Napa County Flood Control and Water Conservation District

Construction Stormwater Management Compliance Workshop

Workshop Sponsored By:

April 5, 2010

Presenter: Sandy Mathews

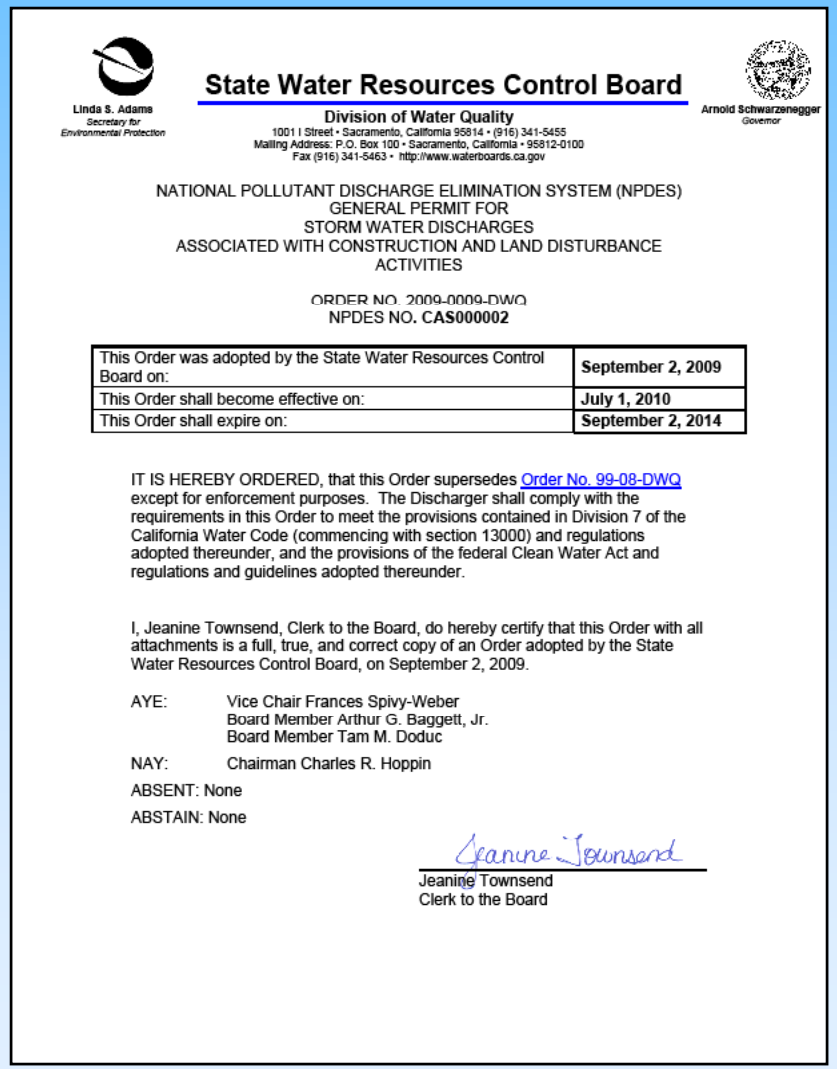
Presentation overview

- Part 1: Overview of the 2009 Construction General Permit
- Part 2: Risk Determination
  - Break ~ 10:30
- Part 3: Construction Site Monitoring
- Part 4: Minimum BMPs
- Part 5: QSD/QSP Preparation
- Working Lunch – Workshop Exercise
  - Wrap up ~ 1:30

Construction Stormwater Management Compliance Workshop

PART 1: OVERVIEW OF THE CGP

The new CGP was adopted September 2, 2009



Linda S. Adams
Secretary for
Environmental Protection

State Water Resources Control Board

Division of Water Quality
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Arnold Schwarzenegger
Governor

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT FOR
STORM WATER DISCHARGES
ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE
ACTIVITIES

ORDER NO. 2009-0009-DWQ
NPDES NO. **CAS000002**

This Order was adopted by the State Water Resources Control Board on:	**September 2, 2009**
This Order shall become effective on:	**July 1, 2010**
This Order shall expire on:	**September 2, 2014**

IT IS HEREBY ORDERED, that this Order supersedes Order No. 99-08-DWQ except for enforcement purposes. The Discharger shall comply with the requirements in this Order to meet the provisions contained in Division 7 of the California Water Code (commencing with section 13000) and regulations adopted thereunder, and the provisions of the federal Clean Water Act and regulations and guidelines adopted thereunder.

I, Jeanine Townsend, Clerk to the Board, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the State Water Resources Control Board, on September 2, 2009.

AYE: Vice Chair Frances Spivy-Weber
Board Member Arthur G. Baggett, Jr.
Board Member Tam M. Doduc

NAY: Chairman Charles R. Hoppin

ABSENT: None

ABSTAIN: None

Jeanine Townsend
Clerk to the Board

- Order 2009-0009-DWQ
- Effective July 1, 2010
- CGP contains several significant new requirements
  - Permit language is subject to interpretation and clarification

CGP = Construction General Permit

“Pull-Apart” permit

- Allows dischargers to focus on the applicable sections for each project
  - Factsheet
  - Order
  - Six attachments (part of the Order)
  - Seven appendices (supplemental information)

CGP can be downloaded from:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml

Key features of the 2009 CGP

1. Projects Covered by the CGP
2. Traditional and Linear Projects
3. Use of Risk
4. R-factor Waivers
5. Permit Registration Documents
6. Developing SWPPPs
7. Implementing SWPPPs
8. Minimum BMPs
9. Numerics (Effluent Limits and Action Levels
10. Post Construction Requirements

Construction activity covered by the CGP

- Projects that affect one acre or more
- Smaller projects part of common plan of development
- Commercial, industrial, residential construction on agricultural lands
- Linear utility construction projects
- Caltrans projects
- Upland spoils piles from projects subject to an Army Corps of Engineers permit

Construction Activity: construction or demolition activity, including, but not limited to, clearing, grading, grubbing, or excavation, or any other activity that results in a **land disturbance**

Construction activity not covered by the CGP

- Projects that disturb less than one acre
- Routine maintenance
- Land disturbances solely due to agricultural operations
- Discharges to a Combines Sewer System
- Projects with an R-Factor Waiver
  - Need to file Waiver Certification
- Projects on Tribal lands
  - EPA regulates
- Disturbances at landfills
  - Covered by Industrial Stormwater General Permit
- Discharges in basins not hydrologically connected to water of the U.S.
  - Check with Regional Board, may need permit under state law - Waste Discharge Requirements

Two project categories: traditional and linear

1. Traditional projects
   - Residential, commercial, industrial, institutional, street/roadway projects
2. Linear underground/overhead projects (LUPs)
   - Utility projects – e.g., water, sewer, cable, electric, gas…

- Most of the CGP addresses traditional projects
  - Attachments C through E
- Attachment A is specific for LUPs

Use of risk in the CGP

- Separate processes for traditional and LUPs to determine water quality risk posed by the project
- Both processes result in three levels of risk
  - Traditional Risk Levels 1 – 3
  - LUP Type 1 – 3
- Permit waiver for very low risk projects

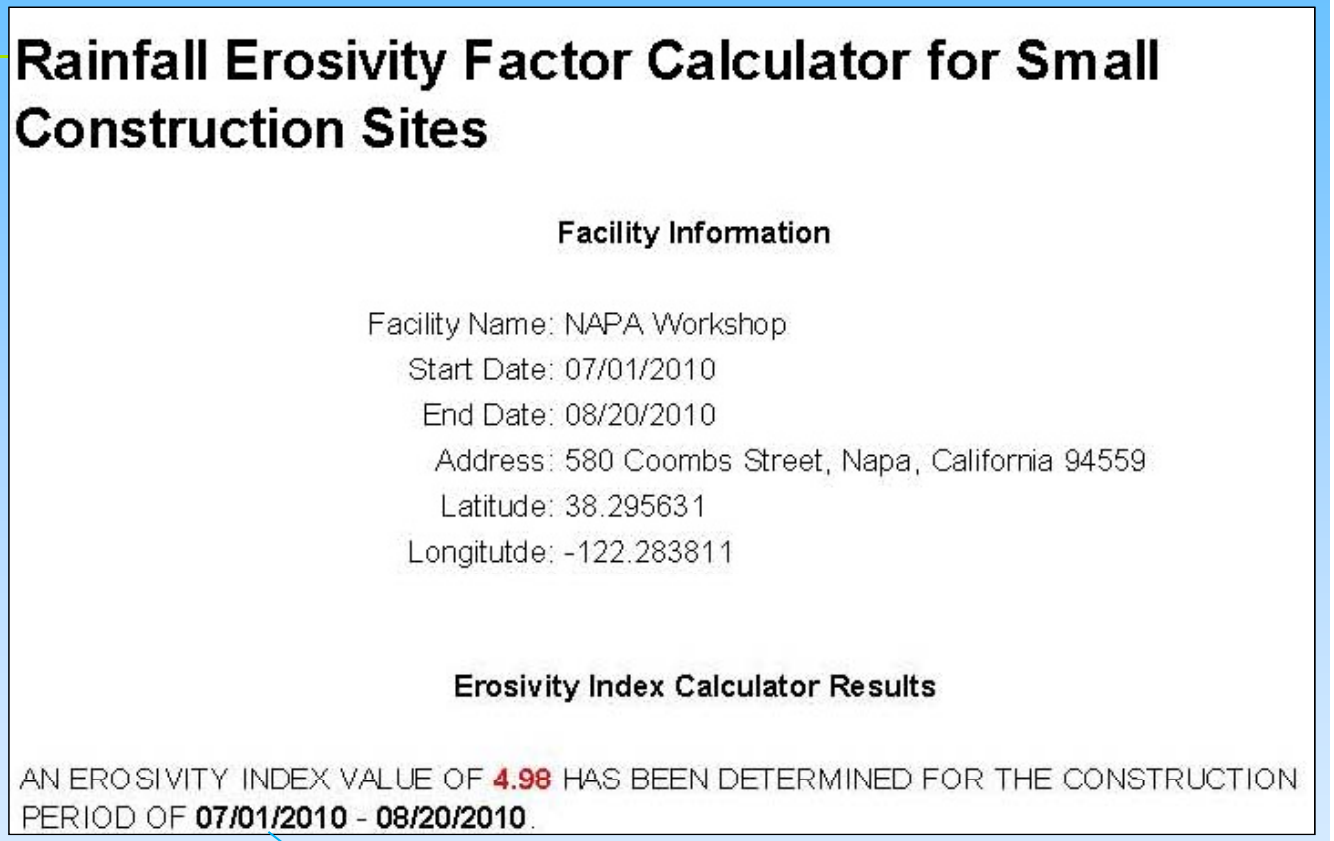
Permit requirements are directly tied to Risk Level/Type

Rainfall erosivity waiver

- Operates as a zero risk level for small projects
  - Small projects are those between 1 and < 5 acres
  - Waives permit requirements for projects with an R-factor of 5 or less
- Based on USEPA R-factor waiver in the Phase II stormwater rule
- Use the EPA R-factor calculator: http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm
- Very few projects in Napa will qualify for an R-factor waiver

R-Factor tool output

- Enter project location
- Enter planned construction period
- **Extremely sensitive to construction period changes**



Rainfall Erosivity Factor Calculator for Small Construction Sites

Facility Information

Facility Name: NAPA Workshop
Start Date: 07/01/2010
End Date: 08/20/2010
Address: 580 Coombs Street, Napa, California 94559
Latitude: 38.295631
Longitutde: -122.283811

Erosivity Index Calculator Results

AN EROSIVITY INDEX VALUE OF **4.98** HAS BEEN DETERMINED FOR THE CONSTRUCTION PERIOD OF **07/01/2010 - 08/20/2010**.

AN EROSIVITY INDEX VALUE OF **4.98** HAS BEEN DETERMINED FOR THE CONSTRUCTION PERIOD OF **07/01/2010 - 08/20/2010**

Submit PRDs prior to start of construction

- Permit Registration Documents (PRDs) include
  - NOI; Risk Determination; Site Map(s); SWPPP; Fee
  - Other documents if applicable
- Legally Responsible Person must submit PRDs
- PRDs are electronically filed into Stormwater Multi-Application and Reporting System (SMARTS)

Note: SWPPPs must be submitted with the PRDs

QSDs develop SWPPPs

- SWPPPs must be developed by a Qualified SWPPP Developer (QSD)
  - QSDs must have pre-requisite qualifications as of July 1, 2010, and by September 2, 2011, must complete State-sponsored or approved training
- Only a QSD is authorized to make SWPPP revisions and amendments
  - Need to have a QSD assigned or available throughout term of project

QSPs implement SWPPPs

- Each project must assign a Qualified SWPPP Practitioner (QSP)
  - From July 1, 2010, until September 1, 2011, any appropriately qualified individual may serve as a QSP
  - By September 2, 2011, QSPs must have the pre-requisite qualifications and have completed State-sponsored or approved training

QSP Is the person assigned responsibility to ensure compliance with the permit and implementation of SWPPP

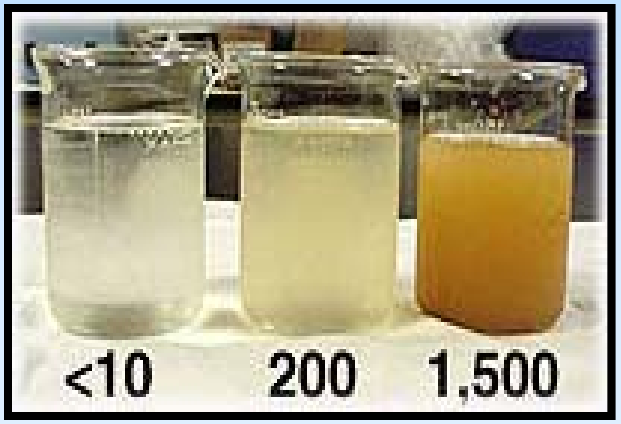
Minimum BMPs are specified in five categories

1. Good Site Management "Housekeeping"
2. Non-stormwater Management
3. Erosion Control
4. Sediment Controls
5. Run-on and Runoff Controls

- Each category has several required BMPs
- Review the details , e.g. "shalls" of all minimum BMPs carefully

Two types of numeric limits assess runoff quality

- Numeric Action Levels - **Risk/Type 2 & 3 sites**
  - Assess BMP/SWPPP performance
  - Based on storm event daily average
    - Turbidity 250 NTU
    - pH 6.5-8.5 pH units
- Numeric Effluent Limitations - **Risk/Type 3 sites**
  - Compliance numbers
  - Exceedance = permit violation
  - Based on daily average
    - Turbidity 500 NTU
    - pH 6.0-9.0 pH units



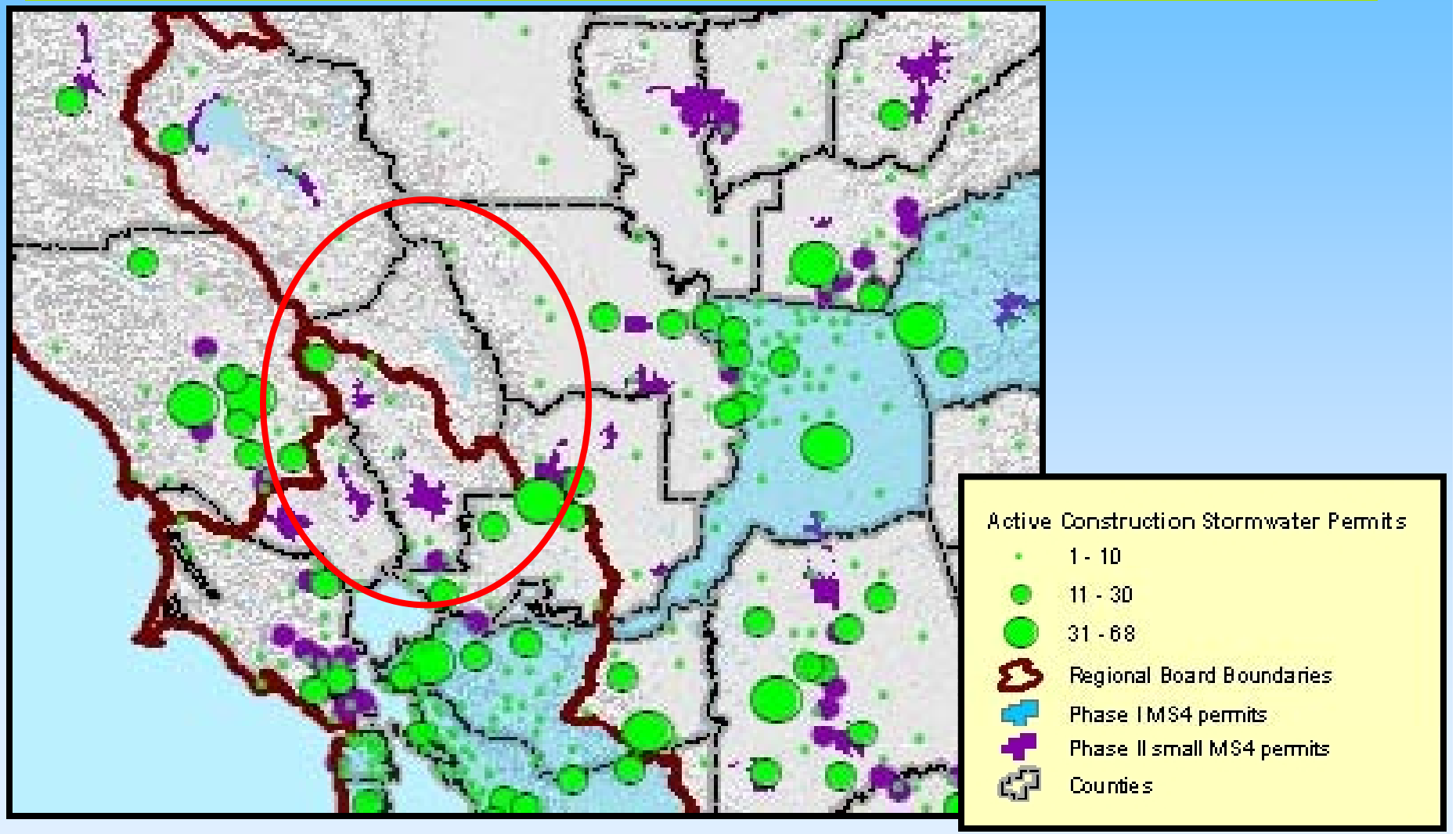
When don’t the numbers apply

- The pH NEL and NAL only apply when there is a “high risk of high pH discharge”
  - Utilities phase
  - Vertical build phase
  - Any other phase when materials are applied to the land that could alter pH of discharge
- NEL exemptions
  - Storms above designated compliance event, 5-year 24-hour event
  - Run-on influenced by disaster (e.g. fire)

Two key post construction requirements

1. Source Control BMPs
   - Applies to all projects; similar to previous permit
     - Implement BMPs to reduce pollutants for the life of the project
     - Expect to submit maintenance program for BMPs with the project NOT
2. Runoff Reduction BMPs
   - Applies to projects outside of the jurisdiction of Phase I or Phase II Municipal Stormwater Program that have Stormwater Management Plans
   - Projects within the jurisdiction of a Municipal Stormwater Program comply with the municipal requirements

Stormwater permit coverage: Northern CA, focused on Napa



Runoff reduction

- Replicate pre-project water balance up to the 85th percentile rainfall event using non-structural practices (match pre-development runoff volume)
  - Use tools in CGP Appendix 2
- Sites greater than two acres of disturbed area, discharger
  - preserve the pre-construction drainage density (miles of stream length per mile of drainage area) and replicate pre-project time of concentration

Construction Stormwater Management Compliance Workshop

PART 2: RISK DETERMINATION

Risk in the 2009 CGP

- Considers two risk factors
  - Sediment discharge and receiving water and risk
- Risk factors combine to yield a project Risk Level
- Permit requirements increase with Risk Level
- Existing projects have a risk determination exemption until July 1, 2011
  - Regional Boards can pre-empt the exemption

Sediment risk factor uses RUSLE

- Revised Universal Soil Loss Equation (RUSLE)

RUSLE

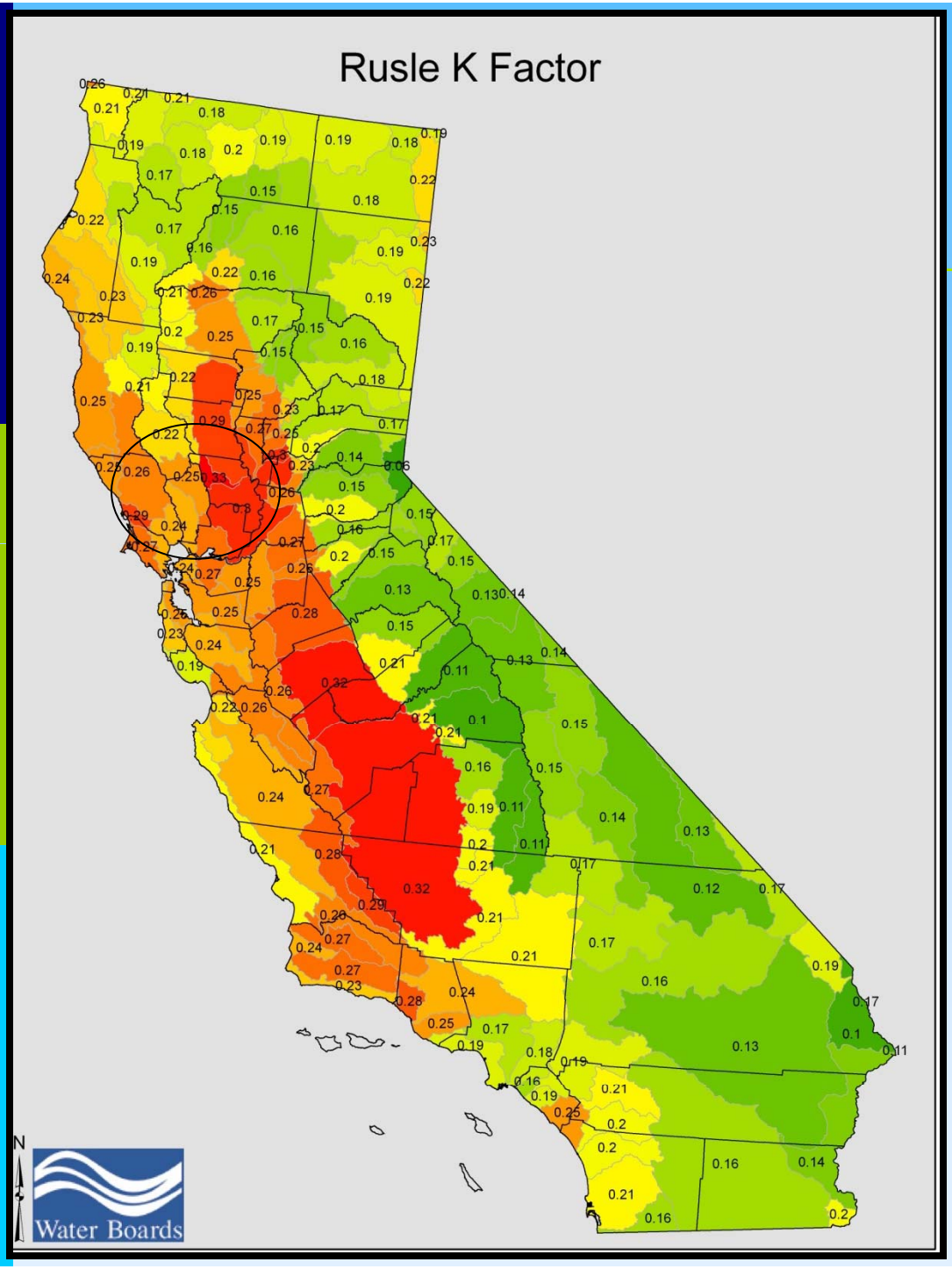
$$A = (R)\,(K)\,(LS)\,(C)\,(P)$$

- A = soil loss from sheet and rill erosion
- R = rainfall-runoff erosivity factor
- K = soil erodibility factor
- LS = length-slope factor
- C = cover factor
- P = practice factor management/support practices

Risk factor: sediment discharge

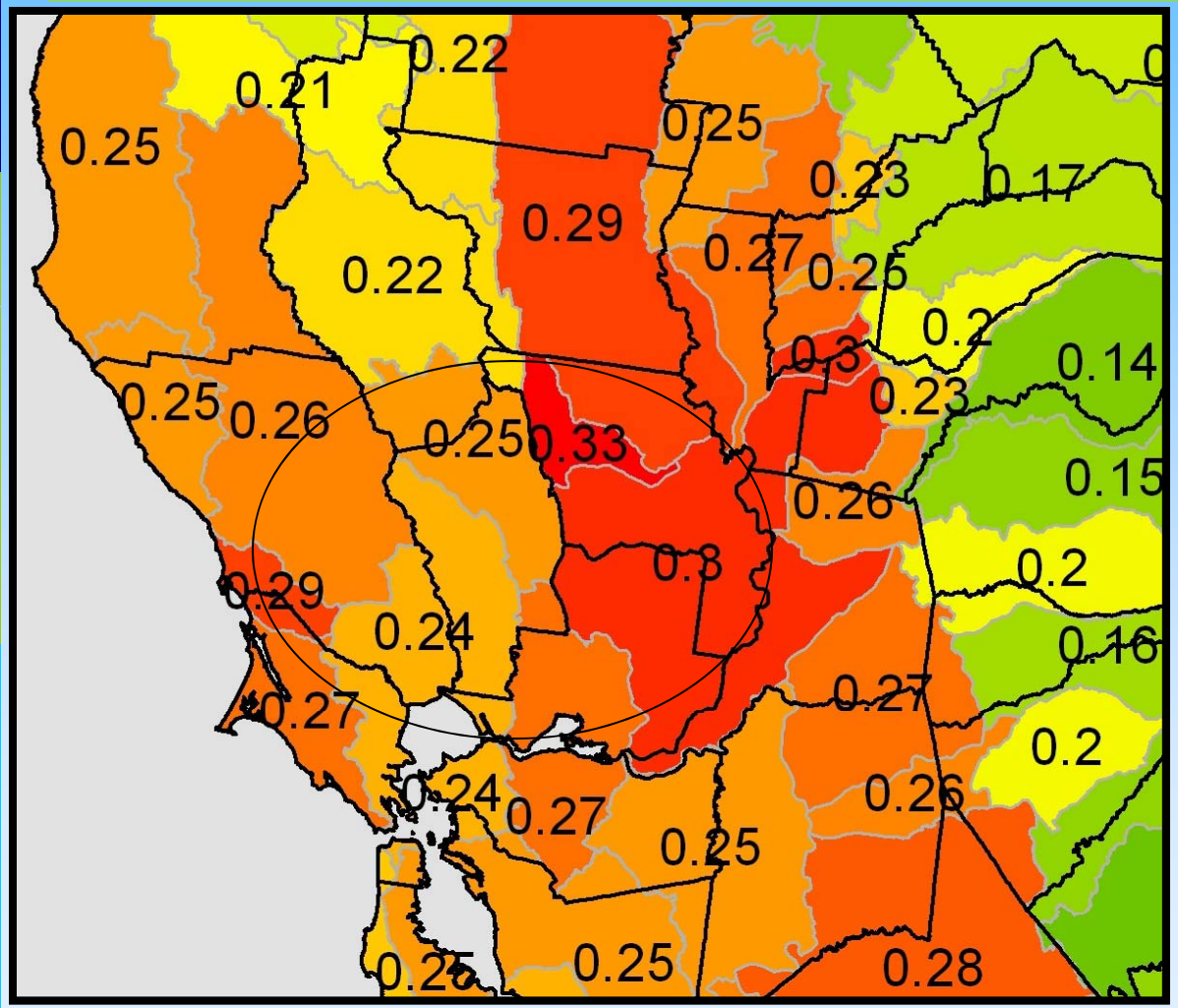
- CGP requires an estimate of the bare ground soil loss using factors from RUSLE
  - Derived from the R, K, LS factors of RUSLE
  - C and P factors are not used (worst case)
- CGP tool calculates a High, Medium or Low risk based on the estimated sediment loss (tons/acre)
  - Low sediment risk= <15 tons/acre
  - Medium ≥15 and <75 tons/acre
  - High ≥75 tons/acre

R will be the primary driver for sediment risk



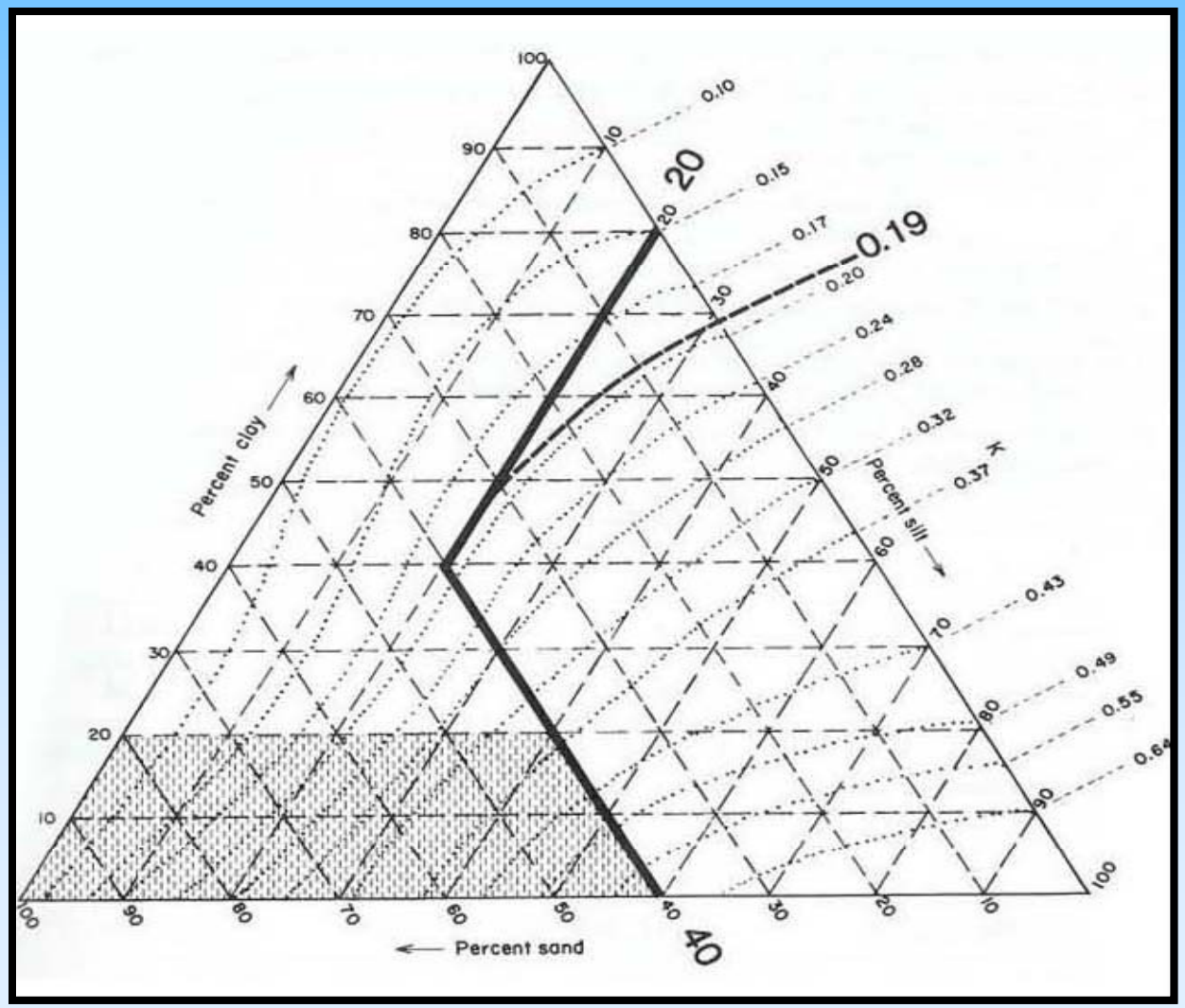
RUSLE K-factor map

K-factor map, focused on Napa

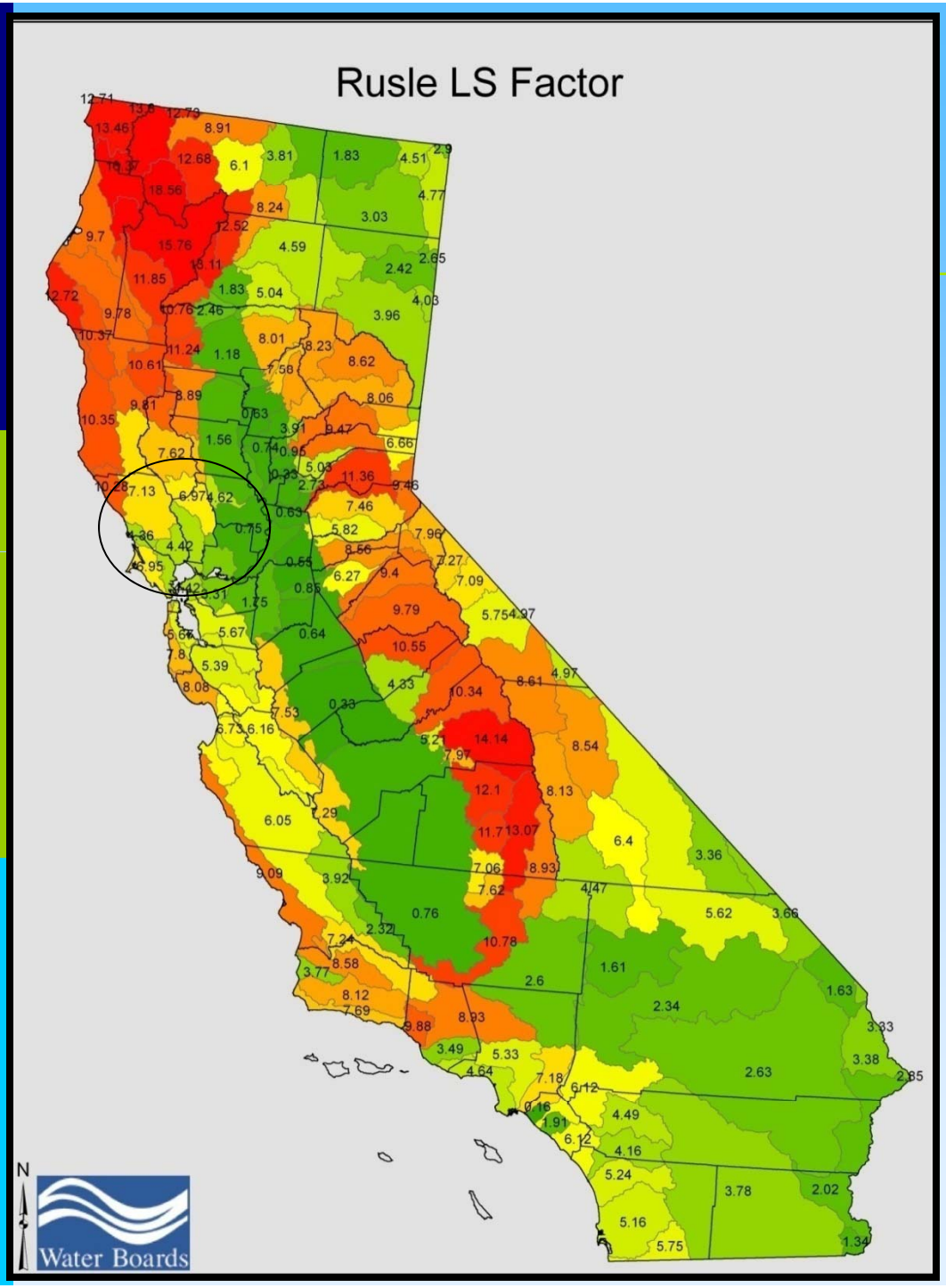


- Napa K-factors
  - NE 0.25
  - SW 0.24
  - SE 0.27

K-factor site specific alternative

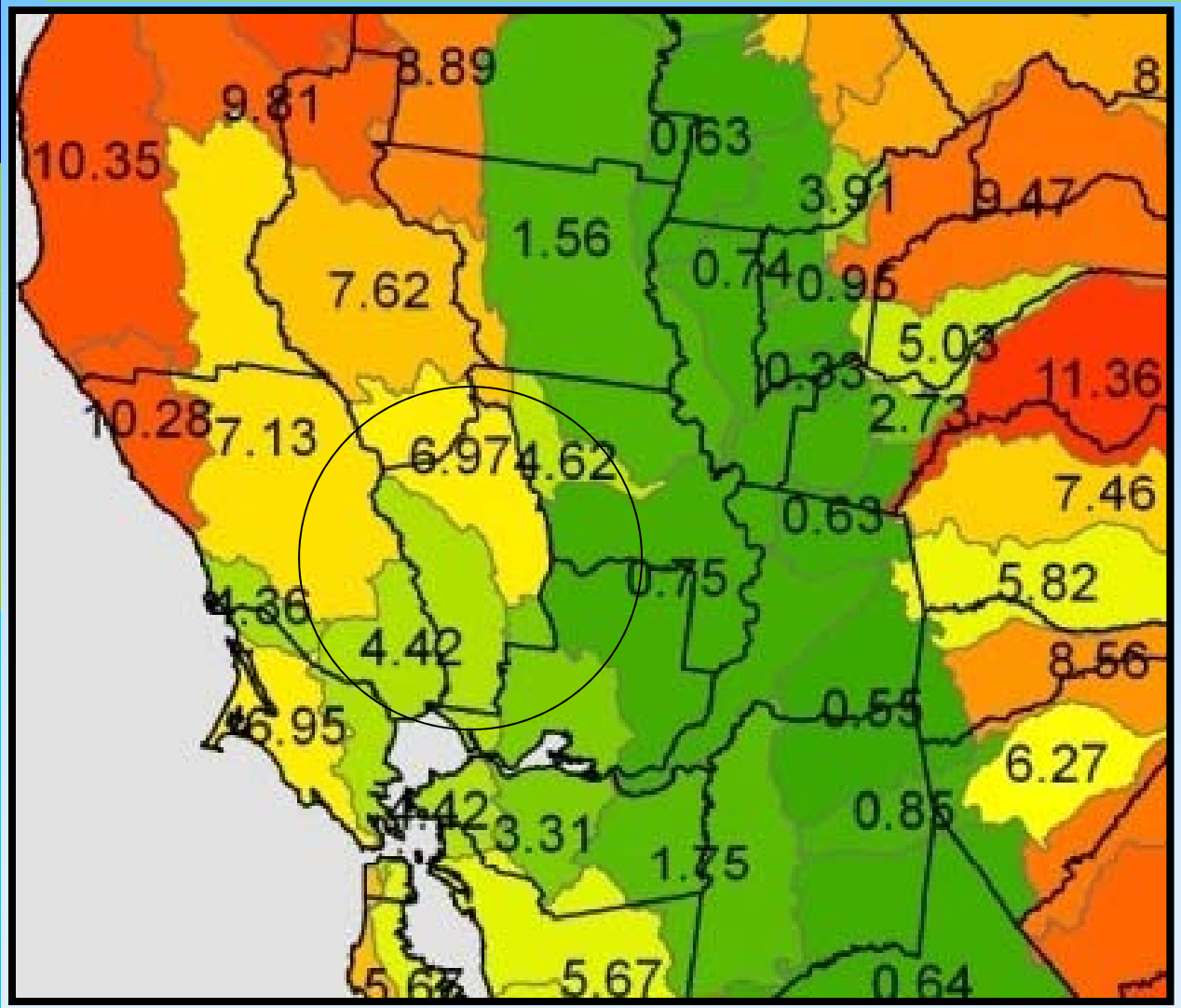


- Conduct soil particle size analysis
  - ASTM D-422
- Determine K-factor from
  - % sand
  - % clay
  - % silt



RUSLE LS-factor map

LS-factor map, focused on Napa



- Napa LS-factors
  - NE 6.97
  - SW 4.42
  - SE 3.31

LS-factor site specific alternative

	Average Watershed Slope (%)				
Sheet Flow Length (ft)	0.2	1.0	5.0	10.0	60.0
<3	0.05	0.09	0.23	0.35	0.63
25	0.05	0.10	0.31	0.57	3.36
50	0.05	0.13	0.46	0.91	5.97
75	0.05	0.14	0.58	1.20	8.37
100	0.05	0.15	0.68	1.46	10.63
150	0.05	0.17	0.86	1.92	14.89
200	0.06	0.18	1.02	2.34	18.92
250	0.06	0.19	1.16	2.72	22.78
1000	0.06	0.27	2.55	7.02	72.15

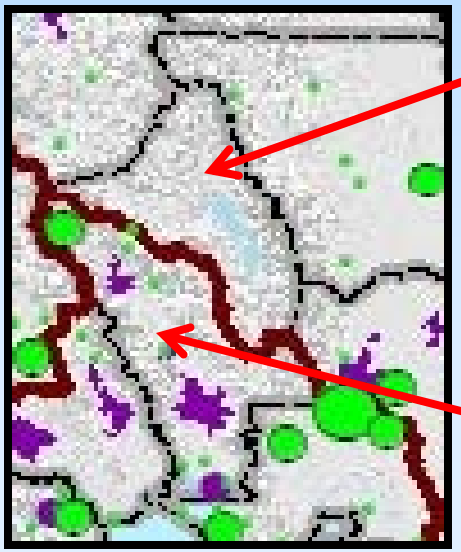
- Calculate area weighted % slope and sheet flow length
  - Topo Map
  - Field measurements
- Determine LS factor from table

Risk factor: receiving water

- Risk based on two conditions indicating the water body is sediment sensitive
  1. Receiving water is listed on the most recent 303(d) list as being impaired for a sediment-related pollutant (e.g. TSS, turbidity)
  2. Receiving water has all three of the following the beneficial uses:
     - Spawning, Reproduction, and/or Early Development (SPWN)
     - Migration of Aquatic Organisms (MIGR)
     - Cold Freshwater Habitat (COLD)
- Knowing your watershed and receiving water is a key part of determining your risk

One county, two watersheds

- Napa is split by a major watershed divide
  - Eastern/Southern part of the county is in Region 2 (San Francisco Bay Region)
  - Western/Northern part of the county is in Region 5 (Central Valley Region – Sacramento River Basin)



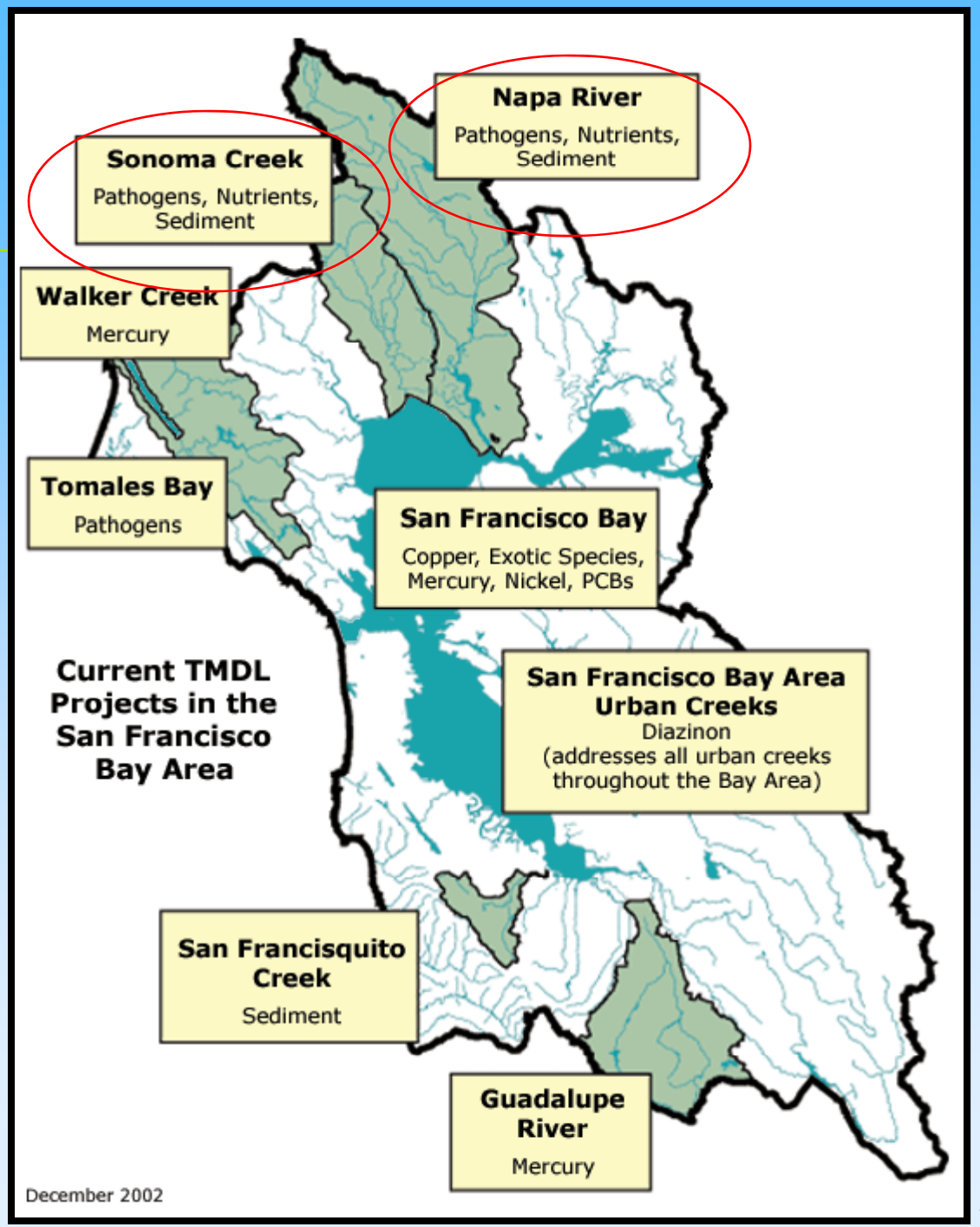
Napa River Beneficial Uses

COUNTY Waterbody	AGR	MUN	FRSH	GWR	IND	PROC	COMM	SHEL	COLD	EST	MAR	MIGR	RARE	SPWN	WARM
Nathanson Creek Agua Caliente Creek (Sonoma) Stuart Creek															
Graham Creek Yulupa Creek															
NAPA COUNTY															
Napa River Huichica Creek Carneros Creek	E	E							E			E	E	E	E

Extracted from SF Bay Basin Plan, Chapter 2, Table 2-1

- ☑ Cold
- ☑ Spawn
- ☑ Migratory

TMDL Projects in the San Francisco Bay Area



Putah Creek and Lake Berryessa Beneficial uses

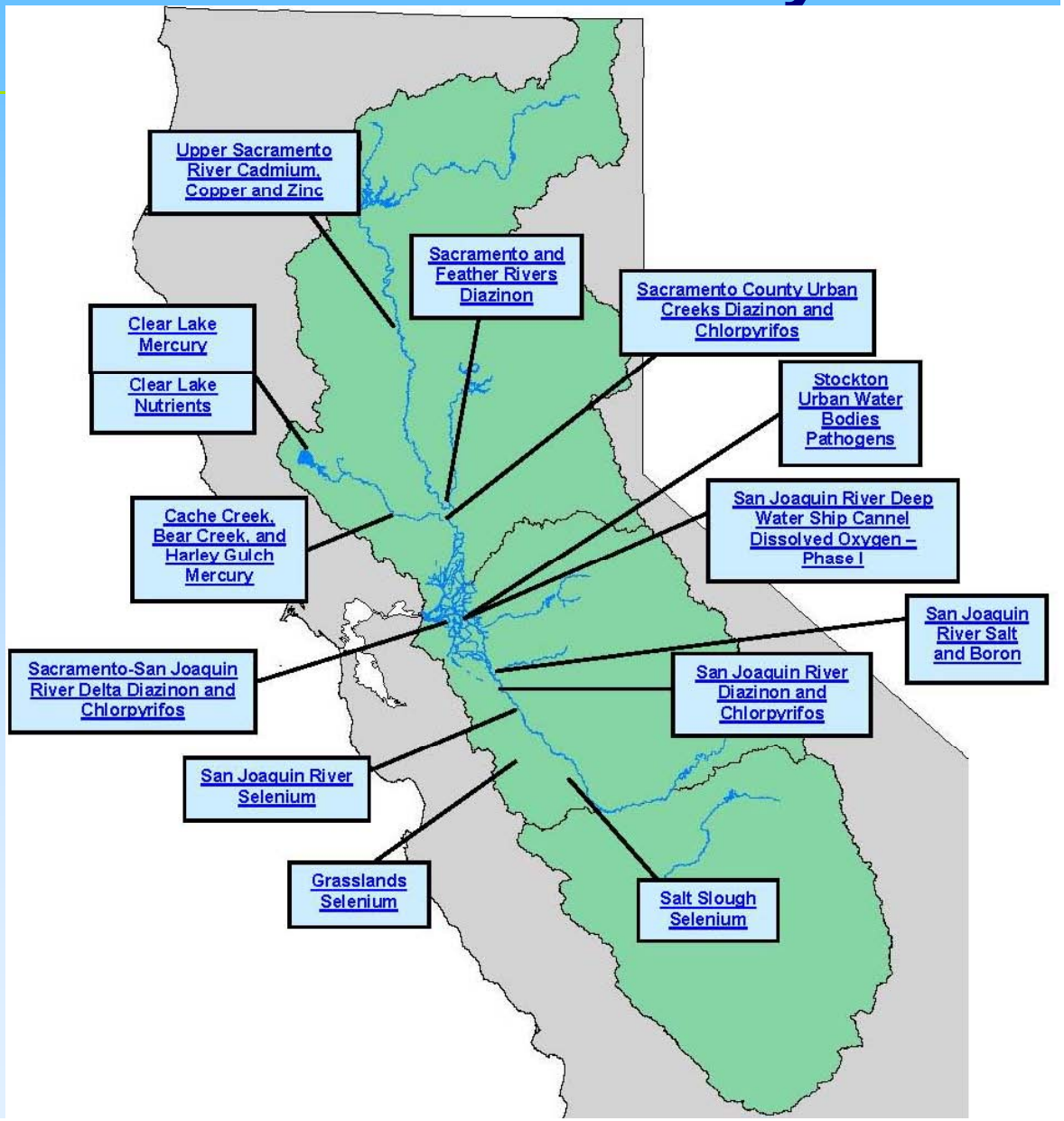
	SURFACE WATER BODIES (1)	HYDRO UNIT NUMBER	FRESHWATER HABITAT (2)		MIGRATION		SPAWNING	
			WARM	COLD	MIGR		SPWN	
			WARM	COLD	WARM (3)	COLD (4)	WARM (3)	COLD (4)
	PUTAH CREEK							
55	LAKE BERRYESSA	512.21	E	E		⊘	E	⊘
56	LAKE BERRYESSA TO YOLO BYPASS	510/511	E	P			E	
	OTHER LAKES AND RESERVOIRS IN SACRAMENTO R. BASIN 5A (6)		E	E				E
	COSUMNES RIVER							

Extracted from Sacramento and San Joaquin Rivers Basin Plan, Chapter II, Table II-1

- ☑ Cold
- ⊘ Spawn
- ⊘ Migratory

Approved TMDLs in the Central Valley

- No sediment related TMDLs under development
- 3 Central Valley water bodies are on the 303d list for sediment
  - Fall River (Pit)
  - Humbug Creek
  - Panoche Creek
- 303d lists are updated every 3 years



Determining risk

- Step 1 Determine Sediment Risk via one of the options listed:
  1. GIS Map Method - EPA Rainfall Erosivity Calculator & GIS map
  2. Individual Method - EPA Rainfall Erosivity Calculator & Site Specific Data
- Step 2 Determine Receiving Water Risk via one of the options listed:
  1. GIS map of Sediment Sensitive Watersheds provided
  2. List of Sediment Sensitive Watersheds provided
- Step 3 Determine Combined Risk Level

CGP sediment risk worksheet

Appendix 1
Construction
General Permit

Sediment Risk Factor Worksheet	Entry
A) R Factor	
Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.	
http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm	
R Factor Value	0
B) K Factor (weighted average, by area, for all site soils)	
The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.	
Site-specific K factor guidance	
K Factor Value	0
C) LS Factor (weighted average, by area, for all slopes)	
The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.	
LS Table	
LS Factor Value	0
Watershed Erosion Estimate (=RxKxLS) in tons/acre	0
Site Sediment Risk Factor	**Low**
Low Sediment Risk: < 15 tons/acre	
Medium Sediment Risk: >=15 and <75 tons/acre	
High Sediment Risk: >= 75 tons/acre	

Sediment Risk for a 23-month project in Napa

Napa River Watershed (Region 2)

1. R-factor - EPA website

   148.88

2. K-factor - State Board map

   0.24

3. LS-factor - State Board map

   4.42

Estimated soil loss **156 tons/acre**

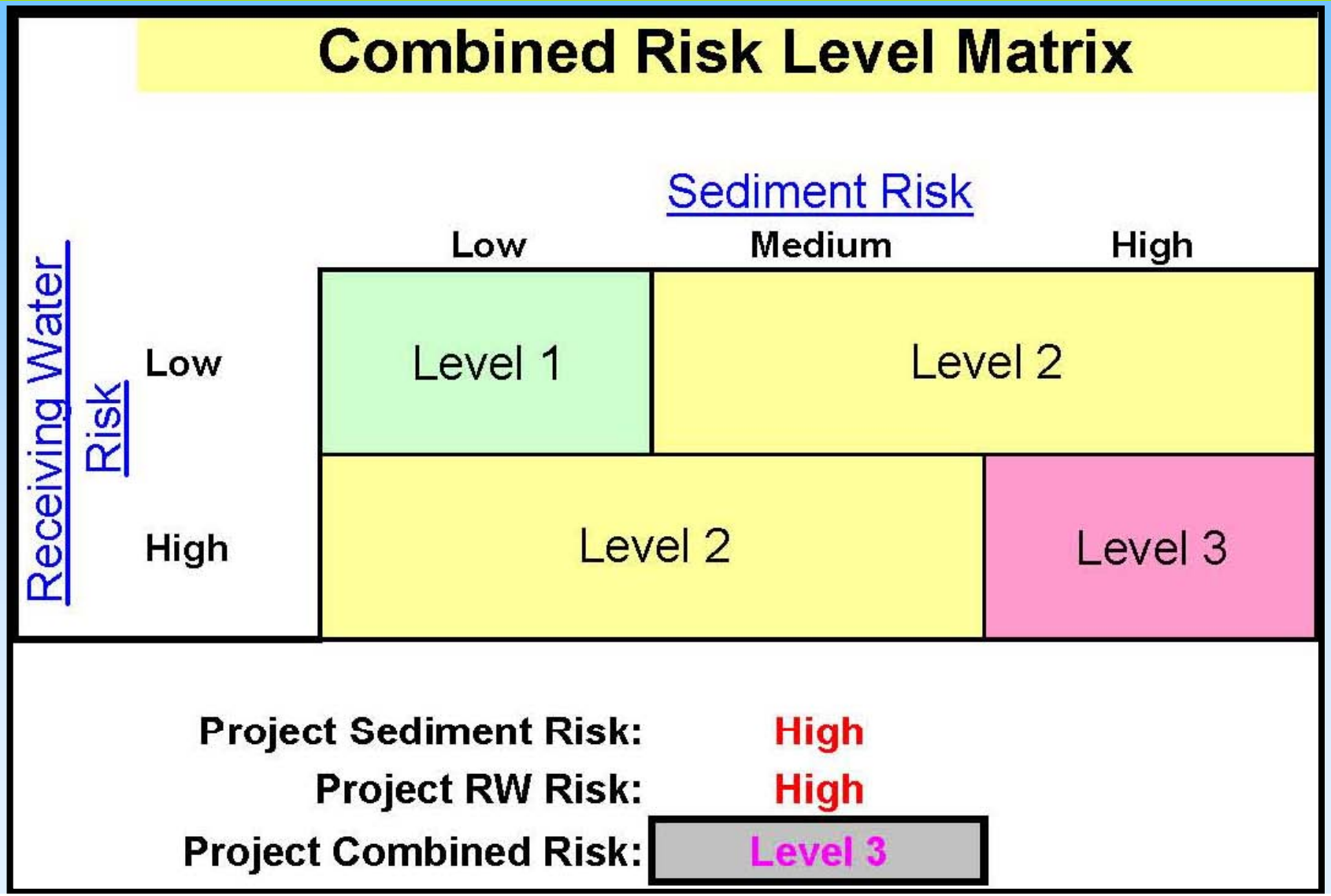
Sediment Risk Factor Worksheet	Entry
A) R Factor	
Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.	
http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm	
R Factor Value	146.88
B) K Factor (weighted average, by area, for all site soils)	
The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.	
Site-specific K factor guidance	
K Factor Value	0.24
C) LS Factor (weighted average, by area, for all slopes)	
The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.	
LS Table	
LS Factor Value	4.42
Watershed Erosion Estimate (=RxKxLS) in tons/acre	155.810304
Site Sediment Risk Factor	**High**
Low Sediment Risk: < 15 tons/acre	
Medium Sediment Risk: >=15 and <75 tons/acre	
High Sediment Risk: >= 75 tons/acre	

Receiving water risk for project in Napa River watershed

Receiving Water (RW) Risk Factor Worksheet	Entry	Score
A. Watershed Characteristics	**yes/no**	
A.1. Does the disturbed area discharge (either directly or indirectly) to a **303(d)-listed waterbody impaired by sediment**? For help with impaired waterbodies please check the attached worksheet or visit the link below: 2006 Approved Sediment-impared WBs Worksheet http://www.waterboards.ca.gov/water_issues/programs/tmdl/303d_lists2006_epa.s html	**Yes**	**High**
OR		
A.2. Does the disturbed area discharge to a waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY? http://www.ice.ucdavis.edu/geowbs/asp/wbquse.asp		

All projects that are in the Napa River watershed will have a high receiving water risk

Combined risk matrix:
23-mo Napa River watershed project



Sediment Risk for a 23-month project in Napa

Lake Berryessa watershed (Region 5)

1. R-factor - EPA website

   168.42

2. K-factor - State Board map

   0.25

3. LS-factor - State Board map

   6.97

Estimated soil loss **293 tons/acre**

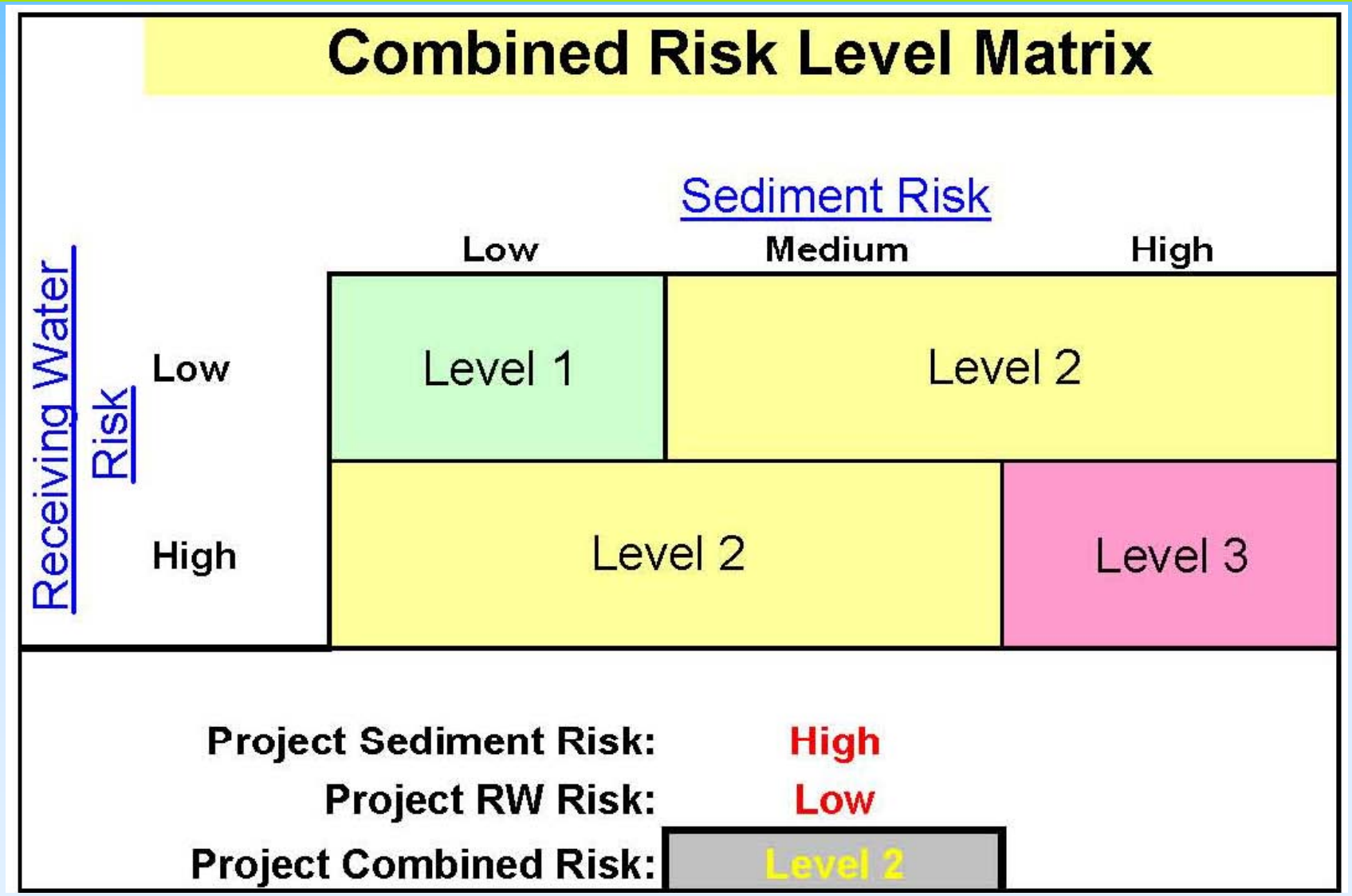
Sediment Risk Factor Worksheet	Entry
A) R Factor	
Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.	
http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm	
R Factor Value	168.42
B) K Factor (weighted average, by area, for all site soils)	
The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.	
Site-specific K factor guidance	
K Factor Value	0.25
C) LS Factor (weighted average, by area, for all slopes)	
The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.	
LS Table	
LS Factor Value	6.97
Watershed Erosion Estimate (=RxKxLS) in tons/acre	293.47185
Site Sediment Risk Factor	**High**
Low Sediment Risk: < 15 tons/acre	
Medium Sediment Risk: >=15 and <75 tons/acre	
High Sediment Risk: >= 75 tons/acre	

Receiving water risk for project in Lake Berryessa watershed

Receiving Water (RW) Risk Factor Worksheet	Entry	Score
A. Watershed Characteristics	yes/no	
A.1. Does the disturbed area discharge (either directly or indirectly) to a **303(d)-listed waterbody impaired by sediment**? For help with impaired waterbodies please check the attached worksheet or visit the link below: 2006 Approved Sediment-impared WBs Worksheet http://www.waterboards.ca.gov/water_issues/programs/tmdl/303d_lists2006_epa.shtml	NO	Low
OR		
A.2. Does the disturbed area discharge to a waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY? http://www.ice.ucdavis.edu/geowbs/asp/wbquse.asp		

All projects that are in the Lake Berryessa watershed will have a low receiving water risk

Combined risk matrix: 23-mo Lake Berryessa project

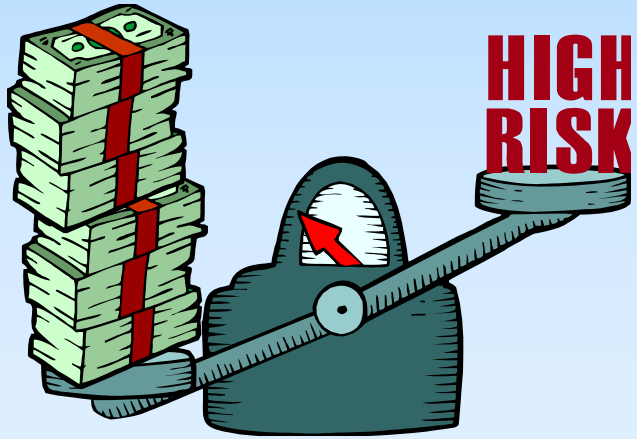


What about existing projects

- Existing projects will be brought into the new permit as Risk Level 1
  - Exemption from full risk determination good until 9/2/2011
- Regional Board may require recalculation of risk level when
  1. Discharger has a demonstrated history of non-compliance with the current permit
  2. Discharger poses a significant risk of causing or contributing to an exceedance of water quality standards

Permit requirements are tied to the project Risk Level

- Permit requirements increase moving from Risk Level 1 through Risk Level 3
  - Minimum BMPs
  - Compliance assessment
  - Water quality monitoring
  - Reporting



Break Time

Construction Stormwater Management Compliance Workshop

PART 3: CONSTRUCTION SITE MONITORING

Risk and monitoring

- Specific monitoring requirements depend on the project's Risk Level
  - Visual Monitoring is required of all projects
  - Sampling and Analysis requirements progressively increase with Risk (typically not applicable to Risk 1)
- Monitoring is required during normal construction site hours
- Rain event triggered monitoring based on a Qualifying Event
  - Rain event that produces ½ inch or more of precipitation with a period of 48 hours or more between rain events

Summary of types of monitoring

- **Visual Inspections** of BMPs
- **Visual Monitoring** of site
  - Qualifying storm events
  - Non-stormwater discharges
- **Sampling and Analysis** of
  - Construction site runoff
  - Non-stormwater discharges
  - Receiving waters
  - Contained runoff
- **Optional/Potential Monitoring**
  - Run-on

CGP required visual inspections

- **Visual Inspections** of BMPs
  - Routine BMP Inspections
    - Weekly (year-round)
      - Note: some BMPs like tracking control require more frequent inspections
  - Rain Event Triggered Inspections
    - Every 24-hours during extended qualifying rain events

CGP required visual monitoring

- **Visual Monitoring** of site
  - Pre-Rain Event; within 48 hours in advance of predicted qualifying rain event
    - Implement when NOAA predicts a probability of precipitation of 50% or more in the project area
  - Post-Rain Event; within 48 hours following an actual qualifying rain event
  - Non-Stormwater Inspections
    - Routine quarterly non-stormwater inspections of all project drainage areas

CGP required water quality monitoring

- Non-visible pollutant monitoring as necessary
  - Carry over from existing permit
- Stormwater discharge monitoring for pH* and turbidity; other pollutants required by RWQCB
- Non-stormwater discharged from site
- Contained rainwater when discharged
- Run-on monitoring
  - Required when suspected causing of NEL violation
  - Recommended

** Only required during construction phases with high risk of high pH discharge*

Bioassessment monitoring

- Risk Level 3 projects must conduct benthic macroinvertebrate bioassessments if project
  - Disturbs 30+ acres, and
  - Has a *direct discharge* to fresh water wadeable stream with the beneficial uses of COLD and SPWN and MIGR

Direct discharge definition(s)

- CGP Glossary – Appendix 5
  - A discharge that is routed directly to waters of the United States by means of a pipe, channel, or ditch (including a municipal storm sewer system), or through surface runoff.
- State Board's FAQ Clarification
  - *Discharges from a construction site to a MS4 where commingling with upstream and/or downstream discharges can occur are not considered 'direct discharges*'." *(emphasis added)*

Baseline stormwater discharge monitoring

- Routine pH and Turbidity
  - Field monitoring preferred
- Minimum of three samples per day of discharge
  - May choose to do more
- Collect runoff samples representative of site discharges
  - Must at minimum collect from all discharge locations
  - Must be representative of site operations over the course of the day

Field measurements

- The CGP presumes that pH and turbidity will be sampled in the field with meters
- Field measurements provide immediate feedback
  - Allow corrective actions to be taken sooner, perhaps before daily NEL or NAL is exceeded
- Field meters do required knowledgeable and trained staff to operate and care for the meters

Meter basics

- Numerous manufacturers and types
  - Hand held meters tend to be the least costly
  - Multi-parameter sensors are more costly
    - Instantaneous in-stream readings for multiple parameters
    - Cables provide measurement at a distance
- Ability to be calibrated
- Rugged design
- Ease of use and user friendly interface
- Detailed operating manual with troubleshooting guide and customer support

Turbidity meters and probes

Sources:
http://www.ierents.com
http://www.fishersci.com
http://www.hach.com/
http://www.globalw.com/

Turbidity meter calibration

- Meters should be calibrated using standards close to the expected sample value
  - Two point calibration unless otherwise specified by manufacturer

	Points of Calibration	Calibration Frequency	Accuracy Check	Allowable Drift
Turbidity	2	Per manufacturer's instructions		± 2 or 10%

Source: SWAMP Quality Assurance Management Plan

Turbidity measurements

- Follow manufacturer's manual for instructions on how to operate the instruments
- The turbidity sample has to be representative for the sampled water mass
- Take several measurements during each sampling event

Turbidity measurements cautions

- Make sure no gas bubbles are trapped in the vial
- Make sure the outside of the vial is completely clean
  - free of scratches
  - free of moisture
  - free of lint
  - free of fingerprints
- If the sample readings are outside of the calibration standard limits, recalibrate with a different standard

pH meters and probes

pH meter calibration

- With care, pH measurements can be accurately measured to the nearest 0.1 pH unit

	Points of Calibration	Calibration Frequency	Accuracy Check	Allowable Drift
pH	2	Before every monitoring day	Every evening or next morning	± 0.2

Source: SWAMP Quality Assurance Management Plan

pH sampling procedures

- In-stream method
  - Preferably, pH is measured directly in-stream
    - Allow the pH probe to equilibrate for at least one minute before pH is recorded to the nearest 0.1 pH unit.
- pH measurement from a container
  - When pH cannot be measured in-stream, it can be measured in a Nalgene or plastic container, following precautions
    - Allow the pH probe to equilibrate for at least one minute before pH is recorded to the nearest 0.1 pH unit.

Source: SWAMP Quality Assurance Management Plan

Meter and probe storage

- Carefully review storage requirements and shelf life of meters and probes
  - Meters may be temperature sensitive
  - Probes usually are temperature sensitive
  - Probes have limited use and shelf lives
  - Probes may need to stay wet
  - Calibration standards have limited shelf lives opened and unopened
- Anticipate regular replacement of probes, calibration standards, and batteries

Augmented monitoring when NEL is exceeded

- Risk Level 3 projects exceeding NEL must augment monitoring program
- Exceed turbidity NEL
  - Add SSC to discharge monitoring
  - Start receiving water* monitoring for SSC and Turbidity
- Exceed pH NEL
  - Start receiving water* monitoring for pH

SSC = Suspended Sediment Concentration

**Only required if the site has a direct discharge to a receiving water*

Reporting data

- Annual Report due September 1
- When NAL is exceeded, submit sample results within 10 days of storm event conclusion
  - Submit NAL report, if requested by RWQCB
- Risk Level 3 Only
  - Field sample results within 5 days of storm event conclusion
  - When NEL is exceeded, submit NEL Violation Report within 24 hours of identification of the exceedance

Construction Stormwater Management Compliance Workshop

PART 4: MINIMUM BMPS

Minimum BMPs are specified in five categories

1. Good Site Management “Housekeeping”
2. Non-stormwater Management
3. Erosion Control
4. Sediment Controls
5. Run-on and Runoff Controls

- Each category has several required BMPs
- Review the details , e.g. “shalls” of all minimum BMPs carefully

	Site Management Minimum BMPs	Level/ Type
1	Manage construction materials Inventory products, cover & berm stockpiles, use watertight containers, minimize exposure, prevent tracking of loose materials	1, 2, 3
2	Manage wastes prevent disposal rinse/wash waters, contain & inspect portable toilets, cover waste containers at the end of the day and during rain events, contain/cover stockpiled wastes, procedures to address spills, develop spill response plan, contain concrete washout - no discharge to storm drain or soil	1, 2, 3
3	Vehicle storage and maintenance Prevent leaks to ground, storm drains, use designated storage areas with BMPs, clean leaks immediately	1, 2, 3

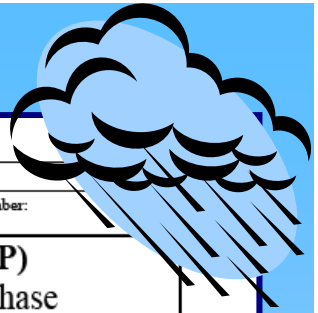
	Site Management Minimum BMPs	Level/ Type
4	Good housekeeping for landscape materials Contain stockpiles not in active use, contain fertilizers & other materials when not in active use, discontinue application of erodible materials 2 days before a predicted rain and during rain, stack *bagged* erodible materials on pallets & cover	1, 2, 3
5	Potential pollutant assessment Create list of potential pollutant sources, identify BMPs to prevent discharge, identify non-visible pollutants	1, 2, 3
6	Good housekeeping to prevent air deposition of site materials (e.g. sediment, trash)	1, 2, 3
7	Develop and implement Rain Event Action Plans (REAPs)	2, 3

Rain Event Action Plans

- Living document - changes for each rain event / project phase
  - Must have REAP if project becomes inactive
- Developed 48 hours prior to forecast event
- Must be on-site 24 hours prior to event
- REAP is specific to each phase of the project and each storm event

REAPs are Checklists

- SWPPP can include templates
- QSP responsible for developing and implementing REAP



Date: _____20____

WDID Number:

Rain Event Action Plan (REAP)
Grading and Land Development Phase

Preparation of land for utility installation and vertical building including clearing and grubbing, demolition, blasting or rock crushing, if necessary, and soil excavation and mass grading. This form to be reviewed and completed by the qualified SWPPP practitioner within 48 hours prior to entering the Grading and Land Development Phase.

Site Information:

_____

Site Name, City and Zip Code ☐ Risk Level 1 ☐ Risk Level 2 ☐ Risk Level 3

Site Storm Water Manager Information:

_____

Name, Company and Emergency Phone Number (24/7)

Erosion and Sediment Control Provider – Labor Force Contracted for the Site:

_____

Name, Company and Emergency Phone Number (24/7)

Storm Water Sampling Agent Information:

_____

Name, Company and Emergency Phone Number (24/7)

Activities Associated with Land Surface Development

Check ALL the boxes below that apply to your site.

☐ Demolition	☐ Vegetation Removal	☐ Vegetation Salvage-Harvest
☐ Rough Grade	☐ Finish Grade	☐ Blasting
☐ Soil Amendment(s):	☐ Over Excavation (____ ft)	☐ Soils Testing
☐ Rock Crushing	☐ Erosion and Sediment Control	☐ Surveying
☐ Equip. Maintenance/Fueling	☐ Material Delivery and Storage	☐ Other:

Trades Active on Site During Land Surface Development

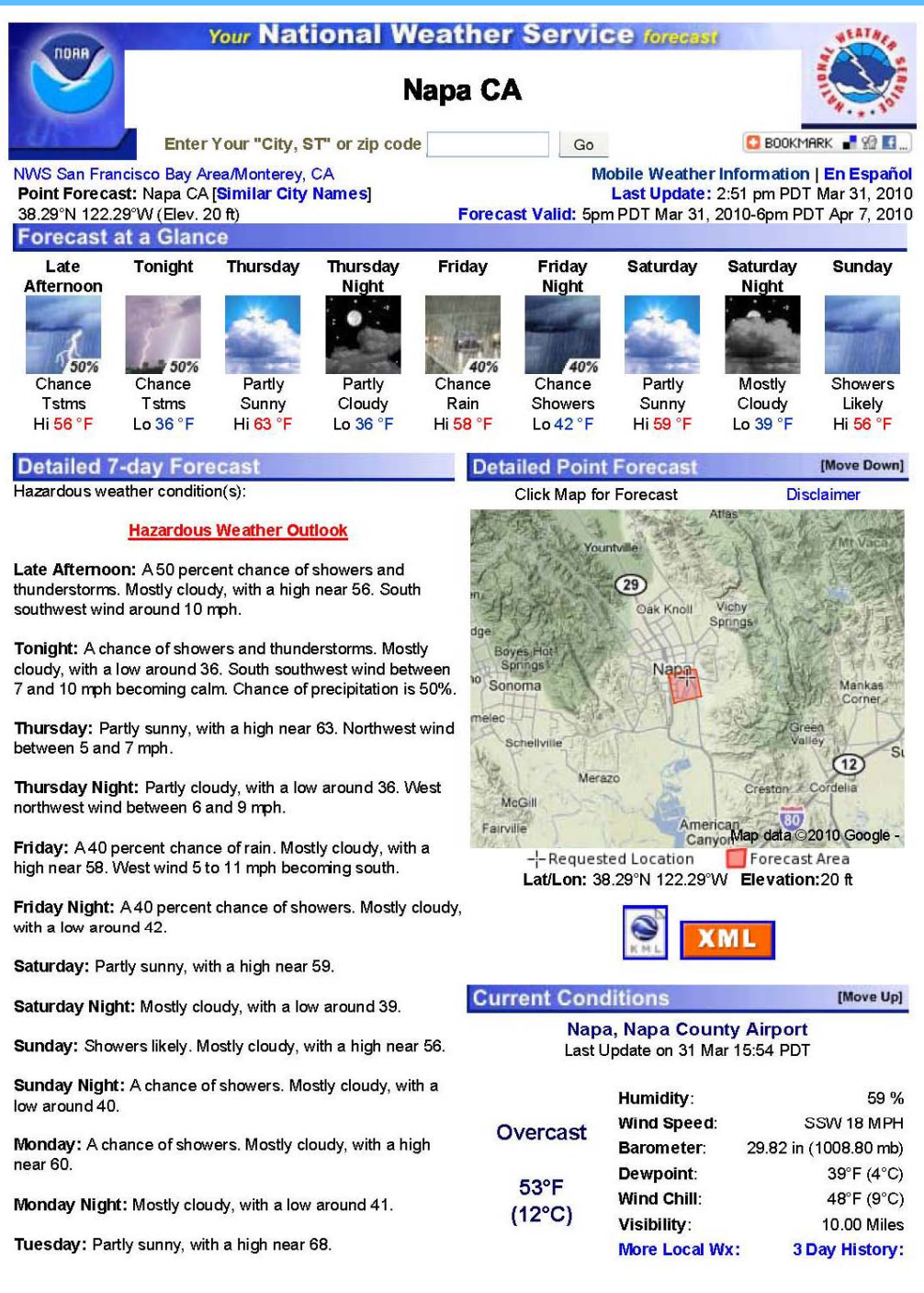
Check ALL the boxes below that apply to your site.

☐ Demolition	☐ Grading Contractor	☐ Erosion and Sediment Control
☐ Storm Drain Improvement	☐ Water, Sewer, Electric Utilities	☐ Surveyor – Soils Technician
☐ Street Improvements	☐ Rock Products	☐ Sanitary Station Provider
☐ Material Delivery	☐ Equipment Fueling/Maintenance	☐ Laborers
☐ Other:	☐ Other:	☐ Other:

Trade Contractor Information Provided

☐ Educational Material Handout	☐ Tailgate Meetings	☐ Training Workshop
☐ Contractual Language	☐ Fines and Penalties	☐ Signage
☐ Other:	☐ Other:	☐ Other:

Draft March 18, 2008 Page 1 of 3



REAP Trigger

- 50% or greater probability of rain in project area
- 48 hours in advance
- Only NOAA/NWS forecasts are acceptable

  http://www.noaa.gov/
- Print out and keep daily forecasts

	Non-Stormwater Minimum BMPs	Level/ Type
1	Control all non-stormwater discharges	1, 2, 3
2	Wash vehicles in manner that prevents discharge to surface water or MS4s	1, 2, 3
3	Clean streets in manner that prevents discharge to surface water or MS4s	1, 2, 3

	Erosion Control Minimum BMPs	Level/ Type
1	Implement wind erosion controls	1, 2, 3
2	Provide effective soil cover for inactive areas *(areas that have been disturbed and won't be re-disturbed for 14 days)*	1, 2, 3
3	Limit use of plastic materials when more sustainable materials are available, when plastic is necessary avoid using photodegradable plastics	1, 2, 3

	Sediment Control Minimum BMPs	Risk Level/ Type
1	Establish and maintain effective perimeter controls	1, 2, 3
2	Stabilize construction entrances and exits	1, 2, 3
3	If using sediment basins, design per guidance	1, 2, 3
4	Implement appropriate erosion control in conjunction with sediment control (runoff control and soil stabilization) for areas under active construction (only applies to traditional projects)	2, 3

	Sediment Control Minimum BMPs	Risk Level/ Type
5	Apply linear slope controls along toe, face, and at grade breaks as specified	2, 3
6	Ensure all construction traffic uses stabilized entrances and exits	2, 3
7	Inspect all access roads daily and clean daily if needed, and clean prior to rain event	2, 3
8	Regional Board may require additional sediment control measures to protect receiving waters	3

CGP specified grade breaks on exposed slopes

Source: http://www.earth-savers.com

Slope %	Maximum Sheet Flow Length
0-25	20 feet
25-50%	15 feet
Over 50%	10 feet

	Run-on and Runoff Control Minimum BMPs	Risk Level/ Type
1	Effectively manage all run-on, all runoff within the site, and all runoff that discharges from the site	1*, 2, 3
2	Direct run-on away from disturbed areas of the site	1*, 2, 3
*	Run-on and runoff controls not required for LUP type 1 projects unless evaluation or inspection indicate controls are required	

Construction Stormwater Management Compliance Workshop

PART 5: QSD AND QSP PREPARATION

The new training requirements

- SWPPPs must be developed and amended by a QSD
- SWPPP implementation must be overseen by a QSP
- CGP specifies two levels of training for QSDs and QSPs
  1. Must have educational or professional training (pre-requisite training)
  2. Must complete a QSD/P training course offered or sponsored by the State Board
     - Becomes effective September 2, 2011

Pre-requisites for QSD and QSP

QSD

- Registered CA Professional Engineer - Civil
- Registered CA Professional Geologist or Engineering Geologist
- Registered CA Landscape Architect
- Registered Professional Hydrologist (AIH)
- Certified Professional
  - Erosion & Sediment Control (CPESC), (NICET)
  - Storm Water Quality (CPSWQ)

QSP

- Qualified as a QSD
- Certified Inspection of Sediment and Erosion Control (CISEC)
- Certified Erosion, Sediment, Storm Water Inspector (CESSWI)

Professional certifications QSD pre-requisite requirements

CPESC/CPSWQ

- Minimum High School diploma/GED
- Education and experience combination
- Four references
- Complete application
- Pay application/exam fee
- Pass exam
- Annual renewal fee
- 60 PDUs / 3 years

NICET

- Minimum High School diploma/GED
- Experience driven
- 4 levels of certifications
- Supervisor verification and 1 recommendation
- Exam fee
- Pass open book exam
- Annual renewal fee

Professional certifications QSP pre-requisite requirements

CISEC

- Two years ESC inspection experience
- Three references
- Current in field
- Complete application
- Pay Application/Exam – Training Fee
- Pass exam
- Annual renewal fee
- Continuing Development 12 hours

CESSWI

- High School diploma or GED
- Experience
- Four references
- Complete application
- Pay Application fee
- Pass exam
- Annual renewal fee
- 10 Professional Development Units

State Board QSD/QSP training

- 2-day training for QSP; 3-day for QSD
- Regulator/Industry Steering Committee developing training program
  - State is partnering with CASQA to manage training program
  - Pilot of training conducted in late March
  - RFQ for “Trainers of Record” issued late March
  - Anticipate qualifying first set of ToRs in June
- Franchise model
  - ToRs will schedule training, set locations, prices
  - List of ToRs will be on CASQA website

Where to look for more info

- EnviroCert, Inc. (CPESC, CPSWQ, CESSWI)
  - http://www.envirocert.org
- CISEC, Inc
  - http://www.cisecinc.org
- National Institute for Certification in Engineering Technologies
  - http://www.nicet.org/candidates/programs/erosion.cfm
- California Stormwater Quality Association
  - QSD-QSP List of Trainers – Available after June 2010
  - http://www.casqa.org

Questions

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