

# Well Construction and Water Rights: Beyond Minimum Well Construction Standards

Harney Basin Groundwater Study  
Advisory Committee Meeting  
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# Introduction

## FIRST THINGS FIRST

- This presentation covers some of the potential well construction requirements that are specific to authorized wells on water rights.
- Meeting the requirements of a water right is the responsibility of the water right holder.
- The information provided here is intended to provide guidance for drilling professionals to help their clients understand and satisfy the conditions of their water rights.

# Presentation Overview

- Groundwater application reviews - brief overview
- Standard permit conditions
- Additional permit conditions
- Transfers, permit amendments, deepenings & replacement wells
- Resources for water rights information

# Groundwater Reviews

## *Public Interest Presumption:*

*The Department shall presume that a proposed ground water use will ensure the preservation of the public welfare, safety and health  
(OAR 690-310-130)*

# Groundwater Reviews

To issue a groundwater right the Department must find:

- The proposed use is allowed by the basin plan
- Water is available
- The proposed use will not injure other water rights
- The proposed use meets other rules of the Commission

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- The proposed use meets other rules of the Commission
- *OAR 690-310-140 allows the proposed use to be modified or conditioned to meet the presumption*

# Standard Permit Conditions

- Standard Conditions:
  - Well Locations
  - Source Aquifer
  - Well Construction

Failure to comply with any of the provisions of this permit may result in action including, but not limited to, restrictions on the use, civil penalties, or cancellation of the permit.

# Standard Permit Conditions

## Well Locations

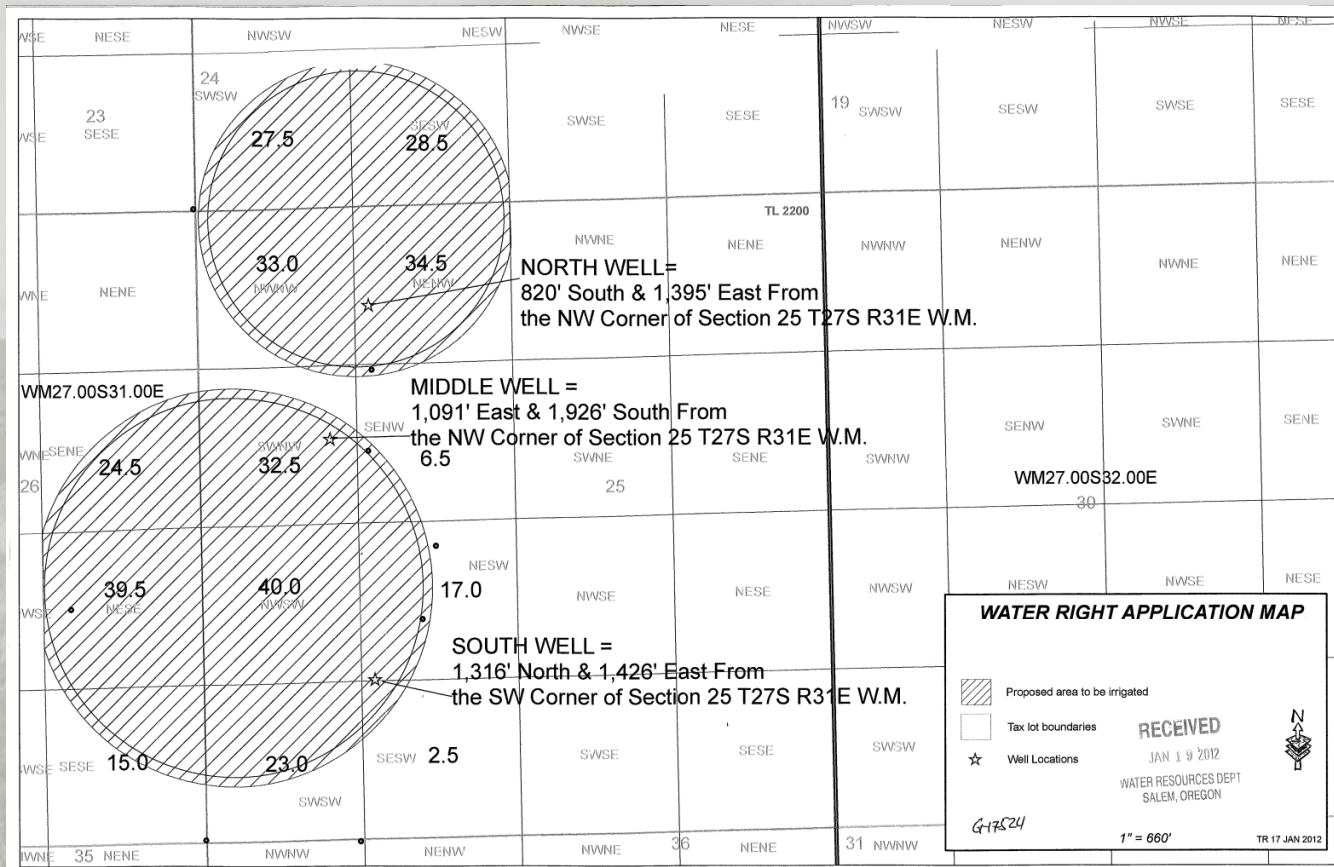
If the number, location, source, or construction of any well deviates from that proposed in the permit application or required by permit conditions, this permit may be subject to cancellation, unless the Department authorizes the change in writing.



# Standard Permit Conditions

## Well Locations

- Application map:



# Standard Permit Conditions

## Well Locations

- Authorized legal descriptions from the application/permit:

### WELL LOCATIONS:

NORTH WELL - NE  $\frac{1}{4}$  NW  $\frac{1}{4}$ , SECTION 25, T27S, R31E, W.M.; 820 FEET SOUTH AND 1395 FEET EAST FROM NW CORNER, SECTION 25

MIDDLE WELL - SW  $\frac{1}{4}$  NW  $\frac{1}{4}$ , SECTION 25, T27S, R31E, W.M.; 1926 FEET SOUTH AND 1091 FEET EAST FROM NW CORNER, SECTION 25

SOUTH WELL - SE  $\frac{1}{4}$  SW  $\frac{1}{4}$ , SECTION 25, T27S, R31E, W.M.; 1316 FEET NORTH AND 1426 FEET EAST FROM SW CORNER, SECTION 25

# Standard Permit Conditions

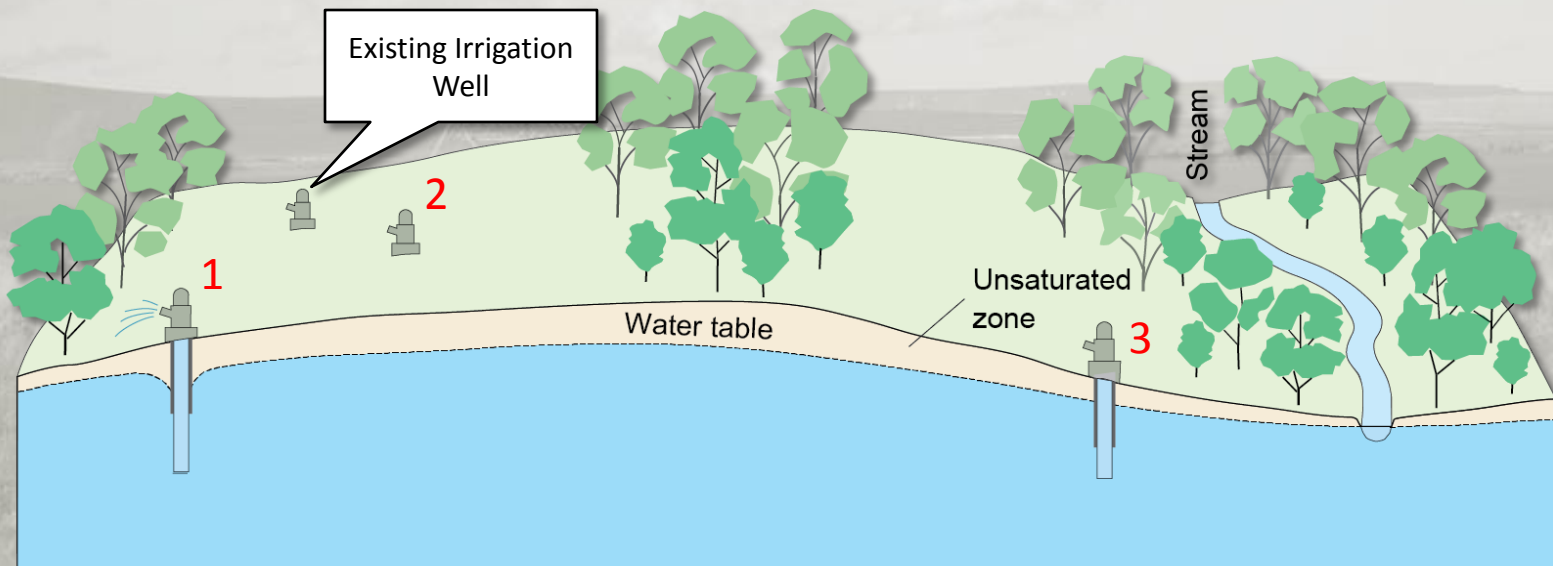
## Well Locations

- Why this matters:
  - Well locations are reviewed as proposed in the application (unless otherwise conditioned)
  - Interference with existing senior groundwater rights
  - Interference with surface water rights

# Standard Permit Conditions

## Well Locations

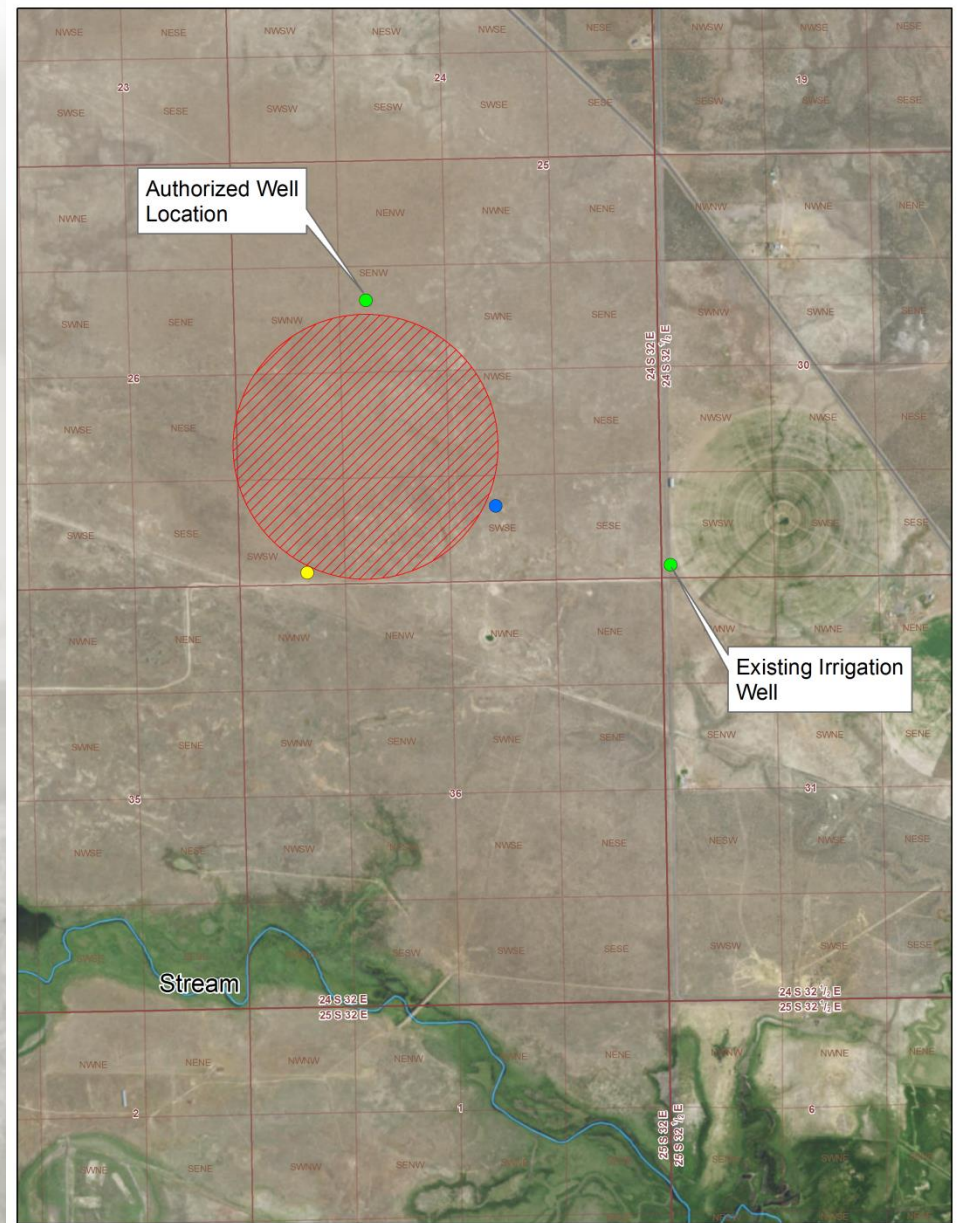
- Why this matters:
  - Interference with existing senior groundwater rights
  - Interference with surface water rights



Modified from Barlow, P.M., and Leake, S.A., 2012, Streamflow depletion by wells—Understanding and managing the effects of groundwater pumping on streamflow: U.S. Geological Survey Circular 1376, 84 p.

# Standard Permit Conditions

- Well Locations:
- Why this matters:
  - Interference with existing senior groundwater rights
  - Interference with surface water



# Standard Permit Conditions

## Source and Construction

If the number, location, **source, or construction** of any well deviates from that proposed in the permit application or required by permit conditions, this permit may be subject to cancellation, unless the Department authorizes the change in writing.

# Standard Permit Conditions

## Source and Construction

- Proposed well construction from application:

### SECTION 3: WELL DEVELOPMENT, CONTINUED

Total maximum rate requested: 150 GPM (each well will be evaluated at the maximum rate unless you indicate well-specific rates and annual volumes in the table below).

**The table below must be completed for each source to be evaluated or the application will be returned.** If this is an existing well, the information may be found on the applicable well log. *(If a well log is available, please submit it in addition to completing the table.)* If this is a proposed well, or well-modification, consider consulting with a licensed well driller, geologist, or certified water right examiner to obtain the necessary information.

OWNER'S WELL NAME OR NO.	PROPOSED	EXISTING	WELL ID (WELL TAG) NO.* OR WELL LOG ID**	FLOWING ARTESIAN	CASING DIAMETER	CASING INTERVALS (IN FEET)	PERFORATED OR SCREENED INTERVALS (IN FEET)	SEAL INTERVALS (IN FEET)	MOST RECENT STATIC WATER LEVEL & DATE (IN FEET)	PROPOSED USE			
										SOURCE AQUIFER***	TOTAL WELL DEPTH	WELL-SPECIFIC RATE (GPM)	ANNUAL VOLUME (ACRE-FEET)
Well #1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	GRAN 50771	<input type="checkbox"/>	10 in 8 in	10": 0-100' 8": 100-600'	Perforated 200-600'	0-100 ft	0-35 ft (no consistent well log reference data)	Bedrock	600 ft		
Well #2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	N/A	<input type="checkbox"/>	10 in 8 in	10": 0-100' 8": 100-600'	Perforated 200-600'	0-100 ft	0-35 ft (no consistent well log reference data)	Bedrock	600 ft		

# Standard Permit Conditions

## Source and Construction

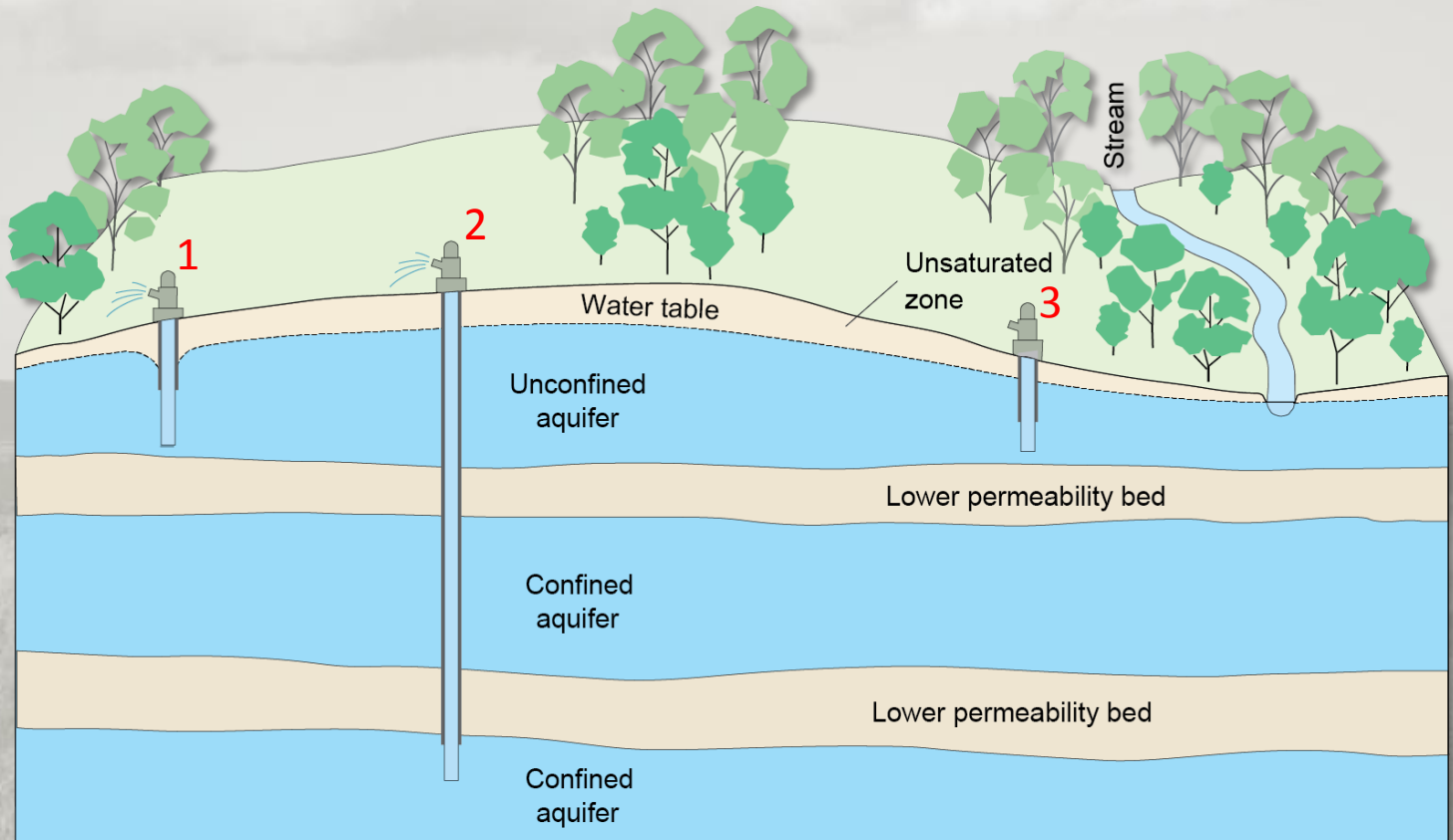
- Why this matters:
  - Source and construction are reviewed as proposed in the application (unless otherwise conditioned)
  - Interference with existing senior groundwater rights
  - Interference with surface water rights
  - Water availability



# Standard Permit Conditions

## Source and Construction

- Why this matters:



Modified from Barlow, P.M., and Leake, S.A., 2012, Streamflow depletion by wells—Understanding and managing the effects of groundwater pumping on streamflow: U.S. Geological Survey Circular 1376, 84 p.

# Additional Permit Conditions

## Several examples:

- Avoiding interference with senior groundwater and surface water rights
- Defining aquifer stratigraphy
- Monitoring impacts in sensitive areas
- Many more...

# Additional Permit Conditions

## Well Construction Condition:

- Avoiding shallow groundwater/surface water interference.

### Well Construction Conditions:

The well(s) shall be constructed to develop groundwater only from the predominantly volcanic/basalt bedrock unit underlying the predominantly basin fill unit. The well(s) shall be continuously cased and continuously sealed a minimum of five (5) feet into the predominantly volcanic/basalt bedrock beneath the predominantly basin fill unit. The well(s) may not be completed in such a manner to allow groundwater to be developed from the overlying basin fill.

If during well construction, it becomes apparent that the well can be constructed to eliminate interference with nearby shallow wells or hydraulically connected streams in a manner other than specified in this permit, the permittee can contact the Department Hydrogeologist for this permit or the Groundwater/Hydrology Section Manager to request approval of such construction. The request shall be in writing, and shall include a rough well log and a proposed construction design for approval by the Department. The request can be approved only if it is received and reviewed prior to placement of any permanent casing and sealing material. If the well is constructed first and then the request made, the requested modification will not be approved. If approved, the new well depth and construction specifications will be incorporated into any certificate issued for this permit.

# Additional Permit Conditions

## Cuttings Collection Condition:

- For characterizing aquifer stratigraphy.

### **1) Drill Cuttings**

Drill cuttings shall be collected at the permitted wells and any test holes. Samples shall be collected at ten-foot intervals and at changes in lithology. A reference set of clean cuttings, in plastic sample trays, shall be submitted to the Department for each well. Select drill cuttings shall be analyzed for a comprehensive suite of major, minor, and trace elements that are appropriate for characterizing Columbia River Basalt Group stratigraphy. The data

# Additional Permit Conditions

## Observation Well Condition:

- For monitoring impacts of groundwater withdrawals in sensitive areas.

The permittee shall construct one minimum six-inch diameter observation well to penetrate the same aquifer as the production wells. The well shall meet the Department's minimum well construction standards and shall be cased and sealed to the same depth as the production wells. The well shall be constructed at a location approved by the Department for the purpose of instrumentation with continuous water-level monitoring equipment. The landowner or permittee shall provide access to Department staff to install and maintain the monitoring equipment. The well shall not be used for any other purpose while the Department is monitoring water levels. The well shall be completed prior to water use.

# Additional Permit Conditions

## Some Notes on Observation Wells

Location approved by the department:

- Owner and driller work with department hydrogeologist to determine the appropriate location prior to drilling

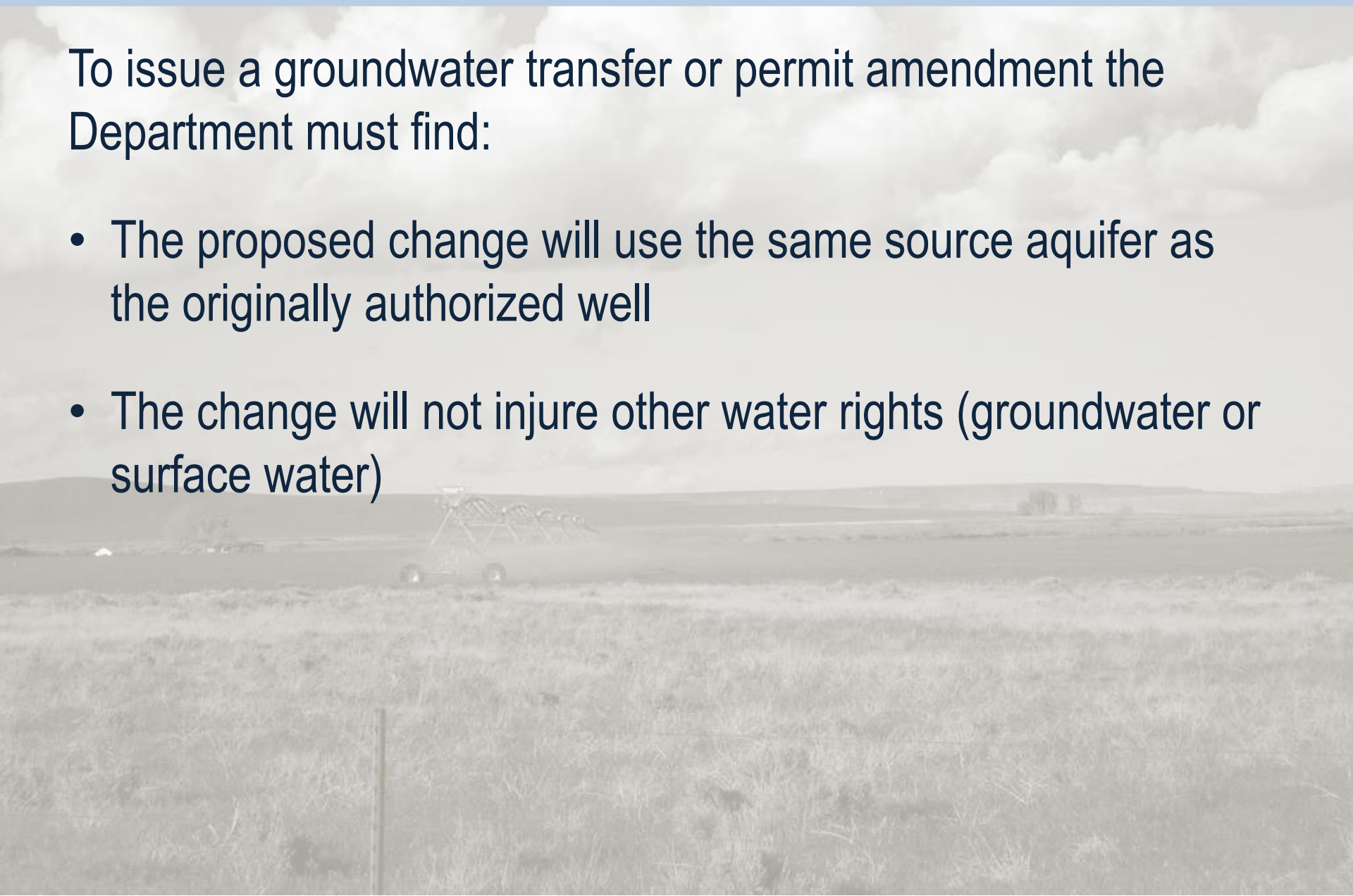
Case and seal same depth as production wells:

- Drill production wells first – then determine location and construction of observation well

# Transfers and permit amendments

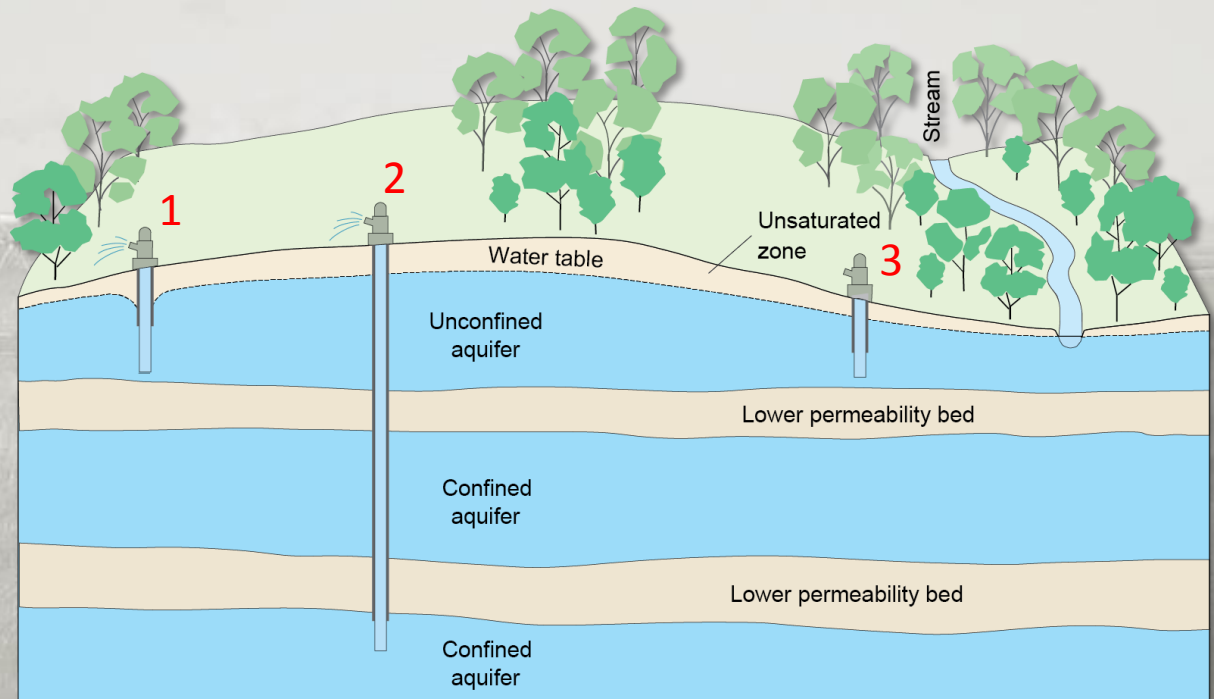
To issue a groundwater transfer or permit amendment the Department must find:

- The proposed change will use the same source aquifer as the originally authorized well
- The change will not injure other water rights (groundwater or surface water)



# Transfers and permit amendments

- Same source
- Injury to existing groundwater and surface water

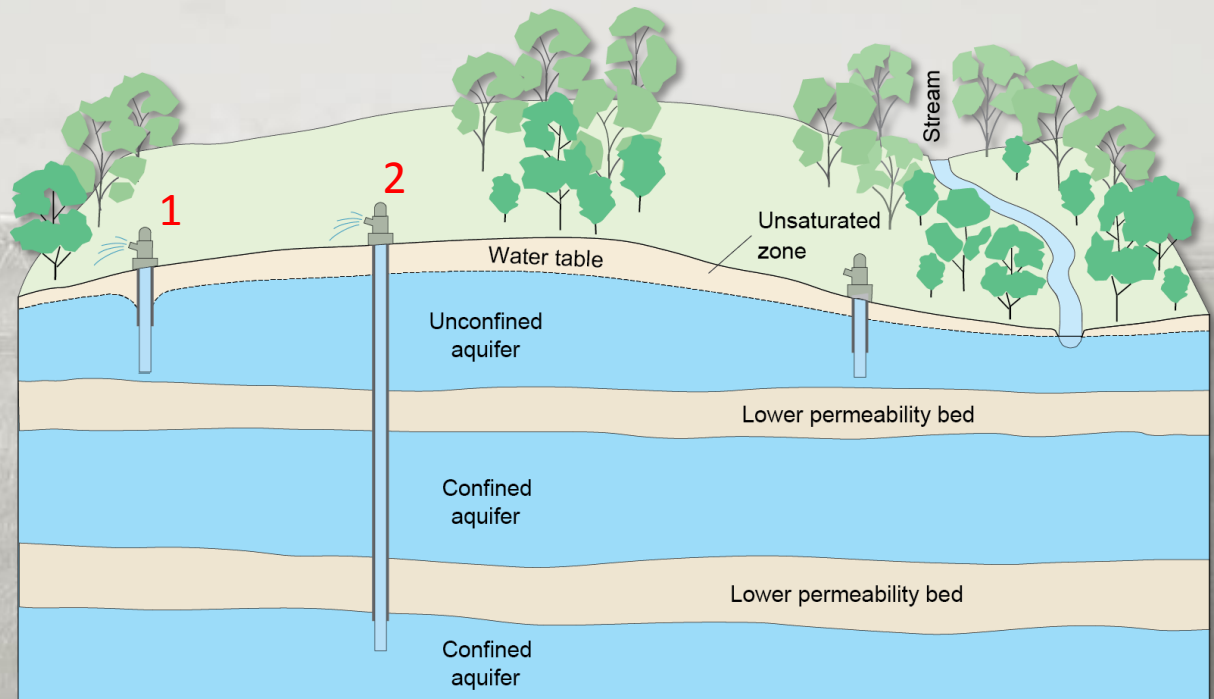


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# Well Deepenings

- Deepenings
  - Same source?

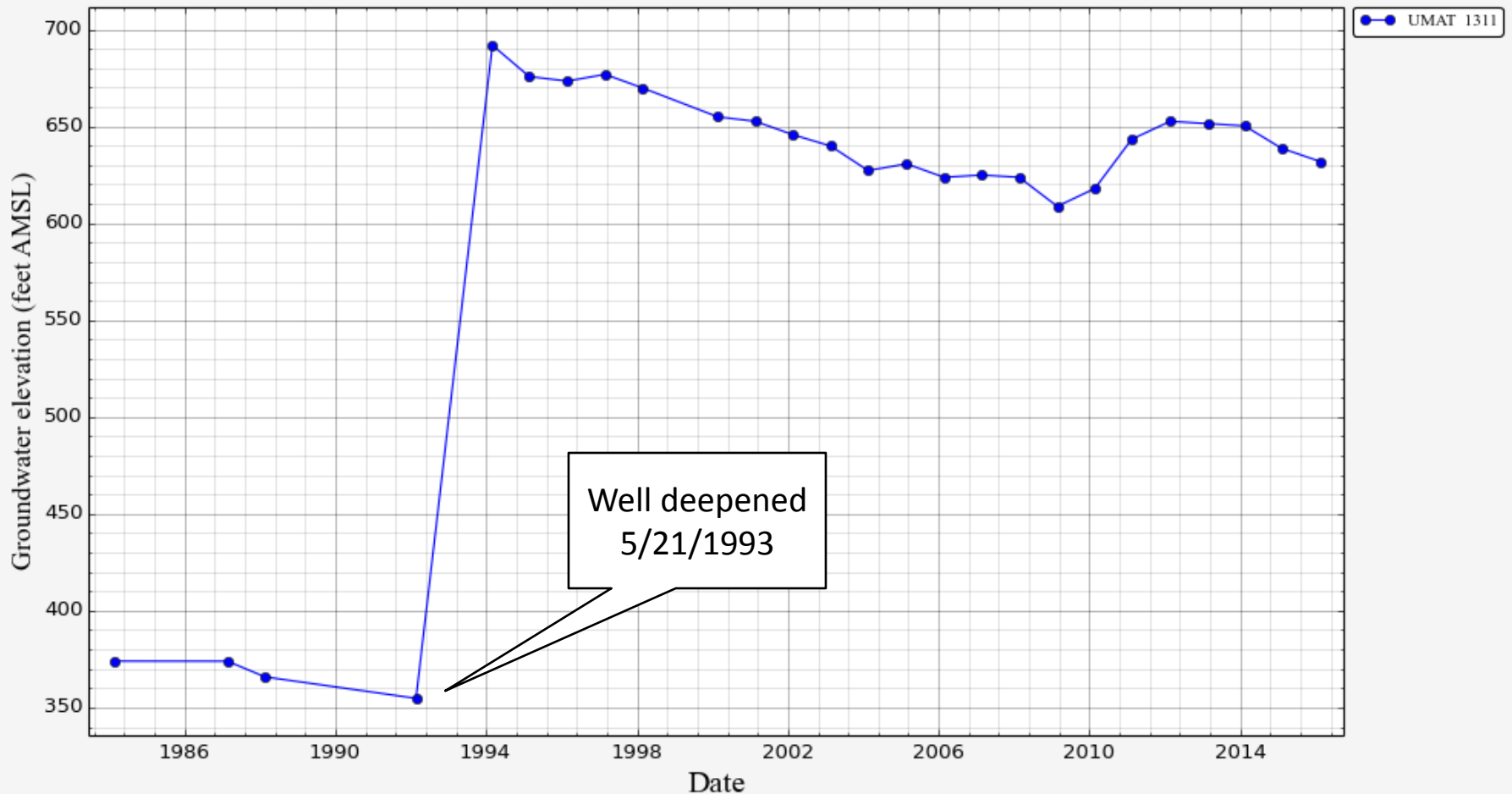


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# Well Deepenings

- Deepenings

Observation Well Data



# “Replacement Wells”

- Same source?
- Closer to surface water?
- Meets all conditions of original permit/certificate?
- **It is always best to file for a permit amendment or transfer before drilling replacement wells.**

# Conclusions

- Meeting the requirements of a water right is the responsibility of the water right holder.
- Drilling contractors are often the first point of contact when landowners begin to develop their groundwater right.
- Encourage your clients to read and understand their water right permit before they drill any wells.

# Resources for water rights information

- Water Rights Information Query:
  - <http://apps.wrd.state.or.us/apps/wr/wrinfo/>
- Water Rights Mapping Tool:
  - <http://apps.wrd.state.or.us/apps/gis/wr/Default.aspx>
- Contact the local Watermaster:
  - [http://www.oregon.gov/owrd/pages/offices.aspx#Watermaster\\_Offices](http://www.oregon.gov/owrd/pages/offices.aspx#Watermaster_Offices)

# Thank You

## Questions?

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**Thank You**



# Supplemental Slides

*The use will not injure other water rights...*

## **Division 09:** *Ground Water Interference With Surface Water*

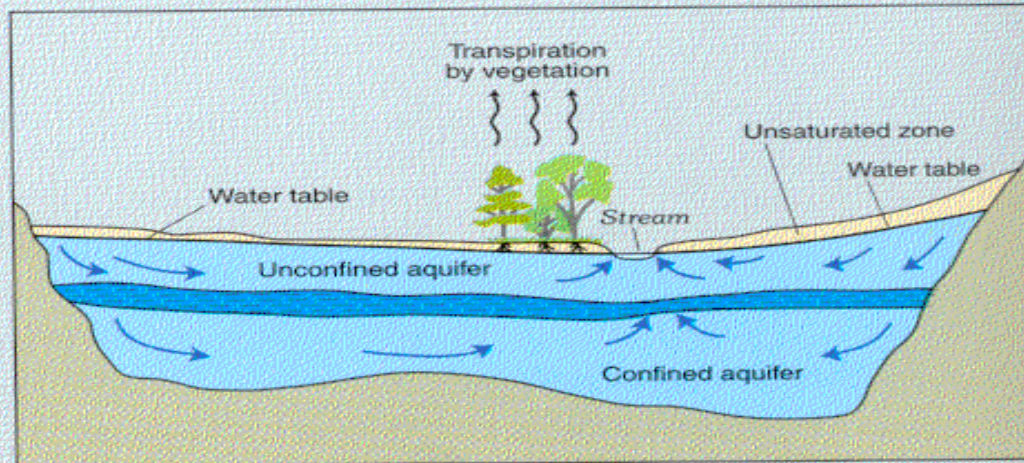
*09-040: Determination of Hydraulic  
Connection and Potential for Substantial  
Interference*







# Supplemental Slides

## Division 09-040:

### 1) Confinement and Hydraulic Connection



#### EXPLANATION

-  High hydraulic-conductivity aquifer
-  Low hydraulic-conductivity confining unit
-  Very low hydraulic-conductivity bedrock
-  Direction of ground-water flow

# Supplemental Slides

Division 09-040:

*(4) If the gw resource is determined to be hydraulically connected to a sw source, the potential for substantial interference is assumed if:*

*a) Less than  $\frac{1}{4}$  mile from the surface water; or*

*b) Rate greater than 5 cfs, less than 1 mi; or*

*c) Rate greater than 1% of a senior instream right or the 80% determined or estimated stream discharge if less than 1 mile; or*

*d) Greater than 25% stream depletion after 30 days of pumping if less than 1 mile*

# Supplemental Slides

