

UTAH

NONPOINT SOURCE POLLUTION

MANAGEMENT PLAN

**Prepared by the
Utah Department of Environmental Quality
in Cooperation With the
UTAH NONPOINT SOURCE TASK FORCE**

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CHAPTER I

I. INTRODUCTION, BACKGROUND AND APPROACH

A. Introduction/ Background

In 1987 Congress added Section 319 to the Clean Water Act to address pollution of the nation's waters from polluted runoff. Nonpoint source pollution (NPS) is pollution that results from diffuse sources in contrast to pollutants which enter waterways from pipes or other man-made conveyances. NPS pollution can include a variety of contaminants such as sediments, nutrients, pesticides, bacteria, organics and heavy metals that enter surface waters or leach into groundwater. Some common sources of NPS pollution include urban streets and parking lots, agricultural lands and operations, and construction sites.

Due to the size and diversity of agriculture in Utah, the nature of our land base and agriculture being the dominant user of water in the state, agriculture has been the primary focus of the State's NPS Program. Since 1990, a majority of the State's Section 319 funds have been directed to locally sponsored projects promoting voluntary NPS pollution control on agricultural lands. These projects have included on-the-ground watershed/stream restoration projects, information and education projects, ground water investigations and technical assistance to landowners implementing best management practices on their land. Since 1990 through 1999, the Utah NPS Management Program has used Section 319 funding to support over fifty local projects throughout the state. Following is a list of entities which have sponsored NPS pollution control projects:

1. Bear Lake Regional Commission
2. Bear River Resource Development Council
3. Box Elder County
4. Murray City
5. Salt Lake County
6. Salt Lake County Water Conservancy District
7. Soil Conservation Districts (some of which include)
 - a. Blacksmith Fork
 - b. Rich
 - c. North Cache
 - d. Summit
 - e. Piute
 - f. Beaver
 - g. Upper Sevier
 - h. Timp - Nebo
 - i. Duchesne
8. University of Utah
9. U.S. Geological Survey
10. USDI - Bureau of Land Management
11. Utah Association of Conservation Districts
12. Utah Department of Agriculture and Food
13. Utah Division of Forestry, Fire and State Lands

14. Utah Division of Wildlife Resources
15. Utah Farm Bureau Federation
16. Utah Geological Survey
17. Utah State University Cooperative Extension Service
18. Wasatch County
19. Washington County Water Conservancy District

These local projects have consisted of some ten watershed areas, over twenty information and education projects, twenty ground water investigations and three for training and technical assistance.

The Governor has designated the Department of Environmental Quality (DEQ) as the lead agency to manage the water pollution control programs set up by State statute and to conduct provisions of the federal Clean Water Act in Utah. The Utah Department of Agriculture and Food (UDAF), working through the Soil Conservation Commission has a prominent role in managing agriculture NPS pollution through an MOU with DEQ.

The NPS Pollution Control Program in Utah has been conducted over the past 10 years under the umbrella of the original NPS Management Plan which was submitted to and approved by EPA in 1989. In recent years, two program plan amendments were also completed and approved by EPA, one for Hydrologic Modification in March 1995 and one for Silviculture in July 1998. Each plan amendment was adopted through an agency and public review process. The amendments were sent to the Task Force for comment and public notice with local public meetings held to receive comments.

Several changes in Utah's water quality management planning process have also taken place. Prominent in Utah's Division of Water Quality's current activities is the transition to a statewide Utah Watershed Approach (WA).

One purpose of this document is to describe the integration of the NPS Program into the Watershed Approach. Another is to clearly show the relationship of the Utah Watershed Approach to the TMDL program.

Adding a watershed approach has been a logical step in the evolution of water resource management. Statewide watershed management is not a new program. It is a means of operating existing regulatory and nonregulatory programs more efficiently and effectively to protect, enhance, and restore the state's aquatic resources. Statewide watershed management, more aptly referred to as an approach, is created by establishing a framework or process to integrate existing programs statewide and coordinate their management activities geographically.

The continuing emphasis is to carry out the watershed approach around a core set of programs solidly based in the authority and precedence of the Clean Water Act (CWA), Safe Drinking Water Act (SDWA) and Utah law, including the:

- C CWA 319 Nonpoint Source Management Program
- C CWA 106 Monitoring Program
- C 104(b)3 Special Studies Related to TMDL Development and NPDES Program

- C CWA 303(d) and 303(e) Total Maximum Daily Load (TMDL) Program
- C CWA 305(b) Assessment and Reporting
- C CWA 314 Clean Lakes Program
- C CWA 402 National Pollutant Discharge Elimination System (NPDES) Permit and Compliance Program
- C CWA 402(p) Storm Water Permitting Program
- C State Revolving Fund (SRF) Program
- C Municipal Wastewater Pollution Prevention (MWPP) Program
- C Ground Water Program
- C Drinking Water Program

B. Goals and Objectives for NPS Management Program/Watershed Approach

Our experience reinforces the vision of a time when management of most water related programs in Utah will be coordinated with watersheds and ecoregions serving as an organizational catalyst. Major programs such as the State Water Plan, County Land Use Plans, Natural Resources Conservation Service Environmental Quality Incentive Program and many others of this nature are particularly appropriate for a joint integrated effort.

Following are several programmatic goals for the NPS Program/WA which will build trust between the agencies and the citizens of Utah, and makes better use of environmental information to tailor solutions to address local water quality problems.

Objective 1: Environmental Protection: The mission of the NPS Management Program and the Watershed Approach is to more effectively achieve Utah’s environmental protection goals which are set out in part in Utah Administrative Code R317-2 as (1) to conserve waters of the state; (2) to protect, maintain, and improve the quality of waters of the state for public water supplies, species protection and propagation, and for other designated beneficial uses; and (3) to provide for the prevention, abatement, and control of new or existing sources of polluted runoff. To achieve these long term goals, the Division of Water Quality establishes the following schedule in conjunction with local, state and federal partners to identify, prioritize and restore the most serious water quality problems in the state; protect those waters known to be of the highest quality; and control major pollutants including TDS, sediments, nutrients, metals, BOD, pathogens and others.

Utah has committed to completing TMDLs for impaired waters on the 1998 303(d) list in about twelve years, or by 2010. In order to accomplish that goal, some 10 TMDL plans per year will be prepared. Multiple TMDL’s will be completed in each plan, the exact number depending on the size of the watershed and the nature of the impairments. Implementation of each watershed plan is estimated to take from five (5) to ten (10) years depending on size and complexity of the watershed. The goals for full implementation of the plans and projected achievement of beneficial use will occur between 2015 and 2020. The following tasks will be conducted to achieve the goals described above. (All tasks are numbered sequentially for easier reference). Also, more specific integrated goals and objectives with time frames will be developed in each watershed TMDL plan that will relate to maintaining high quality waters and restoring impaired beneficial uses.

- Task 1. Develop statewide watershed/basin prioritization process and criteria by June 2001.
- Task 2. Work with local basin/watershed committees stakeholder to target BMPs through preparation of water quality management TMDL plans in watersheds now impaired as identified on 303(d) list and selected for improvement in the next five years. Prepare ten to twelve TMDL plans per year.
- Task 3. Complete at least two basin or watershed intensive survey/assessment reports each year. Provide reports to basin/watershed steering committees and develop waterbody priorities and schedule for TMDL development within each basin.
- Task 4. Complete development of TMDL plans for impaired waterbodies according to schedule submitted to EPA Region VIII. Submit priority TMDL targeted waterbodies to EPA every two years.
- Task 5. Conduct summary assessments of Utah's 10 major hydrologic basins every five years (1998, 2003, etc.)
- Task 6. Prepare TMDL implementation report three (3) to five (5) years following approval of TMDL. Gather data to evaluate progress in achieving watershed restoration goals to reduce NPS pollution causes and restore beneficial uses. Ongoing.
- Task 7. Develop an annual ground water work program that continues to enhance ground water protection in Utah. Incorporate into PPG as negotiated with EPA.
- Task 8. Prepare any upgraded urban/stormwater runoff component to the NPS Pollution Control Program. Complete by June 30, 2003. The upgrade will focus on education components demonstration projects to evaluate best management practices and development of categorical urban and construction BMP manuals and guidance documents.

Objective 2: Improve Program Efficiency: Implementing a Watershed Approach will streamline use of resources as roles are clarified and coordinated within and across programs and agencies. Redundancies in program activities are anticipated to be reduced or eliminated. Streamlining can also occur when resources are geographically focused. This goal will be accomplished through the formation of watershed steering committees coordinated or integrated with USDA/SCD Local Workgroups to achieve just one local advisory group per watershed area.

- Task 9. Provide technical assistance and education in the formation of TMDL/Watershed advisory committees. (Ongoing).
- Task 10. Report annually the number of these TMDL/Watershed advisory groups that are formed each year and that are being actively supported.

Objective 3: Increase Program Effectiveness: Implementing a statewide watershed management approach for nonpoint source control will increase the effectiveness of water quality programs by increasing data reliability, improving assessments, facilitating meaningful selection of management priorities, fostering better TMDL implementation criteria, broadening input to management solutions, and enhancing continuity in management decisions and bringing all agencies' focus on established priority areas.

The State needs to further develop its watershed selection and prioritization methods for assessment and NPS project implementation.

- Task 11. Develop a method to categorize the states waterbodies or watersheds.
- Task 12. Delineate the waterbodies/subwatersheds and produce GIS coverages. (June 2001).
- Task 13. Review water quality assessment data, 303(d) list, land use inventories in conjunction with local steering committees to set priorities within each basin according to basin specific criteria. (Ongoing).
- Task 14. Produce GIS coverages identifying priority ratings for high, medium and low categories based on water quality. (June 2001).

Objective 4: Improve Public Participation: Implementing the Statewide Watershed Approach to deal with nonpoint source problems will increase public awareness of polluted run-off issues. Public input will be incorporated into local management decisions on resource allocation and the establishment of management plans and goals for specific watersheds as TMDLs are developed and implemented. Public input will also be integral to identifying appropriate measures of success for use in documenting environmental improvements.

- Task 15. A public involvement process will be carried out with the development of all watershed/TMDL plans. This process is currently underway and will continue. The process includes initial scoping issues and problem identification, data/results review, prioritization, source identification, goals development, allocation of responsibility, review of draft and adoption of a final plan. (Ongoing).
- Task 16. Information and education projects will continue to be funded by 319 funds. Projects are selected, reviewed and funded each year according to specific I&E criteria. Projects include statewide activities and projects designated to priority categories such as AFO/CAFO inventory and assessment and toward specific watershed areas such as the Bear River. (Ongoing).
- Task 17. By May 2001, review and revise as needed the Information and Education and Strategy for the NPS Program to reflect closer program integration with the Watershed Approach and TMDL development and implementation.

Task 18. Consider preparing ‘public friendly’ multipurpose NPS program documents including summary of NPS Pollution Management Plan, WRASs and 319 Annual Program Report.

Objective 5: Integrate, Review and Focus Statewide Management Programs: Focusing the management efforts of several programs in the same geographic priority area and coordinating them around a fixed schedule of activities within the watershed management cycle will help achieve an unprecedented level of integration among water quality programs. Furthermore, the structure will help federal agencies comply with Executive Order 12088 to integrate management efforts across federal, state, and local levels of government by providing a common point of reference and creating a common set of management priorities thus assuring that problems are not transferred between environmental media.

Task 19. Continue to foster program integration and interagency technical and financial assistance through active support and participation of locally led and empowered watershed committees including at the state level the Utah Partners for Conservation and Development and the NPS Task Force. Complete revision of Task Force Charter pursuant to upgraded Management Program by December 2001.

Task 20. By December 2000, establish a schedule with the Forest Service and Bureau of Land Management to review and revise Memorandum of Understanding to address federal consistency. Consider adding the State Division of Forestry, Fire and State Lands to the MOU.

Task 21. Review and upgrade the Hydrologic Modification Component of the NPS Program by 2002 to include habitat modification. Integrate implementation of the revised plan into the TMDL/Watershed planning process.

Objective 6: Improved Data Management: The more efficient collection, storage, analysis, and assessment of data to support watershed planning will improve DWQ's data management capabilities. The relationships between data and management decisions will be made more explicit through watershed management unit planning, compelling programs to improve quality assurance and quality control.

Task 22. Develop as part of the DWQ annual monitoring program strategy components related to NPS Program including ambient NPS monitoring and monitoring specific to watershed projects. Components of this strategy also include stream and lake assessment, permit compliance, ground water and WLA/TMDL development. Review and update the Division’s Monitoring Strategy by June of each year.

Task 23. Assure annually that individual 319 projects and sponsors have adequately designed sample and analyses plans to elevate project success and document water quality improvements. Prepare monitoring guidance for project sponsors. (Ongoing)

- Task 24. Develop a website for water quality data by July 1, 2001.
- Task 25. DWQ will continue to negotiate annual cooperative monitoring programs with Forest Service and BLM. Priority will be given to monitoring programs that develop information in support of the state's 305(b) Water Quality Assessment Program and on data needs to enhance development of TMDLs.
- Task 26. Complete base GIS coverages and specific water quality information coverages for WMU and subwatershed areas as requested for specific TMDL development. Coverages are created as requested by DWQ staff for basin reports and plans.

Objective 7: Improve Working Relationships at All Levels of Government and Private Sector: DWQ anticipates that coordinating management programs and activities around priority watersheds with a focus on TMDL development and implementation will lead to improved working relationships among a host of stakeholders. The WA framework facilitates cooperation through planned outreach and stakeholder participation in watershed planning and management strategy development and implementation. Also, the watershed planning process and written watershed management plans with TMDLs for impaired waters provide points of reference for all participants.

- Task 27. Annually, hold program coordination meetings with the Forest Service, BLM and NRCS. Review monitoring programs, implementation activities and priorities, and watershed assessment and planning functions related to TMDL development and NPS pollution control.
- Task 28. Continue to be an active partner in the Utah Partners for Conservation and Development. DEQ will serve as chairman of the Director's Council on a rotational basis.
- Task 29. Improve federal consistency with NPS Management Plan and state water quality goals by establishing an annual BMP audit process schedule with Forest Service, BLM and Division of Forestry, Fire and State Lands. (June 2001).
- Task 30. Continue to provide water quality sampling training to other agencies such as Forest Service and BLM for sampling consistency.
- Task 31. Work with private sectors to strengthen involvement in the NPS Management Program. Develop an action plan by June 2001.

Objective 8: Increased Accountability of Agency and Staff: The Watershed Approach (WA) management/TMDL unit planning and implementation process is well defined with specific steps and performance objectives. Watershed management plans include development of TMDLs with implementation plans. The planning implementation process provides ample basis upon which DWQ management and the public can evaluate the performance of DWQ and partner agencies. A few of the major tasks from the Annual NPS workplan have been restated here to highlight management aspects of the program in support of the Watershed Approach.

- Task 32. Work with 319 project sponsors to assure semi-annual progress reports are submitted and loaded into GRTS.
- Task 33. Provide assurance to EPA that GRTS is updated and current on semi-annual basis.
- Task 34. Submit 319 NPS Annual Report to EPA as negotiated.
- Task 35. Conduct annual 319 project solicitation and review in a timely manner.
- Task 36. Prioritize expenditure of 319 funds in priority watersheds with impaired waters or acceptable TMDLs.
- Task 37. Conduct a comprehensive NPS Program management review every five years beginning in January 2005.
- Task 38. Conduct a review of categorical BMPs and update as necessary every two years.
- Task 39. Conduct a 'final project review' at the closeout of each 319 project to determine what worked, what didn't, final disposition of all outputs and concluding recommendations.
- Task 40. DEQ and UDAF will work with project sponsors to produce annual project 'fact sheets' or bulletins which will summarize status and actions of each project.

C. Implementing the Watershed Management Approach

Implementation of the Utah Watershed Approach began in 1994 with the start of five year rotations of basin intensive monitoring surveys. This document includes a statewide schedule for and a description of the watershed planning and implementation process. The purpose is to provide agencies and local watershed stakeholders with the information they will need to become involved in the Watershed Approach process. DWQ will be using this plan/document for internal guidance to conduct their programs. Guidance to citizens and DWQ for water quality activities will be consistent. DWQ, as the state water quality agency, expects participation from all federal partners which will lead to enhanced federal consistency.

Better coordination and integration extend beyond local, state, and federal agencies to include all stakeholders in the water quality management process. The initiative is based on using alternatives to political boundaries and de-emphasizing jurisdictional delineations in favor of treating a lake or a stream and its interactive surroundings as a whole. Coordinating all water quality programs foster more innovative, responsive, and cost-effective solutions to water quality problems. The integrated Utah Watershed Approach is based on the nine elements as listed below:

Organizational Steps:

- Element 1 - Establish watershed management units
- Element 2 - Organize Stakeholder Involvement
- Element 3 - Watershed Approach Planning Cycle

Management Plan Tasks:

- Element 4 - Strategic monitoring
- Element 5 - Watershed Management Unit assessment
- Element 6 - Prioritize, quantify and target (develop - TMDLs)
- Element 7 - Develop management strategies
- Element 8 - Prepare Watershed Management Unit/TMDL management plan document
- Element 9 - Implement plan projects

Each element is discussed in detail in Chapter II.

D. Integration of the Nine Key Elements for Nonpoint Source Program and TMDL Requirements

NPS Requirements: EPA asked that, beginning in late fiscal year 1996, states review and, as appropriate, revise nonpoint source management programs to reflect nine key component as follows:

1. The state program contains explicit short-and long-term goals, objectives and strategies to protect surface and ground water.
2. The state strengthens its working partnerships and linkages to appropriate state, interstate, Tribal, regional, and local entities (including conservation districts) private sector groups, citizen groups, and Federal agencies.
3. The state uses a balanced approach that emphasizes both state-wide nonpoint source programs and on-the ground management of individual watersheds where waters are impaired or threatened.
4. The state program (a) abates known water quality impairments from nonpoint source pollution and (b) prevents significant threats to water quality from present and future nonpoint source activities.
5. The state program identifies waters and their watersheds impaired by nonpoint source pollution and identifies important unimpaired waters that are threatened or otherwise at risk. Further, the State establishes a process to progressively address these identified waters by conducting more detailed watershed assessments and developing watershed implementation plans, and then by implementing the plans.
6. The state reviews, upgrades, and implements all program components required by section 319(b) of the Clean Water Act, and establishes flexible, targeted, and iterative approaches to achieve and maintain beneficial uses of water as expeditiously as practicable.

7. The state identifies Federal lands and activities which are not managed consistently with state nonpoint source program objectives. Where appropriate, the State seeks EPA assistance to help resolve issues.
8. The state manages and implements its nonpoint source program efficiently and effectively, including necessary financial management.
9. The state periodically reviews and evaluates its nonpoint source management program using environmental and functional measures of success, and revises its nonpoint source assessment and its management program at least every five years.

TMDL Requirements: A TMDL is a measure of how much of a given pollutant a waterbody (or reach of a stream) can assimilate without exceeding its water quality standards or causing loss of a beneficial use.

In August of 1997 EPA sent a “Guidance for TMDL Submittal - Format and Content” and memos more clearly laying out the process to achieve TMDL development. These state, “The following outlines the minimum requirements for TMDLs as presented by EPA, Region VIII. These requirements are intended to cover TMDLs that are developed for the full range of situations that are addressed by the TMDL process, including all point and nonpoint source pollution problems. How each requirement as fulfilled is dependent on numerous factors such as the type of water quality problem, the geographic scope of the TMDL, the number of stakeholders involved in the process, and the availability of data.” The list below summarizes the eight components for meeting the minimum requirements of a TMDL.

1. Application of TMDLs results in maintaining and attaining water quality standards.
2. TMDLs have a quantified target or endpoint.
3. TMDLs include a quantified pollutant reduction target.
4. TMDLs must consider all significant sources of the stressor of concern.
5. TMDLs are supported by an appropriate level of technical analysis.
6. TMDLs must contain a margin of safety and consider seasonality.
7. TMDLs apportion responsibility for taking actions.
8. TMDLs involve some level of public involvement or review.

The Utah NPS Plan/Watershed Approach provides the State together with its local and federal partners with the capability to meet all nine of EPA’s NPS guidelines and the eight requirements for TMDLs.

The table below helps to visualize the relationship of the Utah Watershed Approach to these two programs. The numbers in columns two and three refer back to the brief descriptions of EPA requirements given above.

Utah Watershed Elements	Nine NPS Guidelines	Eight TMDL Requirements
Introduction	1,3,5	

1. Watershed Mgmt Units	3	7
2. Stakeholder Involvement	2, 7	8
3. Planning Cycle	9	EPA Memo
4. Strategic Data Collection	7	2
5. Watershed Assessment	5,7,9	1,2,3,4,5,6
6. Prioritize and Target	6	7,8
7. Management Strategies	1,3,5,6,7,8,9	1,2,3,4,5,6,7,8
8. Watershed Plans	1,2,3,4,5,6,7,8,9	1,2,3,4,5,6,7,8
9. Implementation	4	1

The nine NPS and eight TMDL requirements are repeated at the beginning of each of the appropriate Utah Watershed Approach elements in Chapter II.

CHAPTER II

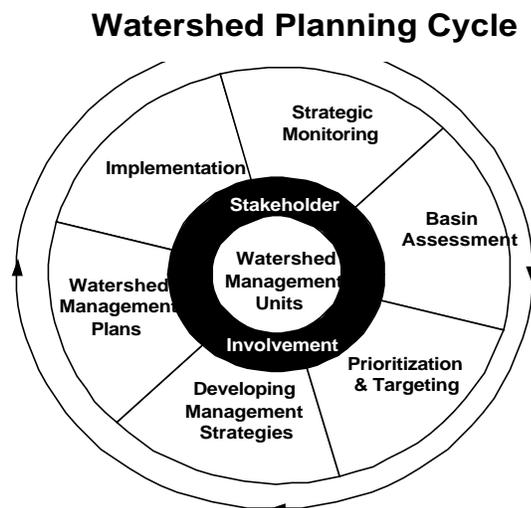
II. THE WATERSHED APPROACH TO NPS MANAGEMENT

A. Implementing a Watershed Approach for the Control of Nonpoint Source Pollution

To demonstrate the State's commitment to environmental protection, DWQ is capitalizing on a watershed-based approach — an approach that has existed for almost a century — and putting it into new wrappings. The DEQ, through cooperation of the NPS Task Force, will use the statewide watershed management initiative to manage the quality of Utah's water resources and the surrounding ecosystems. This NPS Plan tailors statewide watershed management to a Utah Watershed Approach, which is described in this document. The essence of Utah's Watershed Approach is better coordination and integration of the state's existing management programs to improve protection measures for Utah's surface and ground water resources. Better coordination and integration extend beyond local, state, and federal agencies to include all stakeholders in the water quality management process. The initiative is based on using alternatives to political boundaries and de-emphasizing jurisdictional delineations in favor of treating a lake or a stream and its interactive surroundings as a whole. Coordinating all water quality programs fosters more innovative, responsive, and cost-effective solutions to water quality problems. The statewide watershed approach is anticipated to accelerate improvements in Utah's water quality as a result of increased coordination and sharing of resources.

Watershed Approach — A Definition: Statewide watershed management is not a new regulatory program. It is a means of operating existing regulatory and nonregulatory programs more efficiently and effectively to protect, enhance, and restore the state's aquatic resources. Statewide watershed management, more aptly referred to as an approach, is created by establishing a framework to integrate existing programs statewide and coordinate their management activities geographically. The integrated approach contains nine elements which are discussed below and illustrated in Figure 2-1.

Figure 2-1. Elements of the watershed planning cycle.



B. **Watershed Element 1: Watershed Management Units**

The first structural element of the Utah Watershed Approach is the geographically defined management area. The State will use ten *Watershed Management Units* (WMUs) have been delineated to provide a spatial focus for managing polluted runoff. These management units have been defined with the intent of improving coordination among programs operating within them and to encourage a sense of "ownership" among the resident stakeholders. Figure 2-2 contains a map of the ten WMUs.

Management decisions must be tailored to specific geographic locations, the scale of which often varies based on the problem and the type of management decision. Geographically defined management units ranging in scale from small, specific sites to large regions are therefore needed. To address this need, the State has defined a hierarchical set of watersheds, some larger and others smaller than the Watershed Management Units, that provide the flexibility of a nested approach as illustrated in Figure 2-3.

Criteria for Delineating Watershed Management Units: Principally, three geographic elements are used for water quality studies: surface water drainages or watersheds, ground water aquifers with associated recharge areas, and ecoregions.

Population distribution, the road network, and past and ongoing work by other agencies and stakeholders has also been considered in setting the WMU boundaries.

Surface Water: Utah's major rivers, streams, and lakes serve as the basic units for assessing surface water quality conditions. These waterbodies have been divided into segments in EPA's "Reach File 3" program, facilitating site-specific work.

As mentioned above, DWQ has established a hierarchy of watershed units defined solely by hydrologic factors. First-level watersheds are based on the three major drainage basins in the state: (1) a small area draining to the Pacific Ocean via the Snake and Columbia rivers; (2) drainage to the Gulf of California by way of the Colorado River System; and (3) drainage to the closed Great Basin. Ten second level watersheds have been defined consisting of large river systems or areas of internal drainage, or segments of them within the three first level watersheds.

Forty-four third-level watersheds are used, which are identical to the Utah Division of Water Resources State Water Plan units. These 44 units are a simplification of the U.S. Geological Survey's (USGS) sixty-eight Hydrologic Unit Code (HUC)(8 digit) areas. The very small areas along state boundaries were combined into an adjacent larger unit where practical. The ten WMUs are comprised of sets of these third-level watersheds. Table 2-1 displays the relationships of these hierarchical watersheds.

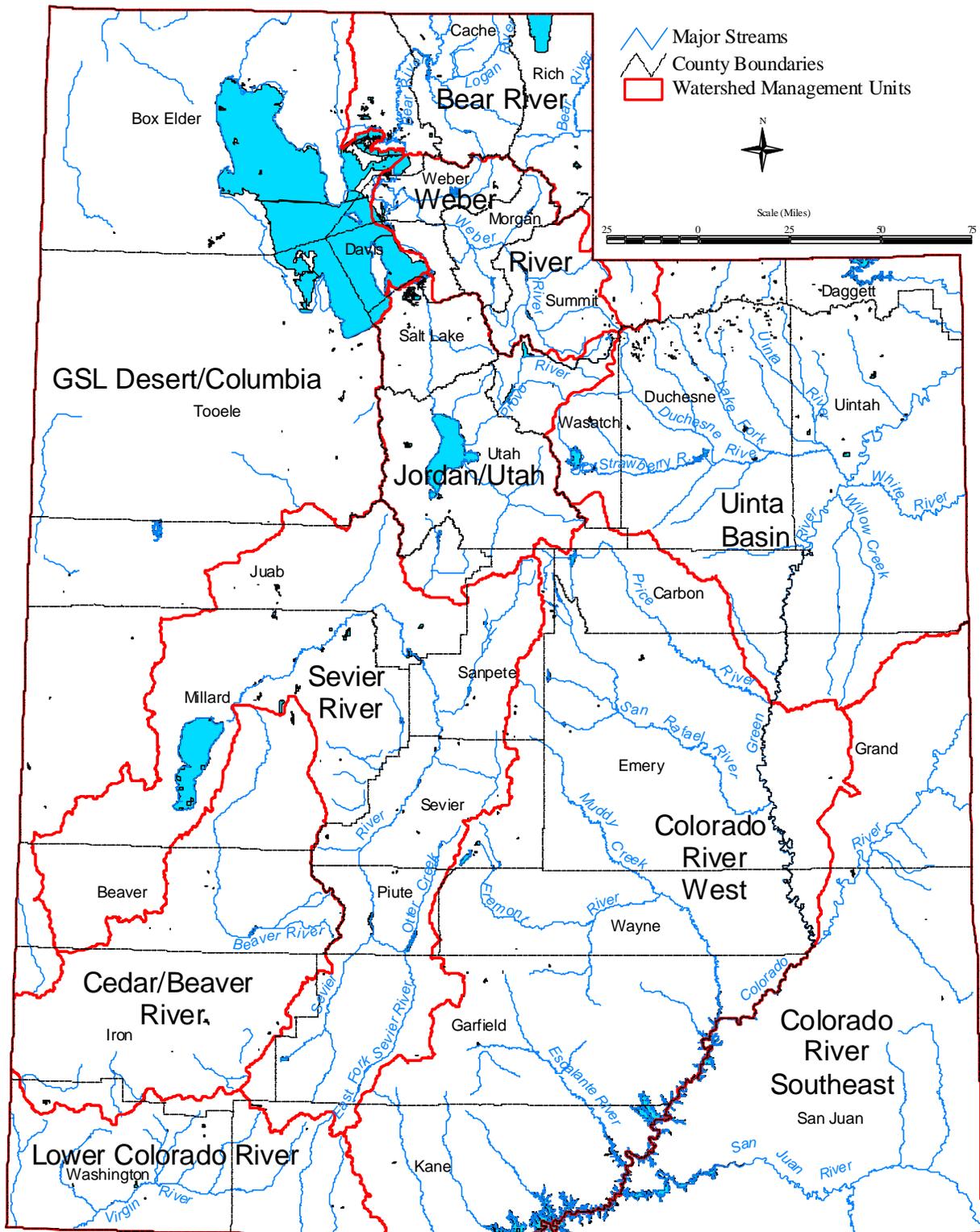


Figure 2-2. Utah's watershed management units.

Utah Watershed Management Units

Figure 2-3. An example of the nested approach to hydrologic unit management of river drainages, watersheds, and associated sub-watersheds. Large hydrologic units begin at the upper right and zoom counterclockwise to sub units.

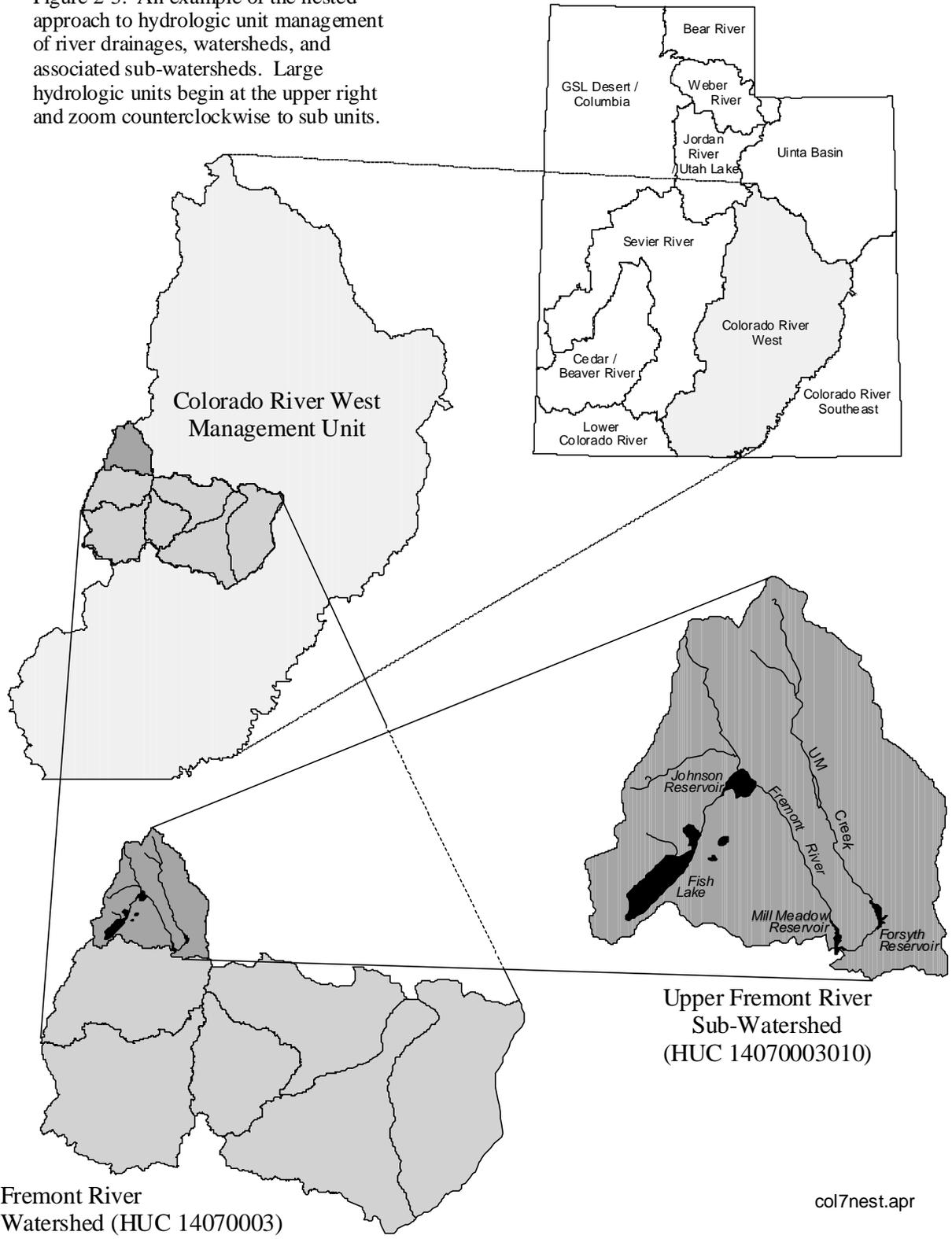


TABLE 2-1. THREE WATERSHED ORDERS WITH ASSOCIATED USGS HUCS AND WATERSHED MANAGEMENT UNITS

3 First Order	10 Second Order	44 Third Order State Water Plan	68 Third Order USGS Hydrologic Unit Code	10 Watershed Management Units Water Quality Management Plan
Pacific Ocean	Snake River	Raft River Goose Creek	Raft Goose	Great Salt Lake Desert/Snake WMU
Great Basin	Great Salt Lake Desert	Park Valley GSL Desert Snake Valley Skull Valley Tooele-Rush Valley Great Salt Lake Promontory	Northern Great Salt Lake Desert Curlew Valley Pilot-Thousand Springs Southern Great Salt Lake Desert Hamblin-Snake Valleys Pine Valley Tule Valley Skull Valley Rush-Tooele Valleys Great Salt Lake Curlew Valley	Great Salt Lake Desert/Snake WMU
	Bear River	Upper Bear Cache Valley Lower Bear	Upper Bear Middle Bear Bear Lake Central Bear Little Bear-Logan Lower Bear-Malad	Bear River WMU
	Weber River	Weber River	Upper Weber Lower Weber	Weber River WMU
	Jordan-Utah Lake	Jordan River Utah Lake	Jordan Utah Lake Spanish Fork Provo	Jordan River/Utah Lake WMU
	Sevier Lake / Escalante Desert	San Pitch Delta Gunnison Sevier East Fork Sevier Upper Sevier Fillmore Sevier Lake Beaver-Milford Cedar-Parowan Escalante Desert	San Pitch Lower Sevier River Middle Sevier Middle Sevier East Fork Sevier Upper Sevier Lower Sevier River Sevier Lake Escalante Desert Beaver Bottoms Lower Beaver Escalante Desert Escalante Desert	Sevier River WMU Cedar/Beaver WMU
Gulf of California	Green River	Upper Green Ashley-Brush Uinta Green White Price San Rafael Lower Green	Upper Green/Flaming Gorge Blacks Fork Muddy Ashley-Brush Ducshense Strawberry Lower Green-Diamond Lower Green-Desolation Canyon Willow Lower White Price San Rafael Lower Green	Uinta WMU West Colorado WMU

3 First Order	10 Second Order	44 Third Order State Water Plan	68 Third Order USGS Hydrologic Unit Code	10 Watershed Management Units Water Quality Management Plan
	Main Stem Colorado	Dirty Devil Escalante Paria	Muddy Creek Fremont River Dirty Devil Escalante Paria	West Colorado WMU
		Lake Powell Colorado Dolores Wahweep	Upper Lake Powell Colorado Headwaters Westwater Canyon U.C.R./Kane Springs Upper Dolores River Lower Dolores River Lower Lake Powell	Southeast Colorado WMU
	San Juan	San Juan	Lower San J./Bluff Lower San Juan Montezuma Creek McElmo Creek Chinle Creek	Southeast Colorado WMU
	Lower Colorado	Kanab Virgin	Kanab Creek Upper Virgin River Lower Virgin River Fort Pierce Wash Meadow Valley Wash	Lower Colorado WMU

Ground Water Units: Ground water/surface water interaction occurs in each of the ten WMUs at ground water recharge and discharge locations. Ground water projects (including well head protection tasks) will be integrated into an individual watershed project when possible and appropriate. The projects will be coordinated among adjacent watersheds as needed to protect aquifers.

Within Utah, unconsolidated basin-fill aquifers are the most prevalent type of aquifer and furnish an estimated 85% of the total ground water withdrawal for the state. Valley-fill aquifers are less important accounting for 10% of withdrawals. The remaining 5 % withdrawal is accounted for by sandstone, carbonate, and igneous rock aquifers.

Four general aquifer types occur in Utah in the mountainous headwater areas. Quaternary alluvial aquifers of the Basin and Range Province are the most extensive type and provide 85% of total ground water withdrawals. These aquifers consist of unconsolidated sands, silts, gravels and clays. Valley fill aquifers occur along stream courses in the south-central part of the State, the most extensive of which are the Tertiary aquifers of WMU 7, the Uinta Basin. Jurassic and Triassic sandstone aquifers of the Colorado Plateau and the transition area between the Basin and Range and the Colorado Plateau constitute the fourth general aquifer type. These aquifers are found in WMUs 5, 6, 8, 9 and 10.

Thirty-five areas of ground water development have been recognized in Utah and reports of their status have been published annually by the Division of Water Rights and USGS for several years. The relative importance of ground water development areas in relation to the ten WMUs and the ground water development unit numbers are shown

in Table 2-2. Only Ground Water Unit 19 (Juab Valley) is split between two WMUs. These ground water pumping areas plus their recharge zones will serve as interim ground water planning units until more data are gathered. The Division of Drinking Water's source protection program has identified wells and springs that supply water for culinary purposes.

TABLE 2-2. Ground water development according to watershed management unit.

WMU No.	WMU Name	% of Ground Water Pumped	GW Development Unit No.
1	GSL Desert/ Columbia	10	1,2,3,11,12,23
2	Bear River	4	4,5,6,7
3	Weber River	8	8,9
4	Jordan River/ Utah Lake	32	10,13,14,15,19
5	Sevier River	18	18,19,20,21,22,32
6	Cedar/Beaver	20	24,25,28,29,30
7	Uinta	negligible	16,17
8	West Colorado	negligible	33
9	Southeast Colorado	negligible	26,27
10	Lower Colorado	2	31

Ecoregions: Ecoregions are loosely defined collections of several types of ecosystems that represent a larger planning area for addressing interrelated goals and issues of natural resource problems, including water quality management. Ecosystem management includes analyzing the structure and function of the systems' living elements and the relationships among and between them and the nonliving elements. An appropriate ecosystem management perspective requires that the direct needs of organisms be addressed and that a local to regional perspective be adopted.

Another concept important to proper ecosystem management is site capability and what role an individual site plays in plant communities, habitats, and landscapes. Knowing the capacity of a site to support plants, animals, and other organisms and how the site responds to manipulation and disturbance is key. Proper management strives to maintain harvesting a site's products at a level that does not damage its capability to recover, a concept referred to as maintaining sustainable yield.

Ecoregions of Utah

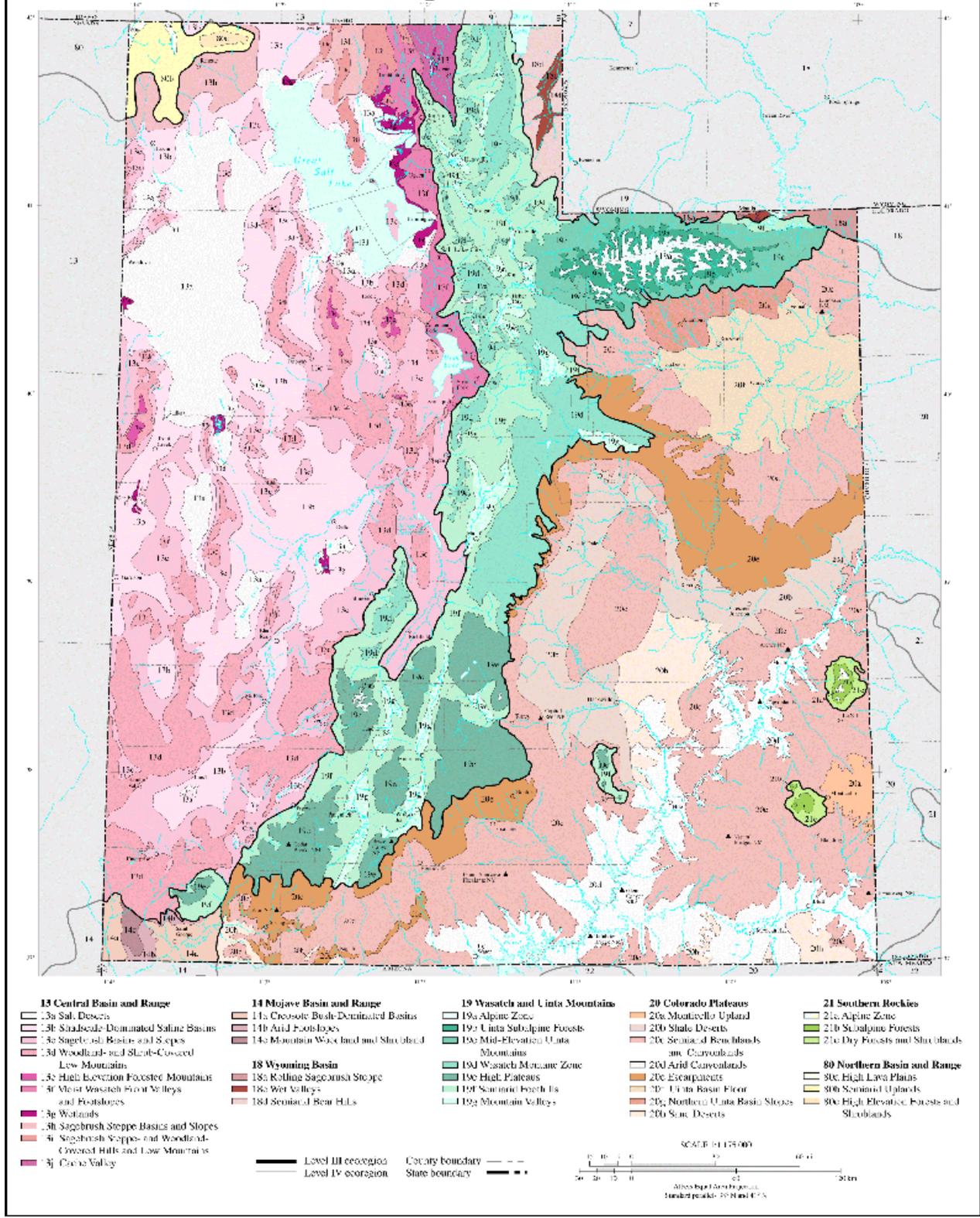


Figure 2.4. Ecoregions of Utah.

Maintaining water quality is a critical function of ecosystem management, which depends on water quality parameters as tools. Sustainability thresholds center around plant, animal, soil, and water relationships. Altering any of these elements impacts the others in complex and often unexpected ways. Water quality management using a Watershed Approach is compatible with ecosystem management because it allows for the consideration of all natural resource factors in a holistic manner.

The predominant ecoregions represented in Utah are illustrated on the map Figure 2-4. The descriptions of the Level III ecoregions are as follows:

13. Central Basin and Range

Ecoregion 13 is composed of northerly trending, fault-block ranges and intervening, drier basins. In the higher mountains, woodland, mountain brush, and scattered open forest are found. Lower elevation basins, slopes, and alluvial fans are either shrub and grass-covered, shrub-covered, or barren. The potential natural vegetation is, in order of decreasing elevation and ruggedness, scattered western spruce-fir forest, juniper-pinyon woodland, Great Basin sagebrush, and saltbush-greasewood; in addition, sagebrush steppe is found in the north and tule marshes occur locally, especially along the Great Salt Lake shoreline. The Central Basin and Range (13) is internally-drained by ephemeral streams. In Utah, most of Ecoregion 13 lower than about 5,200 feet elevation was inundated by Pleistocene Lake Bonneville. Extensive playas occur and are flat, clayey, and salty. In general, Ecoregion 13 is drier than the Wasatch and Uinta Mountains (19), cooler than the Mojave Basin and Range (14), and warmer and drier than Ecoregions 12 and 80. Ecoregion 13 has more shrubland and less grassland than the Snake River Basin (12) but lacks the creosote bush of Ecoregion 14 and the extensive, dense forests of Ecoregion 19. Soils grade upslope from mesic Aridisols to frigid Mollisols; Entisols also occur on fans, floodplains, and valley bottoms. The land is primarily used for grazing and a greater percentage is used for livestock grazing than in Ecoregion 14. In addition, some irrigated cropland is found in valleys near mountain water sources.

14. Mojave Basin and Range

Ecoregion 14 is composed of basins and scattered mountains that are generally lower, warmer, and drier than those of the Central Basin and Range (13). The potential natural vegetation is mapped as creosote bush and is distinct from the saltbush-greasewood, Great Basin sagebrush, sagebrush steppe, and juniper-pinyon woodlands that occur to the north in the Central Basin and Range (13) and Northern Basin and Range (80); it is also distinct from the creosote bush-bur sage and the palo verde-cactus shrub that occur in the Sonoran Basin and Range (81) to the south. Soils are mostly Entisols and Aridisols and have a thermic temperature regime; they are warmer than the soils of Ecoregion 13. Most of Ecoregion 14 is federally owned and there is relatively little grazing

activity because of the lack of water and forage for livestock. Heavy use of off-road vehicles and motorcycles in some areas has caused severe wind and water erosion problems.

18. Wyoming Basin

Ecoregion 18 is a broad intermountain basin containing rolling plains, high hills, mesas, and low mountains. It is dominated by arid grasslands and shrublands. Ecoregion 18 is somewhat drier than the Northwestern Great Plains (43) to the northeast, lacks the extensive pinyon-juniper woodland of the Colorado Plateaus (20) to the south, and does not have the extensive forests of the neighboring Middle Rockies (17), Wasatch and Uinta Mountains (19), and Southern Rockies (21). Much of the ecoregion is used for livestock grazing, although many areas lack sufficient vegetation to adequately support this activity in the long term. Ecoregion 18 also contains major oil and natural gas fields.

19. Wasatch and Uinta Mountains

Ecoregion 19 is composed of high, glaciated mountains, dissected plateaus, foothills, and intervening valleys. It includes the extensively glaciated Uinta Mountains, the Wasatch Range, and the Wasatch Plateau. Agricultural valleys occur especially in the eastern part of the Wasatch Range. The Wasatch Front is steeper, more rugged, and wetter than more easterly parts of the Wasatch Range. Alkaline dust from the Great Basin does not buffer high elevation surface waters. Streams draining the quartzite-dominated Uinta Mountains and portions of the Wasatch Front that are underlain by acidic intrusive volcanics tend to be non-alkaline, low in nutrients, and low in total dissolved solids. Above an elevation of about 11,000 feet, alpine meadows, rockland, and talus slopes occur and are especially widespread in the Uinta Mountains. Between about 8,000 and 11,000 feet elevation, subalpine forests, Douglas-fir forests, and aspen parkland are widespread with ponderosa pine and limber pine also occurring on the high volcanic plateaus. Between approximately 5,000 and 8,000 feet elevation, juniper-pinyon woodland and mountain mahogany-oak scrub communities occur, with the latter more prevalent in the north than in the south. Lodgepole pine is less widespread and summer livestock grazing is more common than in the Middle Rockies (17). Grand fir is absent from Ecoregion 19 but is common in the Northern Rockies (15). Soils are mostly Mollisols, Alfisols, and Inceptisols. The ecoregion is used for logging, recreation, homes, and summer grazing.

20. Colorado Plateaus

Ecoregion 20 is an uplifted, eroded, and deeply dissected tableland. Its benches, mesas, buttes, salt valleys, cliffs, and canyons are formed in and underlain by thick layers of sedimentary rock. Juniper-pinyon woodland dominates higher elevations and is far more extensive than in the Wyoming Basin (18). Saltbush-greasewood and blackbrush communities are common at lower elevations but are generally absent from the higher Arizona/New Mexico Plateau (22). Summer

moisture from thunderstorms supports warm season grasses not found in the Central Basin and Range (13). Many endemic plants occur and species diversity is greater than in Ecoregion 13. Several national parks are located in this ecoregion and attract many visitors to view their arches, spires, and canyons. Major gas and oil fields are found in Ecoregions 20g, 20c, and 20f in the Uinta Basin.

21. Southern Rockies

In Utah, Ecoregion 21 is made up of isolated, laccolithic mountains that protrude from the dry expanses of the Colorado Plateaus (20). The La Sal and Abajo mountains are nearer the Rocky Mountains than the Wasatch Range and have faunal affinities with the southern Rockies in Colorado. Vegetation, soils, and land use are elevationally banded. Low to middle elevations are grazed and support Gambel oak, widely-spaced ponderosa pine, and mountain brush. Higher elevations are not as heavily grazed as lower elevations and are largely covered by subalpine fir, Engelmann spruce, Douglas-fir, aspen parkland, and mountain brush. In contrast to Ecoregion 19, lodgepole pine is absent from Ecoregion 21. The highest elevations have alpine characteristics.

80. Northern Basin and Range

Ecoregion 80 consists of arid tablelands, intermountain basins, dissected lava plains, and widely scattered low mountains. Overall, it is higher and cooler than the Snake River Basin (12) and has more available moisture than the Central Basin and Range (13). Sagebrush steppe is extensive. Juniper-dominated woodland occurs on rugged, stony uplands and contains less pinyon pine than the Woodland- and Shrub-Covered Low Mountains (13d). Mollisols are prevalent and much of the ecoregion is used as rangeland. Dryland and irrigated agriculture are found locally, but, in general, Ecoregion 80 is less suitable for agriculture than the Columbia Plateau (10) or the Snake River Basin (12). In Utah, Ecoregion 80 is limited to the Raft River Mountains which contain mammal and plant species that are typical of the Columbia Plateau but absent from the rest of Utah.

C. Watershed Element 2: Organization and Stakeholder Involvement

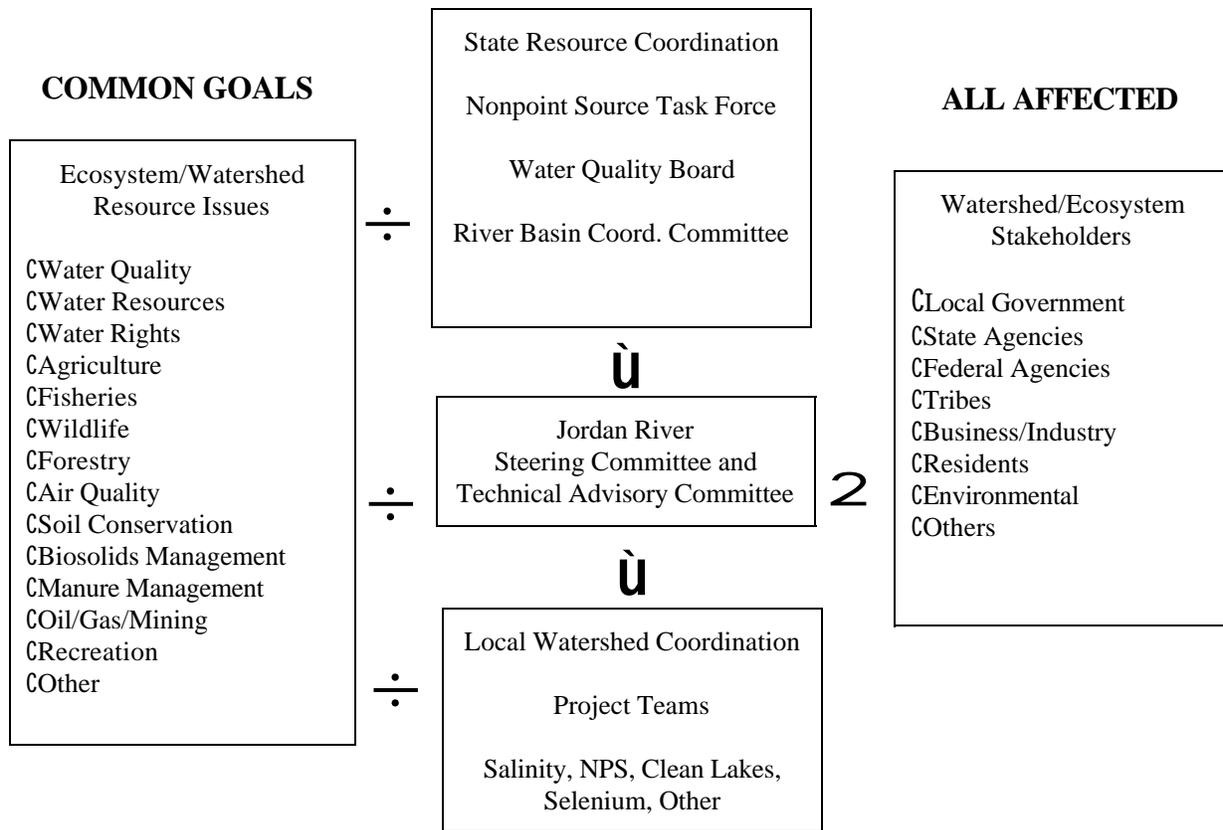
NPS Component 2 - The State strengthens its working partnerships and linkages to appropriate State, interstate, Tribal, regional, and local entities (including conservation districts), private sector groups, citizen groups, and Federal agencies.

TMDL Requirement Number 8: TMDLs involve some level of public involvement or review.

The Clean Water Action Plan (1998) states that “states and tribes should work with other appropriate agencies, governments, organizations, and the public to create Unified Watershed Assessments that identify watersheds that do not meet clean water and other natural resource goals and where prevention action is needed to sustain water quality and aquatic resources . . . ”

A stakeholder is a broad term that “would include as a minimum, the following: the general public; environmental and other public interest groups; affected tax-and rate- payers; affected point and nonpoint sources (including industries, landowners, and wastewater treatment owners and operators); and interested or affected governmental units with public responsibilities but who are not directly responsible for TMDL development (e.g., local governments and various State, Tribal, and federal agencies).” This definition is contained in the “Report of the Federal Advisory Committee on the Total Maximum Daily Load (TMDL) Program” recently prepared for EPA by the National Advisory Council for Environmental Policy and Technology (NACEPT).

The long-term success of the Utah Watershed Approach will depend equally on coordination between government and private agencies and organizations, private citizens, and other stakeholders. As illustrated in the Figure below, involvement and coordination of work by stakeholders occur at three levels: statewide, regional watershed management units, and the local level.



Statewide

The governor has designated the Department of Environmental Quality (DEQ) as the lead agency to manage the water quality pollution control program set up by state statute and to carry out provisions of the Clean Water Act in Utah. This responsibility is carried out within the Division of Water Quality (DWQ) and the Utah Water Quality Board. Membership of this Board represents a cross section of Utah's water quality community, including industry, municipalities, sewer districts, environmental interests and the public at large.

Utah's Department of Agriculture and Food (UDAF), working through the Utah Soil Conservation Commission, has been given a prominent role in managing agricultural NPS pollution through an MOU with the Department of Environmental Quality. Interagency transfers of money from DEQ to UDAF to support management of the agriculture portion of the 319 program. The UDAF in turn has given significant responsibility to its 38 local Soil Conservation Districts to sponsor individual 319 projects and oversee implementation and to have significant involvement in local watershed steering/advisory committees. The Utah Association of Conservation Districts (UACD) manages the individual cooperator contracts and financial aspects of the program including local match. The UACD is a strong local 'grassroots' partner in implementing the State NPS Management Program as described in Appendix IX including a recently developed Clean Water Strategy.

DEQ is also involving the state's seven Association of Governments, and the seven USDA Resource Conservation and Development Councils in implementing the Watershed Approach. Thus Utah's program has a healthy "grass roots" flavor.

Currently the NPS Pollution Control program is coordinated through the Utah NPS Task Force, which is currently a 28-member organization with a staff work group, and subcommittees as needed (see Appendix I.) As the Utah Watershed Approach matures the NPS Task Force needs to be enlarged and restructured to fully service the needs of the state by adding representation from local watershed steering committees. Invitations will be sent to Steering Committee chairman to participate on the Task Force on an ongoing basis.

Other similar groups now exist and need to be closely integrated into the watershed approach. These include NRCS's EQIP State Technical Committee, USDA's River Basin Coordinating Committee and UACD's Partners for Conservation and Development and other specialized groups such as the Silviculture Subcommittee and the AFO/CAFO Committee. Integration of these groups is recommended where program missions allow to avoid duplication of effort.

Expanded activities for the Task Force include policy advice, task sharing responsibility, technical team staffing, establishment of a common data network and input to TMDL development and implementation. DWQ, with the assistance of selected Task Force members, will carry out the following more specific activities (among others) of watershed management:

- Identify state and federal level goals and objectives for water quality jointly with agency partners and local stakeholders for impaired watersheds. (This will occur according to the schedule for TMDL development);

- Advise local stakeholders in the development and implementation of TMDLs according to annual workplans and TMDL development schedules;
- Help staff of local Technical Advisory Committees (TACs) (Ongoing);
- Participate and help organize Coordinated Resource Management Planning (CRMP) projects (generally maintain three project areas on a continuing basis);
- Provide water quality sampling and monitoring teams pursuant to DWQ Annual Monitoring Strategy;
- Provide water quality lab analysis according to annual agreement between DEQ and the Department of Health;
- Establish a standard water quality database with common accessibility by participants via Internet (This will be completed by DEQ in FY 2001);
- Prepare assessments of water quality data including total maximum daily loads of pollutants for impaired waterbodies/watersheds with input from local watershed forums (reports completed annually according to Monitoring Strategy);
- Establish state criteria for selection of priority project areas and provide technical and financial assistance to local forums in implementing TMDL plans (Criteria is evaluated annually);
- Provide direction to ongoing information and education activities to promote NPS education in Utah;
- Provide state and federal agency oversight, review and sign off for regulatory components of the Water Quality plans (Ongoing);
- Provide progress reports and/or compliance monitoring with input from local watershed committees (Ongoing with specific reports determined annually);
- Assist in production and adoption of WQM Plans for each basin or sub-watershed area by Water Quality Board action and Agency sign-off according to TMDL development schedules; and
- Assist local watershed committees in implementation of recommended WQM Plan pursuant to CWA Section 303 and enabling regulations (Ongoing activities as determined in annual workplans and according to TMDL development schedules).

These functions will assure that water quality problems are abated in such a manner that problems are not transferred to other environmental media. This means, for example, that as control measures or BMPs are implemented to control or abate surface water pollutants by increased infiltration, that such BMPs are evaluated to assure that ground waters are not adversely impacted. The seven (7) current NPS Task Force functions outlined in their Charter

(see Appendix I) are listed below. The Charter will be revised subsequent to approval of this NPS Plan by EPA. The upgraded Charter will be completed by December 2001.

- 1) Provide a forum for the exchange of information on activities which involve nonpoint source pollution control.
- 2) Prioritize watersheds for nonpoint control activities.
- 3) Provide guidance for funding of nonpoint pollution control projects and project funding proposals which request funds under Section 319 of the Clean Water Act.
- 4) Serve as a coordinating body for the review and direction of federal, state and local governmental programs to assure that nonpoint source control programs are implemented in an effective and efficient manner.
- 5) Coordinate information, education and public awareness programs regarding nonpoint source pollution control.
- 6) Provide a forum for discussion and resolution of programs conflicts.
- 7) Establish subcommittees for project implementation, field inspections, and evaluation of best management practices being installed and development of new program components. Examples of such committees have included the Silviculture and Hydromod Committees that prepared those plan components. Future committees could include mining, BMP evaluation and project audit committees.

Watershed Management Unit (WMU) Structure at the Basin or Sub-Watershed Level

The planning and work to complete the WMU steps will occur within the Watershed Steering Committee and Technical Advisory Committee that are created to assist in the development of TMDLs. The DWQ Watershed Coordinator responsible for coordination and plan development, are assigned to the Steering and Technical Advisory Committees in each WMU. Other Steering Committee membership would come from closely aligned existing regional organizations, augmented as needed to represent all stakeholders. The Technical Advisory Committee members would be professional staff from participating agencies. These committees are described in greater detail below.

Where possible, DWQ is using an existing local or regional board or Council for the watershed management unit Steering Committees. Committee structures will be modified as necessary to accommodate development of TMDLs by the state on a subwatershed scale. Currently steering committees exist in the following basins:

Bear River	Bear River RC&D Council
Weber River	Bonneville RC&D Council
Jordan/Utah Lake	Jordan River Watershed Council and Mountainlands AOG
Great Salt Lake Desert	Not determined
Uinta	Dinosaurland RC&D
Sevier River	Panoramaland RC&D

Cedar/Beaver	Beaver River CRMP Council
Lower Colorado	Virgin River Advisory Committee
West Colorado	Formation in process
Southeast Colorado	Formation in process

Subwatershed Advisory Committees:

Little Bear River CRMP Steering Committee
 Chalk Creek CRMP Steering Committee
 Upper Sevier River CRMP Committee
 Spanish Fork CRMP Committee
 Fremont River Advisory Committee

WMU Steering Committee:

DWQ would like the local Steering Committee to take the lead role in the watershed planning process. The objective of using local leadership in the watershed approach is to foster local grass roots involvement. They will participate in all components of watershed planning process. DWQ believes that this is the key to effective coordination and local ownership of any water quality management plan. The chairperson of local watershed steering committees could also be a member of the State Nonpoint Source Task Force if requested.

The local steering committee should include representatives from landowners, resource agencies, county commissions, conservation districts, environmental groups, municipalities, industry and other appropriate organizations which are significantly involved with the planning area. These representatives should have authority to make decisions for the agency or group they represent. The scope and detail of each watershed plan (TMDL/CRMP) will depend on magnitude of problems, complexity of the watershed, availability of resources and will be negotiated between DWQ and the Steering Committee. Tasks for the Steering Committee would include the following:

- Provide a forum for integration of local, state, and federal agency activities to address impaired waterbodies,
- Identify local water quality goals and objectives,
- Request support for CRMP project from state/federal agencies,
- Encourage involvement with neighboring watersheds,
- Establish consistency of purpose and operation among sub-watersheds,
- Hold agency and public review forums,
- Develop management strategies to meet, in some cases, TMDLs contained in the CRMP plan,
- Identify and set priorities and target water quality concerns, with the assistance of the Technical Team. (By HUCs, sub-watersheds, stream segments, etc.),
- Define long and short range management strategy, including goals and objectives,
- Select sub-watershed water quality management strategies within the scope of UWA & 303(d) listed waters,
- Select and schedule the final management approach,
- Revise the plan in consideration of public and agency comment,

- Facilitate implementation of the WQ Plan and in procuring funding and
- Revise the plan based on five year assessment and evaluation of management plan.
- Prepare annual implementation status report.

Technical Advisory Committee:

Agencies with vested interests are invited to serve on a Technical Advisory Committee for each of the ten watershed management units or as needed at the sub-watershed level commensurate with TMDL Plan development. Several such TACs currently function in various watersheds throughout the state including Cub River, Chalk Creek, East Canyon, Spanish Fork, Beaver River and Upper Sevier River. Participating agency staff will be part of and advisors to the Steering Committee. Their assistance is crucial in formulating details of the plan, implementing the plan and evaluating plan effectiveness. Watershed ownership, agency responsibilities, phase of the project, and pollutant sources to be addressed will influence agency roles in watershed planning and implementation. Signing the plan upon its completion will signify agencies' commitment to implementing the plan.

The Technical Advisory Committee is interagency with multi-disciplinary skills in order to achieve a comprehensive and coordinated approach to the total resource management plan. Personnel and expertise for the Committee could include those as shown below as well as other specialists as needed. A core group would meet regularly with others contributing on a more limited time basis as needed.

- Team Leader/Coordinator
- Watershed Specialist
- Soil Scientist
- Biological evaluation tasks
 - Fishes
 - Macroinvertebrates
 - Wetland and Upland Fauna
- Botanist (Riparian, Wetland, Upland Flora)
- Range Scientist
- Environmental Engineer(s) (Water Quality)
- Hydrologist / Stream morphology
- Ground Water Hydrologist
- Riparian Specialist
- Report writer/editor
- GIS, GPS, videography and graphics specialists
- Water Quality Sampling team
- Other (e.g., Drinking Water / Ground Water specialists)

Tasks for the Technical Advisory Committee to conduct under the direction of the Steering Committee include, but are not limited to:

- Develop/implement a strategic data collection plan;
- Canvases for information/conduct monitoring and inventory assessments;
- Analyze and evaluate information/data;
- Identify areas of concern and issues for priority setting and targeting;

- Perform supplemental monitoring for targeted issues;
- Review Total Maximum Daily Loads;
- Recommend endpoints needed to achieve water quality standards;
- Problem quantification for priority issues;
- Recommend quantified pollution reductions and allocate responsibilities;
- Assist with development of CRMP or TMDL plan management strategies;
- Write Watershed Plan;
- Prepare 319 project proposals and project implementation plans; and
- Implement the TMDL plan according to allocation of responsibilities.

The Division of Water Quality and the Steering Committee may choose to use contractual agreements, joint work plans, memoranda of agreements to build support and assistance from participating agencies and as needed private contractors. Some agencies may utilize an Interagency Personnel Agreement to provide staff to assist the watershed advisory group or another agency in planning or implementing activities.

Local Sub-Watersheds and CRMP Projects

As TMDL plans are prepared and issues are clarified and projects identified for more intensive planning or for implementation, smaller third and fourth sub-watersheds, identified for such work, may be organized according to Watershed Approach guidance outlined in the plan or the Coordinated Resource Management and Planning (CRMP) process or other similar planning process depending on lead agency. These CRMP projects are organized with a similar structure as described for the Watershed Management Unit above, but are tailored to the smaller area, having a local steering committee and a technical advisory team. Specific plans for water quality improvement or preservation are formulated and implemented with agencies and individual landowners.

Several CRMP watershed projects are now underway in Utah, including the Little Bear River, Otter Creek, Chalk Creek, Beaver River, Spanish Fork River, Upper Sevier River and others, and are considered a critical key part of the implementation process of the Watershed Approach and the 319 NPS Pollution Control Program.

D. Watershed Element 3: Watershed Approach Planning Cycle

NPS component 9 - The State periodically reviews and evaluates its nonpoint source management program using environmental and functional measures of success, and revises its nonpoint source assessment and its management program at least every five years.

TMDL - EPA Memo of Aug. 8, 1997 “ . . . each State should prepare a written schedule for development of TMDLs for waters on the 1998 list. Such a schedule should be subject to public review and should accompany the submission of the 1998 303(d) waterbody list to EPA. The schedule would subsequently be modified to reflect any changes to the list as a result of EPA review . . . ”

The Watershed Approach planning cycle provides temporal coordination for participating programs and agencies. The three components of the Utah Watershed Approach planning cycle are:

1. A common series of steps that all stakeholders agree to use for watershed planning and implementation. Figure 1-1 illustrates the steps that will be used for the Utah Watershed Approach. These steps allow programs and agencies to coordinate their activities in the watershed management unit assessment including the development of individual TMDL plans. Other stakeholders can anticipate events and meetings of interest.
2. A specified length of time for each complete iteration of the watershed management unit planning and implementation steps. The actual time needed to complete these steps may vary from one watershed management/TMDL plan to the next. Planning activities will be focused on impaired waterbodies in coordination and participation with local stakeholders. Completion of TMDLs for impaired waterbodies will be driven by UDEQ according to schedules submitted to EPA every two years. (Refer to Objective 1 - Task 4 in Chapter One.)
3. A five-year sequence for monitoring the ten (10) watershed management units is conducted by DEQ. (See Table below). Watershed management plans have been scheduled to balance annual workloads for participating programs and agencies. As indicated, ten to fifteen watershed/TMDL plans are initiated each year because of varying complexity and difficulty among subwatersheds. By the end of five years, all watershed management units will have complete and active plans for priority subwatersheds within each of the major basins. The cycle is then repeated in the same sequence so that watershed assessments are updated every 5 years to reflect completion of TMDLs/Watershed Restoration Action Strategies for 303(d) listed (impaired) waterbodies and selection of priority subwatershed areas for which new TMDL plans will be prepared and implemented during next cycle.

<u>Basin</u>	<u>Fiscal Year Monitored</u>		
	<u>1st Round</u>	<u>2nd Round</u>	<u>3rd Round</u>
Bear River	1994	1999	2004
Weber River	1994	1999	2004
Jordan/Utah Lake	1995	2000	2005
West Desert	Not Monitored	Not Monitored	2005

Uinta	1996	2001	2006
Sevier River	1997	2002	2007
Cedar/Beaver	1997	2002	2007
Lower Colorado	1997	2002	2007
West Colorado	1998	2003	2008
East Colorado	1998	2003	2008

E. Watershed Element 4: Strategic Data Collection

NPS component 5(a) - The State program identifies waters and their watersheds impaired by nonpoint source pollution and identifies important unimpaired waters that are threatened or otherwise at risk . . . (also see 5 (b) on page ES 2)

TMDLs have a quantified target or endpoint

Well-structured strategic data collection plans are key to the success of the watershed approach. Natural resource management programs and agencies have substantial complementary information needs. Through the Utah Watershed Approach, participating programs and agencies will develop a coordinated strategic information collection plan and monitoring plan for each watershed management unit. Local watershed TACs will have an opportunity for input into the intensive surveys design for that region. The plan will address the distribution of administrative monitoring resources (funding, personnel) between the existing ambient status and trends network, watershed management unit special studies requirements, and compliance and enforcement needs.

Accurate data are needed for several purposes, including establishing use support status; identifying positive or negative water quality trends; screening existing or emerging water quality problems; locating and quantifying pollutant sources; characterizing the extent of environmental contamination, physical habitat degradation, and information on other water body stressors; evaluating the effectiveness of management actions; and calibrating models for use in defining and distributing a watershed's assimilative capacity for the establishment of TMDLs.

Currently, the Division of Water Quality has monitoring agreements with the U.S. Forest Service, Bureau of Land Management and the National Park Service in Capitol Reef and Canyonlands National Parks. DWQ also has an interlocal monitoring agreement with Salt Lake City and County and five water conservancy districts related to the upper Provo River Watershed. These agreements were made to share costs in collecting and analyzing samples which have proved to be beneficial to all parties.

The DWQ statewide strategic monitoring plan will be updated by June of each year. Each year's strategic plan will outline the proposed allocation of resources to various types of monitoring to support the Watershed Approach. In addition, DWQ commits at least a portion of their monitoring resources to compliance sampling inspections for key UPDES permitted point sources. The remainder of the strategic monitoring plan will need to address special studies in prioritized 303(d) list waters for purposes such as problem quantification, model calibration, quantified TMDL target or endpoint identification and measuring program success.

Stream Monitoring: The current stream monitoring program consists of Watershed Management Unit intensive and long-term ambient water quality monitoring stations. The fixed-station ambient monitoring network consists of 63 stations across the state. These stations are

used to evaluate long-term water quality trends. Samples are collected every six weeks (eight times per year).

Approximately 80 stream sites are added within an individual WMU at the beginning of each watershed planning cycle to carry out the intensive survey. During intensive surveys, samples are collected twice monthly during the runoff period, and monthly the rest of the year except during December. Parameters collected general include, but are not limited to, metals (quarterly), chemical anions and cations, nutrients, dissolved oxygen, ph, conductivity and temperature. Macroinvertebrate samples are also collected at selected sites to supplement chemical data. First Cycle Intensive surveys for Bear River (lower portion only), Weber River, Jordan/Utah Lake, Uinta, Sevier River, Cedar/Beaver, West Colorado and Southeast Colorado WMUs have been completed. Monitoring was completed on the second cycle for Bear River and Weber River WMUs in June 1999. The intensive surveys were completed in June 2000 in the Utah Lake/Jordan River Basin. Monitoring sites are set up to concentrate on identification of sources and causes of pollution for 303(d) segments and on measuring success of implementation.

Lake Monitoring: Under the Division's lake assessment program, 130 lakes are monitored for water quality on a regular basis. One-half of them are sampled during odd numbered years, the other half during even numbered years. They are sampled twice a year, May/June and August/September. Trophic levels and beneficial use support status are determined with results incorporated into 305(b) report and 303(d) list. Lakes with very soft water can be influenced by atmospheric deposition. The State currently has no monitoring program specifically designed to assess the impact of atmospheric deposition on soft water lakes in the Uintah Mountains. Adjustments will be made as needed to accommodate the data needs for TMDL development.

Point Source and Compliance Monitoring: Waste load analysis (WLAs) are calculated to determine levels, if any, that a water constituent can be discharged to a waterbody without affecting its beneficial uses. Under the UPDES program 135 industrial and municipal facilities are monitored to ensure that they are meeting their discharge permit limitations. Discharges are also monitored for parameters of concern as defined in the 303(d) list for future permit limitations. The WLA is recalculated each time permits are renewed to determine appropriate discharge limits.

Total Maximum Daily Load Monitoring: Additional data may be collected to complete TMDL analyses. Under section 303(d) of the Clean Water Act, each State is required to identify those waterbodies that are not supporting their beneficial uses. Waterbodies are then targeted for TMDL development with revised schedules submitted to EPA with 303(d) list every two years.

NPS Project Monitoring: Active NPS projects with EPA 319(h) monies may have additional monitoring sites to collect background levels of water quality constituents and to identify nonpoint sources in these areas that need additional monitoring. Currently these projects are Little Bear River, Mill Creek (Salt Lake County), Chalk Creek, Otter Creek and Beaver River. Second cycle NPS basin wide intensive monitoring was completed in the Little Bear River project area in June 1999 to try to determine the effectiveness of project measures that have been installed. An interim water quality report was completed in July 2000

Traditional methods of monitoring the water chemistry are important, but stream function and biology are also important in determining the health of a stream. To this end, the DWQ has developed an interagency NPS Monitoring Workgroup to also evaluate the effectiveness of

BMPs. Data on the riparian zone vegetation, stream shape (geomorphology), macroinvertebrate occurrence, fish habitat and fish populations are used in this process. Detailed facts are recorded at each site, including photographs of the conditions before, during and after project implementation. Reports have been published on three NPS watershed areas, Little Bear River, Chalk Creek, Mill Creek and Otter Creek.

Benthic Macroinvertebrate (Aquatic Insect) Sampling: Currently this monitoring capability is devoted to macroinvertebrate samples collected at 18 sites in the WMUs where intensive monitoring is being conducted. Three replicates are collected at each site. Collections are made in early spring and fall of each year. Data indices are used to supplement chemical data to determine beneficial use support for waters needing further study. Aquatic insect population and diversity are excellent indicators of the health of aquatic environments.

Ground Water Monitoring: The DWQ currently has 35 ground water permits in force. Ground water sources are monitored to ensure compliance with the limits established within each of the permits. Facilities that may discharge pollutants to ground water are required to obtain ground water discharge permits according to State Rule R 317-6. The Division has also inventoried about 4,000 Class V injection wells in the state.

In addition, the Division's Ground Water Section has been working with USGS to develop recharge zone maps in several counties throughout the state. Most recently emphasis has been on the "Wasatch Front" in the Lower Bear River, Weber River and Jordan/Utah Lake units. Samples were taken at 73 wells. Recharge area maps are prepared to assist State DWQ and local county and city officials protect recharge areas from potential ground water contaminants related to nonpoint and point sources.

Five ground water study projects have been recently completed or are still underway. These are: (1) a completed study in the Salt Lake Valley with emphasis on the shallow aquifer system with water samples were taken from 54 wells; (2) an ongoing study of the application of lawn fertilizers, herbicides and insecticides in certain recharge areas, also in Salt Lake Valley; (3) the "East Salt Lake Valley Drinking Water Source Protection Ground Water Project" which is being conducted as a multi-jurisdictional project; (4) the Box Elder and Cache Counties are the sites for another 319 funded study to locate sources of contaminants that may be entering the ground water system; and (5) now completed, an innovative study of ground water quality which resulted in the formal classification of ground water in the Heber Valley aquifers. This action has provided the basis for increased protection of ground water quality in the Heber Valley through the adoption of stringent local ordinances related to septic tank density to minimize aquifer contamination.

Volunteer Monitoring: The Division of Water Quality currently has no citizen volunteer monitoring program that is integrated with the other monitoring programs and there are no plans to do so. Some random volunteer monitoring is conducted by Adopt-A-Waterbody groups for educational purposes only at this time.

Data and Information Management: An adequate data management system is an essential component to transform the environmental data collected into a comprehensive assessment that supports the planning process and builds stewardship among stakeholders. UDEQ has assembled much of the hardware needed to store and retrieve large amounts of environmental information. However, the Watershed Approach will require consideration of improved procedures and potentially software that provides access to a larger audience of users and supports comprehensive analysis techniques. Such a project is underway by UDEQ called the Environmental Information Management Initiative which is a pilot project funded by EPA dealing primarily with permit compliance and issuance information.

UDEQ Integrated Information System: UDEQ will need to continue to develop an information system that has the capability to receive geographically-targeted environmental data from multiple sources and can be accessed for use by Watershed Approach partners. The design of the UDEQ integrated information management system will need to incorporate data and/or computer applications unique to the Watershed Approach. In addition, the system will need to support those functions unique to individual programs. Some of the functions of the UDEQ integrated information system that have been identified are listed below.

1. Interface with existing federal, state, and local databases as feasible and appropriate. Examples would include GRTS and the new waterbody assessment database.
2. Interface with UDEQ's GIS.
3. Gather information from paper and microfilm files maintained by UDEQ and other agencies.
4. Bring together related information, including: Facility location, Names and addresses of facility owners, operators, and contact people, SIC Codes - UDEQ permits issued to the facility, Operational status, Compliance status, Chronology of facility inspections, and Monitoring data collected for the facility.
5. Provide the capability to consolidate information by drainage basin: both point and nonpoint source loadings (by pollutant), compile habitat suitability indices by stream reach, evaluate wetlands information within the context of the watershed management unit and incorporate nontraditional parameters that are important to water quality planning (e.g., percent impervious service, buffer zones, and open space).
6. Provide a scheduling tool for coordination of events on an agency-wide basis, including - Inspections - Monitoring - Mailings - Combined permitting - Watershed management unit meetings (e.g., public outreach, watershed management unit assessment/priority setting and targeting).

UDEQ expects the system to provide several benefits, including improved information quality, increased consistency through use of a common information base, and easier access to data in other programs. An agency-wide scheduling capability would greatly enhance day-to-day planning between agency components for implementing the Watershed Approach. Also, improvements in the accuracy of environmental and location data will increase the reliability of assessment tools that rely on the information and ultimately result in better management decisions.

The Watershed Approach and GIS - UDEQ's Use and Capabilities: GIS is an overall term encompassing the entire field of computerized mapping. It is revolutionizing the way Utah can

use and store geographic or mapped information. A GIS is a computerized database of information that is stored and retrieved based upon geographic location. This database may be stored on a user's computer or on a network server where it can be widely accessed by Watershed Approach stakeholders.

A complete GIS system can be used to perform a number of functions, such as:

- Effectively describe what exists at a specific location;
- Locate areas consistent with specified evaluation criteria;
- Illustrate environmental trends for multiple parameters;
- Identify landscape patterns; and
- Model various scenarios.

The Utah legislature passed a Geographic Information Systems Data Sharing and Conformity Act in 1991. This act established "... a state geographic information base; providing for its contents and management; mandating state agencies to comply with policies and standards approved by the data processing coordinator; and making technical corrections" and created the Automated Geographic Reference Center (AGRC). It also provided for a State Geographic Information Database (SGID). AGRC has established a network connecting state, federal, local agencies and universities together in a data sharing pool. DWQ is included in this linkage. AGRC also has an interagency group working for consistent GIS data for the State.

Natural resource-related agencies have described a base data set that is useful for a number of purposes and are working on completing it for inclusion in the SGID. In addition, DWQ has defined a water quality data set to meet its purposes. The goal is to prepare these two sets of data for each of the watershed management units as part of Step 2 (Develop/Implement Strategic Data Collection Plan) of the watershed planning cycle. This process is completed as maps are produced to fill requests for reports and TMDL plans prepared by DWQ staff.

Grant Reporting and Tracking system (GRTS) Utah DEQ/DWQ has been a user and supporter of the GRTS NPS database. DEQ/DWQ has worked to maintain current information for both national mandated elements and additional regional fields up-to-date for all 319 projects. The State will continue to commit its support and use of GRTS pursuant to provisions in the annual Performance Partnership Agreement and 319 project grant conditions.

F. Watershed Element 5: Watershed Assessment

NPS component 5 - The State program identifies waters and their watersheds impaired by nonpoint source pollution and identifies important unimpaired waters that are threatened or otherwise at risk. Further, the State establishes a process to progressively address these identified waters by conducting more detailed watershed assessments . . .

NPS component 7 - The State identifies Federal lands and activities which are not managed consistently with State nonpoint source program objectives. Where appropriate, the State seeks NPS assistance to help resolve issues.

TMDLs must consider all significant sources of the stressor (or pollutant) of concern.

TMDLs are supported by an appropriate level of technical analysis.

Clean Water Action Plan “states and tribes should work with other appropriate agencies, governments, organizations, and the public to create Unified Watershed Assessments that identify watersheds that do not meet clean water and other natural resource goals and where prevention action is needed to sustain water quality and aquatic resources. Federal agencies will ask NRCS state conservationists and state environmental agency leaders to jointly convene this process and to involve a full range of appropriate parties.”

Introduction

The term watershed assessment is applied generally to several types of assessments that occur throughout a watershed management cycle. In the early stages of the cycle, assessment involves determining water quality conditions, beneficial use support status and ecosystem impairment and identifying sources and causes of impairment. Assessment procedures, including problem quantification and predictive water quality modeling, may be used in the middle stages of the cycle to help establish total maximum daily loads (TMDLs) and management goals. In later phases of the cycle, assessment procedures can be used to evaluate the effectiveness of implemented management strategies.

Additional considerations in assessments may include habitats (e.g., channel and riparian corridor condition); landscape characteristics (e.g., percent imperviousness); and point and nonpoint sources, as applicable. The biological measures of ecosystem integrity used in the Watershed Approach for issue identification and goal setting will also become an integral feature of assessments. Biological measures such as species diversity, abundance, vitality, and fecundity aid in evaluating the correlation between management actions and maintaining stream ecosystem health.

Assessments developed as part of the statewide watershed management strategy will include information that will fulfill a broad range of U.S. Environmental Protection Agency (EPA) reporting requirements [e.g., Sections 303(d), 305(b), 319(b) and 314(a) of the CWA]. These reports will also make information readily accessible and easily comprehensible to a broad range of stakeholders. Two assessments are described in this section.

Unified Watershed Assessment: A June 1998 request from the US Department of Agriculture and US Environmental Protection Agency asked for a Unified Watershed Assessment of each of the 68 eight-digit Hydrologic Code areas defined by the USGS and described in Element 1 Watershed Management Units of this document. The first phase was to bring together all involved state and federal agencies and jointly classify all of these units into four categories. These are:

Category I	Watersheds in Need of Restoration
Category II	Watersheds Meeting Goals, Including those needing action to sustain water quality
Category III	Watersheds with pristine or sensitive aquatic system conditions on lands administered by Federal, State, and Tribal Governments
Category IV	Watersheds with insufficient data to make an assessment

The Utah Unified Watershed Assessment and Watershed Restoration priorities were submitted to EPA October 1, 1998. Refer to Appendix II for a copy of the document. The Inland West Water Initiative being conducted by the Forest Service will provide watershed assessment information useful to the next Unified Watershed Assessment in Utah.

Utah Water Quality Assessment: Utah’s water quality assessment program is fully integrated with tasks needed to meet the Clean Water Act Section 305(b) requirements. This section

stipulates a Water Quality Assessment Report to Congress every two years. The latest of these reports was prepared in 2000.

In the Utah Code R317-2 Standards of Quality for Waters of the State, streams and lakes are classified according to the beneficial use of the waters. Each of these classifications in turn, have detailed water quality standards which allow a determination of whether or not waters are meeting their classified use. Waters of the state are assessed against the standards adopted for the uses as listed below:

Beneficial Use Classifications for Waters in the State of Utah

Class 1	Protected for use as a raw water source for domestic water systems.
Class 1A	Reserved.
Class 1B	Reserved.
Class 1C	Protected for domestic purposes with prior treatment by treatment processes as required by the Utah Department of Health.
Class 2	Protected for in-stream recreational use and aesthetics.
Class 2A	Protected for primary contact recreation such as swimming.
Class 2B	Protected for secondary contact recreation such as boating, wading, or similar uses.
Class 3	Protected for in-stream use by aquatic wildlife.
Class 3A	Protected for cold water species of game fish and other cold water aquatic, including the necessary aquatic organisms in their food chain.
Class 3B	Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain.
Class 3C	Protected for nongame fish and other aquatic life, including the necessary aquatic organisms in their food chain.
Class 3D	Protected for waterfowl, shore birds and other water-oriented wildlife not included in Classes 3A, 3B, or 3C, including the necessary aquatic organisms in their food chain.
Class 3E	Severely habitat-limited waters. Narrative standards will be applied to protect these waters for aquatic wildlife.
Class 4	Protected for agricultural uses including irrigation of crops and stock watering.
Class 5	The Great Salt Lake. Protected for primary and secondary contact recreation, aquatic wildlife, and mineral extraction.

Executive Summary - FY 2000 305(b) Report: Utah’s surface water resources include 16,457 miles of perennial rivers and streams, nearly 3,000 lakes and reservoirs, and approximately 510,039 acres of wetlands and 1,902 linear miles of wetlands. Since Utah is the second driest state in the country, these waters play a major role in the private, commercial and industrial development of the state. They are sources of drinking water, provide enormous recreational opportunities, sustain a wide variety of wildlife, and provide water for agricultural production.

Small quantities of ground water can be obtained throughout Utah, but large supplies of water suitable for various uses are confined to thirty-three areas within the state (U.S.G.S., 1991). However, the importance of groundwater cannot be overlooked. In some counties, almost 90% of the drinking water comes from ground water sources.

One could say that Utah's water resources are the fabric of its society. They delineate and constrain where we live, play, and work. Early pioneer communities were built where water was available and even today with all our reservoirs, aqueducts, canals, and ditches, water still defines and molds the demographics of the state. As such, these resources are invaluable and must be developed, protected and used wisely. To do this, the State has developed water quality standards to protect it for use as raw water sources for domestic water systems, for recreational use and aesthetics, aquatic life support, and agricultural use.

Point Source Program: The Utah Pollutant Discharge Elimination System (UPDES) regulates municipal and industrial discharge as well as general permits, federal facilities and industrial pretreatment. One-hundred and one (101) industrial and 95 municipal facilities are currently regulated under the UPDES program. To date, there are also 1,051 storm water discharge general permits that regulate the discharge of pollutants from industrial and construction sites to waters of the state. In addition, there are 72 general permit coverages in effect that regulate such activities as construction dewatering and concentrated aquatic animal production (fish hatcheries). During 1998 and 1999, 26 UPDES permits were issued or renewed for municipal dischargers, 33 industrial permits were issued or renewed.

By the end of 1999, 694 individuals had been certified as wastewater operators by the wastewater certification program that is administered by the Division of Water Quality.

Nonpoint Source Program; New Funding Source: On March 16, 2000, Governor Leavitt signed into law House Bill 265, "Water Pollution Loans." This bill provides authority to the Water Quality Board to make loans, but not grants, for many kinds of nonpoint source pollution (NPS) projects. As a result of this bill, a significant source of funding will soon be available to help reduce water pollution caused by uncontrolled runoff, to repair or replace failing on-site wastewater disposal systems, or for projects that will help implement total maximum daily load (TMDL) assessments.

Cost/Benefit Assessment: Since 1972 over 400 million dollars has been provided to municipal type wastewater projects within the State through EPA Construction Grants, Utah Water Quality Project Assistance or State Revolving Loan Funds. The actual monetary benefit is difficult to calculate, but needless to say, these efforts have protected the public health and the environment. It has also allowed Utah to continue to grow economically and the monetary benefits to the state and its residents have been very significant.

State Concerns: Some of the major concerns include state and federal funding to support Utah's water pollution control program. This affects the ability to provide technical and financial assistance to communities for the efficient operation and maintenance of wastewater facilities, and nonpoint source pollution from agriculture, industrial and municipal runoff.

Utah, in cooperation with the agricultural community, has developed a strategy for dealing with runoff from animal feeding operations and concentrated animal feeding operations. This strategy will focus work toward inventorying, assessing, and improving management of AFOs and CAFOs in Utah. Additional resources will be needed to implement this program.

One of the most significant concerns is the preparation of useful and implementable TMDLs in the time frames allowed. EPA's recently issued regulations will significantly increase the workload and require an increase in resources.

New stormwater rules will also require an increase in resources and the State will need increased staffing and funding in this program to meet the new requirements.

In general, these new programs require the State to implement programs without sufficient funding to do the work. It is a continuing concern of how and where to obtain funding for new or increased requirements for current programs.

Other concerns include the need for clean up and protection of ground water quality.

Monitoring Program: In 1993, Utah changed to a basin or watershed intensive monitoring program. The state was divided into ten water quality management areas. Stream water quality monitoring has been designed to rotate through these management areas every five years. Intensive surveys were completed for the West Colorado, Southeast Colorado, Bear River, and Weber River Watershed Management Units for this reporting cycle. The surveys for the Bear River and the Weber River units were part of the second five-year monitoring cycle. The results of previous intensive surveys and assessments for the Jordan River, Uinta, Sevier River, Cedar/Beaver and Lower Colorado watershed management units were combined with the above assessments to obtain the statewide assessment results. A small portion of the GSL/West Desert watershed management unit was sampled with the intensive monitoring of the Weber River in 1993-94. Sixty-three (63) long term stations are being sampled to determine water quality trends throughout the state. Under the Division of Water Quality's lake assessment program, 130 lakes are monitored on a regular basis. One-half of them are sampled during even numbered years and the other half during odd numbered years. Industrial and municipal facilities are monitored up to eight times per year to ensure that they are meeting their discharge permit limitations. Five nonpoint source pollution projects were also monitored.

Rivers / Streams: Utah assessed approximately 10,519 miles of perennial streams. This is about 64% of the perennial stream miles in the state based on EPA estimates of stream miles. However, the State believes that the EPA estimate is too high for perennial streams and that it has assessed about 70% of the perennial stream miles within the state.

About 73 percent of the stream miles assessed were found to be fully supporting their assessed beneficial uses. Some 13.3% were partially supporting and 13.5% were non supporting of designated uses (Figure 2-5).

The major causes of water quality impairment are total dissolved solids, sediments, nutrients and, stream habitat alterations. Stream habitat alterations include riparian habitat and in-stream habitat. The major sources of pollutants are agriculture, natural sources, hydrological modification, resource extraction and habitat modification. About 3% percent of the stream miles are affected by point source discharges. Agricultural practices, such as grazing and irrigation, caused increased nutrient and sediment loading into streams. Point sources are also

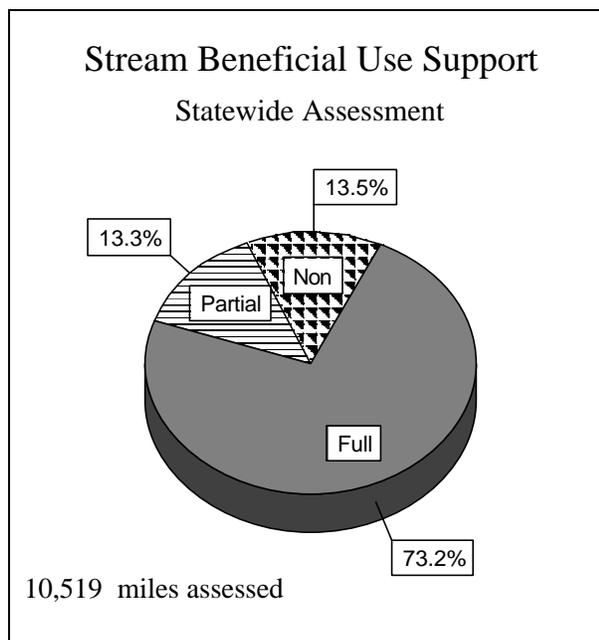


Figure 2-5. River / Stream beneficial use assessment.

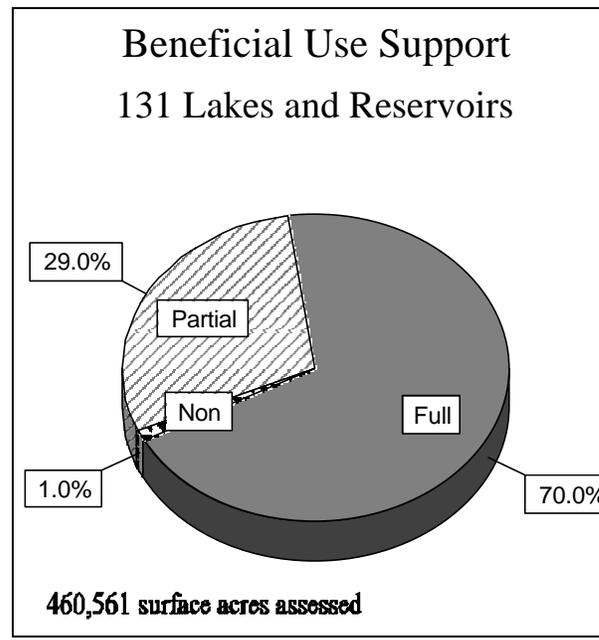


Figure 2-6. Lake / Reservoir beneficial use assessment.

responsible for nutrient input into streams, while natural sources contributed metals, total dissolved solids and sediments to streams in some areas. Resource extraction and associated practices such as road construction contributed significantly to impairment of water quality also.

Utah's proposed 303(d) list of impaired waters includes 80 stream segments (Figure 2-7). Because multiple factors affect some of the segments, 131 parameters were listed for TMDL analysis. Seven stream TMDLs were submitted to EPA for approval during this cycle.

Figure 2-5 illustrates the overall beneficial use support for streams. The majority of streams were not assessed for Class 2B (contact recreation). Therefore, the assessment is primarily based on Class 1C (source of drinking water), aquatic life beneficial uses (3A, 3B, 3C, and 3D), and Class 4 (agriculture use).

Lakes / Reservoirs: About 95% of the lake acreage (460,642) in the state was assessed during this reporting cycle. Approximately 70% of the acreage was found supporting its designated uses. About 29% was partially supporting and about 1% non supporting its designated uses (Figure 2-6).

The causes of impairment in lakes and reservoirs continue to be nutrients, siltation, low dissolved oxygen, suspended solids, organic enrichment, and noxious aquatic plants.

The major sources of pollutants causing impairments are agricultural practices, industrial and municipal point sources, and hydrologic modification (draw down of reservoirs).

During this reporting cycle, 50 lakes (Table 2-3 and Figure 2-8) were proposed to be on the 303(d) list. Because of multiple pollutants or stressors, 80 parameters were identified as needing TMDL analysis. During this cycle, 8 lake and reservoir TMDLs were submitted to EPA for approval. Figure 2-6 shows the lake beneficial use assessment for this 305(b) cycle.

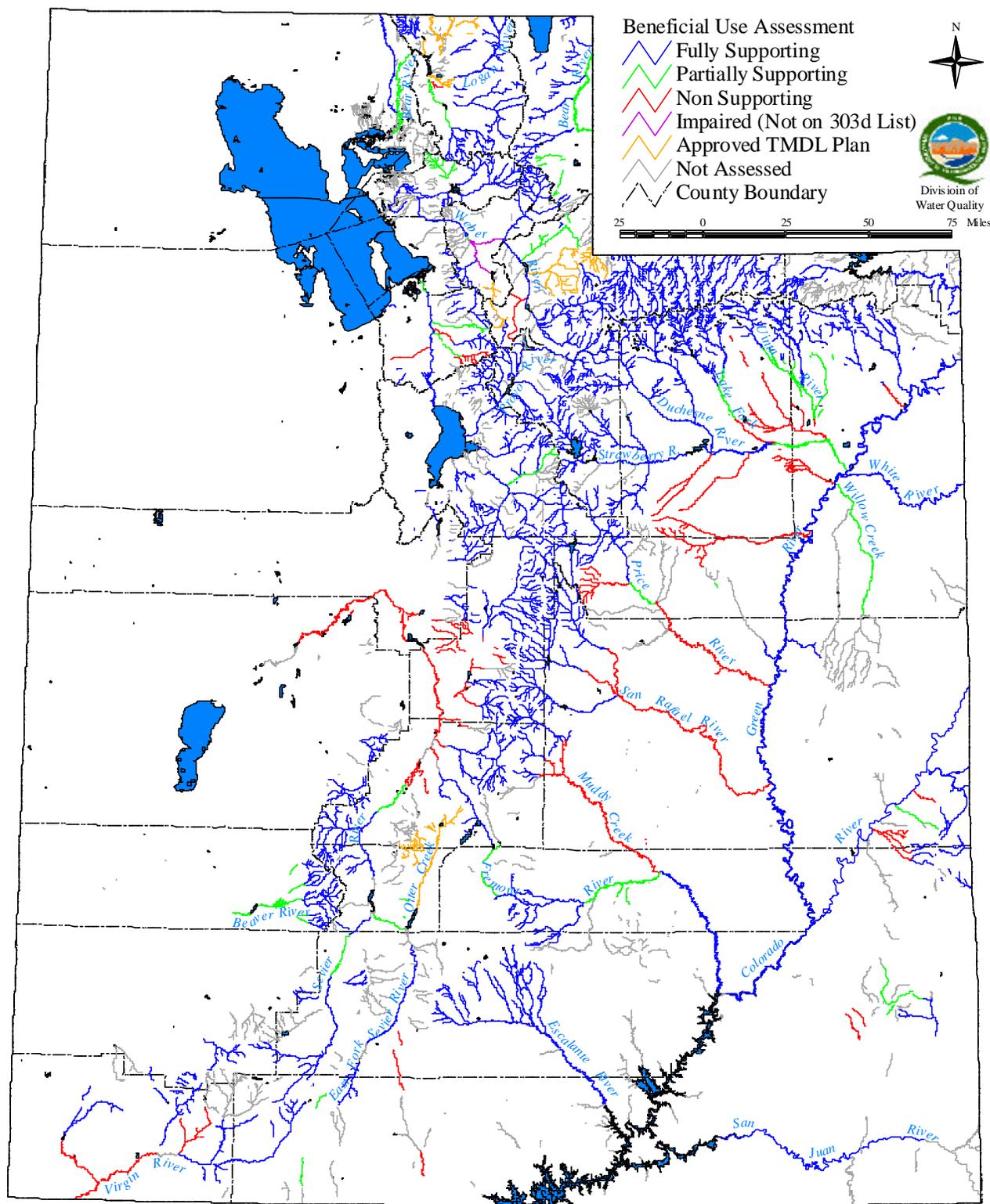
Public Health/Aquatic Life Impacts: The State still has a health advisory in effect on the lower portion of Ashley Creek drainage and Stewart Lake in Uintah County. This advisory was issued by the State because of elevated levels of selenium found in fish, ducks, and American coots.

Wetlands: The Division of Wildlife Resources (DWR) has completed a wetlands classification for the State of Utah. This classification scheme is closely tied with the physiographic provinces of Utah. In this classification, there are references to comparable Cowardin classes. Wetlands are protected under the State's water quality standards as "waters of the state."

Ground Water: In accordance with 305(b) reporting guidance and the watershed approach, Utah selected to report on the Cedar/Beaver Basin watershed for its FY2000 305(b) ground water assessment report. One of the significant issues affecting this area has been increased corporate hog farming operations located in the area. Since 1995 there have been eleven new facilities constructed. The potential impact to groundwater from these facilities has made this a priority watershed. Future 305(b) reports will encompass the basins for which basin water quality plans have been completed during the prescribed reporting period.

The Cedar/Beaver Basin is made up of six groundwater reservoirs. These are the upper Beaver River, Milford area, lower Beaver River, Parowan Valley, Cedar Valley, and the Beryl-Enterprise area. The lower Beaver River groundwater basin, which includes the area below Black Rock and Sulphurdale, is not discussed in detail as there are no data available. These groundwater reservoirs are discussed in greater detail later in the full report. They are used to supply water for municipal and industrial, agricultural and irrigation, stock and other minor miscellaneous uses. Groundwater reservoirs function in a way similar to surface water storage reservoirs where the volume of water in storage is determined by the recharge and discharge. When groundwater levels decline, well water levels drop and seep and spring discharges on the valley floors may be reduced. The opposite is also true when groundwater levels raise. If the groundwater discharge exceeds the recharge over several decades, then mining occurs. This has occurred in some areas of the basin.

Man-caused pollution along with natural causes has affected the water quality in the Cedar/Beaver Basin. This has resulted in increased concentrations of nitrates and total dissolved solids in localized areas. The State ground water quality program uses total dissolved solids (TDS) concentrations to categorize ground water beneficial uses. The lower the TDS concentrations, the greater the beneficial use is considered to be for that water. In addition, recent and future growth and development will create changes in water use and will further impact the water quality. Due to the increased development of large animal farms and a large number of wells, the area known as Milford Flats is currently under investigation.



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Figure 2-7. Overall beneficial use support for streams in Utah.

Table 2.3. Lake/ Reservoir Number and Name for Map of Lake/Reservoir 303(d) Waters

Lake Number	Lake Name	Lake Number	Lake Name
1	Newton Reservoir	26	Scofield Reservoir
2	Tony Grove Lake	27	Lower Gooseberry Reservoir
3	Hyrum Reservoir	28	Palisade Lake
4	Porcupine Reservoir	29	Nine Mile Reservoir
5	Mantua Reservoir	30	Johnson Valley Reservoir
6	Pineview Reservoir	31	Koosharem Reservoir
7	Bridger Lake	32	Forsyth Reservoir
8	Marsh Lake	33	Mill Meadow Reservoir
9	Echo Reservoir	34	Manning Meadow
10	Lyman Lake	35	Kens Lake
11	China Lake	36	Lower Box Creek Reservoir
12	East Canyon Reservoir	37	Piute Reservoir
13	Browne Reservoir	38	Puffer Lake
14	Spirit Lake	39	Minersville Reservoir
15	Matt Warner	40	Kents Lake
16	Calder Reservoir	41	Labaron Reservoir
17	Mirror Lake	42	Otter Creek Reservoir
18	Mill Hollow Reservoir	43	Red Creek Reservoir (Iron County)
19	Red Fleet Reservoir	44	Yankee Meadow Reservoir
20	Steinaker Reservoir	45	Panguitch Lake
21	Deer Creek Reservoir	46	Recapture Reservoir
22	Brough Reservoir	47	Newcastle Reservoir
23	Utah Lake	48	Navajo Lake
24	Strawberry Reservoir	49	Baker Dam Reservoir
25	Big East Lake	50	Gunlock Reservoir

G. Watershed Element 6: Prioritization, Quantification (TMDL) & Targeting

EPA NPS components 1, 3, 4, 5, and 6 apply

TMDLs have a quantified target or endpoint.

TMDLs include a quantified pollutant reduction target, . . . can be expressed in several ways

TMDLs must consider all significant sources of the stressor of concern.

TMDLs must contain a margin of safety and consider seasonality.

CLEAN WATER ACTION PLAN “States and tribes working with appropriate agencies, organizations, and the public define watershed restoration priorities, with special attention to watersheds most in need of restoration and protection through the year 2000. This schedule must be coordinated with section 303(d) of the Clean Water Act and provide an opportunity to bundle Total Maximum Daily Loads on a watershed scale.”

Introduction

Prioritization is the process of ranking watershed concerns, identified in element 5 assessments, in order of their importance. Targeting is deciding where resources should be spent to address priority issues. The purpose of these steps is to ensure that the highest priority risks in a watershed are being addressed by a local watershed committee capable of putting together comprehensive management strategies.

These steps, more than any other in the watershed management unit cycle, allow DWQ jointly with UDAF and fellow stakeholders to tailor their actions to a level that can be sustained by available resources. For example, adequate resources are a targeting criterion. The flexibility of deciding which problems to address first and negotiating solutions provides DWQ a valuable opportunity to more actively involve and secure a higher degree of commitment from stakeholders.

It is important to note that the involvement of a broader base of stakeholders in the priority setting process is not a retreat from the environmental benchmarks established in the Clean Water Act and Utah's own water quality enabling legislation. DWQ staff will serve a communication and teaching role to facilitate the participation of stakeholders in these steps. Assistance in conducting information and education activities in priority watersheds will be provided by UDAF and the Extension Service.

The product of this evaluation is a list of recommended priorities and targeted issues that incorporates stakeholder input. This rationale will be presented to the Steering Committee and at the watershed management unit public meetings designated for priority setting and targeting. In addition, DWQ staff and the WQ Task Force will then be required to translate targeted priorities into specific project objectives and management actions (Element 7) that are consistent with available resources. UDAF will have resources to aid in preparing watershed specific project implementation plans to implement elements of TMDLs.

Prioritization:

The Consensus-Based Approach: The consensus-based approach uses broad participation by multiple agencies and other stakeholders to reach a consensus on priorities within the watershed management unit. Participants review technical information on agreed upon ranking criteria. A consensus is reached when all parties

agree on decisions or agree to support the decisions of the larger group. The strengths of this approach lie in the widespread acceptance of the end product. Weaknesses include the potential inability to reach a consensus.

Emphasis will be on negotiating consensus positions with the Steering Committee and at watershed management unit public meetings. The Technical Advisory Committee will take the lead in representing the agencies positions on priority setting, targeting, and the development of management strategies.

Quantification (Assessment and Evaluation): Establishing total maximum daily loads (TMDL) of a pollutant or stressor that a prioritized water body can sustain and still meet its beneficial uses, is the transition step between a priority list and establishing a target. EPA's TMDL regulation states, "TMDLs can be expressed as mass per unit of time, toxicity, or other appropriate measure." Other measures could include such things as percent of reduction of sedimentation or nutrients, application of BMPs on a percentage of priority areas within a watershed, decrease in miles of deteriorated stream banks, use of irrigation efficiency BMPs on a certain amount of acres, treatment of a certain number of significant animal feeding operations and others. Quantification also includes identification of all major sources of the stressor of concern.

Targeting Criteria: After waters have been prioritized and the issues quantified, deciding how to allocate resources to address protection or restoration goals is the next step. Programs within the Watershed Approach framework are expected to begin at the top of the water body priority list and evaluate where to direct their resources based on the following types of criteria.

Public Support: This category involves assessing factors, such as the degree of public interest, availability of local funding, and the degree of support by other resource agencies, that are integral to implementation of management measures. These criteria will need to be a qualitative assessment using categories such as high, medium, or low. Assignment to a particular category will be based on public meeting participation, written contributions/responses to the watershed plan, steering committee support, contributions of resources from partner agencies, and in some cases formal surveys.

Manageability: Evaluating manageability could include such factors as the feasibility of mitigating water quality problems or protecting the watershed, magnitude of cost, size of the watershed, time necessary to correct the problem, opportunity for success (e.g., ability of agencies to work together or capability to deal with the problem), amenability to available tools and controls, etc. For example, the UDEQ NPS program currently does not target watersheds greater than 256,000 acres because the potential for success has been shown to be very low.

Data Availability: Data may be sufficient to assess the water body, but insufficient to quantify the problem for management purposes. If the problem cannot be quantified satisfactorily, then a data gap would be identified to be addressed in the future; information on data gaps would also be shared with those responsible for updating annual monitoring strategies.

Program-Specific Funding: Managers should consider such elements as project funding eligibility (i.e., constraints regarding use of resources), projects or funds already planned by cooperating agencies, availability of funds for specific purposes, and DWQ's overall Clean Water Strategy (i.e., allocation of DWQ resources for completion of TMDLs).

Program Constraints: Program actions may be limited by personnel and (or) operational resources. Programs may also be constrained by an inability to determine specific causes of pollution and recommend solutions due to nonpoint nature of the pollution and other factors.

Goals: Resource allocations should be based on water quality impairment and results of TMDL completion and may be constrained by specific federal, state, agency or basin management goals. Thus, a fixed amount of resources may need to be allocated to a variety of water body types or for different program-specific areas (e.g., point source versus nonpoint source problems or to address AFO/CAFO problems).

Current Priorities and Targeted Areas: Two assessment programs have gone into setting priorities and targeting actions of DWQ and influencing other agencies programs. First is the Water Quality Assessment report to congress every two years as required by section 305(b) of the Clean Water Act. The act as amended requires each state to identify those waterbodies that are currently not meeting state water quality standards. Section 303(d) further requires the State to develop Total Maximum Daily Loads (TMDLs) for selected waterbodies during the following two years. Selection criteria for TMDL development were described in 2000 303(d) list (see Appendix III).

This report is also the key document for Utah Division of Water Quality as well as for national uses. The 2000 report lists eighty (80) stream waterbodies and fifty (50) lakes as having water quality problems. Also 37 permitted facilities are named that require a renewal review and a new permit issued during the 2000 to year 2002 time frame. All of these waters require the development of TMDLs according to a twelve-year schedule submitted to EPA on October 1, 1998.

The second program arises from a June 1998 request from the US Department of Agriculture and US Environmental Protection Agency which asked states to prepare a Unified Watershed Assessment and identify watershed restoration priorities. This is part of the Clean Water Action Plan recently developed as part of the Clean Water Act. This action plan stipulated bringing together a high-level interagency group to carry it out in a short four month period. The interagency assessment has been made for each of the 68 eight-digit Hydrologic Code areas defined by the USGS and described in Element 1 Watershed Management Units of this document that occur in Utah. The first phase has resulted in classifying all of these units into four categories and a prioritization of them. Refer to Appendix II for a description of Utah's submittal to EPA.

Water Quality Assessment Report to Congress (Section 305(b) of Clean Water Act) and 303(d) List/TMDL Priorities:

The following criteria were used Year 2000 prioritizing 303(d) listed waters:

Severity of pollution and beneficial uses of waters: UPDES permit renewal wasteload allocations received a high priority because many of the industrial permits required effluent limits on parameters that could be toxic to aquatic life as well as a danger to human health. In addition, the volume of the effluent discharged by the permittee can be a major component of the flow after the point of discharge. Severity of pollution is also used in determining the priority of nonpoint source TMDLs.

Programmatic needs regarding UPDES permitting: Utah's UPDES program is based upon a five-year permit renewal cycle. Permit renewals have been set up so that the number of permit renewals each year during the five-year cycle are approximately equal. Because of this, the UPDES permit TMDLs are given a high priority so that the TMDL can be completed in time for the permit to be renewed because of the statutory requirements for permits to be issued.

Basin Planning Cycles: The Division of Water Quality has currently divided the state into ten Watershed Management Units. These units were combined to create five monitoring regions or units that are sampled intensively once every five years. This schedule allows the state to monitor a majority of the perennial streams state-wide to identify those waters that are not meeting beneficial uses. It is part of the Division's water quality management plan to complete some of the TMDLs in each of these watersheds during the five-year cycle. This would allow the Division to develop a water quality management plan for each of the basins based upon the results of the assessment and TMDLs in sub-watersheds.

Ongoing Activities Within the Watershed: The Division uses water quality related projects and activities that are ongoing in a watershed to prioritize its TMDL waterbodies. The Division has cooperated with the Natural Resources Conservation Service to implement TMDL work and water quality management plans throughout the state and will continue to do so. This cooperation provides additional funding and staff for water quality related assessments and improvements. The Division has and will continue to work with the Division of Water Resources to coordinate work when the Division produces its state water plans for each basin.

Economic and social impact on communities, businesses, and citizens: Economic and social impacts on different sectors of the public are used to help prioritize TMDLs. The need to develop a TMDL to allocate discharges of water quality parameters to prevent the closure of industries or create undue burdens on communities and individuals is used in developing TMDL priorities.

The degree of public interest, support, and resource importance: This information is also used to assist in prioritizing TMDL waterbodies. Public interest has played a significant role in developing TMDLs in various watersheds. The lower Bear River is one example where public interest as well as other parties was used as a ranking criterion to list waterbodies high on the list for TMDL completion. Most of those TMDLs were completed in the 1996-1998 reporting cycle.

H. Watershed Element 7: Development of Management Strategies

NPS component 1 - The State program contains explicit short-and long-term goals, objectives and strategies to protect surface and ground water.

NPS component 6 - The State reviews, upgrades, and implements all program components required by section 319(b) of the Clean Water Act, and establishes flexible, targeted, and iterative approaches to achieve and maintain beneficial uses of water as expeditiously as practicable.

NPS component 8 - The State manages and implements its nonpoint source program efficiently and effectively, including necessary financial management.

TMDLs apportion responsibility for taking actions and require an implementation program/plan.

CLEAN WATER ACTION PLAN “States and tribes should work with public agencies and private-sector organizations and citizens to develop, based on the initial schedule for the first two years, Watershed Restoration Action Strategies, for watersheds most in need of restoration.”

The dominant water quality management strategy for DWQ is the Utah Watershed Approach as explained throughout this plan. This approach has been designed to carry out the goals and objectives of DWQ as given in the introduction section and to meet requirements of the Clean Water Act. Guidelines for both the NPS and TMDL programs have been integrated into the Watershed Approach. Element 2 in Chapter II lays out the organizational strategy for state, regional and local activities.

The local Watershed Management Unit Steering Committee and the Technical Advisory Committee provide the mechanism for programs, agencies, and other stakeholders to collaborate in developing management strategies. Collaborative work within the committees will promote the development of more specific locally acceptable solutions to water quality problems.

Watershed Management Unit Team Development of Management Strategies:

Development of management strategies is a logical extension of the priority setting and targeting steps. While targeting is primarily an administrative and budgeting process, management strategy development focuses on technical factors and local issues and on implementing specific actions. During the developmental process, stakeholders identify specific goals and objectives for targeted watersheds with impaired waterbodies and then design strategies to achieve the goals and objectives.

The Watershed Management Unit Steering and Technical Advisory Committees will evaluate the targeted issues and sub-watersheds with 303(d) listed waters to prepare management plans containing State/EPA approvable TMDLs. In some cases a problem may have been identified in most sub-watersheds making up the watershed management unit. This issue would probably require a solution that applies to the entire watershed unit (e.g., a basin-wide permit or basin-wide BMP recommendations). State DEQ provides technical assistance to committees and may establish a phased TMDL approach for implementing the management strategies.

Design of Watershed Management Unit Project Objectives and Activities:

The Watershed Approach will require that existing DWQ programs remain in place. DWQ programs provide the home base for the specific expertise needed for the design and implementation of various water quality activities. These are:

- CWA 106 General Water Pollution Control Program/Monitoring/Permitting
- CWA 104(b) special studies related to TMDL development and NPDES program
- CWA 303(e) and 303(d) Total Maximum Daily Load (TMDL) Program
- CWA 305(b) Assessment and Reporting
- CWA 314 Clean Lakes Program
- CWA 319 Nonpoint Source Management Program
- CWA 402 National Pollutant Discharge Elimination System (NPDES) Permit and Compliance Program
- CWA 402(p) Storm Water Permitting Program

- State Revolving Fund (SRF) Program
- Municipal Wastewater Pollution Prevention (MWPP) Program
- Ground Water Program
- Drinking Water Program (Division of Drinking Water)

Appropriate DWQ staff is assigned to the WMU Technical Advisory Committee to complete tasks necessary to prepare the water quality management plan/restoration action strategy. For example, the DWQ staff would design a pollutant loading reduction program for a targeted sub watershed in coordination and direction from local steering committees. Watershed restoration action strategies for each watershed or WMU will include elements such as those recommended in EPA guidance for the Unified Watershed Assessment/Watershed Restoration Action strategies and relevant TMDL program guidance/regulations:

- identification of measurable environmental and programmatic goals
- identification of sources of water pollution and the relative contribution of sources
- implementation of pollution control and natural resource restoration measures (e.g., permit revisions, implementation of best management practices and buffer strips) to achieve clean water and other natural resource goals, especially those measures which will achieve multiple environmental and public health benefits
- schedules for implementation of needed restoration measures and identification appropriate lead agencies to oversee implementation, maintenance, monitoring and evaluation
- implementation of total maximum daily loads (TMDLs) for pollutants exceeding state water quality standards
- implementation of source water assessment and protection programs
- needed monitoring and evaluation to assess progress toward achieving environmental and programmatic goals
- funding plans to support the implementation and maintenance of needed restoration measures
- a process for cross-agency (federal, state, interstate, tribal, and local) coordination to help implement watershed restoration action strategies and for public involvement

WMU plans include a specific schedule of stakeholder activities which is the final component of the Watershed Approach planning and implementation cycle. After the planning process has been completed, stakeholders will have identified specific goals and management objectives.

Responsibility for project objectives would be noted for each stakeholder contributing funding, expertise, or other resources to its completion. A schedule would also be completed for each project objective. This aspect of the watershed management unit cycle allows both citizens and agency stakeholders to track implementation and to plan their commitments in other watershed management units. See Appendix IV for some specific examples of watershed restoration goals and objectives for priority watersheds.

I. Watershed Element 8: Development of Watershed Management Plans

NPS and TMDL guidelines do not specifically state that a plan or report document be prepared but it is implicitly understood that a document as described in this element is needed. The plan will reflect all guidelines for the NPS, TMDL, and watershed restoration action strategy guidelines pursuant to the Clean Water Action Plan and Clean Water Act.

WMU or sub-watershed TMDL plans are essential tools that provide critical direction for the steps in implementing a watershed management approach, and they provide a frame of reference for the approach as a whole. The plans document current water quality conditions, development trends within watershed management units, management priorities and goals, and management strategies to achieve those goals. Written in nontechnical terms to reach as wide an audience as possible, plans could be updated every five years or as needed to enhance their use as long-term references for planning and for determining regulatory requirements. Technical studies that are significant in shaping the plans are summarized in the document, with technical details included in separate reference documents for the more restricted scientific audience. The watershed management unit plan is outlined below.

Production of watershed management unit plans containing priority area TMDLs will be led by a Steering Committee and a Technical Advisory Committee. A DWQ Watershed Management Unit Coordinator, to be assigned in each watershed management unit, will be responsible for coordinating plan development with assistance from local committees. Committee membership would include representatives from closely aligned regional organizations, augmented as required by members of other interest groups.

DWQ envisions that watershed management/TMDL plans will be adopted pursuant to Utah's Continuing Planning Process according to EPA Water Quality Planning and Management Regulations. DWQ will focus on coordinating and implementing the management plans to achieve environmental objectives as efficiently and effectively as possible. Plans will be prepared for approval by the Water Quality Division Director, conferring with the Water Quality Board. All plans will be prepared on a collaborative basis with continuous input and direction from local Steering Committees and Technical Advisory Committees. Much of the public participation process will be conducted by the local steering committees and will consist of the following actions: 1) Preplanning scoping meetings; 2) Public/agency meeting to review preliminary assessment and draft TMDLs; 3) Public meeting and request for comment on draft TMDL/WQM Plan; 4) DWQ will post the document on the Web Page for public access and comment.

Great diversity exists among the ten major Watershed Management Units in Utah. This ranges from the metropolitan Jordan/Utah Lake WMU containing about 58% of the state's population and its attendant business and industrial activities to the extensive but largely unpopulated Great Salt Lake Desert/Snake WMU. Sub-Watershed plans will likewise reflect this diversity. Following is a generic outline of a watershed water quality management plan. This content will be modified as necessary to comply with new EPA Water Quality Planning and Management regulations and program guidance as necessary.

Executive Summary: The Executive Summary will essentially be a condensed version of the watershed management unit plan and will include major findings and management recommendations. Activities crucial to successful plan implementation will be highlighted, along with steps critical to future planning efforts.

Chapter 1. Introduction: The Introduction will provide a historical perspective on past management efforts, the vision and rationale of future plans, a brief description of Utah's Watershed Approach, and an explanation that the purpose of the watershed plan is to serve as a comprehensive guide to management activities affecting the protection or restoration of the

watershed's aquatic resources. The Introduction will describe the role of the Watershed Management Unit Steering Committee and other stakeholder input to the development of the plan. DWQ's role in environmental management will be covered briefly, and a guide for using the document will be provided.

Chapter 2. General Description of the Watershed Management Unit: This chapter will characterize the watershed management unit through a combination of narrative descriptions, tables, maps and other types of graphics that cover a wide-range of features such as geology, hydrology, land uses, demographics, economic bases, and basin development trends. Water use designations and general descriptions of major pollutant sources will also be included. The purpose of Chapter 2 will be to provide the reader with a thorough foundation for understanding factors critical to water quality assessment and management.

Chapter 3. Existing Watershed Conditions - Assessment of Environmental Data: Chapter 3 will describe the current and historical condition of surface and ground waters within the watershed management unit. After a brief discussion of the relationship between surface and ground water quality, information will be provided on sources of data, methods of data interpretation, and assessment results for each resource. In addition to providing use support status summaries, the chapter will discuss the implications of data coverage. Critical issues addressing both protection and restoration objectives will be identified, along with data gaps and deficiencies that should be filled by future monitoring efforts.

Chapter 4. Priority Concerns and Targeted Environmental Objectives: This chapter will show how stakeholders assigned priorities to restoration and protection objectives identified in Chapter 3. That is, both the priority setting methodology and the results will be briefly described. The ranking of critical issues and priority waterbodies are discussed and a consensus reached between stakeholders. Chapter 4 will also address the issue of how priority concerns were targeted for further consideration for management actions. The subset of priority issues that have been targeted for further action become the focus for the remainder of the document.

Chapter 5. Problem Quantification: Chapter 5 will summarize quantification analyses that are performed on waters targeted for implementation of management strategies during the current basin cycle. These analyses will reflect work needed to clarify the magnitude, causes, and sources of problems. Quantification includes estimates of assimilative capacity and existing source loads; establishing TMDL control strategies (i.e., required reductions); estimates on extent of habitat impairment; estimates of extent of hydrological modification (i.e., percent imperviousness, loss of wetlands, magnitude of diversions, withdrawals, return flows, and extent of ground water use); and population status of biological resources.

Chapter 6. Management Goals and General Management Strategy: This chapter will discuss immediate and long-range goals for the entire watershed management unit, along with the corresponding general management strategy to meet those goals. The Technical Advisory Committee will determine the extent to which the targeted problems are interrelated and subject to an integrated management strategy. Existing management activities that are relevant to those goals will be covered in addition to new management initiatives that will be necessary to achieve environmental objectives.

Chapter 7. Recommended Water Quality Actions: Chapter 7 will present the individual management strategies for each impaired waterbody/watershed. Decisions, methods, and criteria used to establish management strategies will be documented. In addition to describing specific control strategies, the chapter will include recommendations for filling monitoring

information gaps and measuring the success of proposed strategies. Also, the implications of the strategies for stakeholders will be summarized. A schedule for implementation of the specific management strategies will also be included.

Chapter 8. Future Considerations: This chapter will briefly discuss potential future efforts for waters involved in phased TMDL development and priority waters that are not currently addressed in the plan due to resource constraints or other management impediments. This section will also describe the ongoing monitoring strategy designed to assess the effectiveness of implementing the plan. The feedback loop will describe the reporting, management oversight and accountability that will be part of the 'reasonable assurance' documentation required as part of the TMDL plan.

J. Watershed Element 9: Implementation Strategy

NPS element 4 - The State program (a) abates known water quality impairments from nonpoint source pollution and (b) prevents significant threats to water quality from present and future nonpoint source activities.

Application of TMDLs results in maintaining and attaining water quality standards.

Implementation is the culmination of the watershed management unit cycle. It installs a cap or horizon on the planning process, serving as a catalyst for stakeholders to implement those management strategies that can be supported by the information and resources that have been assembled. Working according to agreed upon schedules, a specific implementation date encourages stakeholders to deal realistically with uncertainties due to a lack of information or insufficient resources to address all of the problems that have been identified in the planning process.

The consensus that has been developed throughout the earlier steps in the planning cycle should reduce the amount of effort and time necessary to begin translating the watershed management unit plan into specific actions. The watershed plan/TMDL document will include an implementation plan that provides detailed actions and a schedule for carrying out the plan specific to implementation elements contained in EPA TMDL program regulations and guidance.

Under local watershed steering committee oversight, the DWQ will produce a periodic implementation report (every three to five years depending on resources available and monitoring cycle) to describe implementation progress. These reports could also aid in fulfilling the need to report on implementation of specific water restoration action strategies pursuant to the Clean Water Action Plan and NPS Program annual reporting requirements. With the assistance of local project sponsors, NPS Program staff will gather and report on status and effectiveness of 319 funded projects.

Considerations for General Statewide Implementation: The description of activities in individual TMDL implementation plans is important because the basin management cycle will not be initiated in all basins at the same time. The individual TMDL implementation plans will provide a record of where DWQ's staff and financial resources have been committed. The basin monitoring and assessment program will follow the five-year rotation described under Watershed Element 3. This will allow DWQ managers to look across watershed TMDL plans that have been completed in the sequence and estimate allocation for the remaining specific TMDL's within management units. Managers will be responsible for maintaining a balance of

activities and resources across the 10 watershed management units to prepare TMDL plans according to a TMDL development schedule.

Individual Watershed Management Unit Implementation Plans: Watershed management unit/TMDL plan implementation components will be keyed to the specific goals identified by DEQ and local watershed stakeholders during the planning process. This NPS Pollution Management Plan will serve as guidance to watershed steering committees and technical advisory groups. Implementation components will address the following topics as appropriate:

- Establish recommended environmental goals and objectives for participating programs and agencies;
- Provide the basis for organization and staff annual workplans;
- Describe how the planning process and compiled information will be used for grant applications to state and federal funding entities;
- Describe how the recommended actions will fulfill local, state, and federal requirements and needs;
- Define areas of collaboration between participating programs and agencies (e.g., NPS and UPDES coordination on load reduction strategies for waters requiring TMDL's);
- Provide a detailed schedule of activities; and
- Describe major watershed management unit issues and general management strategies that specific activities will take into consideration (e.g., general condition permits to protect vulnerable aquifers).

Implementation mechanisms will include:

- Project Implementation Plans (319 funds)
- Memoranda of Agreement
- Federal Consistency Reviews
- State EPA Performance Partnership Agreement
- Contractual (Agreements with project sponsors)
- Conservancy District involvement
- UPDES Permits
- Existing action plans (State, Federal, Tribal, Local, etc.)
- Implementation Plans (e.g., NPS controls and BMPs)

The Watershed Management Unit Coordinator will promote watershed implementation activities to ensure consistency for specific TMDL plans and to facilitate the implementation plan. The Watershed Management Unit Coordinator will work with steering committee, DWQ water quality assessment and NPS Program staff to prepare a periodic (every three (3) to five (5) years) implementation progress report. These reports will describe actions taken, projects completed, changes in environmental indicators, achievement of Water Quality Standards (attainment of beneficial use), removal of waterbodies from the 303(d) list, objectives achieved, problems encountered, and any suggested changes in the implementation plan. Such reports are key to providing justification for removal of waterbodies from the 303(d) list and for securing continuing grants for on-the-ground implementation projects.

CHAPTER III

III. NPS POLLUTION CONTROL & MANAGEMENT PROGRAMS

Implementation is carried out by focusing on impaired waters with TMDLs using installation of appropriate BMPs. This chapter contains an overview of programs to address categories and subcategories of nonpoint source pollution listed in Table 3-1. Chapter IV covers an overview of “Best Management Practices.”

A. Development and Implementation of TMDLs

Definition: “In general, a TMDL is a quantitative assessment of water quality problems, contributing sources, and pollution reductions needed to attain water quality standards. The TMDL specifies the amount of pollution or other stressor that needs to be reduced to meet water quality standards, allocates pollution control or management responsibilities among sources in a watershed, and provides a scientific and policy basis for taking actions needed to restore a waterbody.” (Report of the Federal Advisory Committee on the Total Maximum Daily Load (TMDL) Program).

The TMDL based on traditional pollutants can also be expressed as the formula:
TMDL = WLA + LA + (+NB) + MOS + RC where:

TMDL	=	Total Maximum Daily Load
WLA	=	Wasteload allocation for point sources
LA	=	Load allocation for nonpoint sources
NB	=	Natural background (if known)
MOS	=	Margin of Safety
RC	=	Reserved capacity for future growth

TMDLs apply to both point and nonpoint sources, for all pollutants (potential threats to water quality) of concern and are pollutant specific. A waterbody will often have several TMDLs applicable to it (one for each pollutant of concern). TMDLs recommend a mix of pollutant reductions (often reflecting a variety of regulatory and non-regulatory controls) necessary to attain and maintain water quality goals, and they include a margin of safety to account for technical uncertainty. They establish target loads or load reductions for pollutants that point/nonpoint sources trading may help meet. Final TMDLs must consider reasonable foreseeable increases in pollutant loads from significant potential threats to water quality, i.e., urban runoff and other sources.

WLAs are developed for specific point sources and incorporated into UPDES permits. LAs are implemented through state and local nonpoint source control programs which rely on a mix of local, state and federal requirements, contractual arrangement established by federal and state farm programs, and voluntary measures.

Table 3-1. Categories and Subcategories of NPS Pollution Sources.

<u>Agriculture</u>	<u>Resource Extraction/Exploration/Development</u>
Non-irrigated crop production	Surface Mining
Irrigated crop production	Subsurface mining
Pasture grazing - riparian and upland	Petroleum activities
Pasture grazing - riparian	Abandoned mining (gravel pits)
Pasture grazing - upland	
Concentrated animal feeding operations	<u>Land Disposal (runoff/leachate from areas)</u>
Animal feeding operations	
Aquaculture	Sludge
Rangeland - riparian and upland	Wastewater
Rangeland - riparian	Landfills
	Industrial land treatment
<u>Silviculture</u>	On-site wastewater systems (septic tanks, etc.)
Harvesting, restoration, residue management	<u>Habitat Modification</u>
Forest management	
Logging road construction/maintenance	Removal of riparian vegetation
	Bank or shoreline modification/destabilization
<u>Construction Runoff</u>	Drainage/filling of wetlands
Highway/road/bridge construction	<u>Hydromodification</u>
Land development	
<u>Other</u>	Channelization
	Dredging
	Dam construction
Golf courses	Upstream impoundment
Atmospheric deposition	Flow regulation/modification
Waste storage/storage tank leaks	
Highway maintenance and runoff	<u>Urban Runoff</u>
Spills	
Natural sources	Nonindustrial
Internal nutrient cycling	Industrial
Sediment resuspension	Surface runoff
Sources outside jurisdiction or borders	Other urban runoff
	Highway/road/bridge runoff
	Erosion and sediment

TMDLs must be approved by EPA and are established by EPA if state TMDLs are disapproved. EPA Region VIII has established eight components that are required in order to give their approval. Pursuant to recently revised TMDL regulations these required elements may be modified slightly in the future. They are:

1. Application of TMDLs results in maintaining and attaining water quality standards.
2. TMDLs have a quantified target or endpoint.
3. TMDLs include a quantified pollutant reduction target.
4. TMDLs must consider all significant sources of the stressor of concern.
5. TMDLs are supported by an appropriate level of technical analysis.
6. TMDLs must contain a margin of safety and consider seasonality.
7. TMDLs apportion responsibility for taking actions.
8. TMDLs involve some level of public involvement or review.

B. Financial Assistance Programs

Nonpoint Source Project Assistance Program: During the FY 2000 Legislative Session, a bill was passed which provides authority to the Water Quality Board to make loans, but not grants, for many kinds of nonpoint source pollution (NPS) projects. As a result of this legislation, the Water Quality Board can consider loan applications to meet the following objectives:

1. Abate or reduce raw sewage discharges;
2. Repair or replace failing individual on-site wastewater disposal systems;
3. Abate or reduce untreated or uncontrolled runoff;
4. Improve critical aquatic habitat resources;
5. Increase resource conservation;
6. Protect and improve ground water quality;
7. Preserve and protect the beneficial uses of water of the state;
8. Reduce the number of water bodies not achieving water quality standards;
9. Improve watershed management;
10. Prepare and implement total maximum daily load (TMDL) assessments.

Since 1985, the Water Quality Board has made nearly \$220 million of loans to Utah cities, towns and improvement districts to assist in the construction of municipal wastewater facilities. While funding needs associated with point-sources of pollution remain great, the majority of Utah's water pollution is caused by nonpoint sources. Until now, the Water Quality Board has been constrained by law to provide assistance to only "political subdivisions of the state," thus preventing individuals or soil conservation districts from receiving funding assistance from the Board. Changes to the statute now allow NPS projects sponsored by "individuals, corporations, associations or other private entities" to be eligible for funding.

Before it begins making NPS loans, the Water Quality Board must first develop administrative rules to govern the program. The Division of Water Quality (DWQ) has evaluated the NPS loan programs in Ohio, Delaware, Rhode Island, Minnesota and West Virginia and intends to copy parts of their programs which will best meet Utah's particular needs. Further, DWQ will partner with the Utah Department of Agriculture and Food, NRCS, the Utah Association of Conservation Districts and other interested parties to develop the framework of the program. The Water Quality Board intends to leverage its loan funds with other state and federal funds in order to fund as many worthy projects as possible. The goal is to have the program in place in the Fall of 2000 and for the Water Quality Board to entertain NPS project funding applications soon thereafter.

The Water Quality Board's NPS funding program will be capitalized from annual grants from EPA and from payments of principal and interest on loans previously made. While approximately \$12 million per year is currently available for the Board to fund NPS projects, the Board will likely limit its funding for NPS projects to approximately \$1 million per year. This amount may increase in the future depending on the number of applications for NPS funding that are received and the readiness of projects to proceed.

The terms which would be offered under this loan program have not yet been developed, but federal regulations allow interest rates as low as zero (zero) percent and require loans to be fully repaid within 20 years. A system to prioritize the funding applications must also be developed as well as a means of securing the loans.

Nearly all costs related to planning, designing and implementing a NPS project will be eligible under this program. This includes the costs for equipment, land, construction, consultants, project administration and materials. Loan funds from the Water Quality Board may be used without restriction to match federal grants and there is no match requirement associated with the loan funds themselves. This program, which is new to Utah, will allow a significant additional source of funding to be brought to bear on nonpoint source pollution problems.

C. Information and Education (I&E) Programs

Utah's NPS program emphasizes voluntary incentive-based actions to achieve the implementation of BMP's. In order to accomplish voluntary compliance, an extensive information and education program is necessary. This will include training for landowners, managers, the general public, decision makers, and those involved in providing technical assistance to landowners and managers. Educational programs are one of the primary methods to address future NPS impacts to surface and groundwaters in Utah.

The Watershed Management Unit Steering Committees and additional smaller sub-watershed committees (CRMP work group) provide a significant opportunity for public and stakeholder involvement in the water quality management process. DWQ and UDAF jointly with the NPS Task Force have developed other mechanisms for stakeholder involvement in the NPS Management Program. Some of these mechanisms include the Adopt-A-Waterbody program, I & E components of specific watershed projects, the Utah Watershed Review, the annual NPS Water Quality Conference, statewide I & E programs conducted by Extension Service and other ongoing activities of the I & E coordinator of UDAF. Significant outreach education programs are conducted by other partner agencies such as Forest Service, BLM, NRCS, Bureau of Reclamation, U.S. Fish & Wildlife Service, to mention only a few.

A natural resource focused I & E committee formed by the NPS Task Force is functioning in Utah and will be the focal point for coordinating public and other stakeholder outreach programs. The document "Utah Nonpoint Source Information and Education Strategy 1995" gives detail on the group and is included in Appendix VII. The strategy will be revised in fiscal year 2001. The need for specific training programs noted above will be determined as part of the I & E Strategy revision.

One of the principal mechanisms for outreach is watershed meetings held in priority watersheds that focus on obtaining information from stakeholders to help establish management goals, identify environmental concerns and monitoring needs, determine priorities and target issues for further consideration, develop management strategies, identify measures of success and solicit public participation in volunteer programs. The meetings generally follow a format which includes open house sessions, large group presentations, and small group discussions. Other education functions often include watershed project tours, volunteer restoration activities, open houses, and county fair displays.

Other media selected for communicating watershed approach management activities to stakeholders are crucial to raising public awareness and keeping participants active and adequately informed. I&E efforts should be related to general watershed management as well as specific needs of individual watersheds. UDEQ and UDAF use several media devices, in addition to the basin meetings, to keep stakeholders informed, including the following:

Newsletters: UDEQ/DWQ supports the UDAF's production of an excellent bimonthly newsletter called the *Utah Watershed Review*. Whereas specific basin highlights provide very

detailed information on a single watershed, newsletters will make the public aware of the broader scope of activities statewide. For example, one issue might highlight what monitoring efforts are being conducted in selected basins, how management plans are being developed in several others, and how plans are being implemented in the remaining basins within the state.

Public Announcements: Local newspapers and radio stations are asked to publicize news stories and announcements about the watershed planning and key local activities. Such publicity helps the local public understand the purpose of watershed planning and implementation and know when meetings are scheduled.

Electronic Media: As more of Utah's citizens become accustomed to the use of computers and their telecommunication capabilities, the most effective mode of communication is likely to be through this media. The use of E-mail and wide reaching Internet system is now common practice. DEQ has set up a home page on the Web that is used to further communication about water quality assessment and planning activities.

Other Media: Many fact sheets, brochures and videos dealing with water quality issues are available from several State, Federal and private sources. Educational efforts are often directed at civic organizations, special interest groups, schools, youth/group programs, and volunteer recruitment. These will be used to their fullest extent. The Utah Farm•A•Syst Fact Sheets are excellent examples of valuable information being produced by the Extension Service to assist farmers and ranchers with sustainable environmentally sound operational practices.

D. Agriculture Programs

Several statewide programs are used to address agriculture NPS pollution. These programs are primarily aimed at improving farm and ranch management to reduce pollution. The programs rely heavily on the Natural Resources Conservation Service and USU Cooperative Extension Service for implementation. Wherever possible, these programs will be targeted to areas where the most benefits for water quality will be realized.

Integrated Pest Management: Integrated Pest Management (IPM) involves monitoring pests to determine optimum spray timing, use of alternative sprays and sprays specific to the identified pests, and the use of biological controls to reduce the potential for chemical contamination of water. This program includes all pests and pesticides encompassing insecticides, fungicides, and herbicides.

Irrigation Water Management: The wise and efficient use of water is important to protect both the quantity and quality of the resource. Water applied only at the rate of use required by the crop will have a reduced probability of becoming a water quality problem. Through deep percolation and tail water runoff, inefficient irrigation systems carry nutrients and chemicals to receiving waters. This program will be delivered to individuals through USU Cooperative Extension Service and local SCD's.

Fertilizer Management: Through the proper timing and application of fertilizers, from both manure and commercial sources, on cropland, the transport of nutrients may be reduced. Nitrates and phosphates, when applied in the proper amounts and timing, will be better utilized by the crop and will be held in place. The amount of fertilizer required by a crop may be

determined through soil analysis. Individual farmers will work directly with Extension Service to carry out the program.

Concentrated Animal Feeding Operations (CAFO)

Animal Feeding Operation (AFO): The contribution of nutrients from concentrated animal feeding operations (AFO) is a major cause of nutrient enrichment in certain watersheds of Utah. These nutrients accelerate the eutrophication of reservoirs, degrade fishery values, and impair drinking water supplies. Larger feedlots more than 1000 animal units will be regulated through a general permit process; however, smaller operators may be unaware of the potential problems. See Appendix VII for a description of Utah AFO/CAFO Strategy to be implemented jointly by DEQ, UDAF, Farm Bureau Federation, NRCS, ES, UACD and numerous agriculture commodity groups including the Dairy Association, Cattleman's Association, wool growers, hog producers and the turkey and poultry industries.

The strategy calls for an AFO/CAFO inventory and assessment to be conducted over the next two years. Operations more than 1000 animal units will be identified early in the process and will come under the general permit program. Those facilities determined to have unacceptable conditions will be given up to five years to correct the conditions. Operators will be informed of available technical and financial assistance. At the end of that period if unacceptable conditions are not corrected, they would be designated as a CAFO and also come under the general permit program. AFOs will be encouraged to complete Comprehensive Nutrient Management Plans (CNMPs) under a voluntary program as outlined in the federal strategy. CAFOs will be required to complete and implement CNMPs. Information, education and training are all key components of the strategy conducted during all phases of the strategy as it is implemented.

Nonpoint Source Training: Many land managers and other personnel are involved in day-to-day activities that could have a significant impact on nonpoint source pollution. These include federal agencies such as NRCS, U.S. Forest Service, BLM and state personnel such as land foresters and specialists of the Division of Forestry, Fire and State Lands. The I & E Program will develop and administer a training program for managers and technical personnel with responsibility for agriculture and grazing activities. Training will be provided by selected agencies on a regular basis and updated every two years as part of I&E Strategy. The program will include riparian zone management, rest rotation grazing practices, and new land management techniques, as well as background on NPS pollution and its impacts. These programs as well as others related to TMDL development and implementation of the Utah Strategy to Address Water Pollution From Animal Feeding Operations and others will be considered during the revision of the Information and Education Strategy.

Erosion Control: Erosion from cropland, rangeland and stream banks is among the largest contributors to water quality degradation in the state. Sediments are responsible for most of the impairments identified in the NPS assessment. Yet the relationship between erosion and off-site water quality impacts is not well known or understood by many farmers, ranchers, and land managers. Information is provided by various NPS Task Force members on erosion control techniques and assistance programs which are available. Information is provided at workshops, seminars and conferences to general and selected audiences as appropriate.

Colorado River Salinity Control Program: Salinity enters the Colorado River system in two ways: 1) through groundwater and 2) as sediment in transport through streams. Not all sediment is of concern in regards to salinity control. However, the Colorado River Basin does contain many salines bearing geologic formations. The Mancos Shale, Carmel Formation, Tropic Shale,

and Green River Formations are just some of the higher salt content geologic rock units. These salt-laden rock units weather into soil which can then become sediment through the processes of wind and water erosion. It has been determined that for every ton of moderately saline (3%) sediment/soil mass in a stream there are 60 pounds of salt delivered, or for every 33.3 tons of sediment delivered to the stream there is 1 ton of salt delivered to the system.

Active salinity control programs are under way in the Uinta and West Colorado WMUs. They consist primarily of irrigation efficiency BMPs that reduce the amount of salinity reaching ground water and minimize irrigation return flows. These programs are implemented by the Natural Resources Conservation Service and Bureau of Reclamation.

Agricultural Resource Development Loans Program (ARDL): In 1976, Utah developed a rangeland loan program which was funded at \$250,000.00 to be loaned at 0% interest. The loan funds were to be used to make improvements on privately owned and state leased rangelands. The program was administered accordingly up until 1983.

In 1983, the program was expanded to include all agricultural lands for installation of soil and water conservation practices with emphasis still being on range projects. Eligible practices were adopted by the Utah Soil Conservation Commission. Local Soil Conservation Districts (SCD's) determine which activities are necessary and appropriate for each area of the state.

The programs early success was due to two critical factors. First, the program was decentralized and resource needs were determined at the local level. Second, the program received the support of the Natural Resource Conservation Service (NRCS). They provided technical assistance. NRCS participated in the development of programs and guidelines and is an ongoing partner in program activities.

The SCD's pooled their resources through Utah Association of Conservation Districts (UACD) and created a framework to assist in administration of the program. The state was divided into seven zones and each zone is composed of six or seven SCD's. Today the ARDL Program has approximately 24.7 million in assets - loans on the books are more than 18 million. The fund is basically self sufficient.

The new Animal Feeding Operation (AFO) and Concentrated Animal Feeding Operation (CAFO) programs will be eligible for funding through ARDL after a Comprehensive Nutrient Management Plan has been developed by the NRCS and UACD.

It is expected that relocations of feeding operations which pollute soil and water will increase the demand for ARDL loans.

E. Urban Runoff Program

Urban areas are responsible for a small, but still locally significant percentage of NPS pollution in Utah. Often this pollution is the most severe because of the type of pollutants and the close proximity to the important drinking water supplies and recreation areas. Utah is a highly urbanized state with a large percentage of the population living in developed communities. The new EPA Stormwater Phase II program will present new challenges and opportunities for communities to address stormwater pollution.

Many local zoning ordinances were developed before NPS pollution became a major concern. These ordinances may have deficiencies that could be adjusted with only minor changes and could provide an important tool for controlling pollution in urban areas.

This program will identify deficiencies in local zoning ordinances and assist local governments in implementing control ordinances. The program will be carried on through local associations of governments (multi-county planning organizations) and designated water quality management agencies.

Utah's NPS Management Program has devoted minimal resource to this component to date. Control of urban runoff to impaired waterbodies will become more critical to full implementation of TMDL plans in the future. As resources permit, the DWQ will review and upgrade the urban/stormwater runoff component of the NPS program over the next two (2) years.

F. Hydrologic Modification Program

Definition: Hydrological modification occurs whenever human activities significantly change the hydrologic function (dynamics) or the attendant pollutant release regime of rivers (and streams) and riverine systems, lakes and impoundments, and ground water systems. Such a broad definition allows overlap with other programs and has been discussed under each topic.

Activities falling in this category are of three types:

- those that alter the flow regime of a body of water: streams, diversions from the stream, diversions to the stream, impoundments; watersheds- vegetation removal or change in type, construction that leaves soil bare, or covers the soil (i.e., hardtop); Lakes and reservoirs- activities that change capacity, circulation patterns, or that release stored pollutants (i.e., sluicing); ground water- change recharge pattern, direct recharge, pumping from ground water.
- near-stream or in stream changes that alter the function or stability of a stream channel or its flood plain - Channel realignment, grade control, in-stream structures, stream crossings, bank stabilization, material extraction
- floodplain areas - flood control practices, riparian/floodplain modification, structures, wetland modification

Complete data does not exist for defining the extent of impact under this heading. However, it is known to be extensive. Alteration of streams, waterways, and lakes in the name of improvement, enhancement, or development often results in unnecessary water quality impacts. Unless the entire flow regime is considered, changes at any one point may result in downstream degradation. Some improvements may also cause

impacts because the long-term effects were not considered. Through continuing education of resource managers, enforcement personnel and contractors, many of these problems will be reduced or eliminated.

Management Plan Addendum: A Nonpoint Source Management Plan for Hydrologic Modifications was prepared by the state and approved by EPA in 1995. The scope and intent of this plan remain current and are considered a part of this program update by reference. (See Appendix IX). The State DWQ, together with select stakeholders, will review the Hydromod Addendum during the next year and modify as appropriate.

G. Mining Program

Mining has always figured prominently in Utah history beginning shortly after the first permanent settlement by pioneers in 1847. At first mining was limited to utilitarian mineral primarily coal and iron. Gold and silver discoveries in the 1860's initiated a metal mining boom that made the state a mineral exporter. Gold, silver, and lead were the principal products until about 1905, when copper assumed a lead role based on new techniques for recovering copper from low grade ores. Most of the early mining was underground. The depression put an end to many of the older era mining operations. Following World War II, Utah mining expanded into non-metallics including potash, phosphate and salt. In the 1950's Utah experienced a uranium boom. Newer generation mines more often use surface mining techniques, although many small underground operations still exist. Water quality impacts from mining are generally localized and are not of a significant statewide problem to warrant completion of a management plan for mining at this time. The DWQ will meet with the Utah Mining Association during the next year to discuss the merit of preparing a Mining NPS Plan for Utah.

H. Road Construction and Maintenance Program

Road construction and maintenance are considered a moderate source of NPS pollution in the state that is difficult to assess. The Utah Department of Transportation has responsibility for state and interstate highways. Other roads are under the jurisdiction of counties and communities and land management agencies.

Best management practices for road construction and maintenance are contained in the manuals of the USDA Forest Service, Utah Department of Transportation, and other agencies as shown in Chapter IV. The Uniform Building Code, Chapter 70, also contains provisions for grading. These manuals are used to guide road construction and maintenance activities. The DWQ will pursue strengthening working/coordination relationships with UDOT during the next year. UDOT will be encouraged to participate on the NPS Task Force.

I. Silviculture Program

In 1998, the state adopted a "Nonpoint Source Management Plan for Silviculture Activities" in the state of Utah. EPA approved the July 1, 1998 Plan which is hereby referenced and included as a part of this Plan revision - Refer to Appendix X. Implementation actions and milestones are being executed as described on Page 48 of the Silviculture Plan. They include education/outreach activities on the Forest Water Quality Guidelines, forest practice demonstration projects, monitoring and evaluation of guidelines and assessments of MOUs.

About 28 percent of the land in Utah is forested and of this over half is Pinyon-Juniper woodland. Although good data is not readily available, it is estimated that only about 15% of the forested area is of commercial quality. Commercial forest land is land that produces annually more than 20 cubic feet of industrial wood per acre. Federal lands hold by far the largest share of these harvestable timber stands. Recent more restrictive rules for cutting timber on federal lands are beginning to put more pressure on state and private forests.

Typical logging and forest management practices have been linked to water quality problems, non point pollution, and habitat degradation. These include road construction, maintenance, and abandonment; site preparation; clear cut and partial cut practices; removal of stream side vegetation; herbicide and pesticide spraying; and debris management. Altered stream sedimentation processes and rates are one of the larger water quality concerns resulting from many of these practices. Specifically, mass wasting from unstable slopes, physical disturbance, and road building all increase erosion and/or sedimentation in surface waters. Increased sediment loads can alter spawning habitats and actually cause physical damage to fish. The perturbation associated with logging and slash burning increase nutrient release from the watershed. Sensitive waters may experience enrichment. Temperature alterations due to the removal of stream side vegetation are also suspected of lessening fish production. Less is known about pesticide, herbicide, and fertilizer use and resulting long-term impacts, although short-term toxicity can result from all three compound classes.

Silvicultural impact intensity can range from slight to complete habitat alteration. Toxicity from forest chemicals and turbidity (solids) likely has short-term impacts (less than a year); whereas, modifications of habitat, temperature, hydrographic regime, and large organic debris loading rates take several years to correct. Extensive stream bed siltation and its impact to the fishery, especially in lower gradient waterways, may never recover without some remedial action. The scale of the potential impact is also variable and relates to the acreage cut. Cumulative effects, which are suspected in large logged watersheds, are poorly understood, but are a major concern.

Not enough Utah data exists to make a meaningful estimate of silvicultural practices on streams and lakes of the state. Generally it is a small percent of total NPS pollution but local site conditions can cause serious water quality and other resource impacts.

J. On-Site Waste Water Disposal Systems

The Division of Water Quality works with the local health departments statewide to implement an on-site wastewater disposal protection program. Ongoing program activities include the following: technical assistance to local health departments, periodic review and upgrade of program rules, review and approval of large systems (over 5,000 gpd) according to state rules, and ground water studies to determine local septic tank density recommendations and support local aquifer classification studies. The local health departments manage the program pursuant to state and local rules governing systems less than 5,000 gpd and the state reviews and approves systems according to state rules for systems greater than 5,000 gpd. On-site waste water disposal systems are used by about 10% percent of Utah' population. There are an estimated 45,000 systems in place today. They are the only alternative for residents in some parts of cities and most rural settings. The ratio of homes using on-site systems to sewers is decreasing because most population growth is occurring in sewered communities and as small towns grow they build sewer systems.

Working properly, on-site systems treat waste waters reasonably well and pose little environmental threat. Population density, proximity to sensitive aquifers, soil type, and soil

saturation all potentially affect the acceptability of on-site systems. Systems located in overly tight or saturated soils may fail. Waste waters then are able to enter surface waters before adequate treatment occurs. Extremely porous soils may also provide inadequate treatment because of minimal contact with the substrata and ground water pollution may result. Impacts include contamination with pathogenic organisms, nutrient and organic enrichment, and in some instances, toxicants. These pollutants can impact both surface and groundwater (groundwater impacts are discussed in another section).

Surface water quality impacts specifically related to on-site waste water systems are difficult to separate from other sources. However, streams and lakes are potentially impacted from this source in areas of heavy concentration of septic systems with the most significant impacts being associated with the potential eutrophication of lakes.

K. Atmospheric Deposition

Concern over possible atmospheric acid accumulation to the waters of Utah led to the formation of the Acid Deposition Technical Advisory Committee in 1986. Its task was to determine that if acid deposition was occurring, to identify sensitive waters in the state and possible sources of acid generating pollutants in Utah. Their findings were:

Sources of acid pollutants were determined to be automobiles, urban combustion sites, coal-fired power generation, copper smelting, mineral recovery and the oil and gas industry all within Utah. There was also evidence that sulfur is being transported long range from the Southwest, Mexico, and the Northwest.

Waters at high elevations of the Uinta, Wasatch and Boulders mountains were deemed to be susceptible because of low Acid Neutralizing Capacities (ANC). Six additional areas were identified as having potential for low ANC characteristics. These were Raft River, Deep Creek, Tushar, Thousand Lake, La Sal, and Pine Valley mountains.

Generally it was concluded that although several areas were susceptible to acid precipitation because of low buffering capacities, at the time none were actually affected by acid deposition. It appears that the presence of wind-borne high alkaline dust from the Great Salt Lake Desert regions are counteracting the acid effect.

Recently, the Forest Service has been increasing attention to the Uinta Mountains for air/acid deposition monitoring.

L. Federal Consistency

The Utah NPS Program uses three approaches to assure consistency of federal NPS related programs to the NPS Management Plan. The Division of Water Quality is a member of the Governor's Office Resource Development Coordinating Committee (RDCC). All federal planning and permitting actions go through RDCC for comment. The Division only comments on major projects that appear to have a significant potential impact on water quality.

Interaction and input is provided to USDA programs via membership on the NRCS State Technical Committee. Federal programs targeted for review include CRP, EQIP, PL-566 Small Watershed Program, and Stewardship Incentive Program. Input is provided on development of project selection criteria and ranking of projects. Annual program coordination meetings are

held each year with Forest Service and BLM to review programs, policies, monitoring plans and special projects. Cooperative monitoring programs are negotiated annually with most forests and BLM districts.

The most important aspect of DWQ's coordination and interaction with federal agencies occurs at the local watershed advisory committee level. Federal agencies must participate in the Watershed Approach to develop TMDLs and be willing to establish priorities for NPS implementation. This coordination occurs in 303(d) listed impaired watersheds as part of the development of watershed TMDL plans. Expanded efforts are needed to strengthen relationships with federal land managers to establish a consistent review process for federal projects within impaired or threatened watersheds. This process is occurring within the technical advisory committees at the watershed level. As TMDL watershed plans are developed for impaired waters, these plans will be developed cooperatively with federal land managers thus assuring consistency between NPS Management Program and federal plans and projects. As appropriate for the specific watershed, special attention will be given to correcting NPS problems related to hydrologic modification and habitat modification. The key requirement for this process to be effective is the participation of federal land management agencies on all local watershed advisory committees and aid in the development and implementation of TMDL plans. Such participation will be the most effective mechanism to assure that federal activities are consistent with the NPS Management Program. The Department of Environmental Quality has a Memorandum of Understanding with both the Forest Service and Bureau of Land Management. It is felt these memoranda should be reviewed and revised to more fully reflect the development of TMDLs and the watershed approach to NPS management to assure federal consistency with NPS pollution management measures contained in individual TMDL/watershed plans.

M. High-Quality Waters and Priority Watersheds

High-quality waters (designated by rule) and priority watersheds are areas which require special attention due to the need for protection or restoration. These are areas which have been targeted because of their unique nature to receive special treatment as impaired waters on the 303(d) list and Category I watersheds according to the Unified Watershed Assessment. These areas will be a main focus for NPS control efforts.

High-Quality Waters: The State of Utah in Part II of the Wastewater Disposal Regulations identifies high-quality waters that require a higher standard of protection. These waters are also known as 'High Quality Waters' and are governed by the following policy:

R317-2-3, Antidegradation Policy.

3.1 Maintenance of Water Quality

“Waters whose existing quality is better than the established standards for the designated uses will be maintained at high quality unless it is determined by the Board, after appropriate intergovernmental coordination and public participation in concert with the Utah continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. However, existing in stream water uses shall be maintained and protected. No water quality degradation is allowable which would interfere with or become injurious to existing in stream water uses. In those cases where potential water quality impairment associated with a thermal discharge is involved, the antidegradation policy and implementing method shall be consistent with Section 316 of the Federal Clean Water Act.”

The Utah continuing planning process, cited above, can be briefly described in summary as the following: 1) Classify waters according to existing beneficial uses and adopt water quality standards protective of those uses; 2) Assess quality (beneficial use support) of State’s waters; 3) Identify waters not achieving Water Quality Standards; 4) Develop and implement TMDLs on priority waters; 5) Implement point and nonpoint source pollution control programs to maintain and restore beneficial use designations; and 6) Monitor and report restoration of beneficial uses for impaired waters.

R317-2, Standards of Quality for Waters of the State

3.2 High Quality Waters - Category I

“Waters of high quality which have been determined by the Committee to be of exceptional recreational or ecological significance or have been determined to be a State or National resource requiring protection, shall be maintained at existing high quality through designations, by the Committee after public hearing, as High Quality Waters - Category I. New point source discharges of wastewater, treated or otherwise, are prohibited in such segments after the effective date of designation. Protection of such segments from pathogens in diffuse, underground sources is covered in R317-5 and R317-7 and the Regulations for Individual Wastewater Disposal Systems (R317-501 through R317-515). Other diffuse sources (nonpoint sources) of wastes shall be controlled to the extent feasible through implementation of best management practices or regulatory programs.

Projects such as, but not limited to, construction of dams or roads will be considered where pollution will result only during the actual construction activity, and where best management practices will be employed to minimize pollution effects.”

It is intended that best management practices shall be used for new developments in these segments and that existing operations shall adopt BMPs as soon as practicable. Every reasonable effort will be made through this program to promote and encourage the adoption of BMPs. In some cases, cost-share may be provided, as available, and enforcement may be necessary. BMPs used in these segments must be protective of water quality at its current level as evidenced by implementation of BMPs described in Chapter IV of this plan as well as others adopted by reference to this plan.

Stream segments meeting this criteria are included in Appendix V.

N. Addressing All Significant Threats to Water Quality

The State DEQ, in conjunction with its natural resources partners on the NPS Task Force will continue to address all significant threats to waters of the State by carrying out the State's continuing planning process as described briefly above. Detailed ongoing pollution control activities, which will achieve this goal as part of the State's continuing planning process in an overall time frame, are listed as follows:

1) Annual monitoring program with basin intensive surveys conducted on a five (5) year rotation to cover entire state; 2) review and update water quality standards every three (3) years; 3) Update 303(d) list of impaired waters every two (or four) years and identify priority waters for TMDL development; 4) develop and implement TMDLs and submit to EPA for approval every two years; 5) All pollution control programs are designed to either protect or enhance water quality conditions for all waters of the state regardless of priority; and 6) Monitoring is conducted to document restoration of beneficial uses for impaired waters and maintenance of water quality. Examples of current programs within the Division of Water Quality to carry out these functions including State Revolving Loan Program for wastewater construction, municipal and industrial wastewater construction permitting, water quality standards, 401 water quality certification, monitoring and assessment of state's waters, TMDL development/watershed planning, nonpoint sources pollution management, surface water permitting and compliance/enforcement, industrial pretreatment, emergency response and several programs related to ground water protection including classification, standards, permitting, compliance/enforcement, and underground injection control. A major portion of all these programs is directed at addressing all significant threats to water quality on a statewide basis.

O. Ground Water NPS Management Program

Introduction:

Ground water management and nonpoint source (NPS) pollution programs offer many opportunities for interaction with one another. When existing or potential pollutants enter the ground water system from NPS sources in the same geographic area, all programs can be focused to accomplish multi purpose objectives. Utah's ground water quality protection program is based on full coordination between agencies and programs to solve existing problems and to avoid possible future contamination. This document briefly describes the NPS program relationship to ground water management.

A planning document titled "Ground Water Quality Protection Strategy for the State of Utah" was produced in 1986 by an intensive interagency effort. Considerable progress has been made toward the goals enumerated in the Strategy. These include establishment of a ground water section in the Division of Water Quality (DWQ); implementation of a ground water (discharge) regulatory and permitting program; devoting DWQ resources to technical assistance, securing and regulatory versions to the enhancing of the resource data inventory. A major task remains in continuing to develop a public ethic about the need to protect ground water quality. This is being promoted through public education, facility permitting and technical assistance to government officials. DWQ's ground water section is currently updating the 1986 document to describe the current status of the organization, regulations and program.

Stakeholders' partnerships have been developed with other regulatory and non-regulatory agencies to supplement the DWQ activities (MOA developed). Significant among these is the relationship with the Utah Department of Agriculture and Food which in 1997 completed "The State Management Plan for Pesticides in Groundwater," utilizing an EPA Federal Insecticide, Fungicide, & Rodenticide (FIFRA) grant. The close partnership with agriculture and local Soil

Conservation Districts for the NPS program has been described in another portion of the overall NPS Management Plan.

The Division of Water Rights within the Department of Natural Resources is a major agency in Ground Water management. This Division has authority over all ground water withdrawals and monitors water yields and levels of aquifers. Ground Water quality is also considered in regulating the amount and location of pumping.

Utah Philosophy - Long and Short Term Goals for Protecting Ground Water: Utah regards all ground water as a vital natural resource that is essential to the overall welfare of the state. Utah's philosophy is based on the Governor's Executive Order "Utah's Ground Water Policy" of October 4, 1984, which states that the quality of the state's ground water resources will be protected to a degree commensurate with current and probable future uses. Ground water used for human consumption, as present and future drinking water sources, will be given highest priority. The Department of Health was directed to develop a ground water quality strategy for achieving this goal under existing statutory authority with the coordination of affected agencies and interested parties and with public involvement. The Department of Health's Division of Environmental Health was assigned the responsibility of developing the strategy.

On July 1, 1991, the State of Utah adopted legislation to create the Department of Environmental Quality. This legislative action changed the administrative structure of the Department of Health Division of Environmental Health to the Department of Environmental Quality (DEQ). In addition, the Bureau of Water Pollution Control and the Bureau of Drinking Water and Sanitation became the Division of Water Quality (DWQ) and Division of Drinking Water (DDW), respectively, within DEQ.

The strategy developed under the executive order reviews facts about ground water, describes government programs that affect ground water, and discusses potential sources of ground water pollution. The strategy also provides management proposals for public consideration and comment. The purpose of the proposals was to generate discussion and provide a framework for a carefully derived protection program.

The main program elements are listed below with a brief status statement:

1. Management of Ground Water Resources
 - a. Ground water quality standards were adopted as part of Utah's Ground Water Quality Protection Regulations. These regulations include provisions for ground water standards, classification, permitting for discharges, corrective action, monitoring and enforcement.
 - b. The Division of Water Quality (DWQ) continues to work cooperatively with such agencies as the U.S. Geological Survey and UGS on hydrologic mapping programs. The programs have focused on recharge area mapping, modeling of withdrawal scenarios and prediction of effects from surface uses.
 - c. DWQ has conducted studies to evaluate pesticide/herbicide sales facilities for the presence of ground water contamination.
 - d. Ground water data management is currently being upgraded through the development of a data base management system by a private contractor.

- e. Coordination of ground water programs as per order is to be accomplished through the Ground Water Coordinating Council and interaction with the NPS Task Force.

2. Source Control

- a. Facilities that may discharge pollutants to ground water are required to obtain ground water discharge permits.
- b. Underground injection control (UIC) is regulated by the UIC program within the Ground Water Section of the Division of Water Quality.
- c. Although discharge permits have been issued for landfills, regulation of landfills including ground water quality protection is now handled by the Division of Solid and Hazardous Wastes under these recently adopted regulations.

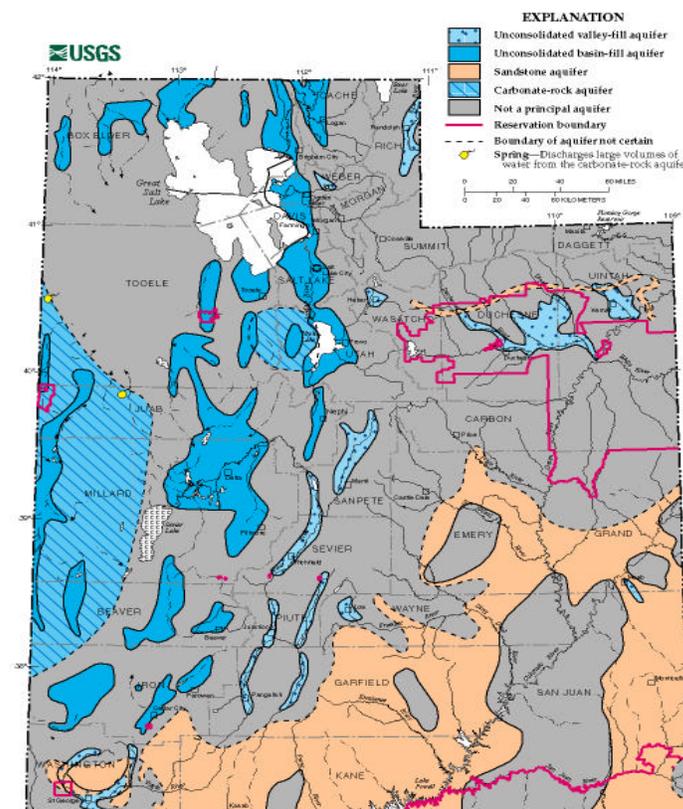


Figure 3-1

- d. Periodic inspections of facilities with ground water discharge permits tends to identify potential problems and alert management to the need for good housekeeping practices.
3. Recharge Area Protection
 - a. Through cooperative mapping efforts, the U.S., Geological Survey has delineated recharge areas in different parts of Utah. These areas are described and identified to local officials through staff contacts.
 4. State Technical Assistance
 - a. Staff personnel continue to work with local officials to assist them in protecting the sources of their culinary water.
 - b. As time allows, staff has participated in public and school education programs directed to prevention of ground water contamination.
 5. Contamination Response
 - a. The ground water quality protection regulations encourage interim actions in a timely fashion to address spills.

Prioritization of Groundwater and Aquifers: Currently, the ground water protection regulations employ a “Differential Protection Approach” as the basis for a formal program to protect the present and probable future beneficial uses of ground water in Utah. The three main regulatory concepts are: to prevent the reduction of ground water quality; to prevent ground water contamination rather than clean up after the fact; and, to provide protection based on the different existing levels of ground water quality. The five significant administrative components are: ground water quality standards; ground water classification; ground water protection levels; ground water classification procedures; and a ground water discharge permit system.

By applying the above aspects of the program, a given aquifer is prioritized according to relative importance due to its given ambient quality. The administration of the program and expenditure of resources would take into account that prioritization. A complete inventory and compilation of the ground water resources in Utah has not been completed although a number of government agencies are now investing resources toward the effort.

With the commitment of DEQ and DWQ to administer its water quality protection program based on a watershed approval, a systematic and time scheduled approach for establishing activities prioritization is now set.

Utah Hydrologic Ground Water Units: Four general aquifer types occur in Utah. These are thin alluvial aquifers, bedrock exposure, geologic alluvium, and Colorado Plateau sandstones. The most important aquifers in Utah are the unconsolidated sand and gravel aquifers in intermountain basins of the Basin and Range physiographic province. Figure 3-1 is a generalized map of ground water aquifers in the state.

Aquifers have different vulnerability to pollution characteristics depending on the permeability of the soil; the presence of confining beds that restrict the vertical movement of contaminants; and the rate, direction of movement, and pressure gradient of ground water in the underlying aquifer. Shallow clay or shale beds may prevent surface contaminants from reaching underlying aquifers.

Within Utah, unconsolidated basin-fill aquifers are the most prevalent type of aquifer and furnish an estimated 85 percent of the total ground water withdrawals for the state. Valley-fill aquifers are less important accounting for 10 percent of withdrawals. The remaining 5 percent of withdrawals are accounted for by sandstone, carbonate, and igneous rock aquifers. These different types of aquifers are present in varying amounts in the watershed management units with the basin-fill aquifers generally aligned north-south from the north central to the southwestern part of the state. Valley-fill aquifers are important in the Uintah Basin and sandstone aquifers in the southern part of the state.

In establishing ground water priorities for watersheds, a ground water contamination vulnerability component will be given consideration. If critical recharge areas with NPS pollution have been identified under the ground water program, that fact will be considered in ratings for priority designation.

Several other factors will be considered for determining relative priority among the ground water aquifers and development areas. These are:

1. Areal extent of any contamination
2. Location of sources relative to ground water used in drinking water
3. Size of population at risk
4. Risk posed to human health and/or the environment
5. High priority contaminants in localized areas of state, but not over majority of state.
6. Hydrogeologic sensitivity to contamination
7. Findings of the State's ground water protection strategy or other pertinent reports

The Utah NPS Pollution Management Plan recognizes that ground water research, planning, assessments, demonstration programs, enforcement efforts, technical assistance, and education, information and training tasks are viable and important components to the overall program.

Utah is in the early phase of a statewide Basin Management Approach (BMA). This approach features bringing together all water quality related programs for surface and ground water, point and nonpoint and regulatory and non-regulatory tasks; in a whole watershed setting.

Categories of NPS Pollutants to Ground Water: Ground water quality depends on both natural situations and man-altered conditions. The primary focus for ground water management is with man-made threats. These include chemicals of many kinds and uses, including synthetic organic compounds; fertilizers; pesticides; wastes from mineral and petroleum exploration, production, transportation, storage, and use; and human and animal wastes among others. Nationally more than 30 major source categories have been identified. Land use activities that may pollute ground water include solid waste facilities, on-site waste treatment systems (septic tanks and soil absorption systems), surface impoundments, urban runoff, oil and gas exploration and production, hazardous wastes, mining and agriculture. Several of these sources are classified as Non Point in origin.

Tables 3-2 and 3-3 which appeared in Utah's 1998 305(b) annual report, give specific lists of sources of pollutants and the type of pollutants Utah has identified.

Table 3-2. Major Sources of Ground Water Contamination
Suggested Sources of Contact

Contaminant Source	Regulating Agencies							
	DWQ	DSHW	DDW	DRC	DAG	DNR	DERR	LHD
<i>Agricultural Activities</i>								
Agricultural chemical facilities					!			
Animal feedlots	!				!			
Drainage wells	!				!			!
Fertilizer applications	!				!			
Irrigation practices	!				!	!		!
Pesticide applications	!				!			
On-farm agricultural mixing and loading procedures	!				!			
Land application of manure (unregulated)	!				!			
<i>Storage and Treatment Activities</i>								
Land application (regulated or permitted)	!	!					!	
Material stockpiles	!	!						!
Storage tanks (AST)							!	
Storage tanks (UST)	!						!	
Surface impoundments	!							
Waste piles	!	!						
<i>Disposal Activities</i>								
Deep injection wells	!	!				!		
Landfills	!	!					!	
Septic systems	!							!
Shallow injection wells	!					!		
<i>Other</i>								
Hazardous waste generators	!	!					!	
Hazardous waste sites	!	!					!	
Large industrial facilities	!	!						
Material transfer operations	!	!				!	!	
Mining and mine drainage	!						!	
Pipelines and sewer lines	!							!
Salt storage and road salting	!							!
Salt water intrusion	!		!					!
Spills	!	!					!	
Transportation of materials	!	!						!
Urban runoff	!							!
Small-scale manf & repair shops		!						!
Other sources (please specify)								

DWQ - Division of Water Quality
 DSHW - Division of Solid and Hazardous Waste
 DDW - Division of Drinking Water
 DRC - Division of Radiation Control

DAG - Utah Department of Agriculture & Food
 DNR - Department of Natural Resources
 DERR - Division of Environmental Response & Remediation
 LHD - Local Health Departments

Table 3-3. Major Sources of Ground Water Contamination			
Containment Source	Ten Highest-Priority Sources (T)	Factors Considered in Selecting a Containment Source ⁽¹⁾	Containments ⁽²⁾
<i>Agricultural Activities</i>			
Agricultural chemical facilities	T	A	A, B, E
Animal feedlots	T	A, B, C, D	E, TDS
Drainage wells			
Fertilizer applications			
Irrigation practices			
Pesticide applications			
<i>Storage and Treatment Activities</i>			
Land application			
Material stockpiles			
Storage tanks (above ground)	T	D	D
Storage tanks (underground)	T	D	D
Surface impoundments	T	E, C	E, TDS
Waste piles			
Waste tailings	T	D	H, I
<i>Disposal Activities</i>			
Deep injection wells			
Landfills			
Septic systems	T	A, B, C, D, E	J, K, L, E
Shallow injection wells			
<i>Other</i>			
Hazardous waste generators			
Hazardous waste sites			
Industrial facilities			
Material transfer operations			
Mining and mine drainage			
Pipelines and sewer lines			
Salt storage and road salting	T	D, E	G
Salt water intrusion			
Spills	T	A	C, D
Transportation of materials			
Urban runoff	T	A, B, C	C, D, G
Other sources (please specify)			

1 - A = Human health and/or environmental risk (toxicity), B = Size of the population at risk, C = Location of the sources relative to drinking water sources, D = Number and/or size of contaminant sources, E = Hydrogeologic sensitivity, F = State findings, other findings.

2 - A = Inorganic pesticides, B = Organic pesticides, C = Halogenated solvents, D = Petroleum compounds, E = Nitrate, F = Fluoride, G = Salinity/Brine, H = Metals, I = Radionuclides, J = Bacteria, K = Protozoa, L = Viruses.

Roles and Responsibilities of DWQ Programs, Utah State Divisions, and Other Stakeholders

Roles and responsibilities under the Watershed Approach have been outlined for some central water quality programs within DWQ and a few other possible partners external to DWQ for the Watershed Approach. The essential expertise that each program has traditionally provided remains unchanged. The manner, timing, and specific applications of how programs deliver their expertise will change under the Watershed Approach framework. The amount of a programs resources that is devoted to the Watershed Approach cycle and products will vary from program to program. The text below provides potential examples of how programs will address their responsibilities within each watershed management unit cycle step, the information that they produce for the watershed management unit plan (as described in Chapter 2), or how they may assist with implementation of specific watershed management unit plan management activities.

Division of Water Quality: The Division of Water Quality is a cornerstone partner in the Watershed Approach. Several sections of DWQ have been moving to a comprehensive water quality protection approach for sometime. For example, the Watershed Approach incorporates the Utah Ground Water Protection Strategy. There is a strong consistency between these two comprehensive water quality protection strategies. Therefore, descriptions for several of the following Sections are taken from the draft report “*Utah Ground Water Protection Strategy - 1996 Revisions; Utah DWQ Ground Water Section.*”

The Utah Water Quality Act, UCA 19-5-101 et seq., establishes procedures for the selection and appointment of the Water Quality Board and defines the powers and duties of the Board. Included in these powers and duties is the development of programs for the prevention, control, and abatement of new or existing pollution of waters of the State. Waters of the State are defined by statute to include surface and ground water. To carry out these duties they have authority to conduct a continuing planning process, investigations, work cooperatively with other government agencies, establish water quality standards, classify waters, regulate discharges, review plans and issue permits for construction of treatment plans, underground injection wells, and dischargers to surface and ground water.

The DWQ implements the policies of the Water Quality Board. To do this, the DWQ is organized into two branches. The Engineering and Water Quality Management Branch includes the Construction Assistance, Design Evaluation, TMDL/Watershed Section and Water Quality Management sections. The Permits, Compliance, and Monitoring Branch includes the Permits and Compliance Section, the Monitoring Section, and the Ground Water Section. Each section has distinct but occasionally overlapping responsibilities and programs such that particular problems may involve personnel from other branches or even other DEQ divisions in some cases.

The Utah Department of Agriculture and Food: The Utah Department of Agriculture and Food (UDAF), is statutorily connected with the Utah Soil Conservation Commission, (Utah Code Title 14, Chapter 18-4). The structure of this Commission is a good example of the partnership efforts of the State. As required by the same statute, the Commission is made up of seven (7) Soil Conservation District (SCD) supervisors and the President of the Utah Association of Conservation Districts; plus four (4) State Agency “Heads” or designees; the Commissioner of Agriculture and Food to serve as chair, the USU Extension Service, the Utah Department of Natural Resources, and the Utah Department of Environmental Quality. Under Title 17A-3, Part 8 of the Utah Code, the Commission functions to coordinate the soil conservation programs and the 38 local Soil Conservation Districts (SCD) of the state of Utah.

In Title 17A-3-805 the Districts are each political subdivisions of the state and are given in part the following charges:

“(2) To conduct surveys, investigations, and research relating to soil erosion, floodwater and sediment damage, nonpoint water pollution, and for the conservation, development, utilization, and disposal of water on State or private lands with the consent of the land occupier.”

“(3) To devise and implement measures for the prevention of soil erosion, flood waters and sediment damage nonpoint water pollution, and for the conservation, development, utilization, and disposal of water on State or private lands with the consent of the land occupier.”

Through UDAF, and the Commission, the SCD’s are utilized in the NPS program as an important local entity to coordinate the NPS projects at the local level. An MOU is used to spell out the respective roles of local coordinators for their own State programs, as well as with other federal programs.

Agriculture is also responsible for the regulation of pesticides, herbicides, and fertilizers through enforcement of the Utah Pesticide Control Act (UCA-4-1 et seq.), FIFRA, and the Utah Fertilizer Act (UCA 4-13-1 et seq.). Generally, UDAF certifies applicators, registers pesticides. Pesticides must be registered with UDAF when distributed in the state. Use may be restricted if they present an unreasonable risk to human health and the environment. Under the Utah Fertilizer Act, UDA requires registration, labeling, and verification of performance claims for commercial fertilizers.

Working with other state and federal agencies, UDAF has developed a generic pesticide State Management Plan (SMP), which has been approved by EPA, whose goal is to prevent contamination of ground and surface water sources. Coordination of the effort among agencies is through the Utah Pesticides in Ground Water Advisory Group. The generic SMP will provide a framework for management of restricted pesticides. Elements of the generic SMP will then be incorporated in pesticide-specific management plans so as to reduce the potential for water contamination from nonpoint sources of pesticides. The department collects and analyses ground water samples at their laboratory, for non public supply wells in rural areas. Watershed Approach roles may include:

- Aid in integration of all agriculture focused 319 watershed projects
- Help in organizing new CRMP watershed projects
- Make ARDL low interest loans available for BMP’s with water quality benefits as appropriate
- Assist SCDs in providing district input to watershed management unit plans
- Coordinate ground water sampling program with watershed management unit strategic data plan

Utah Department of Natural Resources: The Department of Natural Resources (DNR) includes state agencies that manage, regulate, and investigate natural resources of the state including waters of the state, state lands, geology, mineral resources, and wildlife. The Utah Natural Resources Act UCA 63-34-1 et seq., created this Department and its administrative divisions including:

- C Division of Water Rights
- C Division of Water Resources
- C Division of Oil, Gas and Mining
- C Division of Wildlife Resources
- C Utah Geological Survey

- C Division of Parks and Recreation
- Division of Forestry, Fire and State Lands

as well as other agencies that are less involved in activities that affect water quality.

Each of the above listed agencies, with the exception of the Division of Water Rights and Division of Forestry, Fire and State Lands, has a division policy board that is appointed by the governor and confirmed by the Senate. The policy board is the policy making body for its respective division. Generally, the boards are authorized to initiate investigations, enter into contracts and agreements, enforce regulations and work cooperatively with other state, federal, and local government agencies.

Except for the Division of Water Rights, the chief administrative officers of each division are appointed by the Executive Director of the Department with the concurrence of the board having policy authority for the division.

Following is a description of the six divisions with significant involvement in the protection of water quality:

Division of Water Rights: The Division of Water Rights was established by UCA 73-1-1 et seq., the Division of Water Rights regulates the exploration and development of geothermal resources.

Under UCA 73-1-1, all waters of the state whether above or underground were declared to be property of the public. The right to make beneficial use of water is based on the date of application for a water right; later applicants may not interfere with earlier water rights. In order to perfect the water right, the applicant must provide proof that the water has been developed and placed in beneficial use according to the application.

The Division of Water Rights published “Administrative Rule for Water Well Drillers” that describes the requirements for water well drillers in Utah. Drillers must be licensed, operators registered, and wells and drilling practices conform to minimum standards. Minimum construction standards address requirements for development, completion, and abandonment of water wells. Any water well including monitoring wells greater than 30 feet deep must file written notice and the well must be drilled by a licensed driller. Public water supply wells must be reviewed and approved by the Division of Drinking Water before construction begins.

The Legislature assigned the responsibility for regulating the exploration for and development of geothermal resources to the Division of Water Rights in 1981. To qualify as a geothermal resource, the water must have a temperature of greater than 120 degree C. Ownership of the resource is based on land ownership in a manner similar to mineral and hydrocarbon ownership. The regulations address not only exploration and development of geothermal wells, but also temperature gradient wells, observation wells and wells drilled for geologic information as part of a geothermal program. The regulations require that useable ground water be protected through use of conductor pipe and surface casing with cement seals.

Because water quality is affected by water quantity, the Division of Water Rights is a significant participant in protecting and maintaining the quality of the ground water resource. Pumping in excess of long-term recharge can result in a gradual deterioration in water quality.

The Division of Water Rights is placing increased emphasis on limiting or eliminating this practice statewide. The Division of Water Rights also has extensive records of water wells that help assess water availability and water quality.

The consideration of issues traditionally considered by Water Rights (ground water over drafting, water diversion, beneficial uses) are increasingly having an impact on water quality. As a stakeholder and watershed management unit committee member in the watershed, Water Rights can continue to take a leading role in these considerations and have the maximum impact on improving water quality. Water Rights primacy over their water right allocation function will not be impacted or included within the Watershed Approach. However, there are several important opportunities for collaboration on aspects of the Water Rights permits. These opportunities include:

- Consideration of when a water quality Designated Use is being negatively impacted by water use. That is, is the water use an approved water use? Can a solution be negotiated through the watershed management unit committees before the issue is litigated?
- Ground water/surface water interactions can be more comprehensively assessed. Water Rights can provide outreach, information, and expertise in considering issues related to ground water over drafting.

The Division of Water Resources (DWR): Water Resources was established by the Legislature by UCA 73-10-1 et seq. This legislation also created the Board of Water Resources to develop policy for the Division. It is the function of Water Resources to encourage the use of the state's water resources to best serve the needs of the people of Utah.

The Board's duties include authorizing studies and investigations, entering into contracts, participating in studies with the federal government and making recommendations on behalf of the state for participation in reclamation projects. In the exercise of their duties they address protection of Utah's rights to interstate waters, coordinate federal-state water programs, plan for water resource usage, and administer and fund water conservation and development projects. Although the Board does not have regulatory authority to accomplish its goals, the Board does have recourse to the courts.

This Division is also charged with having a State Water Plan. State water planning began in 1963 at the direction of the Utah Legislature. Addition legislation in 1984 and 1985 led to an interagency planning team. The plan blends the input of state and federal agencies and private contributors into a workable and clear framework for water development. It is an ongoing process to establish and implement the state's policy on water management. Agriculture, municipal and industrial water, pollution control, recreation, wildlife, flood control and drought response are all recognized as important components.

Utah's water planning process recognizes the need for flexibility to accommodate changes in conditions, needs, problems, and information. Accordingly, revision is a continual and scheduled activity. Water resources have organized a State Water Plan Coordinating Committee consisting the following state agency members:

Core Members

Department of Natural Resources

Department of Agriculture

Division of Water Resources
Division of Water Rights
Division of Water Quality
Division of Parks and Recreation

Governor's Office of Planning and Budget
Division of Drinking Water
Division of Wildlife Resources
Utah Water Research Laboratory

Other Cooperating State Agencies:

Utah Geological Survey
Division of State History
Division of Oil, Gas & Mining
Department of Transportation

Office of Energy and Resource Planning
Division of Forestry, Fire and State Lands
Division of Comprehensive Emergency Management
Dept. of Community & Economic Development

Cooperating Federal Agencies:

U.S. Army Corps of Engineers
USDA Forest Service
Bureau of Reclamation
Geological Survey
Emergency Management Agency
Bureau of Indian Affairs

U.S. Fish and Wildlife Service
Natural Resources Conservation Service
Bureau of Land Management
Environmental Protection Agency
Farm Services Agency

A steering committee consists of the executive director of the DNR, chairman and vice chairman of the Board of Water Resources, and director and assistant director of the Division of Water Resources. This committee guides plan development regarding policy, issues resolution, and approves the plan prior to official acceptance by the Board of Water Resources.

Other advisory groups have been formed in order to involve local participation in the early stages of the planning process. A statewide advisory committee has been formed with these members:

Utah Water Users Association
Stonefly Association
Utah Nature Study Society
Utah Farm Bureau Federation
Salt Lake City/County Health Dept.
Nat. Res. Public Lands Coalition
S.L.C. Dept. Of Public Utilities
Rancher - Farmer (individual)
Utah Association of Counties

Rural Water Association of Utah
Central Utah Water Conservancy District
League of Women Voters
Utah League of Cities and Towns
Utah Association of Conservation Districts
Western States Water Council
Attorney (individual)
Recreationist (individual)
Utah Wildlife Leadership Coalition

Local advisory groups of similar appropriate membership are formed for each of the 10 Hydrologic Units for which a State Water Basin Plan is being prepared. These groups are disbanded after the final publication of the respective basin plans.

In planning for water use and funding of water development projects, the Division has established an ongoing cooperative program of hydrologic mapping with the Water Resource Division of the USGS in order to develop the information necessary for planning and implementation of water projects. This cooperative relationship has resulted in the publication by the DNR and/or the USGS of a continuing series of technical publications that describe various aspects of the hydrologic basins of Utah. These reports give perspective by describing past conditions, current trends, and prospective changes that could result from different water development scenarios.

Through the Division of Water Resources' planning and hydrologic investigation programs, information is developed that is important to the protection of the ground water resource. This work has been and continues to be extremely important to the diagnosis of and response to potential threats to ground water quality.

Since DWQ and the State Water Plan planning units have the same boundaries, considerable interaction can occur as the two planning cycles coincide.

- A joint use of the advisory groups, technical teams, and public outreach may be possible.
- Many components of a base data set for water are common to the State Water Plan and the Watershed Approach, facilitating coordination and sharing of work.
- Water quality issues associated with new water developments can be identified in the early stage of planning, and included as an element of the development.
- Water Resources can provide information on current and projected water uses for growing cities, industries, and agriculture (watershed management unit cycle Steps 1 and 2).
- Water Resources can assist with outreach to stakeholders for reconsideration of the timing, location, and structure of diversions and return flows associated with irrigation (watershed management unit cycle Steps 3, 4, and 5).

Division of Oil, Gas and Mining: The Division of Oil, Gas and Mining (DOGM) carries out the policies and administers the rules established by the Board of Oil, Gas and Mining. The Board was established under UCA 40-6-1 et seq., and consists of seven members appointed by the governor and confirmed by the Senate. The Board includes members from the oil and gas industry, mining industry, private land owners with a mineral or royalty interest, a geologist, and “. . . one member knowledgeable in ecological and environmental matters.”

The Board is authorized to regulate all operations related to the production of oil and gas including drilling, well spacing, site reclamation and injection wells. The Oil and Gas Conservation General Rules and Regulations sets standards for exploration, drilling, and production practices. Standard operational requirements are established for seismic operations, exploration, and production drilling operations and oil and gas well abandonments that are protective of water quality.

EPA funds the regulation of Class II injection wells used for the disposal of produced brines and to improve recovery of oil and gas through pressure maintenance in the reservoir. DOGM has exclusive jurisdiction over Class II wells while DWQ regulates other injection wells under the UIC program of the SDWA. Regulations address plugging of nearby wells, monitoring pressure, and periodic reporting of operating data.

Through UCA 40-8-1 et seq., the Utah Mined Land Reclamation Act, the Board of Oil, Gas and Mining was empowered to facilitate the reclamation of lands affected by mining. Objectives of the legislation include: (1) to return the land, concurrently with mining or within a reasonable amount of time thereafter, to a stable ecological condition compatible with past, present, and probable future local land uses; (2) to minimize or prevent present and future on

site or off site environmental degradation caused by mining operations to the ecologic and hydrologic regimes and to meet other pertinent state and federal regulations regarding air and water quality standards and health and safety criteria; and (3) to minimize or prevent future hazards to public safety and welfare. DOGM requires plugging of drill holes, a post-mining reclamation plan, and a bond to insure that the site is restored to minimum standards set forth in rules adopted by the Board. The focus on reducing or eliminating potential adverse effects on water quality underscores the recognition of the need to eliminate acid mine drainage and pyrite-generated sulfate ground water contamination.

The Coal Mining and Reclamation Act, UCA 40-10 et seq., established the authority of the Board to regulate coal mining and reclamation of coal mining sites. The Act requires that coal mining permitted under the Act meet defined performance standards. For underground coal mining these include, “minimize the disturbance of the prevailing hydrologic balance at the mine site and in associated off-site areas and to the quantity of water in surface and ground water systems both during and after coal mining operations and during reclamation.”

In addition, the Act created an expendable trust fund known as the Abandoned Mine Reclamation Trust Fund to finance restoration of land and water resources and the environment previously degraded by adverse effects of coal mining practices.

Division of Wildlife Resources: The Division of Wildlife Resources was established by UCA 23-14-1 et seq., with the duty to protect, propagate, manage, conserve and distribute protected wildlife throughout the state. The division of Wildlife Resources is subject to the broad policy making authorities of the Wildlife board and the Board of Big Game Control.

Under UCA 23-15-1 et seq., the Division of Wildlife Resources is authorized to exercise jurisdiction over all wildlife whether on public or private lands and waters. Under UCA 23-15-6 it is unlawful for any person to pollute waters deemed necessary by the Wildlife Board for wildlife purposes. These rules could augment the water quality standards set by DWQ.

Water of adequate quality is a resource critical to the maintenance of many wildlife communities. Fisheries and the related biotic community including wetlands and riparian vegetation can and have been impacted from several sources of pollutants. Assessments of biotic community health and stream classification systems made by Division of Wildlife Resources will be of great help in establishing beneficial use impacts that may be occurring.

Geological Survey (UGS): The policy making board of the Geological Survey was created by UCA 63-34-2 as part of the effort to coordinate and consolidate function and activities of several boards, commissions, and affiliated agencies in one department.

Broadly, the UGS is charged with the responsibility of developing knowledge and understanding of the geology and mineral resources of Utah and the dissemination of that information to interested parties. Their objectives include the “survey the geology and mineral occurrences of the state, including . . . all mineral-bearing waters, and other surface and underground water supplies . . .” Because knowledge of the geology of an area is indispensable to the understanding and management of ground water, information developed by UGS and other state and federal agencies is necessary for the protection of the quality of the water resource.

The Environmental Sciences Program of UGS manages specific ground water programs including definition of drinking water source protection zones, recharge area mapping, water resource evaluation, septic tank suitability mapping and landfill suitability mapping. In addition, they investigate ground water related geologic hazards and provide assistance to various local and state agencies. Recently they have established a Ground Water Program within the Applied Geology Program to focus additional effort on addressing ground water related problems.

School and Institutional Trust Lands Administration: In 1994 the Legislature passed the School and Institutional Trust Lands Management Act, UCA 53C-1-101 et seq., to establish an independent state agency, the School and Institutional Trust Lands Administration (SITLA), to manage all school and institutional trust lands. The legislation created a seven-member Board of Trustees appointed by the governor and confirmed by the Senate. The Board selects a director that carries out the policies of the board and the authorities defined by the legislation.

As a result of this legislation, DNR's Division of State Lands and Forestry was reorganized and renamed. It is now called Division of Forestry, Fire and State Lands. They now exercise jurisdiction over lands beneath lakes, streams, and reservoirs and manage state forests.

SITLA administers about 3.6 million acres comprising some 6.9 percent of Utah's lands. These lands are concentrated in rural areas primarily as 640-acre (1 square mile) blocks with some larger parcels. Through grazing, mineral, hydrocarbon and other leases, SITLA derives income to finance Utah's educational system. The Director is required to manage the lands so that natural and cultural resource values are protected for the benefit of the trust beneficiaries.

Division of Forestry, Fire and State Lands: The Division of Forestry, Fire and State Lands is responsible for management of the sovereign lands of Utah for the good of the public. Sovereign lands are those lands beneath bodies of water which were navigable at the time of statehood. The lands beneath Utah, Bear and great Salt Lakes have been designated sovereign lands and this includes the exposed shorelines as well. In addition, portions of the green and Colorado Rivers are considered and have been adjudicated as sovereign lands.

The Division of Forestry, Fire and state Lands is also responsible for protection of private and state land from wildfires. In addition, the Division of Forestry, Fire and State Lands provides technical assistance to land owners who have private forest land. This technical assistance can assist a landowner to determine how much timber one owns, the best method to harvest the timber and practices to be implemented to protect water quality. The Division provides assistance through several federally-funded programs. The Forest Stewardship Program and the Stewardship Incentive Program are both administered to aid owners of private forestland.

Indian Tribes and Federal Agencies: Indian Tribal Lands: Within Utah's boundaries, Indian tribal lands comprise some 4.3 percent of the surface and total about 2.3 million acres. Major reservations in Utah include the Uintah and Ouray Reservation in northeastern Utah, the Navajo Reservation in southeastern Utah, the Piute Indian reservations in Central Utah and Shivwits reservation near St. George.

The Indian Tribes manage their own environmental protection programs. The EPA recognizes Tribes as sovereign governments and works with the Tribes to implement environmental programs approved and funded by Congress. EPA performs functions including outreach, training, technical assistance, environmental surveys, pilot program grants and regulation

development to assist the Tribes in protecting the environment including water quality on tribal lands. EPA regional offices work directly with the Tribes. In Utah, tribal environmental programs work with the Denver, region 8 EPA office, except for the Goshute Reservation that is served by San Francisco, Region 9, and the Navajo Reservation served by Dallas, Region 6.

Tribes will continue to have primary authority for water quality on tribal lands. However, Tribes could be a significant stakeholder on watershed management unit committees where they are a landowner. The Watershed Approach framework would provide a convenient mechanism for Tribes to coordinate with resource management agencies to collaborate on complementary objectives.

Federal Agencies: Federal agencies can serve as either lead agencies or stakeholders on the advisory committees. Many of these agencies have goals and objectives that are directly related to water quality or have at least complementary water quality objectives. Participation does not necessarily require that these agencies adopt the watershed management unit schedule. However, it is hoped that the momentum of having several resource management agencies in one region at the same time will pull several of these federal agencies into the process. The spatial and temporal coordination of DWQ programs in the Watershed Approach framework will increase the number of opportunities and likelihood for collaboration on water quality objectives. The outreach steps will allow significant agency stakeholders to be identified early in the process.

U.S. Environmental Protection Agency: EPA was created by President Richard M. Nixon's Executive Order in 1972, to administer environmental programs in the United States and territories. EPA presently administers major environmental legislation passed by the Congress and subsequent amendments and reauthorizations of the CWA; SDWA; RCRA; Comprehensive Environmental Response, Compensation and Liability Act (CERCLA); Federal Insecticide, Fungicide and Rodenticide Act (FIFRA); and Toxic Substances Control Act (TSCA). For most of these programs, EPA delegates primacy to the states for direct day-to-day management while retaining program oversight and some level of involvement.

Program administrative management is conducted through 10 regional offices of the EPA. The regional office oversee a multi-state area that may also include territories and tribal lands. Utah is within Region 8, headquartered in Denver, Colorado. This region is responsible for programs in Colorado, Wyoming, Montana, North Dakota and South Dakota, in addition to Utah.

The Region 8 Ground Water Branch oversees implementation of sole source aquifer and wellhead protection programs under the SDWA, and expenditure of the CWA's Section 106 funding that is designated for ground water protection. In addition, the Branches' personnel oversee state programs and provide technical expertise and advice to other federal programs concerned with ground water.

Expenditures under Section 106 of the CWA fund ground water, pesticide control, and wellhead protection activities. Funding is based on an approved federal fiscal year work plan called the SEA agreement (for State EPA Agreement). The SEA for Utah's GWS includes a description of all anticipated activities and personnel time allocations for each activity for the year. Periodic and annual reports are furnished to EPA describing permitting, compliance, education, corrective actions and other activities of the Section.

Section 319 funds of the CWA are managed by the Watershed Section of the Water Quality Branch. While most of the 319 Grant is targeted for surface water projects, 10 percent of the funds are set aside for ground water projects.

EPA will have several responsibilities in the Watershed Approach as a core partner with oversight on federal regulatory issues. The Watershed Approach will allow an increased emphasis on flexible, negotiated solutions within the state. EPA is considering revision of their grant allocation process to better support the Watershed Approach. In addition, EPA is willing to consider the use of nontraditional products (e.g., watershed management unit plans) to fulfill various requirements. EPA will also be expected to continue to provide technical assistance in several areas including the development and use of environmental indicators.

U.S. Army Corps of Engineers (USACE): The Corps of Engineers provides support in two basic areas - regulatory and civil works. Under its regulatory authority (through Section 404 of the Clean Water Act) the Corps oversees the environmental protection of our rivers, lakes, and wetlands. Ecosystem Restoration is one of the primary missions of the Corps Civil Works program. Under various restoration authorities, the Corps works in partnership with local entities to restore significant ecosystem function, structure and dynamic processes that have been degraded. Generally these projects include a 25 to 35 percent local match. Examples of such projects currently in Utah include the following:

Project Title	Sponsor
Upper Jordan Aquatic Ecosystem Restoration	Salt Lake County
Ashley Creek Project Modification for Improvement of the Environ	Uintah County
West Jordan Aquatic Ecosystem Restoration	West Jordan City
City Creek Aquatic Ecosystem Restoration	Salt Lake City
Soldier Hollow Aquatic Ecosystem Restoration	State of Utah and SLOC
Decker Lake Aquatic Ecosystem Restoration	Salt Lake County and SLOC
Kays Creek Project Modification for Improvement of the Environ	The Nature Conservancy/Davis Co

U.S. Department of Interior (USDI): The USDI is the major land manager for the U.S. Government. It includes many agencies that are important participants in the national effort to protect ground water quality. These include the USGS, Bureau of Land Management, Bureau of Reclamation, National Park Service, Fish and Wildlife Service and the Bureau of Indian Affairs. Following is a description of the water quality related activities of USDI agencies.

U.S. Geological Survey: The USGS was established by Congress in 1879. Legislation in 1888 and 1894 expanded the USGS's mission to include gaging of streams and studying the nation's water resources. The USGS has five divisions, the Water Resources division (WRD), Geologic Division, National Mapping Division, and Administrative and Information Systems Divisions. The WRD is currently responsible for development of hydrologic information necessary for management of the Nation's water resources.

In recent years the WRD has concentrated efforts on ground water quality. Concerns have mounted over the vulnerability of ground water to contamination from point sources, such as landfills, as well as nonpoint sources, such as agriculture chemicals. WRD has recognized the need for knowledge of ground water processes including flow dynamics, solute transport, and geochemical and biological actions that affect concentrations of contaminants in ground

water. Much of the effort in this field of investigation has been facilitated by the Federal-State Cooperative program through 50:50 federal-state funding. The ground water use and contamination assessment program is the basis for planning, development, and management of water resources.

In cooperation with Utah's Department of Natural Resources' Division of Water Resources and Division of Water Rights, the USGS has published numerous hydrologic basin studies. The USGS also provides assistance to other federal agencies including contributions and review of Environmental Impact Statements (EIS) pursuant to the National Environmental Policy Act (NEPA) and as a contractor for studies and investigations under the Department of Defense Installation Restoration Program and other programs to comply with state environmental regulations.

Bureau of Land Management (BLM): The BLM manages 41.9 percent of Utah's lands, in aggregate 22 million acres. In addition they administer energy and mineral resources where the surface is private, but mineral rights are retained by the federal government. Proper management of the land surface and mineral estate is necessary for the protection of water quality.

While the primary authority for the management and protection of water quality lies with the State, BLM has regulations for activities such as grazing, timber harvest, coal mining, metal mining and processing and oil and gas production. In general these regulations reflect their policy " . . . to protect, maintain, restore and/or enhance the quality of water on public lands so that its utility for other dependent ecosystems, including present and/or desired human environments, will be maintained equal to or above legal water quality criteria."

In working with state regulatory agencies, the BLM has developed MOU's with the relevant state agencies. The March 1993 MOU for Operations Conducted Under the 1872 Mining Law as it Relates to Ground and Surface Water Issues, acknowledges that DWQ has primary responsibility for review of proposed mining operations for water quality impacts. Additionally, DWQ is to review proposed development plans, contact the operation if permits are required, and issue necessary state permits.

Bureau of Reclamation (BR): Although BR has primarily been concerned with water control structures in the western states, the agency now manages some programs that have direct, as well as secondary effects, on water quality. In Utah a joint program between BR and UDAF, the Colorado River Salinity Control Program, addresses point sources, such as salt springs and abandoned leaking wells, as well as nonpoint sources that can have deleterious effects on ground water quality as the result of discharges of saline water. BR is also conducting water quality studies within the Bear, Weber, and Jordan River watersheds. Through the Utah Department of Agriculture and Food, Reclamation participates with a cost share program provided funding for salinity control practices.

National Park Service: The National Park Service is a significant land manager in Utah with nearby two million acres, comprising 3.7 percent of Utah's land surface. In preserving outstanding natural areas, National Park Service programs have beneficial effects on water quality.

Fish and Wildlife Service (USFWS): Federal wildlife refuges and ancillary facilities cover a little more than 100,000 acres in Utah. They primarily serve the needs of migratory water fowl.

In assuring good water quality for water fowl, the USFWS also advances the state's water quality program.

U.S. Department of Agriculture (USDA): The USDA includes many agencies that provide information, technical assistance and cost share resources to the agricultural community. USDA includes a major land manager, the U.S. Forest Service. A few years ago, Congress passed USDA reorganization bills. Included in this first major reorganization since the 1930's is the creation of a Farm Services Agency that consolidates farmer services and a Natural Resources Conservation Service that combines most existing farm conservation programs. This reorganization has resulted in increased emphasis on water quality protection. Following is a description of the current water-related programs of present USDA agencies.

Forest Service (USFS): USFS land in Utah comprises 15.3 percent of the surface, and totals more than 8 million acres. Because much of this property is located in hilly to mountainous terrain with high precipitation, it is important as the supplier of surface water and aquifer recharge areas. For example, it is estimated that 50 percent of the aquifer recharge in the Salt Lake Valley is derived from recharge from the high mountainous terrain that bounds the Valley.

Programs for protection of watersheds have derivative benefits and effects on protection of ground water quality. USFS regulations that address oil exploration and development, timber harvest, mining and grazing have beneficial effects on water quality. However, USFS regulations do not supersede state regulations.

Natural Resources Conservation Service: The NRCS provides technical assistance for agriculture to landowners, farm and ranch operators and other local governmental units upon request. This includes assistance with development and implementation of BMP's such as pesticide management, irrigation water management, nutrient management and other conservation practices. The NRCS also provides site information on soil characteristics such as nutrients and agricultural chemical leaching potentials.

With the increased attention given to nonpoint sources of ground water contamination traceable to agricultural practices, NRCS has performed an important role in developing methods of fertilizer and pesticide application and ways to handle animal manure so that ground water is not contaminated. With their hands-on knowledge of specific areas, operators, and practices, the NRCS is able to encourage the employment of suitable BMP's.

NRCS is heavily involved in all NPS watershed projects currently underway in Utah. The Little Bear River and Otter Creek are Hydrologic Unit Area (HUA) programs which are primarily funded and staffed by the agency. All of the CRMP structured watersheds receive leadership and staffing as well.

Farm Service Agency (FSA): The missions of the U.S. Department of Agriculture's Farm Service Agency (FSA) are stabilizing farm income, helping farmers conserve land and water resources, providing credit to new or disadvantaged farmers and ranchers, and helping farm operations recover from the effects of disaster.

Utah State Cooperative Extension Service (USCES): The USCES supported by Utah State University is an agriculture education program and has no regulatory authority. Currently USCES provides training in fertilizer application and animal waste and pesticide management

practices including Pesticide Applicator Training. USCES has an effective outreach program that will enhance the State's ability to carry out the watershed restoration programs.

State/Federal Coordination

DWQ will work closely with local grassroots watershed groups and appropriate federal agencies to bring about a common locally driven approach to water quality management. These activities will include, task sharing responsibility, technical team staffing, establishment of a common data network and sequential focus to each of the ten watershed management units and individual TMDL plans for impaired subwatersheds. To the extent possible, federal agency staff will be encouraged to participate on the watershed management unit Technical Advisory Committee to support the development and implementation of local watershed management unit(subwatershed TMDL) plans. The spatial and temporal coordinating elements of the Watershed Approach will encourage closer collaboration with federal agencies in Utah. Three existing coordinating groups will give close support to the team. These are the River Basin Coordinating Committee, the NPS Task Force, and the State Water Plan Coordinating Committee.

EPA has delegated authority to DWQ to administer CWA water quality programs, and the EPA regional office oversees DWQ's adherence to federal mandates. Additionally, the regional office manages federal grants that partially support DWQ's water quality program. Other forms of EPA assistance include training, program implementation support, and expert consultation. EPA's renewed emphasis on watershed protection should continue to create opportunities for the regional office to support and facilitate Utah's Watershed Approach, strengthening this partnership. DWQ and EPA Region 8 must remain firmly committed to the Watershed Approach to ensure its success. Agency policies and procedures should reflect their commitment, as should resource allocations to fundamental program elements.

The traditional grant application, allocation, reporting, tracking, and implementation will need to be substantially modified to support the Watershed Approach. The rationale and other supporting information for grant applications (e.g., 106, 319, 314, 104(b)(3)) will come from watershed management unit plans or intermediate background information collected for the watershed management unit plan. Grant effectiveness will also use environmental objectives or indicators identified in the watershed management unit plan. In effect, the watershed management unit/TMDL plans become a primary reporting entity between DWQ and EPA Region 8. There will, however, still need to be intermediate progress reports on many DWQ activities.

Activities and Funding for DWQ Ground Water Program

Utah's ground water programs are funded by the State and Federal government and from permit fees. Funds are appropriated annually by the Utah Legislature under the ground water and permitting titles to fund ground water programs. Fees paid for ground water permits are also used to fund ground water protection programs. Federal funding is granted under Section 106 and 319 of the Clean Water Act and indirectly, through funding matches by the U.S. Geological Survey for hydrologic studies.

P. U.S. Department of Agriculture (USDA)/ Conservation Programs

While there are a variety of USDA programs available to assist people with their conservation needs, the following primarily financial assistance programs are the principal programs available. Funding of the various programs is dependent upon appropriations from Congress. Locally led Conservation groups are encouraged to contact the State Offices of the appropriate agency for more specific information about each program.

Conservation Technical Assistance (CTA)

Contact: USDA, Natural Resources Conservation Service

The purpose of the program is to assist land-users, communities, units of state and local government, and other Federal agencies in planning and implementing conservation systems. The purpose of the conservation systems is to reduce erosion, improve soil and water quality, improve and conserve wetlands, enhance fish and wildlife habitats, improve air quality, improve pasture and range condition, reduce upstream flooding, and improve woodlands.

Objectives of the program are to:

1. Assist individual land users, communities, conservation districts, and other units of State and local government and Federal agencies to meet their goals for resource stewardship and assist individuals to comply with State and local requirements. NRCS assistance to individuals is provided through conservation districts in accordance with the memorandum of understanding signed by the Secretary of Agriculture, the governor of the state, and the conservation district. Assistance is provided to land users voluntarily applying conservation and to those who must comply with local or State laws and regulations.
2. Assist agricultural producers to comply with the highly erodible land (HEL) and wetland (Swampbuster) provisions of the 1985 Food Security Act as amended by the Food, Agriculture, Conservation and Trade Act of 1990 (16 U.S.C. 3801 et. seq.) and the Federal Agriculture Improvement and Reform Act of 1996 and wetlands requirements of Section 404 of the Clean Water Act. NRCS makes HEL and wetland determinations and helps land users develop and implement conservation plans to comply with the law.
3. Provide technical assistance to participants in USDA cost-share and conservation incentive programs. (Assistance is funded on a reimbursable basis from the CCC.)
4. Collect, analyze, interpret, display, and disseminate information about the condition and trends of the Nation's soil and other natural resources so that people can make good decisions about resource use and about public policies for resource conservation.
5. Develop effective science-based technologies for natural resource assessment, management, and conservation.

Conservation of Private Grazing Land Initiative (CPGL)

Contact: USDA, Natural Resources Conservation Service

The Conservation of Private Grazing Land initiative will ensure that technical, educational, and related assistance is provided to those who own private grazing lands. It is not a cost

share program. This technical assistance will offer opportunities for: better grazing land management; protecting soil from erosive wind and water; using more energy-efficient ways to produce food and fiber; conserving water; providing habitat for wildlife; sustaining forage and grazing plants; using plants to sequester greenhouse gases and increase soil organic matter; and using grazing lands as a source of biomass energy and raw materials for industrial products. More information can be found at the Grazing Lands Technology Institute.

Conservation Reserve Program (CRP)

Contact: USDA, Farm Service Agency

The Conservation Reserve Program reduces soil erosion, protects the Nation's ability to produce food and fiber, reduces sedimentation in streams and lakes, improves water quality, establishes wildlife habitats, and enhances forest and wetland resources. It encourages farmers to convert highly erodible cropland or other environmentally sensitive acreage to vegetative cover, such as tame or native grasses, wildlife plantings, trees, filterstrips, or riparian buffers. Farmers receive an annual rental payment for the term of the multi-year contract. Cost sharing is provided to establish the vegetative cover practices.

Except for “Continuous CRP Signup,” applicants must submit bids during announced signup periods. Bids are evaluated and ranked based on a comparison of environmental benefits indicators with the rental payment specified in the applicant’s bid. Only the highest ranked bids are accepted. Applicants desiring to install high environmental benefit practices, such as filter strips, riparian buffers, shelter belts, or living snow fences, may sign up anytime without competing in the bidding process required under regular CRP. Numerous financial incentives are offered to encourage applicants to apply these high environmental benefit practices.

Environmental Quality Incentives Program (EQIP)

Contact: USDA, Natural Resources Conservation Service

The Environmental Quality Incentives Program provides technical, educational, and financial assistance to eligible farmers and ranchers to address soil, water, and related natural resource concerns on their lands in an environmentally beneficial and cost-effective manner. The program provides assistance to farmers and ranchers in complying with Federal, State, and tribal environmental laws, and encourages environmental enhancement. The program is funded through the Commodity Credit Corporation. The purposes of the program are achieved through the implementation of a conservation plan which includes structural, vegetative, and land management practices on eligible land. Five- to ten-year contracts are made with eligible producers. Cost-share payments may be made to implement one or more eligible structural or vegetative practices, such as animal waste management facilities, terraces, filter strips, tree planting, and permanent wildlife habitat. Incentive payments can be made to implement one or more land management practices, such as nutrient management, pest management, and grazing land management. Fifty percent of the funding available for the program will be targeted at natural resource concerns relating to livestock production. The program is carried-out primarily in priority areas that may be watersheds, regions, or multi-state areas, and for significant statewide natural resource concerns that are outside of geographic priority areas.

Soil Survey Programs

Contact: USDA, Natural Resources Conservation Service

The National Cooperative Soil Survey Program (NCSS) is a partnership led by NRCS in cooperation with state agricultural experiment stations and state and local units of government that provide soil survey information necessary for understanding, managing, conserving and sustaining the nation's limited soil resources. In Utah, much of the funding for ongoing surveys is provided through the Utah Soil Conservation Commission.

Soil surveys provide an orderly, on-the-ground, scientific inventory of soil resources that includes maps showing the locations and extent of soils, data about the physical and chemical properties of those soils, and information derived from that data about potentialities and problems of use on each kind of soil in sufficient detail to meet all reasonable needs for farmers, agricultural technicians, community planners, engineers, and scientists in planning and transferring the findings of research and experience to specific land areas. Soil surveys provide the basic information needed to manage soil sustainably. They also provide information needed to protect water quality, wetlands, and wildlife habitat. Soil surveys are the basis for predicting the behavior of a soil under alternative uses, its potential erosion hazard, potential for ground water contamination, suitability and productivity for cultivated crops, trees, and grasses. Soil surveys are important to planners, engineers, zoning commissions, tax commissioners, homeowners, developers, as well as agricultural producers. Soil surveys also provide a basis to help predict the effect of global climate change on worldwide agricultural production and other land-dependent processes. The NRCS Soil Survey Division through its world Soil Resources Staff helps gather and interpret soil information for global use.

NRCS provides the soil surveys for the privately owned lands of the nation and, through its National Soil Survey Center, provides scientific expertise to enable the NCSS to develop and maintain a uniform system for mapping and assessing soil resources so that soil information from different locations can be shared, regardless of which agency collects it. NRCS provides most of the training in soil survey to Federal agencies and assists other Federal agencies with their soil inventories on a reimbursable basis. NRCS is also responsible for developing the standards and mechanisms for providing digital soil information for the national spatial data infrastructure required by Executive Order 12906.

Snow Survey and Water Supply Forecasts

Contact: USDA, Natural Resources Conservation Service

The purpose of the program is to provide western states and Alaska with information on future water supplies. NRCS field staff collect and analyze data on depth and water equivalent of the snowpack at more than 1,200 mountain sites and estimate annual water availability, spring runoff, and summer streamflows. Individuals, organizations, and state and Federal agencies use these forecasts for decisions relating to agricultural production, fish and wildlife management, municipal and industrial water supply, urban development, flood control, recreation power generation, and water quality management. The National Weather Service includes the forecasts in their river forecasting function.

The objectives of the program are to:

- Provide water users with accurate forecasts of surface water supply within the first five working days of each month, Jan.-June.

- Efficiently obtain, manage, and disseminate high quality information on snow, water, climate, and hydrologic conditions.
- Develop and apply technology necessary to meet changing needs of water users.

Farmland Protection Program (FPP)

Contact: USDA, Natural Resources Conservation Service

The Farmland Protection Program provides funds to help purchase development rights to keep productive farmland in agricultural uses. Working through existing programs, USDA joins with State, tribal, or local governments to acquire conservation easements or other interests from landowners. USDA provides up to 50 percent of the fair market easement value. To qualify, farmland must: be part of a pending offer from a State, tribe, or local farmland protection program; be privately owned; have a conservation plan; be large enough to sustain agricultural production; be accessible to markets for what the land produces; have adequate infrastructure and agricultural support services; and have surrounding parcels of land that can support long-term agricultural production. Depending on funding availability, proposals must be submitted by the government entities to the appropriate NRCS State Office during the application window. These contract payments provide incentives to move farming operations from frequently flooded land.

Forestry Incentives Program (FIP)

Contact: State Division of Forestry, Fire and State Lands

The Forestry Incentives Program (FIP) supports good forest management practices on privately owned, non-industrial forest lands nationwide. FIP is designed to benefit the environment while meeting future demands for wood products. Eligible practices are tree planting, timber stand improvement, site preparation for natural regeneration, and other related activities. FIP is available in counties designated by a Forest Service survey of eligible private timber acreage.

Watershed Surveys and Planning

Contact: USDA, Natural Resources Conservation Service

The Watershed and Flood Prevention Act, P.L. 83-566, August 4, 1954, (16 U.S.C. 1001-1008) authorized this program. Prior to fiscal year 1996, small watershed planning activities and the cooperative river basin surveys and investigations authorized by Section 6 of the Act were operated as separate programs. The 1996 appropriations act combined the activities into a single program entitled the Watershed Surveys and Planning program. Activities under both programs are continuing under this authority. The purpose of the program is to assist Federal, State, and local agencies and tribal governments to protect watersheds from damage caused by erosion, floodwater, and sediment and to conserve and develop water and land resources. Resource concerns addressed by the program include water quality, opportunities for water conservation, wetland and water storage capacity, agricultural drought problems, rural development, municipal and industrial water needs, upstream flood damages, and water needs for fish, wildlife, and forest-based industries.

Types of surveys and plans include watershed plans, river basin surveys and studies, flood hazard analyses, and flood plain management assistance. The focus of these plans is to identify solutions that use land treatment and nonstructural measures to solve resource problems.

Resource Conservation & Development Program (RC&D)

Contact: USDA, Natural Resources Conservation Service

The purpose of the Resource Conservation and Development (RC&D) program is to accelerate the conservation, development and utilization of natural resources, improve the general level of economic activity, and to enhance the environment and standard of living in authorized RC&D areas. It improves the capability of State, tribal and local units of government and local nonprofit organizations in rural areas to plan, develop and carry out programs for resource conservation and development. The program also establishes or improves coordination systems in rural areas. Current program objectives focus on improvement of quality of life achieved through natural resources conservation and community development which leads to sustainable communities, prudent use (development), and the management and conservation of natural resources. Authorized RC&D areas are locally sponsored areas designated by the Secretary of Agriculture for RC&D technical and financial assistance program funds. NRCS can provide grants for land conservation, water management, community development, and environmental needs in authorized RC&D areas.

Stewardship Incentives Program (SIP)

Contact: State Division of Forestry, Fire and State Lands

The Stewardship Incentive Program provides technical and financial assistance to encourage non-industrial private forest landowners to keep their lands and natural resources productive and healthy. Qualifying land includes rural lands with existing tree cover or land suitable for growing trees and which is owned by a private individual, group, association, corporation, Indian tribe, or other legal private entity. Eligible landowners must have an approved Forest Stewardship Plan and own 1,000 or fewer acres of qualifying land. Authorizations may be obtained for exceptions of up to 5,000 acres.

Watersheds Operations - Small Watershed Program and Flood Prevention Program (WF 08 or FP 03)

Contact: USDA, Natural Resources Conservation Service

The Small Watershed Program works through local government sponsors and helps participants solve natural resource and related economic problems on a watershed basis. Projects include watershed protection, flood prevention, erosion and sediment control, water supply, water quality, fish and wildlife habitat enhancement, wetlands creation and restoration, and public recreation in watersheds of 250,000 or fewer acres. Both technical and financial assistance are available.

Wetlands Reserve Program (WRP)

Contact: USDA, Natural Resources Conservation Service

The Wetlands Reserve Program is a voluntary program to restore wetlands. Participating landowners can establish conservation easements of either permanent or 30-year duration, or can enter into restoration cost-share agreements where no easement is involved. In exchange for establishing a permanent easement, the landowner receives payment up to the agricultural value of the land and 100 percent of the restoration costs for restoring the wetlands. The 30-year easement payment is 75 percent of what would be provided for a permanent easement on the same site and 75 percent of the restoration cost. The voluntary agreements are for a minimum 10-year duration and provide for 75 percent of the cost of restoring the involved wetlands. Easements and restoration cost-share agreements establish wetland protection and restoration as the primary land use for the duration of the easement or agreement. In all instances, landowners continue to control access to their land.

Wildlife Habitat Incentives Program (WHIP)

Contact: USDA, Natural Resources Conservation Service

The Wildlife Habitat Incentives Program provides financial incentives to develop habitat for fish and wildlife on private lands. Participants agree to implement a wildlife habitat development plan and USDA agrees to provide cost-share assistance for the initial implementation of wildlife habitat development practices. USDA and program participants enter into a cost-share agreement for wildlife habitat development. This agreement generally lasts a minimum of 10 years from the date that the contract is signed.

CHAPTER IV

IV. BEST MANAGEMENT PRACTICES

Best management practices (BMP's) may be defined as methods, measures, or combinations of measures that are determined by an agency after problem assessment to meet its nonpoint source (NPS) pollution control needs. They include, but are not limited to, structural and nonstructural controls and operation and maintenance procedures.

The diffuse nature of nonpoint source pollution complicates the issue of control. Apparent solutions are not necessarily effective, and the implementation of a control measure at one point may create a more serious problem at another. BMP's must be flexible and suited to the specific location at which they are to be implemented. Each site has different characteristics of soil, slope, vegetative cover, precipitation, and other variables that must be considered before control practices may be prescribed.

There is no practical way to achieve 100% control of NPS pollution problems. The goal is to restore beneficial uses and achieve a cost-effective control level. In many cases, the cost to control NPS pollution may exceed monetary benefits of the project. However, a large measure of control may often be gained at small cost by using commonsense solutions. In simpler terms, the goal is not to implement a set of BMP's across the state, but rather to effect improvements in water quality. Measures that accomplish this goal in a cost-effective manner should be emphasized.

Best management practices cannot be viewed in isolation. They must be seen as a management strategy, an approach, or a system. Seldom is one practice sufficient to resolve a nonpoint source problem. A combination of practices is usually required, along with a management philosophy of commitment to reducing nonpoint pollution. It is rarely sufficient to install a practice and forget it. BMP's and systems require an ongoing maintenance and management effort that must be recognized at the outset.

The best management practices are intended for use on state, federal, and private lands throughout Utah. These practices are not intended to supercede the judgment of public land managers. Public land management agencies will be expected to continue to operate through the established procedures in the Memoranda of Agreement with the State Planning Coordinator and State Department of Environmental Quality. When other federal BMPs, for example those used by the Forest Service or BLM, fall below minimum standards established by the NRCS's Field Office Technical Guide, the NRCS's standards shall take precedence.

Many BMP's are already in use by agencies and legal subdivisions of the State of Utah. The practices of those agencies will be considered adequate unless they are shown to be deficient. These practices will be evaluated by the Division of Water Quality.

The following agencies have developed formal best management practices (BMP) to resolve NPS issues. These BMP's have been determined to meet the minimum acceptable standards as provided in the NRCS's Field Office Technical Guide.

1. USDA-Forest Service
Forest Service Handbook 2509.22
Soil and Water Conservation Practices Handbook
2. USDA-Natural Resources Conservation Service
Field Office Technical Guide
3. Utah Department of Transportation
Manual of Instruction, Part 4, Roadway Drainage
4. U.S. Army Corps of Engineers
(Utah Division of Water Rights)
State of Utah, Administrative Rules for Stream Channel Alterations
5. Local Governments
Uniform Building Code, Chapter 70

These agencies also have formal working agreements with the state which provide for periodic review of BMPs. BMPs will be reviewed for adequacy as deemed necessary by agency staff. On-site inspection and monitoring for water quality objectives will be included in the review for selected BMPs. Updates to agency manuals shall become a part of this plan. Modifications to BMPs may also become a part of this plan after recommendation of the Task Force and an opportunity for public review. Additional BMPs may be added by the same process. Special practices may also be included for use in specific areas after review by the appropriate Task Force and the public.

NPS pollution control can best be addressed through a locally led watershed planning process. This process is based on the premise that decision makers will make and implement acceptable resource use and treatment decisions if they understand the causes of the problems and the effects of their decisions.

The planning process is designed for skilled technicians to assist decision makers determine how to improve and maintain soil, water, animal, plant, and air (SWAPA) resources. It provides a consistent and orderly method for determining objectives and reaching and implementing decisions. The programs can be used for either planning and/or implementation.

Nonpoint source water quality contaminants should be considered in the planning process and coordinated with all SWAPA resources as an integral part of the resource management system (RMS). An RMS is a combination of conservation management practice that, when installed, will protect the resource base. Acceptable standards for SWAPA components must be applied for an RMS to occur.

NPS pollution control cannot generally be obtained by one conservation practice. A combination of management, vegetative, or structural practices is usually required to achieve protection of SWAPA resources. BMPs become a system that may be all or a portion of a complete RMS. The RMS identifies problems and treatments during the planning process.

Special consideration must be given to groundwater before implementing best management practices. Many BMPs are designed to reduce impacts on surface waters by increasing infiltration into the soil. This increased infiltration may have an undetermined impact on groundwater. Chemicals and nutrients may be carried through the soil into the parent material and geologic layers below, or percolating waters may contact a geologic formation, leading to quality degradation. Degradation is readily

apparent in many areas of Utah where groundwater contacts saline layers and water quality is reduced. In other areas, fertilizers or hazardous chemicals may be transported to aquifers.

The potential impacts on groundwater are largely unquantified, and important groundwater resources have not yet been fully identified. It is incumbent upon those who prescribe BMP's that groundwater resources are given due consideration. The following steps should be followed in determining the mix of BMP's to ensure that groundwater resources have been adequately considered:

- a. Determine if the BMP or set of BMP's has the potential to impact groundwater resources.
- b. Determine the potential for BMP's to impact a locally or regionally important aquifer. (Important aquifers should be identified in the State Groundwater Plan or consult local planning agencies).
- c. If the BMP's have the potential to impact groundwater quality and an important aquifer exists in the vicinity, then BMP's should be modified to the greatest extent practicable to prevent groundwater contamination. More detailed investigation may be required and the value of the surface versus ground-water resources should be considered before making adjustments to practices that provide a "best fit" in the local circumstance. Additional technical assistance from participating agencies may also be necessary.

BMP's fall into three categories for implementation: 1) Those the state intends to encourage, 2) those which will be assisted through financial cost share or loans and 3) those which will be enforced through regulations. Any of the BMPs referenced in this plan could be enforced on an individual case by case basis. While it is not the intent of the state to develop new regulations, communities and counties in the state will be encouraged to adopt regulations to control urban construction and development activities, including road construction. Agriculture and grazing practices may be eligible for cost-sharing through USDA conservation programs or the Agriculture Resource Development Loan Program. Technical assistance and education will be provided to the maximum extent feasible on practices for all nonpoint sources.

The following section lists the BMP's available for NPS control in Utah. They are described in general terms, and then specific practices are included by reference. The physical location of the reference material is also included.

Resource Management Systems Format

Definition:

This section describes the general control category and application of the best management practice. A suitable combination of Best Management Practices.

Purpose:

This section describes the goal and desired results of implementing the Resource Management System.

Conditions Where Practice Applied:

Defines the physical constraints on practice application.

Specification Guides:

BMP specification guides which may be needed to develop and implement an appropriate Resource Management System (RMS).

Reference:

Includes technical references for detail on specific practices. These references should be used in determining site specific applications. (The physical location of the reference is also included in parentheses.) References may be obtained by contacting the agency cited or by contacting the Utah Department of Agriculture & Food at 538-7177, 350 N. Redwood Road, Salt Lake City, Utah, 84116.

NRCS Field Offices are located at the following addresses:

State Office
Federal Bldg.
P.O. Box 11350
Salt Lake City, UT 84147-0350

Price Field Office
350 N. 400 E.
Price, UT 84501

Bridgerland Field Office
1860 North 100 East
North Logan, UT 84341-1784

Roosevelt Field Office
Niles Chapman Building
240 West Highway 40, 333-4
Roosevelt, UT 84066

Bonneville Field Office
302 East 1860 South.
Provo, UT 84606-7317

Richfield Field Office
340 North 600 East
Richfield UT 84701

Cedar City Field Office
Blackrock Village
2390 West Highway 56 #14
Cedar City, UT 84720

A. Agriculture and Grazing - Best Management Practices

Grazing Management on Rangeland

Definition:

Grazing at an intensity that will maintain enough cover to protect the soil and maintain or improve the quantity and quality of desirable vegetation.

Purpose:

To: (1) increase the vigor and reproduction of key plants; (2) accumulate litter and mulch necessary to reduce erosion and sedimentation and improve water quality; (3) improve or maintain the condition of vegetation; (4) increase forage production; (5) maintain natural beauty; (6) reduce the hazard of wildfire; and (7) improve wildlife habitats.

Conditions Where Practice Applies:

On all rangeland, grazeable woodland, and grazed wildlife land.

Specification Guides:

Specification Guides are available in NRCS Field Office Technical Guides.

Management specification includes but is not limited to:

Access Roads 560	Prescribed Grazing 556 & 528A
Firebreak 394	Proper Woodland Grazing 530
Fence 382	Spring Development 574
Heavy Use Area Protection 561	Trough's or Tank 614
Pipeline 516	Use Exclusion 412

Note: Numeric codes following a practice coincide with NRCS standards and specification numbers.

Reference:

- 1) Technical Report No. 15, Best Management Practices for Nonpoint Source Water Pollution Control in Utah, Mountainland Association of Governments, 1977 Provo, Utah (Utah Department of Agriculture & Food, Utah Department of Environmental Quality).
- 2) Natural Resources Conservation Service (NRCS), Field Office Technical Guide.

B. Soil Stabilization on Rangelands

Definition:

Stabilizing soils on rangelands to reduce soil erosion, control surface runoff, and minimize groundwater contamination through vegetative management and structural practices.

Purpose:

To: (1) prevent excessive soil and water loss and improve water quality; (2) produce more forage for grazing or browsing animals on rangeland or land converted to range from other uses; and (3) improve the visual quality of grazing land.

Conditions Where Practice Applies:

On rangeland, grazable woodland and grazable wildlife land.

Specification Guides:

Specification guides are available in NRCS Field Office Technical Guides.

Management specification includes but is not limited to:

Animal Trails & Walkways 575	Prescribed Burning 338
Brush Management 314	Prescribed Grazing 528
Critical Area Planting 342	Range Planting 550
Diversion 362	Seeding Stock Trail and Walkway
Fence 382	Spring Development 574
Filter Strip 393	Stream Channel Stabilization 584
Grazing Land Mechanical Treatment 548	Streambank Protection 580
Grade Stabilization Structures 410	Water & Sediment Containment Basins 638
Heavy Use Area Protection 561	Waterspreading 64
Wildlife Water Facility 648	

Note: Numeric codes following a practice coincide with SCS standards specification numbers.

Reference:

- 1) Natural Resources Conservation Service Field Office Technical Guide.
- 2) Technical Report 15, Best Management Practices for Nonpoint Source Water Pollution Control in Utah, Mountainland Association of Governments, 1977 Provo, Utah (Utah Department of Agriculture & Food, Utah Department of Environmental Quality).

C. Riparian Area Management

Definition:

Managing the riparian zone to minimize damage to streambanks, ground water recharge areas, shoreline and surface water quality from animal wastes, stomping and over-grazing.

Purpose:

To prevent surface and groundwater pollution from animal wastes, prevent excessive streambank and stream channel erosion, improve water quality, and maintain wildlife and fisheries habitat.

Conditions Where Practice Applies:

On all rangeland, pastureland and wildlife upland.

Specification Guides:

Specification Guides are available in NRCS Field Office Technical Guides.

Management Specification Includes but Is Not Limited To:

Fence 382
Filter Strip 393
Nutrient Management 590
Pipeline 516
Prescribed Grazing Use 528
Range Planting 550
Restoration & Mgt of Declining Habitat 643
Riparian Herbaceous Cover 390
Riparian Forest Buffer 391A
Tree/Shrub Establishment 612
Trough or Tank 614
Streambank Protection 580
Stream Channel Stabilization 584
Use Exclusion 472

Note: Numeric code following a practice coincides with NRCS standards specification numbers.

Reference:

- 1) Technical Report No. 15, Best Management Practices for Nonpoint Sources Water Pollution Control in Utah, Mountainland Association of Governments, 1977 Provo, Utah (Utah Department of Agriculture, Utah Department of Environmental Quality).
- 2) Natural Resources Conservation Service Field Office Technical Guide.

D. Riparian Area Stabilization

Definition:

Using vegetation or structures to stabilize and protect banks of streams or excavated channels against scour and erosion.

Purpose:

This standard applies to measures to stabilize and protect the aggradation or degradation in a stream channel and stream bank for one or more of the following purposes: (1) to prevent the loss of land or damage to utilities, roads, buildings, or other facilities adjacent to the channel banks; (2) to control channel meander that would adversely affect downstream facilities; (3) to reduce sediment loads causing downstream damages and pollution and; (4) to improve the stream for recreation or as a habitat for fish or wildlife.

Conditions Where Practice Applies:

This practice applies to natural or excavated channels undergoing damaging aggradation or degradation.

Specification Guide:

Management specification includes but is not limited to:

Channel Vegetation 322	Riparian Herbaceous Cover 390
Ditch and Canal Lining 428	Sediment Basins 350
Floodwater Diversion and Floodway 400,404	Streambank Protection 580
Grassed Waterways 412	Stream Channel Stabilization 584
Grade Stabilization Structure 410	Wildlife Watering Facility 648
Maintenance of Flow for Channel Stability	

Note: Numeric code following practice coincides with NRCS standards and specification number.

Reference:

- 1) Natural Resources Conservation Service Field Office Technical Guide, Codes 322, 400, 404, 410, 412, 428, 580 and 584 (NRCS Field Office)
- 2) State of Utah Administrative Rules for Stream Channel Alterations (Utah State Engineer, Division of Water Rights).

E. Cropland Management

Definition:

Developing and maintaining residues or establishing temporary or a permanent cover crop to reduce runoff and increase the infiltration of water.

Purpose:

To improve or maintain good physical, chemical, and biological conditions of the soil; reduce erosion; improve water use efficiency and water quality; improve wildlife habitats; and/or break reproduction cycles of plant pests.

Conditions Where Practice Applies:

On all cropland or other lands where agricultural crops are grown.

Specifications Guides:

Specification Guides are available in NRCS Field Office Technical Guide.

The management specification includes but is not limited to:

Chiseling and Subsoiling 324
Conservation Cover 327
Conservation Crop Rotation 328
Cover and Green Manure Crop 340
Critical Area Planting 342

Filter Strip 393
Grassed Waterway 412
Heavy Use Area Protection 561
Irrigation Water Management 499
Irrigation System 442, 443, 444
Mulching 484
Nutrient Management 590
Pasture and Hayland Planting 512
Pest Management 595A
Pipeline 430
Residue Management Use 329A, 329B,
Strip Cropping Contour 585
Strip Cropping Field 586

Note: Numeric code following a practice coincides with NRCS standards specification numbers.

Reference:

- 1) Natural Resources Conservation Service Field Office Technical Guide.

F. Soil Stabilization in Croplands

Definition:

Stabilizing soils on croplands to reduce soil erosion, control surface runoff, and minimize groundwater contamination through vegetative management and structural practices.

Purpose:

To prevent sediment and other pollutants from entering the surface and subsurface waters.

Conditions Where Practice applies:

On all the agricultural lands where the slope grade and length are significant because of soil type and local precipitation conditions.

Specification Guides:

Specification Guides are available in NRCS Field Office Technical Guide.

Management specification for this practice includes but is not limited to:

Conservation Cover 327
Cover and Green Manure Crop 340
Contour Farming 330
Critical Area Planting 342
Filter Strip 393
Field Border 386
Grassed Water Way 412
Nutrient Management 590

Pest Management 595A
Residue Management 329A, 329B
Terraces 600
Windbreak/Shelter belt 380

Note: Numeric code following a practice coincides with NRCS standards specification numbers.

Reference:

- 1) Natural Resources Conservation Service Field Office Technical Guide.
- 2) Technical Report 15, Best Management Practices for Nonpoint Source Water Pollution Control in Utah, Mountainland Association of Governments, 1977 Provo, Utah (Utah Department of Agriculture & Food, Utah Department of Environmental Quality).

G. Drainage Modification in Croplands

Definition:

Subsurface diversion and other similar practices (interception drains) to prevent the movement of deep percolated waters from cropland to groundwater.

Purpose:

To prevent groundwater pollution caused by the deep percolated waters.

Conditions Where Practice Applies:

On fields where the infiltration rate is very high (sandy soils) or the water table level is close to the surface and there is a likelihood of groundwater contamination from cultural practices. (This practice is intended for use on existing cropland and not for the purpose of bringing new land into production.)

Specification Guides:

Specification Guides are available in NRCS Field Office Technical Guides.

Management specification for this practice includes but is not limited to:

Bedding 310
Diversion 362
Mole Drain 482
Pumped Well Drain 532
Subsurface Drain 606
Surface drainage 607,608
Vertical Drain 630
Water Table Control 641

Note: Numeric code following a practice coincides with NRCS standards specification numbers.

Reference:

- 1) Natural Resources Conservation Service Field Office Technical Guide.

H. Agricultural Waste Management

Definition:

Minimizing the transport of nutrients from confined animal feeding operations to surface and groundwater through vegetative and structural practices.

Purpose:

To prevent surface and subsurface water pollution from animal wastes.

Conditions Where Practice Applies:

On feed lots, dairies, hog farms, poultry farms, and other concentrated animal feedlots.

Specification Guide:

Management specification includes but is not limited to:

Composting Facility 317
Filter Strips 393
Nutrient Management 590
Riparian Forest Buffer 391A
Roof Management System 570
Roof Runoff Management 558
Use Exclusion 472
Waste Management Systems 312
Waste Storage Pond 425
Waste Storage Facility 313
Waste Treatment Lagoon 359
Waste Utilization 633

Note: Numeric code following a practice coincides with NRCS standard and specification number.

Reference:

- 1) Technical Report No. 15, Best Management Practices for Nonpoint Source Water Pollution Control in Utah, Mountainland Association of Governments, 1977 Provo, Utah (Utah Department of Agriculture & Food, Utah Department of Environmental Quality).
- 2) Natural Resources Conservation Service Field Office Technical Guide, Codes.

I. Agricultural Pesticide Management

Definition:

Managing pesticide applications to minimize the transport of chemicals and chemical residue to surface and groundwater through the utilization of alternative pesticides, alternative crops, proper timing, application rates, of pesticides. The term pesticides refers to all insecticides, herbicides, and fungicides.

Purpose:

To reduce pesticide loss to the surface and ground water.

Condition Where Practice Applies:

On all cropland or on other lands where pesticides are applied (e.g., rangeland).

Specification Guide:

Pest control actions include monitoring pest increases, the judicious use of a pesticide, or effective communication that no action is necessary.

Management specification includes but is not limited to:

- Soil Testing
- Planting Time Optimization
- Use of Alternative Pesticides
- Timing of Applications
- Application Rate Adjustment
- Timing of Field Tillage Operation
- Use of Alternative Methods of Pest Control
- Use of Insect and Disease- Resistant Crop Varieties
- Pest Management 595A

Reference:

- 1) Planning Guide for Evaluating Agricultural Nonpoint Source Water Quality Controls. USEPA, 1982, Athens, GA. (Utah Department of Agriculture & Food)
- 2) Technical Report 15, Best Management Practice for Nonpoint Source Water Pollution Control in Utah, Mountainland Association of Governments, 1977 Provo, Utah (Utah Department of Agriculture & Food, Utah Department of Environmental Quality)
- 3) Natural Resources Conservation Service Field Office Technical Guide.

J. Agricultural Fertilizer Management

Definition:

Managing fertilizer and manure applications to minimize the transport of nutrients to surface and groundwater through the utilization of proper timing and application rates.

Purpose:

To reduce fertilizer and manure loss to the surface and groundwater.

Conditions Where Practice Applies:

On all cropland or other lands where fertilizers or manure are applied.

Specification Guides:

Management specification includes but is not limited to:

Application Timing
Composting Facility 317
Nutrient Management 590
Optimizing the Planting Time
Proper Application Rates
Soil Testing
Tillage Operation Timing
Use of Adapted Fertilizers
Waste Management System 312
Waste Storage Facility 313
Waste Treatment Lagoon 359
Waste Utilization 633

Reference:

- 1) Planning Guide for Evaluating Agricultural Nonpoint Source Water Quality Controls. USEPA, 1982, Athens, GA. (Utah Department of Agriculture & Food)
- 2) Technical Report No. 15, Best Management Practices for Nonpoint Source Water Pollution Control in Utah, Mountainland Association of Governments, 1077 Provo, Utah (Utah Department of Agriculture & Food, Utah Department of Environmental Quality),
- 3) Natural Resources Conservation Service Field Office Technical Guide.

K. Urban Best Management Practices

Wetland Management in Urban Areas

Definition:

Managing wetlands to control and trap pollutants and minimize the potential for transport of pollutants to surface and groundwater.

Purpose:

To control pollution from urban stormwater runoff through the construction and stabilization of wetland storm water basins.

Conditions Where Practice Applies:

On any residential or nonresidential area where a wetland storm water basin is needed.

Specification Guides:

Management specification includes but is not limited to:

Streambank and Shoreline Protection 580
Structures for Water Control 587
Water Table Control 641
Wetland Creation 658
Wetland Enhancement 659
Wetland Restoration 657
Wetland Wildlife Habitat Management 644

Reference:

- 1) Maryland Department of Natural Resource, "Guide for Constructing Wetland Storm-Water Basins," March 1987, (Utah Department of Agriculture & Food).
- 2) State of Utah Administrative Rules for Stream Channel Alteration (Utah State Engineer, Division of Water Rights).
- 3) "Guiding Principles for Constructed Treatment Wetlands: Providing Water Quality and Wildlife Habitat" (U.S. Fish and Wildlife Service, Utah Field Office, Salt Lake City)

L. Water Quality Protection in Urban Areas

Definition:

Minimizing the transport of sediments, organic materials, pathogenic organisms, chemicals, and toxins to surface and groundwater from urban stormwater runoff through management and structural practices.

Purpose:

To protect surface and subsurface water quality from contamination carried by storm water.

Conditions Where Practice Applies:

In all urbanized areas.

Specification Guide:

Management specification includes but is not limited to:

Altering Time of Runoff	Street Paving
Concentration Community Pride	Sewerage System
Garbage and Trash Collection	Storm Water Collection System
Good Housekeeping Practices	Storage Basin
Grade Stabilization Structure 410	Street Cleaning
Grassed Waterways 412	Street De-icing
Heavy Use Area Protection 561	Tree Planting 612
Infiltration Fields	Water and Sediment Containment Basin 638
Local Ordinance	Water Spreading 640
Lined Waterway or Outlet 468	
Mulching 484	
Pet Ordinances	
Runoff Management System 570	
Sediment Basin 350	
Septic Tanks	
Stream Banks	
Streambank and Shoreline Protection 580	
Street Cleaning	

Reference:

- 1) Technical Report No. 15, Best Management Practices for Nonpoint Source Water Pollution Control in Utah, Mountainland Association of Governments, 1977 Provo, Utah (Utah Department of Agriculture & Food and Utah Department of Environmental Quality).
- 2) Maryland NRCS/WRA for Soil Erosion and Sediment Control, April 1983 (Utah Department of Agriculture & Food).
- 3) Maryland NRCS/WRA for Infiltration, February 1984 .
- 4) Maryland NRCS/WRA for Soil Erosion and Sediment Control, April 1983.
- 5) Design and Construction of Urban Stormwater Management Systems, Water Environment Federation and American Society of Civil Engineers, 1992.
- 6) Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs, Metropolitan Washington Council of Governments, 1987.

M. Irrigation Water Management

Definition:

Determining and controlling the rate, amount, and timing of irrigation water in a planned and efficient manner.

Purpose:

To effectively use available irrigation water supply in managing and controlling the moisture environment of crops to promote the desired crop response, to minimize soil erosion and an undesirable migration of chemicals (pesticides, nutrients, and salts), to control undesirable water loss, and to protect water quality.

Conditions Where Practice Applies:

This practice is suited to all areas that are suitable for irrigation and that have water supply of suitable quality and quantity.

Specification Guides:

The management specification includes but is not limited to:

Application Rate
Irrigation Scheduling
Tailwater Control
Recycling Irrigation Runoff
Salinity Control
Drainage Water Re-use
Irrigation and Sediment Removal
Optimal integration of water and chemical application
Site-specific guidelines

Reference:

- 1) Natural Resources Conservation Service, Field Office Technical Guide, Code 449, 570, and 573 (NRCS Field Office).
- 2) Planning Guide for Evaluating Agricultural Nonpoint Source Water Quality Controls. USEPA, 1982, Athens, GA. (Utah Department of Agriculture & Food)
- 3) Technical Report No. 15, Best Management Practices for Nonpoint Source Water Pollution Control in Utah, Mountainland Association of Governments, 1977 Provo, Utah (Utah Department of Agriculture & Food, Utah Department of Environmental Quality).

N. Silviculture-Forest Water Quality Guidelines

These guidelines are described in the Nonpoint Source Management Plan Silviculture Activities July 1, 1998 addendum which is referenced herein and included as part of this NPS Plan revision. (See Appendix X.) The guidelines are available by contacting either the Division of Forestry, Fire and State Lands or the Division of Water Quality.

O. Best Management Practices for Hydrologic Modification

These BMPs are described in the document entitled “State of Utah Nonpoint Source Management Plan for Hydrologic Modification,” March 1995 and is included by reference as a part of this NPS Plan revision. (See Appendix IX.) This document is available by contacting the Division of Water Quality.