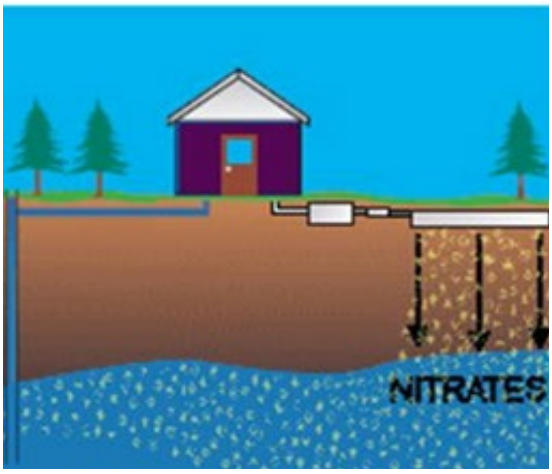
Southern Deschutes County Groundwater Protection Program Annual Report



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ACKNOWLEDGMENTS

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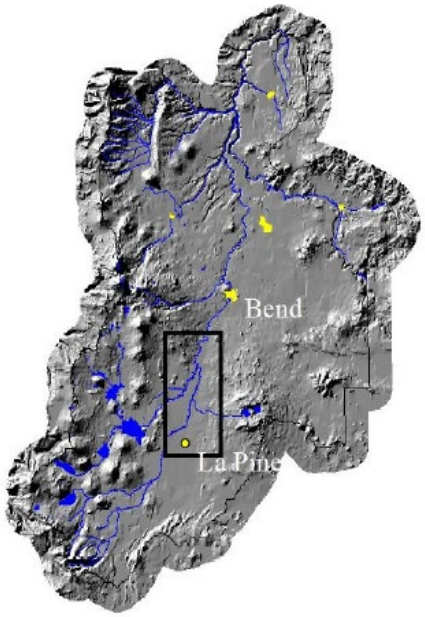
INTRODUCTION

The La Pine subbasin serves as the primary drinking water source for thousands of residents south of Sunriver. However, groundwater investigations by the U.S. Geological Survey (USGS) and Oregon Department of Environmental Quality (DEQ) indicate that this sole source aquifer is vulnerable to nitrate loading from onsite wastewater systems, posing a long-term threat to public health and the environment. The *Southern Deschutes County Groundwater Protection Program Annual Report* discusses the status, progress, and challenges related to protecting the groundwater in this subbasin (Figure 1). The Community Development Department (CDD) now updates the report yearly to identify changes in environmental conditions, development patterns, emerging opportunities, and/or the outcomes of ongoing initiatives. By documenting these efforts, Deschutes County is showcasing its commitment to mitigating the impacts from nitrate pollution.

Figure 1 – La Pine Subbasin



From 1996 to 2009, stemming from a Regional Problem Solving Project, Deschutes County actively pursued innovative approaches to protect the aquifer. Unexpectedly, in 2009, Deschutes County voters overturned a Local Rule, regulations that would have required upgrading all existing septic systems in Southern Deschutes County to nitrogen-reducing onsite systems by 2022. Immediately afterwards, the Board of County Commissioners (Board) acknowledged that Deschutes County as an agent of the state had exhausted its efforts on a local level to protect the groundwater and requested that DEQ take the lead. DEQ agreed and this arrangement remains in effect today.

CDD currently implements regulatory programs that help mitigate the impacts of groundwater pollution from conventional onsite wastewater treatment systems because:

- Deschutes County's permitting authority is limited to onsite systems;
- Oregon land use law directs the County to avoid using new sewer systems;
- Dispersed, rural patterns of development are prevalent in the region;
- Models developed by USGS show groundwater quality can be protected by using alternative nitrogen-reducing onsite systems that provide higher levels of wastewater treatment; and
- Oregon Administrative Rules (OARs) allow Deschutes County to issue permits for nitrogen-reducing onsite systems.

Certain footnotes in the report provide links to USGS, DEQ, and Deschutes County documents. A detailed timeline is provided in Appendix A. It summarizes collective efforts by these three

agencies over several decades to protect the groundwater. Appendices B and C contain maps depicting the locations of DEQ septic system variances and onsite alternative treatment technologies (ATTs).

SECTION 1: BACKGROUND

The La Pine subbasin of the Upper Deschutes River is a region where geology, hydrology, and human development intersect to create unique opportunities and challenges. Underlain by a shallow aquifer, this area serves as the primary drinking water source for its residents, while porous, pumice-based soils facilitate rapid infiltration of precipitation and human-derived discharges. This hydrological setup, coupled with historic patterns of rural development and reliance on conventional onsite wastewater systems, place significant stress on groundwater quality. Over the decades, concerted efforts have aimed to address these challenges. Through state and federal initiatives such as Regional Problems Solving grants, a National Demonstration Project, advanced onsite wastewater treatment technology, and innovative programs like Transferable Development Credits, the region has pioneered strategies to balance environmental protection with rural land use. However, the aquifer's oxic (oxygen rich conditions) upper layers remain susceptible to nitrate contamination, underlining the ongoing need for collaborative, science-driven management to safeguard this critical resource.

Geology

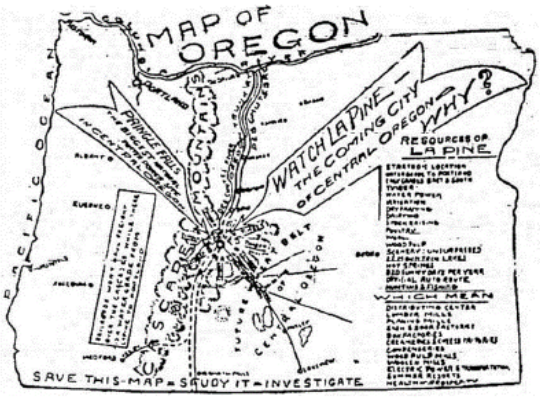
The La Pine subbasin of the Upper Deschutes River is underlain by a shallow aquifer that supplies the primary source of drinking water for approximately 18,000 residents. The soils in the region are highly porous and permeable with no impervious layer that protects the aquifer from pollution sources. In addition, soils are young, pumice-based (volcanic), and relatively low in organic matter. Recharge from natural (precipitation) or human (residential onsite system discharges or irrigation) sources move rapidly down through surface soils to the aquifer. The water table ranges in depth from less than two feet to approximately fifty feet below land surface. Recharge from infiltration of precipitation averages 2.0 inches per year; the balance of water from precipitation evaporates, transpires, or discharges via surface runoff to the Deschutes and Little Deschutes Rivers. Groundwater discharges in the basin include baseflow contributions to the Deschutes and Little Deschutes Rivers, evapotranspiration by vegetation, and water pumped from domestic wells.

Regional groundwater characteristics include temperatures that are among the lowest in the state, generally 42.5 F (6 C) to 48.2 F (9 C) and high dissolved oxygen content (3 mg/L to 6 mg/L). Groundwater velocities are low and, at the water table, groundwater is generally oxic (oxygen rich conditions); however, at depths ranging from near zero to more than fifty feet below the water table, it becomes suboxic (depleted oxygen conditions) and natural nitrate reduction (denitrification) can occur. Denitrification thus keeps deeper portions of the La Pine aquifer essentially nitrate-free, but the oxic portions remain vulnerable to nitrate contamination from onsite wastewater systems, the primary anthropogenic source. Nitrate contamination of the oxic

groundwater is a concern because the shallow oxic aquifer is the desired drinking water supply for individual domestic wells and because of the potential for nitrogen-enriched groundwater to discharge to the nitrogen-limited rivers in the region.

Historic Development Patterns

Figure 2 – Bend Bulletin Advertisement



Rural development threatens groundwater quality in this region through onsite wastewater system discharges. Over eleven thousand lots of one-half to one-acre in size were platted in the 1960s and 1970s prior to the enactment of Oregon's land use planning laws (Figure 2). These lots are located within a 125-square mile corridor near the Deschutes and Little Deschutes Rivers. Developers marketed these residential lots nationally with no promise of infrastructure improvements and without an understanding of the high water table or the aquifer's vulnerability. Currently, there are 10,338 lots in the region: 6,974 are developed and 3,364 are vacant. Five thousand, six hundred and seventy-three (5,673) rely on conventional onsite wastewater systems and individually owned domestic wells.[1] Most of these wells draw from the most vulnerable upper fifty feet of the aquifer. One thousand, three hundred and one (1,301) developed lots utilize ATTs.

Regional Problem Solving for Southern Deschutes County

In 1982, DEQ discovered high nitrate levels in groundwater underlying the core area of the unincorporated community of La Pine.[2] This led to the installation of a Septic Tank Effluent Gravity community sewer system in 1986. DEQ continued to monitor groundwater resources in the region and, in 1994, found increasing nitrate levels in certain locations outside the areas served by the La Pine sewer system. As a result of these findings and due to other issues resulting from the impacts of poorly planned rural subdivisions, Deschutes County received a $157,250 Regional Problem Solving grant in 1996 from the Oregon Department of Land Conservation and Development (DLCD). The grant, after identifying problems facing South County, evaluated innovative land use solutions to help resolve them.

Deschutes County initiated the grant by prioritizing public involvement using Oregon Revised Statute (ORS) 197.650 that provided the legal mechanism for establishing a collaborative process directed toward the resolution of the land use challenges in the region. ORS 197.650 required Governor Kitzhaber to specify which state agencies were obligated to participate, ensuring that the appropriate agencies fully engaged. The project ultimately included more than 50

[1] Approximately 46 mg/L of nitrate reaches the groundwater from each conventional septic system.

[2] The City of La Pine incorporated in 2006.

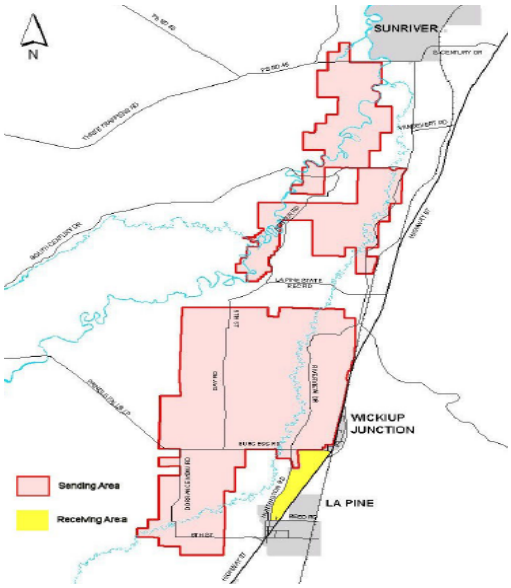
representatives from local, state and federal agencies, and special districts. They collectively examined the region's rural development patterns and the physical threats that thousands of rural lots placed on a shallow, sole source aquifer, winter deer migration corridors, neighboring federal lands, and the Deschutes and Little Deschutes Rivers. In January 1998, stakeholders, which included concerned citizens, recommended regional goals to the Deschutes County Planning Commission and the Board.[3] Twelve months later, the Board adopted Comprehensive Plan goals and policies to address groundwater quality, wildlife migration, wildfire hazards, emergency access, substandard roads, and road-related air pollution from dust.[4]

Water quality-related goals directed Deschutes County to use advanced onsite wastewater treatment systems, instead of relying on sewer systems. This decision, defined in a technical report, was based on an analysis of the social and economic impacts of sewering the region.[5] There were two exceptions, however: Oregon Water Wonderland Unit No. 2's sewer system was upgraded to serve its residents and a Septic Tank Effluent Gravity system serving the La Pine core area was expanded for the Newberry Neighborhood, which is discussed further below.

Transferable Development Credit Program and Newberry Neighborhood

One of the goals from the Regional Problem Solving Project pertained to developing an equitable, market-driven system that reduced the development potential of existing rural lots in floodplains, wetlands, mule deer migration corridors and areas susceptible to groundwater pollution. This goal referred to a Transferable Development Credit (TDC) Program. Adopted by the Board in 2002, the program transferred development rights from vacant rural lots in the region that require onsite wastewater systems (sending area) to the Newberry Neighborhood (receiving area) served by the La Pine Sewer District (Figure 3). New subdivisions in the Newberry Neighborhood required TDCs prior to tentative plat approval. The program, which was voluntary, encouraged 1,650 property owners of 3,600 "eligible" lots to sell their TDCs based on Newberry Neighborhood's projected buildout.

Figure 3 – TDC Sending & Receiving Area

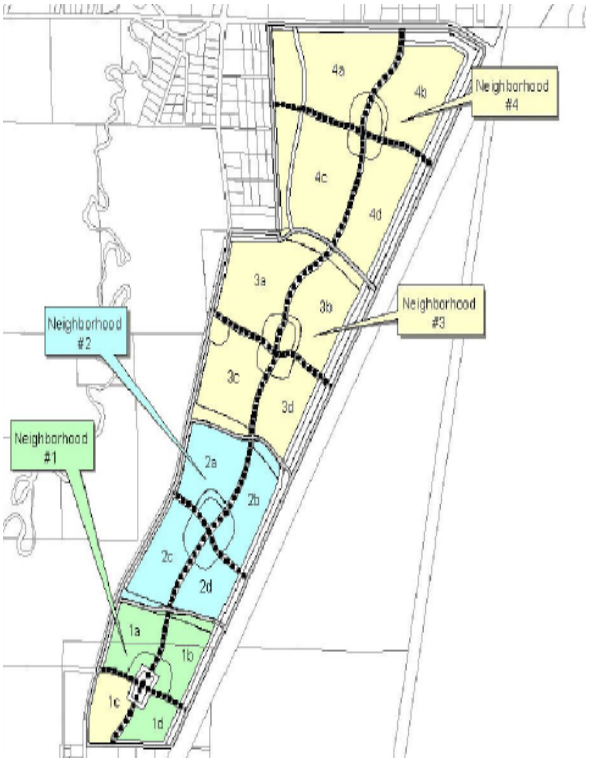


[3] RPS Final Report. 1999.

[4] RPS Project Revised Consensus Points. 1998.

[5] KCW Cost-Benefit Analysis. 1997

Figure 4 – Newberry Neighborhood / Receiving Area



The creation of the Newberry Neighborhood relied upon an Act of Congress that allowed Deschutes County to purchase U.S. Department of Interior Bureau of Land Management (BLM) property.[6] Upon acquisition in 2000, Deschutes County up-zoned 518 acres of land originally zoned for forest uses to urban uses, including approximately 50 acres of privately owned land represented by the Baldwin Herndon Trust (Figure 4). The property is located between La Pine and Wickiup Junction, west of Highway 97 and east of Huntington Road. These lands were subsequently annexed into the La Pine Sewer and Water Districts so they could be developed as residential neighborhoods. A sewer line runs through the property. Congress awarded an additional $433,000 and Deschutes County loaned $1.1 million for expanding the sewer system to serve the Newberry Neighborhood. The federal grant represented a significant achievement at the time because federal earmarks rarely subsidized sewer service for new development.

The effect of up-zoning and including the land in the sewer and water districts raised the property's value from $1,200 per acre to over $25,000 per acre. Proceeds from land sales were dedicated through a Memorandum of Understanding between Deschutes County and the BLM, to reducing rural density and solving water quality challenges in the region. Figure 4 shows the Newberry Neighborhood and its four neighborhoods. The Baldwin-Herndon Trust land was located in Neighborhood 1. The land acquired from BLM encompassed Neighborhoods 2, 3, and 4. Currently, the County retains ownership of Quadrants 2a and 2d and all of Neighborhoods 3 and 4.

Quadrants 1a, 1b, and 1d were purchased and ultimately subdivided by Sagebrush Development, LLC in 2020 and 2022.[7] Pahlisch Homes acquired and subdivided Quadrants 2c and 2b in 2004, 2005, 2006, 2018, and 2021. As discussed below, the TDC program changed to Pollution Reduction Credits (PRCs) in 2006 because land values in the sending area increased dramatically,

[6] BLM Land Purchase Legislation and Resolution 2000-021. 1998 and 2000.

[7] Deschutes County acquired Quadrant 1c from the Baldwin-Herndon Trust. It ultimately developed into the La Pine Senior Center (2005), Little Deschutes Lodge 1 (2009), Little Deschutes Lodge 2 (2012), Housing Works – Village Meadow (2017), and Habitat for Humanity – Putney Place (2019). The Board of County Commissioners determined that these projects were not required to contribute to the Groundwater Partnership Fund, Fund 296, due to their commitment to affordable housing and a community gathering place for seniors.

making voluntary purchases of TDCs from private landowners unaffordable.[8] In 2019, the Board eliminated the TDC/PRC requirements for developing Quadrants 2a, 2d, and Neighborhoods 3 and 4. To date, those lands remain undeveloped. Proceeds from fair market value sales of these lands will be deposited in CDD's dedicated Newberry Neighborhood Fund (Fund 297) and Groundwater Partnership Fund (Fund 296) for reinvestment in Southern Deschutes County groundwater protection.

La Pine National Demonstration Project

In the 1990s, Deschutes County and DEQ identified the need for a better understanding of the processes that affect the movement and chemistry of nitrogen in the aquifer underlying the La Pine subbasin. In 1999 Deschutes County, DEQ, and USGS received a $5.5 million National Decentralized Wastewater Demonstration Project (La Pine Project) grant from the U.S. Environmental Protection Agency (EPA) for the purpose of protecting water quality and improving wastewater treatment options for residents. The La Pine Project produced an extensive knowledge base on the hydrogeology of the groundwater system, dynamics of nitrogen fate and transport, and the performance of conventional and new technologies for onsite wastewater treatment.

Two groundwater models developed by the USGS in 2003 and 2005, a three-dimensional groundwater nutrient fate and transport model and a Nitrate Loading Management Model (NLMM), demonstrated that Deschutes County must require higher treatment standards for existing and future septic systems to protect the region's groundwater.[9] Incorporating development projections, the USGS estimated average nitrate concentrations could triple within forty years if all new homes continued using standard or sand-filter systems.[10] Continual reliance on conventional onsite systems would cause nitrate concentrations to exceed state action levels (7 mg/L nitrate as N) and federal drinking water standards (10 mg/L nitrate as N) over large areas within the subbasin. Elevated nitrate in drinking water is linked to various health risks, including methemoglobinemia (blue baby syndrome) in infants and certain cancers in adults.

The map below on the left of Figure 5 shows the results of the USGS three-dimensional groundwater and nutrient fate and transport model. It simulated average nitrate concentrations tripling within forty years if all new homes in the La Pine subbasin continued using standard or sand filter onsite wastewater treatment systems. The map on the right of Figure 5 illustrates that, even with the diversion of a maximum 1,600 residences from the sending area as part of the County's TDC program, groundwater quality would exceed state and federal drinking water standards for nitrate (10 mg/L) over large areas.

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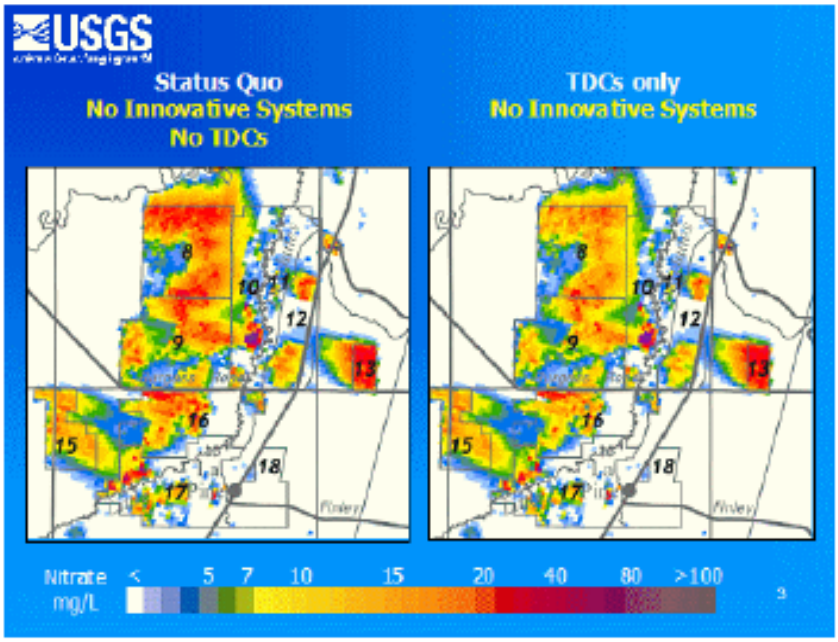
[8] While the program was in place, Deschutes County received 111 TDCs and applied them for development in the Newberry Neighborhood. The majority of TDCs were applied to development in Quadrant 2c. Approximately 3,500 pounds (1,588 kg) per year of nitrogen loading to the aquifer were prevented.

[9] https://or.water.usgs.gov/proj/or186/new_site/reports.html. http://pubs.usgs.gov/sir/2007/5237/

[10] The La Pine National Decentralized Wastewater Treatment Demonstration Project. Federal Identification No. X596007801. https://www.deschutescounty.gov/cd/page/la-pine-national-demonstration-project

Figure 5 –USGS 3-D Groundwater and Nitrate Fate and Transport Model Results



The La Pine Project also field-tested nitrogen-reducing onsite wastewater treatment systems. The results were promising, showing that specific groundwater nitrate loading rates could be achieved with them. The NLMM, the second USGS model, allowed the County to understand the minimum nitrate loading reductions that would be required to meet specified constraints on nitrate loading to groundwater and streams that receive groundwater discharge. This model, which expanded the capability of the three-dimensional groundwater and nutrient fate and transport model, allowed Deschutes County to establish water quality and other resource goals for the region and produce management strategies to meet those goals. Instead of establishing scenarios to examine impacts to the aquifer if all wastewater treatment systems were required to meet a specific performance standard, the NLMM supplied the performance standard needed to be met if the groundwater quality is to remain at a specified level. Other constraints to the model could be added, including loading limits to surface water bodies, the cost of systems, and applying minimum performance standards for existing and future development.

The La Pine Project found that several systems can substantially reduce nitrogen (and other pollutant) loading and protect the groundwater in a manner that meets adopted Comprehensive Plan goals and policies for Southern Deschutes County. The demonstration project led the DEQ to draft and ultimately adopt rule changes to OARs for onsite wastewater treatment. These rules, which became effective on March 1, 2005, made it easier for property owners in Deschutes County and throughout the state to use onsite ATTs by simplifying the permitting process and requiring the certification of installers and maintenance providers.

Federal Earmark for Groundwater Protection

In 2005, Deschutes County received a $400,000 federal earmark to advance decentralized wastewater treatment techniques for Southern Deschutes County. The first phase of the project enabled CDD to:

- Use the existing NLMM developed by the USGS to identify maximum nitrate loading rates for subregions/neighborhoods that could provide long term compliance with Oregon's groundwater quality standards;
- Develop onsite system performance standards and a local ordinance;[11]
- Research incentive strategies (financial and regulatory) to retrofit or replace existing
- onsite systems;
- Perform cost / benefit analyses to understand the opportunity costs for selecting different types of denitrifying onsite systems; and
- Conduct public outreach.[12]

The second phase allowed CDD to develop policy and regulatory approaches and define the organizational capacity required to administer a groundwater protection program. Deliverables included:

- Developing an operation and maintenance program for new and existing onsite systems relying on onsite ATTs;
- Designing a groundwater monitoring program, and
- Identifying financial approaches for providing pollution reduction credits and low-interest loan programs that enable existing property owners to retrofit or replace underperforming septic systems.

The final report, produced in September 2008, describes the grant's achievements.[13] Three are summarized below:

Creation of a Pollution Reduction Credit (PRC) Program

In 2006, the Board changed the TDC program to PRCs. The goal was to incentivize onsite system retrofits because they reduce the total quantity of nitrate discharged to the groundwater.[14] This

[11] Joni Hammond, DEQ Eastern Region Administrator, acknowledged in a 2005 letter, that DEQ supports the use of a local ordinance as the legal mechanism to impose performance standards for septic systems in South County.

[12] Deschutes County, DEQ, and USGS conducted several open houses and developed a fact sheet for the public.

[13] Protection of Groundwater Resources in the Upper Deschutes Basin. September 2008.

[14] In 2019, the Board adopted Resolution 2019-040 and eliminated the TDC/PRC requirements for Quadrants 2a, 2d, and Neighborhoods 3 and 4 of the Newberry Neighborhood. Pahlisch owns two undeveloped lots in Quadrant 2a that have not received a building permit. Sagebrush Development LLC, Reserve of the Pines, Quadrants 1a, 1b, and 1d, owns sixty-six undeveloped lots. Pahlisch has satisfied their PRC obligations. For Sagebrush Development, LLC, they owe $1,500 per lot. Payment is due when a building permit is issued. To date, Sagebrush has paid $150,000 into Fund 296.

program required developers of the Newberry Neighborhood to acquire a certain number of PRCs prior to recording a subdivision plat. PRCs were obtained when property owners, with developer assistance, upgraded their existing septic systems to nitrogen-reducing ATTs or when a Newberry Neighborhood developer made a payment into CDD's Groundwater Partnership Fund, Fund 296.[15]

Local Rule Added to County Code

Deschutes County adopted two ordinances and a resolution as a part of a Local Rule in 2008.

- Ordinance 2008-019 required every property owner in Southern Deschutes County, with or without an existing site evaluation report approval, to install a nitrogen-reducing onsite wastewater treatment system in order to receive a septic system permit for a new residential dwelling; major residential alteration or major repair of an existing septic system; and authorization notices for changes in use, additions, new connections or replacement dwellings.[16]

- Ordinance 2008-012 required all property owners with conventional onsite septic systems in unsewered areas of Southern Deschutes County to retrofit their systems by November 2022.[17] At the time, the estimated cost of upgrading conventional septic systems ranged from $7,000 to $16,000, not including regular maintenance.

- Resolution 2008-021 adopted USGS' NLMM to establish performance standards for onsite wastewater treatment systems in Southern Deschutes County. The NLMM identified performance standards for onsite systems that demonstrated they maintain no higher than 7 mg/L nitrate as N average concentrations in the shallow groundwater in accordance with OAR 340-040, Groundwater Quality Protection.[18]

Financial Advisory Committee

The Board convened an advisory committee with a specific charter in 2008 to discuss how financial assistance should be provided to rural homeowners. The committee met eleven times. CDD produced a report, *Financial Assistance Overview*, that shared data pertaining to demographics, County financial assets, projected costs of meeting groundwater protection goals, and proposed financial assistance programs, including loans and grants.[19]

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[15] Ordinance 2006-016 and Resolution No. 2006-043.

[16] See Footnote 13. Page 75.

[17] Ibid. Page 36. The Local Rule recognized that Deschutes County's permitting jurisdiction is limited to onsite systems. However, the code also specified that other approaches may be used to meet groundwater protection goals, including connection to sewer and innovative techniques as allowed by state law.

[18] Id. Page 78.

[19] Id. Page 83.

Operation and Maintenance Program

CDD upgraded its permit tracking database to help homeowners comply with ATT wastewater rules. New software allowed CDD's Onsite Wastewater Division to monitor ATTs for annual maintenance and generate automatic reminders to homeowners and service providers for annual reports.

Local Rule and Measure 9-70

As noted above, the Board adopted a Local Rule, Ordinances 2008-019 and 2008-012 in 2008. Commissioners made the following findings when they adopted the ordinances:

- USGS and DEQ conducted significant groundwater investigations in the La Pine subbasin, developing a three-dimensional groundwater and nutrient fate and transport model. The results were published in 2007, showing that the groundwater underlying Southern Deschutes County is threatened predominantly by discharges from conventional onsite wastewater treatment.

- USGS developed a NLMM as a groundwater quality management tool for use in Southern Deschutes County. The model can identify performance standards for onsite systems that will maintain no higher than 7 mg/L nitrate as N average concentrations in the shallow groundwater in accordance with OAR 340-040, Groundwater Quality Protection.

- Nitrogen-reducing onsite wastewater treatment systems are available and effective to reduce pollutants contributing to the public health hazard and protect public waters.

- OAR 340-071-0130(1) states that county permitting authorities acting on behalf of the state, such as Deschutes County, may not authorize installation of a wastewater treatment system that is likely to pollute public waters, but rather, must require the installation of a wastewater treatment system that protects public water or public health.

- Receipt of testimony from three public hearings in March 2007 and an open written record period from March 27, 2007 to April 18, 2008.

- In a January 2008 letter, DEQ determined a public health hazard exists in Southern Deschutes County, caused by pollution discharged by conventional onsite wastewater treatment systems.

- Receipt of testimony from a public hearing on July 7, 2008.

Throughout the public process and immediately following the adoption of the Local Rule, residents in Southern Deschutes County mobilized to overturn Ordinance 2008-012. Many questioned USGS and its groundwater modeling, asked that DEQ lead the groundwater

protection effort, and expressed a preference for sewer systems. Enough voters eventually signed a referendum petition to place Ordinance 2008-012 on the ballot for March 10, 2009. The overarching question in Measure 9-70 for Deschutes County voters was:

Should South Deschutes County residential properties be required to upgrade wastewater treatment systems to reduce nitrogen discharges in regional groundwater?

- A "Yes" vote would adopt the Local Rule and require owners of property in designated portions of south Deschutes County by November 2022 to connect to a sanitary sewer system or upgrade existing septic systems to systems that reduce discharged nitrogen by at least 35% and up to 79% depending on location.

- A "No" vote would repeal Ordinance 2008-012 and prevent Deschutes County from setting a deadline for property owners with existing septic systems to upgrade to an approved nitrate-reducing system.

On March 10, 2009, voters overturned Ordinance 2008-012 by voting "No." "No" carried with 56.99% of the vote.[20]

South Deschutes County Sewage Collection, Treatment, and Disposal Feasibility Study

In 2008, Sunriver Environmental LLC (SELLC) was in the process of upgrading its sewerage facility to meet DEQ-mandated treatment requirements. Deschutes County and DEQ asked SELLC to consider extending sewer service outside its current area to add a portion of South County. In June 2009, Deschutes County issued a grant to SELLC for $127,595 and received a loan from DEQ's Clean Water State Revolving Fund Program for $40,000 to help offset the cost of performing a feasibility study.[21]

In March 2010, Newton Consultants, WH Pacific Engineers, and Vision Engineering estimated the cost of expanding SELLC's sewer treatment plant and reuse facilities to serve areas south of Sunriver that rely on septic systems.[22] The feasibility study included four basic objectives:

[20] CDD continues to administer OAR 340-071-130(1), Nitrogen-Reducing Systems by requiring advanced onsite wastewater treatment systems for:

1. New residential dwellings;
2. Major septic repairs (repairs to drainfields, not including tank replacements);
3. Major residential alterations (changes that would cause increases in flows or proposals to connect to a system that doesn't meet minimum sizing requirements for the use); and
4. Authorization notices for changes in use, additions, new connections or replacement dwellings.

[21] Order 2009-036, Order 2009-039 and Deschutes County Contract No. 2009-246. Both amounts encumbered CDD's Groundwater Partnership Fund (Fund 296).

[22] South Deschutes County Sewage Collection, Treatment, and Disposal Feasibility Study. March 2010.

- Determine which areas within the defined study areas are feasible for sewer service within the constraints of DEQ criteria;

- Provide a proposed mechanism for dividing costs for sewerage treatment (construction, operation, and maintenance) between current Sunriver customers and the areas to be served outside the current sewer service area;

- Evaluate various administrative options and identify one that is most suitable for operating the sewage collection system; and

- Evaluate various financing mechanisms and identify one that is most suited for financing construction and operation.

The study area was divided into two zones. It considered all the existing lots between Sunriver and State Recreation Road. At the time, there were 3,975 rural lots not served by sewer, with 1,819 of those utilizing septic systems. Extending sewer service necessitated a treatment plant of sufficient size to serve the approximately 5,400 customers currently in the SELLC service area plus the lots south of Sunriver. Due to limited capacity of the existing sewer trunk lines within Sunriver, a new plant at Lake Penhollow on Cottonwood Road would be required, in addition to expanding existing pond storage and disposal areas. The total capital cost ranged from $39M to $75M. The total capital cost per lot for those living south of Sunriver ranged from $18,000 to $19,000. The project was never further explored in part due to a Land Use Board of Appeals (LUBA) Remand of Deschutes County's Goal 11 Exception application. SEELC ultimately completed the sewer upgrade for their service boundary in 2023.

SECTION 2: DEQ RESPONSIBILITIES

After the Local Rule failed in July 2009, Deschutes County, DLCD, and South County residents met with DEQ in La Pine to discuss next steps. The Board requested DEQ take the lead on groundwater protection, acknowledging that Deschutes County as an agent of the state, had exhausted its efforts on a local level. DEQ agreed and this remains in effect today.[23] The following section outlines efforts made by DEQ leadership since 2009, including:

- Convening a local citizen Steering Committee;
- Initiating a Goal 11 Exception;
- Issuing onsite wastewater variances;
- Conducting groundwater sampling; and
- Providing financial aid for septic assistance.

[23] Board of County Commission Meeting Minutes. July 22, 2009. Page 6. While DEQ continues to lead the groundwater protection effort, onsite wastewater permitting remains with Deschutes County and CDD.

South Deschutes/North Klamath Groundwater Protection: Report and Recommendations

After agreeing to lead the groundwater protection efforts in Southern Deschutes County, DEQ sought volunteers for a local citizen Steering Committee to recommend affordable solutions to protect the region's groundwater. DEQ solicited volunteers through a direct mailing sent to more than 10,500 residences. DEQ interviewed two dozen candidates, ultimately selecting eleven members and three alternates. Members met regularly for nearly three years starting in September 2010, spending considerable time learning and discussing issues related to septic systems and groundwater contamination. The group studied topics including geology, soils, hydrogeology, toxicology, and septic system technology. They also learned about the political, financial and regulatory entities involved in wastewater management. The committee eventually approved ten recommendations to address groundwater contamination in the area.[24] One recommendation sought an exception to state planning rules that would allow multi-residence wastewater treatment systems outside of existing urban growth boundaries and sanitary districts. Another recommended establishing a groundwater monitoring program. In June 2013, the committee fulfilled its goal of providing recommendations to DEQ and disbanded.

Goal 11 Exception and Land Use Board of Appeals Remand

As noted above, the DEQ Steering Committee recommended utilizing sewer systems to address groundwater contamination in South County instead of onsite ATTs. In December 2014, DEQ collaborated with DLCD and submitted draft findings to CDD for a Goal 11 Exception. The findings included a rationale for the exception and a map of the proposed area.[25] The Goal 11 Exception would have allowed sewer systems and sanitary authorities in this region. After numerous public hearings with the Planning Commission and the Board, the Board took an exception to Goal 11 and adopted Ordinance 2016-007 in February 2016.

Central Oregon Landwatch (COLW) appealed the ordinance to LUBA. COLW argued the record did not demonstrate there was an imminent and significant threat to public health per OAR 660-011-0060(9). In November 2016, LUBA concurred and remanded the decision back to the County.[26] Notable excerpts of their decision included:

- Deschutes County, DEQ, and DLCD did not demonstrate there is imminent public health hazard that necessitates extending sewer systems.

[24] South Deschutes-North Klamath Groundwater Protection Report and Recommendations. July 2013

[25] The exception area encompassed the unincorporated portions of Deschutes County contained in Townships 19S, 20S, 21S, and 22S and Ranges 9E, 10E and 11E, except those areas authorized for sewer.

[26] *Central Oregon Landwatch v. Deschutes County.* LUBA No. 2016-020.

- It is the scope of the exception (11,000 lots), the area of the exception (180-square miles), and the indefiniteness of the number and location of the lots, if any, that will be connected to the sewer system that makes it improper.

- The ordinance impermissibly "established a planning or zoning policy of general applicability" that allows sewer systems in order to facilitate residential development on rural lands in the county.

- Deschutes County, DEQ, and DLCD need to explain how sewer service that they describe as "necessary to guard against unacceptable levels of pollution in the area's groundwater that would expose citizens to health risks" will correct the problem when connection to the sewer system is entirely optional.

Due to the LUBA decision, DEQ, DLCD, and Deschutes County cannot permit new sewer systems until state law changes or DEQ or the Oregon Health Authority declare an imminent public health hazard.

DEQ Variances for Onsite Septic Systems

Not all parcels in Southern Deschutes County (and elsewhere) are suitable for septic systems. Depth to groundwater, soil types, setbacks, landscape position of the property and local geology are all factors. Property owners must have a site evaluation conducted by an Onsite Wastewater Specialist in CDD to determine if a parcel is suitable for a septic system. If a parcel is deemed unsuitable, the site evaluation report outlines reasons for denial and cites the applicable rules. A property owner or consultant may then submit to DEQ a variance application that includes a copy of the site evaluation report, plans and specifications for the proposed septic system, other supporting documents, and an application fee. The applicant must demonstrate that the variance from each requested state rule is warranted, and that the proposed system would adequately function to safeguard public health and the environment. Variances are approved only when the proposal meets these objectives.

A DEQ variance officer reviews the proposal and other application materials, conducts a site visit, considers site-specific conditions and holds a public hearing. The variance officer then issues a decision on the variance within 45 days of the hearing close date. The decision to approve or deny a variance application is based on the information presented in the proposal and the requirements and purpose of DEQ's regulations.[27] To date, DEQ has issued 117 variance approvals in Southern Deschutes County. Eight were approved in 2025.[28] Appendix B shows their locations. Starting in 2024, during each variance proceeding, CDD submits a letter to DEQ, expressing concerns about the implications of siting septic systems in this region through a variance process if future impacts to the aquifer cannot be mitigated. Excerpts are below:

[27] https://www.oregon.gov/deq/Residential/Documents/ossSepticVariancesFS.pdf

[28] Last year's report incorrectly cited 124 approved variances. It should have been 109.

Variance approvals on naturally limited properties that do not meet minimum criteria undermine the goal of protecting a sole source aquifer. It also undercuts our collective efforts and public perception that Deschutes County and DEQ are actively protecting the groundwater from nitrate loading.

As DEQ approves onsite septic system variances, CDD requests documentation describing the rationale, specifically in relation to DEQ's December 2023 letter to the Board.

Groundwater Sampling Event

In 2022, DEQ announced that they would be testing groundwater for approximately 100 wells for free in Southern Deschutes County as part of a statewide study of groundwater pollution. DEQ collected samples in 2023 and 2024 from a mix of private and public wells for nitrate, arsenic, pesticides and other contaminants. In November, CDD received well sampling data in a tabular format from DEQ. It revealed the following:

- Many of the sampled wells are new;
- In several well locations there are non-detect (negligible) traces of nitrates;
- Certain wells north of Burgess Road and in La Pine showed increases in nitrates;
- The well data is a snapshot in time that can be used and referenced in future well sampling events;
- The data does not change our understanding of the La Pine subbasin; it is still vulnerable to nitrate loading; and
- Nitrate-reducing onsite systems are still necessary to protect the aquifer.

DEQ / Central Oregon Septic Assistance Program

In 2023, DEQ provided financial aid from American Recovery Act Funds to Central Oregon Intergovernmental Council (COIC) for a Central Oregon Septic Assistance Program (COSAP). The program offered reimbursements to qualified homeowners at or below annual median income levels that are either in need of or have recently completed septic repairs or replacements in Crook, Deschutes and Jefferson counties. COSAP received two rounds of funding from DEQ. The first round of $1,378,418 was administered through a two-month application period. COIC received 102 applications and approved 73 projects (13 for previous work completed and 47 for new work, including 13 septic-to-sewer connections).

COSAP received an additional $877,998.00 from DEQ for a second round of funding. Of those funds, approximately $400,000 was set aside for Crook, Deschutes, and Jefferson counties, and $400,000 for the Confederated Tribes of Warm Springs. COSAP launched a one-month application period in March 2024, during which COIC received 143 applications and approved 18 projects. Following outreach and review of applications from Warm Springs, COIC was able to allocate an additional three projects for a total of 21 projects for the tri-county region. Of the 91 approved projects, 16 homeowners received funding in Southern Deschutes County.

DEQ 2023 Letter

On December 19, 2023, DEQ Deputy Director Shannon Davis provided a letter to the Board discussing groundwater pollution concerns from septic systems in Southern Deschutes County.[29] It acknowledged, among other topics:

- The Sunriver and La Pine area is vulnerable to nitrate contamination from septic systems and private wells are the primary drinking water source for most properties in this area.

- Conditions documented from past investigations and outlined in a USGS factsheet are still valid.[30]

- Testing and research indicate most of the contamination in this region comes from septic systems. This means nutrients from septic systems are seeping into the area's porous, volcanic soil and the aquifer that is used as a primary drinking water source.

- Continued unrestricted development in the area will reach a tipping point that may be difficult or impossible to recover from due to groundwater contamination which will then require additional regulation and funding to address.

- Even with a septic design capable of producing high quality effluent, the treatment may not sufficiently minimize or eliminate nutrients and pathogens from wastewater or future impacts to the aquifer system as outlined by a USGS model.

- Some parcels are not suitable for septic systems.

- DEQ previously determined that a variety of approaches were likely needed to properly manage wastewater pollutants and nitrate loading, including individual onsite wastewater treatment systems and various types of community sewer systems. In some locations, DEQ believes the use of various types of community sewer systems and/or drinking water systems may be a better long-term solution to human health impacts, however, drinking water systems may not mitigate the effect on surface water or ecological impacts.

- Convene a meeting with non-government organizations (NGO), non-profits, and 3rd party stakeholders on support of installation and funding of sanitary systems, water systems, Goal 11 exemptions or other alternatives.

- DEQ still believes that conditions in South Deschutes County are a potential public health and ecological impact issue.

[29] DEQ Deputy Director Davis Letter to Deschutes County. December 2023.

[30] See Footnote #12.

- As outlined in previous communications, DEQ understands that there will be further aspects of this process that will require additional work, refinement, clarification and coordination and they stand committed to helping Deschutes County and the citizens in South Deschutes County.

Onsite Wastewater Management Program / Rulemaking

The siting, design, installation, and ongoing operation and maintenance of septic systems are regulated through DEQ's Onsite Wastewater Management Program. This is a state-based program with no direct EPA standards for the state to follow. The state first established statewide rules in 1972, and DEQ was delegated authority in 1974 to oversee the program. DEQ currently implements the permitting program directly in Curry, Josephine, and Jackson counties and has Intergovernmental Agreements with the other 33 counties, including Deschutes County, to implement the program at a local level.

DEQ completed rulemaking after convening a Rules Advisory Committee (RAC) to address sewer availability and accessory dwelling unit issues prompted by bills enacted by the 2023 Legislature. During rulemaking, DEQ also revisited nitrates, variances, and operation and maintenance for ATTs. CDD's Onsite Wastewater Manager participated on the RAC. On September 11, the Environmental Quality Commission (EQC) adopted new rules, effective January 1, 2026. As it pertains to ATT systems, they provide greater clarity on roles and responsibilities to ensure consistent maintenance statewide, establish minimum maintenance requirements, update enforcement penalties, and facilitate efficient operation of the Onsite Program. The rules also stipulate that an agent of DEQ or their designee to consider geographic challenges when evaluating a site for the suitability of a septic system. The current rule already provides the agent the ability to be stricter than the rules, so the new rule change just adds additional transparency. Lastly, for variances, the new rules clearly state that any variance proposal must be at least as protective as if the existing standards were strictly adhered to. The rule changes also change how variance denials may be appealed.

SECTION 3: DESCHUTES COUNTY FINANCIAL ASSISTANCE

CDD oversees and distributes two funds to protect groundwater quality in Southern Deschutes County:

- Groundwater Partnership Fund; and
- Newberry Neighborhood Fund.

Groundwater Partnership Fund

CDD's Groundwater Partnership fund, Fund 296, is a discrete fund dedicated to protecting groundwater in Southern Deschutes County. It currently provides financial assistance to property owners needing assistance to upgrade their septic system. Deschutes County owns large sections of the Newberry Neighborhood in La Pine; specifically, Quadrants 2a and 2d, and Neighborhoods 3 and 4. Fund 296 revenue comes from Newberry Neighborhood land sales and Pollution Reduction Credits of $1,500 collected on properties located within The Reserve in the Pines (Quadrants 1a, 1b and 1d). Currently, Fund 296 has an available balance of $41,600. Over the last twenty years, it has funded:

- South Deschutes County Sewage Collection, Treatment, and Disposal Feasibility Study;
- Goal 11 Exception Application;
- Financial assistance (rebates) for property owners installing nitrogen-reducing onsite wastewater systems; and
- NeighborImpact loans to eligible property owners to retrofit or repair conventional septic systems.

Nitrogen-Reducing Onsite Wastewater Treatment Rebate Program

CDD currently offers a maximum rebate of $3,750 to property owners who retrofit an existing onsite system serving a residence. Properties must be located within Southern Deschutes County and outside an area currently eligible for connection to a sewer system.[31] Funding comes from Newberry Neighborhood land sales and is transferred to the Groundwater Partnership Fund. To date, CDD has issued 150 rebates for a total cost of $611,250.[32] Twelve rebates were issued in 2025. Appendix C shows the locations of all the 1,216 ATTs installed to date in this region.

NeighborImpact Non-Conforming Loan Program

Deschutes County contracts with NeighborImpact to administer a non-conforming loan program for septic upgrades in Southern Deschutes County. The program aids residents disqualified from conventional loan programs due to mortgage delinquency or inadequate equity. Funded by Newberry Neighborhood land sales, the total contribution of $240,000 occurred in four disbursements between 2011 and 2017. The program has an available balance of $12,190. Seventeen property owners have benefited from this program.

Newberry Neighborhood Fund

The Newberry Neighborhood Fund (Fund 297) was established for land sale proceeds and loan repayments for the La Pine Special Sewer District's loan, assumed by the City of La Pine through

[31] Order 2010-006. Adopted by the Board, it established a nitrogen reducing onsite wastewater treatment rebate program that is administered by CDD.
[32] Previous rebates were $1,875.

annexation in 2012 to extend sewer services to the Newberry Neighborhood. Deschutes County supported the district through the transfer of federal grant funds and a County loan of $1,130,350. The loan was paid in full in May 2022. In 2019, the Board eliminated TDC/PRC requirements for developing the area. Future land sales will be retained in this fund, with distributions transferred to CDD's Groundwater Partnership Fund (Fund 296) for reinvestment in Southern Deschutes County groundwater protection. Currently, Fund 297 has an available balance of $149,500.

SECTION 4: EMERGING OPPORTUNITIES

There are two emerging opportunities that can contribute to groundwater protection.

Senate Bill 1154 (2025)

The Governor signed Senate Bill 1154 on July 24. This legislation modifies state law pertaining to Ground Water Quality Concern Areas (GWQCA). It streamlines GWQCA declarations once contaminants like nitrates are found in groundwater. This allows the state to provide a quicker response by formulating an interagency team, assessment, outreach plan, trend analysis, monitoring plan, and publicly assessable information. Additionally, once a declaration is made by DEQ and its Environmental Quality Commission (EQC), Goal 11 Exceptions are waived. A county can then enter into an agreement with a city or sanitary district to provide wastewater services for residential dwellings.

Looking ahead, the Board may want to consider requesting that DEQ and the EQC declare a GWQCA for Southern Deschutes County. Such a declaration could also foster community conversations to explore shared domestic well agreements and the creation of municipal water service districts.

Newberry Neighborhood Land Sales

In November 2024, Deschutes County's Property Manager listed Quadrants 2a and 2d with NAI Cascades for sale.[33]

- Quadrant 2a: List price for 19.57-acres, $1,467,750 ($75,000/acre).
- Quadrant 2d: List price for 17.66-acres, $1,324,500 ($75,000/acre).

In December 2025, a developer signed a prospective purchaser agreement for Quadrant 2d, subject to certain terms and conditions that include approval of a tentative subdivision plat and civil engineering drawings. The closing date is October 2026. When Quadrants 2a or 2d sell, CDD

[33] Quadrant 2a: List price for 19.57-acres, $1,467,750 ($75,000/acre). Quadrant 2d: List price for 17.66-acres, $1,324,500 ($75,000/acre).

will coordinate with the Board to seek direction for strategically investing resources into groundwater protection. Options include but are not limited to:

- Increasing the rebate to help existing residences retrofit septic systems;
- Funding a conventional loan program with NeighborImpact and/or COIC;
- Supporting NeighborImpact's non-conforming loan program for septic upgrades; and
- Deepening domestic wells.

As Neighborhood 2 eventually gets built out, it will be important to coordinate with the Deschutes County Property Manager, City of La Pine, and the Board to prepare quadrant and marketing plans for Neighborhoods 3 and 4. Combined, they consist of 325 acres with a real market value exceeding $24M.

APPENDICES

Appendix A – Southern Deschutes County Groundwater Protection Timeline

Year	Topic	Comments
Pre-1970s	**Preplatted Subdivisions**	30-square mile area in Southern Deschutes County (excluding La Pine Urban Unincorporated Area and Sunriver) was subdivided into over 11,000 lots prior to Senate Bill 100 and the establishment of Oregon's Statewide Land Use System and Deschutes County Subdivision Ordinances.
1982	**Nitrates Detected in La Pine**	Department of Environmental Quality (DEQ) La Pine Aquifer Study identified high nitrate levels in groundwater underlying the core area of La Pine.
1986	**La Pine Core Area**	La Pine core area sewered.
1994	**2-D Nitrate Model**	DEQ model identifies nitrates in groundwater outside La Pine core area.
1996	**Regional Problem Solving Grant**	County received a $157,250 Regional Problem Solving (RPS) grant from Department of Land Conservation and Development (DLCD) to identify regional problems and evaluate solutions.
1997	**Cost / Benefit Analysis for Sewer Feasibility**	*South County Regional Cost/Benefit Analysis PRS Project Final Report, Sewer Feasibility Study*, found creating or expanding sewers in the study area costs between $19,000 and $28,000 per household. A 20-year payback at 3% costs between $1,275 and $2,880 per household per year. This estimate also assumed that the sewage treatment plant site and related land could be purchased at $3,000 per acre.
1998	**Regional Problem Solving Water Quality Directives**	Water Quality Directives resulting from RPS included: • Continuing to study nitrates, well head protection, and alternative sewage disposal systems. ▪ Do not build a new sewer system in study area ▪ Reducing residential density to meet the carrying capacity of onsite sewage disposal systems through a market-based TDC Program ▪ Identifying areas where existing community sewer systems can be expanded (La Pine Sewer District). ▪ Supporting Oregon Water Wonderland II efforts to upgrade the existing sewage treatment facilities for that subdivision
1998-2003	**Bureau of Land Management Property Acquisition**	Bureau of Land Management sells, through an act of Congress, 518 acres to Deschutes County for $500,000. Deschutes County expands the La Pine Unincorporated Community boundary to include this property and a private parcel owned by the Baldwin-Herndon Trust so they can be master planned for residential development and served with water and sewer from the La Pine Water and Sewer Districts. Proceeds from county land sales are explicitly dedicated to South County groundwater protection.

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Year	Topic	Comments
1999	**National Demonstration Project**	DEQ received $5.5 million grant from EPA to study the groundwater, model the aquifer, and field test nitrogen reducing onsite systems not available in Oregon.
1999-2004	**Groundwater Sampling**	DEQ and Deschutes County field sampled groundwater and onsite wastewater treatment system effluent. Results of studies reported at numerous national, regional and state meetings.
2000	**Comprehensive Plan Amendments (RPS)**	Deschutes County Comprehensive Plan amended to include certain goals in response to public comments during RPS: 1. To preserve water and air quality, reduce wildfire hazards and protect wildlife habitat. 2. To ensure that domestic water derived from groundwater meets safe drinking water standards. 3. To develop an equitable, market-driven system that reduces the potential development of existing lots in floodplains, wetlands, mule deer migration corridors and areas susceptible to groundwater pollution. 4. To create a new neighborhood, primarily residential in character, between La Pine and Wickiup Junction, that provides services efficiently, sustains economic development and reduces adverse impacts to groundwater quality in South Deschutes County. 5. To explore innovative sewage treatment and disposal methods.
2002	**Transferable Development Credits Adopted**	Transferable Development Credit (TDC) Program adopted into County Code.
2003	**La Pine National Demonstration Project Findings**	Findings of the La Pine National Demonstration Project groundwater investigation and three-dimensional groundwater modeling were presented at a public meeting in La Pine.
	Oregon Water Wonderland Unit No. 2 Sewer Treatment Facility Upgrade	Board of County Commissioners (Board) approved a Comprehensive Plan Amendment, Zone Change, and exceptions to Goals 4 and 11 for Oregon Water Wonderland II for a 480-acre parcel to establish sewage treatment facilities for that subdivision.

Appendix A – Southern Deschutes County Groundwater Protection Timeline

Year	Topic	Comments
2003-2022	**La Pine Special Sewer District Loan**	Deschutes County aided La Pine Special Sewer District in constructing increased sewer capacity for the Newberry Neighborhood in La Pine through the transfer of federal grant funds and a County loan of $1,130,350. The loan was funded through Full Faith and Credit Obligation Bonds. The last bond was called in 2021 and paid off in May 2022. System Development Charges for new development within the Newberry Neighborhood were applied toward this fund for debt service.
2005	**Nitrate Fate and Transport Model Completed**	U.S. Geological Survey (USGS) completed upgrade to a three-dimensional groundwater model and produced a Nitrate Loading Management Model.
	USGS Report	USGS releases a report, *Organic Wastewater Compounds, Pharmaceuticals, and Coliphage in Ground Water Receiving Discharge from Onsite Wastewater Treatment Systems near La Pine, Oregon: Occurrence, and Implications for Transport.* Organic wastewater compounds, pharmaceuticals, and coliphage (viruses that infect coliform bacteria) in onsite wastewater and in a shallow, unconfined aquifer that serves as the primary source of drinking water for most residents near La Pine was documented.
	TDC Technical Advisory Committee	The County convenes the TDC Technical Advisory Committee to amend the Transferable Development Credit Program to focus resources created by the La Pine Newbery Neighborhood on solving the groundwater protection problem.
	Pollution Reduction Credits	The TDC Technical Advisory Committee recommends creating a Pollution Reduction Credit (PRC) program to work in conjunction with a Local Rule to require the use of nitrogen reducing onsite wastewater treatment systems.
		The Board adopted amendments to the TDC Program to create PRCs to create financial assistance for homeowners upgrading their existing onsite wastewater treatment systems to better protect groundwater.
	New Alternative Treatment Technologies for Septic Systems	Based on the results of the La Pine National Demonstration Project, DEQ amended state rules to allow alternative treatment technologies in Oregon for onsite septic systems. These systems provide a higher level of treatment for wastewater.

Appendix A – Southern Deschutes County Groundwater Protection Timeline

Year	Topic	Comments
2005-2008	**Groundwater Protection Federal Earmark**	Deschutes County received a $400,000 federal earmark to advance decentralized wastewater treatment techniques for Southern Deschutes County. The County utilized groundwater and nitrate fate, transport and optimization models and new state rules permitting the use of denitrifying onsite wastewater systems. The County also implemented performance standards, pollution credits, administrative procedures and monitoring wells to protect and improve the aquifer's water quality.
2007	**USGS Reports**	USGS released a report, *Evaluation of Approaches for Managing Nitrate Loading from On-Site Wastewater Systems near La Pine, Oregon*. USGS releases report, *Ground Water Redox Zonation near La Pine, Oregon: Relation to River Position within the Aquifer-Riparian Zone Continuum,* acknowledging that the Deschutes and Little Deschutes Rivers, which receive part of their flow from groundwater, are vulnerable to contamination by wastewater from septic systems in southern Deschutes County and northern Klamath County.
	Draft Local Rule	The Board held three public hearings in La Pine to take testimony on a draft Local Rule that would require that: ▪ New development (on bare land) uses the best performing nitrogen reducing systems. If future development installs the best system possible the costs for existing system upgrades are kept as low as possible ▪ All existing systems are upgraded within 10 years of the date the rule is adopted.
	Groundwater Discussions	The Board held a public meeting with the DEQ and DLCD to discuss the groundwater science and modeling and next steps for protecting groundwater in the region.
2008	**DEQ Public Health Hazard Letter**	DEQ issued a letter that stated that a public health hazard is being created in the region by continued use of conventional onsite wastewater treatment systems. DEQ stated that potential solutions to this public health hazard may include a variety of approaches ranging from onsite wastewater treatment systems to expanded or new sewer systems through a Goal 11 exception. The Board held a public work session with the DEQ and DLCD to discuss the groundwater science and modeling and next steps for protecting groundwater in the region.

Appendix A – Southern Deschutes County Groundwater Protection Timeline

Year	Topic	Comments
	Financial Advisory Committee	The Board convened a financial advisory committee to provide recommendations for a financial assistance program. This program is intended to help residents of south Deschutes County offset the costs of installing groundwater protection measures.
	Draft Local Rule	The Board held a public hearing in La Pine to take testimony on a revised draft Local Rule that would require that: ▪ New residential development (on bare land) uses the best performing nitrogen reducing systems. If future development installs the best system possible the costs for existing system upgrades are kept as low as possible ▪ All existing systems are upgraded within 10-14 years of the date the rule is adopted.
2008	**Ordinance 2008-019 (Advance On-site Treatment Systems for New Residential Development)**	The Board adopted Ordinance 2008-019. It required advanced onsite wastewater treatment systems for: 1. New residential dwellings; 2. Major septic repairs (repairs to drainfields, not including tank replacements); 3. Major residential alterations (changes that would cause increases in flows or proposing to connect to a system that doesn't meet minimum sizing requirements for the use); and 4. Authorization notices for changes in use, additions, new connections or replacement dwellings.
	Local Rule Adopted (Advance On-site Treatment Systems for Existing Development)	The Board adopted Ordinance 2008-012, which required: ▪ All existing septic systems to be upgraded to an approved nitrate reducing system or other methods to prevent nitrate pollution from conventional septic systems by November 2022. ▪ 6,500 existing septic units in southern Deschutes County affected by this requirement. Cost estimates for property owners at the time were between $7,000-$16,000.
	Nitrate Loading Management Model Adopted	The Board adopted Resolution 2008-021, adopting a Nitrate Loading Management Model to establish performance measures for onsite wastewater treatment systems. The model could be used to identify performance standards for onsite systems that maintain no higher than 7 mg/L nitrate as N average concentrations in the shallow groundwater in accordance with Oregon Administrative Rule 340-040, Groundwater Quality Protection. Minimum and maximum nitrogen regulation requirements and locations for the performance standards were established.

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Year	Topic	Comments
2008-2009	**High Groundwater Project**	Deschutes received a $90,000 DLCD Technical Assistance Grant to provide support for a technical committee and community involvement process to address land use and water quality issues in South Deschutes County. Three months of community conversations identified numerous priorities including: ▪ Involving the community in decisions affecting South County ▪ Reducing wildfire hazards ▪ DEQ and sewer districts leading the formation or expansion of sewer systems ▪ Deschutes County leading an effort to construct and pave roads ▪ Additional protection of natural resources However, residents remained deadlocked on development in high groundwater areas.
2009	**Local Rule Overturned**	Voters overturned Ordinance 2008-012 by voting "No" to Measure 9-70, a special election ballot referendum. "No" carried with 56.99% of the vote. The referendum prevented Deschutes County from, requiring existing septic systems to be upgraded to an approved nitrate reducing system or other methods to prevent nitrate pollution from conventional septic systems by November 2022.
	DEQ Responsible for Groundwater Protection	Deschutes County, DLCD, and community members met with DEQ to discuss next steps. The Board requested that DEQ take the lead on groundwater protection, expressing that it has exhausted its efforts to address the issue on a local level. DEQ agreed and this remains in effect today.
	Variance to Ordinance 2008-019	The Board adopted Ordinance 2009-022 to allow a variance to Ordinance 2008-019 in cases where strict compliance with the ordinance poses an extreme hardship for the property owner and where other potential sources for financial assistance have been exhausted.
2010	**Non-Conforming Loan Program**	Deschutes County entered into a Personal Services Contract with NeighborImpact to administer a non-conforming loan program for septic upgrades in South Deschutes County. The purpose of the contract was to establish a separate lending pool for South Deschutes residents who have been disqualified from the existing loan program due to mortgage delinquency and/or inadequate equity. Deschutes County has funded the loan program (grants, Newberry Neighborhood land sales) with a total contribution of $240,000. Disbursements in the amount of $60,000 to NeighborImpact occurred in FY 2011, FY 2012, FY 2014 and FY 2017. The program in partnership with NeighborImpact remains in effect today.

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Year	Topic	Comments
	Sunriver Sewer Feasibility Study	Sunriver Environment LLC completed *South Deschutes County Sewage Collection, Treatment, and Disposal Feasibility Study*, supported by DEQ and Deschutes County, that examined the cost of extending sewer into rural areas south of Sunriver. Deschutes County contracted with Sunriver Environment LLC, for $127,595 and received a loan from DEQ for $40,000.
	Rebate Program	The Board adopted Order 2010-006, establishing a nitrogen reducing onsite wastewater treatment rebate program administered by the Community Development Department. The amount of the rebate based on meeting certain conditions is currently $3,750. Funds are derived from the sale of County-owned property (Newberry Neighborhood) in the city of La Pine. The rebate program remains in effect today. To date, CDD has issued 150 rebates.
2010-2013	**DEQ Groundwater Steering Committee**	DEQ assembled a steering committee of community members to discuss and make recommendations to improve groundwater protection in South Deschutes and North Klamath counties. They met over 20 times in nearly three years.
2011	**Repeal of Ordinance 2008-019**	The Board adopted Ordinance 2011-010 to repeal Ordinance 2008-019. This action ended further litigation related to the *Deschutes County Citizens Action Group v. Deschutes County*, Case No. 08CV0658AB. CDD currently administers OAR 340-071-130(1), Nitrogen-Reducing Systems today by requiring advanced onsite wastewater treatment systems for: 1. New residential dwellings; 2. Major septic repairs (repairs to drainfields, not including tank replacements); 3. Major residential alterations (changes that would cause increases in flows or proposing to connect to a system that doesn't meet minimum sizing requirements for the use); and 4. Authorization notices for changes in use, additions, new connections or replacement dwellings.
	Repeal of Ordinance 2009-022	The Board adopted Ordinance 2011-012 to repeal Ordinance 2009-022 because it was no longer applicable given the repeal of Ordinance 2008-019.
	South County Local Wetland Inventory	The Board adopted a South County Local Wetland Inventory. It replaced the National Wetland Inventory in this area and improved the accuracy in the identification of jurisdictional wetland characteristics in the upper Deschutes Basin. Functions that were evaluated included wildlife habitat quality, water quality improvement, and floodwater retention capability.

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Year	Topic	Comments
2013	**DEQ Groundwater Steering Committee Recommendations**	DEQ released, *South Deschutes/North Klamath Groundwater Protection Report and Recommendations*. The DEQ steering committee approved a list of recommendations to address groundwater contamination in the area, then having fulfilled its mission, voted to disband. Recommendations included: 1. Pursue a Goal 11 exception for at-risk areas in South Deschutes and North Klamath counties; 2. DEQ designs a testing program to determine whether there is a groundwater contamination problem, and if so, where it might be located; 3. Form a Sanitation Authority to protect the groundwater in the affected area spanning South Deschutes and North Klamath counties; 4. Institute an ordinance that limits the number of livestock per acre to reduce risk to groundwater contamination and provide education to manage livestock; 5. Investigate establishing a permitting/groundwater monitoring program for all golf courses, nurseries and other point sources; 6. Explore an ATT moratorium; 7. Explore disadvantaged community financing solutions; 8. Establish an outreach committee to educate the community; and 9. Explore alternative "green" solutions for disposing human waste.
	Newberry Country Plan Policies	Board adopted *Newberry Country, A Plan for Southern Deschutes County*, into the Comprehensive Plan. Policies include: ▪ Consider an ordinance to limit the number of livestock allowed on small acreages in order to limit nitrates from entering the groundwater and protecting public health; ▪ Use all the proceeds derived from the sale of County-owned property in the La Pine Neighborhood Planning Area to protect the groundwater in South Deschutes County, through methods such as funding septic system repairs and upgrades to qualifying low-income homeowners; ▪ Evaluate and revise the TDC and Pollution Reduction Credit programs as needed; and ▪ Explore opportunities for Goal 11 exceptions and the full range of advanced wastewater treatment opportunities.

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Year	Topic	Comments
2014	**Livestock and Animal Husbandry**	Planning Commission convened a domestic livestock panel comprised of representatives from Deschutes Soil and Water Conservation District, the Oregon Department of Agriculture, Oregon State University (OSU) Extension Services, and the South Deschutes/North Klamath Groundwater Protection Project Steering Committee. The panel and subsequent public comments focused on the importance of best management practices and several educational opportunities that are currently available to rural property owners. Planning Commission recommended that while there is no need for additional land use regulations, there is an extraordinary opportunity to emphasize the value of the information gathered during this process. The Board agreed with the Planning Commission's recommendations regarding rural residential domestic livestock and animal husbandry, directing staff to develop and/or promote: ▪ An education and enforcement contacts matrix ▪ Links to web sites of related organizations ▪ An Upper Deschutes Agricultural Water Quality Management Area Plan ▪ A Deschutes County Rural Living Handbook ▪ Deschutes County Code Chapter 13.36, Nuisances and Abatement
2015-2016	**Goal 11 Exception**	DEQ, DLCD and the Community Development Department initiated a legislative amendment updating the County's Comprehensive Plan to take an exception to Statewide Planning Goal 11 (Public Facilities and Services) to allow for sewers in unincorporated lands in southern Deschutes County. After numerous public hearings with the Planning Commission and the Board, the Board adopted Ordinance 2016-007 taking an exception to Goal 11.

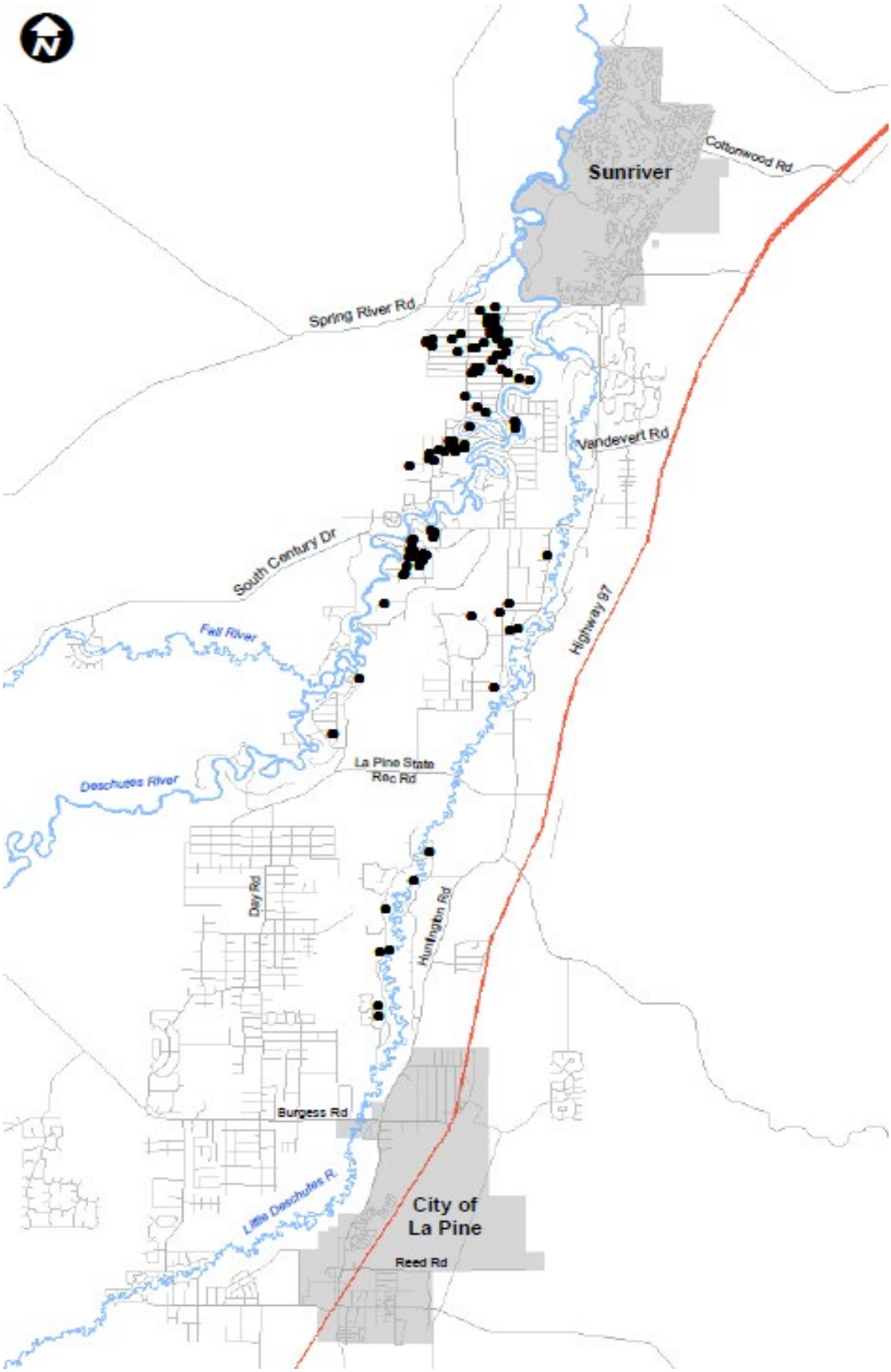
Appendix A – Southern Deschutes County Groundwater Protection Timeline

Year	Topic	Comments
2016	**Goal 11 Exception Remand from LUBA**	Central Oregon Landwatch (COLW) appealed Ordinance 2016-007 to the Land Use Board of Appeals (LUBA). COLW argued the Record did not demonstrate there was an imminent and significant threat to public health per OAR 660-011-0060(9). LUBA concurred and remanded the decision back to the County. Notable excerpts of LUBA's decision included: ▪ Deschutes County, DEQ, and DLCD did not demonstrate there is imminent public health hazard that necessitates extending sewers. ▪ It is the scope of the exception (11,000 lots), the area of the exception (180 square miles), and the indefiniteness of the number and location of the lots, if any, that will be connected to the sewer system that makes it improper. ▪ The ordinance impermissibly "established a planning or zoning policy of general applicability" that allows sewer systems in order to facilitate residential development on rural lands in the county. Deschutes County, DEQ, and DLCD need to explain how sewer service that they describe as "necessary to guard against unacceptable levels of pollution in the area's groundwater that would expose citizens to health risks" will correct the problem when connection to the sewer system is entirely optional.
2022-2024	**DEQ Groundwater Sampling**	DEQ initiated a groundwater monitoring study for South Deschutes County. CDD received well sampling data in a tabular format from DEQ. It revealed the following: ▪ Many of the sampled wells are new; ▪ In several well locations there are non-detect (negligible) traces of nitrates; ▪ Certain wells north of Burgess Road and in La Pine showed increases in nitrates; ▪ The well data is a snapshot in time that can be used and referenced in future well sampling events; ▪ The data does not change our understanding of the La Pine subbasin; it is still vulnerable to nitrate loading; and ▪ Nitrate-reducing onsite systems are still necessary to protect the aquifer.
2024	**EPA Community Change Grant Application**	Coordinated a $20 million Community Change Grant application to the EPA in partnership with NeighborImpact, COIC, DEQ and other County departments. Approximately $10 million is allocated to assist eligible residents to upgrade their onsite wastewater treatment systems to alternative treatment technologies. The application was ultimately not selected.

Appendix A – Southern Deschutes County Groundwater Protection Timeline

Year	Topic	Comments
2025	**Senate Bill 1154**	The Governor signed Senate Bill 1154 on July 24. This legislation modifies state law pertaining to Ground Water Quality Concern Areas (GWQCA). It streamlines GWQCA declarations once contaminants like nitrates are found in groundwater. This allows the state to provide a quicker response by formulating an interagency team, assessment, outreach plan, trend analysis, monitoring plan, and publicly assessable information. Additionally, once a declaration is made by DEQ and its Environmental Quality Commission (EQC), Goal 11 Exceptions are waived. A county can then enter into an agreement with a city, water, or wastewater district to provide water or wastewater services for residential dwellings.
	DEQ Rulemaking	DEQ completed rulemaking to address sewer availability and accessory dwelling unit issues prompted by bills enacted by the 2023 Legislature. During rulemaking, DEQ also discussed nitrates, variances, and operation and maintenance for Alternative Treatment Systems (ATTs). On September 11, 2025 the EQC adopted new rules, effective January 1, 2026. As it pertains to ATT systems, they provide greater clarity on roles and responsibilities to ensure consistent maintenance statewide, establish minimum maintenance requirements, update enforcement penalties, and facilitate efficient operation of the Onsite Program.

Appendix B – Approved DEQ Septic Variance Map



Appendix C – Installed ATT Systems Map