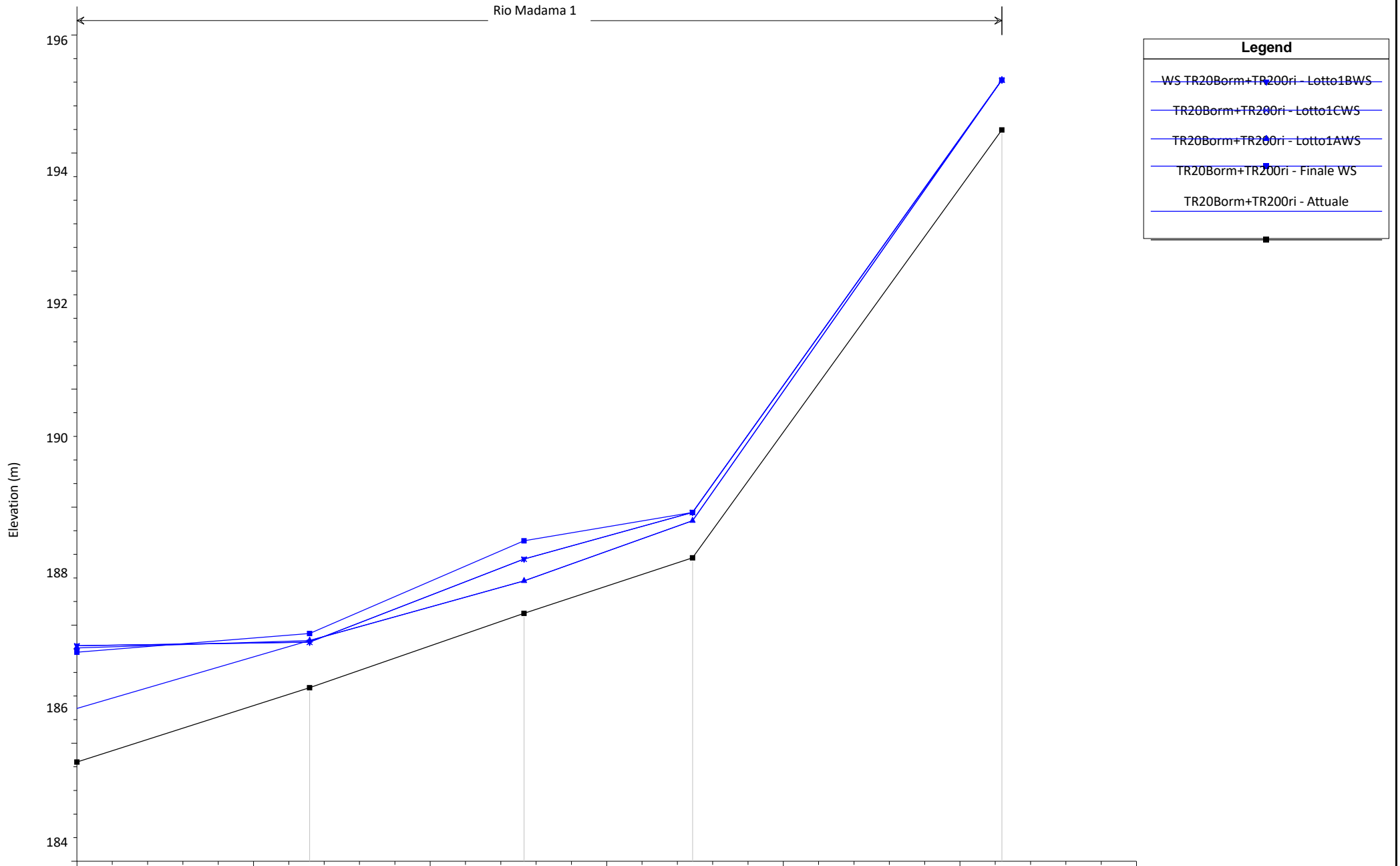
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Main Channel Distance (m)

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02

Rio Madama 1



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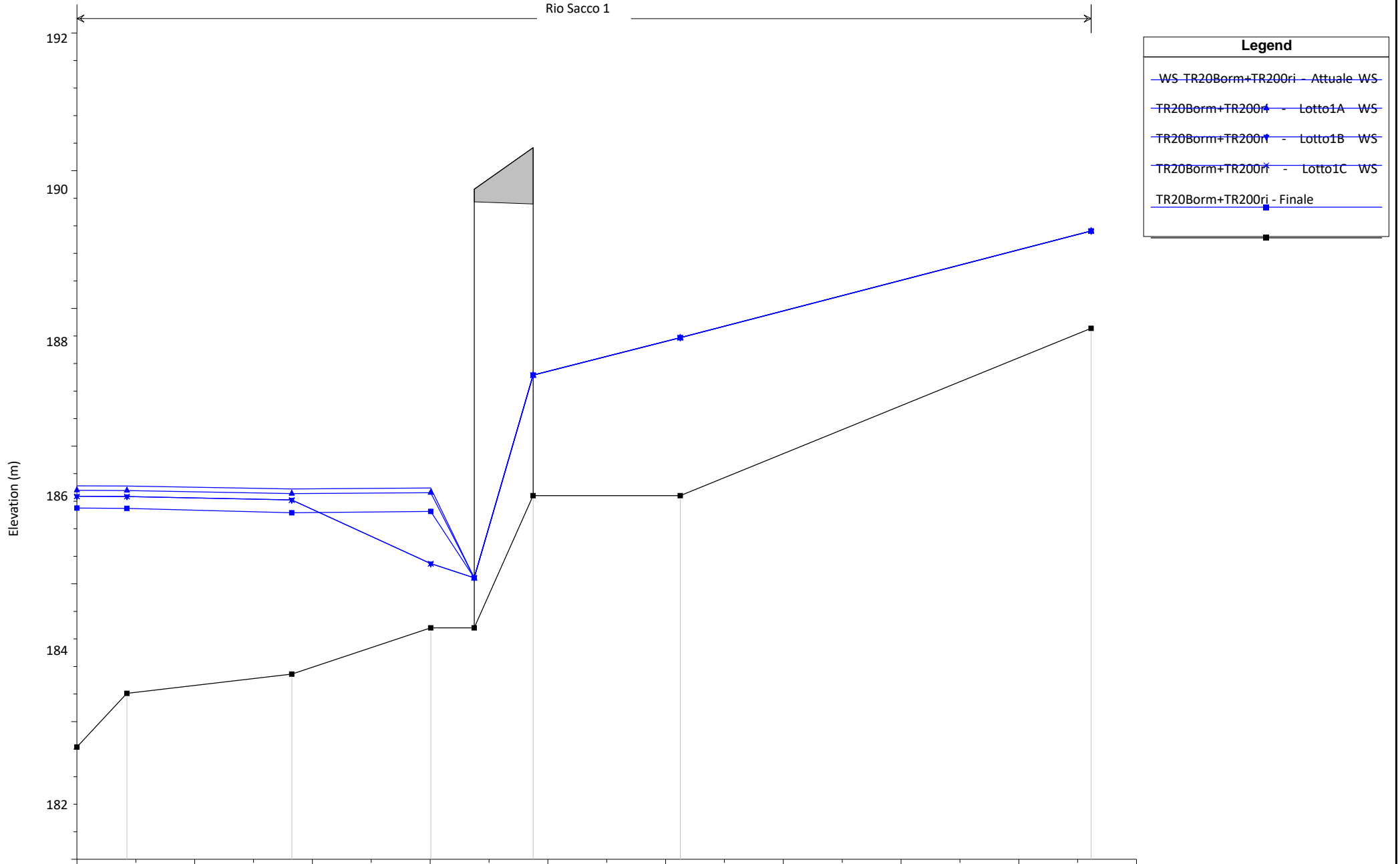
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Main Channel Distance (m)

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02

Rio Sacco 1



180

302

303

304

304.5

305

306

0

20

40

60

80

100

120

140

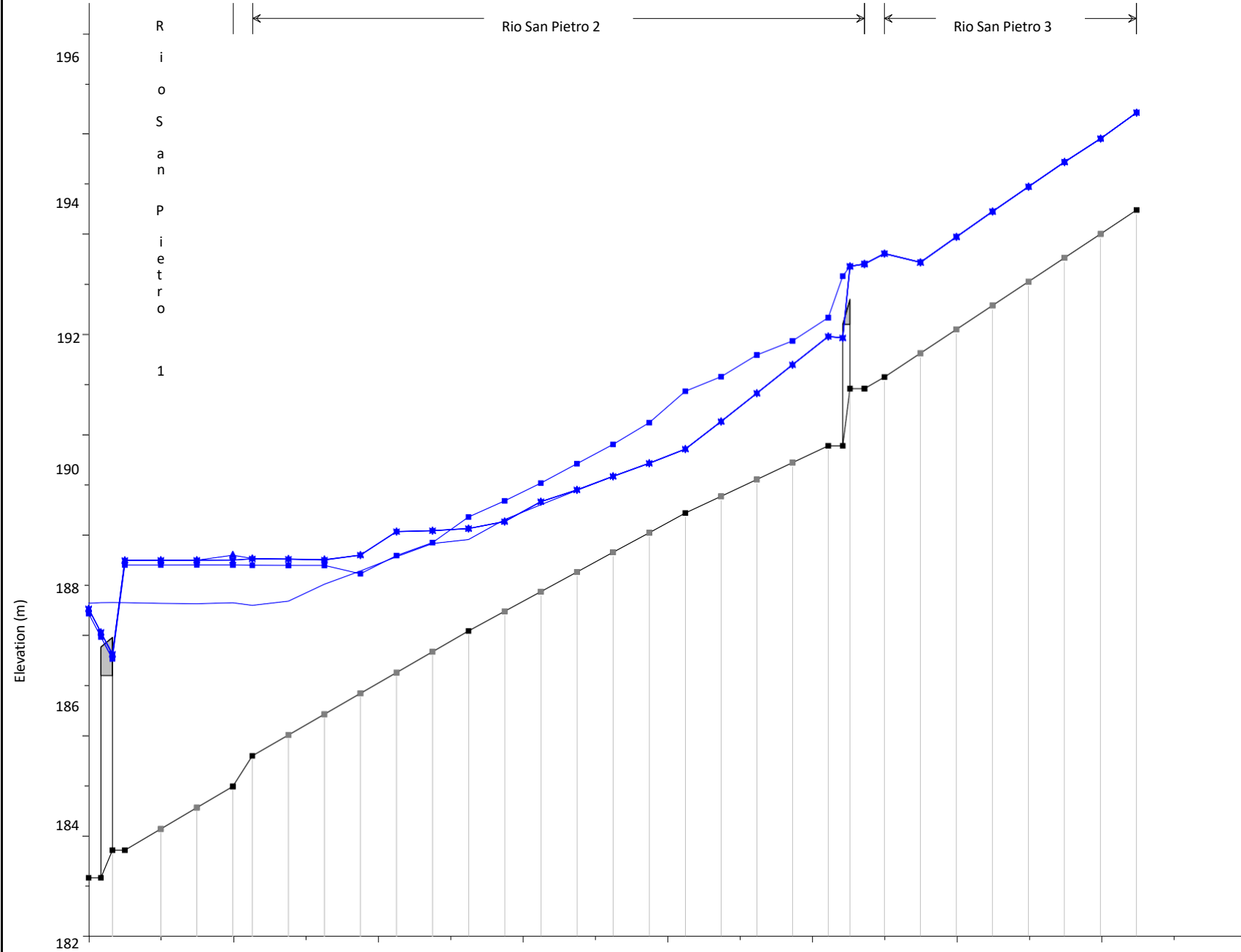
160

180

Main Channel Distance (m)

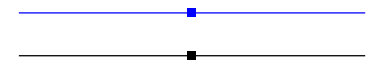
1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02



Legend

- WS TR20Borm+TR200ri - Attuale WS
- TR20Borm+TR200ri - Lotto1A WS
- TR20Borm+TR200ri - Lotto1B WS
- TR20Borm+TR200ri - Lotto1C WS
- TR20Borm+TR200ri - Finale



180

178

0 100 200 300 400 500 600 700 800

Main Channel Distance (m)

104.5

106.00*

107.00*

108

110.00*

111.00*

112.00*

113.00*

114.00*

115

116.00*

117.00*

118.00*

119.00*

120.00*

121

122.00*

123.00*

124.00*

125

127

128.00*

129.00*

130.00*

131.00*

132.00*

133.00*

134

CONFRONTO 4 TR200Borm+TR20rii

Corso d'acqua	Portata al colmo [m³/s]	Tempo di ritorno [anni]
Rio Sacco	10.1	20
Rio Madama	5.6	20
Rio della Caffra	19.2	20
Rio San Pietro monte	22.2	20
Rio San Pietro valle	34.3	20
Bormida di Millesimo a Bubbio	1469	200

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	3	134	TR200Borm+TR20ri	Attuale	22.20	192.48	194.13	194.20	194.73	0.017012	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	TR200Borm+TR20ri	Lotto1A	22.20	192.48	194.13	194.20	194.73	0.017012	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	TR200Borm+TR20ri	Lotto1B	22.20	192.48	194.13	194.20	194.73	0.017012	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	TR200Borm+TR20ri	Lotto1C	22.20	192.48	194.13	194.20	194.73	0.017012	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	TR200Borm+TR20ri	Finale	22.20	192.48	194.13	194.20	194.73	0.017012	3.42	6.50	6.49	1.09
Rio San Pietro	3	133.00*	TR200Borm+TR20ri	Attuale	22.20	192.00	193.62	193.73	194.27	0.019484	3.58	6.20	6.42	1.16
Rio San Pietro	3	133.00*	TR200Borm+TR20ri	Lotto1A	22.20	192.00	193.62	193.73	194.27	0.019484	3.58	6.20	6.42	1.16
Rio San Pietro	3	133.00*	TR200Borm+TR20ri	Lotto1B	22.20	192.00	193.62	193.73	194.27	0.019476	3.58	6.20	6.42	1.16
Rio San Pietro	3	133.00*	TR200Borm+TR20ri	Lotto1C	22.20	192.00	193.62	193.73	194.27	0.019476	3.58	6.20	6.42	1.16
Rio San Pietro	3	133.00*	TR200Borm+TR20ri	Finale	22.20	192.00	193.62	193.73	194.27	0.019319	3.57	6.22	6.43	1.16
Rio San Pietro	3	132.00*	TR200Borm+TR20ri	Attuale	22.20	191.53	193.16	193.26	193.79	0.018621	3.51	6.33	6.56	1.14
Rio San Pietro	3	132.00*	TR200Borm+TR20ri	Lotto1A	22.20	191.53	193.16	193.26	193.79	0.018621	3.51	6.33	6.56	1.14
Rio San Pietro	3	132.00*	TR200Borm+TR20ri	Lotto1B	22.20	191.53	193.16	193.26	193.79	0.018608	3.51	6.33	6.56	1.14
Rio San Pietro	3	132.00*	TR200Borm+TR20ri	Lotto1C	22.20	191.53	193.16	193.26	193.79	0.018608	3.51	6.33	6.56	1.14
Rio San Pietro	3	132.00*	TR200Borm+TR20ri	Finale	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	131.00*	TR200Borm+TR20ri	Attuale	22.20	191.05	192.67	192.79	193.31	0.019639	3.54	6.26	6.70	1.17
Rio San Pietro	3	131.00*	TR200Borm+TR20ri	Lotto1A	22.20	191.05	192.67	192.79	193.31	0.019639	3.54	6.26	6.70	1.17
Rio San Pietro	3	131.00*	TR200Borm+TR20ri	Lotto1B	22.20	191.05	192.67	192.79	193.31	0.019641	3.54	6.26	6.70	1.17
Rio San Pietro	3	131.00*	TR200Borm+TR20ri	Lotto1C	22.20	191.05	192.67	192.79	193.31	0.019641	3.54	6.26	6.70	1.17
Rio San Pietro	3	131.00*	TR200Borm+TR20ri	Finale	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	130.00*	TR200Borm+TR20ri	Attuale	22.20	190.58	192.18	192.31	192.82	0.019894	3.54	6.28	6.85	1.18
Rio San Pietro	3	130.00*	TR200Borm+TR20ri	Lotto1A	22.20	190.58	192.18	192.31	192.82	0.019894	3.54	6.28	6.85	1.18
Rio San Pietro	3	130.00*	TR200Borm+TR20ri	Lotto1B	22.20	190.58	192.18	192.31	192.82	0.019897	3.54	6.28	6.85	1.18
Rio San Pietro	3	130.00*	TR200Borm+TR20ri	Lotto1C	22.20	190.58	192.18	192.31	192.82	0.019897	3.54	6.28	6.85	1.18
Rio San Pietro	3	130.00*	TR200Borm+TR20ri	Finale	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	129.00*	TR200Borm+TR20ri	Attuale	22.20	190.10	191.68	191.80	192.32	0.020086	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	TR200Borm+TR20ri	Lotto1A	22.20	190.10	191.68	191.80	192.32	0.020086	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	TR200Borm+TR20ri	Lotto1B	22.20	190.10	191.68	191.80	192.32	0.020086	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	TR200Borm+TR20ri	Lotto1C	22.20	190.10	191.68	191.80	192.32	0.020086	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	TR200Borm+TR20ri	Finale	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19
Rio San Pietro	3	128.00*	TR200Borm+TR20ri	Attuale	22.20	189.63	191.18	191.30	191.82	0.020227	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	TR200Borm+TR20ri	Lotto1A	22.20	189.63	191.18	191.30	191.82	0.020227	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	TR200Borm+TR20ri	Lotto1B	22.20	189.63	191.18	191.30	191.82	0.020227	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	TR200Borm+TR20ri	Lotto1C	22.20	189.63	191.18	191.30	191.82	0.020227	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	TR200Borm+TR20ri	Finale	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	127	TR200Borm+TR20ri	Attuale	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	TR200Borm+TR20ri	Lotto1A	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	TR200Borm+TR20ri	Lotto1B	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	TR200Borm+TR20ri	Lotto1C	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	TR200Borm+TR20ri	Finale	22.20	189.15	191.45	190.82	191.50	0.001209	1.26	35.09	60.60	0.32

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	126	TR200Borm+TR20ri	Attuale	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	TR200Borm+TR20ri	Lotto1A	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	TR200Borm+TR20ri	Lotto1B	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	TR200Borm+TR20ri	Lotto1C	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	TR200Borm+TR20ri	Finale	34.30	188.92	191.34	190.73	191.47	0.002112	1.81	35.11	72.91	0.43
Rio San Pietro	2	125.5			Bridge									
Rio San Pietro	2	125	TR200Borm+TR20ri	Attuale	34.30	187.78	189.96	189.96	190.01	0.003089	1.41	41.17	54.90	0.47
Rio San Pietro	2	125	TR200Borm+TR20ri	Lotto1A	34.30	187.78	189.96	189.96	190.01	0.003090	1.41	41.12	53.50	0.47
Rio San Pietro	2	125	TR200Borm+TR20ri	Lotto1B	34.30	187.78	189.96	189.96	190.01	0.003090	1.41	41.12	53.50	0.47
Rio San Pietro	2	125	TR200Borm+TR20ri	Lotto1C	34.30	187.78	189.96	189.96	190.01	0.003090	1.41	41.12	53.50	0.47
Rio San Pietro	2	125	TR200Borm+TR20ri	Finale	34.30	187.78	190.01	190.01	190.60	0.013636	3.42	10.04	8.40	1.00
Rio San Pietro	2	124.00*	TR200Borm+TR20ri	Attuale	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	TR200Borm+TR20ri	Lotto1A	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	TR200Borm+TR20ri	Lotto1B	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	TR200Borm+TR20ri	Lotto1C	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	TR200Borm+TR20ri	Finale	34.30	187.45	189.57	189.62	190.23	0.015985	3.62	9.49	8.22	1.07
Rio San Pietro	2	123.00*	TR200Borm+TR20ri	Attuale	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	123.00*	TR200Borm+TR20ri	Lotto1A	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	123.00*	TR200Borm+TR20ri	Lotto1B	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	123.00*	TR200Borm+TR20ri	Lotto1C	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	123.00*	TR200Borm+TR20ri	Finale	34.30	187.11	189.25	189.26	189.86	0.014388	3.47	9.90	8.34	1.02
Rio San Pietro	2	122.00*	TR200Borm+TR20ri	Attuale	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	TR200Borm+TR20ri	Lotto1A	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	TR200Borm+TR20ri	Lotto1B	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	TR200Borm+TR20ri	Lotto1C	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	TR200Borm+TR20ri	Finale	34.30	186.78	188.88	188.90	189.50	0.014955	3.49	9.82	8.36	1.03
Rio San Pietro	2	121	TR200Borm+TR20ri	Attuale	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	TR200Borm+TR20ri	Lotto1A	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	TR200Borm+TR20ri	Lotto1B	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	TR200Borm+TR20ri	Lotto1C	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	TR200Borm+TR20ri	Finale	34.30	186.44	188.53	188.54	189.14	0.014500	3.45	9.94	8.57	1.01
Rio San Pietro	2	120.00*	TR200Borm+TR20ri	Attuale	34.30	186.05	187.32	187.21	187.40	0.010131	1.94	33.75	72.93	0.80
Rio San Pietro	2	120.00*	TR200Borm+TR20ri	Lotto1A	34.30	186.05	187.33	187.19	187.40	0.009943	1.93	33.96	72.95	0.80
Rio San Pietro	2	120.00*	TR200Borm+TR20ri	Lotto1B	34.30	186.05	187.33	187.19	187.40	0.009943	1.93	33.96	72.95	0.80
Rio San Pietro	2	120.00*	TR200Borm+TR20ri	Lotto1C	34.30	186.05	187.33	187.19	187.40	0.009943	1.93	33.96	72.95	0.80
Rio San Pietro	2	120.00*	TR200Borm+TR20ri	Finale	34.30	186.05	187.96	188.09	188.71	0.019793	3.82	8.99	8.25	1.17
Rio San Pietro	2	119.00*	TR200Borm+TR20ri	Attuale	34.30	185.66	187.07		187.16	0.008735	2.13	35.99	85.89	0.78
Rio San Pietro	2	119.00*	TR200Borm+TR20ri	Lotto1A	34.30	185.66	187.06	187.02	187.16	0.009167	2.17	35.40	85.86	0.80

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	119.00*	TR200Borm+TR20ri	Lotto1B	34.30	185.66	187.06	187.02	187.16	0.009167	2.17	35.40	85.86	0.80
Rio San Pietro	2	119.00*	TR200Borm+TR20ri	Lotto1C	34.30	185.66	187.06	187.02	187.16	0.009167	2.17	35.40	85.86	0.80
Rio San Pietro	2	119.00*	TR200Borm+TR20ri	Finale	34.30	185.66	187.55	187.65	188.25	0.016226	3.69	9.35	8.65	1.13
Rio San Pietro	2	118.00*	TR200Borm+TR20ri	Attuale	34.30	185.27	186.80	186.80	186.94	0.008589	2.37	36.07	107.82	0.79
Rio San Pietro	2	118.00*	TR200Borm+TR20ri	Lotto1A	34.30	185.27	186.81	186.81	186.94	0.008080	2.31	36.68	99.25	0.77
Rio San Pietro	2	118.00*	TR200Borm+TR20ri	Lotto1B	34.30	185.27	186.81	186.81	186.94	0.008080	2.31	36.68	99.25	0.77
Rio San Pietro	2	118.00*	TR200Borm+TR20ri	Lotto1C	34.30	185.27	186.81	186.81	186.94	0.008080	2.31	36.68	99.25	0.77
Rio San Pietro	2	118.00*	TR200Borm+TR20ri	Finale	34.30	185.27	187.14	187.24	187.85	0.015800	3.74	9.55	9.15	1.12
Rio San Pietro	2	117.00*	TR200Borm+TR20ri	Attuale	34.30	184.87	186.52	186.58	186.72	0.009017	2.61	36.59	138.85	0.83
Rio San Pietro	2	117.00*	TR200Borm+TR20ri	Lotto1A	34.30	184.87	186.73	186.59	186.77	0.002108	1.40	67.25	153.08	0.41
Rio San Pietro	2	117.00*	TR200Borm+TR20ri	Lotto1B	34.30	184.87	186.74	186.59	186.78	0.002068	1.39	67.72	153.10	0.41
Rio San Pietro	2	117.00*	TR200Borm+TR20ri	Lotto1C	34.30	184.87	186.74	186.59	186.78	0.002068	1.39	67.72	153.10	0.41
Rio San Pietro	2	117.00*	TR200Borm+TR20ri	Finale	34.30	184.87	186.75	186.85	187.46	0.014925	3.76	9.73	9.63	1.10
Rio San Pietro	2	116.00*	TR200Borm+TR20ri	Attuale	34.30	184.48	186.19	186.27	186.47	0.010331	2.92	31.19	125.91	0.89
Rio San Pietro	2	116.00*	TR200Borm+TR20ri	Lotto1A	34.30	184.48	186.73	186.29	186.74	0.000430	0.78	120.01	171.01	0.19
Rio San Pietro	2	116.00*	TR200Borm+TR20ri	Lotto1B	34.30	184.48	186.74	186.29	186.75	0.000425	0.78	120.51	171.02	0.19
Rio San Pietro	2	116.00*	TR200Borm+TR20ri	Lotto1C	34.30	184.48	186.74	186.29	186.75	0.000425	0.78	120.51	171.02	0.19
Rio San Pietro	2	116.00*	TR200Borm+TR20ri	Finale	34.30	184.48	186.54	186.48	187.09	0.009404	3.35	11.33	9.67	0.89
Rio San Pietro	2	115	TR200Borm+TR20ri	Attuale	34.30	184.09	186.28	185.93	186.30	0.000773	1.03	97.26	182.73	0.26
Rio San Pietro	2	115	TR200Borm+TR20ri	Lotto1A	34.30	184.09	186.73	185.94	186.74	0.000134	0.51	180.99	188.88	0.11
Rio San Pietro	2	115	TR200Borm+TR20ri	Lotto1B	34.30	184.09	186.74	185.94	186.74	0.000133	0.50	181.54	188.89	0.11
Rio San Pietro	2	115	TR200Borm+TR20ri	Lotto1C	34.30	184.09	186.74	185.94	186.74	0.000133	0.50	181.54	188.89	0.11
Rio San Pietro	2	115	TR200Borm+TR20ri	Finale	34.30	184.09	186.51	186.12	186.88	0.004609	2.76	14.51	9.70	0.64
Rio San Pietro	2	114.00*	TR200Borm+TR20ri	Attuale	34.30	183.67	186.27		186.29	0.000435	0.86	111.18	177.51	0.20
Rio San Pietro	2	114.00*	TR200Borm+TR20ri	Lotto1A	34.30	183.67	186.73		186.73	0.000095	0.46	199.50	197.48	0.10
Rio San Pietro	2	114.00*	TR200Borm+TR20ri	Lotto1B	34.30	183.67	186.73		186.74	0.000094	0.46	200.08	197.52	0.10
Rio San Pietro	2	114.00*	TR200Borm+TR20ri	Lotto1C	34.30	183.67	186.73		186.74	0.000094	0.46	200.08	197.52	0.10
Rio San Pietro	2	114.00*	TR200Borm+TR20ri	Finale	34.30	183.67	186.55	185.75	186.76	0.002146	2.08	19.28	10.90	0.45
Rio San Pietro	2	113.00*	TR200Borm+TR20ri	Attuale	34.30	183.26	186.27		186.28	0.000245	0.70	131.10	171.99	0.15
Rio San Pietro	2	113.00*	TR200Borm+TR20ri	Lotto1A	34.30	183.26	186.73		186.73	0.000068	0.42	220.14	205.93	0.08
Rio San Pietro	2	113.00*	TR200Borm+TR20ri	Lotto1B	34.30	183.26	186.73		186.73	0.000067	0.41	220.74	205.97	0.08
Rio San Pietro	2	113.00*	TR200Borm+TR20ri	Lotto1C	34.30	183.26	186.73		186.73	0.000067	0.41	220.74	205.97	0.08
Rio San Pietro	2	113.00*	TR200Borm+TR20ri	Finale	34.30	183.26	186.56	185.37	186.69	0.001163	1.65	24.35	12.10	0.34
Rio San Pietro	2	112.00*	TR200Borm+TR20ri	Attuale	34.30	182.85	186.27		186.27	0.000151	0.58	152.74	180.51	0.12
Rio San Pietro	2	112.00*	TR200Borm+TR20ri	Lotto1A	34.30	182.85	186.72	185.03	186.73	0.000115	0.57	162.95	167.64	0.11
Rio San Pietro	2	112.00*	TR200Borm+TR20ri	Lotto1B	34.30	182.85	186.72	185.03	186.73	0.000114	0.57	163.45	167.77	0.11
Rio San Pietro	2	112.00*	TR200Borm+TR20ri	Lotto1C	34.30	182.85	186.72	185.03	186.73	0.000114	0.57	163.45	167.77	0.11
Rio San Pietro	2	112.00*	TR200Borm+TR20ri	Finale	34.30	182.85	186.57	185.03	186.66	0.000690	1.35	29.81	13.30	0.26
Rio San Pietro	2	111.00*	TR200Borm+TR20ri	Attuale	34.30	182.43	186.26		186.27	0.000098	0.50	175.54	187.17	0.10

HEC-RAS Profile: TR200Borm+TR20ri (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	111.00*	TR200Borm+TR20ri	Lotto1A	34.30	182.43	186.72	184.68	186.73	0.000081	0.50	179.95	168.20	0.09
Rio San Pietro	2	111.00*	TR200Borm+TR20ri	Lotto1B	34.30	182.43	186.72	184.68	186.73	0.000080	0.50	180.46	168.45	0.09
Rio San Pietro	2	111.00*	TR200Borm+TR20ri	Lotto1C	34.30	182.43	186.72	184.68	186.73	0.000080	0.50	180.46	168.45	0.09
Rio San Pietro	2	111.00*	TR200Borm+TR20ri	Finale	34.30	182.43	186.58	184.68	186.64	0.000435	1.13	35.69	14.50	0.21
Rio San Pietro	2	110.00*	TR200Borm+TR20ri	Attuale	34.30	182.02	186.26		186.27	0.000066	0.43	199.55	193.49	0.08
Rio San Pietro	2	110.00*	TR200Borm+TR20ri	Lotto1A	34.30	182.02	186.72	184.32	186.72	0.000059	0.45	199.65	174.67	0.08
Rio San Pietro	2	110.00*	TR200Borm+TR20ri	Lotto1B	34.30	182.02	186.72	184.32	186.73	0.000058	0.45	200.18	175.29	0.08
Rio San Pietro	2	110.00*	TR200Borm+TR20ri	Lotto1C	34.30	182.02	186.72	184.32	186.73	0.000058	0.45	200.18	175.29	0.08
Rio San Pietro	2	110.00*	TR200Borm+TR20ri	Finale	34.30	182.02	186.58	184.32	186.62	0.000288	0.96	42.00	15.70	0.17
Rio San Pietro	2	109	TR200Borm+TR20ri	Attuale	34.30	181.60	186.26		186.27	0.000046	0.37	224.78	200.70	0.07
Rio San Pietro	2	109	TR200Borm+TR20ri	Lotto1A	34.30	181.60	186.72	183.95	186.72	0.000043	0.40	220.91	182.14	0.07
Rio San Pietro	2	109	TR200Borm+TR20ri	Lotto1B	34.30	181.60	186.72	183.95	186.72	0.000043	0.40	221.47	182.26	0.07
Rio San Pietro	2	109	TR200Borm+TR20ri	Lotto1C	34.30	181.60	186.72	183.95	186.72	0.000043	0.40	221.47	182.26	0.07
Rio San Pietro	2	109	TR200Borm+TR20ri	Finale	34.30	181.60	186.58	183.95	186.61	0.000197	0.83	48.74	16.90	0.14
Rio San Pietro	1	108	TR200Borm+TR20ri	Attuale	34.30	180.99	186.26		186.26	0.000013	0.21	420.39	263.83	0.04
Rio San Pietro	1	108	TR200Borm+TR20ri	Lotto1A	34.30	180.99	186.72	183.66	186.72	0.000009	0.20	437.60	224.74	0.03
Rio San Pietro	1	108	TR200Borm+TR20ri	Lotto1B	34.30	180.99	186.70	183.66	186.72	0.000130	0.74	66.93	22.80	0.12
Rio San Pietro	1	108	TR200Borm+TR20ri	Lotto1C	34.30	180.99	186.70	183.66	186.72	0.000130	0.74	66.93	22.80	0.12
Rio San Pietro	1	108	TR200Borm+TR20ri	Finale	34.30	180.99	186.58	183.66	186.61	0.000144	0.76	64.30	22.80	0.12
Rio San Pietro	1	107.00*	TR200Borm+TR20ri	Attuale	34.30	180.57	186.26		186.26	0.000009	0.19	456.40	259.41	0.03
Rio San Pietro	1	107.00*	TR200Borm+TR20ri	Lotto1A	34.30	180.57	186.70	183.30	186.72	0.000102	0.67	70.47	22.10	0.10
Rio San Pietro	1	107.00*	TR200Borm+TR20ri	Lotto1B	34.30	180.57	186.70	183.30	186.72	0.000102	0.67	70.47	22.10	0.10
Rio San Pietro	1	107.00*	TR200Borm+TR20ri	Lotto1C	34.30	180.57	186.70	183.30	186.72	0.000102	0.67	70.47	22.10	0.10
Rio San Pietro	1	107.00*	TR200Borm+TR20ri	Finale	34.30	180.57	186.58	183.30	186.60	0.000113	0.69	67.93	22.10	0.11
Rio San Pietro	1	106.00*	TR200Borm+TR20ri	Attuale	34.30	180.14	186.26		186.26	0.000007	0.17	492.86	255.38	0.03
Rio San Pietro	1	106.00*	TR200Borm+TR20ri	Lotto1A	34.30	180.14	186.70	182.90	186.72	0.000083	0.61	73.99	21.40	0.09
Rio San Pietro	1	106.00*	TR200Borm+TR20ri	Lotto1B	34.30	180.14	186.70	182.90	186.72	0.000083	0.61	73.99	21.40	0.09
Rio San Pietro	1	106.00*	TR200Borm+TR20ri	Lotto1C	34.30	180.14	186.70	182.90	186.72	0.000083	0.61	73.99	21.40	0.09
Rio San Pietro	1	106.00*	TR200Borm+TR20ri	Finale	34.30	180.14	186.58	182.90	186.60	0.000091	0.62	71.53	21.40	0.10
Rio San Pietro	1	105	TR200Borm+TR20ri	Attuale	34.30	179.72	186.26	182.50	186.26	0.000006	0.15	536.89	252.40	0.02
Rio San Pietro	1	105	TR200Borm+TR20ri	Lotto1A	34.30	179.72	186.70	182.50	186.71	0.000067	0.55	77.69	20.70	0.08
Rio San Pietro	1	105	TR200Borm+TR20ri	Lotto1B	34.30	179.72	186.70	182.50	186.71	0.000067	0.55	77.69	20.70	0.08
Rio San Pietro	1	105	TR200Borm+TR20ri	Lotto1C	34.30	179.72	186.70	182.50	186.71	0.000067	0.55	77.69	20.70	0.08
Rio San Pietro	1	105	TR200Borm+TR20ri	Finale	34.30	179.72	186.58	182.50	186.60	0.000074	0.57	75.31	20.70	0.09
Rio San Pietro	1	104.5			Bridge									
Rio San Pietro	1	104	TR200Borm+TR20ri	Attuale	34.30	179.17	186.26		186.26	0.000004	0.14	614.34	267.40	0.02
Rio San Pietro	1	104	TR200Borm+TR20ri	Lotto1A	34.30	179.17	186.23	181.58	186.25	0.000049	0.52	78.13	18.70	0.07
Rio San Pietro	1	104	TR200Borm+TR20ri	Lotto1B	34.30	179.17	186.23	181.58	186.25	0.000049	0.52	78.13	18.70	0.07
Rio San Pietro	1	104	TR200Borm+TR20ri	Lotto1C	34.30	179.17	186.23	181.58	186.25	0.000049	0.52	78.13	18.70	0.07

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	1	104	TR200Borm+TR20ri	Finale	34.30	179.17	186.12	181.58	186.13	0.000053	0.53	75.98	18.70	0.08
Rio Sacco	1	306	TR200Borm+TR20ri	Attuale	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	TR200Borm+TR20ri	Lotto1A	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	TR200Borm+TR20ri	Lotto1B	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	TR200Borm+TR20ri	Lotto1C	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	TR200Borm+TR20ri	Finale	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	305	TR200Borm+TR20ri	Attuale	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	TR200Borm+TR20ri	Lotto1A	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	TR200Borm+TR20ri	Lotto1B	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	TR200Borm+TR20ri	Lotto1C	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	TR200Borm+TR20ri	Finale	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	304.5			Bridge									
Rio Sacco	1	304	TR200Borm+TR20ri	Attuale	10.10	183.36	186.99		187.00	0.000117	0.44	22.78	10.47	0.10
Rio Sacco	1	304	TR200Borm+TR20ri	Lotto1A	10.10	183.36	186.88		186.89	0.000131	0.47	21.69	10.08	0.10
Rio Sacco	1	304	TR200Borm+TR20ri	Lotto1B	10.10	183.36	186.85		186.86	0.000136	0.47	21.38	9.97	0.10
Rio Sacco	1	304	TR200Borm+TR20ri	Lotto1C	10.10	183.36	186.84		186.85	0.000137	0.47	21.33	9.95	0.10
Rio Sacco	1	304	TR200Borm+TR20ri	Finale	10.10	183.36	186.66		186.68	0.000167	0.52	19.59	9.29	0.11
Rio Sacco	1	303	TR200Borm+TR20ri	Attuale	10.10	182.69	186.99		186.99	0.000081	0.37	27.50	13.19	0.08
Rio Sacco	1	303	TR200Borm+TR20ri	Lotto1A	10.10	182.69	186.88		186.89	0.000089	0.39	26.13	12.36	0.08
Rio Sacco	1	303	TR200Borm+TR20ri	Lotto1B	10.10	182.69	186.85		186.86	0.000092	0.39	25.76	12.22	0.09
Rio Sacco	1	303	TR200Borm+TR20ri	Lotto1C	10.10	182.69	186.84		186.85	0.000093	0.39	25.69	12.20	0.09
Rio Sacco	1	303	TR200Borm+TR20ri	Finale	10.10	182.69	186.66		186.67	0.000115	0.43	23.55	11.43	0.10
Rio Sacco	1	302	TR200Borm+TR20ri	Attuale	10.10	182.41	186.99		186.99	0.000006	0.16	93.26	55.00	0.03
Rio Sacco	1	302	TR200Borm+TR20ri	Lotto1A	10.10	182.41	186.88		186.88	0.000007	0.17	87.40	55.00	0.03
Rio Sacco	1	302	TR200Borm+TR20ri	Lotto1B	10.10	182.41	186.85		186.85	0.000007	0.17	85.72	55.00	0.03
Rio Sacco	1	302	TR200Borm+TR20ri	Lotto1C	10.10	182.41	186.85		186.85	0.000007	0.17	85.43	55.00	0.03
Rio Sacco	1	302	TR200Borm+TR20ri	Finale	10.10	182.41	186.67		186.67	0.000009	0.18	75.78	48.16	0.03
Rio Sacco	1	301	TR200Borm+TR20ri	Attuale	10.10	181.63	186.99		186.99	0.000004	0.14	122.57	56.40	0.02
Rio Sacco	1	301	TR200Borm+TR20ri	Lotto1A	10.10	181.63	186.88		186.88	0.000005	0.14	116.56	56.40	0.02
Rio Sacco	1	301	TR200Borm+TR20ri	Lotto1B	10.10	181.63	186.85		186.85	0.000005	0.14	114.84	56.40	0.02
Rio Sacco	1	301	TR200Borm+TR20ri	Lotto1C	10.10	181.63	186.85		186.85	0.000005	0.15	114.54	56.40	0.02
Rio Sacco	1	301	TR200Borm+TR20ri	Finale	10.10	181.63	186.67		186.67	0.000006	0.16	104.37	56.40	0.03
Rio Madama	1	405	TR200Borm+TR20ri	Attuale	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	TR200Borm+TR20ri	Lotto1A	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	TR200Borm+TR20ri	Lotto1B	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	TR200Borm+TR20ri	Lotto1C	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	TR200Borm+TR20ri	Finale	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	404	TR200Borm+TR20ri	Attuale	5.60	187.14	187.77	187.77	187.77	0.000039	0.08	43.18	25.69	0.04

HEC-RAS Profile: TR200Borm+TR20ri (Continued)

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio Madama	1	404	TR200Borm+TR20ri	Lotto1A	5.60	187.14	187.77	187.77	187.77	0.000039	0.08	43.18	25.69	0.04
Rio Madama	1	404	TR200Borm+TR20ri	Lotto1B	5.60	187.14	188.08	188.08	188.36	0.016189	2.36	2.38	4.20	1.00
Rio Madama	1	404	TR200Borm+TR20ri	Lotto1C	5.60	187.14	188.08	188.08	188.36	0.016189	2.36	2.38	4.20	1.00
Rio Madama	1	404	TR200Borm+TR20ri	Finale	5.60	187.14	188.08	188.08	188.36	0.015933	2.34	2.40	4.21	0.99
Rio Madama	1	403	TR200Borm+TR20ri	Attuale	5.60	186.20	186.75	186.75	186.75	0.000170	0.17	26.88	23.66	0.09
Rio Madama	1	403	TR200Borm+TR20ri	Lotto1A	5.60	186.20	186.75	186.75	186.75	0.000170	0.17	26.88	23.66	0.09
Rio Madama	1	403	TR200Borm+TR20ri	Lotto1B	5.60	186.20	187.12	187.12	187.12	0.000517	0.37	18.46	22.64	0.17
Rio Madama	1	403	TR200Borm+TR20ri	Lotto1C	5.60	186.20	187.12	187.12	187.12	0.000517	0.37	18.46	22.64	0.17
Rio Madama	1	403	TR200Borm+TR20ri	Finale	5.60	186.20	187.25	187.25	187.57	0.017485	2.50	2.35	3.91	1.02
Rio Madama	1	402	TR200Borm+TR20ri	Attuale	5.60	184.94	186.27	185.74	186.27	0.000056	0.18	46.58	46.00	0.06
Rio Madama	1	402	TR200Borm+TR20ri	Lotto1A	5.60	184.94	186.72	185.74	186.72	0.000017	0.13	67.54	46.00	0.04
Rio Madama	1	402	TR200Borm+TR20ri	Lotto1B	5.60	184.94	186.73	185.88	186.73	0.000080	0.29	30.57	24.34	0.08
Rio Madama	1	402	TR200Borm+TR20ri	Lotto1C	5.60	184.94	186.73	185.88	186.73	0.000080	0.29	30.57	24.34	0.08
Rio Madama	1	402	TR200Borm+TR20ri	Finale	5.60	184.94	186.60	185.88	186.63	0.000684	0.79	7.12	6.23	0.24
Rio Madama	1	401	TR200Borm+TR20ri	Attuale	5.60	183.68	186.26		186.26	0.000014	0.15	68.21	48.30	0.04
Rio Madama	1	401	TR200Borm+TR20ri	Lotto1A	5.60	183.68	186.72		186.72	0.000006	0.11	90.26	48.30	0.02
Rio Madama	1	401	TR200Borm+TR20ri	Lotto1B	5.60	183.68	186.73	184.67	186.73	0.000013	0.17	53.23	28.20	0.04
Rio Madama	1	401	TR200Borm+TR20ri	Lotto1C	5.60	183.68	186.73	184.67	186.73	0.000013	0.17	53.23	28.20	0.04
Rio Madama	1	401	TR200Borm+TR20ri	Finale	5.60	183.68	186.61	184.67	186.61	0.000068	0.33	17.53	8.50	0.07
Rio Caffra	1	205	TR200Borm+TR20ri	Attuale	19.20	190.88	192.26	192.11	192.38	0.004193	1.71	17.62	37.78	0.57
Rio Caffra	1	205	TR200Borm+TR20ri	Lotto1A	19.20	190.88	192.26	192.11	192.38	0.004193	1.71	17.62	37.78	0.57
Rio Caffra	1	205	TR200Borm+TR20ri	Lotto1B	19.20	190.88	192.26	192.11	192.38	0.004192	1.71	17.62	37.78	0.57
Rio Caffra	1	205	TR200Borm+TR20ri	Lotto1C	19.20	190.88	192.26	192.11	192.38	0.004192	1.71	17.62	37.78	0.57
Rio Caffra	1	205	TR200Borm+TR20ri	Finale	19.20	190.88	192.26	192.11	192.38	0.004193	1.71	17.62	37.78	0.57
Rio Caffra	1	203	TR200Borm+TR20ri	Attuale	19.20	190.29	191.76	191.76	192.10	0.013227	2.78	9.41	17.25	0.97
Rio Caffra	1	203	TR200Borm+TR20ri	Lotto1A	19.20	190.29	191.76	191.76	192.10	0.013227	2.78	9.41	17.25	0.97
Rio Caffra	1	203	TR200Borm+TR20ri	Lotto1B	19.20	190.29	191.76	191.76	192.10	0.013221	2.78	9.42	17.27	0.97
Rio Caffra	1	203	TR200Borm+TR20ri	Lotto1C	19.20	190.29	191.76	191.76	192.10	0.013221	2.78	9.42	17.27	0.97
Rio Caffra	1	203	TR200Borm+TR20ri	Finale	19.20	190.29	191.76	191.76	192.10	0.013227	2.78	9.41	17.25	0.97
Rio Caffra	1	201	TR200Borm+TR20ri	Attuale	19.20	189.19	191.44	190.74	191.52	0.001386	1.38	19.60	18.90	0.35
Rio Caffra	1	201	TR200Borm+TR20ri	Lotto1A	19.20	189.19	191.44	190.74	191.52	0.001386	1.38	19.60	18.90	0.35
Rio Caffra	1	201	TR200Borm+TR20ri	Lotto1B	19.20	189.19	191.44	190.74	191.52	0.001387	1.38	19.60	18.90	0.35
Rio Caffra	1	201	TR200Borm+TR20ri	Lotto1C	19.20	189.19	191.44	190.74	191.52	0.001387	1.38	19.60	18.90	0.35
Rio Caffra	1	201	TR200Borm+TR20ri	Finale	19.20	189.19	191.44	190.74	191.52	0.001384	1.38	19.61	18.90	0.35
Bormida	3	43	TR200Borm+TR20ri	Attuale	1469.00	179.12	186.49	185.68	187.27	0.002048	4.30	551.27	194.71	0.54
Bormida	3	43	TR200Borm+TR20ri	Lotto1A	1469.00	179.12	186.33	185.68	187.20	0.002314	4.49	520.69	194.44	0.58
Bormida	3	43	TR200Borm+TR20ri	Lotto1B	1469.00	179.12	186.29	185.68	187.18	0.002386	4.54	513.08	194.37	0.58
Bormida	3	43	TR200Borm+TR20ri	Lotto1C	1469.00	179.12	186.44	185.18	187.07	0.001799	3.80	567.53	194.62	0.50
Bormida	3	43	TR200Borm+TR20ri	Finale	1469.00	179.12	186.29	184.69	186.88	0.001717	3.58	564.18	194.37	0.49

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	3	42.000*	TR200Borm+TR20ri	Attuale	1469.00	179.09	186.50		187.19	0.001871	4.07	580.49	204.45	0.52
Bormida	3	42.000*	TR200Borm+TR20ri	Lotto1A	1469.00	179.09	186.34		187.11	0.002118	4.26	548.29	204.15	0.55
Bormida	3	42.000*	TR200Borm+TR20ri	Lotto1B	1469.00	179.09	186.30		187.10	0.002185	4.31	540.26	204.08	0.56
Bormida	3	42.000*	TR200Borm+TR20ri	Lotto1C	1469.00	179.09	186.43		187.02	0.001686	3.66	591.22	204.31	0.49
Bormida	3	42.000*	TR200Borm+TR20ri	Finale	1469.00	179.09	186.28		186.83	0.001628	3.47	584.82	204.03	0.48
Bormida	3	41.000*	TR200Borm+TR20ri	Attuale	1469.00	179.06	186.50		187.13	0.001731	3.87	608.39	214.24	0.50
Bormida	3	41.000*	TR200Borm+TR20ri	Lotto1A	1469.00	179.06	186.34		187.04	0.001965	4.05	574.32	213.90	0.53
Bormida	3	41.000*	TR200Borm+TR20ri	Lotto1B	1469.00	179.06	186.30		187.02	0.002029	4.10	565.79	213.81	0.54
Bormida	3	41.000*	TR200Borm+TR20ri	Lotto1C	1469.00	179.06	186.42		186.96	0.001592	3.54	614.30	214.06	0.47
Bormida	3	41.000*	TR200Borm+TR20ri	Finale	1469.00	179.06	186.26		186.78	0.001555	3.37	604.82	213.73	0.47
Bormida	3	40.000*	TR200Borm+TR20ri	Attuale	1469.00	179.04	186.50		187.07	0.001617	3.70	635.20	224.18	0.48
Bormida	3	40.000*	TR200Borm+TR20ri	Lotto1A	1469.00	179.04	186.34		186.98	0.001842	3.88	599.05	223.72	0.51
Bormida	3	40.000*	TR200Borm+TR20ri	Lotto1B	1469.00	179.04	186.30		186.95	0.001904	3.93	589.96	223.61	0.52
Bormida	3	40.000*	TR200Borm+TR20ri	Lotto1C	1469.00	179.04	186.41		186.91	0.001512	3.42	636.83	223.91	0.46
Bormida	3	40.000*	TR200Borm+TR20ri	Finale	1469.00	179.04	186.25		186.73	0.001492	3.28	624.29	223.48	0.46
Bormida	3	39.000*	TR200Borm+TR20ri	Attuale	1469.00	179.01	186.49		187.02	0.001523	3.55	661.10	234.59	0.47
Bormida	3	39.000*	TR200Borm+TR20ri	Lotto1A	1469.00	179.01	186.33		186.92	0.001742	3.72	622.63	233.76	0.50
Bormida	3	39.000*	TR200Borm+TR20ri	Lotto1B	1469.00	179.01	186.29		186.89	0.001803	3.77	612.93	233.61	0.51
Bormida	3	39.000*	TR200Borm+TR20ri	Lotto1C	1469.00	179.01	186.39		186.87	0.001445	3.32	658.81	234.02	0.45
Bormida	3	39.000*	TR200Borm+TR20ri	Finale	1469.00	179.01	186.23		186.69	0.001440	3.19	643.12	233.39	0.45
Bormida	3	38.000*	TR200Borm+TR20ri	Attuale	1469.00	178.98	186.49		186.97	0.001443	3.41	686.46	245.65	0.45
Bormida	3	38.000*	TR200Borm+TR20ri	Lotto1A	1469.00	178.98	186.32		186.86	0.001659	3.59	645.34	244.69	0.49
Bormida	3	38.000*	TR200Borm+TR20ri	Lotto1B	1469.00	178.98	186.28		186.84	0.001720	3.64	634.94	244.42	0.49
Bormida	3	38.000*	TR200Borm+TR20ri	Lotto1C	1469.00	178.98	186.38		186.83	0.001386	3.22	680.44	245.06	0.44
Bormida	3	38.000*	TR200Borm+TR20ri	Finale	1469.00	178.98	186.21		186.64	0.001395	3.12	661.42	243.90	0.44
Bormida	3	37	TR200Borm+TR20ri	Attuale	1469.00	178.95	186.48		186.92	0.001375	3.29	711.75	256.75	0.44
Bormida	3	37	TR200Borm+TR20ri	Lotto1A	1469.00	178.95	186.31		186.81	0.001590	3.47	667.77	256.34	0.47
Bormida	3	37	TR200Borm+TR20ri	Lotto1B	1469.00	178.95	186.26		186.78	0.001651	3.51	656.57	256.23	0.48
Bormida	3	37	TR200Borm+TR20ri	Lotto1C	1469.00	178.95	186.36		186.78	0.001335	3.13	702.24	256.47	0.43
Bormida	3	37	TR200Borm+TR20ri	Finale	1469.00	178.95	186.19		186.60	0.001357	3.05	679.65	255.99	0.43
Bormida	2	35	TR200Borm+TR20ri	Attuale	1469.00	178.59	186.33		186.88	0.001480	3.65	683.24	267.00	0.46
Bormida	2	35	TR200Borm+TR20ri	Lotto1A	1469.00	178.59	186.22		186.76	0.001636	3.61	653.20	262.82	0.48
Bormida	2	35	TR200Borm+TR20ri	Lotto1B	1469.00	178.59	186.22		186.74	0.001460	3.50	669.42	263.40	0.46
Bormida	2	35	TR200Borm+TR20ri	Lotto1C	1469.00	178.59	186.21	184.64	186.74	0.001472	3.51	666.77	259.70	0.46
Bormida	2	35	TR200Borm+TR20ri	Finale	1469.00	178.59	186.06	184.16	186.56	0.001445	3.34	650.07	255.29	0.45
Bormida	2	34.000*	TR200Borm+TR20ri	Attuale	1469.00	178.53	186.30		186.84	0.001474	3.65	686.17	272.17	0.46
Bormida	2	34.000*	TR200Borm+TR20ri	Lotto1A	1469.00	178.53	186.18		186.72	0.001592	3.60	658.37	264.18	0.48
Bormida	2	34.000*	TR200Borm+TR20ri	Lotto1B	1469.00	178.53	186.19		186.71	0.001435	3.49	673.91	264.89	0.45
Bormida	2	34.000*	TR200Borm+TR20ri	Lotto1C	1469.00	178.53	186.18	184.46	186.70	0.001446	3.50	668.20	249.03	0.45
Bormida	2	34.000*	TR200Borm+TR20ri	Finale	1469.00	178.53	186.03	184.03	186.52	0.001410	3.33	653.38	249.03	0.45

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	2	33.000*	TR200Borm+TR20ri	Attuale	1469.00	178.46	186.27		186.80	0.001459	3.64	692.15	267.74	0.46
Bormida	2	33.000*	TR200Borm+TR20ri	Lotto1A	1469.00	178.46	186.14		186.69	0.001616	3.61	660.15	267.74	0.48
Bormida	2	33.000*	TR200Borm+TR20ri	Lotto1B	1469.00	178.46	186.16		186.67	0.001410	3.48	681.42	267.74	0.45
Bormida	2	33.000*	TR200Borm+TR20ri	Lotto1C	1469.00	178.46	186.15	184.79	186.67	0.001428	3.49	666.56	238.36	0.45
Bormida	2	33.000*	TR200Borm+TR20ri	Finale	1469.00	178.46	186.00	183.98	186.49	0.001379	3.31	654.30	238.36	0.44
Bormida	2	32.000*	TR200Borm+TR20ri	Attuale	1469.00	178.40	186.24		186.77	0.001439	3.62	699.44	263.31	0.46
Bormida	2	32.000*	TR200Borm+TR20ri	Lotto1A	1469.00	178.40	186.11		186.64	0.001563	3.58	670.15	263.31	0.47
Bormida	2	32.000*	TR200Borm+TR20ri	Lotto1B	1469.00	178.40	186.14		186.64	0.001380	3.45	690.50	263.31	0.44
Bormida	2	32.000*	TR200Borm+TR20ri	Lotto1C	1469.00	178.40	186.12	184.72	186.63	0.001420	3.50	661.86	227.69	0.45
Bormida	2	32.000*	TR200Borm+TR20ri	Finale	1469.00	178.40	185.97	183.92	186.45	0.001356	3.30	652.36	227.69	0.44
Bormida	2	31.000*	TR200Borm+TR20ri	Attuale	1469.00	178.33	186.22		186.73	0.001415	3.60	707.76	258.89	0.45
Bormida	2	31.000*	TR200Borm+TR20ri	Lotto1A	1469.00	178.33	186.10		186.60	0.001433	3.49	689.26	258.89	0.45
Bormida	2	31.000*	TR200Borm+TR20ri	Lotto1B	1469.00	178.33	186.11		186.60	0.001348	3.43	700.58	258.89	0.44
Bormida	2	31.000*	TR200Borm+TR20ri	Lotto1C	1469.00	178.33	186.08	184.66	186.60	0.001422	3.51	654.03	217.01	0.45
Bormida	2	31.000*	TR200Borm+TR20ri	Finale	1469.00	178.33	185.94	183.88	186.42	0.001340	3.30	647.66	217.01	0.44
Bormida	2	30.000*	TR200Borm+TR20ri	Attuale	1469.00	178.27	186.19		186.69	0.001388	3.57	717.08	254.46	0.45
Bormida	2	30.000*	TR200Borm+TR20ri	Lotto1A	1469.00	178.27	186.04	184.57	186.56	0.001435	3.53	642.95	206.34	0.45
Bormida	2	30.000*	TR200Borm+TR20ri	Lotto1B	1469.00	178.27	186.04	184.57	186.56	0.001435	3.53	642.95	206.34	0.45
Bormida	2	30.000*	TR200Borm+TR20ri	Lotto1C	1469.00	178.27	186.04	184.57	186.56	0.001435	3.53	642.95	206.34	0.45
Bormida	2	30.000*	TR200Borm+TR20ri	Finale	1469.00	178.27	185.91	183.86	186.39	0.001334	3.30	640.05	206.34	0.43
Bormida	2	29.000*	TR200Borm+TR20ri	Attuale	1469.00	178.20	186.17		186.65	0.001356	3.54	727.48	250.03	0.44
Bormida	2	29.000*	TR200Borm+TR20ri	Lotto1A	1469.00	178.20	185.99	184.48	186.52	0.001463	3.56	628.39	195.67	0.46
Bormida	2	29.000*	TR200Borm+TR20ri	Lotto1B	1469.00	178.20	185.99	184.48	186.52	0.001463	3.56	628.39	195.67	0.46
Bormida	2	29.000*	TR200Borm+TR20ri	Lotto1C	1469.00	178.20	185.99	184.48	186.52	0.001463	3.56	628.39	195.67	0.46
Bormida	2	29.000*	TR200Borm+TR20ri	Finale	1469.00	178.20	185.87	183.98	186.36	0.001337	3.32	629.26	195.37	0.44
Bormida	2	28	TR200Borm+TR20ri	Attuale	1469.00	178.14	186.15		186.62	0.001321	3.49	738.91	245.60	0.44
Bormida	2	28	TR200Borm+TR20ri	Lotto1A	1469.00	178.14	185.94	184.38	186.49	0.001500	3.60	611.79	185.00	0.46
Bormida	2	28	TR200Borm+TR20ri	Lotto1B	1469.00	178.14	185.94	184.38	186.49	0.001500	3.60	611.79	185.00	0.46
Bormida	2	28	TR200Borm+TR20ri	Lotto1C	1469.00	178.14	185.94	184.38	186.49	0.001500	3.60	611.79	185.00	0.46
Bormida	2	28	TR200Borm+TR20ri	Finale	1469.00	178.14	185.84	183.90	186.32	0.001323	3.31	618.57	181.69	0.43
Bormida	2	27.000*	TR200Borm+TR20ri	Attuale	1469.00	178.10	186.04		186.57	0.001453	3.67	678.02	224.70	0.46
Bormida	2	27.000*	TR200Borm+TR20ri	Lotto1A	1469.00	178.10	185.84	184.20	186.44	0.001592	3.71	573.08	172.72	0.48
Bormida	2	27.000*	TR200Borm+TR20ri	Lotto1B	1469.00	178.10	185.84	184.20	186.44	0.001592	3.71	573.08	172.72	0.48
Bormida	2	27.000*	TR200Borm+TR20ri	Lotto1C	1469.00	178.10	185.84	184.20	186.44	0.001592	3.71	573.08	172.72	0.48
Bormida	2	27.000*	TR200Borm+TR20ri	Finale	1469.00	178.10	185.76	183.77	186.29	0.001390	3.39	582.08	168.15	0.44
Bormida	2	26.000*	TR200Borm+TR20ri	Attuale	1469.00	178.05	185.91		186.53	0.001614	3.86	616.88	203.80	0.48
Bormida	2	26.000*	TR200Borm+TR20ri	Lotto1A	1469.00	178.05	185.75	184.10	186.39	0.001660	3.79	537.86	157.44	0.49
Bormida	2	26.000*	TR200Borm+TR20ri	Lotto1B	1469.00	178.05	185.75	184.10	186.39	0.001660	3.79	537.86	157.44	0.49
Bormida	2	26.000*	TR200Borm+TR20ri	Lotto1C	1469.00	178.05	185.75	184.10	186.39	0.001660	3.79	537.86	157.44	0.49

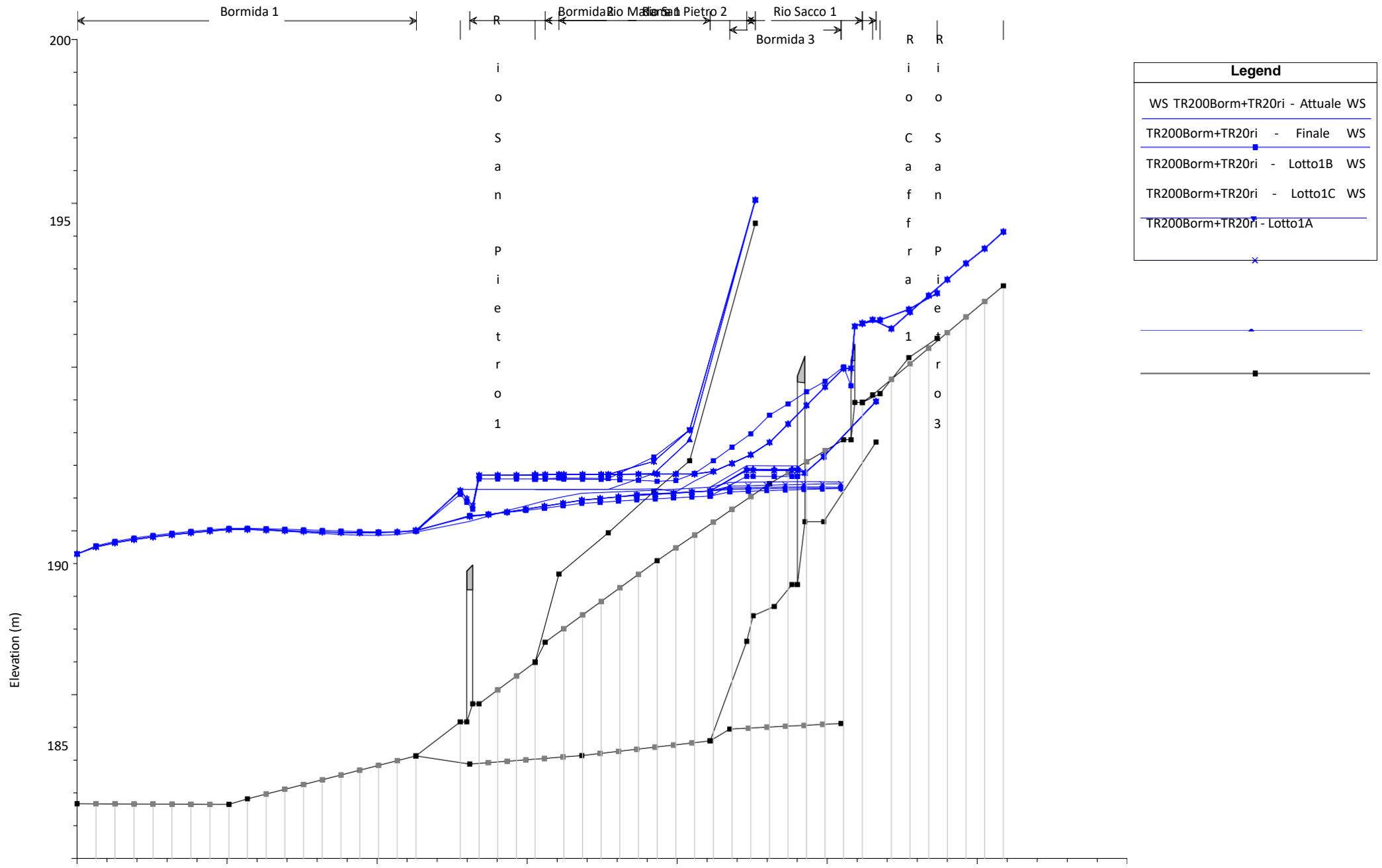
River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	2	26.000*	TR200Borm+TR20ri	Finale	1469.00	178.05	185.69	183.66	186.25	0.001447	3.46	549.46	154.39	0.45
Bormida	2	25.000*	TR200Borm+TR20ri	Attuale	1469.00	178.01	185.76		186.48	0.001812	4.08	555.87	182.90	0.51
Bormida	2	25.000*	TR200Borm+TR20ri	Lotto1A	1469.00	178.01	185.66	183.95	186.35	0.001733	3.87	506.00	142.51	0.50
Bormida	2	25.000*	TR200Borm+TR20ri	Lotto1B	1469.00	178.01	185.66	183.95	186.35	0.001733	3.87	506.00	142.51	0.50
Bormida	2	25.000*	TR200Borm+TR20ri	Lotto1C	1469.00	178.01	185.66	183.95	186.35	0.001733	3.87	506.00	142.51	0.50
Bormida	2	25.000*	TR200Borm+TR20ri	Finale	1469.00	178.01	185.62	183.55	186.21	0.001489	3.51	520.99	141.94	0.46
Bormida	2	24.000*	TR200Borm+TR20ri	Attuale	1469.00	177.97	185.62		186.42	0.001983	4.25	501.52	155.01	0.54
Bormida	2	24.000*	TR200Borm+TR20ri	Lotto1A	1469.00	177.97	185.58	183.81	186.30	0.001793	3.93	477.71	130.16	0.51
Bormida	2	24.000*	TR200Borm+TR20ri	Lotto1B	1469.00	177.97	185.58	183.81	186.30	0.001793	3.93	477.71	130.16	0.51
Bormida	2	24.000*	TR200Borm+TR20ri	Lotto1C	1469.00	177.97	185.58	183.81	186.30	0.001793	3.93	477.71	130.16	0.51
Bormida	2	24.000*	TR200Borm+TR20ri	Finale	1469.00	177.97	185.56	183.44	186.17	0.001518	3.55	496.29	130.38	0.47
Bormida	2	23.000*	TR200Borm+TR20ri	Attuale	1469.00	177.92	185.45		186.35	0.002212	4.46	448.87	131.55	0.57
Bormida	2	23.000*	TR200Borm+TR20ri	Lotto1A	1469.00	177.92	185.50	183.68	186.25	0.001832	3.98	453.27	117.35	0.51
Bormida	2	23.000*	TR200Borm+TR20ri	Lotto1B	1469.00	177.92	185.50	183.68	186.25	0.001832	3.98	453.27	117.35	0.51
Bormida	2	23.000*	TR200Borm+TR20ri	Lotto1C	1469.00	177.92	185.50	183.68	186.25	0.001832	3.98	453.27	117.35	0.51
Bormida	2	23.000*	TR200Borm+TR20ri	Finale	1469.00	177.92	185.51	183.32	186.13	0.001528	3.57	475.71	118.02	0.47
Bormida	2	22	TR200Borm+TR20ri	Attuale	1469.00	177.88	185.29		186.29	0.002400	4.63	405.43	106.32	0.59
Bormida	2	22	TR200Borm+TR20ri	Lotto1A	1469.00	177.88	185.44	183.54	186.21	0.001825	3.98	434.23	101.46	0.51
Bormida	2	22	TR200Borm+TR20ri	Lotto1B	1469.00	177.88	185.44	183.54	186.21	0.001825	3.98	434.23	101.46	0.51
Bormida	2	22	TR200Borm+TR20ri	Lotto1C	1469.00	177.88	185.44	183.54	186.21	0.001825	3.98	434.23	101.46	0.51
Bormida	2	22	TR200Borm+TR20ri	Finale	1469.00	177.88	185.47	183.20	186.09	0.001505	3.56	460.12	101.86	0.46
Bormida	1	19	TR200Borm+TR20ri	Attuale	1469.00	178.13	184.96	183.84	186.09	0.002931	4.82	375.82	136.07	0.64
Bormida	1	19	TR200Borm+TR20ri	Lotto1A	1469.00	178.13	185.01	183.51	186.02	0.002799	4.45	337.57	91.82	0.62
Bormida	1	19	TR200Borm+TR20ri	Lotto1B	1469.00	178.13	185.01	183.51	186.02	0.002799	4.45	337.57	91.82	0.62
Bormida	1	19	TR200Borm+TR20ri	Lotto1C	1469.00	178.13	185.01	183.51	186.02	0.002799	4.45	337.57	91.82	0.62
Bormida	1	19	TR200Borm+TR20ri	Finale	1469.00	178.13	184.99	183.42	185.92	0.002506	4.31	367.47	89.05	0.59
Bormida	1	18.000*	TR200Borm+TR20ri	Attuale	1469.00	177.98	184.89	183.60	186.01	0.002913	4.79	378.09	194.48	0.64
Bormida	1	18.000*	TR200Borm+TR20ri	Lotto1A	1469.00	177.98	184.96	183.45	185.94	0.002703	4.40	358.15	150.35	0.61
Bormida	1	18.000*	TR200Borm+TR20ri	Lotto1B	1469.00	177.98	184.96	183.45	185.94	0.002703	4.40	358.15	150.35	0.61
Bormida	1	18.000*	TR200Borm+TR20ri	Lotto1C	1469.00	177.98	184.96	183.45	185.94	0.002703	4.40	358.15	150.35	0.61
Bormida	1	18.000*	TR200Borm+TR20ri	Finale	1469.00	177.98	184.96	183.34	185.85	0.002385	4.21	390.94	150.18	0.58
Bormida	1	17.000*	TR200Borm+TR20ri	Attuale	1469.00	177.84	184.86	183.46	185.92	0.002725	4.65	398.56	204.66	0.62
Bormida	1	17.000*	TR200Borm+TR20ri	Lotto1A	1469.00	177.84	184.94	183.39	185.86	0.002511	4.28	390.31	172.40	0.59
Bormida	1	17.000*	TR200Borm+TR20ri	Lotto1B	1469.00	177.84	184.94	183.39	185.86	0.002511	4.28	390.31	172.40	0.59
Bormida	1	17.000*	TR200Borm+TR20ri	Lotto1C	1469.00	177.84	184.94	183.39	185.86	0.002511	4.28	390.31	172.40	0.59
Bormida	1	17.000*	TR200Borm+TR20ri	Finale	1469.00	177.84	184.96	183.25	185.77	0.002137	4.03	428.94	172.49	0.55
Bormida	1	16.000*	TR200Borm+TR20ri	Attuale	1469.00	177.69	184.87	183.33	185.83	0.002456	4.45	430.08	219.82	0.59
Bormida	1	16.000*	TR200Borm+TR20ri	Lotto1A	1469.00	177.69	184.94	183.29	185.78	0.002256	4.11	431.26	186.80	0.56
Bormida	1	16.000*	TR200Borm+TR20ri	Lotto1B	1469.00	177.69	184.94	183.29	185.78	0.002256	4.11	431.26	186.80	0.56

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	1	16.000*	TR200Borm+TR20ri	Lotto1C	1469.00	177.69	184.94	183.29	185.78	0.002256	4.11	431.26	186.80	0.56
Bormida	1	16.000*	TR200Borm+TR20ri	Finale	1469.00	177.69	184.98	183.12	185.69	0.001870	3.81	473.89	187.20	0.52
Bormida	1	15.000*	TR200Borm+TR20ri	Attuale	1469.00	177.55	184.89	183.18	185.74	0.002129	4.19	472.19	222.55	0.55
Bormida	1	15.000*	TR200Borm+TR20ri	Lotto1A	1469.00	177.55	184.95	183.15	185.70	0.001989	3.93	477.73	206.39	0.53
Bormida	1	15.000*	TR200Borm+TR20ri	Lotto1B	1469.00	177.55	184.95	183.15	185.70	0.001989	3.93	477.73	206.39	0.53
Bormida	1	15.000*	TR200Borm+TR20ri	Lotto1C	1469.00	177.55	184.95	183.15	185.70	0.001989	3.93	477.73	206.39	0.53
Bormida	1	15.000*	TR200Borm+TR20ri	Finale	1469.00	177.55	185.00	182.99	185.62	0.001623	3.60	523.00	207.15	0.48
Bormida	1	14.000*	TR200Borm+TR20ri	Attuale	1469.00	177.40	184.92		185.65	0.001826	3.94	520.63	232.93	0.52
Bormida	1	14.000*	TR200Borm+TR20ri	Lotto1A	1469.00	177.40	184.97	183.00	185.62	0.001715	3.72	529.99	217.31	0.50
Bormida	1	14.000*	TR200Borm+TR20ri	Lotto1B	1469.00	177.40	184.97	183.00	185.62	0.001715	3.72	529.99	217.31	0.50
Bormida	1	14.000*	TR200Borm+TR20ri	Lotto1C	1469.00	177.40	184.97	183.00	185.62	0.001715	3.72	529.99	217.31	0.50
Bormida	1	14.000*	TR200Borm+TR20ri	Finale	1469.00	177.40	185.02	182.83	185.56	0.001391	3.39	575.69	218.44	0.45
Bormida	1	13.000*	TR200Borm+TR20ri	Attuale	1469.00	177.26	184.96		185.58	0.001542	3.67	574.90	236.61	0.48
Bormida	1	13.000*	TR200Borm+TR20ri	Lotto1A	1469.00	177.26	184.99	182.84	185.56	0.001464	3.51	585.27	228.38	0.46
Bormida	1	13.000*	TR200Borm+TR20ri	Lotto1B	1469.00	177.26	184.99	182.84	185.56	0.001464	3.51	585.27	228.38	0.46
Bormida	1	13.000*	TR200Borm+TR20ri	Lotto1C	1469.00	177.26	184.99	182.84	185.56	0.001464	3.51	585.27	228.38	0.46
Bormida	1	13.000*	TR200Borm+TR20ri	Finale	1469.00	177.26	185.03	182.66	185.51	0.001187	3.18	630.04	229.17	0.42
Bormida	1	12.000*	TR200Borm+TR20ri	Attuale	1469.00	177.11	184.99		185.51	0.001292	3.42	633.67	237.61	0.44
Bormida	1	12.000*	TR200Borm+TR20ri	Lotto1A	1469.00	177.11	185.01		185.50	0.001243	3.30	642.14	238.44	0.43
Bormida	1	12.000*	TR200Borm+TR20ri	Lotto1B	1469.00	177.11	185.01		185.50	0.001243	3.30	642.14	238.44	0.43
Bormida	1	12.000*	TR200Borm+TR20ri	Lotto1C	1469.00	177.11	185.01	182.65	185.50	0.001243	3.30	642.14	238.44	0.43
Bormida	1	12.000*	TR200Borm+TR20ri	Finale	1469.00	177.11	185.05	182.46	185.46	0.001013	2.99	684.95	242.53	0.39
Bormida	1	11.000*	TR200Borm+TR20ri	Attuale	1469.00	176.97	185.01		185.46	0.001085	3.18	695.86	246.72	0.40
Bormida	1	11.000*	TR200Borm+TR20ri	Lotto1A	1469.00	176.97	185.02		185.45	0.001053	3.10	702.81	249.12	0.39
Bormida	1	11.000*	TR200Borm+TR20ri	Lotto1B	1469.00	176.97	185.02		185.45	0.001053	3.10	702.81	249.12	0.39
Bormida	1	11.000*	TR200Borm+TR20ri	Lotto1C	1469.00	176.97	185.02	182.45	185.45	0.001053	3.10	702.81	249.12	0.39
Bormida	1	11.000*	TR200Borm+TR20ri	Finale	1469.00	176.97	185.06	182.23	185.42	0.000863	2.81	742.91	249.66	0.36
Bormida	1	10	TR200Borm+TR20ri	Attuale	1469.00	176.82	185.04		185.42	0.000918	2.97	760.71	254.38	0.37
Bormida	1	10	TR200Borm+TR20ri	Lotto1A	1469.00	176.82	185.04		185.41	0.000881	2.90	768.85	254.46	0.36
Bormida	1	10	TR200Borm+TR20ri	Lotto1B	1469.00	176.82	185.04		185.41	0.000881	2.90	768.85	254.46	0.36
Bormida	1	10	TR200Borm+TR20ri	Lotto1C	1469.00	176.82	185.04	182.23	185.41	0.000881	2.90	768.85	254.46	0.36
Bormida	1	10	TR200Borm+TR20ri	Finale	1469.00	176.82	185.08	181.98	185.39	0.000730	2.63	805.05	254.92	0.33
Bormida	1	9	TR200Borm+TR20ri	Attuale	1469.00	176.65	185.04		185.39	0.000795	2.83	781.48	246.18	0.35
Bormida	1	9	TR200Borm+TR20ri	Lotto1A	1469.00	176.65	185.04		185.39	0.000763	2.78	789.50	246.31	0.34
Bormida	1	9	TR200Borm+TR20ri	Lotto1B	1469.00	176.65	185.04		185.39	0.000763	2.78	789.50	246.31	0.34
Bormida	1	9	TR200Borm+TR20ri	Lotto1C	1469.00	176.65	185.04		185.39	0.000763	2.78	789.50	246.31	0.34
Bormida	1	9	TR200Borm+TR20ri	Finale	1469.00	176.65	185.08		185.37	0.000646	2.53	824.70	247.88	0.31
Bormida	1	8.0000*	TR200Borm+TR20ri	Attuale	1469.00	176.65	184.99		185.37	0.000879	2.95	767.03	250.13	0.36
Bormida	1	8.0000*	TR200Borm+TR20ri	Lotto1A	1469.00	176.65	185.00		185.36	0.000846	2.91	774.05	250.19	0.36

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	1	8.0000*	TR200Borm+TR20ri	Lotto1B	1469.00	176.65	185.00		185.36	0.000846	2.91	774.05	250.19	0.36
Bormida	1	8.0000*	TR200Borm+TR20ri	Lotto1C	1469.00	176.65	185.00		185.36	0.000846	2.91	774.05	250.19	0.36
Bormida	1	8.0000*	TR200Borm+TR20ri	Finale	1469.00	176.65	185.03		185.35	0.000719	2.66	807.15	250.58	0.33
Bormida	1	7.0000*	TR200Borm+TR20ri	Attuale	1469.00	176.66	184.94		185.34	0.000973	3.08	752.34	251.42	0.38
Bormida	1	7.0000*	TR200Borm+TR20ri	Lotto1A	1469.00	176.66	184.94		185.34	0.000941	3.04	758.37	251.48	0.37
Bormida	1	7.0000*	TR200Borm+TR20ri	Lotto1B	1469.00	176.66	184.94		185.34	0.000941	3.04	758.37	251.48	0.37
Bormida	1	7.0000*	TR200Borm+TR20ri	Lotto1C	1469.00	176.66	184.94		185.34	0.000941	3.04	758.37	251.48	0.37
Bormida	1	7.0000*	TR200Borm+TR20ri	Finale	1469.00	176.66	184.98		185.32	0.000806	2.79	788.90	251.88	0.35
Bormida	1	6.0000*	TR200Borm+TR20ri	Attuale	1469.00	176.66	184.88		185.31	0.001084	3.21	736.51	252.70	0.40
Bormida	1	6.0000*	TR200Borm+TR20ri	Lotto1A	1469.00	176.66	184.88		185.31	0.001053	3.18	741.55	252.74	0.39
Bormida	1	6.0000*	TR200Borm+TR20ri	Lotto1B	1469.00	176.66	184.88		185.31	0.001053	3.18	741.55	252.74	0.39
Bormida	1	6.0000*	TR200Borm+TR20ri	Lotto1C	1469.00	176.66	184.88		185.31	0.001053	3.18	741.55	252.74	0.39
Bormida	1	6.0000*	TR200Borm+TR20ri	Finale	1469.00	176.66	184.92		185.30	0.000911	2.95	769.34	253.13	0.37
Bormida	1	5.0000*	TR200Borm+TR20ri	Attuale	1469.00	176.66	184.81		185.28	0.001219	3.37	719.01	253.91	0.42
Bormida	1	5.0000*	TR200Borm+TR20ri	Lotto1A	1469.00	176.66	184.81		185.28	0.001189	3.34	723.16	253.95	0.42
Bormida	1	5.0000*	TR200Borm+TR20ri	Lotto1B	1469.00	176.66	184.81		185.28	0.001189	3.34	723.16	253.95	0.42
Bormida	1	5.0000*	TR200Borm+TR20ri	Lotto1C	1469.00	176.66	184.81		185.28	0.001189	3.34	723.16	253.95	0.42
Bormida	1	5.0000*	TR200Borm+TR20ri	Finale	1469.00	176.66	184.86		185.27	0.001043	3.13	747.93	254.28	0.39
Bormida	1	4.0000*	TR200Borm+TR20ri	Attuale	1469.00	176.66	184.73		185.24	0.001387	3.55	699.06	255.02	0.45
Bormida	1	4.0000*	TR200Borm+TR20ri	Lotto1A	1469.00	176.66	184.73		185.24	0.001360	3.52	702.30	255.06	0.44
Bormida	1	4.0000*	TR200Borm+TR20ri	Lotto1B	1469.00	176.66	184.73		185.24	0.001360	3.52	702.30	255.06	0.44
Bormida	1	4.0000*	TR200Borm+TR20ri	Lotto1C	1469.00	176.66	184.73		185.24	0.001360	3.52	702.30	255.06	0.44
Bormida	1	4.0000*	TR200Borm+TR20ri	Finale	1469.00	176.66	184.78		185.24	0.001213	3.33	723.67	255.38	0.42
Bormida	1	3.0000*	TR200Borm+TR20ri	Attuale	1469.00	176.67	184.63		185.20	0.001608	3.76	675.14	255.91	0.48
Bormida	1	3.0000*	TR200Borm+TR20ri	Lotto1A	1469.00	176.67	184.64		185.20	0.001585	3.74	677.46	255.96	0.48
Bormida	1	3.0000*	TR200Borm+TR20ri	Lotto1B	1469.00	176.67	184.64		185.20	0.001585	3.74	677.46	255.96	0.48
Bormida	1	3.0000*	TR200Borm+TR20ri	Lotto1C	1469.00	176.67	184.64		185.20	0.001585	3.74	677.46	255.96	0.48
Bormida	1	3.0000*	TR200Borm+TR20ri	Finale	1469.00	176.67	184.68		185.20	0.001445	3.58	694.78	256.32	0.46
Bormida	1	2.0000*	TR200Borm+TR20ri	Attuale	1469.00	176.67	184.51		185.15	0.001923	4.02	643.87	256.33	0.52
Bormida	1	2.0000*	TR200Borm+TR20ri	Lotto1A	1469.00	176.67	184.51		185.15	0.001908	4.01	645.18	256.36	0.52
Bormida	1	2.0000*	TR200Borm+TR20ri	Lotto1B	1469.00	176.67	184.51		185.15	0.001908	4.01	645.18	256.36	0.52
Bormida	1	2.0000*	TR200Borm+TR20ri	Lotto1C	1469.00	176.67	184.51		185.15	0.001908	4.01	645.18	256.36	0.52
Bormida	1	2.0000*	TR200Borm+TR20ri	Finale	1469.00	176.67	184.54		185.15	0.001795	3.91	657.01	256.72	0.50
Bormida	1	1	TR200Borm+TR20ri	Attuale	1469.00	176.67	184.30	183.87	185.08	0.002504	4.45	591.61	255.34	0.59
Bormida	1	1	TR200Borm+TR20ri	Lotto1A	1469.00	176.67	184.30	183.88	185.08	0.002504	4.45	591.60	255.34	0.59
Bormida	1	1	TR200Borm+TR20ri	Lotto1B	1469.00	176.67	184.30	183.88	185.08	0.002504	4.45	591.60	255.34	0.59
Bormida	1	1	TR200Borm+TR20ri	Lotto1C	1469.00	176.67	184.30	183.88	185.08	0.002504	4.45	591.60	255.34	0.59
Bormida	1	1	TR200Borm+TR20ri	Finale	1469.00	176.67	184.30	183.88	185.08	0.002504	4.45	591.61	255.34	0.59

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02



Bormida 1

R Bormida Rio M... Pietro 2 Rio Sacco 1 Bormida 3

R R

Elevation (m)

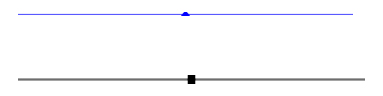
200
195
190
185

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Legend

WS TR200Borm+TR20ri - Attuale	WS
TR200Borm+TR20ri - Finale	WS
TR200Borm+TR20ri - Lotto1B	WS
TR200Borm+TR20ri - Lotto1C	WS
TR200Borm+TR20ri - Lotto1A	WS



180

175

2.0000...
3.0000...
4.0000...
5.0000...
6.0000...
7.0000...
8.0000...
9
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11.000*
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104
105
106.00*
107.00*
108
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113.00*
114.00*
115
116.00*
117.00*
128.00*
129.00*
130.00*
131.00*

0 200 400 600 800 1000 1200 1400

Main Channel Distance (m)

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

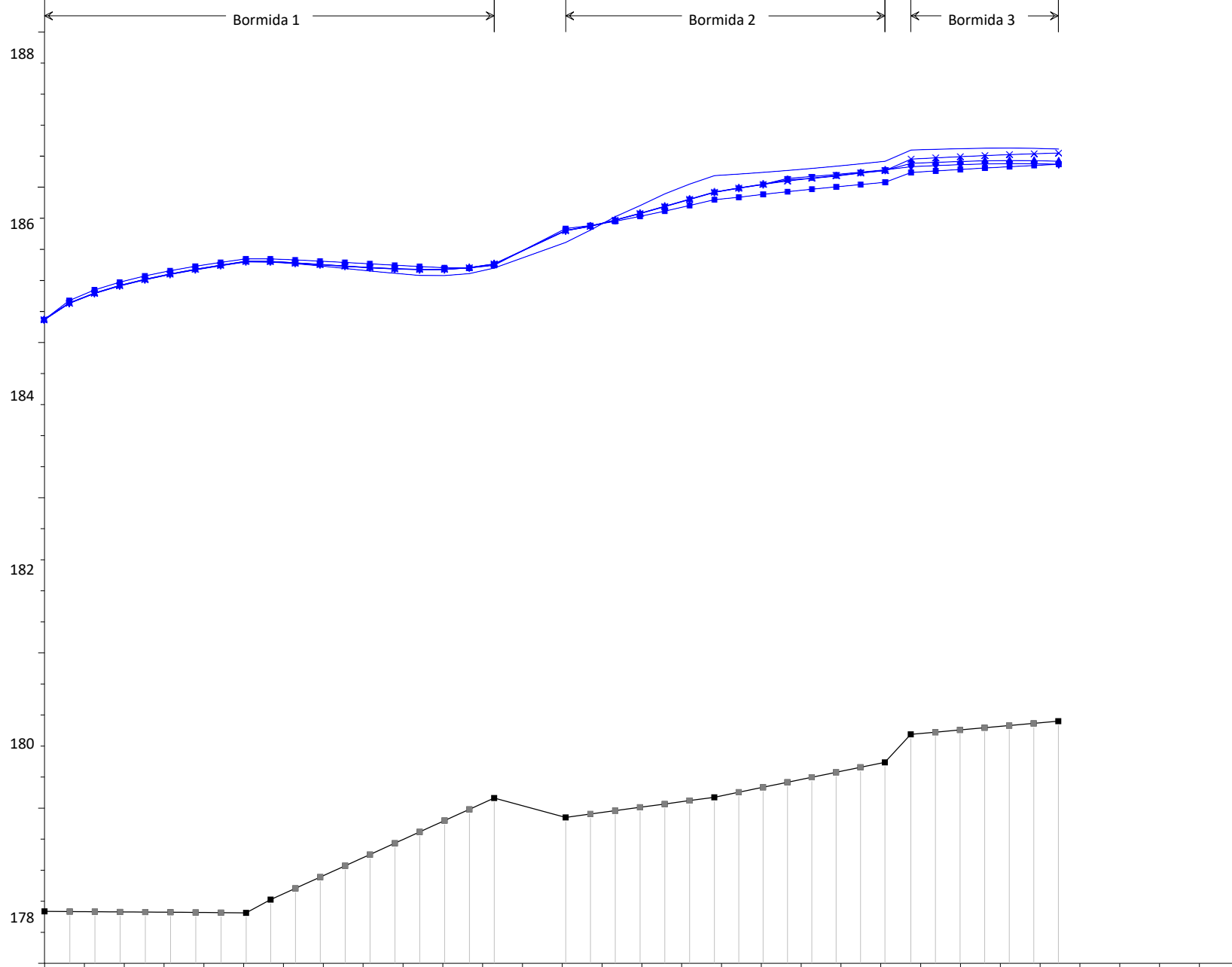
Geom: Finale_rev02

Bormida 1

Bormida 2

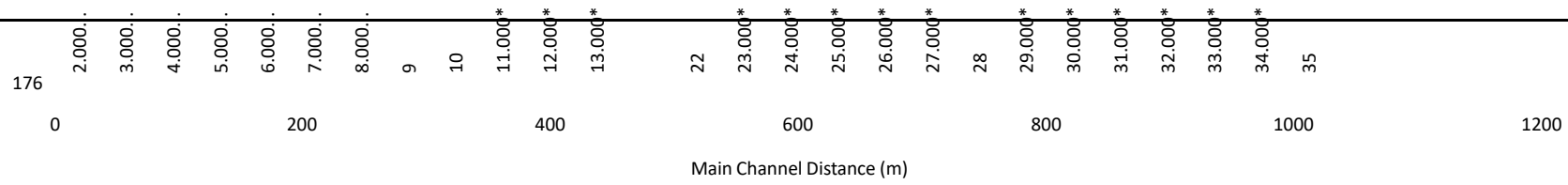
Bormida 3

Elevation (m)



Legend

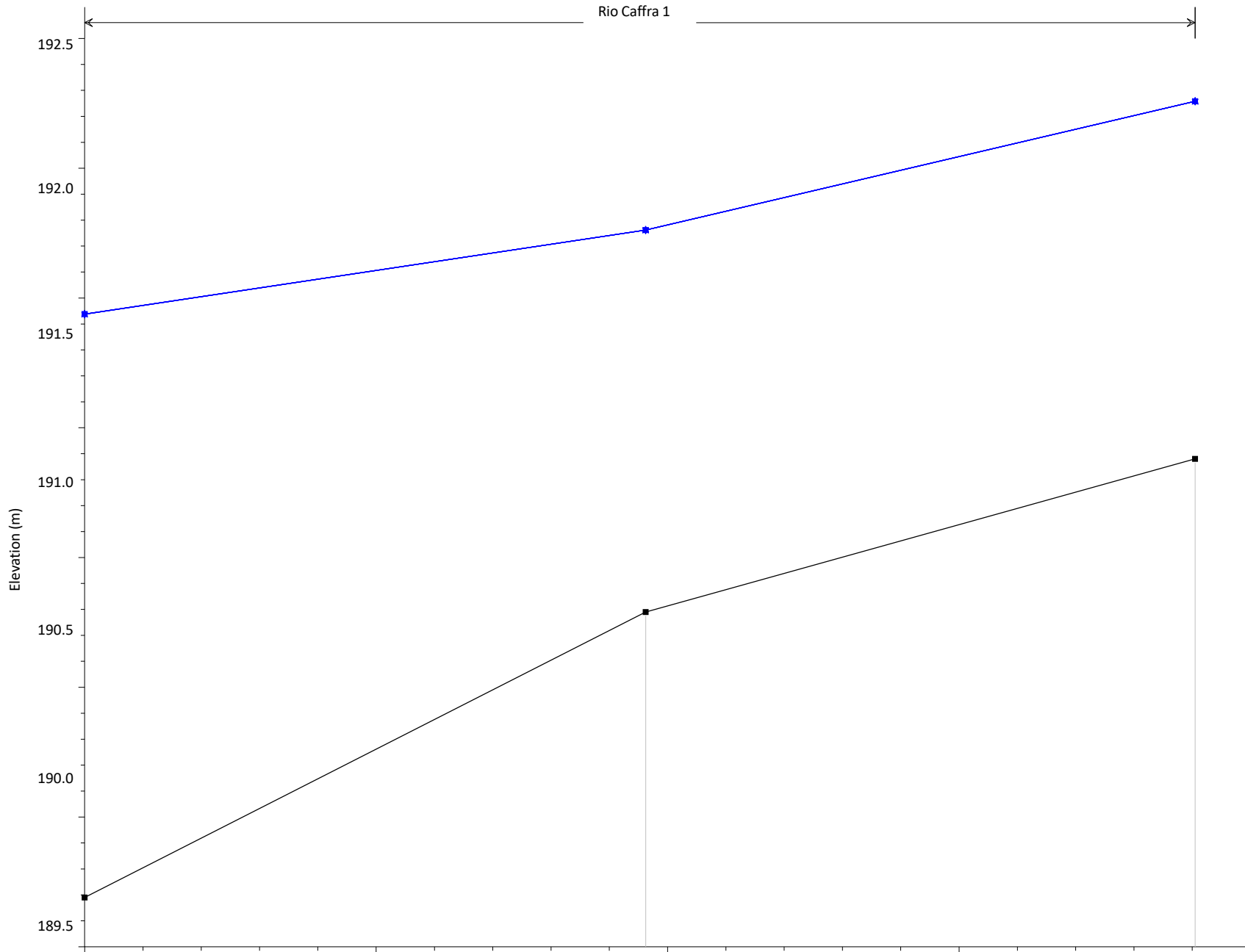
- WS TR200Borm+TR20ri - Attuale WS
- TR200Borm+TR20ri - Finale WS
- TR200Borm+TR20ri - Lotto1B WS
- TR200Borm+TR20ri - Lotto1C WS
- TR200Borm+TR20ri - Lotto1A



1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02

Rio Caffra 1



Legend	
WS TR200Borm+TR20ri - Finale WS	Blue line with square marker
TR200Borm+TR20ri - Lotto1AWS	Blue line with square marker
TR200Borm+TR20ri - Attuale WS	Blue line with square marker
TR200Borm+TR20ri - Lotto1CWS	Blue line with square marker
TR200Borm+TR20ri - Lotto1B	Blue line with square marker

189.0

0

20

203

40

60

205

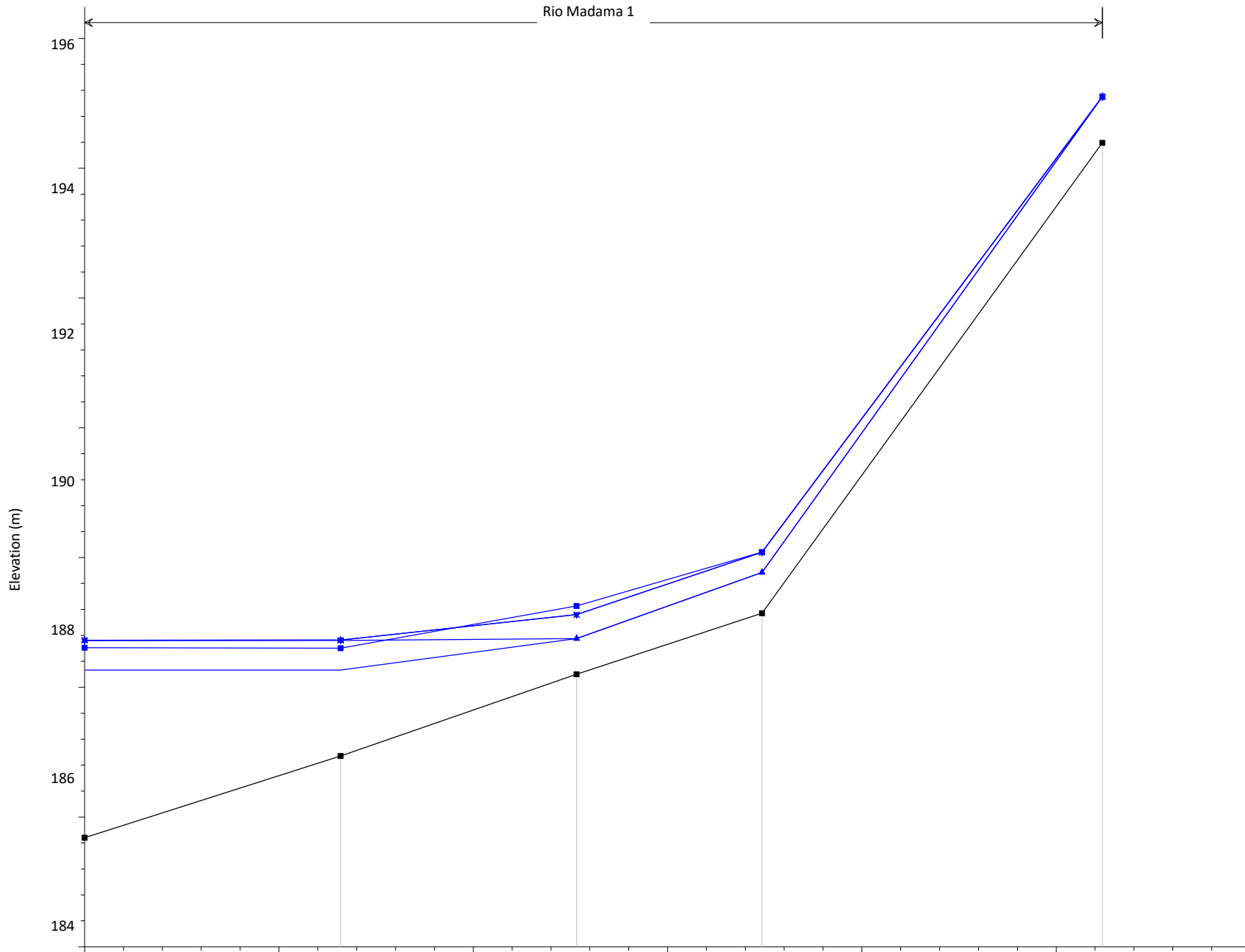
80

Main Channel Distance (m)

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02

Rio Madama 1



Legend	
— WS TR200Borm+TR20ri - Lotto1BWS	■
— TR200Borm+TR20ri - Lotto1CWS	×
— TR200Borm+TR20ri - Lotto1AWS	▲
— TR200Borm+TR20ri - Finale WS	■
— TR200Borm+TR20ri - Attuale	■

182

0

50

402

100

403

150

404

200

250

405

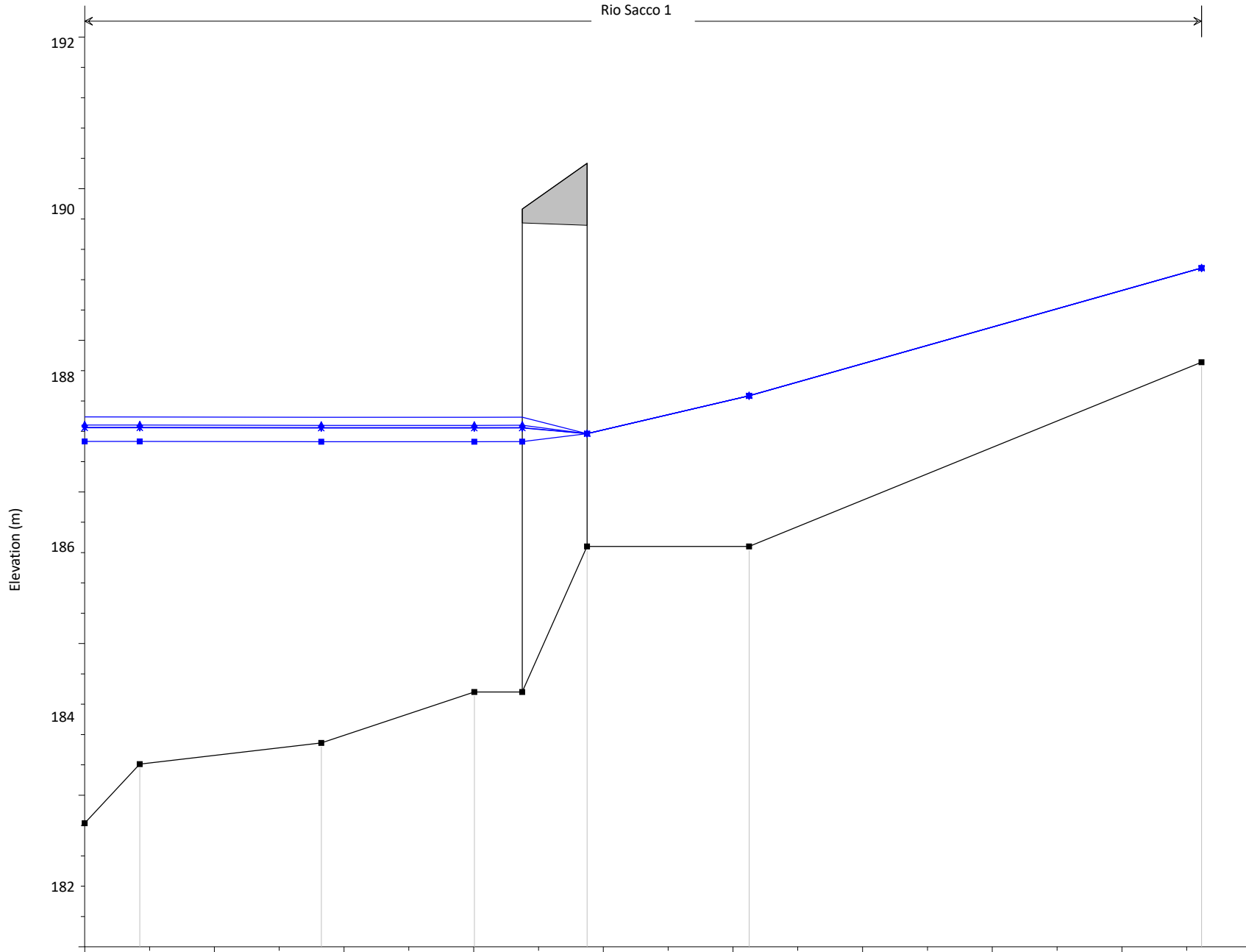
300

Main Channel Distance (m)

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02

Rio Sacco 1



Legend

- WS TR200Borm+TR20ri - Attuale WS
- TR200Borm+TR20ri - Lotto1A WS
- TR200Borm+TR20ri - Lotto1B WS
- TR200Borm+TR20ri - Lotto1C WS
- TR200Borm+TR20ri - Finale

180

302

303

304

304.5

305

306

0

20

40

60

80

100

120

140

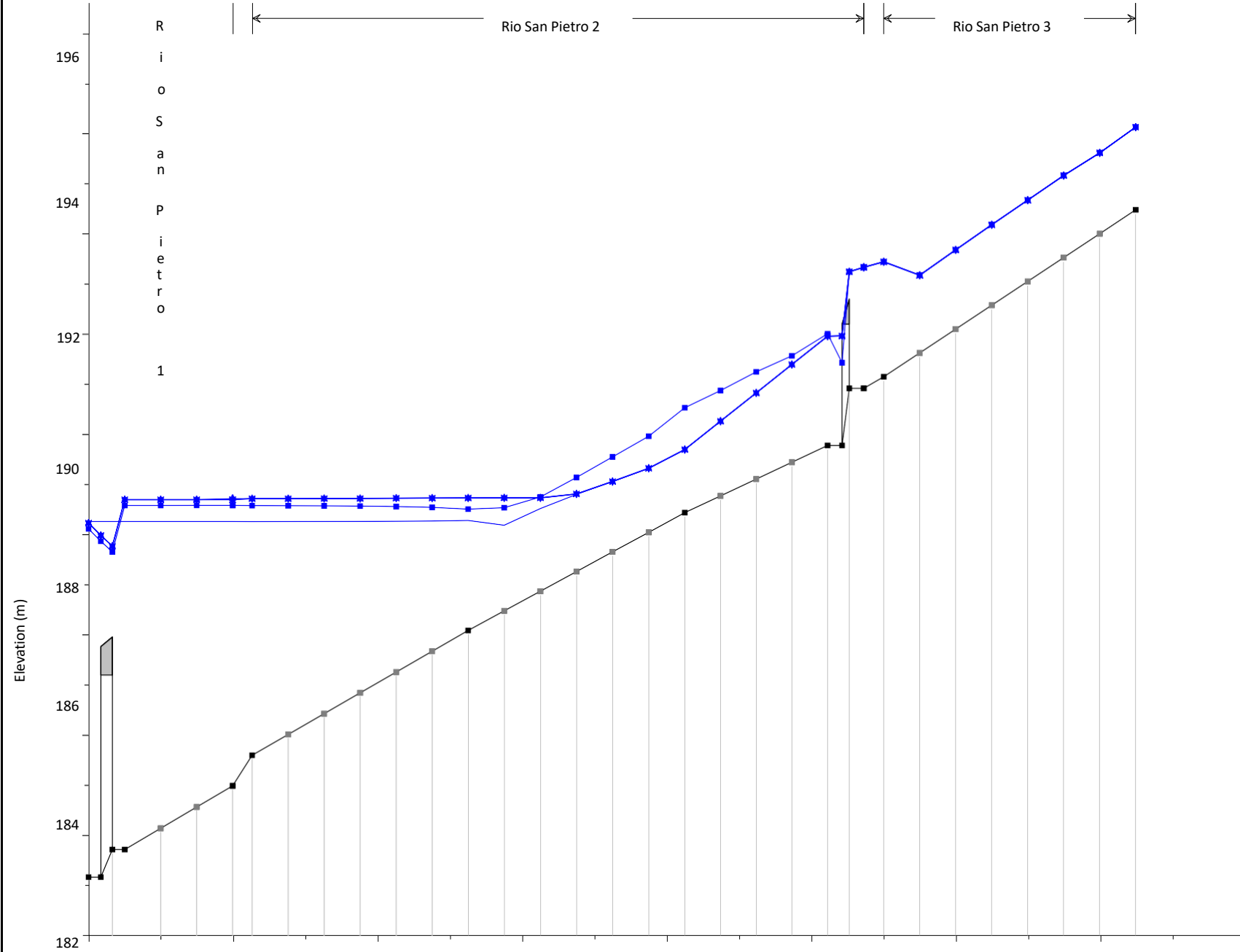
160

180

Main Channel Distance (m)

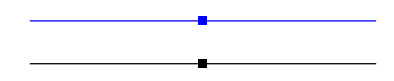
1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02



Legend

- WS TR200Borm+TR20ri - Attuale WS
- TR200Borm+TR20ri - Lotto1A WS
- TR200Borm+TR20ri - Lotto1B WS
- TR200Borm+TR20ri - Lotto1C WS
- TR200Borm+TR20ri - Finale



180

178

0
104.5

106.00*

107.00*

108
100

110.00*

111.00*

112.00*

113.00*

114.00*

115

116.00*

117.00*

118.00*

119.00*

120.00*

121

122.00*

123.00*

124.00*

125

127

128.00*

129.00*

130.00*

131.00*

132.00*

133.00*

134

800

Main Channel Distance (m)

CONFRONTO 5

2016Borm+TR20rii

Corso d'acqua	Portata al colmo [m³/s]	Tempo di ritorno [anni]
Rio Sacco	10.1	20
Rio Madama	5.6	20
Rio della Caffra	19.2	20
Rio San Pietro monte	22.2	20
Rio San Pietro valle	34.3	20
Bormida di Millesimo a Bubbio	1000	20-100

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Rio San Pietro	3	134	2016Borm+TR20rii	Attuale	22.20	192.48	194.13	194.19	194.73	0.017011	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	2016Borm+TR20rii	Lotto1A	22.20	192.48	194.13	194.19	194.73	0.017011	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	2016Borm+TR20rii	Lotto1B	22.20	192.48	194.13	194.19	194.73	0.017011	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	2016Borm+TR20rii	Lotto1C	22.20	192.48	194.13	194.19	194.73	0.017011	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	2016Borm+TR20rii	Finale	22.20	192.48	194.13	194.19	194.73	0.017011	3.42	6.50	6.49	1.09
Rio San Pietro	3	133.00*	2016Borm+TR20rii	Attuale	22.20	192.00	193.62	193.73	194.27	0.019320	3.57	6.22	6.43	1.16
Rio San Pietro	3	133.00*	2016Borm+TR20rii	Lotto1A	22.20	192.00	193.62	193.73	194.27	0.019320	3.57	6.22	6.43	1.16
Rio San Pietro	3	133.00*	2016Borm+TR20rii	Lotto1B	22.20	192.00	193.62	193.73	194.27	0.019320	3.57	6.22	6.43	1.16
Rio San Pietro	3	133.00*	2016Borm+TR20rii	Lotto1C	22.20	192.00	193.62	193.73	194.27	0.019320	3.57	6.22	6.43	1.16
Rio San Pietro	3	133.00*	2016Borm+TR20rii	Finale	22.20	192.00	193.62	193.73	194.27	0.019320	3.57	6.22	6.43	1.16
Rio San Pietro	3	132.00*	2016Borm+TR20rii	Attuale	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	132.00*	2016Borm+TR20rii	Lotto1A	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	132.00*	2016Borm+TR20rii	Lotto1B	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	132.00*	2016Borm+TR20rii	Lotto1C	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	132.00*	2016Borm+TR20rii	Finale	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	131.00*	2016Borm+TR20rii	Attuale	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	131.00*	2016Borm+TR20rii	Lotto1A	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	131.00*	2016Borm+TR20rii	Lotto1B	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	131.00*	2016Borm+TR20rii	Lotto1C	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	131.00*	2016Borm+TR20rii	Finale	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	130.00*	2016Borm+TR20rii	Attuale	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	130.00*	2016Borm+TR20rii	Lotto1A	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	130.00*	2016Borm+TR20rii	Lotto1B	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	130.00*	2016Borm+TR20rii	Lotto1C	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	130.00*	2016Borm+TR20rii	Finale	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	129.00*	2016Borm+TR20rii	Attuale	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	2016Borm+TR20rii	Lotto1A	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	2016Borm+TR20rii	Lotto1B	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	2016Borm+TR20rii	Lotto1C	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	2016Borm+TR20rii	Finale	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19
Rio San Pietro	3	128.00*	2016Borm+TR20rii	Attuale	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	2016Borm+TR20rii	Lotto1A	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	2016Borm+TR20rii	Lotto1B	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	2016Borm+TR20rii	Lotto1C	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	2016Borm+TR20rii	Finale	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	127	2016Borm+TR20rii	Attuale	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	2016Borm+TR20rii	Lotto1A	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	2016Borm+TR20rii	Lotto1B	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	2016Borm+TR20rii	Lotto1C	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	2016Borm+TR20rii	Finale	22.20	189.15	191.45	190.82	191.50	0.001209	1.26	35.09	60.60	0.32

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	126	2016Borm+TR20rii	Attuale	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	2016Borm+TR20rii	Lotto1A	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	2016Borm+TR20rii	Lotto1B	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	2016Borm+TR20rii	Lotto1C	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	2016Borm+TR20rii	Finale	34.30	188.92	191.34	190.73	191.47	0.002112	1.81	35.11	72.91	0.43
Rio San Pietro	2	125.5			Bridge									
Rio San Pietro	2	125	2016Borm+TR20rii	Attuale	34.30	187.78	189.96	189.96	190.01	0.003089	1.41	41.17	54.90	0.47
Rio San Pietro	2	125	2016Borm+TR20rii	Lotto1A	34.30	187.78	189.96	189.96	190.01	0.003090	1.41	41.12	53.50	0.47
Rio San Pietro	2	125	2016Borm+TR20rii	Lotto1B	34.30	187.78	189.96	189.96	190.01	0.003090	1.41	41.12	53.50	0.47
Rio San Pietro	2	125	2016Borm+TR20rii	Lotto1C	34.30	187.78	189.96	189.96	190.01	0.003090	1.41	41.12	53.50	0.47
Rio San Pietro	2	125	2016Borm+TR20rii	Finale	34.30	187.78	190.01	190.01	190.60	0.013636	3.42	10.04	8.40	1.00
Rio San Pietro	2	124.00*	2016Borm+TR20rii	Attuale	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	2016Borm+TR20rii	Lotto1A	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	2016Borm+TR20rii	Lotto1B	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	2016Borm+TR20rii	Lotto1C	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	2016Borm+TR20rii	Finale	34.30	187.45	189.57	189.62	190.23	0.015985	3.62	9.49	8.22	1.07
Rio San Pietro	2	123.00*	2016Borm+TR20rii	Attuale	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	123.00*	2016Borm+TR20rii	Lotto1A	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	123.00*	2016Borm+TR20rii	Lotto1B	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	123.00*	2016Borm+TR20rii	Lotto1C	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	123.00*	2016Borm+TR20rii	Finale	34.30	187.11	189.25	189.26	189.86	0.014388	3.47	9.90	8.34	1.02
Rio San Pietro	2	122.00*	2016Borm+TR20rii	Attuale	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	2016Borm+TR20rii	Lotto1A	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	2016Borm+TR20rii	Lotto1B	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	2016Borm+TR20rii	Lotto1C	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	2016Borm+TR20rii	Finale	34.30	186.78	188.88	188.90	189.50	0.014955	3.49	9.82	8.36	1.03
Rio San Pietro	2	121	2016Borm+TR20rii	Attuale	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	2016Borm+TR20rii	Lotto1A	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	2016Borm+TR20rii	Lotto1B	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	2016Borm+TR20rii	Lotto1C	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	2016Borm+TR20rii	Finale	34.30	186.44	188.53	188.54	189.14	0.014500	3.45	9.94	8.57	1.01
Rio San Pietro	2	120.00*	2016Borm+TR20rii	Attuale	34.30	186.05	187.32	187.21	187.40	0.010131	1.94	33.75	72.93	0.80
Rio San Pietro	2	120.00*	2016Borm+TR20rii	Lotto1A	34.30	186.05	187.33	187.19	187.40	0.009943	1.93	33.96	72.95	0.80
Rio San Pietro	2	120.00*	2016Borm+TR20rii	Lotto1B	34.30	186.05	187.33	187.19	187.40	0.009943	1.93	33.96	72.95	0.80
Rio San Pietro	2	120.00*	2016Borm+TR20rii	Lotto1C	34.30	186.05	187.33	187.19	187.40	0.009943	1.93	33.96	72.95	0.80
Rio San Pietro	2	120.00*	2016Borm+TR20rii	Finale	34.30	186.05	187.96	188.09	188.71	0.019793	3.82	8.99	8.25	1.17
Rio San Pietro	2	119.00*	2016Borm+TR20rii	Attuale	34.30	185.66	187.07		187.16	0.008735	2.13	35.99	85.89	0.78
Rio San Pietro	2	119.00*	2016Borm+TR20rii	Lotto1A	34.30	185.66	187.06	187.02	187.16	0.009167	2.17	35.40	85.86	0.80

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	119.00*	2016Borm+TR20rii	Lotto1B	34.30	185.66	187.06	187.02	187.16	0.009167	2.17	35.40	85.86	0.80
Rio San Pietro	2	119.00*	2016Borm+TR20rii	Lotto1C	34.30	185.66	187.06	187.02	187.16	0.009167	2.17	35.40	85.86	0.80
Rio San Pietro	2	119.00*	2016Borm+TR20rii	Finale	34.30	185.66	187.55	187.65	188.25	0.016226	3.69	9.35	8.65	1.13
Rio San Pietro	2	118.00*	2016Borm+TR20rii	Attuale	34.30	185.27	186.80	186.80	186.94	0.008589	2.37	36.07	107.82	0.79
Rio San Pietro	2	118.00*	2016Borm+TR20rii	Lotto1A	34.30	185.27	186.81	186.81	186.94	0.008080	2.31	36.68	99.25	0.77
Rio San Pietro	2	118.00*	2016Borm+TR20rii	Lotto1B	34.30	185.27	186.81	186.81	186.94	0.008080	2.31	36.68	99.25	0.77
Rio San Pietro	2	118.00*	2016Borm+TR20rii	Lotto1C	34.30	185.27	186.81	186.81	186.94	0.008080	2.31	36.68	99.25	0.77
Rio San Pietro	2	118.00*	2016Borm+TR20rii	Finale	34.30	185.27	187.14	187.24	187.85	0.015800	3.74	9.55	9.15	1.12
Rio San Pietro	2	117.00*	2016Borm+TR20rii	Attuale	34.30	184.87	186.52	186.58	186.72	0.009017	2.61	36.59	138.85	0.83
Rio San Pietro	2	117.00*	2016Borm+TR20rii	Lotto1A	34.30	184.87	186.55	186.59	186.73	0.008337	2.53	34.91	109.75	0.80
Rio San Pietro	2	117.00*	2016Borm+TR20rii	Lotto1B	34.30	184.87	186.55	186.59	186.73	0.008337	2.53	34.91	109.75	0.80
Rio San Pietro	2	117.00*	2016Borm+TR20rii	Lotto1C	34.30	184.87	186.55	186.59	186.73	0.008337	2.53	34.91	109.75	0.80
Rio San Pietro	2	117.00*	2016Borm+TR20rii	Finale	34.30	184.87	186.75	186.85	187.46	0.014925	3.76	9.73	9.63	1.10
Rio San Pietro	2	116.00*	2016Borm+TR20rii	Attuale	34.30	184.48	186.19	186.27	186.47	0.010331	2.92	31.19	125.91	0.89
Rio San Pietro	2	116.00*	2016Borm+TR20rii	Lotto1A	34.30	184.48	186.29	186.29	186.42	0.005272	2.21	44.98	156.32	0.65
Rio San Pietro	2	116.00*	2016Borm+TR20rii	Lotto1B	34.30	184.48	186.29	186.29	186.42	0.005272	2.21	44.98	156.32	0.65
Rio San Pietro	2	116.00*	2016Borm+TR20rii	Lotto1C	34.30	184.48	186.29	186.29	186.42	0.005272	2.21	44.98	156.32	0.65
Rio San Pietro	2	116.00*	2016Borm+TR20rii	Finale	34.30	184.48	186.39	186.48	187.10	0.013986	3.79	9.84	9.67	1.07
Rio San Pietro	2	115	2016Borm+TR20rii	Attuale	34.30	184.09	185.81	185.93	186.18	0.012026	3.24	25.02	112.64	0.96
Rio San Pietro	2	115	2016Borm+TR20rii	Lotto1A	34.30	184.09	185.82	185.94	186.21	0.012028	3.26	21.68	55.18	0.96
Rio San Pietro	2	115	2016Borm+TR20rii	Lotto1B	34.30	184.09	185.82	185.94	186.21	0.012028	3.26	21.68	55.18	0.96
Rio San Pietro	2	115	2016Borm+TR20rii	Lotto1C	34.30	184.09	185.82	185.94	186.21	0.012028	3.26	21.68	55.18	0.96
Rio San Pietro	2	115	2016Borm+TR20rii	Finale	34.30	184.09	186.04	186.12	186.76	0.013078	3.82	9.91	9.70	1.03
Rio San Pietro	2	114.00*	2016Borm+TR20rii	Attuale	34.30	183.67	185.67	185.73	185.93	0.006786	2.62	27.19	80.86	0.74
Rio San Pietro	2	114.00*	2016Borm+TR20rii	Lotto1A	34.30	183.67	185.79	185.73	185.93	0.003655	2.04	40.47	120.26	0.55
Rio San Pietro	2	114.00*	2016Borm+TR20rii	Lotto1B	34.30	183.67	185.79	185.73	185.93	0.003688	2.05	40.26	120.09	0.55
Rio San Pietro	2	114.00*	2016Borm+TR20rii	Lotto1C	34.30	183.67	185.79	185.73	185.93	0.003688	2.05	40.26	120.09	0.55
Rio San Pietro	2	114.00*	2016Borm+TR20rii	Finale	34.30	183.67	185.57	185.75	186.38	0.017639	4.00	8.82	9.03	1.17
Rio San Pietro	2	113.00*	2016Borm+TR20rii	Attuale	34.30	183.26	185.33	185.45	185.71	0.009740	2.99	18.76	43.25	0.87
Rio San Pietro	2	113.00*	2016Borm+TR20rii	Lotto1A	34.30	183.26	185.79		185.85	0.001411	1.41	58.24	127.10	0.35
Rio San Pietro	2	113.00*	2016Borm+TR20rii	Lotto1B	34.30	183.26	185.79		185.85	0.001420	1.42	58.05	126.96	0.35
Rio San Pietro	2	113.00*	2016Borm+TR20rii	Lotto1C	34.30	183.26	185.79		185.85	0.001420	1.42	58.05	126.96	0.35
Rio San Pietro	2	113.00*	2016Borm+TR20rii	Finale	34.30	183.26	185.46	185.37	185.97	0.009576	3.18	11.18	10.28	0.88
Rio San Pietro	2	112.00*	2016Borm+TR20rii	Attuale	34.30	182.85	185.04	185.13	185.46	0.010444	3.00	16.23	35.48	0.89
Rio San Pietro	2	112.00*	2016Borm+TR20rii	Lotto1A	34.30	182.85	185.55	185.03	185.78	0.003396	2.18	21.60	48.56	0.54
Rio San Pietro	2	112.00*	2016Borm+TR20rii	Lotto1B	34.30	182.85	185.55	185.03	185.78	0.003404	2.18	21.52	47.18	0.54
Rio San Pietro	2	112.00*	2016Borm+TR20rii	Lotto1C	34.30	182.85	185.55	185.03	185.78	0.003404	2.18	21.52	47.18	0.54
Rio San Pietro	2	112.00*	2016Borm+TR20rii	Finale	34.30	182.85	185.45	185.03	185.75	0.004611	2.44	14.88	13.30	0.62
Rio San Pietro	2	111.00*	2016Borm+TR20rii	Attuale	34.30	182.43	185.15	184.84	185.28	0.002787	1.83	32.67	56.58	0.48

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Rio San Pietro	2	111.00*	2016Borm+TR20rii	Lotto1A	34.30	182.43	185.56	184.68	185.69	0.001701	1.68	31.55	74.06	0.39
Rio San Pietro	2	111.00*	2016Borm+TR20rii	Lotto1B	34.30	182.43	185.56	184.68	185.69	0.001710	1.69	31.41	72.66	0.39
Rio San Pietro	2	111.00*	2016Borm+TR20rii	Lotto1C	34.30	182.43	185.56	184.68	185.69	0.001710	1.69	31.41	72.66	0.39
Rio San Pietro	2	111.00*	2016Borm+TR20rii	Finale	34.30	182.43	185.45	184.68	185.63	0.002395	1.92	19.35	14.50	0.46
Rio San Pietro	2	110.00*	2016Borm+TR20rii	Attuale	34.30	182.02	185.15		185.22	0.001235	1.34	46.51	78.39	0.32
Rio San Pietro	2	110.00*	2016Borm+TR20rii	Lotto1A	34.30	182.02	185.57	184.32	185.65	0.000923	1.33	43.68	90.44	0.29
Rio San Pietro	2	110.00*	2016Borm+TR20rii	Lotto1B	34.30	182.02	185.57	184.32	185.65	0.000930	1.34	43.42	90.39	0.29
Rio San Pietro	2	110.00*	2016Borm+TR20rii	Lotto1C	34.30	182.02	185.57	184.32	185.65	0.000930	1.34	43.42	90.39	0.29
Rio San Pietro	2	110.00*	2016Borm+TR20rii	Finale	34.30	182.02	185.45	184.32	185.57	0.001353	1.55	24.27	15.70	0.35
Rio San Pietro	2	109	2016Borm+TR20rii	Attuale	34.30	181.60	185.15		185.19	0.000623	1.02	62.58	88.14	0.23
Rio San Pietro	2	109	2016Borm+TR20rii	Lotto1A	34.30	181.60	185.57	183.95	185.62	0.000529	1.07	57.07	96.98	0.22
Rio San Pietro	2	109	2016Borm+TR20rii	Lotto1B	34.30	181.60	185.57	183.95	185.62	0.000532	1.08	56.79	96.96	0.22
Rio San Pietro	2	109	2016Borm+TR20rii	Lotto1C	34.30	181.60	185.57	183.95	185.62	0.000532	1.08	56.79	96.96	0.22
Rio San Pietro	2	109	2016Borm+TR20rii	Finale	34.30	181.60	185.45	183.95	185.53	0.000816	1.29	29.64	16.90	0.27
Rio San Pietro	1	108	2016Borm+TR20rii	Attuale	34.30	180.99	185.16		185.18	0.000235	0.73	135.43	253.62	0.14
Rio San Pietro	1	108	2016Borm+TR20rii	Lotto1A	34.30	180.99	185.60	183.66	185.61	0.000098	0.52	188.96	216.60	0.10
Rio San Pietro	1	108	2016Borm+TR20rii	Lotto1B	34.30	180.99	185.56	183.66	185.61	0.000467	1.13	40.83	22.80	0.21
Rio San Pietro	1	108	2016Borm+TR20rii	Lotto1C	34.30	180.99	185.56	183.66	185.61	0.000467	1.13	40.83	22.80	0.21
Rio San Pietro	1	108	2016Borm+TR20rii	Finale	34.30	180.99	185.45	183.66	185.52	0.000537	1.18	38.53	22.80	0.22
Rio San Pietro	1	107.00*	2016Borm+TR20rii	Attuale	34.30	180.57	185.16		185.17	0.000133	0.56	173.18	251.69	0.11
Rio San Pietro	1	107.00*	2016Borm+TR20rii	Lotto1A	34.30	180.57	185.55	183.30	185.60	0.000337	0.98	45.18	22.10	0.18
Rio San Pietro	1	107.00*	2016Borm+TR20rii	Lotto1B	34.30	180.57	185.55	183.30	185.60	0.000337	0.98	45.18	22.10	0.18
Rio San Pietro	1	107.00*	2016Borm+TR20rii	Lotto1C	34.30	180.57	185.55	183.30	185.60	0.000337	0.98	45.18	22.10	0.18
Rio San Pietro	1	107.00*	2016Borm+TR20rii	Finale	34.30	180.57	185.45	183.30	185.50	0.000383	1.02	42.95	22.10	0.19
Rio San Pietro	1	106.00*	2016Borm+TR20rii	Attuale	34.30	180.14	185.16		185.17	0.000079	0.45	212.87	252.64	0.08
Rio San Pietro	1	106.00*	2016Borm+TR20rii	Lotto1A	34.30	180.14	185.55	182.90	185.59	0.000252	0.87	49.49	21.40	0.15
Rio San Pietro	1	106.00*	2016Borm+TR20rii	Lotto1B	34.30	180.14	185.55	182.90	185.59	0.000252	0.87	49.49	21.40	0.15
Rio San Pietro	1	106.00*	2016Borm+TR20rii	Lotto1C	34.30	180.14	185.55	182.90	185.59	0.000252	0.87	49.49	21.40	0.15
Rio San Pietro	1	106.00*	2016Borm+TR20rii	Finale	34.30	180.14	185.45	182.90	185.49	0.000284	0.90	47.33	21.40	0.16
Rio San Pietro	1	105	2016Borm+TR20rii	Attuale	34.30	179.72	185.16	182.50	185.16	0.000047	0.35	258.90	252.40	0.06
Rio San Pietro	1	105	2016Borm+TR20rii	Lotto1A	34.30	179.72	185.55	182.50	185.58	0.000193	0.77	53.99	20.70	0.13
Rio San Pietro	1	105	2016Borm+TR20rii	Lotto1B	34.30	179.72	185.55	182.50	185.58	0.000193	0.77	53.99	20.70	0.13
Rio San Pietro	1	105	2016Borm+TR20rii	Lotto1C	34.30	179.72	185.55	182.50	185.58	0.000193	0.77	53.99	20.70	0.13
Rio San Pietro	1	105	2016Borm+TR20rii	Finale	34.30	179.72	185.45	182.50	185.48	0.000216	0.80	51.90	20.70	0.14
Rio San Pietro	1	104.5			Bridge									
Rio San Pietro	1	104	2016Borm+TR20rii	Attuale	34.30	179.17	185.16		185.16	0.000022	0.30	319.69	266.98	0.05
Rio San Pietro	1	104	2016Borm+TR20rii	Lotto1A	34.30	179.17	185.09	181.58	185.11	0.000120	0.68	56.77	18.70	0.11
Rio San Pietro	1	104	2016Borm+TR20rii	Lotto1B	34.30	179.17	185.09	181.58	185.11	0.000120	0.68	56.77	18.70	0.11
Rio San Pietro	1	104	2016Borm+TR20rii	Lotto1C	34.30	179.17	185.09	181.58	185.11	0.000120	0.68	56.77	18.70	0.11

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	1	104	2016Borm+TR20rii	Finale	34.30	179.17	184.99	181.58	185.01	0.000131	0.70	54.89	18.70	0.11
Rio Sacco	1	306	2016Borm+TR20rii	Attuale	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	2016Borm+TR20rii	Lotto1A	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	2016Borm+TR20rii	Lotto1B	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	2016Borm+TR20rii	Lotto1C	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	2016Borm+TR20rii	Finale	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	305	2016Borm+TR20rii	Attuale	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	2016Borm+TR20rii	Lotto1A	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	2016Borm+TR20rii	Lotto1B	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	2016Borm+TR20rii	Lotto1C	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	305	2016Borm+TR20rii	Finale	10.10	185.28	187.27	186.77	187.42	0.004578	1.75	5.76	5.12	0.53
Rio Sacco	1	304.5			Bridge									
Rio Sacco	1	304	2016Borm+TR20rii	Attuale	10.10	183.36	185.91		185.94	0.000508	0.77	13.04	8.02	0.19
Rio Sacco	1	304	2016Borm+TR20rii	Lotto1A	10.10	183.36	185.82		185.86	0.000585	0.82	12.39	7.88	0.21
Rio Sacco	1	304	2016Borm+TR20rii	Lotto1B	10.10	183.36	185.75		185.79	0.000662	0.85	11.84	7.76	0.22
Rio Sacco	1	304	2016Borm+TR20rii	Lotto1C	10.10	183.36	185.75		185.79	0.000662	0.85	11.84	7.76	0.22
Rio Sacco	1	304	2016Borm+TR20rii	Finale	10.10	183.36	185.58		185.63	0.000907	0.96	10.56	7.43	0.26
Rio Sacco	1	303	2016Borm+TR20rii	Attuale	10.10	182.69	185.90		185.92	0.000322	0.64	15.78	9.01	0.15
Rio Sacco	1	303	2016Borm+TR20rii	Lotto1A	10.10	182.69	185.82		185.84	0.000362	0.67	15.06	8.74	0.16
Rio Sacco	1	303	2016Borm+TR20rii	Lotto1B	10.10	182.69	185.75		185.78	0.000403	0.70	14.45	8.52	0.17
Rio Sacco	1	303	2016Borm+TR20rii	Lotto1C	10.10	182.69	185.75		185.78	0.000403	0.70	14.45	8.52	0.17
Rio Sacco	1	303	2016Borm+TR20rii	Finale	10.10	182.69	185.58		185.61	0.000520	0.77	13.05	7.95	0.19
Rio Sacco	1	302	2016Borm+TR20rii	Attuale	10.10	182.41	185.91		185.92	0.000023	0.25	51.51	28.88	0.05
Rio Sacco	1	302	2016Borm+TR20rii	Lotto1A	10.10	182.41	185.83		185.84	0.000026	0.26	49.19	28.62	0.05
Rio Sacco	1	302	2016Borm+TR20rii	Lotto1B	10.10	182.41	185.76		185.77	0.000029	0.27	47.21	28.40	0.06
Rio Sacco	1	302	2016Borm+TR20rii	Lotto1C	10.10	182.41	185.76		185.77	0.000029	0.27	47.21	28.40	0.06
Rio Sacco	1	302	2016Borm+TR20rii	Finale	10.10	182.41	185.60		185.60	0.000038	0.29	42.50	27.80	0.06
Rio Sacco	1	301	2016Borm+TR20rii	Attuale	10.10	181.63	185.91		185.92	0.000015	0.21	71.41	33.13	0.04
Rio Sacco	1	301	2016Borm+TR20rii	Lotto1A	10.10	181.63	185.83		185.84	0.000016	0.21	68.74	32.78	0.04
Rio Sacco	1	301	2016Borm+TR20rii	Lotto1B	10.10	181.63	185.76		185.77	0.000018	0.22	66.49	32.49	0.04
Rio Sacco	1	301	2016Borm+TR20rii	Lotto1C	10.10	181.63	185.76		185.77	0.000018	0.22	66.49	32.49	0.04
Rio Sacco	1	301	2016Borm+TR20rii	Finale	10.10	181.63	185.60		185.60	0.000023	0.24	61.10	31.99	0.05
Rio Madama	1	405	2016Borm+TR20rii	Attuale	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	2016Borm+TR20rii	Lotto1A	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	2016Borm+TR20rii	Lotto1B	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	2016Borm+TR20rii	Lotto1C	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	2016Borm+TR20rii	Finale	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	404	2016Borm+TR20rii	Attuale	5.60	187.14	187.77	187.77	187.77	0.000039	0.08	43.18	25.69	0.04

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Rio Madama	1	404	2016Borm+TR20rii	Lotto1A	5.60	187.14	187.77	187.77	187.77	0.000039	0.08	43.18	25.69	0.04
Rio Madama	1	404	2016Borm+TR20rii	Lotto1B	5.60	187.14	188.08	188.08	188.36	0.016189	2.36	2.38	4.20	1.00
Rio Madama	1	404	2016Borm+TR20rii	Lotto1C	5.60	187.14	188.08	188.08	188.36	0.016189	2.36	2.38	4.20	1.00
Rio Madama	1	404	2016Borm+TR20rii	Finale	5.60	187.14	188.08	188.08	188.36	0.015948	2.35	2.40	4.21	0.99
Rio Madama	1	403	2016Borm+TR20rii	Attuale	5.60	186.20	186.75	186.75	186.75	0.000170	0.17	26.88	23.66	0.09
Rio Madama	1	403	2016Borm+TR20rii	Lotto1A	5.60	186.20	186.75	186.75	186.75	0.000170	0.17	26.88	23.66	0.09
Rio Madama	1	403	2016Borm+TR20rii	Lotto1B	5.60	186.20	187.12	187.12	187.12	0.000517	0.37	18.46	22.64	0.17
Rio Madama	1	403	2016Borm+TR20rii	Lotto1C	5.60	186.20	187.12	187.12	187.12	0.000517	0.37	18.46	22.64	0.17
Rio Madama	1	403	2016Borm+TR20rii	Finale	5.60	186.20	187.25	187.25	187.57	0.017485	2.50	2.35	3.91	1.02
Rio Madama	1	402	2016Borm+TR20rii	Attuale	5.60	184.94	185.58	185.74	186.61	0.107703	4.49	1.25	3.51	2.41
Rio Madama	1	402	2016Borm+TR20rii	Lotto1A	5.60	184.94	185.58	185.74	186.61	0.107703	4.49	1.25	3.51	2.41
Rio Madama	1	402	2016Borm+TR20rii	Lotto1B	5.60	184.94	185.54	185.88	186.88	0.152691	5.13	1.09	3.27	2.84
Rio Madama	1	402	2016Borm+TR20rii	Lotto1C	5.60	184.94	185.54	185.88	186.88	0.152691	5.13	1.09	3.27	2.84
Rio Madama	1	402	2016Borm+TR20rii	Finale	5.60	184.94	185.78	185.88	186.15	0.032453	2.68	2.09	5.30	1.36
Rio Madama	1	401	2016Borm+TR20rii	Attuale	5.60	183.68	185.17	184.67	185.19	0.001110	0.68	15.34	48.30	0.27
Rio Madama	1	401	2016Borm+TR20rii	Lotto1A	5.60	183.68	185.61	184.67	185.61	0.000097	0.28	36.52	48.30	0.09
Rio Madama	1	401	2016Borm+TR20rii	Lotto1B	5.60	183.68	185.62	184.67	185.63	0.000191	0.40	22.18	28.20	0.12
Rio Madama	1	401	2016Borm+TR20rii	Lotto1C	5.60	183.68	185.62	184.67	185.63	0.000191	0.40	22.18	28.20	0.12
Rio Madama	1	401	2016Borm+TR20rii	Finale	5.60	183.68	185.52	184.67	185.54	0.000691	0.69	8.23	8.50	0.22
Rio Caffra	1	205	2016Borm+TR20rii	Attuale	19.20	190.88	192.26	192.11	192.38	0.004193	1.71	17.62	37.78	0.57
Rio Caffra	1	205	2016Borm+TR20rii	Lotto1A	19.20	190.88	192.26	192.11	192.38	0.004193	1.71	17.62	37.78	0.57
Rio Caffra	1	205	2016Borm+TR20rii	Lotto1B	19.20	190.88	192.26	192.11	192.38	0.004192	1.71	17.62	37.78	0.57
Rio Caffra	1	205	2016Borm+TR20rii	Lotto1C	19.20	190.88	192.26	192.11	192.38	0.004192	1.71	17.62	37.78	0.57
Rio Caffra	1	205	2016Borm+TR20rii	Finale	19.20	190.88	192.26	192.11	192.38	0.004194	1.71	17.62	37.78	0.57
Rio Caffra	1	203	2016Borm+TR20rii	Attuale	19.20	190.29	191.76	191.76	192.10	0.013227	2.78	9.41	17.25	0.97
Rio Caffra	1	203	2016Borm+TR20rii	Lotto1A	19.20	190.29	191.76	191.76	192.10	0.013227	2.78	9.41	17.25	0.97
Rio Caffra	1	203	2016Borm+TR20rii	Lotto1B	19.20	190.29	191.76	191.76	192.10	0.013221	2.78	9.42	17.27	0.97
Rio Caffra	1	203	2016Borm+TR20rii	Lotto1C	19.20	190.29	191.76	191.76	192.10	0.013221	2.78	9.42	17.27	0.97
Rio Caffra	1	203	2016Borm+TR20rii	Finale	19.20	190.29	191.76	191.76	192.10	0.013230	2.78	9.41	17.24	0.97
Rio Caffra	1	201	2016Borm+TR20rii	Attuale	19.20	189.19	191.44	190.74	191.52	0.001386	1.38	19.60	18.90	0.35
Rio Caffra	1	201	2016Borm+TR20rii	Lotto1A	19.20	189.19	191.44	190.74	191.52	0.001386	1.38	19.60	18.90	0.35
Rio Caffra	1	201	2016Borm+TR20rii	Lotto1B	19.20	189.19	191.44	190.74	191.52	0.001387	1.38	19.60	18.90	0.35
Rio Caffra	1	201	2016Borm+TR20rii	Lotto1C	19.20	189.19	191.44	190.74	191.52	0.001387	1.38	19.60	18.90	0.35
Rio Caffra	1	201	2016Borm+TR20rii	Finale	19.20	189.19	191.44	190.74	191.52	0.001384	1.38	19.61	18.90	0.35
Bormida	3	43	2016Borm+TR20rii	Attuale	1000.00	179.12	185.45	183.86	186.21	0.002245	3.99	349.67	192.09	0.55
Bormida	3	43	2016Borm+TR20rii	Lotto1A	1000.00	179.12	185.33	183.86	186.15	0.002488	4.14	327.08	188.49	0.58
Bormida	3	43	2016Borm+TR20rii	Lotto1B	1000.00	179.12	185.27	183.86	186.13	0.002610	4.21	316.58	184.94	0.59
Bormida	3	43	2016Borm+TR20rii	Lotto1C	1000.00	179.12	185.41	183.72	186.00	0.001969	3.50	368.76	190.61	0.51
Bormida	3	43	2016Borm+TR20rii	Finale	1000.00	179.12	185.30	183.62	185.82	0.001845	3.24	372.20	186.37	0.49

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Bormida	3	42.000*	2016Borm+TR20rii	Attuale	1000.00	179.09	185.44	183.80	186.13	0.002108	3.82	365.57	200.93	0.54
Bormida	3	42.000*	2016Borm+TR20rii	Lotto1A	1000.00	179.09	185.32	183.81	186.07	0.002355	3.97	340.86	197.83	0.56
Bormida	3	42.000*	2016Borm+TR20rii	Lotto1B	1000.00	179.09	185.26	183.81	186.05	0.002479	4.04	329.32	193.96	0.58
Bormida	3	42.000*	2016Borm+TR20rii	Lotto1C	1000.00	179.09	185.39		185.95	0.001894	3.40	379.64	198.98	0.50
Bormida	3	42.000*	2016Borm+TR20rii	Finale	1000.00	179.09	185.27		185.77	0.001793	3.17	380.81	194.47	0.48
Bormida	3	41.000*	2016Borm+TR20rii	Attuale	1000.00	179.06	185.43		186.07	0.002007	3.67	379.97	209.44	0.52
Bormida	3	41.000*	2016Borm+TR20rii	Lotto1A	1000.00	179.06	185.30	183.76	186.00	0.002261	3.82	352.86	207.03	0.55
Bormida	3	41.000*	2016Borm+TR20rii	Lotto1B	1000.00	179.06	185.24	183.76	185.97	0.002390	3.90	340.12	202.79	0.57
Bormida	3	41.000*	2016Borm+TR20rii	Lotto1C	1000.00	179.06	185.36		185.89	0.001838	3.31	389.58	208.03	0.49
Bormida	3	41.000*	2016Borm+TR20rii	Finale	1000.00	179.06	185.24		185.72	0.001757	3.11	388.51	203.06	0.48
Bormida	3	40.000*	2016Borm+TR20rii	Attuale	1000.00	179.04	185.41		186.00	0.001931	3.54	393.01	217.86	0.51
Bormida	3	40.000*	2016Borm+TR20rii	Lotto1A	1000.00	179.04	185.27	183.69	185.93	0.002197	3.70	363.20	216.03	0.54
Bormida	3	40.000*	2016Borm+TR20rii	Lotto1B	1000.00	179.04	185.21	183.69	185.90	0.002335	3.78	349.15	211.52	0.56
Bormida	3	40.000*	2016Borm+TR20rii	Lotto1C	1000.00	179.04	185.33		185.84	0.001797	3.24	398.64	217.07	0.49
Bormida	3	40.000*	2016Borm+TR20rii	Finale	1000.00	179.04	185.21		185.67	0.001734	3.05	395.37	211.69	0.47
Bormida	3	39.000*	2016Borm+TR20rii	Attuale	1000.00	179.01	185.39		185.95	0.001878	3.43	404.63	226.82	0.50
Bormida	3	39.000*	2016Borm+TR20rii	Lotto1A	1000.00	179.01	185.25	183.62	185.87	0.002154	3.60	372.10	222.51	0.53
Bormida	3	39.000*	2016Borm+TR20rii	Lotto1B	1000.00	179.01	185.18	183.62	185.83	0.002307	3.69	356.38	220.00	0.55
Bormida	3	39.000*	2016Borm+TR20rii	Lotto1C	1000.00	179.01	185.30		185.79	0.001769	3.17	406.74	225.96	0.48
Bormida	3	39.000*	2016Borm+TR20rii	Finale	1000.00	179.01	185.18		185.62	0.001722	3.01	401.26	220.14	0.47
Bormida	3	38.000*	2016Borm+TR20rii	Attuale	1000.00	178.98	185.37		185.89	0.001842	3.34	414.99	235.50	0.50
Bormida	3	38.000*	2016Borm+TR20rii	Lotto1A	1000.00	178.98	185.21		185.81	0.002130	3.51	379.32	229.68	0.53
Bormida	3	38.000*	2016Borm+TR20rii	Lotto1B	1000.00	178.98	185.14	183.55	185.77	0.002288	3.61	361.77	228.59	0.55
Bormida	3	38.000*	2016Borm+TR20rii	Lotto1C	1000.00	178.98	185.27		185.74	0.001754	3.12	413.87	234.55	0.48
Bormida	3	38.000*	2016Borm+TR20rii	Finale	1000.00	178.98	185.14		185.58	0.001712	2.97	406.02	228.71	0.47
Bormida	3	37	2016Borm+TR20rii	Attuale	1000.00	178.95	185.34		185.84	0.001809	3.26	424.05	244.30	0.49
Bormida	3	37	2016Borm+TR20rii	Lotto1A	1000.00	178.95	185.18		185.75	0.002106	3.45	384.92	238.23	0.53
Bormida	3	37	2016Borm+TR20rii	Lotto1B	1000.00	178.95	185.09	183.47	185.71	0.002282	3.55	365.08	237.26	0.55
Bormida	3	37	2016Borm+TR20rii	Lotto1C	1000.00	178.95	185.24		185.69	0.001725	3.07	420.32	242.21	0.47
Bormida	3	37	2016Borm+TR20rii	Finale	1000.00	178.95	185.10		185.53	0.001705	2.93	409.89	237.41	0.47
Bormida	2	35	2016Borm+TR20rii	Attuale	1000.00	178.59	185.17		185.78	0.001865	3.58	393.81	232.85	0.50
Bormida	2	35	2016Borm+TR20rii	Lotto1A	1000.00	178.59	185.08	183.40	185.69	0.002127	3.56	373.42	230.97	0.53
Bormida	2	35	2016Borm+TR20rii	Lotto1B	1000.00	178.59	185.08		185.64	0.001819	3.39	387.68	230.98	0.49
Bormida	2	35	2016Borm+TR20rii	Lotto1C	1000.00	178.59	185.08	183.28	185.64	0.001819	3.39	387.67	230.98	0.49
Bormida	2	35	2016Borm+TR20rii	Finale	1000.00	178.59	184.99	183.20	185.48	0.001703	3.15	389.09	230.02	0.47
Bormida	2	34.000*	2016Borm+TR20rii	Attuale	1000.00	178.53	185.13		185.73	0.001849	3.57	398.46	224.71	0.50
Bormida	2	34.000*	2016Borm+TR20rii	Lotto1A	1000.00	178.53	185.04		185.63	0.002046	3.52	381.18	222.33	0.52
Bormida	2	34.000*	2016Borm+TR20rii	Lotto1B	1000.00	178.53	185.04		185.59	0.001775	3.37	394.81	222.37	0.49
Bormida	2	34.000*	2016Borm+TR20rii	Lotto1C	1000.00	178.53	185.04	183.23	185.59	0.001775	3.37	394.80	222.37	0.49
Bormida	2	34.000*	2016Borm+TR20rii	Finale	1000.00	178.53	184.96	183.13	185.43	0.001643	3.12	398.11	221.38	0.46

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Bormida	2	33.000*	2016Borm+TR20rii	Attuale	1000.00	178.46	185.09		185.69	0.001834	3.56	403.01	218.78	0.50
Bormida	2	33.000*	2016Borm+TR20rii	Lotto1A	1000.00	178.46	184.98		185.58	0.002120	3.56	379.32	216.78	0.53
Bormida	2	33.000*	2016Borm+TR20rii	Lotto1B	1000.00	178.46	185.01		185.54	0.001734	3.35	401.59	217.34	0.48
Bormida	2	33.000*	2016Borm+TR20rii	Lotto1C	1000.00	178.46	185.01	183.17	185.54	0.001734	3.35	401.59	217.33	0.48
Bormida	2	33.000*	2016Borm+TR20rii	Finale	1000.00	178.46	184.93	183.06	185.39	0.001587	3.09	406.52	214.25	0.46
Bormida	2	32.000*	2016Borm+TR20rii	Attuale	1000.00	178.40	185.06		185.64	0.001819	3.55	407.28	212.51	0.50
Bormida	2	32.000*	2016Borm+TR20rii	Lotto1A	1000.00	178.40	184.94		185.52	0.002039	3.52	386.87	209.58	0.52
Bormida	2	32.000*	2016Borm+TR20rii	Lotto1B	1000.00	178.40	184.97		185.50	0.001696	3.33	408.26	210.30	0.48
Bormida	2	32.000*	2016Borm+TR20rii	Lotto1C	1000.00	178.40	184.97	183.12	185.50	0.001696	3.33	408.25	210.30	0.48
Bormida	2	32.000*	2016Borm+TR20rii	Finale	1000.00	178.40	184.90	183.00	185.35	0.001534	3.06	414.99	208.73	0.45
Bormida	2	31.000*	2016Borm+TR20rii	Attuale	1000.00	178.33	185.02		185.60	0.001804	3.54	412.15	212.50	0.49
Bormida	2	31.000*	2016Borm+TR20rii	Lotto1A	1000.00	178.33	184.92		185.46	0.001811	3.40	404.33	208.53	0.49
Bormida	2	31.000*	2016Borm+TR20rii	Lotto1B	1000.00	178.33	184.94		185.45	0.001661	3.31	415.02	209.08	0.47
Bormida	2	31.000*	2016Borm+TR20rii	Lotto1C	1000.00	178.33	184.94	183.07	185.45	0.001661	3.31	414.57	203.02	0.47
Bormida	2	31.000*	2016Borm+TR20rii	Finale	1000.00	178.33	184.87	182.93	185.31	0.001484	3.03	423.14	202.34	0.44
Bormida	2	30.000*	2016Borm+TR20rii	Attuale	1000.00	178.27	184.98		185.55	0.001788	3.53	418.98	219.48	0.49
Bormida	2	30.000*	2016Borm+TR20rii	Lotto1A	1000.00	178.27	184.91	183.02	185.41	0.001630	3.29	418.89	192.01	0.47
Bormida	2	30.000*	2016Borm+TR20rii	Lotto1B	1000.00	178.27	184.91	183.02	185.41	0.001630	3.29	418.89	192.01	0.47
Bormida	2	30.000*	2016Borm+TR20rii	Lotto1C	1000.00	178.27	184.91	183.02	185.41	0.001630	3.29	418.89	192.01	0.47
Bormida	2	30.000*	2016Borm+TR20rii	Finale	1000.00	178.27	184.84	182.86	185.27	0.001439	3.00	429.65	191.50	0.44
Bormida	2	29.000*	2016Borm+TR20rii	Attuale	1000.00	178.20	184.95		185.50	0.001762	3.51	431.42	236.13	0.49
Bormida	2	29.000*	2016Borm+TR20rii	Lotto1A	1000.00	178.20	184.87	182.96	185.37	0.001608	3.27	420.40	181.29	0.46
Bormida	2	29.000*	2016Borm+TR20rii	Lotto1B	1000.00	178.20	184.87	182.96	185.37	0.001608	3.27	420.40	181.29	0.46
Bormida	2	29.000*	2016Borm+TR20rii	Lotto1C	1000.00	178.20	184.87	182.96	185.37	0.001608	3.27	420.40	181.29	0.46
Bormida	2	29.000*	2016Borm+TR20rii	Finale	1000.00	178.20	184.81	182.80	185.23	0.001401	2.98	433.36	180.73	0.43
Bormida	2	28	2016Borm+TR20rii	Attuale	1000.00	178.14	184.92		185.45	0.001712	3.46	447.86	231.69	0.48
Bormida	2	28	2016Borm+TR20rii	Lotto1A	1000.00	178.14	184.84	182.91	185.33	0.001593	3.26	420.20	170.37	0.46
Bormida	2	28	2016Borm+TR20rii	Lotto1B	1000.00	178.14	184.84	182.91	185.33	0.001593	3.26	420.20	170.37	0.46
Bormida	2	28	2016Borm+TR20rii	Lotto1C	1000.00	178.14	184.84	182.91	185.33	0.001593	3.26	420.20	170.37	0.46
Bormida	2	28	2016Borm+TR20rii	Finale	1000.00	178.14	184.78	182.74	185.20	0.001368	2.95	435.38	169.79	0.43
Bormida	2	27.000*	2016Borm+TR20rii	Attuale	1000.00	178.10	184.83		185.41	0.001793	3.55	417.40	209.76	0.49
Bormida	2	27.000*	2016Borm+TR20rii	Lotto1A	1000.00	178.10	184.78	182.85	185.29	0.001624	3.30	399.76	157.63	0.47
Bormida	2	27.000*	2016Borm+TR20rii	Lotto1B	1000.00	178.10	184.78	182.85	185.29	0.001624	3.30	399.76	157.63	0.47
Bormida	2	27.000*	2016Borm+TR20rii	Lotto1C	1000.00	178.10	184.78	182.85	185.29	0.001624	3.30	399.76	157.63	0.47
Bormida	2	27.000*	2016Borm+TR20rii	Finale	1000.00	178.10	184.73	182.67	185.16	0.001385	2.98	415.50	157.08	0.43
Bormida	2	26.000*	2016Borm+TR20rii	Attuale	1000.00	178.05	184.75		185.36	0.001850	3.62	391.40	186.28	0.50
Bormida	2	26.000*	2016Borm+TR20rii	Lotto1A	1000.00	178.05	184.72	182.78	185.25	0.001624	3.31	383.78	143.06	0.47
Bormida	2	26.000*	2016Borm+TR20rii	Lotto1B	1000.00	178.05	184.72	182.78	185.25	0.001624	3.31	383.78	143.06	0.47
Bormida	2	26.000*	2016Borm+TR20rii	Lotto1C	1000.00	178.05	184.72	182.78	185.25	0.001624	3.31	383.78	143.06	0.47

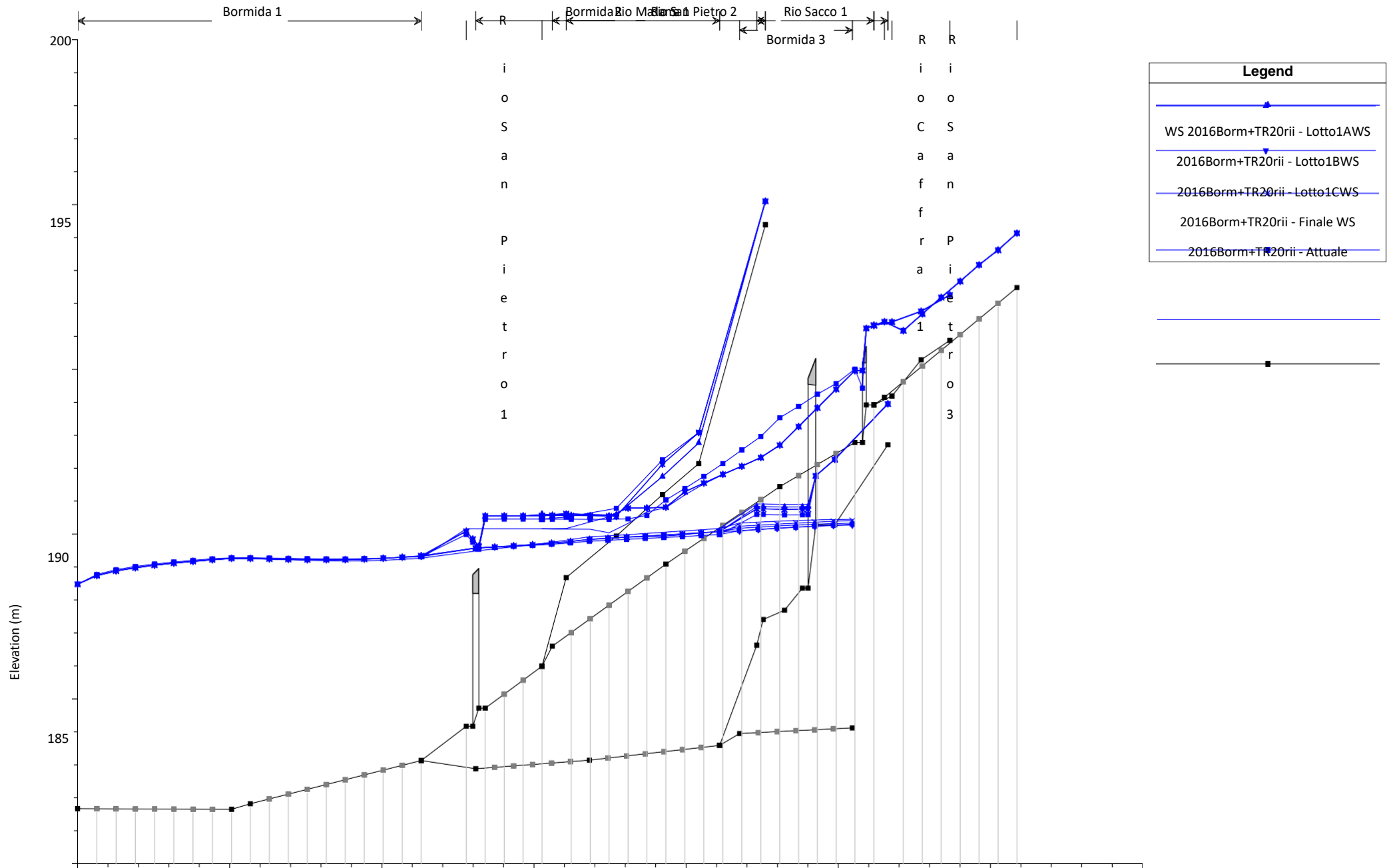
River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	2	26.000*	2016Borm+TR20rii	Finale	1000.00	178.05	184.69	182.61	185.13	0.001381	2.99	399.98	142.41	0.43
Bormida	2	25.000*	2016Borm+TR20rii	Attuale	1000.00	178.01	184.68		185.31	0.001869	3.66	370.92	161.50	0.51
Bormida	2	25.000*	2016Borm+TR20rii	Lotto1A	1000.00	178.01	184.68	182.69	185.21	0.001594	3.30	372.29	126.71	0.46
Bormida	2	25.000*	2016Borm+TR20rii	Lotto1B	1000.00	178.01	184.68	182.69	185.21	0.001594	3.30	372.29	126.71	0.46
Bormida	2	25.000*	2016Borm+TR20rii	Lotto1C	1000.00	178.01	184.68	182.69	185.21	0.001594	3.30	372.29	126.71	0.46
Bormida	2	25.000*	2016Borm+TR20rii	Finale	1000.00	178.01	184.66	182.53	185.09	0.001351	2.97	389.57	124.99	0.43
Bormida	2	24.000*	2016Borm+TR20rii	Attuale	1000.00	177.97	184.62		185.26	0.001877	3.69	353.41	139.58	0.51
Bormida	2	24.000*	2016Borm+TR20rii	Lotto1A	1000.00	177.97	184.65	182.61	185.17	0.001554	3.28	363.76	113.79	0.46
Bormida	2	24.000*	2016Borm+TR20rii	Lotto1B	1000.00	177.97	184.65	182.61	185.17	0.001554	3.28	363.76	113.79	0.46
Bormida	2	24.000*	2016Borm+TR20rii	Lotto1C	1000.00	177.97	184.65	182.61	185.17	0.001554	3.28	363.76	113.79	0.46
Bormida	2	24.000*	2016Borm+TR20rii	Finale	1000.00	177.97	184.63	182.45	185.06	0.001314	2.95	382.64	112.43	0.42
Bormida	2	23.000*	2016Borm+TR20rii	Attuale	1000.00	177.92	184.55		185.21	0.001884	3.72	337.28	119.92	0.51
Bormida	2	23.000*	2016Borm+TR20rii	Lotto1A	1000.00	177.92	184.61	182.51	185.13	0.001511	3.25	356.60	103.71	0.45
Bormida	2	23.000*	2016Borm+TR20rii	Lotto1B	1000.00	177.92	184.61	182.51	185.13	0.001511	3.25	356.60	103.71	0.45
Bormida	2	23.000*	2016Borm+TR20rii	Lotto1C	1000.00	177.92	184.61	182.51	185.13	0.001511	3.25	356.60	103.71	0.45
Bormida	2	23.000*	2016Borm+TR20rii	Finale	1000.00	177.92	184.60	182.37	185.02	0.001274	2.92	377.40	102.93	0.42
Bormida	2	22	2016Borm+TR20rii	Attuale	1000.00	177.88	184.49		185.16	0.001885	3.75	322.22	101.15	0.51
Bormida	2	22	2016Borm+TR20rii	Lotto1A	1000.00	177.88	184.58	182.42	185.09	0.001466	3.22	349.96	94.67	0.45
Bormida	2	22	2016Borm+TR20rii	Lotto1B	1000.00	177.88	184.58	182.42	185.09	0.001466	3.22	349.96	94.67	0.45
Bormida	2	22	2016Borm+TR20rii	Lotto1C	1000.00	177.88	184.58	182.42	185.09	0.001466	3.22	349.96	94.67	0.45
Bormida	2	22	2016Borm+TR20rii	Finale	1000.00	177.88	184.57	182.27	184.99	0.001232	2.89	372.95	94.66	0.41
Bormida	1	19	2016Borm+TR20rii	Attuale	1000.00	178.13	184.27		185.01	0.002210	3.85	291.27	106.28	0.54
Bormida	1	19	2016Borm+TR20rii	Lotto1A	1000.00	178.13	184.34	182.53	184.95	0.002037	3.48	288.52	62.96	0.51
Bormida	1	19	2016Borm+TR20rii	Lotto1B	1000.00	178.13	184.34	182.53	184.95	0.002037	3.48	288.52	62.96	0.51
Bormida	1	19	2016Borm+TR20rii	Lotto1C	1000.00	178.13	184.34	182.53	184.95	0.002037	3.48	288.52	62.96	0.51
Bormida	1	19	2016Borm+TR20rii	Finale	1000.00	178.13	184.32	182.51	184.87	0.001787	3.33	316.55	72.52	0.49
Bormida	1	18.000*	2016Borm+TR20rii	Attuale	1000.00	177.98	184.24		184.95	0.002125	3.77	292.13	105.94	0.54
Bormida	1	18.000*	2016Borm+TR20rii	Lotto1A	1000.00	177.98	184.30	182.48	184.90	0.001979	3.44	293.96	72.72	0.51
Bormida	1	18.000*	2016Borm+TR20rii	Lotto1B	1000.00	177.98	184.30	182.48	184.90	0.001979	3.44	293.96	72.72	0.51
Bormida	1	18.000*	2016Borm+TR20rii	Lotto1C	1000.00	177.98	184.30	182.48	184.90	0.001979	3.44	293.96	72.72	0.51
Bormida	1	18.000*	2016Borm+TR20rii	Finale	1000.00	177.98	184.30	182.45	184.82	0.001684	3.24	326.98	77.60	0.48
Bormida	1	17.000*	2016Borm+TR20rii	Attuale	1000.00	177.84	184.21		184.89	0.002000	3.67	298.22	111.93	0.52
Bormida	1	17.000*	2016Borm+TR20rii	Lotto1A	1000.00	177.84	184.27	182.41	184.85	0.001876	3.38	303.98	84.64	0.50
Bormida	1	17.000*	2016Borm+TR20rii	Lotto1B	1000.00	177.84	184.27	182.41	184.85	0.001876	3.38	303.98	84.64	0.50
Bormida	1	17.000*	2016Borm+TR20rii	Lotto1C	1000.00	177.84	184.27	182.41	184.85	0.001876	3.38	303.98	84.64	0.50
Bormida	1	17.000*	2016Borm+TR20rii	Finale	1000.00	177.84	184.27	182.37	184.77	0.001573	3.16	340.04	86.46	0.46
Bormida	1	16.000*	2016Borm+TR20rii	Attuale	1000.00	177.69	184.19		184.83	0.001839	3.54	310.58	117.27	0.50
Bormida	1	16.000*	2016Borm+TR20rii	Lotto1A	1000.00	177.69	184.24	182.32	184.79	0.001744	3.30	319.18	107.61	0.48
Bormida	1	16.000*	2016Borm+TR20rii	Lotto1B	1000.00	177.69	184.24	182.32	184.79	0.001744	3.30	319.18	107.61	0.48

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Bormida	1	16.000*	2016Borm+TR20rii	Lotto1C	1000.00	177.69	184.24	182.32	184.79	0.001744	3.30	319.18	107.61	0.48
Bormida	1	16.000*	2016Borm+TR20rii	Finale	1000.00	177.69	184.26	182.26	184.73	0.001451	3.06	356.90	107.73	0.44
Bormida	1	15.000*	2016Borm+TR20rii	Attuale	1000.00	177.55	184.19		184.77	0.001659	3.40	332.73	163.74	0.48
Bormida	1	15.000*	2016Borm+TR20rii	Lotto1A	1000.00	177.55	184.22	182.20	184.74	0.001587	3.20	343.73	163.96	0.46
Bormida	1	15.000*	2016Borm+TR20rii	Lotto1B	1000.00	177.55	184.22	182.20	184.74	0.001587	3.20	343.73	163.96	0.46
Bormida	1	15.000*	2016Borm+TR20rii	Lotto1C	1000.00	177.55	184.22	182.20	184.74	0.001587	3.20	343.73	163.96	0.46
Bormida	1	15.000*	2016Borm+TR20rii	Finale	1000.00	177.55	184.25	182.13	184.68	0.001311	2.95	383.22	167.00	0.42
Bormida	1	14.000*	2016Borm+TR20rii	Attuale	1000.00	177.40	184.19		184.71	0.001456	3.22	369.93	182.51	0.45
Bormida	1	14.000*	2016Borm+TR20rii	Lotto1A	1000.00	177.40	184.22	182.06	184.69	0.001403	3.07	379.84	181.52	0.44
Bormida	1	14.000*	2016Borm+TR20rii	Lotto1B	1000.00	177.40	184.22	182.06	184.69	0.001403	3.07	379.84	181.52	0.44
Bormida	1	14.000*	2016Borm+TR20rii	Lotto1C	1000.00	177.40	184.22	182.06	184.69	0.001403	3.07	379.84	181.52	0.44
Bormida	1	14.000*	2016Borm+TR20rii	Finale	1000.00	177.40	184.25	181.96	184.64	0.001140	2.79	420.52	182.62	0.40
Bormida	1	13.000*	2016Borm+TR20rii	Attuale	1000.00	177.26	184.20		184.66	0.001253	3.03	413.62	201.03	0.42
Bormida	1	13.000*	2016Borm+TR20rii	Lotto1A	1000.00	177.26	184.22	181.90	184.64	0.001215	2.91	421.36	202.67	0.41
Bormida	1	13.000*	2016Borm+TR20rii	Lotto1B	1000.00	177.26	184.22	181.90	184.64	0.001215	2.91	421.36	202.67	0.41
Bormida	1	13.000*	2016Borm+TR20rii	Lotto1C	1000.00	177.26	184.22	181.90	184.64	0.001215	2.91	421.36	202.67	0.41
Bormida	1	13.000*	2016Borm+TR20rii	Finale	1000.00	177.26	184.25	181.78	184.60	0.000981	2.63	462.09	203.27	0.37
Bormida	1	12.000*	2016Borm+TR20rii	Attuale	1000.00	177.11	184.22		184.61	0.001057	2.83	463.81	209.11	0.39
Bormida	1	12.000*	2016Borm+TR20rii	Lotto1A	1000.00	177.11	184.23		184.60	0.001026	2.74	470.32	209.90	0.38
Bormida	1	12.000*	2016Borm+TR20rii	Lotto1B	1000.00	177.11	184.23		184.60	0.001026	2.74	470.32	209.90	0.38
Bormida	1	12.000*	2016Borm+TR20rii	Lotto1C	1000.00	177.11	184.23	181.71	184.60	0.001026	2.74	470.32	209.90	0.38
Bormida	1	12.000*	2016Borm+TR20rii	Finale	1000.00	177.11	184.26	181.58	184.56	0.000830	2.47	509.18	210.25	0.34
Bormida	1	11.000*	2016Borm+TR20rii	Attuale	1000.00	176.97	184.24		184.57	0.000885	2.63	517.93	215.08	0.35
Bormida	1	11.000*	2016Borm+TR20rii	Lotto1A	1000.00	176.97	184.25		184.56	0.000854	2.56	524.35	215.55	0.35
Bormida	1	11.000*	2016Borm+TR20rii	Lotto1B	1000.00	176.97	184.25		184.56	0.000854	2.56	524.35	215.55	0.35
Bormida	1	11.000*	2016Borm+TR20rii	Lotto1C	1000.00	176.97	184.25	181.50	184.56	0.000854	2.56	524.35	215.55	0.35
Bormida	1	11.000*	2016Borm+TR20rii	Finale	1000.00	176.97	184.27	181.36	184.53	0.000697	2.31	560.36	216.29	0.31
Bormida	1	10	2016Borm+TR20rii	Attuale	1000.00	176.82	184.25		184.53	0.000738	2.44	575.36	221.97	0.33
Bormida	1	10	2016Borm+TR20rii	Lotto1A	1000.00	176.82	184.26		184.52	0.000706	2.39	582.85	222.08	0.32
Bormida	1	10	2016Borm+TR20rii	Lotto1B	1000.00	176.82	184.26		184.52	0.000706	2.39	582.85	222.08	0.32
Bormida	1	10	2016Borm+TR20rii	Lotto1C	1000.00	176.82	184.26	181.23	184.52	0.000706	2.39	582.85	222.08	0.32
Bormida	1	10	2016Borm+TR20rii	Finale	1000.00	176.82	184.28	181.10	184.50	0.000583	2.15	615.29	222.55	0.29
Bormida	1	9	2016Borm+TR20rii	Attuale	1000.00	176.65	184.26		184.51	0.000623	2.31	600.02	218.52	0.30
Bormida	1	9	2016Borm+TR20rii	Lotto1A	1000.00	176.65	184.26		184.50	0.000594	2.27	607.68	218.58	0.29
Bormida	1	9	2016Borm+TR20rii	Lotto1B	1000.00	176.65	184.26		184.50	0.000594	2.27	607.68	218.58	0.29
Bormida	1	9	2016Borm+TR20rii	Lotto1C	1000.00	176.65	184.26		184.50	0.000594	2.27	607.68	218.58	0.29
Bormida	1	9	2016Borm+TR20rii	Finale	1000.00	176.65	184.28		184.48	0.000503	2.05	639.34	218.87	0.27
Bormida	1	8.0000*	2016Borm+TR20rii	Attuale	1000.00	176.65	184.22		184.49	0.000695	2.42	584.24	220.88	0.32
Bormida	1	8.0000*	2016Borm+TR20rii	Lotto1A	1000.00	176.65	184.22		184.48	0.000665	2.38	590.90	220.98	0.31

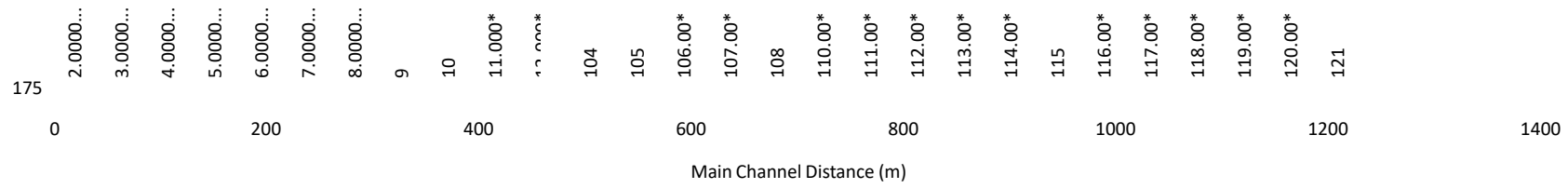
River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	1	8.0000*	2016Borm+TR20rii	Lotto1B	1000.00	176.65	184.22		184.48	0.000665	2.38	590.90	220.98	0.31
Bormida	1	8.0000*	2016Borm+TR20rii	Lotto1C	1000.00	176.65	184.22		184.48	0.000665	2.38	590.90	220.98	0.31
Bormida	1	8.0000*	2016Borm+TR20rii	Finale	1000.00	176.65	184.25		184.47	0.000566	2.17	620.09	221.79	0.28
Bormida	1	7.0000*	2016Borm+TR20rii	Attuale	1000.00	176.66	184.17		184.47	0.000786	2.55	567.43	228.58	0.33
Bormida	1	7.0000*	2016Borm+TR20rii	Lotto1A	1000.00	176.66	184.17		184.46	0.000756	2.51	573.23	228.92	0.33
Bormida	1	7.0000*	2016Borm+TR20rii	Lotto1B	1000.00	176.66	184.17		184.46	0.000756	2.51	573.23	228.92	0.33
Bormida	1	7.0000*	2016Borm+TR20rii	Lotto1C	1000.00	176.66	184.17		184.46	0.000756	2.51	573.23	228.92	0.33
Bormida	1	7.0000*	2016Borm+TR20rii	Finale	1000.00	176.66	184.20		184.45	0.000646	2.30	600.31	230.91	0.30
Bormida	1	6.0000*	2016Borm+TR20rii	Attuale	1000.00	176.66	184.11		184.44	0.000895	2.69	550.02	234.56	0.36
Bormida	1	6.0000*	2016Borm+TR20rii	Lotto1A	1000.00	176.66	184.12		184.44	0.000865	2.66	555.03	234.65	0.35
Bormida	1	6.0000*	2016Borm+TR20rii	Lotto1B	1000.00	176.66	184.12		184.44	0.000865	2.66	555.03	234.65	0.35
Bormida	1	6.0000*	2016Borm+TR20rii	Lotto1C	1000.00	176.66	184.12		184.44	0.000865	2.66	555.03	234.65	0.35
Bormida	1	6.0000*	2016Borm+TR20rii	Finale	1000.00	176.66	184.15		184.43	0.000743	2.45	579.96	234.71	0.32
Bormida	1	5.0000*	2016Borm+TR20rii	Attuale	1000.00	176.66	184.05		184.41	0.001025	2.84	531.67	236.19	0.38
Bormida	1	5.0000*	2016Borm+TR20rii	Lotto1A	1000.00	176.66	184.06		184.41	0.000995	2.81	535.89	236.26	0.37
Bormida	1	5.0000*	2016Borm+TR20rii	Lotto1B	1000.00	176.66	184.06		184.41	0.000995	2.81	535.89	236.26	0.37
Bormida	1	5.0000*	2016Borm+TR20rii	Lotto1C	1000.00	176.66	184.06		184.41	0.000995	2.81	535.89	236.26	0.37
Bormida	1	5.0000*	2016Borm+TR20rii	Finale	1000.00	176.66	184.09		184.41	0.000866	2.62	558.14	236.77	0.35
Bormida	1	4.0000*	2016Borm+TR20rii	Attuale	1000.00	176.66	183.97		184.38	0.001194	3.03	510.68	237.85	0.41
Bormida	1	4.0000*	2016Borm+TR20rii	Lotto1A	1000.00	176.66	183.98		184.38	0.001165	3.00	514.10	237.96	0.40
Bormida	1	4.0000*	2016Borm+TR20rii	Lotto1B	1000.00	176.66	183.98		184.38	0.001165	3.00	514.10	237.96	0.40
Bormida	1	4.0000*	2016Borm+TR20rii	Lotto1C	1000.00	176.66	183.98		184.38	0.001165	3.00	514.10	237.96	0.40
Bormida	1	4.0000*	2016Borm+TR20rii	Finale	1000.00	176.66	184.02		184.38	0.001030	2.82	533.50	238.81	0.38
Bormida	1	3.0000*	2016Borm+TR20rii	Attuale	1000.00	176.67	183.88		184.34	0.001426	3.25	485.19	239.48	0.44
Bormida	1	3.0000*	2016Borm+TR20rii	Lotto1A	1000.00	176.67	183.88		184.34	0.001400	3.23	487.84	239.62	0.44
Bormida	1	3.0000*	2016Borm+TR20rii	Lotto1B	1000.00	176.67	183.88		184.34	0.001400	3.23	487.84	239.62	0.44
Bormida	1	3.0000*	2016Borm+TR20rii	Lotto1C	1000.00	176.67	183.88		184.34	0.001400	3.23	487.84	239.62	0.44
Bormida	1	3.0000*	2016Borm+TR20rii	Finale	1000.00	176.67	183.92		184.34	0.001266	3.08	503.86	241.01	0.42
Bormida	1	2.0000*	2016Borm+TR20rii	Attuale	1000.00	176.67	183.74		184.29	0.001785	3.54	450.44	240.48	0.49
Bormida	1	2.0000*	2016Borm+TR20rii	Lotto1A	1000.00	176.67	183.74		184.29	0.001764	3.53	452.27	240.67	0.49
Bormida	1	2.0000*	2016Borm+TR20rii	Lotto1B	1000.00	176.67	183.74		184.29	0.001764	3.53	452.27	240.67	0.49
Bormida	1	2.0000*	2016Borm+TR20rii	Lotto1C	1000.00	176.67	183.74		184.29	0.001764	3.53	452.27	240.67	0.49
Bormida	1	2.0000*	2016Borm+TR20rii	Finale	1000.00	176.67	183.77		184.30	0.001649	3.43	463.52	242.69	0.47
Bormida	1	1	2016Borm+TR20rii	Attuale	1000.00	176.67	183.48	182.52	184.22	0.002505	4.05	387.98	236.19	0.57
Bormida	1	1	2016Borm+TR20rii	Lotto1A	1000.00	176.67	183.48	182.45	184.22	0.002503	4.05	388.18	236.30	0.57
Bormida	1	1	2016Borm+TR20rii	Lotto1B	1000.00	176.67	183.48	182.45	184.22	0.002503	4.05	388.18	236.30	0.57
Bormida	1	1	2016Borm+TR20rii	Lotto1C	1000.00	176.67	183.48	182.45	184.22	0.002503	4.05	388.18	236.30	0.57
Bormida	1	1	2016Borm+TR20rii	Finale	1000.00	176.67	183.48	182.51	184.22	0.002505	4.05	387.99	236.20	0.57

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02



180



1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

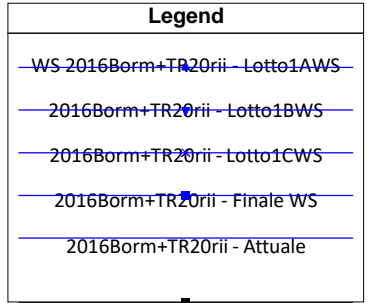
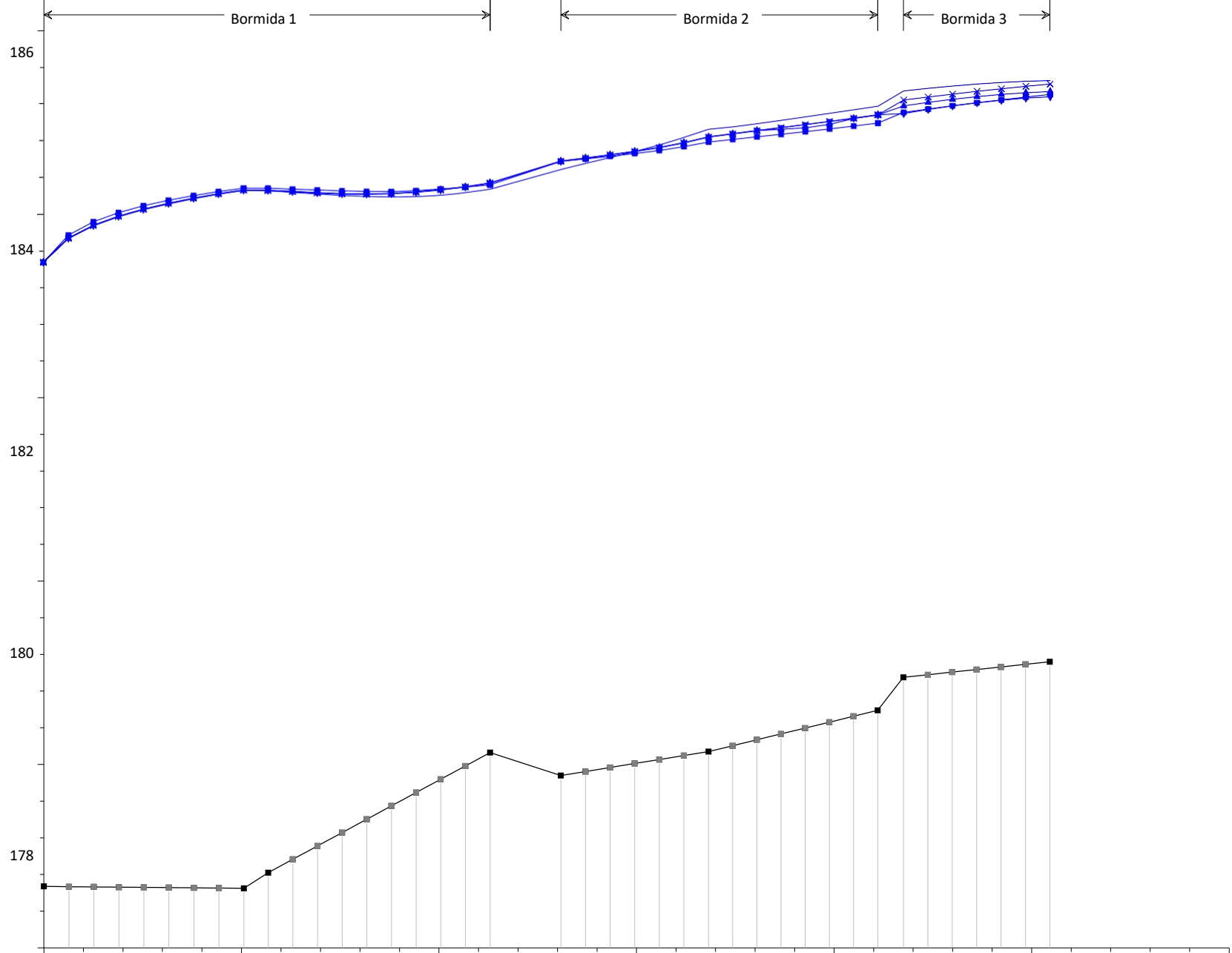
Geom: Finale_rev02

Bormida 1

Bormida 2

Bormida 3

Elevation (m)



176

2.0000...
3.0000...
4.0000...
5.0000...
6.0000...
7.0000...
8.0000...

9

10

11.000*
12.000*
13.000*

22

23.000*
24.000*
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28

29.000*
30.000*
31.000*

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33.000*

34.000*

35

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200

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600

800

1000

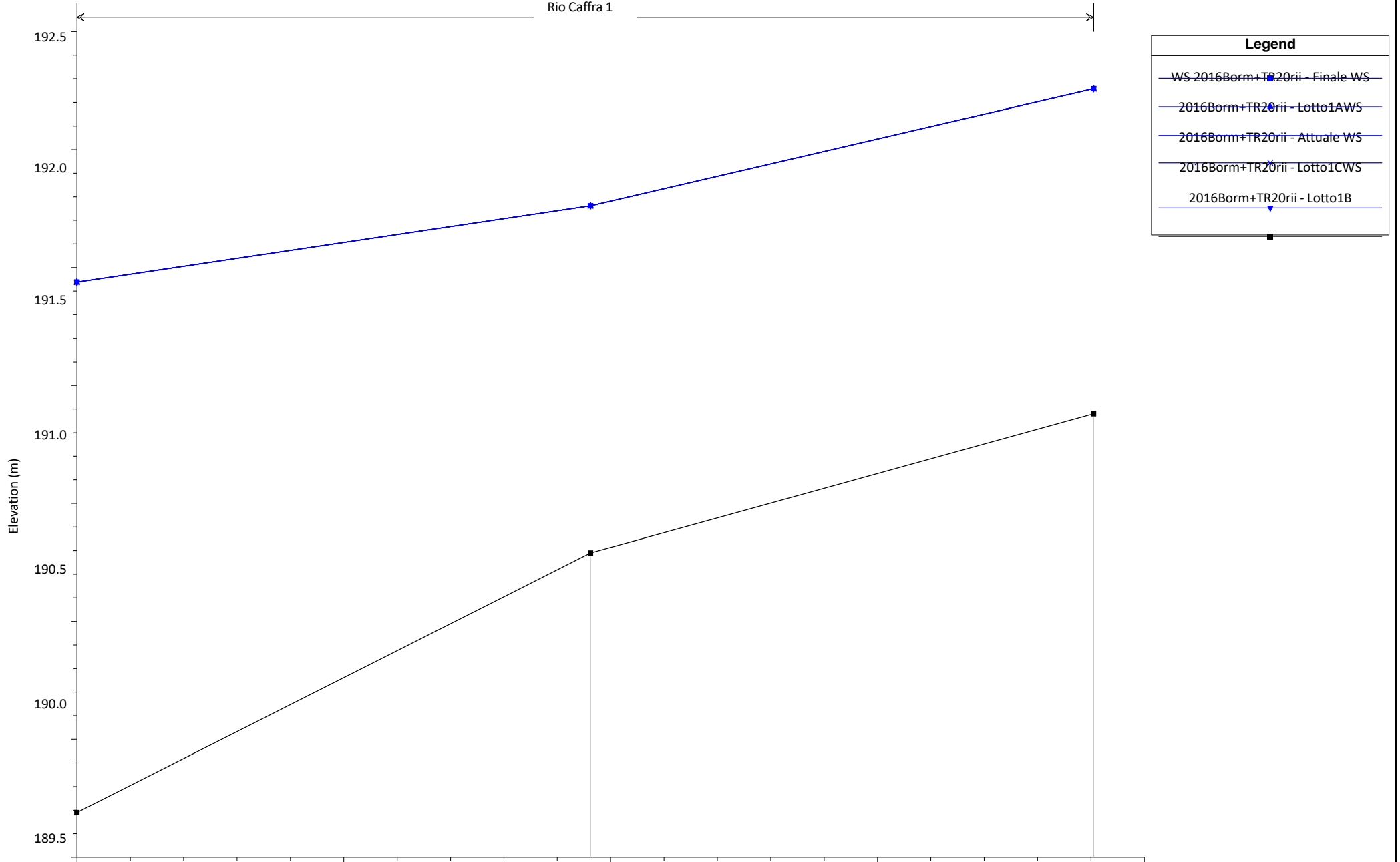
1200

Main Channel Distance (m)

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02

Rio Caffra 1



189.0

0

20

203

40

60

205

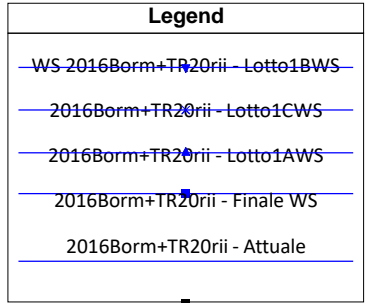
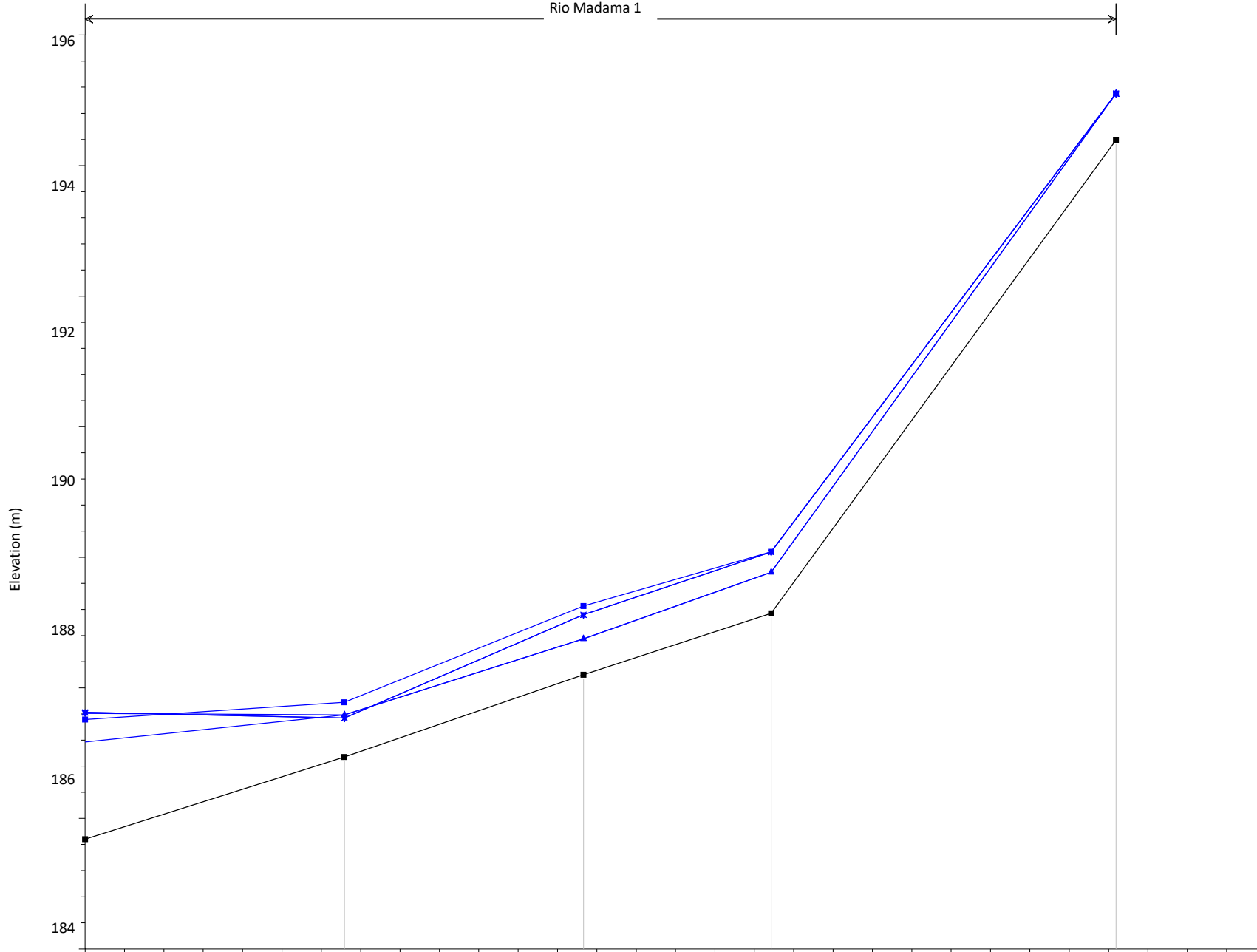
80

Main Channel Distance (m)

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02

Rio Madama 1



182

402

403

404

405

0

50

100

150

200

250

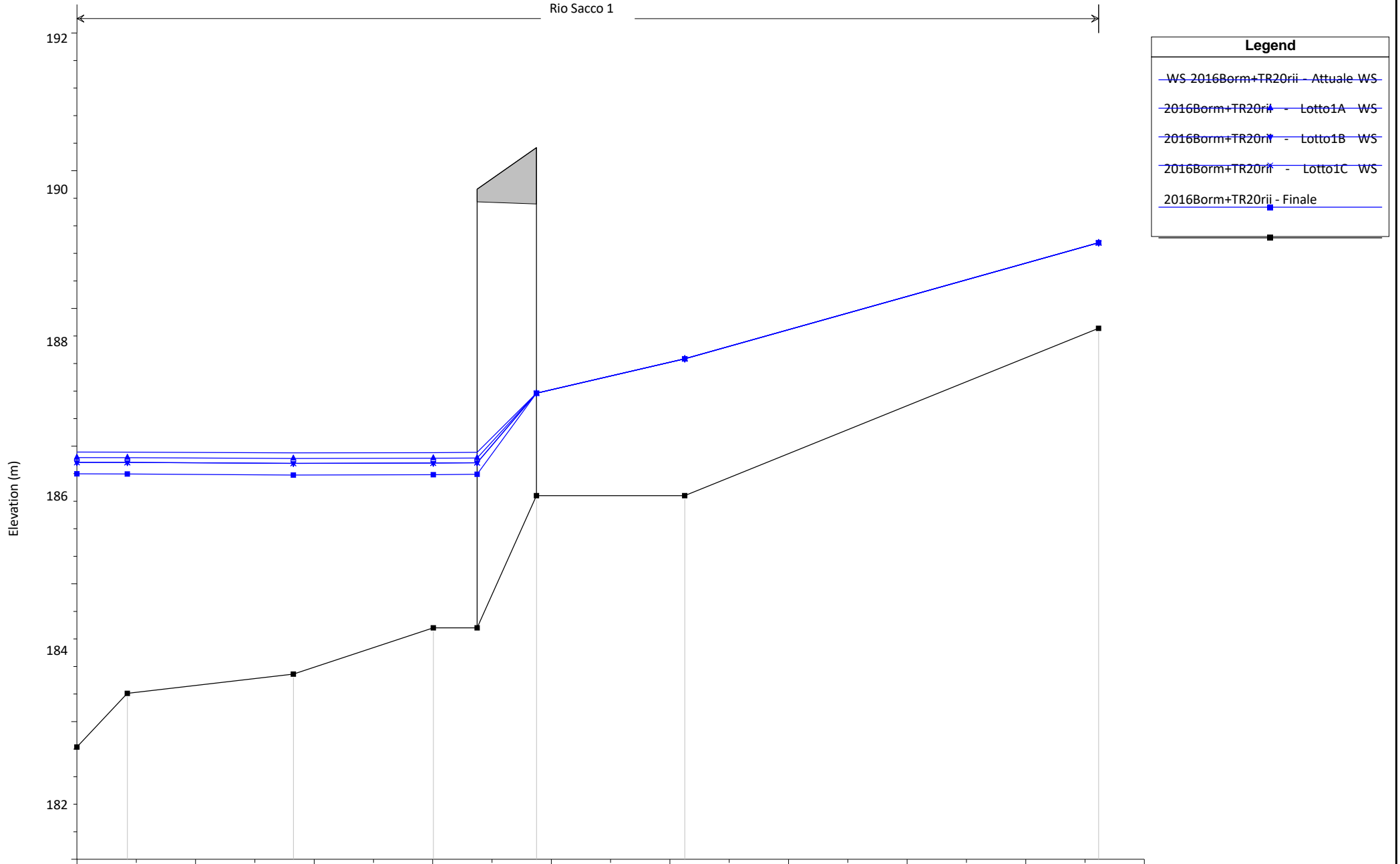
300

Main Channel Distance (m)

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02

Rio Sacco 1



180

302

303

304

304.5

305

306

0

20

40

60

80

100

120

140

160

180

Main Channel Distance (m)

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02

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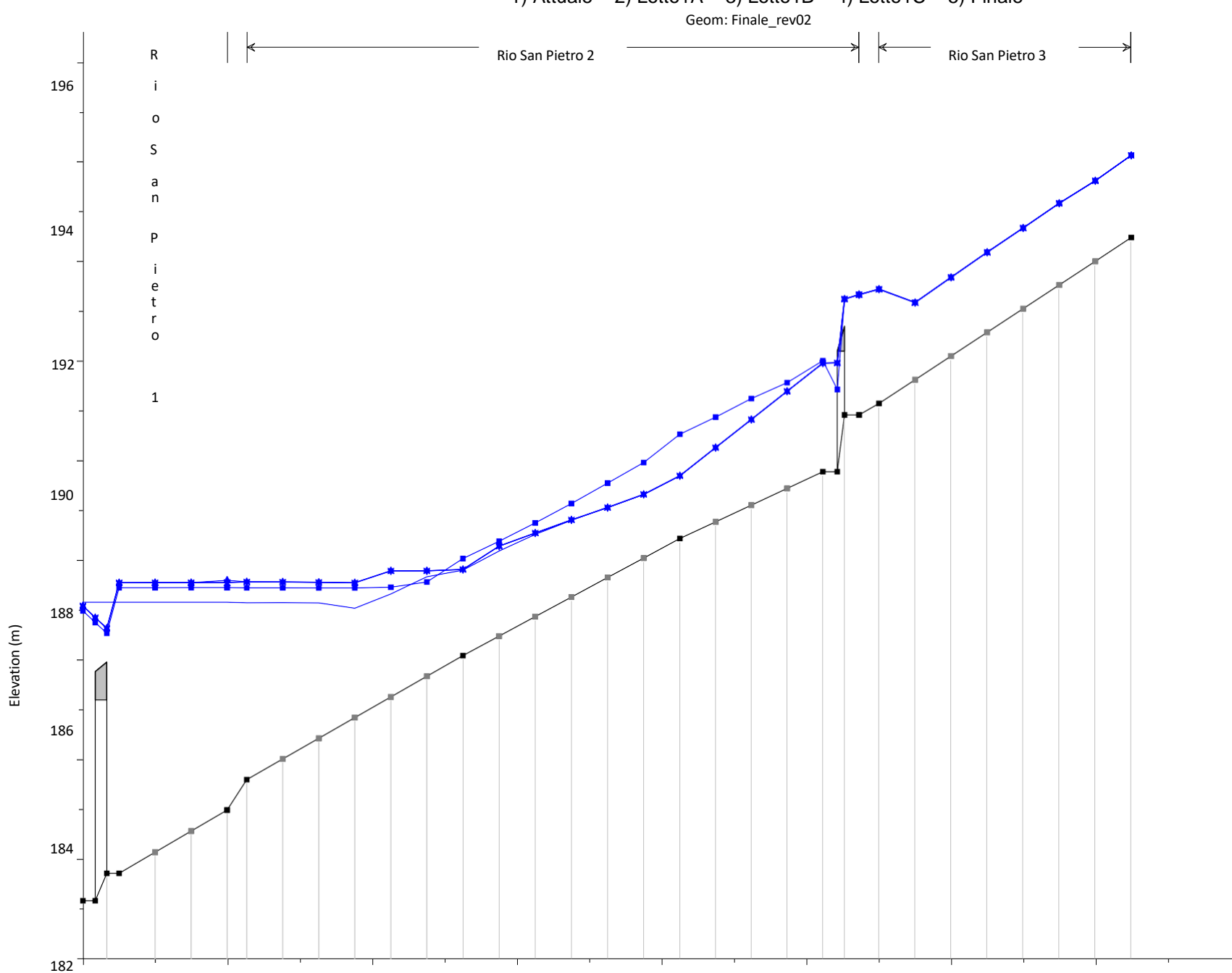
1

Rio San Pietro 2

Rio San Pietro 3

Legend

- WS 2016Borm+TR20rii - Attuale WS
- 2016Borm+TR20rii - Lotto1A WS
- 2016Borm+TR20rii - Lotto1B WS
- 2016Borm+TR20rii - Lotto1C WS
- 2016Borm+TR20rii - Finale



180

178

0 100 200 300 400 500 600 700 800

Main Channel Distance (m)

104.5

106.00*

107.00*

108

110.00*

111.00*

112.00*

113.00*

114.00*

115

116.00*

117.00*

118.00*

119.00*

120.00*

121

122.00*

123.00*

124.00*

125

126

127

128.00*

129.00*

130.00*

131.00*

132.00*

133.00*

134

INTERVENTO CODICE AT_A18_622_19_102 – PROGETTO PER LAVORI DI ADEGUAMENTO SEZIONI DI DEFLUSSO FOSSI COLATORI PROVENIENTI DA VERSANTI IN GIARONETTO - ADEGUAMENTO DEI TRATTI DEL FIUME BORMIDA E DEL RIO SAN PIETRO IN CORRISPONDENZA DELLA S.P. 25 - PROGETTO ESECUTIVO – LOTTO 1A

CONFRONTO 6
1994Borm+TR20rii

Corso d'acqua	Portata al colmo [m³/s]	Tempo di ritorno [anni]
Rio Sacco	10.1	20
Rio Madama	5.6	20
Rio della Caffra	19.2	20
Rio San Pietro monte	22.2	20
Rio San Pietro valle	34.3	20
Bormida di Millesimo a Bubbio	1900	>500

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Rio San Pietro	3	134	1994Borm+TR20rii	Attuale	22.20	192.48	194.13	194.20	194.73	0.017012	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	1994Borm+TR20rii	Lotto1A	22.20	192.48	194.13	194.20	194.73	0.017012	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	1994Borm+TR20rii	Lotto1B	22.20	192.48	194.13	194.20	194.73	0.017012	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	1994Borm+TR20rii	Lotto1C	22.20	192.48	194.13	194.20	194.73	0.017012	3.42	6.50	6.49	1.09
Rio San Pietro	3	134	1994Borm+TR20rii	Finale	22.20	192.48	194.13	194.20	194.73	0.017011	3.42	6.50	6.49	1.09
Rio San Pietro	3	133.00*	1994Borm+TR20rii	Attuale	22.20	192.00	193.62	193.73	194.27	0.019319	3.57	6.22	6.43	1.16
Rio San Pietro	3	133.00*	1994Borm+TR20rii	Lotto1A	22.20	192.00	193.62	193.73	194.27	0.019319	3.57	6.22	6.43	1.16
Rio San Pietro	3	133.00*	1994Borm+TR20rii	Lotto1B	22.20	192.00	193.62	193.73	194.27	0.019319	3.57	6.22	6.43	1.16
Rio San Pietro	3	133.00*	1994Borm+TR20rii	Lotto1C	22.20	192.00	193.62	193.73	194.27	0.019319	3.57	6.22	6.43	1.16
Rio San Pietro	3	133.00*	1994Borm+TR20rii	Finale	22.20	192.00	193.62	193.73	194.27	0.019336	3.57	6.22	6.43	1.16
Rio San Pietro	3	132.00*	1994Borm+TR20rii	Attuale	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	132.00*	1994Borm+TR20rii	Lotto1A	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	132.00*	1994Borm+TR20rii	Lotto1B	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	132.00*	1994Borm+TR20rii	Lotto1C	22.20	191.53	193.17	193.26	193.79	0.018368	3.49	6.36	6.58	1.13
Rio San Pietro	3	132.00*	1994Borm+TR20rii	Finale	22.20	191.53	193.17	193.26	193.79	0.018393	3.49	6.36	6.58	1.13
Rio San Pietro	3	131.00*	1994Borm+TR20rii	Attuale	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	131.00*	1994Borm+TR20rii	Lotto1A	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	131.00*	1994Borm+TR20rii	Lotto1B	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	131.00*	1994Borm+TR20rii	Lotto1C	22.20	191.05	192.67	192.79	193.31	0.019682	3.55	6.26	6.70	1.17
Rio San Pietro	3	131.00*	1994Borm+TR20rii	Finale	22.20	191.05	192.67	192.79	193.31	0.019678	3.55	6.26	6.70	1.17
Rio San Pietro	3	130.00*	1994Borm+TR20rii	Attuale	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	130.00*	1994Borm+TR20rii	Lotto1A	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	130.00*	1994Borm+TR20rii	Lotto1B	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	130.00*	1994Borm+TR20rii	Lotto1C	22.20	190.58	192.18	192.31	192.82	0.019855	3.53	6.28	6.85	1.18
Rio San Pietro	3	130.00*	1994Borm+TR20rii	Finale	22.20	190.58	192.18	192.31	192.82	0.019856	3.54	6.28	6.85	1.18
Rio San Pietro	3	129.00*	1994Borm+TR20rii	Attuale	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	1994Borm+TR20rii	Lotto1A	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	1994Borm+TR20rii	Lotto1B	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	1994Borm+TR20rii	Lotto1C	22.20	190.10	191.68	191.80	192.32	0.020098	3.55	6.26	6.89	1.19
Rio San Pietro	3	129.00*	1994Borm+TR20rii	Finale	22.20	190.10	191.68	191.80	192.32	0.020097	3.55	6.26	6.89	1.19
Rio San Pietro	3	128.00*	1994Borm+TR20rii	Attuale	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	1994Borm+TR20rii	Lotto1A	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	1994Borm+TR20rii	Lotto1B	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	1994Borm+TR20rii	Lotto1C	22.20	189.63	191.18	191.30	191.82	0.020226	3.56	6.24	6.89	1.19
Rio San Pietro	3	128.00*	1994Borm+TR20rii	Finale	22.20	189.63	191.18	191.30	191.82	0.020225	3.56	6.24	6.89	1.19
Rio San Pietro	3	127	1994Borm+TR20rii	Attuale	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	1994Borm+TR20rii	Lotto1A	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	1994Borm+TR20rii	Lotto1B	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	1994Borm+TR20rii	Lotto1C	22.20	189.15	191.45	190.82	191.50	0.001213	1.26	35.05	60.60	0.32
Rio San Pietro	3	127	1994Borm+TR20rii	Finale	22.20	189.15	191.45	190.82	191.50	0.001209	1.26	35.09	60.60	0.32

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	2	126	1994Borm+TR20rii	Attuale	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	1994Borm+TR20rii	Lotto1A	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	1994Borm+TR20rii	Lotto1B	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	1994Borm+TR20rii	Lotto1C	34.30	188.92	191.33	190.73	191.47	0.002121	1.81	35.02	72.82	0.43
Rio San Pietro	2	126	1994Borm+TR20rii	Finale	34.30	188.92	191.34	190.73	191.47	0.002112	1.81	35.11	72.91	0.43
Rio San Pietro	2	125.5			Bridge									
Rio San Pietro	2	125	1994Borm+TR20rii	Attuale	34.30	187.78	189.96	189.96	190.01	0.003089	1.41	41.17	54.90	0.47
Rio San Pietro	2	125	1994Borm+TR20rii	Lotto1A	34.30	187.78	189.96	189.96	190.01	0.003090	1.41	41.12	53.50	0.47
Rio San Pietro	2	125	1994Borm+TR20rii	Lotto1B	34.30	187.78	189.96	189.96	190.01	0.003090	1.41	41.12	53.50	0.47
Rio San Pietro	2	125	1994Borm+TR20rii	Lotto1C	34.30	187.78	189.96	189.96	190.01	0.003090	1.41	41.12	53.50	0.47
Rio San Pietro	2	125	1994Borm+TR20rii	Finale	34.30	187.78	190.01	190.01	190.60	0.013636	3.42	10.04	8.40	1.00
Rio San Pietro	2	124.00*	1994Borm+TR20rii	Attuale	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	1994Borm+TR20rii	Lotto1A	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	1994Borm+TR20rii	Lotto1B	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	1994Borm+TR20rii	Lotto1C	34.30	187.45	189.40	189.40	189.45	0.003691	1.44	40.10	54.98	0.50
Rio San Pietro	2	124.00*	1994Borm+TR20rii	Finale	34.30	187.45	189.57	189.62	190.23	0.015985	3.62	9.49	8.22	1.07
Rio San Pietro	2	123.00*	1994Borm+TR20rii	Attuale	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	123.00*	1994Borm+TR20rii	Lotto1A	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	123.00*	1994Borm+TR20rii	Lotto1B	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	123.00*	1994Borm+TR20rii	Lotto1C	34.30	187.11	188.83	188.83	188.88	0.004430	1.45	39.03	56.38	0.54
Rio San Pietro	2	123.00*	1994Borm+TR20rii	Finale	34.30	187.11	189.25	189.26	189.86	0.014388	3.47	9.90	8.34	1.02
Rio San Pietro	2	122.00*	1994Borm+TR20rii	Attuale	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	1994Borm+TR20rii	Lotto1A	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	1994Borm+TR20rii	Lotto1B	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	1994Borm+TR20rii	Lotto1C	34.30	186.78	188.27	188.27	188.32	0.005300	1.44	37.95	57.70	0.58
Rio San Pietro	2	122.00*	1994Borm+TR20rii	Finale	34.30	186.78	188.88	188.90	189.50	0.014955	3.49	9.82	8.36	1.03
Rio San Pietro	2	121	1994Borm+TR20rii	Attuale	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	1994Borm+TR20rii	Lotto1A	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	1994Borm+TR20rii	Lotto1B	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	1994Borm+TR20rii	Lotto1C	34.30	186.44	187.70	187.70	187.75	0.006276	1.39	36.92	58.96	0.62
Rio San Pietro	2	121	1994Borm+TR20rii	Finale	34.30	186.44	188.53	188.54	189.14	0.014500	3.45	9.94	8.57	1.01
Rio San Pietro	2	120.00*	1994Borm+TR20rii	Attuale	34.30	186.05	187.31	187.21	187.39	0.010802	1.98	33.07	72.84	0.83
Rio San Pietro	2	120.00*	1994Borm+TR20rii	Lotto1A	34.30	186.05	187.63	187.19	187.66	0.001962	1.08	56.38	74.00	0.37
Rio San Pietro	2	120.00*	1994Borm+TR20rii	Lotto1B	34.30	186.05	187.63	187.19	187.66	0.001948	1.08	56.50	74.00	0.37
Rio San Pietro	2	120.00*	1994Borm+TR20rii	Lotto1C	34.30	186.05	187.63	187.19	187.66	0.001949	1.08	56.50	74.00	0.37
Rio San Pietro	2	120.00*	1994Borm+TR20rii	Finale	34.30	186.05	187.96	188.09	188.71	0.019793	3.82	8.99	8.25	1.17
Rio San Pietro	2	119.00*	1994Borm+TR20rii	Attuale	34.30	185.66	187.15		187.21	0.005206	1.73	42.83	86.26	0.61
Rio San Pietro	2	119.00*	1994Borm+TR20rii	Lotto1A	34.30	185.66	187.61	187.02	187.63	0.000661	0.77	83.73	89.46	0.23

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Rio San Pietro	2	119.00*	1994Borm+TR20rii	Lotto1B	34.30	185.66	187.61	187.02	187.63	0.000657	0.77	83.88	89.49	0.23
Rio San Pietro	2	119.00*	1994Borm+TR20rii	Lotto1C	34.30	185.66	187.61	187.02	187.63	0.000657	0.77	83.88	89.49	0.23
Rio San Pietro	2	119.00*	1994Borm+TR20rii	Finale	34.30	185.66	187.55	187.65	188.25	0.016226	3.69	9.35	8.65	1.13
Rio San Pietro	2	118.00*	1994Borm+TR20rii	Attuale	34.30	185.27	187.12		187.14	0.001311	1.06	75.53	132.32	0.32
Rio San Pietro	2	118.00*	1994Borm+TR20rii	Lotto1A	34.30	185.27	187.61	186.81	187.61	0.000196	0.52	143.01	137.65	0.13
Rio San Pietro	2	118.00*	1994Borm+TR20rii	Lotto1B	34.30	185.27	187.61	186.81	187.62	0.000195	0.52	143.25	137.65	0.13
Rio San Pietro	2	118.00*	1994Borm+TR20rii	Lotto1C	34.30	185.27	187.61	186.81	187.62	0.000195	0.52	143.24	137.65	0.13
Rio San Pietro	2	118.00*	1994Borm+TR20rii	Finale	34.30	185.27	187.44	187.24	187.87	0.007219	2.95	12.39	9.60	0.79
Rio San Pietro	2	117.00*	1994Borm+TR20rii	Attuale	34.30	184.87	187.11		187.12	0.000341	0.68	125.47	154.24	0.17
Rio San Pietro	2	117.00*	1994Borm+TR20rii	Lotto1A	34.30	184.87	187.61	186.59	187.61	0.000076	0.39	202.48	155.24	0.09
Rio San Pietro	2	117.00*	1994Borm+TR20rii	Lotto1B	34.30	184.87	187.61	186.59	187.61	0.000076	0.38	202.75	155.25	0.09
Rio San Pietro	2	117.00*	1994Borm+TR20rii	Lotto1C	34.30	184.87	187.61	186.59	187.61	0.000076	0.38	202.74	155.25	0.09
Rio San Pietro	2	117.00*	1994Borm+TR20rii	Finale	34.30	184.87	187.44	186.85	187.71	0.003205	2.35	16.32	9.63	0.55
Rio San Pietro	2	116.00*	1994Borm+TR20rii	Attuale	34.30	184.48	187.11		187.11	0.000116	0.46	184.56	171.99	0.10
Rio San Pietro	2	116.00*	1994Borm+TR20rii	Lotto1A	34.30	184.48	187.61	186.29	187.61	0.000035	0.29	270.57	172.91	0.06
Rio San Pietro	2	116.00*	1994Borm+TR20rii	Lotto1B	34.30	184.48	187.61	186.29	187.61	0.000035	0.29	270.87	172.91	0.06
Rio San Pietro	2	116.00*	1994Borm+TR20rii	Lotto1C	34.30	184.48	187.61	186.29	187.61	0.000035	0.29	270.86	172.91	0.06
Rio San Pietro	2	116.00*	1994Borm+TR20rii	Finale	34.30	184.48	187.43	186.48	187.63	0.001780	2.01	19.98	9.67	0.42
Rio San Pietro	2	115	1994Borm+TR20rii	Attuale	34.30	184.09	187.11		187.11	0.000048	0.34	252.32	189.74	0.07
Rio San Pietro	2	115	1994Borm+TR20rii	Lotto1A	34.30	184.09	187.61	185.94	187.61	0.000018	0.23	347.25	190.60	0.04
Rio San Pietro	2	115	1994Borm+TR20rii	Lotto1B	34.30	184.09	187.61	185.94	187.61	0.000017	0.23	347.58	190.60	0.04
Rio San Pietro	2	115	1994Borm+TR20rii	Lotto1C	34.30	184.09	187.61	185.94	187.61	0.000017	0.23	347.57	190.60	0.04
Rio San Pietro	2	115	1994Borm+TR20rii	Finale	34.30	184.09	187.43	186.12	187.58	0.001146	1.79	23.40	9.70	0.34
Rio San Pietro	2	114.00*	1994Borm+TR20rii	Attuale	34.30	183.67	187.11		187.11	0.000037	0.32	275.31	202.93	0.06
Rio San Pietro	2	114.00*	1994Borm+TR20rii	Lotto1A	34.30	183.67	187.61		187.61	0.000014	0.22	377.18	204.47	0.04
Rio San Pietro	2	114.00*	1994Borm+TR20rii	Lotto1B	34.30	183.67	187.61		187.61	0.000014	0.22	377.54	204.47	0.04
Rio San Pietro	2	114.00*	1994Borm+TR20rii	Lotto1C	34.30	183.67	187.61		187.61	0.000014	0.22	377.53	204.47	0.04
Rio San Pietro	2	114.00*	1994Borm+TR20rii	Finale	34.30	183.67	187.44	185.75	187.54	0.000647	1.44	29.07	10.90	0.26
Rio San Pietro	2	113.00*	1994Borm+TR20rii	Attuale	34.30	183.26	187.11		187.11	0.000028	0.29	299.31	211.26	0.05
Rio San Pietro	2	113.00*	1994Borm+TR20rii	Lotto1A	34.30	183.26	187.61		187.61	0.000011	0.21	406.61	217.44	0.04
Rio San Pietro	2	113.00*	1994Borm+TR20rii	Lotto1B	34.30	183.26	187.61		187.61	0.000011	0.21	407.00	217.45	0.04
Rio San Pietro	2	113.00*	1994Borm+TR20rii	Lotto1C	34.30	183.26	187.61		187.61	0.000011	0.21	406.98	217.45	0.04
Rio San Pietro	2	113.00*	1994Borm+TR20rii	Finale	34.30	183.26	187.45	185.37	187.52	0.000397	1.19	35.14	12.10	0.21
Rio San Pietro	2	112.00*	1994Borm+TR20rii	Attuale	34.30	182.85	187.11		187.11	0.000022	0.27	325.02	220.35	0.05
Rio San Pietro	2	112.00*	1994Borm+TR20rii	Lotto1A	34.30	182.85	187.61	185.03	187.61	0.000018	0.27	319.33	182.49	0.05
Rio San Pietro	2	112.00*	1994Borm+TR20rii	Lotto1B	34.30	182.85	187.61	185.03	187.61	0.000018	0.27	319.65	182.51	0.05
Rio San Pietro	2	112.00*	1994Borm+TR20rii	Lotto1C	34.30	182.85	187.61	185.03	187.61	0.000018	0.27	319.64	182.51	0.05
Rio San Pietro	2	112.00*	1994Borm+TR20rii	Finale	34.30	182.85	187.46	185.03	187.51	0.000258	1.00	41.64	13.30	0.17
Rio San Pietro	2	111.00*	1994Borm+TR20rii	Attuale	34.30	182.43	187.11		187.11	0.000017	0.25	352.31	228.72	0.04

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Rio San Pietro	2	111.00*	1994Borm+TR20rii	Lotto1A	34.30	182.43	187.61	184.68	187.61	0.000015	0.26	342.84	192.23	0.04
Rio San Pietro	2	111.00*	1994Borm+TR20rii	Lotto1B	34.30	182.43	187.61	184.68	187.61	0.000015	0.26	343.18	192.25	0.04
Rio San Pietro	2	111.00*	1994Borm+TR20rii	Lotto1C	34.30	182.43	187.61	184.68	187.61	0.000015	0.26	343.17	192.25	0.04
Rio San Pietro	2	111.00*	1994Borm+TR20rii	Finale	34.30	182.43	187.46	184.68	187.50	0.000175	0.85	48.57	14.50	0.14
Rio San Pietro	2	110.00*	1994Borm+TR20rii	Attuale	34.30	182.02	187.11		187.11	0.000013	0.23	380.95	231.88	0.04
Rio San Pietro	2	110.00*	1994Borm+TR20rii	Lotto1A	34.30	182.02	187.61	184.32	187.61	0.000012	0.24	369.02	202.04	0.04
Rio San Pietro	2	110.00*	1994Borm+TR20rii	Lotto1B	34.30	182.02	187.61	184.32	187.61	0.000012	0.24	369.38	202.08	0.04
Rio San Pietro	2	110.00*	1994Borm+TR20rii	Lotto1C	34.30	182.02	187.61	184.32	187.61	0.000012	0.24	369.37	202.08	0.04
Rio San Pietro	2	110.00*	1994Borm+TR20rii	Finale	34.30	182.02	187.47	184.32	187.49	0.000123	0.74	55.93	15.70	0.12
Rio San Pietro	2	109	1994Borm+TR20rii	Attuale	34.30	181.60	187.11		187.11	0.000010	0.21	412.17	238.76	0.03
Rio San Pietro	2	109	1994Borm+TR20rii	Lotto1A	34.30	181.60	187.61	183.95	187.61	0.000010	0.22	396.81	212.01	0.03
Rio San Pietro	2	109	1994Borm+TR20rii	Lotto1B	34.30	181.60	187.61	183.95	187.61	0.000010	0.22	397.18	212.02	0.03
Rio San Pietro	2	109	1994Borm+TR20rii	Lotto1C	34.30	181.60	187.61	183.95	187.61	0.000010	0.22	397.17	212.02	0.03
Rio San Pietro	2	109	1994Borm+TR20rii	Finale	34.30	181.60	187.47	183.95	187.49	0.000089	0.65	63.73	16.90	0.10
Rio San Pietro	1	108	1994Borm+TR20rii	Attuale	34.30	180.99	187.11		187.11	0.000003	0.13	643.75	265.61	0.02
Rio San Pietro	1	108	1994Borm+TR20rii	Lotto1A	34.30	180.99	187.61	183.66	187.61	0.000003	0.12	637.20	225.86	0.02
Rio San Pietro	1	108	1994Borm+TR20rii	Lotto1B	34.30	180.99	187.59	183.66	187.61	0.000062	0.58	87.30	22.80	0.08
Rio San Pietro	1	108	1994Borm+TR20rii	Lotto1C	34.30	180.99	187.59	183.66	187.61	0.000062	0.58	87.30	22.80	0.08
Rio San Pietro	1	108	1994Borm+TR20rii	Finale	34.30	180.99	187.47	183.66	187.48	0.000068	0.60	84.50	22.80	0.09
Rio San Pietro	1	107.00*	1994Borm+TR20rii	Attuale	34.30	180.57	187.11		187.11	0.000003	0.12	675.62	260.68	0.02
Rio San Pietro	1	107.00*	1994Borm+TR20rii	Lotto1A	34.30	180.57	187.59	183.30	187.60	0.000051	0.53	90.22	22.10	0.07
Rio San Pietro	1	107.00*	1994Borm+TR20rii	Lotto1B	34.30	180.57	187.59	183.30	187.60	0.000051	0.53	90.22	22.10	0.07
Rio San Pietro	1	107.00*	1994Borm+TR20rii	Lotto1C	34.30	180.57	187.59	183.30	187.60	0.000051	0.53	90.22	22.10	0.07
Rio San Pietro	1	107.00*	1994Borm+TR20rii	Finale	34.30	180.57	187.47	183.30	187.48	0.000056	0.55	87.51	22.10	0.08
Rio San Pietro	1	106.00*	1994Borm+TR20rii	Attuale	34.30	180.14	187.11		187.11	0.000002	0.11	708.93	257.53	0.02
Rio San Pietro	1	106.00*	1994Borm+TR20rii	Lotto1A	34.30	180.14	187.59	182.90	187.60	0.000043	0.49	93.12	21.40	0.07
Rio San Pietro	1	106.00*	1994Borm+TR20rii	Lotto1B	34.30	180.14	187.59	182.90	187.60	0.000043	0.49	93.12	21.40	0.07
Rio San Pietro	1	106.00*	1994Borm+TR20rii	Lotto1C	34.30	180.14	187.59	182.90	187.60	0.000043	0.49	93.12	21.40	0.07
Rio San Pietro	1	106.00*	1994Borm+TR20rii	Finale	34.30	180.14	187.47	182.90	187.48	0.000046	0.50	90.49	21.40	0.07
Rio San Pietro	1	105	1994Borm+TR20rii	Attuale	34.30	179.72	187.11	182.50	187.11	0.000002	0.10	749.66	252.40	0.01
Rio San Pietro	1	105	1994Borm+TR20rii	Lotto1A	34.30	179.72	187.59	182.50	187.60	0.000036	0.45	96.20	20.70	0.06
Rio San Pietro	1	105	1994Borm+TR20rii	Lotto1B	34.30	179.72	187.59	182.50	187.60	0.000036	0.45	96.20	20.70	0.06
Rio San Pietro	1	105	1994Borm+TR20rii	Lotto1C	34.30	179.72	187.59	182.50	187.60	0.000036	0.45	96.20	20.70	0.06
Rio San Pietro	1	105	1994Borm+TR20rii	Finale	34.30	179.72	187.47	182.50	187.48	0.000039	0.46	93.65	20.70	0.06
Rio San Pietro	1	104.5			Bridge									
Rio San Pietro	1	104	1994Borm+TR20rii	Attuale	34.30	179.17	187.11		187.11	0.000001	0.10	839.78	267.40	0.01
Rio San Pietro	1	104	1994Borm+TR20rii	Lotto1A	34.30	179.17	187.13	181.58	187.13	0.000028	0.44	94.84	18.70	0.06
Rio San Pietro	1	104	1994Borm+TR20rii	Lotto1B	34.30	179.17	187.13	181.58	187.13	0.000028	0.44	94.84	18.70	0.06
Rio San Pietro	1	104	1994Borm+TR20rii	Lotto1C	34.30	179.17	187.13	181.58	187.13	0.000028	0.44	94.84	18.70	0.06

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Rio San Pietro	1	104	1994Borm+TR20rii	Finale	34.30	179.17	187.00	181.58	187.01	0.000030	0.45	92.54	18.70	0.06
Rio Sacco	1	306	1994Borm+TR20rii	Attuale	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	1994Borm+TR20rii	Lotto1A	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	1994Borm+TR20rii	Lotto1B	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	1994Borm+TR20rii	Lotto1C	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	306	1994Borm+TR20rii	Finale	10.10	187.71	188.95	189.10	189.49	0.030053	3.25	3.11	5.20	1.34
Rio Sacco	1	305	1994Borm+TR20rii	Attuale	10.10	185.28	187.83	186.77	187.89	0.001414	1.13	8.97	6.36	0.30
Rio Sacco	1	305	1994Borm+TR20rii	Lotto1A	10.10	185.28	187.72	186.77	187.80	0.001716	1.21	8.34	6.14	0.33
Rio Sacco	1	305	1994Borm+TR20rii	Lotto1B	10.10	185.28	187.71	186.77	187.78	0.001772	1.23	8.24	6.10	0.34
Rio Sacco	1	305	1994Borm+TR20rii	Lotto1C	10.10	185.28	187.71	186.77	187.78	0.001778	1.23	8.23	6.10	0.34
Rio Sacco	1	305	1994Borm+TR20rii	Finale	10.10	185.28	187.53	186.77	187.63	0.002549	1.41	7.18	5.71	0.40
Rio Sacco	1	304.5			Bridge									
Rio Sacco	1	304	1994Borm+TR20rii	Attuale	10.10	183.36	187.83		187.83	0.000045	0.31	32.36	12.24	0.06
Rio Sacco	1	304	1994Borm+TR20rii	Lotto1A	10.10	183.36	187.72		187.73	0.000051	0.32	31.11	12.06	0.06
Rio Sacco	1	304	1994Borm+TR20rii	Lotto1B	10.10	183.36	187.71		187.71	0.000052	0.33	30.90	12.03	0.07
Rio Sacco	1	304	1994Borm+TR20rii	Lotto1C	10.10	183.36	187.70		187.71	0.000052	0.33	30.88	12.02	0.07
Rio Sacco	1	304	1994Borm+TR20rii	Finale	10.10	183.36	187.52		187.52	0.000063	0.35	28.67	11.63	0.07
Rio Sacco	1	303	1994Borm+TR20rii	Attuale	10.10	182.69	187.83		187.83	0.000028	0.25	41.84	26.17	0.05
Rio Sacco	1	303	1994Borm+TR20rii	Lotto1A	10.10	182.69	187.72		187.73	0.000032	0.26	39.37	19.06	0.05
Rio Sacco	1	303	1994Borm+TR20rii	Lotto1B	10.10	182.69	187.71		187.71	0.000032	0.27	39.05	18.26	0.05
Rio Sacco	1	303	1994Borm+TR20rii	Lotto1C	10.10	182.69	187.71		187.71	0.000032	0.27	39.02	18.24	0.05
Rio Sacco	1	303	1994Borm+TR20rii	Finale	10.10	182.69	187.52		187.52	0.000041	0.29	35.72	17.06	0.06
Rio Sacco	1	302	1994Borm+TR20rii	Attuale	10.10	182.41	187.83		187.83	0.000002	0.12	139.48	55.00	0.02
Rio Sacco	1	302	1994Borm+TR20rii	Lotto1A	10.10	182.41	187.73		187.73	0.000003	0.12	133.79	55.00	0.02
Rio Sacco	1	302	1994Borm+TR20rii	Lotto1B	10.10	182.41	187.71		187.71	0.000003	0.12	132.86	55.00	0.02
Rio Sacco	1	302	1994Borm+TR20rii	Lotto1C	10.10	182.41	187.71		187.71	0.000003	0.12	132.76	55.00	0.02
Rio Sacco	1	302	1994Borm+TR20rii	Finale	10.10	182.41	187.52		187.52	0.000003	0.13	122.48	55.00	0.02
Rio Sacco	1	301	1994Borm+TR20rii	Attuale	10.10	181.63	187.83		187.83	0.000002	0.10	169.95	56.40	0.02
Rio Sacco	1	301	1994Borm+TR20rii	Lotto1A	10.10	181.63	187.73		187.73	0.000002	0.11	164.13	56.40	0.02
Rio Sacco	1	301	1994Borm+TR20rii	Lotto1B	10.10	181.63	187.71		187.71	0.000002	0.11	163.17	56.40	0.02
Rio Sacco	1	301	1994Borm+TR20rii	Lotto1C	10.10	181.63	187.71		187.71	0.000002	0.11	163.07	56.40	0.02
Rio Sacco	1	301	1994Borm+TR20rii	Finale	10.10	181.63	187.52		187.52	0.000002	0.11	152.53	56.40	0.02
Rio Madama	1	405	1994Borm+TR20rii	Attuale	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	1994Borm+TR20rii	Lotto1A	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	1994Borm+TR20rii	Lotto1B	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	1994Borm+TR20rii	Lotto1C	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	405	1994Borm+TR20rii	Finale	5.60	194.39	195.10	195.40	196.07	0.080008	4.35	1.29	2.82	2.06
Rio Madama	1	404	1994Borm+TR20rii	Attuale	5.60	187.14	187.77	187.77	187.77	0.000039	0.08	43.18	25.69	0.04

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(m ³ /s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m ²)	(m)	
Rio Madama	1	404	1994Borm+TR20rii	Lotto1A	5.60	187.14	187.77	187.77	187.77	0.000039	0.08	43.18	25.69	0.04
Rio Madama	1	404	1994Borm+TR20rii	Lotto1B	5.60	187.14	188.08	188.08	188.36	0.016189	2.36	2.38	4.20	1.00
Rio Madama	1	404	1994Borm+TR20rii	Lotto1C	5.60	187.14	188.08	188.08	188.36	0.016189	2.36	2.38	4.20	1.00
Rio Madama	1	404	1994Borm+TR20rii	Finale	5.60	187.14	188.08	188.08	188.36	0.016081	2.35	2.39	4.21	1.00
Rio Madama	1	403	1994Borm+TR20rii	Attuale	5.60	186.20	187.11	186.75	187.11	0.000071	0.14	35.51	25.07	0.06
Rio Madama	1	403	1994Borm+TR20rii	Lotto1A	5.60	186.20	187.61	186.75	187.61	0.000013	0.09	73.84	43.94	0.03
Rio Madama	1	403	1994Borm+TR20rii	Lotto1B	5.60	186.20	187.61	187.12	187.61	0.000109	0.27	29.54	22.64	0.09
Rio Madama	1	403	1994Borm+TR20rii	Lotto1C	5.60	186.20	187.61	187.12	187.61	0.000109	0.27	29.54	22.64	0.09
Rio Madama	1	403	1994Borm+TR20rii	Finale	5.60	186.20	187.34	187.25	187.58	0.010946	2.17	2.71	3.91	0.83
Rio Madama	1	402	1994Borm+TR20rii	Attuale	5.60	184.94	187.11	185.74	187.11	0.000008	0.11	85.27	46.00	0.03
Rio Madama	1	402	1994Borm+TR20rii	Lotto1A	5.60	184.94	187.61	185.74	187.61	0.000004	0.09	108.26	46.00	0.02
Rio Madama	1	402	1994Borm+TR20rii	Lotto1B	5.60	184.94	187.61	185.88	187.61	0.000014	0.17	52.04	24.34	0.04
Rio Madama	1	402	1994Borm+TR20rii	Lotto1C	5.60	184.94	187.61	185.88	187.61	0.000014	0.17	52.04	24.34	0.04
Rio Madama	1	402	1994Borm+TR20rii	Finale	5.60	184.94	187.48	185.88	187.49	0.000102	0.45	12.61	6.23	0.10
Rio Madama	1	401	1994Borm+TR20rii	Attuale	5.60	183.68	187.11		187.11	0.000003	0.09	108.89	48.30	0.02
Rio Madama	1	401	1994Borm+TR20rii	Lotto1A	5.60	183.68	187.61		187.61	0.000002	0.08	133.03	48.30	0.01
Rio Madama	1	401	1994Borm+TR20rii	Lotto1B	5.60	183.68	187.61	184.67	187.61	0.000004	0.12	78.12	28.20	0.02
Rio Madama	1	401	1994Borm+TR20rii	Lotto1C	5.60	183.68	187.61	184.67	187.61	0.000004	0.12	78.12	28.20	0.02
Rio Madama	1	401	1994Borm+TR20rii	Finale	5.60	183.68	187.49	184.67	187.49	0.000024	0.23	24.97	8.50	0.04
Rio Caffra	1	205	1994Borm+TR20rii	Attuale	19.20	190.88	192.26	192.11	192.38	0.004193	1.71	17.62	37.78	0.57
Rio Caffra	1	205	1994Borm+TR20rii	Lotto1A	19.20	190.88	192.26	192.11	192.38	0.004194	1.71	17.62	37.78	0.57
Rio Caffra	1	205	1994Borm+TR20rii	Lotto1B	19.20	190.88	192.26	192.11	192.38	0.004192	1.71	17.62	37.78	0.57
Rio Caffra	1	205	1994Borm+TR20rii	Lotto1C	19.20	190.88	192.26	192.11	192.38	0.004192	1.71	17.62	37.78	0.57
Rio Caffra	1	205	1994Borm+TR20rii	Finale	19.20	190.88	192.26	192.11	192.38	0.004193	1.71	17.62	37.78	0.57
Rio Caffra	1	203	1994Borm+TR20rii	Attuale	19.20	190.29	191.76	191.76	192.10	0.013227	2.78	9.41	17.25	0.97
Rio Caffra	1	203	1994Borm+TR20rii	Lotto1A	19.20	190.29	191.76	191.76	192.10	0.013233	2.78	9.41	17.23	0.97
Rio Caffra	1	203	1994Borm+TR20rii	Lotto1B	19.20	190.29	191.76	191.76	192.10	0.013221	2.78	9.42	17.27	0.97
Rio Caffra	1	203	1994Borm+TR20rii	Lotto1C	19.20	190.29	191.76	191.76	192.10	0.013221	2.78	9.42	17.27	0.97
Rio Caffra	1	203	1994Borm+TR20rii	Finale	19.20	190.29	191.76	191.76	192.10	0.013224	2.78	9.41	17.26	0.97
Rio Caffra	1	201	1994Borm+TR20rii	Attuale	19.20	189.19	191.44	190.74	191.52	0.001386	1.38	19.60	18.90	0.35
Rio Caffra	1	201	1994Borm+TR20rii	Lotto1A	19.20	189.19	191.44	190.74	191.52	0.001386	1.38	19.60	18.90	0.35
Rio Caffra	1	201	1994Borm+TR20rii	Lotto1B	19.20	189.19	191.44	190.74	191.52	0.001387	1.38	19.60	18.90	0.35
Rio Caffra	1	201	1994Borm+TR20rii	Lotto1C	19.20	189.19	191.44	190.74	191.52	0.001387	1.38	19.60	18.90	0.35
Rio Caffra	1	201	1994Borm+TR20rii	Finale	19.20	189.19	191.44	190.74	191.52	0.001384	1.38	19.61	18.90	0.35
Bormida	3	43	1994Borm+TR20rii	Attuale	1900.00	179.12	187.31	186.30	188.10	0.001908	4.50	711.30	196.23	0.54
Bormida	3	43	1994Borm+TR20rii	Lotto1A	1900.00	179.12	187.16	186.30	188.02	0.002103	4.66	683.00	195.93	0.56
Bormida	3	43	1994Borm+TR20rii	Lotto1B	1900.00	179.12	187.14	186.30	188.01	0.002133	4.68	678.95	195.89	0.56
Bormida	3	43	1994Borm+TR20rii	Lotto1C	1900.00	179.12	187.27	185.94	187.92	0.001662	4.00	729.41	196.14	0.50
Bormida	3	43	1994Borm+TR20rii	Finale	1900.00	179.12	187.11	185.64	187.72	0.001591	3.78	722.80	195.82	0.48

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Bormida	3	42.000*	1994Borm+TR20rii	Attuale	1900.00	179.09	187.32		188.02	0.001725	4.25	750.07	206.47	0.51
Bormida	3	42.000*	1994Borm+TR20rii	Lotto1A	1900.00	179.09	187.18		187.94	0.001901	4.40	720.50	206.00	0.53
Bormida	3	42.000*	1994Borm+TR20rii	Lotto1B	1900.00	179.09	187.16		187.93	0.001928	4.42	716.28	205.93	0.54
Bormida	3	42.000*	1994Borm+TR20rii	Lotto1C	1900.00	179.09	187.27		187.87	0.001537	3.83	763.10	206.28	0.48
Bormida	3	42.000*	1994Borm+TR20rii	Finale	1900.00	179.09	187.10		187.67	0.001489	3.65	753.31	205.73	0.47
Bormida	3	41.000*	1994Borm+TR20rii	Attuale	1900.00	179.06	187.33		187.96	0.001578	4.03	787.83	216.89	0.49
Bormida	3	41.000*	1994Borm+TR20rii	Lotto1A	1900.00	179.06	187.19		187.87	0.001741	4.17	756.76	216.37	0.51
Bormida	3	41.000*	1994Borm+TR20rii	Lotto1B	1900.00	179.06	187.17		187.86	0.001766	4.19	752.33	216.30	0.51
Bormida	3	41.000*	1994Borm+TR20rii	Lotto1C	1900.00	179.06	187.26		187.82	0.001433	3.68	796.43	216.64	0.46
Bormida	3	41.000*	1994Borm+TR20rii	Finale	1900.00	179.06	187.09		187.62	0.001401	3.52	783.39	216.01	0.45
Bormida	3	40.000*	1994Borm+TR20rii	Attuale	1900.00	179.04	187.34		187.91	0.001456	3.83	824.86	227.19	0.47
Bormida	3	40.000*	1994Borm+TR20rii	Lotto1A	1900.00	179.04	187.20		187.81	0.001609	3.97	792.17	226.86	0.49
Bormida	3	40.000*	1994Borm+TR20rii	Lotto1B	1900.00	179.04	187.18		187.80	0.001632	3.99	787.50	226.80	0.49
Bormida	3	40.000*	1994Borm+TR20rii	Lotto1C	1900.00	179.04	187.26		187.77	0.001343	3.55	829.54	227.01	0.45
Bormida	3	40.000*	1994Borm+TR20rii	Finale	1900.00	179.04	187.09		187.58	0.001326	3.41	813.26	226.54	0.44
Bormida	3	39.000*	1994Borm+TR20rii	Attuale	1900.00	179.01	187.34		187.86	0.001353	3.66	861.25	237.47	0.45
Bormida	3	39.000*	1994Borm+TR20rii	Lotto1A	1900.00	179.01	187.20		187.76	0.001498	3.80	826.87	237.18	0.47
Bormida	3	39.000*	1994Borm+TR20rii	Lotto1B	1900.00	179.01	187.18		187.74	0.001520	3.82	821.95	237.14	0.48
Bormida	3	39.000*	1994Borm+TR20rii	Lotto1C	1900.00	179.01	187.25		187.73	0.001264	3.42	862.44	237.30	0.43
Bormida	3	39.000*	1994Borm+TR20rii	Finale	1900.00	179.01	187.08		187.54	0.001260	3.30	842.94	236.89	0.43
Bormida	3	38.000*	1994Borm+TR20rii	Attuale	1900.00	178.98	187.34		187.81	0.001265	3.51	897.38	248.08	0.44
Bormida	3	38.000*	1994Borm+TR20rii	Lotto1A	1900.00	178.98	187.20		187.71	0.001403	3.64	861.19	247.67	0.46
Bormida	3	38.000*	1994Borm+TR20rii	Lotto1B	1900.00	178.98	187.17		187.69	0.001424	3.66	856.00	247.62	0.46
Bormida	3	38.000*	1994Borm+TR20rii	Lotto1C	1900.00	178.98	187.25		187.69	0.001196	3.30	895.34	247.82	0.42
Bormida	3	38.000*	1994Borm+TR20rii	Finale	1900.00	178.98	187.07		187.50	0.001201	3.21	872.60	247.38	0.42
Bormida	3	37	1994Borm+TR20rii	Attuale	1900.00	178.95	187.34		187.77	0.001189	3.36	933.47	258.24	0.42
Bormida	3	37	1994Borm+TR20rii	Lotto1A	1900.00	178.95	187.19		187.66	0.001321	3.49	895.43	258.01	0.44
Bormida	3	37	1994Borm+TR20rii	Lotto1B	1900.00	178.95	187.17		187.65	0.001342	3.51	889.98	257.98	0.45
Bormida	3	37	1994Borm+TR20rii	Lotto1C	1900.00	178.95	187.24		187.65	0.001134	3.20	928.54	258.09	0.41
Bormida	3	37	1994Borm+TR20rii	Finale	1900.00	178.95	187.06		187.46	0.001149	3.12	902.56	257.81	0.41
Bormida	2	35	1994Borm+TR20rii	Attuale	1900.00	178.59	187.23		187.73	0.001258	3.68	930.40	276.60	0.44
Bormida	2	35	1994Borm+TR20rii	Lotto1A	1900.00	178.59	187.13		187.63	0.001337	3.60	903.32	276.60	0.45
Bormida	2	35	1994Borm+TR20rii	Lotto1B	1900.00	178.59	187.13		187.61	0.001227	3.52	918.68	276.60	0.43
Bormida	2	35	1994Borm+TR20rii	Lotto1C	1900.00	178.59	187.12	185.62	187.61	0.001242	3.54	903.39	259.70	0.43
Bormida	2	35	1994Borm+TR20rii	Finale	1900.00	178.59	186.95	185.32	187.42	0.001232	3.40	880.16	259.70	0.43
Bormida	2	34.000*	1994Borm+TR20rii	Attuale	1900.00	178.53	187.21		187.70	0.001247	3.67	932.83	272.17	0.43
Bormida	2	34.000*	1994Borm+TR20rii	Lotto1A	1900.00	178.53	187.10		187.59	0.001303	3.59	908.48	272.17	0.44
Bormida	2	34.000*	1994Borm+TR20rii	Lotto1B	1900.00	178.53	187.11		187.58	0.001206	3.51	922.93	272.17	0.42
Bormida	2	34.000*	1994Borm+TR20rii	Lotto1C	1900.00	178.53	187.09	185.54	187.58	0.001236	3.55	894.67	249.03	0.43
Bormida	2	34.000*	1994Borm+TR20rii	Finale	1900.00	178.53	186.92	185.24	187.40	0.001215	3.40	874.41	249.03	0.42

River	Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
					(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
Bormida	2	33.000*	1994Borm+TR20rii	Attuale	1900.00	178.46	187.18		187.67	0.001234	3.66	936.17	267.74	0.43
Bormida	2	33.000*	1994Borm+TR20rii	Lotto1A	1900.00	178.46	187.07		187.56	0.001308	3.59	909.76	267.74	0.44
Bormida	2	33.000*	1994Borm+TR20rii	Lotto1B	1900.00	178.46	187.08		187.55	0.001185	3.50	928.07	267.74	0.42
Bormida	2	33.000*	1994Borm+TR20rii	Lotto1C	1900.00	178.46	187.06	185.46	187.55	0.001238	3.57	882.44	238.36	0.43
Bormida	2	33.000*	1994Borm+TR20rii	Finale	1900.00	178.46	186.89	185.16	187.37	0.001206	3.41	865.22	238.36	0.42
Bormida	2	32.000*	1994Borm+TR20rii	Attuale	1900.00	178.40	187.16		187.64	0.001219	3.65	940.36	263.31	0.43
Bormida	2	32.000*	1994Borm+TR20rii	Lotto1A	1900.00	178.40	187.05		187.53	0.001272	3.56	916.82	263.31	0.44
Bormida	2	32.000*	1994Borm+TR20rii	Lotto1B	1900.00	178.40	187.06		187.52	0.001164	3.48	934.00	263.31	0.42
Bormida	2	32.000*	1994Borm+TR20rii	Lotto1C	1900.00	178.40	187.02	185.39	187.52	0.001251	3.59	866.81	227.69	0.43
Bormida	2	32.000*	1994Borm+TR20rii	Finale	1900.00	178.40	186.85	185.06	187.34	0.001205	3.42	852.82	227.69	0.42
Bormida	2	31.000*	1994Borm+TR20rii	Attuale	1900.00	178.33	187.13		187.61	0.001203	3.63	945.42	258.89	0.43
Bormida	2	31.000*	1994Borm+TR20rii	Lotto1A	1900.00	178.33	187.03		187.49	0.001192	3.51	931.39	258.89	0.42
Bormida	2	31.000*	1994Borm+TR20rii	Lotto1B	1900.00	178.33	187.04		187.49	0.001142	3.46	940.72	258.89	0.41
Bormida	2	31.000*	1994Borm+TR20rii	Lotto1C	1900.00	178.33	186.97	185.29	187.49	0.001272	3.63	848.00	217.01	0.44
Bormida	2	31.000*	1994Borm+TR20rii	Finale	1900.00	178.33	186.82	185.00	187.31	0.001212	3.44	837.37	217.01	0.42
Bormida	2	30.000*	1994Borm+TR20rii	Attuale	1900.00	178.27	187.11		187.58	0.001184	3.61	951.28	254.46	0.42
Bormida	2	30.000*	1994Borm+TR20rii	Lotto1A	1900.00	178.27	186.92	185.22	187.46	0.001304	3.68	825.95	206.34	0.44
Bormida	2	30.000*	1994Borm+TR20rii	Lotto1B	1900.00	178.27	186.92	185.22	187.46	0.001304	3.68	825.95	206.34	0.44
Bormida	2	30.000*	1994Borm+TR20rii	Lotto1C	1900.00	178.27	186.92	185.22	187.46	0.001305	3.68	825.94	206.34	0.44
Bormida	2	30.000*	1994Borm+TR20rii	Finale	1900.00	178.27	186.77	184.91	187.28	0.001227	3.47	818.88	206.34	0.43
Bormida	2	29.000*	1994Borm+TR20rii	Attuale	1900.00	178.20	187.09		187.54	0.001164	3.58	958.00	250.03	0.42
Bormida	2	29.000*	1994Borm+TR20rii	Lotto1A	1900.00	178.20	186.87	185.14	187.42	0.001349	3.73	800.45	195.67	0.45
Bormida	2	29.000*	1994Borm+TR20rii	Lotto1B	1900.00	178.20	186.87	185.14	187.42	0.001349	3.73	800.45	195.67	0.45
Bormida	2	29.000*	1994Borm+TR20rii	Lotto1C	1900.00	178.20	186.87	185.14	187.42	0.001349	3.73	800.43	195.67	0.45
Bormida	2	29.000*	1994Borm+TR20rii	Finale	1900.00	178.20	186.73	184.81	187.24	0.001252	3.51	797.14	195.67	0.43
Bormida	2	28	1994Borm+TR20rii	Attuale	1900.00	178.14	187.07		187.51	0.001141	3.55	965.55	245.60	0.42
Bormida	2	28	1994Borm+TR20rii	Lotto1A	1900.00	178.14	186.81	185.06	187.39	0.001405	3.80	772.70	185.00	0.46
Bormida	2	28	1994Borm+TR20rii	Lotto1B	1900.00	178.14	186.81	185.06	187.39	0.001405	3.80	772.70	185.00	0.46
Bormida	2	28	1994Borm+TR20rii	Lotto1C	1900.00	178.14	186.81	185.06	187.39	0.001405	3.80	772.68	185.00	0.46
Bormida	2	28	1994Borm+TR20rii	Finale	1900.00	178.14	186.68	184.71	187.21	0.001283	3.56	773.51	185.00	0.44
Bormida	2	27.000*	1994Borm+TR20rii	Attuale	1900.00	178.10	186.96		187.48	0.001272	3.75	885.14	224.70	0.44
Bormida	2	27.000*	1994Borm+TR20rii	Lotto1A	1900.00	178.10	186.70	184.98	187.34	0.001518	3.95	720.98	173.03	0.47
Bormida	2	27.000*	1994Borm+TR20rii	Lotto1B	1900.00	178.10	186.70	184.98	187.34	0.001518	3.95	720.98	173.03	0.47
Bormida	2	27.000*	1994Borm+TR20rii	Lotto1C	1900.00	178.10	186.70	184.98	187.34	0.001518	3.95	720.96	173.03	0.47
Bormida	2	27.000*	1994Borm+TR20rii	Finale	1900.00	178.10	186.59	184.60	187.17	0.001372	3.67	724.11	173.03	0.45
Bormida	2	26.000*	1994Borm+TR20rii	Attuale	1900.00	178.05	186.83		187.43	0.001437	3.98	803.48	203.80	0.47
Bormida	2	26.000*	1994Borm+TR20rii	Lotto1A	1900.00	178.05	186.58	184.87	187.30	0.001638	4.09	671.40	161.07	0.49
Bormida	2	26.000*	1994Borm+TR20rii	Lotto1B	1900.00	178.05	186.58	184.87	187.30	0.001638	4.09	671.40	161.07	0.49
Bormida	2	26.000*	1994Borm+TR20rii	Lotto1C	1900.00	178.05	186.58	184.87	187.30	0.001638	4.09	671.38	161.07	0.49

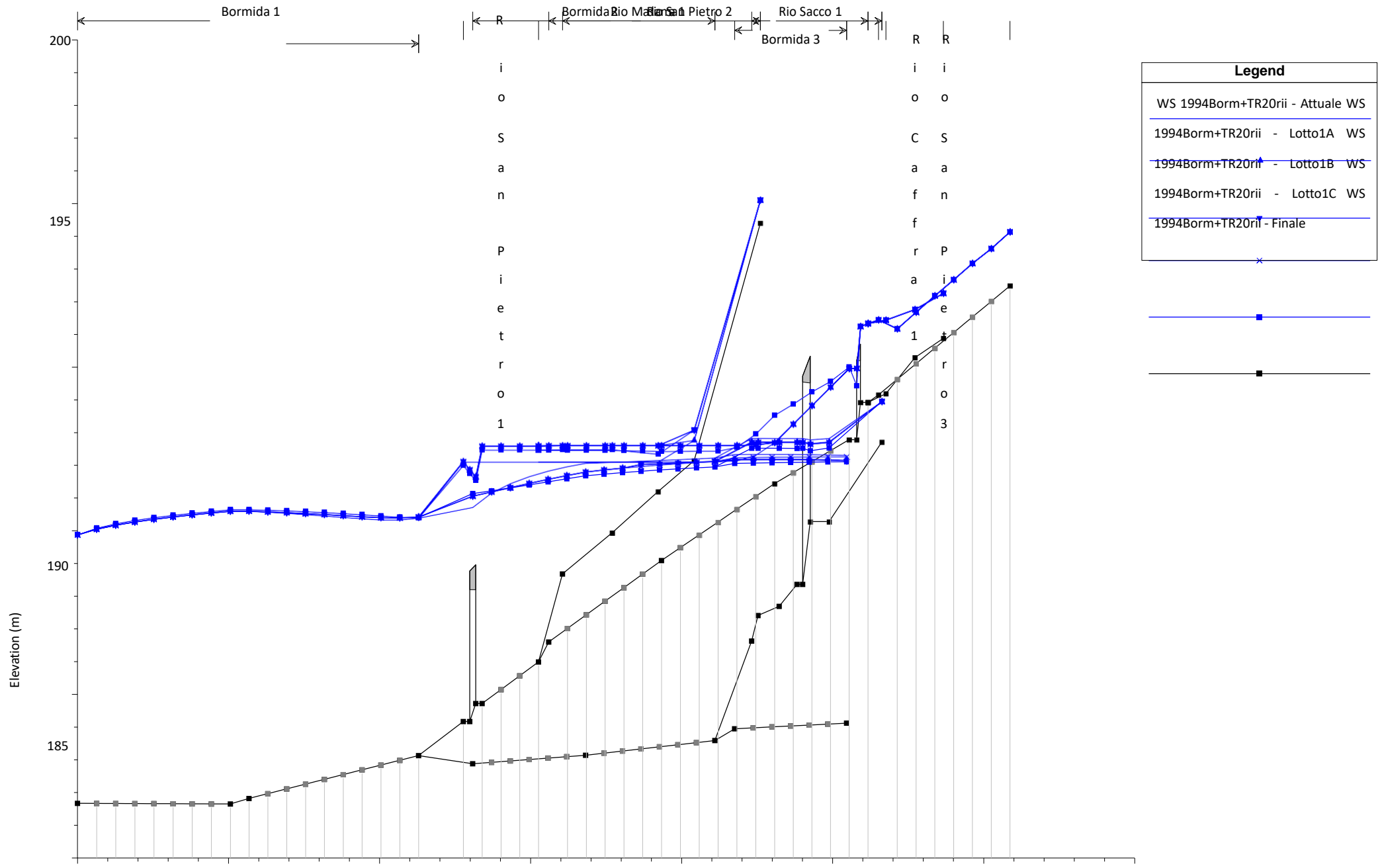
River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	2	26.000*	1994Borm+TR20rii	Finale	1900.00	178.05	186.49	184.44	187.13	0.001460	3.78	678.14	161.07	0.47
Bormida	2	25.000*	1994Borm+TR20rii	Attuale	1900.00	178.01	186.66		187.38	0.001653	4.25	720.40	182.90	0.50
Bormida	2	25.000*	1994Borm+TR20rii	Lotto1A	1900.00	178.01	186.46	184.66	187.25	0.001765	4.23	624.35	149.10	0.51
Bormida	2	25.000*	1994Borm+TR20rii	Lotto1B	1900.00	178.01	186.46	184.66	187.25	0.001765	4.23	624.35	149.10	0.51
Bormida	2	25.000*	1994Borm+TR20rii	Lotto1C	1900.00	178.01	186.46	184.66	187.25	0.001765	4.23	624.33	149.10	0.51
Bormida	2	25.000*	1994Borm+TR20rii	Finale	1900.00	178.01	186.40	184.33	187.09	0.001543	3.88	635.91	149.10	0.48
Bormida	2	24.000*	1994Borm+TR20rii	Attuale	1900.00	177.97	186.45		187.32	0.001948	4.57	635.47	162.00	0.54
Bormida	2	24.000*	1994Borm+TR20rii	Lotto1A	1900.00	177.97	186.33	184.57	187.19	0.001896	4.37	580.38	137.13	0.53
Bormida	2	24.000*	1994Borm+TR20rii	Lotto1B	1900.00	177.97	186.33	184.57	187.19	0.001896	4.37	580.38	137.13	0.53
Bormida	2	24.000*	1994Borm+TR20rii	Lotto1C	1900.00	177.97	186.33	184.57	187.19	0.001896	4.37	580.36	137.13	0.53
Bormida	2	24.000*	1994Borm+TR20rii	Finale	1900.00	177.97	186.31	184.19	187.05	0.001618	3.97	597.84	137.13	0.49
Bormida	2	23.000*	1994Borm+TR20rii	Attuale	1900.00	177.92	186.16		187.25	0.002382	4.97	548.31	141.10	0.60
Bormida	2	23.000*	1994Borm+TR20rii	Lotto1A	1900.00	177.92	186.20	184.46	187.14	0.002024	4.49	540.04	125.17	0.55
Bormida	2	23.000*	1994Borm+TR20rii	Lotto1B	1900.00	177.92	186.20	184.46	187.14	0.002024	4.49	540.03	125.17	0.55
Bormida	2	23.000*	1994Borm+TR20rii	Lotto1C	1900.00	177.92	186.20	184.46	187.14	0.002024	4.49	540.02	125.17	0.55
Bormida	2	23.000*	1994Borm+TR20rii	Finale	1900.00	177.92	186.22	184.08	187.00	0.001681	4.04	564.11	125.17	0.50
Bormida	2	22	1994Borm+TR20rii	Attuale	1900.00	177.88	185.72	184.81	187.15	0.003156	5.55	453.86	120.20	0.68
Bormida	2	22	1994Borm+TR20rii	Lotto1A	1900.00	177.88	186.07	184.32	187.08	0.002145	4.60	503.49	113.20	0.56
Bormida	2	22	1994Borm+TR20rii	Lotto1B	1900.00	177.88	186.07	184.32	187.08	0.002145	4.60	503.49	113.20	0.56
Bormida	2	22	1994Borm+TR20rii	Lotto1C	1900.00	177.88	186.07	184.32	187.08	0.002146	4.60	503.47	113.20	0.56
Bormida	2	22	1994Borm+TR20rii	Finale	1900.00	177.88	186.14	183.95	186.96	0.001728	4.09	534.49	113.20	0.51
Bormida	1	19	1994Borm+TR20rii	Attuale	1900.00	178.13	185.40	184.81	186.90	0.003639	5.64	459.17	232.75	0.72
Bormida	1	19	1994Borm+TR20rii	Lotto1A	1900.00	178.13	185.43	184.28	186.84	0.003567	5.29	400.03	180.00	0.70
Bormida	1	19	1994Borm+TR20rii	Lotto1B	1900.00	178.13	185.43	184.28	186.84	0.003567	5.29	400.03	180.00	0.70
Bormida	1	19	1994Borm+TR20rii	Lotto1C	1900.00	178.13	185.43	184.28	186.84	0.003568	5.29	399.94	180.00	0.70
Bormida	1	19	1994Borm+TR20rii	Finale	1900.00	178.13	185.40	184.12	186.74	0.003285	5.17	425.38	179.97	0.68
Bormida	1	18.000*	1994Borm+TR20rii	Attuale	1900.00	177.98	185.34	184.82	186.79	0.003509	5.53	474.84	236.87	0.71
Bormida	1	18.000*	1994Borm+TR20rii	Lotto1A	1900.00	177.98	185.41	184.23	186.73	0.003352	5.16	433.88	189.68	0.69
Bormida	1	18.000*	1994Borm+TR20rii	Lotto1B	1900.00	177.98	185.41	184.23	186.73	0.003352	5.16	433.88	189.68	0.69
Bormida	1	18.000*	1994Borm+TR20rii	Lotto1C	1900.00	177.98	185.40	184.23	186.73	0.003353	5.16	433.77	189.68	0.69
Bormida	1	18.000*	1994Borm+TR20rii	Finale	1900.00	177.98	185.42	184.05	186.62	0.002924	4.93	470.23	189.68	0.65
Bormida	1	17.000*	1994Borm+TR20rii	Attuale	1900.00	177.84	185.34	184.61	186.67	0.003208	5.32	505.99	241.86	0.68
Bormida	1	17.000*	1994Borm+TR20rii	Lotto1A	1900.00	177.84	185.41	184.18	186.61	0.003016	4.96	479.10	199.36	0.66
Bormida	1	17.000*	1994Borm+TR20rii	Lotto1B	1900.00	177.84	185.41	184.18	186.61	0.003016	4.96	479.10	199.36	0.66
Bormida	1	17.000*	1994Borm+TR20rii	Lotto1C	1900.00	177.84	185.41	184.18	186.61	0.003017	4.96	478.99	199.36	0.66
Bormida	1	17.000*	1994Borm+TR20rii	Finale	1900.00	177.84	185.46	183.96	186.50	0.002534	4.65	523.00	199.36	0.61
Bormida	1	16.000*	1994Borm+TR20rii	Attuale	1900.00	177.69	185.37	184.65	186.55	0.002814	5.04	549.52	246.33	0.64
Bormida	1	16.000*	1994Borm+TR20rii	Lotto1A	1900.00	177.69	185.44	184.13	186.50	0.002636	4.71	532.24	209.03	0.62
Bormida	1	16.000*	1994Borm+TR20rii	Lotto1B	1900.00	177.69	185.44	184.13	186.50	0.002636	4.71	532.24	209.03	0.62

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	1	16.000*	1994Borm+TR20rii	Lotto1C	1900.00	177.69	185.44	184.13	186.50	0.002637	4.72	532.12	209.03	0.62
Bormida	1	16.000*	1994Borm+TR20rii	Finale	1900.00	177.69	185.50	183.84	186.40	0.002169	4.36	580.08	209.03	0.57
Bormida	1	15.000*	1994Borm+TR20rii	Attuale	1900.00	177.55	185.42	184.47	186.44	0.002413	4.73	600.52	250.81	0.60
Bormida	1	15.000*	1994Borm+TR20rii	Lotto1A	1900.00	177.55	185.47	184.05	186.40	0.002268	4.45	590.30	218.71	0.58
Bormida	1	15.000*	1994Borm+TR20rii	Lotto1B	1900.00	177.55	185.47	184.05	186.40	0.002268	4.45	590.30	218.71	0.58
Bormida	1	15.000*	1994Borm+TR20rii	Lotto1C	1900.00	177.55	185.47	184.05	186.40	0.002269	4.46	590.19	218.71	0.58
Bormida	1	15.000*	1994Borm+TR20rii	Finale	1900.00	177.55	185.54	183.62	186.31	0.001849	4.09	639.55	218.71	0.52
Bormida	1	14.000*	1994Borm+TR20rii	Attuale	1900.00	177.40	185.46		186.34	0.002048	4.42	655.98	255.29	0.55
Bormida	1	14.000*	1994Borm+TR20rii	Lotto1A	1900.00	177.40	185.51	183.99	186.31	0.001933	4.19	652.18	228.39	0.53
Bormida	1	14.000*	1994Borm+TR20rii	Lotto1B	1900.00	177.40	185.51	183.99	186.31	0.001933	4.19	652.18	228.39	0.53
Bormida	1	14.000*	1994Borm+TR20rii	Lotto1C	1900.00	177.40	185.51	183.99	186.31	0.001934	4.20	652.07	228.39	0.53
Bormida	1	14.000*	1994Borm+TR20rii	Finale	1900.00	177.40	185.57	183.35	186.24	0.001573	3.83	701.01	228.39	0.49
Bormida	1	13.000*	1994Borm+TR20rii	Attuale	1900.00	177.26	185.51		186.25	0.001733	4.13	714.33	259.77	0.51
Bormida	1	13.000*	1994Borm+TR20rii	Lotto1A	1900.00	177.26	185.54	183.73	186.23	0.001642	3.94	716.14	238.07	0.50
Bormida	1	13.000*	1994Borm+TR20rii	Lotto1B	1900.00	177.26	185.54	183.73	186.23	0.001642	3.94	716.14	238.07	0.50
Bormida	1	13.000*	1994Borm+TR20rii	Lotto1C	1900.00	177.26	185.54	183.73	186.23	0.001643	3.95	716.03	238.07	0.50
Bormida	1	13.000*	1994Borm+TR20rii	Finale	1900.00	177.26	185.60	183.31	186.17	0.001341	3.59	763.42	238.07	0.45
Bormida	1	12.000*	1994Borm+TR20rii	Attuale	1900.00	177.11	185.54		186.18	0.001465	3.85	775.54	264.24	0.47
Bormida	1	12.000*	1994Borm+TR20rii	Lotto1A	1900.00	177.11	185.56		186.17	0.001404	3.72	785.47	264.24	0.46
Bormida	1	12.000*	1994Borm+TR20rii	Lotto1B	1900.00	177.11	185.56		186.17	0.001404	3.72	785.47	264.24	0.46
Bormida	1	12.000*	1994Borm+TR20rii	Lotto1C	1900.00	177.11	185.57	183.79	186.16	0.001397	3.71	780.71	247.74	0.46
Bormida	1	12.000*	1994Borm+TR20rii	Finale	1900.00	177.11	185.62	183.05	186.12	0.001146	3.37	825.72	247.74	0.42
Bormida	1	11.000*	1994Borm+TR20rii	Attuale	1900.00	176.97	185.57		186.12	0.001238	3.59	839.64	267.89	0.44
Bormida	1	11.000*	1994Borm+TR20rii	Lotto1A	1900.00	176.97	185.59		186.11	0.001192	3.50	848.11	267.99	0.43
Bormida	1	11.000*	1994Borm+TR20rii	Lotto1B	1900.00	176.97	185.59		186.11	0.001192	3.50	848.11	267.99	0.43
Bormida	1	11.000*	1994Borm+TR20rii	Lotto1C	1900.00	176.97	185.59	183.59	186.11	0.001186	3.49	847.13	257.42	0.42
Bormida	1	11.000*	1994Borm+TR20rii	Finale	1900.00	176.97	185.64	182.94	186.07	0.000981	3.17	889.09	257.42	0.39
Bormida	1	10	1994Borm+TR20rii	Attuale	1900.00	176.82	185.60		186.07	0.001045	3.35	907.02	265.99	0.40
Bormida	1	10	1994Borm+TR20rii	Lotto1A	1900.00	176.82	185.61		186.06	0.001006	3.28	915.60	267.18	0.39
Bormida	1	10	1994Borm+TR20rii	Lotto1B	1900.00	176.82	185.61		186.06	0.001006	3.28	915.60	267.18	0.39
Bormida	1	10	1994Borm+TR20rii	Lotto1C	1900.00	176.82	185.61	183.39	186.06	0.001006	3.28	915.60	266.55	0.39
Bormida	1	10	1994Borm+TR20rii	Finale	1900.00	176.82	185.65	182.73	186.03	0.000839	2.98	953.79	267.10	0.36
Bormida	1	9	1994Borm+TR20rii	Attuale	1900.00	176.65	185.60		186.04	0.000923	3.21	922.72	251.25	0.38
Bormida	1	9	1994Borm+TR20rii	Lotto1A	1900.00	176.65	185.61		186.03	0.000889	3.17	930.96	251.27	0.37
Bormida	1	9	1994Borm+TR20rii	Lotto1B	1900.00	176.65	185.61		186.03	0.000889	3.17	930.96	251.27	0.37
Bormida	1	9	1994Borm+TR20rii	Lotto1C	1900.00	176.65	185.61		186.03	0.000889	3.17	930.96	251.27	0.37
Bormida	1	9	1994Borm+TR20rii	Finale	1900.00	176.65	185.65		186.01	0.000755	2.89	968.28	251.36	0.34
Bormida	1	8.0000*	1994Borm+TR20rii	Attuale	1900.00	176.65	185.55		186.01	0.001010	3.33	908.44	252.83	0.39
Bormida	1	8.0000*	1994Borm+TR20rii	Lotto1A	1900.00	176.65	185.56		186.01	0.000976	3.29	915.59	252.84	0.39

River	Reach	River Sta	Profile	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Bormida	1	8.0000*	1994Borm+TR20rii	Lotto1B	1900.00	176.65	185.56		186.01	0.000976	3.29	915.59	252.84	0.39
Bormida	1	8.0000*	1994Borm+TR20rii	Lotto1C	1900.00	176.65	185.56		186.01	0.000976	3.29	915.59	252.84	0.39
Bormida	1	8.0000*	1994Borm+TR20rii	Finale	1900.00	176.65	185.60		185.99	0.000834	3.02	950.30	252.93	0.36
Bormida	1	7.0000*	1994Borm+TR20rii	Attuale	1900.00	176.66	185.49		185.98	0.001109	3.47	893.34	254.39	0.41
Bormida	1	7.0000*	1994Borm+TR20rii	Lotto1A	1900.00	176.66	185.50		185.98	0.001076	3.43	899.46	254.40	0.41
Bormida	1	7.0000*	1994Borm+TR20rii	Lotto1B	1900.00	176.66	185.50		185.98	0.001076	3.43	899.46	254.40	0.41
Bormida	1	7.0000*	1994Borm+TR20rii	Lotto1C	1900.00	176.66	185.50		185.98	0.001076	3.43	899.46	254.40	0.41
Bormida	1	7.0000*	1994Borm+TR20rii	Finale	1900.00	176.66	185.54		185.96	0.000928	3.16	931.41	254.52	0.38
Bormida	1	6.0000*	1994Borm+TR20rii	Attuale	1900.00	176.66	185.43		185.95	0.001226	3.61	877.16	255.96	0.43
Bormida	1	6.0000*	1994Borm+TR20rii	Lotto1A	1900.00	176.66	185.43		185.95	0.001195	3.57	882.24	255.97	0.43
Bormida	1	6.0000*	1994Borm+TR20rii	Lotto1B	1900.00	176.66	185.43		185.95	0.001195	3.57	882.24	255.97	0.43
Bormida	1	6.0000*	1994Borm+TR20rii	Lotto1C	1900.00	176.66	185.43		185.95	0.001195	3.57	882.24	255.97	0.43
Bormida	1	6.0000*	1994Borm+TR20rii	Finale	1900.00	176.66	185.48		185.94	0.001042	3.33	911.17	256.11	0.40
Bormida	1	5.0000*	1994Borm+TR20rii	Attuale	1900.00	176.66	185.36		185.91	0.001365	3.76	859.43	257.51	0.45
Bormida	1	5.0000*	1994Borm+TR20rii	Lotto1A	1900.00	176.66	185.36		185.91	0.001336	3.74	863.54	257.53	0.45
Bormida	1	5.0000*	1994Borm+TR20rii	Lotto1B	1900.00	176.66	185.36		185.91	0.001336	3.74	863.54	257.53	0.45
Bormida	1	5.0000*	1994Borm+TR20rii	Lotto1C	1900.00	176.66	185.36		185.91	0.001336	3.74	863.54	257.53	0.45
Bormida	1	5.0000*	1994Borm+TR20rii	Finale	1900.00	176.66	185.41		185.90	0.001181	3.51	889.09	257.70	0.42
Bormida	1	4.0000*	1994Borm+TR20rii	Attuale	1900.00	176.66	185.28		185.87	0.001535	3.94	839.49	259.05	0.48
Bormida	1	4.0000*	1994Borm+TR20rii	Lotto1A	1900.00	176.66	185.28		185.87	0.001510	3.92	842.63	259.07	0.47
Bormida	1	4.0000*	1994Borm+TR20rii	Lotto1B	1900.00	176.66	185.28		185.87	0.001510	3.92	842.63	259.07	0.47
Bormida	1	4.0000*	1994Borm+TR20rii	Lotto1C	1900.00	176.66	185.28		185.87	0.001510	3.92	842.63	259.07	0.47
Bormida	1	4.0000*	1994Borm+TR20rii	Finale	1900.00	176.66	185.32		185.87	0.001358	3.72	864.32	259.27	0.45
Bormida	1	3.0000*	1994Borm+TR20rii	Attuale	1900.00	176.67	185.18		185.83	0.001751	4.15	816.16	260.51	0.51
Bormida	1	3.0000*	1994Borm+TR20rii	Lotto1A	1900.00	176.67	185.18		185.82	0.001730	4.13	818.31	260.53	0.50
Bormida	1	3.0000*	1994Borm+TR20rii	Lotto1B	1900.00	176.67	185.18		185.82	0.001730	4.13	818.31	260.53	0.50
Bormida	1	3.0000*	1994Borm+TR20rii	Lotto1C	1900.00	176.67	185.18		185.82	0.001730	4.13	818.31	260.53	0.50
Bormida	1	3.0000*	1994Borm+TR20rii	Finale	1900.00	176.67	185.22		185.82	0.001593	3.97	835.31	260.75	0.48
Bormida	1	2.0000*	1994Borm+TR20rii	Attuale	1900.00	176.67	185.06		185.77	0.002043	4.39	787.03	261.72	0.54
Bormida	1	2.0000*	1994Borm+TR20rii	Lotto1A	1900.00	176.67	185.06		185.77	0.002030	4.38	788.13	261.74	0.54
Bormida	1	2.0000*	1994Borm+TR20rii	Lotto1B	1900.00	176.67	185.06		185.77	0.002030	4.38	788.13	261.74	0.54
Bormida	1	2.0000*	1994Borm+TR20rii	Lotto1C	1900.00	176.67	185.06		185.77	0.002030	4.38	788.13	261.74	0.54
Bormida	1	2.0000*	1994Borm+TR20rii	Finale	1900.00	176.67	185.09		185.77	0.001929	4.29	798.84	261.97	0.53
Bormida	1	1	1994Borm+TR20rii	Attuale	1900.00	176.67	184.89	184.36	185.70	0.002503	4.74	744.60	262.06	0.59
Bormida	1	1	1994Borm+TR20rii	Lotto1A	1900.00	176.67	184.89	184.38	185.70	0.002503	4.74	744.58	262.06	0.59
Bormida	1	1	1994Borm+TR20rii	Lotto1B	1900.00	176.67	184.89	184.38	185.70	0.002503	4.74	744.58	262.06	0.59
Bormida	1	1	1994Borm+TR20rii	Lotto1C	1900.00	176.67	184.89	184.38	185.70	0.002503	4.74	744.58	262.06	0.59
Bormida	1	1	1994Borm+TR20rii	Finale	1900.00	176.67	184.89	184.39	185.70	0.002503	4.74	744.58	262.06	0.59

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02



Bormida 1

Bormida 2 Rio Maffio 1 Pietro 2 Rio Sacco 1 Bormida 3

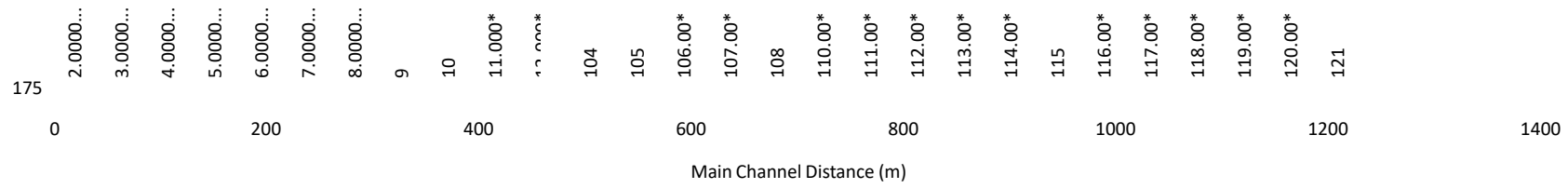
Elevation (m)

200
195
190
185

R
i
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S
a
n
P
i
e
t
r
o
1
1
1
3

R
i
o
S
a
c
c
o
1
1
3

180



1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

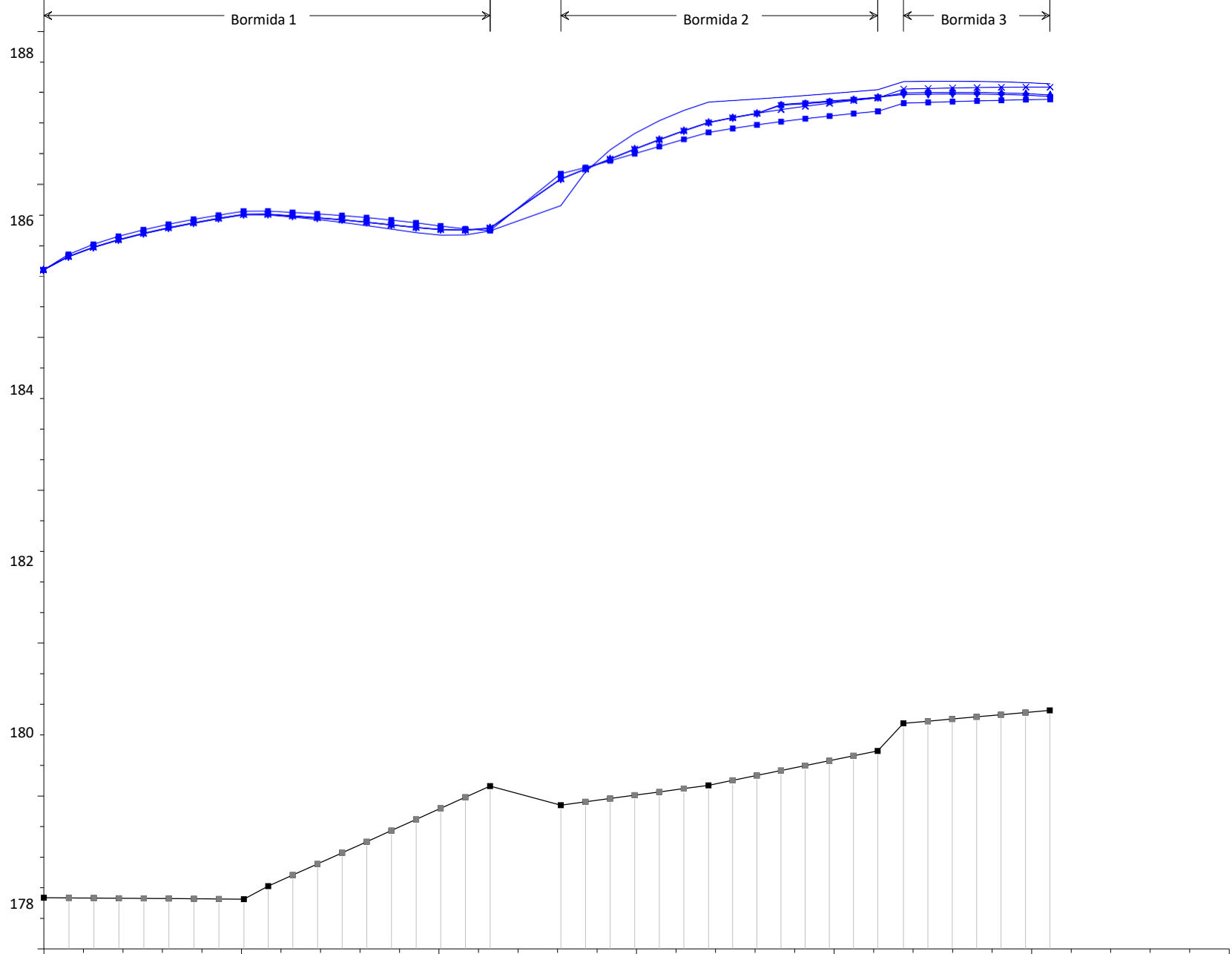
Geom: Finale_rev02

Bormida 1

Bormida 2

Bormida 3

Elevation (m)



Legend

- WS 1994Borm+TR20rii - Attuale WS
- 1994Borm+TR20rii - Lotto1A WS
- 1994Borm+TR20rii - Lotto1B WS
- 1994Borm+TR20rii - Lotto1C WS
- 1994Borm+TR20rii - Finale

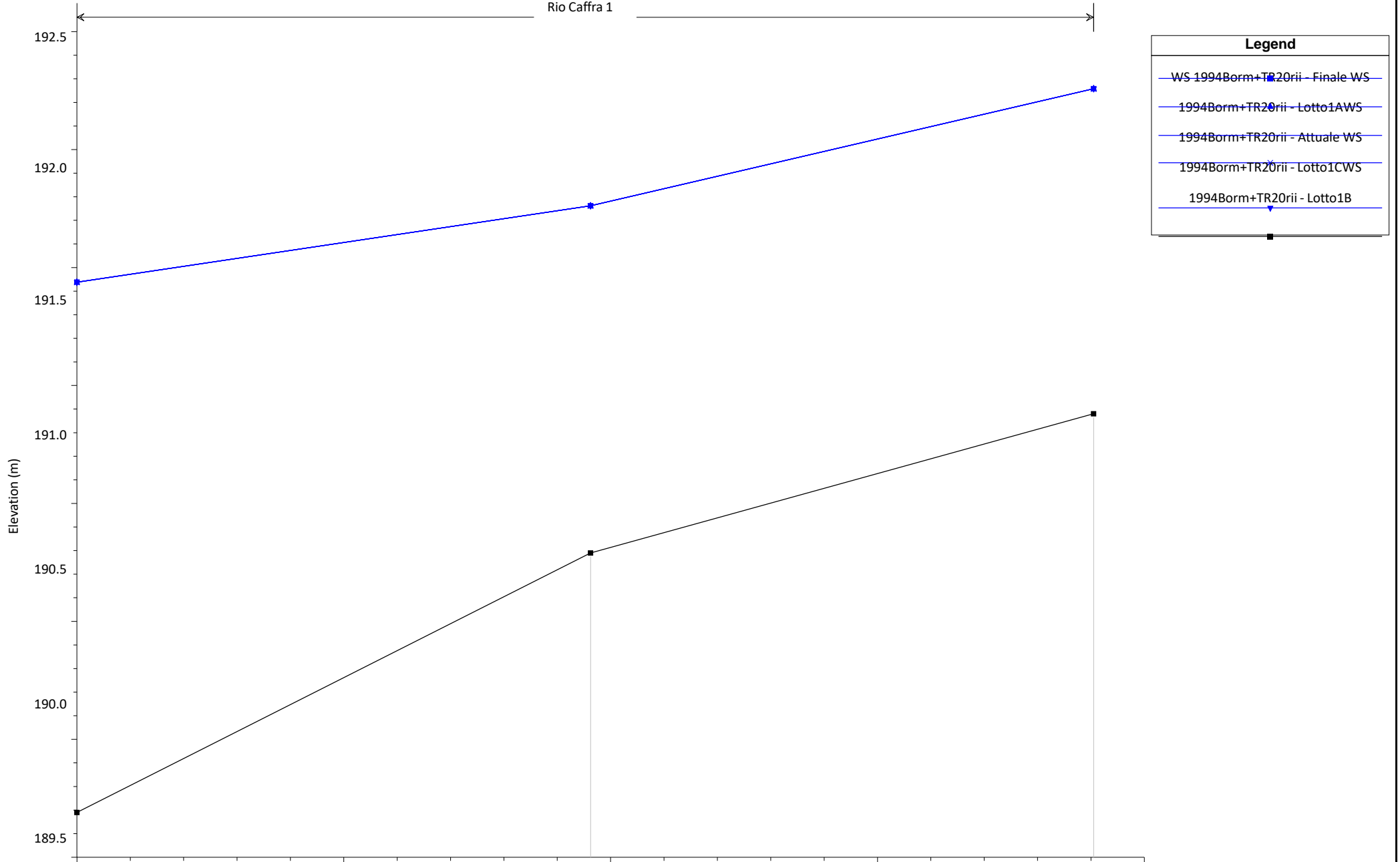
176
0 200 400 600 800 1000 1200
Main Channel Distance (m)

2.000.
3.000.
4.000.
5.000.
6.000.
7.000.
8.000.
9
10
11.000*
12.000*
13.000*
22
23.000*
24.000*
25.000*
26.000*
27.000*
28
29.000*
30.000*
31.000*
32.000*
33.000*
34.000*
35

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02

Rio Caffra 1



189.0

0

20

203

40

60

205

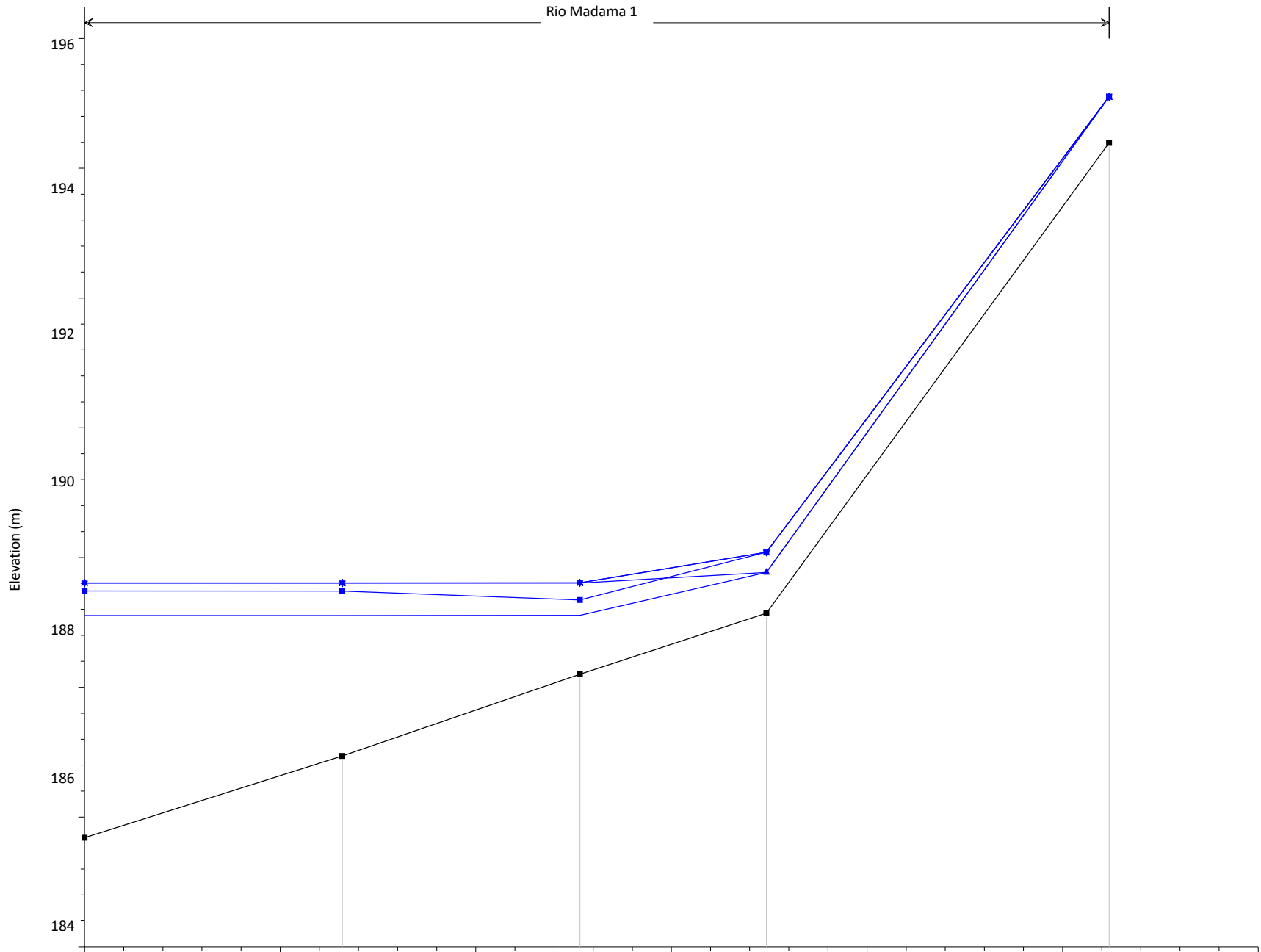
80

Main Channel Distance (m)

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02

Rio Madama 1



Legend

- WS 1994Borm+TR20rii - Lotto1BWS
- 1994Borm+TR20rii - Lotto1CWS
- 1994Borm+TR20rii - Lotto1AWS
- 1994Borm+TR20rii - Finale WS
- 1994Borm+TR20rii - Attuale

182

402

403

404

405

0

50

100

150

200

250

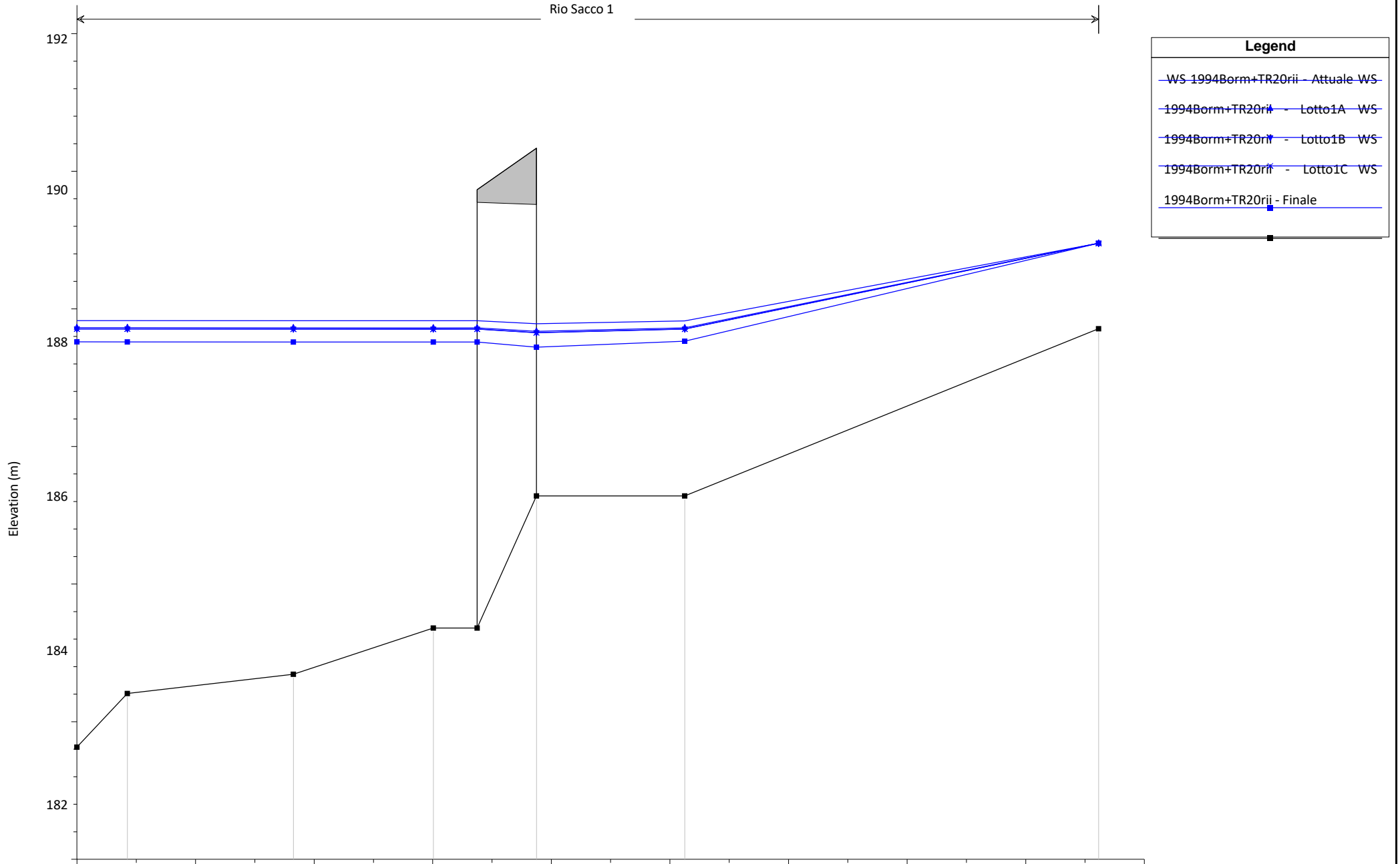
300

Main Channel Distance (m)

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02

Rio Sacco 1



180

302

303

304

304.5

305

306

0

20

40

60

80

100

120

140

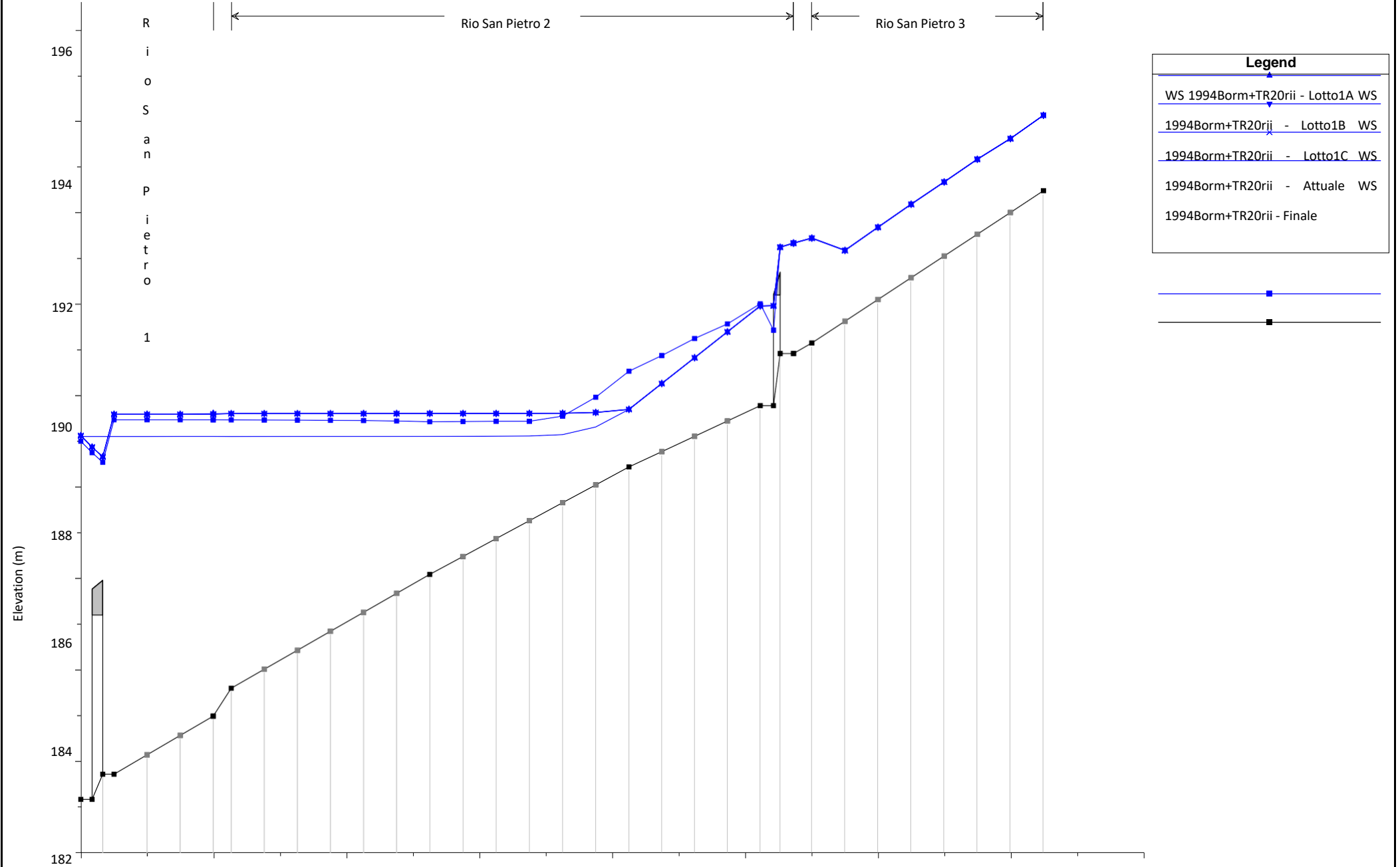
160

180

Main Channel Distance (m)

1) Attuale 2) Lotto1A 3) Lotto1B 4) Lotto1C 5) Finale

Geom: Finale_rev02



180

178

0 100 200 300 400 500 600 700 800

Main Channel Distance (m)

104.5

106.00*

107.00*

108

110.00*

111.00*

112.00*

113.00*

114.00*

115

116.00*

117.00*

118.00*

119.00*

120.00*

121

122.00*

123.00*

124.00*

125

126

127

128.00*

129.00*

130.00*

131.00*

132.00*

133.00*

134

9 VERIFICA DEL FRANCO ARGINALE

L'evento di piena di progetto delle arginature, come già riportato nei precedenti paragrafi, risulta essere quello che prevede per il fiume Bormida di Millesimo un tempo di ritorno pari a 200 anni, mentre per i fossi colatori coinvolti un tempo di ritorno pari a 20 anni.

La verifica del franco idraulico è stata condotta nella situazione di progetto finale, ovvero dove tutte le opere di minimizzazione del rischio idraulico previste sono state realizzate.

Nelle seguenti tabelle vengono riportate le verifiche puntuali delle arginature in progetto in corrispondenza delle sezioni di calcolo del modello, dove il franco idraulico minimo fissato dalla "Direttiva contenente i criteri per la valutazione della compatibilità idraulica delle infrastrutture pubbliche all'interno delle fasce A e B" pari ad 1.00 m risulta essere ampiamente verificato.

SIMULAZIONE TR200Borm+TR20rii – STATO FINALE				
River	River Station	W.S. Elev (m s.l.m.)	Quota argine (m s.l.m.)	Franco (m)
Rio San Pietro	125	190.01	191.10	1.09
Rio San Pietro	124.00*	189.57	190.78	1.21
Rio San Pietro	123.00*	189.25	190.45	1.20
Rio San Pietro	122.00*	188.88	190.13	1.25
Rio San Pietro	121	188.53	189.80	1.27
Rio San Pietro	120.00*	187.96	189.45	1.49
Rio San Pietro	119.00*	187.55	189.10	1.55
Rio San Pietro	118.00*	187.14	188.75	1.61
Rio San Pietro	117.00*	186.75	188.40	1.65
Rio San Pietro	116.00*	186.54	188.05	1.51
Rio San Pietro	115	186.51	187.70	1.19
Rio San Pietro	114.00*	186.55	187.70	1.15
Rio San Pietro	113.00*	186.56	187.70	1.14
Rio San Pietro	112.00*	186.57	187.70	1.13
Rio San Pietro	111.00*	186.58	187.70	1.12
Rio San Pietro	110.00*	186.58	187.70	1.12
Rio San Pietro	109	186.58	187.70	1.12
Rio San Pietro	108	186.58	187.70	1.12
Rio San Pietro	107.00*	186.58	187.70	1.12
Rio San Pietro	106.00*	186.58	187.70	1.12
Rio San Pietro	105	186.58	187.70	1.12
Rio San Pietro	104	186.12	187.70	1.58

INTERVENTO CODICE AT_A18_622_19_102 – PROGETTO PER LAVORI DI ADEGUAMENTO SEZIONI DI DEFLUSSO FOSSI COLATORI PROVENIENTI DA VERSANTI IN GIARONETTO - ADEGUAMENTO DEI TRATTI DEL FIUME BORMIDA E DEL RIO SAN PIETRO IN CORRISPONDENZA DELLA S.P. 25 - PROGETTO ESECUTIVO – LOTTO 1A

SIMULAZIONE TR200Borm+TR20rii – STATO FINALE				
River	River Station	W.S. Elev (m s.l.m.)	Quota argine (m s.l.m.)	Franco (m)
Rio Madama	402	186.6	187.70	1.10
Rio Madama	401	186.61	187.70	1.09
Bormida	35	186.06	187.74	1.68
Bormida	34.000*	186.03	187.72	1.69
Bormida	33.000*	186	187.69	1.69
Bormida	32.000*	185.97	187.67	1.70
Bormida	31.000*	185.94	187.64	1.70
Bormida	30.000*	185.91	187.62	1.71
Bormida	29.000*	185.87	187.59	1.72
Bormida	28	185.84	187.57	1.73
Bormida	27.000*	185.76	187.40	1.64
Bormida	26.000*	185.69	187.24	1.55
Bormida	25.000*	185.62	187.07	1.45
Bormida	24.000*	185.56	186.90	1.34
Bormida	23.000*	185.51	186.74	1.23
Bormida	22	185.47	186.57	1.10
Bormida	19	184.99	186.07	1.08
Bormida	18.000*	184.96	186.07	1.11
Bormida	17.000*	184.96	186.07	1.11
Bormida	16.000*	184.98	186.07	1.09
Bormida	15.000*	185	186.07	1.07
Bormida	14.000*	185.02	186.07	1.05
Bormida	13.000*	185.03	186.07	1.04
Bormida	12.000*	185.05	186.07	1.02
Bormida	11.000*	185.06	186.07	1.01
Bormida	10	185.08	186.08	1.00

10 VERIFICA DELLA SCOGLIERA IN PROGETTO

Si compie la verifica dei massi della scogliera utilizzando i risultati ottenuti con la modellazione di moto permanente monodimensionale della situazione di progetto finale dell'evento di piena di progetto, che risulta essere quello che prevede per il fiume Bormida di Millesimo un tempo di ritorno pari a 200 anni, mentre per i fossi colatori coinvolti un tempo di ritorno pari a 20 anni, considerando il valore più cautelativo di velocità della corrente in alveo in corrispondenza della medesima. Gli interventi di rivestimento sono disposti su di un tratto del Bormida di Millesimo e pertanto verranno condotte le verifiche per la sezione maggiormente sollecitata, ovvero dove il modello numerico evidenzia le maggiori velocità medie. La sezione interessata dalla scogliera maggiormente sollecitata risulta essere la n. 19, in corrispondenza della strettoia, i cui valori sono riportati in tabella:

Corso d'acqua	Sez.	Portata [m³/s]	Quota idrometrica [m s.l.m.]	Velocità media [m/s]
Bormida di Millesimo	19	1469	184.99	4.31

Tabella 10.1: Quota idrometrica e velocità media nella sezione di verifica

Occorre tenere conto che la velocità dell'acqua nelle vicinanze altimetriche del rivestimento non è quella valutata, che ha caratteristiche altimetriche medie nella sezione, ma è un valore ricavabile dalla precedente e definito come velocità di fondo.

Le velocità di fondo nella stessa sezione si può ottenere tramite la seguente relazione:

$$U_f = \mu U = 0.7U$$

da cui si ricava la seguente tabella:

Corso d'acqua	Portata [m³/s]	Velocità media [m/s]	Velocità di fondo [m/s]
Bormida di Millesimo	1469	4.31	3.02

Tabella 10.2: Velocità di fondo della corrente in corrispondenza della sezione di verifica

La scogliera sarà realizzata con massi di peso superiore a 2000 daN.

Assumendo un peso specifico del materiale solido γ_s medio roccia = 2550 daN/m³, si evidenziano nella tabella sottostante i valori del volume del materiale, del diametro teorico del materiale e della velocità critica ad essi correlata, determinata secondo la seguente:

$$U_{crit} = 6\sqrt{d}$$

Peso materiale (daN)	Volume materiale (m³)	ϕ materiale (m)	V critica (m/s)
2000	0.78	0.92	5.75

Tabella 10.3: Velocità critica per le dimensioni dei massi considerati

Tale massa è quindi da ritenersi cautelativamente rappresentativo della struttura dell'opera.

Le condizioni idrauliche che si riscontrano nella sezione di verifica sono:

Corso d'acqua	Velocità media [m/s]	Velocità di fondo [m/s]	Velocità critica [m/s]	Coeff. di sicurezza
Bormida di Millesimo	4.31	3.02	5.75	1.90

Tabella 10.4: Valore della velocità media di calcolo, della velocità del fondo, della velocità critica e del coefficiente di sicurezza minimo nella sezione di verifica.

Dalle verifiche risulta che il masso in esame soddisfa la condizione di sicurezza:

$$U_f < U_{crit}$$

con coefficiente che, per la condizione più gravosa, è pari a 1.90 rispetto alla condizione teorica di equilibrio limite. Tale risultato è maggiormente significativo se si considera che il masso verificato rappresenta quello di peso minimo. Pertanto, si può concludere che la scogliera in progetto, realizzata con massi del peso minimo pari a 2000 daN, risulta verificata allo scalzamento anche nelle condizioni idrauliche più gravose.

11 CONCLUSIONI

L'obiettivo del progetto è quello di ottenere la minimizzazione del rischio idraulico nel tratto del fiume Bormida di Millesimo in corrispondenza della zona industriale e residenziale del Comune di Bubbio e dei tratti di confluenza dei fossi colatori.

Si osserva che in questo tratto la strada provinciale SP25 è parallela e nelle vicinanze dell'alveo del corso d'acqua.

Si è previsto di intervenire sull'alveo del fiume da monte fino a valle della zona industriale mediante un intervento di arginatura in sinistra idrografica tra la SP25 ed il fiume ed un intervento di ricalibratura con ampliamento finale della sezione di circa 30 m in sponda destra.

Tale intervento in destra idraulica migliora l'andamento dei filetti fluidi in corrispondenza della zona di intervento dove il tracciato del fiume presenta curve piuttosto marcate dando al fiume la possibilità di espandersi in destra.

L'intervento in progetto migliora pertanto globalmente la dinamica fluviale del tratto di fiume oggetto di ricalibratura.

A parità di portata, si registrano abbassamenti del livello idraulico significativi, dell'ordine di 25-30 cm massimi sulla piena di progetto, tra la situazione attuale e quella in progetto finale. In merito ai rii ed i fossi presenti si osserva che questi non danno particolari problemi nella configurazione di progetto in quanto quelli interferenti con la sistemazione del fiume Bormida sono sistemati con arginature che contengono il rigurgito mentre quelli a monte dell'intervento che si immettono nel reticolo non presentano variazioni apprezzabili nelle condizioni idrauliche di progetto rispetto alla situazione attuale.

Si precisa comunque che il rischio idraulico di esondazione di questi corsi d'acqua secondari ha caratteristiche che sono di alcuni ordini di grandezza inferiori rispetto al fiume Bormida. Tale affermazione trova conferma nell'analisi degli effetti degli eventi alluvionali del 1994 e del 2016 che sono riportati nelle pagine precedenti.

Come già anticipato ai capitoli precedenti, si osserva sul rio San Pietro, a causa delle nuove arginature che impediscono il deflusso fuori dall'alveo e a causa del moto in pressione che si instaura al di sotto del ponte sulla SP25 nella situazione di progetto, un aumento dei livelli idraulici a monte del ponte nella situazione finale rispetto a quella attuale di circa 0.40-0.80 m.

INTERVENTO CODICE AT_A18_622_19_102 – PROGETTO PER LAVORI DI ADEGUAMENTO SEZIONI DI DEFLUSSO FOSSI COLATORI PROVENIENTI DA VERSANTI IN GIARONETTO - ADEGUAMENTO DEI TRATTI DEL FIUME BORMIDA E DEL RIO SAN PIETRO IN CORRISPONDENZA DELLA S.P. 25 - PROGETTO ESECUTIVO – LOTTO 1A

Tale incremento è stato opportunamente valutato e le arginature sul rio San Pietro sono state dimensionate in considerazione di tale aumento, in ragione anche degli importanti miglioramenti ottenuti sulla minimizzazione del rischio idraulico derivante dal fiume Bormida. Si evidenzia che il ponte in regione Giarone sul rio San Pietro collocato poco a valle della confluenza del rio della Caffra, che risulta essere al di fuori dell'area di intervento in progetto, non risulta verificato secondo quanto previsto dalla normativa vigente, determinando fenomeni di rigurgito nei due corpi idrici coinvolti esclusivamente verso monte.

Di seguito si riportano i principali miglioramenti ottenuti dalla realizzazione dei lotti funzionali previsti rispetto alla situazione attuale:

LOTTO 1A:

- **Bormida:** In seguito alle modifiche apportate nel progetto esecutivo, l'estensione dei muri d'argine previsti nel tratto di monte del presente lotto è stata ridotta di circa 31 m rispetto a quanto previsto nel PFTE: risulta quindi che la piena con tempo di ritorno pari a 20 anni e l'evento di piena del 2016 simulati non sono più contenuti dall'arginatura in progetto nel lotto. **È importante sottolineare che tale condizione risulta transitoria e verrà risolta mediante il completamento dei successivi lotti già finanziati.**

La piena con tempo di ritorno pari a 200 anni e l'evento di piena del 1994 esondano nei tratti a monte e a valle interessati dalle arginature previste al successivo lotto 1C (in giallo). Per effetto della ricalibratura, si osservano abbassamenti a monte della confluenza con il rio San Pietro degli abbassamenti dell'ordine dei 15 cm;

- **Fossi colatori:** Il rigurgito della piena del Bormida con tempo di ritorno pari a 20 anni nel rio San Pietro viene contenuto grazie alle nuove arginature, mentre la piena concomitante dei fossi colatori che viene contenuta risulta avere un tempo di ritorno inferiore ai 20 anni. In particolare, in concomitanza della portata con tempo di ritorno ventennale del Bormida, la massima portata defluibile nel rio San Pietro a valle della confluenza con il rio della Caffra risulta pari a 8.00 m³/s, mentre la massima portata defluibile nel rio Madama risulta pari a 1.00 m³/s;

LOTTO 1B:

- **Bormida:** Vista l'entità minima, in termini idraulici, di ricalibratura aggiuntiva, i risultati sono analoghi a quanto riportato al precedente lotto 1A.

INTERVENTO CODICE AT_A18_622_19_102 – PROGETTO PER LAVORI DI ADEGUAMENTO SEZIONI DI DEFLUSSO FOSSI COLATORI PROVENIENTI DA VERSANTI IN GIARONETTO - ADEGUAMENTO DEI TRATTI DEL FIUME BORMIDA E DEL RIO SAN PIETRO IN CORRISPONDENZA DELLA S.P. 25 - PROGETTO ESECUTIVO – LOTTO 1A

- **Fossi colatori:** Il completamento degli argini in sinistra del rio Madama permette di ottenere la mitigazione del rischio idraulico nei confronti dell'area industriale per portate con tempi di ritorno inferiori a quello corrispondente all'evento di piena del 2016 simulato; infatti, tali arginature impediscono alle acque esondate a monte dal rio Madama e dal rio San Pietro di ruscellare sul piano campagna dell'area agricola verso valle, poiché intercettate dall'arginatura in progetto e ricondotte all'interno dell'alveo. Per quanto riguarda l'esondabilità del rio San Pietro in sponda destra verso la zona residenziale, i risultati sono analoghi a quanto riportato al precedente lotto 1A.

LOTTO 1C:

- **Bormida:** Il completamento delle arginature a monte e a valle del tratto già realizzato al precedente lotto 1A permettono la minimizzazione del rischio idraulico diretto del fiume Bormida per una portata con tempo di ritorno di progetto considerato di 200 anni, con un ulteriore franco idraulico sulla piena del 1994 mediamente pari a 50 cm.
- **Fossi colatori:** non intervenendo direttamente sui fossi colatori, i risultati sono analoghi a quanto riportato al precedente lotto 1B.

OPERE DI COMPLETAMENTO (STATO FINALE):

- **Bormida:** L'ulteriore ricalibratura in sponda destra permette di raggiungere un abbassamento finale rispetto alla situazione attuale a monte della confluenza con il rio San Pietro dell'ordine dei 25-30 cm. A valle della confluenza con il rio San Pietro, si osserva, anche a causa delle arginature in progetto che impediscono la laminazione in sponda sinistra, un lieve incremento dei livelli idraulici nell'ordine dei 5 cm. Tale innalzamento, in ogni caso assolutamente trascurabile, tende ad azzerarsi verso valle, indicando che l'intervento congiunto di arginatura e ricalibratura permette di migliorare l'assetto generale del profilo di piena, evitando l'esondazione a Bubbio e allo stesso tempo risultando idraulicamente trasparente per il territorio a valle dell'intervento;
- **Fossi colatori:** Con il completamento delle arginature sul rio San Pietro verso monte, si ottiene la minimizzazione del rischio idraulico indotto dal rigurgito del fiume Bormida per una portata con tempo di ritorno di progetto considerato di 200 anni e la minimizzazione del rischio idraulico indotto dalle piene dei fossi colatori coinvolti per

una portata di piena concomitante pari a 20 anni, ottenendo un franco minimo idraulico pari ad 1.00 m, come previsto dalla normativa. Nella situazione finale, è stato analizzato anche il comportamento del rio San Pietro coinvolto da una piena con tempo di ritorno pari a 200 anni, concomitante con una piena sul Bormida con tempo di ritorno pari a 20 anni: tale situazione mostra come nella parte alta dell'asta del san Pietro, dove viene meno l'influenza del rigurgito del Bormida, i livelli si alzano rispetto alla simulazione utilizzata per la verifica delle arginature di circa 30 cm, rimanendo ad ogni modo contenuti all'interno dell'alveo seppur con un franco idraulico inferiore.