Appendix C

C1. Sample Water Resource Protection Plan Cover Letter

C2. Sample Water Resource Protection Plan

C3. Sample Inspection Report and Erosion Control Plan

C4. Sample Hazardous Materials Compliance Plan (Map not included)

C5. Sample Hazardous Materials Report of Compliance (Map not included)

C6. Sample Restoration Plan (Maps, Sheets and Appendixes not included)

C7. Sample Remediation Report of Findings (Maps & Appendixes not included)

C3. Sample Inspection Report and Erosion Control Plan

Date: January 20, 2012

To: President XYZ Ranch LLC
3737 Blueberry Hill
Brown Cow, CA 94555

From: Colin Hughes, PG #8549
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Subject: Inspection report and erosion control plan for APN 123-456-789, Brown Cow, Valley County, California.

In October, 2011, Pacific Watershed Associates (PWA) was contacted by D.B. Cooper (hereafter referred to as "landowner") regarding notices of Valley County Code violations and Superior Court of California proceedings regarding recent grading performed under supervision of the landowner on his property, Valley County Assessor's Parcel Number 123-456-789 (hereafter referred to as "property"). At the request of the landowner, PWA conducted a field inspection of the property to identify sources of potential future erosion and sediment delivery to a watercourse and recommend erosion control and erosion prevention treatments to mitigate the potential for erosion and sediment delivery. The field inspection identified all roads and areas of recent grading with the potential to erode through surface and gully erosion processes. In my professional opinion, these areas have limited potential to deliver sediment to an unnamed tributary to Brown Cow Creek. A summary of current conditions and both short-term and long-term erosion remediation recommendations are included in this report.

Contents:

Attachments:

Map 1. Existing conditions map of XYZ Ranch, Valley County, California.
Map 2. Pad #s 1 – 4 profile and cross section survey locations.
Map 3. Erosion control treatment recommendations.
A. Historic aerial photographs and imagery of the project area.
B. Graphic renderings of Pad #s 1 – 4 survey cross sections.
C. Typical design drawings of road drainage treatments

1 GEOLOGIC AND GEOMORPHIC SETTING

The XYZ Ranch property is located in the upper portion of West Branch Cowboy River, tributary to the Sacramento River, approximately 3 miles east of the town of Brown Cow. The majority of the property is located within the USGS Brown Cow East 7.5-minute Quadrangle Township 16N Range 2E, in the north east portion of Section 12, Valley County California (Map 1). The project area lies within the northern extent of the Sierra Nevada Geomorphic Province of California, characterized as a near 400 mile long tilted fault block which in the vicinity of the project area is cut by deep river canyons (CGS, 2002).

The local bedrock of the project area is primarily composed of Paleozoic and Mesozoic metavolcanic rocks (Saucedo and Wagner, 1992). Outcrops on the property were identified through hand specimen inspection as albite gneiss.

Hillslopes observed on the property were of moderate steepness (35-50% hillslope gradient). The topography of the north-facing slopes examined was irregular, containing numerous benches, midslope breaks-in-slope, and discontinuous swales, suggesting that landsliding and rapid/stochastic processes related to geologic instability have played a large role in hillslope evolution.

The bulk of the property inspected by PWA is underlain by the GriffGulch-Surnuf-Spine Taxadjunct Complex of soils (NRCS, 2009). This complex of gravelly to very cobbly loam and silty loam soils are described as well drained soils typically 10 inches to more than 80 inches in thickness that form from colluvium or residuum weathered from metavolcanic parent rock typically occurring on 30 to 50% slopes in mountainous areas.

The XYZ Ranch property is located in a seismically active area. Numerous identified active and potentially active faults could experience earthquake activity resulting in significant ground motion within the county and project area. Recognized active faults which could experience earthquake activity affecting the project area include the Cleveland Hill Fault, Midland-Sweitzer Fault, San Andreas Fault Zone (north section), Hayward-Calaveras Fault Complex, Russell Valley Fault, and the Last Chance-Honey Lake Fault Zones. Strong ground acceleration may reduce slope stability and plan in integral role in the initiation or reactivation of landslides on both native hillslopes or associated with man-made fillslopes. Ground motion maps have been created by the California Seismic Hazards Mapping Act as a byproduct of the delineation of Seismic Hazards Zones by the Department of Conservation. According to the California Geological Survey (CGS), there is a 10% probability that the area will experience Mean Peak Ground Acceleration of 0.10 – 0.20 g between the calendar years 1999-2049 (CGS, 2002).

Although geology, tectonic setting, slope morphology, and soils play an inherently major role in the stability of the native and modified hillslopes assessed by PWA, erosion control measures recommended by PWA in this inspection report and erosion control plan are essentially limited to material produced from the cleared roads and cut and fill pad areas. Potential mass wasting related to geologic instability and/or seismic activity is not mitigated by the erosion control recommendations provided by this inspection report and erosion control plan.

2 HISTORY OF ROAD AND PAD CONSTRUCTION

Historic imagery available on Google Earth (years 2008, 2010, and 2011) and aerial photographs (years 1977, 1997, and 2000) were obtained and analyzed to develop a partial road and fill pad construction history for the XYZ Ranch property. The Main Access Road through the property was initially constructed prior to 1977, likely for the purposes of timber harvest or mining. As visible on 1977 aerial photographs taken by the USDA, the Main Access Road had been constructed at least to the location of the spring at Site 2 (Map 1 and Attachment A). Several skid road alignments can be seen in the 1977 photography stemming from the spring area to Pad #1 and other upslope areas on the property (Attachment A). Camp Roads A, B, and C may presently occupy some of these former skid road alignments (Map 1). Pad #1 appears to have been originally cleared as a small logging landing by 1977.

Photographs from 1997 are taken well after large-scale timber harvest activities had concluded on the property and the entire alignment of the Main Access Road is more clearly visible, trending upslope to the west of Pad #1 and providing access to the ridgeline in the middle of the parcel (Map 1 and Attachment A). Vegetative regrowth (shrubs) on Pad #1 largely obscures the landings appearance in the 1997 photos, though the lack of large trees on the landing is apparent.

The year 2000 USDA photography, taken only 3 years after the 1997 photography were also reviewed but are not included in Appendix A. The 2000 photographs show property roads and pads to be in similar condition to the 1997 photography, with no additional road or pad construction activities discernable.

Imagery dated June 5, 2010, available on Google Earth, shows the property after the fire of 2008. Existing property roads and Pad #1 are much more visible on the 2010 imagery due to the loss of canopy in the 2008 fire. Pad #1 can be observed to be similar in shape and footprint area to the main/large terrace portion of Pad #1 in its current condition (Map 1 and Attachment A). Main Access Road can be discerned on the 2010 imagery in its current alignment and extending to the ridgeline in the central portion of the property.

Imagery dated June 5, 2010, available on Google Earth, provides an even clearer view of the Main Access Road alignment. Tracks from four-wheel automobile traffic are observable on the final approach to the ridgeline (Map 1 and Attachment A).

Imagery dated March 10, 2011, available on Google Earth, shows the property after recent grading and road opening in early 2011 (Maps 1, 2, and 3). All roads and cleared or constructed pads on the property are clearly discernable on the 2011 imagery, including the recently re-opened skid road alignments of Camp Roads A, B, and C, Pads #1 - 4, and the area cleared of brush north of Pad #4 (Map 1). The 2011 imagery was taken prior to any erosion control efforts on the property, excepting a line of straw bales placed at the downslope outboard edge of the grading performed at Pad #1. The 2011 Google Earth imagery was utilized as the base imagery for Maps 1-3 and field mapping performed on the property.

3 EXISTING CONDITIONS OF ROADS AND PADS

3.1 Roads

Based on field observation of existing conditions, recent grading and opening of the Main Access Road involved brush removal and minor grading primarily to flatten the road and smooth the road surface. The Main Access Road is approximately 12 feet in width and ranges from flat to nearly 30% in gradient near Pad # 1 (Map 1). Cutbanks were observed to range from non-existent to 3 feet in height. Graded earthen material from the cutbank and roadbed was pushed to the outboard edge of the road, forming a small berm up to ¾ of a foot in height, where present, along midslope alignments (Photo 1 and Map 1). The roadbed is generally flat in cross section view with some minor areas of mild outsloping (less than 6%). The Main Access Road bisects the swale alignments containing the springs at Sites # 1 and # 2 near the lowest elevations on the property (Map 1). Recent road opening activities on the Main Access Road resulted in very limited sidecasting of brush and earthen materials in midslope areas. Road opening activities along the sharp ridgeline in the central portion of the parcel were observed to primarily consist of brush removal and very limited surficial grading of the roadbed (Photo 2 and Map 1). Road fill thickness along midslope alignments was not observed to be greater than approximately 2 feet thick in any location. No evidence suggesting a moderate or high potential for fill failure was observed anywhere along the Main Access Road. No structures to either disperse road surface runoff (e.g. rolling dips, waterbars) or collect or control road surface runoff (e.g. insloping, ditching, ditch relief culverts) were observed along the Main Access Road. Straw mulch was observed to have been placed on the road surface of the Main Access Road along its streamside and midslope alignments for the purpose of erosion prevention, achieving approximately 50% coverage of exposed mineral soil (Photo 1). No straw mulch was observed along the sharp ridgeline alignment of the Main Access Road (Map 1).

Camp Roads A, B, and C are 12 ft wide access roads to the tent area at Pad #4 and may have been former skid road alignments during historic timber harvest on the property (Map 1, Attachment A). Cutbanks were observed to range from non-existent to a maximum of 3 feet in height and have been denuded or otherwise enlarged by grading efforts in 2010. Roadbeds are flat to moderately outsloped (up to approximately 12%), particularly at the low point and swale axis on Camp Roads B and C (Map 1). Camp Road A is one of the steepest road segments on the property, trending up a gentle ridgeline with a down-road gradient of up to 35% between Camp Road B and the Main Access Road (Map 1). Camp Roads B and C are steeply contouring alignments with down-road gradients of up to 22%. No structures to either disperse road surface runoff (e.g. rolling dips, waterbars) or collect or control road surface runoff (e.g. insloping, ditching, ditch relief culverts) were observed on any of the Camp Roads. Camp Roads A, B, and C were observed to have straw mulch placed on the road surface for the purpose of erosion prevention, achieving approximately 50% coverage of exposed mineral soil.

Photo 1. View of the Main Access Road through the XYZ Ranch with low cutbanks and small berm visible at the outboard edge of the road (Map 1).

Photo 2. View looking west, of the Main Access Road along the sharp ridgeline in the center of the parcel (Map 1).

3.2 Cut and Fill Pads

Four cut and fill pads were created or altered during 2010 grading activities on the property (Maps 1 and 2). Each of the pads were observed to have been mulched with straw for erosion prevention with varying degrees of surface area coverage. All four cut and fill pads were surveyed with tape and clinometer surveys to estimate the quantity of fill material cut to construct new pads or alter existing pads during 2010 grading activity (Map 2, Attachment B)[1]. Although more accurate methods of survey are available (total station), tape and clinometer surveys are much more cost effective for the size and morphology of the pads surveyed and provide a level of accuracy suitable for the estimation of subject fill volumes.

3.2.1 Pad #1

Pad #1 is located on a natural topographic bench above the streamside slope leading to an unnamed Class III watercourse, tributary to Brown Cow Creek (Map 1). Based on field observation and analysis of historic imagery, the large landing at Pad #1 was initially constructed and utilized during historic timber harvest activities on the property and not during recent grading efforts conducted in 2010 (Attachment A). Grading activities conducted in 2010 have cleared the existing landing of brush and cut 2 arcuate cut and fill terrace benches (Benches #3 and 4) into the cutbank of the preexisting landing (Bench #2), and a third arcuate cut and fill terrace (Bench #1) at the outboard toe of the landing, thereby increasing the footprint of the landing by approximately 50% (Map 2, Photo 3). Terraces were observed to be outsloped between 9 and 25% and range from 7 to 10 feet in width (Attachment B). Cut slopes were observed to be 3 feet or less in height and range from 50% to 72% in slope. Some graded earthen material was also observed to have been placed on the outboard edge of the preexisting landing surface (Map 2, Bench #1). Straw mulch was observed to have been placed on the Pad #1 bench and cutslope and fillslope surfaces for the purpose of erosion prevention, achieving approximately 40% coverage of exposed mineral soil.

The terraces constructed at Pad #1 were identified as simple cut and fill features through the observation of several surficial features:

1) Projection of the 42% gradient native hillslope from the cutbank above Bench #4 would intersect the middle of terrace surface of Bench #4, suggesting that material excavated from the cutbank was emplaced on the preexisting surface downslope of the excavated bench to form a 7 to 10 foot wide bench surface of both cut and fill sections (Map 2, Photos 3 and 4).

2) Preexisting vegetation not entirely removed during pre-construction clearing and grubbing protrudes (i.e. is sprouting), in most areas, from the boundary between cut and fill slopes. The broken and stripped stems of the protruding shrub remains is consistent with the inferred means of pad clearing and terrace construction (bulldozer blade). Vegetative regrowth of the shrubs is only possible due to the root structures remaining intact and in place. The orientation of the broken shrub stems (lying down and

1 The location of cross sections are shown on Map 2, and the plots of cross sections are shown in Attachment B.

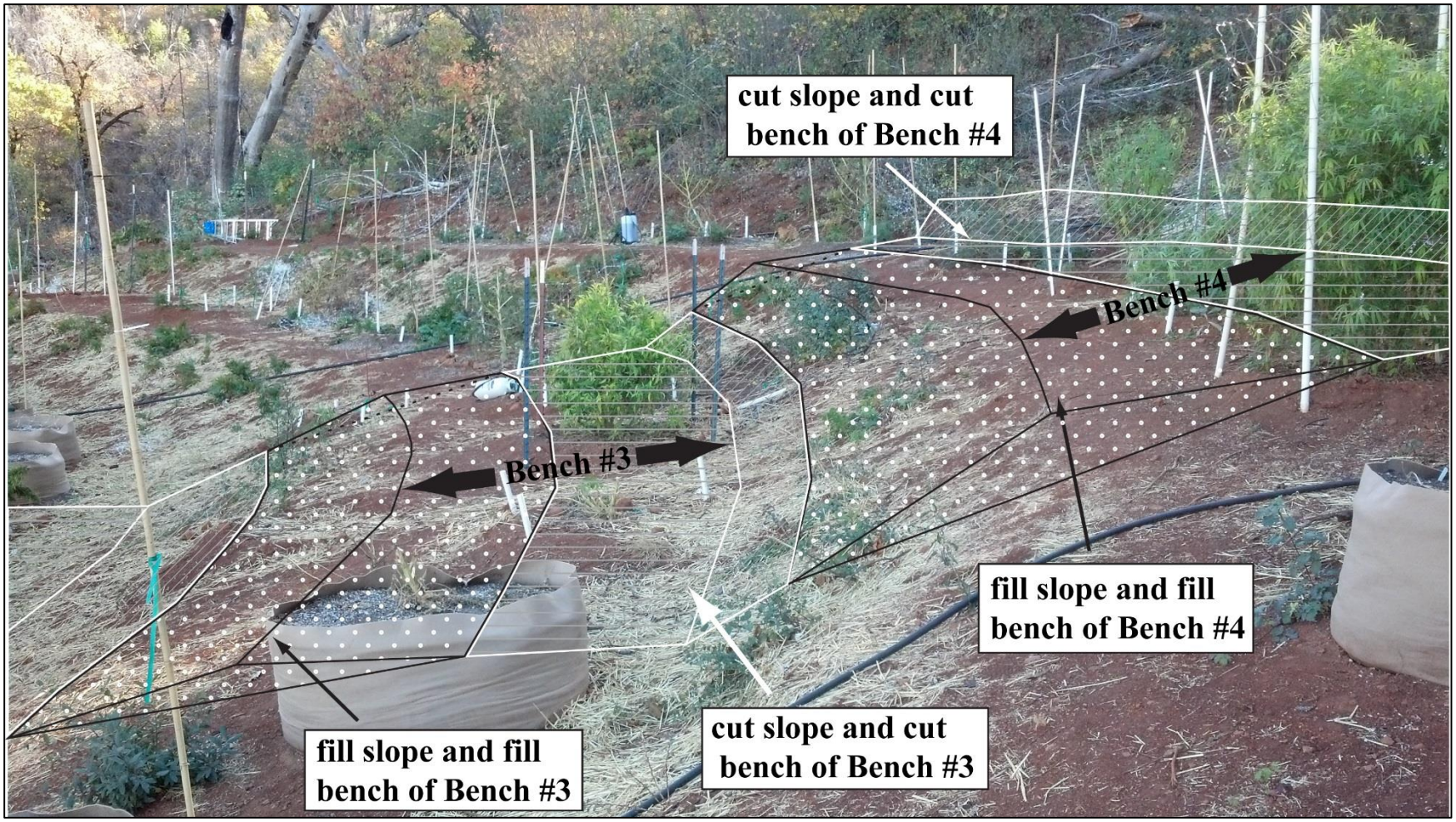

Photo 3. View looking east across Pad #1. Cut and fill areas of Benches #3 and 4 are graphically illustrated in cross section to display the cut and fill bench areas and thicknesses. Approximate fill areas are bounded by black lines with white stippling patterns, and cut areas are bounded by white lines with white lined patterns.

protruding obliquely from the fillslope) is also consistent with having fill placed or pushed on top of the residual stripped brush.

3) Fill depths are observable as being equal to or less than approximately 2 feet at the outboard edges of each bench and no large stockpiles of excess graded earthen material are built up on the pad. Cross section #5, at station 1+25 ft has no cut area identified and only fill volume surveyed, suggesting a predominant bulldozer push direction of west to east (Appendix B).

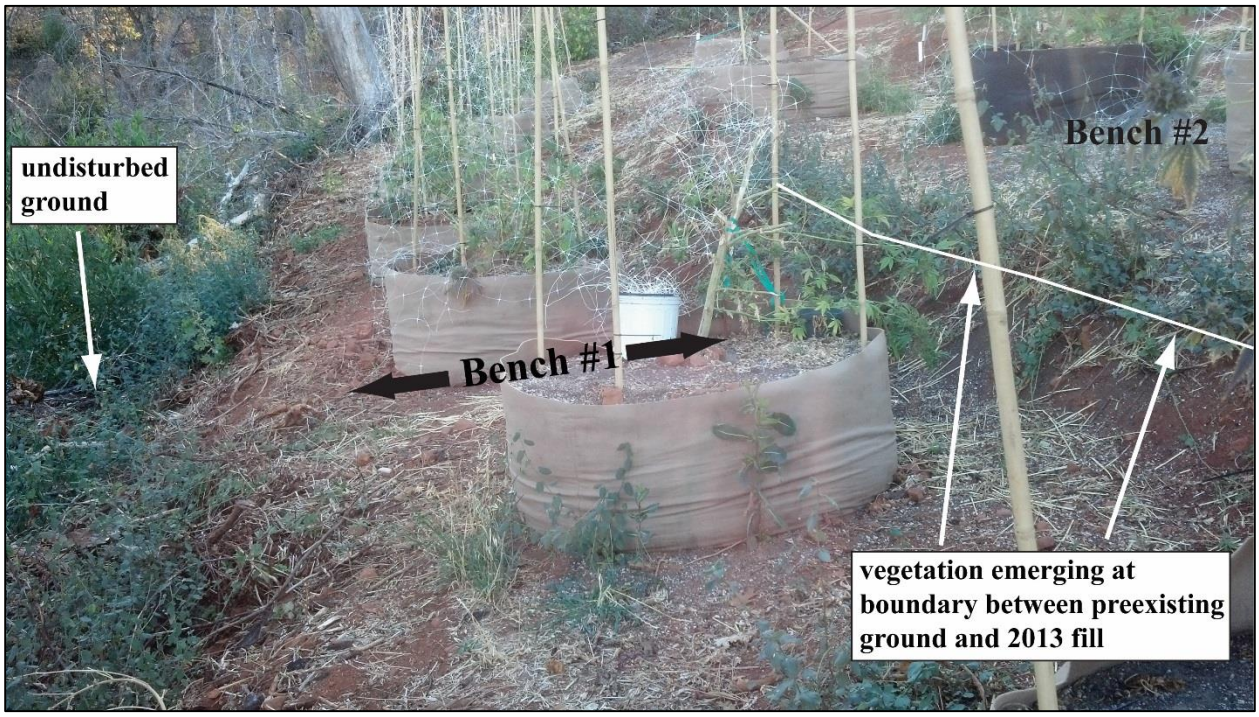

Photo 4. View of the outboard portion of Pad #1, looking southeast at Bench #1. Note the stripped stems and regrowth of vegetation from in place root structures midway up the cutslope of Bench #1.

Analysis of the tape and clinometer survey of Pad #1 estimates that a maximum of 60 - 65 yd^3 of earthen material was cut from the preexisting landing to construct the 3 new terraces and modify the large Bench #2 through grading performed in 2013.

3.2.2 Pad #2

Pad #2 is located west of the Main Access Road adjacent to Pad #1 and is above the cutbank of Camp Road B (Maps 1 and 2). Pad #2 is a cut and fill pad identifiable through observation of the same surficial features described at Pad #1 above. The bench at Pad #2 was measured to be 39 feet in length and 7 to 8 feet wide. The cutbank is less than 3 feet in vertical height and at 100% slope gradient, or 1:1. Fillslopes length ranges from ½ a foot near the intersection with the Main Access Road to 3 feet in length at the center and west end of the pad (Attachment B). Straw

mulch was observed to have been placed on the Pad #2 bench and fillslope surfaces for the purpose of erosion prevention, achieving approximately 10% coverage of exposed mineral soil.

Analysis of the tape and clinometer survey of Pad #2 estimates that 3yd^3 of earthen material was cut from the native slope to create the bench terrace during grading performed in 2013. Attachment B contains graphic renderings of the cross section data taken at Pad #2, and displays the cut and fill areas surveyed at each cross section. Cross section data analysis estimates the maximum depth of fill to be 1.5 feet at the west end of the pad.

3.2.3 Pad #3

Pad #3 is located approximately 150 feet upslope of Pad #1, along the east side of the Main Access Road and adjacent Camp Road C (Maps 1 and 2). At the time of PWA's inspection, a 1,500 gallon capacity black polyethylene water tank was positioned on the pad. The cut and fill bench at Pad #3 was measured to be 31 feet in length and 16 feet in width (Attachment B). The cutbank at the west end of the pad is nonexistent at the edge of the Main Access Road, and increases to approximately 2.5 feet in height at the east extent of the pad (Attachment B). The cutbank slope gradients, range from 45 % near the center of the pad to 73% to the east. The fillslope was observed to be uniformly 4 feet in length and 84% in steepness. Straw mulch was observed to have been placed on the Pad #3 cut and fillslope surfaces for the purpose of erosion prevention, achieving approximately 85% coverage of exposed mineral soil.

Analysis of the tape and clinometer survey at Pad #3 estimates that 8yd^3 of earthen material was cut from the native slope to create the bench during grading performed in 2013. Attachment B contains graphic renderings of the cross section data taken at Pad #3, and displays the cut and fill areas surveyed at each cross section. Cross section data analysis estimates the maximum depth of fill to be 1.5 feet.

A large bench skid road was observed to intersect with Pad #3 and continue both downslope towards Pad #1 and contour upslope to the northwest. It is highly likely that Pad #3 has been constructed on a preexisting small tractor cut connecting the Main Access Road alignment with the large skid road to the east.

3.2.4 Pad #4

Pad #4 was constructed on 8% to 33% native hillslopes located at the southern extent of Camp Road A (Maps 1 and 2) and was used during 2010 as a camp location. Pad #4 is a cut and fill bench measured to be 85 feet in length with width varying from 6 feet at the western extent to 41 feet at the eastern extent of the pad (Attachment B). The pad bench is uniformly outsloped at approximately 6% in the down slope direction (i.e. north). Cut slopes at Pad #4 range from 2 to 3 feet in height and from 37% to 75% in slope gradient. Fillslopes at Pad #4 vary in length from 3 to 6 feet and range from 32% to 120% in slope gradient (Attachment B). No organic materials were observed to have been incorporated into the pad fill materials. Straw mulch was observed to have been placed on the Pad#3 cut and fillslope surfaces for the purpose of erosion prevention, achieving approximately 85% coverage of exposed mineral soil.

Analysis of the tape and clinometer survey of Pad #4 estimates that 40-45 yd^3 of earthen material was cut from native slopes to create the cut and fill pad during grading performed in 2010. Attachment B contains graphic renderings of the cross section data taken at Pad #4, and displays the cut and fill areas surveyed at each cross section. Cross section data analysis estimates the maximum depth of fill to be 2 feet.

3.3 Areas of Brush Clearing

An area approximately 6,450 ft^2 in size located directly downslope (northeast) of Pad #4 and a smaller, 675 ft^2 area, immediately south of Pad #4 were observed to have been cleared of vegetation during 2010 grading activities on the property (Maps 1 and 2). No evidence of substantial grading was observed within these areas (e.g. cuts, fills, overturned soils with root material). Stripped stems of in place vegetation were observed protruding from in place soil. Activities conducted in these areas in 2010 are inferred to have been brush removal with a bulldozer or Bobcat blade.

4 POTENTIAL FUTURE EROSION AND SEDIMENT DELIVERY

4.1 Cut and Fill Pads

Pad #1 is the largest of the four pads constructed or altered during 2010 grading activities. Given the small depth of fill and minimal cut into native slopes at Pad #1, and low gradient topography downslope of Pad #1, no potential for future erosion or sediment delivery through the processes of fill failure or cutbank failure was identified.

If no further erosion prevention or erosion control measures were performed prior to measurable precipitation during the 2011-2012 wet season, a minor amount of surface erosion is predicted to occur on bare soil surfaces disturbed during 2010 grading. The existing straw mulch will be moderately successful in reducing the quantity of surface erosion and soil transportation or loss from Pad #1, however, application of additional straw mulch increasing effective coverage of bare soil areas to 95% or greater would greatly reduce surface erosion from the pad. The surface topography of the benches on Pad #1 is well outsloped, draining uniformly off the outboard edge of the landing (to the north and northeast), and does not concentrate runoff down the length of the benches or direct runoff onto the Main Access Road. At its closest point, Pad #1 is approximately 150 ft in slope distance from the unnamed Class III watercourse located to the north (Map 1). The hillslope between Pad #1 and the unnamed stream is gentle in gradient (approximately 33%) and covered with thick brush and organic debris associated with natural revegetation following the 2008 fire. Additionally, vegetation cleared from the pad was loosely windrowed just beyond the outboard edge of the pad providing additional vegetative buffering for sediment laden runoff from Pad #1. Given the size of the small rainfall collection area of Pad #1, dispersion of runoff resulting from the outsloped pad topography, gentle hillslope gradient downslope of the pad, and the density of effective vegetative and debris buffer downslope of the pad, sediment delivery to the nearest watercourse from rainfall runoff is considered to be highly unlikely and in quantities that are predicted to be nearly unmeasurable or negligible.

Pads #2, 3, and 4 are located substantially farther from watercourses than Pad #1, have even smaller fill volumes and depths, and have much less surface area for rainfall collection and concentration of runoff. These pads are considered to be stable, and no failure of fills or native cutbank hillslopes are predicted. Although these pads lack complete coverage of bare soil areas with straw mulch or another surface erosion prevention material (particularly Pad #2), sediment production from these surfaces will be very minor, and will be deposited within the first few feet of duff and debris on native hillslopes downslope of the cut and fill pads.

4.2 Road Sediment Delivery Site # 1

Spring flow at Site # 1 is not entirely captured by the currently in place infrastructure (Map 1). Flow is observed to run directly across the roadbed, wetting the roadbed and resulting in minor rutting of the road. During periods of rainfall or saturated ground conditions, spring flow and road surface runoff will flow off the outboard edge of the road and deliver sediment to the unnamed Class III tributary to Brown Cow Creek (Map 1). The outboard edge of the road has the potential to be minimally eroded (i.e. via rill and small gully formation) by this discharge and result in the delivery of approximately 1 yd^3 of sediment to the watercourse. In addition, the 105 feet of hydrologically connected roadbed draining to Site # 1 has the potential to deliver approximately 10 yd^3 of fine sediment over the next decade, if left untreated.

4.3 Road Sediment Delivery Site # 2

Although spring flow at Site # 2 is currently being entirely captured by the plastic lined spring box, field evidence indicates flows have been diverted in the past down the Main Access Road to the west approximately 35 feet before flowing off the outboard edge of the road (Map 1). A fan shaped deposit of alluvial sediment and duff has developed above the inboard edge of the road and is currently directing any flow from the swale and spring down the left road approach, out of the natural historic flow path. Diverted spring flow has eroded a gully in the outboard fill and has delivered approximately 1 yd^3 of road fill to the unnamed watercourse in the past. If left untreated, continued diversion of spring flow has the potential to result in the erosion and delivery of an additional 1 yd^3 of road fill to the unnamed Class III watercourse.

4.4 Road Sediment Delivery Site # 3

The greatest potential for future erosion and sediment delivery to the Class III watercourse on the property comes from the long lengths of hydrologically connected road surfaces on the Main Access Road and Camp Roads A and C (Map 1). Although straw mulch may be beneficial in protecting road surfaces from initial precipitation immediately after reconstruction or grading, these steep roads currently have no drainage structures and have small berms along the outboard road edge that will promote the concentration of road surface runoff along long lengths of road. Road surface runoff that is concentrated and not effectively dispersed will flow down the road length forming rills and gullies. Concentrated road surface runoff with enough hydraulic power will eventually flow off of the road surface, eroding a gully across native hillslopes and deliver fine sediment produced from road surfaces and gully erosion to the nearby watercourse.

Site 3 is a low point on the Main Access Road where road surface runoff from approximately 550 linear feet of hydrologically connected road surfaces on Camp Road A, 100 linear feet from Camp Road C, and 960 linear feet of hydrologically connected road surfaces on the Main Access Road are likely to drain off the roadbed with sufficient hydraulic power to deliver to the unnamed stream (Map 1). Utilizing studied surface erosion rates from native roads (Reid and Dunne, 1984) it is estimated that runoff from these in use and untreated hydrologically connected road surfaces draining to Site #3 could potentially deliver up to 155 yd^3 of fine sediment to the watercourse over the next decade.

5 RECOMMENDED EROSION CONTROL AND EROSION PREVENTION TREATMENTS

The following recommended erosion control and erosion prevention treatments are grouped into short-term and long-term treatments. Short-term treatments involve only hand labor and should be implemented at the earliest possible opportunity by the landowner regardless of ground moisture conditions. Long-term treatments involve heavy equipment and hand labor and should be implemented at the earliest possible opportunity by the landowner or contractor when soil moisture conditions and precipitation forecast are favorable for earthmoving and allow adequate time for post-construction application of additional straw mulch and seed. The location and approximate orientation for the following recommended erosion control and erosion prevention treatments are shown on Map 3. PWA personnel flagged the individual treatment locations in the field during the initial site inspection.

5.1 Short-term erosion control treatments

1) Spread additional straw mulch on bare soil surfaces on Pad #1, Pad #2, and on the roadbed of the Main Access Road from the property entrance gate to Pad#1, achieving 95% coverage of all exposed soil disturbed during 2013 grading (Map 3). Spread erosion control seed mix (50 lb/acre) on bare soil surfaces to be mulched prior to the application of mulch to help tackify straw mulch to the soil and prevent the mulch from being transported by sheet flow.

2) Install Waterbars #1 - 5 across the roadbed of Camp Road A and the Main Access Road above and below Pads #1 and 2 (Map 3). Construct waterbars such that they trend diagonally (i.e. at a 30° to 40° angle) from the cutbank across the roadbed, extending off the outboard edge of the road with a grade approximately equal to or greater than the down-road gradient. Refer to typical drawings (Attachment C) for construction specifications for road drainage structures.

5.2 Long-term erosion control treatments

1) Construct a rolling dip at Site 1 to drain spring flow directly across the roadbed and prevent diversion down the road. Install a 4 ft wide by 4 ft long by 3 ft deep sediment basin at the outboard edge of the road to pond spring flow and drop out roadbed derived sediment before outflow reaches the nearby stream. Ensure that all road surface runoff and spring flow draining off the roadbed must flow into the sediment basin before exiting onto the floodplain

of the Class III watercourse. Refer to typical drawings (Attachment C) for construction specifications for road drainage structures.

2) Construct an armored fill at Site 2 to drain spring flow directly across the road and hardening the break-in-slope at the outboard edge of the road. Use approximately 7 yd^3 of 1 ft and smaller mixed diameter riprap in construction of the armored fill keyway. Construct the riprap keyway to be approximately 12 ft wide within the road, 6 ft wide at the base of the fill, 10 ft in length, and 2 ft deep. Remove the aggraded alluvial fan above the inboard edge of the road and spoil along the road to improve the outslope. Refer to typical drawings attached to this inspection report and ECP for construction specifications for armored fill crossings.

3) Install road drainage treatments on the Main Access Road and Camp Roads A and C where indicated on Map 3. Road drainage treatments include installation of 10 rolling dips (Rolling dip #s 1 through 10) and removal of the outboard berm along approximately 350 linear feet of road (PB #s 1 and 2). Refer to typical design drawings attached to this inspection report and ECP for construction specifications of rolling dip types. Additional straw mulch and seed should be applied to the disturbed outboard edge of the Main Access Road between Site # 1 and Rolling Dip # 9 after installation of the road drainage treatments. Apply straw mulch to achieve 95% coverage of bare soil and erosion control seed mix at an application rate of 50 lb/acre.

   Waterbar #s 1, 2 and 4 should each be replaced with rolling dips (Rolling dip #s 8, 11, and 12 respectively), upgrading road drainage treatments in these areas to long-term and maintenance free structures. Rolling dip # 8 should be installed as a Type I rolling dip and Rolling dips #s 11 and 12 should be installed as Type III rolling dips. Following the upgrade of Waterbar #2 and 4 to rolling dips, Waterbar #s 3 and 5 can be removed to improve drivability.

6 CONCLUSIONS

In its current condition, the property does not pose a substantial risk to watershed health through episodic failure of roads or pads altered or constructed during grading performed in 2010. The greatest threat to watershed health from the cut and fill pads and roads on the property comes from the long lengths of hydrologically connected road surfaces which will collect and concentrate road surface runoff, chronically delivering fine sediment derived from surface and rill erosion along roadbed and cutbank surfaces.

The recommended erosion control plan treatments require the use of heavy earthmoving equipment and hand labor. Effective implementation of the long-term erosion control plan treatments will hydrologically disconnect the vast majority of road surfaces from the stream system, greatly reduce the likelihood and quantity of anthropogenic sediment input to watercourses on the property, and greatly reduce long-term road maintenance costs on the XYZ Ranch property.

7 CERTIFICATION AND LIMITATIONS

The interpretations and conclusions presented in this report are based on a study of inherently limited scope. Observations are qualitative, or semi-quantitative, and confined to surface expressions of limited extent and artificial exposures of subsurface materials. Interpretations of problematic geologic and geomorphic features (such as unstable hillslopes) and erosion processes are based on the information available at the time of the study and on the nature and distribution of existing features.

The conclusions and recommendations contained in this report are professional opinions derived in accordance with current standards of professional practice, and are valid as of the submittal date. No other warranty, expressed or implied, is made. PWA is not responsible for changes in the conditions of the property with the passage of time, whether due to natural processes or to the works of man, or changing conditions on adjacent areas. Furthermore, to be consistent with existing conditions, information contained in the report should be reevaluated after a period of no more than three years, and it is the responsibility of the landowner to ensure that all recommendations in the report are reviewed and implemented according to the conditions existing at the time of construction. Finally, PWA is not responsible for changes in applicable or appropriate standards beyond our control, such as those arising from changes in legislation or the broadening of knowledge, which may invalidate any of our findings.

Certified by:

_____

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8 REFERENCES

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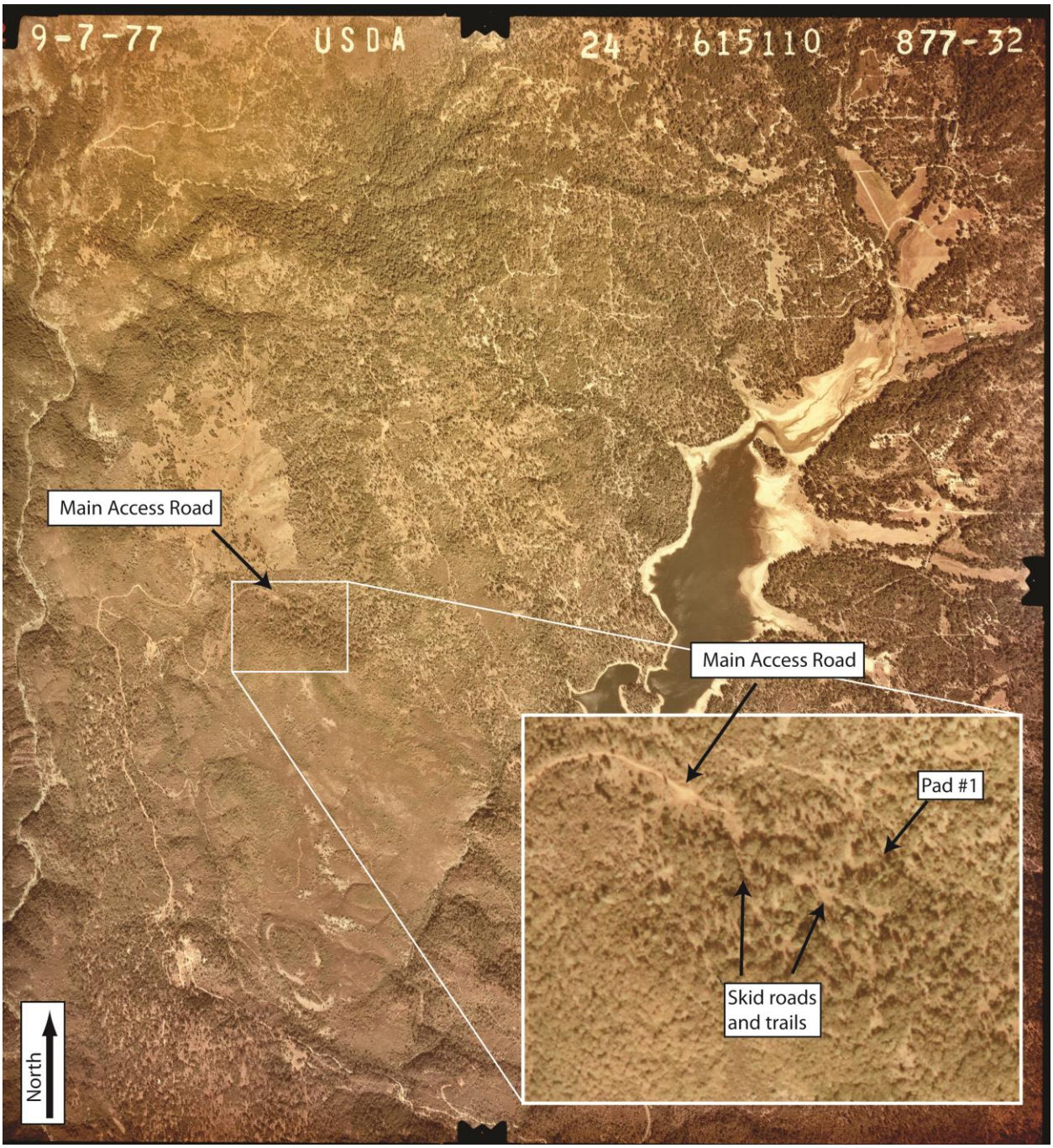
Saucedo, G.J., and Wagner, D.L.,1992, Geologic map of the Chico quadrangle, California, 1:250,000: Sacramento, CA, California Division of Mines and Geology Regional Geologic Map Series 7A, scale 1:250,000/

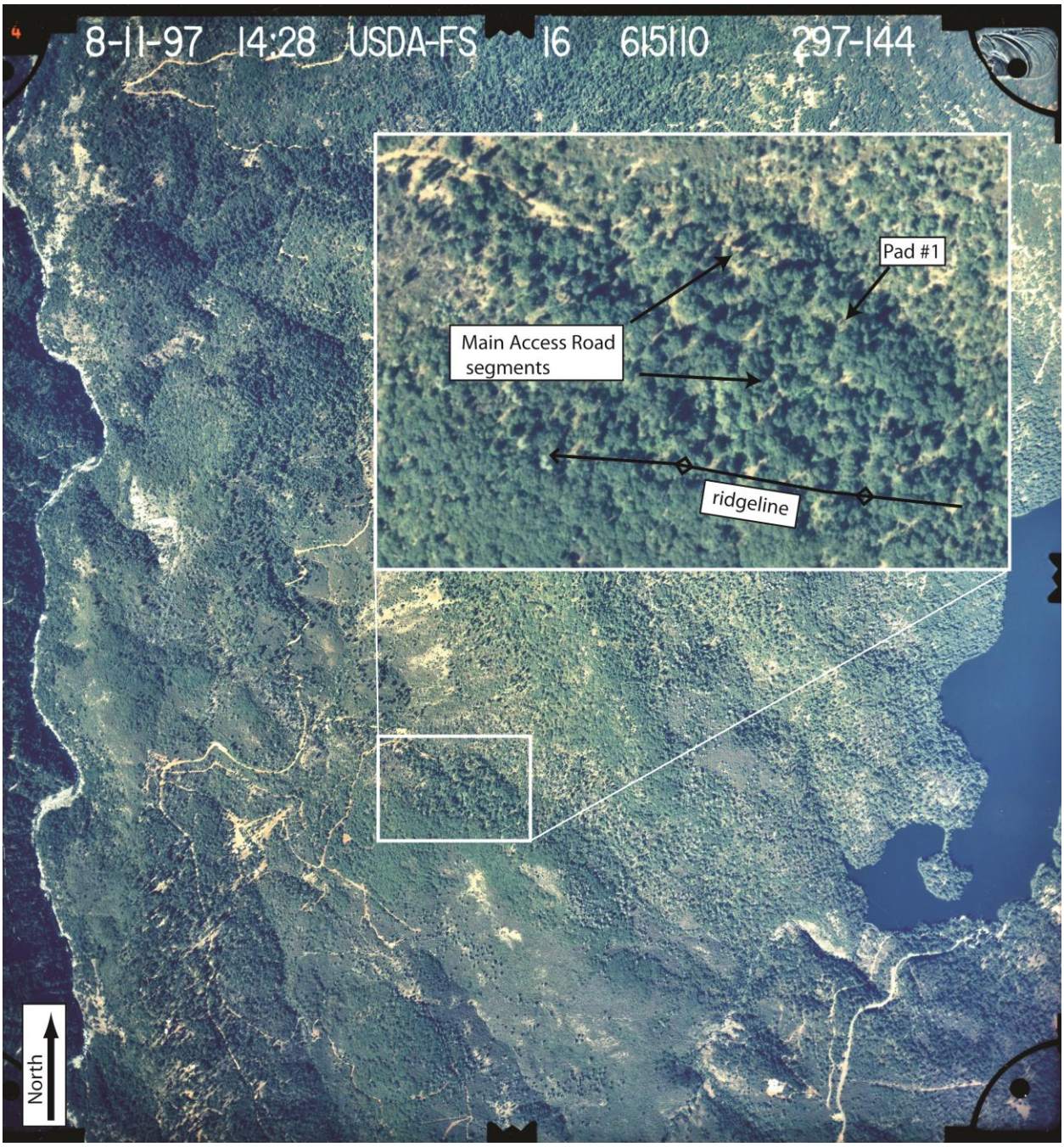
Attachment A

Historic aerial photographs and imagery of the LLL Ranch property.

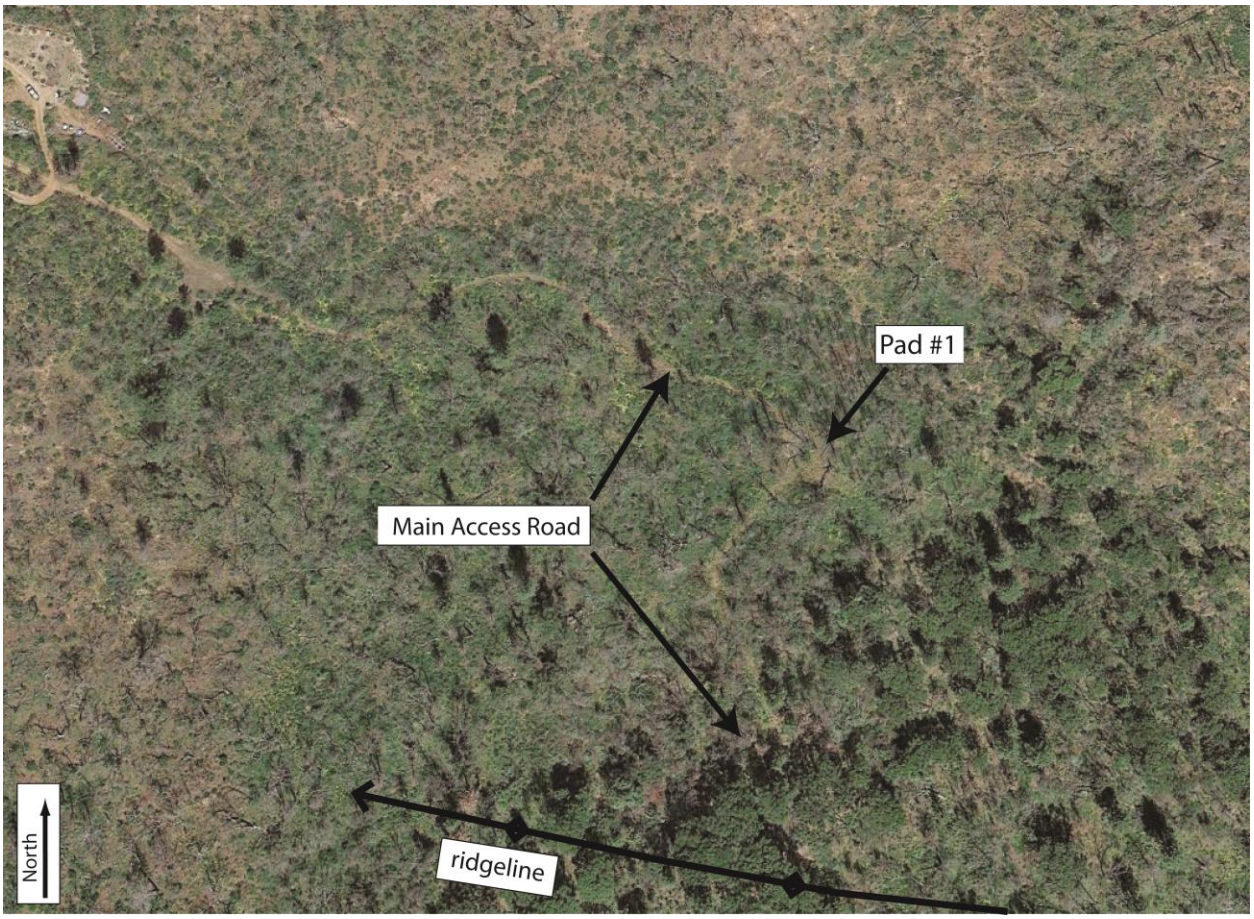
Inspection report and erosion control plan for D.B. Cooper, Valley County, California



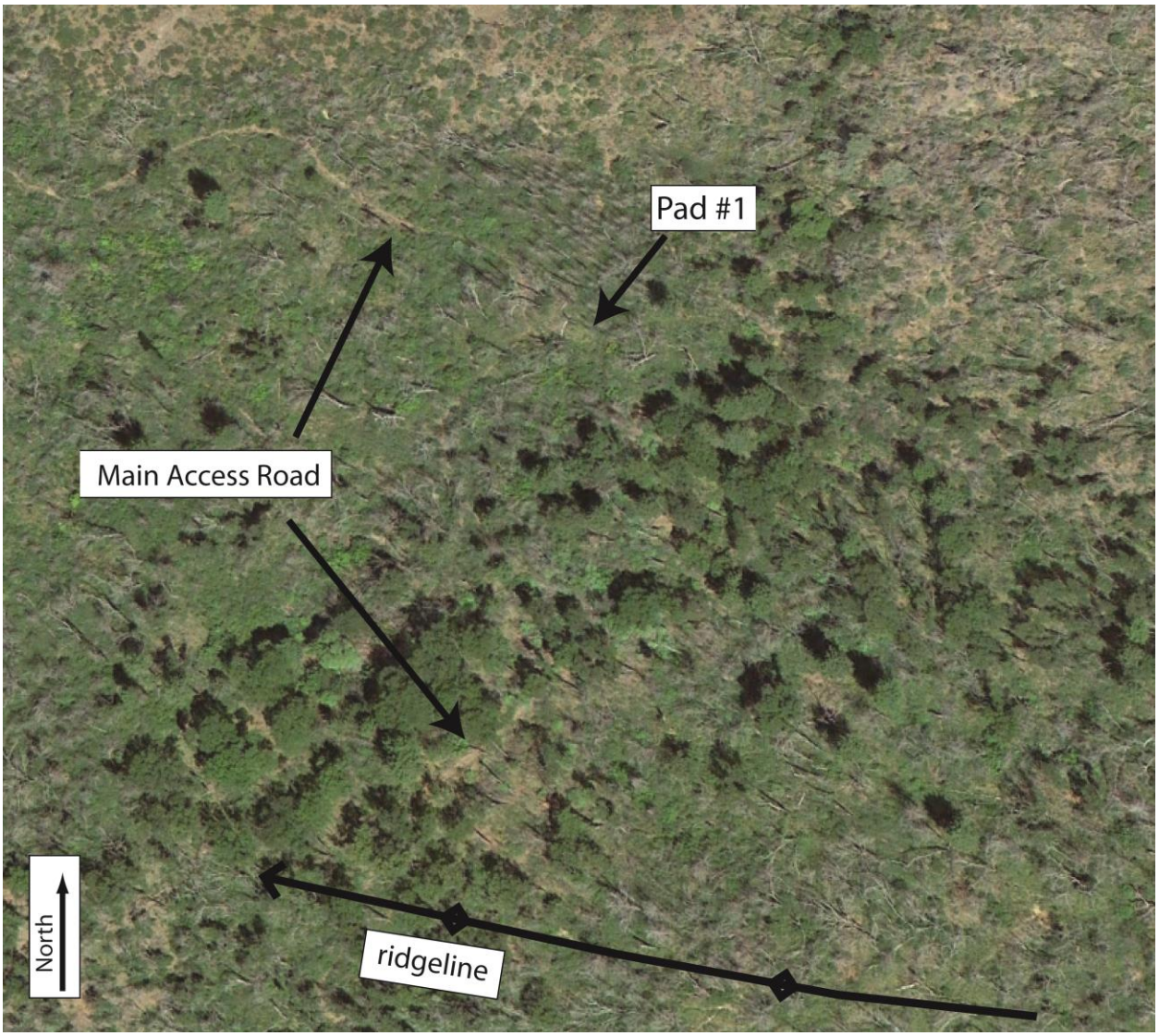
This aerial photograph was taken by the USDA in 1977. A larger scale inset has been added to the photo to provide greater detail at the XYZ Ranch property. The Main Access Road leading into the XYZ Ranch property can clearly be discerned. Numerous skid trails and skid roads can be seen, as well as canopy reduction from timber harvest and/or mining activities. Pad #1 can be seen in the photo to have been cleared of trees and vegetation and utilized by timber harvest activities.



This aerial photograph was taken by the USDA in 1997. A larger scale inset has been added to the photo to provide greater detail at the XYZ Ranch property. By 1997, the Main Access Road had been constructed beyond Pad #1 and provided access towards the east-west trending ridge shown at the southern extent of the photograph inset.



Google Earth imagery dated May 12, 2008. This photo was taken approximately two years after large-scale fires swept through this area of Valley County. Loss of tree canopy improves the visibility of existing property roads and cut and fill pads.



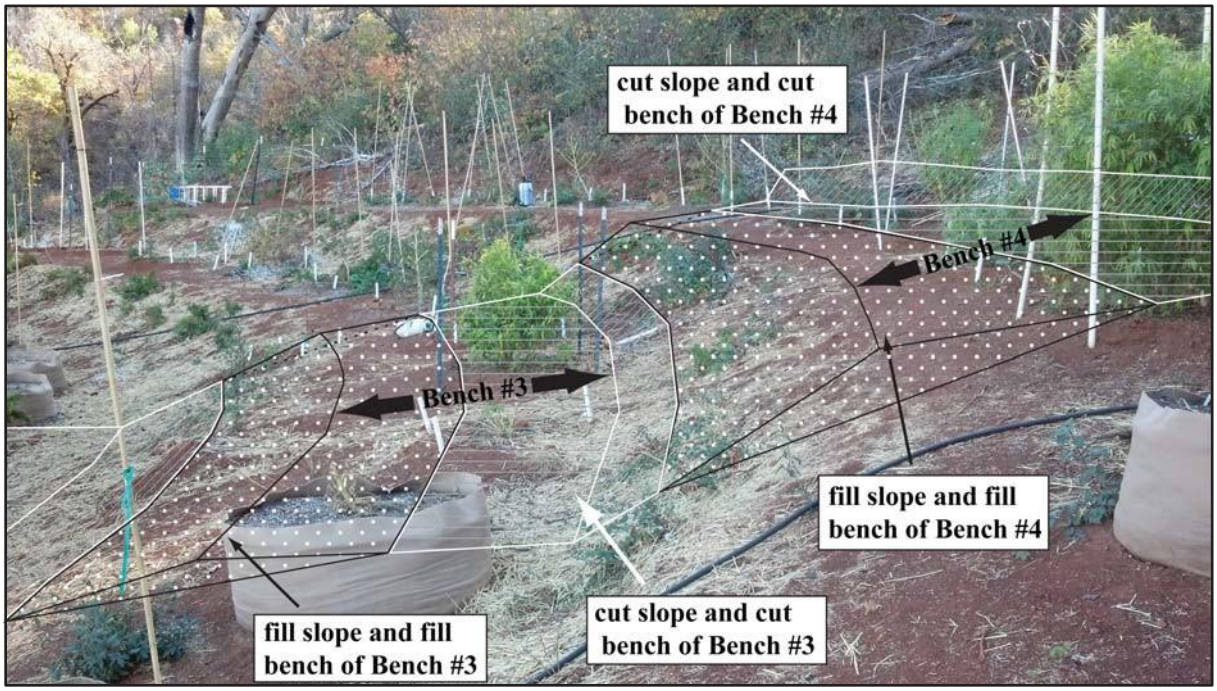
Google Earth imagery dated June 5, 2010. This photo was taken approximately four years after large-scale fires swept through this area of Valley County. Substantial regrowth of vegetation is visible. No recent grading of property roads or cut and fill pads can be discerned from this imagery.

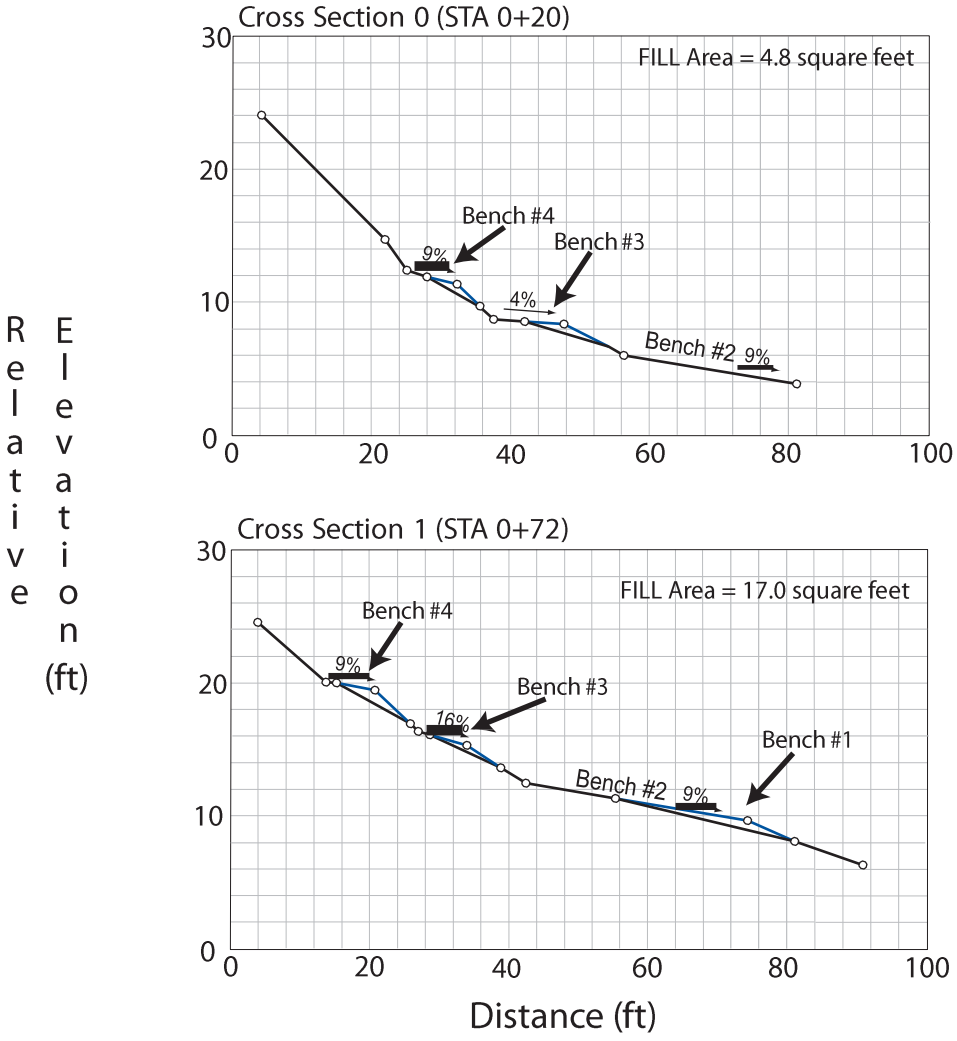
Attachment B

Illustrated photographs and graphic renderings of cross section surveys at Pad #s 1 - 4.

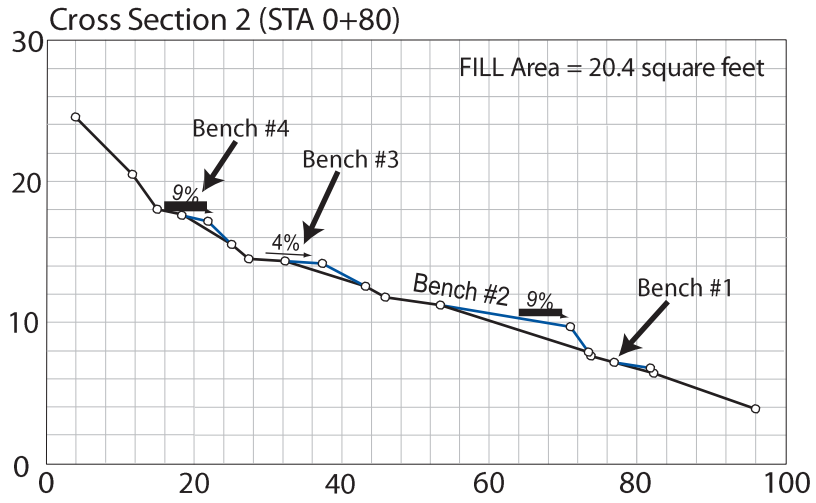
Inspection report and erosion control plan for D.B. Cooper Valley County, California

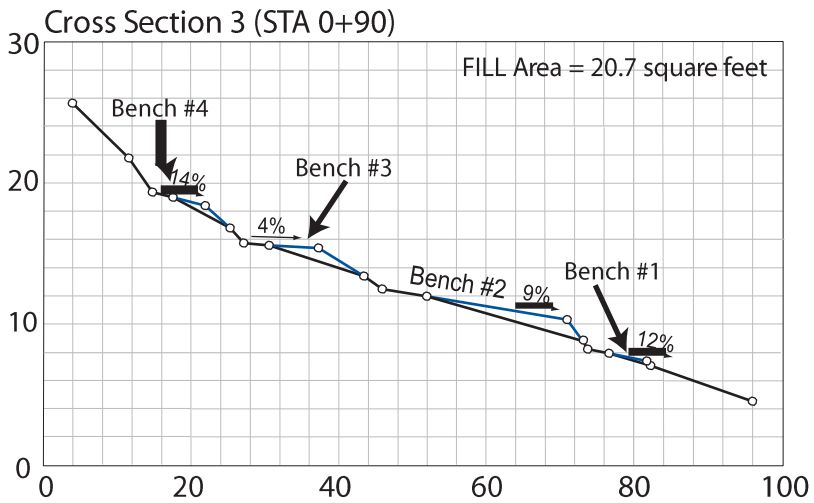
Pad #1, illustrated photo and cross sections 0 and 1 (estimated fill volume = 60 cu yd)

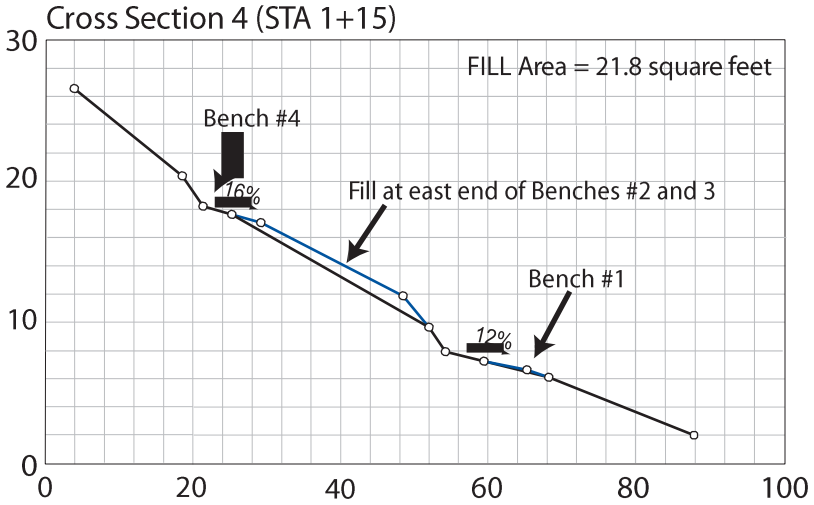


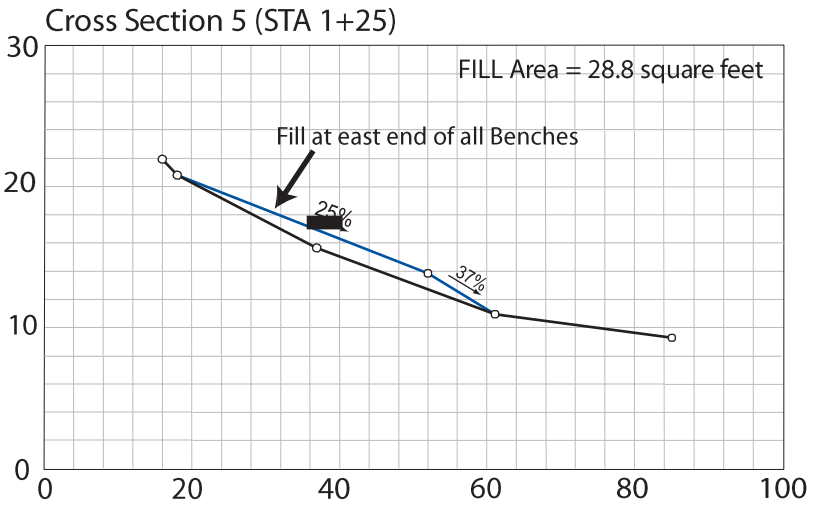


Pad #1, cross sections 2 - 5, (estimated fill volume = 60 cu yd)









Relative Elevation (ft)

Distance (ft)

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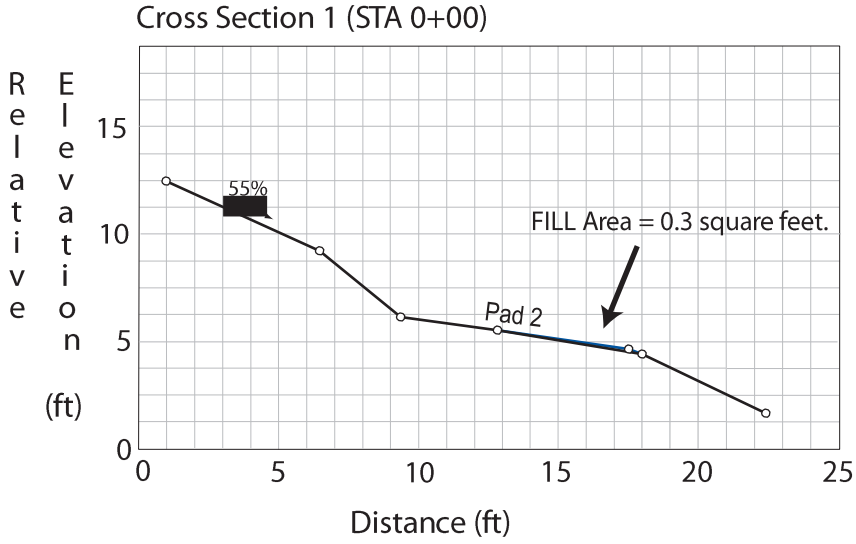
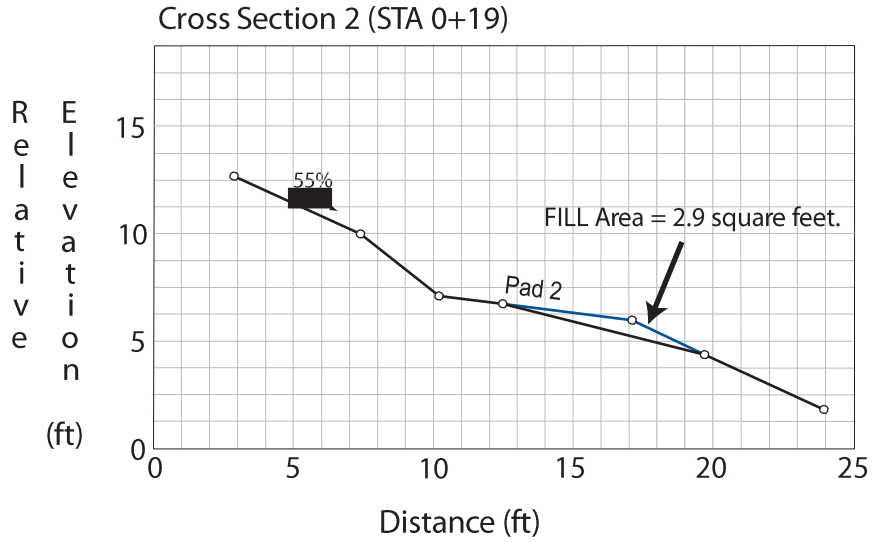
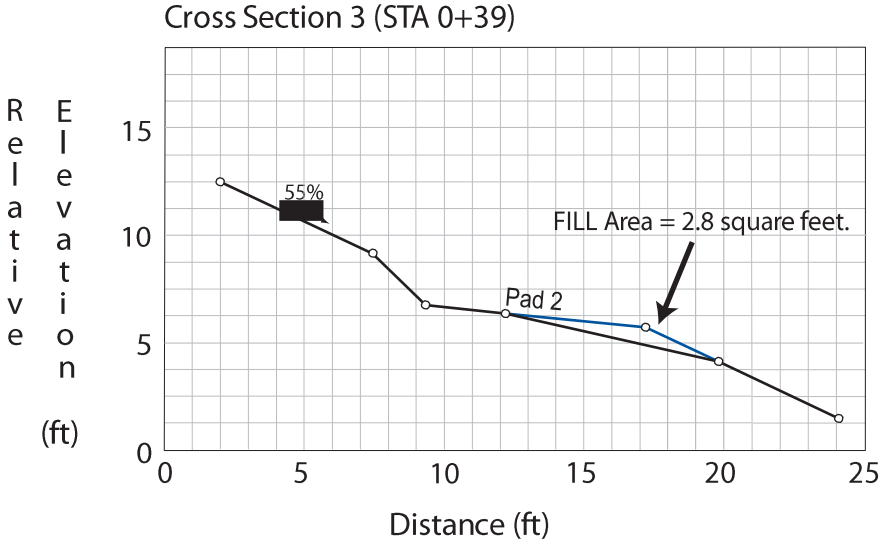
Pad #2, illustrated photograph and cross sections 1 - 3 (estimated fill volume = 3 cu yd)







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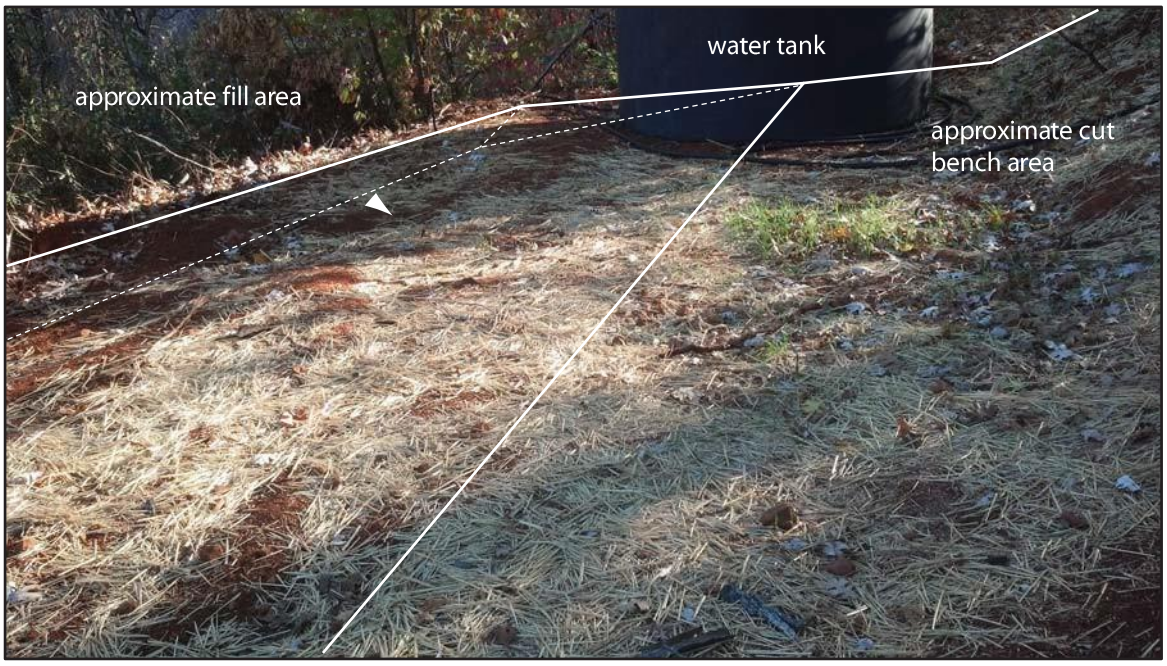
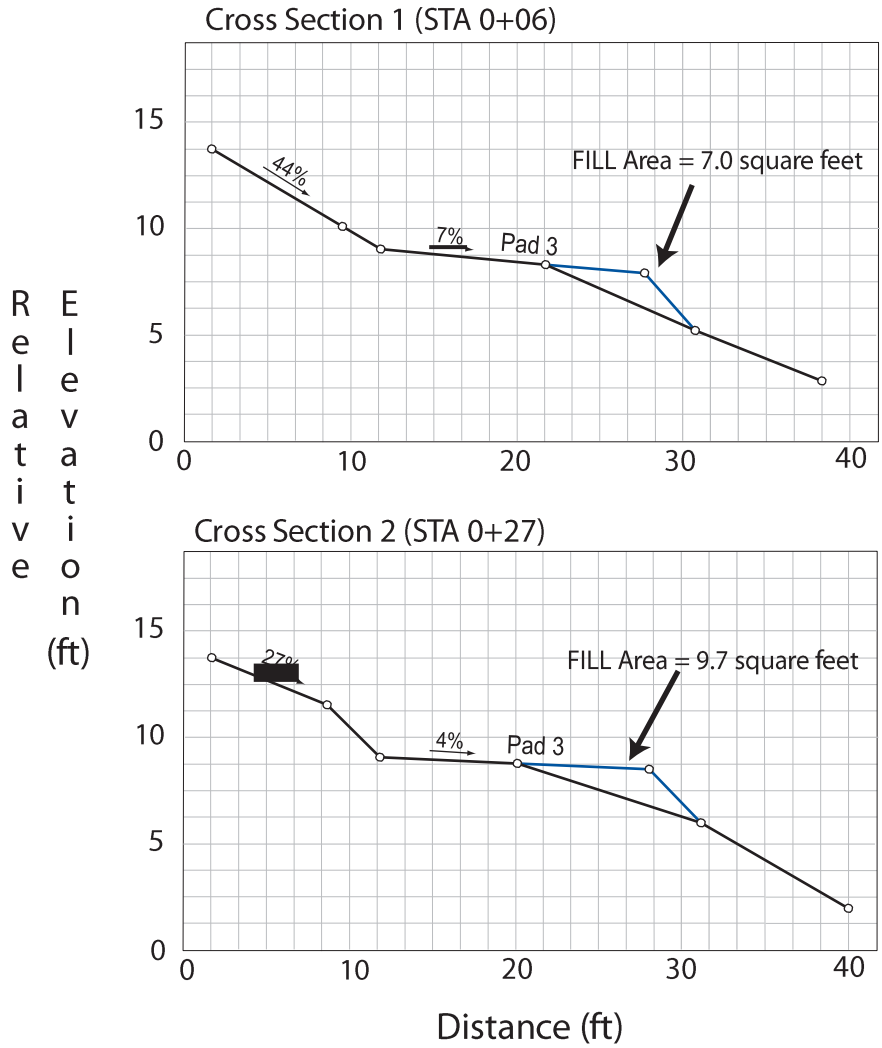
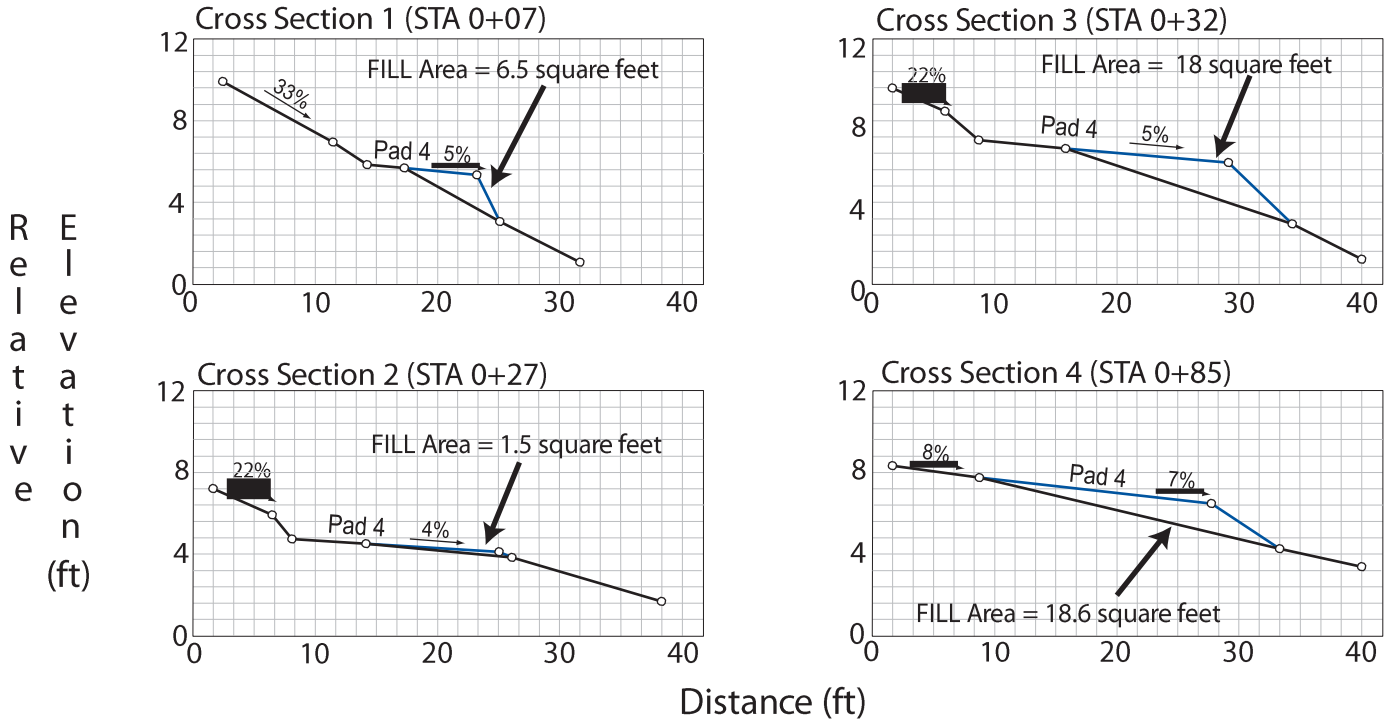
Pad #3, illustrated photograph and cross sections 1 and 2 (estimated fill volume = 8 cu yd)





Pad #4, illustrated photograph and cross sections 1 - 4, (estimated fill volume = 41cu yd)



Attachment C

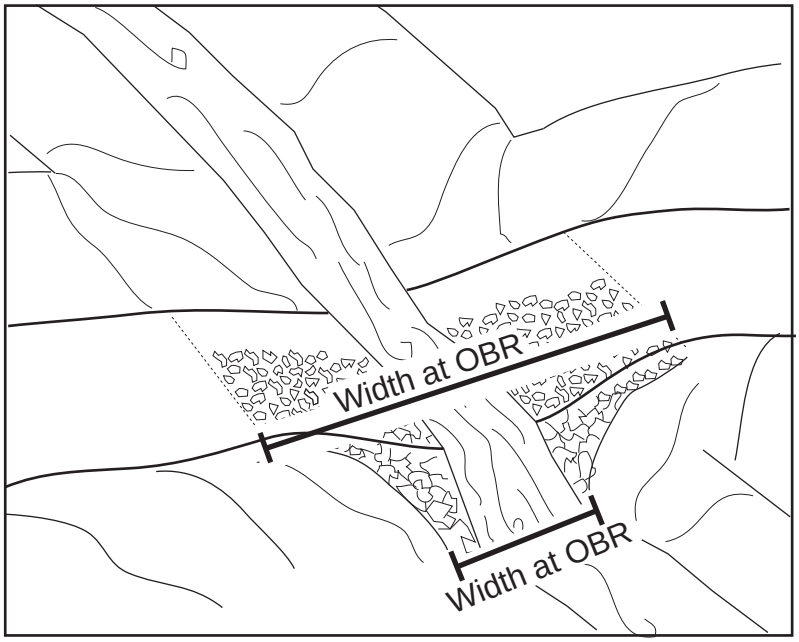
Typical Drawings (schematic diagrams) showing construction and installation techniques for recommended erosion control and erosion prevention treatment.

Inspection report and erosion plan for D.B. Cooper

Valley County, California

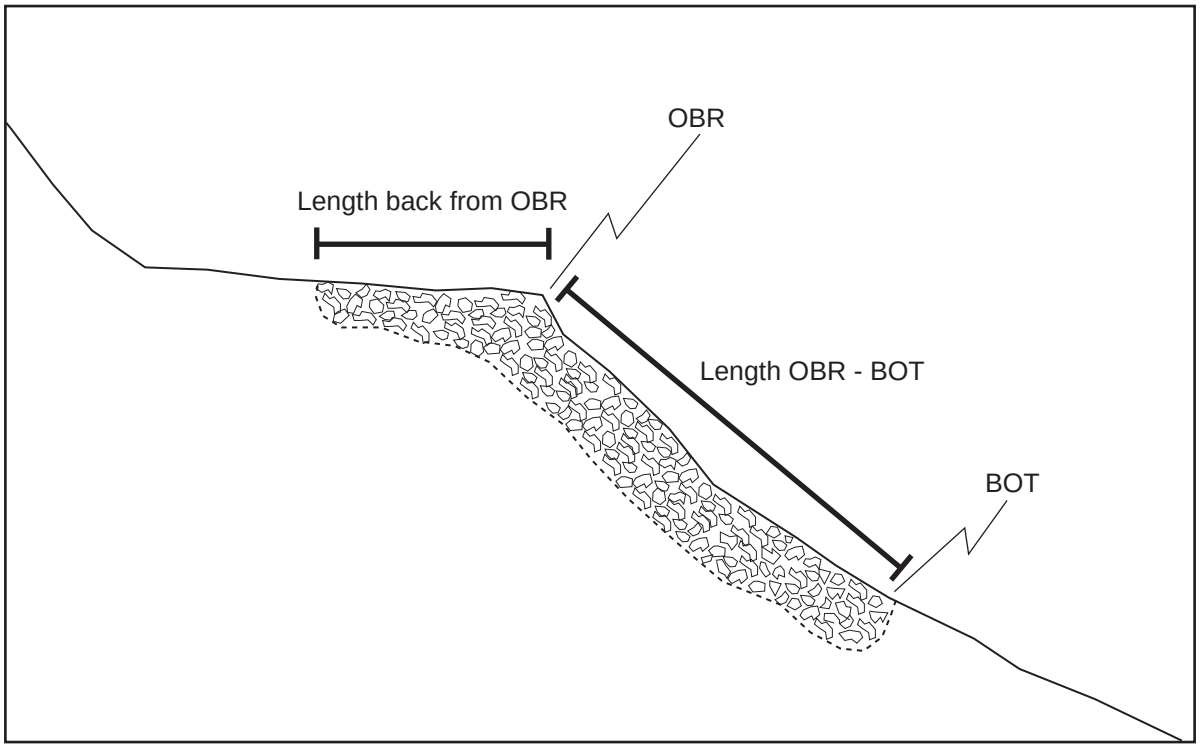
Typical Dimensions Refered to for Armored Fill Crossings

Widths in oblique view



OBR - Outboard edge of road

Lengths in profile view



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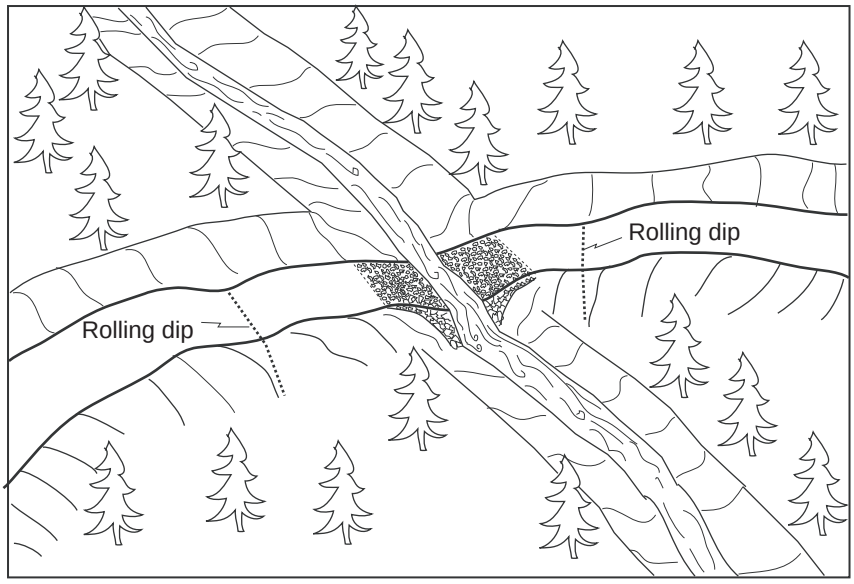
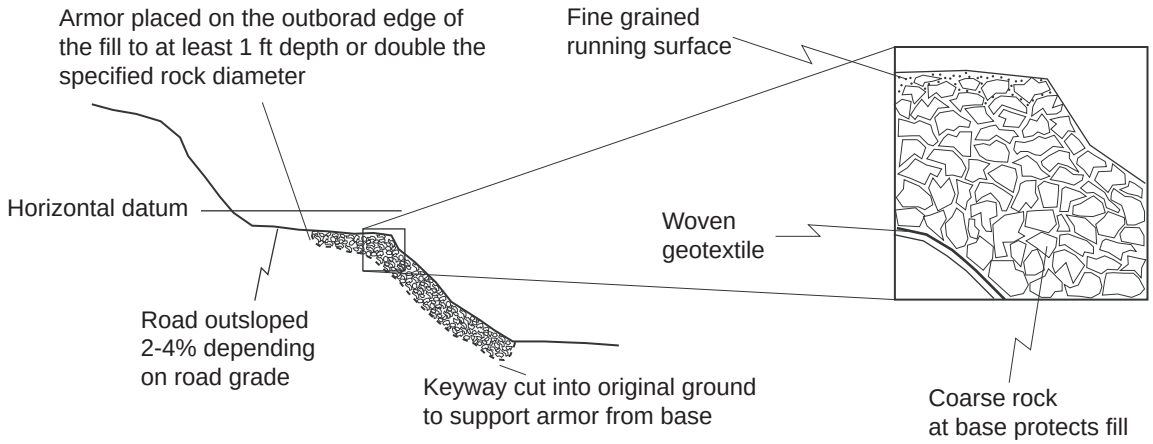
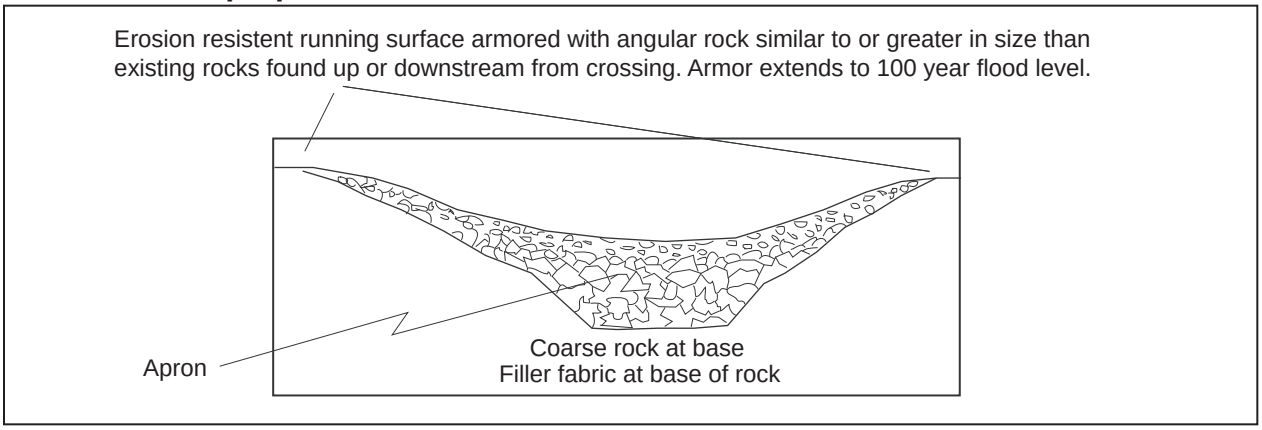
Typical Armored Fill Crossing Installation



Cross section parallel to watercourse



Cross section perpendicular to watercourse



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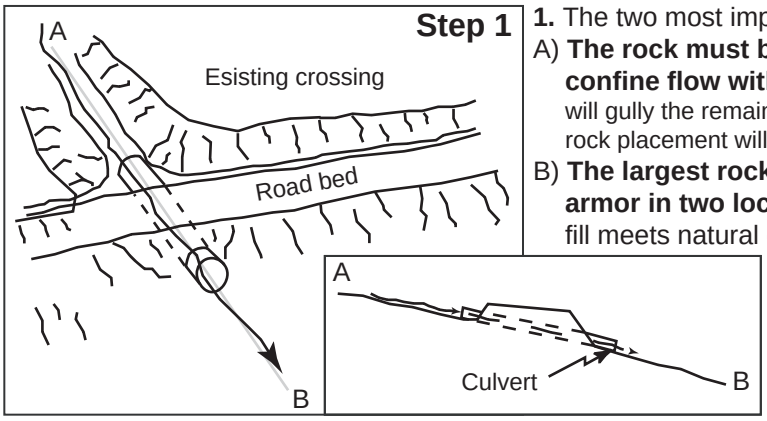
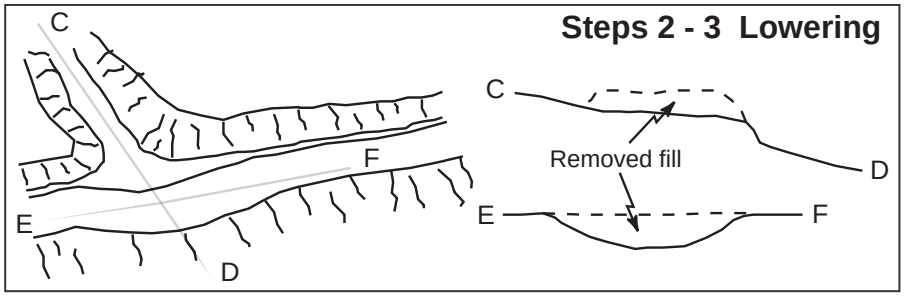
Ten Steps for Constructing a Typical Armored Fill Stream Crossing



1. The two most important points are:

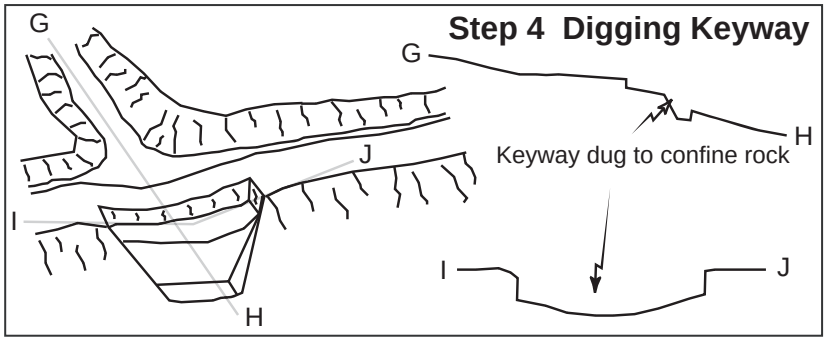
A) **The rock must be placed in a "U" shape across the channel to confine flow within the armored area.** (Flow around the rock armor will gully the remaining fill. Proper shape of surrounding road fill and good rock placement will reduce the likelihood of crossing failure).

B) **The largest rocks must be used to buttress the rest of the armor in two locations:** (i) The base of the armored fill where the fill meets natural channel. (This will butress the armor placed on the outboard fill face and reduce the likelihood of it washing downslope). (ii) The break in slope from the road tread to the outer fill face. (This will butress the fill placed on the outer road tread and will determine the "base level" of the creek as it crosses the road surface).



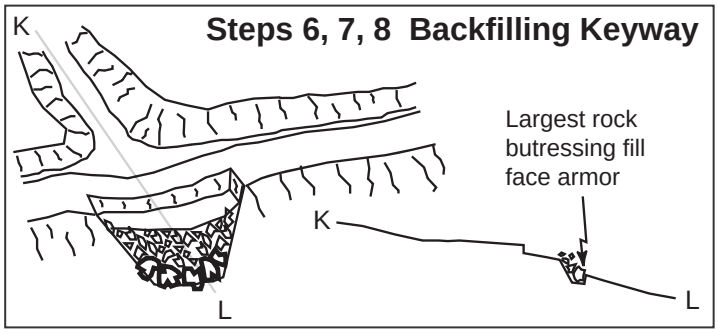
2. Remove any existing drainage structures including culverts and Humboldt logs.

3. Construct a dip centered at the crossing that is large enough to accomodate the 100-year peak storm flow and prevent diversion (C-D, E-F).



4. Dig a keyway (to place rock in) that extends from the outer 1/3 of the road tread down the outboard road fill to the point where outbaord fill meets natural channel (up to 3 feet into the channel bed depending on site specifics) (G-H, I-J).

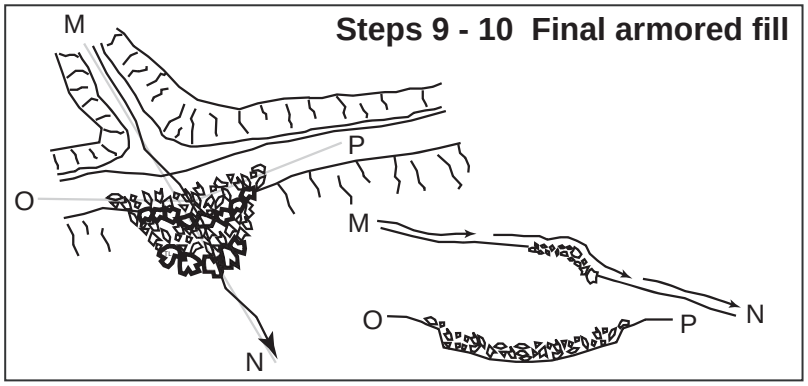
5. Install geofabric (optional) within keyway to support rock in wet areas and to prevent winnowing of the crossing at low flows.



6. Put aside the largest rock armoring to create 2 buttresses in the next step.

7. Create a buttress using the largest rock (as described in the site treatments specifications) at the base of fill. (This should have a "U" shape to it and will define the outlet of the armored fill.)

8. Backfill the fill face with remaining rock armor making sure the final armored area has "U" shape that will accomodate the largest expected flow (K-L).



9. Install a second buttress at the break in slope between the outboard road and the outboard fill face. (This should define the base level of the stream and determine how deep the stream will backfill after construction). (M-N)

10. Back fill the rest of the keyway with the unsorted rock armor making sure the final armored area has a "U" shape that will accommodate the largest expected flow (O-P).

Typical Drawing #7

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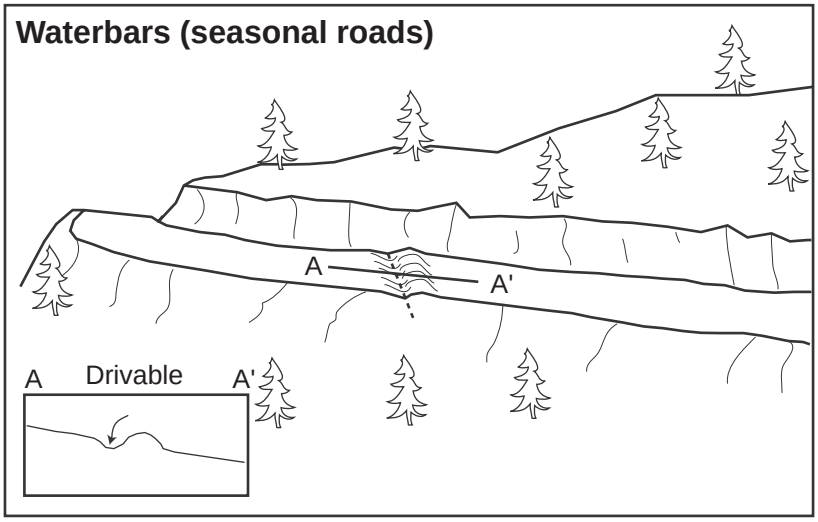
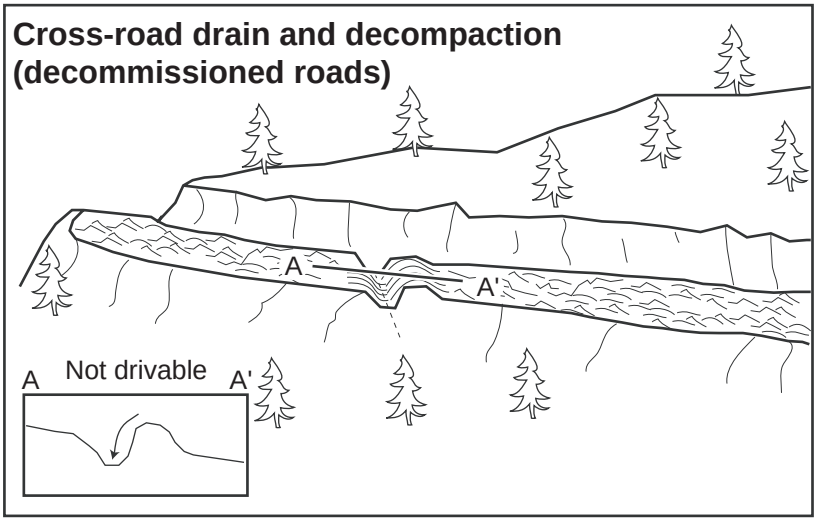
Typical Methods for Dispersing Road Surface Runoff with Waterbars, Cross-road Drains, and Rolling Dips

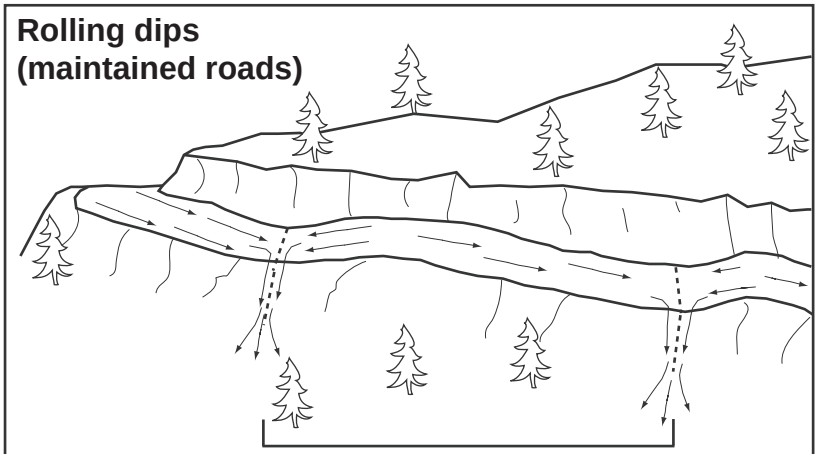
Waterbars (seasonal roads)



Cross-road drain and decompaction (decommissioned roads)



Rolling dips (maintained roads)



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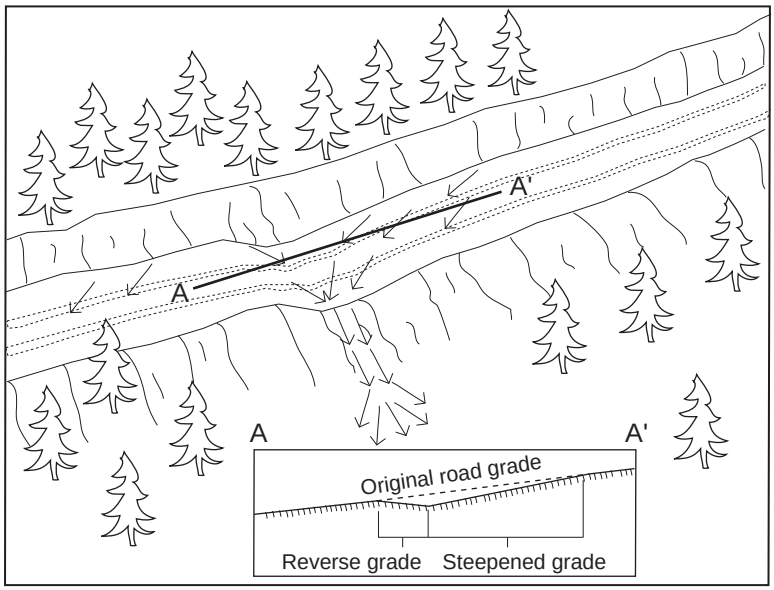
Typical Road Surface Drainage by Rolling Dips



Rolling dip installation:

1. Rolling dips will be installed in the roadbed as needed to drain the road surface.
2. Rolling dips will be sloped either into the ditch or to the outside of the road edge as required to properly drain the road.
3. Rolling dips are usually built at 30 to 45 degree angles to the road alignment with cross road grade of at least 1% greater than the grade of the road.
4. Excavation for the dips will be done with a medium-size bulldozer or similar equipment.
5. Excavation of the dips will begin 50 to 100 feet up road from where the axis of the dip is planned as per guidelines established in the rolling dip dimensions table.
6. Material will be progressively excavated from the roadbed, steepening the grade unitl the axis is reached.
7. The depth of the dip will be determined by the grade of the road (see table below).
8. On the down road side of the rolling dip axis, a grade change will be installed to prevent the runoff from continuing down the road (see figure above).
9. The rise in the reverse grade will be carried for about 10 to 20 feet and then return to the original slope.
10. The transition from axis to bottom, through rising grade to falling grade, will be in a road distance of at least 15 to 30 feet.

Table of rolling dip dimensions by road grade

Road grade %	**Upslope approach distance** (from up road start to trough) ft	**Reverse grade distance** (from trough to crest) ft	**Depth at trough outlet** (below average road grade) ft	**Depth at trough inlet** (below average road grade) ft
<6	55	15 - 20	0.9	0.3
8	65	15 - 20	1.0	0.2
10	75	15 - 20	1.1	0.01
12	85	20 - 25	1.2	0.01
>12	100	20 - 25	1.3	0.01

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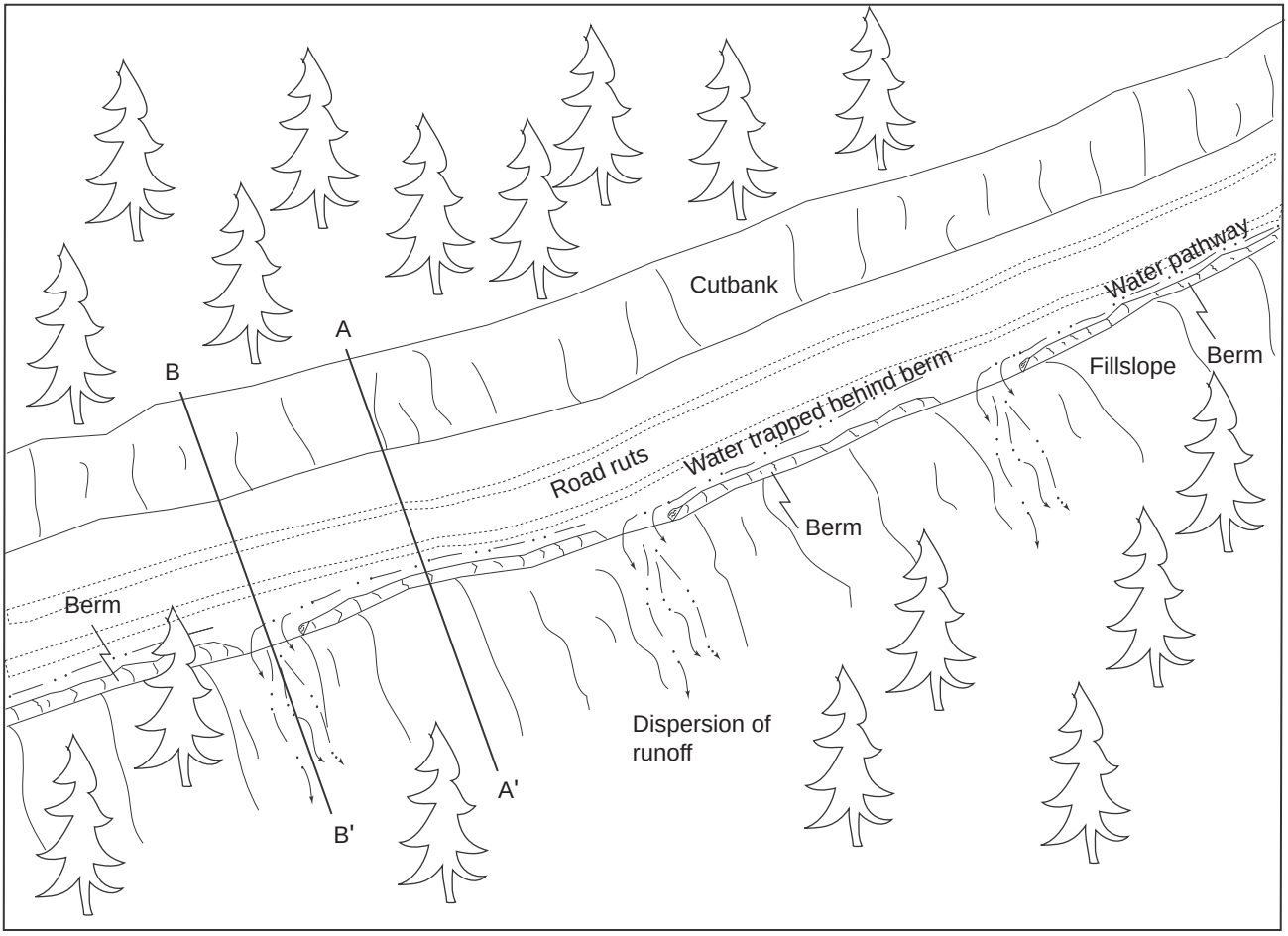
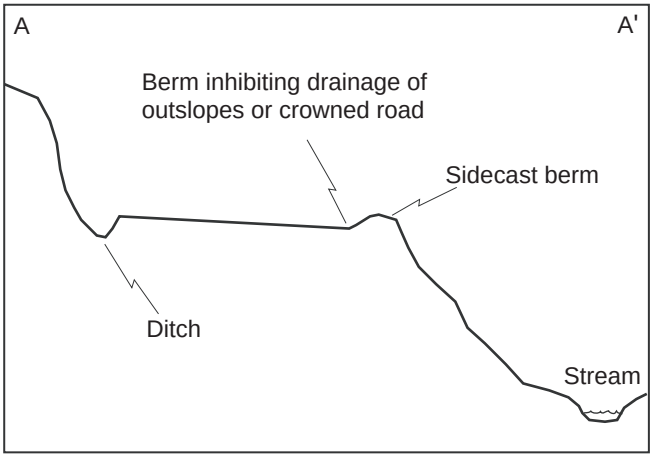
Typical Sidecast or Excavation Methods for Removing Outboard Berms on a Maintained Road

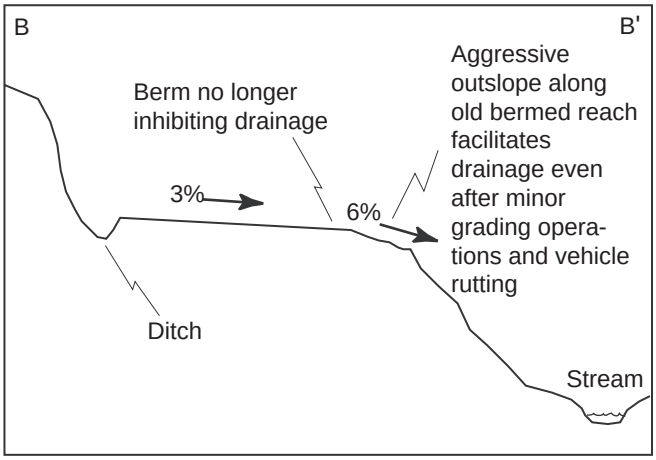
1. On gentle road segments berms can be removed continuously (see B-B').
2. On steep road segments, where safety is a concern, the berm can be frequently breached (see A-A' & B-B') Berm breaches should be spaced every 30 to 100 feet to provide adequate drainage of the road system while maintaining a semi-continuous berm for vehicle safety.



Road cross section between berm breaches



Road cross section at berm breaches



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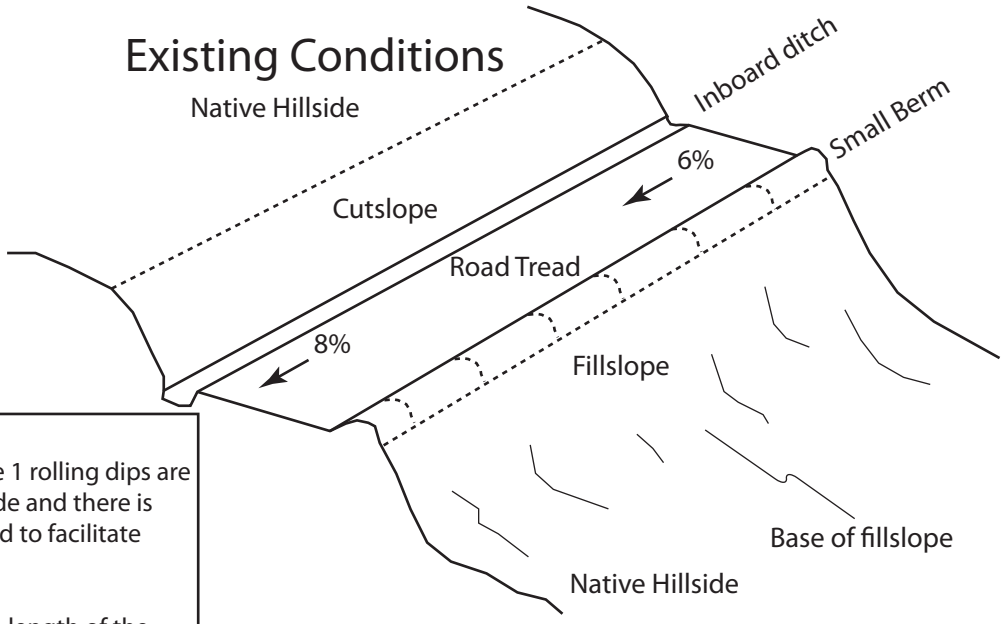
Standard (Type 1) Rolling Dip Construction

Existing Conditions



Notes

Rolling dip type 1 existing conditions: Type 1 rolling dips are utilized when roads are less than 12-14% grade and there is proximal outfall adjacent to the outboard road to facilitate road drainage.

Design Notes:

1) The berm should be removed for the entire length of the dip.

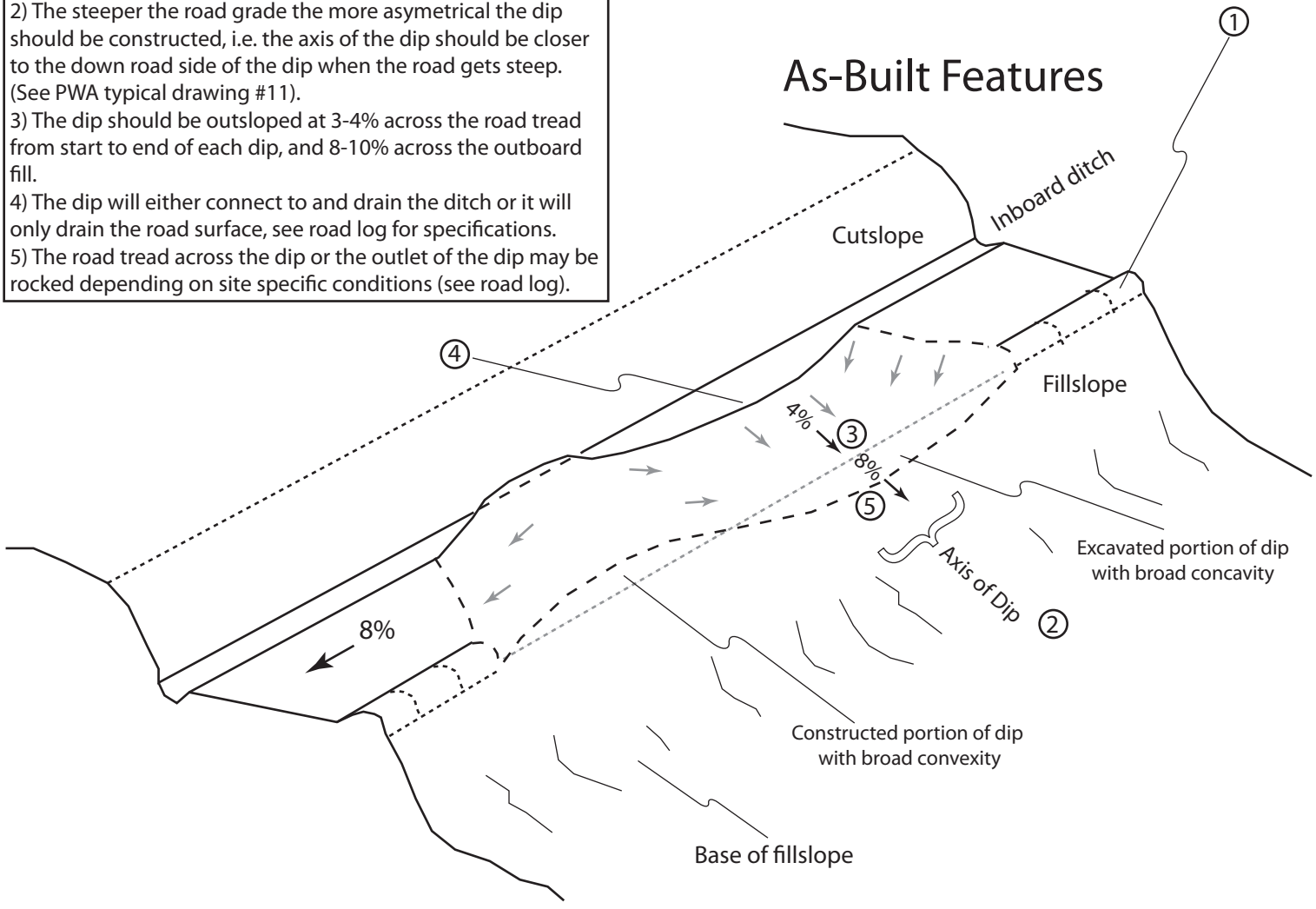
2) The steeper the road grade the more asymetrical the dip should be constructed, i.e. the axis of the dip should be closer to the down road side of the dip when the road gets steep. (See PWA typical drawing #11).

3) The dip should be outsloped at 3-4% across the road tread from start to end of each dip, and 8-10% across the outboard fill.

4) The dip will either connect to and drain the ditch or it will only drain the road surface, see road log for specifications.

5) The road tread across the dip or the outlet of the dip may be rocked depending on site specific conditions (see road log).

As-Built Features



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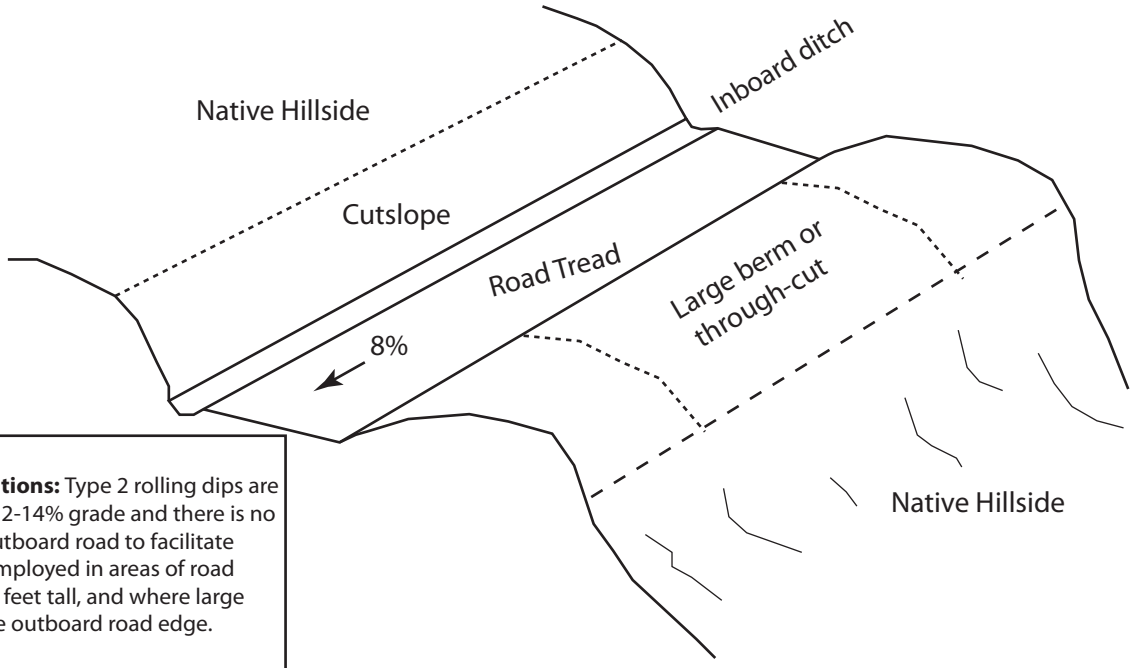
Type 2 Rolling Dip Construction

(Through-cut or thick berm road reaches)



Notes

Rolling dip type 2 existing conditions: Type 2 rolling dips are utilized when roads are less than 12-14% grade and there is no proximal outfall adjacent to the outboard road to facilitate road drainage. These should be employed in areas of road through-cuts generally less than 3 feet tall, and where large wide and/or tall berms exist on the outboard road edge.

Design Notes:

1) The berm or native hillside should be removed for the entire length of the excavated portion of the dip, or, at a minimuim through the axis of the dip.

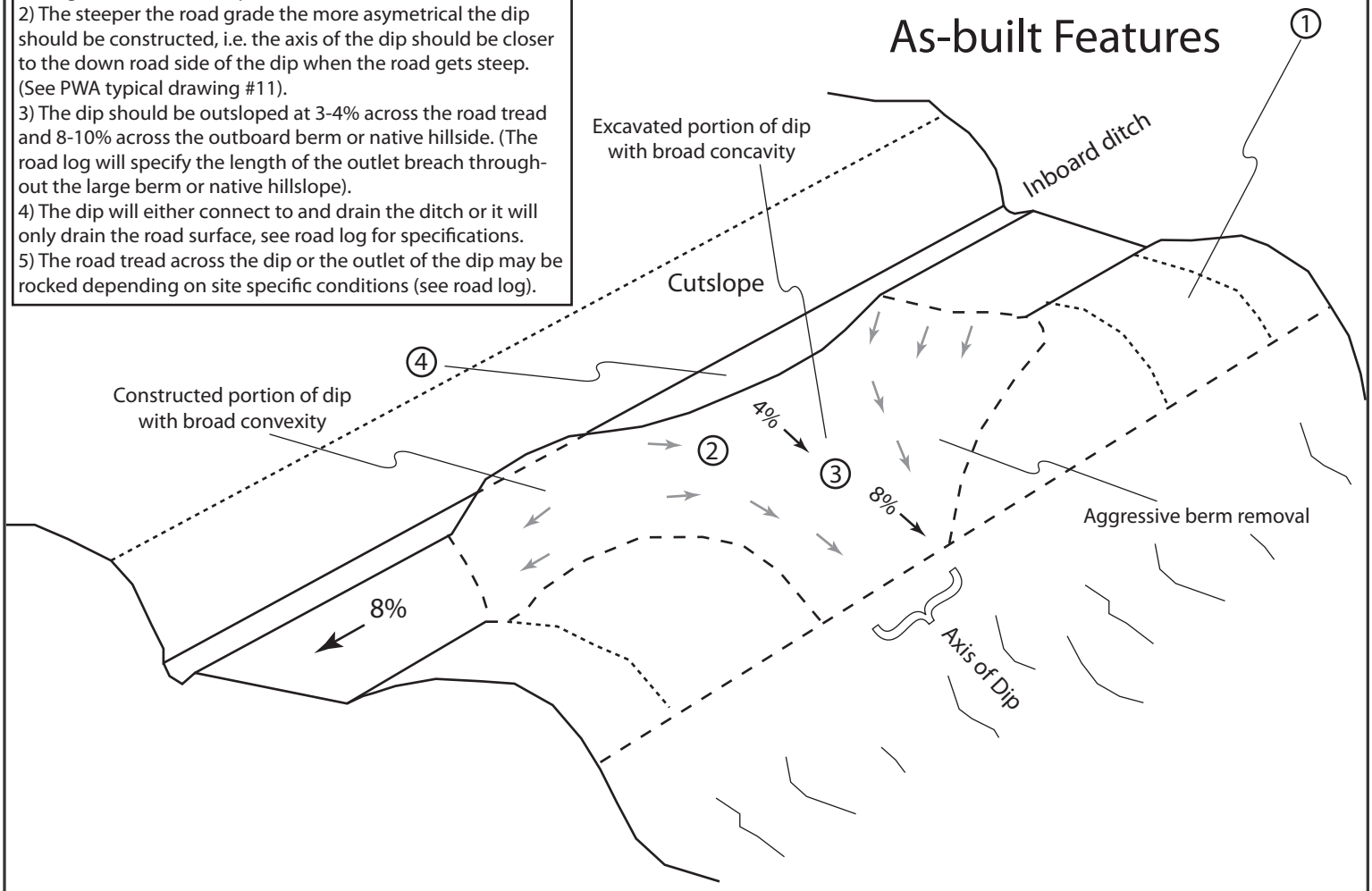
2) The steeper the road grade the more asymetrical the dip should be constructed, i.e. the axis of the dip should be closer to the down road side of the dip when the road gets steep. (See PWA typical drawing #11).

3) The dip should be outsloped at 3-4% across the road tread and 8-10% across the outboard berm or native hillside. (The road log will specify the length of the outlet breach through-out the large berm or native hillslope).

4) The dip will either connect to and drain the ditch or it will only drain the road surface, see road log for specifications.

5) The road tread across the dip or the outlet of the dip may be rocked depending on site specific conditions (see road log).

As-built Features



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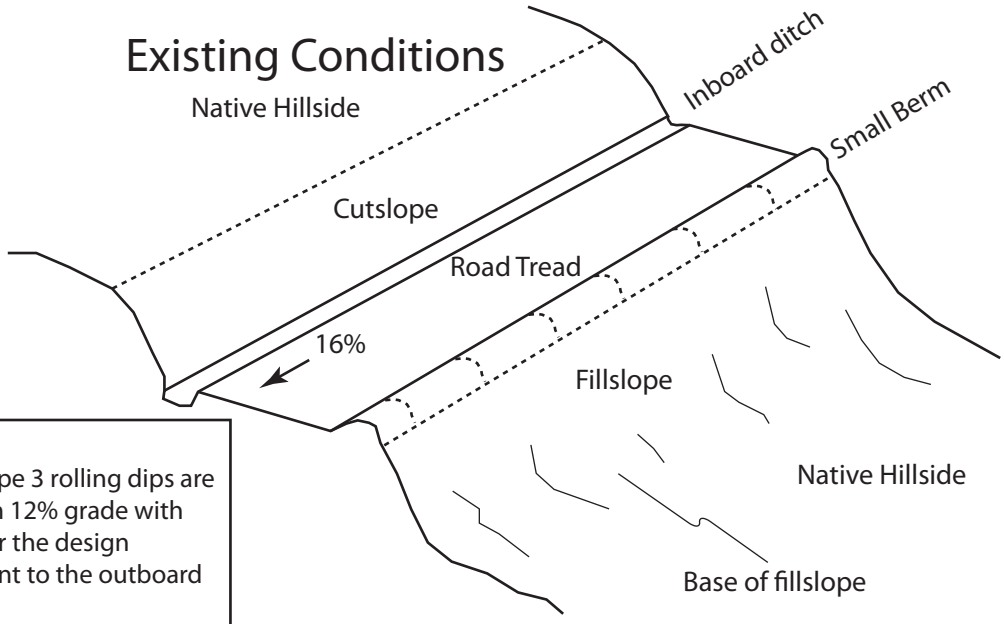
PWA Typical Drawing #19b

Type 3 Rolling Dip Construction
(steep slope outslope)



Notes

Rolling dip type 3 existing conditions: Type 3 rolling dips are utilized when roads grades are steeper than 12% grade with little opportunity to create reverse grade for the design vehicle, and there is proximal outfall adjacent to the outboard road to facilitate road drainage.

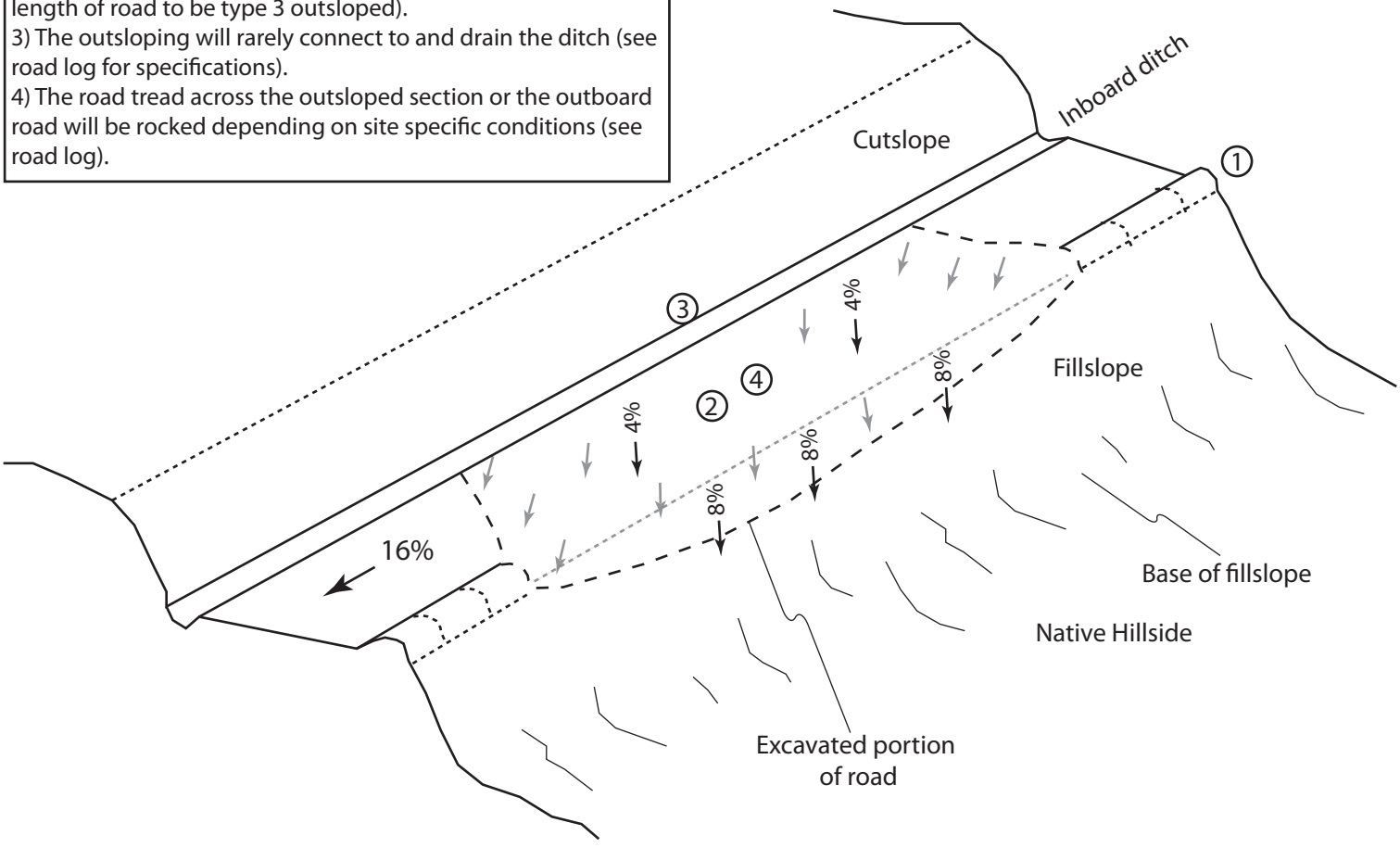
Design Notes:

1) The berm should be removed for the entire length of the outsloped section.

2) The dip should be outsloped at 2-4% across the road tread and 4-8% across the outboard fill. (The road log will specify the length of road to be type 3 outsloped).

3) The outsloping will rarely connect to and drain the ditch (see road log for specifications).

4) The road tread across the outsloped section or the outboard road will be rocked depending on site specific conditions (see road log).



Pacific Watershed Associates Inc.
Geologic and Geomorphic Studies • Watershed Restoration • Wildland Hydrology • Erosion Control • Environmental Services
PO Box 4433, Arcata, CA 95518 / Ph: 707-839-5130 / FAX: 707-839-8168 / www.pacificwatershed.com

PWA Typical Drawing #19c

C4. Sample Hazardous Materials Compliance Plan (Map not included)

PACIFIC WATERSHED ASSOCIATES INC.

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November 17, 2015

Humboldt County
Division of Environmental Health
100 H Street, Suite 100
Eureka, California 95501
Attention: Derek Prestesater

RE: Compliance Plan for A.P. No. 123-456-789, located at 3737 Blueberry Hill, Thrill, California. EPA-ID Number CA555555555.

INTRODUCTION

Pacific Watershed Associates (PWA) has compiled this Compliance Plan for A.P. No.: 123-456-789, located at 3737 Blueberry Hill, Thrill, California (Figure 1), as a response to a letter dated September 2, 2015 from the Humboldt County Environmental Health Department (HCDEH) to the property owner.

The HCDEH letter states that on July 20, 2015, the HCDEH responded to a Humboldt County Sheriff's Office report of hazardous material on the subject property. Upon inspection HCDEH found four (4) aboveground storage tanks (AST) with a combined capacity of approximately 1,942 gallons, and several containers of waste oil, several containers of new oil, and two open five gallon containers which contained red dyed diesel fuel.

As a result of this site visit HCDEH sent a Notice of Violation (NOV) and a Schedule of Compliance to the property owner. The NOV stated that the combined capacity of the four fuel tanks at the site is above the threshold volume required to implement a Spill Prevention, Control and Countermeasure (SPCC) plan. Additionally, the four fuel tanks and hazardous wastes are also above the threshold volume required to implement a Hazardous Materials Business Plan.

NOTICE OF VIOLATIONS (NOV)

The HCDEH list of violations included:

1. 19 CCR § 2729.1; HSC § 25507: Failure to establish a Hazardous Materials Business Plan.
2. 40 CFR § 112.3; HSC § 25270.4.5(a): Failure to prepare and implement a Spill Prevention, Control and Countermeasures (SPCC) plan.
3. 40 CFR § 112.6(a)(3)(ii); HSC § 25270.4.5(a): Failure to provide secondary containment for above ground storage fuel tanks.

4. 40 CFR § 112.6(a)(3)(iii); HSC § 25270.4.5(a): Failure to provide overfill protection for above ground storage fuel tanks.

5. 22 CCR § 66262.12(a); HSC § 25160.2(b)(10): No EPA ID number.

6. 22 CCR § 66262.11; HSC § 25141: Failed to make a hazardous waste determination.

7. HSC §25250.4: Mismanagement of waste oil.

8. HSC §2520l(a): Unauthorized waste storage.

9. 22 CCR § 66262.34(±): Failure to properly label containers of hazardous waste.

10. 22 CCR § 66262.34(d): Hazardous waste accumulation storage time limit exceeded.

11. 22 CCR § 66262.34(d)(2) / 40 CFR § 265.173: Failed to close hazardous waste containers.

CORRECTIVE ACTIONS

In addition to listing the violations, HCDEH provided a list of corrective actions to be taken:

1. Hire a qualified environmental consultant to conduct a site assessment and cleanup plan for the property. Submit the plan to DEH for review.

2. Remove the four fuel tanks and associated piping or submit a completed SPCC plan addressing proper secondary containment measures prepared by a qualified professional. See enclosure.

3. Characterize and dispose of all hazardous waste (used motor oil, used oily rags, etc.) and contaminated soil using a licensed hazardous waste hauler and a licensed hazardous waste disposal facility. Provide copies of manifests to DEH verifying legal disposal.

4. Remove the above ground fuel tanks and associated piping or submit a completed HMBP via the California Environmental Reporting System (CERS) along with a completed SPCC plan addressing proper secondary containment components. You can access CERS business portal by going to their website at http://cers.calepa.ca.gov/. If you opt to remove the tank, then provide DEH with a bill of lading/transfer receipt for final destination of the tanks and diesel.

5. Obtain a temporary E.P.A. Identification Number by calling (800) 618-6942. See enclosure.

6. Remit the enclosed invoice for DEH staff time and lab analyses. See enclosure

SITE CONDITIONS/INVENTORY OF HAZARDOUS MATERIALS

On 4 November 2015, Kathy Moley, Professional Geologist with PWA was onsite to conduct an inventory of hazardous materials located on site and to develop a Compliance Plan. Upon arrival PWA found: two 1000-gallon AST which contained an unknown quantity of red dyed diesel fuel (Photo 1). The tanks are side by side, located close to the driveway, sited on pallets and wood. There was no

olfactory or visual indication of spilled material (Photo 2). In a separate location, within a building with a concrete floor was: one 25 KW generator (Photo 3); one 225-gallon AST and one 100-gallon AST transfer tank (Photo 4), both containing an unknown volume of red dyed diesel fuel; twelve 5-quart containers of used motor oil (Photo 5), and five unopened 5-quart containers of motor oil (not shown); two 5-gallon buckets containing approximately 4-gallons of red dyed diesel fuel, two empty 5-gallon buckets, and an empty oil changing pan with fuel transfer hose (Photo 6). In addition to hazardous fuels found onsite there was absorbent towels and chips (Figure 7), both used in the clean-up of any spills. Figure 2 displays where on the site the above mentions items are located. For a listing of hazardous material found on site, see Table 1 below.

Table 1. Inventory of Hazardous Material

Volume	Hazardous Material/Container
2	1000-gallon AST
1	25 KW Generator
1	225-gallon AST
1	100-gallon AST Transfer Tank
12	5-quart containers of used motor oil (15-gallons)
5	5-quart unopened containers of motor oil
1	1-gallon of antifreeze
2	5-gallon buckets partially filled containing red dyed diesel fuel (Approx. 4-gallons total)
1	25 KW Generator
2	Empty 5 gallon buckets
1	Empty 3-gallon bucket
2 bags	Absorbent Chips
2 rolls	Absorbent Towels

EPA-ID NUMBER

To remain in compliance, this property needs an EPA-ID Number. EPA-ID Numbers are person specific and property specific. Therefore an EPA-ID Number is needed for this property Owner at this location. An EPA-ID Number has been obtained for this property owner at this location. The EPA-ID Number was obtained 6 November 2015. The EPA-ID Number is CA555555555.

COMPLIANCE PLAN

The goal of this Compliance Plan is to get all hazardous materials moved off the site as soon as possible. For a summary of compliance actions see Table 2 below.

- All remaining red dyed diesel fuel will be used to fuel heavy equipment used on site during compliance operations or relocated to another site via a licensed hazardous waste transporter. All manifests generated by this transfer will be retained and submitted as part of a final reporting product.

- The 25 KM Generator is slated to be either sold, or utilized by the property owner for his personal use. Any and all receipts or manifests generated by this transfer will be retained and submitted as part of a final reporting product.

- All AST are to be removed from the property via licensed hazardous waste transporters. ASTs will either be scrapped at an approved facility, or sold. Any and all receipts or manifests generated by this transfer will be retained and submitted as part of a final reporting product.

- Any unused motor oil or antifreeze will be removed from the property, by the property owner for personal household use.

- All used motor oil will be sealed and labeled by the property owner and transported by the property owner to a licensed disposal site for household hazardous waste. Once this plan is approved, an appointment with be made with the Humboldt County Household Hazardous Waste Department by calling 441-2005. Up to 15-gallons of hazardous waste can be disposed of at one time. A receipt documenting the proper disposal of the used motor oil will be obtained. This receipt will display the EPA-ID Number for this property owner and this property – CA555555555, and will submitted as part of a final reporting product.

- Any used absorbent chips or absorbent towels can also be disposed of at the Humboldt County Household Hazardous Waste facility at the same time the used motor oil is disposed of.

- Any remaining, dry buckets or hoses may be properly disposed of by placing them into the trash.

Table 2. Compliance Actions to be Taken.

Hazardous Material/Container	Planned Action
1000-gallons AST	One re-located to property owners place of business, one to be sold.
25 KW Generator	To be sold or transferred to an alternative facility
225-gallon AST	To be sold or transferred to an alternative facility
100-gallon AST Transfer Tank	To be sold or transferred to an alternative facility
5-quart containers of used motor oil	To be transported by the property owner to a certified Household Hazardous Waste facility with an EPA Number
5-quart unopened containers of motor oil	To be transported offsite by the property owner to be used for personal use.
1-gallon of antifreeze	To be transported offsite by the property owner to be used for personal use
Any remaining red dyed diesel fuel	To be used by the property owner onsite or to be transported by a licensed hazardous materials transporter offsite to be used by the property owner for personal use.
25 KW Generator	To be sold or transferred to an alternative facility
Empty 5-gallon buckets	Disposed of as trash
Empty 3-gallon bucket	Disposed of as trash
Any used Absorbent Chips or Absorbent Towels	To be properly disposed of at a certified Household Hazardous Waste facility

SUMMARY/RECOMMENDATIONS

As stated above, in accordance with 22 CCR § 66262.12(a) and HSC § 25160.2(b)(10), an EPA-ID Number (CA555555555) has been retained for this site and this property owner.

Because all hazardous materials will be removed from this site, there will be no need in the future to develop a Hazardous Waste Business Plan (19 CCR § 2729.1; HSC § 25507), or create a Spill Prevention, Control and Countermeasures (SPCC) Plan (40 CFR § 112.3; HSC § 25270.4.5(a)).

Furthermore, since the property owner does not intend on having hazardous materials on site in the future, there will be no future mismanagement of waste oil (22 CCR § 66262.11; HSC § 25141), unauthorized waste oil storage (HSC §25250.4), and therefore no need to make a hazardous waste determination (HSC §2520l(a)).

Additionally, in the future there should be no improperly or poorly label containers of hazardous waste (22 CCR § 66262.34(±)) on this site, nor should there be any hazardous waste accumulation (22 CCR § 66262.34(d)).

All ASTs removal from the property will be conducted via a licensed hazardous waste transporter. If these tanks are transported to a separate business, it will be the responsibility of the receiving party to insure that all the necessary and appropriate documentation is filed with the State and/or County in order to remain in compliance in regards to the handling of hazardous materials.

As part of this Compliance Plan a final report will be submitted to the HCDEH which will include all manifests, receipts and/or proofs of proper disposal of any and all hazardous waste which currently remains on this site.

We trust this Compliance Plan provides you with the information you require at this time. If you have any questions or concerns contact myself, Kathy Moley at our McKinleyville office at 707-839-5130 or on my cell phone at 707-498-0801.

Sincerely,

PACIFIC WATERSHED ASSOCIATES INC.

Kathy Moley P.G. 7594, Environmental Division Manager
kathym@pacificwatershed.com

cc: Landowner
Danny Hagans, Principal, Pacific Watershed Associates

Photo Pages

Photo 1. Two 1000-gallon AST. Tanks are located on wooden pallets. There is no visible or olfactory indications of a hazardous material spill or soil contamination.

Photo 2. Base of one of the 1000-gallon AST. No soil contamination observed.

Photo 3. 25 KW Generator. Note that generator is on a concrete floor and there are absorbent chips beneath the generator to clean up small drips.

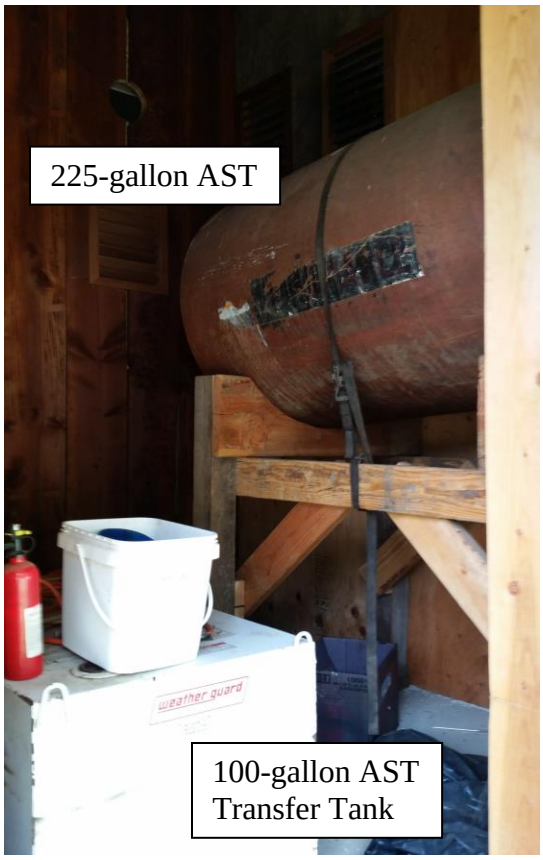


Photo 4. 225-gallon AST and a 100-gallon transfer tank. Also note empty 3-gallon bucket and fire extinguisher.

Photo 5. Twelve 5-quart plastic containers containing used motor oil totaling 15-galons.

Photo 6. Two 5-gallon buckets containing approximately 4-gallons of red dyed diesel fuel, two empty 5-gallon buckets, and an empty oil changing pan with fuel transfer hose.

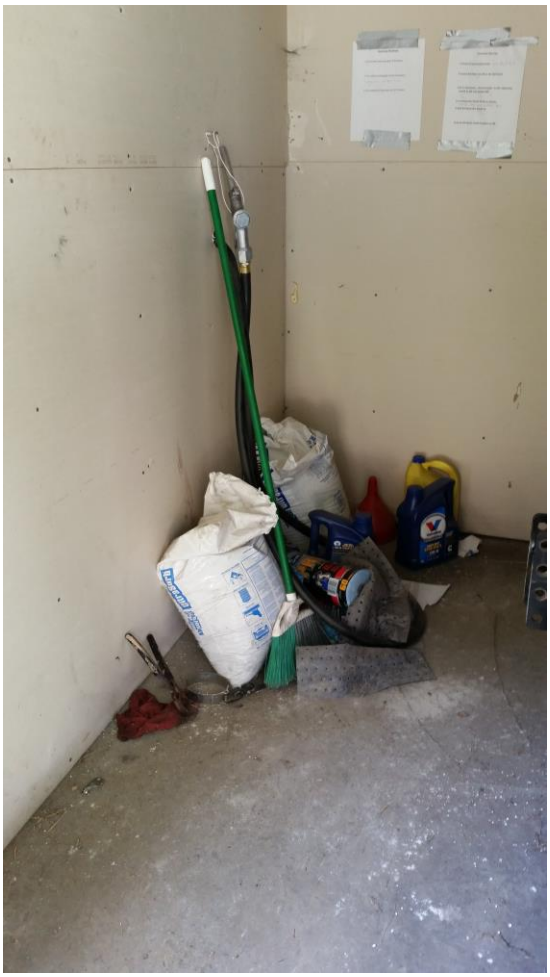


Photo 7. Fuel hose from 225-gallon AST used to transfer fuel to the generator. Also shown are two bags of absorbent chips and some absorbent towels. All unused chips and absorbent towels will be retained by the property owner for personal use. Any used items will be cleaned up and disposed of at the Humboldt Household Hazardous Waste facility

C5. Sample Hazardous Materials Report of Compliance (Map not included)

PACIFIC WATERSHED ASSOCIATES INC.

PO Box 4433 • Arcata, CA 95518-4433
Ph 707-839-5130 • Fax 707-839-8168
www.pacificwatershed.com

February 2, 2016

Humboldt County
Division of Environmental Health
100 H Street, Suite 100
Eureka, California 95501
Attention: Derek Prestesater

RE: Report of Compliance for A.P. No. 123-456-789, located at 3737 Blueberry Hill, Thrill, California. EPA-ID Number CA555555555.

INTRODUCTION

On 17 November 2015 Pacific Watershed Associates (PWA) submitted a Compliance Plan (Plan) for the clean-up of A.P. No.: 123-456-789, located at 3737 Blueberry Hill, Thrill, California (Figure 1). Within one week's time the Plan was approved by the Humboldt County Division of Environmental Health and the property owner was informed that he could officially move forward with activities as outlined in the Plan. The purpose of this letter is to document actions taken by the property owner as part of complying with the Plan.

ACTIONS TAKEN

In accordance with 22 CCR § 66262.12(a) and HSC § 25160.2(b)(10), it was required that a temporary EPA-ID Number be obtained

- The EPA-ID number obtained was CA555555555. See attached communications from the California Department of Toxic Substance Control (DTSC) for documentation.

Because all hazardous materials were to be removed from the site, PWA did not develop a Hazardous Waste Business Plan; create a Spill Prevention, Control and Countermeasures Plan; or compile a hazardous waste determination.

Because the property owner does not intend on having hazardous materials on site in the future there will be no:

- future mismanagement of waste oil (22 CCR § 66262.11; HSC § 25141)
- unauthorized waste oil storage (HSC §25250.4)
- improperly or poorly label containers of hazardous waste (22 CCR § 66262.34(±))

All hazardous waste materials that had accumulated on this site has been properly removed and disposed of. Attached to this letter, please find a receipts from the Humboldt Waste Management Authority for the proper disposal of all waste oil from this site.

The two 1,000-gallon above ground storage tanks, along with 703-gallons of red diesel fuel, were transported offsite by Barbier Trucking, a licensed hazardous waste transporter. Attached to this letter, please find receipts from Barbier Trucking, a licensed hazardous waste transported.

See Table 1 below for a summary of the hazardous materials that were documented on this site as part of an onsite inventory, and the actions taken as part of the Compliance Plan.

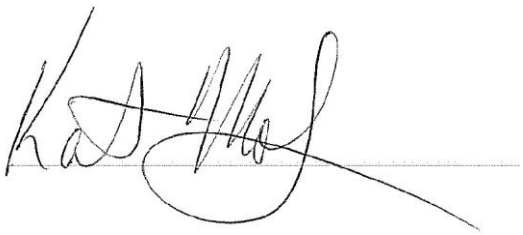
Table 1. Compliance Actions to be Taken.

Hazardous Material/Container	Planned Action
Two 1000-gallons AST and associated fuel	Transported off the property by a licensed transporter – See Attached receipt. COMPLETED
25 KW Generator	Sold to a private party. COMPLETED
225-gallon AST	Personally transported by the property owner to an alternate location. COMPLETED
100-gallon AST Transfer Tank	Personally transported by the property owner to an alternate location. COMPLETED
Twelve 5-quart containers of used motor oil (15-gallons)	Transported by the property owner to the Humboldt Waste Management Authority facility – See Attached receipt. COMPLETED
Five 5-quart unopened containers of motor oil	Transported off the property for personal use by the property owner. COMPLETED
1-gallon of antifreeze	Transported off the property for personal use by the property owner. COMPLETED
Any remaining red dyed diesel fuel	Transported off the property by a licensed transporter – See Attached receipt. COMPLETED
Empty 5-gallon buckets	Disposed of as trash. COMPLETED
Empty 3-gallon bucket	Disposed of as trash. COMPLETED
Any used Absorbent Chips or Absorbent Towels	Disposed of the Humboldt Waste Management Authority facility. COMPLETED

We trust this letter provides you with the information you require at this time. PWA now considers this project closed. If you have any further questions or concerns please contact myself, Kathy Moley at our McKinleyville office at 707-839-5130 or on my cell phone at 707-498-0801.

Sincerely,

PACIFIC WATERSHED ASSOCIATES INC.



Kathy Moley P.G. 7594, Environmental Division Manager
kathym@pacificwatershed.com

cc: Landowner
Danny Hagans, Principal, Pacific Watershed Associates

Enclosures:

- Communications with DTSC
- Receipt Humboldt Waste Management Authority
- Receipt – Barbier Trucking

C6. Sample Restoration Plan

(Maps, Sheets and Appendixes not included)

Stream and Slope Restoration and Monitoring Plan for the Billybob Property, Located at APN 123-456-789 Blueberry Hill, Thrill, California

prepared by

Pacific Watershed Associates, Inc.

as per

Cleanup and Abatement Order #R1-2003-XXXX

Note: Maps, sheets and figures are not attached to this example.

I. Introduction

The North Coast Regional Water Quality Control Board (NCRWQCB) and other County and State agencies charged with protecting water and air quality, public health, and safety conducted a warranted inspection of the property owned by Mr. and Mrs. Billybob of Thrill, CA on January 27, 2003. The property (APN 123-456-789) is located approximately 12 west-northwest of Garberville, CA in the Wildberry subdivision near Thrill, CA. A summary of the inspection findings was drafted by the NCRWQCB on February 5, 2003, citing unpermitted grading, timber conversion, and diversion of streams resulting in deleterious effects on water quality as well as sewage and diesel spills and unpermitted buildings. On February 12, 2003, the Humboldt County Division of Environmental Health (HCDEH) issued a notice of violation and schedule for compliance. On May 5, 2003, the NCRWQCB issued Cleanup and Abatement Order #R1-2003-XXXX (CAO), requiring Mr. Billybob to cleanup and abate the threatened sediment discharges, as well as submit a stream and slope restoration and monitoring plan (restoration plan) for the property.

II. Current Conditions

In late April 2003, Mr. Billybob requested that Pacific Watershed Associates, Inc. (PWA) develop this restoration plan for the property and aid in his compliance with the CAO and Department of Environmental Health code violations. Apparently, the property had been rented out in 2002 to tenants who graded soils, constructed an instream pond, removed trees and vegetation from approximately 4.2 acres, and filled portions of a Class III stream channels with earthen and woody debris (see Map 1, Sheet #1 Not Included). The presence of a visible flow path across the dam and past erosion of the dam fill is evidence suggesting that the stream flow overtopped the dam fill during the storms of late 2002. Sedimentation in the southern channel (Stream #2) and downstream of the channel's confluence is evident. Additionally, diesel fuel was spilled onto the ground in a localized area around and within a small shed that stored a generator with external above ground diesel storage tank. In March 2003, Mr. Billybob hired Green Environmental, Inc. (GEI) to address the requests made by the HCDEH. A workplan was prepared by GEI in mid-March, 2003, detailing actions to remove diesel contaminated soils, sample soil materials, and dispose of excavated hazardous materials. The GEI workplan was approved by the HCDEH in late March, 2003.

At this time, Mr. Billybob is actively working with electrical engineers and septic specialists to bring the buildings and wastewater treatment into county code compliance for permitting. All 12 greenhouses constructed in 2002 have been removed. Implementation of this restoration plan will require Mr. Billybob to obtain a California Department of Fish and Wildlife Lake and Streambed Alteration Agreement, a Humboldt County Building Permit for grading, and a Special Permit from the Humboldt County Planning Department. Humboldt County will likely need to issue emergency permits for site restoration to be achieved by the October 15, 2003 deadline set by the CAO. If the landowner chooses the option of burning a portion of the excess downed wood, a permit will also be required by CALFIRE and the North Coast Unified Air Quality Management District (NCUAQMD).

The most arduous element of the restoration plan is the removal of the large downed wood. PWA received consent from the NCRWQCB to begin removal of the wood from the property prior to the submission of the restoration plan provided the wood for preliminary removal was designated by PWA and that operations to remove designated wood would not affect any watercourse. PWA acquired CALFIRE's recommendations for site restoration and wood removal prior to the preliminary wood removal to ensure regulatory acceptance of the activity. To date, no wood has been removed, and Mr. Billybob is actively communicating with organizations (such as the Thrill Volunteer Fire Department) who may accept the wood as a donation. Written confirmation documenting that the wood has been donated will be furnished to CALFIRE.

III. Contents of the Billybob Property Restoration Plan

The restoration plan consists of: 1) a number of specific tasks that will occur in the stream channels and disturbed areas to remove emplaced fills, restore the natural surface topography and hydrologic function, and effectively reduce and prevent erosion of disturbed ground and sediment delivery to a watercourse, 2) revegetation of stream banks and slopes for the purpose of erosion control and to meet the recommendations of CALFIRE, 3) a monitoring plan to determine the success of stream restoration and revegetation efforts and outline the strategy for inspections, corrective actions, and reporting, 4) removal and disposal of diesel contaminated soil as per the workplan developed by GEI, and 5) a schedule for restoration plan elements that completes all physical restoration work by October 15, 2003.

In general, the Billybob Property Restoration Plan will: 1) restore both stream channels on the property to pre-disturbance topography and hydrologic function utilizing heavy equipment, 2) greatly reduce or eliminate surface erosion and sediment delivery from bare soil areas utilizing seeding and mulching, 3) revegetate the cleared areas of the property with native tree and riparian plant species, 4) implement the HCDEH approved workplan for contaminated soil removal as developed by GEI, and 5) set forth a monitoring strategy detailing the inspection, corrective actions, and reporting on the success of restoration plan elements.

PWA will provide technical oversight for work itemized as plan elements A through E below. Table 1 on Sheet #1 **(Not Included)** provides a timeline schedule for completing all elements of the Billybob restoration plan.

A. Billybob Property Restoration Plan Notes

Restoration plan element A addresses items 1, 2 and 3 of section 2, page 5 of the CAO.

1. Downed Wood Removal – General Notes

a. Remove and either donate the wood to a non-profit entity or pile and burn all downed wood greater than one inch in diameter and greater than two feet long from the area indicated on Map 2, Sheet #2 for proper disposal. An industrial chipper can be used to chip smaller downed wood and slash from within the indicated areas for use as erosion control materials. Alternately, small wood and slash will be piled and burned in the area designated on Map 2, Sheet #2, per CALFIRE specifications.

2. Topographic Site Restoration – General Notes

Map 2 on Sheet #2 identify respectively the:

- **a.** current extent of emplaced fill within Stream #1 and Stream #2 (i.e. area to be excavated),
- **b.** approximate extent of sidecast and pushed fill material placed beneath downed wood to be removed in element 1 above,
- **c.** location of greenhouse cut and fill pads, and
- **d.** location of 9 cross-sections and two longitudinal profiles down Stream #1 and Stream #2, and 3 profiles (P-10-12) along sidecast fill areas that were utilized to design the extent of cut areas, cut volumes, and finished slope gradients (see Sheet #2 and Sheet #3) related to the affected channels.

1) **At Stream #1**, approximately 775 yd^3 of emplaced fill within the channel will be excavated and stockpiled at Stockpile Area A (Map 2 on Sheet #2) in order to protect water quality, minimize future erosion and sediment delivery, and restore stream function. Table 2 on Sheet #2 summarizes the volumes of material to be excavated and disposed of from the Stream #1 channel. The Stream #1 Profile (Sheet #2) and XS#9 (Sheet #3) detail the design channel dimensions and stream bank lengths and gradients. A rock grade control structure composed of no more than 10 yd^3 of ¾ ft and smaller diameter rock armor will be installed at the upstream extent of the channel excavation to prevent further sediment input to the watercourse from headcut development and migration.

   Due to the expanse of low gradient topography at Stockpile Area A, this area will accommodate all earthen materials excavated from Stream #1.

2) **At Stream #2**, approximately 525 yd^3 of fill material within the channel and along the channel banks will be excavated and stockpiled at Stockpile Area B, located against the cutbank of road along the left bank adjacent to the pond and a large bench between Stream #1 and Stream #2 (Map 2 on Sheet #2) in order to protect water quality, minimize future erosion and sediment delivery, and restore stream function. Table 2 on Sheet #2 summarizes the volumes of material to be excavated and disposed of from the channel. The Stream #2 Profile (Sheet #2) and Stream #2 cross-sections 1 through 8 (Sheet #3) detail the design channel dimensions and stream bank lengths and gradients.

   Due to the expanse of low gradient topography at Stockpile Area B, this area will accommodate all earthen materials excavated from Stream #2.

3) **At sidecast fill profiles # 10, 11, and 12** (graded fill pad between Stream #1 and Stream #2), approximately 780 yd^3 of fill material located on the outboard edge of the constructed fill pad will be excavated and stockpiled at Stockpile Area B to protect water quality, minimize future erosion and sediment delivery, and topographically restore the hillside and accomplish the directives of the CAO. Table 2 on Sheet #2 summarizes the volumes of material to be excavated and removed from the outboard edge of the graded pad between Stream #1 and Stream #2. Table 3 on Sheet #2 details the volumes of sidecast material at these profiles. Profiles P-10, P-11, and P-12 (Sheet #3) detail the cut areas and design slopes of the excavation along the graded pad.

4) **At greenhouse cut and fill pads** (identified on Map 2 on Sheet #2), the fill portion of the pads will be excavated and stockpiled within the cut portion of the pad to topographically restore the hillslope to accomplish the directives of the CAO. Restoration of these cut and fill pads involves significantly smaller volumes of material. Survey and approximation of the volume of fill material moved to topographically restore these small pads has not been performed due to it constituting a relatively small component of the required earthwork. On site supervision by PWA will ensure effective restoration of topography at the small cut and fill pads.

B. Topographic site restoration: - Specific Notes:

Restoration plan element B addresses items 1, 2 and 3 of section 2, page 5 of the CAO.

1. At Stockpile Areas A and B, prior to spoiling excavated sidecast fill on the surface, rip spoil areas prior to filling.
2. Where fill spoil material is stored anywhere on existing cut pads or at the Stockpile Areas designated on Map 2, it shall be free of organics and trash and placed to generally reconstruct the pre-construction hillslope topography. Organics will be removed from fill and excavated materials to the standards specified in element A.1 of the restoration plan.
3. All spoils disposed of onsite shall be watered and compacted via track walking with a bulldozer or vibratory drum compactor to meet a minimum 85% compaction standard. Fills shall be constructed in lifts that are a maximum of 8 inches thick and no more than 2H:1V.

4. At all excavated cut areas and fill areas, efforts shall be made to mimic the pre-construction hillslope topography and disperse runoff to the maximum extent.
5. At all fill excavations locations, excepting areas detailed in the hazardous materials workplan developed by GEI, excavations will stop where native soil is reached, such that no significant further grading or excavation of in-place earthen materials occurs.
6. All disturbed soil areas including newly constructed fill slopes, excavations, and areas exposed to surface erosion by vegetation removal will be seeded with an appropriate erosion control seed mix at a rate of 50#/acre and mulched at a rate of 4000#/acre with rice straw, another certified weed-free straw, or wood chips and mulch generated from the removed downed wood (Map 3 on Sheet #2).

C. Revegetation Plan – General Notes

Restoration plan element C addresses items 2, 4, and 5, of section 2, on page 5 of the CAO. Map 3 on Sheet #3 identifies the areas where replanting with native tree species seedlings (Douglas-fir and madrone) will occur during the winter of 2004. Seedlings will be from seed zone #093 and from similar elevation to the restoration site to ensure meeting the silvical requirements of the seedlings. Seedlings will be planted throughout the indicated area with planting density of no less than 1 seedling per 100 ft^2 with the exception of restored stream channel beds. No seedlings will be planted in the restored stream channel beds. At least 85% of the planted seedlings will have thriving growth at the end of five years from the date of the planting, per section 2.ii, on page 6 of the CAO. Either sprinklers, drip irrigation, or a combination of sprinklers and drip irrigation will be utilized to ensure the success of thriving growth to the above specified level, if necessary.

D. Hazardous Materials Workplan – General Notes

The March 20, 2003 Workplan for Soil Excavation, Confirmation Soil Sampling, and Waste Disposal (Sheet #4), developed by GEI, will be implemented during the period that heavy equipment will be present on the property to implement the topographic restoration tasks itemized in plan element B. This workplan involves the removal and transport of contaminated shallow soil by excavation, sampling and analysis of soils to ensure complete removal of toxic soils, and reporting.

E. Site Monitoring Plan – General Notes

Restoration plan element E addresses section 2.iii on page 6 of the CAO. For up to five years after restoration plan elements A through D have been implemented, PWA personnel will conduct periodic site inspections to: 1) document conditions on the property, including the locations and volumes of erosion and sediment delivery, 2) evaluate the success of the implemented topographic restoration and revegetation plans, and 3) recommend and implement remediation measures, both heavy equipment and labor intensive, to minimize future water quality impacts from the property and ensure the 85% success rate of vegetation re-establishment is achieved within 5 years. For the first two years after physical remediation of the site, inspections will occur within 48 hours following any rainfall event that produces 2" or more of rainfall in a 24 hour period, based on the rainfall data for the RAWS unit at Thrill (ERCC1). At least 3 site inspections will occur between November 2003 and May 2004. Following each site inspection, a report of findings and any recommended corrective measures, including site photographs, will be submitted to the NCRWQCB staff within 30 days. For years three through five following physical remediation of the site, at least two inspections will be conducted each year: Inspection 1 prior to January 15, with an inspection report due within thirty days (by February 15), and Inspection 2 prior to April 1, with a report due within 30 days (by May 1). In the event more than two inspections are necessary during years three through five, for instance due to site failures, or in order to ensure revegetation success, a report will be due within 30 days of the date of each inspection. An annual monitoring report will also be submitted until monitoring is no longer required.

C7. Sample Remediation Report of Findings

(Maps and Appendixes not included)

Soil Remediation

Report of Findings

For

Billybob

A.P. No.: 123-456-789

located on
Blueberry Hill, Thrill, California

March 7, 2004

Prepared for:
Billybob
P.O. Box 12
Thrill, California 95123

Prepared by:
Kathy Moley, Professional Geologist #7594
Pacific Watershed Associates Inc.
P.O. Box 4433, Arcata, CA 95518
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Table of Contents

1.0 INTRODUCTION

This document presents the Report of Findings (ROF) for subsurface investigations and removal of diesel contaminated soils on the property known as A.P. No.: 123-456-789, located on Blueberry Hill, Thrill, California (Figure 1).

It is Pacific Watershed Associates' (PWA) understanding that on 27 January 2003, a multi-agency site inspection entered the project property under an inspection warrant. This multi-agency inspection included staff from the Humboldt County District Attorney's Office, North Coast Regional Water Quality Control Board (NCRWQCB), the Humboldt County Division of Environmental Health (HCDEH) Hazardous Materials Division, CALFIRE, North Coast Air Quality Management District, California Department of Fish and Wildlife (CDFW), Humboldt County Code Enforcement, and the property owner.

In a letter, dated 12 March 2003, Mr. Mouse of the HCDEH, states that on 27 January 2003 HCDEH staff responded to a Humboldt County Sheriff's Office report of hazardous materials and hazardous waste at the subject site. Additionally, this letter states that HCDEH inspectors observed an above ground storage tank (AST), and that olfactory and visual evidence indicated an un-permitted hazardous materials/waste releases. At that time HCDEH staff collected soil samples for laboratory analysis.

Analytical results of soils sampled demonstrated that hydrocarbon contamination of 24,000 mg/kg of TPHd and 3,200 mg/kg TPHmo existed within the upper soil horizon. Based on this finding, the HCDEH required the property owner remediate the situation.

PWA's involvement in the project began in April of 2003 to assist the land owner with an emergency erosion control measures as required by the NCRWQCB and other agencies. In addition to these erosion control measures, PWA also became involved with the environmental hazards clean-up related to diesel contamination. The purpose of this ROF is to summarize and document actions taken by PWA as they relate to environmental hazards and remediation associated with the diesel contamination.

A history of this project's site remediation can be found within Section 1.3.4 Project Investigations and Regulatory Involvement of this report, including details of HCDEH violations and corrective action requirements.

1.1 REPORT ORGANIZATION

This report is broken out into five sections: 1) Introduction, 2) Implementation of Workplan, 3) Investigation Results, 4) Site Investigations Summary, 5) Certification and Limitations.

Site Map Figure 1 Intentionally removed for privacy reasons.

1.2 PROJECT PERSONNEL

Table 1. Project Personnel, A.P. No.: 123-456-789, Thrill, California		
Property Owner	Billybob	707-123-467
HCDEH Oversight	Mr. Mouse	707-891-0123
HCDEH Oversight	Ms. Duck	N/A
PWA Geologist/Project Manager	Colin Hughes	707-839-5130
PWA Geologist	Kathy Moley	707-839-5130
Coyote Construction	Mr. Coyote	707-456-7890
Certified Transporters	Joe Craven Trucking	530-632-4500
Certified Laboratory	North Coast Laboratory	707-822-5469

1.3 BACKGROUND

1.3.1 Location Description

This rural property is located in the SW, NE, Section 5, T4S, R5E of the Garberville Quadrangle and is identified as APN 123-456-789 located on Blueberry Hill, within the Wildberry subdivision, southwest of Thrill, California (Figure 1). The property is approximately 10 acres in size with a disturbed/developed area of approximately 4.2 acres. Developed portions on the property include a small cabin and three out buildings. Previously located on this property, within the area of hydrocarbon contamination, was a generator shed that included a diesel generator and an above ground storage tank (AST).

1.3.2 – Operational History

Table 2. Operational History		
Date	**Description**	**Comments**
1986	Property purchased	Owners –Mr and Mrs. Billybob
February 2002	Property leased	Tenants
January 2003	Site inspection	NCRWQCB, et. al.
February 2003	NOV Issued	By HCDEH
March 2003	Workplan submitted	By Green Environmental
April 2003	Draft CAO	From NCRWQCB/Multi Agency
May 2003	Final CAO Order	From NCRWQCB
July 2003	EECP Submitted	By PWA
October – November 2003	EECP and Soil Remediation Completed	By PWA

1.3.3 Site Geology, Topography and Hydrology

The project site is located in relatively steep terrain of the California Coast Ranges. Local geology is Cretaceous Franciscan mélange bedrock which typically decomposes to a clay-rich soil type, which dominates the soil type on this site.

The property ranges in elevation from approximately 1,920 feet to 2,010 feet above mean sea level. On a typical year this site receives approximately 65- to 75-inches of rainfall annually (Western Region Climate Center), with the majority of that rainfall occurring during the

winter months. General site topography slopes in a northwest direction and ranges from a gentle gradient (<10%) to steep (<65%).

Also on this property are two small unnamed tributaries which drain to Rabbit Run Creek, a tributary to the South Fork Eel River. These tributaries are ephemeral, typically flowing in direct response to rainfall.

1.3.4 Project Investigations and Regulatory Involvement

1.3.4.1 January 2003 through February 2003

Based on documents provided to PWA, on 27 January 2003, a multi-agency site inspection occurred which included the Humboldt County District Attorney's Office, NCRWQB, the HCDEH Hazardous Materials Division, CALFIRE, North Coast Air Quality Management District, California Department of Fish and Wildlife (CDFW), Humboldt County Code Enforcement, and the property owner.

The property was inspected for numerous environmental violations. Of concern to HCDEH Hazardous Materials staff was an AST which contained diesel fuel. It was determined by HCDEH that the AST had a capacity of approximately 537-gallons and that visual and olfactory evidence indicated a hazardous materials/waste release had occurred. At that time HCDEH staff collected two (2) soils samples and submitted them to North Coast Laboratories (NCL) in Arcata, California. Samples were analyzed for total petroleum hydrocarbons as motor oil (TPHmo) and total petroleum hydrocarbons as diesel (TPHd) by EPA Method 3550/8015B.

Evidence gathered during this site investigation prompted the issuance of four (4) violations by HCDEH. As stated in Notice of Violation dated 12 February 2003, they are:

1. HSC §25503.5 *I* 19 CCR §2729.1: Failed to establish a Hazardous Materials Business Plan.
2. HSC §25507(a) *I* 19 CCR §2703: Failed to report a release/threatened release from the generator shed and the surrounding area.
3. HSC §25250.5: Disposal of used oil by discharge to sewer, drainage systems, surface or groundwaters; by incineration or burning as a fuel or by deposit on land.
4. HSC § 25160.2(b)(10)/ 22 CCR §66262.12(a): No EPA ID number.

In this same letter HCDEH provided a schedule of compliance for corrective actions to be taken by March 30, 2003.

1. Hire a qualified environmental consultant to conduct a site assessment and clean-up plan of the property for contamination. Submit the plan to HCDEH for review by March 3, 2003. Provide both pre- and post-cleanup soil samples once cleanup has occurred.
2. Remove fuel tank and associated piping or submit a completed Hazardous Materials

Business Plan (HMBP). Provide HCDEH with a bill of lading/transfer receipt for final destination of tank and diesel.

3. Obtain a temporary EPA Identification Number by calling (800) 618-6942.
4. Characterize and dispose of all hazardous waste (used motor oil, contaminated soil, used oil filters, waste batteries, etc.) using a licensed hazardous waste hauler and a licensed hazardous waste disposal facility. Provide copies of manifests to DEH verifying legal disposal.
5. Remit fees for HCDEH staff time and lab analyses.

1.3.4.2 February 2003 through April 2003

Based on the above schedule of compliance set forth by HCDEH the property owner retained Green Environmental (Green) to conduct site investigations and to prepare a work plan for the remediation of the hazardous materials on this property. On 11 March 2003 Green was on site to determine the scope of work necessary to achieve regulatory compliance. On 15 March 2003, Green, submitted a "Workplan for Soil Excavation, Confirmation Soil Sampling and Waste Disposal for the Billybob Property" (Workplan) to the HCDEH (Appendix A) which was approved on 20 March 2003.

On 3 April 2003 the NCRWQCB issued a DRAFT Clean-up and Abatement Order (CAO) and 12345 Order No. R1-2003-XXXX. In this DRAFT CAO the NCRWQCB projected issuance of the Final CAO by 05 May 2003.

On 10 April 2003, upon advice from Mr. Tweedy of Green, the property owner met with PWA staff in regards to developing a remediation plan as required by the NCRWQCB and to oversee the Workplan as developed by Green. On 12 April 2003 went into contract with PWA. Within 30 days Mr. Tweedy of Blue Rock communicated with Mr. Mouse of HCDEH to inform him that PWA would be implementing the approved Workplan.

1.3.4.3 May 2003 through August 2003

On 10 May 2003 the NCRWQCB issued a Final Clean-up and Abatement Order (CAO) and 12345 Order No. R1-2003-XXXX (Order) in response to observed water quality violations associated with soil disturbance, vegetation removal, in-stream dredging, filling, excavation, pond construction, and burial of two unnamed tributaries to Rabbit Run Creek. The CAO required that the property owner submit a Stream and Slope Restoration and Monitoring Plan (Plan) to the NCRWQCB no later than 1 July 2003. Therefore between May and July, PWA conducted the necessary work and to complete the Plan as required.

In an effort to work with the landowner's resources, PWA proposed to conduct all earth-moving activities, restoration and contaminated soil removal at the same time, while staff and equipment were onsite rather than to schedule equipment multiple times. This proposal was communicated to HCDEH and met with approval.

The Plan was approved by the NCRWQCB on 15 July 2003. However, prior to any earth-moving activities the Humboldt County Building Department required a Grading Permit, Humboldt County Planning Division Special Permit, and CDFW required a 1600 Permit.

Obtaining these permits delayed the implementation of both the Workplan and the Plan.

1.3.4.4 September 2003 through November 2003

On 12 August 2003 PWA received the Emergency Special Permit from the Humboldt County Planning Division, on 18 September 2003, PWA received a Building Permit for Grading from the Humboldt County Building Division, and on 28 September 2003, PWA received the CDFW 1600 Permit.

On 30 September 2003, PWA initiated contaminated soil excavation which was completed on 15 November 2003.

2.0 IMPLEMENTATION OF WORKPLAN

2.1 OBJECTIVE

The primary objective of the Workplan was to become compliant with HCDEH regulations regarding the AST and diesel contamination on this site. As noted above, previous investigations on this site consisted of sample collection conducted by HCDEH staff and laboratory analysis conducted by NCL.

2.2 SCOPE OF WORK

As per the approved Workplan the scope of work was to include:

- Transfer remaining diesel fuel in AST to drums and obtain a temporary EPA Identification Number for disposal of all hazardous waste at an appropriate facility.
- Removal and disposal of diesel AST at an appropriate facility
- Excavate and drum diesel impacted soil from the area of the former generator.
- Collect confirmation soil samples from the excavation area for laboratory analysis.
- Profile excavated soil for disposal at an appropriate facility.
- Preparation of a summary Report of Findings.

2.3 PROJECT IMPLEMENTATION/SOIL EXCAVATION

The projected volume of excavated soil within the Workplan was based on the impacted area, approximately 10 feet long by 15 wide with an unknown depth. The Workplan proposed that excavated soils be transferred into labeled steel 55-gallon drums pending disposal.

Due to an unknown quantity of soil to be excavated, it was PWA's goal to stage contaminated soils on-site until a final excavated volume was determined. If the volume was significantly large, PWA proposed utilizing bulk soil disposal for this project.

Prior to conducting any excavation activities PWA obtained a temporary EPA Identification Number: CA009876543. Additionally, prior to excavation activities PWA obtained verbal permission from the HCDEH for any usable diesel fuel which remained within the AST to be

utilized by either the client and/or his contractors. Therefore, the diesel fuel was utilized by the client's contractor, Coyote Construction, and the AST was removed off site to the contractor's place of business by one of his equipment operators who is a certified Hazardous Materials Transporter.

Under the supervision of Professional Geologist Colin Hughes, contaminated soil excavation began on 30 September 2003. Excavated soil was placed on a Visqueen surface for stockpiling during excavation and staging which was expected to continue until results of laboratory analysis of soils indicated that the bulk of the contaminated soil had been excavated.

2.4 SOIL SAMPLING AND SOIL REMOVAL

On 30 September 2003 soil samples were collected from the east, west, north and south walls, and floor of the excavation pit. Soils were described and classification using the Unified Soil Classification System (USCS) guidelines. Samples were collected in 4 oz glass jars, labeled and kept at temperatures below 4 degrees centigrade for transportation under chain-of-custody to NCL. Soil samples collected were analyzed for:

- TPHd/mo by EPAM 8015M w/ Silica gel clean-up.
- BTEX by EPAM 8260B.

It was PWA's goal to meet a water quality standard level of contamination of 100 mg/kg of TPHd or less. Based on test results of laboratory analysis, water quality standards were met during initial excavations on the north, south and west walls. However, water quality standards were not met on the east wall and floor.

On 7 October 2003 Professional Geologist Colin Hughes returned to the site, increased the size of the excavation pit, re-sampled the east wall and floor for TPHd and TPHmo and sampled the east, west, north and south walls, and floor for BTEX analysis. All samples were again labeled and kept at temperatures below 4 degrees centigrade for transportation under chain-of-custody to NCL.

Based on laboratory analysis results of samples collected, water quality standards were met for BTEX on all samples, and TPHd and THPmo for the east wall; however, laboratory analysis of samples collected from the floor of the excavation pit indicated that elevated concentrations of TPHd and TPHmo still remained onsite.

On two additional occasions, 10 October 2003 and 9 November 2003, PWA returned to the site to deepen the excavation pit and collect additional samples in an effort to determine the lower extent of soil contamination and to oversee removal of contaminated soil. Laboratory test results, along with sample depth and location for all samples analyzed are located within Table 3 below.

2.5 SOIL REMOVAL/EXCAVATION PIT BACKFILLING

Due to the large quantity of contaminated soils to be removed from this site, PWA elected to

utilize bulk soil removal and retained Joe Craven Trucking a licensed hazardous waste hauler out of Blue Bluff, California to remove soil from the site to a licensed hazardous waste disposal facility utilizing truck and trailer.

Soil stockpiled during excavation was loaded into truck bed and trailers via an excavator. Clean soil obtained from other areas on the property were used to backfill the excavated pit and the area surrounding the excavation pit was re-contoured (see cover photo). Overall, approximately 120 yds^3 of diesel contaminated soil was removed from this site.

3.0 INVESTIGATION RESULTS

3.1 LITHOLOGY AND HYDROGEOLOGY

During different phases of this project PWA advanced several test pits to depths ranging from three (3) feet below the ground surface (bgs) to 17 feet bgs (Photo 1). Soils were consistently dominated by stiff clayey materials. Some areas contained greater concentrations of rock fragments and decomposing Franciscan bedrock with a clay rich matrix.

Soils within the excavation pit were observed and logged by professional geologists at PWA. Soils logged were a stiff clay with variable amounts of decomposing bedrock and rock fragments, typically less that 25% by volume. Photos 1 thru 3 exhibit a thin upper horizon of topsoil, underlain by reddish brown (5YR 6/6) to yellowish brown (10YR 5/6). Roots were common and fine to common and large in the upper three feet of the excavation pit, diminishing to few and fine with depth. Mottles were absent in the upper 7 feet and became intermittent with depth and fluctuated between few, fine and faint to few, large and distinct. While mottles are indications of saturated soils, ground water was not encountered in any test pits on this site. See Soil Log within Appendix B.

3.2 SOIL ANALYTICAL RESULTS

Petroleum hydrocarbon analytical results from the soil samples collected from the excavation pit are displayed in Table 3. Laboratory analytical reports are also included in Appendix C.

For this project there were four (4) separate sampling events. On 30 September 2003 preliminary excavation extended down to approximately 6-feet bgs. Five (5) soils samples were collected, one from the east, west, north, south walls and floor of the excavation pit. Based on laboratory test results, soil samples collected from the south, west and north walls were either non-detect for TPHd and TPHmo, or below the 100 mg/kg threshold goal.

A second sampling event occurred after deepening the excavation pit and advancing the width of the pit eastward, on 10 October 2003. On that date, samples were again taken from the expanded eastern wall and floor of the deepened pit. It was also at that time that samples to be analyzed for BTEX were collected from all four walls and floor.

Results from this sampling event indicated that the boundaries of contamination had been reached to the east, west, north and south, but the lower extent had not been located. Also based on laboratory test results, all samples collected for BTEX analysis met water quality standards.

As excavation continued and the pit increased in depth, contaminated soil was stockpiled within the vicinity of the excavation pit until it could be removed from the site. Soil samples of the excavation pit floor were taken on 10 October and 9 November. Laboratory test results of the soil sample collected on 9 November from 17' bgs indicated that the lower extent of the bulk of soil contamination had been reached.

3.5 POST EXCAVATION ACTIVITIES

Once the lower extent of the contaminated soils had been located, PWA returned to the site to "clean-out" the excavation pit by removing any remaining potentially contaminated soils. Based on analytical results of soils sampled from the walls and floor of the excavation pit, PWA considered that the bulk of contaminated soil had been removed from the site. Additionally, clean soils, which had been collected and stockpiled from another location on the site, were utilized to backfill and cap the excavation pit. Once closed, the area within the vicinity of the excavation pit was re-contoured so as to provide a smooth transition to the surrounding terrain and maintain a safe area for humans and wildlife. All areas where bare soils existed were seeded and mulched.

3.6 DISCUSSION OF RESULTS

While the outer boundaries of the area of soil contamination were defined early during this process, the depth of excavation far surpassed anyone's expectations. During this project, the majority of contaminated soil has been removed from this site; however, any small amount of contaminated soil which may have been missed is confined to a relatively small area within the vicinity of the excavation pit, has been capped with clean soil, and is considered not to create a risk to humans or the environment. Furthermore, contamination levels are within acceptable water quality standards and anticipated to decline over time due to natural attenuation. As such, PWA considers any further environmental impact of this site to be minimal.

4.0 SITE INVESTIGATIONS SUMMARY

Prior to any soil excavation a temporary EPA Identification Number was obtained. As part of this project approximately 120 yd^3 of contaminated soils have been removed from the site. Results of laboratory soil analysis indicated that soil contamination levels decreased from a high of 24,000 mg/kg TPHd at the ground surface to 1.1 mg/kg at the excavation pit floor 17' bgs. The overall excavation pit was approximately 12 feet wide and 15 feet long and 17 feet deep at its greatest extent.

The bulk of contaminated soil has been removed and disposal of at an appropriate facility. Any remaining soil that may still have some level of hydrocarbon contamination on this site is within water quality standards (<100 mg/kg). The excavation pit has been backfilled with clean soils and the slope re-contoured so as to not create a hazardous environment.

Photo 1. South and East Wall

Photo 2. East, South and West walls.

Photo 3. This photo illustrates the rocky nature of soils.

Table 3. Petroleum Hydrocarbons - Soil Analytical Data – (in mg/kg)

Boring Number and Sample Depth	Sample Date	TPHmo (mg/kg)	TPHd (mg/kg)	TPHg (mg/kg)	MTBE (mg/kg)	B (mg/kg)	T (mg/kg)	E (mg/kg)	m, p-X (mg/kg)	o - X (mg/kg)
HCDEH		3,200	24,000							
HCDEH		31	78							
North Wall @ 3’	09/30/03	ND	4.8	NT	NT	NT	NT	NT	NT	NT
South Wall @ 5’		ND	2.8	NT	NT	NT	NT	NT	NT	NT
East Wall @ 3.5’		100	740	NT	NT	NT	NT	NT	NT	NT
West Wall @ 5.5’		ND	ND	NT	NT	NT	NT	NT	NT	NT
Floor @ 6’		NT	NT	NT	NT	NT	NT	NT	NT	NT
	10/07/03									
North Wall		NT	NT	NT	NT	ND	ND	ND	ND	ND
South Wall		NT	NT	NT	NT	ND	ND	0.020	0.064	0.064
East Wall @ 8’		ND	ND	NT	NT	ND	ND	ND	ND	ND
West Wall		NT	NT	NT	NT	ND	ND	ND	ND	ND
Floor @ 10’		390	4,700	NT	NT	ND	ND	0.018	0.029	0.11
	10/10/03									
Floor @ 15’		ND	230	NT	NT	NT	NT	NT	NT	NT
	11/09/03									
Floor @ 17’		ND	1.1	NT	NT	NT	NT	NT	NT	NT

There is no longer a known source of contamination on this property as any fuel that remained within the AST was utilized as part of this cleanup project and the AST has been removed to an appropriate location. Based on current site conditions on this property, PWA considers this project closed.

5.0 CERTIFICATION AND LIMITATIONS

This ROF was prepared under the direct supervision of a California Professional Geologist at Pacific Watershed Associates. All information provided in this ROF including statements, conclusions and recommendations are based solely upon a review of existing files within the HCDEH office, written and verbal communications with staff at the HCDEH, field observations made by a professional geologists at PWA, and chemical analyses performed by a state-certified laboratory. PWA is not responsible for laboratory errors.

Sincerely,

PACIFIC WATERSHED ASSOCIATES INC.

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