

# New Mexico's Approach to Nutrient Impaired Waters

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# **New Mexico's current Nutrient Standard states:**

*“Plant nutrients from other than natural causes shall not be present in concentrations which will produce undesirable aquatic life or result in a dominance of nuisance species in surface waters of the state.”*



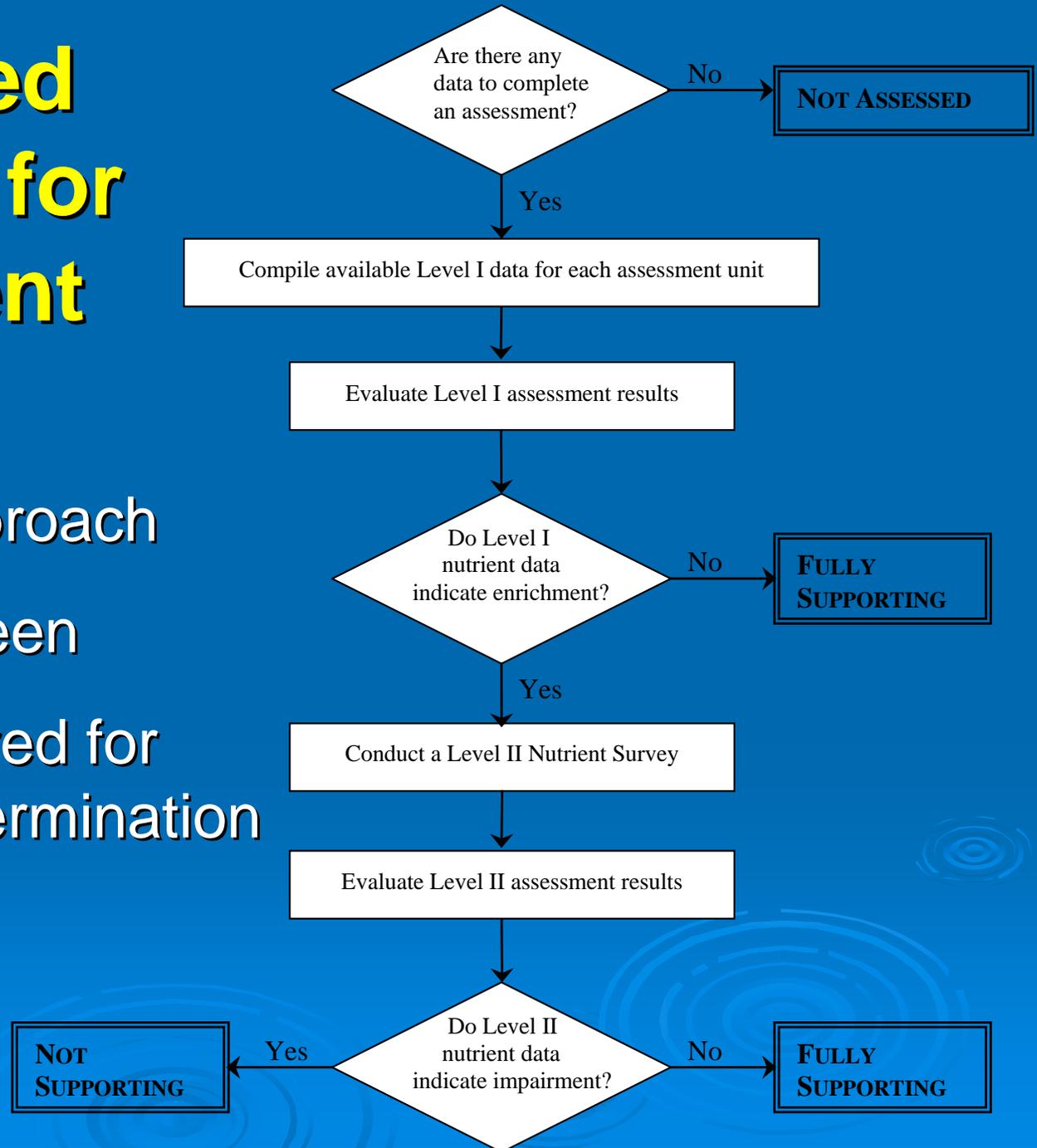
**The question is, how to assess for attainment of this standard and define *quantifiable endpoints*.**

# Nutrient Data Collection

- Sampling typically extends over three seasons with a regular sampling schedule.
- Water quality monitoring includes:
  - Level I Nutrient Survey (qualitative)
    - ◆ *Results of the Level I assessment will determine if a Level II survey is needed*
  - Level II Nutrient Survey (quantitative)
- Nutrient data are assessed using SWQB's current assessment protocols.

# Generalized Flow Chart for Assessment

- Two-Tiered Approach
- Level 1 is a screen
- Level 2 is required for impairment determination



# Nutrient Assessment

## Weight-of-Evidence Approach

*is used:*

- to strengthen the ASSESSMENT
- to account for various situations, such as:  
*the rapid assimilation of TN and TP by autotrophs  
and/or exceedences due to suspended solids during  
peak flows*

*Threshold values used in assessment are derived  
from water quality standards, SWQB analyses, or  
published literature.*

# NM's indicators of nutrient enrichment:

Indicator	Streams	Lakes	Rivers
Nutrient Concentrations	X	X	X
Dissolved Oxygen (mg/L)	X	X	X
DO % Local Saturation	X		
% DO profile below criterion		X	
Ave. Diurnal DO Flux			X
pH	X		
Secchi Depth		X	
Chlorophyll <i>a</i> Concentration	X	X	X
Algal Productivity	X		
% Bluegreen Algae		X	
% Algal Cover	X		X

# TMDL Development

- NM writes Nutrient TMDLs that address causal variables (phosphorus and nitrogen)
- TP and TN targets are set to ecoregion – aquatic life use thresholds or to a value that is proven effective at maintaining the integrity of the waterbody
- WLA calculated as a percentage of the TMDL
  - Often times WLA is well below what is technologically feasible because NM doesn't have much water for dilution

# Evolution of our Process: Case Studies

- Rio Ruidoso – 2005
- Mora River – 2007
- Cieneguilla Creek (Angel Fire) – 2010

# Rio Ruidoso

Based on 2003 data, Rio Ruidoso was determined impaired for nutrients.

Rio Ruidoso was co-limiting so TMDL addresses TP and TN.

4Q3 = 1.183 cfs (0.765 mgd)



Based on the data, phosphorus loading from the WWTP was approximately 30X the level that it should have been; nitrogen loading from the WWTP was 15X the appropriate level.

In-stream targets were set to:

0.1 mg/L for TP and 1.0 mg/L for TN

# Rio Ruidoso – *continued*



*The Rio Ruidoso in 2008*



*The Rio Ruidoso Today*

Effluent limits based on the WLA were set to in-stream targets:  
0.1 mg/L for TP and 1.0 mg/L for TN

The TMDL ultimately resulted in a Settlement Agreement in 2007 between NMED and the Villages of Ruidoso and Ruidoso Downs (WWTP) to define a compliance schedule to meet the new, stringent limits.

# Mora River

The Mora River was determined to be impaired for nutrients.

Wastewater treatment system is an aerated lagoon system with 110 active hookups.

4Q3 = 0.87 cfs (0.562 mgd)



Based on the data, phosphorus loading from the effluent was approximately 6X the level that it should have been; nitrogen loading from the effluent was 5X the appropriate level.

In-stream targets were set to ecoregional median values of:  
0.03 mg/L for TP and 0.38 mg/L for TN

# Mora River – *continued*

Because there was absolutely no “wiggle room” (i.e., no dilution – 88% of TMDL allocated to WLA!), effluent limits were set to in-stream targets:

0.03 mg/L for TP and 0.38 mg/L for TN

Several options were outlined in the TMDL:

Option 1 = meet the WLA and stringent effluent limits

Option 2 = cluster system\* instead of lagoons

\*The NMED CPB and GWQB both supported this option

*Other options to meet the WLA were not excluded.*

# Mora River – *continued*

- The new NPDES permit was issued on September 17, 2008.
- The permit allowed for a compliance schedule of 4 years from the issue date.

The TMDL and NPDES permit ultimately resulted in a Congressional request for assistance, an official response from EPA, more than one article highlighting this controversy

(e.g., WATER POLICY REPORT - 3/1/2010 - “New Mexico Permit Dispute Highlights Limits Of Ban On TMDL Trading”)

Issue is still unresolved... although village is now looking into cluster systems

# Cieneguilla Creek

Based on 2006 data, Cieneguilla Creek was determined impaired for nutrients.

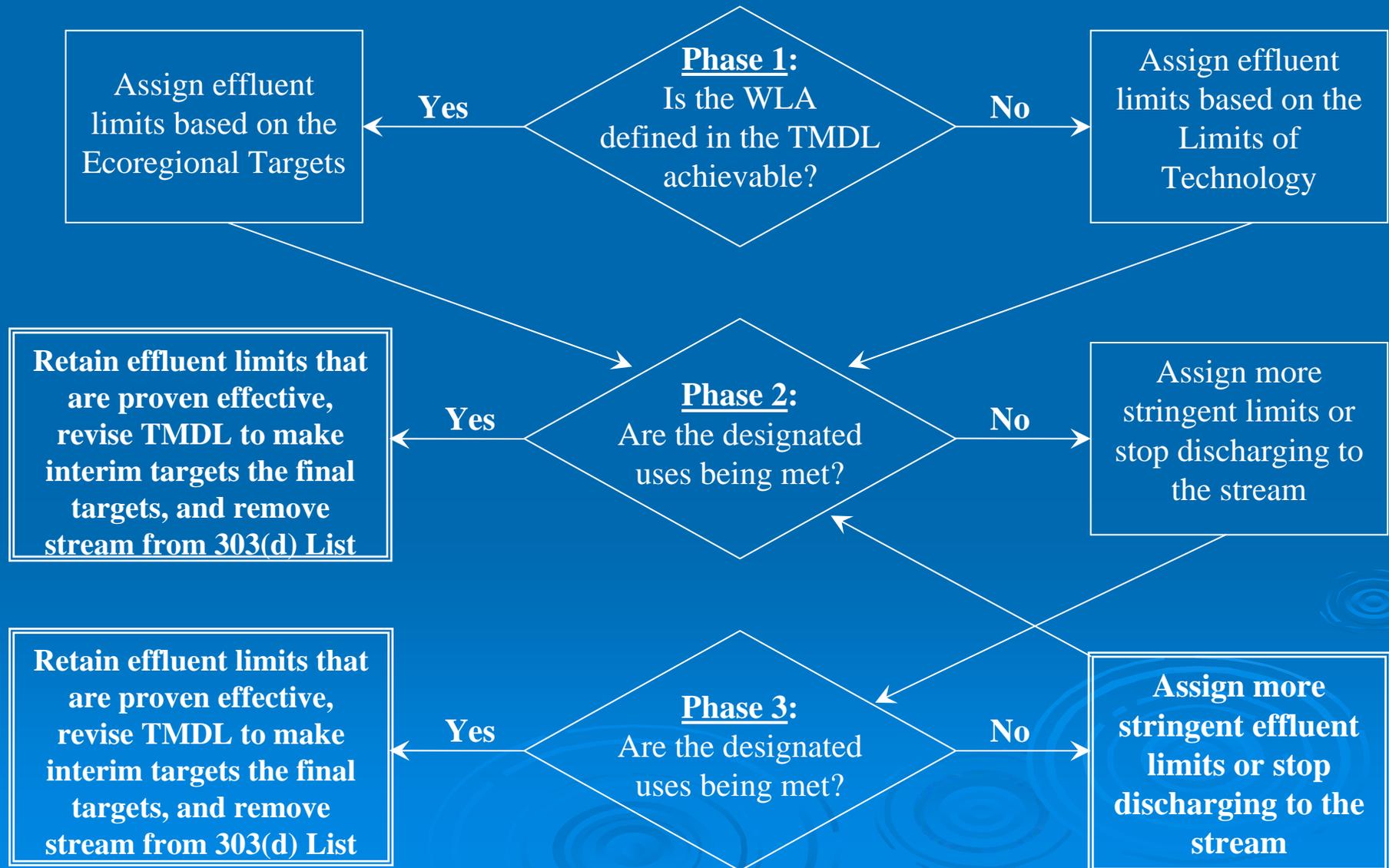
4Q3 = 0.31 cfs (0.20 mgd)



Based on the data, phosphorus loading from the WWTP was approximately 3X the level that it should have been; nitrogen loading from the WWTP was essentially the entire target load defined in the TMDL document.

In-stream targets were set to upstream (non-impaired) values:  
0.06 mg/L for TP and 0.56 mg/L for TN

# Cieneguilla Creek – *Phased Implementation*



# In Conclusion...

- ☞ Nutrient cycling is a dynamic process that cannot (at least with our current data) be defined by a single threshold value.
- ☞ Despite this, there are reasonable and effective ways to monitor and assess a stream for nutrients.
- ☞ NM's tiered, weight-of-evidence approach provides a robust methodology to confidently assess use attainment in our waterways.
- ☞ Because nutrients are a moving target, NM would like to see implementation of the TMDL through the permit process to be flexible enough such that some treatment is required but there is a recognition of the limits of technology for nutrient treatment.
- ☞ The main idea behind this approach is that advanced treatment should substantially reduce the load of TP and TN that is introduced into the stream... it is an ITERATIVE process!

# Contact Information

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SWQB's Nutrient Criteria Homepage:

<http://www.nmenv.state.nm.us/swqb/Nutrients/>