



Nebraska Excess Flow Variance Petition

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DSS Id: 45

Water Rights Id: Pending

Permit Type: Temporary

Appropriator: Suburban Irrigation District

Point of Diversion: Suburban Diversion Dam

Annual Operating Plan Year: 2024

Address: PO Box 210 Hershey, NE 69143

Phone Number: (308) 386-2272

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Permit Variance

Description of Proposed Project & Good Cause Narrative (Expected Benefits) *Narrative on the Benefits of The Irrigation Canal(s) Recharge Project in the Twin Platte NRD* The water appropriations being sought is for a temporary right to provide broad benefits to many local, regional, and state interests. The objective of this project is to allow an opportunity in the non-irrigation season, when "excess" flows are available in the North and South Platte Rivers, to divert those excess flows into the existing irrigation canals for intentional ground water recharge. A temporary permit is being requested at this time over a permanent permit since the Twin Platte (TPNRD) and the Irrigation Districts are just beginning the process of building a working relationship with one another. A long-term goal of this project would be to build future plans on a more permanent basis. In the meantime, being approved for a temporary permit will allow the TPNRD the time to develop a relationship that can benefit the entire region in the long term and continue to collect data that supports the beliefs that were created during the Upper Platte River Recharge & Flood Mitigation Project of 2011. "Excess" flow can be identified as any flow that is not already being identified in the Platte River Recovery Implementation Agreement (PRIP) to which the State of Nebraska is a party, as well as any flow that is already appropriated for by the state. This temporary water right being sought after will be used for ground water recharge through the Western Irrigation Canal from the South Platte River and the Keith-Lincoln Irrigation Canal; Suburban Irrigation District; Paxton-Hershey Water Company; and the Platte Valley Irrigation District (North Platte Canal) all of which divert from the North Platte River. When excess water is available, water would be diverted by any or all of the above mentioned irrigation canals to flow through the canals and their laterals. This diversion could take place in the fall, winter, and spring months as long as ice is not a problem and weather allows. The diversions could occur for however long an excess flow event occurs and benefits could be gained, which could be in the spring prior to the irrigation canals normal diversion period, or it may be in the late fall and early winter after their diversion ceases if ice does not cause a problem. All of the diversions would be subject to the availability of excess flows and would occur only when excess flow events occur. Times when diversions would be not eligible would be when the irrigation district normally diverts for irrigation purposes in April through October. Memorandums of agreements have been signed between the above irrigation districts, the TPNRD, and the Nebraska Department of Natural Resources District (DNR) for a five year period of time with the ability to re-new for another five year period. The intent of this project is to apply for a temporary water appropriation on an annual basis when excess flows are available during the five year period of the signed agreement. During the fifth year of the project, the TPNRD would work with their partners of this project to evaluate the overall benefit of the project. Since the exact same project has already been performed in 2011 as a demonstration project, many of the unknowns have been worked through. Three of the canals have a spill where discharge measurements can be measured. For each spill measurement taken, the rate of water measured at the canal spill can be subtracted from the average daily diversion rate to determine the rate of canal loss. The loss is then divided by the average daily rate of diversion to calculate a daily loss as a proportion of the total volume of water diverted. For the other two canals, loss estimates can be calculated using the STELLA model by taking the total volume diverted and the modeled loss rate to determine the volume of water recharged. Benefits of this project would include increased stream flows during the summer months as a result of the ground water recharge and the underground returns from this project. The enhanced stream flows would help the TPNRD fulfill its obligation of getting back to 1997 levels of depletions in the Platte River required by LB 962 and as agreed to by the State of Nebraska for the PRIP. Increased flows in the river benefit threatened and endangered species and their habitats. Both the Basin-wide Integrated Management Plan (IMP) and the TPNRD's IMP allows for the Platte Basin NRDs to identify management options to achieve the goal of incrementally achieving and sustaining a fully appropriated status from the current over appropriated status. This project would also protect existing water users, local economies, environmental health, and recreation uses, while maintaining the economic and social aspects of life within the TPNRD through a healthy balance between the surface and ground water users of this area, and lastly would be in the public's best interest.

The Proposed Project Must Meet at Least One of the Following Criteria (Check All That Apply)

- ☒ The applicant has credible information that indicates there may be unappropriated water available at the proposed location at the time the depletion is likely to occur. (Upload analysis, PDF with descriptive name)

[Use DNR Report](#)[Upload Analysis](#)

- ☐ The proposed project is for a non-consumptive use. (Upload description of use, PDF with descriptive name)
- ☐ The applicant has a credible proposal for replacing any consumptive use that will occur in a manner such that the project will not harm other users. (Upload offset plan, PDF with descriptive name)
- ☐ The project existed prior to any informal moratorium, formal moratorium or stay. (Upload proof, PDF with descriptive name)
- ☐ There is a public safety issue that must be addressed and the proposed project addresses that issue. (Upload explanation, PDF with descriptive name)
- ☐ The proposed use is a temporary use for public construction and the total volume requested is less than ten (10) acre-feet.

Upload Files to Support the Criteria Selected Above

 [Narrative on the Benefits 2013 to go along with variance applications.docx \[https://dssdnr.nebraska.gov/filedownload/123\]](https://dssdnr.nebraska.gov/filedownload/123)

Permit Application (*Alternate Form APA-001*)

What Is the Recharge Application Type? *Natural Flow*

Source Name (From Point of Diversion) *Suburban Canal from North Platte River*

Diversion Type (From Point of Diversion) *Headgate*

Diversion Structure Name (From Point of Diversion) *Suburban Diversion Dam*

Maximum Capacity of Canal or Delivery Works (CFS) (From Point of Diversion) *105*

Quantity Desired for Recharge Appropriation (CFS) *77.47*

What is the Minimum Operational Rate of the Canal (CFS) *20*

What is the Earliest Diversion Date? *04/01/2024*

Will This Project Be Constructed under a Federal Program, Receive Federal Funding, or Have Federal Planning Assistance? *No*

Do You Intend to Divert Water into Recharge Facilities Other than Your Canal? *Yes*

How Many Recharge Facilities Will Be Utilized under This Application? *3*

Narrative on the Benefits of The Irrigation Canal(s) Recharge Project in the Twin Platte NRD

The water appropriations being sought is for a temporary right to provide broad benefits to many local, regional, and state interests. The objective of this project is to allow an opportunity in the non-irrigation season, when “excess” flows are available in the North and South Platte Rivers, to divert those excess flows into the existing irrigation canals for intentional ground water recharge.

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This temporary water right being sought after will be used for ground water recharge through the Western Irrigation Canal from the South Platte River and the Keith-Lincoln Irrigation Canal; Suburban Irrigation District; Paxton-Hershey Water Company; and the Platte Valley Irrigation District (North Platte Canal) all of which divert from the North Platte River. When excess water is available, water would be diverted by any or all of the above mentioned irrigation canals to flow through the canals and their laterals. This diversion could take place in the fall, winter, and spring months as long as ice is not a problem and weather allows. The diversions could occur for however long an excess flow event occurs and benefits could be gained, which could be in the spring prior to the irrigation canals normal diversion period, or it may be in the late fall and early winter after their diversion ceases if ice does not cause a problem. All of the diversions would be subject to the availability of excess flows and would occur only when excess flow events occur. Times when diversions would be not eligible would be when the irrigation district normally diverts for irrigation purposes in April through October. Memorandums of agreements have been signed between the above irrigation districts, the TPNRD, and the Nebraska Department of Natural Resources District (DNR) for a five year period of time with the ability to re-new for another five year period. The intent of this project is to apply for a temporary water appropriation on an annual basis when excess flows are available during the five year period of the signed agreement. During the fifth year of the project, the TPNRD would work with their partners of this project to evaluate the overall benefit of the project. Since the exact same project has already been performed in 2011 as a demonstration

project, many of the unknowns have been worked through. Three of the canals have a spill where discharge measurements can be measured. For each spill measurement taken, the rate of water measured at the canal spill can be subtracted from the average daily diversion rate to determine the rate of canal loss. The loss is then divided by the average daily rate of diversion to calculate a daily loss as a proportion of the total volume of water diverted. For the other two canals, loss estimates can be calculated using the STELLA model by taking the total volume diverted and the modeled loss rate to determine the volume of water recharged.

Benefits of this project would include increased stream flows during the summer months as a result of the ground water recharge and the underground returns from this project. The enhanced stream flows would help the TPNRD fulfill its obligation of getting back to 1997 levels of depletions in the Platte River required by LB 962 and as agreed to by the State of Nebraska for the PRIP. Increased flows in the river benefit threatened and endangered species and their habitats. Both the Basin-wide Integrated Management Plan (IMP) and the TPNRD's IMP allows for the Platte Basin NRDs to identify management options to achieve the goal of incrementally achieving and sustaining a fully appropriated status from the current over appropriated status. This project would also protect existing water users, local economies, environmental health, and recreation uses, while maintaining the economic and social aspects of life within the TPNRD through a healthy balance between the surface and ground water users of this area, and lastly would be in the public's best interest.

In 2011, a demonstration project titled The Upper Platte River Recharge and Flood Mitigation Demonstration Project was developed in conjunction with the DNR, the Platte Basin NRDs (North Platte, South Platte, Twin Platte, Central Platte, and Tri-Basin), and willing irrigation districts along the North and South Platte Rivers.

Twenty-one irrigation districts participated in the spring 2011 Recharge and Flood Mitigation Project during the months of April and May. Twenty irrigation districts participated in the fall 2011 Recharge and Flood Mitigation Project during the months of September through December. In order to quantify the volume of water that was recharged by the canals, canal losses were developed for each canal. Canal losses were calculated using diversion and spill discharge measurements or were estimated from existing data sources. Based on the diversion records and calculated losses, recharge volumes were calculated by canal and summarized for each NRD. Recharge volumes for each canal were used in conjunction with response functions developed by the technical committee under the Platte Basin Habitat Enhancement Program (PBHEP) to calculate estimated accretions/depletions to the Platte River.

Results are summarized for each canal and the Western Canal Pond seepage project. These results are then aggregated by NRD. The estimated accretions to Platte River streamflow in each NRD is shown in the table below. These results estimate that the annual accretion during the first decade is approximately 1,000 to 1,500 AF per year and residual accretions greater than 500 AF per year will persist for 25 years. NRD specific estimates show a 50-year benefit to streamflow ranging from 2,000 up to 12,000 AF, with total 50-year benefits over 36,000 AF. Canal specific source data indicates that approximately 140,000 AF of water was diverted, of

which about 65,000 AF is estimated to have seeped into ground water storage. This indicates that much of the benefit from this single seepage demonstration may persist well beyond the 50-year planning horizon presented here. Water use and management practices in the interim will fundamentally effect the realization of these benefits, though this project has provided options that would not have been available if the DNR and its collaborating partners had not taken the opportunity to divert and store abundant excess flows in the Platte River throughout 2011.

The table below is taken from the Upper Platte River Recharge and Flood Mitigation Demonstration Project: Part of the Conjunctive Management Toolbox Technical Memorandum – January 2013. It shows the estimated accretions (in acre feet) to the Platte River stream flow for each NRD that participated in the demonstration recharge project during the spring and fall of 2011. These results of this demonstration project show the numerical values annually over a 50 year period from just one year of excess flows in the river.

Year	NPNRD	SPNRD	TPNRD	TBNRD	CPNRD	Annual Total
2011	3	3	422	0	634	1062
2012	83	44	853	21	671	1672
2013	229	89	868	69	590	1844
2014	328	105	805	104	511	1853
2015	381	107	724	121	445	1777
2016	405	102	644	126	392	1669
2017	414	95	574	125	348	1555
2018	413	88	513	121	311	1446
2019	406	81	461	115	281	1344
2020	396	75	416	109	255	1251
2021	384	69	378	103	233	1167
2022	371	64	345	97	214	1091
2023	357	59	316	91	198	1022
2024	343	55	291	86	183	959
2025	330	51	269	81	171	903
2026	317	48	250	77	159	851
2027	305	45	233	72	149	804
2028	293	42	218	68	140	761
2029	281	40	204	65	132	722
2030	271	38	191	62	124	685
2031	260	36	180	59	118	652
2032	251	34	170	56	111	621
2033	241	32	161	53	106	593
2034	233	30	152	51	100	567
2035	224	29	145	48	96	542

2036	216	28	138	46	91	519
2037	209	26	131	44	87	498
2038	202	25	125	43	83	478
2039	195	24	119	41	80	460
2040	189	23	114	39	77	442
2041	183	22	109	38	74	426
2042	177	21	105	36	71	410
2043	171	21	101	35	68	396
2044	166	20	97	34	66	382
2045	161	19	93	33	63	369
2046	157	18	90	32	61	357
2047	152	18	86	30	59	346
2048	148	17	83	30	57	335
2049	144	17	80	29	55	324
2050	140	16	78	28	53	315
2051	136	16	75	27	52	305
2052	132	15	73	26	50	296
2053	129	15	70	25	48	288
2054	126	14	68	25	47	280
2055	122	14	66	24	46	272
2056	119	13	64	23	44	265
2057	117	13	62	23	43	258
2058	114	13	61	22	42	251
2059	111	12	59	21	41	244
2060	108	12	57	21	40	238
10yr Benefit	3056	787	6281	911	4439	15474
50yr Benefit	11341	1913	11991	2753	8171	36168

The TPNRD and their partners agree that the benefits gained from recharge projects were most beneficial in 2011 and would like the opportunity to re-create this re-charge project again when the opportunity arises.

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Envelope ID: 1217

Money Type: Check

How Received:	Mailed
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Receive Date: 01/29/2024

Receipt Information

	Receipt ID	Program	Payer Name	Address1	Address2	City	State	Zip	Amount Received	Check/IBT Number	Check Memo	Comments	Submitter Name
View Receipt (/Iwp/Receipts/Receipt/ReceiptView?ReceiptID=1224)	1224	Surface Water	Twin Platte NRD	111 South Dewey Street, 2nd Floor	PO Box 1347	North Platte	NE	69103-1347	\$50.00	014358	Application Fees for Excess Flows	Twin Platte NRD Irrigation Canals	Suburban-\$10
													Platte-Valley (North Platte)-\$10
													Paxton-Hershey-\$10
													Keith-Lincoln-\$10
													Western-\$10