

Fish Creek Reservoir Company – Aquifer Recharge Plan

Staff Review Notes – September 21, 2007

Fish Creek Reservoir – right 37-1162 (AJ recommendation)

- 1922 priority
- irrigation storage - 14411 afy
- provides supplemental water for irrigation of 8066.3 acres
- ground water right 37-14273 (2.4 cfs) also used in service area
- service area includes lands above reservoir (exchange storage with natural flow)

Fish Creek Dam

- historical operation of the dam – close outlet in November, store water through beginning of irrigation season (base flow 10 to 20 cfs), extremely high runoff years water is released prior to use for irrigation - proposal indicates limited storage and use data available
- concerns about the structural integrity of the dam required changes resulting in reduced storage volume to 5515 af (8896 af foregone storage) beginning in 2005

Proposed Aquifer Recharge Project

- foregone storage proposed to be used for aquifer recharge and marketed for mitigation purposes
- proposed to use Water Supply Bank to administer, lease 8896 afy and rent to users as needed at \$ rate based on market conditions
- Fish Creek has not normally discharged to other surface streams, in high runoff years the discharge is to Carey Lake which generally evaporates or infiltrates, extremely high years result in overflow to laterals at the end of Little Wood Irrigation District and ultimate infiltration
- proposed recharge potential
 - Mean – 5579 afy
 - Median – 6714 afy
 - Maximum – 8896 afy
 - Minimum – 0 afy
- channel seepage in Fish Creek – seepage from the dam to the recharge site is proposed to be credited to recharge, proposal assumes credit exists when irrigation deliveries would not have been occurring.

- measurement proposal – since flow in Fish Creek could be a combination of natural flow, storage deliveries and foregone storage, measure flow below last irrigation diversion from Fish Creek (Hot Springs Ditch); add channel seepage above that which would have normally occurred due to irrigation deliveries.
- evaporation in Fish Creek reach to recharge site is estimated at 6.9 afy

Comments and Questions Related to Water Right and Other Issues

- need analysis to assess change from irrigation storage to ground water recharge

transfer of supplemental irrigation use is typically limited to average historic use – consider allowing transfer of maximum use due to the nature of surface water/storage and then limit mitigation credit based on volume available and actually diverted for recharge

need an annual-historical accounting (measured or estimated) of storage, use from storage (deliveries), evaporation and seepage losses and crop consumption to determine a percentage of historic storage that was consumed - use that value as a basis to determine an amount that can be recharged and used for mitigation credit - proposal indicates limited historical data is available; however, additional water district records are available at IDWR, see summary prepared by Tim Luke

conveyance losses – proposal suggests full credit to recharge for conveyance losses associated with recharge deliveries made prior to irrigation season; however, conveyance losses would have occurred historically whenever storage was delivered – need to estimate historic losses and compare to losses under proposed recharge plan

recharge use diversion rate – how to quantify a flow rate under the right if converted from storage to natural flow right - could be based on historic inflow (minus natural flow releases) during storage period; alternative might be to view as recharge storage with a point of redirection to the recharge site instead of a change to a flow right to avoid the flow rate issue (fill irrigation storage first, release recharge from storage as it enters reservoir)

- need mechanism to approve water right change, authorize mitigation plans, and account for mitigation credits used as a result of the recharge

Option 1 – transfer right to recharge use – would need conditions to address the accounting of future mitigation quantities, company would enter into private agreements for use of recharged water as mitigation with department approvals for mitigation plans and updates to water right records; no protection from forfeiture unless water is diverted and used as recharge; recharge could be continuous regardless of rental for mitigation

Option 2 – lease to bank and rent all back out by company for recharge use – same conditions as option 1; annual fee for rental based on 10% administration fee for water supply bank (e.g. $8896 \times 14 \times 0.1 = \$12454.4$); rental greater than 5 years requires board approval and advertising

Option 3 – lease to bank and rent to other users as needed for mitigation – lease might be conditioned to rent only as recharge for mitigation purposes; rental administered by bank at fee indicated on lease application (10% administration fee to bank); rentals greater than 5 years require advertising and board approval; protected from forfeiture while in bank; recharge could not occur unless rented (bank requires that water cannot be diverted and used unless the right is rented from the bank); conditions may be necessary in lease to bank to ensure company remains responsible for recharge diversions and measurement

- Other questions/comments

where will recharged water provide benefit for mitigation use? initial model simulations (transfer spreadsheet) indicate long-term recharge benefits primarily Near Blackfoot to Neeley and Devil's Washbowl to Buhl reaches of the Snake River; benefit as short-term rental may have limited value unless rented to users near recharge site; benefit as long-term plan may have more value (but limited to specific reaches)

how will water be recharged; will an engineered, managed facility be constructed requiring DEQ approval?

how much evaporation will occur at the recharge facility?

proposal should provide additional detail regarding measurement plan for recharge water

should any water right change approval include a condition limiting recharge credit for existing uses instead of new appropriations (is it in the public interest to allow new uses to utilize recharge as mitigation when there are shortages that may result in curtailment of existing rights?) exception might be to allow current users in Fish Creek Reservoir Co. to utilize recharge credits for supplemental wells

Fish Creek Reservoir Company – Aquifer Recharge Plan

Fish Creek Reservoir – right 37-1162 (AJ recommendation)

- 1922 priority
- irrigation storage - 14411 afy
- provides supplemental water for irrigation of 8066.3 acres
- ground water right 37-14273 (2.4 cfs) also used in service area
- service area includes lands above reservoir (exchange storage with natural flow)

Fish Creek Dam

- historical operation of the dam – close outlet in November, store water through beginning of irrigation season (base flow 10 to 20 cfs), extremely high runoff years water is released prior to use for irrigation, proposal indicates limited storage and use data available
- concerns about the structural integrity of the dam required changes resulting in reduced storage volume to 5515 af (8896 af foregone storage) beginning in 2005

Proposed Aquifer Recharge Project

- foregone storage proposed to be used for aquifer recharge and marketed for mitigation purposes
- proposed to use Water Supply Bank to administer, lease 8896 afy and rent to users as needed at \$ rate based on market conditions
- Fish Creek has not normally discharged to other surface streams, in high runoff years the discharge is to Carey Lake which generally evaporates or infiltrates, extremely high years result in overflow to laterals at the end of Little Wood Irrigation District and ultimate infiltration
- proposed recharge potential
 - Mean – 5579 afy
 - Median – 6714 afy
 - Maximum – 8896 afy
 - Minimum – 0 afy
- channel seepage in Fish Creek – seepage from the dam to the recharge site is proposed to be credited to recharge, proposal assumes credit exists when irrigation deliveries would not have been occurring.

- measurement proposal – since flow in Fish Creek could be a combination of natural flow, storage deliveries and foregone storage, measure flow below last irrigation diversion from Fish Creek (Hot Springs Ditch). Add channel seepage above that which would have normally occurred due to irrigation deliveries.
- evaporation in Fish Creek reach to recharge site is estimated at 6.9 afy

Water Right and Other Issues

- need authorization to change from irrigation storage to ground water recharge

transfer of supplemental irrigation use is typically limited to average historic use – consider allowing transfer of maximum use due to the nature of surface water/storage and then limit mitigation credit based on actual recharge

need an annual-historical accounting (measured or estimated) of storage, use from storage (deliveries), evaporation and seepage losses and crop consumption to determine a percentage of historic storage that was consumed - use that value as a basis to determine an amount that can be recharged and used for mitigation credit - proposal indicates limited historical data is available; however, additional water district records are available at IDWR, see summary prepared by Tim Luke

conveyance losses – proposal suggests full credit to recharge for conveyance losses associated with recharge deliveries made prior to irrigation season; however, conveyance losses would have occurred historically whenever storage was delivered – need to estimate historic losses as described above

recharge use diversion rate – should be based on historic inflow (minus natural flow releases) during storage period or could view as recharge storage with a point of rediversion to the recharge site instead of a change to a flow right to avoid the flow rate issue (fill irrigation storage first, release recharge from storage as it enters reservoir)

- need mechanism to approve and account for mitigation credits used as a result of the recharge

Option 1 – transfer right to recharge use – need conditions addressing future mitigation quantities, company enters into private agreements for use as mitigation with department approvals for mitigation plans and updates to records, no protection from forfeiture unless water is diverted and used as recharge, recharge could be continuous regardless of rental for mitigation

Option 2 – (not desired) lease to bank and rent all back out by company for recharge – same conditions as option 1, annual fee is set at \$14 per acre foot with 10% to bank ($8896 \times 14 \times 0.1 = \$12454.4$), greater than 5 years requires board approval and advertising

Option 3 – lease to bank and rent as needed for mitigation – lease could be conditioned to rent only as recharge for mitigation purposes, rental administered by bank at fee indicated on lease application, rentals greater than 5 years require advertising and board approval, protected from forfeiture while in bank, recharge could not occur unless rented (bank requires that water cannot

be diverted and used unless the right is rented from the bank), conditions necessary in lease to ensure company remains responsible for recharge diversions and measurement.

- Other questions

where will recharged water provide benefit for mitigation use? (see model simulations)

how will water be recharged; will an engineered, managed facility be constructed requiring DEQ approval?

how much evaporation will occur at the recharge facility?

proposal should provide additional detail regarding measurement plan for recharge water.

should any water right change approval include a condition limiting recharge credit for existing uses instead of new appropriations (is it in the public interest to allow new uses to utilize recharge as mitigation when there are shortages that may result in curtailment of existing rights?) exception might be to allow current users in Fish Creek Reservoir Co. to utilize recharge credits for supplemental wells