ENVIRONMENTAL ASSESSMENT WORKSHEET

Note to reviewers: Comments must be submitted to the RGU during the 30-day comment period following notice of the EAW in the *EQB Monitor*. Comments should address the accuracy and completeness of information, potential impacts that warrant further investigation and the need for an EIS.

1. Project Title: Lake Redwood Reclamation Project

2. Proposer: RCRCA

Contact Person Jim Doering
and Title RCRCA Executive Director
Address 1241 East Bridge Street
Redwood Falls, MN 56283
Phone 507-637-2142 ext 124
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3. RGU: RCRCA

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and Title RCRCA Executive Director
Address 1241 East Bridge Street
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4. Reason for EAW Preparation:

EIS Scoping	Mandatory EAW	Citizen Petition	RGU Discretion	Proposer Volunteered
	X			

If EAW or EIS is mandatory give EQB rule category subpart number and name: Minn. R. 4410.4300, Subpart 27. Wetlands and Public Waters.

5. Project Location: **County** Redwood County **City/Twp** Redwood Falls/Redwood Falls

1/4 **1/4** **Section** 1, 2 **Township** 112N **Range** 36W

Tables, Figures, and Appendices attached to the EAW:

- Figures
  Figure1 – Project location
  Figure 2 – Historic photograph of impoundment structure at Lake Redwood.
  Figure 3 – Aerial photography of Lake Redwood in 1938
  Figure 4 – Historic photograph of watercraft usage on Lake Redwood.
  Figure 5 – Historic photograph of water skiing activity on Lake Redwood.
  Figure 6 – Aerial photograph of Lake Redwood in 1991.
  Figure 7 – Aerial photograph of Lake Redwood in 2006.
  Figure 8 – Project boundary
  Figure 9 – Existing lake bathymetry
  Figure 10 – Proposed lake bathymetry
  Figure 11 – Water related features
- Tables
  Table 1 – List of permits and approvals.
  Table 2 – Estimated range of flows entering Lake Redwood.
  Table 3 – List of pertinent impaired waters.
- Appendix
  Appendix A – Additional historic photographs
  Appendix B – 1992 Lake Survey Report
  Appendix C – 2006 Lake Survey Report

6. Description:

a. Provide a project summary of 50 words or less to be published in the *EQB Monitor*.

The Redwood-Cottonwood Rivers Control Area (RCRCA), a multi-county joint powers organization, proposes to reclaim Lake Redwood by dredging accumulated sediments. This project proposes to restore original conditions of the 65-acre reservoir by removing up to approximately 650,000 cubic yards of sediment from Lake Redwood by hydraulic dredging. The proposed project will increase the average water depth from 2.6 feet to almost 10 feet with a maximum depth of 20 feet. A slurry of sediment and water will be pumped to a diked disposal area for dewatering. Return flows will be discharged back to the river. Agricultural fields are being considered for disposal sites.

b. Give a complete description of the proposed project and related new construction. Attach additional sheets as necessary. Emphasize construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes. Include modifications to existing equipment or industrial processes and significant demolition, removal or remodeling of existing structures. Indicate the timing and duration of construction activities.

Background. The Redwood-Cottonwood Rivers Control Area (RCRCA), a multi-county joint powers organization, proposes to reclaim Lake Redwood by dredging accumulated sediments. Lake Redwood is a man-made impoundment located at the downstream end of 629-square mile drainage area with predominantly agriculture land uses (Figure 1). Lake Redwood was originally formed in 1902 when the Redwood River was impounded (Figures 2 and 3). The current dam, which is over thirty feet high, was installed in the 1950s. Abundant recreational opportunities were provided by this reservoir and local citizens actively used the lake (Figures 4 and 5; further historic photos are in Appendix A). The dam also provides a source of

electricity to the city of Redwood Falls. The current hydropower facility has a capacity of 0.6 megawatts which is used to provide summertime peak demand reduction.

High concentrations and loads of suspended sediment are often linked to artificial drainage patterns (ditches, tile, etc.) in agricultural watersheds. The tendency for reservoirs to fill with silt is common in the highly agricultural areas of the Midwest. As far back as 1957, there were noticeable effects of the reservoir filling with sediment. Islands and sand bars have formed due to shallow depths (Figures 6 and 7). The 65-acre man-made lake is almost completely filled with sediment and averages only 2.6 feet deep. Currently little or no recreation takes place on the most visible and accessible lake in the county.

Sediment in water often leads to impaired habitat for aquatic life, decreased photosynthetic activity, and reduced recreational quality. The Redwood River is characterized by the Minnesota Pollution Control Agency (MPCA) as exceeding water quality standards for turbidity, and other standards. The same holds true for the Minnesota River to which the Redwood River is a tributary. These rivers are formally listed as impaired on the MPCA 303(d) list. Efforts must be identified and implemented to reduce pollutants (such as turbidity in this case) so that waters meet their designated standards and uses. Currently the reservoir does not address or improve existing downstream impairments for turbidity. The dredging efforts should address the downstream TMDL impairment by increasing the residence time of the reservoir, restoring the sediment storage capacity and reducing concentrations of suspended sediment and associated pollutants. The ability to maintain a higher quality fishery and associated aquatic plant community is expected to improve. The restored capacity will likely benefit hydropower production by reducing the amount of maintenance required to remove accumulated debris. Last, the recreational capacity of the reservoir will be restored. This will occur because increased depths will allow water craft usage, skiing, and other active recreation. Further, the increased depth will likely allow for improved water clarity, benefiting the habitat for fish and other aquatic species. The improved water clarity will also enhance recreational suitability.

Proposed project. The boundary of the proposed project is shown in Figure 8. The lake will be dredged such that the lake will have an average depth of roughly 9.8 feet, with the deepest portions being dredged to a depth up to 20 feet below the surface. In total up to approximately 650,000 cubic yards of sediment will be removed from the reservoir. A hydraulic dredge will be used to complete the dredging efforts. A hydraulic dredge floats on the water and pumps a slurry of sediment and water through a pipeline to a disposal site. A dredge may utilize a cutter head to aid with loosening the sediment at the suction inlet. Re-suspended sediment is captured by the suction of the dredge so impacts to water quality during operation are generally insignificant.

Competitive bids will be requested for constructing the project. A bid letting is planned for the winter of 2007. Upon accepting a bid from a qualified contractor, the construction of the dikes at the disposal site will begin in the spring of 2008. Dredging will commence upon the completion of the dikes, also in the spring of 2008. Dredging efforts are expected to take approximately 2 years, and may conclude as early as the winter of 2009. Dredging during the winter months is not expected.

The slurry of sediment and water will be pumped to a disposal site where the sediment will settle out of the water. Potential disposal sites were selected based on their location relative to the reservoir and ability to hold the sediment volume (Figure 8). Final selection of a dredge disposal site will be dependent on negotiations with land owners. The disposal site will consist of large diked areas. (The details for the disposal sites, effluent treatment, and effluent return

will be reviewed and approved as part of the MPCA dredge disposal permit, which also requires public notice.) Disposal site water will be released through a control structure for discharge back to the river. Water quality requirements for the effluent discharge will be established by the MPCA. The disposal site will be operated so that the water discharged does not contribute to the water quality impairments in the river. The water quality requirements and details of the disposal site will be reviewed and approved as part of the MPCA dredge disposal permit, which also requires public notice.

Over time the settled sediment in the disposal site will dry out and eventually achieve normal moisture content. During the drying process, the surface of the material may form a cracked crust yet the underlying material may still hold moisture. Dust control may possibly be required in the form of establishing a temporary annual cover crop. However, the settled sediment may contain a seed stock (which may or may not be viable) of plant species, either upland seeds eroded from the landscape or aquatic vegetation from the river system. The disposal site may experience some volunteer colonization from the seeds of adjacent upland areas. Interim control of volunteer vegetation may be needed. Stripping and re-spreading topsoil on the fields may be cost-prohibitive due to likely size of the disposal area.

The time required for the disposal site drying process is dependent on a number of factors including the drainage properties of the existing soils at the site, internal drainage tiles/features incorporated at the site, the depth of the sediment layer, and other factors. At this time, it is uncertain how long it will take the disposal site to return to a productive condition. Once the sediments are sufficiently dewatered, the dikes may be removed and the disposal site closed.

c. Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

The 65-acre man-made lake is almost completely filled with sediment and averages only 2.6 feet deep. Currently little or no recreation takes place on the most visible and accessible lake in the county. The proposed project will increase the average depth to almost 10 feet with a maximum depth of 20 feet. With the reservoir in its current state the discharge from the dam does not address or improve existing downstream impairments for turbidity. Due to the shallow conditions and the large degree of turbidity within the reservoir, the quality of fisheries and aquatic vegetation is poor. The dredging efforts should provide sediment storage to address the downstream TMDL impairment. The ability to maintain a higher quality fishery and associated aquatic plant community is expected to improve. Debris removal activities to maintain hydropower production will be addressed. Last, the active recreational capacity of the reservoir will be restored. There is only one other lake in the County that provides the potential for active recreation. This other lake is Lake Laura, a 22-acre lake which was impounded in 1978 for flood control. The City of Redwood Falls, users of Lake Redwood, as well as downstream residents will all benefit from the outcomes of the reclamation project.

d. Are future stages of this development including development on any outlots planned or likely to happen? ☒Yes ☐No

If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

The goal of the project is to restore the reservoir to its original condition when the impoundment was created. The objective is to dredge up to approximately 650,000 cubic yards to achieve this goal. At this time, approximately $1.6 million in funding has been secured. An

engineering feasibility analysis was completed to determine the volume of dredging that might be attained with the current budget. Depending on a number of factors, it is estimated that dredging potentially between 155,000 and 310,000 cubic yards of sediment might attained with the existing budget. This is considered the first stage of the project. The RCRCA is intending to secure additional funds in order to ultimately achieve the project goal. The remaining sediment to be dredged will comprise the second stage of the project, once additional funds are secured. It is anticipated that the first stage will commence on or about spring 2008 and continue until about late fall 2009. The second stage would commence in 2010 and conclude most likely in late fall 2011.

The intent is to undertake environmental review on the full project scope, given that the second stage of the project is merely continuation of the dredging project. No other project factors are expected to change. The construction documents (especially proposed lake contours) are expected to provide sufficient detail to complete the project in its entirety. The sediment disposal site will be designed and constructed with enough storage capacity to receive dredge spoils up to 650,000 cubic yards (plus additional volume to account for sediment bulking or "fluffing" and detention of the slurry). Thus, this EAW document presents all information and incorporates all stages of the project.

The dredging project will be bid with the documents showing the project in two stages, identified as line item alternatives in the construction bid form. The expectation is that the project will be awarded to one contractor to dredge up to a certain volume based on available budget and unit costs. A change order may later be executed with the contractor to extend the dredging volume based on any new monies secured.

e. Is this project a subsequent stage of an earlier project? ☐ Yes ☒ No

If yes, briefly describe the past development, timeline and any past environmental review.

7. Project Magnitude Data

Total Project Area (acres) **255*** **or Length (miles)** _____

*65 acres in reservoir and up to 190 acres in upland

Number of Residential Units: **Unattached** **NA** **Attached** **NA** **Maximum Units Per Building:** **NA**

Commercial/Industrial/Institutional Building Area (gross floor space): **total square feet** **NA**

Indicate area of specific uses (in square feet): NA

Office		**Manufacturing**	
Retail		**Other Industrial**	
Warehouse		**Institutional**	
Light Industrial		**Agricultural**	
Other Commercial (specify)			

Building height _____ **If over 2 stories, compare to heights of nearby buildings** _____

8. Permits and approvals required. List all known local, state and federal permits, approvals and financial assistance for the project. Include modifications of any existing permits, governmental review of plans, and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure.

Table 1 – List of permits and approvals.

Unit of Government	Type of Application	Status
US Army Corps of Engineers	Section 404 Permit	To be applied for
MN DNR	Protected Waters Permit	To be applied for
MN DNR	Water Appropriations Permit	To be applied for
MN DNR	Dam Safety Permit	To be determined by Area Hydrologist
MPCA	Dredge Material Management and Section 401 Certification	To be applied for
MPCA	NPDES Phase II Construction Activity	To be applied for
Redwood County SWCD	Wetland Conservation Act	Dependent on presence of wetlands on disposal site
Redwood County	Conditional Use Permit	To be applied for

9. Land use. Describe current and recent past land use and development on the site and on adjacent lands. Discuss project compatibility with adjacent and nearby land uses. Indicate whether any potential conflicts involve environmental matters. Identify any potential environmental hazards due to past site uses, such as soil contamination or abandoned storage tanks, or proximity to nearby hazardous liquid or gas pipelines.

The reservoir has been in place since about 1902. The primary land uses adjoining the reservoir are residential, parks, and agricultural. The sites under consideration for disposal sites are agricultural lands, which will be taken out of production while being used as a disposal site. The land is expected to be returned to production upon completion of the project. The land uses have not changed much over time. No potential environmental hazards have been identified in the areas considered for sediment dewatering and disposal. Sediment sampling performed in the reservoir in 2006 found that the PCB's were below detectable levels (results will be submitted to the MPCA as part of the dredge material management permit).

10. Cover Types. Estimate the acreage of the site with each of the following cover types before and after development:

	Before	After		Before	After
Types 1-8 wetlands			**Lawn/landscaping**		
Wooded/forest			**Impervious Surfaces**		
Brush/grassland			**Other (describe)**	65	65
Cropland	190	190	Artificial reservoir		
			TOTAL	255	255

11. Fish, Wildlife, and Ecologically Sensitive Resources.

a. Identify fish and wildlife resources and habitats on or near the site and describe how they would be affected by the project. Describe any measures to be taken to minimize or avoid impacts.

The reservoir occupies an area of approximately 65 acres according to Minnesota Department of Natural Resource (DNR) data. The dam is located on the Redwood River, where it creates a pool on the river. Currently the lake averages only a 2.6 feet deep, due to large amounts of sediment deposits. These sediment deposits provide fertile substrate and shallow rooting depths which often provide for aquatic abundant plant growth. However, excessive turbidity levels have significantly reduced the presence of aquatic plants in the areas to be dredged.

Islands and sand bars located on the lake will be removed during the dredging process. The locations that are proposed for removal are shown in Figures 6 and 7. These areas provide only marginal value habitat. They were formed as sand bars which were colonized by reed canary grass and followed by cattails and other volunteer species.

The lake's fishery was sampled in 1992 and 2006; the survey reports are presented in Appendix B and C, respectively. In 1992, the DNR felt that the majority of the fish sampled had migrated into the reservoir from upstream. Dissolved oxygen conditions sampled in 2006 were below 5 milligrams per liter, which is below water quality standards for aquatic life. This is likely due in part to the shallow depths of the reservoir and lack of mixing. The DNR observed that partial winterkills have occurred in the past. In its current state the lake provides very little game fish opportunities for fisherman. The majority of the fish presently in the lake are rough fish including redhorse suckers, carp, and bullhead. Channel catfish were not caught during sampling in 1992, but in 2006 channel catfish had the second highest catch numbers per sampling set (carp were highest).

Spawning for several game fish species are rated as poor to fair. Silt is a major factor noted for the poor spawning conditions. During the dredging efforts some fish are expected to be captured by the intake, and mortality is expected. However, the ponded discharge water and upland depositional mud flats provide excellent habitat and foraging for waterfowl, shorebirds and wading birds.

The aquatic resources within the lake will likely improve upon completion of the project. Due to the increased storage, the turbidity in the water is expected to improve and rooted aquatic plants may take hold. The increased volume of water within the reservoir will provide additional habitat for fish, and an increase in the abundance of fish is expected.

b. Are any state (endangered or threatened) species, rare plant communities or other sensitive ecological resources such as native prairie habitat, colonial waterbird nesting colonies or regionally rare plant communities on or near the site? ☐ Yes ☒ No

If yes, describe the resource and how it would be affected by the project. Indicate if a site survey of the resources has been conducted and describe the results. If the DNR Natural Heritage and Nongame Research program has been contacted give the correspondence reference number: _____

Describe measures to minimize or avoid adverse impacts.

No endangered or threatened species were found at any of the disposal sites, in the reservoir, or within two miles upstream of the reservoir. There are no rare plant communities, native prairie habitat, or colonial waterbird nesting colonies on the reservoir or disposal sites.

12. Physical Impacts on Water Resources. Will the project involve the physical or hydrologic alteration (dredging, filling, stream diversion, outfall structure, diking, and impoundment) of any surface

waters such as a lake, pond, wetland, stream or drainage ditch? ☒ Yes ☐ No

If yes, identify water resource affected. Describe alternatives considered and proposed mitigation measures to minimize impacts. Give the DNR Protected Waters Inventory (PWI) number(s) if the water resources affected are on the PWI.

This project involves dredging within Lake Redwood (DNR PWI number 64-58P). Project activities will be restricted to the lake itself. However, since the lake is an impoundment on the Redwood River the project also indirectly relates to the river.

Dredging is proposed to remove up to approximately 650,000 cubic yards of sediment from Lake Redwood. The affected area will be up to approximately 65 acres (size of reservoir according to DNR data) with an anticipated average dredge depth of almost 10 feet and a maximum depth of 20 feet. The existing conditions of the reservoir are shown in Figure 9. The proposed condition of the lake after completion of the project is shown in Figure 10. The proposed shape and depth of the lake bottom is based on sediment probings performed by the RCRCA in 1991 and 1999.

Lake Redwood is a man-made impoundment at the downstream end of a 629-square mile drainage area (measured at the Redwood River USGS gauge station). The watershed is dominated by agricultural activities which traditionally have been identified as a cause of erosion and sedimentation issues. This likely was a primary cause for the substantial filling of the reservoir. Before considering any proposed dredging efforts in the reservoir, watershed stabilization projects and incentives were evaluated and implemented by the RCRCA. Because the RCRCA is a multi-county joint powers organization, they are uniquely positioned to carry out efforts to reduce the rate of sedimentation in the reservoir itself. Numerous watershed stabilization efforts over many years have been implemented by the RCRCA including grassed waterways, contour terracing, and establishing long-term easements on areas along the Redwood River. Based on RCRCA analysis of monitoring data, it is estimated that the sedimentation rate in the reservoir has decreased from 1.5 feet per year to 0.1 feet per year.

After efforts were made to stabilize the watershed, various in-lake alternatives were considered for managing the reservoir: no dredging, partial dredging, and full dredging of the reservoir. A key context for these alternatives is the distribution of lakes within Redwood County. There is only one other lake in the County that provides the potential for active recreation. This other lake is Lake Laura, a 22-acre lake which was impounded in 1978 for flood control. The DNR PWI database indicates only 16 other protected water basins exist in the County, which consist predominantly of sloughs or marshes.

No dredging alternative. The primary uses for the reservoir include recreation and hydroelectric power generation. These uses are not attainable at this time, primarily due to the fact that the current average depth is less than three feet. The tendency for reservoirs to fill with silt is common in the highly agricultural areas of the Midwest. Maintenance, such as in the form of dredging, is an intrinsic and integral component of creating a reservoir impoundment. The lack of any dredging activity from the time the current dam was installed is the reason why the magnitude of this proposed project is so large. Further, there is a timely opportunity to address downstream river impairments and TMDL listings by implementing this dredging project. Not implementing a dredging effort is not considered a feasible alternative for the reservoir impoundment.

Partial dredging alternative. This alternative would consist of dredging only a limited portion of the accumulated sediment, such as only by the dam face. The purpose would be to reduce the scope of the dredging, thereby reducing costs, the upland disposal site area required, and

potentially reducing the incidental aquatic impacts to rough game fish and other species during dredging operations. This alternative is not considered feasible since partial dredging would likely not allow the lake to fully achieve its intended uses (recreation and hydroelectric power), or successfully address downstream TMDL listings. In addition, there are large costs associated with required permitting, sampling, and disposal site preparation that would have to be repeated each time the lake was dredged.

Full dredging alternative. This alternative is considered the best approach to restore the intended uses of the reservoir, including: hydroelectric power generation; and, restoring open water recreational opportunities which are extremely limited in Redwood County. If dredging up to 650,000 is achieved, due to watershed stabilization efforts the RCRCA estimates it may be 50-70 years before dredging is again required.

Dam removal or modification. This alternative would need to implemented in conjunction with a full dredging project to prevent sediment from flushing downstream which would contribute to the existing TMDL impairment. The impoundment is situated at a granite gorge where natural grade change in the Redwood River channel occurs. This grade change is over 20 feet in height. Removing or modifying the dam would not benefit fish passage due to this natural grade change. The primary rationale for a dam removal (or modification) alternative would be to naturalize the hydrology of the Redwood River and downstream waterways, already disturbed by upland drainage and other factors. The cost to dredge the sediment and restore the benefits of the existing impoundment (recreation, TMDL improvement, fisheries, hydropower), then coupled with the significant cost to engineer and contract for removal of the dam and negating the previously associated benefits, is not a feasible alternative.

Mitigation measures. Various mitigation measures will be taken to limit the impacts to the environment. All construction plans will be developed with the appropriate measures for erosion and sediment control in upland disposal areas. The final disposal site is in the process of being selected. If necessary, Wetland Conservation Act sequencing during the disposal site selection process will be used to avoid, minimize, or mitigate any wetland impacts. (Only one of the disposal sites contains a possible wetland(s) as shown in Figure 11.)

Any effluent discharged from the disposal area will meet stringent requirements set by the MPCA. Within the lake, several steps are proposed to mitigate any impacts from the physical alternations. First, no dredging will take place near the shoreline to protect habitat and biology. Currently, a 25-foot shoreline “set back” is proposed. Second, there will be no dredging into the upstream channel, which will preserve the natural bottom in this area. Finally, an irregular and undulating bottom will be created (resulting from areas less favorable for hydraulic dredging) thereby providing a more natural habitat for various aquatic species. While some mortality is expected to occur with rough game fish and other species due to dredging operations, this is incidental to the activity and it is consistent with industry standards and normal engineering practices.

Summary. The physical alterations are intended to restore the reservoir to approximately its original condition when the dam was installed. The physical alterations provide positive benefits in the form of increased recreation capability, improved capacity to provide hydroelectric power, and an ability to reduce downstream turbidity levels thereby addressing existing TMDLs. During implementation of dredging, some minor and temporary disruptions to the natural system are expected. These include limited mortality of mostly rough game fish near dredging operations, and minor localized resuspension of bottom sediments. However, any resuspended sediment is not expected to migrate into the general water column or move downstream.

13. Water Use. Will the project involve installation or abandonment of any water wells, connection to or changes in any public water supply or appropriation of any ground or surface water (including dewatering)? ☐ Yes ☒ No

If yes, as applicable, give location and purpose of any new wells; public supply affected, changes to be made, and water quantities to be used; the source, duration, quantity and purpose of any appropriations; and unique well numbers and DNR appropriation permit numbers, if known. Identify any existing and new wells on the site map. If there are no wells known on site, explain methodology used to determine.

A search of the Minnesota Department of Health County Well Index did not reveal any wells within the proposed project area. A well is located at the farmstead between the two southern disposal sites (Figure 11), but is not located within the disposal site areas. A City well is located in the southeast corner of a potential site. No wells will be constructed for this project.

An analysis was done to determine the probability of low flows. The hydraulic dredge will most likely operate using a flow rate range of approximately 9 to 20 cubic feet per second (cfs). Table 1 below lists flows for the expected time frame of the dredging operation. Monthly time frames are subject to final approval through DNR permitting. The average daily flows are greater than the expected pumping rate, therefore, a sudden drawdown of the reservoir is generally not expected.

Table 2* -- Estimated range of flows entering Lake Redwood.

Flow Regime	April	May	June	July	August	September	October
7Q2		68.4	49.6	24.7	11.1	8.4	12.8
7Q5		21.7	12.5	4.53	2.42	2.13	3.51
7Q10		11.3	5.55	1.6	1.02	1.01	1.77
7Q20		6.46	2.71	0.63	0.48	0.53	1
7Q50		3.34	1.15	0.2	0.2	0.26	0.52
Minimum ave. daily flow	297	174	185	96	50	44	51
Maximum ave. daily flow	733	360	499	234	99	61	72

*Data from USGS Gage 05316500, REDWOOD RIVER NEAR REDWOOD FALLS, MN, with a period of record from 1909 to 2007

14. Water-related land use management districts. Does any part of the project involve a shoreland zoning district, a delineated 100-year flood plain, or a state or federally designated wild or scenic river land use district? ☒ Yes ☐ No

If yes, identify the district and discuss project compatibility with district land use restrictions.

The reservoir is within the shoreland and floodplain zoning districts. This project is compatible with the land use requirements of these districts.

15. Water Surface Use. Will the project change the number or type of watercraft on any water body? ☒ Yes ☐ No

If yes, indicate the current and projected watercraft usage and discuss any potential overcrowding or conflicts with other uses.

The watercraft usage has the possibility to increase on the reservoir. Due to the fact that the reservoir is largely filled in with sediment and very shallow, its recreational potential is severely

limited. Removal of the sediment is expected to restore recreational usage on the reservoir. This restoration will be aided by removal of logs and trees buried in the sediment as well as protruding above the surface. A public water access currently exists at the park located on the northwest side of the lake. Local groups are expected to meet and discuss setting watercraft restrictions once the reservoir has been dredged and boating resumes on the lake.

16. Erosion and Sedimentation. Give the acreage to be graded or excavated and the cubic yards of soil to be moved: 255 acres; up to 650,000 cubic yards. Describe any steep slopes or highly erodible soils and identify them on the site map. Describe any erosion and sedimentation control measures to be used during and after project construction.

A dredge will pump a slurry of sediment and water to a diked disposal site. The amount estimated for excavation by dredging is up to approximately 650,000 cubic yards within a reservoir foot print of about 65 acres. The potential foot print to be graded and used as a disposal area is up to approximately 190 acres. Water will be detained within the disposal site allowing the suspended solids to settle out.

The water will be returned through open channels or temporary pipes to the river. Steep slopes are present along the perimeter of the reservoir and upstream along the banks of the river. No water is expected to be conveyed across any steep slopes. Instead, concentrated flows will be conveyed by closed pipe. Silt fences and other perimeter protection will be utilized near the shore line. Other erosion and sedimentation control practices will be specified in the construction document Storm Water Pollution Prevention Plan as per the MPCA Permit Number MN R100001 (construction storm water permit). The Contractor will be responsible for implementing adequate measures (detention storage, erosion control practices, etc.) to comply with the permit requirement.

17. Water Quality – Surface-water Runoff.

a. Compare the quantity and quality of site runoff before and after the project. Describe permanent controls to manage or treat runoff. Describe any storm-water pollution prevention plans.

Currently both the lake and the upstream and downstream reaches are impaired. The impairments are listed in Table 3.

Table 3 – List of pertinent impaired waters.

Assessment ID	Waterbody Name	Impaired Use(s)	Impairment	Reach
64-0058-00	Redwood	Aquatic Consumption	Mercury	N / A
07020006-509	Redwood River	Aquatic Consumption, Aquatic Life and Aquatic Recreation	Fecal coliform, Mercury, Turbidity	Upstream of Reservoir
07020006-501	Redwood River	Aquatic Consumption, Aquatic Life and Aquatic Recreation	Fecal coliform, Mercury, Turbidity	Downstream of Reservoir

Dredge slurry will be pumped to a diked disposal area. The slurry will be detained within the disposal area for a sufficient length of time to allow the suspended solids to settle out. After treatment, the water leaving the site will return to the river. Dredging agitates in-place

sediments and may temporarily increase turbidity near the cutter head of the dredge. This is not expected to have a negative/adverse impact on the reservoir. The disposal site effluent will have water quality limits that will not cause or contribute to the impairment levels. These levels will be set by the MPCA, after a water quality assessment has been conducted. The disposal site will be designed to meet these performance standards, yet to be set by MPCA dredge material management permit. The permit also requires public notice.

b. Identify routes and receiving water bodies for runoff from the site; include major downstream water bodies as well as the immediate receiving waters. Estimate impact runoff on the quality of receiving waters.

The final disposal site has not been chosen yet, accordingly, the route of the effluent is not yet known. The details for the disposal sites, effluent treatment, and effluent return will be reviewed and approved as part of the MPCA dredge material management permit. The permit also requires public notice.

18. Water Quality – Wastewater.

a. Describe sources, composition and quantities of all sanitary, municipal and industrial wastewater produced or treated at the site.

This project has no source of wastewater associated with it.

b. Describe waste treatment methods or pollution prevention efforts and give estimates of composition after treatment. Identify receiving waters, including major downstream water bodies, and estimate the discharge impact on the quality of receiving waters. If the project involves on-site sewage systems, discuss the suitability of site conditions for such systems.

There are no waste treatment systems associated with this project.

c. If wastes will be discharged into a publicly owned treatment facility, identify the facility, describe any pretreatment provisions and discuss the facility's ability to handle the volume and composition of wastes, identifying any improvements necessary.

No wastes will be discharged to a public treatment facility.

d. If the project requires disposal of liquid animal manure, describe disposal technique and location and discuss capacity to handle the volume and composition of manure. Identify any improvements necessary. Describe any required setbacks for land disposal systems.

This project does not require the disposal of any liquid animal manure.

19. Geologic hazards and soil conditions.

a. Approximate depth (in feet) to **Ground water:** **1-foot** **minimum;** **< 50 feet** **average.**
Bedrock: _____ **minimum;** **variable** **average.**

Describe any of the following geologic site hazards to ground water and also identify them on the site map: sinkholes, shallow limestone formations or karst conditions. Describe measures to avoid or minimize environmental problems due to any of these hazards.

There are no known karst conditions in this area. Glacial drift (comprised mostly of clayey till) covers the entire watershed and is often several hundred feet thick. (Ground water and bedrock data was evaluated by review of Web Soil Survey 2.0 (Natural Resource Conservation Service) and description of the Redwood River watershed by the MPCA.)

b. Describe the soils on the site, giving SCS classifications, if known. Discuss soil granularity and potential for ground-water contamination from wastes or chemicals spread or spilled onto the soils. Discuss any mitigation measures to prevent such contamination.

Soils in the areas considered for dredge material disposal include Ves Loams and Canisteo Loams. Textures in these areas are typically clay loams. The soils have a complex drainage pattern, including very poorly drained soils in areas where clays accumulations are present to being well drained in open upland areas. Soils may be further evaluated when a disposal site has been chosen.

The proposed project will not require wastes or chemicals in bulk containers. The risk of soil contamination is low. In the event that a spill occurs during the construction process the containment and cleanup will be conducted according to MPCA standards.

20. Solid Wastes, Hazardous Wastes, Storage Tanks.

a. Describe types, amounts and compositions of solid or hazardous wastes, including solid animal manure, sludge and ash, produced during construction and operation. Identify method and location of disposal. For projects generating municipal solid waste, indicate if there is a source separation plan; describe how the project will be modified for recycling. If hazardous waste is generated, indicate if there is a hazardous waste minimization plan and routine hazardous waste reduction assessments.

The proposed project will not require wastes or chemicals in bulk containers. The risk of soil contamination is low. In the event that a spill occurs during the construction process the containment and cleanup will be conducted according to MPCA standards. Efforts will be made to minimize pollution during construction including construction debris or waste created by construction. All waste will be disposed of properly.

b. Identify any toxic or hazardous materials to be used or present at the site and identify measures to be used to prevent them from contaminating ground water. If the use of toxic or hazardous materials will lead to a regulated waste, discharge or emission, discuss any alternatives considered to minimize or eliminate the waste, discharge or emission.

Toxic or hazardous materials will not be used during construction.

c. Indicate the number, location, size and use of any above or below ground tanks to store petroleum products or other materials, except water. Describe any emergency response containment plans.

There are no storage tanks located on the sites considered for dredge material disposal.

21. Traffic. Parking spaces added: NA Existing spaces (if project involves expansion): NA
Estimated total average daily traffic generated: _____ vpd
Estimated maximum peak hour traffic generated (if known) and its timing: unknown

Provide an estimate of the impact on traffic congestion affected roads and describe any traffic improvements necessary. If the project is within the Twin Cities metropolitan area, discuss its impact on the regional transportation system.

There will be no adverse effects on traffic resulting from this project.

22. Vehicle-related Air Emissions. Estimate the effect of the project's traffic generation on air quality, including carbon monoxide levels. Discuss the effect of traffic improvements or other mitigation measures on air quality impacts. Note: If the project involves 500 or more parking spaces, consult *EAW Guidelines* about whether a detailed air quality analysis is needed.

There should be no adverse effects on the air quality due to vehicle related emissions.

23. Stationary Source Air Emissions. Describe the type, sources, quantities and compositions of any emissions from stationary sources of air emissions such as boilers, exhaust stacks or fugitive dust sources. Include any hazardous air pollutants (consult *EAW Guidelines* for a listing), any greenhouse gases (such as carbon dioxide, methane, and nitrous oxides), and ozone-depleting chemicals (chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons or sulfur hexafluoride). Also describe any proposed pollution prevention techniques and proposed air pollution control devices. Describe the impacts on air quality.

There should be no stationary source air emissions at the site.

24. Odors, noise and dust. Will the project generate odors, noise or dust during construction or during operation? ☒ Yes ☐ No

If yes, describe sources, characteristics, duration, quantities or intensity and any proposed measures to mitigate adverse impacts. Also identify locations of nearby sensitive receptors and estimate impacts on them. Discuss potential impacts on human health or quality of life. (Note: fugitive dust generated by operations may be discussed at item 23 instead of here.)

Operation

The potential allowable hours of dredging would be Monday through Saturday, 24 hours a day. Expected time frames for dredging are May 1 to October 31, however, monthly time frames are subject to final approval through DNR permitting.

Odors

This project may cause odors to be released from the sediment and water at the disposal site. Odors relating to anaerobic sediments generally dissipate shortly after mixing with air. The disposal sites are located in a rural setting, and odors are not expected to be significantly objectionable. Similar dredging operations at Sleepy Eye Minnesota presented very minimal odor issues and are not expected to pose a significant problem at this site.

Dust

There is a limited possibility that dust will be created during construction of the disposal site, typical of earthmoving equipment. Any dust that will be created will be limited to a close proximity of the disposal site. Due to the rural setting of the site, very few homes will be near the site. During the actual dredging operation no dust is expected to be created. During the sediment drying process, the surface of the material at the disposal site may eventually form a cracked crust. This crust may be susceptible to wind erosion similar to adjacent agricultural fields. Dust

control may possibly be required in the form of establishing a temporary annual cover crop.

Noise

The motor and pump of the dredge will create an audible humming noise, but it is not expected to be offensive to adjacent residents. The noise will be limited to a close proximity to the site.

25. Nearby resources. Are any of the following resources on or in proximity to the site?

a. Archaeological, historical, or architectural resources? ☐ Yes ☒ No
b. Prime or unique farmlands or land within an agricultural preserve? ☐ Yes ☒ No
c. Designated parks, recreation areas, or trails? ☒ Yes ☐ No
d. Scenic views and vistas? ☐ Yes ☒ No
e. Other unique resources? ☐ Yes ☒ No

If yes, describe the resource and identify any project-related impacts on the resources. Describe any measures to minimize or avoid adverse impacts.

A park is located on the north side of the lake, construction is not expected to have an impact on the park. Users will be able to use the park and fish on the dock.

26. Visual impacts. Will the project create adverse visual impacts during construction or operation? Such as glare from intense lights, lights visible in wilderness areas and large visible plumes from cooling towers or exhaust stacks? ☐ Yes ☒ No

If yes, explain.

27. Compatibility with plans and land use regulations. Is the project subject to an adopted local comprehensive plan, land use plan or regulation, or other applicable land use, water, or resource management plan of a local, regional, state or federal agency? ☒ Yes ☐ No

If yes, describe the plan, discuss its compatibility with the project and explain how any conflicts will be resolved. If no, explain.

The Redwood County Comprehensive Water Plan (December 2005) addressing impaired waters is one of four priory concerns in the overall plan. A goal for this priority concern is to "target all TMDL water bodies for implementation of practices to reduce pollutants." Implementing the reservoir dredging is a practice to reduce pollutants. This is achieved by increasing the storage capacity of the reservoir allowing sediment and associated pollutants to settle out of the water column.

The draft Redwood County Comprehensive Plan (July 2007) notes that "current attempts to restore the depth of the water in Lake Redwood, by dredging sediment, should have a positive impact on the community. These efforts should benefit fishing resources in the most visible and accessible lake in the county."

28. Impact on infrastructure and public services. Will new or expanded utilities, roads, other infrastructure or public services be required to serve the project? ☐ Yes ☒ No

If yes, describe the new or additional infrastructure or services needed. (Note: any infrastructure that is a connected action with respect to the project must be assessed in the EAW; see *EAW Guidelines* for details.)

29. Cumulative impacts. Minn. R. 4410.1700, subp. 7, item B requires that the RGU consider the "cumulative potential effects of related or anticipated future projects" when determining the need for an environmental impact statement. Identify any past, present or reasonably foreseeable future projects that may interact with the project described in this EAW in such a way as to cause cumulative impacts. Describe the nature of the cumulative impacts and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to cumulative impacts (or discuss each cumulative impact under appropriate item(s) elsewhere on this form).

There are no anticipated cumulative impacts. This project is not part of a larger project.

30. Other Potential Environmental Impacts. If the project may cause any adverse environmental impacts not addressed by items 1 to 28, identify and discuss them here, along with any proposed mitigation.

Removal of sediment increases storage and removes sediment and associated chemicals. Dredging may also expose presently buried sediments and associated chemicals into the water column. Chemical testing has been done on the sediment, and no major contamination was found at the sample sites.

31. Summary of issues. List any impacts and issues identified above that may require further investigation before the project is begun. Discuss any alternatives or mitigative measures that have been or may be considered for these impacts and issues, including those that have been or may be ordered as permit conditions.

Land use:	Disposal sites will be located on agricultural land. Upon completion of the project the sites are expected to return to agricultural production.
Fish and Wildlife:	Localized minor fish mortality is expected to occur during the dredging process. The impact of this will be mitigated by the fact that fish habitat will be greatly expanded and the disposal area most likely will provide a temporary foraging resource and habitat waterfowl and shore birds.
Physical Impacts on Water Resources:	The dredging will alter the physical characteristics of the lake. Three alternatives were considered and the full dredging of the reservoir was chosen due to: the ability to address downstream TMDL issues; to increase recreation suitability and capacity; and address hydropower production. Mitigation measures include: no dredging near the shoreline, creating an irregular bottom, and no dredging in the upstream channel.
Recreational Usage:	Recreational usage of the reservoir will likely increase due to removal of sediment. This is a desired outcome due to limited open water basins in the County which afford recreation. Local groups will establish expectations and possibly ordinances to control boating and other activities.

Water Quality:	Dredging agitates in-place sediments and may temporarily increase turbidity near the cutter head of the dredge. This is not expected to have a negative/adverse impact on the reservoir. The disposal site effluent will have water quality limits that will not cause or contribute to the existing impairment levels.

RGU CERTIFICATION.

I hereby certify that:

- The information contained in this document is accurate and complete to the best of my knowledge.
- The EAW describes the complete project; there are no other projects, stages or components other than those described in this document, which are related to the project as connected actions or phased actions, as defined at Minn. R. 4410.0200, subps. 9b and 60, respectively.
- Copies of this EAW are being sent to the entire EQB distribution list.

Name and Title of Signer: [signature]; Executive Director

Date: August 6, 2007

The format of the Environmental Assessment Worksheet was prepared by the staff of the Environmental Quality Board at Minnesota Planning. For additional information, worksheets or for *EAW Guidelines*, contact: Environmental Quality Board, 658 Cedar Street, St. Paul, Minnesota, 55155, 651-201-2499, or at their Web site http://www.eqb.state.mn.us/review.html.