Executive Summary

The Lincoln County Rehydration Project would deliver water from Lake Roosevelt to the Crab Creek watershed within Lincoln County. A portion of the delivered water would rehydrate depleted lakes and streams tributary to Crab Creek. A portion of the delivered water would infiltrate and help replenish the over-drafted groundwater aquifer within the Odessa Subarea. This report describes a prefeasibility analysis of this project idea. Using available scientific information, preliminary field reconnaissance, basic engineering and hydrologic assessments, interviews with landowners in and around the potentially affected area, and information provided by personnel with various federal and state agencies, this prefeasibility assessment for the Lincoln County Conservation District Passive Rehydration Project shows that work should move forward into the feasibility phase: further defining the scope of the project, securing permits and authorizations to proceed, and planning and implementing a pilot scale project.

Based on the work reported on herein, it is the project team's conclusion that (1) the goals, objectives, and intent of RCW 90.90 can be met by the rehydration project envisioned by LCCD; (2) there are viable options for securing water rights to be used in supplying water for a proposed pilot-scale project and potential options identified for assembling a potential water right portfolio for a final project buildout; and (3) one or more routes and drainages seem to be favorable to a potential project. Coupled with these conclusions, this Prefeasibility Study identifies no fatal flaws in the passive rehydration concept with respect to geology, hydrogeology, routing, delivery pathways, regulatory and permitting issues, land ownership, water rights, or environmental concerns. While many challenges were identified, none were found to be insurmountable. The assessments done for this report do not include a cost-benefit evaluation.

RCW 90.90 Compliance. RCW 90.90 specifies that one-third of the water developed by new storage under the Act must contribute to instream flow. The project team finds that this may not apply to the pilot study, since new storage water will likely not be the source of the water used. Also, not every project must exactly comply with the division of water—it is likely that only the total of all of a combination of projects needs to comply. Nevertheless, a brief description of how a Lincoln County rehydration pilot study might meet this requirement is provided in this report.

As shown in the project schematic, this project would pump water out of Lake Roosevelt and deliver it into one or more drainages in the Crab Creek watershed, initially in a pilot project and, if successful, in a larger, long-term project. This prefeasibility assessment identifies Lake Creek as the best drainage for continued evaluation. Water pumped out of Lake Roosevelt and released into Lake Creek would flow downstream, contributing to instream flows and likely producing gains to riparian habitat and water-based recreation. The extra

water flowing down the creek could be diverted for use by irrigation water users along the Creek, or it could be allowed to continue flowing downstream to rehydrate the channel and lakes at the bottom of the basin. If allowed to flow undiverted to the confluence of Lake Creek with Crab Creek, a portion of the supplemental water would seep into the ground and contribute to the overall groundwater supply in the area, which is currently over-allocated. The portion allowed to flow into Crab Creek would return, unconsumed, to the Columbia River. It should be noted that both the water that seeps into the ground and any part of the supplemental water that is rediverted would directly contribute to RCW 90.90 part (2)(b), which encourages "alternatives to groundwater for agricultural users in the Odessa subarea aquifer."

Water rights review. A review of potential water rights options that might be used for a pilot project identifies the following: (1) a temporary use authorization, (2) municipal and industrial use water acquired from the U.S. Bureau of Reclamation (Reclamation), (3) long-term water rights agreements with Reclamation, (4) a preliminary permit, and (5) lease/ transfer of a private water right. This prefeasibility assessment suggests that approach 5 is the most feasible. The temporary permit would provide authorization for the use of Lake Roosevelt water for a potential pilot project and allow it to be put to beneficial use while the pilot testing program was being conducted. If the project is authorized for moving forward into the feasibility phase, a water right permit application would be completed and submitted to the Washington State Department of Ecology (Ecology) at the completion of a successful feasibility phase. This application would name the responsible authority that would take on the planning, permitting, construction, and operation of the pilot project. Other water right use options other than a new water right permit would be used to compile a water right portfolio to operate the system, inclusive of but not limited to leasing water, purchasing and transferring water rights, and developing an Upper Lake Roosevelt water banking program.

Project governance. Governance and landowner issues would need to be addressed in the feasibility study. Governance, or ownership, of the pilot project and a potential subsequent long-term project is important from the point of view that some entity would be responsible for owning and operating the project, holding necessary water rights and permits that would be required for the project to function, and planning and reporting on project activities. While no specific entity has yet been identified for this role, the currently inactive Lincoln Public Utility District (PUD) and the Lincoln Water Conservancy Board have expressed conditional interest in at least exploring potential roles in the project. Once an ownership, or governance, entity is identified, then landowner agreements, National Environmental Policy Act/State Environmental Policy Act (NEPA/SEPA), and other activities can be completed.

Route assessment. Based on a preliminary pipeline routing assessment, the proposed project should move forward with the feasibility analysis, including further review of the preferred Lincoln Pipeline Route for delivering water into the Lake Creek drainage. This route is slightly longer than several others, but overall has a more open construction route and would require lower head pumps.

Drainage recommendation. Given the history of stream flow losses and lake depletion in the lower half of the Lake Creek drainage we conclude that the lower reaches of the Creek are plausible candidates for potential basalt aquifer recharge. At this time we believe that basalt aquifer recharge will impact a shallow basalt aquifer system and a deeper basalt aquifer system. The shallower basalt aquifer system (that staying within 200 to 300 feet of the surface) is most likely a local system predominantly within the Wanapum Basalt and will result in spring discharge into Crab Creek at and downstream of Odessa. The deeper basalt aquifer system, found predominantly within the upper Grande Ronde Basalt, is more extensive. If recharged groundwater water can reach into this system the project should recharge groundwater systems south of Crab Creek. If water can get deeper in to the unit it has the potential to move unimpeded beneath the creek and south into the core of the Odessa Subarea.

Next steps. The prefeasibility assessment was funded by a grant awarded to Lincoln County Conservation District by the Department of Ecology Columbia River Basin Water Management Program (Grant No. 1000097). If the results of the prefeasibility assessment are accepted by Ecology, additional funds will be released for the next phase, a feasibility study.

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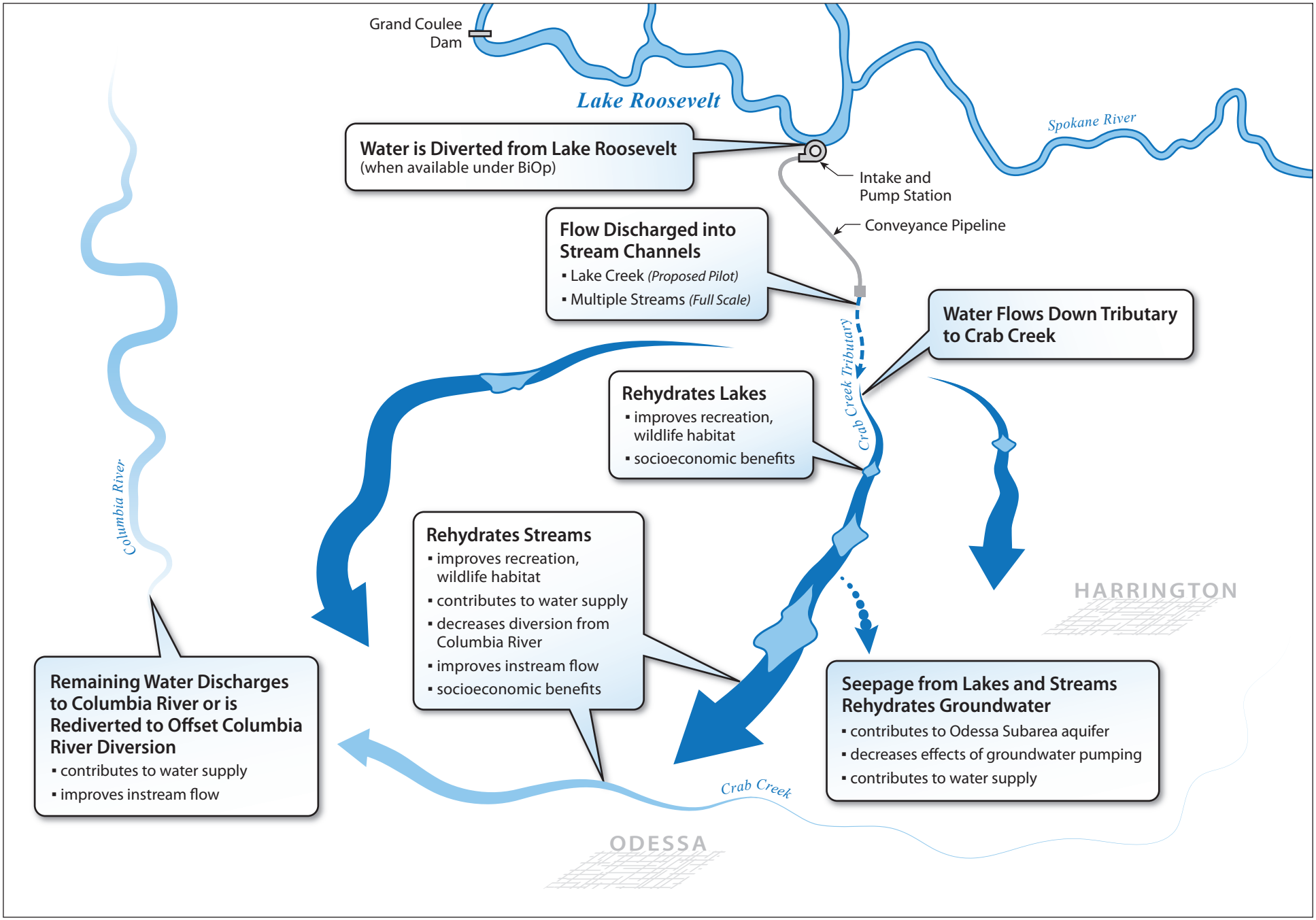

Lincoln County Passive Rehydration Project
Conceptual Schematic Diagram

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Prefeasibility Study Conclusions
Hydrology and Water Rights
Water is likely to be available for diversions from Lake Roosevelt during average and/or wet water years to provide a source for a 10- to 20-cfs pilot project, and a subsequent larger (50 to 100+ cfs) full-scale project.
Water rights for the pilot project could be obtained by multiple means. The most favorable approach appears to be a temporary permit issued under a water right permit application in order to conduct the pilot test.
Water released into a tributary of Crab Creek would increase depleted natural stream flows and help rehydrate dried up lakes, especially in the central portion of Lincoln County.
A portion of water released into a tributary flowing toward Crab Creek (most notably Duck Creek, Lake Creek, Marlin Hollow, and Canniwai Creek) would provide recharge to a local lower Wanapum Basalt groundwater system and a deeper, more regional groundwater system found within the widespread Sentinel Bluffs Member (Grande Ronde Basalt).
Engineering
The Lake Creek drainage is identified as the preferred site for the pilot project.
A preferred pipeline route for delivering water into the Lake Creek drainage has been identified.
Governance
More than one potential organization is available to assume sponsorship and management of the pilot project.
RCW 90.90 Compliance
If water supply is developed under the storage provisions of RCW 90.90, the project could contribute to instream flow.
If successful, the project could provide alternatives to groundwater for the east Odessa area.
Hydrogeology
Recharge of the localized lower Wanapum groundwater system would help recharge depleted springs.
Water added to the more widespread Sentinel Bluffs (upper Grande Ronde) groundwater system would migrate southwest into the core of the Odessa Groundwater Management Subarea.

Critical Questions for the Feasibility Phase of Study
Hydrology and Water Rights
Begin negotiations for a pilot study water supply.
Prepare water right permit application and further define other water right options to create a water portfolio.
Conduct monitoring and further hydrologic analysis; begin establishing hydrologic baseline for assessing pilot project results.
Engineering
Estimate costs for a pilot and full-scale project and compare against project benefits.
Prepare design for pilot project.
Environmental and Permitting
Prepare list of required permits and environmental issues.
Meet with resource agencies to extent of environmental review.
Governance
Further address governance and landowner issues.
Name the responsible authority to take on the planning, permitting, construction, and operation of the pilot project.