Preliminary Results From the North Alkali Drain
Water Quality Improvement Pilot Project

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Observations in the field and quantitative data produced in the laboratory demonstrate the practicality of constructing and operating a sedimentation basin and constructed wetlands to remove phosphorous from the North Alkali Drain, and provide early evidence of its efficacy. The project may be scaled to larger sizes to accommodate greater water volumes in other waterways, and its design adjusted to complement the landscapes of natural rivers and their floodplains. Factors that limit its application include: (1) landform and elevation gradients allowing for passive operation rather than active pumping of water as is done for this project, (2) available area to construct and operate a sedimentation basin of a size sufficient to remove a range of forms and particle sizes of suspended sediments, and (3) available area to grow a community of hydrophytes and / or an agricultural crop that can later be harvested and removed from the path that cycles nutrients through the ecosystem.

This presentation complements that by Hal Anderson. Together they describe: (1) the development of a conceptual plan and preliminary design alternatives; (2) survey and engineering; (3) status of the installed plant community designed to remove dissolved phosphorous from the raw water delivered to the project; (4) measurements of water quality and interpretations of the data; and (5) regulatory requirements met by the project. The numeric data confirm what we know from experience. Water quality in the North Alkali Drain is variable during the growing season. The data show consistent reductions of concentrations of suspended solids between the North Alkali Drain and samples taken at the outlet of "treatment" by the sedimentation basin and constructed wetlands. The data are ambiguous for measured concentrations of total phosphorous (TP) and dissolved phosphorous (DP). We compared samples taken at the North Alkali Drain to those taken at the outlet of "treatment" and found no discernable pattern in which we had confidence. More data are needed. Our documentation of reductions in load of suspended solids by the "treatment", in combination with the fact a portion of the load of phosphorous in water is known to be associated with particulates gives us optimism that we may find the same reduction in phosphorous when the plant community is fully established and with more data from our project.