



## **PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM**

Kearney Canal Water Quality Monitoring Protocol

***Submitted to:***

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23 **I. INTRODUCTION**

24  
25 This project will include monitoring of stage/discharge (where available) and water quality  
26 parameters (temperature, turbidity, dissolved oxygen, pH, specific conductance and suspended  
27 sediment concentration).

28  
29 The purpose of the project is to monitor suspended sediments in select locations on the Platte  
30 River, Elm Creek, and Kearney Canal to determine if Program activities alter suspended  
31 sediment in the Kearney Canal.

32  
33 **II. DESIGN CONSIDERATIONS**

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35 **II.A.1. Monitoring Locations**

36  
37 Monitoring locations on the Platte River, Elm Creek, and Kearney Canal were selected to  
38 determine if program activities are impacting suspended sediment levels at the Nebraska Public  
39 Power Districts (NPPD) Kearney hydro power plant. The monitoring locations are listed in  
40 Table 1 and illustrated on Figure 1.

41  
42 **Table 1. Spatial Monitoring Matrix**

Monitoring Location No.	Locations	Discharge	Water Quality	Suspended Sediment Concentration
1*	Platte River near Lexington, NE	NDNR	Contractor	Contractor
2	Platte River near Elm Creek, NE	N/A	Contractor	Contractor
3	Elm Creek near confluence with the Platte River Elm Creek, NE	USGS	Contractor	Contractor
4	Kearney Canal just downstream of the diversion Elm Creek, NE	NPPD	Contractor	Contractor
5	Kearney Canal near the Kearney Hydro Kearney, NE	NPPD	Contractor	Contractor

43 Notes:  
44 NDNR – Nebraska Department of Natural Resources  
45 USGS – United States Geological Survey  
46 Contractor – Firm contracted to implement the Protocol  
47 \*An existing sonde is in place at Lexington as part of the Programs Water Quality Monitoring  
48 Protocol.  
49



50 **II.A.2. Parameters of Interest**

51

52 Water quality data collected for the Protocol can be placed in the following groups:

53

54 • **Discharge** – Discharge and river stage or gage height will be collected. Existing gaging  
55 stations maintained by the USGS, NDNR, and NPPD will be used where possible. No  
56 gaging stations will be installed or maintained.

57

58 • **Continuous Water Quality Monitoring** – Continuous water quality data will include  
59 temperature, turbidity (optical sensor), dissolved oxygen by optical or Luminescent  
60 Dissolved Oxygen (LDO) technology, pH, and specific conductance. Data will be logged  
61 at set intervals, and downloaded at regular intervals.

62

63 • **Discrete Water Quality Monitoring** – Representative, discrete water samples will be  
64 collected and analyzed by Ward Laboratories, Inc. Analyses include suspended sediment  
65 concentration.

66

67 **II.A.3. Frequency and Duration**

68

69 The frequency and duration of data collection for the monitoring groups are listed below. The  
70 contractor will consult with the Program to determine the actual index period and may vary  
71 depending on environmental conditions at the start and end of the monitoring period.

72

73 • **Discharge**

74 ○ Discharge data will be collected in the same frequency as listed in the Program’s  
75 Water Quality Monitoring Protocol and collected from mid-April through  
76 November.

77

78 • **Continuous Water Quality Monitoring**

79 ○ The Contractor will install sondes for pH, temperature, turbidity, dissolved  
80 oxygen, and specific conductance at the locations listed in Table 1 and provide  
81 operation and maintenance from approximately mid-April through November.  
82 The frequency for operation and maintenance will be the same as listed in the  
83 Program’s Water Quality Monitoring Protocol.

84

85 • **Discrete Water Quality Monitoring**

86

87 ○ Representative water samples for analytical analysis will be collected at the five  
88 monitoring locations listed in Table 1. Samples will be collected during  
89 maintenance of sondes from approximately mid-April through November. Also,  
90 four separate trips to collect samples will be scheduled during this time to allow  
91 collection during various environmental conditions (storm events, pulse flows,  
92 etc.).

93



- 94 ○ The methods and reporting limits (Table 2) selected are current industry standards
- 95 approved by the EPA.

96

97 **III. METHODS AND PROCEDURES**

98

99 **III.A. Discharge and River Stage**

100

101 The methods and procedures for the collection of discharge and river stage data will be the same  
102 as listed in the Program’s Water Quality Monitoring Protocol.

103

104 **III.B. Continuous Water Quality Monitoring**

105

106 The methods and procedures for the collection of continuous water quality monitoring data will  
107 be the same as listed in the Program’s Water Quality Monitoring Protocol.

108

109 **III.C. Discrete Water Quality Monitoring**

110

111 **III.C.1. Discrete Water Sample Collection**

112

113 Representative samples of water will be collected for analytical analysis of suspended sediment  
114 concentration. One depth integrated sample will be collected at each location where the sonde is  
115 deployed as listed in Table 1 during maintenance of sondes. The following procedures will be  
116 used to collect representative discrete samples:

117

- 118 • One depth integrated sample will be collected adjacent to the water quality sonde.

119

- 120 • The sample containers will be stored in a cooler with ice for delivery to the laboratory.

121

- 122 • Once the sample container is stored, the Chain-of-Custody form will be filled out, as  
123 detailed in section III.C.5.

124

125 **III.C.2. Analytical Method**

126

127 The analytical method, required containers, volume, preservative, and holding times are listed in  
128 Table 2.

129

**Table 2. Discrete Sampling Handling and Analytical Methods**

Analyte	Method	Sample Container	Reporting Limit	Preservation
Suspended Sediment Concentration	ASTM D3977 – 97	500- mL Plastic	1 mg/L	Cool, 4°C

130

131



### 132 **III.C.3. Sample Labels**

133

134 Every sample collected and submitted for analysis will have a sample label uniquely identifying  
135 the sample and listing the parameters to be analyzed. Each label will include the following  
136 information:

137

138 • Project Name – PRRIP Kearney Canal Monitoring

139 • Location Identification – e.g., Lexpr081511

140 ○ Samples from the different monitoring locations will be identified as follows.

141 Platte River at Lexington – Lexpr

142 Platte River at Elm Creek – Elcpr

143 Elm Creek at Elm Creek – Elcec

144 Kearney Canal at Elm Creek – Elckc

145 Kearney Canal at Kearney – Kerkc

146 ○ Followed by numerical abbreviation for the day, month, and year sampled.

147 e.g., 081511 – August 15, 2011, 100911 – October 9, 2011, etc.

148 • Date of sample collection

149 • Time of sample collection (military format)

150 • Analyses to be performed

151 ○ Suspended Sediment Concentration

152 • Preservative –cool to 4 °C

153 • Samplers' initials

154

### 155 **III.C.4. QC Sample Collection and Documentation**

156

157 One duplicate water sample will be collected at one randomly selected site during each discrete  
158 water quality sampling event. Duplicate samples will be labeled as “Dup” followed by day,  
159 month, and year sampled (e.g., Dup081511). An arbitrary sample time will be placed on the  
160 container label and chain of custody. The actual location and sample time will be recorded in the  
161 field book at the time of sampling.

162

### 163 **III.C.5. Chain-of-Custody**

164

165 The procedure for the chain-of-custody will be the same as listed in the Program's Water Quality  
166 Monitoring Protocol.

167

### 168 **III.C.6. Field Book**

169

170 The information collected in the field book will be the same as listed in the Program's Water  
171 Quality Monitoring Protocol.

172



173 **III.C.7. Sample Control and Handling**

174  
175 The Sample Control and Handling will be the same as listed in the Program’s Water Quality  
176 Monitoring Protocol.

177  
178 **IV. DATA COLLECTED FROM OTHER ENTITIES**

179  
180 The data collected from other entities will be the same as listed in the Program’s Water Quality  
181 Monitoring Protocol.

182  
183 **V. QUALITY ASSURANCE/QUALITY CONTROL**

184  
185 The Quality Assurance/Quality Control will be the same as listed in the Program’s Water Quality  
186 Monitoring Protocol.

187  
188 **VI. ANNUAL SUMMARY REPORTS**

189  
190 An Annual Data Summary Report will be prepared and submitted upon completion of field data  
191 collection. The purpose of the report is to present the data collected, provide a summary of the  
192 methods and procedures, evaluate the data quality, and summarize observed temporal, spatial,  
193 and flow variations.

