# *Summary of Allocation Options and Examples in Idaho*

## *Presented by Tom Dupuis*



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HDR

# *Topics*

- Allocation methods
- Summary of mainstem LBR sediment allocations
- Summary of previous phosphorus TMDLs and LBR implementation plan
- Key issues for the ongoing LBR phosphorus TMDL allocations

# *EPA Guidance on Wasteload Allocations*

## *Table 4-1 of EPA TSD (see Handout for complete list and source)*

1. Equal percent removal (equal percent treatment)
2. Equal effluent concentrations
3. Equal total mass discharge per day
4. Equal mass discharge per capita per day
5. Equal reduction of raw load (pounds per day)
6. Equal ambient mean annual quality (mg/l)
7. Equal cost per pound of pollutant removed
8. Equal treatment cost per unit of production
9. Equal mass discharged per unit of raw material used
10. Equal mass discharged per unit of production

11 a. Percent removal proportional to raw load per day

11 b. Larger facilities to achieve higher removal rates

12. Percent removal proportional to community effective income

13a. Effluent charges (dollars per pound, etc.)

13b. Effluent charge above some load limit

14. Seasonal limits based on cost-effectiveness analysis
15. Minimum total treatment cost

# *EPA Guidance on Allocations*

- "Table 4-1 lists 19 allocation schemes that may be used by States to develop WLAs. This is not intended to be a complete list of approaches; regulatory authorities may use any reasonable allocation scheme that meets…requirements of State water quality standards."
- "The most commonly used allocation methods have been equal percent removal, equal effluent concentrations, and a hybrid method."

# *LBR Sediment TMDL Process and Allocations*

- Series of stakeholder workshops to identify and evaluate potential allocation methods
- Mass balance model used to quantify implications
- Outcome:
  - Wastewater sources:
    - Equal concentration per NPDES permit limits translated to loads at design flows, limits < target concentrations
    - Plus allowance for future growth
  - Agriculture sources:
    - Equal % reduction (37%) for tribs downstream of Middleton
  - Stormwater not rigorously addressed

# *Phosphorus TMDLs and Implementation Plans*

- Lower Boise River:
  - LBR “Strawman” (~1997, first mass balance model)
  - TMDL Litigation/Settlement (2000-2002)
  - Snake River-Hells Canyon TMDL (approved  2004)
  - Preliminary LBR TMDL (2005-2007)
  - SR-HC TMDL Implementation Plan (2007-2008)
  - Lake Lowell (2010)
- Other Southern Idaho TMDL Examples:
  - Mid-Snake (1998)
  - Portneuf River (2010)

# *Snake River-Hells Canyon (2004 approval)*

- Public Advisory Team, numerous meetings
- Allocations to tributaries: equal concentration (0.07 mg/L) converted to mass based on average seasonal flows:
  - Implementation approach (see Appendix I)
  - Trading recognized as critical to meeting TMDL goal
- Allocations to mainstem:
  - Wastewater sources:
    - Equal % removal (80%, BNR)
  - Agriculture sources:
    - Drains: 86% reduction
  - Stormwater sources: no explicit allocations

# *From Appendix I*

- Evaluated equal percent reduction, equal concentration and hybrid (least-cost)

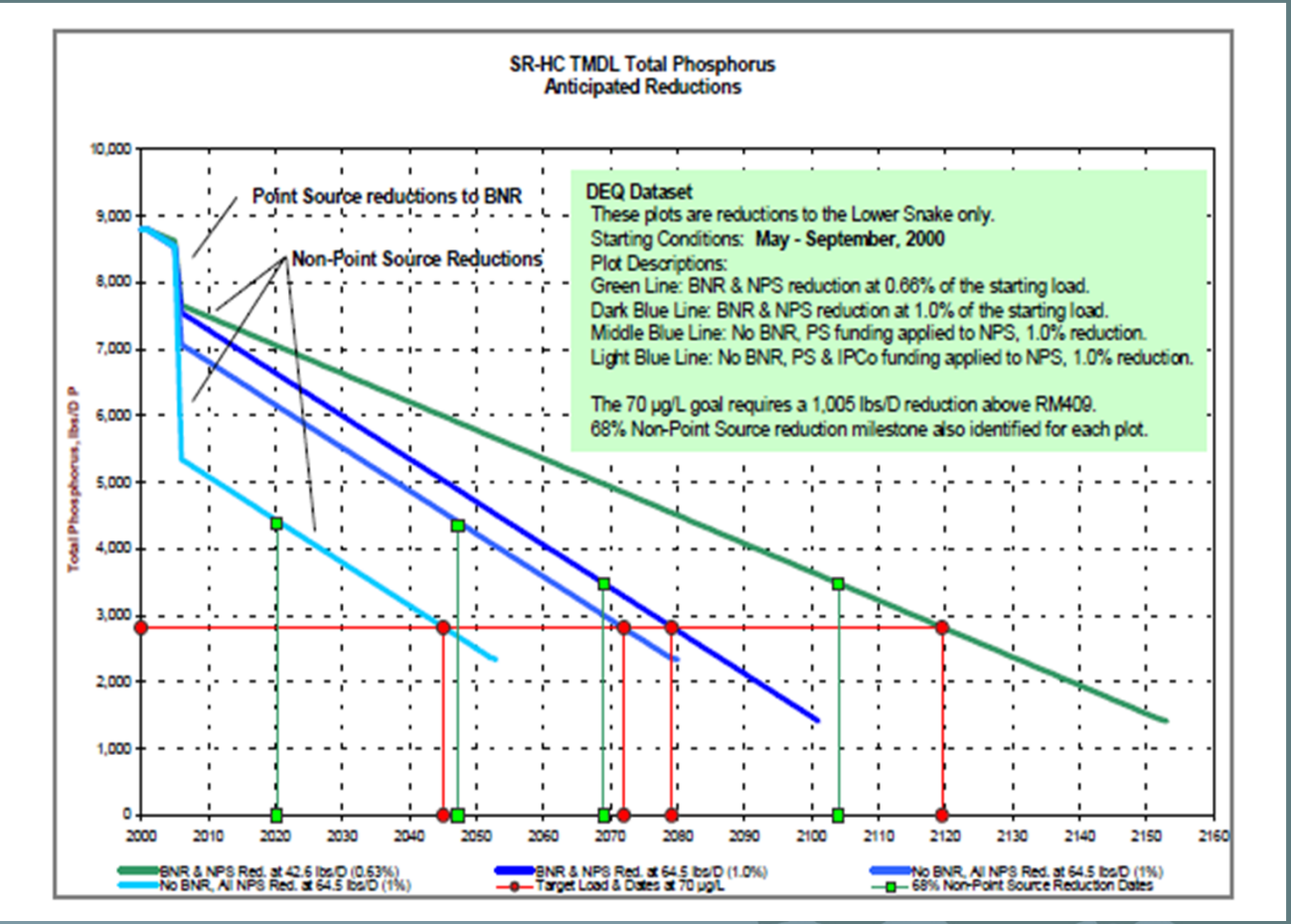
Recommended Allocation Approach

1. A technology based point source allocation with additional reductions necessary to meet the TMDL being allocated to non point sources used by the states of Wisconsin, Minnesota, Montana and Vermont appears to be the best nutrient allocation method (e.g. meets TMDL goals, least expensive).

2. The Wisconsin approach, including the four alternative limits based on technical feasibility and economics should be adopted and applied to industrial and municipal point source nutrient controls.

3. Oregon and Idaho DEQs should add multiple allocation alternatives as a standard TMDL allocation process to provide critical cost information to decision makers and the public.

# *From Appendix I*



# *Lower Boise River TMDL (2005-2007)*

- EPA Grant for multiple workshops and mass balance model update
- Mass balance model used to evaluate multiple allocation scenarios
- Trading authorized
- Outcome (hybrid):
  - Wastewater sources:
    - Phase 1: Equal % removal (80%)
    - Phase 2: Equal concentration (0.5 mg/L)
    - Lumped allocation for future growth
  - Stormwater sources:
    - Implement BMPs
  - Agriculture:
    - Little land remaining in agricultural use
    - Allocation for water passing through delivery system

# *Lower Boise River Implementation Plan (2007-2008)*

- Multiple TAC and workgroup meetings and mass balance model update
- Mass balance model used to evaluate multiple allocation scenarios
- Trading authorized
- Outcome (hybrid):
  - Wastewater sources:
    - Phase 1: Equal concentration (1 mg/L)
    - Phase 2: Equal concentration (0.5 mg/L)
    - Phase 3: Equal concentration (0.2 mg/L)
    - Allocation for future growth with 50% reuse
  - Stormwater sources:
    - Equal % removal (50% new development, implement BMPs)
  - Agriculture:
    - Equal % removal (50%)

# *Lake Lowell (2010)*

- BETTER model used to evaluate allocation scenarios
- WAG and TAC meeting, stormwater workgroup
- Outcome (hybrid):
  - Overall goal: 37% reduction
  - Wastewater sources: None
  - Stormwater sources:
    - Existing: no reduction (assumed 30% BMP effectiveness)
    - New development: equal % reduction (50% via BMPs)
    - 0.34 grams/acre/day allocation for ag land converted to urban
  - Agriculture sources:
    - 1.35 g/ac/d allocation
  - Canal and trib inputs:
    - Equal concentration for tribs to the lake (0.07 mg/L)
    - New York Canal: 0.05 mg/L

# *Mid-Snake TP TMDL (1998)*

- Annual TMDL, TP target = 0.075 mg/L
- Water quality model by EPA R10
- Trading framework developed later
- Allocations (variable % reductions by source):
  - Municipal 34%
  - Food processors 20%
  - Aquaculture 40%
  - Irrigated agriculture 10%
  - CAFOs 100%
  - Hydropower 100%

# *Portneuf River TP TMDL (2010)*

- TP targets: 0.07 mg/L (low flow), 0.125 mg/L (high flow)
- Mass balance used to evaluate scenarios by segment

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2004 Estimated TP load | 2700 | 1982 | 2084 | 2900 | 1974 | 1960 | 1884 | 1767 | 2064 | 1957 | 2188 | 2449 |
| 2004 Target load* | 146.5 | 147.4 | 346.9 | 341.9 | 237.2 | 213.0 | 103.0 | 98.9 | 104.0 | 121.2 | 143.1 | 150.4 |
| 2005 Estimate TP load | 2646 | 2723 | 3226 | 2333 | 3146 | 2804 | 2233 | 2305 | 2339 | 2441 | 2668 | 3087 |
| 2005 Target load* | 150.6 | 148.9 | 353.7 | 359.5 | 473.8 | 376.9 | 110.1 | 103.4 | 111.4 | 149.9 | 168.3 | 174.3 |
| 2006 Estimated TP load | 2565 | 3572 | 3037 | 5007 | 3343 | 2468 | 2463 | 2789 | 2954 | 2982 | 3321 | 3446 |
| 2006 Target load* | 190.8 | 166.7 | 412.6 | 815.0 | 910.4 | 345.1 | 121.4 | 112.2 | 139.7 | 178.4 | 192.1 | 185.6 |
| Average TP load (2004 – 2006) | 2637 | 2759 | 2782 | 3413 | 2821 | 2411 | 2193 | 2287 | 2452 | 2460 | 2726 | 2994 |
| | | | | | | | | | | | | |
| City of Pocatello WWTP TP wasteload | 26.6 | 35.2 | 68.0 | 141.8 | 31.2 | 33.5 | 66.9 | 23.2 | 17.6 | 96.4 | 28.4 | 20.7 |
| City of Pocatello WWTP TP wasteload allocation | 25.1 | 25.1 | 25.1 | 25.1 | 25.1 | 25.1 | 25.1 | 25.1 | 25.1 | 25.1 | 25.1 | 25.1 |
| WWTP TP wasteload reduction required | 6% | 29% | 63% | 82% | 20% | 25% | 62% | 0% | 0% | 74% | 11% | 0% |
| | | | | | | | | | | | | |
| Batise Springs Trout Farm wasteload | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 | 8.4 |
| Batise Springs Trout Farm wasteload allocation | 13.0 | 13.0 | 13.0 | 13.0 | 13.0 | 13.0 | 13.0 | 13.0 | 13.0 | 13.0 | 13.0 | 13.0 |
| Batise Springs Trout Farm wasteload reduction | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| | | | | | | | | | | | | |
| Papoose Springs Hatchery wasteload | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| Papoose Springs Hatchery wasteload allocation | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| Papoose Springs Hatchery wasteload reduction | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| | | | | | | | | | | | | |
| Nonpoint Load | 94.9 | 51.4 | 458.6 | 678.1 | 564.5 | 146.7 | 25.3 | 16.1 | 20.5 | 53.4 | 49.2 | 81.0 |
| Nonpoint Load Allocation | 74.5 | 82.2 | 262.1 | 252.9 | 145.8 | 109.0 | 11.7 | 13.9 | 20.8 | 35.3 | 60.9 | 75.8 |
| Nonpoint Load reduction | 21% | 0% | 43% | 63% | 74% | 26% | 54% | 14% | 0% | 34% | 0% | 6% |
| | | | | | | | | | | | | |
| Groundwater Load | 2506.2 | 2663.1 | 2246.1 | 2583.8 | 2216.0 | 2221.5 | 2091.5 | 2238.4 | 2404.6 | 2300.9 | 2639.1 | 2883. |
| Groundwater Load Allocation | 48.6 | 48.6 | 48.6 | 48.6 | 48.6 | 48.6 | 48.6 | 48.6 | 48.6 | 48.6 | 48.6 | 48.6 |
| Groundwater Reduction | 98% | 98% | 98% | 98% | 98% | 98% | 98% | 98% | 98% | 98% | 98% | 98% |
| | | | | | | | | | | | | |
| Load Capacity** | 162.1 | 169.8 | 349.7 | 340.5 | 233.4 | 196.6 | 99.3 | 101.5 | 108.4 | 122.9 | 148.5 | 163.4 |
| Total Reduction*** | 94% | 94% | 87% | 90% | 92% | 92% | 95% | 96% | 96% | 95% | 95% | 95% |

# *Key Issues for Ongoing TP TMDL for LBR*

- Allowance for growth
- Conversion of agriculture to urban/suburban land uses
- Magnitude, duration and seasonality will have to be addressed, as with TP target decisions
- Provide authorization and incentives for trading to enhance cost-effective implementation

# *Conclusions*

- States have wide latitude in how to slice the pie as long as water quality standards will be met
- Most TMDLs with PS and NPS have used a hybrid approach
- Cost considerations are important, promote trading
- Allowance for growth will be critical factor
- Allocations will have to address magnitude, duration, and seasonality issues