



125 Main Street
Scotia, CA 95565
Phone (707) 764-4392
Fax (707) 764-4118

Annual Monitoring Summary Report

2007

North Fork Elk River Cleanup and Abatement Order R1-2006-0055

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Version 1.1



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**PROJECT TITLE: NORTH FORK ELK RIVER CAO R1-2006-0055
MONITORING PROGRAM**

ORGANIZATION IMPLEMENTING THE PROJECT:

PALCO (The Pacific Lumber Company)
PO Box 712
125 Main St.
Scotia, CA 95565

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

**SCIENCE TEAM LEADER FOR THIS
PROJECT**

_____ Date _____
Kathleen Sullivan, Ph.D.

PALCO AUTHORIZED REPRESENTATIVE

_____ Date _____
Kathleen Sullivan

2006 Work Plan

A total of 28 sites were scheduled to be completed in 2006 (as per the North Fork Elk River Monitoring QAPP 1.1). Work was scheduled from May through October 15th. The work plan summary for 2006 documents all treatment work conducted under the order and summarizes variations that occurred during the conduct of operations throughout the operating season. The work plan summary is attached in Appendix 1.

These sites included a number of road projects, including but not limited to:

- Removal of Humboldt crossings
- Culvert replacement, removal of crossing fill
- Culvert installation
- Bridge installation
- Construction of water bars

Sites are located on Map 1. Each site number for North Fork Elk River corresponds to the distance in feet on a given road. It is consistent with the listing of sites in the ECP listing in each corresponding THP. Site numbers on this table are consistent with the sediment source inventory submitted on 11/15/2006.

Deviation from Plan

Twenty eight sites were originally scheduled to be completed in 2006 with 25,944 cubic yards of sediment to be treated (as per the North Fork Elk River Monitoring QAPP 1.1). As of November 15, 2006, 44 sites in North Fork Elk River have been completed. These sites totaled 33,044 cubic yards of material saved. Twenty three sites were added to the original Monitoring Plan. Table 2 identifies the sites completed and the monitoring studies selected for each site. Seven sites were not completed as originally identified in the first work plan submittals. Table 1 lists the seven sites that were not completed and explains the reasons that they were removed from the work plan.

Table 1. Sites not completed per original 2006 work plan and treatment schedule

North Fork Elk River Sites not Completed in 2006		
Road Number	Site Number	Reasons sites not completed
N75.35	2100	Site did not show any signs of failure – low priority
U46.1960	1240	Not completed because of time constraints due to murrelet restrictions
U46.1960	1241	Not completed because of time constraints due to murrelet restrictions
U46.1960	2260	Not completed because of time constraints due to murrelet restrictions
U46.1960	2780	Not completed because of time constraints due to murrelet restrictions
U46.196045	80	Not completed because of time constraints due to murrelet restrictions
U46.196045	81	Not completed because of time constraints due to murrelet restrictions

CAO Sites Monitoring Plan

The monitoring plan for the 44 sites completed in North Fork Elk River in 2006 is provided in Table 2. Work was scheduled from May through October 15th

Table 2. Overview of North Fork Elk River CAO Monitoring Plan for CAO sites completed in 2006.

2006 North Fork Elk River CAO Sites Monitoring Plan						
Road #	Site ID #	Sub-basin	Site Completed	Wet Weather Inspection	Erosion Void	Photo Monitoring
N	73165	North Fork Elk	6/12/2006	X		
N	73431	North Fork Elk	7/18/2006	X	X	
N	73521	North Fork Elk	6/8/2006	X		
N75	1164	North Fork Elk	7/14/2006		X	X
N90	4700	North Branch NF	6/26/2006			
N90.10	214	North Branch NF	7/5/2006	X		X
N90.10	250	North Branch NF	7/5/2006	X		
U08	17400	Lake Creek	6/26/2006			
U11	508	Lower NF	3/31/2006	X	X	
U11	3700	Lower NF	6/20/2006	X	X	X
U11	3701	Lower NF	6/15/2006	X	X	X
U11.11	180	Lower NF	6/24/2006	X		
U11.11	700	Lower NF	6/21/2006	X	X	X
U11.11	1000	Lower NF	6/21/2006	X	X	X
U11.11	1006	Lower NF	6/19/2006	X	X	X
U17.10	50	Browns	8/27/2006			
U25.5181	2200	Browns	8/12/2006	X		X
U25.5181	2900	Browns	8/15/2006	X		X
U25.54	1250	Bridge Creek Elk	5/9/2006	X		
U25.54	0-S1	Bridge Creek Elk	5/10/2006		X	X
U25.80	5850	Bridge Creek Elk	5/30/2006			
U25.804107	250	Bridge Creek Elk	5/10/2006			X
U31	150	Bridge Creek Elk	8/13/2006	X		
U46.19	3290	Upper NF	10/13/2006			
U46.1960	100	Upper NF	10/10/2006	X	X	X
U46.198060	551.2	South Branch NF	9/27/2006			
U46.198060	552.1	South Branch NF	9/27/2006			
U46.198060	552.2	South Branch NF	9/27/2006			
U46.198060	1730	South Branch NF	9/9/2006			X
U46.198060	2395	South Branch NF	9/7/2006		X	X
U46.198060	2510	South Branch NF	9/6/2006		X	X
U46.198060	4490	South Branch NF	10/4/2006			
U46.198060	5410	South Branch NF	9/15/2006		X	X
U46.198060	6010	South Branch NF	9/13/2006			X
U46.19806050	530.3	South Branch NF	9/27/2006	X	X	
U46.19806050	530.4	South Branch NF	9/27/2006			
U46.19806050	530.5	South Branch NF	9/27/2006			
U46.19806050	530.6	South Branch NF	9/27/2006			
U46.19806050	1370	South Branch NF	9/27/2006			
U46.198080	1900	South Branch NF	8/31/2006			X
U46.19808020	600	South Branch NF	8/31/2006	X		X
U46.19808020	1110	South Branch NF	8/31/2006	X		X
U46.19808020	1260	South Branch NF	8/23/2006	X		X
Skid Road	4500	South Branch NF	8/9/2006			

Daily Rainfall

Daily rainfall for 2006/ 2007 is as follows in Table 3. Rainfall is recorded in inches and is gathered from the National Weather Service Station in Eureka (www.whr.noaa.gov/eka).

Table 3. Daily rainfall recorded at NWS station in Eureka, California. Data is presented in inches.

NWS Station at Eureka Hydrologic Year 2006-2007												
Date	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	July	Aug.	Sep.
1	0.00	0.00	0.01	0.00	0.00	0.20	0.00	0.29	0.00	0.00	0.00	0.00
2	0.00	0.64	0.00	0.01	0.00	0.13	0.00	0.14	0.00	0.00	0.01	0.00
3	0.00	0.86	0.00	0.97	0.00	0.00	0.00	0.31	0.00	0.00	0.01	0.00
4	0.22	0.00	0.00	0.40	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.06
5	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
6	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
7	0.00	0.66	0.00	0.00	1.03	0.36	0.29	0.00	0.00	0.00	0.00	0.00
8	0.00	0.14	0.26	0.00	0.50	0.00	0.29	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.29	0.00	0.05	0.04	0.00	0.00	0.11	0.00	0.00	0.00
10	0.00	0.60	0.85	0.12	1.32	0.00	0.00	0.00	0.12	0.00	0.00	0.00
11	0.00	0.18	0.70	0.04	0.23	0.00	0.33	0.00	0.00	0.02	0.00	0.00
12	0.00	0.38	0.98	0.00	0.23	0.00	0.10	0.01	0.00	0.00	0.00	0.00
13	0.00	0.58	0.57	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
14	0.02	0.03	0.44	0.00	0.20	0.00	0.76	0.00	0.00	0.00	0.00	0.00
15	0.30	0.43	0.03	0.00	0.52	0.00	0.00	0.01	0.00	0.00	0.00	0.00
16	0.03	0.06	0.14	0.12	0.00	0.00	0.04	0.00	0.00	0.00	0.06	0.00
17	0.00	0.00	0.03	0.00	0.04	0.00	0.36	0.00	0.00	0.88	0.00	0.00
18	0.00	0.00	0.00	0.00	0.12	0.00	0.06	0.00	0.00	0.05	0.00	0.00
19	0.01	0.35	0.00	0.01	0.04	0.62	0.04	0.03	0.00	0.00	0.00	0.00
20	0.00	0.39	0.01	0.00	0.97	0.04	0.00	0.05	0.00	0.00	0.00	0.00
21	0.00	0.44	0.77	0.00	2.32	0.00	0.28	0.00	0.00	0.00	0.00	0.00
22	0.00	0.78	0.00	0.00	0.79	0.00	0.13	0.00	0.00	0.00	0.00	0.00
23	0.00	0.05	0.08	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.01	0.03	0.01	0.79	0.00	0.00	0.00	0.00	0.01	0.00	0.00
25	0.00	0.03	0.73	0.00	0.51	0.26	0.02	0.00	0.00	0.00	0.00	0.00
26	0.00	0.45	0.97	0.00	0.50	0.39	0.00	0.02	0.00	0.01	0.00	0.00
27	0.00	0.14	0.13	0.00	1.16	0.45	0.00	0.02	0.00	0.00	0.00	0.00
28	0.00	0.13	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.10
29	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.01		0.00	0.00	0.00	0.00	0.00	0.00	0.44
31	0.00		0.00	0.00		0.02		0.00		0.00	0.00	

Post Activity Audits

Audits were conducted on all 44 sites completed this year. All post activity audit field forms are attached in Appendix 2.

Table 4. 2006 North Fork Elk River CAO Sites Audit Results

2006 North Fork Elk River CAO Sites Audit Results					
Road #	Site ID #	Site Completed	Audit Date	Within Time Restrictions	Conforms to Permits
N	73165	6/12/2006	7/18/2006	X	No
N	73431	7/18/2006	7/18/2006	X	Yes
N	73521	6/8/2006	7/18/2006	X	Yes
N75	1164	7/14/2006	8/16/2006	X	Yes
N90	4700	6/26/2006	8/9/2006	X	Yes
N90.10	214	7/5/2006	8/16/2006	X	No
N90.10	250	7/5/2006	8/16/2006	X	No
U08	17400	6/26/2006	7/26/2006	X	Yes
U11	508	3/31/2006	04/31/06	X	Yes
U11	3700	6/20/2006	7/26/2006	X	Yes
U11	3701	6/15/2006	7/26/2006	X	Yes
U11.11	180	6/24/2006	7/24/2006	X	Yes
U11.11	700	6/21/2006	7/24/2006	X	Yes
U11.11	1000	6/21/2006	7/26/2006	X	Yes
U11.11	1006	6/19/2006	7/26/2006	X	Yes
U17.10	50	8/27/2006	9/26/2006	X	No
U25.5181	2200	8/12/2006	9/12/2006	X	Yes
U25.5181	2900	8/15/2006	9/12/2006	X	Yes
U25.54	1250	5/9/2006	6/11/2006	X	Yes
U25.54	0-S1	5/10/2006	6/11/2006	X	Yes
U25.80	5850	5/30/2006	6/11/2006	X	Yes
U25.804107	250	5/10/2006	6/11/2006	X	Yes
U31	150	8/13/2006	9/13/2006	X	Yes
U46.19	3290	10/13/2006	11/7/2006	X	Yes
U46.1960	100	10/10/2006	11/7/2006	X	Yes
U46.198060	551.2	9/27/2006	11/9/2006	X	Yes
U46.198060	552.1	9/27/2006	11/9/2006	X	Yes
U46.198060	552.2	9/27/2006	11/9/2006	X	Yes
U46.198060	1730	9/9/2006	10/9/2006	X	Yes
U46.198060	2395	9/7/2006	10/6/2006	X	Yes
U46.198060	2510	9/6/2006	10/6/2006	X	Yes
U46.198060	4490	10/4/2006	11/9/2006	X	Yes
U46.198060	5410	9/15/2006	10/9/2006	X	Yes
U46.198060	6010	9/13/2006	10/9/2006	X	Yes
U46.19806050	530.3	9/27/2006	11/10/2006	X	Yes
U46.19806050	530.4	9/27/2006	11/10/2006	X	Yes
U46.19806050	530.5	9/27/2006	11/10/2006	X	Yes
U46.19806050	530.6	9/27/2006	11/10/2006	X	Yes
U46.19806050	1370	9/27/2006	11/9/2006	X	Yes
U46.198080	1900	8/31/2006	10/9/2006	X	Yes
U46.19808020	600	8/31/2006	10/9/2006	X	Yes
U46.19808020	1110	8/31/2006	10/9/2006	X	Yes
U46.19808020	1260	8/23/2006	10/6/2006	X	Yes
Skid Road	4500	8/9/2006	9/12/2006	X	Yes

Those sites that did not conform to the permit are listed in Table 5. These sites will have additional corrective actions taken in 2007 or will be monitored over the 2006-2007 winter period and re-evaluated for conformance.

Table 5. Non Conforming CAO Sites North Fork Elk River 2006

Non Conforming CAO Sites North Fork Elk River 2006				
Road Number	Site Number	Proposed Treatment	Variance from Specifications	Proposed Corrective Action
N	73165	Excavate top to bottom orange flags and install 24" culvert.	Not excavated to bottom flag. Pipe is shotgunned at outlet	Installed Downspout
N90.10	214	Excavate crossing, create new channel 5' wide from top to bottom, layback 2 to 1. Place rolling dip in swale to right of excavation. Spoil to left on landing in stable area, if there is any room available, or endhaul up road to landing off N90.	Spoils were not put on landing to right. Spoils are left on road. Site is slash-packed. Coverage is not 90% and there is no straw.	Pack straw 300' and straw site
N90.10	250	CDF PHI Recommendation: A rolling dip or water break that intercepts the inside ditch shall be installed about halfway between the landing to be used for spoils deposition on road N90.10 and the sediment saving site. The landing shall also be drained properly after use as a spoils area.	Landing is not properly drained per CDF PHI Recommendation	Properly Drain landing
U17.10	50	This is a sediment savings site. Excavate old Humboldt crossing. Any excess material (logs and spoils) shall be hauled to the nearest landing or stable area where slopes are less than 30%. Seed and mulch all exposed soils at crossing. Finished side slope gradients shall be 50% or a gradient equal to the natural slope. This crossing shall remain pulled and not suitable for vehicular use.	Perched fill left bank not 2:1	Excavate Perched Fill

Photo Monitoring

Photo Monitoring was conducted on 30 of the 44 sites completed in 2006. The date when photo monitoring has occurred at each site is listed in Table 6. Photo monitoring field forms are attached in Appendix 3.

Due to the considerable number of photographs taken at each site, the photos have been submitted on CD North Fork Elk River CAO R1-2006-0055_1. Photos are indexed on the CD by road and site number. Photographs within each site file are in numeric order and correspond to the SCOPAC assigned file name on the corresponding field sheet for each particular site.

Table 6. Photo- monitoring activity log for 2006 North Fork CAO Sites

Photo monitoring- 2006 North Fork Elk River CAO Sites							
Road #	Site ID #	Site Completed	Post Audit Photo Monitoring	Wet Weather Inspection 1 Photo Mon.	Wet Weather Inspection 2 Photo Mon.	Wet Weather Inspection 3 Photo Mon.	Erosion Void Photo Mon.
N	73165	6/12/2006	11/20/2006	12/13/2006	4/19/2007		N/A
N	73431	7/18/2006	11/20/2006	12/13/2006	4/19/2007		9/13/2007
N	73521	6/8/2006	11/20/2006	12/13/2006	4/19/2007		N/A
N75	1164	7/14/2006	11/7/2006	N/A	N/A		9/11/2007
N90	4700	6/26/2006	N/A	N/A	N/A		N/A
N90.10	214	7/5/2006	11/20/2006	12/13/2006	4/19/2007		N/A
N90.10	250	7/5/2006	11/20/2006	12/13/2006	4/19/2007		N/A
U08	17400	6/26/2006	N/A	N/A	N/A		N/A
U11	508	3/31/2006	11/21/2006	12/13/2006	4/19/2007		9/28/2007
U11	3700	6/20/2006	11/21/2006	12/13/2006	4/19/2007		9/10/2007
U11	3701	6/15/2006	11/21/2006	12/13/2006	4/19/2007		9/10/2007
U11.11	180	6/24/2006	11/21/2006	12/13/2006	4/19/2007		N/A
U11.11	700	6/21/2006	11/21/2006	12/13/2006	4/19/2007		9/12/2007
U11.11	1000	6/21/2006	11/21/2006	12/13/2006	4/19/2007		9/12/2007
U11.11	1006	6/19/2006	11/21/2006	12/13/2006	4/19/2007		9/12/2007
U17.10	50	8/27/2006	N/A	N/A	N/A		N/A
U25.5181	2200	8/12/2006	12/6/2006	12/13/2006	4/19/2007		N/A
U25.5181	2900	8/15/2006	12/6/2006	12/13/2006	4/19/2007		N/A
U25.54	1250	5/9/2006	12/6/2006	12/13/2006	4/19/2007		N/A
U25.54	0-S1	5/10/2006	12/6/2006	N/A	N/A		9/13/2007
U25.80	5850	5/30/2006	N/A	N/A	N/A		N/A
U25.804107	250	5/10/2006	12/6/2006	N/A	N/A		N/A
U31	150	8/13/2006	11/21/2006	12/13/2006	4/19/2007		N/A
U46.19	3290	10/13/2006	N/A	N/A	N/A		N/A
U46.1960	100	10/10/2006	11/29/2006	12/13/2006	4/19/2007		9/10/2007
U46.198060	551.2	9/27/2006	N/A	N/A	N/A		N/A
U46.198060	552.1	9/27/2006	N/A	N/A	N/A		N/A
U46.198060	552.2	9/27/2006	N/A	N/A	N/A		N/A
U46.198060	1730	9/9/2006	11/9/2006	N/A	N/A		N/A
U46.198060	2395	9/7/2006	11/9/2006	N/A	N/A		9/11/2007
U46.198060	2510	9/6/2006	11/9/2006	N/A	N/A		9/11/2007
U46.198060	4490	10/4/2006	N/A	N/A	N/A		N/A
U46.198060	5410	9/15/2006	11/9/2006	N/A	N/A		9/10/2007
U46.198060	6010	9/13/2006	11/9/2006	N/A	N/A		N/A
U46.19806050	530.3	9/27/2006	11/30/2006	12/13/2006	4/19/2007		9/11/2007
U46.19806050	530.4	9/27/2006	N/A	N/A	N/A		N/A
U46.19806050	530.5	9/27/2006	N/A	N/A	N/A		N/A
U46.19806050	530.6	9/27/2006	N/A	N/A	N/A		N/A
U46.19806050	1370	9/27/2006	N/A	N/A	N/A		N/A
U46.198080	1900	8/31/2006	11/9/2006	N/A	N/A		N/A
U46.19808020	600	8/31/2006	11/29/2006	12/13/2006	4/19/2007		N/A
U46.19808020	1110	8/31/2006	11/29/2006	12/13/2006	4/19/2007		N/A
U46.19808020	1260	8/23/2006	11/29/2006	12/13/2006	4/19/2007		N/A
Skid Road	4500	8/9/2006	N/A	N/A	N/A		N/A

Water Quality Inspections

Wet weather inspections were conducted on all sites that were selected to receive that specific monitoring treatment described in the 2006 workplan and treatment schedule.

The log of wet weather inspection activity including audits and wet weather inspections is provided in Table 7. This table will be updated in each quarterly report.

Wet Weather Inspection field forms are attached in Appendix 4.

Table 7. Monitoring activity log for audits and inspections of sites completed in 2006

2006 North Fork Elk River CAO Site Inspection Log							
Road #	Site ID #	Site Completed	Post Activity Audit	Wet Weather Inspection 1	Wet Weather Inspection 2	Wet Weather Inspection 3	Erosion Void
N	73165	6/12/2006	7/18/2006	12/13/2006	4/19/2007		N/A
N	73431	7/18/2006	7/18/2006	12/13/2006	4/19/2007		9/13/2007
N	73521	6/8/2006	7/18/2006	12/13/2006	4/19/2007		N/A
N75	1164	7/14/2006	8/16/2006	N/A	N/A		9/11/2007
N90	4700	6/26/2006	8/9/2006	N/A	N/A		N/A
N90.10	214	7/5/2006	8/16/2006	12/13/2006	4/19/2007		N/A
N90.10	250	7/5/2006	8/16/2006	12/13/2006	4/19/2007		N/A
U08	17400	6/26/2006	7/26/2006	N/A	N/A		N/A
U11	508	3/31/2006	04/31/06	12/13/2006	4/19/2007		9/28/2007
U11	3700	6/20/2006	7/26/2006	12/13/2006	4/19/2007		9/10/2007
U11	3701	6/15/2006	7/26/2006	12/13/2006	4/19/2007		9/10/2007
U11.11	180	6/24/2006	7/24/2006	12/13/2006	4/19/2007		N/A
U11.11	700	6/21/2006	7/24/2006	12/13/2006	4/19/2007		9/12/2007
U11.11	1000	6/21/2006	7/26/2006	12/13/2006	4/19/2007		9/12/2007
U11.11	1006	6/19/2006	7/26/2006	12/13/2006	4/19/2007		9/12/2007
U17.10	50	8/27/2006	9/26/2006	N/A	N/A		N/A
U25.5181	2200	8/12/2006	9/12/2006	12/13/2006	4/19/2007		N/A
U25.5181	2900	8/15/2006	9/12/2006	12/13/2006	4/19/2007		N/A
U25.54	1250	5/9/2006	6/11/2006	12/13/2006	4/19/2007		N/A
U25.54	0-S1	5/10/2006	6/11/2006	N/A	N/A		9/13/2007
U25.80	5850	5/30/2006	6/11/2006	N/A	N/A		N/A
U25.804107	250	5/10/2006	6/11/2006	N/A	N/A		N/A
U31	150	8/13/2006	9/13/2006	12/13/2006	4/19/2007		N/A
U46.19	3290	10/13/2006	11/7/2006	N/A	N/A		N/A
U46.1960	100	10/10/2006	11/7/2006	12/13/2006	4/19/2007		9/10/2007
U46.198060	551.2	9/27/2006	11/9/2006	N/A	N/A		N/A
U46.198060	552.1	9/27/2006	11/9/2006	N/A	N/A		N/A
U46.198060	552.2	9/27/2006	11/9/2006	N/A	N/A		N/A
U46.198060	1730	9/9/2006	10/9/2006	N/A	N/A		N/A
U46.198060	2395	9/7/2006	10/6/2006	N/A	N/A		9/11/2007
U46.198060	2510	9/6/2006	10/6/2006	N/A	N/A		9/11/2007
U46.198060	4490	10/4/2006	11/9/2006	N/A	N/A		N/A
U46.198060	5410	9/15/2006	10/9/2006	N/A	N/A		9/10/2007
U46.198060	6010	9/13/2006	10/9/2006	N/A	N/A		N/A

2006 North Fork Elk River CAO Site Inspection Log

Road #	Site ID #	Site Completed	Post Activity Audit	Wet Weather Inspection 1	Wet Weather Inspection 2	Wet Weather Inspection 3	Erosion Void
U46.19806050	530.3	9/27/2006	11/10/2006	12/13/2006	4/19/2007		9/11/2007
U46.19806050	530.4	9/27/2006	11/10/2006	N/A	N/A		N/A
U46.19806050	530.5	9/27/2006	11/10/2006	N/A	N/A		N/A
U46.19806050	530.6	9/27/2006	11/10/2006	N/A	N/A		N/A
U46.19806050	1370	9/27/2006	11/9/2006	N/A	N/A		N/A
U46.198080	1900	8/31/2006	10/9/2006	N/A	N/A		N/A
U46.19808020	600	8/31/2006	10/9/2006	12/13/2006	4/19/2007		N/A
U46.19808020	1110	8/31/2006	10/9/2006	12/13/2006	4/19/2007		N/A
U46.19808020	1260	8/23/2006	10/6/2006	12/13/2006	4/19/2007		N/A
Skid Road	4500	8/9/2006	9/12/2006	N/A	N/A		N/A

Summary of wet weather inspection results for 2006 North Fork Elk River CAO sites

Table 9 provides the wet weather inspection findings. Erosion was observed at 15 sites during the wet weather inspections, and consisted primarily of sloughing, slope failure, and channel erosion. Turbidity increases greater than 20% were observed at 11 of the sites. At 3 sites, turbidity increases occurred but no erosion or discharge was visible

Water samples were taken at all feasible sites during the wet weather inspections using a grab sampling technique. Samples were taken upstream and downstream relative to the road or where appropriate on decommissioned sites. Surveyors took great effort to minimize disturbance to the site during sample collection. In some instances samples could not be taken. Table 8 lists the sites where samples were not taken.

Table 8. Summary of North Fork Elk River sites with no water samples taken

2006 Wet Weather Inspection sites with no water samples taken			
Road Number	Site ID Number	Wet Weather Inspection	Reasons Samples Not Taken
N	73165	12/13/2006	Not Enough Flow to Take Water Samples
N90.10	214	12/13/2006	Not Enough Flow to Take Water Samples
U11	3701	12/13/2006	Not Enough Flow to Take Water Samples
U25.5181	2900	12/13/2006	Not Enough Flow to Take Water Samples
U25.54	1250	12/13/2006	Not Enough Flow to Take Water Samples
U46.19806050	530.3	12/13/2006	Not Enough Flow to Take Water Samples
N	73165	4/19/2007	Not Enough Flow to Take Water Samples
N	73431	4/19/2007	Not Enough Flow to Take Water Samples
N90.10	214	4/19/2007	Not Enough Flow to Take Water Samples
U11	3701	4/19/2007	Not Enough Flow to Take Water Samples
U11.11	180	4/19/2007	Not Enough Flow to Take Water Samples
U11.11	700	4/19/2007	Not Enough Flow to Take Water Samples
U11.11	1006	4/19/2007	Not Enough Flow to Take Water Samples
U25.5181	2900	4/19/2007	Not Enough Flow to Take Water Samples
U25.54	1250	4/19/2007	Not Enough Flow to Take Water Samples
U31	150	4/19/2007	Not Enough Flow to Take Water Samples

Table 9. Summary of wet weather inspection results for 2006 North Fork Elk River CAO sites

Wet Weather Inspection Results--2006 North Fork Elk River CAO Sites										
Road Number	Site ID Number	Wet Weather Inspection	Daily Rainfall	Date Samples Collected	Upstream NTU	Downstream NTU	NTU Difference	Percent Difference	Type of Erosion Observed	Estimated Amount
N	73165	12/13/2006	0.57	N/A	X	X	X	X	No Erosion Observed	None
N	73431	12/13/2006	0.57	12/13/2006	1179	859	-320	-27.1%	No Erosion Observed	None
N	73521	12/13/2006	0.57	12/13/2006	193	338	145	75.1%	Sloughing or Slope Failure	< 1 yard
N90.10	214	12/13/2006	0.57	N/A	X	X	X	X	Bank Erosion	< 1 yard
N90.10	250	12/13/2006	0.57	12/13/2006	72.4	187	115	158.3%	Channel Erosion	< 1 yard
U11	508	12/13/2006	0.57	12/13/2006	136	155	19	14.0%	No Erosion Observed	None
U11	3700	12/13/2006	0.57	12/13/2006	121	167	46	38.0%	Sloughing or Slope Failure	< 1 yard
U11	3701	12/13/2006	0.57	N/A	X	X	X	X	No Erosion Observed	None
U11.11	180	12/13/2006	0.57	12/13/2006	225	250	25	11.1%	No Erosion Observed	None
U11.11	700	12/13/2006	0.57	12/13/2006	101	238	137	135.6%	No Erosion Observed	None
U11.11	1000	12/13/2006	0.57	12/13/2006	257	308	51	19.8%	No Erosion Observed	None
U11.11	1006	12/13/2006	0.57	12/13/2006	193	169	-24	-12.4%	No Erosion Observed	None
U25.5181	2200	12/13/2006	0.57	12/13/2006	1358	1451	93	6.8%	Sloughing, Rilling	< 1 yard
U25.5181	2900	12/13/2006	0.57	N/A	X	X	X	X	No Erosion Observed	None
U25.54	1250	12/13/2006	0.57	N/A	X	X	X	X	No Erosion Observed	None
U31	150	12/13/2006	0.57	12/13/2006	179	223	44	24.6%	No Erosion Observed	None
U46.1960	100	12/13/2006	0.57	12/13/2006	33.4	264	231	690.4%	No Erosion Observed	None
U46.19806050	530.3	12/13/2006	0.57	N/A	X	X	X	X	No Erosion Observed	None
U46.19808020	600	12/13/2006	0.57	12/13/2006	1997	3134	1137	56.9%	Sloughing, Bank Erosion Channel Erosion	1-5 yards
U46.19808020	1110	12/13/2006	0.57	12/13/2006	1997	3134	1137	56.9%	Sloughing Channel Erosion	1-5 yards
U46.19808020	1260	12/13/2006	0.57	12/13/2006	198	1997	1799	908.6%	Channel Erosion, Gullyng	1-5 yards

Road Number	Site ID Number	Wet Weather Inspection	Daily Rainfall	Date Samples Collected	Upstream NTU	Downstream NTU	NTU Difference	Percent Difference	Type of Erosion Observed	Estimated Amount
N	73165	4/19/2007	0.04	N/A	X	X	X	X	No Erosion Observed	None
N	73431	4/19/2007	0.04	N/A	X	X	X	X	No Erosion Observed	None
N	73521	4/19/2007	0.04	4/19/2007	9.8	13.3	3.5	35.7%	Sloughing or Slope Failure, Downcutting	< 1 yard
N90.10	214	4/19/2007	0.04	N/A	X	X	X	X	No Erosion Observed	None
N90.10	250	4/19/2007	0.04	4/19/2007	10.5	11.7	1.2	11.4%	No Erosion Observed	None
U11	508	4/19/2007	0.04	4/19/2007	33	37.5	4.5	13.6%	No Erosion Observed	None
U11	3700	4/19/2007	0.04	4/19/2007	40.4	37.3	-3.1	7.7%	No Erosion Observed	None
U11	3701	4/19/2007	0.04	N/A	X	X	X	X	No Erosion Observed	None
U11.11	180	4/19/2007	0.04	N/A	X	X	X	X	No Erosion Observed	None
U11.11	700	4/19/2007	0.04	N/A	X	X	X	X	No Erosion Observed	None
U11.11	1000	4/19/2007	0.04	4/19/2007	51.4	47.7	-3.7	7.2%	No Erosion Observed	None
U11.11	1006	4/19/2007	0.04	N/A	X	X	X	X	No Erosion Observed	None
U25.5181	2200	4/19/2007	0.04	4/19/2007	44.3	51.7	7.4	16.7%	Sloughing or Slope Failure	1-5 yards
U25.5181	2900	4/19/2007	0.04	N/A	X	X	X	X	Channel Erosion	< 1 yard
U25.54	1250	4/19/2007	0.04	N/A	X	X	X	X	No Erosion Observed	None
U31	150	4/19/2007	0.04	N/A	X	X	X	X	No Erosion Observed	None
U46.1960	100	4/19/2007	0.04	4/19/2007	11.1	11.3	0.2	1.8%	Rilling, Channel Erosion	< 1 yard
U46.19806050	530.3	4/19/2007	0.04	4/19/2007	10.7	9.4	-1.3	12.1%	No Erosion Observed	None
U46.19808020	600	4/19/2007	0.04	4/19/2007	47.1	44.7	-2.4	5.1%	Sloughing or Slope Failure, Channel Erosion, Downcutting	1-5 yards
U46.19808020	1110	4/19/2007	0.04	4/19/2007	46.6	54.2	7.6	16.3%	Sloughing, Rilling, Gullyng, Bank, Surface and Channel Erosion	1-5 yards
U46.19808020	1260	4/19/2007	0.04	4/19/2007	27.8	40.3	12.5	45%	Bank and Channel Erosion, Gullyng, Rilling, Sloughing, Downcutting	> 5 yards

Notifications

Observations of sediment discharges to streams during the wet weather inspections are reported to the NCRWQCB. There are several possible outcomes of the inspections that determine when and if notifications are provided.

When the field inspector observes erosion features, such as bank slumps, rilling, etc., they complete a sediment discharge form upon returning from the field. The determination that sediment has been discharged to the stream, or may in the future, is based on observation and inspector judgment. The NCRWQCB is notified in writing, by phone and/or email within 48 hours of the observation consistent with Erosion Control Plan (ECP) reporting protocol. In cases where turbidity samples show significant turbidity increases but no erosion was visible during the inspection, the NCRWQCB is notified of a turbidity discharge via this monitoring report (Table 11).

PALCO operations managers review all types of discharges in a timely manner to determine notification status and corrective action. Table 12 lists the erosion and discharge findings and the PALCO operations follow-up if any.

As per the draft memorandum dated December 5, 2006 by the NCRWQCB, the discharge notifications are summarized in tabular form in Table 10. A map with the locations of these discharges is attached in Appendix 5.

Table 10. Log of Discharge Notifications sent to NCRWQCB for North Fork Elk River

Water Quality Discharge Notifications- North Fork Elk River 2006 CAO Sites							
Road Number	Site Number	Date Discharge Discovered	Amount of Sediment Discharged	Nature and Cause of Discharge	Corrective Action Taken	Date Corrective Action Taken	Corrective Action Applied to Site or Recommendation
U25.5181	2200	4/19/2007	4 yards	Bank Failure	Pending	N/A	Material will be excavated out of channel and LWD will be placed against bank
U46.19808020	1260	4/19/2007	2 yards discharged, 15 yards in creek	Bank Failure	No	N/A	No access- Decommissioned Road
U25.5181	2200	12/13/2006	1 yard	Bank Sloughing	Pending	N/A	Bioengineering
U46.19808020	600	11/29/2006	1-3 yards	Bank Slumping	No	N/A	No access- Decommissioned Road
U46.19808020	1110	11/29/2006	1-3 yards	Bank Slumping	No	N/A	Bioengineering
U	N/A	2/22/07	7 yards	Landslide	Completed	5/1/2007	Realignment of Road, construct inboard ditch, straw mulch and seed in RMZ
U25.5181	2200	3/26/07	1-5 yards	Bank Sloughing	Pending	N/A	Hay and seed
N	73521	1/10/06	< 1 yard	Fill Failure	Yes	2/1/2006	Installed subsurface drain, armored, hayed, seeded
N75.8844	687	2/20/06	< 1 yard	Fill Failure	No	N/A	No access- Decommissioned Road
N75.8861	1410	2/20/06	< 1 yard	Bank Sloughing	No	N/A	No access- Decommissioned Road
N85	9270	2/20/06	< 1 yard	Bank Sloughing	No	N/A	No access- Decommissioned Road

Table 11. Log of PALCO Notification Activities for 2006 North Fork Elk River Sites

Notification Log North Fork Elk River 2006 CAO Sites							
Road Number	Site ID Number	Wet Weather Inspection	Percent Turbidity Difference	Estimated Erosion Amount	ECP Discharge Notification to NCRWQCB	Date NCRWQCB Notified of ECP Discharges	Date Turbidity Discharges Reported
N	73165	12/13/2006	X	None	No	N/A	N/A
N	73431	12/13/2006	-27%	None	No	N/A	No
N	73521	12/13/2006	75%	< 1 yard	No	N/A	1/15/2007
N90.10	214	12/13/2006	X	< 1 yard	No	N/A	N/A
N90.10	250	12/13/2006	158%	< 1 yard	No	N/A	1/15/2007
U11	508	12/13/2006	14%	None	No	N/A	No
U11	3700	12/13/2006	38%	< 1 yard	No	N/A	1/15/2007
U11	3701	12/13/2006	X	None	No	N/A	N/A
U11.11	180	12/13/2006	11%	None	No	N/A	No
U11.11	700	12/13/2006	136%	None	No	N/A	1/15/2007
U11.11	1000	12/13/2006	20%	None	No	N/A	1/15/2007
U11.11	1006	12/13/2006	-12%	None	No	N/A	No
U25.5181	2200	12/13/2006	7%	< 1 yard	Yes	12/15/2006	No
U25.5181	2900	12/13/2006	X	None	No	N/A	N/A
U25.54	1250	12/13/2006	X	None	No	N/A	N/A
U31	150	12/13/2006	25%	None	No	N/A	1/15/2007
U46.1960	100	12/13/2006	690%	None	No	N/A	1/15/2007
U46.19806050	530.3	12/13/2006	X	None	No	N/A	N/A
U46.19808020	600	12/13/2006	57%	1-5 yards	Yes	12/1/2006	1/15/2007
U46.19808020	1110	12/13/2006	57%	1-5 yards	Yes	12/1/2006	1/15/2007
U46.19808020	1260	12/13/2006	909%	1-5 yards	No	N/A	1/15/2007
N	73165	4/19/2007	X	None	No	N/A	N/A
N	73431	4/19/2007	X	None	No	N/A	N/A
N	73521	4/19/2007	35.7%	< 1 yard	No	N/A	7/13/2007
N90.10	214	4/19/2007	X	None	No	N/A	N/A
N90.10	250	4/19/2007	11.4%	None	No	N/A	N/A
U11	508	4/19/2007	13.6%	None	No	N/A	N/A
U11	3700	4/19/2007	7.7%	None	No	N/A	N/A
U11	3701	4/19/2007	X	None	No	N/A	N/A
U11.11	180	4/19/2007	X	None	No	N/A	N/A
U11.11	700	4/19/2007	X	None	No	N/A	N/A
U11.11	1000	4/19/2007	7.2%	None	No	N/A	N/A
U11.11	1006	4/19/2007	X	None	No	N/A	N/A
U25.5181	2200	4/19/2007	16.7%	1-5 yards	Yes	4/20/2007	N/A
U25.5181	2900	4/19/2007	X	< 1 yard	No	N/A	N/A
U25.54	1250	4/19/2007	X	None	No	N/A	N/A
U31	150	4/19/2007	X	None	No	N/A	N/A
U46.1960	100	4/19/2007	1.8%	< 1 yard	No	N/A	N/A
U46.19806050	530.3	4/19/2007	12.1%	None	No	N/A	N/A
U46.19808020	600	4/19/2007	5.1%	1-5 yards	No	N/A	N/A
U46.19808020	1110	4/19/2007	16.3%	1-5 yards	No	N/A	N/A
U46.19808020	1260	4/19/2007	45%	> 5 yards	Yes	4/20/2007	4/20/2007

Corrective Actions

PALCO operations managers consider a number of factors when determining what corrective actions will be taken. Accessibility and knowledge of site conditions will determine whether foresters or road maintenance crews are dispatched immediately or whether improvements are postponed until dryer operating conditions occur to avoid causing additional erosion damage at the site (typically the next summer).

The corrective action activities are listed in Table 12. Sites where activities are delayed are listed as pending.

Table 12. Corrective Actions Log for 2006 North Fork Elk River CAO sites

Corrective Action Log- 2006 North Fork Elk River CAO Sites									
Road Number	Site ID Number	Turbidity Difference	Estimated Erosion Amount	Discharge Reported	Operations Notification Date	Operations Person Notified	PALCO Operations Follow-up	Date Completed	Corrective Action Taken or Recommended
N	73165	X	None	No	N/A	N/A	None	N/A	None
N	73431	-27.1%	None	No	N/A	N/A	None	N/A	None
N	73521	75.1%	< 1 yard	No	12/15/2006	Dave Carter	Completed	1/2007	Hayed & Seeded
N90.10	214	X	< 1 yard	No	12/15/2006	Dave Carter	Completed	6/1/2007	Hay & Seed
N90.10	250	158.3%	< 1 yard	No	12/15/2006	Dave Carter	Completed	6/1/2007	Hay & Seed
U11	508	14.0%	None	No	N/A	N/A	None	N/A	None
U11	3700	38.0%	< 1 yard	No	12/15/2006	Dave Carter	None	N/A	None
U11	3701	X	None	No	N/A	N/A	None	N/A	None
U11.11	180	11.1%	None	No	N/A	N/A	None	N/A	None
U11.11	700	135.6%	None	No	N/A	N/A	None	N/A	None
U11.11	1000	19.8%	None	No	N/A	N/A	None	N/A	None
U11.11	1006	-12.4%	None	No	N/A	N/A	None	N/A	None
U25.5181	2200	6.8%	< 1 yard	Yes	12/15/2006	Dave Carter	Pending	N/A	Bioengineering
U25.5181	2900	X	None	No	N/A	N/A	None	N/A	None
U25.54	1250	X	None	No	N/A	N/A	None	N/A	None
U31	150	24.6%	None	No	N/A	N/A	None	N/A	None
U46.1960	100	690.4%	None	No	N/A	N/A	None	N/A	None
U46.19806050	530.3	X	None	No	N/A	N/A	None	N/A	None
U46.19808020	600	56.9%	1-5 yards	Yes	12/15/2006	Dave Carter	None	N/A	None
U46.19808020	1110	56.9%	1-5 yards	Yes	12/15/2006	Dave Carter	None	N/A	None
U46.19808020	1260	908.6%	1-5 yards	No	12/15/2006	Dave Carter	None	N/A	None

Road Number	Site ID Number	Turbidity Difference	Estimated Erosion Amount	Discharge Reported	Operations Notification Date	Operations Person Notified	PALCO Operations Follow-up	Date Completed	Corrective Action Taken or Recommended
N	73431	X	None	No	N/A	N/A	None	N/A	None
N	73521	35.7%	< 1 yard	No	4/20/2007	Dave Carter	None	N/A	None
N90.10	214	X	None	No	N/A	N/A	None	N/A	None
N90.10	250	11.4%	None	No	N/A	N/A	None	N/A	None
U11	508	13.6%	None	No	N/A	N/A	None	N/A	None
U11	3700	7.7%	None	No	N/A	N/A	None	N/A	None
U11	3701	X	None	No	N/A	N/A	None	N/A	None
U11.11	180	X	None	No	N/A	N/A	None	N/A	None
U11.11	700	X	None	No	N/A	N/A	None	N/A	None
U11.11	1000	7.2%	None	No	N/A	N/A	None	N/A	None
U11.11	1006	X	None	No	N/A	N/A	None	N/A	None
U25.5181	2200	16.7%	1-5 yards	Yes	4/20/2007	Dave Carter	Yes	Pending	Material will be excavated out of channel, LWD placement
U25.5181	2900	X	< 1 yard	No	4/20/2007	Dave Carter	None	N/A	None
U25.54	1250	X	None	No	N/A	N/A	None	N/A	None
U31	150	X	None	No	N/A	N/A	None	N/A	None
U46.1960	100	1.8%	< 1 yard	No	4/20/2007	Dave Carter	None	N/A	None
U46.19806050	530.3	12.1%	None	No	N/A	N/A	None	N/A	None
U46.19808020	600	5.1%	1-5 yards	No	4/20/2007	Dave Carter	None	N/A	None
U46.19808020	1110	16.3%	1-5 yards	No	4/20/2007	Dave Carter	None	N/A	None
U46.19808020	1260	45%	> 5 yards	Yes	4/20/2007	Dave Carter	None	N/A	None
N	73521	X	< 1 yard	Yes	1/10/06	Dave Carter	Completed	2/1/06	Installed Subsurface Drain, hayed, seeded
N75.8844	687	X	< 1 yard	Yes	2/20/06	Dave Carter	None	N/A	None
N75.8861	1410	X	< 1 yard	Yes	2/20/06	Dave Carter	None	N/A	None
N85	9270	X	< 1 yard	Yes	2/20/06	Dave Carter	None	N/A	None

Erosion Void Assessment

Erosion void assessments were conducted on 14 of the 44 sites completed in 2006. Table 7 lists the dates the assessments were conducted. Results are listed in Table 13. Erosion void field forms are attached in Appendix 6.

Table 13. Erosion Void Results for 2006 North Fork Elk River CAO Sites

Road & Site Number	Estimated Cubic Yards Saved/ % lost	Erosion Feature #	Displaced Volume (yds ³)	Already Delivered Volume (yds ³)	Likely Future Delivery Volume (yds ³)
N 73431	401/ 0.0004%	1	0.016	0.002	0.014
		2	0.014	0.000	0.000
		Total	0.030	0.002	0.014
N75 1164	1805/ 0.0532%	1	0.537	0.322	0.215
		2	0.270	0.216	0.054
		3	0.469	0.422	0.047
		Total	1.276	0.960	0.316
U11 508	6770	None			
U11 700	0	None			
U11 1000	120/ 0.0018%	1	0.011	0.002	0.009
		2	1.112	0.000	0.222
		Total	1.123	0.002	0.231
U11.11 1006	95	None			
U11.42 3700	5968/ 0.00%	1	0.348	0.000	0.000
		2	2.146	0.000	0.000
		3	0.002	0.000	0.000
		Total	2.495	0.000	0.000
U11.42 3701	101/ 0.1190%	1	0.039	0.012	0.008
		2	0.073	0.058	0.015
		3	0.056	0.050	0.000
		Total	0.168	0.120	0.022
U25.54 0-S1	380	None			
U46.1960 100	125/ 3.2443%	1	1.609	1.356	0.259
		2	0.184	0.184	0.000
		3	0.153	0.153	0.000
		4	2.952	2.361	0.590
		Total	4.899	4.055	0.849
U46.198060 2395	139/ 0.0709%	1	0.063	0.006	0.019
		2	0.228	0.034	0.057
		3	0.088	0.018	0.0219
		4	0.135	0.040	0.027
		Total	0.514	0.099	0.125

Road & Site Number	Estimated Cubic Yards Saved/ % lost	Erosion Feature #	Displaced Volume (yds ³)	Already Delivered Volume (yds ³)	Likely Future Delivery Volume (yds ³)
U46.198060 2510	40/ 4.9993%	1	0.466	0.420	0.047
		2	0.388	0.349	0.039
		3	0.219	0.197	0.022
		4	0.314	0.283	0.031
		5	0.835	0.751	0.083
		Total	2.222	2.000	0.222
U46.198060 5410	372/ 0.0773%	1	0.320	0.288	0.032
		Total	0.320	0.288	0.032
U46.19806050 530.3	531	None			

Total Estimated Yards Saved **16847**
 Weighted Average Sediment Lost **0.045%**

Project Problems Encountered and Resolution

There were several minor problems encountered with the implementation of this first set of wet weather inspections. The triggering event can be somewhat difficult to catch. It was found that the weather forecast for that particular day is not necessarily accurate. These decisions are always going to be judgment calls. We'll continue to strive to hit the storm triggers.

Most of the inspectors working on this project do not have an extensive background in road construction. In reviewing some of the erosion findings with the road manager, we decided that it would be beneficial to hold a more detailed training to discuss general road construction and provide a better baseline of knowledge for the inspectors.

There were several inspectors that observed bare mineral soil at the sites. We would ideally like to have inspectors take hay bales, seed, wattles, and a shovel to the wet weather inspection sites, if feasible. This would enable the inspectors to take corrective action when a problem is observed. This could help minimize additional trips to the site to implement the corrective action.

In the first large storm after construction, most of the water samples taken exhibited more than a 20% increase in value from the upstream to the downstream sample for a particular site. The significant turbidity increases may have been caused by these sites being recently constructed and flushing out sediment from operations during these first storms. We expect to see a decrease in the NTU's over time at these sites.

We were unable to compare the two wet weather inspections due to the difference in weather conditions. In the future, comparing the wet weather inspections should help us to find trends in the data that may enable us to evaluate the sites more clearly. We will continue to make improvements to streamline this process. We look forward to analyzing the trends that the sites exhibit over time, and use our knowledge to improve our practices.

Appendices

Appendix 1

2006 Work Plan Summary

Appendix 2

Copies of Post Activity Audit Field Sheets

Appendix 3

Copies of 2006 Photo Monitoring Field Sheets

Appendix 4

Copies of 2006 Wet Weather Inspection Field Sheets

Appendix 5

Copies of 2006 Water Quality Discharge Notifications Map

Appendix 6

Copies of 2007 Erosion Void Field Sheets

CD North Fork Elk River CAO R1-2006-0055_1

Copies of Electronic Files Containing Site Photos and Erosion Void Photos