Northern Mariana Islands

Watershed Restoration Action Strategy

Division of Environmental Quality

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Division of Environmental Quality

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Introduction.

Since 1973 the Clean Water Act has resulted in tremendous strides in cleaning up America s rivers, lakes, and coastal waters. The improvement in the health of the nation s waters is a direct result of a concerted effort to enhance stewardship of natural resources and to implement the environmental provisions of federal, state, tribal and local laws.

Despite tremendous progress, 40 percent of the nation s waterways assessed by states and territories are still unsafe for fishing and swimming. Pollution from factories and sewage treatment plants, soil erosion, and wetland losses have been dramatically reduced. But runoff from city streets, rural areas, and other sources continues to degrade the environment and puts drinking water at risk.

Implementation of the existing programs will not stop serious new threats to public health, living resources, and the nation s waterways, particularly from polluted runoff. These programs lack the strength, resources, and framework to finish the job of restoring rivers, lakes, and coastal areas. To fulfill the original goal of the Clean Water Act - fishable and swimmable water for every American - the nation must chart a new course to address the pollution problems of the next generation by strengthening public health protections, targeting community-based watershed protection efforts at high priority areas, and providing communities with new resources to control polluted runoff.

This has resulted in the Clean Water Action Plan. The Action Plan builds on the solid foundation of existing clean water programs and proposes new actions to strengthen efforts to restore and protect water resources. In implementing this Action Plan, the federal government will: support locally led partnerships that include a broad array of federal agencies, states, tribes, communities, businesses, and citizens to meet clean water and public health goals; increase financial and technical assistance to states, tribes, local governments, farmers, and others; and help states and tribes restore and sustain the health of aquatic systems on a watershed basis.

The Action Plan is built around four key tools to achieve clean water goals.

- A Watershed Approach to focus new, collaborative effort by federal, state, tribal, and local governments; the public; and the private sector to restore and sustain the health of watersheds in the nation. The watershed approach is the key to setting priorities and taking action to clean up rivers, lakes, and coastal waters.
- Strong Federal and State Standards to revise where needed and make existing programs more effective. Effective standards are key to protecting public health, preventing polluted runoff, and ensuring accountability.
- Natural Resource Stewardship by federal natural resource and conservation agencies to apply their collective resources and technical expertise to state and local watershed restoration and protection.
- Informed Citizens and Officials is the foundation of a sound and accountable water quality program. Informed citizens and officials make better decisions about their watersheds. This Action Plan calls on federal agencies to improve the information available to the public, governments, and others about the health of their watersheds and the safety of their beaches, drinking water, and fish

While the Clean Water Action Plan encompasses a wide variety of actions, the preparation of Unified Watershed Assessments was the first step in classifying all watersheds of the United States. For these purposes watersheds are classified in four categories:

- Category I - Watersheds needing restoration because they do not meet or are faced with imminent threat of not meeting, clean water and other natural resource goals.
- Category II - Watersheds needing preventive action to sustain water quality and aquatic ecosystems.
- Category III - Pristine or sensitive watersheds on federal lands needing an extra measure of protection.
- Category IV - Watersheds with insufficient data to make an assessment.

CNMI Unified Watershed Assessment

The process to prioritize CNMI watersheds was initiated by the Division of Environmental Quality (DEQ), with support from the CNMI NRCS office in consultation with a Federal Unified Watershed Assessment Working Group led by the Pacific Basin Area Natural Resources Conservation Service (NRCS) and the US Environmental Protection Agency (USEPA).

Under the Clean Water Action Plan EPA and NRCS will allocate a portion of the budget through existing programs to the CNMI to be used to restore those watersheds listed in Category I. These programs include nonpoint source and water programs under the Clean Water Act and EQIP and WHIP programs under NRCS. After developing and receiving approval for the Unified Watershed Assessment, the CNMI will develop a Watershed Restoration Action Strategy that will strive to attain clean water goals for the CNMI using these additional funds.

During the Unified Watershed Assessment process, significant input was received by the CNMI Watershed Working Group. The public was notified of the assessment through advertisements placed in the local newspaper, they were invited to the August meeting of the Watershed Working Group, and copies of the assessment were distributed to various resource agencies to be available for public review. No public comments were received.

The CNMI Watershed Group was formed in 1995 with the purpose of providing technical assistance to government agencies, participating in the decision making process, and making regulatory changes -- on a watershed scale. The Secretary of the Department of Lands and Natural Resources created the group and the Chair of the Saipan and Northern Islands Soil and Water Conservation District spearheads the group. The group meets at least once a month and are advertised in order to include any interested parties. Members of the Watershed Group include representatives from:

- CNMI Division of Environmental Quality
- CNMI Coastal Resources Management
- CNMI Division of Fish and Wildlife
- CNMI Department of Public Works
- Northern Marianas College
- Board of Public Lands
- Saipan and Northern Islands Soil and Water Conservation District
- Tinian and Aguijan Soil and Water Conservation District
- Luta Soil and Water Conservation District
- Natural Resources Conservation Service
- US Fish and Wildlife Service

- Private Environmental Consulting Firms
- Office of the Governor

The CNMI completed its Unified Watershed Assessment in September, 1998 and subsequently received approval from the Federal Unified Watershed Assessment Working Group. The Unified Watershed Assessment document serves as an official record of the results of the Watershed Group s assessment, with a list of the prioritized watersheds, descriptions of the causes of degradation, and a guide to the documentation of the problems.

The classification of Watershed Categories resulting from the Unified Watershed Assessment process is summarized in Table 1.

Table 1. Categorical Watersheds (from Unified Watershed Assessment)					
Category	Restoration year & (Ranking)	Saipan	Tinian	Rota	Northern Islands
1	FY99-00 (1)	Takpochao 20100010 110 006	Makpo 20100010 120 005	Sabana/Talakhaya/Palie 20100010 100 005, 6, 7, & 8	Pagan 20100010 085 006
1	FY99-00 (2)	Kagman 20100010 110 007	Puntan Diabo-Lamanibot 20100010 120 002	Songsong 2010010 100 001	Anatahan 20100010 085 002
1	FY01-02 (3)	Susupe 20100010 110 009		Uyulan Hulo/Teteto 20100010 100 002	Agrihan 20100010 085 007
1	FY03-04 (4)	Lau Lau 20100010 110 008		Dugi/Gampapa/I Chenchon 20100010 100 004 & 009	
1	FY05-06 (5)	Achugao 20100010 110 004			
2		Banaderu 20100010 110 001	Masalok 20100010 120 003	Chaliat/Talo 20100010 100 003	Sarigan 20100010 085 003
2		Kalabera 20100010 110 003	Carolinas 20100010 120 004		Guguan 20100010 085 004
2		As Mautis 20100010 110 002	Aguijan undesignated		Agrihan 20100010 085 007
2		Isley 20100010 110 011			Asuncion 20100010 085 008
3					Maug 20100010 085 009
3					Farallon de Pajaros 20100010 085 010
3			Puntan Tahgong 20100010 120 001		Farallon de Medinilla 20100010 085 001
4		Talafofo 20100010 110 005			
4		Dan Dan 20100010 110 010			

National Watershed Restoration Action Strategies Process

Upon approval of the Unified Watershed Assessment, the next step in the Clean Water Action Plan process calls for the restoration of aquatic system health on a watershed basis starting with a systematic process to restore water quality and the health of the aquatic system in the approximately 1,000 watersheds that do not now meet clean water, natural resource, and public health goals.

The next step in the process is the development of Watershed Restoration Action Strategies. For waters identified as not meeting clean water goals, the Clean Water Act requires states and tribes to develop and implement response plans to restore the health of the water body. For those watersheds identified as having the greatest need for restoration, states and tribes should develop a Watershed Restoration Action Strategy for each individual watershed. By developing response plans on a watershed scale, rather than a smaller water body scale, states and tribes will be able to better account for cumulative effects of diffuse pollution sources and for pollution in one river segment that comes from upstream segments.

A Watershed Strategy creates an opportunity to strike an appropriate balance between controls over discharges and polluted runoff, and to consider other water-related problems in the watershed, including wetland loss, sediment contamination, aquatic species habitat degradation, drinking water protection, and health of riparian areas.

By taking a more comprehensive approach to restoring the health of the aquatic system in the watershed, a Watershed Strategy can result in improvements in environmental conditions that are mutually reinforcing, with higher long-term success rates. Water bodies impaired by polluted runoff in most instances will require a watershed-wide effort to achieve the necessary restoration and clean water goals.

Development of Watershed Restoration Action Strategies is also an opportunity to identify and demonstrate innovative approaches to restoring water quality and protecting public health and the environment.

A water quality restoration effort on a watershed scale also offers citizens and other stakeholders better opportunities to participate in a water management process that is understandable and meaningful. States and tribes should reach out to the public, especially minority groups, in developing Watershed Strategies. Outreach can occur through public meetings, participation in developing assessments and plans, use of the Internet, and other means.

Watershed Restoration Action Strategies should specifically identify funding needed to implement actions, including expected roles of available federal assistance programs, state funds, and other resources. Federal agencies, such as USDA, EPA, NOAA, and federal land management agencies, will work to bring current funding and financial resources together to implement watershed restoration plans while still meeting mandated goals and objectives.

Current CNMI-wide Strategies for Watershed Restoration
from the CNMI Nonpoint Source Pollution Prevention and Control Program
FY 2003-2014 Program Strategy

The CNMI NPS Prevention and Control Program initiated in FY 99 is well underway. The strategies are being implemented CNMI-wide and are important measures in the context of individual watershed restoration strategies. For this reason, an abbreviated updated CNMI Prevention and Control Program is presented here. Completed milestones and marina related program elements have been removed, and schedules have been adjusted to reflect current status.

The CNMI has an integrated Nonpoint Source Pollution Prevention and Control Program, which incorporates both the 6217 Coastal Nonpoint Program and the 319 Clean Water Act Nonpoint Program. The Division of Environmental Quality, Coastal Resources Management Office, and all other agencies represented on the CNMI Watershed Working Group have developed and are committed to implementing the goals set forth in this Nonpoint Source Pollution Prevention and Control Program.

Vision statement: The CNMI s NPS program will maintain beneficial uses of the Commonwealth s waters. The key to our program is prevention through education and voluntary compliance, although enforceable policies and mechanisms are or will be in place within the next fifteen years to ensure the beneficial uses are maintained.

1. Long-term goal: Restore and maintain the designated uses of all waterbodies.

1a. Short-term goal: Restore the designated uses of the waters of the lagoon surrounding Garapan #1 drainage, a 303(d) listed waterbody by 2004.

Milestones:

- FY03: DEQ will complete the Total Maximum Daily Load (TMDL) for Garapan #1 drainage.
- Ongoing: Conduct more frequent inspections; increase enforcement of environmental, sanitation, and public health regulations; and cite violators (i.e., combined sewer overflows, illegal connections to drainages, litter control, and illegal discharges) in the Garapan district. The Division of Environmental Quality, Coastal Resources Management Office, Bureau of Environmental Health, Marianas Visitor s Authority, Department of Public Works, and Commonwealth Utilities Corporation will form a Task Force in FY00 and develop a workplan to accomplish this milestone.
- Ongoing: DEQ, Department of Public Works, Commonwealth Utilities Corporation, and other appropriate agencies will implement recommendations put forth in the TMDL for Garapan #1 drainage. Section 319 funds can be used to implement demonstration projects and Capital Improvement Funds can be used for any necessary infrastructure improvements.

1b. Short-term goal: Restore the designated uses of the waters of the lagoon surrounding Puerto Rico dump, a 303(d) listed waterbody, by 2006.

Milestones:

- The Department of Public Works will follow the compliance schedule to close Puerto Rico dump, as required by the Administrative Order issued by EPA. Highlights include:
  FY03: Implement closure and post-closure plans, construct transfer stations and related

facilities, and complete design for Marpi landfill.

- FY03: Complete analysis of contaminants in sediments of Tanapag Lagoon, including those surrounding Puerto Rico Dump with Water and Environmental Research Institute (WERI) using funds from the USGS grant program.
- FY03: DEQ, Department of Public Works, Division of Fish and Wildlife, and Bureau of Environmental Health will work with EPA to create and erect appropriate signs and distribute brochures to ensure that the public is clearly notified of fish consumption risks associated with fishing near Puerto Rico Dump.
- FY04: Close Puerto Rico Dump, open Marpi Landfill, implement post-closure maintenance of Puerto Rico Dump.
- FY05-06: DEQ, Department of Public Works, Division of Fish and Wildlife, and Bureau of Public Health will conduct a study to analyze the risks of consuming fish caught near Puerto Rico Dump and to determine if the beneficial uses of the waters of the lagoon surrounding Puerto Rico Dump have been restored.

1c. Long-term goal: Develop and implement all appropriate management measures and enforceable policies and mechanisms for the CNMI s Coastal Nonpoint Source Pollution Prevention and Control Programs. Receive final approval of the Coastal NPS plan from NOAA and EPA by 2014.

2a. Short-term goal: By 2004, implement ten management measures; by 2009, implement another ten management measures; and by 2014, implement the remaining management measure.

Milestones:

- Agriculture - Confined Animal Facilities (large and small) - Animal waste management measures

- FY03: DEQ will review their Individual and Other Wastewater Disposal System regulations to determine if they should be revised to provide size thresholds for applicability and if they should list appropriate animal waste management measures for confined animal facilities.
- FY03: DEQ will revise their Individual and Other Wastewater Disposal System regulations if deemed necessary.
- FY04,09,&14: CRM, DEQ, and the Division of Agriculture will evaluate the success of the management measures implemented to limit the discharge from confined animal facilities. If necessary, add or modify management measures.

- Agriculture - Confined Animal Facilities (large and small) - Aspects of the nutrient management measures
- FY03 & 13: See projects under 2b -- Evaluating the success of management measures.
- FY04: NRCS will require all applicants for EQIP and WHIP funding to prepare a Conservation Plan that includes a nutrient management plan.
- FY04: DEQ and CRM will require all permitted confined animal facilities to prepare a nutrient management plan.
- FY09&14: Conduct inspections (including water quality analysis) of farms to ensure compliance with and to determine the success of nutrient management plans.

¥ Urban - Watershed protection

- FY03-14: CRM and DEQ will provide introductory GIS training to all government agencies at the Northern Marianas College.
- FY03: CRM and DEQ develop a computerized tracking system and incorporate it into GIS.
- FY03: Continue reforestation and revegetation efforts in Lau Lau watershed.
- FY03-04: The Watershed Group will locate and map all areas that need to be designated as conservation areas. Once zoning laws have been implemented, the group will work with elected officials to set aside these areas to protect water quality and biota. (Potential funding: CWA 319 and CZARA 310)
- FY04: CRM and the Watershed Group will work with elected officials to restore zoning in the CNMI.
- FY04: The Watershed Group will map land tenure of important watersheds and evaluate the feasibility of regulating privately-owned lands in important watersheds that are threatened by nonpoint source pollution.
- FY04-05: If zoning has not been reinstated, CRM will revise their regulations to include the following as Areas of Particular Concern (APC): (1) Highly erodable soils and (2) Areas surrounding well heads and water lenses.
- FY04,09,14: The Watershed Group will evaluate the success of the Watershed Protection management measures implemented. If necessary, add or modify management measures.
- FY06: The Watershed Group will develop management plans for conservation areas.
- FY06: The Watershed Group will develop new and innovative methods to provide incentives for private landowners to implement pollution prevention plans, including risk management protection for adoption of new pollution prevention technologies and market recognition for producers that meet environmental goals.
- FY07: The Watershed group will develop an agreement with the USDA to use the Conservation Reserve Enhancement Program to improve watersheds.

- Urban - Existing development
- FY04: Luta Soil and Water Conservation District will conduct an analysis of current contamination of marine water from roads and existing development in Songsong Village; evaluate existing road design and drainages; prepare a plan for future road design and maintenance, which includes the installation of a Best Management Practice (BMP); and teach the Department of Public Works, Mayor s office, and local contractors how to install a BMP.
- FY04-09: CRM and the Watershed Group will work with elected officials to implement the Saipan Lagoon Use Management Plan (SLUMP). (Funding: CZARA 6217).
- FY04: The Department of Public Works will conduct an analysis of current contamination of marine water from roads and existing development along Beach Road (Saipan) and San Jose Village (Tinian); evaluate existing road design and drainages; prepare a plan for future road design and maintenance, which includes the installation of a Best Management Practice (BMP); and teach the Department of Public Works, Mayor s office, and local contractors how to install a BMP. (Funding: Capital Improvement Project)
- FY04-ongoing: CRM will use satellite imagery and air photos to measure shoreline erosion and to analyze silt plumes.
- FY04,09,14: The Watershed Group will evaluate the success of the management measures implemented to reduce runoff pollutant concentrations and volume from existing development. If necessary, add or modify management measures.
- FY05: The Department of Public Works, Division of Environmental Quality, Coastal Resources Management, Governor s Office, Mayor s Offices, Legislature, and Office of

Insular Affairs will develop a MOA to ensure sufficient Capital Improvement Project funds and local funds are appropriated to implement retrofitting proposals for existing development.

- Urban - Chemical control
- FY03: DEQ will modify their Earthmoving and Erosion Control Permits to require the applicant to implement management measures to reduce potential contamination from toxic substances and nutrients applied during construction.
- FY04,09,14: DEQ and CRM will evaluate the success of the management measures implemented to control chemicals at construction sites. If necessary, add or modify management measures.

- Urban - Operating OSDS
- FY03-04: EPA, CUC, and DEQ will explore the use of constructed wetlands rather than a conventional sewage system or Individual Wastewater Disposal systems for Kagman, Dugi/Gampapa/I Chenchon, and Marpo Watersheds.
- FY03-04: DEQ will create a GIS database tracking system that will notify inspection staff when inspections of IWDS and OSDS are needed and where they are located.
- FY04: DEQ will inspect IWDS starting in Category 1 high priority watersheds scheduled for inspections by the GIS tracking system.
- FY04,09,14: DEQ and CRM will evaluate the success of the management measures implemented to protect waters from pollutants discharged by OSDS. If necessary, add or modify management measures.
- FY05: DEQ will revise their IWDS regulations to require inspections at a frequency to ascertain whether they are failing.

¥ Critical Coastal Areas and Additional Management Measures - Identify critical coastal areas, Create a process for updating classification for critical coastal areas, and Create a process for revising and adding additional management measures applicable to the critical coastal areas

- FY03-14: The Watershed Group will use the Unified Watershed Assessment to identify, revise, and add critical coastal areas and develop additional management measures.
- FY03: CRM, NOAA, USCG, DFW, DPW, DLNR, and DEQ will establish a Global Positioning System base station for the CNMI.
- FY04,09,14: The Watershed Group will evaluate the success of the management measures implemented to protect critical coastal areas. If necessary, add or modify management measures.

¥ Monitoring - Assess management measures in the reduction of pollution loads and improved water quality

- FY03: DEQ and CRM will develop guidance sheets with locally-appropriate management measures (adapted from the 6217 g guidance document) that can be implemented to prevent polluted runoff.
- FY03: DEQ will devise a method to track the implementation and success of management measures. If necessary, create new management measures to meet water quality objectives.
- FY04: DEQ will conduct a survey of watersheds to identify causes and solutions to runoff problems.

2b. Short-term goal: Evaluate the success of restoring and maintaining the designated uses of all CNMI waterbodies and evaluate the need for additional restoration activities if, god forbid, maintenance activities fail.

Milestones:

- FY04 and all even numbered years: Conduct a Water Quality Assessment for the 305(b) report and revise the list of impaired water bodies for the 303(d) report.
- FY03: DEQ, CRM, DFW, and NMC will complete the Long-Term Coral Reef Monitoring Plan.
- FY03: DEQ will collect and analyze data for watersheds designated as Category IV in the Unified Watershed. The Watershed Working Group will then categorize those watersheds.
- FY03-04: Establish baseline water quality data at marinas: inventory existing monitoring data and provide data to managers and the public for use in performing water quality assessments and establishing baseline conditions; identify marinas where recent monitoring data are not available and develop a plan to assess water quality and establish baseline data at these marinas; assess water quality at marinas and determine baseline data.
- FY03: Develop a monitoring plan that includes information regarding the number and location of monitoring stations, the types and frequency of water quality data being collected, methods for tracking management measure implementation, and the analytic approaches that will be employed in conjunction with existing monitoring efforts to assess the success of management measures in achieving water quality objectives.
- FY03: In coordination with EPA s efforts to establish numeric criteria for nutrients, as stated in the Clean Water Action Plan, conduct a thorough analysis of nutrient levels in runoff from confined animal facilities, streams, ground water, and marine water. Determine the effect of nutrient levels on the environment and public health. Revise nutrient criteria in CNMI Water quality Standards if deemed necessary.
- FY13: Conduct a follow-up study to FY03 project to determine if the amount of nutrients in CNMI waters has been reduced.

2c. Short-term goal: Restore watersheds designated as Category I in the CNMI s Unified Watershed Assessment. These watersheds do not meet or are faced with imminent threat of not meeting clean water and other natural resource goals.

Category I watersheds are: Takpochao, Kagman, Susupe, Lau Lau, and Achugao -- Saipan; Makpo and Puntan Diaplo-Lamanibot -- Tinian; Sabana/Talakhaya/Palie, Songsong, Uyulan Hulo/Teteto, and Dugi/Gampapa/I Chenchon -- Rota; and Pagan, Anatahan, and Agrihan -- Northern Islands.

Milestones:

- FY02-03: Develop Watershed Action Strategies for all watersheds.
- FY03-06: Implement Watershed Action Strategies for Category I watersheds.

2d. Short-term goal: Take preventive action in Category II watersheds to sustain water quality and aquatic ecosystems.

Category II watersheds are: Banaderu, Kalabera, As Mautis, and Isley -- Saipan; Masalok, Carolinas, and Aguijan -- Tinian; Chaliat/Talo -- Rota; and Sarigan, Guguan, Agrihan, Asuncion, Maug, and Farallon de Pajaros -- Northern Islands.

Milestones:

- FY07-14: Implement Watershed Action Strategies for Category II watersheds.

Short-term goal: Require an extra measure of protection for Category III watersheds, which are pristine or sensitive watersheds on federal lands.

Category III watersheds are: Puntan Tahgong on Tinian and Farallon de Mendinilla in the Northern Islands.

Milestones:

1. Ongoing: All CNMI and federal regulatory agencies will ensure the military complies with the Environmental Impact Statement for Military Training in the Marianas.

3. Long-term goal: Instill a sense of stewardship into the general public to gain their support in protecting the health of the watersheds and coral reefs.

Short-term goal: Instill a sense of stewardship into the children of the CNMI to gain their support in protecting the health of the watersheds and coral reefs.

Milestones:

- FY03-04: DEQ and CRM will develop a public education program on nonpoint source pollution that targets school-age children. The program will include NPS curriculum, a media campaign, volunteer monitoring programs, and special activities for Environmental Awareness Week and Coastal Month.

4. Long-term goal: Prevent the increase of total suspended solid (TSS) loadings and associated contaminants in surface water, as the result of new development.

Short-term goal: Prevent the increase of TSS loadings and associated contaminants in the surface waters as a result of new development in Category I watersheds.

- FY00-ongoing: Require all new agriculture homesteads in Dugi/Gampapa/I Chenchon Watershed to follow the earthmoving and erosion control plans developed as a part of the Division of Public Land s CRM permit application.
- FY03-ongoing: Require all CRM permit applicants for homesteads to develop and implement earthmoving and erosion control plans for the entire homestead.
- FY03: Conduct workshops for DEQ, CRM, and DPW inspection and enforcement staff, and contractors, on how to inspect, design, and construct appropriate stormwater control mechanisms.

5. Long-term goal: Reduce the contamination of surface, ground, and marine water from pesticides and other toxic chemicals by 75 percent by 2014.

- Ongoing: NMC will train and license pesticide applicators; and DEQ will conduct field investigations and monitor pesticide application, storage, and container disposal.
- FY03: Conduct a household hazardous waste drive on Saipan, Tinian, and Rota. (Funding: CWA 319)
- FY03: Demonstrate the efficiency and safety benefits of pesticide chemical missing stations to farmers by constructing mixing stations and conducting workshops. (Funding: FY97 CWA 319)

6. Long-term goal: Slow the rate of wetland losses in the CNMI and provide incentives to landowners to restore wetlands.

- Ongoing: NRCS will encourage landowners to apply for Wildlife Habitat Incentive Program (WHIP) grants to restore wetland habitat on their property.
- FY03-04: DEQ, CRM, DFW, and DPL will determine the societal values of Saipan s wetlands.
- FY05: DEQ, CRM, DFW, and DPL will revise the CNMI s wetlands management plan.

- FY06: DEQ will revise the CNMI s Water Quality Standards to include appropriate standards for wetlands.
- FY07: CRM and DEQ will incorporate the revised wetlands management plan into the CNMI s Coastal Nonpoint Source Pollution Prevention and Control Plan.

CNMI Watershed Restoration Action Strategies

This following section tabulates the CNMI Watershed Restoration Action Strategy for Category I watersheds located on Saipan, Tinian and Rota. These are watersheds needing restoration because they do not meet, or are faced with imminent threat of not meeting, clean water and other natural resource goals.

The schedule to complete restoration strategies for all CNMI Category I watersheds is anticipated to occur over two years. This is considered necessary due to the number of Saipan watersheds, and the difficulties of addressing remote watersheds located in the Northern Islands. This schedule addresses all Tinian and Rota Category I watersheds as well as the more severe problem areas of Saipan in the initial round. The schedule is as follows:

CNMI Category I Watersheds addressed in 2002 WRAS			
Saipan	***Tinian***	***Rota***	***Northern Islands***
Takpochau	Puntan Diablo-Lamanibot	Sabana/Talakhaya/Palie	
Kagman	Makpo	Uyulan Hulo/Teteto	
		Songsong	
CNMI Category I Watersheds to be addressed in 2003 WRAS			
Saipan	***Tinian***	***Rota***	***Northern Islands***
Susupe	(completed)	(completed)	Pagan
Achugao			Anatahan
Lau Lau			Agrihan

Watershed Restoration Strategies are one element of a comprehensive Clean Water Action Plan. The Unified Watershed Assessment, completed by the CNMI in 1998, and the CNMI Coastal Nonpoint Source Pollution Control Program, completed in 2002 are key components. For this reason major elements of these have been incorporated to provide context. These reports are available separately and provide more details needed for better understanding of the CNMI clean water effort.

The CNMI WRAS is presented in tabular format. For each Category I watershed the table presents criteria used by the Unified Watershed Assessment, the key findings resulting in the Category I designation, a priority ranking, schedule and individual strategies designed to address specific criteria for Water Quality, Listed Species, Sensitive Habitat, Cultural and Planning and Management. This approach assists in understanding the relative quality of CNMI Category I Watersheds in comparison with other Category I watersheds of the United States.

The individual watershed strategies are based on recommendations proposed by island committees with only minor modifications to reflect current needs. The recommendations have been linked with specific UWA criteria findings. The individual strategies will occur in the context of other CNMI-wide authorities that are already in force or which will be coming online through new measures or improvements in existing authority. The complete description of these authorities is beyond the scope of this report. The basic overall CNMI-wide approach is contained in the CNMI Coastal Nonpoint Source Pollution Control Program. The 5/15 Year work program for the CNMI NPS program is provided in the preceding section. Other important strategies include the DEQ/CRM 6217 regulatory improvements, the CRM 309 Program Improvement Strategy, and the CNMI Coral Reef Initiative. These provide for an overall framework in which individual watersheds will be restored.

Priority and Implementation Schedules are also indicated. Priority is based on source of concern. Concerns arising out of water quality criteria and Planning and Management criteria received highest priority. Concerns based on cultural criteria were ranked 2nd. First and second priority issues were accorded implementation schedules.

Concerns arising from listed species and habitat criteria issues were ranked 3rd. While a strategy such as Rehabilitate wetlands, mangroves, streams, and forests is important to watershed restoration goals, it is believed that improving water quality affecting wetlands, mangroves, streams, and forests as first priority will support accomplishment of the same goal. Also receiving 3RD priority designations were individual actions listed by the UWA with low priorities, and recommended strategies which while important are not directly germane to watershed restoration, such as for example, improving water supply distribution systems.

Implementation schedules were identified for First and Second priority issues. Schedules are based on fiscal year and represent the first year efforts will be focused on an individual strategy based on apparent urgency of need for action.

Funding for restoration strategies is expected to be derived from EPA Clean Water Act funds granted to the CNMI Division of Environmental Quality. Funding may also be derived from 6217 funding made available to the CNMI DEQ and CRM under the 6217 funds made available by EPA and NOAA. Additional funding is expected to be available from CNMI sources such as capital improvement program funding.

Implementation will take place under the general auspices of the CNMI Division of Environmental Quality.

Issue / Criteria	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Takpochau *Saipan*	***Summary of Watershed Issues (Unified Watershed Assessment)***	***Priority***	***Schedule***	***Restoration Strategy***
Water Quality *Beneficial Use Attainment and Water Quality Standards*	Eight coastal sites in the West Takpochao watershed have five or more annual violations of the CNMI s microbiological standards, as reported in the CNMI s 305(b) report (Division of Environmental Quality 1998b). Two of these sites violate these microbiological standards ten or more times per year. One of these sites (the waters surrounding the mouth of the drainage next to the Dai Ichi Hotel) is in Class AA waters---defined in the CNMI s Water Quality Standards to mean that the uses to be protected in this class of waters are the support and propagation of shellfish and other marine life, conservation of coral reefs and wilderness areas, oceanographic research, and aesthetic enjoyment and compatible recreation inclusive of whole body contact and related activities. As a result of the frequent microbiological violations, the waters surrounding the mouth of the drainage next to the Dai Ichi Hotel do not attain its beneficial use standard. The Puerto Rico dump is located on the shoreline of the Saipan lagoon in Takpochau watershed. Because the dump is in violation of the Clean Water Act (pursuant to an Administrative Order issued by the EPA) and because leachate entering the lagoon obviously contains numerous contaminants, including metals, synthetic organic compounds, and other pollutants, the area surrounding Puerto Rico dump does not support its designated use (Class A), as defined in the CNMI s Water Quality Standards to mean that their use for recreational purposes and aesthetic enjoyment must be protected.			*Implement CNMI-wide Management Measures:* • *CNMI 5&15 Year NPS program* • *CNMI 6217 Regulatory Improvements* • *CNMI CRM 309 Improvement Strategies* *Other Measures:* • *Coral Reef Initiative*
Number of Pollutants Exceeding Limits	DEQ s water quality database (containing data from 1993 - 1998) shows that the waters of the Saipan lagoon surrounding Takpochau watershed have poorer water quality than the other Saipan watersheds with data for the following three parameters: turbidity, dissolved oxygen, and fecal coliform. The median orthophosphate level of the nearshore waters surrounding Takpochau watershed, while not the worst, exceeds the CNMI s water quality standard of 0.025 mg/L. In addition, numerous pollutants that DEQ does not monitor, are suspected to be leaching from the Puerto Rico dump into the lagoon.	1	2003	• Development of watershed-specific capital infrastructure, maintenance & operating improvement needs to address chronic water quality violations.

Issue / Criteria	Significance of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Underground/aboveground Storage Tanks	The fuel storage tanks for Mobil and Shell oil (the two major distributors) and for the Commonwealth Utilities Corporation (used for power generation) are located in the watershed. In addition, numerous gas stations are located throughout the watershed and many businesses store fuel and used oil for generators on their property.			
Septic Tanks	According to staff in DEQ s wastewater section, there are over 1,000 septic systems in the Takpochau watershed. Approximately only 25 percent of the watershed s area is served by the municipal sewer system.			
Sewage treatment plant	The Sadog Tasi Sewage Treatment Plant is located in the Takpochau *watershed.*	1	2005	• Determine efficacy of extending the Sewage Treatment Plant outfall to discharge outside of the lagoon.
Contaminated Sites	Numerous contaminated sites are located in the Takpochau watershed, including a leaky fuel pipeline running through the wetland in American Memorial Park and mercury contamination in the Agag well.	1	2003 2008	• Public education to inform the community of contaminated FUDS for their safety • Remediate contaminated sites
Wells	Ten public utility wells are located in the Takpochau watershed. The Capitol Hill area is reported to produce the highest quality water on Saipan. Numerous private wells	1	2002 2004	• Reduce overpumping/Avoid deep wells (salt water) • Consider need for mandatory rain water catchments and cisterns such as used during Japanese times

Issue / Criteria	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
CWA 303(d) list	The only two waterbodies on the CNMI s 303(d) list are located in the Takpochau watershed. The waters of the Saipan lagoon around the Puerto Rico Dump and the drainage next to the Dai Ichi Hotel are listed as impaired.	1	2003 2003 2004 2004	• Initiate TMDL s for Puerto Rico Waters • Complete TMDL for GD1 • Implement recommendations put forth in the TMDL for Garapan #1 drainage. Section 319 funds can be used to implement demonstration projects and Capital Improvement Funds can be used for any necessary infrastructure improvements. • Develop constructed wetland to treat Garapan #1 drainage.
Urban runoff potential	Very high. A large portion of this watershed is urban (containing the villages of Garapan, Capitol Hill, Gualo Rai, and Navy Hill) and most of Saipan s major roads traverse the Takpochau watershed. Little consideration was given to planning for control of urban runoff on impervious surfaces.	1	2002 2005	• Develop a workplan to conduct more frequent inspections; increase enforcement of environmental, sanitation, and public health regulations; and cite violators (i.e., combined sewer overflows, illegal connections to drainages, litter control, and illegal discharges) in the Garapan district. • Develop stormwater management plans and consider diverting runoff to recharge locations (wetlands, etc.)

Issue / Criteria	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Agricultural runoff potential	Relatively low. The primary soil type in the Takpochau watershed is Tapochau-Chinen soil, which is not highly erodible. Less than one percent of the land area is under cultivation at one time.	3	2007	• Develop, implement, and periodically update nutrient management plans for large and small confined animal facilities.
Polluting Land uses	The sewage delivery system in the Takpochau watershed has frequent leaks, especially at the lift stations; reverse osmosis effluent from hotels creates frequent hypersaline discharges into streams and the lagoon; the central business district of Garapan contains uses such as automobile repair shops where hazardous materials may be illegally discharged into stormwater drains; Puerto Rico Dump is likely a source of surface water pollution; Formerly Used Defense Sites contain hazardous materials such as the petroleum pipeline that has leaked into the upland and wetland portions of the American Memorial Park; overpumping groundwater is causing saltwater intrusion; and the Smiling Cove Marina does not contain a pumpout station and may be a source of sewage discharge into the lagoon.	1	2003 2002 2003	• Implement Puerto Rico dump closure and post-closure plans. • Conduct Phase II WERI sediment study of contaminants in sediments of Tanapag Lagoon, including those surrounding Puerto Rico Dump. • Create and erect appropriate signs and distribute brochures to ensure that the public is clearly notified of fish consumption risks associated with fishing near Puerto Rico Dump.
Polluting land uses percent	10%			
Spatial Extent of Non-Attainment	Unknown.	1	2005	• Determine extent of non-attainment area.
Percent Non-Attainment	3%			
Listed Species *Listed species*	The Nightingale Reed Warbler (*Acrocephalus luscina*), Island Swiftlet (*Aerodramus vanikorensis bartschi*), and Mariana moorhen (*Gallinula chloropus guami*) definitely exist within the watershed. The Micronesian Megapode (*Megapodis laperouse laperouse*), Mariana fruit bat (*Pteropus mariannus mariannus*), green sea turtle (*Chelonia mydas*), and hawksbill turtle (*Eretmochelys imbricata*) are possibly present.	3		• Evaluate species recovery plans and incorporate recommendations wherever practical.

Issue / Criteria	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Rehabilitatable habitat	Upland and wetland habitat used by the nightingale reed-warbler can be enhanced, restored, and created. Wetland moorhern habitat can be enhanced, restored, and created. Turtle nesting beaches can be enhanced. Wetland areas have been degraded through contamination by metals and petroleum hydrocarbons, filling, altered hydrologic regime and reduced watershed catchment area, reduced tidal amplitude, eliminated diurnal seawater mixing in the American Memorial Park wetland, and reduced upland buffer widths in terms of noise and pollutants. All of these factors contributing to lowered wetland habitat quality can be reduced.	3		• Rehabilitate wetlands, mangroves, streams, and forests • Consider alternative treatment measures that provide habitat value such as the example of Rota Resort (which created new habitat for listed species).
Spatial Extent of Non-Attainment	Unknown			
Percent Non-Attainment	10%			
Other Sensitive Natural Resources *Rare Natural Resources*	Most of Saipan s only remaining mangrove stands are in this watershed. Most of these stands are degraded or are at risk of being degraded from altered hydrologic and salinity regimes, slope failure from dredging, altered sedimentation rates, pollution, disease, storms and typhoons, and oil spills. The lagoon in the Takpochau watershed has sea grass beds, which serve as nurseries for the fish that inhabit the coral reef, and a portion of Saipan s barrier reef.			
Rehabilitatable habitat:	A proposal has been prepared by DEQ to restore mangrove stands, and one of the three proposed restoration sites is within the Takpochau watershed in the American Memorial Park (Division of Environmental Quality 1998a).			
Diversity	Wetland and marine environments located in the Takpochau watershed have high diversity. Upland areas located in the Takpochau watershed have moderate to low diversity.			
Naturalness	The American Memorial Park contains the least disturbed wetland on Saipan. The marine and upland environments are relatively disturbed.			
Fragility	The wetlands, coral reefs, and seagrass beds located in the Takpochau watershed are very fragile.			
Representativeness, typicalness, and habitat types	Typical marine, wetland, and upland systems are all represented in the Takpochau watershed.			
Spatial Extent of Non-Attainment	Unknown.			
Percent Non-Attainment	15%			
Cultural Criteria *Educational value*	Unknown			

Issue/ Criteria	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Historical value and traditional use sustainability	Unknown.			
Recreational and tourism value	High.			
Archaeological value	High (WWII artifacts in the American Memorial Park, among others).	2		• Involve CNMI Historic Preservation Office in Watershed Working Group
Scientific and research value	High (wetlands)			
Economic value	Extremely high central tourist district; Saipan is the CNMI s capital.			
Percent Non-Attainment	1%			
Planning and Management Criteria *Geographical location and zoning plans*	Wetland, mangrove, stream, and forest rehabilitation is feasible for the long term. Implementation of stormwater Best Management Practices (BMPs) for roads and the marina, and remediation of contaminated sites is feasible.			
Threat (as relates to the need to protect the watershed	Urban area is encroaching on natural areas. Alteration of surrounding land uses of natural fragile systems threatens these natural systems.	2		• Consider development of wetland habitat mitigation bank.
Manageability	Is feasible wetlands are on public land and can be protected from development encroachment. Implementation of water quality BMPs is possible.			
Size & Shape	Can be feasibly monitored and policed.			

Kagman Saipan	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Water Quality *Beneficial Use Attainment and Water Quality Standards*	All marine waters of Kagman watershed are Class AA waters. The CNMI s 305(b) report reported that the beneficial uses of the waters of Kagman watershed are being obtained. The water quality standards are generally being met. Coral reef on the west side of Kagman watershed (Lau Lau Bay #1) has similar percent cover of coral to other Saipan locations and a lower sedimentation rate (which may be due to a longer sampling duration).	1	2002 2003 2006	• Require BMPs on permit conditions • Development of watershed-specific capital infrastructure, maintenance & operating improvement needs to address chronic water quality violations. • Fully implement the Kagman Watershed Project
Number of Pollutants Exceeding Limits	One. Turbidity levels are higher on the reef flat and higher during the rainy season by more than 0.5 NTU. The rainy season turbidity levels on the reef flat exceed dry season levels. This exceedence is probably not due to natural conditions, meaning that the Water Quality Standards for turbidity are not being met.	1	2003	• Do assessment and determine source for lowering quality of water
Underground/aboveground Storage Tanks	There are no gas stations located in the watershed; however some businesses, including the farms and golf course, store fuel and used oil for generators on their property.			
Septic Tanks	According to staff in DEQ s wastewater section, there are approximately 2,000 septic systems in the Kagman watershed. The watershed is not served by the municipal sewer system and it is anticipated that another 1,000 septic systems will be installed in the Kagman homestead area.	1	2002 2004	• Support CUC efforts to develop a sewage treatment system with land-based effluent discharge. • Consider funding options for mandatory sewer connection when available.
Sewage treatment plant	None.	1	2002	• Support CUC efforts to develop a sewage treatment system with land-based effluent discharge.
Contaminated Sites	Unknown			
Wells	Nine public utility wells are located in the Kagman watershed and new wells are being drilled as a part of the NRCS Kagman Watershed Project.			
CWA 303(d) list	None			
Urban runoff potential	Relatively minor; however, many unpaved and paved roads traverse the Kagman watershed. These roads were built with little consideration given to runoff potential	1	2003	• Implement stormwater BMPs for roads

Issue / Criteria	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Agricultural runoff potential	Kagman peninsula provides 75 percent of all commercial crops on Saipan. The soils of Kagman watershed are not highly erodible; however, certain agricultural practices increase the agricultural runoff potential. The LaoLao golf course is also located in the watershed. Approximately 40 percent of the land area is under cultivation at one time.	1	2003 2005 2003 2003 2003	• Implement stormwater BMPs for farms Implement integrated farming • CAFOs — limit the number of farmers and educate them • Use DEQ 319 Pesticide Mixing Station to prevent misuse of agrichemicals • Nutrient & Pesticide Management Plans for farmers • Promote Integrated Pest Management practices
Polluting Land uses	The golf course, farms, confined animal facilities, grazing areas, septic systems, and poorly designed roads are all polluting land uses that may contribute to the degradation of the water quality in the Kagman watershed.			
Polluting land uses percent	20%			
Spatial Extent of Non-Attainment	Unknown.	1	2004	• Determine extent of non-attainment area.
Percent Non-Attainment	5%			
Listed Species *Listed species*	The Nightingale Reed Warbler (*Acrocephalus luscina*), Island Swiftlet (*Aerodramus vanikorensis bartschi*), and Marianas Moorehen (*Gallinula chloropus guami*) definitely exist within the watershed. The Green Sea Turtle (*Chelonia mydas*) and Hawksbill Turtle (*Eretmochelys imbricata*) are possibly present.	3		• Evaluate species recovery plans and incorporate recommendations wherever practical.

Issue / Criteria	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Rehabilitatable habitat	Upland and wetland habitat used by the Nightingale Reed-warbler can be enhanced, restored, and created. Wetland Moorhen habitat can be enhanced, restored, and created. Turtle nesting beaches can be enhanced. Wetlands have been degraded by contamination by metals, petroleum, agrochemical, hydrocarbons; filling; altered hydrologic regime; reduced watershed catchment area; and reduced upland buffer widths in terms of noise and pollutants. All of these factors contributing to lowered wetland habitat quality can be reduced.	3		• Rehabilitate wetlands and forests • Work with golf courses and homesteads to restore naturalness
Spatial Extent of Non-Attainment	Unknown.			
Percent Non-Attainment	10%			
Other Sensitive Natural Resources *Rare Natural Resources*	The coral reef in Lau Lau Bay is highly diverse and a popular recreational destination for SCUBA diving tourists.			
Rehabilitatable habitat:	The Forbidden Island Wildlife Conservation area has uncontrolled cattle grazing in it. The cattle can be removed or managed to protect the habitat.			
Diversity	Wetland and marine environments located in the Kagman watershed have high diversity. Upland areas located in the Kagman watershed have moderate to low diversity.			
Naturalness	Most of Kagman watershed is disturbed, with the exception of the immediate surroundings of Forbidden Island and the coral reef.			
Fragility	The wetlands and coral reefs located in the Kagman watershed are very fragile.			
Representativeness, typicalness, and habitat types	Typical marine, wetland, and upland systems are all represented in the Kagman watershed.			
Spatial Extent of Non-Attainment	Unknown.			
Percent Non-Attainment	15%			
Cultural Criteria *Educational value*	unknown.	2	2003	• Develop and implement Agricultural BMP Educational program.
Historical value and traditional use sustainability	Unknown.	2	2004	• Reuse animal waste
Recreational and tourism value	High (golfing and SCUBA diving).			
Archaeological value	High (Latte and pre-latte sites).			
Scientific and research value	High (wetlands).			

Issue / Criteria	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Economic value	High homesteads, agricultural homesteads, golf course, and coral reefs for diving; Saipan is the CNMI s capital.			
Percent Non-Attainment	1%			
Planning and Management Criteria *Geographical location and zoning plans*	Wetland and forest rehabilitation is feasible for the long term. Implementation of stormwater Best Management Practices (BMPs) for roads and agricultural BMPs for farms is feasible.			
Threat (as relates to the need to protect the watershed	The homesteads and golf course have encroached upon natural areas. The lack of a public sewage system threatens both the quality of the groundwater and marine water. Misuse of agrochemical threatens ground and marine water.	1	2003 2003	• Proper land-use management • Layout farmsteads according to topography
Manageability	Is feasible most wetlands can be protected from development encroachment. Implementation of water quality BMPs is possible.			
Size & shape	Can be feasibly monitored and policed.			

Puntan Diablo-Lamanibot — Tinian	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Water Quality *Beneficial Use Attainment and Water Quality Standards*	Tinian s marine waters were not analyzed in the CNMI s 305(b) report (Division of Environmental Quality 1998b) and DEQ s water quality database does not contain data for the Puntan Diablo - Lamanibot watershed.	1	2003 2003	• Monitor marine water quality • Enforce regulations • Development of watershed-specific capital infrastructure, maintenance & operating improvement needs to address chronic water quality violations.
Number of Pollutants Exceeding Limits	Unknown			
Underground/aboveground Storage Tanks	Unknown			
Septic Tanks	There is no public sewer system on Tinian; therefore all businesses and residences in the Puntan Diaplo-Lamanibot watershed have a septic tank or outhouse.			
Sewage treatment plant	None.			
Contaminated Sites	Numerous live bombs and shells from the war remain in the Puntan Diablo-Lamanibot watershed.	1	2006	• Hazardous waste disposal
Wells	There are no public wells in the Puntan Diaplo-Lamanibot watershed, but there is good potential for potable groundwater in the central and east parts of the watershed below the volcanic contact.	1	2005 2003	• Explore new aquifers; • implement well-head protection
CWA 303(d) list	None			
Urban runoff potential	Very minor.			

Issue / Criteria	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Agricultural runoff potential	Minor. Some farming and grazing is practiced in this watershed, with little regard to controlling erosion.	1	2004 2004 2004 2004 2004 2002	• Nutrient & Pesticide Management Plans for farmers • Promote Integrated Pest Management practices • Move Sanchez Piggery & operate under Nutrient & Waste Management Plan. • Relocate coop farm plats in Marpo Valley and hill slope to Lease Back Area • Continue Farm Conservation • Plan Requirements for land clearing.
Polluting Land Uses	The Peipeinimaru dump, which also receives pumped out septic tank waste, is located in the Puntan Diablo-Lamanibot watershed. This is an open pit dump, located near the shoreline and the airport, neither waste segregation nor composting is practiced, day cover is not employed, and the dump frequently catches fire.	1	2006 2003 2004	• Build new landfill and close old one • Implement BMPs for existing dump • Waste segregation/Recycling
Polluting land uses percent	Unknown.			
Spatial Extent of Non-Attainment	Unknown	1	2003	• Determine extent of non-attainment area.
Percent Non-Attainment	5%			

Issue / Criteria	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Listed Species *Listed species*	The Island Swiftlet (*Aerodramus vanikorensis bartschi*), Tinian monarch (*Monarcha takatsukasae*), and Green Sea Turtle (*Chelonia mydas*) definitely exist within the watershed. The Micronesian Megapode (*Megapodis laperouse laperouse*), Mariana Fruit Bat (*Pteropus mariannus mariannus*), and Hawksbill Turtle (*Eretmochelys imbricata*) are possibly present.	3		• Test water, sediments, and marine life and conduct an Ecological Risk Assessment for contamination associated with the dump • Remedy the feral cat problem • Evaluate species recovery plans and incorporate recommendations wherever practical.
Rehabilitatable habitat	Upland habitat used by the Tinian Monarch can be enhanced, restored, and created. Turtle nesting beaches can be enhanced.	3		• Restore and enhance limestone forests and restore turtle nesting beaches • Restore coral reefs • Fire prevention
Spatial Extent of Non-Attainment	Unknown.			
Percent Non-Attainment	20%			
Other Sensitive Natural Resources *Rare Natural Resources*	The Puntan Diaplo-Lamanibot watershed contains the last remaining limestone forest on Tinian. The fringing reefs in the watershed are relatively pristine and highly diverse	3		• Consider development of Commonwealth Forest encompassing Tiniain s only remnant limestone forest and adjoining coral reef.
Rehabilitatable habitat:	The limestone forests could be rehabilitated.			
Diversity	The upland areas have moderate to low diversity. The marine area has high diversity			
Naturalness	The beaches and coral reef of the Puntan Diaplo-Lamanibot watershed are relatively undisturbed and natural.			
Fragility	The coral reefs and limestone forest located in the Puntan Diaplo-Lamanibot watershed are very fragile.			
Representativeness, typicalness, and habitat types	Typical marine and upland systems are represented in the Puntan Diaplo-Lamanibot watershed.			
Spatial Extent of Non-Attainment	Unknown.			
Percent Non-Attainment	5%			

Issue / Criteria	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Cultural Criteria *Educational value*	2	2	2003	• Chinese translator needed to work with farms on BMPs.
Historical value and traditional use sustainability	Unknown.	2	2003	• Recycling/Hazardous waste disposal facility/program and education program
Recreational and tourism value	High			
Archaeological value	High (WWII sites).			
Scientific and research value	High (coral reefs).			
Economic value	Moderate airport and military land.			
Percent Non-Attainment	1%			
Planning and Management Criteria *Geographical location and zoning plans*	Forest rehabilitation is feasible and coral reef restoration may be possible. Stormwater Best Management Practices (BMPs) should be implemented for roads.	1	2003 2006 2003 2004	• Military lease back area —complete transaction • Clean up military debris • Use funds from lease to implement projects Partner with the military Control asphalt melt runoff • Implement stormwater BMPs for roads and farms
Threat (as relates to the need to protect the watershed	The continued operation of the dump causes a great threat to the ground and marine water of the Puntan Diaplo-Lamanibot watershed.			
Manageabilit:	Is feasible.			
Size & shape	Can be feasibly monitored and policed.			

Makpo Tinian	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Water Quality *Beneficial Use Attainment and Water Quality Standards*	Although Tinian s marine waters were not analyzed in the CNMI s 305(b) report (Division of Environmental Quality 1998b), DEQ s water quality database shows that the water quality is good and the designated use of Class AA waters, of which all marine waters of the Makpo Watershed (except San Jose Harbor) are included, is being met. Water quality testing in Makpo watershed from 1983-1998 indicates the median orthophosphate level of the nearshore waters surrounding Makpo watershed exceeds the CNMI s water quality standard of 0.025 mg/L. Recent coral reef surveys of Tachongna Reef in the Makpo watershed show that while coral species diversity is high, percent cover of living coral is not as high as locations on Saipan (Figures 7 and 8). Additionally, while the coral reef appears healthy at the present time, the high sedimentation rates may affect the reef in the near futurE.	1	2003	• Development of watershed-specific capital infrastructure, maintenance & operating improvement needs to address chronic water quality violations.
Number of Pollutants Exceeding Limits	None for marine water; see Wells section for drinking water.			
Underground/aboveground Storage Tanks	Unknown			
Septic Tanks	A survey conducted in 1995 found 95 septic tanks and 35 outhouses in the Makpo Watershed. There is no public sewer system on Tinian.			
Sewage treatment plant	The Tinian Dynasty Casino and Hotel recently an individual sewage treatment plant for the hotel and associated facilities. The potential proliferation of sewage treatment plants for individual developments within the watershed presents problems. The operation of sewage treatment plants for large developments is a complicated process and requires adequately trained personnel (Baldwin 1995).	1	2004	• Sewage treatment — sewer, possible better alternatives such as constructed wetlands
Contaminated Sites	Unknown	1	2006 2004	• New and improved landfill • Disposal facility for hazardous waste

Issue / Criteria	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Wells	The Makpo aquifer supplies Tinian s sole source of drinking water. The Makpo aquifer system is highly susceptible to overdraft and nonpoint source pollution contamination because recent development of village homesteads without a public waste disposal system, increased agricultural activity near the Makpo aquifer, and development pressures to expand the economy of Tinian further jeopardize this primary water source (USDA 1994b). In addition, because the Makpo aquifer is pumped using a Maui type well, which pumps water from the top of the aquifer where most pollutants accumulate because the water surface is very near ground level, this type of well is highly susceptible to contamination. Water quality testing of the Makpo aquifer well show the water quality is impaired. The nitrate level is greater than 6 mg/L, which is close to the drinking water standards of 10 mg/L. Consequently, the well is under threat	3	2004 2005 2003 2004 2006 2003 2008	• Implement recommendations made in USGS water resources study • Improve Maui well collection efficiency • Establish a comprehensive water metering system to reduce waste • Develop additional drinking water storage capacity to reduce dry season withdrawl • Repair or replace the distribution system • Consider water supply alternatives such as reservoir to collect surface water in Carolinas slope. • Construct new wells and reactivate old military wells.
CWA 303(d) list	None			
Urban runoff potential	High. San Jose Village, the only urban site on Tinian, is located in the Makpo Watershed. Several new roads were paved throughout the watershed with little consideration given to planning for control of urban runoff on impervious surfaces.	1	2003	• Nutrient control and monitoring

Issue / Criteria	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Agricultural runoff potential	High. Practically all of the farming done on Tinian is within the Makpo watershed. Makpo Valley has excellent soils for crop production and irrigation water is available. However, much of the farming and grazing is done with little regard to controlling erosion.	1	2003 2004 2005 2006 2006 2003 2004 2004	• Identify and preserve prime agricultural soils • Relocate Marpo agricultural area to the lease-back area • Homestead program — way to implement zoning and better planning for development • Implement new regulations to restrict livestock farms • Animal waste treatment — regulations and alternatives • Prevent misuse of agrichemicals • Nutrient & Pesticide Management Plans for farmers • Promote Integrated Pest Management practices
Polluting Land uses	Limestone quarry (2); Auto repair shops (1); Automotive fluids (11,468 gallons); Septic tanks (95); Outhouses (35); Agricultural chemicals (108 gallons + 6,837 pounds); Fertilizers (31,020 pounds); Area farmed (34 hectares); Area pastured (435 hectares); Area co-op agricultural (14 hectares)	1	2003	• Public Education
Polluting land uses percent	10%			
Spatial Extent of Non-Attainment	Unknown	1	2003	• Determine extent of non-attainment area.
Percent Non-Attainment	10%			

Issue / Criteria	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Listed Species *Listed species*	The Island Swiftlet (*Aerodramus vanikorensis bartschi*), Tinian monarch (*Monarcha takatsukasae*), Mariana moorhen (*Gallinula chloropus guami*), and green sea turtle (*Chelonia mydas*) definitely exist within the watershed. The Micronesian Megapode (*Megapodis laperouse laperouse*), Mariana fruit bat (*Pteropus mariannus mariannus*), and hawksbill turtle (*Eretmochelys imbricata*) are possibly present.	3		• Implement or boost land exchange for sensitive areas • Rehabilitate wetland and forests • Restore coral reef • Modeling for wetland and well-head deliniation • Fence wetland, well-head protection, special-use zoning • Develop and monitor conservation plans • Enforce boating and coral harvesting regulations. Restrict reef walking. • Create legislation to protect coastal waters from contamination from petroleum waste and shipwrecks • Animal waste treatment — regulations and alternatives • Nutrient control and monitoring • Evaluate species recovery plans and incorporate recommendations wherever practical.

Issue / Criteria	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Rehabilitatable habitat	Upland habitat used by the Tinian monarch can be enhanced, restored, and created. Wetland moorhern habitat can be enhanced, restored, and created. Turtle nesting beaches can be enhanced. The Makpo wetland (11.1 hectares) is one of only two major wetlands on Tinian. The wetland has been degraded through contamination from agricultural runoff, filling, altered hydrologic regime and reduced watershed catchment area, and reduced upland buffer widths in terms of noise and pollutants. All of these factors contributing to lowered wetland habitat quality can be reduced.			
Spatial Extent of Non-Attainment	Unknown.			
Percent Non-Attainment	3%			
Other Sensitive Natural Resources *Rare Natural Resources*	The patch reef directly off Tachongna Beach has one of the highest diversities of marine life in the CNMI. In addition, this area has received a high listing as a possible marine sanctuary under Title III of the Marine Protection, Research, and Sanctuaries Act - National Marine Sanctuary Program, which is administered by the National Oceanic and Atmospheric Administration.			
Rehabilitatable habitat:	The Makpo wetland could be easily restored through private land acquisition and implementation of Best Management Practices (BMPs).	3		• Delineate sensitive area boundaries. Fence Wetland • Zoning around wetlands, designate sole-source aquifer • Develop and monitor conservation plans • Enforce boating and coral harvesting regulations. Restrict reef walking. Restore coral reef • Rehabilitate wetland and forests
Diversity	Wetland and marine environments located in the Makpo watershed have high diversity. Upland areas located in the Makpo watershed are moderate to low diversity.			
Naturalness	The beaches and coral reef of Makpo watershed used to be relatively undisturbed and natural. However, with the increased use from staff and guests of the Tinian Dynasty Hotel and Casino, the beaches and reefs are likely to lose their naturalness rather quickly.			

Issue / Criteria	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Fragility	The wetland, coral reefs, and limestone forest located in the Makpo watershed are very fragile.			
Representativeness, typicalness, and habitat types	Typical marine, wetland, and upland systems are all represented in the Makpo watershed.			
Spatial Extent of Non-Attainment	Unknown.			
Percent Non-Attainment	5%			
Cultural Criteria *Educational value*	Unknown.	2	2003 2003 2004 2003	• Education, publicity, media, practice, awareness, pollution prevention • Educate public about the importance of preserving soil, wildlife, and water resources • Education for schools to promote water conservation • Educate resource users from the casino on the fragileness of the beach and reef
Historical value and traditional use sustainability	Unknown.			
Recreational and tourism value	High. Almost all of Tinian s tourist facilities are located in the Makpo watershed.			
Archaeological value	High (Taga House)			
Scientific and research value	High (wetlands and coral reefs).			
Economic value	Extremely high central business district, tourism center, homesteads, and sole source of drinking water.			
Percent Non-Attainment	1%			

Issue / Criteria	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Planning and Management Criteria *Geographical location and zoning plans*	Wetland and forest rehabilitation is feasible and coral reef restoration may be possible. Stormwater Best Management Practices (BMPs) should be implemented for roads and the marina.	1	2004 2003 2004 2003 2003 2004	• Finalize the Tinian Master Plan or implement Land-Use Planning • Implement stormwater BMPs for roads, farms and marina • Connect beach-side restrooms to sewage system • Control land-use, grading and paving of roads • Hire new or delegate responsibility for watershed coordinator • Better Well-head protection, special-use zoning
Threat (as relates to the need to protect the watershed	Urban and agricultural areas are encroaching on the Makpo wetland. Increased use of the beach and coral reef by inexperienced visitors put this valuable resource at risk. Alteration of surrounding land uses of natural fragile systems threatens these natural systems. Other casinos and a major golf course are proposed to be developed in this watershed.	1	2003 2003 2004 2004	• Regulate land use surrounding the Marpo wetland to prevent contamination • Implement Baldwin recommendations • Implement or boost land exchange for sensitive areas • Create legislation to protect coastal waters from contamination from petroleum waste and shipwrecks
Manageability	Is feasible the majority of the wetland is on public land and can be protected from encroaching development. Implementation of water quality BMPs is possible.			
Size & shape	Can be feasibly monitored and policed.			

Sabana/ Talakahaya/ Palie — Rota	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Water Quality *Beneficial Use Attainment and Water Quality Standards*	Rota s marine waters were not analyzed in the CNMI s 305(b) report (Division of Environmental Quality 1998b), and DEQ s water quality database does not contain water quality data for the Sabana/Talakhaya/Palie watershed. All of the watershed s marine waters are Class AA waters (defined in the CNMI s Water Quality Standards to mean that the uses to be protected in this class of waters are the support and propagation of shellfish and other marine life, conservation of coral reefs and wilderness areas, oceanographic research, and aesthetic enjoyment and compatible recreation inclusive of whole body contact and related activities) (Division of Environmental Quality 1997a). It is unknown at this time whether or not the designated use or water quality standards are being met, although Rota residents report high turbidity levels during the rainy season (J.Rosario, pers.comm.).	1	2004 2003 2003 2005	• Monitor marine water quality • Implement stormwater BMPs for roads and farms • Development of watershed-specific capital infrastructure, maintenance & operating improvement needs to address chronic water quality violations. • Construct small-scale erosion control practices to prevent gullies on the Sabana
Number of Pollutants Exceeding Limits	Unknown.			
Underground/aboveground Storage Tanks	A small fuel storage tank is located at the MTC site in the Sabana/Talakhaya/Palie watershed and some of the farms may store fuel for generators.			
Septic Tanks	There is no public sewer system on Rota; therefore all businesses and residences in the Sabana/Talakhaya/Palie watershed have a septic tank or outhouse. The Rota Watershed Group estimates there are fewer than ten septic tanks in the watershed.	1	2003	• Maintain septic systems better
Sewage treatment plant	None.			
Contaminated Sites	Minor. Guano phosphate and manganese oxide were mined within the Sabana/Talakhaya/Palie watershed before World War II. A pile of approximately 100 tons of manganese oxide was left and open phosphate holes and trenches remain (USDA 1994a). EnviroSearch (1995) found DDT in several soil samples taken from the Sabana.			

Issue / Criteria	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Wells	None; however, the Matan Hanom and As Onaan springs in Talakhaya produce considerable amounts of water that constitute the island s sole source of domestic water. These springs are the only source of surface drinking water in the CNMI and the quality of the water is quite good. USGS performed water quality sampling at the Matan Hanom, As Onan, and Okgog streams in 1993. They found the quality of the water generally excellent. They found only three constituents (toluene, benzene, and methylenechloride) to be above detectable limits, during one sample period (EnviroSearch 1995).	1	2004 2008	• Designate the aquifer as a sole-source aquifer • Collect surface water runoff and divert to storage
CWA 303(d) list	None			
Urban runoff potential	Minor			
Agricultural runoff potential	Talakhaya and Palie - The volcanic core of Rota is exposed at Mt. Manira, the island s highest point, and on the steeply dissected river valley complex that slopes toward the southern shoreline. Soils of Laolao Clay and the Akina-Badland Complex are predominant in the Talakhaya area; these are highly erodible soils (Young 1986). Talakhaya sustains numerous small ranches and subsistence farms, which are operated using traditional methods (USDA 1994). Sabana - The soils of the Sabana are not necessarily highly erodible; however, certain agricultural practices on the Sabana increase the agricultural runoff potential. Much of the Sabana is an open area, meaning that any individual may begin farming without any formal lease process, payments, or land tenure transferals (USDA 1994). Cultivation using low cost government tractors and lack of ownership on the Sabana result in the tilling of the soil under improper conditions (USDA 1994).	1 -	2004 2004	• Nutrient & Pesticide Management Plans for farmers • Promote Integrated Pest Management practices

Issue / Criteria	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Polluting Land uses	Agricultural plots and grazing, secondary road erosion, and range fires are the three predominant polluting land uses in the Sabana/Talakhaya/Palie watershed. An unpaved, secondary road traverses much of this watershed. Frequent storms and lack of BMPs make this road susceptible to erosion. The volcanic slopes in the Talakhaya area are experiencing accelerated erosion and slumping because residents intentionally set range fires to reduce the protective cover favored by the introduced Sambar deer. New grass shoots emerge after burning, which attract the deer to open areas where they are more easily taken by poachers. The periodic burning encourages the growth of clump grasses that provide inadequate cover, poor forage, and further increase the fire hazard (USDA 1994). It was estimated that there were over 80 fires in the 1998 dry season and 240 hectares were burned.			
Polluting land uses percent	60 %	1	2003	
Spatial Extent of Non-Attainment	Unknown.	1	2003	• Determine extent of non-attainment area.
Percent Non-Attainment	25%			
Listed Species *Listed species*	The Marianas Fruit Bat (*Pteropus mariannus mariannus*), Marianas Crow (*Corvus kubaryi*), Rota Bridled White-eye (*Zosterops conspicillata rotensis*), Green Sea Turtle (*Chelonia mydas*), the fern disciplina (*Lycopodium phlegmaria* var. *longifolium*) and the fire tree (*Serianthes nelsonii*) definitely exist within the watershed. The Hawksbill Turtle (*Eretmochelys imbricata*) is possibly present.	3		• Botanical study for threatened plants • Revegetation projects • Restore coral reefs • Restore and enhance forests and upland habitat and restore turtle nesting beaches • Evaluate species recovery plans and incorporate recommendations wherever practical.
Rehabilitatable habitat *Spatial Extent of Non-Attainment*	Upland and wetland habitat used by all of the listed species can be enhanced, restored, and created. The riparian habitat can be enhanced and restored. Turtle nesting beaches can be enhanced. The riparian habitat has been degraded by contamination by sedimentation, altered hydrologic regime and reduced watershed catchment area, and reduced buffer widths in terms of noise and pollutants. All of these factors contributing to lowered riparian habitat quality can be reduced.			
	Unknown.			

Issue/ Criteria	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Suitable	Restoration Strategy
Percent Non-Attainment	50%	3		• Consider reasons for high polluting land use percentages.
Other Sensitive Natural Resources *Rare Natural Resources*	The seven streams in the Sabana/Talakhaya/Palie watershed are the only of their type in the CNMI. Oggog stream contains a number of waterfalls. The western part of the watershed drains into Sasanhaya Bay, which is a proposed marine park.	3		• Consider adequacy of streamflow rates for habitat maintenance.
Rehabilitatable habitat:	The streams could be restored and the coral reef protected by reducing soil erosion in the Talakhaya and preventing agricultural runoff on the Sabana.			
Diversity	The streams and marine environments located in the Makpo watershed have high diversity. Upland areas located in the have moderate to low diversity, but high plant diversity as compared to other areas in the CNMI.			
Naturalness	The Sabana has lost much of its naturalness since its cultivation during the Japanese area. The Talakhaya and Palie areas are still relatively natural. The fringing coral reef is still natural.			
Fragility	The streams, coral reefs, and limestone forest located in the Sabana/Talakhaya/Palie watershed are very fragile.			
Representativeness, typicalness, and habitat types	Typical marine, riparian, and upland systems are all represented in the Sabana/Talakhaya/Palie watershed.			
Spatial Extent of Non-Attainment	Unknown.			
Percent Non-Attainment	5%			

Issue / Criteria	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Start date	Restoration Strategy
Cultural Criteria *Educational value*	Moderate. The Sabana/Talakhaya/Palie watershed contains the only perennial streams in the CNMI, the watershed is home to endangered plants and animals, and it is an area where traditional farming practices and medicinal plants knowledge can be passed on.	2	2003 2003 2005 2003	• Education and enforcement against poachers and fire starters • Encourage ecotourism • Train Sabana farmers to use the DLNR equipment properly • Expand the NMC/DEQ pesticide applicator courses — emphasize the environment, offer them more frequently, offer them in native languages of all farming employees. • Implement a strong education program in natural resource protection
Historical value and traditional use sustainability	Moderate. Ancient Chamorro, Spanish, and Japanese historical sites are present in the watershed.			
Recreational and tourism value	High. Several tourist sites are in the watershed, including the Pace Memorial and Japanese command post. The watershed has great potential for ecotourism and spectacular views.			
Archaeological value	Moderate. There are ancient settlements near the streams.			
Scientific and research value	High (riparian areas, limestone forests, rare plants, and coral reefs).			
Economic value	High agricultural center, sole source of drinking water, tourism potential.			
Percent Non-Attainment	1%			

Issue / Criteria	Summary of Watershed Issues (Tafled Watershed Assessment)	Priority	Schedule	Restoration Strategy
Planning and Management Criteria *Geographical location and zoning plans*	Riparian and forest rehabilitation is feasible and coral reef restoration may be possible.	1	2004 2003 2003 2004 2004 2003	• Recycle • Waste oil collection • Buy a chipper to be used for composting • Implement land-use planning • Land-exchange for sensitive lots • Implement the Sabana Management Plan
Threat (as relates to the need to protect the watershed	Contamination resulting from increased and uninformed use of agrochemical on the Sabana; Sediment loading in the surface water resources resulting from the loss of top soil in the Talakhaya; and Contamination from septic back pressure on water transmission lines resulting from poorly maintained septic systems (EnviroSearch 1995).			
Manageability	Is feasible the majority of the Sabana/Talakhaya/Palie watershed (80 percent) is on public land and can be protected from through implementation of BMPs.			
Size & shape	Can be feasibly monitored and policed.			

Uyulan Hulo/Teteto° Rota	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Water Quality *Beneficial Use Attainment and Water Quality Standards*	Rota s marine waters were not analyzed in the CNMI s 305(b) report (Division of Environmental Quality 1998b), and DEQ s water quality database does not contain water quality data for the Uyulan Hulo/Teteto watershed. All of the watershed s marine waters are Class AA waters (defined in the CNMI s Water Quality Standards to mean that the uses to be protected in this class of waters are the support and propagation of shellfish and other marine life, conservation of coral reefs and wilderness areas, oceanographic research, and aesthetic enjoyment and compatible recreation inclusive of whole body contact and related activities) (Division of Environmental Quality 1997a). It is unknown at this time whether or not the designated use or water quality standards are being met.	1	2003	• Development of watershed-specific capital infrastructure, maintenance & operating improvement needs to address chronic water quality violations.
Number of Pollutants Exceeding Limits	Unknown.			
Underground/aboveground Storage Tanks	One gas station and a store that sells LPG are located in the Uyulan Hulo/Teteto watershed.			
Septic Tanks	here is no public sewer system on Rota, so all commercial and residential establishments utilize septic systems or outhouses, some of which are very close to the coastline.			
Sewage treatment plant	The Rota Resort built an individual sewage treatment plant for the resort. The potential proliferation of sewage treatment plants for individual developments within the watershed presents problems. The operation of sewage treatment plants for large developments is a complicated process and requires adequately trained personnel (Baldwin 1995).			
Contaminated Sites	The main polluting land-use in the Uyulan Hulo/Teteto watershed is the dump. This is an open pit dump, located near the shoreline, neither waste segregation nor composting is practiced, day cover is not employed, and the dump frequently catches fire.	1	2004	• Develop and implement Sanitary Landfill Plan for Rota
Wells	The Rota Resort drilled several wells for use by resort.			
CWA 303(d) list	None			
Urban runoff potential	Minor.			
Agricultural runoff potential	Minor. Over-grazing and feral animals are causing the greatest runoff in the Uyulan Huto/Teteto watershed.	1	2004 2004	• Nutrient & Pesticide Management Plans for farmers • Promote Integrated Pest Management practices
Polluting Land uses	The dump is the primary polluting landuse in the Uyulan Hulo/Teteto watershed..			

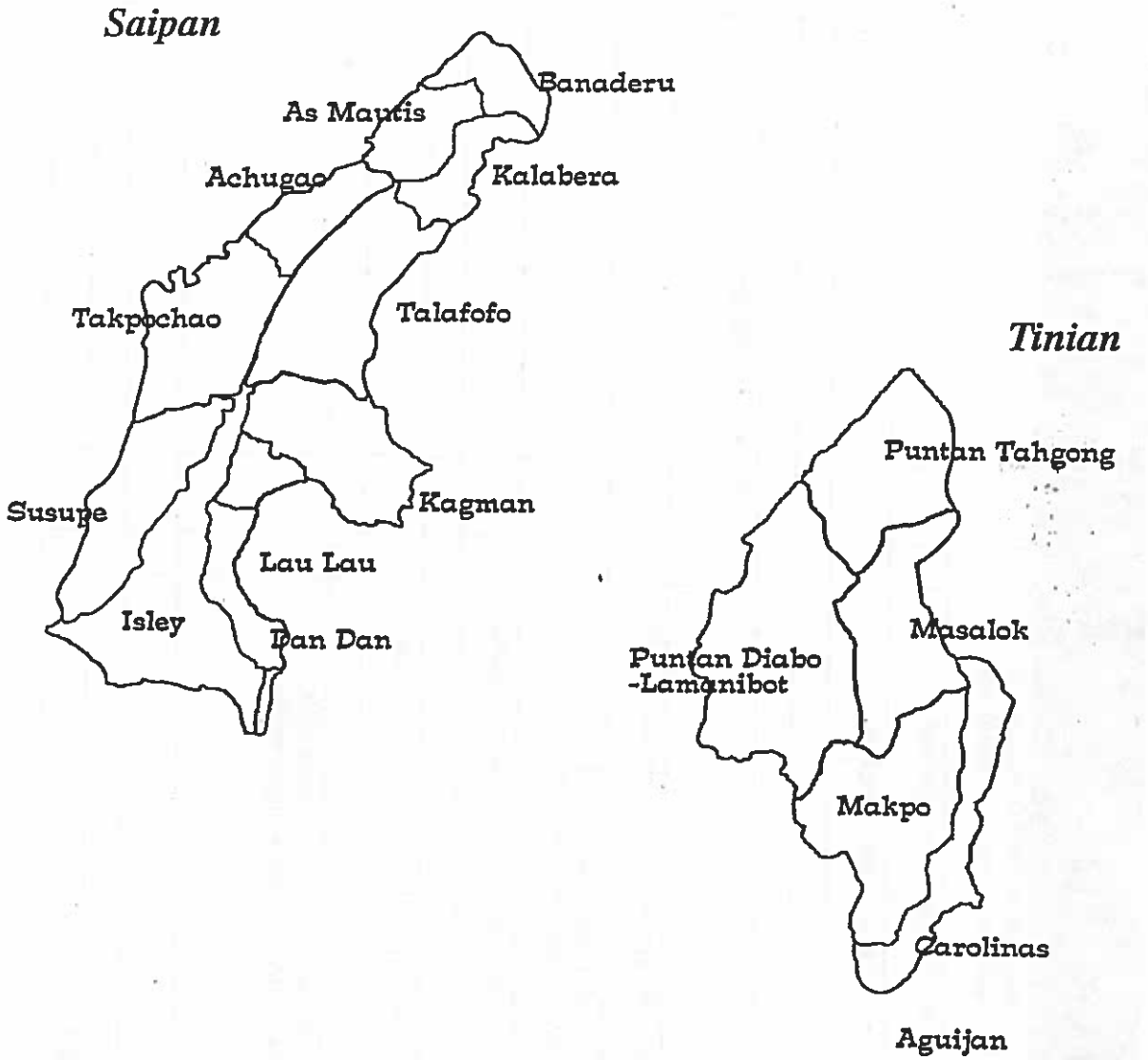
Issue / Criteria	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Polluting land uses percent	10%			
Spatial Extent of Non-Attainment	Unknown	1	2003	• Determine extent of non-attainment area.
Percent Non-Attainment	5%			
Listed Species *Listed species*	The Marianas Fruit Bat (*Pteropus mariannus mariannus*), Marianas Crow (*Corvus kubaryi*), Rota Bridled White-eye (*Zosterops conspicillata rotensis*), Green Sea Turtle (*Chelonia mydas*), and the fire tree (*Serianthes nelsonii*) definitely exist within the watershed. The Hawksbill Turtle (*Eretmochelys imbricata*) is possibly present.	3		• Evaluate species recovery plans and incorporate recommendations wherever practical.
Rehabilitatable habitat	Upland and wetland habitat used by all of the listed species can be enhanced, restored, and created.			
Spatial Extent of Non-Attainment	Unknown.			
Percent Non-Attainment	8%			
Other Sensitive Natural Resources *Rare Natural Resources*	The Uyulan Huto/Teteto watershed contains healthy and diverse coral reefs and a few pocket beaches.			
Rehabilitatable habitat:	Unknown.			
Diversity	The coral reef environment in the Uyulan Huto/Teteto watershed has high diversity. Upland areas located in the have moderate to low diversity.			
Naturalness	The coral reef is in a natural state.			
Fragility	The coral reefs and limestone forest located in the Uyulan Huto/Teteto watershed are very fragile.			
Representativeness, typicalness, and habitat types	Typical marine and upland systems are all represented in the Uyulan Huto/Teteto watershed.			
Spatial Extent of Non-Attainment	Unknown.			
Percent Non-Attainment	5%			
Cultural Criteria *Educational value*	Moderate. Ancient Chamorro, Spanish, and Japanese historical sites are present in the watershed.			
Historical value and traditional use sustainability	Moderate. Ancient Chamorro, Spanish, and Japanese historical sites are present in the watershed.			
Recreational and tourism value	High.			
Archaeological value	High. The *Santa Margarita*, a Manila galleon is supposedly located in the Uyulan Huto/Teteto watershed.			

Issue / Criteria	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Scientific and research value	High (coral reefs).			
Economic value	Moderate.			
Percent Non-Attainment	1%			
Planning and Management Criteria *Geographical location and zoning plans*	Forest rehabilitation is feasible and coral reef restoration may be possible.	1	2003	• Stormwater Best Management Practices (BMPs) should be implemented for roads.
Threat (as relates to the need to protect the watershed	Unknown			
Manageabilit	Is feasible.			
Size & shape	Can be feasibly monitored and policed.			

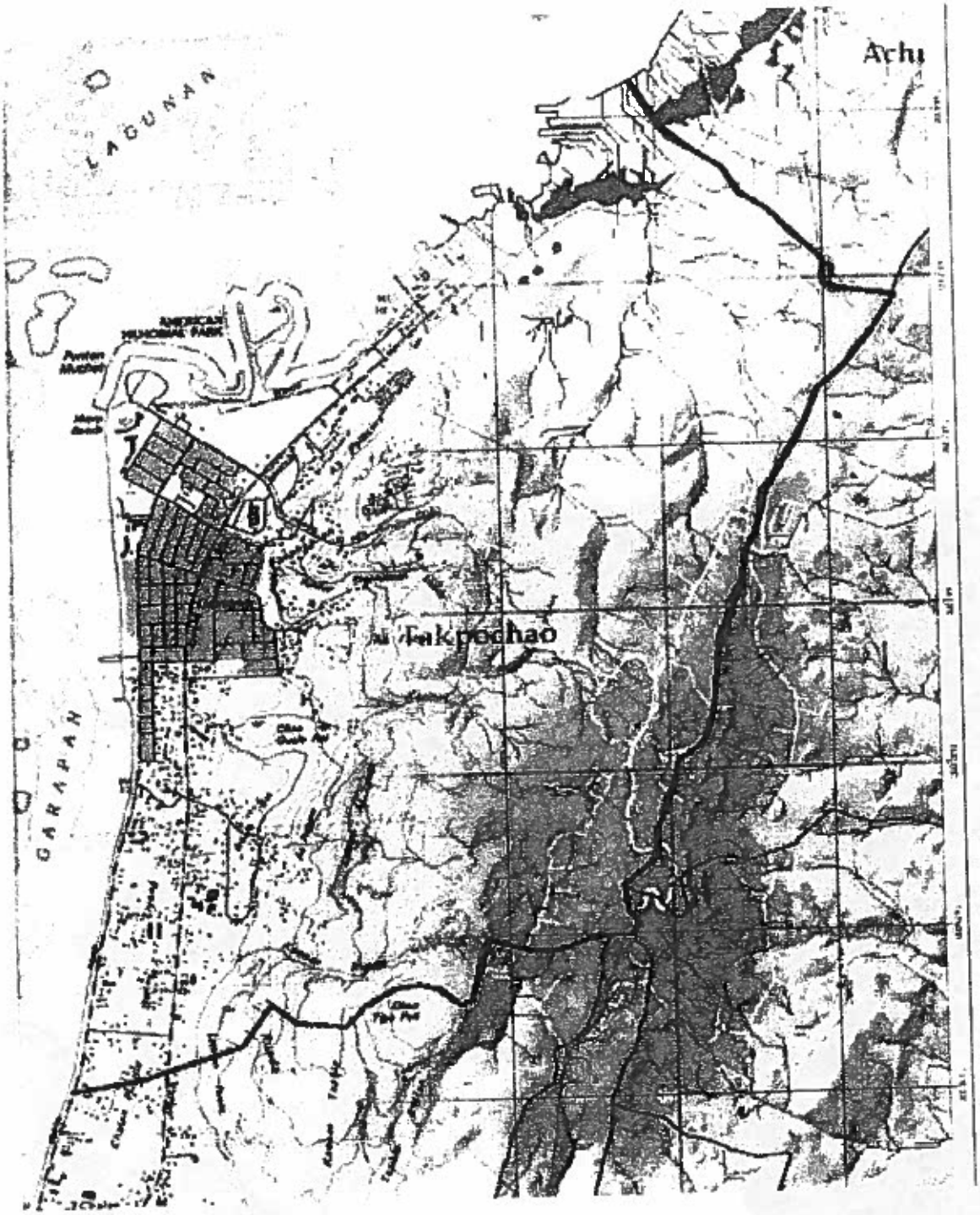
Songsong Rota	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Water Quality *Beneficial Use Attainment and Water Quality Standards*	Although Rota s marine waters were not analyzed in the CNMI s 305(b) report (Division of Environmental Quality 1998b), DEQ s water quality database shows that the water quality is good and the designated uses of the Songsong watershed are being met. East Harbor and West Harbor are Class A waters and the remaining waters of Songsong watershed are designated as Class AA. Figures 13-19 show the geometric means of water quality data collected from 1994-1998 in both Songsong and Uyulan/Teteto watersheds. The water quality data show that the water quality of these two watersheds is generally good. Figure 18 shows Songsong watershed has more frequent microbiological violations than Uyulan/Teteto watershed.	1	2003 2003 2003 2005	• Development of watershed-specific capital infrastructure, maintenance & operating improvement needs to address chronic water quality violations. • Monitor marine water quality • Implement stormwater BMPs for roads and the marina • Centralize recirculating sand filter or other nitrogen-reducing, alternative wastewater system (i.e., wetland)
Number of Pollutants Exceeding Limits	None.			
Underground/aboveground Storage Tanks	Mobil Oil and the Commonwealth Utilities Corporations bulk oil storage tanks are located in the Songsong watershed, as are the power plant, several mechanic shops, and several gas stations.			
Septic Tanks	There is no public sewer system on Rota, so all commercial and residential establishments utilize septic systems or outhouses.	1	2003	• Maintain septic systems better
Sewage treatment plant	None. A variable grade sewer system, which would have linked septic tanks in the Songsong watershed and disposed of the waste through an ocean outfall, was partially constructed. However, the outfall was destroyed by a typhoon in 1988 and was never completed (USDA 1994).	1	2008	• Develop and implement WWTP
Contaminated Sites	Several former dump sites are scattered throughout Songsong watershed			
Wells	There are no public or private wells in the Songsong watershed.			
CWA 303(d) list	None			
Urban runoff potential	High. The major streets in Songsong village were recently paved without developing a storm water control system. The stormwater flows directly to the shoreline, causing beach erosion and a major inflow of fresh, sediment- and petroleum product-laden, water into the reef ecosystem			

Issue / Criteria	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Agricultural runoff potential	Minor.	1	2004 2004	• Nutrient & Pesticide Management Plans for farmers • Promote Integrated Pest Management practices
Polluting Land uses	The watershed contains the main village of Songsong and other smaller villages. Most of the island s major facilities, such as the power plant, harbors, government offices, schools, and businesses are located in Songsong watershed.			
Polluting land uses percent	Unknown			
Spatial Extent of Non-Attainment	Unknown.	1	2003	• Determine extent of non-attainment area.
Percent Non-Attainment	50%			
Listed Species *Listed species*	The Marianas Fruit Bat (*Pteropus mariannus mariannus*), Marianas Crow (*Corvus kubaryi)* definitely exist within the watershed, and possibly the Hawksbill Turtle (*Eretmochelys imbricata*) and Green Sea Turtle (*Chelonia mydas*) are present.	3		• Restore and enhance forests and upland habitat and restore turtle nesting beaches • Restore coral reefs • Evaluate species recovery plans and incorporate recommendations wherever practical.
Rehabilitatable habitat	Upland habitat used by all of the listed species can be enhanced, restored, and created. Turtle nesting beaches can be enhanced.			
Spatial Extent of Non-Attainment	Unknown			
Percent Non-Attainment	10%			
Other Sensitive Natural Resources *Rare Natural Resources*	Songsong watershed contains healthy and diverse fringing coral reefs and a few pocket beaches. The Rota delegation is proposing a bill to the legislature to create the Pinatang Marine Reserve on the Northeastern part of the Songsong watershed.	3		Support efforts to develop Pinatang Marine Reserve
Rehabilitatable habitat	Unknown.			
Diversity	The coral reef environment in the Songsong watershed has high diversity. Upland areas located in the have moderate to low diversity.			

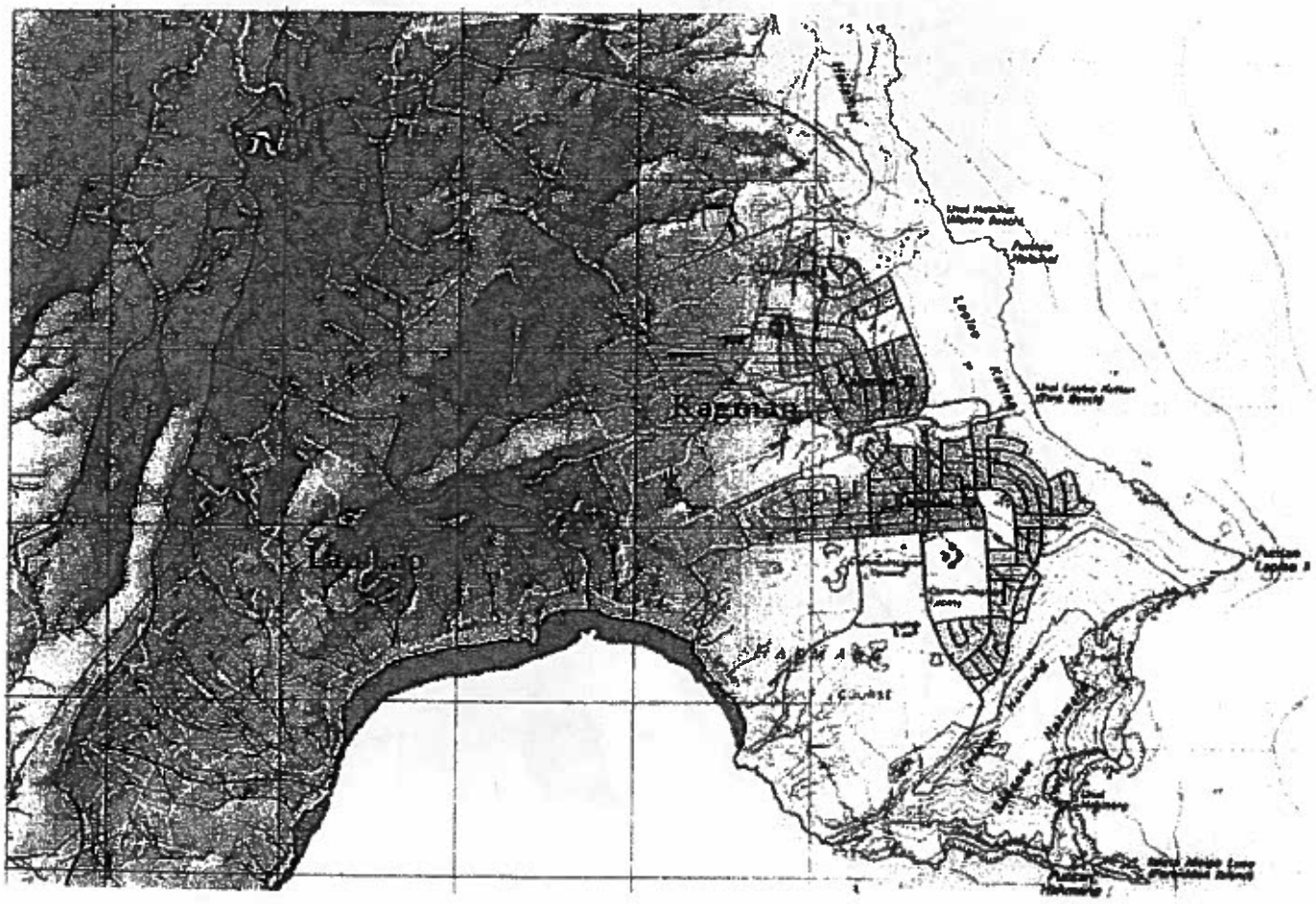
Issue / Criteria	Summary of Watershed Issues (Unified Watershed Assessment)	Priority	Schedule	Restoration Strategy
Naturalness	The coral reef in Sasanhaya Bay (with the exception of Coral Gardens, which was recently destroyed when the US Navy detonated 50-year old unexploded depth chargers) is in a natural state.			
Fragility	The coral reefs and limestone forest located in the Songsong watershed are very fragile.			
Representativeness, typicalness, and habitat types	Typical marine and upland systems are all represented in the Songsong watershed.			
Spatial Extent of Non-Attainment	Unknown.			
Percent Non-Attainment	5%			
Cultural Criteria	Moderate.	2	2003	• Encourage ecotourism
Educational value				
Historical value and traditional use sustainability	Moderate. Ancient Chamorro, Spanish, and Japanese historical sites are present in the watershed.			
Recreational and tourism value	High. Songsong is the central business and residential district in Rota. Most tourists SCUBA dive in Sasanhaya Bay and depart from either East or West Harbor.			
Archaeological value	High. The *Shoun Maru*, a Japanese cargo ship sunk during WWII, is designated as a Nationally Historic site.			
Scientific and research value	High (coral reefs).			
Economic value	High the commercial seaport and business center of the island lie in Songsong village.			
Percent Non-Attainment	1%			
Planning and Management Criteria	Forest rehabilitation is feasible and coral reef restoration may be possible. Stormwater Best Management Practices (BMPs) should be implemented for roads.			
Geographical location and zoning plans				
Threat (as relates to the need to protect the watershed	Unknown.			
Manageability	Is feasible.			
Size & Shape	Can be feasibly monitored and policed.			



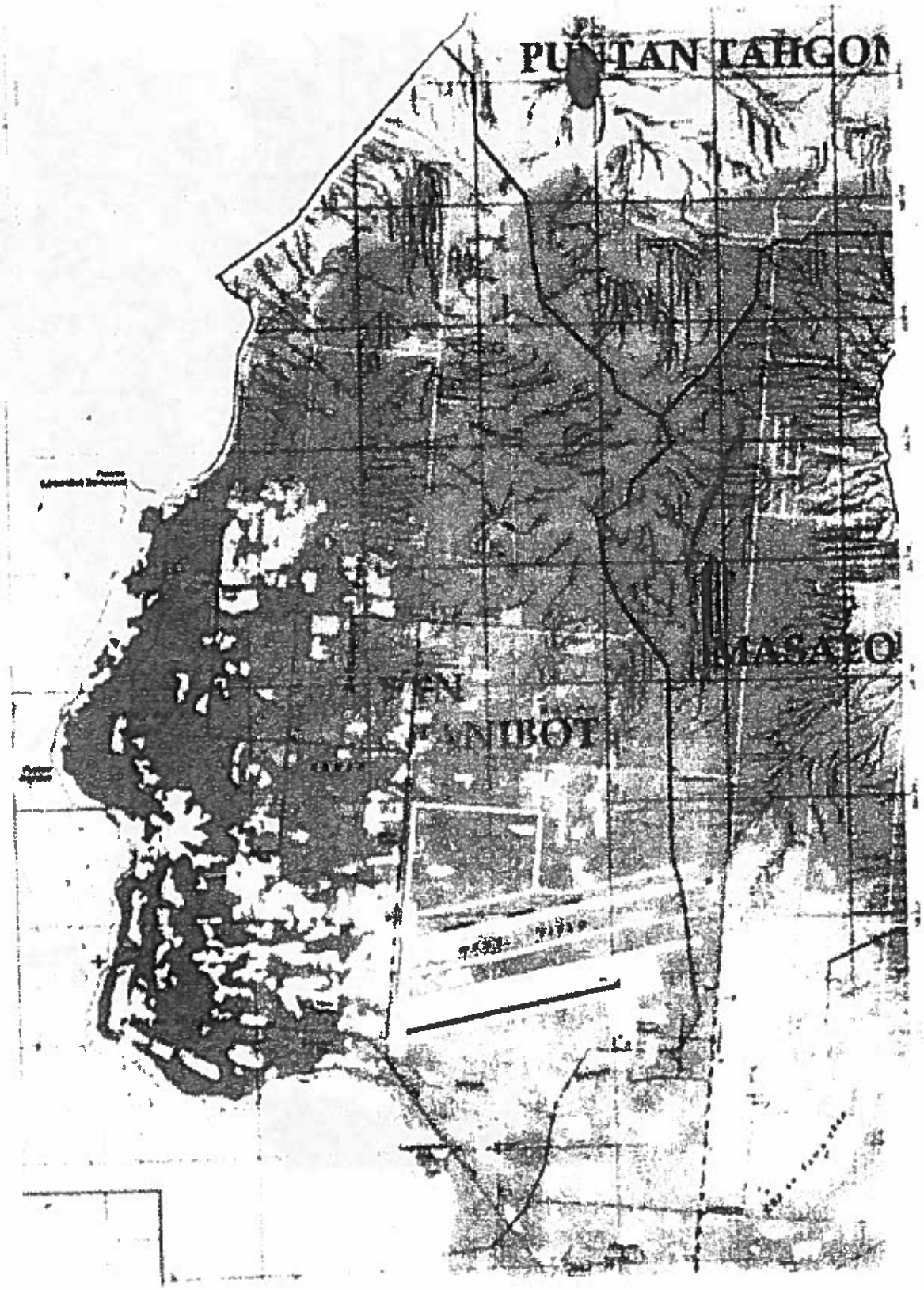
CNMI Watershed Locations



Saipan **Takpochau Watershed**



Saipan **Kagman Watershed**



Tinian **Puntan Diablo-Lamanibot Watershed**

Tinian Makpo Watershed

Narratives

1. Nutrient Management Measure for Animal Waste Control Facilities
2. Watershed Protection and Existing Development
3. On-Site Disposal System
4. Construction Site Chemical Control
5. Roads, Highways Bridges
6. Critical Coastal Areas
7. Marinas – Siting and Design
8. Marinas – Boat Operation and Maintenance
9. Monitoring Measure

COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS GOVERNMENT

Assessment of the Implementation of Section 6217 Nutrient Management Measure for Animal Waste Control Facilities in The Commonwealth of the Northern Mariana Islands

NOAA Draft, September10, 2002

The following are the original finding, condition, and rationale as described in the letter from USEPA and NOAA, dated October 3, 1997, that transmitted the Findings for the Commonwealth of The Northern Mariana Islands Coastal Nonpoint Pollution Program.

FINDING: The CNMI has provided sufficient justification to support a categorical exclusion of agriculture, except for exclusion of measures for confined animal facilities and certain aspects of the nutrient management measure.

CONDITION: Within two years, the CNMI will include in its program management measures in conformity with the 6217(g) guidance for confined animal facilities (large and small) and for nutrient management as it applies to animal waste, and enforceable policies and mechanisms to ensure implementation throughout the 6217 management area.

RATIONALE: The 1990 Census of Agriculture accounts for approximately 120 farms covering 14,400 acres in the CNMI. CNMI's submittal indicates that the number of farms and acreage may be considerably less. Most of the farms are small subsistence farms averaging two to five acres in size. Corporate farms are found on each of the major islands, but these are also relatively small, e. g. two to 15 acres in size on Saipan. While 20% of the Northern Marianas is classified as rangeland or pastureland, many of these areas are not actually grazed, and where grazing does occur, topography makes it unlikely that runoff would impact coastal waters.

The 1990 Census of Agriculture found over 4,400 head of cattle and calves, and 2,800 hogs in the CNMI. Information included in the program submittal indicates that there are three chicken ranches, two which meet the 6217(g) guidance for small facilities, and one which meets the criteria for a large confined animal facility. The CNMI is also evaluating a planned piggery which may eventually house 5,000 to 10,000 animals. The size of these facilities and the amount of animal waste generated has the potential to adversely impact coastal waters, and therefore, an exclusion of these sources from the coastal nonpoint program is not justified. NOAA and EPA recognize the special circumstances of the CNMI with respect high annual rainfall and will work with the CNMI to identify appropriate approaches to meet these management measures.

NOAA and EPA note that CNMI has the authority to require implementation of management measures for some new and expanding facilities under the Coastal Resources Management permitting procedure and under Individual/Other Wastewater Disposal System (IWDS) Regulations.

In response to this finding and condition, the Commonwealth of the Northern Mariana Islands Division of Environmental Quality and the Coastal Resources Management Program have strengthened the Commonwealth's programs to address CAFOs , including the nutrient management measurement as it applies to animal waste control facilities.

The CNMI's program to address the Nutrient Management Measure As It Applies to Animal Waste Control Facilities

Nutrients from confined animal facilities are generated from manure that includes bedding, and other wastes added to the manure, containing nitrogen, phosphorus, and potassium, secondary nutrients, micronutrients, salts, some metals and organics. Manure from animal waste control facilities may be used as a fertilizer. The goal of the nutrient management measure is to minimize edge of field delivery of nutrients, and minimize leaching of nutrients from the root zone which is achieved by developing a nutrient budget for the crop. Applying only types and amounts of nutrients at the proper time, necessary to produce a crop, and considering the environmental hazards of the site. Until the CNMI Agriculture Census becomes available in February, 2003, we will not have an accurate inventory of CAFOs.

In the CNMI, there are two types of animal waste control systems that generate manure that could be used for fertilizer. These are chicken farms and a piggery. There are three (3) chicken farms (Torres Farm, Youth With a Mission and Joeten) that have several hundred chickens each, and the piggery (Seishin Farm) is a fairly medium size, housing less than 500 pigs. Since the findings in the rationale above, numbers have changed. The proposed piggery to be built that will house 5,000 to 10,000 pigs never materialized due to the inability to manage the existing one mentioned in this paragraph.

Two chicken farms segregate and give out chicken wastes for use as fertilizer by vegetable farmers. Amount and methods for application of chicken manure as fertilizer are based on experience of the farmer. The other chicken farm is connected to the sewer system, and diverts its waste into the sewer. The piggery has a waste treatment system, and composts sludge material with grass clippings for landscape use. Treated wastewater is used for irrigation at their existing vegetable farm adjacent to the piggery. The piggery has a ponding basin to filter out pollutants. (Personal communication with Pedro Palacios, Wastewater Branch Manager, DEQ.)

The CNMI is addressing the nutrient measure by requiring permit applicants to obtain a Nutrient Management Plan from the U.S.DA.- Natural Resource Conservation Service. Also, there are long standing voluntary programs in place to assist farmers and ranchers in the CNMI to address this management measure. Funding for their operations or upgrading their operation with state of the art technology is secured through these programs. There are a total of four (4) CAFOs in the CNMI, which are permitted. These CAFO owners have been granted a cost-share grant through the Environmental Quality Incentives Program (EQIP). In the Individual Wastewater Disposal Systems (IWDS) Regulations, (Attachment A) Section 20.2, *"systems designed and certified by USDA-NRCS under an EQIP cost-share grant shall be considered to meet the requirements"*.

Due to the fact that these CAFO owners were given for EQIP grants, and that their systems were designed and certified by NRCS, they are considered to have met the nutrient management requirement.

DEQ permits for CAFOs must be in compliance with the IWDS Regulations, as well as the Earthmoving and Erosion Control Regulations. As stated above, the applicant will be referred to NRCS by DEQ to ensure that the proposed project meets their criteria. Given that Confined Animal Feeding Operation owners are following the IWDS regulations in this regard, and the IWDS regulations for the CNMI have been amended "*to establish minimum standards for the treatment of animal wastes*" (Section 2.4) as NOAA and EPA requested, the CNMI has proven that nutrient management as it applies to animal waste is being implemented throughout the 6217 management area. The regulations do not require nutrient management plans, but through an Internal Policy Memorandum DEQ 2002-02, permit applicants are required to obtain and submit Nutrient Management Plans through NRCS before a permit is issued. (See attached, NRCS- Nutrient Management 590-1). (Attachment B)

The CNMI has an extremely tight knit Soil and Water Conservation District with one on each of the three inhabited islands in the CNMI (Saipan, Tinian, and Rota). Regional conferences are held annually, and monthly meetings are held locally. These meetings are means for the farmers to leverage resources for funding. Farmers or ranchers starting a business, will most likely be involved with the Soil and Water Conservation District. All farmers are encouraged to apply for the Environmental Quality Incentives Program (EQIP) funds to get their operation off the ground. In order to qualify for EQIP funds in the CNMI, nutrient management plans are mandatory and are supplied free of charge by the local USDA-NRCS. NRCS reviews specifications of the farm using the NRCS Field Office Technical Guide which includes best management practices, and nutrient management guidance.

If an applicant bypasses NRCS for some reason, DEQ would refer the applicant to NRCS for technical assistance and to obtain a Nutrient Management Plan at no cost. Since there are very few farmers and ranchers in the CNMI, and no farmland left, this is a great incentive to increase the profitability of their operation.

The Northern Marianas College – Cooperative Research Extension and Education Services (NMC-CREES) also assists in contributing extensively to outreach, education, and technical assistance in the farming community. In addition, the NMC-CREES voluntarily assists, trains, and performs demonstrations to local farmers on the latest best management practices that have been proven to control nonpoint source pollution in regards to Animal Waste, nutrient management, and pesticide management.

The Coastal Nonpoint Team has also addressed this issue of CAFOs with brochures (Attachment C) illustrating management measures and best management practices that can be implemented to prevent nutrient and pathogen contamination from large and small confined animal facilities.

Several 319 grant demonstration projects have also been implemented. The CNMI Interagency Watershed Working Group and the agencies involved are developing watershed approaches to handle nonpoint sources in farmland in high priority watersheds on each island in the CNMI (Saipan, Tinian, and Rota).

On Tinian, the Marpo Watershed Interim Animal Wastes Strategy project demonstrates to the swine producers in the Marpo Watershed how to protect ground and surface water through the use of compost material. A valuable soil amendment is transformed by using bedding material generated by a chipper. The chipped woods absorb the animal wastes, therefore reducing potential animal wastes runoff and threats to the water supply. This was very successful and an ongoing project currently practiced by other farmers on Tinian.

CONCLUSION:

The CNMI program addresses this management measure through outreach and education, and enforceable policies and mechanisms to ensure implementation. The amendments to the IWDS, combined with the extensive outreach to the farming community, impeccable monetary and technical assistance incentives, provide the means to effectively address this management measure. It is being practiced because the local farmers can't afford not to take advantage of the existing resources such as, EQIP funds, technical assistance from NRCS, the college, and the local government agencies made available to them. Furthermore, in the 5 and 15 year plan, water quality from agricultural sources will be continuously monitored and assessed by the Marine Monitoring Team (See Monitoring Strategy, (Attachment D) on whether these management measures are controlling and or reducing nonpoint sources from entering coastal waters.

The CNMI hereby requests clearance from this condition that continues to remain on the conditional approval of the Commonwealth of the Northern Mariana Islands Nonpoint Source Pollution Control Program for the rationale stated above and the corrective actions that have been implemented in regards to animal waste and the nutrient management measure.

COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS GOVERNMENT

Assessment of the Section 6217 Watershed Protection and Existing Development management measure in The Commonwealth of the Northern Mariana Islands

September, 2002

The following are the original finding, condition, and rationale as described in the letter from USEPA and NOAA, dated October 3, 1997, that transmitted the Findings for the Commonwealth of The Northern Mariana Islands Coastal Nonpoint Pollution Program.

FINDING: The CNMI's program does not include management measures in conformity with the 6217(g) guidance but includes enforceable policies and mechanisms that can be used to ensure implementation. The CNMI has not provided sufficient justification to support an exclusion of existing development from its coastal nonpoint program.

CONDITION: Within three years, the CNMI will include in its program management measures in conformity with the 6217(g) guidance watershed protection and existing development

RATIONALE: The CNMI, often in partnership with federal agencies , has devoted considerable effort in developing resource studies for Rota and Tinian. Watershed projects have been conducted in the Kagman and Rota Sabana/Talakaya watersheds and a watershed/wetland protection plan was recently completed in the Tinian Magpo watershed. In addition, a strategic watershed prioritization and mapping project for Saipan was conducted and the CNMI also has a land exchange program under which it has acquired numerous private wetland areas.

The land acquisition trades, planning documents, and resource studies provide a good foundation for watershed level protection. These activities, however, only partially meet the objectives of the management measure and do not result in comprehensive watershed protection programs or policies that preserve areas critical to water quality within all watersheds of the Commonwealth.

Section 1511(a) of the Coastal Resources Management Act (CRMA), which provides authority to, "not permit, to the extent practicable, development with the potential for causing significant adverse impacts in fragile areas…critical wildlife, beaches, designated and potential pristine marine and terrestrial communities…mangrove stands and other wetlands" is the enforceable policy and mechanism which can be used to implement these management measures.

Finally, the CNMI has requested, but does not provide any information to justify, an exclusion for existing development. The Commonwealth has areas with significant existing development (e.g., the urban/tourist area adjacent to the Saipan Lagoon) which have the potential to significantly impact coastal waters. Incorporation and

implementation of plans and schedules to address existing sources into strategic watershed prioritization or restoration plans would fulfill the objectives of this management measure. The CNMI is encouraged to examine potential updates to the Saipan Lagoon Use Management Plan (SLUMP) as means to address nonpoint sources related to existing development adjacent to the Lagoon. As mentioned above, NOAA and EPA acknowledge the special circumstances of the CNMI with respect to the vast quantity of annual rainfall and will work with the CNMI to identify appropriate approaches to meet these management measures.

In response to this finding and condition, the Commonwealth of the Northern Mariana Islands Division of Environmental Quality and the Coastal Resources Management program, have completed an assessment of the Watershed Protection and Existing Development management measures as it applies to Watershed Protection and Existing Development. The findings of that assessment are provided here.

Assessment of the Watershed Protection and Existing Development Management Measures

The Watershed Protection Management Measure is being addressed by the Use of general assessments and plans such as the Unified Watershed Assessment, Nonpoint Source Program Upgrade, Watershed Restoration Action Strategies, Total Maximum Daily Load study, and other specific projects.

In 1998, the CNMI developed the Unified Watershed Assessment (UWA) (Attachment E). The process to prioritize watersheds was initiated by DEQ with support from the Natural Resource Conservation Service (NRCS). Significant input was received by the CNMI Interagency Watershed Working Group, which includes the Coastal Resources Management (CRM), Soil and Water Conservation Districts (Saipan, Tinian and Rota), Department of Public Works (DPW), Division of Fish and Wildlife (DFW), Northern Marianas College (NMC) and DEQ. The UWA includes the categorization and strategic watershed prioritization for the CNMI.

Several documents and plans have been developed in detail to address the Watershed Protection Management Measure. Many of these plans are used for Existing Development as well. It identifies priority local watersheds. With the exception of the the Watershed Restoration Action Strategies (WRAS-Attachment F), all other plans and schedules have been completed and approved. The WRAS was sent back to the consultant in order to do a more complete assessment to task out watershed pollutant reduction opportunities in the CNMI. The preliminary draft is submitted with this package, yet the CNMI is awaiting the final product which should be more detailed in the task scheduling and procedures to implement tasks. The final WRAS document is scheduled to be completed by October 4, 2002.

In December, 1999, the CNMI DEQ along with CRM submitted its *Nonpoint Source Pollution Program Upgrade*. In March, 2000, the United States Environmental

Protection Agency (USEPA) commended the CNMI on one of the first programs to submit their upgrade. Furthermore, the program's 5/15 year (Attachment G) schedule and tasks, sets forth a framework that meets the criteria for program update approval. The plan to implement the management measures of the Coastal Zone Amendments Reauthorization Act (CZARA), together with the many shorter-term goals and activities are in the plan. Major milestones are formulated below. Many have been completed and the CNMI is on task in regards to following the plan that was submitted to EPA. The milestones and schedules are consistent with WRAS although WRAS is more detailed on the processes needed for implementation.:

- FY99: DEQ will produced a video that demonstrates how appropriate Best Management Practices prevent nonpoint source pollution and protect coral reefs. (Funding: FY97 CWA 319) Status: This video is completed. Copies have been distributed to the schools and various departments in the CNMI.
- FY99-00: CRM will create a watershed atlas for Saipan, Tinian, and Rota, print it on CD-ROMs, and distribute them to local agencies. (Funding: FY97&98 CWA 319 and CZARA 310) Status: Completed and distributed.
- FY99-04: CRM and the Watershed Group will work with elected officials to restore zoning in the CNMI. Status: CRM has worked with DLNR to develop a simplified zoning program. Preliminary discussions at the legislature are ongoing to put zoning back into existence in the CNMI.
- FY99-14: CRM and DEQ will provide introductory GIS training to all government agencies at the Northern Marianas College. Status: This process has been ongoing lately, funds have been secured through Sea Grant and classes should start in the spring of 2003.
- FY00-04: CRM and DEQ will develop a computerized permit tracking system for CRM and DEQ permits and incorporate it into GIS. Status: Plan has been introduced of a 3 year, 5 year, and 10 year inspection list to monitor. Currently working on updating the system. Collateral data is being collected and database structure is under development.
- FY03: Continue reforestation and revegetation efforts in Lau Lau watershed.
- FY03-04: The Watershed Group will locate and map all areas that need to be designated as conservation areas. Once zoning laws have been implemented, the group will work with elected officials to set aside these areas to protect water quality and biota. (Potential funding: CWA 319 and CZARA 310)
- FY04,09,14: The Watershed Group will evaluate the success of the Watershed Protection management measures implemented. If necessary, add or modify management measures.
- FY06: The Watershed Group will develop management plans for conservation areas.
- FY06: The Watershed Group will develop new and innovative methods to provide incentives for private landowners to implement pollution prevention plans, including risk management protection for adoption of new pollution prevention technologies and market recognition for producers that meet environmental goals.
- FY07: The Watershed group will develop an agreement with the USDA to use the Conservation Reserve Enhancement Program to improve watersheds.

Existing Development Management Measure

The Existing Development Management Measure is being addressed through regulation changes, and by use of the same documents and plans mentioned above.

Schedules are included to address watersheds, therefore fulfilling the objectives of the existing development management measure. The 5 and 15 year plan and the Watershed Restoration Action Strategies (WRAS-Draft) are attached to show when and where measures will be implemented in the CNMI. The implementation of appropriate controls to reduce nonpoint source pollutants from entering waterbodies are spelled out in these plans so it is easy for future staff to implement the tasks needed to restore impaired watersheds, should there be a turnover.

In the Existing Development Management Measure, the CNMI must limit destruction of natural conveyance systems. In order to implement this, CRM amended regulations (Attachment H) to include the following under Standards for Determination of a Major Siting. With these regulation changes, any project situated in the 6217 area can be put through vigorous permitting requirements. The regulation reads:

"Proposed projects that modify areas that are particularly susceptible to erosion and sediment loss; areas that provide important water quality benefits and/or are necessary to maintain riparian and aquatic biota and/or necessary to maintain the natural integrity of waterbodies and natural drainage systems."

With this in place, the CRM Agency Officials can limit the destruction of natural conveyance systems.

Furthermore, the Existing Development Management Measure includes that where appropriate, preserve, enhance, or establish buffers along surface waterbodies and their tributaries. In order to implement this, CRM again addresses it through regulation changes. Under the mandatory conditions of a CRM permit, this condition will be included in every CRM permit:

Where appropriate, the project shall preserve, enhance, or establish buffers along surface waterbodies and their tributaries.

In addition, we have been concentrating our efforts in addressing the water quality issue along the Saipan Lagoon. The lagoon is the major recipient of nonpoint source pollution, which enters the lagoon from Beach Road, adjacent drainages, upland drainages reaching Middle Road and beyond. There are ongoing and future projects that have or will address the existing development management measure:

1. Beach Road Area Management Plan – This project will develop a comprehensive solution to nonpoint source ("NPS") pollution problems occurring in the Beach Road area of Saipan and adjoining drainageways. This will be accomplished through a series of projects demonstrating best management practices ("BMP") that may be replicated elsewhere in the CNMI that also seek to restore water quality and adjacent lands. This is

also intended to provide widespread public education, develop a community interest in restoring and improving the Beach Road area through voluntary actions of adjacent residents and businesses. The project is intended to provide direction for future conservation efforts through development of comprehensive control of NPS and implementation of selected BMP demonstration projects, voluntary improvement projects, community education, and identification of phased future improvements.

2. **Total Maximum Daily Load (TMDL)** – There is an ongoing TMDL study to of the Garapan Drainage #1, which will include recommendations to improve the water quality, but is not yet complete. Garapan Drainage #1 is a 303(d) listed waterbody.

3. **Closure of Puerto Rico Dump** - There are also plans in the works to close the Puerto Rico Dump by the end of 2002, or early 2003. The closure of the dump will significantly improve the water quality of the Saipan Lagoon .

4. **Assessment of the Saipan Lagoon** - The Army Corp of Engineers is also conducting an assessment of the Saipan Lagoon along Beach Road, and will recommend appropriate best management practices to be implemented to control nonpoint source pollution.

5. **Constructed Wetland Stormwater Control Project** – The CNMI Governor, with the assistance of the Watershed Group is putting a proposal together to submit to EPA as a watershed initiative project. The project will address runoff problems in the Garapan area through the use a Constructed Wetland proposed to be built south of Garapan Drainage #1.

6. **Saipan Lagoon Use Management Plan** - The CNMI has updated its Saipan Lagoon Use Management Plan in 1997. CRM staff is currently in the process of examining the implementation phase. (Attachment I)

Other specific projects that address the Urban - Existing development category are as follows:

- FY99-03: The US Army Corps of Engineers will conduct a study of the effect of the drainages along Beach Road (from Fishing Base to Quartermaster Road) on the nearshore marine life. They will recommend management measures to limit the input of contaminants into the lagoon. (Funding: USACOE) Status: Ongoing
- FY99-01: Luta Soil and Water Conservation District will conduct an analysis of current contamination of marine water from roads and existing development in Songsong Village; evaluate existing road design and drainages; prepare a plan for future road design and maintenance, which includes the installation of a Best Management Practice (BMP); and teach the Department of Public Works, Mayor's office, and local contractors how to install a BMP. (Funding: FY99 CWA 319) Status: The design for this project is finished. The project may be delayed because the EPA says that the project has to be bidded out in order to proceed. This bidding process could delay the project for another year.
- FY99-04: CRM and the Watershed Group will work with elected officials to implement the Saipan Lagoon Use Management Plan (SLUMP). (Funding: CZARA 6217). Status: SLUMP was updated in 1997.

- FY01: The Department of Public Works and Mayor of Saipan will implement management measures recommended by the USACOE's FY99-03 study. (Funding: Capitol Improvement Project) Status: Ongoing.
- FY04: The Department of Public Works will conduct an analysis of current contamination of marine water from roads and existing development along Beach Road (Saipan) and San Jose Village (Tinian); evaluate existing road design and drainages; prepare a plan for future road design and maintenance, which includes the installation of a Best Management Practice (BMP); and teach the Department of Public Works, Mayor's office, and local contractors how to install a BMP. (Funding: Capital Improvement Project)
- FY04-ongoing: CRM will use satellite imagery and air photos to measure shoreline erosion and to analyze silt plumes.
- FY04,09,14: The Watershed Group will evaluate the success of the management measures implemented to reduce runoff pollutant concentrations and volume from existing development. If necessary, add or modify management measures.
- FY03-05: The Department of Public Works, Division of Environmental Quality, Coastal Resources Management, Governor's Office, Mayor's Offices, Legislature, and Office of Insular Affairs will develop a MOA to ensure sufficient Capital Improvement Project funds and local funds are appropriated to implement retrofitting proposals for existing development.

CONCLUSION:

The current process of dealing with the context of the Watershed Protection and Existing Development management measure is being applied in the CNMI with regulation changes as it applies to Existing Development. Plans and schedules to address watershed protection and existing sources into strategic watershed prioritization and restoration plans currently exist, therefore fulfilling the objectives of both management measures. We hereby request clearance from this condition remaining on the conditional approval of the Commonwealth of the Northern Mariana Islands Nonpoint Source Pollution Control Program for the rationale stated above and the actions that have been implemented in regards to watershed protection and existing developments.

THE COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS GOVERNMENT

Assessment of the Implementation of Section 6217 On site Disposal System Management Measure for inspections of OSDS in The Commonwealth of the Northern Mariana Islands

August, 2002

The following are the original finding, condition, and rationale as described in the letter from USEPA and NOAA, dated October 3, 1997, that transmitted the Findings for the Commonwealth of The Northern Mariana Islands Coastal Nonpoint Pollution Program.

FINDING: The CNMI's program includes management measures in conformity with the 6217(g) guidance and includes enforceable policies and mechanisms to ensure implementation, except for inspections of OSDS at a frequency adequate to ascertain whether they are failing.

CONDITION: Within three years, the CNMI will amend its program to include enforceable policies and mechanisms to ensure inspection of operating OSDS at a frequency to ascertain whether OSDS are failing.

RATIONALE: The recently upgraded CNMI Individual/Other Wastewater Disposal System (IWDS) regulations provide management measures that are in conformity with the 6217(g) guidance except for inspecting OSDS at a frequency adequate to ascertain whether OSDS are failing. The Commonwealth's OSDS regulations contain siting, separation distances, setbacks, and pre-construction inspection standards in conformity with the 6217(g) measures. The Chief of DEQ has the authority to enforce these provisions and levy penalties for violations. No areas where OSDS cause excessive nitrogen loadings have been identified, but the Commonwealth is encouraged to continue monitoring for nitrogen from OSDS. The Commonwealth will consider investigating the potential to use official maps to determine OSDS site suitability and the need for restrictions regarding phosphate detergent use. Under IWDS regulations, maintenance of OSDS is the responsibility of the owner. The regulations include a recommendation that owners inspect their systems at intervals of not more that three years. While the Commonwealth lacks a program to ensure that periodic inspections and maintenance occur, it has initiated the design of a tracking mechanism in conjunction with its IWDS permitting system to verify that applicants are complying with the periodic inspection requirements.

In response to this finding and condition, the Commonwealth of the Northern Mariana Islands Division of Environmental Quality and the Coastal Resources Management program, Department of Commerce have completed an assessment of the OSDS management measurement in regards to inspections. The findings of that assessment are provided here.

Assessment of the Management Measure for inspections of OSDS

In the conditions for approval of the Commonwealth of the Northern Mariana Islands (CNMI) Coastal Nonpoint Pollution Control Program, the inclusion of management measure for inspections of OSDS in conformity with the (g) Guidance is required. The CNMI Division of Environmental Quality (DEQ), and the Coastal Resources Management Office (CRM) have completed an assessment of this management measure in the Commonwealth of the Northern Mariana Islands. The findings of this assessment are provided here, and these support that the management measure is being adequately addressed by existing practices and should have the conditional approval in this category changed to fully approved status.

In August, 2002, an Executive Directive, signed by the Governor of the Commonwealth of the Northern Mariana Islands stated the following(Attachment K):

> *The Division of Environmental Quality and the Bureau of Environmental Health, under the Department of Public Health, shall execute a Memorandum of Understanding to implement the On-site Disposal System Compliance Inspection Program of July 2002 (attached) and to formulate a septic system tracking system that will insure all On-Site Disposal Systems in the Commonwealth of the Northern Mariana Islands are permitted, are operating properly, and are properly maintained in order to reduce the threat of contamination of the ground water, surface waters, streams, or coastal waters.*

With this directive, the Division of Environmental Quality and the Bureau of Environmental Health must follow the On-Site Disposal System Compliance Program (Attachment M). This executive directive constitutes the enforceable policy needed to gain full approval of the New and Operating Onsite Disposal Systems Category. The Memorandum of Understanding will provide internal policies to ensure that the Inspection Program will be implemented. This program will start in October 2002 and inspect all OSDS in the CNMI every 15 years. Owners through the DEQ Individual Wastewater Disposal Systems Regulations (Section 17.3) are currently responsible to have their OSDS checked at least every three years. With the On-Site Disposal System Compliance Program, both the Commonwealth and the owners will inspect septic systems to ensure that they are functioning and being properly maintained.

CONCLUSION the current process of dealing with the context of this management measure is being applied in the CNMI and has enforceable policies and mechanisms to ensure implementation. We hereby request clearance from this condition remaining on the conditional approval of the Commonwealth of the Northern Mariana Islands Nonpoint Source Pollution Control Program for the rationale stated above and the corrective actions that have been implemented in regards to the management measure for inspections of On Site Disposal Systems.

COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS GOVERNMENT

Assessment of the Section 6217 Construction Site Chemical Control management measure in The Commonwealth of the Northern Mariana Islands

The following are the original finding, condition, and rationale as described in the letter from USEPA and NOAA, dated October 3, 1997, that transmitted the Findings for the Commonwealth of The Northern Mariana Islands Coastal Nonpoint Pollution Program.

FINDING: The CNMI's program includes management measures in conformity with the 6217(g) guidance and includes enforceable policies and mechanisms to ensure implementation, except: (1) the program applies only to large scale developments and a subset of smaller developments, and (2) the program lacks measures addressing proper management of toxic substances and nutrients.

CONDITION: Within two years, the CNMI will expand the applicability of its construction site chemical control management measure to include, and will include in its program a measure that provides for currently excluded sites proper application and management of toxic substances and nutrients.

RATIONALE: The CNMI's "Hazardous Waste Plans" and "Utility Plans" are in conformity with the management measure for large projects. Under the CRM Rules and Regulations, the Plans require inventories of hazardous materials used on the project site, descriptions of storage facilities for these materials, and disposal plans for project wastes. In addition, the Utility Plan contains a requirement for measures to ensure that containment of 200% of the volume of any stored petroleum products is provided to control accidental spills.

Under the CRM Rules for Hazardous Waste and Utility Plans, these requirements apply to major sitings (large scale developments), minor projects within Areas of Particular Concern (APC) and to projects with the potential to result in significant and adverse effects. As a result, a gap exists regarding management measures for smaller projects. In addition, adoption of management measures to ensure proper management of toxic substances is needed to ensure complete coverage of the management measures. Revision to the CNMI's hazardous waste management regulations are currently undergoing review by EPA. The CNMI also needs to address nutrients in the administrative mechanisms for both large and small development sites.

In response to this finding and condition, the Commonwealth of the Northern Mariana Islands Division of Environmental Quality (DEQ) and Coastal Resources Management Program (CRM) have developed and implemented measures to ensure the application of the Construction Site Chemical Control management measure to those smaller sites previously excluded.

CRM and DEQ have implemented the following four specific measures: 1) several amendments to the CRM regulations, 2) an Internal Policy Memorandum within the Division of Environmental Quality (DEQ), 3) a Non Point Source Executive Directive, signed by the Governor, and 4) the creation of a *Construction Site Chemical and Material Control Handbook.*

1. The CRM Regulations (Attachment H) have been amended to include the following mandatory condition that is included on all CRM permits involving construction of any kind in the CNMI.
   This is found under section 12 of the regulations:

   E. The following condition will be included in every permit involving construction of any kind:

   1 "The permittee shall be responsible for preventing discharge of construction site chemicals through the proper use of Best Management Practices as described in the document "Construction Site Chemical and Material Control Handbook of August 2002" for the following activities: Material delivery and storage; Material Use, Spill Prevention and Control; Hazardous Waste Management; Concrete Waste Management; Vehicle and Equipment Cleaning, Maintenance and Fueling.

2. The Division of Environmental Quality has issued an Internal Policy Memorandum (Attachment J) to be executed by DEQ for all Earthmoving and Erosion Control permits. This internal policy states that the following permit condition must be included in every Earthmoving and Erosion Control Permit issued by the Division of Environmental Quality, beginning November 1, 2002.

   "The permittee shall be responsible for preventing discharge of construction site chemicals through the proper use of Best Management Practices as described in the document "Construction Site Chemical and Material Control Handbook of August 2002" for the following activities: Material delivery and storage; Material Use, Spill Prevention and Control; Hazardous Waste Management; Concrete Waste Management; Vehicle and Equipment Cleaning, Maintenance and Fueling.

3. The Executive Directive, signed by the Governor of the CNMI (Attachment K) in September of 2002, states the following:

The Division of Environmental Quality, under the Office of the Governor of the Commonwealth of the Northern Mariana Islands, shall include in its programs, enforceable policies and mechanisms to implement management measures for the control and reduction of non-point source pollutants entering coastal waters, surface waters, ground water, lakes, and streams in the land use/activities categories that have been conditionally approved consisting of Construction Site Chemical Control, Watershed Protection and Existing Development, Agriculture in regards to Animal Waste Control, and the Inspections of On Site Disposal Systems to insure the implementation of locally appropriate management measures in the Commonwealth of the Northern Mariana

Islands that are consistent with the guidelines promulgated by the Federal Environmental Protection Agency.

4. A *Construction Site Chemical and Material Control Handbook* (Attachment L)has been created to offer guidance of proper application and management of toxic substances and nutrients as well as other construction material.

   A copy of the *Construction Site Chemical and Material Control Handbook* is derived from other state's (Virginia and South Carolina) Construction Site Chemical Control Handbooks, yet made locally appropriate in some cases. The handbook will be distributed to all construction companies in the CNMI and made readily available at the Department of Public Works, The Division of Environmental Quality, Coastal Resources Management Office, Commonwealth Utilities Corporation, the Mayor's Offices and all Libraries in the CNMI. Furthermore, this will be distributed to all applicants that apply for an earthmoving and erosion control permit.

   In regards to the condition that the CNMI include in its program a measure that provides for proper application and management of toxic substances and nutrients, the CNMI feels that they should be excluded from this management measure. Seed, mulch, sod, pesticides, and herbicides or other nutrients are not causing significant nutrient runoff to surface waters because construction developments for roads and highways in the CNMI do not apply nutrients to re-vegetate due to the tropical climate and cost of doing so. This management measure is tended to in the *Construction Site Chemical and Material Control Handbook* under the Fertilizers/Nutrient heading, and the CNMI feels that a nutrient plan would be too costly to the public if it were required. Nutrient plans are done through the help of NRCS in regards to agriculture, however.

   CONCLUSION the current process of dealing with the context of this management measure is being applied in the CNMI. We hereby request an exemption from the nutrient management measure, and clearance from this condition remaining on the conditional approval of the Commonwealth of the Northern Mariana Islands Nonpoint Source Pollution Control Program for the rationale stated above and the corrective actions that have been implemented in regards the Construction Site Chemical Control Management Measure.

COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS GOVERNMENT

Assessment of the Section 6217 Roads, Highways, and Bridges management measure in The Commonwealth of the Northern Mariana Islands

September, 2002

The following are the original finding, condition, and rationale as described in the letter from USEPA and NOAA, dated October 3, 1997, that transmitted the Findings for the Commonwealth of The Northern Mariana Islands Coastal Nonpoint Pollution Program.

FINDING: The CNMI's program includes management measures for roads, highways, and bridges in conformity with the 6217(g) guidance except for the construction site chemical control, operation and maintenance and runoff systems management measures. The CNMI has provided sufficient justification to support a categorical exclusion of bridges from its coastal nonpoint program, but has not provided sufficient justification to exclude runoff systems. CNMI's program includes enforceable policies and mechanisms that can be used to ensure implementation of the management measures, except that the CNMI program for construction site chemical control only applies to large scale developments and a subset of smaller developments.

CONDITION: Within three years, the CNMI will include in its program management measures in conformity with the 6217(g) guidance for operation and maintenance and runoff systems and expand the applicability of its construction site chemical control management measure to include currently excluded sites in conformity with the 6217(g) guidance. In addition, within three years, the CNMI will include in its program a measure that provides for proper management of toxic substances and nutrients in conformity with the 6217(g) guidance.

RATIONALE: The CNMI publication Erosion Control in the Commonwealth of the Northern Mariana Islands (December 1990) identifies measures that meet the (g) guidance measure for planning, siting, and design and construction site erosion control. The Commonwealth agencies and soil and water conservation districts work together to assure projects are properly sited, erosion and sediment plans are approved before construction, and inspections are provided. The Storm Water Control Handbook (1989), prepared by conservation districts, provides detailed technical information tailored to each island.

The CNMI does not indicate whether, and if so, how, they implement the components of the management measure for operation and maintenance. The program submittal lists some practices that could be used to implement this measure, but not all practices listed for the measure are relevant, and it is not clear how and to what extent the practices are used on both primary and secondary roads.

The CNMI does not use bridges to cross waters and wetlands; therefore, the request for an exclusion from the bridges management measure is justified. The CNMI does not make crossings of waters by fill and box culverts, which can impact wetlands and other surface waters. These are subject to road and highway, as well as urban new development management measures.

The CNMI has also requested an exclusion from the runoff systems management measure. This request is not justified because the CNMI states that unpaved roadways, along with new construction clearings, are the single greatest contributor of nonpoint pollution to its coastal waters. The CNMI is developing more effective BMP's to address pollution from these existing roadways, and is conducting a demonstration project on which to base new practices. This strategy should, when fully implemented, meet the runoff systems management measure.

The CNMI authorities which implement these measures include the Earthmoving and Erosion Control Regulations, permit requirements, inspections, and penalties. The CRM permit program includes authority to permit roads, highways, and bridges. Pesticide and hazardous waste management regulations and the Commonwealth Environmental Protection Act (PL3-2 Section &) provide authorities to implement the construction site chemical control and operation and maintenance management measures.

In response to these finding and conditions, the Commonwealth of the Northern Mariana Islands Division of Environmental Quality and the Coastal Resources Management program has completed an assessment of the management measures for Roads, Highways, and Bridges. The findings of that assessment are provided here.

Assessment of the Roads, Highways and Bridges Management Measures

In the conditions for approval of the Commonwealth of the Northern Mariana Islands Coastal Nonpoint Pollution Control Program, the inclusion of Roads, Highways, and bridges in conformity with the (g) Guidance is required. The Commonwealth of the Northern Mariana Islands Division of Environmental Quality (DEQ) and the Commonwealth of the Northern Mariana Islands Coastal Resources Management program (CRM) have completed an assessment of this management measure in the Commonwealth of the Northern Mariana Islands. The findings of this assessment are provided here, and these support that the management measure is being adequately addressed by existing practices and corrective actions that have been taken since 1997, and should have the conditional approval in this category changed to fully approved status.

In regards to the Construction Site Chemical Control Management Measure under this category, the CNMI has sufficient justification in the Construction Site Chemical Control Management Measure that this Management Measure has been adequately addressed..

In regards to Operation and Maintenance, it appears the original submittal of the plan in 1995 did not explain to NOAA or EPA how the CNMI addressed this management measure. Since then, there has been continuous staff turnover. There is a need to explain that nutrient and herbicide/pesticide management plans are not necessary in the CNMI since these chemicals are not applied along the highways by the Department of Public Works (DPW) or the Mayors's Office. Furthermore, pesticide and herbicide management plans are not necessary since these chemicals are not applied along the highways by DPW or the Mayor's Office. There is a *Construction Site Chemical and Material Control Handbook of August 2002* (Attachment L) that provides Best Management Practice guidance that will aid in addressing the Operation and Maintenance Management Measure in regards to all Road and Highway construction projects. Road maintenance such as pothole repair are conducted regularly by DPW. Street sweeping by DPW, MVA, Mayor's office and volunteer clean-up campaigns by the public are also regular occurrences.

The offices of CRM and DEQ are consistently sending their enforcement staff out to ensure that general maintenance is performed on urban runoff systems as well as any NPS control facilities such as the American Memorial Park constructed Wetland and the Rota Ponding Basin. The agencies maintaining these systems need to get an annual permit for general maintenance and follow the conditions of the permit that exist in the regulations. With the adoption of the new regulations aimed at NPS reduction and control specifically, there appears to be no more loopholes to address this management measure. Some of the regulations used to address this management measure include the following (regulations are attached for context – Attachment H):

In order to get a permit,
CRM permit applications shall include a description and design of proposed management measures which will avoid, reduce, and/or minimize nonpoint source pollution contributed by the proposed project.(Section 8, A, v)

An applicant must submit the following erosion control and drainage plan:...
4)Preliminary stormwater nonpoint source management plan.(section 8, A,viii, h, 4)

When evaluating all CRM permits, the CRM agency Officials must consider the following, they:
... shall determine , to the extent practicable, the extent of the impact of the proposed project, including construction, operation and maintenance and intermittent activities, on its watershed and receiving waters, marine, freshwater, wetland, and terrestrial habitat, and preserve, to the extent practicable, the physical characteristics of the site necessary to support water quality and living resources.(Section 9,B,iv)

The CNMI has also been cleared of the Pollution Prevention management measure in the urban category and will continue to educate on the importance of "packing your trash" and develop more education programs to promote Best Management Practices in regards to this Operation and Maintenance Management Measure.

Plans to create and distribute a BMP manual in the "request for proposal " stage for Stormwater and Erosion Control in a joint effort with Guam. Training workshops on both Saipan and Guam will be given. The purpose of the workshops shall be to introduce and explain the use of the manuals to an audience of engineers, contractors, and developers. The following is the scope of the project: (Attachment N)

1. Introductory material aimed at describing the nature and effect of "nonpoint source" pollution as related to erosion, stormwater runoff, and site design. Groundwater contamination and protection with respect to site usage and stormwater system design should also be introduced here.
2. Introduction to BMP treatment and sizing criteria, and stormwater runoff calculations (Rational Method and/or TR-55). Rainfall data and relevant analysis products to be presented here for each island. Diskettes/CD-ROMs shall be provided containing easy-to-use spreadsheet versions of the chosen runoff calculation method(s) and associated BMP sizing calculations. Where possible, graphs, tables, and charts should be provided to further simplify calculations.
3. Chapter on site design – with focus on planning measures and "non-structural" BMPs. Methods of reducing a site's overall impact to stormwater runoff and erosion control will be discussed, with an emphasis on how this can minimize the size, complexity, and cost of structural BMPs.
4. Overview of stormwater/erosion control system design – Selection, design, and integration of BMPs, conveyance systems, and their relation to site characteristics (soils, slopes). This section should discuss the general design approaches to the typical soil/lot types found in the CNMI and Guam, namely: 1.) projects on highly permeable limestone substrate; 2.) projects on sloped, highly erodible and impermeable volcanic clays; 3.) projects on relatively flat, impermeable soils (such as deep clays); 4.) projects on sandy coastal areas; 5) projects on small lots in heavily-developed urban areas. This might require two chapters (or chapters in separate volumes) to separately cover construction erosion control and stormwater treatment. Simple examples should be provided to illustrate important principles.
5. Detailed sub-chapters on each BMP – including schematic and plan drawings as necessary, important design details, recommended pre-treatment components, application of sizing criteria, site feasibility criteria, and maintenance requirements. Important construction specifications shall also be included as necessary, similar to those included in the appendices of the Maryland manual.
6. Detailed chapter on miscellaneous stormwater system components – conveyance structures (pipes, gutters, swales), first-flush bypass structures, pre-treatment structures (catch basins, oil/water separators, etc) including diagrams, sizing calculations and important design details. Diskettes/CD-ROMs shall be provided containing easy-to-use spreadsheet versions of appropriate conveyance sizing calculations. Where possible, graphs, tables, and charts should be provided to further simplify calculations.

7. A separate (short) chapter concerning the importance of BMP maintenance should be included, including details referring to any regulatory requirements recommended under the "program development" phase of this project.
8. Several design examples should be included in the manual. At least two should be presented as complete, detailed design tutorials in the appendices. Others should be integrated as shorter, simplified examples to illustrate the various criteria and design principals that will be presented in the first few chapters. Suggested examples include: 1) a small commercial re-development of a mostly-paved lot in a cramped, urban environment; 2) A new medium-sized commercial development with little available space, but soils amenable to infiltration; 3) a new commercial development on an impermeable, sloped, erodible soil; 4) An individual residence located on a sloped, impermeable and erodible soil; 5) a larger, multiple-watershed project (for example to illustrate splitting up a project based on drainage basins); 6) a short, paved road project; and (7) a section of unpaved road to serve as basic examples of how to apply BMPs to road projects.
9. Technical appendices as necessary to provide the information necessary to develop a complete stormwater/erosion control system design. The appendices included in the Maryland manual are a good example. Existing information specific to the CNMI/Guam should be used wherever possible.

This BMP manual will aid in the implementation of both Operation and Maintenance and Runoff Systems Management Measures, as well as others not in the scope of this narrative.

The CNMI is a tourist destination, so the incentive of improving water quality is always going to keep these Best Management Practices ongoing. This management measure is being addressed in the CNMI, but was not explained "How" in the initial submittal of the *CNMI Coastal Nonpoint Source Pollution Control Plan* of 1995.

In regards to the condition of addressing runoff systems, the CNMI has management measures in place to ensure the runoff system management measure is implemented in the CNMI. Enforceable policies and mechanisms exist to ensure implementation, and education and trainings have been completed for implementation. The BMP Manual referred to above will add to addressing this management measure. The *Know your Watershed Campaign* in the priority, Category 1 watershed of West Takpochau entailed cleaning out debris from storm drains and priority drainage system that infects the most developed area in the CNMI. Education on maintenance of storm drains by surrounding businesses was very successful as well. Success was measured by people volunteering for the program, and follow-up programs in the Garapan Drainage area.

Capital Improvement Project (CIP) funds are used almost exclusively in road projects in the CNMI. In order to receive CIP funding, Nonpoint source pollution management measures and retrofitting of projects must be addressed. Local Permitting requirements under the Division of Environmental Quality Earthmoving and Erosion Control Regulations further require all projects (even ones excluded from CIP requirements) to

incorporate runoff management measures into all projects. In the CNMI, vegetative filter strips are plentiful and naturally occurring because of the tropical climate.

The CRM regulation changes that were adopted in regards to Nonpoint Source Pollution and the Stormwater BMP manual will facilitate the continued implementation of the Runoff Systems Management Measure as well. Priority and watershed pollutant reduction opportunities are being identified in the Watershed Restoration Action Strategies (WRAS). The 5 and 15 year strategy further shows a control schedule for the reduction of NPS by making improvements to existing urban runoff control structures (Attachment G). The schedule for implementation of BMPs is as follows: Impaired watersheds will be addressed first, all other watersheds will be fully implemented by the completion date. These milestones have already been reached and will continue to be addressed:

- Milestone: Require all construction sites for roads and highways to
1. Limit application, generation, and migration of toxic substances.
2. Ensure the proper storage and disposal of toxic materials.

- Milestone: Require all construction sites for roads and highways to reduce runoff pollutant concentrations and volumes entering groundwater and surface water.

- Milestone: Incorporate pollution prevention procedures into the operation and maintenance of road and highways to reduce pollutant loading to groundwater and surface water.

***It is also very important for EPA and NOAA to understand that NPDES Phase 2 stormwater permit requirement will exempt the CNMI from the Runoff Systems Management Measure.

Several things that have been done or are in the process of implementing this management measure include a new house resolution (Attachment O), which was specifically introduced to appropriate land for the Garapan Drainage treatment basin. Other completed projects include the American Memorial Park Constructed Wetland, Laulau Bay Re-vegetation Project, and the Rota Ponding Basin.

Current projects made possible by 319 grants through the Division of Environmental Quality include an assessment along Beach Road area to identify areas most affected by runoff. Best management demonstration projects will be installed following the assessment and identification of problem areas and BMPs to correct impairment.

CONCLUSION the current process of dealing with the context of these management measures is being applied in the CNMI. We hereby request clearance from this condition remaining on the conditional approval of the Commonwealth of the Northern Mariana Islands Nonpoint Source Pollution Control Program for the rationale stated above and the corrective actions that have been implemented in regards to the Roads, Highways, and Bridges management measures including, Construction Site Chemical Control, Operation

and Maintenance, and Runoff Systems. We further request to be exempt from the condition that the CNMI needs to provide for proper management of toxic substances and nutrients in conformity with the 6217(g) guidance. The justification for the elimination of the 6217 'g' guidance management measures that require the application of nutrients at rates necessary to establish and maintain vegetation without causing significant nutrient runoff to surface waters is that construction development for roads and highways in the CNMI does not typically include the application of nutrients. The *Construction Site Chemical and Material Control Handbook of August 2002* further ensures that in the rare cases that there are nutrient applications, that they are applied following Best Management Practices.

COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS GOVERNMENT

Assessment of the Implementation of Section 6217 Critical Coastal Areas Management Measure in The Commonwealth of the Northern Mariana Islands

The following are the original finding, condition, and rationale as described in the letter from USEPA and NOAA, dated October 3, 1997, that transmitted the Findings for the Commonwealth of The Northern Mariana Islands Coastal Nonpoint Pollution Program.

FINDING: The CNMI's program does not include processes for the identification of critical coastal areas or for the development and continuing revision of additional management measured applicable to the critical areas.

CONDITION: Within two years, the CNMI will develop a process for the identification of critical coastal areas and a process for developing and revising management measures to be applied in critical coastal areas and in areas where it is necessary to attain and maintain water quality standards.

RATIONALE: Beyond a generalized problem statement for the Puerto Rico dump, the CNMI has not outlined in its program a process for identifying additional critical areas. Two additional management measure categories have been identified for future consideration: golf course management measure (existing and new) and wildland fires management measure. The CNMI is encouraged to develop management measures in these categories. The CNMI is also encouraged to consider Saipan Lagoon as a critical coastal area, based on its unique recreational value.

In response to this finding and condition, the Commonwealth of the Northern Mariana Islands Division of Environmental Quality (DEQ) and Coastal Resources Management Program (CRM) have developed and implemented measures to meet the condition for the Critical Coastal Areas management measure.

A Non Point Source Executive Directive, signed by the Governor, on September 20, 2002 addresses this management measure to ensure implementation.
The Executive Directive (Attachment K), signed by the Governor of the CNMI in September of 2002, states the following:

> *The Office of Coastal Resources Management and The Division of Environmental Quality shall create an interagency Committee that is designated to formulate and identify Critical Coastal Areas in the CNMI that need additional measures to protect against current and anticipated nonpoint pollution problems. The Committee will develop a process to identify, implement, evaluate, and, as necessary, revise additional management measures to mitigate problems that may occur in these identified areas of concern. The Committee will designate Saipan Lagoon as the first Critical Coastal Area.*

Members of this committee will include the members of the CNMI Interagency Watershed Working group who are the most informed individuals in the CNMI in regard to nonpoint source pollution and have representation from both the environmental resource agencies and the motivated public. The Committee as set up in the Executive Directive will develop a process to identify, implement, evaluate, and as necessary, revise additional management measures to mitigate problems that may occur in these identified areas of concern. Pending is an MOU between DEQ and CRM to appoint this group as the committee. Nonpoint Source Managers of both CRM and DEQ have lobbied for this group to be designated as the Committee. Although the Interagency Watershed Working Group has been identifying, implementing, evaluating, and revising additional management measures for a few years, they have not yet been delegated the "Committee" that will be executing the Critical Coastal Area Management Measure.

In 1999, The Interagency Watershed Workgroup discussed the need to address Golf Courses in the proper application of pesticides. What became of this effort, was that golf course staff and hotel/resort staff of Saipan, Tinian, and Rota were trained and completed a certification course on how to properly mix and apply pesticides at rates necessary to maintain vegetation without causing significant runoff to surface waters. The training was given by the Pesticide Management Branch at the Northern Mariana Community College's CREES extension. Farmers were also certified in recent actions taken on by CREES.

The CNMI has been encouraged to look into management measures in regards to golf courses and wildfire areas, and has set up a list of other areas that this critical coastal areas management measure will look into. They are as follows:

1. Highly erodible soils
2. Wildland Fire areas,
3. Puerto Rico Dump (although this is in the port and industrial APC, it may need more specialized management to curtail adverse effects on the environment.)

The Interagency Watershed Group presently discusses issues such as this and reports to their administrators with advice and data in order to facilitate appropriate decisions and procedures that need to be implemented.

COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS GOVERNMENT

Request for Clearance from the Section 6217 Marinas and Boating Siting and Design Management Measure for The Commonwealth of the Northern Mariana Islands

SEPTEMBER 2002

The following is the original finding, condition, and rationale as described in the letter from U.S. EPA and NOAA, dated, October 3, 1997, that transmitted the Findings for the Commonwealth of the Northern Mariana Islands Coastal Nonpoint Program.

FINDING: The CNMI's program includes management measures for marina flushing, water quality assessment, and habitat assessment in conformity with the 6217(g) guidance. The program does not include management measures for stormwater runoff, shoreline stabilization, fueling station design, and sewage facility design (except for pumpout). The program includes enforceable policies and mechanisms to ensure implementation.

CONDITION: Within two years, the CNMI will include in its program management measures for stormwater runoff, shoreline stabilization, fueling station design, and sewage facility design in conformity with the 6217(g) guidance.

RATIONALE: New and expanding marinas developed in the CNMI are considered major sitings which require a Coastal Resources Management (CRM) permit. All CRM major siting permit applications must address specific criteria and include an environmental assessment report that addresses impacts to the physical, chemical, and biological characteristics of the site. Specific criteria and management standards address habitat, water quality, water flow, and circulation, nutrients, wildlife, and marine resources. In addition, the Submerged Land Rules and Regulations, adopted by the Department of Lands and Natural Resources (DLNR), include guidelines for flushing and stormwater runoff mitigation. However, these guidelines are only enforceable if contained in other CNMI permitting authorities. NOAA and EPA suggest the Coastal Resources Management Office (CRMO) work with other CNMI agencies to develop a coordinated approach to implementation of these measures and the marina operation and maintenance management measures discussed below.

Under the CRM major siting permit process, marina plans may be conditioned to address certain marina issues, e.g. the design and development of operational procedures for fuel handling and spill prevention plans, mitigation of stormwater runoff based on the peak storm and minimum detention times, and sediment removal rates. However, these elements are not specified in the CRM permit regulations.

In response to this finding and condition, The Commonwealth of the Northern Mariana Islands Coastal Resources Management Office and the Division of Environmental Quality have completed an assessment of the applicability of the management measures

for Marinas and Boating Siting and Design. The findings of this assessment are provided here.

Assessment of the applicability of the Marinas and Boating Siting and Design Management Measure

In the rationale of the findings on regards to this management measure, the CNMI needs to clarify that there is coordination on Marina Siting and Design. All major permit applications are reviewed and must be unanimously approved by the CRM Board which is made up of Directors and Administrators of the Coastal Resources Management Agencies. These include The Division of Fish and Wildlife under DLNR, Coastal Resources Management, the Division of Environmental Quality, the Department of Public Works, the Commonwealth Utilities Corporation, the Historical Preservation Office, and the Department of Commerce. There cannot be a better coordinated effort than what is in place currently to address these management measures except for including enforceable policies and mechanisms in the Coastal Resource Management Regulations (Attachment H).

The amended regulations are attached to put management standards on any new and expanding marina project in the Commonwealth in order to specify certain marina issues, e.g. the design and development of operational procedures for fuel handling and spill prevention plans, mitigation of stormwater runoff based on the peak storm and minimum detention times, and sediment removal rates.

Management Measures listed for Siting and Design are generally not applicable to The Commonwealth of the Northern Mariana Islands (CNMI) because no new marina development is anticipated. These management measures have, however, been inserted into the regulations of CRMO to be shoreline APC management standards in order to address new and Expanding Facilities.

The amended regulations read

> *(6)Marina and small boat harbor projects shall be evaluated for consistency with the following performance standards and goals:*
>
> *(a) Effective runoff control. Runoff control should be implemented which includes the use of pollution prevention activities and the proper design of hull maintenance areas*
>
> *(b) Shoreline stabilization shall be implemented where erosion is a nonpoint source pollution problem. Vegetative methods are strongly preferred unless structural methods are justified based on cost benefit analysis (over what term?), considering the severity of wave and wind erosion, offshore bathymetry, and the potential adverse impact on other shorelines and offshore areas.*

(c) Effective fuel station design shall be implemented to allow for efficient and effective cleanup of spills.

(d) Effective sewage management facilities shall be installed where needed to reduce the release of sewage to surface waters. Facilities shall be designed to allow for efficient and effective maintenance and signage shall be posted to facilitate the public's use of the facility.

(e) Effective fish waste management shall be implemented through restrictions, public education, and/or proper disposal of fish waste.

(f) Petroleum Control Management. Petroleum control shall be implemented to reduce the amount of fuel and oil from boat bilges and fuel tank air vents and other vessel activities from entering marina and surface waters.

(g) Boat Cleaning Management. Boat Cleaning operations shall minimize, to the extent practicable, the release of harmful cleaners and solvents as well as paint from in-water hull cleaning.

(h) Public Education Management. Public education , outreach, and training shall promote the proper manner of disposing materials.

(j) Boating activities within marina areas shall conform with Department of Public Safety Boating Safety Regulations (Attachment P).

Furthermore, the CNMI is in the process of developing the national Clean Marina Program for the CNMI using FY 2002 grant funding. Projects that are in the process of being implemented are the development of a Clean Marina Guidebook, an NPS Tide Calendar, a Ponding Basin Demonstration Project, and cost sharing with the Division of Fish and Wildlife on the insertion of a sewage pumpout facility, and creating promotional items to enhance the campaign for clean marinas in the CNMI.

CONCLUSION the current process of dealing with the context of this management measure is being applied in the CNMI and has enforceable policies and mechanisms to insure implementation. We hereby request clearance from this condition remaining on the conditional approval of the Commonwealth of the Northern Mariana Islands Nonpoint Source Pollution Control Program for the rationale stated above and the corrective actions that have been implemented in regards to the management measure for Marina and Recreational Boating Siting and Design.

COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS GOVERNMENT

Request for Clearance from the Section 6217 Marina and Boating Operation and Maintenance Management Measure for The Commonwealth of the Northern Mariana Islands

September 2002

The following is the original finding, condition, and rationale as described in the letter from U.S. EPA and NOAA, dated, October 3, 1997, that transmitted the Findings for the Commonwealth of the Northern Mariana Islands Coastal Nonpoint Program.

FINDING: The CNMI's program includes management measures in conformity with the 6217(g) guidance for solid waste management but not for other operation and maintenance measures. The CNMI's program does not include enforceable policies and mechanisms to ensure implementation.

CONDITION: Within two years, the CNMI will include in its program management measures for fish waste, liquid material, petroleum control, boat cleaning, public education, maintenance of sewage facilities, and boat operation in conformity with the 6217(g) guidance and will include enforceable policies and mechanisms to ensure implementation.

RATIONALE: The CNMI's program does not include management measures in conformity with the (g) guidance for fish waste, liquid material, petroleum control, boat cleaning, public education, maintenance of sewage facilities, and boat operation . The CNMI notes that existing marinas do not have sewage pumpout facilities or running water for fish cleaning and therefore believes that these operation and maintenance management measures do not apply. However, proposals for new and expanding marinas should include measures to address potential nonpoint source impacts. NOAA and EPA encourage the CRMO in conjunction with DEQ, Commonwealth Port authority, and DLNR's Division of Fish and Wildlife to coordinate efforts to address these gaps.

In response to this finding and condition, The Commonwealth of the Northern Mariana Islands Coastal Resources Management Office has completed evaluation of existing marina boat operations and maintenance. (Individual surveys are attached-Attachment Q). The survey visited 10 locations covering the habited islands of Saipan, Tinian, and Rota, which covers all boating ramps and marinas in the Commonwealth. The survey questions specifically addressed the management measure in the (g) guidance. Although the results of the survey indicate that there are few marina operation and maintenance issues in The Commonwealth of the Northern Mariana Islands, the CRMO has amended its regulations to insert these management measures in the Coastal Resources Management Measure to make sure water quality is backed by enforceable policies and mechanisms in the case of new and expanding marinas. The amended regulations (Attachment H) have been inserted into the regulations of CRMO to be shoreline APC management standards in order to address New and Expanding Facilities.

The amended regulations read:

(6)Marina and small boat harbor projects shall be evaluated for consistency with the following performance standards and goals:

(a) Effective runoff control. Runoff control shall be implemented which includes the use of pollution prevention activities and the proper design of hull maintenance areas.

(b) Shoreline stabilization shall be implemented where erosion is a nonpoint source pollution problem. Vegetative methods are strongly preferred unless structural methods are justified based on cost benefit analysis (over what term?), considering the severity of wave and wind erosion, offshore bathymetry, and the potential adverse impact on other shorelines and offshore areas.

(c) Effective fuel station design shall be implemented to allow for efficient and effective cleanup of spills.

(d) Effective sewage management facilities shall be installed where needed to reduce the release of sewage to surface waters. Facilities shall be designed to allow for efficient and effective maintenance and signage shall be posted to facilitate the public's use of the facility.

(e) Effective fish waste management shall be implemented through restrictions, public education, and/or proper disposal of fish waste.

(f) Petroleum Control Management. Petroleum control shall be implemented to reduce the amount of fuel and oil from boat bilges and fuel tank air vents and other vessel activities from entering marina and surface waters.

(g) Boat Cleaning Management. Boat Cleaning operations shall minimize, to the extent practicable, the release of harmful cleaners and solvents as well as paint from in-water hull cleaning.

(h) Public Education Management. Public education , outreach, and training shall promote the proper manner of disposing materials.

(j) Boating activities within marina areas shall conform with Department of Public Safety Boating Safety Regulations (Attachment P).

In regards to restricting boating activities in shallow water habitat, according to legal counsel of the Attorney General's Office of the CNMI, the CNMI already addresses this management measure under the Boating Safety regulations within the Department of Public Safety pursuant to 3 CMC 5459 and 5460 and the attorney general advised that this should not be put into the CRM regulations.

The CNMI is also begun development of a Clean Marina Program for the CNMI using FY 2002 grant funding. Projects that are in the process of being implemented are the development of a Clean Marina Guidebook, an NPS Tide Calendar, a Ponding Basin Demonstration Project, and cost sharing with the Division of Fish and Wildlife on the insertion of a sewage pumpout facility, and creating promotional items to enhance the campaign for clean marinas in the CNMI.

Assessment of the Implementation of Section 6217 Monitoring Measure for The Commonwealth of the Northern Mariana Islands

September, 2002

The following are the original finding, condition, and rationale as described in the letter from USEPA and NOAA, dated October 3, 1997, that transmitted the Findings for the Commonwealth of The Northern Mariana Islands Coastal Nonpoint Pollution Program.

FINDING: The CNMI's program does not include a plan to assess overtime the success of the management measures in reducing pollution loads and improving water quality.

CONDITION: Within one year, the CNMI will develop a plan that enables the Commonwealth to assess overtime the extent to which implementation of management measures is reducing pollution loads and improving the water quality.

RATIONALE: The CNMI included on page 68 of its program submittal a statement that a methodology to determine if water quality degradation still occurs after management measures are implemented is "to be developed." The CNMI has, however, added biological monitoring, sediment monitoring, research into alternative bacterial indicators, and analysis of nutrients to its existing monitoring program. The Commonwealth also proposes to hold monthly meetings between CRM and DEQ to discuss monitoring findings and to determine future program directions (LCRAG), including the need to implement additional management measures.

The CNMI has described a fairly extensive beach sampling program that should help determine whether the management measures are improving the water quality, particularly with regard to fecal coliform, sediment, and nutrients. With weekly sampling at 37 beaches, there should considerable opportunity to focus on the impacts of management measures in selected watersheds or watershed sub-areas. The land use and other maps provided in the submittal indicated that the CNMI has the capability to closely track management measure implementation in concert with water quality monitoring.

While the Commonwealth provides some detail regarding its monitoring program and expectations for section 6217, it does not describe how these efforts will be applied to the coastal nonpoint program. In its monitoring plan, the CNMI should include information regarding the number and location of monitoring stations, the types and frequency of water quality data being collected, methods for tracking management measure implementation, and the analytic approaches that will be employed in conjunction with existing monitoring efforts to assess the success of management measures in achieving water quality objectives. The monitoring plan will also specifically target the proposed expansion of the Seishin Farm piggery in Kalabera and the Puerto Rico Dump Critical Coastal Area.

Response to the findings and condition of the Monitoring Management Measure

In response to this finding and condition, the Commonwealth of the Northern Mariana Islands Division of Environmental Quality and the Coastal Resources Management program, have completed a detailed documentation of our current monitoring strategy to address the conditions. The *Commonwealth of the Northern Mariana Islands Monitoring Strategy* (Attachment D) applies to the Coastal Nonpoint Program by collecting and providing all data necessary to make resource management decisions. Utilizing a GIS database, the different parameters being assessed, and monitoring techniques described in this document, the CNMI can measure the effectiveness of implemented management measures and assess overtime the success of the management measures in reducing pollution loads and improving water quality.

The CNMI monitoring plan does not include the expansion of the Seishin Farm Piggery in Kalabera because the proposed expansion never occurred, and will not likely occur in the future due to economic downturn in the CNMI. The Saipan Lagoon habitat assessment project will address monitoring concerns for the Puerto Rico Dump area.

While the ecological monitoring is based on two general types of parameters, physical and biocriteria, the approach to utilizing the data provided by these methods is similar. First, an initial quantitative assessment (baseline monitoring) of the watershed and associated waterbodies is completed. When possible, this will include historical data as well as any new surveys needed to characterize the area (trend and baseline monitoring). The combination of physical parameter and biocriteria data are used to assess the status of the waterbody in question. If water quality impairment is detected, the source of impairment is sought out and appropriate management measures are identified to mitigate the negative effects. Monitoring is then initiated to assure compliance and maintenance of management measures and/or BMPs (compliance monitoring) and to assess the effectiveness of the management measures in maintaining and mitigating the water quality in receiving waterbodies (validation and compliance monitoring).

In the case of proposed projects that have the potential for creating NPS pollution, a similar methodology is employed. In this case, management measures are required through regulations or project permit conditions. The assessment and monitoring procedures are followed as outlined above. Monitoring assures compliance with management measure requirements and maintenance of water quality. If monitoring discovers a water quality reduction, regulatory agencies will modify management measures to mitigate for the effect. Continued water quality monitoring will then validate the effectiveness of the implemented management measures and BMPs associated with it.

Of the seven types of monitoring listed in the 6217(g) guidance, the CNMI uses a less dissected set which still comprises all types: **Assessment** (= Baseline), **Trend** (= Trend, Validation and Effectiveness), and **Compliance** (= Compliance, Implementation, and Project). The application of these monitoring types to NPS issues is identical to five points of Meals (1991) listed in the 6217(g) guidance.

In the conditions for approval of the Commonwealth of the Northern Mariana Islands (CNMI) Coastal Nonpoint Pollution Control Program, the inclusion of management measure for Monitoring Strategies in conformity with the (g) Guidance is required. The CNMI Division of Environmental Quality (DEQ) and the CNMI Coastal Resources Management Office (CRM) have completed the documentation of detailed processes to illustrate how this is being implemented in the CNMI.