Appendix E: Small Group Monitoring Strategy Study Teams

I. WPDES Related Monitoring – Paul LaLiberte

Monitoring done by DNR involving a significant staff effort and can be foreseen sufficiently to be incorporated into work plans

- Update use designations for receiving waters of existing WWTPs using new protocols. Committee currently meeting to formulate guidance.
    - Natural Community Verification guidance to be posted in EGAD.
    - Additional sections and rule promulgation are also needed.
    - Automation of verification process underway. Work is underway to verify communities in summer 2014.
    - Prioritize NC verification fieldwork based on data age, likelihood for change and permit expiration.
- Evaluate effect of existing discharges on receiving waters (e.g. upstream/downstream studies). WDNR does not currently conduct this work systematically.
    - Develop guidance for including a point source element in TWA studies.
- Toxicity special investigations.
    - Inform staff by sharing examples of past experience using receiving stream WET data to follow-up on effluent WET problems.
        - Guidance is available for staff use when performing toxicity testing in response to a spill or suspected illicit discharge, at: http://dnr.wi.gov/topic/wastewater/documents/Chap1x13SpillsToxTesting.pdf.
        - Other WET guidance (sampling for WET tests, toxicity identification studies, etc.) can also be found at: http://dnr.wi.gov/topic/wastewater/WETguidance.html.
- Complex downstream point of standard application issues (pollutant decay, wetland attenuation, etc)
    - Use a team clearinghouse approach rather than guidance document due to pending phosphorus court cases. Make limit calculators aware of WR local needs project planning system.
    - Limit calculators group needs access to wetlands expertise.
- DNR initiated upstream chemistry sampling to determine background concentration involving more than minimal effort water quality sampling. Adverse consequences of the current approach of using regional default values are probably minimal both environmentally and economically in most cases.
    - Might need an effort in the future due to new standards (TSS, nitrogen, E coli) or existing standards mercury, chloride, arsenic regulation.
        - Update the datasets used to identify default concentrations for some parameters.
- Flow measurements for systematic update of 7Q10 estimates (climate change?)

Monitoring done by DNR in response to developing circumstances that typically does not involve significant time or expense.

- Simple downstream point of standard application issues or upstream background issues that can be settled with minimal effort water quality sampling. Utilize WPDES SLOH sampling account code WW014.
    - Update the datasets used to identify default concentrations for some parameters. Flow measurement to refine 7Q10 estimates **[HIGH PRIORITY]**
    - Consultation on monitoring plans from WPDES permit holders

Monitoring done by DNR in response to developing circumstances that involves significant time or expense (extensive water quality sampling or biological monitoring)

- Use designations for proposed new outfalls. Guidelines for designating Fish & Aquatic Life Uses for WI Surface Waters (2004) This pertains primarily to designations of wetland or effluent ditch. Other designations are by default until NC use designation system is better developed.
    - Need clarification of current practice of waterbody use designations related to recent changes. [DONE]
        - Lisa, Diane and Kristi will compile a history of the history of this issue. [DONE]

- Site specific phosphorus criteria development. (likely a joint DNR / permitee effort) guidance document under development (draft available soon).
    - The guidance document may identify the need for DNR to get ahead of the effort with some limited biological recon sampling or evaluation of existing data.
- Monitoring in support of enforcement actions. No guidance available other than manure spills. Some guidance exists for WET.
    - Develop example case studies to share with WW and WR staff in lieu of more guidance.

Receiving water monitoring primarily done by WPDES Permittee

- Permittee initiated upstream sampling to refine effluent limits:
    - Guidance for thermal limits and thermal mixing zones are in http://dnr.wi.gov/topic/surfacewater/documents/ThermalGuidance2edition8152013.pdf.
    - Guidance for phosphorus limits are in http://dnr.wi.gov/topic/SurfaceWater/documents/Phosphorus_Guidance_Signed.pdf

- Dissipative cooling investigations and alternative effluent limitations for temperature (usually a facility effort with minimal assistance from DNR staff)
    - Guidance in http://dnr.wi.gov/topic/surfacewater/documents/ThermalGuidance2edition8152013.pdf

- Mixing zone investigations for other parameters.
    - Mixing Zone Guidance (1992); Effluent Limits Calculation Guide: Water Quality Rules Implementation Plan, PUBL-WT-511-98
- Chemistry sampling to support regulation of dissolved metals
    - Effluent limits calculation guide. Water Quality Rules Implementation Plan, PUBL-WT-511-98; Dissolved-Based Special Monitoring Requirements In Permits, Thoughts by Tom Mugan 2/10/00.
- WET testing of receiving waters
    - http://dnr.wi.gov/topic/wastewater/wetguidance.html
- Section 316(b) of the Clean Water Act requires that permitting authorities ensure that the location, design, and capacity of cooling water intake structures reflect the best technology available to minimize harmful impacts on the environment.
    - EPA promulgated regulations in 2001-2006 and 2014 at 40 CFR Parts 122 and 125 (Subparts I, J, and N) that require facilities with intake structures (in Wisconsin, mostly power plants and paper mills) to collect biological data (fish and shellfish types & abundance) in the area around their intake.
    - Some guidance is available at: http://dnr.wi.gov/topic/wastewater/intakestructures.html. Additional guidance to address the new 2014 federal rule is under development.

(9/25/2014)

II. Levels and Flows Related Monitoring

Topical Area: Water Quantity -- Levels and Flows Monitoring		
Leadership:	Tim Asplund	
Small Team Members:	Shaili Pfeiffer	Jeff Helmuth
	Kris Stepenuck	Katie Hein
	Mark Hazuga	Matt Diebel
	Tom Bernthal (Wetlands)	Lori Tate (Fisheries)
Charge:	Group is charged with identifying specific monitoring work to fulfill program requirements. Funding/work will change with the change to program and project-based funding.	
Monitoring Objectives:	Water Quantity Data is needed for multiple management purposes: • Stream Flow Monitoring – August/Baseflow, Q7/10, other • Lakes – Lake Level Monitoring • Surface Water Assessments – High Cap Well Reviews (wetlands, springs, stream and river impacts)	
Overall Monitoring Approach/Design best suited to achieve each objective (targeted, random, fixed sites, etc)	Streams: -long-term, fixed monitoring stations -target streams not monitored by other entities (e.g., USGS monitors about 600 sites, none of which are <10 cfs) -target headwater streams, low flow periods, frac sand mine areas, the central sands, and better statewide coverage in general Lakes: -long-term, fixed monitoring stations -target seepage lakes -add lakes for better statewide coverage (e.g., northwest Wisconsin)	
Indicators/ Parameters	Streams: stream flow (cubic feet per second) 1. Flow meter across a stream cross-section 2. Install staff gage and develop rating curve? 3. WAV float method Lakes: lake stage (meters above sea level): 1. staff gage installed in spring and surveyed in spring and fall 2. piezometer near lake shore – only to be used near lakes with homogenous, porous geology	

Scale and Frequency of sampling	Streams: Unknown? Lakes: At least monthly during ice-free season, as frequently as possible
Prioritization of waterbodies/watersheds	Streams: • Small streams and headwater streams • Areas of the state deemed high priority (in regards to data needs and gaps) by DNR staff representing various waters programs • Areas of the state sensitive to groundwater withdrawals (e.g., for irrigation or sand mining) • Areas of the state where there are active volunteer stream monitors Lakes: 1. Seepage lakes 2. Regions with little to no existing lake level monitoring data (northwest, north central, northeast, central east) 3. Higher priority for regions vulnerable to groundwater withdrawal (sand and gravel) 4. Higher priority to lakes currently monitored for water quality by dedicated volunteers
Who does it (DNR staff, partners, volunteers, etc)	Streams: 1. County staff (Central Sands area) 2. WAV 3. DNR stream biologists 4. DNR fisheries staff 5. George Kraft – UW Steven's Point 6. USGS Lakes: 1. DNR staff on selected Long Term Trend Lakes 2. County staff – coordinators, surveyors 3. Citizen Lake Monitoring Network volunteers – make lake level observations; select individuals may be able to do surveys 4. Consultants – survey staff gages 5. Non-profits – survey staff gages and coordinate volunteers 6. Other? There is a need to find qualified staff who can survey staff gages in spring and fall. The hope is to fund network hubs in various parts of the state that can be responsible for coordinating volunteers and surveying gages. For example, North Lakeland Discovery Center does so for Vilas County. 7. UW Center for Limnology – monitors lake levels in Vilas and Dane Counties 8. USGS – monitors 10 seepage lakes across the state in addition to several large lakes (e.g. Green Lake, Lake Geneva)

III. Quality Assurance Quality Control Elements

Topical Area: Quality Assurance Quality Control Elements		
Leadership:	Lisa Helmuth	
Small Team Members:	Donalea Dinsmore	Molli MacDonald
	Kris Stepenuck	Katie Hein
	Mike Shupryt	Lori Tate (Fisheries)
	Filbert, Jennifer M - DNR	Miller, Michael A - DNR
	Person, Ruth A - DNR	Bernthal, Thomas W - DNR
	Arneson, Ronald C - DNR	
Charge:	Group is charged with identifying specific quality assurance control issues, existing tools, and gaps for the 2014 update of the Monitoring Strategy. In particular, the group identified items to address during strategy implementation.	
Team Objectives:	• Monitoring Program Quality Assurance Project Plan (Surface Waters) • Monitoring Program QAPP Detailed Template(s) • Monitoring Program Auto-Generated Template for QAPP. • Creating rolling list of issues that might be addressed through implementation.	
Overall Approach	**Specifically:** • Identify ongoing quality control processes for all WDNR monitoring including data integrity plans for databases. **An QAQC Inventory Matrix was created for this.** • Create QAPP Template for projects and flow of review and signoff for complex projects. **Multi-Agency Projects to use formal protocol. Others program generated qaap, requiring specific data filled into SWIMS.** • Identify key elements to include in QAPP generated by SWIMS (required fields, logic). • Create template/format/storage location and routine tasks for creating and accessing **study protocols, parameter collection methods**, and **equipment management** protocols / preparation, etc. • Create recommendations on training, storage of training records, and association of quality assurance information in SWIMS, Fish Management Database, and other pertinent databases.	
Indicators/ Parameters	○ Study purpose, objectives and design filled out in SWIMS field. ○ Final report or conclusions filled out or attached on swims project.	
Prioritization of Work	• After a comprehensive list is created, priorities will be identified with media teams and QAQC Implementation Team.	
Who does it (DNR staff, partners, volunteers, etc)	DNR staff – biologists, project managers, grant managers – all dnr staff who manage projects and oversee monitoring work will help ensure the completeness of datasets with descriptions, purpose, collectors, study design, protocols, methods, equipment, results analyses and final report.	

IV. Runoff/Best Management Plan Evaluation

Topical Area: Nonpoint Source Program Monitoring Needs (CWA Section 319)		
Leadership:	Mike Shupryt	
Small Team Members:	Jim Amrhein	Corinne Billings
	Andrew Craig	Kevin Kirsch
	Mike Miller	Theresa Nelson
	Aaron Ruesch	Greg Searle
Charge:	Group is charged with identifying specific monitoring work to fulfill program requirements. Funding/work will change with the change to program and project-based funding. Note there are **three** objectives addressed by this group.	
Monitoring Objectives:	Monitoring to evaluate the success of best management practices.	
Overall Monitoring Approach/Design best suited to achieve each objective (targeted, random, fixed sites, etc)	Targeted, intensive monitoring is required in order to evaluate the effectiveness of BMPs. For WQ10 Performance measures (restoring an impaired waterbody) monitoring could be completed at the reach scale. For WQ-SP12 performance measures a watershed wide (HUC 12) monitoring design would be needed in order to show watershed wide improvements. In either case the best chance of showing improvements would be to identify watersheds where multiple BMPs and multiple landowners have installed practices over a relatively short time period. Gathering data on BMP installation with accurate locational and temporal data is a key element in order to best target monitoring activities in watersheds where there is the best chance of documenting success.	
Indicators/ Parameters	There are many entities (USGS, UW, etc.) working on showing the efficiency of BMPs with edge of field monitoring. We should be focusing on BMP effectiveness monitoring through in-stream water quality measures. Delisting streams as a result of BMP success is going to depend on the specific pollutant that was initially listed. The most likely pollutants will be total phosphorus and total suspended solids. In order to show whole watershed improvements other water quality measures could be used such as biology and load reductions.	
Scale and Frequency of sampling	Frequency of measurements for delisting will be based on WisCALM methodologies for delisting requirements for specific pollutants. In order to show load reductions biweekly chemical and flow samples may be required. For more intensive studies spatially intense sampling with continuous flows may need to be captured (USGS flow gauge or pressure transducers) along with event based WQ samples.	
Prioritization of waterbodies/watersheds	Priority watersheds for monitoring would include sites that had pre implementation data and high density BMP installation. Watersheds with approved TMDLs would meet both of these criteria and likely be good candidates. Other watersheds with high densities of BMPs installed that are not in TMDL watersheds could also be good candidates for showing watershed wide improvement and/or delisting. In order to show improvement it is important to select a performance measure(s) and stick to it through time at each location.	
Who does it (DNR staff, partners, volunteers, etc)	Monitoring would be done by DNR staff but multiple organizations are involved in BMP installation and funding including DNR, DATCP, NRCS, Counties, etc.	

Monitoring Objectives:	Monitoring to collect data for the development of a Nine Key Element Plans.
Overall Monitoring Approach/Design best suited to achieve each objective	Targeted watershed wide monitoring is essential for the development of Nine Key Element plans.
Indicators/ Parameters	Indicators to be monitored would include phosphorus, nitrogen and sediment associated with some in stream flow measurements. Loads can be estimated in order to establish a baseline for Nine Key Element plans so continuous flows may not be necessary in all areas of a watershed. Baseline data on land use is also critical in developing Nine Key Element plans.
Scale and Frequency of sampling	Spatially and temporally intense monitoring is required for developing Nine Key Element plans. Some measures of frequent flows are needed but can be estimated at the watershed scale so they are not necessary at all locations sampled. Performance of Nine Key Element plans can be measured through modelling the improvements of BMP installation but intensive monitoring can be included in order to achieve WQ10 or SP12 performance measures.
Prioritization of waterbodies/watersheds	Initially targeting of approved TMDL watersheds would lead to the development of Nine Key Element plans that would not require additional data collection. Secondarily, data collection in order to develop a Nine Key Element plan should be conducted at the HUC 12 level at sites where Counties or other partners have expressed interest in collaborating. Watersheds in Counties with lower interest could still be targeted for developing Plans but would likely be a lower priority. Using 106 monitoring funds for the development of Nine Key Element plans should be prioritized as once Plans are approved those areas are available to receive 319 project funds for future monitoring activities. There are limited watersheds in WI that have approved Plans for 319 project funds for monitoring activities.
Who does it (DNR staff, partners, volunteers)	Monitoring work conducted by DNR staff with the help of volunteers. Collaboration with Counties is critically in determining areas to prioritize for monitoring and Plan development.
Monitoring Objectives:	Monitoring to develop TMDLs for runoff dominated catchments with waters impaired primarily due to diffuse pollutant sources.
Overall Monitoring Approach/Design	Targeted watershed monitoring is required with a focus at monitoring sites at the pour points of major watersheds, sub-watersheds or tributaries.
Indicators/Parameters	Phosphorus, nitrogen and/or total suspended solids are required along with flow monitoring.
Scale and Frequency of sampling	Scale for monitoring is dependent on scale of the TMDL. Recently TMDLs have been conducted at the HUC 8 scale but the future direction is unknown. Sampling frequency is at minimum biweekly water quality and flow measurements. However, in many situations more frequent monitoring, event based water quality samples or continuous flow monitoring may be necessary.
Prioritization of waterbodies/watersheds	Prioritization of future TMDLs is unknown at this time.
Who does it (DNR staff, partners, volunteers, etc.)	DNR staff along with possible partners would be responsible for monitoring.