Appendix D
Questionnaire Concerning Effectiveness

APPENDIX D

Responses to Five Questions Regarding Nonpoint Source Control Measures by 20 Questionnaire Respondents[1]

1. QUESTION: Please list the measures which you believe are the most effective in controlling nonpoint, and the pollutants that the measures primarily address.

It's important to realize that effectiveness of controls is relative. If the concentration of pollutants coming in is high - more likely to get good removal rates than if concentrations are low. Also, many controls are seasonal in their effectiveness.

Stormwater ponds and wetlands; limiting impervious cover; sand filters.

Ranked in the following order: 1) public education, 2) land-use controls, 3) riparian buffers, 4) drainage controls/standards, 5) strict erosion control, and 6) BMPs are effective to some degree, facilities and designed measures are site specific.

Reduction of impervious surface/sq.ft. of usable residential/commercial space; riparian area/wetland protection (sediment, temperature, general urban nonpoint); maintenance of septic systems and constructed drainage systems (bacteria, nutrients, general urban nonpoint); livestock management (bacteria, nutrients); retrofitting of existing detention ponds (general urban nonpoint); general urban nonpoint (metals, organic pollutants, suspended solids, bacteria).

Vegetated swales (economical and easy to fit into site; address most pollutants; high effectiveness). Non structural source control, illicit connection/discharge controls.

Oil-water separators must be maintained properly. Integrated landscaping including ponds and marshes, bio-filtration swales and landscaping with native species to reduce turf area and increase infiltration and reduces runoff, reduce soil erosion. Constructed wetlands and pond-marsh systems-nutrients. Leaf compost filtration facilities (oil/grease, heavy metals, debris).

Sedimentation pond (suspended sediments), vegetated swales (suspended sediments, oil/grease), erosion control (suspended sediments).

Most effective: 1) land-use planning and zoning to reduce generation of pollutant loads and locate development in least sensitive areas (e.g. away from streams and wetlands; 2) source control, especially for industrial land uses; 3) infiltration BMPs when feasible for all pollutants; 4) wet ponds and sand filters for particulates.

Preventative source controls tailored to the specific problem; preventative erosion controls; treatment measures are a step down but the most effective potentially seems to be constructed wetlands, wet ponds, and infiltration (if failure can be avoided in the latter cases).

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1 All decipherable comments are presented. Inclusion does not imply that DEQ, DLCD or Montgomery Watson agree with the comment.

Detention basins (TSS/heavy metals- particulate); landscape controls such as grassy swales, bio-filters (TSS, PAHs); land-use controls: minimizing directly connected impervious surfaces, use of buffer strips, staying out of steep areas (TSS, PAHs, copper).

2. **QUESTION: Which measures require the most research and development regarding performance or design (i.e. currently appear to be unpredictable and/or have poor defined design criteria).**

Leaf compost filters are still in testing phase - no design criteria yet.

Street/sewer system BMP's like CB's, sed MH's, vaults - we still don't know how effective they are.

Lack of performance information for buffers.

Water quality inlets, infiltration basins, dry extended detention ponds, filter strips and infiltration trenches.

All structural BMPs, most research has not gone on long enough nor is it rigorous enough.

Infiltration systems, and reduction of impervious surface/sq.ft. of usable space.

Seems like almost all structured controls need ongoing research and development.

The leaf compost filters need to be monitored for urban/industrial run-off and there is currently no O&M manual and track record. The constructed wetlands must be defined carefully and maintenance is an issue.

Street sweeping and water quality inlets/catch basins.

Biofiltration swales; vegetative filter strips; wet ponds/constructed wetlands (esp. long term effectiveness at removing nutrients); compost/peat/etc. filtration; infiltration due to clogging and poor site evaluation for soils, water table.

Infiltration (siting); source controls (demonstration of actual effectiveness and how to get them used more).

Need guidance where oil/grit separators should be used (these are commonly cited for use in inappropriate locations: residential developments); infiltration devices are not allowed in Santa Clara Co. except in very limited cases (roof drains).

3. **QUESTION: Which measures do you believe (a) are the most predictable regarding performance, and (b) have well defined design criteria.**

Elimination of sources obviously most predictable. Also, in agricultural areas: CAFO controls, fencing. In forestry areas: reducing roads, putting roads 'to bed' after logging.

Swales and erosion control have most well-defined criteria.

None.

Stormwater ponds.

Swales, wet-ponds/wetlands, some infiltration facilities.

Riparian area protection, livestock management, septic system maintenance and retrofitting of old dry ponds to extended ponds.

Structural: swales, ponds, infiltration.
Source: source identification and elimination.

Oil-water separators, grassy swales, detention ponds, sumps and infiltration basins.

Sedimentation ponds and sedimentation manholes.

Sediment ponds; sand filters; wet ponds/ constructed wetlands (for TSS removal, not nutrients).

All are lacking but vegetated swales and wet ponds are probably best documented.

Detention basins; media/sand filtration.

4. QUESTION: Please discuss any control measures that you believe are of particular interest to local governments. Include performance or design information if appropriate and available.

All depends on specific site/basin problems.

Those that do not commit public works to high O&M costs; and those that do not involve a failure loop that commits agencies to high replacement/repair costs.

Reduction of impervious surface/sq.ft. of usable residential/commercial space; riparian area/wetland protection (sediment, temperature, general urban nonpoint); maintenance of septic systems and constructed drainage systems (bacteria, nutrients, general urban nonpoint); livestock management (bacteria, nutrients); retrofitting of existing detention ponds (general urban nonpoint); general urban nonpoint (metals, organic pollutants, suspended solids, bacteria).

We need more innovation in how we design the buildings and other elements of the urban environment to reduce pollutants and improve the environment as a whole.

Oil-water separators must be maintained properly. Integrated landscaping including ponds and marshes, bio-filtration swales and landscaping with native species to reduce turf area and increase infiltration and reduces runoff, reduce soil erosion. Constructed wetlands and pond-marsh systems-nutrients. Leaf compost filtration facilities (oil/grease, heavy metals, debris). The leaf compost filters need to be monitored for urban/industrial run-off and there is currently no O&M manual and track record. The constructed wetlands must be defined carefully and maintenance

is an issue. Oil-water separators, grassy swales, detention ponds, sumps and infiltration basins.

Marsh-wetland treatment.

Infiltration BMPs; filtration BMPs (sand, compost, peat).

Should be concentrated more on source controls, including land-use planning measures.

Sand filters are of interest. Multi-purpose detention basins are also of interest (flood water quality and recreational uses). Controls relating to land-use are strongly suggested by State regulators (San Francisco Bay Reg Board Recommendation for New Dev. Controls).

5. **QUESTION: Please briefly describe the approaches to public involvement in local nonpoint source control programs which you have found to be effective.**

Direct community involvement in stream restoration projects.

Involving residents in substantive ways; and empowering citizens to be involved.

Participation in developing watershed plans; and participation in hands-on projects: detention pond retrofitting and stream clean-up, etc.

One-on-one personal contact.

School outreach and education programs. Work with local "friends" group to clean-up streams, plant riparian buffers, etc. Involve service groups, i.e. scouts, church groups, neighborhood associations in storm drain stenciling and stream restoration efforts.

Public education: provide information to all residents in the affected area on the hows and whys of pollution prevention.

"Business Partners for Clean Water" - a program to educate business owners with focus on source control; "Stream Teams" - direct public involvement in cleaning up, re vegetating, monitoring, and "careful taking" of streams; volunteer monitoring of lakes and streams.

Oil recycling, household hazardous waste collection events, recycling are all well accepted. Adopt-A-Creek programs (citizen volunteers to assess creek condition, collect water/sediment samples, perform trash removal) becoming more popular.