

DEFINING AND DELINEATION OF WATER SOURCES

Contact: Policy and Planning Section

Effective Date: February 15, 2007

References: RCW 90.03.265, 90.03.290, 90.03.380, 90.03.390; RCW 90.44.020-030, 90.44.100, 90.44.105, 90.44.130, 90.44.400-430; RCW 90.46.130; RCW 90.54.020(9); Chapters 173-100, 173-150, 173-152 & 173-154 WAC

Purpose: To provide a consistent framework for determining the source of water in water resources permitting, rulemaking, and other administrative actions.

Application: Applies to Water Resources Staff¹ when evaluating:

- Surface water to surface water right transfer applications.
- Surface water to groundwater or groundwater to surface water right transfer applications.
- Whether a groundwater change proposing a replacement or additional well taps the *same body of public groundwater* under RCW 90.44.100.
- The boundaries of groundwater areas, sub-areas, or depth zones under the groundwater management provisions of Chapter 90.44.130 RCW, and Chapter 173-100 WAC.
- Which applications share the *same source of supply* for a cost-reimbursement agreement for expedited review under RCW 90.03.265.
- The number of competing applications within the *same water source or source of water* for processing under Chapter 173-152 WAC (Hillis Rule).
- Impairment of water rights within the *source of supply* for reclaimed water proposals under RCW 90.46.130.

Background:

The allocation and administration of water rights in Washington State is based on the Prior Appropriation Doctrine which holds that the “first in time is first in right.” Under this doctrine, holders of earlier (senior) water rights are able to use their full right before a junior right holder may use any water during periods of short supply. Seniority or priority is based on when the application for a water right was submitted to Ecology, or in the case of vested water rights, when water was first put to beneficial use.

¹ This policy is intended for Ecology staff. Other consultants, local government or the general public who use this policy for guidance on Ecology source determinations should contact regional Ecology offices with inquiries about existing management of a particular source of water.

The priority of a water right has meaning only within the specific *water source*. For surface water rights, the state has historically defined the source as the stream or lake from which water is diverted. This can include one or more streams or other water bodies managed together. For groundwater, the source has been historically defined as the aquifer or aquifer system from which groundwater is withdrawn.

During much of the 20th century, Ecology and predecessor agencies managed surface water and groundwater separately. Eighty-two surface drainage systems (basins) in the state have been adjudicated since 1918 with varying consideration of groundwater. Similarly, in the last 30 years, Ecology has adopted numerous instream flow rules to protect aquatic resources, with varying consideration of groundwater in managing surface water. Increasingly though, the state has recognized that the two are connected and considered both surface water and groundwater together.

Hydrogeological science has long recognized that interactions between surface water and groundwater often indicate they should be treated as a single entity. This recognition was made law in Washington through the passage of the Water Resources Act of 1971 (Chapter 90.54 RCW). Chapter 90.54.020(9) RCW requires full recognition of the natural interactions between surface and ground waters in Ecology's administration of allocation and use programs.

As Washington State enters the 21st century, population growth and competing water interests have increased consideration of water source interactions, including:

- Listing of threatened or endangered species has resulted in more applications to transfer surface water rights to groundwater.
- Implementation of more stringent surface water treatment standards has resulted in more applications by municipalities to transfer surface water rights to groundwater.
- Permitting of new groundwater rights and drilling of exempt groundwater wells has reduced surface water availability for senior water right holders.
- Aquifers in some areas of the state are declining, resulting in increased applications for change to other, usually deeper, aquifers.
- Some local watershed planning efforts have emphasized conjunctive management of surface and groundwater rights, while others have focused on developing instream flow rules to protect aquatic resources.
- Many adjudications have not included groundwater. This results in clarification of surface water rights but leaves the relative extent and priority of groundwater rights in question. This has been a barrier to managing the two together even when there is strong evidence showing it would be prudent.

Ecology finds itself in a transition period where its historic management efforts have been primarily associated with surface water rights. In the future, the need to manage groundwater will increase. In many basins, Ecology will need to manage surface water and groundwater together. Meanwhile, we must still make permitting decisions requiring source designations. Many of these are based on basic hydrogeology overlain by administrative or regulatory requirements. The purpose of this policy is to

describe how Ecology should define and delineate water sources for permitting and other decisions.

Definitions:

Conjunctive management: A water resource management scheme in which surface water and groundwater in hydraulic connection are managed as a single source of water.

Effective barrier to hydraulic flow: Geologic or hydrologic features that substantially reduce or prevent the flow of water, including (1) Geological materials of sufficiently low permeability to effectively prevent the flow of water, (2) Topographic and hydrologic divides that direct water into independent flow regimes, and (3) Geological structural boundaries, such as faults and folds, which prevent the flow of water.

Flow Regime: The pattern in space and time of water flow, both underground (groundwater) and above ground (surface water).

Groundwater body: Water contained within geological materials that allow for storage and flow, with recognizable boundaries or effective barriers to hydraulic flow.

Recharge area: The geographical area from which a body of water draws its supply. Recharge areas include watersheds, sub-areas within a watershed, and groundwater catchment areas.

Source of water: Surface waters and/or groundwater in hydraulic connection, meeting the following four conditions:

1. They share a common recharge area.
2. They are part of a common flow regime.
3. They are separable from other water sources by effective barriers to hydraulic flow.
4. They are an independent water body for the purpose of water right administration, as determined by Ecology.

Surface water body: A stream, lake, wetland, spring or other water feature in which surface land features contain and direct the flow of water in contact with the atmosphere.

Water right administration: Refers to Ecology's authority regarding the allocation and management of water resources in the State of Washington. Includes, but is not limited to:

- The investigation, issuance, and enforcement of water rights.
- The establishment and enforcement of Instream Flow Rules and rules adopted through Watershed Plans.
- The management and enforcement of court issued adjudication decrees.

Typically, water right administration begins at the Water Resources Inventory Area (WRIA) level (first order), followed by major tributary river systems (second order), and then at the level of lesser tributary streams (third order).

Determination of Source

Who Makes Source Determinations?

Most source determinations require the application of geologic and hydrogeologic principles. Therefore, licensed hydrogeologists² should have primary responsibility in defining or designating sources of water. In some cases, other technical staff may be responsible for such analysis. Ecology's goal is to make technically sound, defensible and consistent permitting and other administrative decisions within the overall administrative framework present in a basin.

When Are Source Determinations Required?

The following are seven primary permitting actions where Ecology has a statutory requirement to determine the extent of a source of supply.³

- Surface to Surface Transfers. Under RCW 90.03.380 points of diversion are to be transferred “without loss of priority” provided there is no impairment of existing rights. Retaining priority implies that both points use the same source of supply. If changing a water right reduces the water available to a junior water user during periods of low flow, such reduction is considered impairment. Ecology could deny such a change based on impairment. Alternatively, it may be possible to prevent impairment by making the priority date of the transferred water right junior, in whole or in part, to the impaired rights.
- Surface to Ground Transfers (or Ground to Surface Transfers). Ecology derives its authority to transfer diversion and withdrawal points between surface and groundwater bodies from RCW 90.03.380, 90.44.020-030, 90.44.100 and 90.54.020(9).

Adding wells under RCW 90.44.100 requires Ecology to make “findings as prescribed in the case of an original application.” This includes both the public interest and water availability tests. Water availability within the source was evaluated at the time the water right issued. However, local water availability within a large source can vary and must be considered in a surface water to groundwater change.

- Same Body of Public Groundwater: When adding wells to groundwater rights (RCW 90.44.100), or when consolidating exempt wells with an existing permit or certificate (RCW 90.44.105), the wells must draw from the *same body of public groundwater*. The same body test preserves the existing priority scheme. The priority system provides certainty to water users as they plan for their projects knowing the reliability of the water supply during times of shortage.

² Licensed under Chapter 18.220 RCW and Chapter 308-15 WAC.

³ Additionally, in the context of water system plan review, watershed planning, instream flow development and other water resource management efforts, Ecology may make source determinations.

- Groundwater Body Designation and Delineation: Chapter 90.44.130 RCW gives authority to Ecology to delineate the boundaries of groundwater bodies and to sub-divide these bodies into sub-areas and depth zones in order to protect senior appropriators. Similar authority for the designation and delineation of groundwater areas is found under Chapter 173-100 WAC. Chapters 173-150 and 173-154 WAC contain regulations for protecting groundwater withdrawals. These statutes and rules provide a mechanism for Ecology to define with certainty a particular source management scheme.
- Cost Reimbursement Proposals: Historically, Ecology had to work on applications for both new water rights and changes to existing water rights in the order they were filed. However, in the late 1990s, requests for new rights and transfers came in faster than Ecology could process them, creating a large backlog of pending applications.

In response, the Legislature passed several laws aimed at relieving this backlog. One statutory change authorized Ecology to consider transfer applications separately from applications for a new water right.⁴ Another allowed applicants to seek faster review of their application through a cost-reimbursement agreement (RCW 90.03.265). This allows the applicant to expedite the processing of their application by paying the cost of processing all other earlier applications from the *same source of supply*.

- Chapter 173-152 WAC (aka Hillis Rule): Ecology adopted Chapter 173-152 WAC in 1998 to clarify, in part, its criteria for processing applications for new water rights and transfers.⁵ The rule's intent is to provide for orderly processing of water right applications in the order filed, except for extraordinary situations. Ecology processes applications in the order they are received within the *same source of water*, subject to several exceptions. These exceptions allow for the priority processing of applications:
 - a. In the case of a new application when public health and safety is at risk, and where the change or transfer if approved would result in providing water supplies to meet the general needs of the public for regional areas.
 - b. In the case of a new application where a proposed use is nonconsumptive and if approved would substantially enhance or protect the quality of the natural environment, and where the change or transfer if approved would substantially enhance the quality of the natural environment.
 - c. Where changes or transfers were filed by participants in an adjudication and action on the change or transfer was necessary to ensure timely action by the Court.
- Impairment Determinations for Water Reclamation Projects: Reclaimed water is water that has historically been disposed of as waste, but is now treated to a higher water quality standard for use for a beneficial purpose. Reclaimed water may be from treated wastewater, agricultural industrial process water, and industrial reuse water.

The Legislature intended reclaimed water to be an alternative water source to offset potable water needs. However, exclusive right to the reclaimed water is only granted if no other

⁴ E.g., the “two-lines” bill, codified in RCW 90.03.380(5).

⁵ This rule was adopted in response to the Supreme Court decision in *Hillis v. Ecology*, 131 Wn.2d 373, 932 P.2d 139 (1997).

water right would be impaired. This is possible if no one else has relied on the historic wastewater disposal, or if the water supply impacts are adequately compensated or mitigated. In order to assess whether existing water users will be impaired, a same *source of supply* determination must be made and then an analysis of impairment within that source of water completed.

How Are Source Determinations Made (Management and Technical Considerations)?

Source determinations consider both management and technical issues. Regulatory, adjudicatory or planning decisions at the local level can affect source boundaries. Technical considerations are rooted in geology and hydrogeology. Both aspects include best professional judgment. In the technical arena, such judgment is founded in scientific principles. In the management arena, such judgment may reflect local values, or criteria set by a court, legislative body or regulatory agency.

Water Right Administration Considerations

Staff making source determinations must consider the existing management framework of the watershed or basin in which they are working. The following regulatory, adjudicatory and local management choices may affect permitting decisions:

- Water Right Adjudications: Adjudication by a superior court provides certainty to water right holders of the extent and validity of their water rights and their relative priority amongst other water rights from that source. Most of the adjudications completed in Washington State apply to small tributary streams where competition for the limited resource has been long-standing. Many adjudications only considered rights associated with a surface water source. Although increased withdrawal of groundwater in continuity with these streams unquestionably affects water availability for adjudicated surface water rights, the courts have created a regulatory structure for curtailment during times of water shortage only for the adjudicated rights. In time, groundwater also may be adjudicated and the management scheme altered. Until that occurs however, Ecology may only regulate amongst water users where certainty in priority is established to settle disputes or allegations of impairment.⁶

The implications of an adjudicated water source on permitting actions is that source determinations tend to be narrower than what a purely technical deliberation might conclude, in order to ensure that senior water users are not impaired. For example, if a junior adjudicated surface water right holder seeks to transfer a water right to a well, Ecology must conclude that the well could be regulated in the same manner as the surface diversion in order to approve the change without impairing existing rights. This management scheme may prevent a transfer that would otherwise be possible based solely on technical considerations.

Historically a call for curtailment of the junior water right would result in immediate curtailment of the surface diversion. If the same call at the proposed well site would result in

⁶ In the meantime, where disputes arise amongst water right holder where certainty in priority is not known, injured parties must seek a judicial remedy for relief (e.g. *Rettkowski v. Ecology*, 122 Wn.2d 219, 858 P.2d 232 1993).

continued impacts to the stream after ceasing the withdrawal, then these impacts act to the detriment of the senior water user.

- **Adoption of Instream Flow Rules:** Ecology is charged with protecting existing aquatic and natural resources for the benefit of the public. Ecology adopts instream flow rules designed to protect and preserve instream resources and values, including fisheries interests and recreation. An instream flow rule creates a water right with a priority date based on the effective date of the rule. Water rights issued after that date are subject to curtailment when the flow is not met. This is true even if the newly issued water rights are based on applications filed before the instream flow rule was adopted.

The presence of an instream flow rule in a basin is another water right administration consideration that can affect source determinations beyond what a purely technical deliberation might yield. *As in the case of an adjudicated basin, transfers from surface to groundwater of water rights junior to the instream flow must be limited to those instances where management of the water right during times of curtailment will not impair the instream flow.*

- **Adoption of Groundwater Area and Subarea Management Rules:** Several rules have been promulgated by Ecology under the authority of RCW 90.44.130 and Chapter 173-100 WAC, which establish groundwater management areas and subareas in many locations within the state. Numerous separate and distinct bodies of groundwater (i.e., sources) are designated within these rules. When making source determinations, these administratively defined groundwater bodies should be considered as separate sources in a manner similar to sources designated through Instream Flow Rules.
- **Adopted Watershed Plan Rules:** Local government has a significant role in shaping existing resource management and future water allocations through the Watershed Planning Act (Chapter 90.82 RCW). Each Water Resource Inventory Area (WRIA) plan must include a water budget. In this way, local government can influence future water resource decisions in their watershed. Ecology is a partner in this process. We provide technical and regulatory assistance as the plan is created, and later help implement planning recommendations. These can include rules that create reserves of water for future uses, establish instream flows, close streams or basins to new uses, and other measures.

Much like Ecology, local governments undertaking watershed plans are faced with determining how to allocate the remaining water resources while protecting existing water right holders. In this way, rules adopted to implement a watershed plan can affect Ecology's permitting decisions and source determinations. *For example, a rule adopted as part of a watershed plan recommending conjunctive management of the resource (surface water and groundwater aquifers together) may lead to broader source determinations than those based on adjudication.*

- **Other Water Right Administration Considerations:** Reservation of waters by the federal government, tribal reserved rights, interstate and international compacts, and other regulatory schemes can affect source determinations. Staff should become familiar with management issues in a particular basin before starting technical deliberations in defining a source of water.

Technical Considerations

Once the management scheme of a particular area is known, qualified Ecology staff apply hydrogeologic principles in defining a source of water. All source determinations are made on the basis of best professional judgment by qualified staff and should be consistent with the management scheme adopted or set for the area. In the absence of an existing management scheme, staff shall make permitting decisions that will not impair existing rights.

Although each of the five source determination requirements addressed in this policy use slightly different language, they all are based on the concept of the *source of water* for the water right. A source of water is a body or bodies of water which:

- Are hydraulically connected.
- Share a common recharge (catchment) area.
- Share a common flow regime.
- Are isolated from other sources by the presence of effective barriers to hydraulic flow.

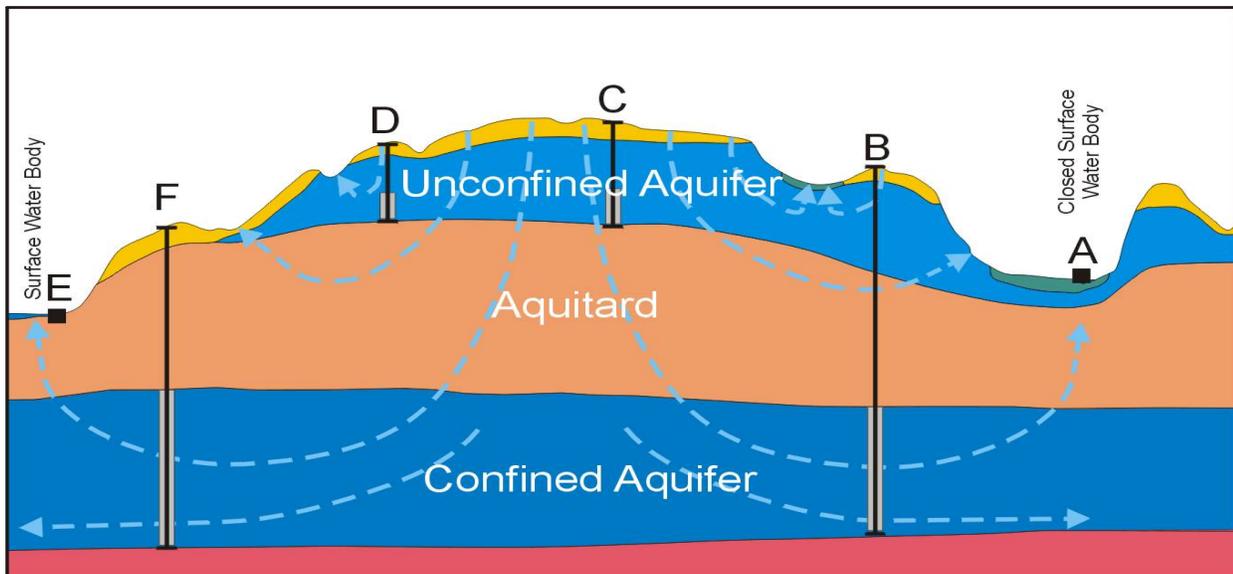
Staff base source of water determinations on sufficient information and data, which in their judgment is necessary to render a sound, defensible decision. They may consider area topography, mapping of geologic structures, well log information, water level measurements in the area, aquifer characteristics, and other factors. Ecology staff should refer to Water Resources Program Technical Guidance that provides a greater depth of technical detail for in defining and determining sources of water.

Additionally, the *Report of the Technical Advisory Committee on the Capture of Surface Water by Wells* (1998) and the *Procedural Guidelines for Hydrogeologic Investigations* (1993) may be useful in providing a technical foundation for source determinations. The types of technical information used in making a source designation can include hydrological and hydrogeological studies, reports, computer models, aquifer tests, and stream and groundwater hydrographs.

In instances where information on source is either not known or is unclear, Ecology can issue preliminary permits pursuant to RCW 90.03.290 (2) to gather more information before a source determination is made.

Implications of Source Management (Examples)

The following examples are offered to instruct staff on how different source management choices can affect source determinations and permitting decisions. Consider the following illustration.



Example 1

Assume in this example that conjunctive management of surface and groundwater supplies has been adopted at the basin level and the aquitard is not an effective barrier to groundwater flow. In this case, staff should consider the drawing as depicting two *sources of water*, separated in the center by a hydrologic divide (or other barrier to groundwater flow). The following permitting decisions might result from such a management scheme (assuming all other statutory tests for change are met):

- Surface water to groundwater changes from A to B or C may be permissible because they would be considered the same *source of water*.
- Surface water to groundwater changes from A to D or F are not permissible because they would be considered different *sources of water*.
- Because Well C is located near the hydrologic divide, best professional judgment is required to determine the source of water. Assuming it is in the source on the right-hand side of the illustration, Wells C and B are in the same body of public groundwater.
- Because of the hydrologic divide, Wells C and B are not in the same body of public groundwater as Wells D or F.
- Processing under Hillis or through cost reimbursement contracts must consider competing applications at A, B and C, but not at D, E or F.
- A proposed water reclamation project supplied by Well C and discharging wastewater at location A would consider the potential for impairment of existing water rights at A, B and C.

Example 2

Using the same illustration, assume in this example that surface water has been adjudicated and instream flows adopted, and that the aquitard has been determined to be a barrier to groundwater flow. In this case, staff should consider the drawing as depicting four separate *sources of water*, separated in

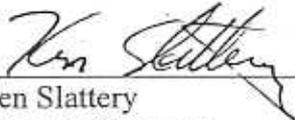
the center by a hydrologic divide (or other barrier to groundwater flow) and separated vertically by the aquitard. The following permitting decisions might result from such a management scheme (assuming all other statutory tests for change are met):

- Surface water to groundwater changes from A to C are permissible provided A can be managed in its historic manner. Generally, water rights senior in the adjudicated management scheme and senior to the instream flow can be moved further away from surface sources than junior water rights, because junior water rights are subject to immediate curtailment during times of water shortage.
- Surface water to groundwater changes from A to B are not permissible because they are not in the same *source of water*.
- Wells B and C are not in the same body of public groundwater.
- Processing under Hillis or through cost reimbursement contracts must consider competing applications at A and C, but not at B, and vice versa.
- A proposed water reclamation project supplied by Well C and discharging wastewater at location A would consider the potential for impairment of existing water rights at A and C.

Summary

The management scheme in place can affect the size and number of sources of water for permitting decisions. In general, conjunctive management results in fewer, larger designated sources of water. As a result, more projects involving surface to ground transfers and same body of public groundwater determinations can be permitted. However, that same management choice can increase the number of applications considered in cost reimbursement agreements, and water rights in Hillis determinations and reclaimed water impairment analyses.

Conversely, a more highly regulated basin may result in more numerous, smaller sources of water. As a result, fewer projects involving surface to ground transfer and same body of public groundwater determinations are possible. Gains include needing to consider fewer applications in cost reimbursement agreements, and fewer water rights in Hillis determinations and reclaimed water impairment analyses.



Ken Slattery
Program Manager
Water Resource Program

Special Note: These policies and procedures are used to guide and ensure consistency among water resources program staff in the administration of laws and regulations. These policies and procedures are not formal administrative regulations that have been adopted through a rule-making process. In some cases, the policies may not reflect subsequent changes in statutory law or judicial findings, but they are indicative of the department's practices and interpretations of laws and regulations at the time they are adopted. If you have any questions regarding a policy or procedure, please contact the department.