PART A
Chapter No.1

SALIENT FEATURES

D.G.Khan canals Division-I, D.G.Khan is responsible for the operation and maintenance of canal Irrigation network detailed below:-

a) D.G.Khan Canal from RD: 40-220 with off taking distributaries
b) Link No. I from RD: 0-203 (tail) with off taking channels.

All these channels are irrigating an area of 299 Sq miles consisting of Tehsils D.G. Khan and Kot Chutta of District Dera Ghazi Khan and Tehsil Jampur of District Rajanpur.

D.G. Khan Canal runs parallel to the edge of Koh Suleman range from north to south. The distance of Hill Torrents to D.G.Khan Canal ranges from 8 to 15 miles on the west. During monsoon period. The following Channel of D.G.Khan Canal system are affected with high flood:-

D.G.Khan Canal RD: 0-220

Which comes from the following Hill Torrents:

1. Sori Lund
2. Sori Khosa
3. Belub
4. Vidore

The hydrology and alluvial morphology of the Hill Torrents are of complex nature that no systematic hydrograph is predictable. The creeks developed due to Hill Torrents water destroy farmers managed basin, bunds across their lands who utilize this water in accordance with their ancient traditions and orthodox culture of this water distribution.

The floodwater then reaches furiously down to the foothills and is encountered by the right bank of D.G.Khan Canal-I. There are aqueduct crossings of insufficient capacity for each of the Hill Torrent to transfer flood water across left bank of D.G.Khan Canal at RD: 220 for its eventual outflow into river Indus after damaging the fertile irrigated land, mostly cotton crop and other public properties.

This flood water extends and spreads out to the village of Shadan Lund, Kala, Shah Saddar Din, Yaru, and D.G Khan city. Vigilant watching and maintaining of the

above reaches of right bank of D.G.Khan Canal at RD:220 is most essential specially during the flood season from 15th April to 15th September.

DETAIL OF BANKS OF D.G.KHAN CANAL-I PROPOSED TO BE CONVERTED INTO FLOOD EMBANKMENT ALONG WITH ITS PARAMETERS ARE TABULATED AS UNDER:-

Sr. No	Name of Embankment	Length (Miles)	Top Width (ft)	Free Board (ft)	Side Slope	Stone Pitching
1	Flood Bund along right bank of D.G.Khan Canal RD: 88000-144000	11.20	25	5	3:1/2:1	500 ft on the outer slope of banks along with the structures/ Hill torrent Crossings
2	Flood Bund along right bank of D.G.Khan Canal RD: 164+000-168+000 RD: 180+000-220+000	 0.80 8.00	 25 25	 5 5	 3:1/2:1 do	

It is pertinent to mention here, that Kachhi Canal has been constructed by WAPDA on the right side of D.G.Khan Canal at RD;220. Now, the Kachhi Canal acts as 1st defense line against the Hill Torrents flood water. Unfortunately, the incomplete banks and structures of Kachhi Canal acted adversely during the recent flood of 2012 & 2013. The accumulated flood water on the right bank of Kachhi Canal outburst through the gaps & incomplete structures which damaged the banks and Hill Torrent X-ings of D.G.Khan Canal-I at RD 220. The restoration and strengthening of mishaps of the banks and structures were taken in hand on emergent basis which are held up due to paucity of funds.

1.1 Location

DERA GHAZI KHAN IRRIGATION SYSTEM

Dera Ghazi Khan, is a District in the Punjab province of Pakistan. The District covers an area of 5,306 km² and it is a long narrow strip of country, 198 km. in length, sloping gradually from the hills which form its western boundary to the river Indus on the east. Below the hills the country is high and arid, generally level, but sometimes rolling in sandy undulations, and intersected by 201 hill torrents. With the exceptions of two, these streams dry up after the rains, and their influence is only felt for a few miles below the Hills.The eastern portion of the district is at a level sufficiently low to benefit by the floods of the Indus. A barren tract intervenes between these zones and is beyond the reach of the hill streams on the one hand and of the Indus on the other. Although liable to great extremes of temperature and to a very scanty rainfall, the district is not unhealthy. The Suleman Mountains rise to a height of 10,000 feet (3,000 m) in the north of the District.

CLIMATE AND GEOGRAPHY

Dera Ghazi Khan is located at 30’03″ N and 70’38″ E. The overall climate of the city is dry with little rainfall. The winter is relatively cold and the climate is hot during the remaining part of the year, but it is very hot in summer. The temperature during summer is usually about 115 °F (46 °C), while during winter season the temperature is as low as 40 °F (4 °C). The prevailing wind direction is North-South. Due to the barren mountains of Koh-Suleman (Sulaiman Mountains) and the sandy soil of the area, windstorms are very common in the summer. During summer, the temperatures are generally amongst the highest in Pakistan

CLIMATE CHANGE IMPACTS ON ROD KOHI

•This unique system is extremely prone to devastating effects of climate change because it entirely depends on the rainfall.

•Climate change induces extreme events of floods / drought conditions.

•An integrated management of Rod Kohi irrigation system is imperative to mitigate the climate change effects by identifying **climate adaptation measures** to minimize adverse effects on land use and water management practices

FLOODS

The area is also vulnerable to floods from the Indus River in the East and from the Rod Koh coming from Suleman Mountains in the West. In 1957 flood water entered in the city and almost after 60 years second time in history water entered in

the city on 9 September 2012 & 2022 due to heavy rains in Koh-e-Suleman. The following main Hill Torrents remains active during heavy Rainfall.

Sr.#	Name of Hill Torrent	Maximum Discharge (Cusecs)
1	SORI LUND	152487
2	Vidore	174360

Safety measures for protection of abadies, human lives and infrastructure of Public as well as Government are adopted before the coming flood season. Flood water extends and spreads out to villages of Shadan Lund, Kala,Shah Sadar Din, Yaru, and D.G.Khan, Keeping in view the flood velocity the flood water spreads and make different routs which can damaged other unknown abadies which has been Scattered faraway and they may can be considered as unknown villages.

1.2 GENERAL DESCRIPTION

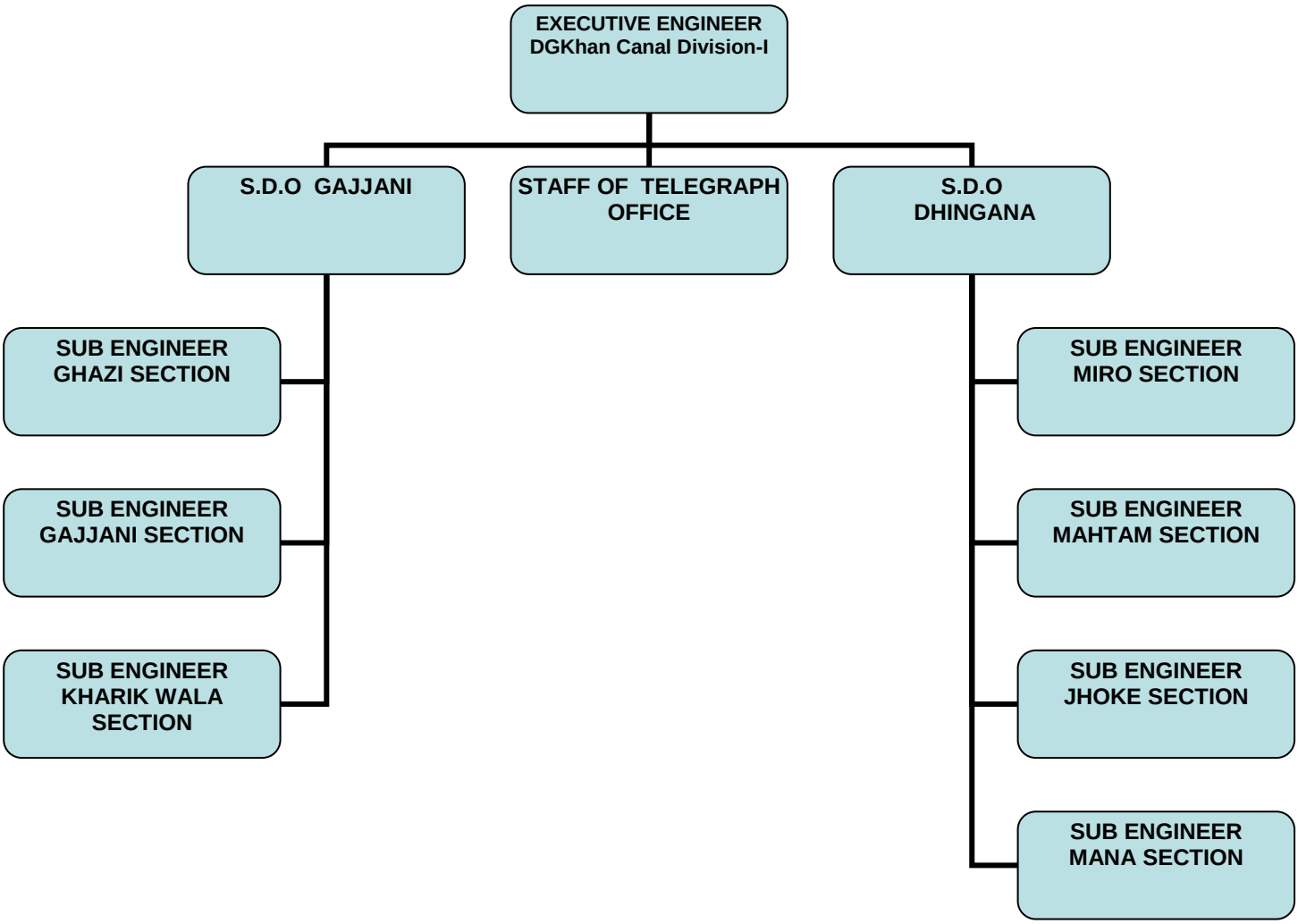
D.G.Khan Canal -I is off taking from the right side of Taunsa Barrage with a designed capacity of 8953 Cs which is irrigating an area of about 0.90 Million Acres. It falls within the Canal command of D.G.Khan canal from RD: 40+000 to 220.

Total length of Channels of D.G.Khan Canal Division-I is as under:-

• Main Canal (D.G.Khan Canal)	=	36.00 C. Miles
• Link No. I	=	40.68 C. Miles
• Distributaries & Minors	=	225.08 C. Miles
Total	**=**	**301.76 C. Miles**

• Gross Command Area	=	199660 Acres
• Culture able Command Area	=	172045 Acres
• No of Outlets	=	946
• Water Allowance	=	6.36

1.3 ADMINISTRATIVE SETUP



Chapter No.2

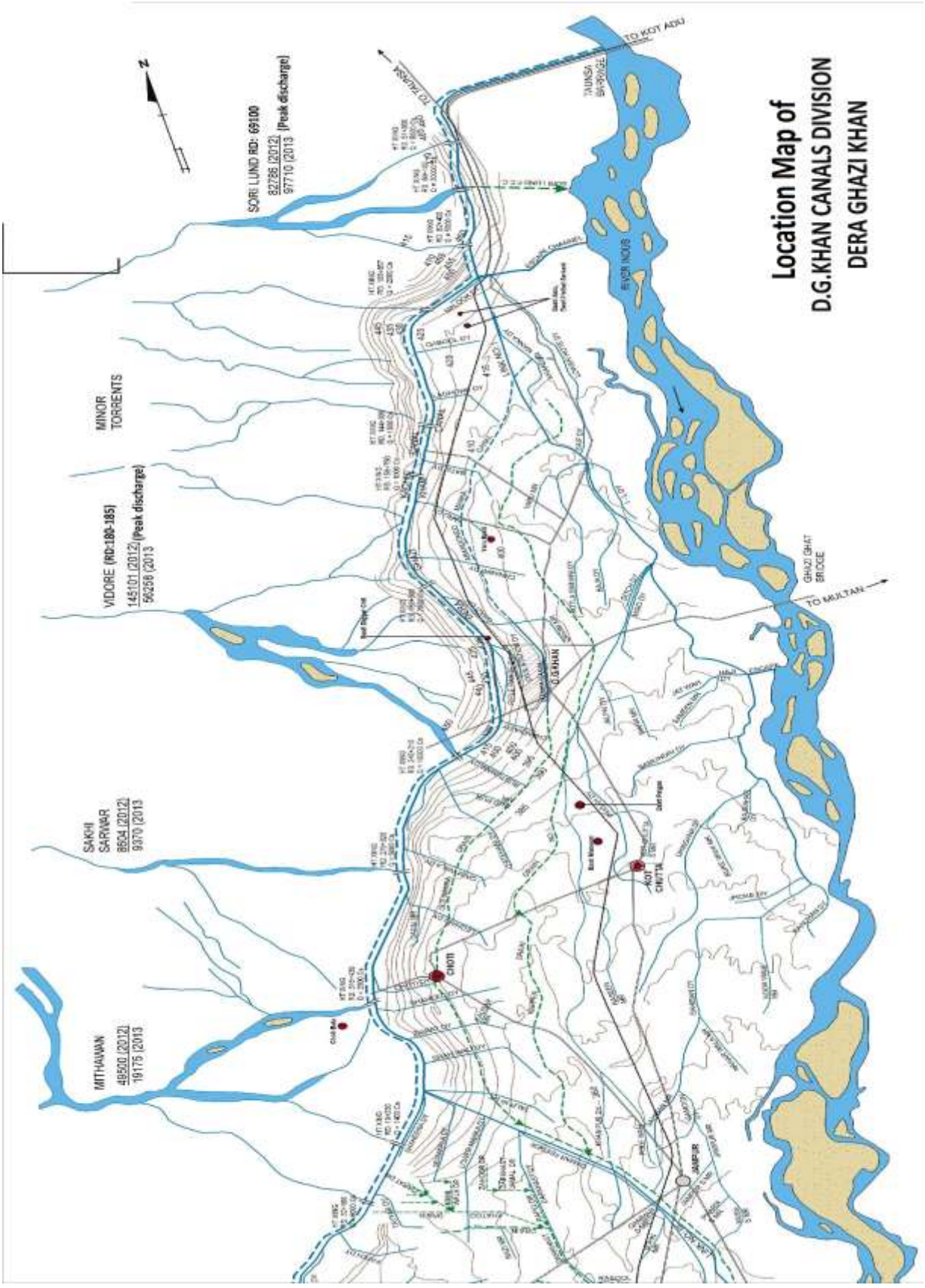
FLOOD PROTECTION AND RIVER TRAINING WORKS

2.1 DESIGNED PARAMETER OF TRAINING WORKS

NO RIVER TRAINING WORK IN THE JURISDICTION OF D.G.KHAN CANAL DIVISION NO.1

2.2 Location Map

2.2 Location Map



Chapter No.3

BRIEF HISTORY OF PAST FLOOD EVENTS

D.G.Khan Canal-I and its whole system is situated on the east side of Koh-e-Suleman. The distance of D.G.Khan Canal and Dajal Branch Canal from Koh-e-Suleman varies from 8 C. Miles to 15 C. Miles respectively. The length of D.G.Khan Canal is 69 C. Miles where as the length of Dajal Branch Canal is 20 C. Miles. 5 C. Miles of Dajal Branch falls in D.G.Khan whereas the remaining 15 C. Miles falls in District Rajanpur. When there is slow or heavy rains, all type of run off passes through the Darrahas striking to right bank of the D.G.Khan Canal and Dajal Branch. The water then spreads in the vast area of various villages. The hill torrent water damages the crops, public properties, roads, telephone lines and high transmission electric lines and also damages the D.G.Khan Canal System of D.G.Khan as well as Jampur Tehsil of Rajanpur. The Hill Torrent water breaches the D.G.Khan Canal & Dajal Branch Canal system as a whole and enters into the canal commanded area, and then enters into Manka Drain whereas the capacity of Manka Drain is not sufficient to accommodate the appreciable quantum of Hill torrent flood water. The bulk of flood water normally exceeds the capacity of this drain, then left bank breaches opposite RD: 185, RD: 242 and 316 of D.G.Khan Canal. The water then enters in the natural depressions called Shoria Disty near D.G.Khan and Kapper Drain near Choti. This flood water stands in these depressions till it is infiltrated and evaporated since it has no out fall to the river.

Link No. I having full supply discharge of 1673 Cs: was constructed along right side of River Indus to irrigate an area of 229000 acres. About 1.00 Lac acres of agricultural land is being irrigated through water from Link No. I in the reach located downstream of Mahtam Rest House. During 1969, River Indus attacked Link No. I and as a result 980 acres were eroded by the River Indus and the canal was set back on a new alignment. Subsequently from the year 1969 to 1994, Link No. I was relocated / diverted about 18 times due to severe attacks of River Indus and ultimately shifted to the present alignment after surrendering more than 2100 acres of fertile land to the river.

During the monsoon season, the major as well as minor hill torrents came in active position in the past year. Alone Vidore hill torrent water have been managed upto 100000 cusecs as it was experienced in 2010 when Vidore hill torrent flood water emerged with discharge of 97000 cusecs for small duration. In 2012, Vidore

hill torrent recorded discharge was unprecedented and could not be even imagined and it hit the D.G.Khan Canal with a peak discharge of 145101 cusecs and high momentum was created with extra ordinary volume of water and super velocities. The duration was exceptionally long and discharge of more than 100000 cusecs kept on gushing about eight hours. This also synchronized with very high discharge around 83000 cusec of Sori Lund Hill Torrent with the duration of about Six hours. The accumulated discharge of Sori Lund and Vidore hill torrent was totally uncontrollable and gushed down hills toward D.G.Khan Canal, devastating everything including abadies, canal, canal structures and infrastructures.

The duration of flood of hill torrent was extra ordinary long and heavy run off was produced which was the main cause of the damages to the structures of Kachhi Canal, D.G.Khan Canal, Dajal Branch and over topping which resulted in to breaches on both sides of the canals.

In year 2012 & 2022, very high flood was received in 07 major hill torrents & small Hill Torrent from Sulaman Range and unprecedented floods were also received in sub hill torrents such as Chitpani, Mohoi, Rakkani, Sori Khosa, Bailub besides many “Churs” (minor torrents) which caused severe damages.

The torrential flash floods 2025 have severely damaged the banks of subject hill torrents at different places for which the different abadies and many others populations are endangered to disaster.

Hill Torrents namely Sori Lund and vidore which are the active Hill Torrents, who hit the D.G.Khan Canal at RD: 51+000, 69+100, 82+400, 108+857, 144+000, 156+750,185+500, The Hill Torrent flood water damaged the banks of said sites and work was taken in hand previously after restoration of banks channel was put in to operation to feed the tails of the Irrigation system of DGKhan Canal Division as well as Rajanpur Canal Division.

Chapter No.4

DESIGN DATA, HISTORIC PEAK FLOOD DATA & PREVIOUS FIVE YEARS FLOOD DATA OF HEAD WORKS/ BARRAGE & OTHER CONTROL POINT.

4.1 **Flood Limits**

Not Related

4.2 **Time Lags of Floods**

Sr. No	Name of Hill torrent	Distance in Km	Time in hours
1	Sori Lund	27 K.M	4 - 6 Hours
2	Vidore	29 K.M	3 - 5 Hours

4.3 **(a) Highest Floods.**

Vidore 75589 Cs dated 18.08.2025

(b) DISCHARGE OF HILL TORRENT

Sr No	Name	Discharge 25 / 40 Years return period (Cs)	Peak Discharge flood 2025 (Cs)	Catchment area (Sq Miles)	Cultivated area (Acres)	Annual average rain fall (Inches)
1	Sori Lund	50700 / 25	29270	193	38696	1.06
2	Vidore	83000 / 40	75589	298	32983	0.99

4.4 Peak discharge

Sr. No	Year	Name of Hill Torrent	Peak Discharge in Cusecs	Date	No. of Days
1	2012	Sori Lund	39758	09.09.2012	01
		Vidore	75589	15-09.2012	01
2	2013	Sori Lund	97710	16.08.2013	01
		Vidore	24767	14.08.2013	01
3	2014	Sori Lund	51460	02.08.2014	01
		Vidore	56258	02.08.2014	01
4	2015	Sori Lund	64304	13.06.2015	01
		Vidore	24764	29.06.2015	01
5	2016	Sori Lund	51460	03.08.2016	01
		Vidore	24767	12.03.2016	01
6	2017	Sori Lund	54609	18.07.2017	01
		Vidore	19355	24.07.2017	01
7	2018	Sori Lund	39758	16.07.2018	01
		Vidore	19355	23.07.2018	01
8	2019	Sori Lund	98525	11.08.2019	01
		Vidore	121000	11.08.2019	01
9	2020	Sori Lund	24679	30.06.2020	01
		Vidore	39254	30.06.2020	01
10	2021	Sori Lund	6145	17.08.2021	01
		Vidore	10151	21.08.2021	01
11	2022	Sori Lund	152487	21.08.2022	01
		Vidore	174360	21.08.2022	01
12	2023	Sori Lund	64304	29.07.2023	01
		Vidore	39254	30.07.2023	01
13	2024	Sori Lund	51460	03.09.2024	01
		Vidore	75589	18.08.2024	01
14	2025	Sori Lund	29270	02.09.2025	01
		Vidore	75589	16.08.2025	01

Chapter No.5

FLOOD FIGHTING STRATEGY

STAGE-1

When the discharge ranges of Hill torrents between 10000 to 50000 Cs Sub Divisional Officer, Gajjani, and Dhingana Sub Division will be In-charge of overall watching operation and the Sub Engineer In-charge of their Sections will perform watching duties in their respective jurisdictions. No special watching is required.

STAGE - II

When discharge ranges between 50000 to 100000 Cs. The Executive Engineer, DGKhan Construction Division and DGKhan Canal Division will be overall In-charge of watching operation. In addition the Sub Divisional Officers, will be In-charge of watching operation of DGKhan Canal & Dajal Branch along with supervisory staff and Sub Engineer concerned , along with their watching gangs as listed in duty roster .

STAGE - III

When discharge ranges between 100000 to 200000 Cs. The Executive Engineer, DGKhan Construction division and DGKhan Canal Division will be overall In-charge of watching operation. The Sub Divisional officer Gajjani,and Dhingana Sub Division, along with supervisory staff of all the concerned Sub Engineers will be responsible for the watching operation.

All the flood gauges from upper region are received through the wireless system already installed at various Police Stations in the District. This is primarily an inadequate arrangement that may be improved. The Executive Engineer Construction Division D.G.Khan will be responsible for transmission of the debit of flood at RIM station and at canal crossings of each Hill Torrent. An information reached even few hour before can save colossal losses by timely adjustment of discharge in the canal. This purpose can be achieved by setting up special long range wireless communication system by installing at selected base and sub-base station. This facility will be extended to the vehicles of the officers and to the handsets for Sub – Engineers. The whole network will be alive to any untoward situation.

Responsibility of Staff

(1) Executive Engineer, of D.G.Khan Canals Division-I will be responsible for watch and ward of D.G.Khan Canal Division. The Executive Engineer, D.G.Khan will have an overall control over the flood preparedness and should have clarity in mind how to control and avert any grievous situation developing at any point around D.G.Khan Canal system. He should also apprise himself and alert other concerned about weather report and flood forecast.

(2) The Executive Engineer, D.G.Khan construction Division will be responsible for transmission of report of flood at RIM station and at Canal crossings of each hill torrent.

(3) The Sub Divisional Officer, Gajjani Sub Division will take over of D.G.Khan Canal RD: 40+000 to 88+500 , RD: 144+000 to 198+000, Gajjani Escape & Link No. 1 from RD 0+000 to 59+000. He will maintain his head quarter at Gajjani.

(4) The Sub Divisional Officer Dhingana Sub Division will be responsible of Link No.1 Form RD: 59+000 to 220+400 (Tail). The S.D.O along with entire staff will be shifted from their head quarter to Mahatam Rest House for Day and Night watching when the discharge in River Indus D/s Taunsa bridge will be increased from 3.00 Lac Cs.

Chapter No.6

FLOOD DAMAGES RESTORATION WORKS

NIL

Chapter No.7

FLOOD FIGHTING / WATCHING ARRANGEMENTS

7.1 PRE FLOOD ARRANGEMENTS

Strict watching arrangements will be started by 15th of May every year. The watching establishment will be employed according to the scale fixed by the department. The pre-flood arrangements explained below are necessarily required.

1. Flood fighting material should be arranged in requisite quantity. Particular care should be taken to ensure that adequate quantity of the required material is distributed and placed at all the watching huts at the start of flood season.

2. The Sub Engineers will inspect all the D.G.Khan Canal-I under Sub Divisional Jurisdiction. They should walk along the toe of right side of Canal and locate rats or porcupine holes, get them opened, refilled and compacted. Similarly Sub Divisional Officer should inspect all the vulnerable reaches of the bunds on foot and act in similar way.

   i) All lamps, patromax torches will be in good working condition. The lighting arrangements at important points and at vulnerable reaches of Canals will be available and ready for use.
   ii) In case of any emergency, Sub Engineers and Sub Divisional Officers will make adequate arrangements for communications of urgent massages from any part of the Canal to the Executive Engineer and the Superintending Engineer. If there is no telephone, telegraph or wire less link special massager should kept ready with proper conveyance at all times for this purpose.
   iii) All the watching establishment should be properly trained and alerted. Each member should know the duty to be performed by him.
   iv) Dry Run Rehearsal of flood fighting plan will be done by the end of May and any shortcoming noticed should immediately be rectified. The watching staff will be engaged on the following works.

      1. Clearing of jungle growth from the outer toe of embankment of Canals up to 5 feet height.
      2. Killing rats and other borrowing animals and closing their holes.
      3. Repairing / establishment temporary watching huts located along the Canals at vulnerable sites.

Detail of stone available and sanctioned

Description	Total Quantity Required During YEAR 2024-25	Available Quantity of Reserve Stock	Balance Quantity Required
Stone	Nil	Nil	Nil

Any other work which is deemed necessary. Temporary watching huts to be constructed / repaired for storing flood fighting material by the watching establishment and are normally to be located at suitable points where a breach could occur or a relief cut is to be introduced.

7.2 WATCHING ESTABLISHMENTS

During different stages of flood limits, sufficient strength of labour shall remain throughout the period of flood on the following basis.

Watching Establishment Details										
Sr. No.	**Structure Name**	**Length (Miles)**	**Flood Limits**							
			Normal Flood Season		**Low Flood**		**Medium/High Flood**		**Very High/ Exp. High Flood**	
			Men	**Shift**	**Men**	**Shift**	**Men**	**Shift**	**Men**	**Shift**
			1 Person/ 2 mile/Shift (1 Shift)		**1 Person/ mile/Shift (1 Shift)**		**2 Person/ mile/Shift (2 Shift)**		**5 Person / mile/ Shift (3 Shift)**	
1	Hill Torrent Xing 51+000	as per site	1	1	1	1	2	2	3	3
2	Hill Torrent Xing 69+100		1		1		2		3	
3	Hill torrent Xing 82+400		1		1		2		3	
4	Hill torrent Xing 108+857		1		1		2		3	
5	Hill torrent Xing 144+000		1		1		2		3	
6	Hill torrent Xing 156+750		1		1		2		3	
7	Hill torrent Xing 185+500		1		1		2		3	
TOTAL Per Shift :-			**7**		**7**		**14**		**21**	
Total			**7**		**7**		**28**		**63**	
No. of Mates			**-**		**-**		**2**		**5**	

Note: 01 No. Mate is for every 12 No. Beldars

Note:

Payment of machinery and work charged establishment subject to verification by the TPM / Consultants

7.3 ARRANGEMENT AT SENSITIVE SITES.

The normal watching of D.G.Khan Canal RD: 40 – 220+000/R. The following sites of D.G. Khan Canal need special watching during the high flood period.

1. D.G. Khan Canal at RD: 40+000 – 88+500.
2. D.G. Khan Canal at RD: 120+000 – 197+000
3. Bank of D.G. KHAN Canal at RD: 197-220

Flood Fighting Camps established at Hill torrent Xing of D.G Khan Canal RD: RD: 69+100, RD: 82+400, RD.144+000 and RD.185+500.

7.4 WATCHING MATERIAL

The following scale of materials as prescribed below is provided

Sr. No.	ITEM	UNIT	Total required.(Qty)	Available (Qty)	Balance (Qty).	Remarks
1	Chholdari / Tent.	No	01	---	01	Material required & Estimates are under process.
2	Chair.	No	06	---	06	
3	Table	No	01	---	01	
4	Generator (2-3 KV).	No	01	---	01	
5	Pedestal Fans	No	01	---	01	
6	charpai.	No	02	---	02	
7	Symbolic jacket.	No	50	---	50	
8	Polyethene Sheet	Kg	100	---	100	
9	Bamboos (4” dia and 10 ft long)	No	100	---	100	
10	Water Coller	No	01	---	01	
11	Portable umbrella	No	02	---	02	
12	Life Jacket	No	05	---	05	
13	Utensils (10 person serving)	No	01	---	01	
14	Jute /Plastic bags	No	1000	---	1000	
15	Walke Talkie Set	Sets	02	---	02	
16	Raincoats	No	10	---	10	
17	LED Flood light	No	10	---	10	
18	Extension Cable (10 ft)	No	02	---	02	
19	Rechargeable torches	No	20	---	20	
20	Kassies.	No	20	---	20	
21	Axes	No	20	---	20	
22	GI buckets.	No	05	---	05	
23	7/44 cable	Feet	500	---	500	

Sr. No.	ITEM	UNIT	Total required.(Qty)	Available (Qty)	Balance (Qty).	Remarks
24	Sutli	Kg	02	---	02	
25	Sewing Needles	No	10	---	10	
26	Emergency Medical Kit	No	01	---	01	

7.5 ARRANGEMENT FOR SOUNDING & PROBING

Every vulnerable sites/ structure following arrangements (detail below) should made for probing.

Lighting arrangements

Ration arrangements

P.O.L arrangements

Transportation arrangements

Law & order arrangements

Medical arrangements

Availability of Boat/ sounding rods etc.

There is no boat / sounding rods in D.G.Khan Canal Division D.G.Khan

7.6 LIGHTING ARRANGEMENTS.

Generators/ Gas lamps and lanterns for each camp site will be purchased and will be shifted as per requirements before flood season.

7.7 RATION ARRANGEMENTS

The Ration arrangements are the responsibility of civil authorities.

7.8 P.O.L ARRANGEMENTS

Grant under Head P.O.L has already been received from higher office for running Govt. Jeeps but it is insufficient for expensive touring/ watching in flood days.

7.9 TRANSPORTATION.

Civil Authorities will be responsible for any emergency to provide the transpiration for inhabitants of flood affected areas.

7.10 LAW & ORDER

Law & order is the core responsibility of District Govt: and Police for which both the agencies have been requested to provide Police Guard to Control the law & order situation if arises for any mishap by the people of the area.

7.11 MEDICAL ARRANGEMENTS FOR LABOUR

Department cannot arrange the medical facilities for labour due to non availability of any such kind of funds. It will be the responsibility of District Govt: to provide medical facilities in flood areas where is required.

7.12 LIAISON WITH OTHER DEPARTMENTS

Necessary liaison with all other District Heads has been made to handle the flood situation. Executive Engineer, D.G.Khan Canals Division, D.G.Khan will keep liaison with civil /Army authorities to combat any mishap occurring due to floods and also will have liaison with flood forecasting centers Lahore for collection of flood related information.

7.13 ROLE OF THE ARMY.

Role of the Army is very impotent in case if any emergent situation arises due to high flood. Continuous liaison with the army authorities will be maintained during the flood if required.

7.14 DUTIES OF TELEPHONE ATTENDANT

To collect the hill-torrent/ river gauge or any kind of messages from any other sources and its proper delivery, the officials are deputed to perform their duties on telephone as telephone attendant during the flood season w.e.f 15-06-2026 to 15-10-2026 respectively.

Name of Official	Period	Time	
		From	To
Muhammad Abid (Signaler)	15.06.2026 to 15.10.2026	8:00 AM	8:00 PM
Muhammad Qasim (Signaler)	15.06.2026 to 15.10.2026	8:00 PM	8:00 AM

7.15 WIRELESS ARRANGEMENTS

1	Superintending Engineer, Derajat Circle, Dera Ghazi Khan.	During flood Police Department provide / fix the wireless system on the officers vehicles. Department has no wireless system. During flood wireless system is also installed on the critical / important sites i.e. Canal Telegraph Office DGKhan, Canal Rest House Mahtam & Canal Rest House at Head Gajjani RD: 88500
2	Executive Engineer, D.G.Khan Canal Division-I	
3	Sub Divisional Officer, Gajjani.	

Chapter No.8

DETAIL OF ENCROACHMENT

Total No of Encroachment	Removed	Balance	Action to be taken
Nil	Nil	Nil	Nil

Chapter No.9

DUTY ROSTER/ FLOOD FIGHTING PROGRAM

Gajjani Sub Division	
Gajjani Section	Ghazi Section
D.G.Khan Canal RD: 40-150	D.G.Khan Canal RD:197-220
Sub Divisional Officer	
Sub Engineer Concerned	

Chapter No.10

EMERGENCY TELEPHONE NUMBERS

Sr#	Name of Officers	Office	Residence / Cell No
IRRIGATION DEPARTMENT			
1	Secretary, Irrigation & Power Department, Lahore.	042 – 99212117 - 18	0304-0920033
2	Chief Engineer, Irrigation Zone, D.G.Khan	064 / 9260245	064 / 9260246 0313-9190684
3	Chief Engineer, Drainage & Flood Zone, Lahore	042-99233551	03099970999
4	Superintending Engineer, Project Circle, (Irrg:) D.G.Khan.	064 / 9260248	0323-4443607
5	Superintending Engineer, Derajat Circle, D.G.Khan.	064 / 9260247	0300-6920400
6	Executive Engineer, D.G.Khan Construction Division, D.G.Khan.	064 / 9260257	0333-0508781
7	Executive Engineer, Jampur Construction Division (Irrg:) D.G.Khan.	0604-689064	0300-0425111
8	Executive Engineer, Rajanpur Canal Division, Rajanpur.	0604 / 689064	0333-1871816
9	Executive Engineer, D.G.Khan Canal Division,-I D.G.Khan.	064 - 9260249	0334-7178578
10	Executive Engineer, D.G.Khan Canal Division-II D.G.Khan.	064-6702694	0345-7861909
11	Executive Engineer, Taunsa Barrage Division, Kot Adu.	066 / 2242796	0300-6306140
12	Director Floods, Lahore.	042 / 99231614	0334-4669308
13	Flood Emergency Cell, Lahore	042 / 7572091 - 93	042-99212166
14	Executive Engineer (Operation) DGKhan Irrigation Zone, (Flood Emergency Cell, DGKhan.	064 / 9260251	0332-6206393
15	Canal Telegraph Office, D.G.Khan.	064 / 9260253	0336-6615223
16	Canal Telegraph Office, Head Taunsa Barrage Kot Addu	066/2243398	066 / 2243398
CIVIL ADMINISTRATION			
1	Police Wireless Station, DGKhan.	064 / 9260113	---
2	District Coordination Officer, DGKhan.	064 / 9060340 - 41	064 / 9260342
3	Tehsil Municipal Officer.	064 / 2463271	--
4	D.I.G, D.G.Khan.	064 / 9060471 - 72	--
5	District Police Officer, DGKhan.	064 / 9260100 - 102	--
6	District Revenue Officer, D.G.Khan.	064 / 9260334	--
7	District Coordination Officer, Rajanpur.	0604 / 689131	0604 / 689002
8	District Police Officer, Rajan pur.	0604 / 689055	0604 / 689042
9	Deputy District Revenue Officer, Rajanpur.	0604 / 689071	0604 / 689131
ARMY AUTHORITY			
1	Military Officer Head Quarter Engineers 2 Corps Multan Cantt.	061/5313388 5313389	--- ---
2	Military Officer, Head Quarter Engineers 31-Corps Bahawalpur Cantt.	062-89132511	---
TEHSIL MUNICIPAL ADMINISTRATION			
1	Tehsil Municipal Officer	064-9260357/ 064-9260553	---
LIVE STOCK			
1	Live Stock Office	064-9260277	--
Water and Power Development Authority (WAPDA			
1	Chief Engineer, MEPCO	---	--
2	Superintending Engineer MEPCO	064-9260229	--
3	Executive Engineer MEPCO	064-9260231	--
Roads Department			
1	Executive District Officer Roads	064-9260115	---

Chapter No.11

STANDARD OPERATING PROCEDURES (SOP) FOR BREACHING SECTION

11.1 HISTORY OF THE BREACHING SECTION

There is no breaching section on any site of the flood infrastructure in DGKhan Canal Division DGKhan. Hence no need any arrangements.

11.2 LOCATION DESIGN QUANTITY AND VARIETY OF THE EXPLOSIVE REQUIRED FOR DETONATION

There is no breaching section on any site of the flood infrastructure in DGKhan Canal Division DGKhan. Hence no need any arrangements.

11.3 ARRANGEMENT OF EXPLOSIVES AND SECURITY OF EXPLOSIVE STORES.

There is no breaching section on any site of the flood infrastructure in DGKhan Canal Division DGKhan. Hence no need any arrangements.

11.4 LIST OF SECURITY STAFF ALONG WITH DETAIL OF THEIR TRAINING ETC.

There is no breaching section on any site of the flood infrastructure in DGKhan Canal Division DGKhan. Hence no need any arrangements.

11.5 DETAIL OF MECHANICAL MEANS AS A STAND BY ARRANGEMENTS IN CASE OF DETONATION FAILURE

There is no breaching section on any site of the flood infrastructure in DGKhan Canal Division DGKhan. Hence no need any arrangements.

11.6 DUTY ROASTER IN CASE OF CRITICAL SITUATION

According to the flood situation, duty roaster programme has been already mentioned in flood fighting plan in Chapter No.9.

11.7 BREACHING COMMITTEE WITH THEIR ACTION PLAN

For this purpose, following relief cuts committees is proposed who will approve the action of operating the relief cuts at site as and when necessity arises with their specific orders and supervision. The committee will start functioning from 15th of May each year.

1	District Coordination Officer, D.G.Khan or his representative.	Convener
2	Executive Engineer, D.G.Khan Canal Division-I, D.G.Khan.	Member
3	Superintendent of Police, D.G.Khan.	Member
4	The Sub Divisional Officers Gajjani.	Member

11.8 **LIST OF THE VILLAGES LIKELY TO BE INUNDATED IN CASE OF BREACH.**

Sr No	Name of Tahsil	Name of District	Name of Village	Area in (Acrs)
1	Relief cuts RD 181 left side of D.G.Khan Canal			
i)	D.G.Khan	D.G.Khan	Yaru	1704
ii)			Chabri	137
iii)			Chabri Bala	17040

11.9 **ANNOUNCEMENT AND DETAIL OF EVACUATION ARRANGEMENTS**.

Commissioner D.G.Khan
District Coordination Officer D.G.Khan.

11.10 **DETAIL OF COORDINATION WITH CIVIL /ARMY AUTHORITIES**

Nil

11.11 **PARALLEL COMMUNICATION ARRANGEMENTS**

Canal Telegraph Office D.G.Khan and wireless in all vehicles of officer

11.12 **INDEX PLAN**

As there is no breaching section, so index plan is not required.

Executive Engineer,
D.G. Khan Canals Division-I,
D.G.Khan

Superintending Engineer,
Derajat Circle
D.G.Khan

Chief Engineer,
D.G.Khan Irrigation Zone,
Dera Ghazi Khan

PART B

Chapter No.12

VULNERABLE SITES ON FLOOD BUNDS /STRUCTURES

12.1 Apprehended breaches in D.G.Khan Canals Division

a) Right bank of D.G.Khan canal RD:88+500 to RD:198+000
Right bank of D.G.Khan canal RD:198+000 to 220+000

b) Left bank of Link No. 1 RD:138+000 to RD:205+000 (Tail)

12.2 Operation of Breaching Sections

Breaches are made with the consultation of District Administration, Police Department, as well as with the consultation of Pak Army, keeping in view the site condition and to save the public as well as Govt: infrastructures breaches are made. After subsiding of flood water breaches are closed by deploying Govt: machinery, Irrigation field staff to fill the breaches through gunny bags and sand etc.

12.3 Breaches due to rising of Flood Water River/ Hill-Torrent water, deterioration of D.G.Khan canal, Dajal Branch & Link No.1

10 Nos. Hill-torrent crossings on D.G.Khan canal & 4 Nos. on Dajal Branch exists. During the Monsoon Season even on normal flood water of these hill-torrents, caused breaches on the right bank of D.G.Khan Canal-I due to the insufficient capacity of Hill torrents. (Detail are given below as Appendix “A”)

The left bank of Link No 1 has been inundated during the flood 2010. However the condition of the left bank of Link No.1 is very poor and due to rising of flood water, there are chances of breach at any location.

Appendix "A"

Sr. No.	Name of Hill Torrent.	Reach of Canal attacked.	H.T.X-ing At RD	Capacity of H.T X-ing (Cs)
1	Sori Lund	RD. 40 – 140 D.G.Khan Canal	69+100	10000
2	Chumbi sori Khosa (Sughri) Balab.	RD. 140 – 180 D.G.Khan Canal	144+000 156+750	1000 1000
3	Vidore	RD. 180 – 245 D.G.Khan Canal	185+500 242+300	2000 10000

Chapter No.13

Emergency contingency plan for vulnerable site (Sites) listed above Emergency contingency plan must include

13.1 Plan showing of rout of flood water coming out of the breach supported with levels.

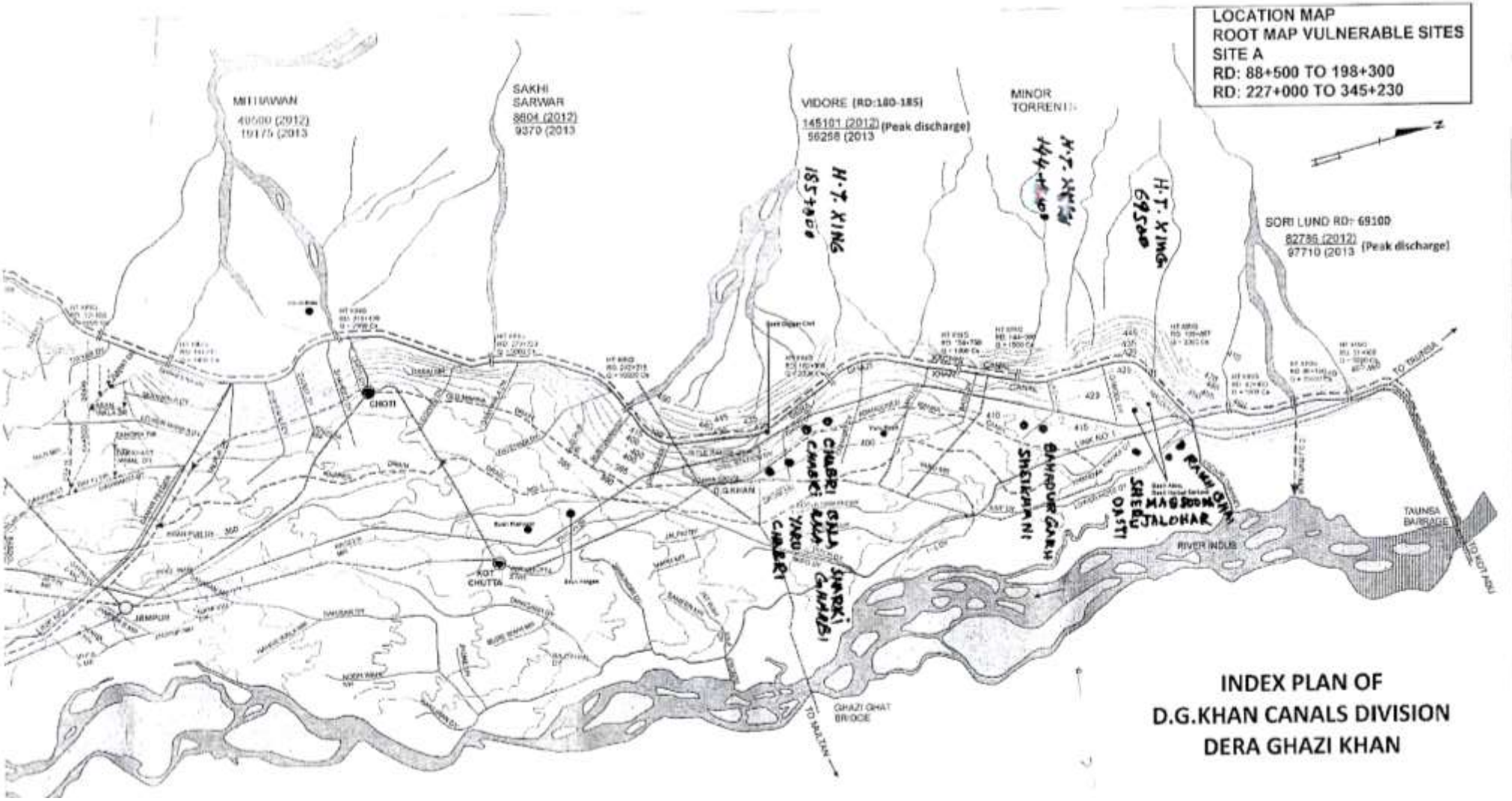
Plan showing the routs of coming H/t water and damaged Right Bank of D.G.Khan Canal (Sori Lund , Sori Khosa and Vidore Hill Torrent)

13.2 Detail of villages & Abadies likely to be affected

a) Detail of H/T Damaged the villages & Abadies given below:

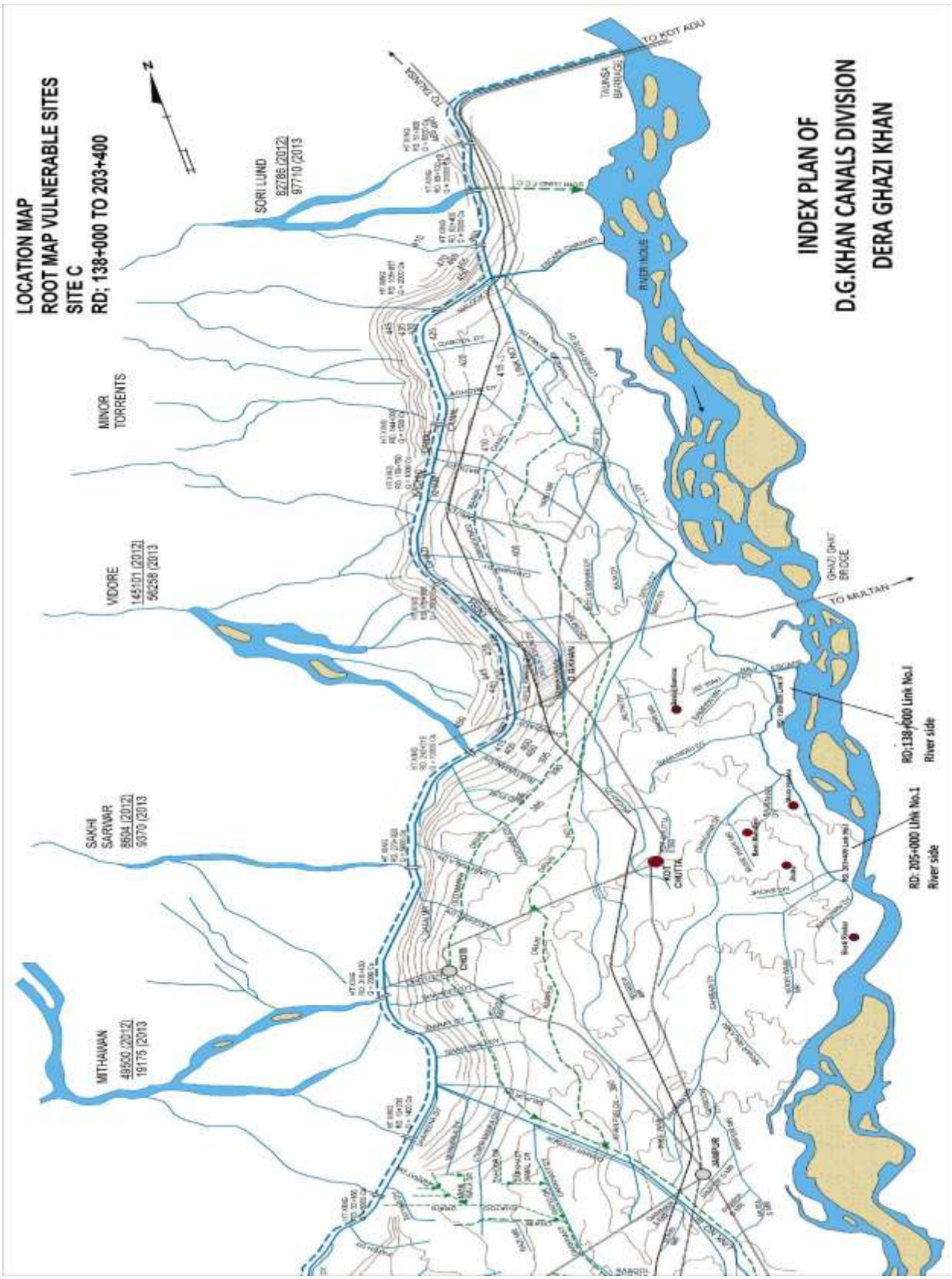
Location Map A

Sr No	Name of District	Tehsil	Vulnerable Sites	Sr. No	Villages	Area (Acres)
1	D.G.KHAN	D.G.KHAN	Hill torrent xing RD: 69+500 Sori Lund & RD: 144+000 & 185+000 D.G.Khan Canal	1	Shero Dasti	908
				2	Maqsoda Jhojhar	105
				3	Rakh Dahi Chalikhan	1102
				4	Bahadurgarh	191
				5	Sheikhani	90
				6	Chabri Bala Sharqi	632
				7	Chabri Bala Gharbi	1240
				8	Yaroo	1704
				9	Chabri	157


LOCATION MAP
ROOT MAP VULNERABLE SITES
SITE A
RD: 88+500 TO 198+300
RD: 227+000 TO 345+230
MITHAWAN
40500 (2012)
19175 (2013
SAKHI SARWAR
8804 (2012)
9370 (2013
VIDORE (RD:180-185)
146101 (2012) (Peak discharge)
56258 (2013
MINOR TORRENT
SORI LUND RD: 69100
82786 (2012)
97710 (2013 (Peak discharge)
CHOTI
KOT CHUTTA
JAMPUR
D.GKHAN
GHAZI GHAT BRIDGE
TO MULTAN
TAUNSA BARRAGE
RIVER INDUS
TO KOT ADU
INDEX PLAN OF
D.G.KHAN CANALS DIVISION
DERA GHAZI KHAN

b) Detail of Abadies & villages

Yaroo, Chabri, Chabri Bala Sharqi, Chabri Bala Gharbi, Shero Dasti, Maqsoda Jhojhar, Rakh Dahi Chalikhan, Bahadurgarh, Sheikhani, Kot Haibat ,



13.3 Strategy and action taken be explained in detail this may include

To meet with any emergent/ critical situation at site safety measures i.e. to save the Government/ Public infrastructure & Human Lives etc. First of all efforts will be made to control the flood water by deploying heavy machinery / man power.

13.3.1 Arrangements

Arrangements for the flood fighting have been completed

13.3.2 Establishment of flood fighting camps

Flood Fighting Camps established at Hill torrent Xing of D.G Khan Canal RD: RD: 69+100, RD: 82+400, RD.144+000 and RD.185+500.

13.3.3 Duties of Officers/ Officials given below:

<table>
<tr><td colspan="2">Gajjani Sub Division</td></tr>
<tr><td>Gajjani Section</td><td>Ghazi Section</td></tr>
<tr><td>D.G.Khan Canal RD: 40-150</td><td>D.G.Khan Canal
RD:197-220</td></tr>
<tr><td colspan="2">Maaz Ali
Sub Divisional Officer
0306-6766711</td></tr>
<tr><td colspan="2">Sub Engineer Concerned</td></tr>
</table>

13.3.4 Department Machinery Available

No Machinery is available in D.G.Khan Canals Division.

13.3.5 Machinery Available from private source.

Machinery will be made available from private source during the flood emergency situation, detail of machinery is as under:-

1. Excavator.
2. Dumpers / Tractor with Trolleys
3. Dozers.

Sr. No.	Name of Government Contractor	Contact No.
1-	M/S Kamran Builders	0345-7218000
2-	M/S Mian Usman Zahoor	0306-7582222

3-	M/S Afzal Khan Khoso	0314-6610088

13.3.6 Flood fighting Material required

13.3.7 Flood fighting Material available

Sr. No.	ITEM	UNIT	Total required.(Qty)	Available (Qty)	Balance (Qty).	Remarks
1	Chholdari / Tent.	No	01	---	01	Material required & Estimates are under process.
2	chair.	No	06	---	06	
3	table	No	01	---	01	
4	Generator (2-3 KV).	No	01	--	01	
5	Pedestal Fans	No	01	---	01	
6	charpai.	No	02	---	02	
7	Symbolic jacket.	No	50	---	50	
8	Polyethene Sheet	Kg	100	---	100	
9	Bamboos (4" dia and 10 ft long)	No	100	---	100	
10	Water Coller	No	01	---	01	
11	Portable umbrella	No	02	---	02	
12	Life Jacket	No	05	---	05	
13	Utensils (10 person serving)	No	01	---	01	
14	Jute /Plastic bags	No	1000	---	1000	
15	Walke Talkie Set	Sets	02	---	02	
16	Raincoats	No	10	---	10	
17	LED Flood light	No	10	---	10	
18	Extension Cable (10 ft)	No	02	---	02	
19	Rechargeable torches	No	20	---	20	
20	Kassies.	No	20	---	20	
21	Axes	No	20	---	20	
22	GI buckets.	No	05	---	05	
23	7/44 cable	Feet	500	---	500	
24	Sutli	Kg	02	---	02	
25	Sewing Needles	No	10	---	10	
26	Emergency Medical Kit	No	01	---	01	

13.4 Detail of other infrastructure like electric, Sui gas, telephone installation, road network, other building, canal and drainages network.

Approach to Link No. I through metalled roads

Ghazi Ghat to Kot chutta at RD: 132+000 Link No. I, Samina east RD: 138 Link No.I Jhokeutra RD: 195-196 Link No.I, D.G.Khan to Taunsa road RD: 49+000 Link No.I, Yaru Road RD: 110000 Link No.I

Approach to D.G.Khan Canal through metalled roads

D.G.Khan to Sakhi Sarwar Road at RD: 227+000 D.G.Khan Canal, D.G.Khan Choti Road RD: 316+000 D.G.Khan Canal, Vidore road RD: 212+000 D.G.Khan Canal, D.G.Khan to Taunsa road RD: 40+000 D.G.Khan Canal.

Buildings

Name of Infrastructures (Building)	No of infrastructures(Building)
Schools	8
Dispensaries	5

Chapter No.14
Action Plan

14.1 Re-Shuffling / recouping plan of reserve stone departmentally

N.A

14.2 Detail of inlet/ outlet crossing along with closing mythology

N.A

14.3 Deployment of Machinery (Normal to Low Flood)

Deployment of Machinery (Normal to Low Flood)

Sr. No.	Structure Name	Length (Miles)	Excavators	Trolleys	Dumpers	Tractor with Front blade (1 per 15 mile)
1	Hill Torrent Xing 51+000	as per site	S.E shall allow deputation of one (1) excavator & four (4) Trolleys during low flood at camps/vulnerable points & LMB / RMB.			-
2	Hill Torrent Xing 69+100					-
3	Hill torrent Xing 82+400					-
4	Hill torrent Xing 108+857					-
5	Hill torrent Xing 144+000					-
6	Hill torrent Xing 156+750					-
7	Hill torrent Xing 185+500					-
Total						**-**

Note: Payment of machinery and work charge establishment to verification by the TPM /Consultants

14.4 Deployment of Machinery (Medium to high flood)

Deployment of Machinery (Medium to High Flood)						
Sr. No.	**Structure Name**	**Length (Miles)**	**Excavators**	**Trolleys**	**Dumpers**	**Tractor with Front blade**
1	Hill Torrent Xing 51+000	as per site	1	4	1	1
2	Hill Torrent Xing 69+100		1	4	1	1
3	Hill torrent Xing 82+400		1	4	1	1
4	Hill torrent Xing 108+857		1	4	1	1
5	Hill torrent Xing 144+000		1	4	1	1
6	Hill torrent Xing 156+750		1	4	1	1
7	Hill torrent Xing 185+500		1	4	1	1
Total			**7**	**28**	**7**	**7**

14.5 Deployment of Machinery (high to exceptionally high flood)

Deployment of Machinery (Very High to Exceptionally High Flood)

Sr. No.	Structure Name	Length (Miles)	Excavators		Trolleys	Dumpers	Tractor with Front blade	
			Very High Flood	Exp. High Flood			Very High Flood	Exp. High Flood
1	Hill Torrent Xing 51+000	as per site	1	2	4	2	1	2
2	Hill Torrent Xing 69+100		1	2	4	2	1	2
3	Hill torrent Xing 82+400		1	2	4	2	1	2
4	Hill torrent Xing 108+857		1	2	4	2	1	2
5	Hill torrent Xing 144+000		1	2	4	2	1	2
6	Hill torrent Xing 156+750		1	2	4	2	1	2
7	Hill torrent Xing 185+500		1	2	4	2	1	2
Total			**7**	**14**	**28**	**14**	**7**	**14**

Note:- Payment of Machinery and work charged establishment subject to verification by the TPM/ Consultant.

14.6 Police Deployment Plan

Flood duty Roster police and Ranger

1-

Sr.	Site of Breaching section	Concerned Canal Division	Concerned Police station & District	Police personal to be deployed		Remarks (if any)
				Inspector / S.I / A.S.I	Constables	
1	--	--	--	--	--	--

2-

Sr.	Vulnerable sites used for illegal cuts during floods	Concerned Canal Division	Concerned Police station & District	Police personal to be deployed		Remarks (if any)
				Inspector / S.I / A.S.I	Constables	
1	RD 181 left side of D.G.Khan Canal (Yaru, Chabri, Chabri Bala)	DGKhan Canal Division	Police station Sadar DGKhan District DGKhan	Sub Inspector = 01 Nos.	4 Nos.	

3-

Sr.	Name of Barrage	Concerned Canal Division	Concerned Police station & District	Police personal to be deployed		Remarks (if any)
				Inspector / S.I / A.S.I	Constables	
1	--	--	--	--	--	--

4-

Traffic police if required for smooth traffic flow at Barrage during flood. (add required detail)
04 Nos. Traffic Police constables will be required during flood.

5-

Any other suggestions.
NIL

14.7 Details of synthetic bags with capacity of 50 kg and 100 kg

Not Required

14.8 Details of polythene sheets of black color to protect upstream slope against wave action and to control seepage through embankments.

Not Required

14.9 Any other details as per SOPs approved by the Administrative Department. (Recommendation for operation during flood)

Recommendations for Operation During Flood

i. The Superintending Engineer (SE) will notify all vulnerable points on the recommendations of Executive Engineer (XEN) and if the vulnerable site falls within 15 miles of embankment, then camp will be established at vulnerable site.

ii. Superintending Engineer shall allow deputation of one (1) excavator and four (4) Trolleys during low flood at Camps/ vulnerable points and LMB/RMB.

iii. The Superintending Engineer (SE) shall approve one additional shift during low to high flood based on necessity of site but he shall clearly mention the reach where additional shift is allowed.

iv. For emergent situation when very high flood levels are attained at lower flood discharges, additional camps may also be established with the approval of Superintending Engineer.

v. The concerned division shall procure flood fighting material as per requirement of seasonal flood fighting camps.

vi. Jackets with official emblem of the PID should be purchased by the concerned Division, to be used during the worst-case scenario, i.e., for exceptionally high flood.

vii. All others camps and supplies along with establishment i.e. Beldars and mates shall be outsourced before the flood season for operational efficiency during the flood fighting activities.

viii. The above mentioned yard stick of human resource is inclusive of 100% of regular flood establishment of the division at normal and low flood and for medium and above flood situation 50% of total regular establishment of the division and backup division in Flood Fighting Plan.

ix. The **Trigger Point** upstream of a Canal Division for commencing preparations shall be mentioned in the flood fighting plan and it shall be such point upstream with lag time of 3 days / 72 hours. The division shall initiate preparation corresponding to discharge magnitude expected to receive at their jurisdiction with respect to discharge at trigger point with 2025 flood data.

6

SE MBN

x. Superintending Engineers shall approve additional resources above the approved FFP on the recommendations of Executive Engineer based on site necessity with copy to TPM and respective Chief Engineer but must mentioned the reach and justify the reason for additional resources in approval.

xi. Executive Engineers (XEN) shall decide the location and relocation of flood camps.

xii. The machinery mentioned above should be hired to remain standby for 24/7 to fight any extreme situation. The working of deployed machinery during normal situation shall be with prior approval of Superintending Engineer.

xiii. Communication means must be arranged through the Government. It is recommended to allocate a unique frequency for irrigation department.

xiv. In the event that water levels reach the 'High Flood' threshold even if the recorded discharge remains below established benchmarks, all field preparations and personnel deployments must immediately escalate to Critical Level protocols.

(Zeeshan Ali)
Member/ SE, Project Circle DG Khan

(Abdul Qayyum Qadume)
Member / SE, Mailsi Canal Circle, Multan

(Mohib Ullah Ali)
Member / SE, Sukhrawa Canal Circle, Sahiwal

(Imtiaz Hussain)
Member / SE, Bahawalpur Canal Circle

(Sammar Iqbal)
Member / SE, LCC(West) Canal Circle, Faisalabad

(Hafiz Ijaz Ahmad)
Member / SE, Mandi Bahauddin Canal Circle

(Mudassar Rehan)
Member / SE Link Circle, Lahore

(Khurram Amin)
Convener / Chief Engineer, Drainage & Flood Zone, Lahore.

Chapter No.15

Back up Divisions (in case of breach)

DGKhan Construction Division is Backup Division of DGKhan Canal Division DGKhan and will cooperate in case of any emergency during flood season

Executive Engineer,
D.G Khan Canals Division-I,
D.G.Khan

Superintending Engineer,
Derajat Canal Circle
D.G Khan

Chief Engineer,
D.G.Khan Irrigation Zone,
Dera Ghazi Khan