GOVERNMENT OF PAKISTAN
MINISTRY OF WATER AND POWER
OFFICE OF PAKISTAN COMMISSIONER FOR INDUS WATERS

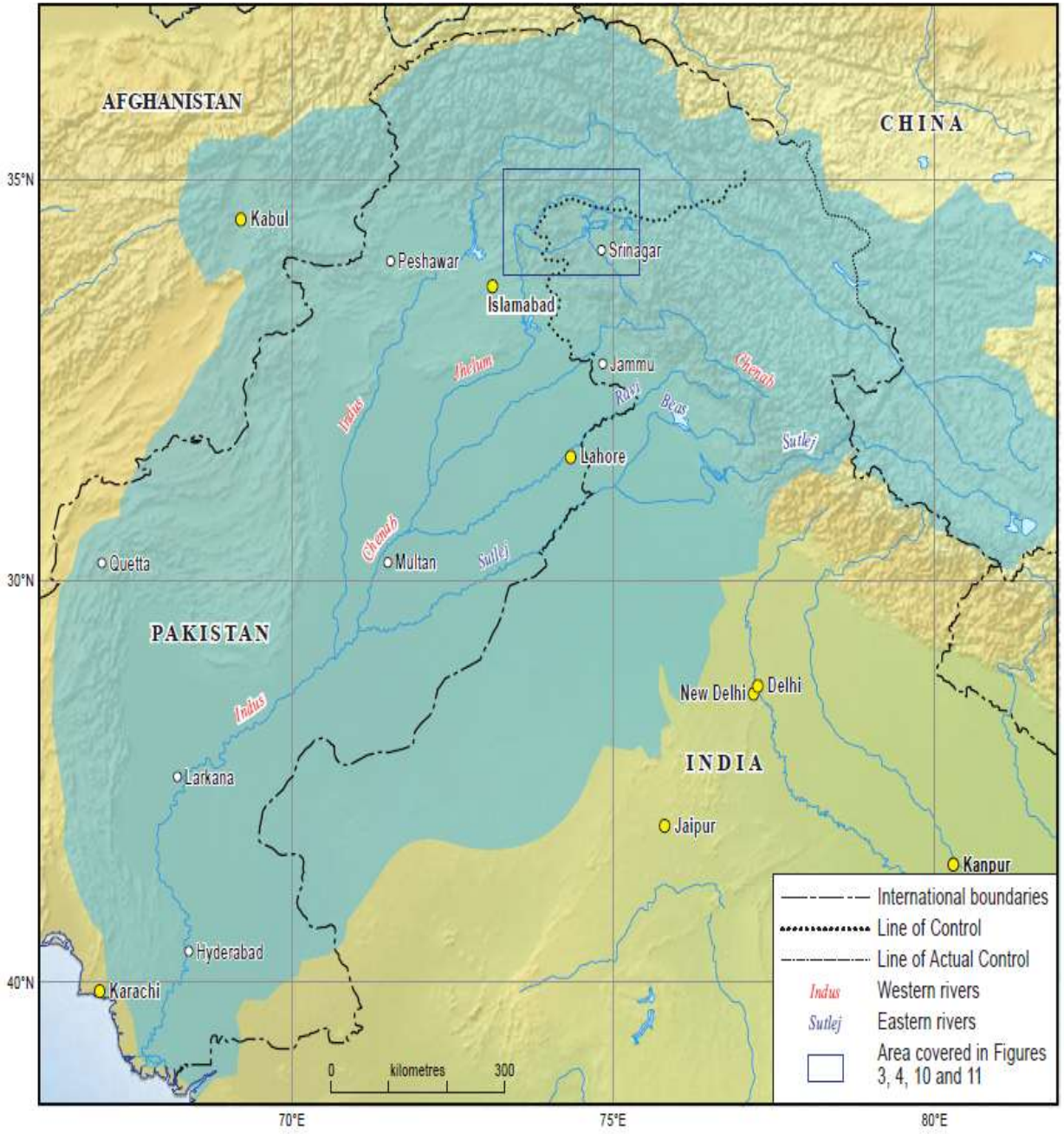
KISHENGANGA AND RATLE DAMS' DISPUTE WITH INDIA

MEETING WITH
WORLD BANK DELEGATION

MIRZA ASIF BAIG
PAKISTAN COMMISSIONER FOR INDUS WATERS (PCIW)

MAY 2017

INDUS BASIN MAP



Inflows of Western Rivers at Rim Stations in Pakistan

Sr. No.	River Stations	Annual Volume (MAF)	
		Pre-Treaty (1922-1960)	Post-Treaty (1960-2013)
1	Indus at Kalabagh	91.05	88.27
2	Jhelum at Mangla	23.16	22.21
3	Chenab at Marala	25.52	25.38
Total		**139.73**	**135.85**

ARTICLE-III

PROVISIONS REGARDING WESTERN RIVERS (INDUS, JHELUM AND CHENAB)

(What is allowed to India)

(a) Domestic Use;

(b) Non-Consumptive Use;

(c) Agricultural Use , as set out in Annexure C; and

(d) Generation of Hydro-electric Power, as set out in Annexure D.

(3)…

(What is not allowed)

(4) Except as provided in Annexures D and E, India shall not store any water of , or construct any storage works on the Western Rivers.

ARTICLE-III

PROVISIONS REGARDING WESTERN RIVERS (INDUS, JHELUM AND CHENAB)

(1) Pakistan shall receive for unrestricted use all those waters of the Western Rivers which India is under obligation to let flow under the provisions of Paragraph 2.

(2) India shall be under an obligation to let flow all the waters of the Western Rivers and shall not permit any interference with these waters, except for the following uses:

STORAGE PERMITTED TO INDIA UNDER THE TREATY

River System		General Storage	Power Storage	Flood Storage
(1)	(2)	(3)	(4)	(5)
		MAF		
(a)	The Indus	0.25	0.15	Nil
(b)	The Jhelum (excluding Main)	0.50	0.25	0.75
(c)	The Jhelum Main	Nil	Nil	As per Paragraph 9
(d)	The Chenab (excluding Main)	0.50	0.60	Nil
(e)	The Chenab Main	Nil	0.60	Nil

AGRICULTURAL AREAS ON WESTERN RIVERS

Figures in Acres

River	Eff. Date	Add Area	Total	From Flow	2014-15
Indus	42,179	70,000	112,179	112,179	51,126
Jhelum	517,909	400,000	917,909	667,909	638,563
Chenab	82,389	231,000	313,389	132,389	110,008
Total:	642,477	701,000	1,343,477	912,477	799,697

PERMISSIBLE LIMITS OF IRRIGATED AREA ON THE WESTERN RIVERS UNDER ANNEXURE-C

Particulars			*Maximum Irrigated Cropped Area (over and above the cropped area irrigated under the provisions of Paragraphs 3 & 4) (acres)*
(a)	From The Indus, in its drainage basin		70,000
(b)	From The Jhelum, in its drainage basin		400,000
(c)	From the Chenab		
	(i)	In its drainage basin	225,000 of which not more than 100,000 acres will be in the Jammu District.
	(ii)	Outside its drainage basin in the area west of the Deg Nadi (also called Devak River), the aggregate capacity of irrigating channels leading out of the drainage basin of The Chenab to this area not to exceed 120 cusecs	6,000

Paragraph 7 of Annexure-C

Within the limits of the maximum Irrigated Cropped Areas specified against items (b) and (c) in Paragraph 5, the development of these areas by withdrawals from river flow (as distinct from withdrawals from General Storage cum river flow in accordance with Paragraph 6 (b)) shall be regulated as follows:-

(a) Until India can release water from Conservation Storage (as defined in Annexure E) in accordance with sub-paragraphs (b) and (c) below, the new area developed shall not exceed the following:-

Contd…..

Paragraph 7 of Annexure-C

(i) From The Jhelum: 150,000 acres

(ii) From The Chenab: 25,000 acres during the Transition Period and 50,000 acres after the end of the Transition Period.

PARAGRAPH 8 OF ANNEXURE D

Except as provided in Paragraph 18, the design of any new Run-of-River Plant (hereinafter in this Part referred to as a Plant) **shall conform** to the following criteria:-

(a) The works themselves shall not be capable of raising artificially the water level in the Operating Pool above the Full Pondage Level specified in the design.

(b) The design of the works shall take due account of the requirements of Surcharge Storage and of Secondary Power.

(c) The maximum Pondage in the Operating Pool shall not exceed twice the Pondage required for Firm Power.

(d) There shall be no outlets below the Dead Storage Level, unless necessary for sediment control or any other technical purpose; any such outlet shall be of the minimum size, and located at the highest level, consistent with sound and economical design and with satisfactory operation of the works.

PARAGRAPH 8 OF ANNEXURE D (CONT….)

(e) If the conditions at the site of a Plant make a gated spillway necessary, the bottom level of the gates in normal closed position shall be located at the highest level consistent with sound and economical design and satisfactory construction and operation of the works.

(f) The intakes for the turbines shall be located at the highest level consistent with satisfactory and economical construction and operation of the Plant as a Run-of-River Plant and with customary and accepted practice of design for the designated range of the Plant's operation.

(g) If any Plant is constructed on the Chenab Main at a site below Kotru (Longitude 74^{o} – 59' East and Latitude 33^{o} – 09' North), a Regulating Basin shall be incorporated.

History of Disputes with India under the Treaty

Sr. No.	Project Name	Pakistan's Objections				Spillway Type
		Freeboard	Pondage	Spillway Crest Elevation	Intake Crest Elevation	
1	Ratle	✓	✓	✓	✓	Surface gated + orifice gated
2	Kishenganga		✓	✓	✓	Orifice gated
3	Baglihar	✓	✓	✓	✓	Surface gated + orifice gated
4	Salal			✓		Surface gated
8	Nimo Bazgoo		✓	✓	✓	Orifice gated
9	Lower Kalnai	✓	✓		✓	Surface gated
10	Miyar		✓	✓	✓	Orifice gated
11	Pakaldul	✓	✓	✓		Surface gated + orifice gated
12	Dulhasti					

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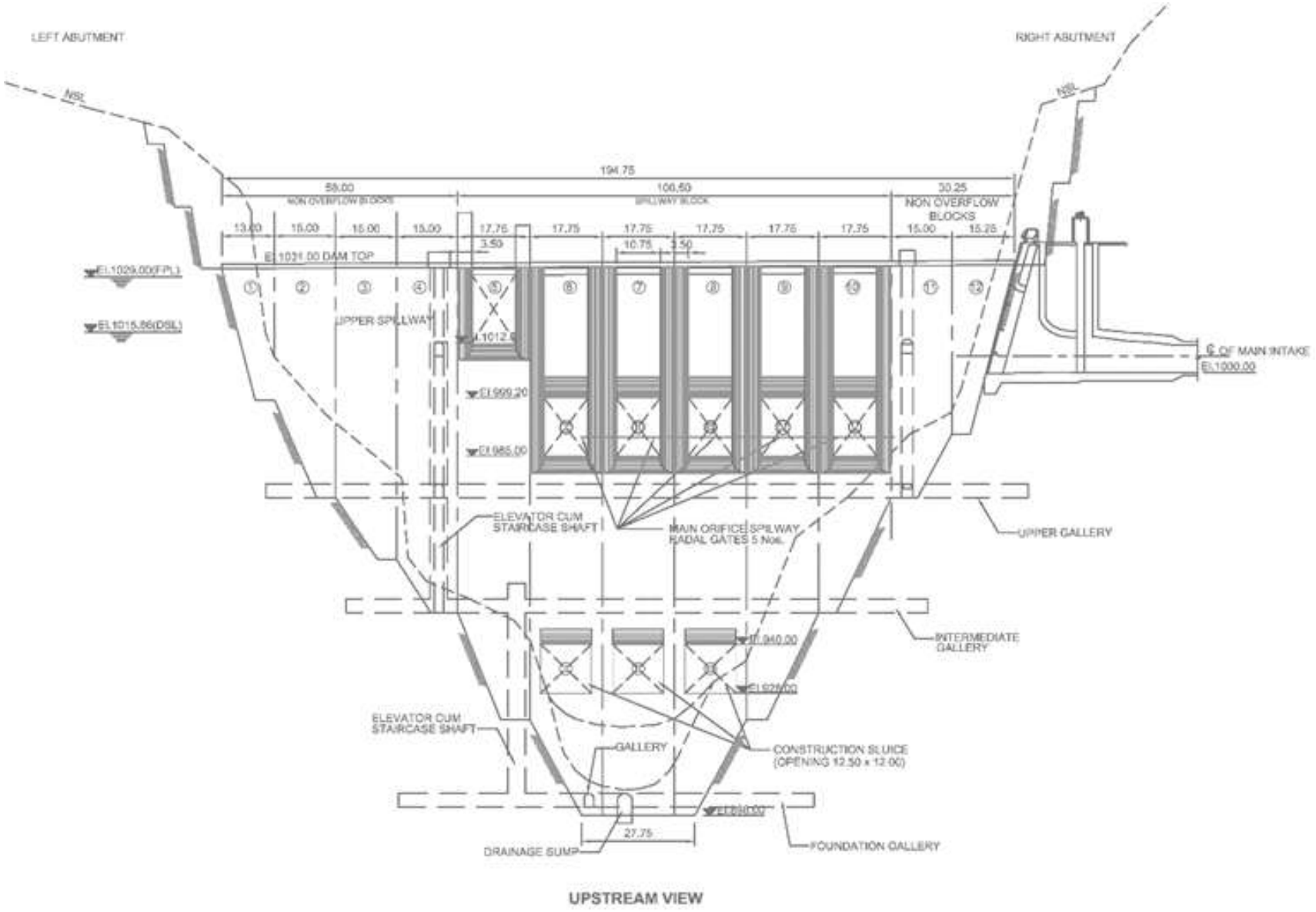
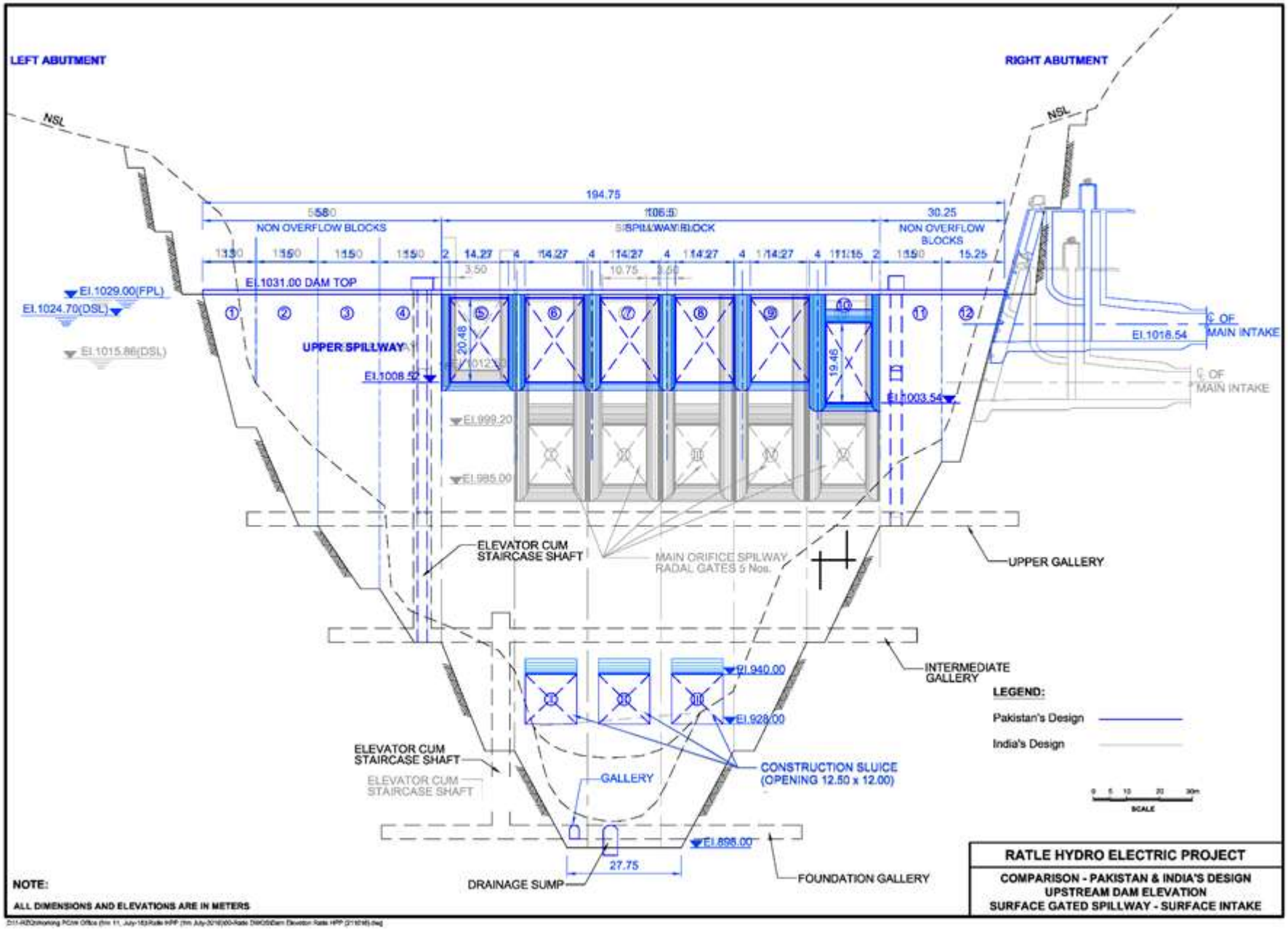
RATLE DAM

INDIA'S DESIGN OF RATLE DAM



UPSTREAM VIEW

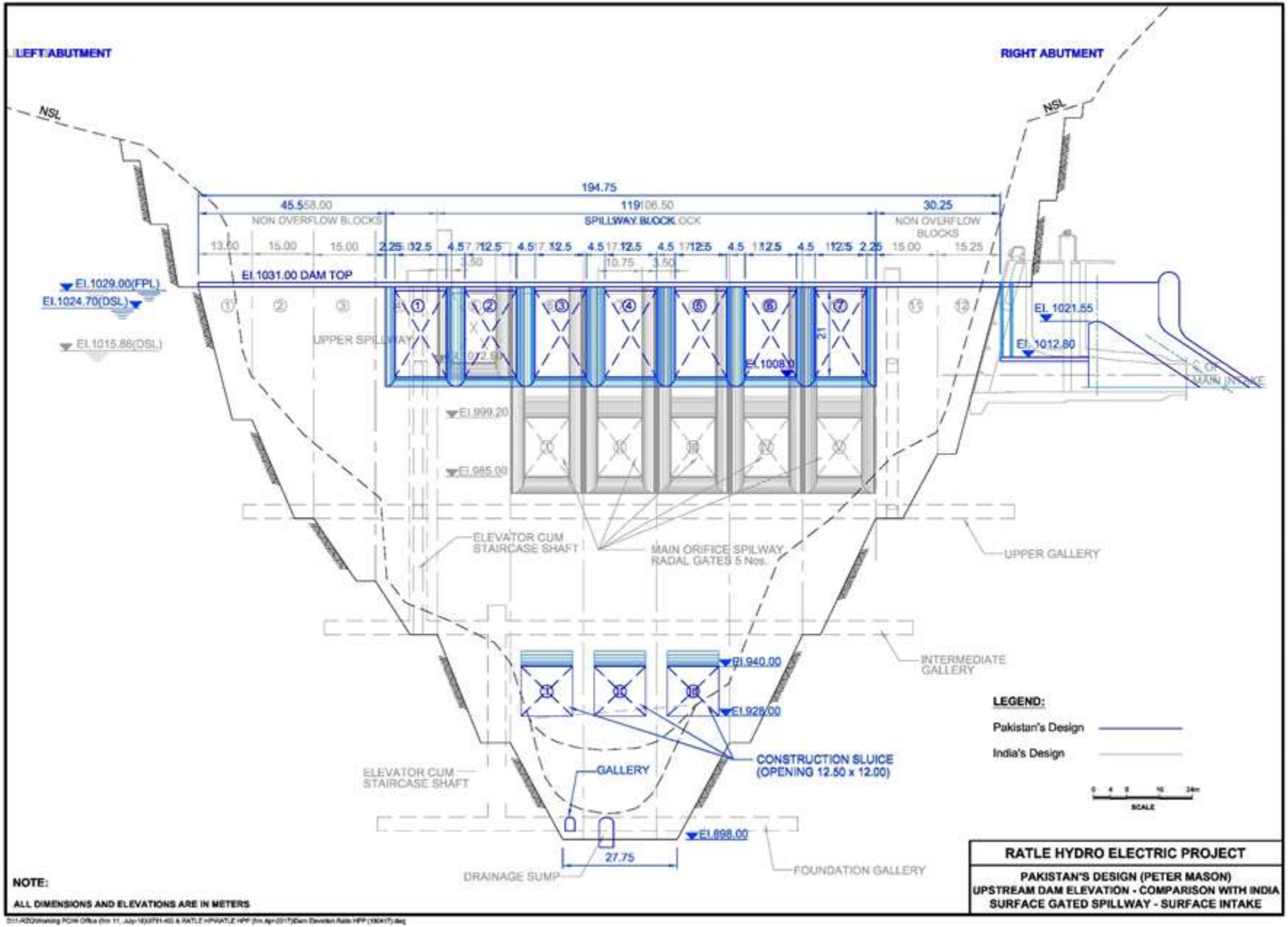
PAKISTAN'S PROPOSED ALTERNATIVE I



COMPARISON OF INDIA'S DESIGNED AND PAKISTAN'S PROPOSED ALTERNATIVE I

Dam Configuration	Units	India's Design	Pakistan's Proposed Alternative I	Difference
Description	(m^3/s)	Surface & orifice spillway, submerged intake	Surface & orifice spillway, surface intake	-
Full Pondage Level (FPL)	(m)	1,029.00	1,029.00	
Dead Storage Level (DSL)	(m)	1,015.86	1,024.70	8.84
Pondage	(Mm^3)	23.84	8.10	294%
Crest Level of deepest spillway	(m)	985.00	1,003.54	18.54
Intake Sill Level	(m)	1,000.00	1,018.54	18.54
Concrete Quantity	(m^3)	991,500	852,800	-14%

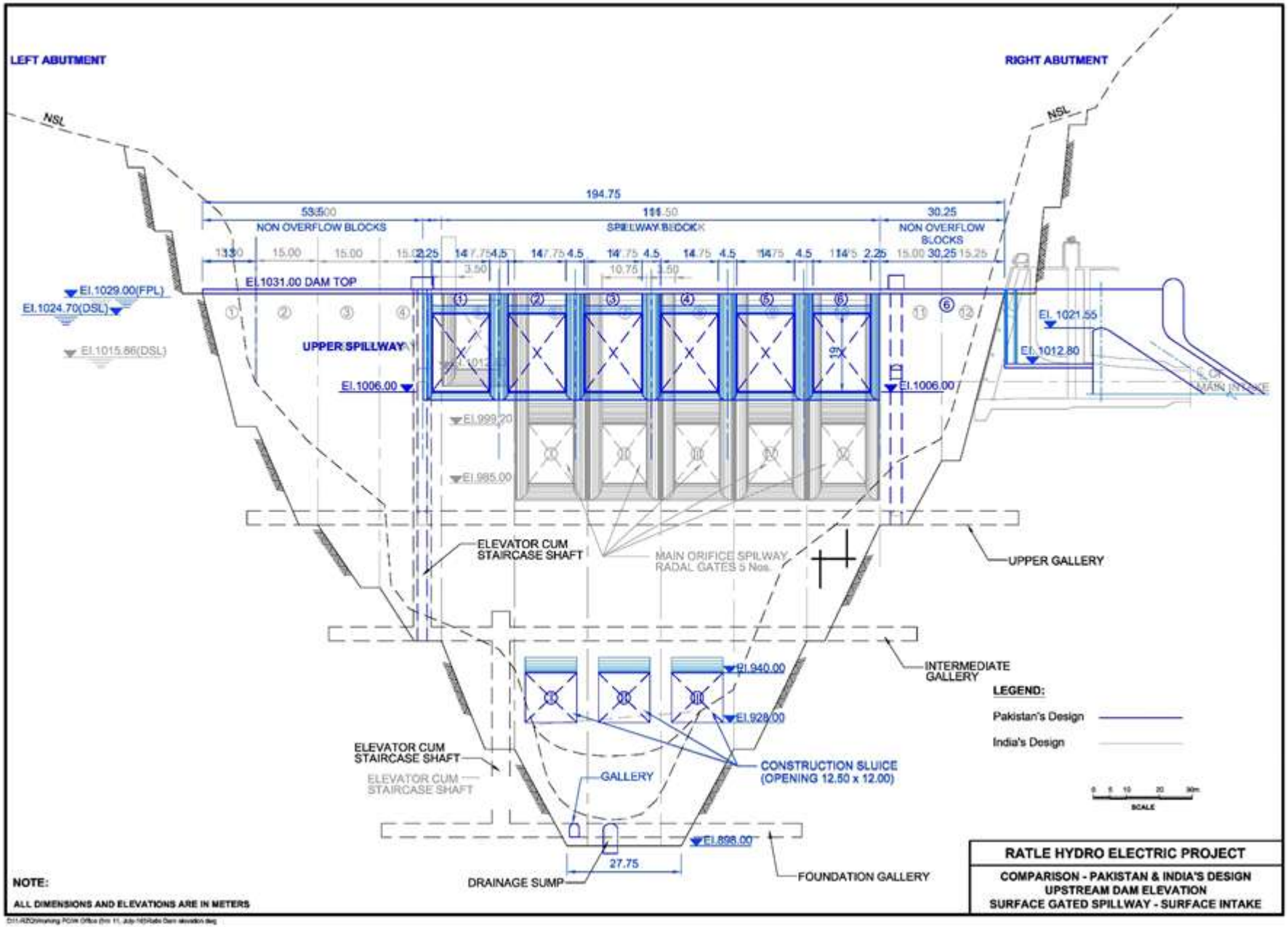
PAKISTAN'S PROPOSED ALTERNATIVE II



COMPARISON OF INDIA'S DESIGNED AND PAKISTAN'S PROPOSED ALTERNATIVE II

Dam Configuration	Units	India's Design	Pakistan's Proposed Alternative II	Difference
Description	(m^3/s)	Surface & orifice spillway, submerged intake	Surface spillway, surface intake	-
Full Pondage Level (FPL)	(m)	1,029.00	1,029.00	
Dead Storage Level (DSL)	(m)	1,015.86	1,024.70	8.84
Pondage	(Mm^3)	23.84	8.10	294%
Crest Level of deepest spillway	(m)	985.00	1,008.00	23.00
Intake Sill Level	(m)	1,000.00	1,021.55	21.55
Concrete Quantity	(m^3)	991,500	766,457	-23%

PAKISTAN'S PROPOSED ALTERNATIVE III

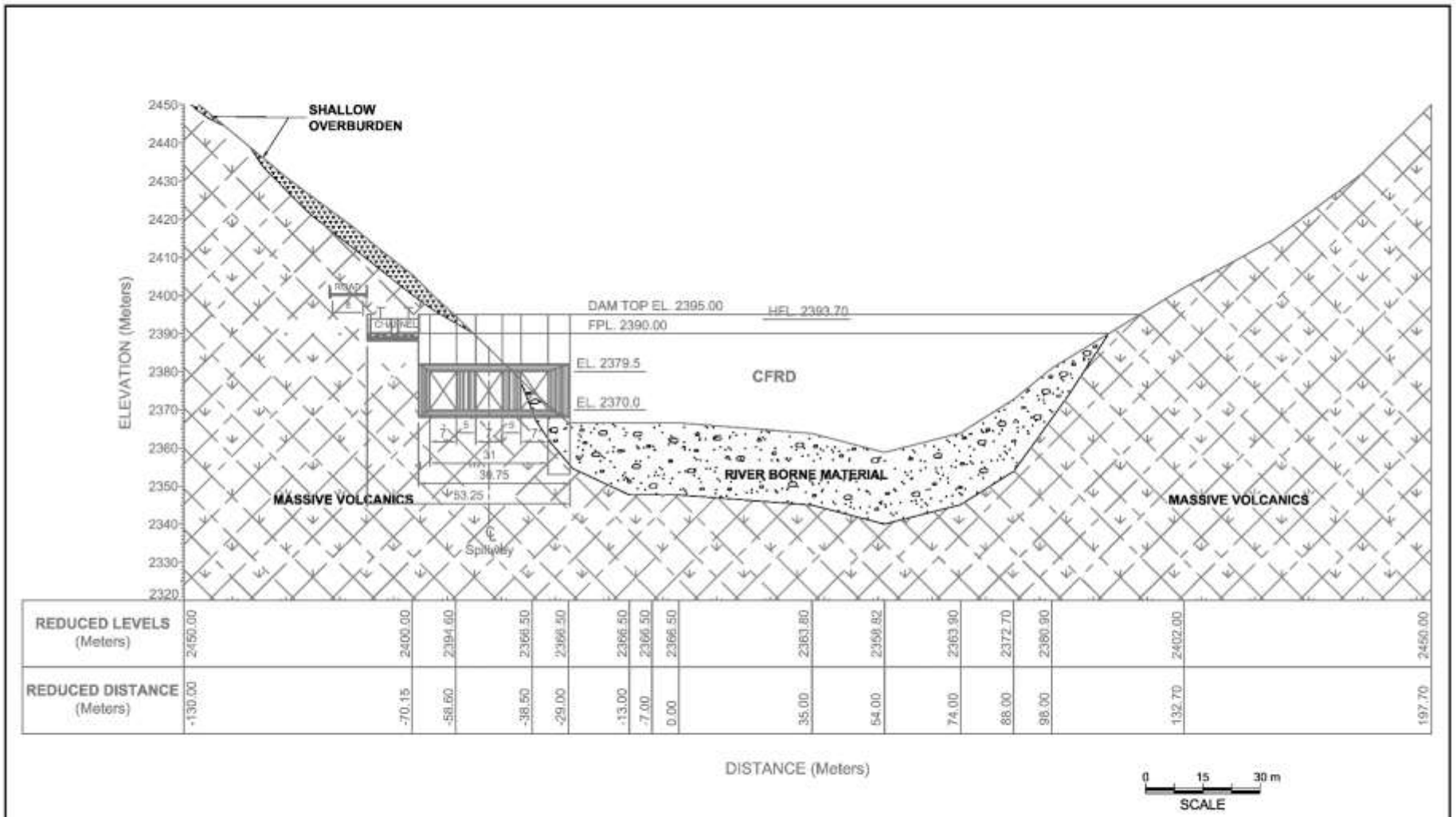


COMPARISON OF INDIA'S DESIGNED AND PAKISTAN'S PROPOSED ALTERNATIVE III

Dam Configuration	Units	India's Design	Pakistan's Proposed Alternative III	Difference
Description	(m^3/s)	Surface & orifice spillway, submerged intake	Surface spillway, surface intake	-
Full Pondage Level (FPL)	(m)	1,029.00	1,029.00	
Dead Storage Level (DSL)	(m)	1,015.86	1,024.70	8.84
Pondage	(Mm^3)	23.84	8.10	294%
Crest Level of deepest spillway	(m)	985.00	1,006.00	21.00
Intake Sill Level	(m)	1,000.00	1,021.55	21.55
Concrete Quantity	(m^3)	991,500	827,800	-17%

KISHENGANGA DAM

INDIA'S DESIGN OF KISHENGANGA DAM



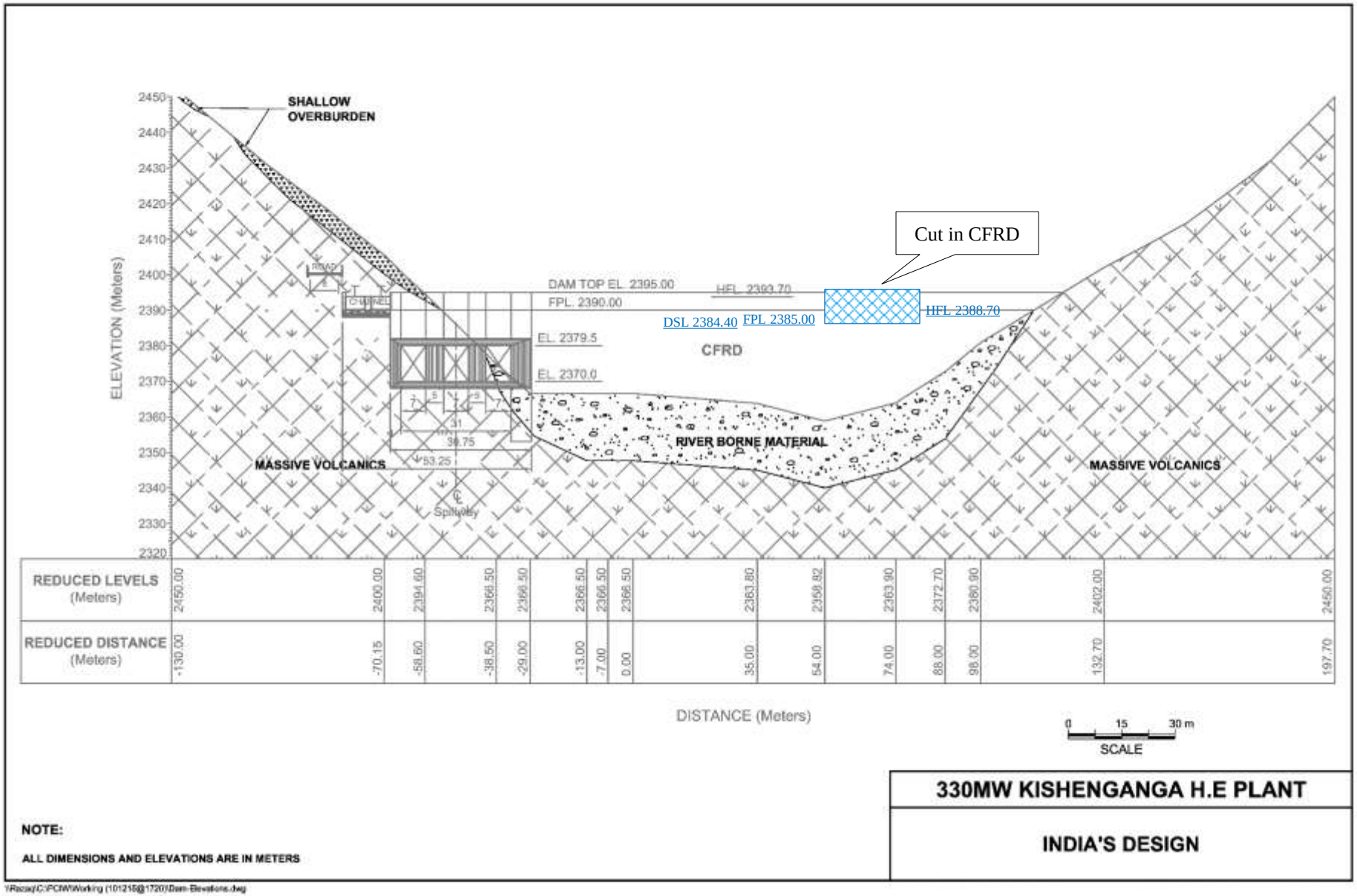
NOTE:

ALL DIMENSIONS AND ELEVATIONS ARE IN METERS

330MW KISHENGANGA H.E PLANT

INDIA'S DESIGN

PAKISTAN'S PROPOSED ALTERNATIVE I



330MW KISHENGANGA H.E PLANT

INDIA'S DESIGN

NOTE:

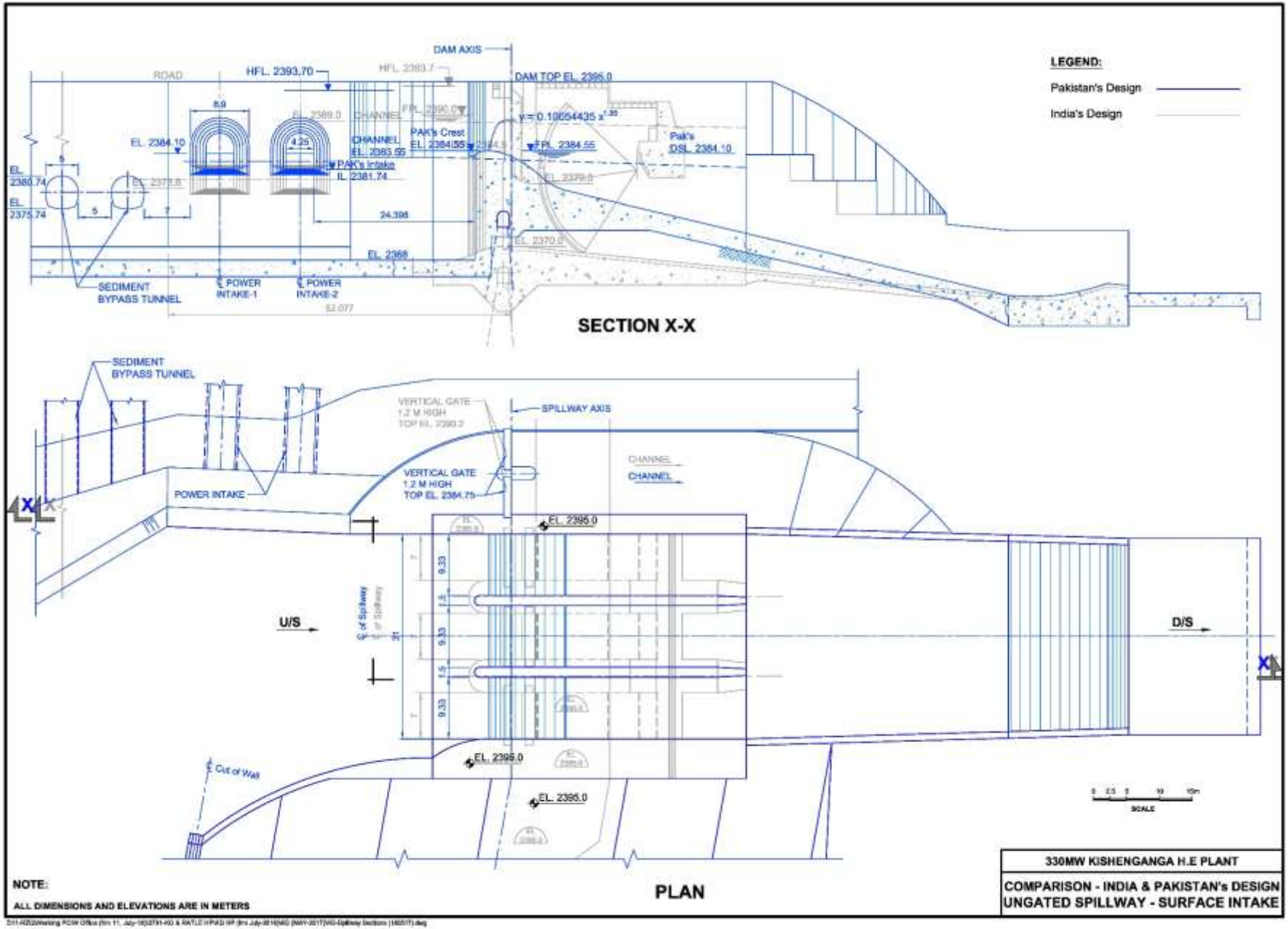
ALL DIMENSIONS AND ELEVATIONS ARE IN METERS

Y:\Recap\C:\PDMWorking (101215@1720)\Dam-Elevations.dwg

COMPARISON OF INDIA'S DESIGNED AND PAKISTAN'S PROPOSED ALTERNATIVE I

Dam Configuration	Units	India's Design	Pakistan's Proposed Alternative I	Difference
Description	(m^3/s)	Orifice spillway, submerged intake	Orifice spillway, submerged intake	-
Highest Flood Level (HFL)	(m)	2,393.70	2,388.70	-5.00
Full Pondage Level (FPL)	(m)	2,390.00	2,385.00	-5.00
Dead Storage Level (DSL)	(m)	2,384.50	2,384.40	-0.10
Pondage	(Mm^3)	7.55	1.00	-87%
Crest Level of deepest spillway	(m)	2,370.00	2,370.00	0.00
Intake Sill Level	(m)	2,378.80	2,378.80	0.00
Concrete Quantity	(m^3)	44,800	44,800	0%
FOS (value greater than 1.00 is categorized as safe)	-	2.15	2.15	Safe

PAKISTAN'S PROPOSED ALTERNATIVE III

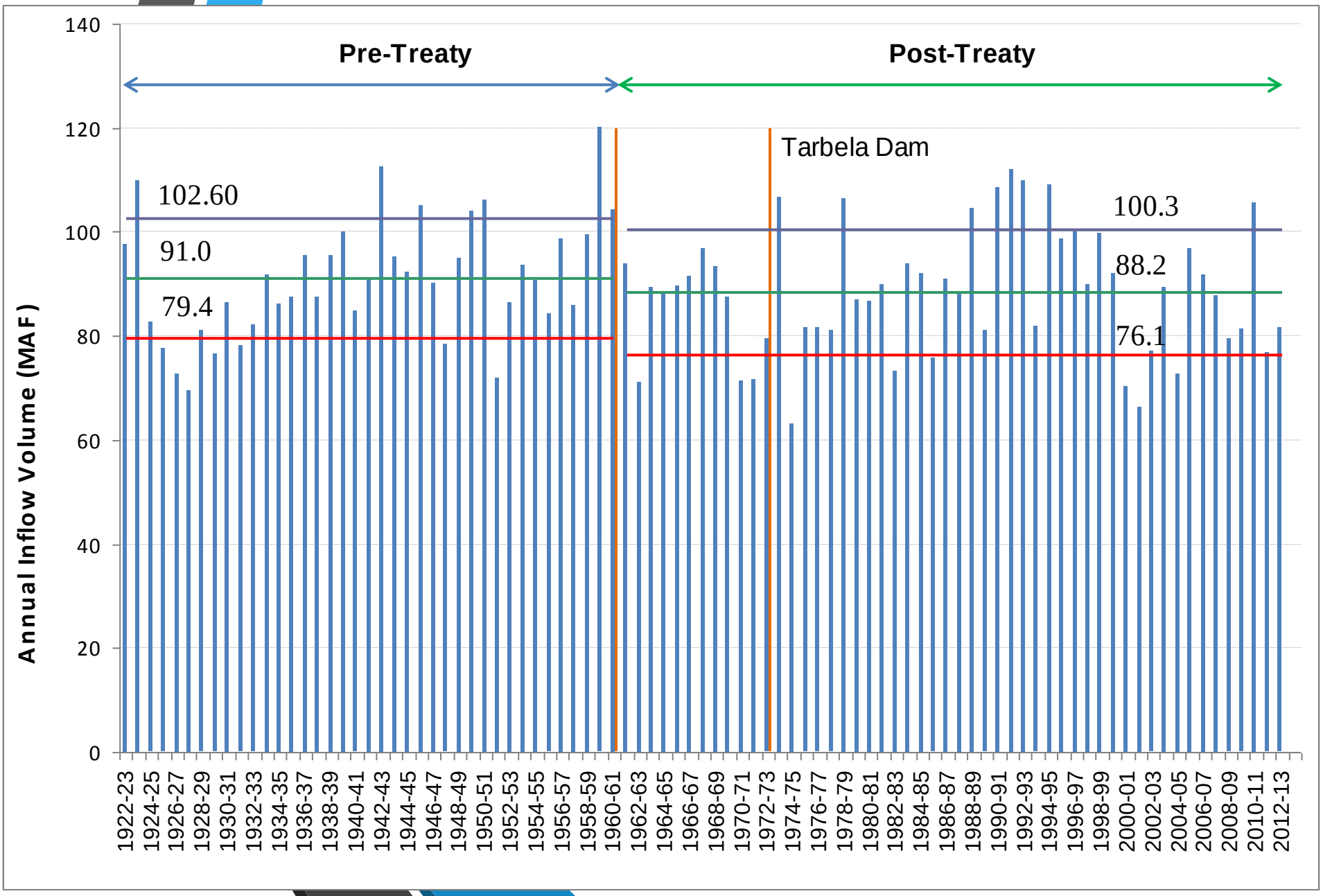


COMPARISON OF INDIA'S DESIGNED AND PAKISTAN'S PROPOSED ALTERNATIVE III

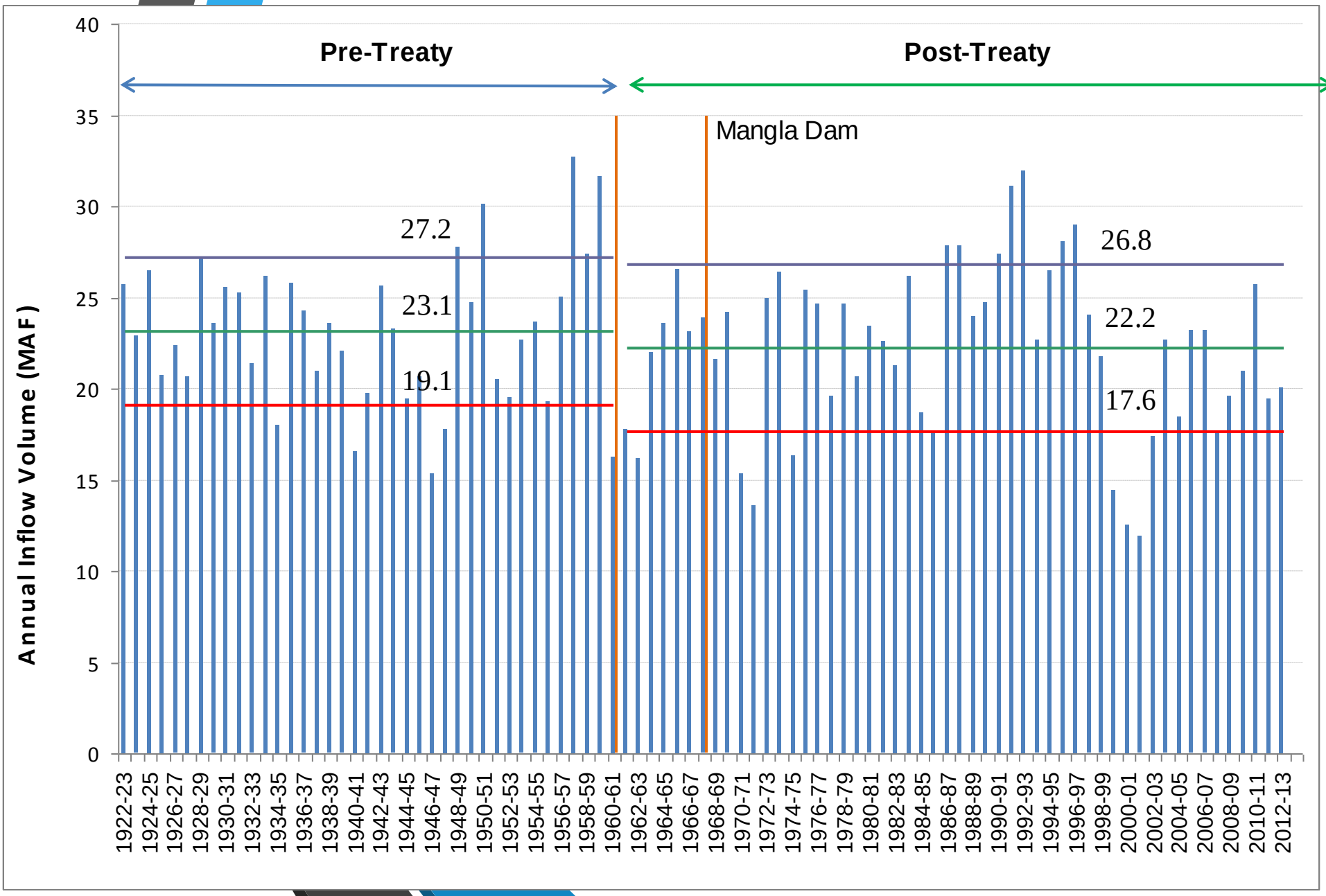
Dam Configuration	Units	India's Design	Pakistan's Proposed Alternative III	Difference
Description	(m^3/s)	Orifice spillway, submerged intake	ungated spillway, surface intake	-
Highest Flood Level (HFL)	(m)	2,393.70	2,393.70	0.00
Full Pondage Level (FPL)	(m)	2,390.00	2,384.55	-5.45
Dead Storage Level (DSL)	(m)	2,384.50	2,384.10	-0.40
Pondage	(Mm^3)	7.55	1.00	-87%
Crest Level of deepest outlet	(m)	2,370.00	2,375.74	5.74
Intake Sill Level	(m)	2,378.80	2,381.74	2.94
Concrete Quantity	(m^3)	44,800	36,800	-18%
FOS (value greater than 1.00 is categorized as safe)	-	2.15	3.16	Safe

THANK YOU

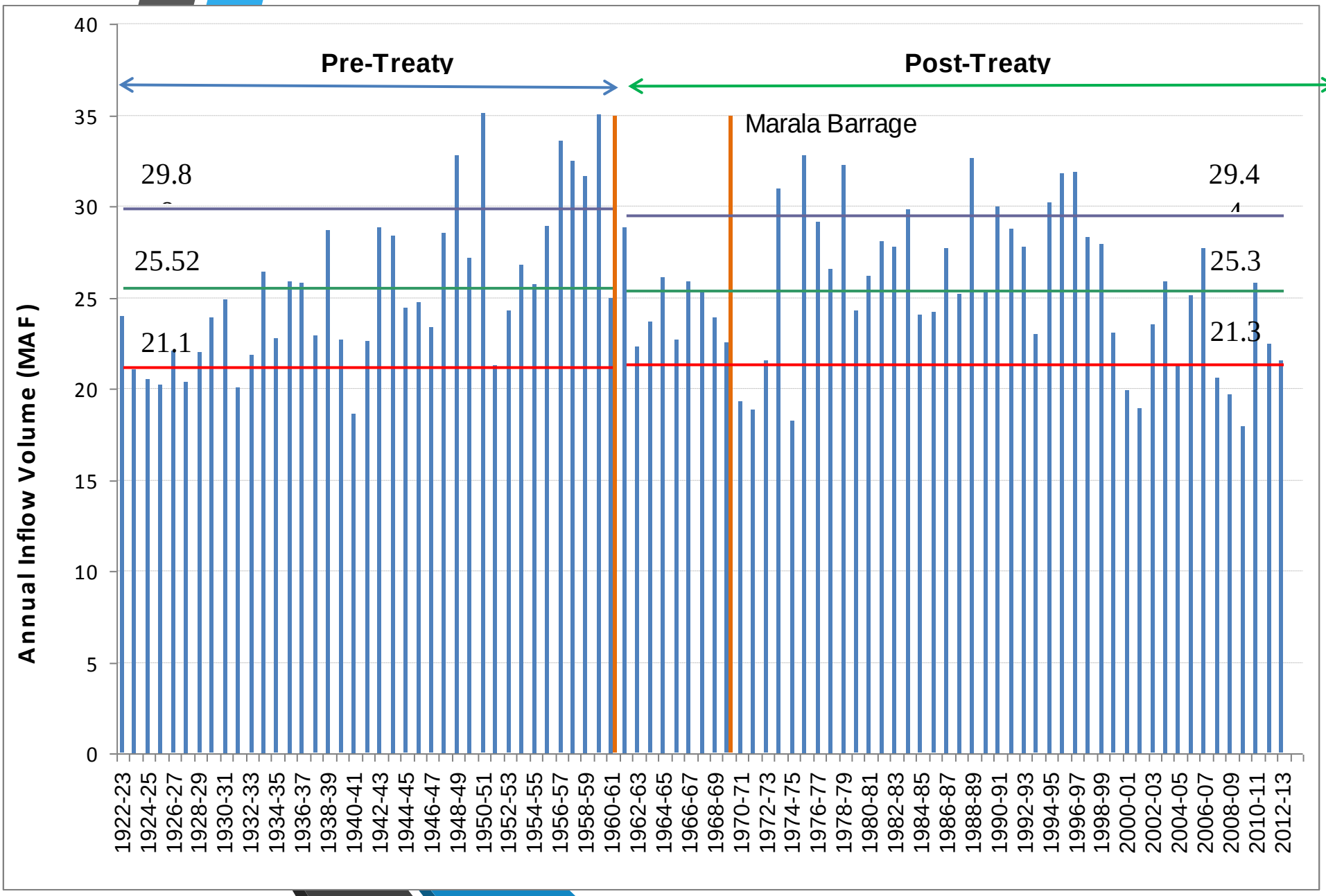
INDUS AT KALABAGH



JHELUM AT MANGLA



CHENAB AT MARALA

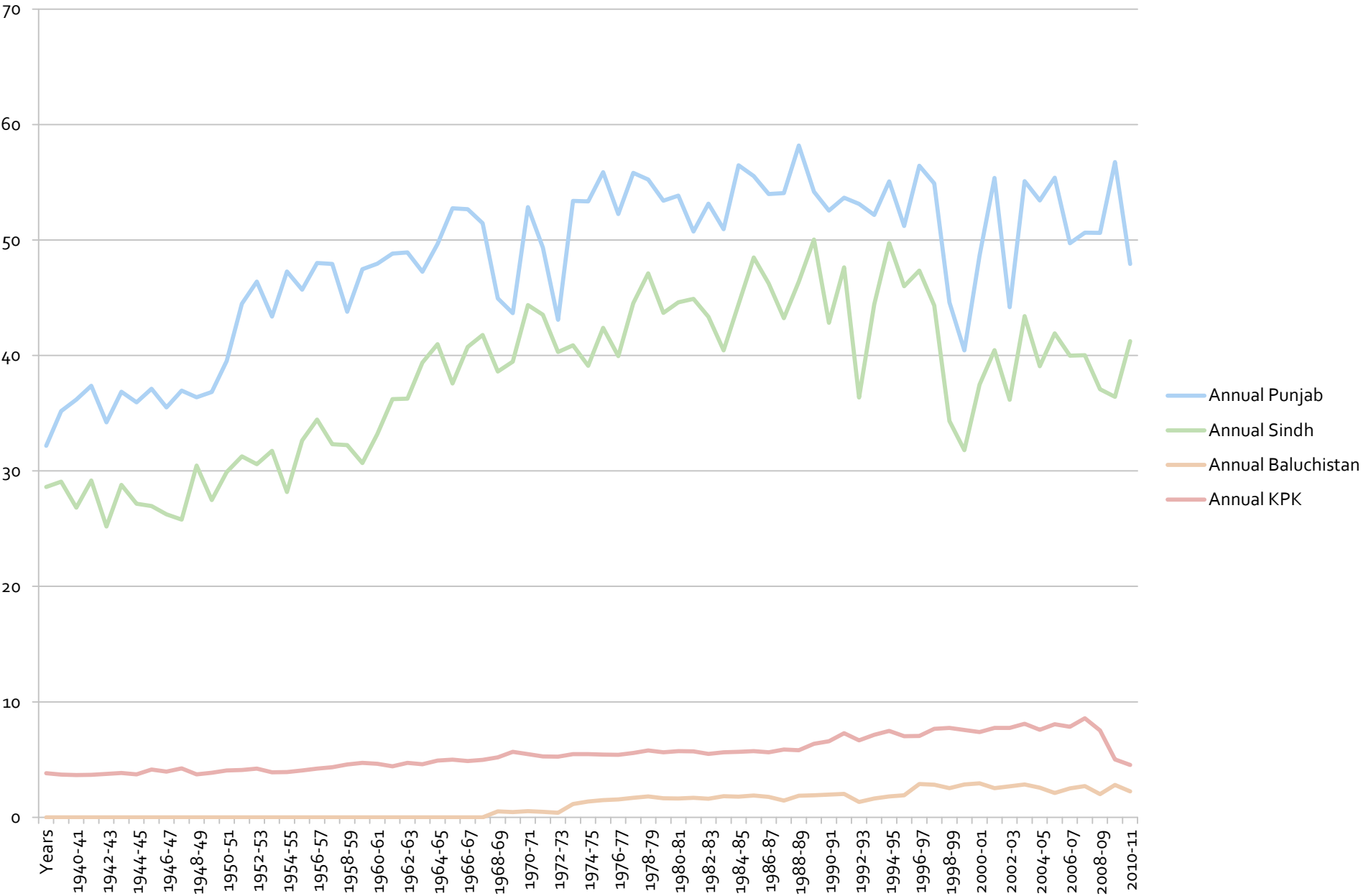


DESIGN AND OPERATIONAL PROVISIONS FOR STORAGE WORKS ON THE WESTERN RIVERS

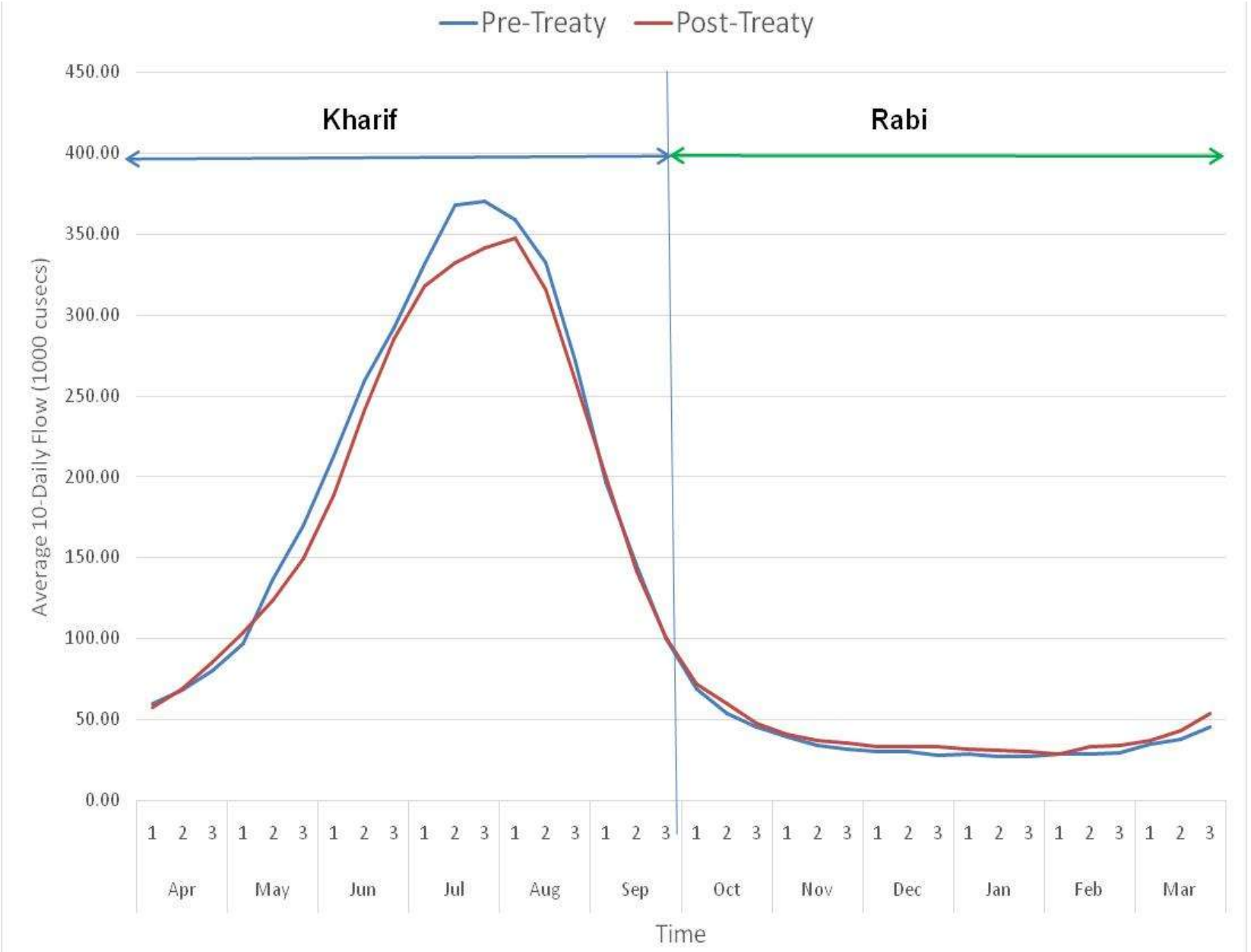
Annexure C, Paragraph 8

The releases from conservation storage, as specified in Paragraph 7(b) and 7(c), shall be made in accordance with the schedule to be determined by the Commission which shall keep in view first, the effect, on Agriculture Use by Pakistan consequent on the reduction in supplies available to Pakistan as a result of withdrawals made by India under the provisions of Paragraph 7 and, then, the requirements, if any, of hydroelectric power to be developed by India from these releases. In the absence of agreement between the Commissioners, the matter may be referred under the provisions of Article IX (2)(a) for a decision to a Neutral Expert.

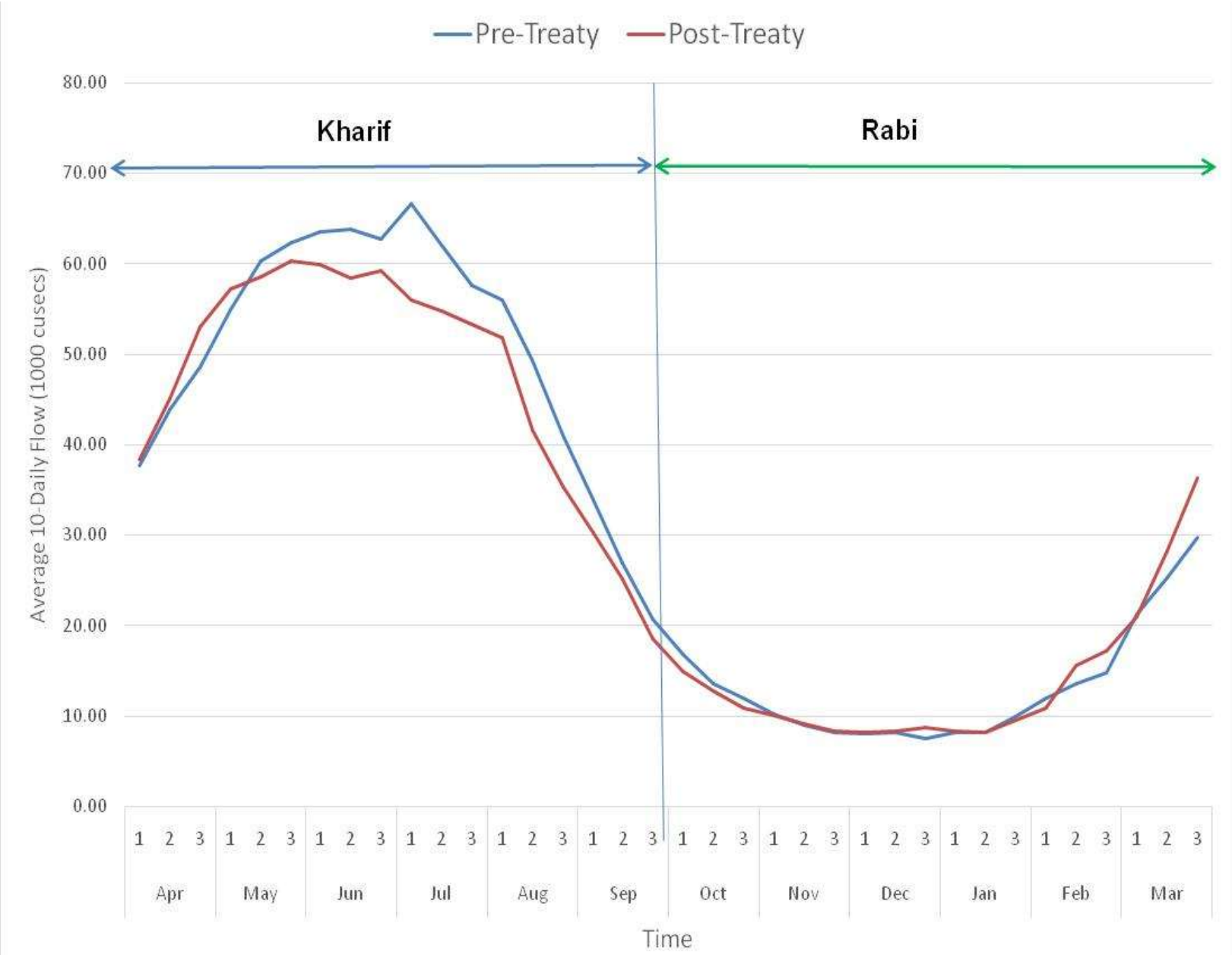
ANNUAL WITHDRAWALS BY ALL PROVINCES



Indus River at Kalabagh



Jhelum River at Mangla



Chenab River at Marala