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April 10, 2017

VIA U.S. MAIL/EMAIL
(kenneth.petruzzelli@waterboards.ca.gov)

Kenneth Petruzzelli
State Water Resources Control Board
801 K Street, 23rd Floor
Sacramento, CA 95814

Re: Marble Mountain Ranch Proposed Time Schedule and March 17, 2017, Notice of Violation No. 2

Dear Mr. Petruzzelli:

On behalf of Douglas and Heidi Cole (the "Coles"), owners and operators of Marble Mountain Ranch ("Ranch"), I am in receipt of the March 17, 2017, North Coast Regional Water Quality Control Board ("Regional Water Board") Notice of Violation No. 2 ("NOV") that indicates that it also serves as a response to my August 26, 2016, correspondence. In addition to the response outlined below, please find attached, as **Exhibit A**, a report produced by Rocco Fiori of Fiori Geosciences discussing sedimentation at the Ranch. This report addresses several of the requirements included in the Regional Water Board's Cleanup and Abatement Order R1-2016-0031 ("CAO") that serves as the basis for the NOV. The data and conclusions contained in the Fiori Geosciences report, with regard to sedimentation at the Ranch, are based on several site visits and conversations with the Coles during the exceptionally wet winter season of 2016-2017.

Beyond providing a response to the NOV through this correspondence, the Coles also seek an update regarding the February 8, 2017, correspondence to you proposing a revised time schedule for many of the requirements under the CAO and the State Water Resources Control Board's ("State Water Board") Draft Order WR 2017-00XX-DWR ("Draft Order"). That correspondence contains a number of milestones and steps with timelines that are fast approaching. The Coles would like to confirm that the State and Regional Water Boards are agreeable to the actions and timelines proposed in that letter. The February 8, 2017, correspondence with the proposed time schedule is attached as **Exhibit B**.

NOV Response

The NOV alleges that the Coles are currently in violation of Directives 1, 2, 3, and 4a. A response to each of those allegations follows.

Directive 1

Directive 1 instructs the Coles to submit both (1) a water efficiency study and (2) water delivery system design to the Regional Water Board by October 15, 2016. As discussed in the February 8, 2017, correspondence and in many other discussions with both the State and Regional Water Boards, the Coles have an established pre-1914 3 cfs right to use water for hydroelectric power generation and for domestic use. The Coles have demonstrated that they put all water diverted under that pre-1914 3 cfs right to beneficial use. Therefore, they do not anticipate completing a water efficiency study.

The second element of Directive 1 under the CAO requires that the Coles submit a water delivery system design for their diversion by October 15, 2016. The February 8, 2017, correspondence proposed June 30, 2017, as the revised deadline for that project. The Coles have continued to seek California Department of Fish and Wildlife's ("CDFW") approval of a proposed approach for water system delivery using technology from Farmers' Conservation Alliance, but they have yet to receive a response to their inquiries. A formal letter seeking CDFW's review and a meeting to discuss a diversion control mechanism was submitted on March 8, 2017. The Coles are still awaiting CDFW's response to that letter.

Directive 2

The CAO's Directive 2 requires that the Coles submit a restoration and monitoring plan for erosion at the Irving Creek outfall. The Fiori Geosciences' report addresses the erosion at the Irving Creek outfall and indicates that the area is evolving to a stable environment but could be improved through simple, cost effective measures. The Coles currently have a unique opportunity to quickly implement the Fiori Geosciences' recommendation to improve the area by installing a culvert at the top of the outfall and placing large rootwads from downed trees on their property at the base of the outfall to dissipate energy from the outfall. To implement this approach, the Coles engaged ECORP Consulting, Inc. to establish a plan. That plan is attached to this correspondence as **Exhibit C**. The opportunity is time sensitive as the heavy machinery required for this approach will only be at the Ranch through mid to late April. The Coles request an expedited review of their plan to ensure they are able to take advantage of the current opportunity to implement a resource improvement at Irving Creek.

To address a concern outlined in the NOV with regard to discharges at Irving Creek and clarify the Coles current operations, the Coles have elected not to operate their Pelton wheel this winter. That decision was made to ensure that they are not impacting any waters of the state through discharge at the Irving Creek outfall. This temporary election does not demonstrate an intent to waive or reduce their pre-1914 3 cfs right. Implementing the proposed plan for Irving Creek discussed above will allow the Coles to operate their Pelton wheel and ensure that the Irving Creek outfall does not result in any erosion in the future.

Directive 3

Directive 3 requires that the Coles (1) evaluate the entire ditch system and identify "all features and locations susceptible to failure" and (2) provide a ditch operation and maintenance plan. The Fiori Geosciences' report, attached as **Exhibit A,** provides a ditch evaluation as required under Directive 3. The second portion of Directive 3 requires that the Coles submit a ditch operation and maintenance plan to address any possible failures along the diversion. The Coles are currently working with their consultants at ECORP Consulting, Inc. to formalize their ditch operation and maintenance activities into a plan. The Coles' ditch operation activities, as reported in the Fiori Geosciences' report, have resulted in no ditch failures during the 2016-2017 winter season and no impacts to waters of the state.

Directive 4a

The final alleged violation in the NOV is a violation of Directive 4a which requires that the Coles:

> assess slopes between the upper ditch and Stanshaw Creek and the streambed of Stanshaw Creek and Irving Creek and the unnamed tributary to Irving Creek for stored sediment deposits and erosional sources associated with the past and current failures of the ditch. Identify all erosional issues and those that should be corrected, propose corrective measures, and provide a schedule for implementing corrective measures.

The Fiori Geosciences' report, attached as **Exhibit A,** assesses the slopes of the diversion ditch along all the identified areas in Directive 4, identifies all erosional issues, and proposes corrective measures. The Coles have also provided a schedule for implementing corrective measures through the February 8, 2017, correspondence. The Fiori Geosciences' report confirms those measures will provide correction to any of the issues along the diversion. Therefore, with the submission of the Fiori Geosciences' report, the Coles have complied with this Directive.

Please contact me at barbara@churchwellwhite.com or (916) 468-0625 if you have any questions or concerns.

Regards,

Churchwell White LLP

for Barbara A. Brenner
KAF/dmg

Enclosures

(via email, with enclosures)
cc: John O'Hagan (john.ohagan@waterboards.ca.gov)
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EXHIBIT A

Stanshaw Creek Diversion Ditch
Sediment Source Assessment

Prepared for: Douglas and Heidi Cole, Marble Mountain Ranch

Prepared by: Rocco Fiori, Engineering Geologist, PG8066

April 4, 2017

Stanshaw Creek Diversion Ditch Sediment Source Assessment

1.0 Introduction

This report summarizes the approach and findings for a sediment source assessment of the Stanshaw Creek diversion ditch prepared by Fiori GeoSciences (FGS). The Marble Mountain Ranch (MMR) has a patented water right to divert water from Stanshaw Creek for consumptive and non-consumptive uses. The California State Water Resources Control Board (SWRCB) and National Marine Fisheries Service (NMFS) are concerned the operation and maintenance of the diversion ditch constitutes a threat to downstream beneficial uses including water quality, and fish and wildlife habitat.

2.0 Approach

The potential for ditch related sediment and turbidity to impact the waters of California was assessed through a combination of field assessments and desktop analysis. Ditch related sediment sources and delivery paths were inventoried and mapped in the field. Storm water runoff was monitored for sediment and turbidity outputs at several key locations in the study area. Visual inspection and photographic monitoring was conducted at springs, un-channelized flow paths, stream courses, and at a five-gallon bucket that was part of a domestic water system located downslope from the ditch. The 19 sites identified by Feiler et al. (2015) were located and assessed as part of this study. Douglas Cole was interviewed in the field and by email regarding ditch infrastructure, implementation of ditch operation and maintenance Best Management Practices (BMPs), and the timing of storm driven erosion events.

Field activities were conducted by FGS on April 20, 2016, December 15 and 16, 2016, February 24, 2017 and March 22, 2017. Field dates in December, February and March were conducted during leaf-off conditions and while overland flow conditions were present. A timeline of key data collection activities associated with this study is summarized in Table 1.

Desktop analysis included assessment of watershed scale and site level conditions using a 1-meter resolution LiDAR DEM, Digital Ortho-Photographs, and the Regional Geologic Map (Wagner and Saucedo 1987) with ArcGIS. LiDAR data was acquired in December 2014 and January 2015 by Quantum Spatial, Inc. (QSI 2015) under contract with the Mid-Klamath Watershed Council and provided to FGS in 2016. Rainfall statistics for the nearby gage at Orleans, California (Station ID 046508), were used to characterize water year types and to identify potential hydrometerologic drivers of slope stability and sediment delivery for recent and historic management periods of the Stanshaw Creek Ditch. Rainfall data was obtained from websites operated by the California Data Exchange Center (CDEC) and the US Geologic Survey (USGS).

Field and desktop analysis followed standard methods including methods described in Kondolf and Piegay (2003), Reid and Dunne (1996), Dunne and Leopold (1978), Sigafoos (1964), and techniques of the USGS. Key infrastructure and erosion feature attributes were recorded in the field and include feature type, location, dimensions (e.g. length, width, and average thickness), sediment delivery ratio (if applicable),

age estimate, and descriptive notes. Sediment volumes for the two largest features (the stream crossing at the unnamed tributary and the gully at Irving Creek outfall) were estimated using dimensions obtained

from the 1-meter LiDAR DEM and calibrated with field measurements. For all other erosion features, sediment production and delivery volumes were estimated by pacing the dimension of at least one side of the feature (typically the width) and then visually estimating its thickness and length. Sediment delivery volumes were defined as the quantity of earth materials that reached a watercourse and/or stored on floodprone surfaces. The sediment delivery ratio was estimated as the ratio of the volume delivered to the volume of sediment stored on the hillslope or road bench. Sediment production and delivery volumes using these methods are assumed to have an approximate +/- 20 percent margin of error, unless noted otherwise. The threat of future sediment delivery was assessed through a combination of field and desktop analysis.

The work presented herein builds on the field reconnaissance and findings from Fiori (2016), Feiler (2015), and Anderson et al. (no date).

Table 1. Data collection activity timeline.

DATE	Activity
December 2014 & January 2015	LiDAR data acquisition by Quantum Spatial, Inc (QSI).
December 17, 2014	SWRCB staff field inspection and meeting with stakeholders.
February 12, 2015	SWRCB staff field inspections, reports by Feiler (2015) and Anderson et al. (no date).
April 20, 2016	FGS Field Reconnaissance, report by FGS (2016).
December 15 and 16, 2016	FGS Field Assessment and Storm Water Quality Monitoring, this study.
February 24, 2017	FGS Field Assessment and Storm Water Quality Monitoring, this study.
March 22, 2017	FGS Storm Water Quality Monitoring, this study.

3.0 Findings

Rainfall is a principle driver of erosion and sedimentation. The likelihood of hillslope derived sediment to deliver to a water course is increased through a combination of saturated soil conditions and storm related triggering events.

Rainfall records for the gage at Orleans California indicate the 2017 water year wet season rank as the 9th wettest for the 112-year period of record (Table 2). Rainfall statistics for this gage also show the WY2017 wet season had a rainfall total of 53.26 inches, a 12.6-year recurrence interval (RI), and characterized as an "Extremely Wet" water year type (Table 2 and Figure 1). In comparison, the Orleans rainfall data show the WY2016 and WY2006 wet seasons rank as the 30th and 6th wettest for the past 112 years of record (Table 2).

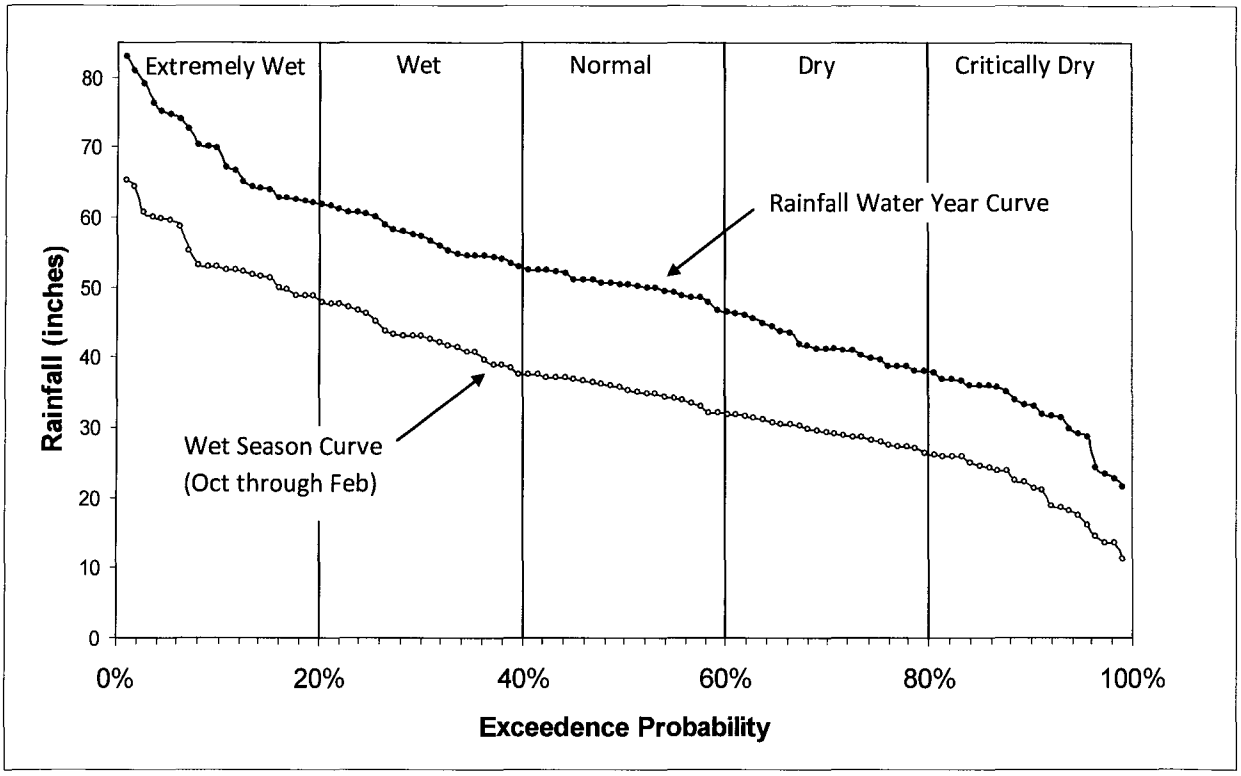

Figure 1. Rainfall exceedence probability and water year type for Orleans, California (NOAA Gage ID: 046508).

Table 2. Rainfall statistics for the top 10 ranked and selected wet season water years for Orleans, California (NOAA Gage ID: 046508). For this study the water year wet season is defined as the period from October 1st to February 28th.

Rank	Water Year	Rain (inches)	Recurrence Interval (years)	Water Year Type
1	1956	65.2	113.0	Extremely Wet
2	1974	64.5	56.5	Extremely Wet
3	1958	60.6	37.7	Extremely Wet
4	1927	59.9	28.3	Extremely Wet
5	1982	59.8	22.6	Extremely Wet
6	2006	59.6	18.8	Extremely Wet
7	1983	58.7	16.1	Extremely Wet
8	1965	55.2	14.1	Extremely Wet
9	2017	53.3	12.6	Extremely Wet

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10	1999	53.0	11.3	Extremely Wet
30	2016	43.8	3.8	Wet
76	2015	30.3	1.5	Dry

3.1 Sediment Sources

Field assessments conducted by FGS identified a total of 33 erosion features and characterized sediment production and delivery for 13 features that occurred during WY2017 and 11 older features (Table 3 and Figure 2. Based on dendrogeomorphic evidence, storm history, and landowner information, the older features were most likely triggered by storms during WY2006 and previous years with wetter than normal water year types (Figure 1 and Table 2).

Cutslope Failures

Data in Table 3 show that compared to other feature types cutslope failures had the greatest frequency of occurrence (14/22), produced approximately 96 yds^3 of sediment, and did not deliver sediment to the waters of California during the study period. Volume estimates for pre-WY2017 cutslope failures were not prepared for this study, but could be extrapolated from existing data. Ditch segments with pre-2017 fillslope and cutslope erosion are delineated by solid yellow and red lines, respectively on Figure 2.

Fillslope Surface Erosion

Fillslope surface erosion (FSE) had the second greatest frequency of occurrence (5/22), produced approximately 3 yds^3 of sediment, and delivered approximately 1.6 yds^3 of sediment to the waters of California during study period (Table 3). Of the total 1.6 yds^3 of sediment delivered, approximately 70% of that volume (1.1 yds^3) was delivered directly to the bed and banks of the unnamed tributary to Stanshaw Creek from two small features at Stations 470 and 513 (Figure 2). Approximately 50 percent, of the 1.1 yds^3 delivered sediment, was stored along the channel margin. Based on field observations of MMR BMPs and rates of natural regeneration, vegetation will likely stabilize the deposition remaining along the channel margin. The third site of fillslope surface erosion related delivery occurred at Station 148 where less than 0.5 yds^3 of sediment was delivered directly to Stanshaw Creek. Sediment delivery from features located at Stations 148 and 513 were associated with grading efforts to relocate sediment produced from nearby cutslope failures. Grading associated sediment delivery could be avoided or minimized if the ditch travel way was larger and capable of using equipment to export sediment spoils off-site. Two of the five FSE features did not deliver sediment.

Shotgun Culvert

Sediment production and delivery volumes were estimated for the shotgun culvert located at Station 474. During WY2017 study period, erosion related to the outfall from the shotgun culvert was estimated to produce and deliver 1 yds^3 and 0.7 yds^3 of sediment, respectively. The long-term sediment production and delivery volumes were estimated to be 6.3 yds^3 (Table 3). According to Douglas Cole, the culvert was installed in 1996. By assuming the plunge pool volume represents erosion over a 21-year period an erosion rate of ~0.3 yds^3/yr and incision rate of ~ 4"/yr was estimated. Field inspection of the feature indicates the plunge pool has become quasi-stable in the consolidated paleo-landslide deposits that underlie the site. The difference in the short- and long-term of sediment delivery rates, 0.7 yds^3 versus

~0.3 yds^3/yr, was likely due to the accounting of the sedimentation related to a scarp that formed along the contact between the unconsolidated colluvium and fill, and the underlying paleo-landslide deposits (Figure 3). The cylindrical shape and flat base of the plunge pool, and the stair-stepped topography suggests this feature has eroded into more resistant material and the current incision rate may be an order of magnitude lower than the rate calculated above.

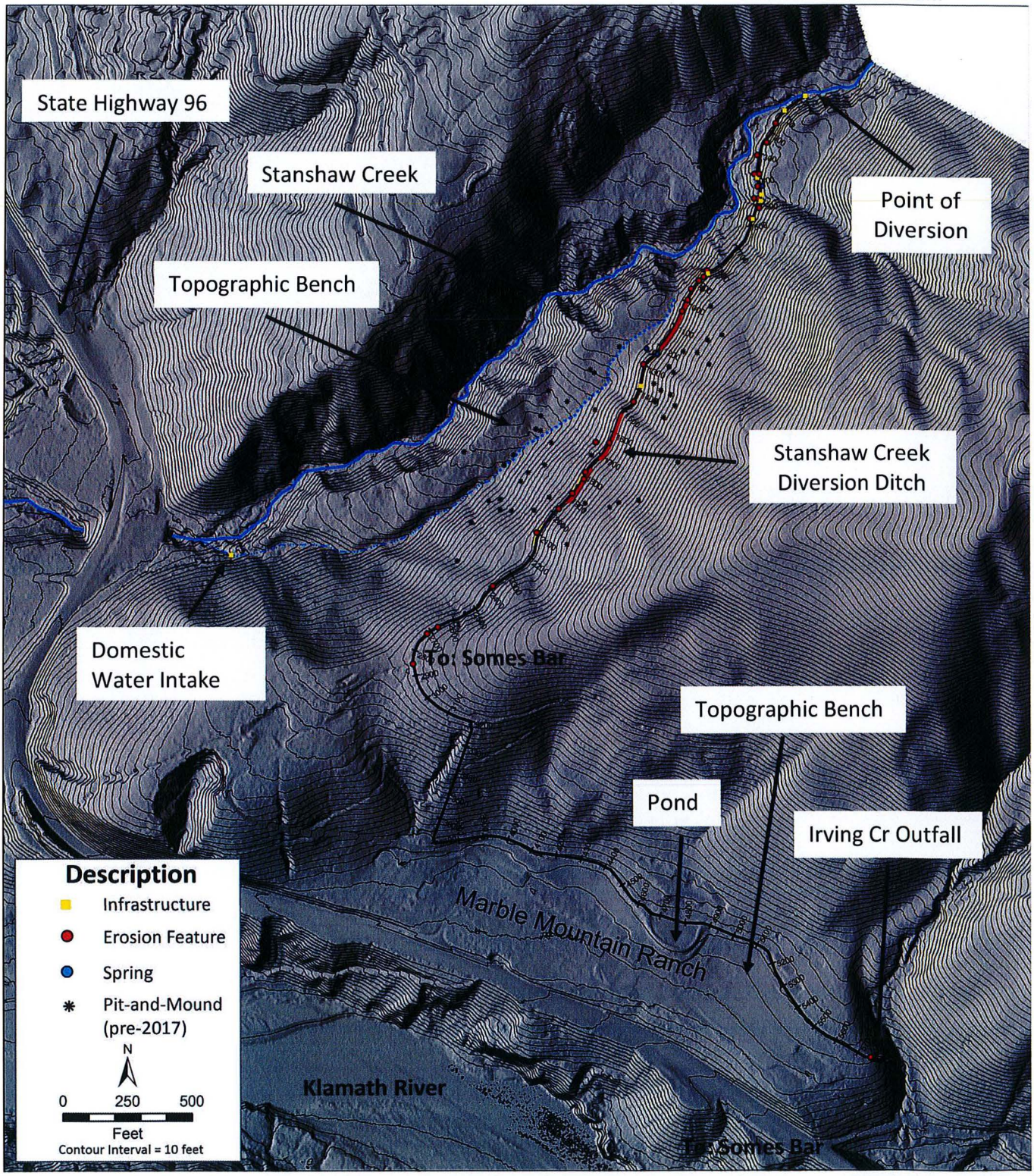

Figure 2. Study Area Map. Marble Mountain Ranch and the Stanshaw Creek Diversion Ditch. Base image is a portion of the 2014/15 1-meter LiDAR DEM Hillshade, provided by the Mid-Klamath Watershed Council.

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Ditch segments with pre-2017 fillslope and cutslope erosion are delineated with solid yellow and red lines, respectively. Map prepared by FGS.

Table 3. Sediment production and delivery estimates for features associated with the operation and maintenance of the Stanshaw Creek Diversion Ditch. Notes: 1) numbers in parenthesis show the total number of features observed and numbers without parenthesis indicate data for features that delivered sediment. 2) The shotgun culvert was installed in 1996 by the Cole's. 3) Pre-WY2017 features were most likely triggered by storms during WY2006 and previous water years. 4) Sediment production and delivery volumes present in this table are assumed to have an approximate +/- 20 percent margin of error.

Feature Type	Frequency[1]	Sediment Production (yds^3)				Sediment Delivery (yds^3)			
		Min	Max	Avg	Total	Min	Max	Avg	Total
WY2017 Features									
Fillslope Surface Erosion	3 (5)	1	2	1.6	3	0.3	0.8	0.5	1.6
Fillslope Failures	1 (2)	-	-	-	56	0	0	0	0
Cutslope Failures	7 (14)	1	65	13.7	96	0	0	0	0
Culvert Erosion[2]	1	-	-	-	0.5	-	-	-	0.5
Headcut Erosion	1	-	-	-	17	-	-	-	10
WY 2017 Total:	**13 (22)**	**2**	**67**	**15.3**	**173.0**	**0.3**	**1**	**0.6**	**12.5**
Pre-WY2017 Features[3]									
Fillslope Failures	6	35	156	89	534	0	133	46	273
Gully	2	23	93	-	116	0	93	-	93
Hillslope Failures	1	-	-	-	278	-	-	-	167
Culvert Erosion[2]	1	-	-	-	6.3	-	-	-	6.3
Headcut Erosion	1	-	-	-	775	-	-	-	775
Pre-WY2017 Total:	**11**	**58**	**249**	**89**	**1709**	**0**	**226**	**45.5**	**1314**

Ditch-Stream Crossing

The ditch-stream crossing located at the unnamed tributary of Stanshaw Creek (Station 488) was identified as an area of concern by Feiler (2015) and evaluated as part of this study. This evaluation, included an on-site interview with Douglas Cole on February 24, 2017. According to Mr. Cole, he constructed the crossing in 1996 to replace a failing wooden flume that he believes was part of the original ditch infrastructure. The crossing was constructed with human powered equipment, consists of a 4-foot diameter plastic culvert placed on a "bedrock ledge", and native earth materials used for backfill. Mr. Cole stated the crossing has not failed since he constructed it. Using this information, in combination with standard methods, the crossing fill volume was estimated to be approximately 160 yds^3 +/- 35 yds^3. There was no field evidence to indicate this feature has failed either catastrophically or partially during the past 21 years.

A likely failure scenario would be related to debris blocking the culvert that would force stream flow to overtop and erode the fill. In this scenario, it would be reasonable to assume that the culvert and 50 percent of the fill volume would wash-out which would result in the potential delivery of approximately 80 yds^3 of sediment (assume a 20 percent plus or minus margin of error). The estimate of potential delivery from this study is less than the 150 to 300 yds^3 estimated by Feiler (2015).

Figure 3. Upstream view of the shotgun culvert located at an unnamed tributary to Stanshaw Creek, Station 474.

Irving Creek Headcut

The Irving Creek headcut is located at Station 5755 near the terminus of the Stanshaw Creek ditch. This feature most likely formed as the result of draining Stanshaw Creek ditch flow over a natural slope and into Irving Creek. Feiler (2015) identified this feature as an area of concern.

Aerial photographs (available at the Mid-Klamath Watershed Council office) indicate this portion of the ditch has been in use since the mid-1940's. Which suggests this feature is at least 72 years old (2017-1945). Profile and volume estimates derived from the 2014/15 1m LiDAR DEM indicate that approximately 775 yds^3 (+/- 100 yds^3) of sediment has been delivered to Irving Creek over the assumed 72 year period and has had an average long-term delivery rate of ~11 yds^3/yr.

Short-term minimum sediment production and delivery rates of 17 yds^3/yr and 10 yds^3/yr were estimated for the actively eroding portion of the gully. These estimates compare favorably to the long-term delivery rate.

The short-term estimates were based on the following observations and assumptions: volumes and rates were estimate by summing: 1) the length of the actively retreating gully head (115 feet), 2) the features average depth (16 feet), and 3) an average retreat rate (0.25 feet/year). The sediment delivery rate was calculated by multiplying the production rate by a sediment delivery ratio of 60 percent. Field observations indicate the lower portions of the gully are currently storing at least 40 percent of sediment produced by the actively eroding headwall portions of the gully. Vegetated deposits are accumulating along the gully sidewalls and the relatively stable bed elevations indicates the feature is evolving toward an equilibrium condition and the feature may stabilize naturally or respond positively to simple stabilization measures.

3.2 Sediment Delivery Paths and Storm Water Quality Monitoring

FGS field assessments identified five features that delivered sediment to the waters of California during WY2017. These features were characterized and described in Section 3.2 and include three small fillslope surface erosion features at Stations 148, 470, and 513, the culvert outfall at Station 474, and the headcut at Station 5755. With the exception of the Irving Creek headcut, these features were located within the first 1000 feet of the ditch.

Field assessments including storm water quality monitoring conducted on the topographic bench located downslope of Stations 1000 to 2850 found no clear evidence that ditch related sedimentation or turbidity has affected or has the potential to affect the waters of California, barring natural and catastrophic events. Instead, FGS observed clear water consistently draining from the topographic bench during storm water runoff periods, a high degree of surface roughness from vegetation and irregular topography capable of trapping and storing fine sediments proximal to sediment producing features, and soils with a significant fraction of coarse angular particles that appear to resist surface erosion. Additionally, a sediment trap (in the form of a five-gallon bucket) connected to a domestic water intake system contained negligible amounts of fine sediment and organic materials during two field surveys (Figure 2 and 4).

The quantities and material types observed in the sediment trap were consistent with and supportive of the observations described herein. Moreover, it should be considered that the domestic water system and sediment trap would provide the water user an alert system and mechanism to document the occurrence of nuisance level water quality impacts associated with disturbances within the watercourse.

Figure 4. Photographs of downstream receiving waters of the Stanshaw Creek Ditch (Stations 1000 to 2880) and the domestic water supply intake system. Note the five-gallon bucket used as a sediment trap. Survey dates: Upper photographs - December 16, 2016, lower photographs - March 22, 2017.

3.3 Future Sediment Delivery Potential

The first 1000 feet of the ditch has the greatest potential to deliver ditch related sediment to Stanshaw Creek. The greater delivery potential of this ditch segment is due to it is location directly above the stream channel (Figure 2). Based on the findings from this study the remaining two segments of the ditch are considered to have low to moderate sediment delivery potential (Figure 2 and Table 4). The lower delivery ratings are due to the capacity of large topographic benches and dense vegetation to intercept and store a majority of sediment before it can be delivered to the receiving waters of the State. These findings are consistent and generally unchanged from what was reported by Fiori (2016)

Table 4. Relative sediment delivery potential of the Stanshaw Creek Diversion Ditch.

Distance from POD (feet)	Relative Sediment Delivery Potential	Percent of Ditch Length	Receiving Waters	Rationale
0 to 1100	Moderate to High	18	Stanshaw Creek	Ditch is directly above stream
1100 to 2850	Low	31	Stanshaw Creek	Topographic bench likely to store most sediment and attenuate turbid runoff
2850 to 5880	Low to Moderate	51	Klamath River And Irving Creek	Topographic bench likely to store most sediment and attenuate turbid runoff

3.4 Background Sediment Sources

Landslides and Gullies

There is approximately 6,400 feet of streambank (2 X 3,200 ft.) on Stanshaw Creek between the Point of Diversion and the Highway 96 Culvert (Figure 2). Review of the LiDAR DEM and Aerial Imagery reveals a significant number of landslides, gullies, roads, and timber harvest units on the lands surrounding the study area and managed by the US Forest Service. These features are capable of contributing acute and chronic sediment to the mainstem of Stanshaw Creek (KNF 1998). Wagner and Saucedo (1987) mapped the landform underlying the study area and lower Stanshaw Creek as Qls (Quaternary Landslide), this indicates there is a high potential for slope instability. Sediment delivery from slope failures and gullies located along the lower reach of Stanshaw Creek pose a significantly greater sediment delivery potential compared to the ditch related features described in this study. Sediment delivery from one of the moderate to large landslides located along lower Stanshaw Creek have the capacity to produce background sedimentation and turbidity levels that would overprint inputs from ditch related failures.

Windthrow and Snowdown Trees

FGS field assessments and desktop analysis identified naturally toppled trees as a likely background contributor of coarse and fine sediments to watercourses within the study area. Close examination of the LiDAR DEM reveals pit-and-mound topographic features distributed across the landforms underlying the study area. Pit-and-mound topography is a characteristic signature of soil disturbance resulting from toppled trees. Tree topple is also referred to as tree uprooting, windthrow, snow-down, floralturbation, arboturbation, among other terms. Schaetzl et al. (1988) provides an excellent review of this phenomenon, and work by Swanson et al. 1982, Gabet et al. 2010, Roering et al. 2010, and Phillips et al. 2017 provide information from regional and global studies.

Several toppled trees were identified and mapped during fieldwork conducted on December 16, 2017. Some of these toppled trees were located within 1200 feet of the domestic water intake and overland flow was observed to connect these sediment sources to the ephemeral channel and domestic water supply intake (Figures 4 and 5a). However, field observations conducted during overland flow conditions indicate sediment transport and/or turbidity originating from these sources would likely occur only during the most extreme, short duration, high intensity rainfall events.

During the field assessment on February 24, 2017, FGS observed the initial aftermath of a significant snow-down event that occurred in relation to a winter storm that delivered several feet of wet snow to the Mid-Klamath region on January 2nd and 3rd, 2017. This snow-down event resulted in toppling a significant number of trees across the study area, including trees in close proximity to the domestic water system intake. Overland flow was observed to connect to the ephemeral watercourse upstream of the domestic water system, yet no sediment transport nor turbid waters were noted (Figure 5b).

Figure 5. Photographic examples of uprooted trees and overland flow in the study area. These natural sediment sources are located on the topographic bench upstream of the domestic water supply that is shown in Figures 2 and 4. Survey dates: Left photograph (5a) - December 16, 2016, Right photograph (5b) - February 24, 2017.

3.5 Discussion

Feiler (2015) described 19 sites on the Stanshaw Creek Diversion Ditch as areas of concern for past and/or future sediment delivery. During this study, FGS located and walked the slopes below each of these sites with the purpose of identifying past and potential sediment delivery. Of these 19 sites, FGS found five sites had delivered sediment to the waters of California. Four of these sites were located within the first 1000 feet of the Point of Diversion (Stations 0 to 1000) and the fifth site at the Irving Creek Headcut (Station 5755) (Figure 2). FGS found no evidence of past sediment delivery from the 14 sites located between Stations 1000 and 2850. Specifically, FGS found no evidence of chronic rilling or gullying on the hillslope below Stations 1000 and 2850. One hillslope gully was located approximately 50 feet downslope of Station 1677. However, no clear evidence linked the formation of this gully with past ditch failures and its genesis may be related to natural hillslope erosion processes. The limited number of fluvial erosion features (rills and gullies) on the hillslope below Stations 1000 and 2850 provides strong evidence that ditch-overtopping events are rare or unlikely. This is most likely due to MMR BMPs and/or that overtopping events result in dispersed flow that lack the tractive force needed to initiate the formation of rills or gullies.

The recent snow-down event, decay state of the pre-WY2017 toppled trees, and the pit-and-mound topography indicate floralturbation is a commonly occurring soil displacement mechanism within the study area. Discussions between FGS and the owner of the domestic water system included statements by the owner that water quality impacts have occurred at this location in the past. Based on the available evidence it appears the water quality impacts described by the adjacent landowner were most likely related to floratubation rather than erosion related to the operation and maintenance of the Stanshaw Creek Diversion Ditch.

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3.6 Recommendations

1. Field evidence and desktop analysis reported herein indicates the Best Management Practices employed by the MMR avoids, minimizes or mitigates sediment delivery related to operation and maintenance of the Stanshaw Creek Diversion Ditch. Mr. Cole described that his inspection and maintenance efforts target repairs to seepage and other minor failure problems before they evolve into larger or catastrophic failures. Similar inspection and maintenance efforts are recommended moving forward.
2. Field evidence and desktop analysis reported herein indicates the Best Management Practices employed by the MMR to shut-off ditch flow prior to winter storm events avoids, minimizes or mitigates sediment delivery related to potential overtopping events. Similar pre-emptive efforts are recommended moving forward.
3. Reconstruct the ditch prism to establish a smooth and continuous gradient (i.e. remove low and high spots) would improve ditch flow efficiency and reduce seepage losses.
4. Reconstruct the ditch prism so the outboard travel way is at least 12 feet wide. This will reduce the potential for uprooted trees from damaging ditch infrastructure, limit overtopping events, avoid or reduce delivery from cutslope failures, and allow larger equipment to be used for routine and emergency maintenance. The use of larger equipment will reduce or avoid grading related sediment delivery and make it possible to export and store sediment spoils off-site. Mild outsloping and appropriately spaced rolling dips along the travel way could be used to effectively improve the stability and drainage of the travel way.

5. Conduct a cost-benefit analysis to determine whether lining or piping the ditch will result in the water savings and reduce sediment delivery threats. This analysis may indicate that a combination of unlined, lined, and piped ditch flow will provide a win-win solution for the MMR and environment.
6. The gully at the Irving Creek Outfall the feature is evolving toward an equilibrium condition and this feature may stabilize naturally or respond positively to simple stabilization measures. Low cost erosion control solutions should be considered to address sediment delivery from this site.

3.7 References

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rocco@fiorigeosci.com

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Cover Image: 3D oblique view of lower Stanshaw Creek and the Stanshaw Creek Diversion Ditch Derived from the 1-meter 2014/15 LiDAR DEM. Image by FGS.

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EXHIBIT B

Churchwell White LLP

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Barbara A. Brenner
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February 8, 2017

VIA U.S. MAIL/EMAIL
(kenneth.petruzzelli@waterboards.ca.gov)

Kenneth Petruzzelli
State Water Resources Control Board
801 K Street, 23rd Floor
Sacramento, CA 95814

Re: Proposed Time Schedule for Projects at Marble Mountain Ranch

Dear Mr. Petruzzelli:

Based on our discussion on December 16, 2016, regarding Marble Mountain Ranch ("Ranch"), please find below a proposed time schedule to complete many of the projects outlined in the State Water Resources Control Board's ("State Water Board") Draft Order WR 2017-00XX-DWR ("Draft Order"), and the North Coast Regional Water Quality Control Board's ("Regional Water Board") Cleanup and Abatement Order R1-2016-0031 ("CAO"). Douglas and Heidi Cole (the "Coles") remain committed to implementing improvements at the Ranch but require additional time to properly retain experts, create plans to implement improvements, secure permits for the identified improvements and execute the plans to make the improvements.

While the Coles remain engaged stewards of the Stanshaw Creek system, there are several requirements in the Draft Order and CAO that are not necessary to achieve the goal of a sustainable Stanshaw Creek system. The Coles are small business owners with limited resources to address any improvements at the Ranch. To ensure that the highest priority improvements are the focus of the Coles' efforts and resources moving forward, a discussion of the lack of need for several of the projects that do not contribute to the goal of establishing a sustainable Stanshaw Creek system contained in the Draft Order and CAO is also included below.

The dates included herein are based on several assumptions that may affect the time required to complete the projects. Those assumptions include, but are not limited to, (1) the Coles and the State and Regional Water Board being able to agree to a time schedule for improvements; (2) the Coles being able to secure all required permits and regulatory approvals for each of the projects; and (3) weather and other unforeseen circumstances not causing undue delay. If the Coles encounter any of these possible complications, additional time to complete the projects may become necessary.

Need for Additional Time

The Coles have been involved in the effort to implement improvements at the Ranch for over 20 years. During that time, in addition to successfully defending their pre-1914 3 cfs water right, the Coles have been engaged with stakeholders discussing and identifying resource improvements for the Ranch, many of which are included in the Draft Order and CAO. Following receipt of the Draft Order and the CAO, the Coles have taken steps to comply with the requirements in those orders, including pursuing a sedimentation study and slope stability analysis, retaining new consultants to assist them in their compliance efforts, submitting progress reports to the State and Regional Water Boards, and providing a water sampling plan for the Regional Water Board's review.

In addition to their efforts to submit the required documentation under the CAO and Draft Order, the Coles have also engaged in diversion management practices that ensure the diversion complies with the requirements under the Draft Order and CAO while they work toward permanent solutions. Those efforts include the Coles temporarily reducing the amount of water they are diverting, not running their hydropower generation plant to comply with the National Marine Fisheries Service ("NMFS") bypass flow requirements and continuing regular inspection and maintenance efforts. Though the Coles have elected to reduce the amount of water they are diverting during their compliance efforts, the Coles are not demonstrating any intention to waive their full pre-1914 3 cfs water right.

Proposed Time Schedule for Resource Improvements at Marble Mountain Ranch

Water Code section 13300 allows for a water user to enter into a time schedule of specific actions the water user will take to avoid a violation of any requirement prescribed by the State or Regional Water Board. To that end, and based on the reasoning below, the Coles propose the following time schedule for several of the projects in the Draft Order and CAO. Proposed dates for significant elements of each of the projects and the final completion date for those projects is also summarized in a table attached as **Exhibit A**.

Install conveyance infrastructure in the ditch, such as a pipeline or other suitable infrastructure (Draft Order, Page 22, Table 4)

The Coles have previously submitted designs and permit review determinations to install a six inch pipe in the diversion at the Ranch. Those plans were proposed as an approach to comply with the NMFS bypass flow recommendation and would have only allowed the Coles to divert enough water for their consumptive use needs. The Coles still identify the piping of at least the first 1,000 feet of the diversion as a practical approach to improving the diversion but must increase the size of the pipe to be installed in order to convey the full complement of their 3 cfs water right to the Ranch.

Thus, they require additional time to create the plan for the greater capacity pipe, obtain any necessary permits, secure the necessary funds for the project and finally install the pipe. Based on projections from the Coles' environmental consultants, ECORP Consulting, Inc., the Coles will require until **June 30, 2018,** to install a conveyance infrastructure in at least the first 1,000 feet of the ditch, such as a pipeline or other suitable infrastructure. The table below details additional dates for submitting plans, securing permits, and beginning and completing construction.

Task 1	**Proposed Date**
Submit plans for an enlarged piping project	June 30, 2017
Secure any necessary permits and agency approvals	January 1, 2018
Begin construction	April 1, 2018*
Project complete	June 30, 2018

*Weather permitting

Install a diversion control mechanism at the point of diversion (Draft Order, Page 22, Table 4)

The Coles are in the process of identifying possible alternatives for a diversion control mechanism and are seeking an engineering consultant to assist them in that effort. The Coles anticipate that a diversion control mechanism will require additional time to design and install based on the nature of the Coles' diversion and the Stanshaw Creek system. The Coles have reached out to the Farmers' Conservation Alliance to discuss the possibility of using their prefabricated fish screen at the Ranch, but those efforts have been stalled by a lack of response from the California Department of Fish and Wildlife with regard to whether they will accept the prefabricated fish screen design. The project may also require additional permitting. Therefore, the diversion control mechanism is projected to be installed at the Ranch by **December 31, 2018**. A proposed timeline to install the diversion control mechanism is outlined in the following table.

Task 2	**Proposed Date**
Submit plans for the diversion control mechanism	June 30, 2017
Secure any necessary permits and agency approvals	January 1, 2018
Begin construction	April 1, 2018*
Project complete	June 30, 2018

*Weather permitting

Stabilize head cut and slope at Irving Creek outfall point (Draft Order, Page 22, Table 4)

The Coles will stabilize the head cut and slope at the Irving Creek outfall point; however, a full remediation of the area that includes a Restoration and Monitoring Plan does not appear warranted or the best approach. The reasons for not perusing a full remediation of the Irving Creek outfall point are more fully discussed on page 7 of this correspondence. Briefly, based on an initial assessment of the area, introducing any fill at the Irving Creek outfall point will potentially result in discharge of that fill material. Therefore, it is requested that any remediation plans avoid fill of the area during the stabilization effort. In order to properly secure any necessary permits, or other approvals for the stabilization effort and any required construction materials, the Coles anticipate they will complete this task by **December 31, 2017**. Deadlines for the significant activities required to implement the stabilization effort at Stanshaw Creek are proposed as follows:

Task 3	**Proposed Date**
Submit plans to stabilize the head cut and slope at Irving Creek	May 31, 2017
Secure any necessary permits and agency approvals	July 31, 2017
Begin construction	September 30, 2017*
Project complete	December 31, 2017

*Weather permitting

Develop a plan to return flow to Stanshaw Creek and return flow to Stanshaw Creek (Draft Order, Page 22, Table 4)

The Coles have been attempting to achieve the goal of returning flow to Stanshaw Creek since at least 2005. Those efforts have been complicated by the challenge to the Coles' water right and many different federal and state agencies' jurisdictional interest in the project. While the Coles maintain that the State Water Board lacks the jurisdiction to require the Coles to return flow to Stanshaw Creek, they are willing to continue exploring a plan to return flow to Stanshaw Creek.

The Coles are in the initial process of identifying possible alternatives for the project and securing cost estimates for permitting and completing each of those alternatives. Therefore, they are unable to speculate on a timeline for any of the elements of this project. In addition to determining possible approaches to returning flow to Stanshaw Creek, the Coles will also be seeking grant funding for the planning and implementation of this project. The uncertainty with regard to when and how the Coles may receive funding for the project further prohibits the Coles from speculating on any possible timelines for implementation or completion of this project; however, an outline of the proposed timeline to seek these funding opportunities is outlined below.

Task 4	Proposed Date
Assess funding opportunities	April 30, 2017
Submit funding proposals or applications, if any	August 31, 2017

Provide a slope stability assessment and sedimentation study of the diversion (CAO, Pages 10 and 11, Items 3 and 4)

The Coles have retained Rocco Fiori of Fiori Geosciences to complete the slope stability assessment and sedimentation study of the diversion. As was discussed at the December 16, 2016, meeting with the State and Regional Water Boards, Mr. Fiori completed a field review of the Ranch on December 16, 2016. Since that time, Mr. Fiori has been in the process of completing a report of his findings. Following the storm events in January of 2017, and conversations with the Coles, Mr. Fiori has had to delay release of his report until **February 28, 2017,** to incorporate additional analysis.[1] As soon as Mr. Fiori completes his report, it will be provided to the State and Regional Water Boards.

Task 5	Proposed Date
Site Visit	December 16, 2016
Slope stability assessment and sedimentation study complete	February 28, 2017

Submit Division of Drinking Water ("DDW") Public Water System determination or copy of DDW Public Water System permit to the Division of Water Rights (Draft Order, Page 22, Table 4)

The Coles completed a declaration in 2005 certifying that the Ranch does not qualify as a public water system. They received a notice on December 22, 2016, that the DDW "received information suggesting that Marble Mountain Ranch may be serving water to at least 25 people daily at least 60 days out of the year." The notice advised the Coles that they either needed to "apply for a permit to operate a public water system" or sign and return a declaration that was attached to the letter. Douglas Cole signed and completed the declaration certifying that the Ranch still does not qualify as a public water system in January of 2017.

[1] Beyond the additional information following the January 2017 storms, Mr. Fiori's report has also been delayed because the scope of his review has expanded and he has been ill during the month of January.

Implement National Marine Fisheries Service ("NMFS") bypass flow recommendation (Draft Order, Page 22, Table 4)

The Coles have voluntarily reduced the amount of water they are diverting to comply with the NMFS bypass flow since the low flow periods of the summer of 2016. The lack of clarity from the State Water Board with regard to how it would implement NMFS's recommendation led the Coles to make the decision to temporarily reduce the amount of water they divert. The Draft Order indicates that the NMFS bypass flow should be implemented upon completion of the return flow to Stanshaw Creek project. The Coles may not be completing the Stanshaw Creek return flow project if they are unable to secure funding for the project. Therefore, the Coles will continue to implement NMFS's bypass flow recommendation during low flow periods, as they have during 2016 low flow periods.

Submit Quarterly Progress Reports (Draft Order and CAO)

Since the release of the CAO and Draft Order, the Coles have submitted two quarterly progress reports for the last two quarters of 2016. The Coles will continue to submit quarterly progress reports until they have completed the projects proposed through this correspondence.

Pending Projects

Water Quality Sampling Plan (CAO, page 11, ¶ 4(b).)

The Coles previously submitted a water quality sampling plan ("Sampling Plan") to the Regional Water Board in the event the Coles would be discharging water from the Ranch. The Regional Water Board approved the Sampling Plan, but the Coles have not taken any further steps to implement the Sampling Plan at the Ranch. Their reasons for this are two-fold.

First, the CAO specifically requires the Coles implement a Sampling Plan to "[e]nsure that water used onsite, conveyed in the ditch and discharged, does not adversely impact waters of the state." (CAO, page 11, ¶ 4(b).) The Coles are not currently discharging water so there is no impact to waters of the state from the Ranch. Secondly, the Coles' water system is tested and monitored by Siskiyou County on a quarterly basis. Therefore, the Ranch's water quality is already monitored and deemed safe by a governmental agency. Once the Coles begin diverting water that they then discharge to waters of the state, they will revisit the Sampling Plan and provide any proposed modifications.

Ditch Operation and Maintenance Plan (CAO, page 11, ¶ 3(b).)

The CAO requires that the Coles provide a ditch operation and maintenance plan "that includes an inspection and maintenance schedule" for the diversion. The Coles have an existing inspection and maintenance schedule that they are in the process of formalizing into a plan with the assistance of their environmental consultants, ECORP Consulting, Inc. Douglas Cole outlined his operation and maintenance efforts at the December 16, 2016, meeting. The Coles propose that they will submit a ditch operation and maintenance plan on the following time schedule.

Task 6	Proposed Date
Submit ditch operation and maintenance plan	March 31, 2017

Projects the Coles do not anticipate completing

Several of the projects contained in the Draft Order and CAO are not necessary to achieve a sustainable Stanshaw Creek system. To focus the Coles' efforts moving forward on the highest priority projects, the Coles propose eliminating the following projects from the Draft Order and CAO. The reasons for eliminating each of the projects is also discussed.

Remediation of the Irving Creek Outfall point that includes a Restoration and Monitoring Plan with monitoring reports through 2021 (CAO, page 8, item 2 and page 10, item 2)

Rocco Fiori of Fiori Geosciences has discussed his initial findings from his site visit at the Ranch with the Coles. Part of the conclusions that will be contained in his forthcoming report indicate that a fill and full remediation of the Irving Creek outfall is unnecessary and will likely result in discharge of that fill material. To avoid that potential outcome, the Coles anticipate that they will install a culvert at the top of the outfall point and riprap at the base of the outfall point to address any impacts to waters of the state from the outfall point. Following that effort, no further remediation or monitoring should be required at the Irving Creek outfall point.

Complete Energy Audit and develop plan to implement recommendations from that audit (CAO, page 8, item 1)

The Coles have established their pre-1914 right to divert 3 cfs of water that includes the right to use water for hydroelectric generation. As part of the discussions with stakeholders in the Stanshaw Creek system, the Coles agreed to pursue possible alternative courses of action to address stakeholder concerns. A review of their energy use was part of that strategy; however, with the issuance of the Draft Order and CAO, the Coles can no longer afford to pursue any additional optional approaches to

addressing stakeholders concerns. The 3 cfs right allows the Coles to operate their existing hydroelectric power plant which adequately serves the Coles' energy needs. Therefore, the Coles do not plan to complete the energy audit or further pursue this alternate course of action.

Complete a water efficiency study (Draft Order, Page 22, Table 4)

As discussed above, the Coles have an established pre-1914 right to divert 3 cfs of water. They have provided data that details the beneficial uses they put that water to at the Ranch. A water efficiency study will not provide any additional helpful information toward the effort to implement water efficiency improvements at the Ranch. Therefore, the Coles do not plan to complete a water efficiency study.

Install a flow gauge upstream from the point of diversion in Stanshaw Creek and downstream below the Highway 96 culvert (Draft Order, Page 22, Table 4)

The Coles lack the authority to place a flow gauge upstream of their point of diversion in Stanshaw Creek, as that area is United States Forest Service land. They also lack the authority to place a flow gauge downstream below the Highway 96 culvert because they do not own property at that location. When the flow gauges were originally discussed, it was the Coles' understanding that flow gauges may be placed by the federal or state fishery agencies. Further, there is no internet or power source along this portion of Stanshaw Creek which makes installation of flow gauges impracticable. Because the Coles lack the authority to comply with this directive, they are not able to implement this task as outlined in the Draft Order.

Cease discharge to Irving Creek by April 30, 2017 (Draft Order, Page 22, Table 4)

As previously noted, the Coles maintain that the State Water Board lacks the authority to require that the Coles return flow to Stanshaw Creek and cease discharging water used for hydroelectric power generation to Irving Creek. The Draft Order bases its requirement that the Coles cease discharging to Irving Creek and return flow back to Stanshaw Creek on the public trust doctrine. (Draft Order ¶¶ 38, 47.)

To date, no California court has necessarily held that the public trust doctrine would allow the State Water Board to assert its jurisdiction and curtail rights held by pre-1914 appropriators. Further, to invoke jurisdiction under the public trust doctrine, the State Water Board must show that the diversion *clearly* harms the interests protected by the public trust. (*National Audubon Society v. Super. Court* (1983) 33 Cal.3d 419; *United States v. State Water Resources Control Bd.* (1986) 182 Cal.App.3d 82.) Potential impacts do not suffice, nor do unsupported allegations.

In the present case, the Draft Order proposes corrective action based on NMFS's theoretical calculations of in-stream flow requirements. The State Water Board lacks substantial evidence of harm to trust resources. This defect is compounded by the fact that the Coles have taken significant steps to eliminate the possibility of harm to trust resources by curtailing diversions during low flow periods. Invoking the public trust doctrine to require that the Coles cease discharging to Irving Creek would require an extraordinary finding of harm to justify the extension of the public trust doctrine to holders of pre-1914 rights. Actions taken by the Coles do not support this finding.

Consequently, the Coles request the ability to return flow to Irving Creek after stabilizing the head cut and slope at the Irving Creek outfall point and obtaining any necessary permits. If and when the Coles are able to secure funding for the effort to return flow to Stanshaw Creek, they will cease diverting water to Irving Creek.

Develop a plan to remove the outboard berm if the ditch is piped (CAO, Page 8, Item 1)

The Coles anticipate that they will be piping at least the first 1,000 feet of the diversion. The diversion lies along a forested hillside that includes many large trees and is habitat for large animals such as elk that can cause damage to installed infrastructure. The outboard berm establishes a path of access to any pipe that is installed in the historical ditch footprint. Therefore, the Coles anticipate keeping the outboard berm in place to ensure that they are able to inspect and repair any damage to any pipe installed in the existing ditch.

Please contact me at barbara@churchwellwhite.com or (916) 468-0625 if you have any questions or concerns.

Regards,

Churchwell White LLP

Barbara A. Brenner
KAF/dmg

Enclosure

(via email, with enclose)
cc: Douglas and Heidi Cole (guestranch@marblemountainranch.com)
Eric Stitt, ECORP Consulting, Inc. (estitt@ecorpconsulting.com)

{CW037256.5}

Marble Mountain Ranch

Proposed Time Schedule Summary Table by Project WR-163

Install conveyance infrastructure in the ditch, such as a pipeline or other suitable infrastructure

Task 1	Proposed Date
Submit plans for an enlarged piping project	June 30, 2017
Secure any necessary permits and agency approvals	January 1, 2018
Begin construction	April 1, 2018*
Project complete	June 30, 2018

*Weather permitting

Install a diversion control mechanism at the point of diversion

Task 2	Proposed Date
Submit plans for a diversion control mechanism	June 30, 2017
Secure all necessary permits and agency approvals	January 1, 2018
Begin construction	April 1, 2018*
Project complete	June 30, 2018

*Weather permitting

Stabilize head cut and slope at Irving Creek outfall point

Task 3	Proposed Date
Submit plans to stabilize the head cut and slope at Irving Creek	May 31, 2017
Secure all necessary permits and agency approvals	July 31, 2017
Begin construction	September 30, 2017*
Project complete	December 31, 2017

*Weather permitting

Seek funding opportunities to return flow to Stanshaw Creek

Task 4	Proposed Date
Assess funding opportunities	April 30, 2017
Submit funding proposals and applications, if any	August 31, 2017

Provide a slope stability assessment and sedimentation study of the diversion

Task 5	Proposed Date
Site Visit	December 16, 2016
Slope stability assessment and sedimentation study complete	February 28, 2017

Provide a ditch operation and maintenance plan

Task 6	Proposed Date
Submit ditch operation and maintenance plan	March 31, 2017

Implement National Marine Fisheries Service bypass flow recommendation

Ongoing Task	Proposed Remedy
Implement bypass flow recommendation	As required during low flow periods

Marble Mountain Ranch

Proposed Time Schedule Summary Table by Project

WR-163

Quarterly progress reports

Ongoing Task	Proposed Date
Submit Report	Quarterly through June 30, 2018*

*The Coles may submit additional progress reports depending on the status of the return flow project

EXHIBIT C

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

7 April 2017

Mr. Matthias St. John
North Coast Regional Water Quality Control Board
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

RE: Marble Mountain Ranch (WDID 1A15024NSI) – Proposed Improvements to Irving Creek Outfall

Dear Mr. St. John:

ECORP Consulting, Inc. (ECORP) has been retained for regulatory assistance on behalf of Douglas and Heidi Cole, owners of Marble Mountain Ranch (Owners). A Cleanup and Abatement and Water Code Section 13267(b) Order Number R1-2016-0031 (Order) was issued by the North Coast Water Quality Control Board (NCWQCB) on 4 August 2016 to address a diversion ditch within the property that diverts water from Stanshaw Creek to Irving Creek. The diversion ditch outfall discharges into an unnamed tributary to Irving Creek. The Order identified this outfall as an active erosional feature leading to sediment discharges into Irving Creek and the Klamath River.

A Sediment Source Assessment (*Stanshaw Creek Diversion Ditch Sediment Source Assessment*; Fiori GeoSciences, April 04 2017) has been prepared to identify sources of erosion and sedimentation and to recommend remedial measures. According to the Sediment Source Assessment, the outfall was estimated to have an erosion rate of 0.3 cubic yards per year and an incision rate of approximately 4 inches per year over the 21-year period since the culvert was installed in 1996. However, this feature may now have a reduced incision rate due to erosion into more resistant material. A photograph of the existing outfall is provided in Attachment A. ECORP is providing information on proposed remediation actions for this outfall.

Proposed Remediation Actions

The Sediment Source Assessment recommends simple, low cost actions to address erosion at outfall. To implement this suggested approach, a new culvert designed to direct flows away from the edge of slope will be installed. In addition, several large rootwads from downed trees on the property will be installed at the base of the outfall to serve as flow velocity dissipation devices and reduce erosional activity. The culvert will be designed such that flows are directed onto the rootwads for maximum energy dissipation, in order to reduce scouring and sediment production.

Rootwads are typically used as a natural revetment material to resist erosive flows on streambanks and serve to create habitat complexity and hydraulic diversity for fish and invertebrates when used in an aquatic setting. Rootwads decompose over time, allowing live vegetation to slowly restore the protected area to a more natural function. During installation, the rootwad fan will be oriented into the outfall flow, with the remaining portion of the tree trunk removed or buried and secured with rocks (see Attachment B for example rootwad revetment installation in a stream setting to show how anchoring may be achieved). The fan of the rootwad(s) used will be of sufficient size to provide full cover over the existing, exposed soil at the base of the outfall.

Best Management Practices

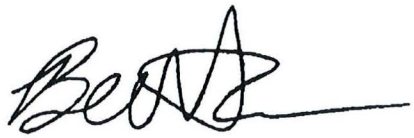
During installation of the culvert and rootwad, Best Management Practices (BMPs) will be implemented to minimize downstream effects. The following BMPs will be utilized:

- All work will be conducted when no flowing water is present within the diversion ditch, the outfall, or the Irving Creek tributary.
- Standard erosion control BMPs (i.e., silt fencing, straw waddles) will be implemented, as appropriate, to prevent sediment from entering watercourses.
- Rootwads to be placed at the base of the outfall will first be cleaned of sediment/soil in an upland location to reduce downstream sedimentation following installation.
- No impacts to existing Waters of the U.S. or Waters of the State will occur as a result of the improvements. All equipment will work from outside of the adjacent tributary to Irving Creek.

With this letter, the Owners request authorization from the NCWQCB to proceed with the aforementioned remediation actions in order to reduce the minor erosion occurring at the site of the outfall. The Owners would very much appreciate an expeditious review of this proposal, as the excess rootwads and heavy equipment necessary to facilitate their installation will only be available on the Marble Mountain Ranch during the month of April 2017.

Please contact me at bwatson@ecorpconsulting.com or (916) 782-9100 if you have any questions, or require any additional information.

Sincerely,



Ben Watson
Senior Regulatory Project Manager

Attachment(s)

LIST OF ATTACHMENTS

Attachment A – Photographs

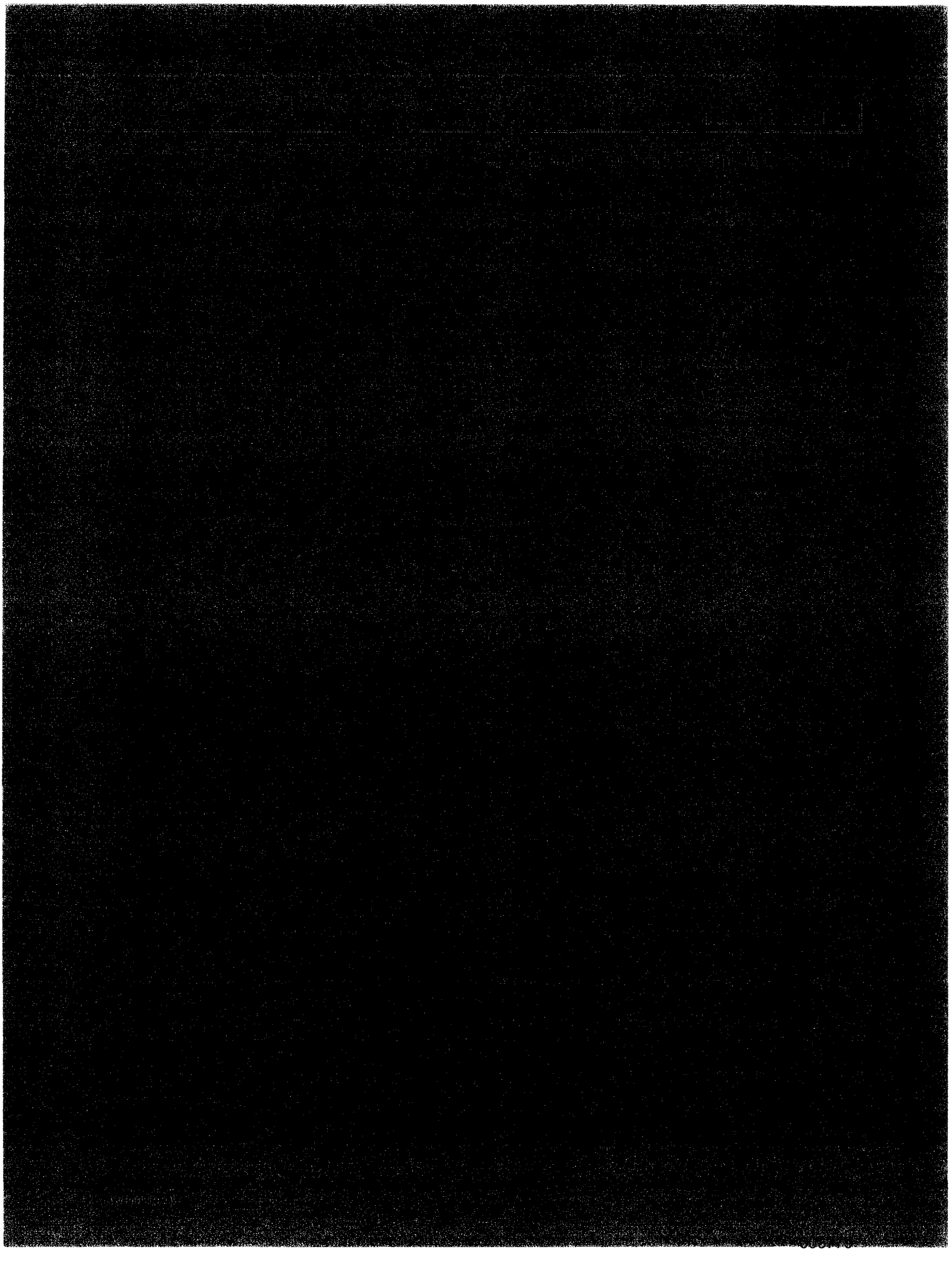
Attachment B – Example Rootwad Revetment Installation

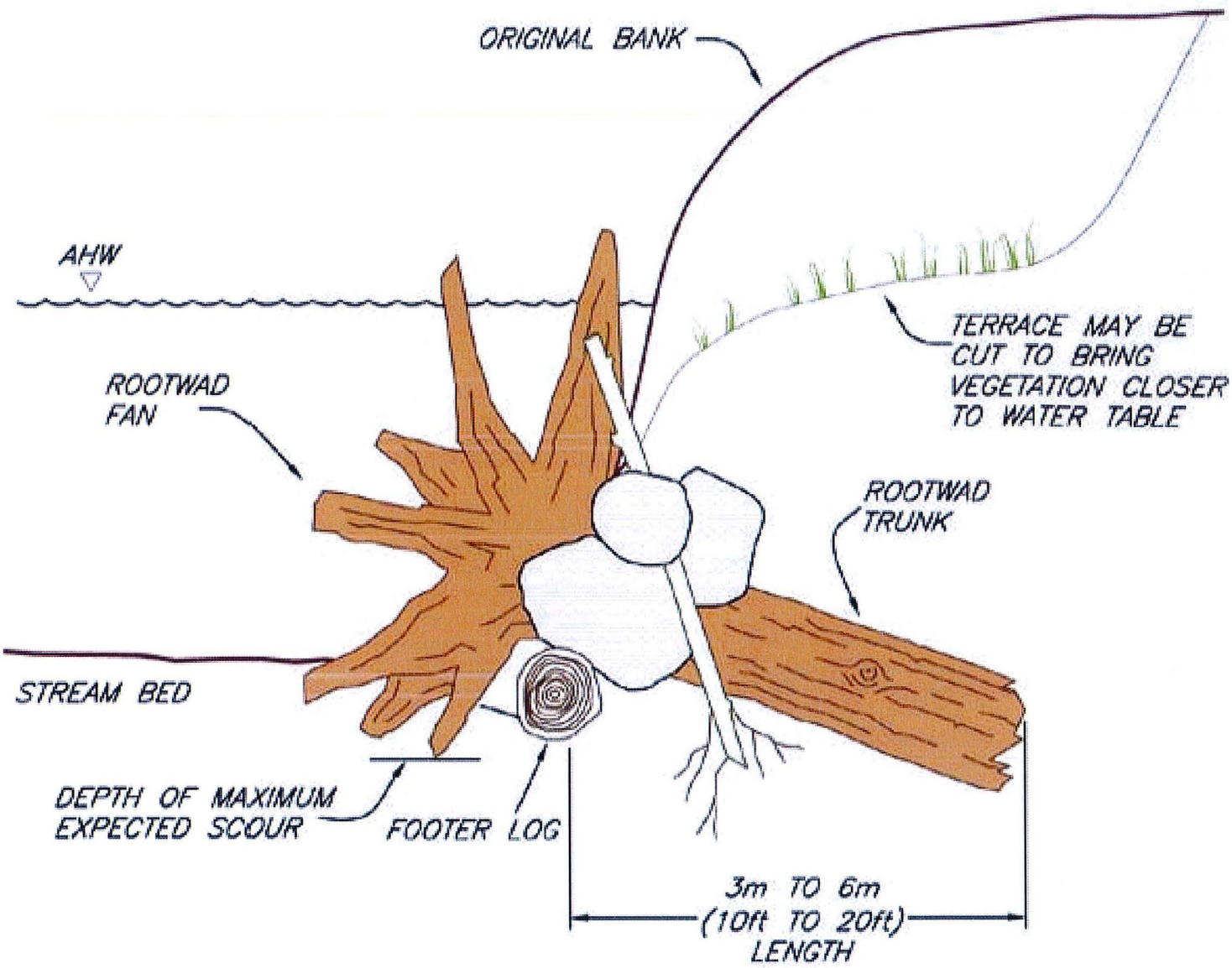
ATTACHMENT A

Photographs

Photo #1. Existing Irving Creek Outfall. Taken by Fiori Geosciences.

Photo #2. Example Rootwad. Photograph taken 28 March 2017.





ROOTWAD REVETMENT CROSS-SECTION