MWEO

From: George Serrill [george4ams@comcast.net]
Sent: Tuesday, December 30, 2008 1:45 PM
To: MWEO
Subject: MWEO COMMENTS
Attachments: MWOE COMMENTS.docx

Simon,

Here are our comments for your review.

Thank you very, very much!

Happy New Year!

George

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December 30, 2008

DEPARTMENT OF WATER RESOURCES
OFFICE OF WATER USE EFFICIENCY AND TRANSFERS
ATTN: SIMON ECHING
POST OFFICE BOX 942836
SACRAMENTO CA 94236-0001

Simon,

Please accept our Comments on the Modified Text of the Model Water Efficient Landscape Ordinance.

Comment 042.1

Our comments in general are in regards to the Soil Management Plan, (SMP) as that is where our expertise, experience, and interest are. Although we are not residents of California, our calcined diatomaceous earth soil amendments are sold and used throughout California in various applications and markets including sportsfields, golf courses, commercial and residential landscaping, and rooftop gardens.

To a large extent, we are very pleased with the recommendations put forth regarding the Soil Management Plan. We are encouraged that soil amendments are now listed in addition to mulch and it appears that inorganic products like ours are allowed as an amendment, and not just organic products which are biodegradeable and have a diminishing effect over time. Relying solely on organics may not guarantee continued soil performance at original, expected or acceptable levels due to the conversion of organics into soil.

In our opinion, the SMP is not specific enough for soils and the MWOE as a body of work places an overwhelming emphasis on the control, regulation and application of water to achieve conservation vs. how efficiently the soil delivers applied water or precipitation for plant use once delivered. The SMP does not call for a sufficient number of specific soil tests, which are commonly available and reasonably priced, that determine the soil's ability to use, hold and make water available to plants in the landscape. Indeed, the recommendations only list one soil test regarding the ***introduction*** *of water into* the soil – infiltration rates. To limit soil/water testing to infiltration alone would seem to assume that as long as water penetrates the ground it is being utilized well enough. This is a bit bothersome if the reaction were to ensure adequate infiltration using high volumes of sand with low available water to plants.

We believe successful conservation should rely as heavily on the soil as a conduit for water delivery to plant roots as much as irrigation piping. We also believe that protection of water resources extends into the soil as a wealthy source of conservation itself. There are additional tests that should be required in the Soil Management Plan. The care and the concern for conservation of water should follow the path of water to it's conclusion adjacent to plant roots at a minimum, and then beyond the rootzone to recharge aquifers at a maximum. Water should enjoy protection it's entire journey in order to ensure it is uitilized in a reasonably efficient manner while in the soil. To stop short of that effort, and to not articulate some measure of soil performance standards tends to negate the above ground efforts of all involved, and creates a missed opportunity and an unmet obligation to soil water stewardship. Soil water resources are assets that can be reasonably seized.

We applaud and appreciate the important contributions that recent advancements of irrigation technology that include soil moisture sensors, rain gauges and smart controllers bring to conservation. This focus is perhaps understandable due to the many different irrigation options available. However, we also believe those advancements are reaching a zenith, and the next great harvest of water conservation is due to come from an improved focus on soil management as resources and demand are likely to increasingly battle for equilibrium. To that end, we have been working for years to understand soil and water relationships, and how those relationships work better when using our products. When time allows, we invite you to visit our website, or give us a call to learn more.

Our specific comments regarding the SMP are inserted in blue, for your convenience.

492.5 Soil Management Plan. Comment 042.2

(a) In order to reduce runoff and encourage healthy plant growth, a soil management plan shall be submitted as part of the Landscape Documentation Plan. The soil management plan may include the following elements:

(1) soil texture;

(2) estimated date of soil analysis (to be conducted after mass grading is complete):

We assume the term"estimated" was used due to the case of being unable to gauge what the soil quality is until after mass grading has been accomplished which is often conducted much, much later than when a project is designed.

Comment 042.3

(3) identification of limiting soil characteristics: and

(4) identification of planned soil management actions to remediate limiting soil characteristics.

(b) After mass grading, the project applicant or his/her deignee shall:

(1) perform a preliminary site inspection;

(2) determine the appropriate level of soil sampling and sampling method needed to obtain representative soil samples(s);

(3) conduct a soil probe test to determine if the soil in the landscape area has sufficient depth to Support the intended plants; and

(4) obtain appropriate soil sample(s).

(c) The project applicant or his/her designee shall submit soil samples(s) to laboratory for analysis and recommendation. The soil analysis ~~may~~ shall include:
~~(A) soil texture;~~
(a)Particle size or sieve analysis;

*Comment: soil texture of sand silt and clay is not sufficient to provide an exact picture of the soil qualities that may present problems. Specifically, the percentage of clay, plus the particle size creates a meaningful understanding. A sieve analysis accomplishes **both** soil texture and particle size. We witnessed a project where the specification was listed by soil texture, the delivered soil was substantially inadequate, but possibly could have met spec, and there was no way to assign liability to the owner's lament and further expense over several acres since the designation was too broad. We would recommend this and these following tests to diagnose designed soils, imported soils and on-site soils to determine adequate recommendations for relief or amendment. The only real way to know exactly what the soil is, is to know the sieve size.*

Comment 042.4

(B) infiltration rate determined by laboratory test ~~or soil texture infiltration rate tables;~~
(B) infiltration rate determined by laboratory test

Comment: we object to the use of infiltration rate tables as being wholly inadequate. Our mentor and soil physicist Dr. Ed McCoy, Ohio State University allowed in conversation that infiltration is the hardest test to rely on, because it varies so much, is difficult to repeat accurately and is somewhat undependable. In soil science circles this is somewhat known. To reduce the opportunity for accuracy for infiltration by relying on tables is hypothetical. Soils vary too much too quickly. Dr. McCoy's phone number is

Comment 042.5

We would also add the following underlined tests that comprise a typical Physical Soil Analysis. A Physical Soil Analysis is a series of tests to understand how air and water work in a soil. Infiltration is one of these tests, but does not present an entire picture.
Bulk Density – determines how much compaction or how compactable a soil is.
Water Holding Capacity – the amount of water a soil can absorb up to Field Capacity
Water Holding Capacity 1/3Bar – WHC minus WHC 1/3 Bar = Available Water for Turf
Water Holding Capacity 15 Bar – WHC minus WHC 15 Bar = Available Water for Agriculture or Native Plants; Available Water = the amount of water in the soil available to plants
Capillary Pore Space – the percent of pore space that contains water
Non-Capillary Pore Space – the percent of pore space that contains air
Total Porosity – the sum of Capillary and Non-Capillary Pore Space
Organic Matter Content – self evident, but would help guide to what extent organic (or inorganic) amendments should be employed.
Soil Nutrient Analysis – perhaps this is what is meant by a soil analysis, but it should be articulated as pertaining to soil nutrient content for clarity.

Comment 042.6

Comment: Textbooks routinely emphasize that good soils should have approximately 50% porosity, ideally combined of 25% air porosity and 25% water porosity, with the remaining 50% comprised of minerals and organic matter. A simple adoption of textbook requirements for approximately 50% porosity would accomplish these conservation goals as porosity affects every single aspect of soil performance. Soil performance hinges on adequate soil porosity, whether

the pores are open, clogged, have access to the surface, or are constantly flooded or constantly dry. The discussion in the added texts attest to this as well when you read the "Infiltration" piece or the "Protecting Urban Soil Quality"article. The Soil Quality Indicators from the USDA Natural Resources Conservation Service, also highlight the same issues we strive to bring to your attention, namely the other indicators in addition to "Infiltration" that you address labeled "Aggregate Stability", "Available Water Capacity", "Bulk Density", "Slaking", "Soil Crusts", and "Soil Structure and Macropores". Another reference, the USGA, recommends a range of 35%-55% Total Porosity in golf green rootzone construction guidelines.

Comment 042.7

We believe it is incumbent upon the DWR to mandate and articulate specific tests that would measure sufficient soil qualities to ensure adequate soil performance; and especially the soil tests concerned with soil water functions to determine the suitability of an intended soil to utilize applied water efficiently and effectively. The MWOE is an ambitious and admirable effort. To require less of the soil, or to leave it's capacities in question, when soil carries a tremendous capacity for storing and making this precious resource available to plants (which are the ultimate target of this effort), with diagnostics easily within reach is both inconsistent with the effort, theme, tone and detail sewn into this document, but also an improper response to using reasonable tools to ensure successful conservation throughout the entire water cycle that includes soil water processes.

Comment 042.8

Adoption of these soil tests creates an informed basis upon which to rely and to act, in order to achieve the stated Purposes in:

490.a,3 "it is the policy of the state to promote the conservation and efficient use of water and to prevent the waste of this valuable resource."

490.a,5 "landscape design, installation, maintenance, and management can and should be water efficient"

490.b,6 "Section 2 of Article X of the California Constitution specifies that the right to use water is limited to the amount reasonably required for the beneficial use to be served and the right does not and shall not extend to waste or unreasonable method of use."

490.b,4 "…. and reduce water use to the lowest practical amount."

Comment 042.9

In view of the conservation instructions in this document and the mandate to use water in a reasonable fashion, it would seem entirely consistent to articulate a means to ensure that California soil adequately receives, holds and delivers California water in an efficient manner to plants. Adding these tests now will accomplish much and is simply prudent instruction and stewardship of careful landscape planning. (Many laboratories offer these tests as a package. We estimate these additional tests would only add $150-200 per project.)

Comment 042.10

(C) pH;
(D)total soluble salts;
(E) sodium: and
(F) recommendations.

Current testing parameters do not provide enough information to gauge soil/water relationships in a document designed to set out and delineate a roadmap to water conservation for landscapes.

We recommend soil reports should emphasize adequate or inadequate soil performance levels that would either hinder or promote the utilization and conservation of water in the landscape. In the case of inadequate soil performance levels, we would advocate recommendations to increase porosity which affect all other soil performance characteristics.

Comment 042.11

(G) Submit the soil analysis report and documentation verifying implementation of soil analysis report recommendations to the local agency per the requirements of 492.9 Certificate of Completion.

492.6
(3)Mulch and Amendments

Comment 042.12

We understand the definition of "Amendments" to include traditional organic amendments and mineral amendments such as lime, dolomite, gypsum as well as other amendments that a Landscape Architect or others bound by the parameters of this document, are free to design into a soil or soil mix to increase soil quality and characteristics. In other words, we understand the definition of amendments is not limited to organics, or restrictive of other products.

Comment 042.13

(D) Soil amendments shall be incorporated according to recommendations of the soil report and what is appropriate for the plants selected (Section 492.5)

(D) Soil amendments shall be incorporated according to recommendations of the soil report <u>with an emphasis on utilizing the soil as an important contributor to landscape water use efficiency and conservation</u> and what is appropriate for the plants selected (Section 492.5)

Comment 042.14

492.7
(I)Relevant information from the soil management plan, such as soil type and infiltration rate, shall be utilized when designing irrigation systems.
In professional landscaping, irrigation design ordinarily comes much earlier than the Soil Management Plan and yet the irrigation design is instructed to rely on the SMP. To the degree that this is possible, sure this is a good idea. This may cause re-design of irrigation systems when using poor or challenging soils cannot be avoided and is only discovered right before landscape installation.

We would like to sincerely thank everyone involved in this process, and the time and effort being exerted. We have been impressed with the degree of integrity, the spirit of cooperation, and the willingness of the DWR to listen. The changes made so far reflect that inclusion into this groundbreaking process. We also are extremely grateful to have an opportunity to express our opinions for your consideration and have them valued.

Sincerely,

George Serrill
Vice President, EnviroTech Soil Solutions, Inc.