

## **APPENDIX B: Local Rule for Groundwater Protection in Southern Deschutes County**

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1. Summary of public outreach
2. Ordinance and adopted code
3. Staff report
4. Resolution and performance standard map for existing systems
5. Local Rule Implementation Plan



## Summary of public outreach

### Local Rule Communication Plan and Public Outreach Summary

Deschutes County Community Development Department  
117 NW Lafayette Ave., Bend, OR 97701  
PH: (541) 388-6575, FAX: (541) 385-1764  
Web: [www.deschutes.org/cdd/gpp/](http://www.deschutes.org/cdd/gpp/)



The goal of the Local Rule is to protect the sole source of drinking water for the residents of south Deschutes County using the least cost option and creating financial assistance programs.

#### Web site

- [www.deschutes.org/cdd/gpp/](http://www.deschutes.org/cdd/gpp/). The documents listed below are available under "Project News."

#### Articles and reports

This list reflects articles published in print media. Television and radio spots are not included.

- Bend Chamber, September 2008
- Bend Bulletin, 09-09-08
- Bend Bulletin, 08-28-08
- Bend Bulletin, 08-21-08
- Bend Bulletin, 08-13-08
- Bend Bulletin, 07-10-08
- Bend Bulletin, 07-08-08
- Bend Bulletin, 06-20-08
- Bend Bulletin, 06-12-08
- Bend Bulletin, 06-06-08
- Bend Bulletin 05-19-08
- Bend Bulletin 05-15-08
- Bend Bulletin 05-05-08
- Bend Bulletin 04-24-08
- Questions from the March 19, 2008 Hearing
- Bend Bulletin 04-03-08
- Bend Bulletin 04-03-08 Map
- Newberry Eagle April 2008
- Bend Bulletin 03-28-08
- Bend Bulletin 03-23-08
- Bend Bulletin 03-20-08 B
- Bend Bulletin 03-20-08 A
- Bend Bulletin 03-17-08
- Bend Bulletin 02-06-08
- Bend Bulletin 01-31-08
- Oregon DLCD Response, 01-30-08
- Questions from the Board to Oregon DEQ & DLCD, 01-30-08
- Bend Bulletin Clarification 12-05-07
- Bend Bulletin 11-06-07
- Bend Bulletin 11-04-07
- USGS Fact Sheet, Questions and answers about the effects of septic systems on water quality in the La Pine area, Oregon
- USGS Report, Evaluation of approaches for managing nitrate loading from on-site wastewater systems near La Pine, Oregon
- USGS Report, Ground Water Redox Zonation near La Pine Oregon: Relation to River Position within the Aquifer-Riparian Zone Continuum
- Bend Bulletin 10-29-07
- Press Release 10-08-07
- Bend Bulletin 10-07-07



- Bend Bulletin 09-27-09
- Bend Bulletin 07-24-07
- Newberry Eagle Article, April 2007
- EH information, Newberry Eagle April 2007
- Bend Bulletin Article, March 30, 2007
- The Source Article, March 29, 2007
- Bend Bulletin Article, March 29, 2007
- Bend Bulletin Article, March 28, 2007
- Bend Bulletin Article, March 21, 2007
- Bend Bulletin Article, March 19, 2007
- Bend Bulletin Article, March 7, 2007
- Bend Bulletin article, March 1, 2007
- Bend Bulletin Article, February 22, 2007
- Newberry Eagle article, February 2007
- Bend Bulletin Article, February 1, 2007
- Bend Bulletin Article, January 17, 2007
- Citizen Update Newsletter, January 2007
- Newberry Eagle articles, January 2007
- Journal of Hydrology paper
  - Supplement 1
  - Supplement 2
  - Supplement 3
  - Supplement 4
- Groundwater Science Open House Notice December 2006
- Bend Bulletin article, December 21, 2006
- Bend Bulletin article, December 20, 2006
- Newberry Eagle article, December 2006
- Bend Bulletin Article, December 1, 2006
- Bend Bulletin Article, November 2006
- Newberry Eagle article, November 2006
- Newberry Eagle article, October 2006
- Newberry Eagle article, September 2006
- Newberry Eagle article, May 2006
- Deschutes County Citizen Update, May 2006
- Bend Bulletin article, May 2006
- Bend Bulletin article, April 2006
- Bend Bulletin article, February 2006

#### Notices (PDF files)

- Press releases issued prior to each public meeting
- Notices of meetings posted at area stores, libraries, La Pine Senior Center, post office, etc.
- Notice of Public Hearing, July 7, 2008
- Notice of Public Meeting, June 5 & 6, 2008
- Notice of Public Hearing 02-15-08
- Notice of Public Hearing on Proposed Local Rule
  - Ordinance 2007-011
  - Draft Local Rule
  - Staff Report
  - Resolution 2007-023
  - Exhibit A to Resolution 2007-023
- Office Hours Scheduled in January 2007
- Notice of Planning Commission meeting, November 30, 2006
- Notice of Local Rule - Tax Bill Insert, October 2006
- Notice of Groundwater Protection Project (distribution began March 2006)
- Groundwater Protection Project Update, September 2006

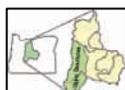


### Brochures, Handouts & Posters (PDF files)

- Application form - south county advisory committee - direct mailed to owners of property in south Deschutes County, 10/09/07
- Frequently Asked Questions (one page), 04/18/08
- Proposed Local Rule documents
- Deschutes County memo on nitrate concerns
- Oregon Department of Human Services - Technical Bulletin on Nitrates
- Nitrogen Reducing Onsite Systems Poster
- Effects of onsite systems on groundwater poster
- Frequently Asked Questions
- Alternatives Analysis
- Retrofit Cost Scenarios, Winter 2007
- Proposed Local Rule Concepts
- But my water was just tested! November 2006
- Pollution Reduction Credit Program Brochure, Fall 2006
- Project Overview Brochure, Spring 2006
- South County Groundwater Protection History, Spring 2006
- Why Not Sewer? Brochure, Spring 2006

### Other Outreach/Participation events:

- Installer meetings – typically held by Deschutes County Environmental Health staff
  - August 22, 2006
  - October 17, 2006
- Realtor meetings
  - Regular weekly meetings with COAR representatives – typically held by Deschutes County Community Development Director and Planning Director
  - September 6, 2006 – conducted by County EH staff and the CDD Director
  - November 27, 2006 (requested by realty office) – presentation provided by EH staff
  - December 9, 2006 (requested by two realty offices) – two presentations provided by EH staff
  - July 2
- Public meetings and events
  - May 13, 2003, Presentation of results from the 3-D model, groundwater study and nitrogen reducing system field test to the Board of County Commissioners in La Pine.
  - May 11, 2006, Planning Commission meeting (part of TDC Amendment Hearing)
    - All published materials leading up to and following up on TDC amendments also referred to the need for a Local Rule (see "Project News" page of website)
  - November 9, 2006 (requested by the La Pine Senior Center)
  - November 30, 2006 (hosted by the Deschutes County Planning Commission)
  - December 20, 2006 (Science Session requested at 11/30/2006 Planning Commission meeting)
  - Office Hours:
    - January 4, 2007, 5:00 - 7:00, Deschutes County office, La Pine
    - January 9, 2007, 1:00-5:00, Village Properties office, Sunriver
    - January 18, 2007, 1:00-5:00, Village Properties, Sunriver
    - January 23, 2007 3:00 - 5:00, Deschutes County office, La Pine
  - Hearing before the Board of County Commissioners, March 13, 20, 27<sup>th</sup>, 6:00 – 9:00 PM, La Pine High School
  - Written record for proposed Local Rule open from February 2007 to present (February 2008)



- Board of County Commissioners work session with Oregon Department of Environmental Quality and Department of Land Conservation and Development, April 18, 2007
  - Board of County Commissioners work session with Oregon Department of Environmental Quality and Department of Land Conservation and Development, January 30, 2008
  - Hearing before the Board of County Commissioners, March 19, 2008, La Pine High School
  - Public work sessions of the Board of County Commissioners, April through June 2008
  - Hearing before the Board of County Commissioners, July 7, 2008, Board Hearing Room
  - Deliberation and Decision of the Board of County Commissioners, July 9, 2008
  - Adoption of Deschutes County Code Chapter 13.14, unanimous vote of the Board of County Commissioners, July 23, 2008, effective October 23, 2008
- Other public information contacts
- On-going one on one contacts with EH staff either in person or by phone/e-mail
  - Deschutes County Home Show, May 2006
  - Open House, May 6, 2006, Deschutes County office, 51340 S. Highway 97, La Pine
  - Groundwater Science Open House, December 20, 2006, 4:00-6:00 PM, 51340 S Highway 97, La Pine
  - Presentations available upon request



**Ordinance and adopted code**

REVIEWED  
*sl*  
LEGAL COUNSEL

For Recording Stamp Only

BEFORE THE BOARD OF COUNTY COMMISSIONERS OF DESCHUTES COUNTY, OREGON

An Ordinance Adding Chapter 13.14 to Title 13,  
Public Services, of the Deschutes County Code.

\*  
\*

ORDINANCE NO. 2008-012

WHEREAS, the Oregon Department of Environmental Quality, in a letter date January 4, 2008, determined that a public health hazard exists in the south Deschutes County area, the cause of which is pollution discharged by conventional onsite wastewater treatment systems;

WHEREAS, "Pollution" is defined in OAR 340-071-0100 as "any alteration of the physical, chemical, or biological properties of any waters of the state, including change in temperature, taste, color, turbidity, silt, or odor of the waters, or any discharge of any liquid, gaseous, solid, radioactive, or other substance into any waters of the state that, alone or in connection with any other substance, threatens to create a public nuisance or render such waters harmful, detrimental, or injurious to public health, safety, or welfare or to domestic, commercial, industrial, agricultural, recreational or other legitimate beneficial uses or to livestock, wildlife, fish, or other aquatic life or the habitat thereof;"

WHEREAS, "Public health hazard" is defined in OAR 660-011-0060 as "a condition whereby it is probable that the public is exposed to disease-caused physical suffering or illness due to the presence of inadequately treated sewage;"

WHEREAS, Deschutes County Community Development Department staff proposed amendments to the Deschutes County Code ("DCC") to require the use of nitrogen reducing onsite systems for permits issued by the County; and

WHEREAS, notice of the proposed DCC text amendment was mailed in the Deschutes County tax statements to 10,243 property owners in the South Deschutes County area; and

WHEREAS, the Deschutes County Planning Commission hosted an information session on the proposal in November 2006, notice of which was published in The Bulletin on November 25, 2006 and the Newberry Eagle on November 1, 2006; and

WHEREAS, the Board of County Commissioners ("Board") held public hearings on March 13, 20 and 27, 2007 and on March 13, 2008, notice of which was published in The Bulletin on March 4, 2007; and

WHEREAS, the public record for the rule was open for written testimony between March 27, 2007 and April 18, 2008; and

WHEREAS, the Board held a public hearing on March 19, 2008, a notice of which was published in the Bend Bulletin on February 18, 2008;

WHEREAS, the Board mailed information about the proposed amendment entitled "Frequently Asked Questions" to 9,484 property owners in south Deschutes County on April 18, 2008; and

PAGE 1 OF 2 - ORDINANCE NO. 2008-12 (7/9/08)



WHEREAS, the Board finds that the public will benefit from changes to the Deschutes County sanitation regulations to require better nitrogen reducing wastewater treatment systems in the south Deschutes County area; now, therefore,

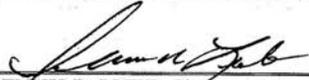
THE BOARD OF COUNTY COMMISSIONERS OF DESCHUTES COUNTY, OREGON, ORDAINS as follows:

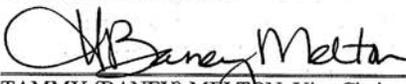
Section 1. ADDING. That Deschutes County Code Title 13 is amended by the addition of a new chapter as described in Exhibit "A," attached hereto and by this reference incorporated herein.

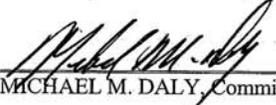
Section 2. FINDINGS. That the Board adopts as its findings in support of this decision, the Staff Report, attached as Exhibit "B" and incorporated by reference herein.

Dated this 23<sup>rd</sup> of July, 2008

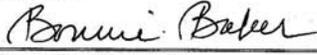
BOARD OF COUNTY COMMISSIONERS  
OF DESCHUTES COUNTY, OREGON

  
DENNIS R. LUKE, Chair

  
TAMMY (BANEY) MELTON, Vice Chair

  
MICHAEL M. DALY, Commissioner

ATTEST:

  
Recording Secretary

Date of 1<sup>st</sup> Reading: 9<sup>th</sup> day of July, 2008.

Date of 2<sup>nd</sup> Reading: 23<sup>rd</sup> day of July, 2008.

Record of Adoption Vote

Commissioner	Yes	No	Abstained	Excused
Dennis R. Luke	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tammy Melton	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Michael M. Daly	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Effective date: 23<sup>rd</sup> day of October, 2008.

ATTEST:

  
Recording Secretary



EXHIBIT "A"

**Chapter 13.14. SOUTH COUNTY ONSITE WASTEWATER TREATMENT**

- 13.14.010. Application.**
- 13.14.020. Definitions.**
- 13.14.030. Siting Criteria for New Development.**
- 13.14.040. Groundwater Level Determinations.**
- 13.14.050. Performance Standards.**
- 13.14.060. Listing Nitrogen Reducing Systems.**
- 13.14.070. Approval of Other Groundwater Protection Wastewater Treatment Systems.**
- 13.14.080. Variances.**
- 13.14.090. Appeals.**
- 13.14.100. Fees.**
- 13.14.110. Violation.**

**13.14.010. Application.**

- A. The provisions in DCC Chapter 13.14 are in addition to the requirements of ORS 454.605 to 454.755 and OAR chapter 340, divisions 071 and 073 and, in the event of an inconsistency, the more stringent provisions shall apply.
- B. The provisions in DCC Chapter 13.14 apply only to those wastewater treatment systems that treat flows of residential strength wastewater, as defined in OAR 340-071, of 2,500 gallons per day or less.  
(Ord. 2008-012 §1, 2008)

**13.14.020. Definitions.**

"Department" means, for purposes of this chapter, the Deschutes County Community Development Department.

"Existing Development" means uses in South County on a Lot served by an Onsite System that does not meet the performance standards contained in DCC 13.14.050(E) as of the effective date of Ordinance 2008-012.

"Lot" means lot or parcel as defined in ORS chapter 92. Tax lots may or may not be equivalent to legal Lots of record.

"Maximum Nitrogen Reducing System" means an Onsite System or Systems allowed for use by ODEQ and listed by the Department in accordance with DCC 13.14.060 as having demonstrated at least 79% nitrogen reduction and total nitrogen concentrations of less than 10 mg/L.

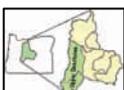
"New Development" means the establishment of a use on a Lot in South County where there is no existing use served by an Onsite System as of the effective date of Ordinance 2008-012.

"Nitrate Loading Management Model" means the model produced by the US Geological Survey ("USGS") that specifies the performance standards that must be met by Onsite Systems in order to meet groundwater protection goals.

"ODEQ" means the Oregon Department of Environmental Quality.

"Onsite System" means onsite wastewater treatment system as defined in OAR 340, division 71.

"Sewer System" means a system as defined in OAR chapter 660, division 11 that serves more than one Lot or parcel, or more than one condominium unit or more than one unit within a planned unit development, and includes pipelines or conduits, pump stations, force mains, and all other structures,



devices, appurtenances and facilities used for treating or disposing of sewage or for collecting or conducting sewage to an ultimate point for treatment and disposal. The following are not considered a Sewer System for the purpose of this code:

- A. A system provided solely for the collection, transfer and/or disposal of storm water runoff; or
- B. A system provided solely for the collection, transfer and/or disposal of animal waste from a farm use as defined in ORS 215.203.

“South County” means those unincorporated portions of Deschutes County contained in Townships 19, 20, 21, 22 and Ranges 9, 10, and 11, except those areas authorized for sewer.

“WPCF Permit” means Water Pollution Control Facility permit.  
(Ord. 2008-012 §1, 2008)

**13.14.030. Siting Criteria for New Development.**

New Development shall meet the following criteria in order for an Onsite System to be permitted and constructed on the Lot:

- A. For the purpose of site evaluation approval, any modification to the Lot, including the placement of fill or the installation of groundwater interceptors, shall not be allowed.
- B. For site evaluations applied for and approved after the effective date of Ordinance 2008-012, an Onsite System, including the absorption facility, shall be installed on the Lot where the use to be served by the system is located.
- C. Locating the Onsite System or portion thereof on an adjoining Lot may be permitted if the Lots are consolidated or the Lot line adjusted following a final land use decision by the County.
- D. The absorption facility for the Onsite System shall be installed to provide a minimum 24 inch vertical separation to the highest level attained by a groundwater table as measured from the bottom of the absorption facility to the highest level of the groundwater table.
- E. The provisions in DCC 13.14.030(A), (B) and (C) expire 3 years from the effective date of Ordinance 2008-012 unless amended by the Board of County Commissioners.

(Ord. 2008-012 §1, 2008)

**13.14.040. Groundwater Level Determinations.**

- A. If the County, upon review of a site evaluation application for an Onsite System, finds that soil characteristics indicating conditions associated with saturation as defined in OAR 340-071 are inconclusive and groundwater levels cannot be determined, then groundwater levels shall be determined using direct measurement of groundwater on the Lot and in the general area.
- B. Direct measurements by the County shall be made during a spring following a winter (October through March) with at least average Central Oregon historical total precipitation.
- C. Application for groundwater level determinations shall be made to the Department no later than the February 15 prior to the dates the groundwater measurements are to be conducted pursuant to DCC 13.14.040(A) and (B).
- D. If the winter precipitation for the year in which the application is made is not equal to at least average precipitation levels described in DCC 13.14.040(B), then the application will be held and the groundwater level determination made after the next winter with at least average Central Oregon historical total precipitation.

(Ord. 2008-012 §1, 2008)

**13.14.050. Performance Standards.**

- A. The following performance standards shall apply to:
  - 1. New Development at time of application for site evaluation and permit issuance;



2. Existing Development at time of application for an authorization notice, major alteration, or major repair, and
  3. Existing Development at the time of upgrade required under DCC 13.14.050(F).
- B. New Development shall install a Maximum Nitrogen Reducing System.
- C. Subject to DCC 13.14.050(F), Existing Development located on a Lot that does not meet the 24 inch vertical separation to groundwater shall install a Maximum Nitrogen Reducing System.
- D. Subject to DCC 13.14.050(F), Existing Development located on a Lot that meets the 24 inch vertical separation to groundwater shall install an Onsite System that reduces nitrogen to at least the level specified for the area within which the Lot lies as specified in DCC 13.14.050(E).
- E. The Board shall adopt by resolution:
1. The Nitrate Loading Management Model;
  2. Minimum nitrogen reduction standards applicable to this chapter; and
  3. The map depicting where standards for Existing Development apply. The Department shall maintain the map depicting where standards for Existing Development apply.
- F. Except as provided in DCC 13.14.050(G) and DCC 13.14.080, all Existing Development served by Onsite Systems shall be upgraded with nitrogen reducing systems in accordance with DCC 13.14.050(C) and (D) no later than November 15, 2022.
- G. An Onsite System that was or is operating under a WPCF Permit from ODEQ shall not be required to meet the performance standards in DCC 13.14.050(D) until such time as a major alteration or major repair is needed in accordance with OAR 340, division 71.
- (Ord. 2008-012 §1, 2008)

**13.14.060. Listing Nitrogen Reducing Systems.**

- A. Onsite Systems used for upgrades to Existing and New Development in the South County shall be Onsite Systems allowed by the ODEQ.
- B. Onsite Systems or components designed to reduce nitrogen, including Maximum Nitrogen Reducing Systems, shall be identified on a list maintained by the Department.
1. The list shall categorize the systems or components by demonstrated nitrogen reduction capability.
  2. The nitrogen reduction categories in this list shall correspond to the performance standards shown in the legend on the map adopted under DCC 13.14.050(E) and which shows where the specific performance standards must be achieved.
- C. Vendors or designers of Onsite Systems may apply to the County to have additional systems listed by the Department as nitrogen reducing systems.
1. Applications must be submitted on a form specified by the Department and shall be accompanied by the fee established by the Board.
  2. Applications must include documentation that the proposed Onsite System will meet the standards contained in DCC 13.14.050(E) and 13.14.060(A).
    - a. An application by a vendor or designer to list an additional Onsite System as a nitrogen reducing system shall include, but is not limited to, the following information:
      - i. The quality of the septic tank effluent or wastewater influent received by the system during the performance test;
      - ii. The quality of the proposed Onsite System influent and effluent including the following:
        - a. The quality of the proposed Onsite System nitrogen concentration including organic and inorganic forms of nitrogen;
        - b. Biochemical oxygen demand (5-day), total suspended solids, pH, dissolved oxygen, and temperature; and
        - c. Measurements of wastewater flow to the system during the performance test.
      - iii. Lists of installers and maintenance providers certified to work in Oregon;
      - iv. List of distributors or qualified designers for the system in Oregon; and



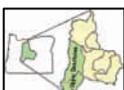
- v. Additional information and application fee as required by the Department.
  - b. Data submitted by vendors or designers in support of an application to list an additional Onsite System as a nitrogen reducing system shall include at least one of the following:
    - i. Peer reviewed articles;
    - ii. Third party reports; or
    - iii. Papers and data presented and published in conference proceedings.
  - c. If data show the total nitrogen concentration of the influent to the proposed Onsite System is less than 65 mg/L on average, then the system's nitrate reduction performance shall be prorated accordingly unless the data show that nitrogen reduction increases as influent increases.
- G. Onsite Systems listed by the Department shall continue to be listed unless performance data indicates that listing should be changed or revoked.  
(Ord. 2008-012 §1, 2008)

**13.14.070. Approval of Other Groundwater Protection Wastewater Treatment Systems.**

- A. A Sewer System is permitted when:
    - 1. A Sewer System has been authorized pursuant to OAR 660-11-0060(9) and OAR 660, division 4, including documentation that the Deschutes County Comprehensive Plan and Zoning Code have been amended and acknowledged pursuant to ORS 197; or
    - 2. A Sewer System has been authorized pursuant to OAR 660-011-0060(4) through (7), including documentation that the Deschutes County Comprehensive Plan and Zoning Code have been amended and acknowledged pursuant to ORS 197; and
    - 3. The performance of the Sewer System reduces total nitrogen loading for the area to be served, as measured in kilograms per day, to the minimum level specified by the Nitrate Loading Management Model and in DCC 13.14.050.
  - B. A property owner may propose to the County a system other than an Onsite System or a Sewer System to reduce nitrogen loading to groundwater.
    - 1. The property owner shall have the burden of proof that the proposed system will perform equal to or better than the performance standards established in DCC 13.14.050.
    - 2. The system proposed to serve either New Development or Existing Development shall meet the minimum requirements adopted by the Board per DCC 13.14.050.
- (Ord. 2008-012 §1, 2008)

**13.14.080. Variances.**

- A. The Department Director or, if on appeal, the Board, may authorize a variance from the requirements of DCC 13.14.050.
- B. Applications to the Department for variances shall be submitted on a form specified by the Department and accompanied by the fee established by the Board.
- C. The application must state fully the grounds for the variance and facts relied upon by the applicant and must demonstrate how strict compliance with the standard is impracticable.
- D. The Department Director or the Board may grant a variance in one of the following situations:
  - 1. The applicant provides a report of a detailed hydrogeologic investigation by a registered hydrogeologist that demonstrates that the groundwater is protected from nitrogen contamination by the presence of persistent oxygen-limited groundwater conditions that will reduce nitrogen in the groundwater for the life of the system; or
  - 2. The applicant demonstrates that an extreme or unusual financial hardship exists.
    - a. The following factors shall be considered by the Department or the Board in reviewing an application for a variance based on financial hardship:
      - 1) Applicant's advanced age or poor health;



- 2) Applicant's financial ability to pay for a nitrogen reducing system;
  - 3) Applicant's need to care for aged, incapacitated, or disabled relatives;
  - 4) The availability of financial assistance that is sufficient to offset the cost of installing, operating, or maintaining a nitrogen reducing Onsite System;
  - 5) Environmental impacts from the variance.
- b. Hardship variances granted by the Department shall include conditions that:
- 1) Limit permits to the life of the applicant;
  - 2) Limit the number of permanent residents using the system;
  - 3) Require that the system is retrofitted to a nitrogen reducing Onsite System at time of sale of the property; and
  - 4) Requiring that the compliance date specified in DCC 13.14.050(F) shall not apply until time of sale of the property.
3. The applicant demonstrates that:
- a. The onsite system serving the property is failing;
  - b. The application for the variance includes a legal commitment from the sewer district or other legal entity to extend a sewer system that meets the requirements of DCC 13.14.050 to the property covered by the application; and
  - c. The connection of the property to the sewer will be complete within five years from the date of application.
- (Ord. 2008-012 §1, 2008)

**13.14.090. Appeals.**

- A. Decisions of the Department made pursuant to this chapter may be appealed to the Board within twelve days of the date the Department's decision was mailed.
  - B. The appeal shall be filed with the Department using a form specified by the Department and fee established by the Board.
  - C. The documentation supporting the appeal must state fully the grounds on which the applicant is appealing the decision, the facts relied upon by the applicant and must demonstrate how strict compliance with the standard is impracticable.
  - D. Decisions of the Board may be appealed in accordance with DCC 13.40.
- (Ord. 2008-012 §1, 2008)

**13.14.100. Fees.**

- A. The Board shall establish fees by resolution for permits and services under DCC 13.14.
- (Ord. 2008-012 §1, 2008)

**13.14.110. Violation.**

- A. Violation of any provision of DCC 13.14 is a Class A violation.
- (Ord. 2008-012 §1, 2008)

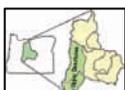


Exhibit "B"



## Community Development Department

Planning Division Building Safety Division Environmental Health Division

117 NW Lafayette Avenue Bend Oregon 97701-1925  
(541)388-6575 FAX (541)385-1764  
<http://www.co.deschutes.or.us/cdd/>

### STAFF REPORT

Public Hearing July 7, 2008

The Board will consider adoption of the proposed "Local Rule," under which all residential properties in the unincorporated areas of South Deschutes County that are not currently served by sewer systems would be required to upgrade their septic systems to reduce nitrogen discharges, connect to sewer systems or take some other nitrogen-reduction measure within 14 years of the effective date of the ordinance.

Highlighted areas in the staff report indicate the significant changes from previous versions.

**PROPOSAL:** Consider adoption of a Local Rule to require the use of nitrate reducing onsite wastewater treatment systems or other approaches to achieve the same level of groundwater protection in south Deschutes County to protect the primary source of drinking water and surface waters of the upper Deschutes River watershed.

The proposal includes requirements that:

1. New development installs systems that are Maximum Nitrogen Reducing Systems (defined as systems that achieve a minimum of 79% reduction in total nitrogen and discharge a maximum of 10 mg/L total nitrogen);
2. Existing systems upgrade within 14 years of the date the rule takes effect;
3. Existing systems meet a variable nitrogen reduction standard established by the USGS Nitrate Loading Management Model

Other programs interacting with the proposal include financial assistance programs funded by the sale and development of land within the La Pine Neighborhood Planning Area and state rules governing the expansion or creation of sewers in rural areas.

**STAFF:** Tom Anderson, Community Development Department Director  
Dan Haldeman, Environmental Health Director  
Barbara Rich, Senior Environmental Health Planner  
Peter Gutowsky, Principal Planner  
Todd Cleveland, Environmental Health Specialist  
George Read, Management Analyst

Dated this 2nd day of July, 2008

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Local Rule for Onsite Wastewater Treatment Systems in South Deschutes County

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*Quality Services Performed with Pride*



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I. **EXISTING POLICY:**

OAR 340-071, Onsite Wastewater Treatment System Rules  
OAR 340-040, Groundwater Quality Protection  
Deschutes County Comprehensive Plan, Chapter 23.44, Regional Problem Solving  
Deschutes County Code Chapter 13.08, Onsite sewage disposal and septic systems  
Deschutes County Code Chapter 11.12, Transferable Development Credit Program  
Ordinance 2008-019

II. **BASIC FINDINGS:**

- A. **Affected area:** The areas affected by the proposal are unsewered areas between Sunriver and the Klamath County border, this area is formally defined as those unincorporated portions of Deschutes County contained in Townships 19, 20, 21, and 22 and Ranges 9, 10 and 11, except those areas authorized for sewer.
- B. **Affected uses:** Uses affected by the proposal are those generating less than 2,500 gallons of residential strength wastewater per day.
- C. **Purpose:** The goal of the proposed rule is to reduce onsite wastewater treatment system pollutants, particularly nitrogen, discharged to the sole source aquifer in order to maintain and improve public waters in the La Pine basin of the upper Deschutes River watershed. The proposed rule applies only to those systems for which the County has permitting authority (systems that generate less than 2,500 gallons per day of residential waste strength wastewater).
- D. **History and background:** South Deschutes County has been the focus of extensive local, state and federal attention beginning in the early 1980s with the identification of significant groundwater impacts from onsite wastewater treatment systems in the La Pine Unincorporated Community. Provided below is a timeline of events related to water quality in the region.

<b>1960's and 1970's</b>	125-square mile area of La Pine subdivided into over 12,000 lots
<b>1982</b>	La Pine Aquifer Study finds high nitrate levels in groundwater underlying the core area of La Pine.
<b>1986</b>	La Pine core area sewerred.
<b>1994</b>	Oregon DEQ finds increasing nitrate levels outside of the La Pine area.
<b>1996</b>	County receives a \$157,250 Regional Problem Solving grant from DLCD to identify regional problems and evaluate solutions.
<b>1997</b>	Sewer Feasibility Study determined that creating or expanding sewers in the study areas to cost 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.



<b>1998</b>	<p>Water Quality Directives resulting from Regional Problem Solving:</p> <ul style="list-style-type: none"> <li>▪ Continue studying nitrates, well head protection, and alternative sewage disposal systems.</li> <li>▪ Do not build a new sewer system in study areas</li> <li>▪ Reduce residential density to meet the carrying capacity of onsite sewage disposal systems through a market-based Transfer of Development Credit Program</li> <li>▪ Identify areas where existing community sewer systems can be expanded (La Pine Sewer District).</li> <li>▪ Support Oregon Water Wonderland II (OWW2) efforts to upgrade existing sewage treatment facilities for that subdivision</li> </ul>
<b>1999</b>	Oregon DEQ received \$5.5 million grant from US Environmental Protection Agency to study the groundwater, model the aquifer, and field test nitrogen reducing onsite systems
<b>2000</b>	<p>Deschutes County Comprehensive Plan amended to include these goals in response to public involvement during Regional Problem Solving:</p> <ol style="list-style-type: none"> <li>1. To preserve water and air quality, reduce wildfire hazards and protect wildlife habitat.</li> <li>2. To ensure that domestic water derived from groundwater meets safe drinking water standards.</li> <li>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.</li> <li>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.</li> <li>5. To explore innovative sewage treatment and disposal methods</li> </ol>
<b>1999-2004</b>	Field sampling of groundwater and onsite wastewater treatment system effluent. Results of studies reported at numerous national, regional and state meetings.
<b>2002</b>	Transferable Development Credit Program adopted
<b>2003</b>	Findings of the La Pine National Demonstration Project groundwater investigation and three-dimensional groundwater modeling presented at a public meeting in La Pine.
<b>2005</b>	The US Geological Survey completes an upgrade to the three dimensional groundwater model and produces the Nitrate Loading Management Model
<b>2005</b>	The County convenes the TDC Technical Advisory Committee to amend the Transferable Development Credit Program to better focus the resources created by the La Pine Neighborhood Planning Area on solving the groundwater protection problem.
<b>Dec 2005</b>	The TDC Technical Advisory Committee recommends creating a Pollution Reduction Credit program to work in conjunction with a local rule to require the use of nitrogen reducing onsite wastewater treatment systems.
<b>May 2006</b>	The Planning Commission, after holding a public hearing in La Pine, recommended that the Board of County Commissioners adopt amendments to the Transferable Development Credit Program to create Pollution Reduction Credits and financial assistance for homeowners upgrading their existing onsite wastewater treatment systems to better protect groundwater.

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<b>June 2006</b>	The Board of County Commissioners adopted amendments to the Transferable Development Credit Program to create Pollution Reduction Credits.
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**E. Public involvement:** The Community Development Department developed a public participation plan to solicit comments and suggestions for the proposed Local Rule while the Pollution Reduction Credit program was being established. The first phase of the public participation process was to develop a notice of the Groundwater Protection Project to include with all site evaluation and permit application materials. The Environmental Health Division began distributing this notice with permit materials in March 2006.

Next, the Department developed the first of a series of public information brochures about the issues and proposal:

- Project Overview Brochure, Spring 2006
- South County Groundwater Protection History, Spring 2006
- Why Not Sewer? Brochure, Spring 2006

These brochures were first distributed at an open house for the opening of the South County Services building and at the Home Show at the Deschutes County Fairgrounds in May 2006.

Next steps included revising the Groundwater Protection Project website and initiating meetings with area onsite system installers and realtors.

Further public information materials were developed in late summer 2006 with monthly articles in the *Newberry Eagle* beginning in September 2007. Additional public information materials were developed at this time including the following notices and brochures:

- Notice of Planning Commission meeting, November 30, 2006
- Notice of Local Rule - Tax Bill Insert, October 2006
- Notice of Groundwater Protection Project (distribution began March 2006)
- Groundwater Protection Project Update, September 2006
- But my water was just tested! November 2006
- Pollution Reduction Credit Program Brochure, Fall 2006

The Tax Bill Insert was mailed to 10,243 property owners to provide individual notice of the proposed rule. Following this the Department held a series of public meetings to present the reason for the proposed rule and solicit comments and suggestions about the Local Rule Concepts. The public meetings began with two events held at the La Pine Senior Center:

- November 9, 2006 (requested by the La Pine Senior Center)
- November 30, 2006 (hosted by the Deschutes County Planning Commission)

The attendees at the November 30 meeting requested a session specifically for reviewing the scientific basis of the proposed rule. This session was held December 20, 2006 and was presented as the Groundwater Science Open House with the USGS in attendance to answer questions about the groundwater investigation and models. The open house format was used to allow interested persons to move from station to station and ask specific questions easily and quickly without having to wait through a lengthy

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presentation. The Department decided to use this format after receiving feedback from the November 30 meeting that some attendees felt intimidated about asking questions in the lecture format when audience members were loudly responding to questions and answers.

The Department, following the Groundwater Science Open House, scheduled additional office hours to provide more opportunities for interested persons to drop by and obtain more information about the science or other aspects of the proposal. The Department scheduled office hours each week in January 2007 on different days of the week and at different times during the day. The variation in locations, times and days were in response to comments that all the meetings were held in the southern portion of the affected area and that they were being held in the evening. By mixing the days, locations and times, Department staff intended to create opportunities for interested persons to be able to attend at least one session. Unfortunately, times and locations for the office hour sessions in the northern portion of the affected area were constrained by the available space. As a result these sessions were made twice as long as the southern sessions.

- January 4, 2007, 5:00 - 7:00, Deschutes County office, La Pine
- January 9, 2007, 1:00-5:00, Village Properties office, Sunriver
- January 18, 2007, 1:00-5:00, Village Properties, Sunriver
- January 23, 2007 3:00 - 5:00, Deschutes County office, La Pine

The Board of County Commissioners held a public hearing over three nights on March 13, 20, and 27, 2007 on the proposed rule. The Board closed the hearing on March 27<sup>th</sup> but left the written record open for public comments. The Board re-opened the record for verbal testimony on the amendments presented at the March 19, 2008 hearing. The record was closed for verbal testimony at the end of the hearing and the written record was left open until April 18, 2008. Because this is a legislative code amendment, the Board has accepted all written testimony submitted after April 18, 2008.

The Board of County Commissioners held public work sessions with the Oregon Department of Environmental Quality and the Oregon Department of Land Conservation and Development on April 18, 2007 and January 30, 2008 to discuss the groundwater science and modeling and next steps for protecting groundwater in the region.

The full list of notices, public information materials, and newspaper articles is available as Appendix A. Appendix B provides a summary of the materials and information provided at the Groundwater Science Open House. These materials were also provided at the office hour sessions.

The Transferable Development Credit Technical Advisory Committee and the Deschutes County Planning Commission have also been kept apprised of the Local Rule public comment and participation process leading up the public hearing in March 2007.

On June 11, 2008, the Board of County Commissioners adopted Ordinance 2008-019 to require the use of nitrogen reducing systems on all new development and existing development at the time of major alteration (major house remodels or replacements) or major repair at time of system failure. This ordinance acknowledges the existing Oregon Administrative Rule that 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 waters or public health (OAR 340-071-0130(1)). Ordinance 2008-019 is provided in Appendix C.

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F. **Public comments:** As of this writing, the Department or the Board of County Commissioners has been accepting public comments and inquiries on the proposal Local Rule for nineteen months. The comments and inquiries are too numerous to include (estimated 3,500 to 4,000 pages of material) in this report but are available for review in the Community Development Department offices in Bend and La Pine or online at <http://www.deschutes.org/cdd/gpp/> at the link to "Public Record for Local Rule." The list below provides basic comment categories:

**Cost:** Affects on cost of living are too great, what kinds and quantity of financial assistance are available, what is the cost of upgrades, what are cost comparisons with other potential solutions, this will have a negative effect on the real estate market, and ideas for additional financial assistance programs.

**Science:** What is the quantity and quality of science supporting the proposed rule, how much sampling was conducted and where were the wells located, how was the quality of the information assured, was the study design and the results peer reviewed, what are the sources of nitrogen in the region, the proposal should be to change drinking water wells instead of onsite systems.

**Nitrogen Reducing System Performance:** How will the performance of these systems be verified, who can install and maintain the systems, what are the types of available systems

**Policy:** Why not a moratorium, what happens with Klamath County (as part of the groundwater system), are there case studies from other parts of the country, will there be future changes to rule requirements, what are the public participation plans, are there appeal procedures in the proposal, will there be a requirement of time of property sale upgrades, what are the enforcement procedures, are there recent installations, what are operation and maintenance requirements and costs

**Sewer:** Why not use sewer instead, what is Goal 11, use a combination of onsite and clusters

**Public Participation:** How do interested persons receive notice of events, what is the public participation plan, what is timing of events

**DEQ jurisdiction:** What are the treatment requirements for commercial and other large systems, will Klamath County have requirements for their residents, how are alternative systems approved, what are the Groundwater Management Area requirements, why not adopt a Geographic Rule instead of a Local (County) Rule

**Local Rule:** What are the performance standards, what is the affected area, what is the time period for upgrades, what are the standards for new development, what are the variance and appeal options, are there time of sale requirements

**Other:** Are there financial reports of previous projects, work plans for previous projects, the County should allow development on high groundwater lots, what is the effect of La Pine incorporation



III. **FINDINGS OF FACT:**

A. **Impacts to water quality from conventional onsite systems:**

1. ***Aquifer-scale controls on the distribution of nitrate and ammonium in ground water near La Pine, Oregon, USA. Hinkle, et al, Journal of Hydrology, (2007) 333, 486-503. (Available on the web at: <http://or.water.usgs.gov/proj/or186/>)***

**FINDING:** In order for the US Geological Survey to have a paper accepted for publication in the Journal of Hydrology, the manuscript must pass review in two stages. First, the manuscript must pass review by the editors. The editors have the option of accepting, rejecting or forwarding the manuscript for further review. Those papers rejected at this stage are insufficiently original, have serious scientific flaws, have poor grammar or English language, or are outside the aims and scope of the journal. Those that meet the minimum criteria are passed on to at least 2 experts for more thorough scientific review. The expert reviewers, or referees, are matched to the paper according to their expertise. The Journal of Hydrology uses single blind review, where the referees remain anonymous throughout the process. Referees are asked, among other considerations, to evaluate whether the manuscript:

- Is original
- Is methodologically sound
- Follows appropriate ethical guidelines
- Has results which are clearly presented and support the conclusions
- Correctly references previous relevant work

In summary, the findings of this paper have been reviewed by experts of national and/or international standing in the field of hydrology and these experts found the paper to be methodologically sound and produced results supporting conclusions that:

1. groundwater in the region is slow moving
2. the source of nitrate in the groundwater is septic tank effluent,
3. the source of ammonium in the groundwater is natural,
4. denitrification can occur in the aquifer at depths where oxygen has been depleted,
5. the nitrate contamination that has entered the aquifer so far is concentrated in the most shallow portions of the aquifer and is slowly moving to greater depths
6. the typical drinking water well produces water that is older than development in the region and therefore is generally not currently contaminated.

2. ***Evaluation of Approaches for Management Nitrate Loading from On-Site Wastewater Systems near La Pine, Oregon. Morgan et al, 2007, USGS Scientific Investigations Report 2007-5237. (Available on the web at: <http://or.water.usgs.gov/proj/or186/>)***

**FINDING:** The US Geological Survey, in partnership with Oregon DEQ, developed the three-dimensional groundwater and nutrient fate and transport model for the La Pine sub-basin of the Upper Deschutes River watershed. This model built on the groundwater study and model developed for the Deschutes River watershed by Gannett, et al (2001 and 2004). The three-dimensional model simulates the aquifer and its response to recharge from precipitation, discharge to streams and wells and certain geochemical loads.



Basic findings of the three-dimensional model are that:

1. using nitrogen reducing onsite systems can reduce the nitrogen load and protect the aquifer;
2. using nitrogen reducing systems on new development alone won't adequately protect groundwater quality;
3. upgrades occurring when systems fail or when houses are remodeled or replaced (approximately 100/year) do not occur quickly enough to protect groundwater quality;
4. the aquifer's ability to remove nitrogen is incorporated into the model (via discharge to rivers, pumping wells, or denitrification in the oxygen depleted portions of the aquifer); and
5. time is of the essence in that as more development is allowed to occur without taking action, more nitrogen enters the aquifer and more existing systems are created that need upgrades.

Resource optimization is a technique used by the military to determine how many planes, tanks, etc. can be constructed with available resources (for example, steel). When this technique is applied to natural resources (like the groundwater in the La Pine sub-basin), the resulting tool tells us how much nitrogen can be allocated to various locations with the region given the different characteristics of each area.

The US Geological Survey (Morgan et al, 2007), developed the Nitrate Loading Management Model by linking resource optimization methods to the three-dimensional simulation model. This model provides a tool that can be used to evaluate alternative strategies for managing nitrate loading to the shallow groundwater system. This model allows resource managers to identify the desired outcome (for example, groundwater meets the Oregon groundwater quality standard action level of 7 mg/L) and obtain, as a model output, the performance standards that need to be met to achieve that desired outcome (for example, area X needs to meet a performance standard of 58% to 78% reduction). Because this model can produce variable performance standards by area, it can help keep the cost for upgrades to existing systems as low as possible by avoiding a requirement that all systems install the highest level of treatment available.

The findings of this study are summarized in US Geological Survey Fact Sheet 2007-3103 entitled, "Questions and Answers About the Effects of Septic Systems on Water Quality in the La Pine Area, Oregon," (Williams et al, 2007).

Peer review processes for USGS Scientific Investigations Reports are comparable to the peer review processes described above for the Journal of Hydrology paper. As a result, staff finds that hydrogeologic expertise of both national and international caliber has reviewed the work embodied in this report and determined that it is scientifically rigorous and defensible.

3. ***Ground Water Redox Zonation near La Pine, Oregon: Relation to River Position within the Aquifer-Riparian Zone Continuum.*** Hinkle et al, 2007, USGS Scientific Investigations Report 2007-5239. (Available on the web at: <http://or.water.usgs.gov/proj/or186/>)

**FINDING:** This study was initiated in order to study how nitrogen enriched groundwater can enter nitrogen-limited surface water bodies in the upper Deschutes River watershed. Additions of nitrogen to nitrogen-limited rivers can lead to increases in primary productivity (for example, algae and aquatic plant growth) which then can reduce dissolved oxygen and change pH levels in the

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river. Significant declines in dissolved oxygen have led to fish and other aquatic life kills in other similarly affected water bodies. This study found that oxic (and potentially nitrate-rich) groundwater can enter rivers in south Deschutes County, which means that there are areas where rivers are vulnerable to impacts from increased nitrogen loading if no corrective action is taken.

**4. Drinking water well tests at time of property sale.**

**FINDING:** Thirty-one percent (31%) of 8,756 samples collected from private drinking water wells at the time of sale between September 1988 and November 2005 exceeded 1 mg/L nitrate (exceeded background levels). The samples showing greater than background levels of nitrate are shown in the table by concentration:

Concentration of NO <sub>3</sub>	Number of samples
1 - 4.99 mg/L	2068
5.00 - 9.99 mg/L	540
≥10 mg/L	82

The samples equaling or exceeding 10 mg/L ranged from 10 to 72 mg/L.

This database, as received from the Oregon DEQ, contains multiple results reported for individual properties because an individual property could have sold more than once during the period between 1988 and 2005. In addition, the quality assurance/quality control of the sample collection and analyses changed over time and could have changed from location to location. There is no information available showing that sample collection and analysis protocols were consistent over the record. While the dataset creates some concerns for the quality of data presented therein, the dataset does show that, given the fact that onsite wastewater treatment systems are the single largest source of nitrate in groundwater in the region, drinking water wells can be and are impacted by onsite system effluent in the south Deschutes County region.

**5. Drinking water well sampling in 2000.**

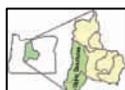
**FINDING:** Oregon Department of Environmental Quality and Deschutes County Community Development Department staff sampled a well network three times between June 2000 and June 2001 as part of the La Pine National Demonstration Project. Data from these sampling events showed 24% of the wells discharged water with nitrate concentrations greater than background levels:

NO <sub>3</sub> concentrations	Number of wells	Notes
<1.0 mg/L	128	Background NO <sub>3</sub> concentrations
1-6.9 mg/L	35	Showing human impacts
7.0-9.9 mg/L	5	Oregon Groundwater Management Area trigger
≥10 mg/L	0	
Total	168	

This dataset was collected in strict compliance with the Oregon DEQ's quality assurance/quality control protocols and the laboratory analyses were conducted in compliance with the Environmental Protection Agency's certification requirements for the DEQ lab, including specific

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quality assurance and quality controls specifications. Therefore these data are considered high quality.

### 6. Shallow monitoring well sampling

**FINDING:** The Oregon DEQ and Deschutes County installed and sampled a network of nearly 200 shallow monitoring wells between 2000 and 2004 as part of the La Pine National Demonstration Project. The monitoring well locations were specified by a registered hydrogeologist and the wells were installed by a licensed well driller in accordance with Oregon Water Resources Department well construction standards.

The table below entitled "Network monitoring well data" shows the descriptive statistics of the sample results from three years of sampling a network of 141 wells. These wells were located at the periphery of the properties on which the field test system was located. These wells provided information on groundwater flow direction, depth to water table, and ambient groundwater quality conditions. The wells were screened at or near the water table in order to document conditions in the shallow aquifer.

The total nitrogen, nitrate and chloride results show that on average, ambient conditions in the shallow aquifer are already showing the effects of human sewage discharged to groundwater because total nitrogen and chloride levels are greater than 1.0 mg/L. Chloride can be used as a tracer for sewage plumes in the environment of south Deschutes County because human sewage is the predominant source of this element.

The bacteria sample results (fecal coliform and E. coli) show that these bacteria are not present in the aquifer.

#### Network monitoring well data

Mean of means 141 Network Wells	Nitrate- Nitrite As N (mg/L)	TN (mg/L)	Chloride (mg/L)	Fecal Coliform	E. coli	Dissolved Oxygen (mg/L)	Depth to Water Table (ft)	Total Phosphorus (mg/L)
Mean	3.7	4.0	12	N/A	N/A	5.1	13.1	0.2
Geometric Mean	0.7	1.3	6.5	N/A	N/A	3.3	12.0	N/A
Median	1.2	1.5	5.9	ND	ND	6.2	11.9	0.2
Standard Deviation	10.5	11	20	N/A	N/A	2.8	5.7	0.4
Minimum	0.005	0.1	0.5	ND	ND	0.1	4.6	ND
Maximum	99	99	139	41	41	8.3	29.9	3.8
Count	141	141	141	139	139	141	141	105
95% Confidence Level	1.7	1.8	3.3	N/A	N/A	0.5	0.9	0.08
99% Confidence Level	2.3	2.4	4.3	N/A	N/A	0.6	1.2	0.10

N/A = statistic not calculable

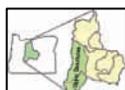
ND = nondetect

The table below shows data from three years of sampling 48 monitoring wells placed in drainfields in the field test program. These wells provide information about the effect of the onsite system on the shallow aquifer immediately below the drainfield. Data show that nitrate and chloride levels are elevated in these wells, indicating the effects of the onsite system on the aquifer. There are some bacteria results indicating that some contamination may be occurring; however, these

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results were not repeated during subsequent sampling. Total phosphorus results indicate that the soil removes most of the phosphorus from wastewater.

48 Drainfield MW	Nitrate-Nitrite As N (mg/L)	Total Nitrogen (mg/L)	Chloride (mg/L)	Fecal Coliform	E. Coli	Dissolved Oxygen (mg/L)	Depth to Water Table (ft)	Total Phosphorus (mg/L)
Mean	9.0	9.2	17	33	47	5.3	12.6	0.18
Geometric Mean	2.4	3.6	12	N/A	N/A	3.7	11.6	0.16
Median	4.1	4.2	11	ND	ND	6.4	11.1	0.17
Standard Deviation	13	13	15	N/A	N/A	2.6	5.6	0.10
Minimum	0.003	0.1	0.7	ND	ND	0.1	4.9	0.04
Maximum	52	52	72	1502	2189	8.5	29.0	0.4
Count	48	48	48	48	48	48	48	37
95% Confidence Level	3.8	3.8	4.3	N/A	N/A	0.8	1.6	0.03
99% Confidence Level	5.0	5.0	5.8	N/A	N/A	1.0	2.2	0.04

N/A = statistic not calculable  
 ND = nondetect

This dataset was collected in strict compliance with the Oregon DEQ's quality assurance/quality control protocols and the laboratory analyses were conducted in compliance with the Environmental Protection Agency's certification requirements for the DEQ lab, including quality assurance and quality control specifications. Therefore these data are considered high quality.

## B. Nitrate Standards

### 1. Safe Drinking Water Act standard

**FINDING:** The US Environmental Protection Agency (EPA) has established the Maximum Contaminant Level for nitrate as nitrogen (N) as 10 mg/L for municipal drinking water supplies. This level is considered protective to prevent methemoglobinemia (blue baby syndrome) in susceptible populations. As a point of comparison, the World Health Organization recommends setting the drinking water standard at 45 mg/L nitrate. While these standards appear to be different, the two concentrations are actually the same because 45 mg/L nitrate is equivalent to 10 mg/L nitrate as N. These two values (10 and 45) use different units to measure the amount of nitrogen contained in a water sample.

The Maximum Contaminant Level does not apply to private drinking water wells but the EPA encourages private well owners to test their wells annually to confirm that their drinking water supply is safe.

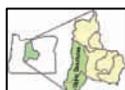
### 2. Groundwater Quality Protection

**FINDING:** The Oregon DEQ establishes groundwater quality protection standards in OAR 340-040 (available at: <http://www.deq.state.or.us/wq/onsite/rules.htm>). This rule sets the water quality standard action level for nitrate as N in groundwater at 70% of the drinking water standard, or 7 mg/L. The proposed rule is designed to maintain compliance with this standard on average in south Deschutes County.

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### C. Nitrogen Reducing Systems

**FINDING:** The Oregon DEQ was awarded \$5.5 million for the La Pine National Demonstration Project. One of the main tasks of this project was to field test nitrogen reducing systems. During the project, the DEQ partnered with Deschutes County to install and monitor 49 onsite wastewater treatment systems. Nine of these systems were conventional systems that were installed and monitored on the same schedule as the nitrogen reducing systems. The nitrogen reducing systems included 14 different designs; each design was replicated in two or three locations. Each onsite system was installed at a residential site and monitored monthly for a year and every two months for the following 1.5 to 2 years.

The results from the field test were reported at national, regional and state meetings of onsite wastewater treatment professionals. The field test demonstrated that nitrogen reducing systems exist nationally or internationally that protect groundwater while eliminating the need for the extensive infrastructure associated with centralized sewer systems. The La Pine National Demonstration Project results indicate that nitrogen reducing systems currently available on the market nationally range in performance between about 35% to 96% nitrogen reduction. Not all of the systems performed adequately for nitrogen reduction and the systems that failed were replaced. The chart on page 15 shows all of the systems participating in the project by their performance for nitrogen reduction.

The Oregon DEQ used the results of this field test when the statewide onsite wastewater treatment system rules were amended in 2005 to allow the use of nitrogen reducing at the residential level under a construction-installation permit. This rule amendment allowed Deschutes County to issue permits for nitrogen reducing systems rather than requiring that homeowners obtain a Water Pollution Control Facility permit from the DEQ.

Since the Oregon DEQ amended OAR 340-071 in 2005, four companies have applied and been approved for use of their product in Oregon. The Oregon DEQ listing process reviews system performance for basic wastewater treatment capabilities (for example, biochemical oxygen demand and total suspended solids reduction) but may not include a review for nitrogen reduction. If nitrogen reduction is included in the review, the standard that systems must meet is to discharge less than 30 mg/L total nitrogen. Deschutes County has reviewed data on the approved systems and found that three of these companies produce nitrogen reducing systems and the fourth does not. A fifth company with a product that is a nitrogen reducing add-on component was approved for use in Oregon on February 12, 2007; however, this product has limited availability because the distribution network has not been fully established in Oregon and certification of installers and maintenance providers has not been completed. While additional wastewater treatment systems have applied for listing in Oregon, until the DEQ completes review of the current applications, staff does not know whether additional nitrogen reducing systems will be available for use locally.

A non-proprietary system is also now available for installation under a construction-installation permit from the County as a result of the 2005 DEQ rule amendment. Recirculating gravel filters are available for use and data published by the National Small Flows Clearinghouse indicates that these systems provide approximately 50% reduction in total nitrogen on a reliable basis. Other research indicates the performance of these systems may achieve higher levels of reduction. Data supporting this research is currently under review.

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#### IV. POTENTIAL GROUNDWATER PROTECTION APPROACHES:

##### A. Sewer Systems

**FINDING:** The creation of new or the expansion of existing sewers is governed by state rule (OAR 660-011-0060 available online at: <http://www.oregon.gov/LCD/adminrules.shtml>). This rule defines any wastewater treatment system that serves two or more lots as a sewer system.

Two processes for creating or expanding sewers in rural areas could apply to the south Deschutes County region and include OAR 660-011-0060(4), when the DEQ determines that a public health hazard exists and that there is no practicable alternative to sewer (the problem cannot be solved using onsite systems), and OAR 660-011-0060(9), when there is an imminent health hazard for which there is no practicable alternative to sewer.

The County retained KCM, Inc. (now KCM-TetraTech, Inc.) to study the feasibility of extending or creating new sewers in the region. The estimates developed in 1997 assumed that sewer treatment plant sites could be acquired for \$3,000 per acre and that the cost of financing the treatment works and transmission system would be 3% per year over 20 years. The consultant estimated in 1997 that each lot would be charged between \$19,000 and \$28,000 for a sewer system hook-up.

Since 1997, land, material, and energy costs have increased significantly and would add to the per lot estimated cost. Adjusting the 1997 costs using historic inflation rates between 1998 and 2008, the per household cost for sewer would be between \$24,000 and \$33,000. In comparison, the City of Bend currently charges about \$28,000 to hook up to the existing sewer system plus about \$22 per month for service charge. The City of Tualatin charges \$40,000 to hook up to sewer. Oregon Water Wonderland Unit 2 charges about \$9,500 to hook up to the sewer system and \$42 per month for service. This low charge reflects the low price for the sewer treatment plant site (about \$500 per acre) and other financial assistance.

The creation or extension of sewer systems requires a large initial capital investment to construct or upgrade the treatment site and install transmission facilities. Construction grants are no longer available for creating or extending sewer systems. Construction loan programs are in place with varying fund amounts available with repayment periods ranging from 5 to 20 years. Using the \$19,000-\$28,000 estimate above, the annual cost to a sewer system user for a loan of this amount at 3% would be between \$1,275 and \$1,880 per household per year.

The amount of time required to establish extensions to existing sewers can be quite long. The expansion of the existing Oregon Water Wonderland Unit 2 sewer took seven years from the time the decision was made to proceed until the first new house was hooked to the system. According to Oregon Department of Land Conservation and Development records, no new sewers in rural areas have been constructed in Oregon (White, personal communication).

##### B. Onsite Wastewater Treatment Systems

**FINDING:** In response to the KCM study referenced above, public participation during the Regional Problem Solving Project identified the creation or extension of sewers into the rural areas as the least desired solution because of the cost. At that time, the public directed the County to pursue the use of innovative kinds of onsite wastewater treatment systems to protect groundwater quality. In response to this direction from the public, the Oregon DEQ sought and obtained \$5.5 million from the US Environmental Protection Agency to identify onsite

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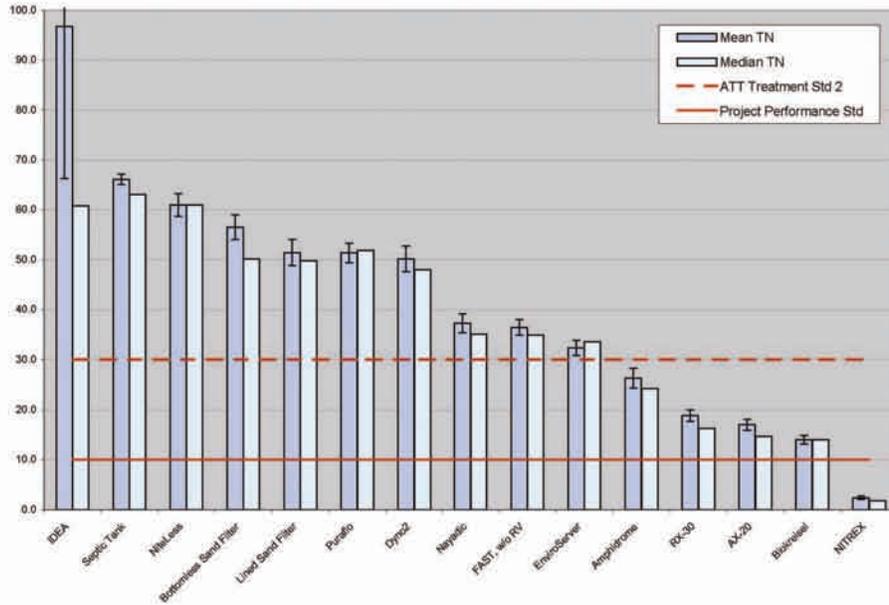
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wastewater treatment systems that would solve the groundwater pollution problem. Performance testing of onsite wastewater treatment systems shows they can be as effective as sewer systems for protecting water quality while maintaining natural groundwater recharge patterns.

The La Pine National Demonstration Project found that there are several commercially available systems that will reduce nitrogen at levels greater than achievable using conventional onsite systems like standard, pressure or sand filter systems. The figure below shows how the systems participating in the La Pine Project can be ranked by nitrogen reduction. Of the systems participating in the project, the AX-20, Puraflo, and NITREX systems have applied for and been listed in Oregon for use under County-issued construction-installation permits. The County has listed the AX-20 as a nitrogen reducing system and has received data on the NITREX to be added to the list. The County has not yet received data on the Puraflo system's nitrogen reducing capability.



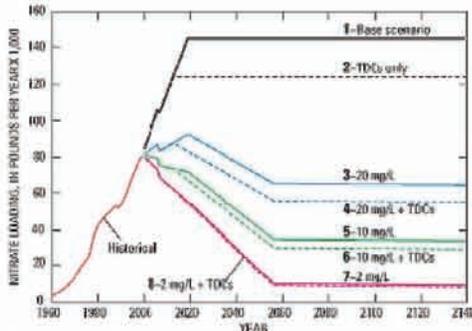
The onsite wastewater treatment systems currently available that reduce nitrogen range between about \$9,000 (standard drainfield) and \$16,000 (bottomless sand filter) for upgrades to existing systems depending on the condition of the existing system. Increased costs can be incurred during upgrades if the existing septic tank is damaged or otherwise unsound or if the drainfield is failing or inappropriately located. Maintenance costs range between \$25 and \$35 per month depending on the system chosen by the property owner. Operation costs will vary depending on the type of system chosen and are largely dependent on electricity demand. In comparison, a new standard system currently costs between \$3,500 and \$4,500 and a new sand filter costs between \$10,000 and \$12,000. The added cost for the nitrogen reducing system is between \$4,500 and \$5,500 for a site using a standard drainfield and between \$4,000 and \$6,000 for a site using a bottomless sand filter.

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Some advantages of using onsite system upgrades are that groundwater protection can begin immediately as compared to typical sewer hookup strategies of waiting until the treatment plant or collection system is complete before water quality protection becomes effective. The figure below shows the increasing nitrogen load to groundwater historically and into the future as the area is built out under different scenarios. The capacity to reduce nitrate loading immediately can be an important consideration because every new system installed in south Deschutes County that does not reduce nitrogen increases pollutant loading while simultaneously increasing the demand for financial assistance.



Historical nitrate loading from onsite wastewater systems and eight nitrate loading scenarios tested with the study-area model. (Morgan et al, 2007)

### C. Do Nothing

**FINDING:** On January 4, 2008, the Oregon Department of Environmental Quality (DEQ) issued a letter determining that a public health hazard is being created in the region by continued use of conventional onsite wastewater treatment systems. The DEQ states that potential solutions to this health hazard may include a variety of approaches ranging from onsite wastewater treatment systems to expanded or new sewer systems. In comments to the Board of County Commissioners (Board) on January 30, 2008, the DEQ also indicated that doing nothing is not an appropriate course of action in light of the developing public health hazard. The proposed rule is an opportunity for the Board to decide on whether it is appropriate to undertake protective action at the local level.

Environmental impacts of a "Do Nothing" scenario include large areas of the region's groundwater contaminated with nitrate concentrations greater than 10 mg/L nitrate as N (equivalent to 45 mg/L nitrate) and adverse impacts to surface water bodies in the region. Surface water impacts include increased algae growth, fluctuations in dissolved oxygen levels, and die-offs of aquatic organisms requiring cold, highly oxygenated water. (Morgan et, 2007; Hinkle et al, 2007)

Financial impacts of a "Do Nothing" scenario are difficult to determine because, while the costs of sewers or onsite system upgrades are avoided, there are other market impacts resulting from declining property values because of groundwater quality degradation, impacts to the sport fishing or recreational boating industry, or the possible imposition of a moratorium on building in the region.



**V. PROPOSED LOCAL RULE:**

**FINDING:** The proposed amendment would require the use of nitrogen reducing systems in south Deschutes County for systems permitted by Deschutes County Community Development Department. While sewer may be a viable option in some circumstances, the county role is largely that of reviewer for the land use process for creating or extending sewers in rural areas under Goal 11 (OAR 660-011-0060, Sewer Service to Rural Lands). The county typically does not have permit authority over sewer systems because the county can issue permits only for wastewater treatment systems that discharge less than 2,500 gallons per day of residential strength wastewater.

Staff finds that there may be a variety of approaches that can be used to protect groundwater quality in south Deschutes County and that one of those approaches is to use nitrogen reducing onsite systems that are appropriately located and installed. Another approach that may be feasible is to use community or regional sewer systems or some other approach that provides the same level of protection. All of these methods are potential actions and therefore need to be reviewed and permitted by the appropriate authorities to ensure that groundwater protection is achieved. With this proposed amendment to Deschutes County Code, the County proposes to ensure that groundwater protection efforts undertaken at the local level meet the overall groundwater protection goals.

**A. Siting criteria for New Development.**

The proposed Local Rule will allow onsite wastewater treatment systems serving New Development to be sited on lots that are shown to provide 24 inches of natural vertical separation between the bottom of the trench and the highest level reached by groundwater.

**FINDING:** The County, in keeping with direction received during the public process conducted during the Regional Problem Solving Project, proposes to codify its current practice of allowing installation of onsite wastewater treatment systems when there is at least 24 inches vertical separation. Based on this pattern of practice, lots or parcels with less than 24 inches of separation will not be approved for onsite systems. The County further proposes to deny lots or parcels that have been filled or dewatered for reasons described below.

Research conducted during the La Pine National Demonstration Project showed that one foot of soil below the bottom of the trench provided significant protection for the groundwater from contamination by pathogenic organisms. The table below shows data from samples taken from the unsaturated zone one foot below the trench in a pressure distribution system. The geometric mean and median values represent a 99.9% reduction in bacteria counts from the bacteria levels discharged from the septic tank. The additional foot of soil (for a total of 24 inches) provides added reduction, particularly for those events when higher bacterial counts are seen, when groundwater mounding occurs and/or during times of high water use in the house (more wastewater loaded to the drainfield or sand filter). This data shows how the soil performs an important treatment function by protecting groundwater from bacterial contamination. These findings are also corroborated by the findings of the USGS 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." (Hinkle et al, 2005; available online at: <http://pubs.usgs.gov/sir/2005/5055/index.html>)

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*Bacteria samples taken one foot below a pressure distribution drainfield*

	<i>Fecal Coliform</i> <i>E. coli</i>		<i>Fecal Coliform</i> <i>E. coli</i>	
	One foot below trench		Septic tank effluent	
Geometric mean	23	23	159,000	140,000
Median	10	10	102,000	100,000
Minimum	ND	ND	1,000	1,000
Maximum	100,000*	81,000*	5,800,000	4,400,000
Count	21	21	21	21

The maximum counts reported here were not replicated with subsequent sampling.

Further, preliminary research conducted on the performance of soil in reducing emerging contaminants like pharmaceuticals, personal care products and household contaminants indicates that the natural soil environment provides important treatment for many of these contaminants. (Tchobanoglous & Leverenz, personal communication).

Groundwater interceptors are a method used to lower, or dewater, the groundwater level within a specific area. These work by collecting groundwater and diverting it to the nearest surface water drainage. While these systems may work physically, they tend to have adverse impacts on surface water quality by diverting nutrient rich groundwater directly to rivers. The rivers in the Deschutes River watershed are nitrogen limited. This means that diverting nitrate-rich groundwater to surface water bodies can increase algae and aquatic plant growth, which in turn affects the levels of dissolved oxygen available for other aquatic organisms, including fish.

Finally, developing high groundwater table lots will add nitrogen loading that can increase the nitrogen reduction requirements for existing and other future development in the area. Increased nitrogen reduction standards could translate into higher treatment costs for property owners based on a preliminary evaluation using the Nitrate Loading Management Model.

**B. Future Development on lots or parcels with high groundwater levels**

**FINDING:** The County, funded by a grant from Oregon DLCD, will begin a public involvement process to determine whether or how development should be allowed on properties with less than 24 inches of separation from ground surface to the highest level reached by groundwater. The County, in a work plan approved by Oregon DLCD, began this process during Fiscal Year 07-08. The process will bring together regional stakeholders, including natural resource managers (Oregon DEQ, Oregon Department of Fish and Wildlife, Oregon Department of State Lands, etc.) and property owners, to investigate the cumulative impacts of increasing development in areas with high groundwater levels. Possible outcomes of this work program could, for example, be increased performance standards for existing systems, increased protection for wetland and riparian resources and/or maintain the existing pattern of practice. Any changes to Deschutes County Code would require a legislative process to solicit public comment and feedback on the proposal.

Staff proposes to reference this work program in the code language in the form of a sunset clause for siting criteria. Standards contained in this portion of the rule would no longer be enforceable as Deschutes County Code three years from the effective date of rule adoption unless amended as a result of the high groundwater work program.



**C. Limit the use of easements.**

**FINDING:** The County proposes to eliminate the use of easements to establish a location for a portion or all of the onsite wastewater treatment system on a lot or parcel separate from the lot or parcel where the source of wastewater is located. The County has witnessed the dissolution of easements to the detriment of the lot where the wastewater is generated. In addition, lots or parcels that propose to use easements typically cannot maintain 24 inches of separation from the bottom of the trench to groundwater. Developing these lots can impact wetlands and riparian resources and is directly counter to the direction received from the public process of the Regional Problem Solving Project. Further, developing high groundwater lots will add nitrogen loading that could have the effect of increasing the nitrogen reduction requirements of, and potentially the cost to, existing development in the area based on a preliminary evaluation using the Nitrate Loading Management Model.

**D. Groundwater level determinations.**

**FINDING:** The County, at DEQ's suggestion, is proposing to codify existing practices used to determine groundwater levels. This procedure is only used for those sites where soil characteristics make it difficult to determine the highest level that groundwater reaches. This procedure only applies to vacant sites seeking approval for development.

**E. Performance standards.**

**FINDING:** The US Geological Survey and Deschutes County, in a grant from the National Decentralized Water Resources Capacity Development Project, developed the Nitrate Loading Management Model. The development of this model is documented in Morgan et al, 2005 and Morgan et al, 2007 (available on the web at: <http://pubs.usgs.gov/sir/2007/5237/>).

Performance standards are established by setting constraints for the region, such as:

1. Future Development installs the maximum nitrogen reducing system available (as defined in the proposed code). This approach reduces the level of nitrogen reduction required for existing systems in many management areas.
2. Existing Development upgrades to achieve a minimum 35% reduction
3. Shallow groundwater meets the 7 mg/L groundwater quality protection standard on average.

Additional constraints may be set for the region using this model, including a constraint on the amount of nitrogen reaching the rivers. No river protection constraints are proposed because it appears that significant protection for the rivers is provided by reducing nitrogen discharges from onsite systems. Future river protection projects may be considered to improve riparian conditions to reduce nitrogen before it reaches the stream channel. If future resource evaluation work indicates the need for increased performance standards for existing onsite wastewater treatment systems, staff expects that it would not be necessary to further upgrade the systems that have already been changed to nitrogen reducing systems in accordance with the code in effect at the time.

**F. Compliance date: Fourteen years from the effective date of the proposed rule.**

**FINDING:** The groundwater studies and predictive models show that groundwater protection actions should be implemented as soon as possible. The chart inserted below is taken from the

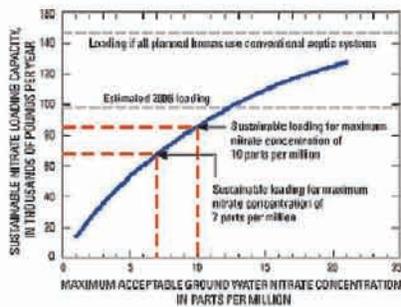
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USGS Fact Sheet (Williams et al, 2007) and shows that the cumulative nitrate load already discharged to the aquifer from existing development significantly exceeds the load needed to exceed the Oregon groundwater quality action level and the federal safe drinking water standard. In spite of the science that indicates a need for immediate action, staff has proposed a fourteen year upgrade schedule to coordinate with projected build-out of south Deschutes County, the sale of land in and platting of the Newberry Neighborhood, and the long term average rate of home sales in the region. Fourteen years from 2008 should allow enough time for the region to build out based on projections for south Deschutes County. Fourteen years also allows significant financial assistance to be generated in the form of revenue from land sales in the Neighborhood Planning Area in La Pine or some form of bonding. Finally, practically speaking, the projected inspection workload for the County's Environmental Health Division would average 400 to 500 systems per year.



*The relation between maximum acceptable nitrate concentration in groundwater and the sustainable nitrate loading capacity of the aquifer determined by the study-area model. (Williams et al, 2007)*

**G. Listing nitrogen reducing systems.**

**FINDING:** The Oregon DEQ must first approve any system before the County may issue a construction-installation permit (OAR 340-071-0135 and -0345). During the listing process, the DEQ reviews performance data and the National Sanitation Foundation (NSF) certification. The only explicit nitrogen standard contained in Oregon DEQ rule is a listing criteria for an Alternative Treatment Technology under Treatment Standard 2 (30 mg/L total nitrogen). Because groundwater protection goals in south Deschutes County require nitrogen reduction levels greater than that achieved by a system discharging 30 mg/L total nitrogen in the effluent, the Oregon DEQ and Deschutes County agree that the County should require additional information from system manufacturers or designers in order to determine which listed Alternative Treatment Technologies can support the groundwater quality goals. And, because the NSF certification process commonly uses influent wastewater that is lower strength (is more dilute) than typical single-family residential wastewater, the Oregon DEQ and the County agree that a system's nitrogen reduction capabilities should be defined by field tests of the treatment system.

**H. Other approaches to groundwater protection.**

**FINDING:** The proposed rule is focused on performance standards for onsite systems within the jurisdiction of Deschutes County and therefore does not limit the creation or expansion of sewer systems. The creation or expansion of sewers is governed by rules contained in OAR

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660-011-0060, Sewer Service to Rural Lands. The proposed code language has been modified to acknowledge this existing process and ensure that the proposed rule does not inadvertently eliminate sewers as an option.

Other approaches may also become available in the future that cannot be predicted at this time. The proposed code language has been modified to ensure that these approaches are not eliminated inadvertently as options and to create a mechanism by which these approaches can be incorporated into the program to protect groundwater quality.

**I. Variances and Appeals.**

**FINDING:** The County received several comments on the Local Rule concepts that concerned the opportunity to apply for variances or appeals of decisions made under the proposed rule. The draft rule language includes variances in the case of economic or personal hardship or where sewer systems are being established.

**J. Fees.**

**FINDING:** The Community Development Department is currently entirely fee supported. Other means of offsetting the cost for permit fees have not been identified or proposed. Currently retrofits of existing systems would be conducted under a repair permit. Repair permits are currently \$380 plus a \$60 DEQ surcharge. The DEQ increased the surcharge from \$40 effective July 1, 2008.

**K. Violations.**

**FINDING:** The County currently enforces the Deschutes County Code. The proposed rule would be enforced in the same manner as any other code requirement and the existing County code enforcement policies are expected to continue to apply for the foreseeable future. Currently the county works with violators to achieve compliance in advance of going to court. In the long run, the level of enforcement undertaken will be a decision for Board of County Commissioners in 14 years. However, the Board will have a responsibility to honor the financial commitment made by those who have complied, by not waiving the requirements of those who have not.

**VI. FINANCIAL ASSISTANCE:**

**A. Existing Financial Assistance Programs**

**FINDING:** There are existing mechanisms by which property owners can gain access to funds available for home improvements, including onsite system repairs or upgrades. The County proposes to coordinate with existing programs to the greatest extent possible.

**1. Pollution Reduction Credit Rebates**

**FINDING:** Developers in the Neighborhood Planning Area have the option of generating Pollution Reduction Credits or paying into the County's Partnership a fee in lieu of credits. The fee paid in lieu of generating Pollution Reduction Credits is \$7,500 per credit. Currently, Elk Horn Land Development is offering a rebate to homeowners upgrading to nitrogen reducing systems in exchange for the Pollution Reduction Credit created by the upgrade.

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## **2. USDA Rural Development Program**

**FINDING:** The USDA offers loans and grants to low income and elderly residents for home improvements. Onsite wastewater treatment system replacements or upgrades qualify for these funds.

## **3. NeighborImpact**

**FINDING:** NeighborImpact currently offers loans to residents at or below 80% of the county median income bracket for home improvements. Homeowners must repay the loan once the house is rented, sold or refinanced. As loans are repaid, proceeds are returned to the program to provide loans for future homeowners. Projects include but are not limited to wastewater treatment systems, roofs, heating systems, handicap accessibility, and exterior paint. NeighborImpact is partnering with Deschutes County during the current round of applications for Community Development Block Grants with the goal of increasing the availability of funds for Deschutes County residents.

### **B. Planned Financial Assistance Programs**

**FINDING:** The Deschutes County Board of Commissioners has established an advisory committee to produce recommendations on how financial resources should be allocated to property owners faced with implementing groundwater protection measures. The following sections provide an outline of the type of financial programs that could help homeowners offset the cost of groundwater protection measures.

#### **1. Low interest loans**

**FINDING:** Funds generated by payment of fees for credits or from the sale of land in the Newberry Neighborhood will be used to assist with groundwater protection measures. The balance between using this fund for loans versus grants may be the subject of a recommendation from the Financial Assistance Advisory Committee.

Funds earmarked for homeowner assistance from the La Pine National Demonstration Project must be used for loans, which may include deferred payment loans, as specified by the grant agreement.

#### **2. Partnership Fund**

**FINDING:** Developers in the Neighborhood Planning Area have the option of generating Pollution Reduction Credits or paying into the County's Partnership a fee in lieu of credits. The fee paid in lieu of generating Pollution Reduction Credits is \$7,500 per credit. Any funds paid into this fund are dedicated to assisting homeowners upgrading their onsite systems to nitrogen reducing systems. The administration of this program will most likely be through a third party. Funds may be disbursed either as conventional loans, payment deferred loans (liens), and/or grants. A recommendation for how funds are disbursed may come from the Financial Assistance Advisory Committee.

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### 3. State Clean Water Revolving Loan Funds

**FINDING:** Oregon DEQ administers the program for the state revolving loan fund. Loans to communities are available for loan periods of between 5 and 20 years at about 2% interest plus an annual fee of 0.5% of the amount owed. This is a potential source of funds to help homeowners upgrade their systems or for neighborhoods to extend or create sewers (more information is available online at: <http://www.deq.state.or.us/wq/loans/loans.htm>). Careful consideration of the impacts of the cost of administering such funds on the interest rate and fees is important. Staff proposes reviewing the potential for using this source of funds if the proposed rule is adopted and after implementation of the County generated financial programs.

#### C. Source of Funds

**FINDING:** The County has existing assets of about \$350,000 in funds for a low interest loan program, the revenue from the Partnership Fund, and revenue from the sale of county-owned land in the Newberry Neighborhood in La Pine. Estimates of the land value are based on 300 acres sold at \$100,000 per acre for a total of \$30 million. The funds can be made available over time through the sale of property and the use of the Pollution Reduction Credit Program through and/or through County bond sales or the loaned use of County interdepartmental fund transfers.

The estimated total cost of retrofits in south Deschutes County ranges between \$43 million and \$65 million. Therefore, considerable financial assistance can be generated by using existing County assets. Using County assets in addition to other programs like the state revolving loan fund and partnering with organizations like USDA Rural Development and NeighborImpact could cover the majority of the projected need for financial assistance.

#### VII. RECOMMENDATION:

Staff recommends **Adoption** of the proposed Local Rule in coordination with the development of additional financial assistance programs that target pollution reduction actions.

BJR:slr



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- NOWRA Annual Conference 2003
- NEHA Annual Conference 2004
- NOWRA Annual Conference 2004
- NOWRA Annual Conference 2006

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US Environmental Protection Agency (USEPA), 2002. *Onsite Wastewater Treatment Systems Manual*. EPA/625/R-00/008.

US Environmental Protection Agency, 2006. *Consumer Factsheet on: NITRATES/NITRITES*. [http://www.epa.gov/ogwdw/contaminants/dw\\_contamfs/nitrates.html](http://www.epa.gov/ogwdw/contaminants/dw_contamfs/nitrates.html), downloaded March, 23, 2006.

Virtanen, SM, Jaakkola L, Rasanen I, Ylonen K, Aro A, Lounamaa R, Akerblo HK, Tuomilehto J, 1994. *Nitrate and nitrite intake and the risk for type 1 diabetes in Finnish children. Childhood diabetes in Finland Study Group*. *Diabetes Medicine*, 1994, 11(7): 656-62.

Weyer, PJ, Cerhan JR, Kross BC, Hallberg GR, Kantamneni J, Breuer G, Jones MP, Zheng W, Lynch CF. *Municipal Drinking Water Nitrate Level and Cancer Risk in Older Women: The Iowa Women's Health Study*. *Epidemiology*, 2001; 11: 327-338.

White, D., Department of Land Conservation and Development, personal communication.



Williams, JS, Morgan, DS, and Hinkle, SR. *Questions and Answers About the Effects of Septic Systems on Waste Quality in the La Pine Area, Oregon*. US Geological Survey Fact Sheet 2007-3103, 6 p.

World Health Organization, 2003. *Nitrate and nitrite in Drinking-water: Background document for development of WHO Guidelines for Drinking-water Quality*. WHO/SDE/WSH/04.03/56

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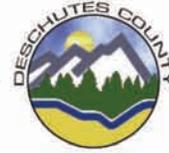
Local Rule for Onsite Wastewater Treatment Systems in South Deschutes County

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## Appendix A: Updated June 27, 2008 Local Rule Communication Plan and Public Outreach Summary

Deschutes County Community Development Department  
117 NW Lafayette Ave., Bend, OR 97701  
PH: (541) 388-6575, FAX: (541) 385-1764  
Web: [www.deschutes.org/cdd/gpp/](http://www.deschutes.org/cdd/gpp/)



The goal of the Local Rule is to protect the sole source of drinking water for the residents of south Deschutes County using the least cost option and creating financial assistance programs.

### Web site

- [www.deschutes.org/cdd/gpp/](http://www.deschutes.org/cdd/gpp/). The documents listed below are available under "Project News."

### Articles and reports

This list reflects articles published in print media. Television and radio spots are not included.

- Bend Bulletin 05-19-08
- Bend Bulletin 05-15-08
- Bend Bulletin 05-05-08
- Bend Bulletin 04-24-08
- Questions from the March 19, 2008 Hearing
- Bend Bulletin 04-03-08
- Bend Bulletin 04-03-08 Map
- Newberry Eagle April 2008
- Bend Bulletin 03-28-08
- Bend Bulletin 03-23-08
- Bend Bulletin 03-20-08 B
- Bend Bulletin 03-20-08 A
- Bend Bulletin 03-17-08
- Notice of Public Hearing 02-15-08
- Bend Bulletin 02-06-08
- Bend Bulletin 01-31-08
- Oregon DLCD Response, 01-30-08
- Questions from the Board to Oregon DEQ & DLCD, 01-30-08
- Bend Bulletin Clarification 12-05-07
- Bend Bulletin 11-06-07
- Bend Bulletin 11-04-07
- USGS Fact Sheet, Questions and answers about the effects of septic systems on water quality in the La Pine area, Oregon
- USGS Report, Evaluation of approaches for managing nitrate loading from on-site wastewater systems near La Pine, Oregon
- USGS Report, Ground Water Redox Zonation near La Pine Oregon: Relation to River Position within the Aquifer-Riparian Zone Continuum
- Bend Bulletin 10-29-07
- Press Release 10-08-07
- Bend Bulletin 10-07-07
- Bend Bulletin 09-27-09
- Bend Bulletin 07-24-07
- Newberry Eagle Article, April 2007
- EH information, Newberry Eagle April 2007
- Bend Bulletin Article, March 30, 2007
- The Source Article, March 29, 2007
- Bend Bulletin Article, March 29, 2007
- Bend Bulletin Article, March 28, 2007

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Local Rule for Onsite Wastewater Treatment Systems in South Deschutes County

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- Bend Bulletin Article, March 21, 2007
- Bend Bulletin Article, March 19, 2007
- Bend Bulletin Article, March 7, 2007
- Bend Bulletin article, March 1, 2007
- Bend Bulletin Article, February 22, 2007
- Newberry Eagle article, February 2007
- Bend Bulletin Article, February 1, 2007
- Bend Bulletin Article, January 17, 2007
- Citizen Update Newsletter, January 2007
- Newberry Eagle articles, January 2007
- Journal of Hydrology paper
  - Supplement 1
  - Supplement 2
  - Supplement 3
  - Supplement 4
- Groundwater Science Open House Notice December 2006
- Bend Bulletin article, December 21, 2006
- Bend Bulletin article, December 20, 2006
- Newberry Eagle article, December 2006
- Bend Bulletin Article, December 1, 2006
- Bend Bulletin Article, November 2006
- Newberry Eagle article, November 2006
- Newberry Eagle article, October 2006
- Newberry Eagle article, September 2006
- Newberry Eagle article, May 2006
- Deschutes County Citizen Update, May 2006
- Bend Bulletin article, May 2006
- Bend Bulletin article, April 2006
- Bend Bulletin article, February 2006

**Notices (PDF files)**

- Press releases issued prior to each public meeting
- Notices of meetings posted at area stores, libraries, La Pine Senior Center, post office, etc.
- Notice of Public Hearing, July 7, 2008
  - Ordinance 2008-012
  - Deschutes County Code Chapter 13.14
  - Resolution 2008-021
  - Exhibit A to Resolution 2008-021
- Notice of Public Hearing - issued February 15, 2008
  - Summary of Changes, 03-19-08
  - Revised DCC 13.14, 2-15-2008 (Deletions are identified by strike-through and additions are identified by underline.)
  - DRAFT Ordinance 2008-012, 2-15-2008
  - Revised Staff Report, 2-19-08 (Deletions are identified by strike-through and additions are identified by underline.)
  - DRAFT Resolution 2008-021, 2-15-2008
  - Exhibit A to Resolution 2008-021, Map of Performance Standards for Existing Onsite Systems with explanatory statement
- Notice of Public Hearing on Proposed Local Rule
  - Ordinance 2007-011
  - Draft Local Rule
  - Staff Report
  - Resolution 2007-023
  - Exhibit A to Resolution 2007-023
- Office Hours Scheduled in January 2007
- Notice of Planning Commission meeting, November 30, 2006

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Local Rule for Onsite Wastewater Treatment Systems in South Deschutes County

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- Notice of Local Rule - Tax Bill Insert, October 2006
- Notice of Groundwater Protection Project (distribution began March 2006)
- Groundwater Protection Project Update, September 2006

**Brochures, Handouts & Posters (PDF files)**

- Application form - south county advisory committee - direct mailed to owners of property in south Deschutes County, 10/09/07
- Proposed Local Rule documents
- Deschutes County memo on nitrate concerns
- Oregon Department of Human Services - Technical Bulletin on Nitrates
- Nitrogen Reducing Onsite Systems Poster
- Effects of onsite systems on groundwater poster
- Frequently Asked Questions
- Alternatives Analysis
- Retrofit Cost Scenarios, Winter 2007
- Proposed Local Rule Concepts
- But my water was just tested! November 2006
- Pollution Reduction Credit Program Brochure, Fall 2006
- Project Overview Brochure, Spring 2006
- South County Groundwater Protection History, Spring 2006
- Why Not Sewer? Brochure, Spring 2006

**Other Outreach/Participation events:**

- Installer meetings – typically held by Deschutes County Environmental Health staff
  - August 22, 2006
  - October 17, 2006
- Realtor meetings
  - Regular weekly meetings with COAR representatives – typically held by Deschutes County Community Development Director and Planning Director
  - September 6, 2006 – conducted by County EH staff and the CDD Director
  - November 27, 2006 (requested by realty office) – presentation provided by EH staff
  - December 9, 2006 (requested by two realty offices) – two presentations provided by EH staff
- Public meetings and events
  - May 13, 2003, Presentation of results from the 3-D model, groundwater study and nitrogen reducing system field test to the Board of County Commissioners in La Pine.
  - May 11, 2006, Planning Commission meeting (part of TDC Amendment Hearing)
    - All published materials leading up to and following up on TDC amendments also referred to the need for a Local Rule (see "Project News" page of website)
  - November 9, 2006 (requested by the La Pine Senior Center)
  - November 30, 2006 (hosted by the Deschutes County Planning Commission)
  - December 20, 2006 (Science Session requested at 11/30/2006 Planning Commission meeting)
  - Office Hours:
    - January 4, 2007, 5:00 - 7:00, Deschutes County office, La Pine
    - January 9, 2007, 1:00-5:00, Village Properties office, Sunriver
    - January 18, 2007, 1:00-5:00, Village Properties, Sunriver
    - January 23, 2007 3:00 - 5:00, Deschutes County office, La Pine
  - Hearing before the Board of County Commissioners, March 13, 20, 27<sup>th</sup>, 6:00 – 9:00 PM, La Pine High School

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Local Rule for Onsite Wastewater Treatment Systems in South Deschutes County

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- Written record for proposed Local Rule open from February 2007 to present (February 2008)
  - Board of County Commissioners work session with Oregon Department of Environmental Quality and Department of Land Conservation and Development, April 18, 2007
  - Board of County Commissioners work session with Oregon Department of Environmental Quality and Department of Land Conservation and Development, January 30, 2008
  - Hearing before the Board of County Commissioners on March 19, 2008, La Pine High School
  - Board of County Commissioners public meeting on Ordinance 2008-019 on June 11, 2008, Deschutes County Services Building
  - Hearing before the Board of County Commissioners on July 7, 2008, Deschutes County Services Building
- Other public information contacts
- On-going one on one contacts with EH staff either in person or by phone/e-mail
  - Deschutes County Home Show, May 2006
  - Open House, May 6, 2006, Deschutes County office, 51340 S. Highway 97, La Pine
  - Groundwater Science Open House, December 20, 2006, 4:00-6:00 PM, 51340 S Highway 97, La Pine
  - Presentations available upon request



## Appendix B

### Groundwater Science Open House

December 20, 2006

#### Staff Available for Q&A:

**Deschutes County:** Tom Anderson, Dan Haldeman, Barbara Rich, Todd Cleveland, Peter Gutowsky, Jerry Kathan, Jeff Freund

**US Geological Survey:** Dave Morgan, Steve Hinkle

**Oregon DEQ:** Bob Baggett

#### Posters/Info Stations:

- USGS Groundwater Model and Groundwater Investigation
- Nitrogen Reducing Systems
- Onsite Wastewater Treatment System Effects on Groundwater
- Background and History
- Physical model illustrating groundwater flow
- The increase in performance standards required as a result of added development between 1999 and 2005
- Map of monitoring and drinking water wells sampled in the region

#### Print Materials Available for Review:

- La Pine National Demonstration Project Draft Final Report
- La Pine National Demonstration Project Work Plan
- Data from the La Pine Project Innovative System Field Test including onsite system data and monitoring well data
- South County Regional Cost Benefit Analysis – Regional Problem Solving, Final Report, August 1997, KCM
- CDC Health Water Fact Sheet, Nitrate and Drinking Water from Private Wells, Summer 2003
- Oregon DEQ Fact Sheet, Nitrate in Drinking Water, September 2002
- Oregon DEQ Fact Sheet, Southern Willamette Valley Groundwater Management Area Declared, May 2004
- US Environmental Protection Agency (EPA) Consumer Fact Sheet on: Nitrates/Nitrites, downloaded from <http://www.epa.gov/cgi-bin/epaprintonly.cgi> on 12/15/06.
- US EPA web page print out, "Drinking Water from Household Wells," <http://www.epa.gov/safewater/privatewells/booklet/concern.html> downloaded 12/15/06.
- "Spontaneous Abortions Possibly Related to Ingestion of Nitrate Contaminated Well Water – LaGrange County, Indiana, 1991-1994," Center for Disease Control, Morbidity and Mortality Weekly Report, July 5, 1996/ 45(26); 569-572. Downloaded from <http://www.cdc.gov/mmwr/preview/mmwrhtml/00042839.htm> on 7/16/01.
- "Municipal Drinking Water Nitrate Level and Cancer Risk in Older Women: The Iowa Women's Health Study," Weyer et al, Epidemiology, May 2001, Vol. 11, No. 3, pp 327-338.
- "An Analysis of Nitrate Nitrogen in Groundwater Beneath Unsewered Subdivisions," Tinker, J.R., Ground Water Monitoring and Remediation, Winter 1991, pp 141-150.
- "Overview of the occurrence of Nitrate in Ground Water of the United States," Madison, R.J. and J.O. Brunett, National Water Summary 1984, Hydrologic Events, Selected Water-Quality Trends, and Ground-Water Resources, US Geological Survey Water-Supply Paper 2275, pp 93-105.
- "Fate and Transport of Biological and Inorganic Contaminants from On-Site Disposal of Domestic Wastewater," Reneau et al, Journal of Environmental Quality, Vol. 18, No. 2, pp 135 – 144.
- "Nitrate/Nitrite Toxicity – Additional Suggested Reading," Department of Health and Human Services, Agency for Toxic Substances and Disease Registry, downloaded from [http://www.atsdr.cdc.gov/HEC/CSEM/nitrate/additional\\_reading.html](http://www.atsdr.cdc.gov/HEC/CSEM/nitrate/additional_reading.html) on 12/15/06.

Local Rule for Onsite Wastewater Treatment Systems in South Deschutes County

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- "Nitrate/Nitrite Toxicity," Case Studies in Environmental Medicine, Agency for Toxic Substances and Disease Registry, Course SS3054, Revised January 2001.
- "A demonstration of innovative treatment and disposal technologies in environmentally sensitive karst terrain near Rock Bridge Memorial State Park, Missouri," Solomon et al, National Onsite Demonstration Program, downloaded from [http://www.nesc.wvu.edu/nodp/nodp\\_reports.htm](http://www.nesc.wvu.edu/nodp/nodp_reports.htm) on 12/15/06.
- "Evaluation of Movement of Septic System Effluent from Lake Development Into Near-Shore Areas of Table Rock Lake, Midwest Environmental Consultants, December 2001.

#### Handouts

- Local Rule Concepts
- Local Rule Communication Plan and Public Outreach Summary
- Transferable Development Credit Technical Advisory Committee Summary of Accomplishments and Direction excerpted from the minutes December 15, 2006
- Bend Bulletin Article, December 20, 2006
- "But my water was just tested!" Deschutes County CDD, November 2006
- "Pollution Reduction Credit Program," Deschutes County CDD, Fall 2006
- "Project Overview," Deschutes County CDD, Spring 2006
- "South County Groundwater Protection History," Deschutes County CDD, Spring 2006
- "How Contaminants Reach Groundwater," University of Florida Cooperative Extension Service, SL143
- "Why Not Sewer?" Deschutes County CDD, Spring 2006
- "Septic tank waste strength and sampling onsite systems: The nuts and bolts," Rich, B.J., et al, reprinted from 2004 Conference Proceedings, 13<sup>th</sup> Annual Technical Conference and Exposition National Onsite Wastewater Recycling Association.
- Papers from the 2003 Conference Proceedings of the 12<sup>th</sup> Annual Technical Conference and Exposition of the National Onsite Wastewater Recycling Association:
  - Denitrifying systems using forced aeration in the La Pine National Demonstration Project
  - Denitrifying systems using packed bed filters in the La Pine National Demonstration Project
  - Denitrifying systems using sequencing batch reactors and rotating biological contactors in the La Pine National Demonstration Project
- "Chemical and Algae Suffocating Lakes & Streams," Cone, M., Los Angeles Times, September 4, 2004.

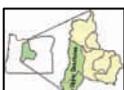
**Estimated Attendance:** 60-80 persons

**Press Coverage:** Bend Bulletin, KTVZ

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Local Rule for Onsite Wastewater Treatment Systems in South Deschutes County

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property owners have not received a permit to install the wastewater treatment system, and for those site evaluation report approvals, the onsite wastewater treatment system that would have been approved at the time of the site evaluation report is for a system that will not protect the groundwater in South Deschutes County from nitrogen discharges; and

WHEREAS, repairs, replacements or remodels of existing development comprise approximately ninety percent (90%) of the permits currently being issued; now, therefore,

THE BOARD OF COUNTY COMMISSIONERS OF DESCHUTES COUNTY, OREGON, ORDAINS as follows:

Section 1. Except as provided in Section 4 of this Ordinance, every owner of property with or without an existing onsite wastewater treatment system site evaluation report approval must install a nitrogen-reducing onsite wastewater treatment system in order to receive a County permit for construction, major alteration or major repair, as defined in Section 3 of this Ordinance.

Section 2. The requirements shall apply to onsite wastewater treatment system permit applications submitted on and after the effective date of this Ordinance.

Section 3. The following definitions from OAR 340-071-0100 are applicable to this Ordinance:

- a. "Alteration" means expansion or change in location of an existing system or any part thereof.
  - 1) Major alteration is the expansion or change in location of the soil absorption facility or any part thereof.
  - 2) Minor alteration is the replacement or relocation of a septic tank or other components of the system other than the soil absorption facility.
- b. "Construction" includes the installation of a new system or part thereof or the alteration, repair, or extension of an existing system. The grading, excavating, and earth-moving work connected with installation, alteration, or repair of a system or part thereof is considered system construction.
- c. "Repair" means installation of all portions of a system necessary to eliminate a public health hazard or pollution of public waters created by a failing system. Major repair is the replacement of a sand filter, RGF, ATT, or soil absorption system.
- d. "Onsite Wastewater Treatment System" means any existing or proposed subsurface onsite wastewater treatment and dispersal system including but not limited to a standard subsurface, alternative, experimental, or nonwater-carried sewage system.
- e. "Site Evaluation Report" means a report on the evaluation of a site to determine its suitability for an onsite system prepared in accordance with OAR 340-071-0150.
- f. "System" or "onsite system" means "onsite wastewater treatment system."

Section 4. The requirements of this Ordinance shall apply only to those unincorporated properties within Townships 19, 20, 21, 22 and Ranges 9, 10, and 11, except those areas authorized by the State for a sewer system.

Section 5. If any section, subsection, sentence, clause or phrase of this Ordinance is, for any reason, held to be invalid or unconstitutional, such decision shall not affect the validity of any remaining portion or portions of this Ordinance, unless:

1. The remaining part or parts are so essentially and inseparably connected with and dependent upon the unconstitutional or invalid part that it is apparent that the remaining part or parts would not have been enacted without the unconstitutional or invalid part; or

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Local Rule for Onsite Wastewater Treatment Systems in South Deschutes County

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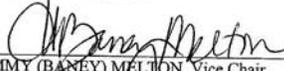
2. The remaining part or parts, standing alone, are incomplete and incapable of being carried out in accordance with the Board of County Commissioners' intent.

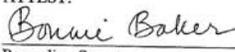
Section 6. EMERGENCY. This Ordinance being necessary for the immediate preservation of the public peace, health and safety, an emergency is declared to exist, and this Ordinance takes effect on its passage.

Dated this 11<sup>th</sup> of June 2008

BOARD OF COUNTY COMMISSIONERS  
OF DESCHUTES COUNTY, OREGON

  
DENNIS R. LUKE, Chair

  
TAMMY (BARNEY) MELTON, Vice Chair

ATTEST:  
  
Recording Secretary

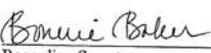
  
MICHAEL M. DALY, Commissioner

Date of 1<sup>st</sup> Reading: 11<sup>th</sup> day of June, 2008.

Date of 2<sup>nd</sup> Reading: 11<sup>th</sup> day of June, 2008.

Record of Adoption Vote				
Commissioner	Yes	No	Abstained	Excused
Dennis R. Luke	<u>✓</u>	—	—	—
Tammy Melton	<u>✓</u>	—	—	—
Michael M. Daly	<u>✓</u>	—	—	—

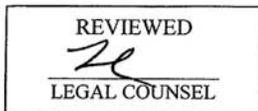
Effective date: 11<sup>th</sup> day of June, 2008.

ATTEST:  
  
Recording Secretary

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## Resolution and performance standard map for existing systems



For Recording Stamp Only

BEFORE THE BOARD OF COUNTY COMMISSIONERS OF DESCHUTES COUNTY, OREGON

A Resolution Adopting the Nitrate Loading  
Management Model to Establish Performance  
Standards for Onsite Wastewater Treatment  
Systems in South Deschutes County.

\*  
\*  
\*  
\*

RESOLUTION NO. 2008-021

WHEREAS, on July 21, 2008, the Board of County Commissioners ("Board") adopted Ordinance 2008-012 to add Deschutes County Code ("DCC") Chapter 13.14 to protect public waters in south Deschutes County from pollution by onsite wastewater treatment systems, and

WHEREAS, DCC 13.14.050(E) provides that the Board must adopt by resolution the minimum nitrogen reduction standards and the map depicting the locations where these standards apply; and

WHEREAS, beginning in 1999, the United States Geological Survey ("USGS") and the Oregon Department of Environmental Quality ("DEQ") conducted significant groundwater investigations in the Upper Deschutes River watershed, in general, and the La Pine sub-basin in particular, and

WHEREAS, the USGS and the DEQ developed the three-dimensional groundwater and nutrient fate and transport model of the La Pine sub-basin of the Upper Deschutes River watershed, and

WHEREAS, on or about 2007, the USGS and the DEQ published documentation of the development and findings of the groundwater study, the three-dimensional groundwater and nutrient transport model and the Nitrate Loading Management Model, and

WHEREAS, the USGS developed the Nitrate Loading Management Model ("Model") as a groundwater quality management tool for use in south Deschutes County;

WHEREAS, the Model can be used to 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, now, therefore,

BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF DESCHUTES COUNTY, OREGON, as follows:

Section 1. The Board adopts the Nitrate Loading Management Model published by the USGS in December 2007 as the basis for approving the nitrogen reducing onsite wastewater treatment systems pursuant to DCC Chapter 13.14.

Section 2. The minimum nitrogen reduction require pursuant to DCC Chapter 13.14.050(D) shall be 35% reduction of total nitrogen, which is approximately equal to a maximum of 30 mg/l total nitrogen in wastewater treatment system effluent from a typical residence at average flows of 225 gallons per day.



Section 3. The maximum nitrogen reduction required pursuant to DCC Chapter 13.14.050(D) shall be the nitrogen reduction achieved by a system approved by the DEQ and listed by Deschutes County as a Maximum Nitrogen Reducing System pursuant to DCC 13.14.060.

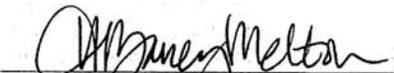
Section 4. The locations, as produced by the Nitrate Loading Management Model, where the performance standards for existing onsite systems must be achieved in the south Deschutes County region are identified on the map attached as Exhibit "A," attached hereto and by this reference incorporated herein.

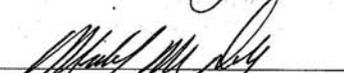
Section 5. The Deschutes County Community Development Department shall maintain the map identifying the locations where the above performance standards must be achieved for existing systems in south Deschutes County.

DATED this 23<sup>rd</sup> day of July, 2008.

BOARD OF COUNTY COMMISSIONERS  
OF DESCHUTES COUNTY, OREGON

  
DENNIS R. LUKE, Chair

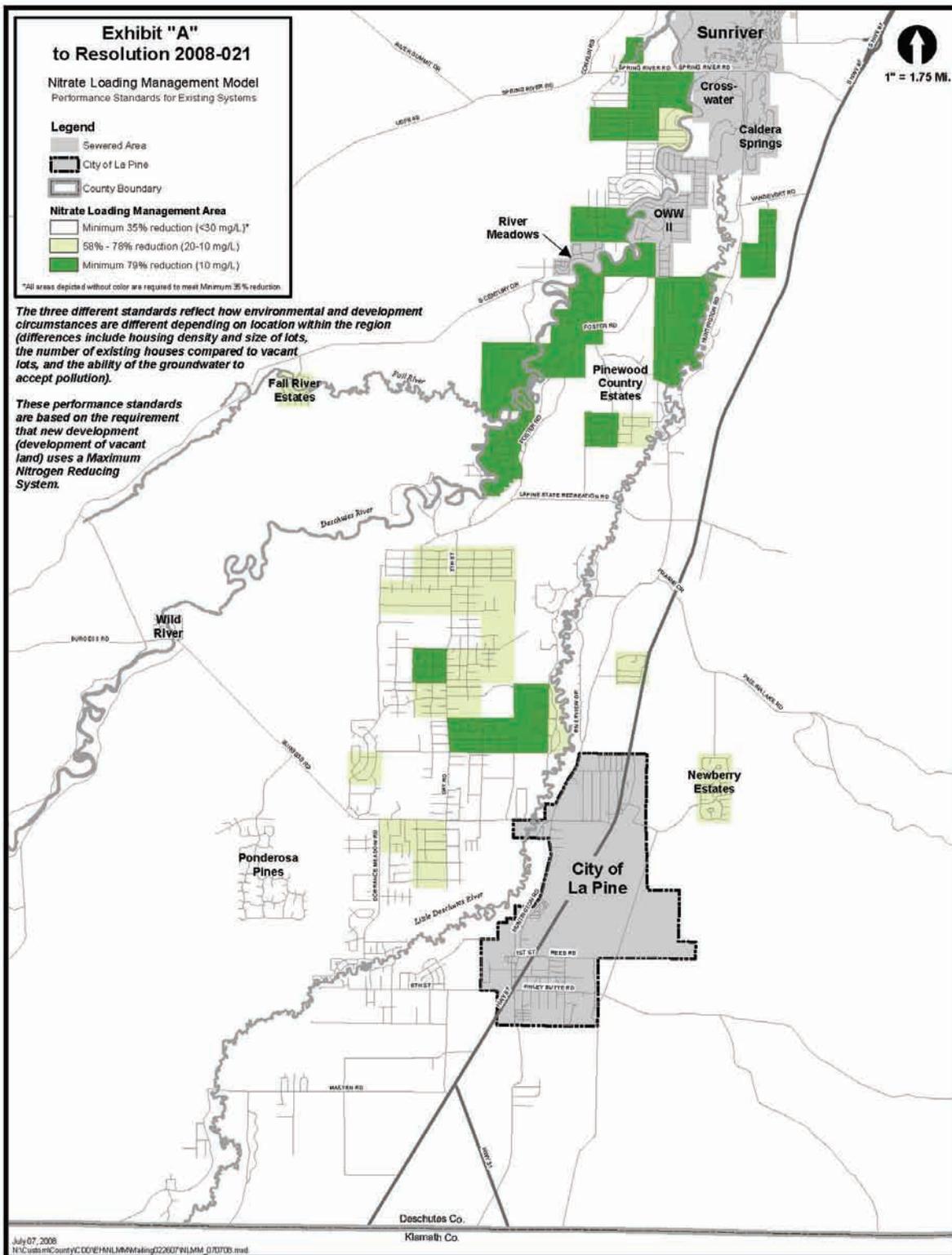
  
TAMMY (BANEY) MELTON, Vice Chair

  
MICHAEL M. DALY, Commissioner

ATTEST:

  
Recording Secretary





## **Local Rule Implementation Plan (90 days between adoption and effective date)**

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### **A. Public Notice**

1. Notice to prop. owners with existing site evaluations
2. Notice to prop. owners currently applying for site evals
  - a. Update: Notice of Groundwater Protection Program
3. Notice to vendors
  - a. Letter drafted
  - b. Compile mailing list
  - c. Mail letter
4. DIAL notice (DIAL is a web-based service providing property information)
  - a. Notice of requirement to upgrade & flag of upgrade completed

### **B. Public information materials/meetings**

1. Realtor info/procedures
  - a. Continuing Education class
  - b. "Property specific ""bid sheet"" with upgrade requirements"
  - c. "Update: Frequently Asked Questions - to web, handout"
  - d. Establish procedure for getting upgrade information into property records
  - e. ID groups of homes that have same requirements - potential for cost sharing
2. Installer info/procedures
  - a. One on one contacts
  - b. Newsletter
  - c. Meetings
3. Treatment standard map to LAVA/CD Map (Locally produced electronic maps)
  - a. Coordinate with IT & GIS
  - b. Permit Tech preview & training

### **C. Permit process update**

1. Permit tech training
  - a. Procedure/handout: Ordinance 2008-019
  - b. Training session #1: Ordinance 2008-019
  - c. Training session #2: LAVA/CD Map preview
2. Permit Tech procedures manual
  - a. Section for each nitrogen reducing system
  - b. Talking points on NLMM
  - c. Section for training materials & procedures
3. Update permit & site evaluation letter templates
  - a. Update: Replacing existing residences in HGW areas
  - b. Update: Site evaluation letter - Local Rule
  - c. Update: Site evaluation - inside city limits/sewer district
  - d. Update: Permit letters
  - e. Update: Trouble letters
  - f. CIDWT homeowners guide to service contracts to web
  - g. Certificate of Completion of Upgrade
4. Establish composting toilet permit process
  - a. Establish performance standard
  - b. Establish permit process
  - c. Create maintenance report form

### **D. Web update (reorient towards action)**

