

Appendix 4-A

Evaluation of Ground Water Management Alternatives

Table 1
Ground Water Management Alternatives Evaluation
Effectiveness Criteria No. 1: Overall Effectiveness ⁽¹⁾

Considerations With Respect to Planning Unit Goals ⁽²⁾	Alternative II-1 Key Resource	Alternative II-2 Selected Uses	Alternative II-3 Prohibit New Withdrawals	Alternative II-4 No Action
<ul style="list-style-type: none"> • Goal 1: Improve reliability of surface water supply for irrigation use 	<ul style="list-style-type: none"> • Access to ground water can improve reliability of supply for irrigation, both as a primary supply and by supplementing surface water supplies 	<ul style="list-style-type: none"> • Extent of improvements in reliability depend on how criteria are defined; would likely be lower than Alternative II-1 	<ul style="list-style-type: none"> • Restrictions on new ground water development would provide no improvement in reliability for irrigation 	<ul style="list-style-type: none"> • Effects unknown. Impact on reliability depends on whether future decisions permit new development of ground water resources.
<ul style="list-style-type: none"> • Goal 2: Provide for growth in municipal, rural domestic and industrial demand 	<ul style="list-style-type: none"> • In many areas ground water is well-suited to provide municipal, domestic and industrial supplies. Access to ground water under Alternative II-1 would help provide for future needs. 	<ul style="list-style-type: none"> • Could improve reliability in selected areas of the Basin, if municipal, domestic and industrial uses fit the criteria developed for this alternative • Extent of improvements in reliability depend on how criteria are defined; would likely be lower than Alternative II-1 	<ul style="list-style-type: none"> • Restrictions would limit growth and development in many communities, particularly where ground water is the most viable source of supply for municipal, domestic and industrial needs • Alternative of using surface water supplies would cause higher costs due to treatment needs 	<ul style="list-style-type: none"> • Effects unknown. Impact on ability to meet growth needs depends on whether future decisions permit new development of ground water resources.
<ul style="list-style-type: none"> • Goal 3: Improve instream flows for all uses, with emphasis on improving fish habitat 	<ul style="list-style-type: none"> • With increased pumping of ground water, instream flows could be reduced in some areas, at some times • Improved data and extensive management effort may be needed to minimize flow impacts 	<ul style="list-style-type: none"> • Criteria used to implement this approach could be designed to protect flows in high priority areas • Improved data and extensive management effort may be needed to minimize flow impacts • Likely to have fewer impacts on flow than Alternative II-1 	<ul style="list-style-type: none"> • Restrictions on additional ground water development would not improve instream flows, but would limit impacts to current levels in areas where hydraulic continuity is significant. 	<ul style="list-style-type: none"> • Effects unknown. Impact on instream flows depends on degree of connectivity between aquifers and surface waters; and on whether future decisions permit new development of ground water resources.

Table 1 (continued)
Ground Water Management Alternatives Evaluation
Effectiveness Criteria No. 1: Overall Effectiveness ⁽¹⁾

Considerations With Respect to Planning Unit Goals ⁽²⁾	Alternative II-1 Key Resource	Alternative II-2 Selected Uses	Alternative II-3 Prohibit New Withdrawals	Alternative II-4 No Action
<ul style="list-style-type: none"> Goal 5: Protect, improve, and sustain ground water quantity and pumping levels of aquifers for the benefit of current and future use 	<ul style="list-style-type: none"> May require active and complex management to prevent decline in water levels Water levels may be impacted in some locations at some times despite management 	<ul style="list-style-type: none"> Criteria used to implement this approach could be designed to protect water levels in aquifers subject to depletion Improved data and extensive management effort may be needed to minimize flow impacts Likely to be more protective than Alternative II-1 	<ul style="list-style-type: none"> Would help limit decline in water level, but would not benefit users. 	<ul style="list-style-type: none"> Effects unknown. Impact on aquifer water levels depends on whether future decisions permit new development of ground water resources.
<ul style="list-style-type: none"> Goal 7: Maintain economic prosperity by providing an adequate water supply for all uses 	<ul style="list-style-type: none"> Communities dependent on ground water supplies would have adequate water to provide for economic growth Agricultural users could supplement surface water supplies in dry years, to reduce losses affecting Basin economy 	<ul style="list-style-type: none"> Economic impacts would depend on area or aquifer in question Benefits depend on criteria developed to implement this Alternative Likely to provide for less economic vitality than Alternative II-1 	<ul style="list-style-type: none"> Would likely compromise economic opportunities since communities dependent on ground water could not satisfy additional demands Agricultural users may be significantly impacted during dry years 	<ul style="list-style-type: none"> Effects unknown. Impact on economic prosperity depends on whether future decisions permit new development of ground water resources.

Notes:

(1) Defined as "Among the alternatives considered, which are most effective at meeting Planning Unit objectives?"

(2) Five of the seven substantive goals are directly related to ground water management. Goals 4 and 6 relate to fish habitat and ground water quality, respectively. Note that goal numbers are not intended to indicate priority.

Table 2
Ground Water Management Alternatives Evaluation
Effectiveness Criteria No. 2: Cost-effectiveness ⁽¹⁾

Alternative II-1 Key Resource	Alternative II-2 Selected Uses	Alternative II-3 Prohibit New Withdrawals	Alternative II-4 No Action
<ul style="list-style-type: none"> Quantitative analysis of cost-effectiveness not performed Financial costs would likely be borne primarily by each water user Cost-effectiveness depends on success of management program since active and comprehensive management program would be needed to balance multiple goals 	<ul style="list-style-type: none"> Similar considerations as Alternative II-1 	<ul style="list-style-type: none"> Does not meet water supply objectives, so cost effectiveness not definable. For instream flow objective, financial cost is low, but cost in terms of lost economic opportunities may be high 	<ul style="list-style-type: none"> Current hiatus in processing permits has similar cost effectiveness considerations as Alternative II-3. In long-term, cost effectiveness will depend on whether future decisions permit new development of ground water resources.

Notes:

(1) Defined as “Which alternatives deliver the highest benefits for each dollar invested”

Table 3
Ground Water Management Alternatives Evaluation
Effectiveness Criteria No. 3: Flexibility Over Time ⁽¹⁾

Alternative II-1 Key Resource	Alternative II-2 Selected Uses	Alternative II-3 Prohibit New Withdrawals	Alternative II-4 No Action
<ul style="list-style-type: none"> Could potentially offer substantial flexibility from year to year, since ground water could be used in conjunction with surface water to meet Basin needs. Comprehensive ground water management program may be necessary to fully realize opportunities for flexible use of this resource 	<ul style="list-style-type: none"> Improved flexibility for municipal, industrial, and domestic users. Comprehensive ground water management program may be necessary to fully realize opportunities for flexible use of this resource. Opportunities for flexible management reduced compared with Alternative I-1. Limited to those areas and uses where ground water development would be permitted. 	<ul style="list-style-type: none"> Little flexibility, since new use of ground water would be highly restricted in all years and all areas of basin 	<ul style="list-style-type: none"> Effects unknown. Depends on whether future decisions permit new development of ground water resources.

Notes:

(1) Defined as “Which solutions offer the ability to be readily modified over time, in response to changing conditions and improved information?”

Table 4
Ground Water Management Alternatives Evaluation
Effectiveness Criteria No. 4: Environmental Impacts ⁽¹⁾

Alternative II-1 Key Resource	Alternative II-2 Selected Uses	Alternative II-3 Prohibit New Withdrawals	Alternative II-4 No Action
<ul style="list-style-type: none"> Increased ground water development could potentially impact regional aquifer system in Columbia Basalts New ground water development may reduce summertime base flow, in some locations; and cause increase in surface water temperatures. 	<ul style="list-style-type: none"> Criteria used to implement this alternative could be designed to minimize undesirable side-effects Would likely have fewer side effects than Alternative II-1 since ground water use would occur in fewer areas 	<ul style="list-style-type: none"> Status quo, since new withdrawals would not be permitted under this alternative. 	<ul style="list-style-type: none"> Effects unknown. Effects depend on whether future decisions permit new development of ground water resources.

Notes:

(1) Defined as “Do some of the potential solutions appear to create new problems, or exacerbate existing problems?”

Table 5
Ground Water Management Alternatives Evaluation
Feasibility Criteria No. 1: Legal Authority ⁽¹⁾

Alternative II-1 Key Resource	Alternative II-2 Selected Uses	Alternative II-3 Prohibit New Withdrawals	Alternative II-4 No Action
<ul style="list-style-type: none"> Ecology has authority to issue new permits, so long as four tests in Chapter 90-03-290 RCW are satisfied NMFS and USFWS may have authority to override state/local decisions if these decisions are deemed to harm fisheries Yakama Nation has legal standing as co-manager of fisheries resources 	<ul style="list-style-type: none"> If specific criteria are developed to define selected uses, rule-making by Ecology may be needed Local governments have some authorities to manage uses of ground water through land use regulations and permitting of development Other considerations similar to Alternative II-1 	<ul style="list-style-type: none"> Rule making by Ecology needed, if Yakima Basin is closed to further ground water appropriations 	<ul style="list-style-type: none"> Ecology has authority to continue regulation of ground water withdrawals in current manner, subject to terms of MOA with USBR and YN

Notes:

(1) Defined as “Do the implementing organizations have the authority to implement the proposed solutions? If not, can ordinances or rules be adopted to provide that authority?”

Table 6
Ground Water Management Alternatives Evaluation
Feasibility Criteria No. 2: Approvals/Permits ⁽¹⁾

Alternative II-1 Key Resource	Alternative II-2 Selected Uses	Alternative II-3 Prohibit New Withdrawals	Alternative II-4 No Action
<ul style="list-style-type: none"> Permits would be handled on case by case basis, through existing water rights administrative process managed by Ecology 	<ul style="list-style-type: none"> Same as Alternative II-1 	<ul style="list-style-type: none"> No permits or approvals will be required since development of new withdrawals will not be allowed (except under emergency circumstances) 	<ul style="list-style-type: none"> Effects unknown. Permitting would be handled as shown for Alternative II-1, but would depend on whether future decisions allow new development of ground water resources.

Notes:

(1) Defined as “What approvals or permits will be required, especially by organizations not represented on the planning unit. Are those approvals or permits likely to be granted?”

Table 7
Ground Water Management Alternatives Evaluation
Feasibility Criteria No. 3: Cost and Funding Sources ⁽¹⁾

Alternative II-1 Key Resource	Alternative II-2 Selected Uses	Alternative II-3 Prohibit New Withdrawals	Alternative II-4 No Action
<ul style="list-style-type: none"> Cost of ground water development is usually borne by individual water user; using funding sources available to them. Generally, funding is not a prohibitive factor in developing new ground water resources. Development of improved data and a comprehensive ground water management system would entail new costs. Funding source(s) to be determined. 	<ul style="list-style-type: none"> Similar to Alternative II-1. May be additional legal or administrative costs involved in managing a system that permits some ground water uses, but not others. 	<ul style="list-style-type: none"> Since further development of ground water prohibited, no capital or operational costs involved May be substantial costs associated with legal challenges 	<ul style="list-style-type: none"> Effects unknown. Impact depends on whether future decisions permit new development of ground water resources.

Notes:

(1) Defined as “How expensive is each alternative, and who will bear the cost? Will funding sources be available, both in the short-term and long-term?”

Table 8
Ground Water Management Alternatives Evaluation
Feasibility Criteria No. 4: Integration with Related Programs ⁽¹⁾

Alternative II-1 Key Resource	Alternative II-2 Selected Uses	Alternative II-3 Prohibit New Withdrawals	Alternative II-4 No Action
<ul style="list-style-type: none"> • Compatible with Ecology’s Water Resources Program • Compatible with local land use planning and economic development programs • Would require careful management to be compatible with fish recovery programs • Would increase demands on Ecology’s administrative system for processing permit applications. This has been a significant limitation on permitting system in recent years. • To improve data and ground water management capabilities would require new or expanded administrative structures, including state and local participation 	<ul style="list-style-type: none"> • Generally, same as Alternative II-1. However, compatibility with local land use and economic development programs depend on criteria developed to implement this alternative. 	<ul style="list-style-type: none"> • Compatible with Ecology’s Water Resources Program • Compatible with fish recovery programs. • Not compatible with local land use planning and economic development programs, unless alternative sources of water are identified to serve growth 	<ul style="list-style-type: none"> • Effects unknown. Impact depends on whether future decisions permit new development of ground water resources.

Notes:

(1) Defined as “How will each solution fit in with related programs and plans?”