

Reducing Toxic Runoff from the CZU Lightning Complex Fire

October 27, 2020

While all fires produce ash, fire debris from burned residential and commercial properties may contain heavy metals, volatile organic compounds (VOCs), asbestos, and hydrocarbons. During a storm, rain has the potential to flow through the burned material and carry these toxic materials away from the site. Post-fire runoff refers to the mix of water, chemicals, and particulate matter (very tiny particles) that drain away from a site after a fire. This runoff can seep into soil, drain into storm drains and culverts, or flow directly into surface water like creeks and rivers.

The CZU Lightning Fire burned 86,509 acres and occurred in water supply watersheds for the City of Santa Cruz, the San Lorenzo Valley Water District, the community of Davenport and groundwater basins used for community water supply and private wells. These watersheds flow to the Monterey Bay National Marine Sanctuary.

While these toxic materials are a serious concern, there is a limited scientific understanding of how mobile these toxins are and the short-term or long-term impacts to water quality and aquatic ecosystems. For perspective, more than 900 structures burned in the CZU Fire, representing less than 1% of the total fire area. However, after the 2017 fires in Sonoma County, runoff control measures were implemented throughout the fire area and water quality research indicates that efforts were successful at preventing toxic material from ending up in local streams.

Property owners are encouraged to take appropriate and reasonable measures to reduce toxic runoff, ash, and sediment from washing off their property. We understand that people are currently dealing with a lot of loss, change, and complex requirements. This handout is intended to provide straightforward information about your options to control toxic runoff from your property and resources to help you.

Priority areas for toxic run-off control include Bonny Doon in the upper Liddell and Laguna watersheds and structures within 100' of streams in the San Lorenzo Watershed.

The Basic Idea

The basic idea is to slow runoff directly downslope of the burned structure and catch toxins in some material – straw, wood chips, compost sock, or wattle. If installed close to the burned structure, these materials will be removed during the Phase 2 clean up.

The goal is to reduce runoff without causing any soil erosion.

Installed runoff control should be placed close enough to the foundation to catch toxic runoff without capturing extra runoff and to allow easy removal during Phase 2 clean up. DO NOT place runoff control within areas of ash or structure debris to reduce your risk of exposure to toxic materials.

If you have limited time or energy, at least place some weed-free straw mulch on the downslope side of the burned structures. If you seed, make sure to use sterile barley or wheat or other recommended non-reseeding seed mix to prevent the spread of non-native grasses into our natural areas.

Get Technical Assistance

We encourage all property owners to get some technical assistance for runoff control. Just like erosion control, runoff control measures can cause problems if they are used inappropriately or installed incorrectly.

Please see the **Resources** section at the end of this handout for information on how to contact the Resource Conservation District of Santa Cruz County to request assistance and to find out about volunteer crews that could assist you.

We are still learning about the most cost-effective measures for runoff control that have been used in other areas – here is a list that describes what we have learned so far.

Weed-free Straw

Definition: Weed-free straw is straw that does not contain weed seeds.

Application: Spread straw to a uniform depth of no more than 2" that covers 60-80% of the ground surface. If spread more densely, seed or native plants are unable to grow through the mulch. For best results, "tuck" some of the straw into the ground using a shovel or spade.

Advantages

- Weed-free straw is one of the best and least expensive approaches to slowing runoff from your property. Two 75 lb. bales will cover approximately 1,500 square-feet 2 inches in depth.

Disadvantages

- Straw can blow away or slide down steep slopes; only appropriate for relatively flat areas. Not recommended for hilltop, windy areas, wildland areas or excessively steep slopes.

Wood Chip Mulch

Definition: Wood chip mulch is created by chipping tree branches or trunks.

Application: Spread wood chips to a uniform depth of no more than 2", (note: 3-4" is too deep and will slow or prevent plant and/or seed regeneration), covering 60-80% of the ground. If spread more densely, even 3-4" deep, seed or native plants will be repressed and unable to grow through the mulch.

Advantages

- Wood chips may be free or easily available from hazardous tree removal
- Wood chips will not blow away

Disadvantages

- Wood chips should not be shared beyond your neighborhood to prevent spreading Sudden Oak fungus or other pathogens that can be found on wood.

- Wood chips can slow down plant regeneration and tie up nitrogen in the soil
- Wood chips are more easily mobilized in swales because wood floats.

Wattles

Definition: Straw or other filtering material bound into a tube, intended to slow runoff and trap sediment along with some toxic pollutants. Wattles with plastic mesh are dangerous to wildlife and are not allowed in Santa Cruz County.

Advantages:

- Can be very effective at reducing runoff and capturing toxic materials
- Longer lasting
- Can also serve as erosion control measures

Disadvantages:

- Requires staking and “keying” into a shallow hand dug trench.
- Can cause erosion, redirect flows, or cause other issues if installed incorrectly
- Requires regular maintenance. Should be removed after Phase 2 and replaced only if needed.

Disposal

If used after Phase 1 (removal of household hazardous materials), wattles will be cleaned up as part of Phase 2 and will be accepted at the County landfill.

Compost Roll or Compost Sock

Definition: Compost type material bound into a tube, intended to absorb runoff.

Advantages:

- Can be very effective at reducing runoff and capturing toxic materials
- Longer lasting
- Does not require staking

Disadvantages:

- Requires regular maintenance
- More costly than a straw wattle, wood chips or straw mulching
- Requires more sophisticated/detailed installation for intended benefit

Disposal

If used after Phase 1, then used compost rolls/socks will be accepted at County landfill.

Weighted wattles

Definition: Weighted wattles can be a combination of straw, wood chips or other absorbent materials rolled into erosion control fabric.

Advantages:

- Does not require staking like regular wattles
- Can be used on hard surfaces such as driveways
- Can be constructed by property owners

Disadvantages:

- May not be locally available for purchase
- Requires staking and “keying” into a shallow hand dug trench.
- Can cause erosion, redirect flows or cause other issues if installed incorrectly
- Require regular maintenance. Should be removed after Phase 2 and replaced only if needed.

Disposal

If used after Phase 1 (removal of household hazardous materials), wattles will be cleaned up as part of Phase 2 and will be accepted at the County landfill.

Erosion Control Blankets

Definition: An erosion control blanket is composed of one or more layers of fabric.

Advantages:

- Can be used on slopes where wattles may retain or redirect runoff
- Can be installed over ash and debris and will absorb raindrop impact
- Requires staking to secure in place

Disadvantages:

- Not as effective as absorbing runoff
- Do not use blankets with plastic mesh that endanger wildlife

Disposal

- Can be disposed of with Phase 2 material

Hydro-mulch

Very site specific but generally not recommended. Studies show that hydro-mulch does not significantly reduce erosion and can be very expensive.

Steep Slopes, Large Homesites, Close to Waterways

If you think you need more complex runoff protection, please get technical assistance through the Resource Conservation District (RCD) of Santa Cruz County, USDA Natural Resources Conservation Service, or from a Certified Professional Erosion and Sediment Control (CPESC) specialist.

Note: Runoff and sediment control measures such as wattles and compost rolls/socks can create problems if they are not properly installed.

Where Do I Get Runoff Control Materials?

Runoff control materials are available at many of the places that sell erosion control materials, including:

- Landscape and agricultural supply businesses
- Landscape and erosion control supply businesses
- Garden, Hardware and Feed stores

The County of Santa Cruz and the RCD are working to develop a more detailed list of local businesses that sell supplies for runoff control.

Resources

We are exploring opportunities to provide materials and technical assistance. Please contact the RCD to request assistance.

County of Santa Cruz

Fire Recovery website: www.santacruzcounty.us/FireRecovery.aspx

Resource Conservation District (RCD) of Santa Cruz County

Post-fire information and to request site visits for technical assistance
www.rcdsantacruz.org; (831) 464-2950