NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

RANGE PLANTING

(Ac.)

CODE 550

DEFINITION

Establishment of adapted annual or perennial vegetation such as grasses, forbs, legumes and/or perennial shrubs and trees. Adapted annual vegetation use is restricted to NRCS approved materials within the Mediterranean climate zone with 12" or less mean annual precipitation.

PURPOSE

One or more of the following:

- Restore a plant community similar to its historic climax or the desired plant community.
- Provide or improve forages for livestock.
- Provide or improve forage, browse or cover for wildlife.
- Reduce erosion by wind and/or water.
- Improve water quality and quantity.
- Increase carbon sequestration

CONDITIONS WHERE PRACTICE APPLIES

On rangeland, grazed forest or other suitable location where the principle method of vegetation management will be with herbivores. This practice shall be applied where desirable vegetation is below the acceptable level for natural reseeding to occur, or where the potential for enhancement of the vegetation by grazing management is unsatisfactory.

CRITERIA

General Criteria Applicable to All Purposes

Establishment of annual grasses, forbs and legumes is restricted to the Mediterranean climate zones receiving less than 12" of mean annual precipitation. The Mediterranean climate zone is described as Storm Intensity Type Zone 1 on Figure 2-1, "Approximate Boundaries for SCS Rainfall Distributions", page 2-15 of the National Engineering Manual. Local values for mean annual precipitation are found in Section II of the FOTG.

Seeding species and rates will be derived from the California Vegetation Guide in Section II of the Field Office Technical Guide and will correspond to the soil vegetation group, the MLRA and (4)eta zone.

Specified seeding/plant material rates, methods of planting, date of planting and species selection shall be consistent with documented guidance cited by Plant Materials Program, research institutions or agency demonstration trials for achieving satisfactory establishment.

Species, cultivars or varieties selected must be compatible with management objectives and adapted to climate conditions, soils, landscape position, (e.g., aspect) and ecological/range site(s).

Species, cultivars or varieties selected shall provide adequate cover to control erosion by wind and/or water within an acceptable period of time.

Seedbed preparation and planting methods will be suitable to meet any special needs for obtaining an acceptable establishment of planted materials.

Planting depths, dates, seeding rates, soil amendments and fertilizer needs for establishment, minimum seed quality standards and management during the establishment period such as weed control and deferment from grazing shall be followed to enhance establishment success.

Timing of planting will correspond to species selection, seasonal considerations and identified site constraints.

Seeding rates will be calculated on a pure live seed (PLS) basis.

Where native materials are used, species selected must be consistent with plant species identified in available corresponding ecological/range site description for the area to be treated.

Seeding of perennial species must be performed using seed mixes containing no exotic annual species component. Overseeding of annual species into stands of desirable perennial grasses will occur only after the perennial species are clearly established and are managed appropriately.

Additional Criteria to Improve Forages for Livestock

Selection of a species or combination of species shall be designed to meet the desired nutritional and palatability requirements for the kind and class of livestock.

Selection of species or combination of species shall be designed to meet the desired season of use or grazing period.

Additional Criteria for Improved Water Quality and Quantity

Select a species or combination of species that will maintain a stable soil surface and increase infiltration.

Species that have high evapotranspiration rates, such as some woody species and phreatophytes, shall not be planted when watershed yields are the primary objective.

A mixture of shrubs and trees indigenous to the site shall be planted when riparian area, stream bank stability and water temperature criteria are important.

Additional Criteria for Improving Forage, Browse or Cover for Wildlife

Selection of planted species shall meet dietary and palatability requirements for the intended wildlife species.

Species will be selected and planted in a designed manner that will meet the cover requirements of the wildlife species of concern.

Additional Criteria to Increase Carbon Sequestration

For optimal carbon storage, select species that increase site biomass.

CONSIDERATIONS

Planting materials selected should contribute to wildlife and aesthetics when opportunities exist.

Other practices such as Brush Management (314) or Grazing Land Mechanical Treatment (548) may be used to promote a satisfactory site preparation to insure a successful range planting.

Use of locally certified planting materials should be encouraged, however, distance and source limitations on seed and planting stock should be considered in terms of logistics and costs.

Any special handling requirements for planting materials need to be followed for best results, (e.g., beards or awns on seed, hard seed coats, seed mixture ratios).

Where air quality concerns exist, site preparation techniques should be utilized that will minimize airborne particulate matter generation and transport.

To retain existing benefits of the current plant community, evaluate compatibility of resident species with those to be seeded. Alternative plant materials and/or alternative treatments should be explored if current plant community benefits are likely to be lost or substantially impaired as a result of the planting.

Stand establishment and success of native species can be maximized by stabilizing ecological processes through management. These ecological processes will appear in the ecological site description for the area to be treated and/or technical references for the specific plant community to be restored.

In most cases, fertilization with nitrogen of native grass species will result in increased competition from exotic annual grasses which may result in seeding failure.

For perennial species, the first one to three years after planting usually determines the overall success of this practice. Emphasis on competition control and reduced defoliation and/or seed predation by rodents during this period can substantially improve establishment success.

Where multiple species of natives are to be established for the purposes of ecological site restoration, establishing groups of species in phases can enhance the effectiveness of competition control and enhance restoration success. For example, it may be more effective to establish perennial native grasses before introducing native annual forbs.

Where native perennial species are to be seeded, site preparation in the form of annual species competition control may be necessary for two to three years prior to insure establishment of the seeded species. Where sufficient quantities are available, irrigation water can effectively suppress annual competition prior to planting and enhance desirable seedling establishment following planting.

PLANS AND SPECIFICATIONS

For standard plantings, appropriate forms, worksheets, etc. may be used to develop specifications and documentation. Plantings that require more detailed information may require the use of other practices prior to planting and require a specific site specification prepared.

Specifications will include:

1) Goals and objectives of this practice
2) The ecological site and/or soil vegetation group associated with this practice
3) Description of competing vegetation
4) Implementation schedule including all seedbed preparations, competition control and phased planting sequences as applicable to this practice.
5) Species and material types (seed, plug, sprig etc.) and corresponding methods of plantings
6) Application rates and acres to be planted
7) Stand establishment and management recommendations for first three years beginning with site treatment and including soil amendment requirements, seedbed preparation, competition control, livestock management and/or predation control requirements
8) Post-establishment stand maintenance recommendations

OPERATION AND MAINTENANCE

Operation. Identify any required items needed to assist in stand establishment such as mowing, burning, flash grazing and herbicides to control weeds. Address insect and disease control needs where they are likely to create establishment problems.

Maintenance. Any necessary replanting due to drought, insects or other uncontrollable event which prevented adequate stand establishment should be addressed as soon as possible. Recommendations may vary from complete re-establishment to overseeding or spot replanting. Thin stands may only need additional grazing deferment during the growing season.

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Rangeland Ecology and Management (Heady, H.F. and R. D. Child. 1994**,** Westview Press, Boulder, Colorado)

Ecological Site Descriptions – Ecological Site Inventory System (USDA, NRCS)

Effectiveness of annual and perennial grasses and legume species for early emergence and erosion control (USDA, NRCS, California Plant Materials Technical Notice # 39)

Field Planting Summaries (USDA, NRCS, California Plant Materials Technical Notice # 32, 33 & 45)

PLS – What is it and how can we use it (USDA, NRCS, California Plant Materials Technical Notice # 34)

Range Development and Improvements third edition (Vallentine, John. 1989. Academic Press)

Dryland Pastures: Establishment and Management in the Intermountain Region of Northern California (Wilson, Rob et. al., Division of Agriculture and Natural Resources, University of California publication 8163, 2006)

NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

RESIDUE AND TILLAGE MANAGEMENT NO TILL/STRIP TILL/DIRECT SEED

(Ac.)

CODE 329

DEFINITION

Managing the amount, orientation and distribution of crop and other plant residue on the soil surface year round while limiting soil-disturbing activities to only those necessary to place nutrients, condition residue and plant crops.

PURPOSE

- Reduce sheet and rill erosion
- Reduce wind erosion
- Improve soil organic matter content
- Reduce CO_2 losses from the soil
- Reduce soil particulate emissions
- Increase plant-available moisture
- Provide food and escape cover for wildlife

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all cropland and other land where crops are planted.

This practice includes planting methods commonly referred to as no-till, strip till, direct seed, zero till, slot till or zone till. Approved implements are: no-till and strip-till planters; certain drills and air seeders; strip-type fertilizer and manure injectors and applicators; in-row chisels; and similar implements that only disturb strips and slots. All others are considered to be full-width or capable of full disturbance and therefore not compatible.

CRITERIA

General Criteria Applicable to All Purposes

Loose residues to be retained on the field, shall be uniformly distributed on the soil surface. Where combines or similar machines are used for harvesting, they shall be equipped with spreaders capable of distributing residue over at least 80 percent of the working width of the header.

Residues shall not be burned, or disturbed by full width tillage operations except as follows: Planters or drills shall be equipped to plant directly through untilled residue or in a tilled seedbed prepared in a narrow strip along each row by planter attachments such as rotary tillers, sweeps, multiple coulters, or row cleaning devices.

If row cultivation or spot treatments for weed escapes, leveling ruts, or similar operations become necessary, tillage shall be limited to undercutting operations which minimize burial of surface residue.

Residue shall not be burned.

All residues shall be uniformly distributed over the entire field.

No full-width tillage shall be performed regardless of the depth of the tillage operation.

The Soil Tillage Intensity Rating (STIR) value shall include all field operations that are performed during the crop interval between harvest of the previous crop and harvest or termination of the current crop (includes fallow periods). The STIR value shall be no greater than 30.

Additional Criteria to Reduce Sheet and Rill Erosion

The amount of randomly distributed surface residue needed and the amount of surface soil disturbance allowed to reduce erosion to the planned soil loss objective shall be determined using the current approved water erosion prediction technology. Partial removal of residue by means such as baling or grazing, shall be limited to retain the amount needed. Calculations shall account for the effects of other practices in the management system.

Additional Criteria to Reduce Wind Erosion

The amount and orientation of standing and surface residue needed and the amount of surface soil disturbance allowed to reduce erosion to the planned soil loss objective shall be determined using the current approved wind erosion prediction technology. Partial removal of residue by means such as baling or grazing, shall be limited to retain the amount needed. Calculations shall account for the effects of other practices in the management system.

Additional Criteria to Improve Soil Condition

An evaluation of the cropping system using the current approved soil conditioning index procedure shall result in a positive trend.

Additional Criteria to Reduce CO_2 Loss from the Soil

The Soil Tillage Intensity Rating (STIR) value shall include all field operations that are performed during the crop interval between harvest of the previous crop and harvest or termination of the current crop and shall be no more than 20.

An evaluation of the cropping system using the current approved soil conditioning index procedure shall result in a positive trend.

Additional Criteria to Reduce Soil Particulate Emissions

The amount and orientation of residue needed and the amount of surface soil disturbance allowed to reduce wind erosion to the tolerable soil loss value (T) shall be determined using the current approved wind erosion prediction technology. Calculations shall account for the effects of other practices in the conservation management system.

Additional Criteria to Increase Plant-available Moisture

Reducing Evaporation from the Soil Surface. The annual Soil Tillage Intensity Rating (STIR) value for all soil-disturbing activities in the cropping system shall be no more than 20.

Crop stubble height during the time evaporation losses can be expected to occur shall be:

- at least 10 inches for crops with a row spacing of less than 15 inches
- at least 15 inches for crops with a row spacing of 15 inches or greater

These stubble heights shall be present on at least 60% of the field.

Trapping Snow. Crop stubble height during the time significant snowfall is expected to occur shall be:

- at least 10 inches for crops with a row spacing of less than 15 inches
- at least 15 inches for crops with a row spacing of 15 inches or greater

These heights shall be present over at least 50% of the field.

Fall field operations that disturb residue shall be done as close to perpendicular as possible to the direction of prevailing winds during the time that significant snowfall is expected to occur.

Additional Criteria to Provide Food and Cover for Wildlife

The time that residue is present, the amount and orientation of residue and the height of stubble needed to provide adequate food and cover for the target species shall be determined using an approved habitat evaluation procedure.

CONSIDERATIONS

General - Removing of crop residue, such as by baling or grazing, can have a negative impact on resources. These activities should not be performed without full evaluation of

impacts on soil, water, animal, plant and air resources.

Production of adequate amounts of crop residues necessary to achieve the purposes of this practice can be enhanced by selection of high residue producing crops and crop varieties in the rotation, use of cover crops, and adjustment of plant populations and row spacing.

Using no till/strip till/direct seed for all crops in the rotation or cropping system can enhance the positive effects of this practice by:

- increasing the rate of soil organic matter accumulation
- keeping soil in a consolidated condition, which provides additional resistance to sheet and rill erosion
- sequestering more carbon in the soil
- further reducing the amount of particulate matter generated by field operations
- forming root channels and other near-surface voids that increase infiltration

A field border planted to permanent vegetation can:

- allow unobstructed turning for equipment
- eliminate unproductive end rows
- provide food and escape cover for wildlife
- provide travel lanes for farming operations

Increasing Soil Organic Matter Level and Reducing CO_2 Loss - CO_2 loss is directly related to the volume of soil disturbed, the intensity of the disturbance and the soil moisture content and soil temperature at the time the disturbance occurs. The following guidelines can make this practice more effective:

- Shallow soil disturbance (1-3 inches) releases less CO_2 than deeper operations.
- When deep soil disturbance is performed, such as by subsoiling or fertilizer injection, make sure the vertical slot created by these implements is closed at the surface.
- Planting with a single disk opener no-till drill will release less CO_2 than planting with a wide-point hoe/chisel opener air seeder drill.
- Soil disturbance that occurs when soil temperatures are below 50° F will release less CO_2 than operations done when the soil is warmer.

Reducing Soil Particulate Emissions - Slower operating speeds generally produce fewer particulate emissions.

Dry soils will produce more particulates than moist soils.

Reducing the wind erosion rate below the tolerable soil loss will help reduce particulate emissions. This can be done by:

- increasing the level of crop residue cover
- reducing the number of soil-disturbing operations
- installing other practices to reduce wind erosion, such as Herbaceous Wind Barriers (code 603)or Cross Wind Trap Strips (code 589C).

Managing Soil Moisture and Protecting Crops from Freeze Damage - The type, timing and depth of soil-disturbing activities all influence moisture loss. Shallow operations (1-2 inches) or operations that do not invert the soil will reduce moisture loss compared to deeper operations or those that invert and mix the soil.

Soil-disturbing operations performed when the soil surface is moist will result in greater moisture loss than operations done when the top two to three inches of soil have dried.

Leaving stubble taller than the minimum required will increase the relative humidity close to the soil surface, which reduces the rate of evaporative loss from the soil.

Leaving stubble taller than the 10-inch minimum will trap more snow and provide better protection to plants from freezing or desiccation.

Variable-height stubble patterns may be created to further increase snow storage.

Performing all field operations on the contour will slow overland flow and allow more opportunity for infiltration.

Wildlife Food and Cover - Leaving rows of unharvested crop standing at intervals across the field or adjacent to permanent cover will enhance the value of residues for wildlife food

and cover. Leaving unharvested crop rows for two growing seasons will further enhance the value of these areas for wildlife.

Leave crop residues undisturbed after harvest (do not shred or roll) to maximize their cover and food source benefits.

Avoid disturbing standing stubble or heavy residue during the nesting season for ground-nesting species.

CULTURAL RESOURCES CONSIDERATIONS

NRCS policy is to avoid any effect to cultural resources and protect them in their original location. Determine if installation of this practice or associated practices in the plan could have an effect on cultural resources. The National Historic Preservation Act may require consultation with the California State Historic Preservation Officer.

http://www.nrcs.usda.gov/technical/cultural.html is the primary website for cultural resources information. The California Environmental Handbook and the California Environmental Assessment Worksheet also provide guidance on how the NRCS must account for cultural resources. The e-Field Office Technical Guide, Section II contains general information, with Web sites for additional information.

Document any specific considerations for cultural resources in the design docket and the Practice Requirements worksheet.

ENDANGERED SPECIES CONSIDERATIONS

If during the Environmental Assessment NRCS determines that installation of this practice, along with any others proposed, will have an effect on any federal or state listed Rare, Threatened or Endangered species or their habitat, NRCS will advise the client of the requirements of the Endangered Species Act and recommend alternative conservation treatments that avoid the adverse effects. Further assistance will be provided only if the client selects one of the alternative conservation treatments for installation; or with concurrence of the client, NRCS initiates consultations concerning the listed species with the U.S. Fish and Wildlife Service, National Marine Fisheries Service and/or California Department of Fish and Game.

PLANS AND SPECIFICATIONS

Specifications for establishment and operation of this practice shall be prepared for each field or treatment unit according to the Criteria and Considerations described in this standard. Specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation.

OPERATION AND MAINTENANCE

No operation and maintenance requirements, national in scope, have been identified for this practice.

REFERENCES

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NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE SPECIFICATION

329 - RESIDUE MANAGEMENT, NO-TILL AND STRIP TILL

I. SCOPE

The work shall consist of performing cultural operations to produce crops or hay in a manner that maintains acceptable yields and provides adequate residues on the soil surface from harvest until after the next planting, on the area of land as shown on the plans or as staked in the field.

II. MATERIALS

Chemicals used in performing this practice shall be Federally, State, and locally registered and shall be applied strictly in accordance with authorized registered uses, directions on the label, and other Federal, State and local policies and requirements.

Chemical containers shall be properly stored and disposed of in a safe manner according to state and local ordinances or procedures.

III. CULTURAL OPERATIONS

In rainfall erosion areas, the tillage and planting system shall provide at least 30 percent coverage of the soil surface with plant residues after planting a crop unless otherwise specified on the Practice Requirements sheet. The soil shall be left undisturbed from harvest to planting except for nutrient injection. Planting or drilling shall be accomplished in a narrow seedbed or slot created by coulters, row cleaners, disk openers, in-row chisels or roto-tillers.

In wind erosion areas, the tillage and planting system shall maintain at least 1000 pounds per acre of flat, small grain residue equivalent on the soil surface throughout the critical wind erosion period unless otherwise specified on the Practice Requirement sheet. The soil shall be left undisturbed from harvest to planting except for nutrient injection. Planting or drilling shall be accomplished in a narrow seedbed or slot created by coulters, row cleaners, disk openers, in-row chisels or roto-tillers.

Planting shall be performed as nearly as practical across the slope.

Planting or drilling shall be accomplished in a narrow seedbed or slot that generally does not exceed three (3) inches in width.

Planting shall be performed directly into old crop residues, annual cover crop, or chemically killed sods.

Combines used to harvest small grains shall be equipped with a straw spreader.

Weed control shall be accomplished primarily with herbicides. Cultivation may be used for emergency weed control.

IV. OTHER REQUIREMENTS

The owner, operator, contractor, or other persons shall conduct all work and operations in accordance with proper safety codes for the type of equipment and operations being performed with due regard to the safety of all persons and property.

NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

SPRING DEVELOPMENT

(No.)

CODE 574

DEFINITION

Collection of water from springs or seeps to provide water for a conservation need.

PURPOSE

Improve the quantity and/or quality of water for livestock, wildlife or other agricultural uses.

CONDITIONS WHERE PRACTICE APPLIES

In areas where a spring or seep will provide a dependable supply of suitable water for the planned use.

CRITERIA

General Criteria Applicable to All Purposes

An investigation of site conditions shall be made, including:

a. Taking soil borings or using other investigative methods as appropriate, to describe the soil and rock material at the spring. Pertinent properties include clay content. erodibility; presence of redoximorphic features, degree of fracturing, and fracture orientation

b. Field estimation or sampling and water quality testing as appropriate, to compare existing water quality with standards for the intended beneficial use

c. Measuring or otherwise estimating springflow discharge, and comparing flows with needs for the intended purpose, including:

   (1) characterizing seasonal fluctuations in springflow discharge; and

   (2) evaluating the impacts of increased discharge on water table elevation and yield to other areas/uses

d. Suitability of the spring location for the intended purpose

e. A determination that the client has the appropriate water rights and any other permits that are required to develop and maintain the spring

f. An assessment to determine existing ecological functions and potential losses from the spring development

g. A certified wetland determination

h. An assessment of the cultural resource associated with the spring.

Develop springs by removing obstructions to the flow, collecting the water flow and storing the water, if flow from the spring is not sufficient to meet the peak demand of the intended use.

Remove obstructions to spring flow such as fine-grained sediments, rock, slope-wash materials and vegetation to allow the spring to flow freely. Design the development of the spring to prevent obstructions from reoccurring.

The type of collection system used for the spring development is dependent upon the type of spring and site geology. Collection systems generally consist of a restrictive barrier that forces water to collect in a perforated pipe that flows to an outlet.

Design the collection system to collect sufficient water for the intended purpose of the spring. Minimize the amount of flow diverted from the spring to that necessary to meet the

intended use, and redirect as much flow as possible to the original wetted area or watercourse.

Include measures in the collection system to prevent sediment from entering the system and/or provisions to trap and remove sediment that does enter the system.

Include a spring box, if necessary, to allow sediment to settle out of the spring flow or to provide storage to meet peak demands on the water from the spring. Locate the spring box to allow water to flow by gravity from the spring to the spring box. Construct the spring box of a, durable material such as concrete, plastic, galvanized steel, or naturally rot resistant wood.

The spring box shall be of sufficient size to provide for the storage of sediment and any required storage of water. The cross-sectional area of the spring box shall be large enough to allow access for periodic cleaning. A tee and vent pipe should be installed on the pipe within the spring box to reduce plugging from leaves or trash, or the entrance to the pipe should be screened. Provide the spring box with a tight fitting cover to prevent trash and surface runoff from entering. Where appropriate, bury the spring box in the soil to prevent freezing.

The spring development shall have an outlet pipe that carries the water to its intended use. Design the outlet pipe according to Conservation Practice Standard Pipelines, 516, Pipeline. If the outlet is from a spring box, the outlet pipe shall be a minimum of 6 inches off the floor to allow for sediment collection.

A shutoff valve and vent system on the spring outlet pipe shall be included for winter shutdown, flow control, and maintenance.

A pump will be needed if gravity will not carry water from the spring to where the water will be used. Base the type and size of the pump upon available power sources and the water delivery needs.

When flow from the spring, whether intermittent or continuous, will exceed the capacity of the collection system, an overflow is required. Size the overflow to carry the maximum flow expected from the spring during periods of wet weather. Manage the overflow so that it does not create a resource problem.

Design the spring development so that it is protected from damage by freezing, flooding, livestock, excess sediment, vehicular traffic and water quality contamination.

Follow Conservation Practice Standard 614, Watering Facility to design facilities to provide access for livestock and wildlife to water from the developed spring.

Regrade areas disturbed by construction of the spring development to keep surface flow out of the spring. Revegetate disturbed areas as soon as possible after construction.

CONSIDERATIONS

Consider the potential impacts of spring development on long-term groundwater supply for existing and planned uses on adjacent properties.

Consider how diversion of water from spring developments affects stream flows in the watershed.

Consider how other conservation practices properly applied on the spring recharge area may increase infiltration of precipitation in order to conserve the spring's flows.

Springs may represent islands of unique habitat in the landscape, supporting plant and animal populations that only occur in an area of a high water table. Consider options for developing the spring or seep that preserve or enhance the conditions that support these unique habitats.

Springs are sources of water for fish and wildlife. Maintain fish and wildlife access to water from the spring development where possible.

Native vegetation adapted to wet conditions should be considered on wet sites as an alternative to introduced grasses to stabilize areas after construction.

Aquatic habitat quality may be conserved when a spring is developed near surface waters, or on a floodplain, by incorporating a float valve that shuts off flow to the tank, and returns overflow via a stable outlet to the same watershed where it was collected.

Consider using filter fabric in lieu of an impervious barrier along the wall(s) of the

collection trench as a way to minimize disturbance to the impacted wetland associated with spring development.

Brush removal, excavation, clean out and withdrawal of water are manipulations that may affect wildlife habitat and wetland functions and values. However, selective removal of undesirable brush and management for desirable native plants may reduce evaporative losses and conserve biodiversity.

Cultural Resources Considerations

NRCS policy is to avoid any effect to cultural resources and protect them in their original location. Determine if installation of this practice or associated practices in the plan could have an effect on cultural resources. The National Historic Preservation Act may require consultation with the California State Historic Preservation Officer.

http://www.nrcs.usda.gov/technical/cultural.html is the primary website for cultural resources information. The California Environmental Handbook and the California Environmental Assessment Worksheet also provide guidance on how the NRCS must account for cultural resources. The e-Field Office Technical Guide, Section II contains general information, with Web sites for additional information.

Document any specific considerations for cultural resources in the design docket and the Practice Requirements worksheet.

Endangered Species Considerations

If during the Environmental Assessment NRCS determines that installation of this practice, along with any others proposed, will have an effect on any federal or state listed Rare, Threatened or Endangered species or their habitat, NRCS will advise the client of the requirements of the Endangered Species Act and recommend alternative conservation treatments that avoid the adverse effects. Further assistance will be provided only if the client selects one of the alternative conservation treatments for installation; or with concurrence of the client, NRCS initiates consultations concerning the listed species with the U.S. Fish and Wildlife Service, National Marine Fisheries Service and/or California Department of Fish and Game.

PLANS AND SPECIFICATIONS

Plans and specifications shall provide details of planned location, materials and construction requirements for the installation of the practice to meet its intended purpose.

OPERATION AND MAINTENANCE

The O&M plan shall contain a schedule for the periodic monitoring of the following items:

- Sediment buildup in the spring box
- Clogging of outlet and overflow pipes
- Diversion of surface water from the collection area and spring box
- Erosion from overflow pipes
- Rodent damage

Any problems discovered shall be immediately repaired.

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NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE SPECIFICATION

574 - SPRING DEVELOPMENT

I. SCOPE

The work shall consist of constructing a water collection system from a spring as shown on the drawings or as staked in the field.

II. PERMITS

Water rights and any other permits required to develop and maintain the spring shall be obtained prior to construction and documented in NRCS records.

III. SITE PREPARATION

Remove all loose rock, sediment, logs, and vegetation that unnecessarily obstruct spring discharge. Material that is removed shall be disposed of in a manner that will neither interfere with the proper functioning or utilization of the spring, nor degrade water quality or otherwise negatively impact natural resources locally.

Explosives shall not be used to excavate rock or other material from the spring.

IV. MATERIALS

All construction materials shall meet the requirements specified and/or detailed on the drawings. For gravity flow systems, well pipe shall be minimum 1 ¼-inch diameter unless otherwise specified on the drawings.

Crushed rock or gravel for collection systems, and sand-gravel material for filters, shall be composed of clean, hard particles and graded as indicated on the drawings.

V. CONSTRUCTION OPERATIONS

A. Springflow Collection Systems

The spring water collection system, (including trenches, drain tiles, perforated pipelines, sumps, and spring boxes) shall be constructed to the lines, grades, dimensions and of the materials shown on the drawings.

B. Appurtenant Systems

Storage tanks, water troughs, or other facilities for beneficial use of the water shall be constructed as shown on the drawings or as staked in the field.

C. General

The owner, operator, Contractor or other persons will conduct all work and operations in accordance with proper safety codes for the type of construction being performed with due regards to the safety of all persons and property.

Construction operations shall be done in such a manner that erosion and air and water pollution are minimized and held within legal limits. Chemical pollutants such as oil, transmission fluid, lubricant, and grease spills shall be cleaned up, removed from the site, and disposed of in accordance with all applicable regulations.

The completed job shall be workmanlike and present a good appearance.

D. Protective Measures

All works shall be adequately protected from physical damage by freezing, surface runoff and flooding, sedimentation, vandalism, vehicle traffic, and animals including livestock.

Unless otherwise specified, a protective cover of vegetation shall be established on the disturbed area where growth will not obstruct the spring outlet. The planting of vegetative materials shall conform to the requirements of the appropriate Practice Specification 342, Critical Area Planting, as indicated in the Practice Requirements Worksheet. Fertilizer shall not be applied unless specified in the Practice Requirement Worksheet.

To the degree practicable, measures and construction methods that enhance fish and wildlife habitat shall be included. Special attention shall be given to protecting visual resources and maintaining key shade, food and den trees.

Other items specific to your project are listed on the "Practice Requirement" sheet.

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

574 – SPRING DEVELOPMENT

OPERATION AND MAINTENANCE

Sponsor/Land user: _____ Date: _____

Address: _____

_____

Location GPS Coordinates Map Datum: _____ E _____ N _____

Quad Sheet Name _____ SEC _____ T _____ R _____

A properly operated and maintained spring development is an asset to the farm. This project was designed and installed to obtain and improve the distribution of water for livestock and/or wildlife purposes. The estimated life span of this installation is at least 10 years. The life of this installation can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This practice will require you to perform periodic operation to maintain satisfactory performance. Here are some recommendations to help you develop a good operation and maintenance program:

GENERAL RECOMMENDATIONS

- Remove any vegetation or debris that has accumulated that might obstruct the free discharge of flows at the spring outlet.
- Check all above ground connections, cover and seals, valves, insect and rodent guards, inlets and outlets to make sure they are functioning properly.
- Maintain all fences in good condition to exclude livestock from collection area.
- Maintain, where necessary, coverings and insulation to prevent damage by freezing.
- Precaution and care are needed to prevent herbicides, insecticides and other pollutants from contaminating the spring's water source.
- Control invasive weeds, reseed, and irrigateas needed to maintain vegetative cover on areas disturbed during development. Limit fertilizer and herbicide application in the vicinity of the spring outlet, particularly on the upgradient side. Periodic mowing may be needed to control growth.
- Inspect for damage from rodents or burrowing animals. Repair any damage. Take appropriate corrective actions to alleviate further damage.
- Immediately repair any vandalism, vehicular or livestock damage.

SPECIFIC RECOMMENDATIONS FOR YOUR SPRING DEVELOPMENT

CONTACT YOUR LOCAL NATURAL RESOURCES CONSERVATION SERVICE OFFICE FOR ANY ADDITIONAL TECHNICAL ASSISTANCE YOU MIGHT NEED FOR IMPLEMENTATION OF THIS OPERATION AND MAINTENANCE PLAN FOR YOUR SPRING DEVELOPMENT.

NRCS, CA
September 2007

STATEMENT OF WORK
Spring Development (574)

These deliverables apply to this individual practice. For other planned practice deliverables refer to those specific Statements of Work.

DESIGN

Deliverables:

1. Design documents that demonstrate criteria in practice standard have been met and are compatible with planned and applied practices
    a. Practice purpose(s) as identified in the conservation plan.
    b. List of required permits to be obtained by the client
    c. Compliance with NRCS national and state utility safety policy (NEM Part 503-Safety, Subpart A - Engineering Activities Affecting Utilities 503.00 through 503.06)
    d. Practice standard criteria related computations and analyses to develop plans and specifications including but not limited to:
        i. Capacity
        ii. Appurtenances
        iii. Environmental Considerations (e.g. wildlife safety, wetlands, water quality)
2. Written plans and specifications including sketches and drawings shall be provided to the client that adequately describes the requirements to install the practice and obtain necessary permits.
3. Operation and maintenance plan..
4. Certification that the design meets practice standard criteria and comply with applicable laws and regulations (NEM Subpart A, 505.03(b) (2)).
5. Design modifications during installation as required

INSTALLATION

Deliverables

1. Pre-installation conference with client and contractor
2. Verification that client has obtained required permits.
3. Staking and layout according to plans and specifications including applicable layout notes
4. Installation inspection
    a. Actual materials used
    b. Inspection records
5. Facilitate and implement required design modifications with client and original designer.
6. Advise client/NRCS on compliance issues with all federal, state, tribal, and local laws, regulations and NRCS policies during installation.
7. Certification that the installation process and materials meets design and permit requirements (NEM Subpart A, 505.03(c) (1)).

CHECK OUT

Deliverables

1. As-built documentation
    a. Extent of practice units applied
    b. Drawings
    c. Final quantities
2. Certification that the installation meets NRCS standards and specifications and is in compliance with permits
3. Progress reporting

REFERENCES

- Field Office Technical Guide (eFOTG), Section IV, Conservation Practice Standard – Spring Development, 574.
- National Engineering Manual
- NRCS National Environmental Compliance Handbook
- NRCS Cultural Resources Handbook