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LAUR: 13-28670

Ms. Lynette Guevara
Assessment Coordinator
Monitoring and Assessment Section
New Mexico Environment Department
Surface Water Quality Bureau
P.O. Box 5469
Santa Fe, New Mexico 87502

Dear: Ms. Guevara:

Subject: **DOE/LANS Response to the Environmental Protection Agency's April 8, 2014 Review of the Category 4b Demonstration**

Attached is the Department of Energy/Los Alamos National Security response to the Environmental Protection Agency's April 8, 2014 comments to the Category 4b Demonstration document.

Thank you for your assistance. Please contact Robert Gallegos (505) 665-0450 of the Environmental Compliance Programs (ENV-CP) if you have questions.

Sincerely,

A R Grieggs

Anthony R. Grieggs
Group Leader
Environmental Compliance Programs
Los Alamos National Security LLC

Sincerely,

Gene E Turner

Gene E. Turner
Environmental Permitting Manager
Environmental Projects Office
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ARG:GET/lm

Enclosures:

1. DOE/LANS Response to Environmental Protection Agency April 8, 2014 Review: Justification for an Integrated Reporting Category 4b Demonstration – Upper SandiaCanyon Assessment Unit - AU NM-9000.A_047–dissolved copper pollutant pair (4b Demonstration)

2. Environmental Protection Agency Memorandum – April 8, 2014

3. Category 4b Data Set

Cy: Katrina Higgins-Coltrain, USEPA/Region 6, (E-File)
Daniel Reid, USEPA/Region 6, (E-File)
James Hogan, NMED/SWQB, w/o enc., (E-File)
Jeff Scarano, NMED/SWQB,w/o enc., (E-File)
Gene E. Turner, NA-LA, w/enc., A316
Eric L. Trujillo, NA-LA, w/enc., A316
Carl A. Beard, PADOPS, w/o enc., (E-File to aosburn@lanl.gov)
Michael T. Brandt, ADESH, w/o enc., (E-File)
Alison M. Dorries, ENV-DO, w/o enc., (E-File)
Michael T. Saladen, ENV-CP, w/o enc., (E-File)
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ENCLOSURE 1

DOE/LANS Response to Environmental Protection Agency April 8, 2014 Review: Justification for an Integrated Reporting Category 4b Demonstration – Upper Sandia Canyon Assessment Unit - AU NM-9000.A_047–dissolved copper pollutant pair (4b Demonstration)

ENV-DO-14-0103

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DOE/LANS Response to Environmental Protection Agency April 8, 2014 Review: Justification for an Integrated Reporting Category 4b Demonstration – Upper Sandia Canyon Assessment Unit - AU NM-9000.A_047–dissolved copper pollutant pair (4b Demonstration)

1. Section 1.3.1.2:

   a. A brief description of the various corrective actions being taken to address the solid waste management unit (SWMUs) under the consent order would be useful and provides information related to source cleanup.

   Under the Consent Order, SWMUs or AOCs are investigated in a phased approach by aggregate area until the nature and extent of contamination from any historical release at a SWMU or AOC have been defined in all relevant media. The investigation results are compiled in an investigation report which includes a risk assessment. If the risk assessment demonstrates that the site poses no unacceptable risk to human health or the environment under current and reasonably foreseeable future land use, DOE/LANS will submit a request for a Certificate of Completion (CoC) with or without controls, as appropriate. DOE/LANS may perform remediation activities and confirmation sampling before they request a CoC. A CoC is requested only after NMED has approved the investigation report.

   On the other hand, if the site is complex and cannot be remediated to residential risk levels, DOE/LANS may be required to prepare corrective measures evaluation (CME) report. Typically, a CME may be required for Sites with buried waste, vadose zone contamination, and/or groundwater contamination. The CME is used to identify, develop, and evaluate potential remedial alternatives for removal, containment, and/or treatment of contamination. Upon approval of the CME report, NMED will select a remedy or remedies for the Site and issue a Statement of Basis for public comment. NMED will select a final remedy and issue a response to public comments within 90 days or other appropriate time after the conclusion of the public comment period. The Consent Order also provides an opportunity for public hearing.

   NMED and DOE entered into a framework agreement in January 2012 for the realignment of environmental priorities at the Laboratory. Under the framework agreement, NMED and DOE agreed to review characterization efforts undertaken to date pursuant to the RCRA Consent Order to identify those Sites where the nature and extent of contamination have been adequately characterized. Pursuant to the framework agreement, the Laboratory reviewed its data evaluation process with respect to EPA guidance and the framework agreement principles and concluded that this process could be revised to more efficiently complete site characterization, while providing full protection of human health and the environment. Specifically, the process for evaluating data to define extent of contamination was revised to provide a greater emphasis on risk reduction, consistent with EPA corrective action guidance.

   This data evaluation process is currently being performed by DOE and LANS for those aggregate areas where investigations have already occurred and will determine if a SWMU or AOC is currently eligible for a CoC with or without controls or if additional investigation is

required. For those aggregate areas not yet in the first phase of investigation, DOE and LANS are in the process of prioritization and developing work plans.

b. Paragraph 6: Text is not clear regarding the refined locations where copper is a contaminant of potential concern (COPC) for soil. Text identifies one area of concern [AOC (C-61-002)] and one SWMU 03-13(i) as areas of concern, but then lists a different AOC [03-003(d)] and 3 different SWMUs [03-45(b), 03-45(c), 03-014(c)] as being covered by the individual permit (IP). It is noted that neither of the COPC soil areas are listed in Table 3 as being covered by the IP.

i. Does storm water from AOC (C-61-002) and SWMU [03-13(i)] discharge to the AU and impact dissolved copper concentrations?

Storm water from AOC C-61-002 does not impact dissolved copper concentrations in the AU. In a Consent Order investigation, copper was detected in samples collected at depth found to be above background values but below residential soil screening levels (SSLs). The site poses no potential unacceptable risks for industrial, construction worker, or residential scenarios or to ecological receptors.

Under the Consent Order, additional sampling at SWMU 03-013(i) was proposed in the Upper Sandia Canyon Aggregate Area Supplemental Investigation Report to define extent of contamination. Copper was detected above the soil background value but below residential soil screening levels (SSLs).

ii. Is this storm water sampled although these are not part of the IP?

The selection of SWMUs and AOCs for inclusion in the Individual Permit was based on historical information and any storm water, sediment, and soil data available at the time the Permit application was submitted. A Site that has met the definition of a SWMU or AOC was evaluated for inclusion in the current Individual Permit based on the following criteria: (1) the SWMU/AOC is exposed to storm water (e.g., not capped or subsurface); (2) the SWMU/AOC contains "significant industrial material" (e.g., not cleaned up or has contamination in place); and (3) the SWMU/AOC potentially impacts surface water. Through this conservative selection process, 405 Sites were selected for inclusion in the IP and the remaining sites were determined to not be a potential source to surface water. The remaining Sites are therefore not monitored for storm water as there is no storm water monitoring requirement under the Consent Order.

iii. What measures will be put in place to control runoff from the COPC soil areas in order to eliminate them as a source?

Monitoring and runoff controls are implemented per the IP, as applicable. For those sites not under the IP, investigation and characterization, risk assessment and appropriate remediation will be conducted per the Consent Order, providing full protection of human health and the environment.

c. Paragraph 7: This text describes the data collected for the thirteen sites and states that copper was not identified in the site description as a *significant* (emphasis added) industrial material historically used at any of the sites. Table 3 identifies some of the areas as **sources**, and if not sources, areas where the copper target action level (TAL) has been **exceeded**. Copper may not have been a 'significant industrial material'; however, based on the results listed in Table 3, it is clearly a discharge pollutant.

The Individual Permit treats a Site as an "industrial activity" that may create a "point-source discharge" and directs the Permittees to monitor storm water releases from Sites at specified sampling points (SMAs). As discussed above, the Site selection process conservatively identified Sites where routine and systematic releases of constituents historically managed at the Site may have occurred, consistent with the RCRA definition, and the Site itself is exposed to storm water. Consent Order soil data, which was collected after the Sites were selected for inclusion in the IP, is used to determine if significant industrial materials were historically released in surface soils (i.e.; to a depth of three feet).

The Individual Permit specifically excludes regulated storm water discharges associated with current conventional industrial activities or non-point runoff from developed areas at the Laboratory (e.g. parking lots). EPA is correct that there are nonpoint sources of copper in the storm water runoff, which contributes to exceedances of the TAL.

2. Section 1.3.1.3

a. The last two paragraphs are not clear. The text states that per the Multi-Sector General Permit (MSGP), copper is identified as a potential pollutant at only one MSGP facility [TA-60 (E122.35)], yet Table 4 shows copper to be a monitoring requirement for all. In addition, Table 4 identifies only one MSGP outfall that is currently being sampled, and it is sampled for PCBs not copper. If TA-60 is a source for copper, how will runoff be managed and monitored in the site monitoring plan (see Section 5).

For each type of industrial activity regulated by the MSGP, the MSGP identifies specific constituents required to be analyzed for in the permit-required storm water monitoring (i.e., potential pollutant for that activity). The MSGP then stipulates a pollutant benchmark concentration for that potential pollutant. Per the MSGP, copper is identified as a potential pollutant at two of LANS's MSGP facilities: the TA-60 Material Recycling Facility (MSGP Sector N – Scrap Recycling Facilities) and the TA-3-66 Sigma Complex (MSGP Sector F – Primary Metals). In addition to monitoring for the MSGP specified potential pollutants, if an industrial facility discharges to an impaired water body the MSGP requires monitoring for all pollutants for which the water body is impaired. Therefore, storm water monitoring for total copper is conducted at all the MSGP facilities discharging to Sandia Canyon.

Per the requirements of the current MSGP, which was issued on September 29, 2008, storm water monitoring was initiated in April 2009. Based on monitoring results since April 2009, and in accordance with the MSGP requirements, additional monitoring for copper has been eliminated at all the MSGP facility outfalls that have had storm water discharges to the Sandia Canyon AU. This reduction in sampling has been achieved through successful management of processes and pollutant sources, and by documenting that copper values

identified in storm water discharges were below either MSGP benchmark or background levels. This is the reason Table 4 does not identify sampling for copper at any MSGP outfall.

b. The last paragraph states that all monitoring results for copper have been below the MSGP sector-specific benchmarks or the LANL specific background value for storm water; therefore, monitoring for copper was discontinued.
   i. Over what time period were samples collected?
   ii. When was monitoring discontinued?
   iii. Please include a Table that provides the sampling results as compared with the MSGP benchmark or LANL specific background.

Table 4 is modified to include information that addresses the questions above. The permit period was from September 29, 2008 to September 29, 2013. LANL continues to operate under the 2008 MSGP under EPA issued Administrative Continuance until a new permit is issued. Per the 2008 MSGP, storm water monitoring was initiated in April 2009. Due to the semi-arid climate and seasonal freezing conditions in Los Alamos, and in accordance with Section 6.1.6 of the MSGP, a quarterly storm water monitoring period from April 1 – November 30 was established. Quarters were identified as two-month periods (Apr-May, June-July, Aug-Sept, Oct-Nov). At each facility monitoring was performed during these periods from April 2009 until the permit requirements authorizing the discontinuation of monitoring were met. These dates are identified in the updated Table 4. Per MSGP requirements, monitoring for copper has been eliminated at all the MSGP facility outfalls that have had storm water discharges to the Sandia Canyon AU. This reduction in sampling has been achieved by eliminating processes and pollutant sources, and by documenting that pollutants are below benchmark or background levels.

3. Sections 1.3.2.1 and 1.3.2.2:

Reference is made to a report titled "*Background Metals concentrations and Radioactivity in Storm Water on the Pajarito Plateau, Northern New Mexico*". This report appears to be the source for the copper data as well as the documentation on how the LANL site-specific copper background concentration and the LANL urban/developed areas copper baseline were determined. This 4b demonstration should present the details on how the LANL site-specific background concentration and the LANL urban/developed areas baseline were developed. These are critical comparison criteria that are used to estimate loads, make decisions regarding monitoring, and evaluate the effectiveness of implemented storm water controls.

a. Has the report been reviewed and accepted by the agencies?

The "Background Metals Concentrations and Radioactivity in Storm Water on the Pajarito Plateau, Northern New Mexico" (Background Report) was produced by LANL and not written to meet any specific regulatory requirements. It therefore has never been formally reviewed or accepted by any regulatory agencies, nor is that expected. However, LANL did provide the report to both EPA and NMED on May 23, 2013. The NMED Oversight and Surface Water Quality Bureaus did have the opportunity to provide comments. LANL intends to collect more data this upcoming field season to support a revision to this report. LANL is seeking input

from NMED and Communities for Clean Water prior to finalizing the sampling plan for 2014 and will ask both parties to review and comment on the revised report prior to publication.

b. Is there agreement that the site-specific background and urban/developed areas baseline values are acceptable and representative?

It is important to understand that the site-specific background and urban/developed areas baseline values for copper in the Background Report are not the primary information source used to make the determination whether or not copper was routinely and systematically released at a Site from historical activities (i.e.: a determination if copper is a significant industrial material at a Site). Consent Order soil data and Site history are the primary information sources used to make this determination. If the review of soil data and Site history demonstrate that copper was not released at the Site, the Background Report is used to as a tool to help determine where the TAL exceedance could be coming from. If the review of soil data indicates that copper was released from historical site activities but the TAL exceedance is higher than would be predicted based on the soil concentrations, the Background Report is used to assist in the determination of other non-Site related potential contributors to the TAL exceedance.

There is no formal agreement that the site-specific background and urban/developed areas baseline values are acceptable and representative.

LANL has used these baseline values in site evaluations and for making corrective action determinations in correspondence with EPA. An updated background report will be issued in 2014 and NMED has been made aware of our intent to update the report and has agreed to participate in grouping of monitoring locations and draft reviews.

c. Generally, copper easily adsorbs to particulate matter, primarily organic matter, and is associated with the matrix of solids in urban fill. The presence of copper in water is dependent on pH, the oxidation-reduction potential of the water, and the presence of competing cations, salts, and anions of insoluble cupric-organic and -inorganic complexing agents. The combined processes of complexation, adsorption, and precipitation control the level of free Cu(II) in water. The chemical conditions in most natural water are such that, even at relatively high copper concentrations, these processes will reduce the free Cu(II) concentration to extremely low values.

Chronic and acute WQC results from E123 (Sandia Canyon below the wetlands) calculated using the Biotic Ligand Model (BLM) and 2013 data range from 25 to 42 and 40 to 68 ug/L copper respectively. Using the same 2013 data set, hardness-based chronic and acute WQC for copper range from 5.2 to 6.6 and 7.3 to 9.6 ug/L. Considering the narrative above, the BLM takes into consideration all of the geochemical processes mentioned.

i. The report provides an estimated background range of 3.43 to 5.7 micrograms per liter (µg/l). When compared with the estimated background, the LANL urban/developed areas baseline is 6 times higher (34 µg/l vs 3-6 µg/l). Based on this, what is expected to be the source of the high dissolved copper concentrations found in the urban/developed area storm water?

Copper sources include automobile brake pads, architectural copper, copper pesticides, vehicle washing, copper cladding on buildings, roofs, pipes, down spouts, printing, cooling towers, and vehicle services. The dominant source of copper in urban runoff is brake pad wear.

ii. Is the calculated LANL urban/developed areas baseline reasonable when compared with other urban areas?

Copper concentrations observed in runoff from urban/developed landscapes in Los Alamos are at the lower end of the range observed nationally.

d. The Background report uses samples from two onsite SMAs to develop the 'run-on values'. S-SMA-0.25 is described in Table 3 as being a potential source for copper, where S-SMA-2 is not; however, both are described as having data that exceed the dissolved copper TAL.

i. Review of the figures in Appendix 2 shows sample locations to be downgradient of and within urban development. Why and how were these locations selected as representative of 'run-on'?

See d. ii. below

ii. If the purpose was to gather data related to 'run-on', then the sample locations should be located outside and upgradient of the urban area. If this is not the purpose of the sampling, then that should be made clear in the report.

Consent Order soil data and Site history are the primary information sources used to make this determination. If the review of soil data and Site history demonstrate that copper was not released at the Site, the Background Report is used to as a tool to help determine where the TAL exceedance could be coming from. If the review of soil data indicate that copper was released from historical site activities but the TAL exceedance is higher than would be predicted based on the soil concentrations, the Background Report is used to assist in the determination of other non-Site related potential contributors to the TAL exceedance.

The background report was intended to better understand the storm water footprint of the area and determine whether it is generally consistent with the literature. Therefore, sample locations to support background evaluation was not intended to be up gradient of all potential sources but to specifically understand the storm water flowing onto the regulated Sites. The locations were chosen to be representative of run-on to the Sites specifically, not of run-on to the entire facility. In addition, it is not always possible to capture paired run-on and run-off samples given the nature of the topography and the localized, intense storms seen in the area.

4. <u>Section 2.1.1:</u>

a. The second paragraph states that a load-duration curve was developed for E-123. The report does not include the data used to develop the load duration curve. The data (flow and concentration) and the process used to develop the flow and load duration curve should be provided. Without this information, it is not possible to evaluate the established curve.

The data used to develop the load duration curve in Figure 2 and Figures 3-5 are included in the attached spreadsheet file entitled: Category 4b Data Set. Gage E-123 flows and water quality data were queried for samples collected and analyzed in the period May 2008 to April 2013.

b. Figure 2 presents 9 data points.
   i. Are these the only data collected over the span of 2008 to 2013?

   No, for the period 2008 – 2013, twenty-five (25) samples were analyzed for dissolved copper. The data set used in figure 2 is amended to include non-detects and field duplicates. The detection limit in these cases was below the applicable water quality criterion. However, figure 2 does not completely align with the information in table 6. Five of the measured sample results did not have corresponding recorded flow data and loading could not be calculated.

   ii. What was the sample frequency?

   The sampling frequency varies. Gage E-121 (S-SMA-2) and Gage E-123 (below wetland) base flows are sampled pursuant to the Interim Ground Water Monitoring Plan once per year. These gages are also sampled in response to storm events.

   iii. Section 5 states that in accordance with the Laboratory's Surveillance Program, surface water and sediment have been sampled and analyzed since approximately 1970. Why are only 9 sample points used to develop the load duration curve?

   The data set from 2008 to 2013 was selected to match with the data for the development of the upcoming 2014 Integrated Report. And, as indicated above, figure 2 is amended to include 20 sample points.

   iv. Table 6 indicates that 15 samples were collected from E-123 and Figure 4 presents at least 21 samples. Why are only 9 data points used to develop the load duration curve and not all 15 and/or 21?

   Table 6 is amended as follows:

Table 6

Copper Monitoring Data for Watershed Based Gages Period 2008–2013

Monitoring Location	Min (µg/L)	Max (µg/L)	Mean (µg/L)	Median (µg/L)	No. of Samples	Ratio of Storm water Samples	No. of Acute WQC Exceedances
E121.9 Sandia Canyon East of Power Plant	—*	4.3	—	—	1	0/1	0
E121 (S-SMA-2) Right Fork at Power Plant	3.23	20.4	7.1	5.7	14	4/14	3
E123 - Sandia Below Wetland	3.16	17.5	6.4	5.3	25	12/25	5
Middle Sandia at WP Terminus (SCS-2)	3.1	6.5 <10	4.6	3.5	10	0/10	0

**Only one data point available.*

v. Table 6 indicates that the acute criterion was exceeded 4 times whereas Figure 2 shows only 2 exceedances. Please explain why these are different.

Table 6 is amended to include 5 excedances of the acute copper criteria and figure 2 shows two exceedances. The load duration curve was calculated using a median hardness value of 75 mg/L instead of the concurrent hardness used in Table 6 and Figures 3-5.

5. Section 2.1.2: Table 6 and Figures 3-5 are not consistent in the number of data points collected and presented. For example, Table 6 indicates that 15 samples were collected from E-121 where Figure 3 presents 13 or 14. Differences between Table 6 and Figures 4 and 5 are greater.

Table 6 and Figures 3-5 are now aligned. The number of data points are expanded to include field duplicates and non-detects. Errors in data selection were also corrected. The supporting data sets are included in the attached spreadsheet file entitled: Category 4b Data Set.

6. Section 2.1.3:

a. As referenced in the comments for Section 2.1.1, the target loads presented cannot be evaluated without the data.

The data set supporting target loading calculations is now included in the attached spreadsheet file entitled: Category 4b Data Set.

b. The report does not provide information or data on how the target loads for each source presented in Table 7 were calculated.

Below is a revised Table 7 that includes the information used to calculate loading for NPDES Outfall 001, 027 and 199. The copper values used to determine outfall loading

rates were obtained from Form 2C in the reapplication for Permit # NM0028355. The flow values were developed from the 2012 monthly averages reported in discharge monitoring reports to EPA Region VI.

Table 7 Target Loads for Dissolved Copper in Upper Sandia AU (E-123)

			High Flow (0-10%)[1]	Mid-Range Flows (10-40%)[1]	Low Flow[4]
Target Loads	**2012 Average Flow[2](mgd)**	**Copper[3] (ug/L)**	**0.248 lbs/day**	**0.0499 lbs/day**	-
Outfall[1] 001	0.268	2.6	0.0058	0.0058	-
Outfall[1] 027	0.059	2.2[6]	0.00108	0.001080	-
Outfall[1] 199	0.041	13.2	0.0045	0.0045	-
S-SMA	-	-	0	0	-
MSGP	-	-	0	0	-
Total Waste Load Allocation (WLA)	-	-	0.0113	0.0113	-
Load Allocation (LA)	-	-	0.212	0.0336	
Margin of Safety[5] (MOS)	-	-	0.0248	0.00499	-
Target Loads	-	-	**0.248**	**0.0499**	-

1. Outfall load is calculated based on flow x copper value x conversion factor 8.34
   a. Outfall 001 - 0.0026 mg/L x 0.268 mgd x 8.34
   b. Outfall 027 - 0.0022 mg/L x 0.059 mgd x 8.34
   c. Outfall 199 – 0.013 mg/L x 0.041 mgd x 8.34
2. 2012 Average Outfall Flow

2012		001	03A027	03A199
Jan	Total (gal)	10,063,100	1,594,600	934,100
Feb	Total (gal)	9,652,800	1,520,500	953,600
Mar	Total (gal)	9,787,700	1,654,800	1,151,400
Apr	Total (gal)	7,943,600	1,762,500	1,203,300
May	Total (gal)	6,817,600	1,842,500	1,363,600
Jun	Total (gal)	6,486,200	2,015,600	1,699,000
Jul	Total (gal)	7,466,700	2,083,600	1,624,700
Aug	Total (gal)	7,492,900	2,089,500	1,567,900
Sep	Total (gal)	7,006,400	1,954,000	1,332,700
Oct	Total (gal)	8,469,700	1,932,300	1,266,500
Nov	Total (gal)	8,687,600	1,666,900	998,200
Dec	Total (gal)	8,007,700	1,511,100	972,900
	Total Gal	97,882,000	21,627,900	15,067,900
	Mgal	97.882	21.6279	15.0679
	mgd	0.268	0.059	0.041

3. NPDES NM0028355 Permit Renewal Application Form Copper values used on Form 2C from application renewal

Location ID	Parameter Name	Report Result	Report Units	Detected	Sample Matrix	Sample Purpose	Filtered
NPDES Outfall 01A001	Copper	2.6	ug/L	Y	W	REG	N
NPDES Outfall 03A027	Copper	2.2	ug/L	N	W	REG	N
NPDES Outfall 03A199	Copper	13.2	ug/L	Y	W	REG	N

4. No TMDL calculations for lower flow because there were no WQS exceedances
5. 10% MOS
6. The copper value was changed from 9.5 ug/L to 2.2 ug/L.

c. There are two locations where copper is a CPOC as cited in Section 1.3.1.2. These two locations are not covered by the IP. It is not clear if water from these areas discharge to the AU. Since they are areas of interest (one AOC and one SWMU) then any load associated with them is of interest. Currently, the S-SMA, assuming that these are covered by the IP, is assigned a WLA of zero (0). Information related to these areas needs further discussion to determine whether they are source areas.

As discussed in the response to comments on Section 1.3.1.2, AOC C-61-002 and SWMU 03-13(i) were evaluated and determined not to be point sources of significant industrial material exposed to storm water and therefore are not included in the IP. These sites are being evaluated under the Consent Order and assessed for risk to human health and the environment.

Though storm water specifically from these Sites is not being monitored under the IP or other NPDES permits, it is important to consider that LANL does perform environmental surveillance in the canyons to study any potential impacts to humans or ecological receptors.

d. As referenced in the comments for 1.3.1.3.a, one MSGP is identified as a source of copper. Currently, the MSGP category is assigned a WLA of zero (0). Information related to the MSGP source area needs further discussion.

For each type of industrial activity regulated by the MSGP, the MSGP identifies specific constituents required to be analyzed for in the permit-required storm water monitoring (i.e., potential pollutant for that activity), The MSGP then stipulates a pollutant benchmark concentration for that potential pollutant. Per the 2008 MSGP, copper is identified as a potential pollutant at <u>two</u> of LANL's MSGP facilities: the TA-60 Material Recycling Facility (E122.35) and the TA-3-66 Sigma Complex. These facilities are covered under MSGP Sectors N and Sector F, respectively. Therefore copper, per the MSGP listing, was identified as a potential pollutant, and not necessarily a source. Storm water monitoring for copper was initiated in April 2009 at all MSGP facilities to identify copper sources and determined pollutant levels. From monitoring results it was identified that copper levels were below benchmark or background levels and therefore not a pollutant

source. In accordance with MSGP requirements storm water monitoring for this pollutant source was discontinued. This is the reason the MSGP category was assigned a WLA of zero.

e. As stated in Comment 3.c, copper easily adsorbs to particulate matter, primarily organic matter, and is associated with the matrix of solids in urban fill. Storm events increase runoff and water velocity resulting in increased total suspended solids/sediments in the water column. Because of its association with solids, it is expected that elevated total copper concentrations would be associated with the increase in total suspended solids/sediments during storm events. This relationship does not necessarily translate to dissolved copper. Figure six in this report is provided to demonstrate a link between dissolved copper and total suspended sediments; however, this relationship is influenced by one sample point that appears to be an outlier. More data need to be collected in order to conclude that there is a positive correlation between dissolved copper and total suspended solids/sediments.

Agree. For the time period between 2008 and 2103, TSS was not always available with the corresponding dissolved copper data. Additional data will be collected and TSS sampling is included in the monitoring plan. It is anticipated that monitoring will be conducted at multiple locations within the developed areas upstream from Sandia Canyon AU to collected first flush storm event samples. Results from these samples will be compared to baseflow and storm event samples from downstream gages to evaluate TSS-dissolved copper correlations. The factors that govern the partition between dissolution, precipitation, adsorption, and redox processes, on the formation of the dissolved copper fraction in rain water and storm water, have not been specifically investigated at the Laboratory. Consequently, sampling in the early stages of a storm event will further our understanding of the factors that impact dissolved copper concentrations.

f. This section states that the Technical Release 55 model was used to estimate load allocations from non-point sources.

i. Please describe how the model was used to calculate the load allocation.

WinTR-55 is a single-event rainfall-runoff small watershed hydrologic model that can generate hydrographs from urban areas. The hydrographs are routed downstream through channels and/or reservoirs. Watersheds in WinTR-55 are composed of sub-areas (land areas) and reaches (major flow paths in the watershed). Each sub-area has a hydrograph generated from the land area based on the land use and climate characteristics input into the model. Reaches are designated as channel reaches where hydrographs are routed based on physical reach characteristics. Hydrographs from sub-areas and reaches are combined as needed to accumulate flow as water moves from the upland areas down through the watershed reach network. The accumulation of all runoff from the watershed is represented at the watershed Outlet.

For this application, the runoff from predominantly impervious areas upstream from Sandia Canyon, generated by a 0.5 inch storm event was calculated. The Outlet was the point of discharge into the head of Sandia Canyon. Model input data consisted primarily of land use details, storm data, and reach characteristics. Land use details included identification of the land cover type, size of the land cover (area), hydrologic soil group, and from these inputs the corresponding runoff curve number. Storm data included the rainfall distribution type and the 24-hr rainfall amount. Reach characteristics include flow type (channel, sheet, shallow concentrated), slope, and length of flow path.

The results of the model indicate that the estimated peak discharge from a 0.5 inch event over a 77 acre area in TA-3 (upstream from Sandia Canyon) is 7.25 cfs (4.6 MGD). The instantaneous discharge was used with the urban/developed baseline copper value of 34.1 ug/l to calculate the peak loading rate of 1.32lbs/day.

[4.6 mgd x 0.034 mg/L x 8.34 conversion factor = 1.32 lbs./day]

ii. The text states that the model estimated a 1.32 lbs/day peak load using a 0.5 inch precipitation event. Based on data presented in Figure 2 and stated in the text, this model estimated 1.32 lbs/day load was not reached even during a site-sampled storm event where flow was measured at 1.49 mgd and load was measured at 0.248 lbs/day. The non-point source load estimate far exceeds the target load for the entire site at high flow conditions.

1. What is the significance of the model estimated load?

This is a first attempt to understand load contributions from a developed area at the Laboratory to the upper Sandia Canyon AU. The model estimated load was derived using runoff from an area of predominantly impervious surfaces located at the head of Sandia Canyon. Runoff from this area is primarily managed through conventional storm water systems (curb and gutter, drop inlets, culverts, etc.) which collect and concentrate runoff prior to discharge into the canyon. A 0.5 inch storm event falling on these impervious surfaces would be expected to result in a higher peak discharge rate compared with flows measured further downstream beyond the open channel and wetland within Sandia Canyon. The load contribution of 1.32 lbs/day was derived from this point of higher flowrate at the head of the canyon. A dissolved copper baseline value of 34.1 ug/L was established from storm water runoff at urban areas of the Laboratory.

Once runoff enters the canyon, the flowrate is reduced by increasing width of the conveyance (change from a pipe to an open channel configuration within the canyon), and through the impacts of infiltration and evapotranspiration, especially through the wetland area. The values in Figure 2 are derived from data measured at a location (E-123)

on the downstream side of the wetland. A reduction in flowrate, from what is measured at the head of the canyon, is expected at E-123. A reduction in flowrate would correspond to a reduction in pollutant loading. Our model results supported this correlation. In addition the flow values used to develop Figure 2 include approximately 0.400 mgd in base flows from NPDES Outfall 011 which enters Sandia Canyon just downstream from the head of the canyon. This baseflow, in compliance with NPDES permit requirements, has very low copper levels. The addition of this baseflow to the storm water runoff from the impervious areas upstream further aids in a reduction of pollutant loading. The results of this modeled scenario demonstrate the impact on loading from a developed area at the Laboratory, provide support for the load allocation contributions from non-point sources outlined in Table 7, and support the correlation that existing topography and controls measures within Sandia Canyon utilized to influence flow rates can contribute to a reduction in pollutant loading within the AU.

2. How do model results influence estimated load allocations?

As indicated above the model results demonstrate that the load allocations from non-point sources represent a signification portion of the total allocation.

g. The text states that the target loads of 0.248 lbs/day and 0.0499 lbs/day were exceeded by 0.042 lbs/day and 0.014 lbs/day, respectively. Please clarify that these exceedances (0.042 lbs/day and 0.014 lbs/day) are intended to represent load reductions that would be necessary in order to meet the water quality standards.

The load duration curve in Figure 2 show a number of copper measured loads calculated from ambient water quality and the average flow on the date of the sample. In two instances the loads plot above the curve and indicate an exceedance of the water quality criterion. At flows of 1.49 mgd the target load was exceeded by 0.042 lbs./day and at flows of 0.538 mgd the target load was exceeded by 0.014 lbs./day. At the same time Figure 2 demonstrates that under similarly high flow conditions target loads were not exceeded. With the inherent uncertainty in load allocation amounts, it is difficult to accurately determine the reductions necessary to achieve target loading. However, reducing the load from high level flow events, in amounts corresponding to the target load exceedances of 0,014lbs/day and 0,042 lbs./day in Figure 2, provides a basis for consistent achievement of target loading goals and represent the load reductions necessary to meet water quality standards.

7. Section 2.3: The control measures discussed in this section of the report are specifically designed to manage storm water and associated total suspended solids/sediments. The AU impairment is for dissolved copper. As noted in comments 3.c and 6.e, more data are needed to support a correlation between dissolved copper and total suspended solids/sediment.

Agree more data is needed to determine a TSS – dissolved copper correlation. It is understood that storm water urban runoff is a significant contributor to copper in the AU. Dissolved copper in storm water runoff is primarily bound with organic matter. The factors that govern the partition between dissolution, precipitation, adsorption, and redox processes, on the formation of the dissolved copper fraction in rain water and storm water, have not been specifically investigated at the Laboratory. Monitoring for TSS and dissolved copper will continue at gages E121, E123 and SCS-2. The Background study is ongoing and expected to gather more information for baseline values from urban/developed areas. The Storm Water Management plan, currently in development, is expected to include a monitoring component that will be used to define direct impacts from urban runoff. It is anticipated that monitoring will be conducted at multiple locations within the developed areas upstream from Sandia Canyon AU to collected first flush storm event samples. Results from these samples will be compared to baseflow and storm event samples from downstream gages to evaluate TSS-dissolved copper correlations.

The wetland area in upper Sandia Canyon is approximately 3.3 acres in size. In November the Sandia Grade Control Project was completed. One of the primary objectives was to better establish an even grade through the wetland to allow additional wetland expansion and further stabilization. The large amount of organic material can serve as a reducing environment which will promote the formation of more stable forms of copper-organic complexes. The wetland also reduces flow rate within the canyon and promotes sediment deposition. The wetland is an important historical sediment deposition area as the area contains approximately 80% to 90% of the inventory of copper within Sandia Canyon sediment deposits. Monitoring of the performance of the wetland to address dissolved copper concentrations will continue.

8. Section 2.3.1.2:

   a. Please include a description of the site-specific control measures implemented by the laboratory to address the non-numeric technology-based effluent limits. In addition, please describe the monitoring program that accompanies these implemented measures.

      The site-specific control measures implemented across the 405 Sites under the IP along with the monitoring program are summarized in the annual update to the Site Discharge Pollution Prevention Plan and the Annual Report. Baseline control measures were installed and certified at all 405 Sites to address the non-numeric technology-based effluent limits. These installations were completed within the first 6-months of the permit that was issued 11/1/10. Photographs of these controls are at the website link provided. Both documents can be found on the IP's public website: http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/index.php

   b. Please provide a schedule for the completion of corrective action and/or BMP implementation for the remaining 33 sites (21 sites delayed due to decommissioning/demolition actions, 2 under other regulatory programs, 10 extend of contamination investigation).

No schedule is currently available for the remaining sites in Upper Sandia Canyon Aggregate Area.

c. What are the other regulatory programs that will be addressing the 2 sites? How will the actions of these other regulatory programs result in and/or support improvements to water quality?

The other two sites are permitted outfalls under the NPDES Industrial Permit.

9. Section 2.3.1.3:
   a. The text states that since April 2009 monitoring results for copper have been below either the MSGP benchmark or the LANL specific background value for storm water.
      i. How many samples were collected and analyzed for copper? Over what time period were these samples collected? When was copper eliminated from the sampling plan?

      Table 4 is amended to include the number of samples collected, the time period the samples were collected and the dates sampling was eliminated.

      ii. The text states that storm water monitoring results identify the need to modify existing controls or implement new controls. If copper is no longer sampled, then potential future exceedances will go unnoticed and necessary adjustments or modifications to control measure will not be made. Please describe the control measures or checks that are in place to address this.

      Activities and operations at MSGP facilities are regularly evaluated for compliance with the MSGP requirements through formal inspections, quarterly visual assessment of storm water discharges, and informal walk-arounds. For MSGP facilities where storm water analytical monitoring has ceased, if there is new construction or a change in the operation or maintenance at the facility that significantly changes the nature or quantity of pollutants discharged in storm water, the facility will be reevaluated and modifications will be made, including possibly resuming analytical monitoring. Additionally, quarterly visual assessments of storm water discharges are conducted even if analytical monitoring has ceased. If either the visual assessments or facility inspections indicate that control measures may not be stringent enough for the discharges to meet applicable water quality standards, necessary adjustments or modifications, including resumption of analytical monitoring, will be implemented.

10. Section 2.3.2.1: Please identify the frequency of the monitoring that will be conducted pursuant to the consent order.

Monitoring pursuant to Consent Order requirement will be conducted at the following frequency: piezometers: quarterly; baseflow samples: quarterly; storm water samples: after significant rain events; vegetation monitoring: annually; and cross section profiles: annually.

11. Section 2.3.2.3: Please clarify if the site investigation has determined whether landfill leachate is discharging to the AU and whether this may be a source of dissolved copper.

The landfill is owned by Los Alamos County and is now closed and operating under a NMED approved closure plan. A leachate collection system is not in place. The Laboratory is not aware of any reports or documentation indicating leachate from the landfill is impacting the upper Sandia Canyon AU.

12. Section 3: Based on this section, achievement of water quality standards is expected within two assessment cycles or 4 years. Since the wetland project is complete (2013), and the document describes storm water controls in place presently, then data collected over the next 4 years, ending in 2018, should indicate that the water quality standard for copper has been met. If at the end of this 4 year assessment the water quality standard has not been met, then what corrective actions and/or alternatives will be implemented?

The development and execution of an urban storm water management plan for the Laboratory is a key to addressing non-point source contamination and eventual attainment of water quality standards in the long-term. While still in development, the storm water management plan is expected to take an adaptive management approach and will include a monitoring component. The plan will be continually reviewed to determine if and where revisions may need to be made to eliminate conditions, prevent reoccurrence, and ensure that water quality standards are attained.

13. Section 5:
    a. This monitoring plan should include E-121. Based on data presented in Section 2.1.2, this location has exceedances of dissolved copper and has data results essentially the same as E-123. This location is upstream of the Sandia Wetland and downstream of LANL TA-03, including the three industrial permitted outfalls. Monitoring E-121 will provide data related to the effectiveness of controls implemented within TA-03 for the purposes of controlling the LANL urban/developed laboratory non-point source. In addition, E-121 will provide data to assess the effectiveness of the wetland area by providing an upstream influent value that can be compared with the downstream effluent data collected at E-123.

    Agree the monitoring plan will be amended to include E-121 (S-SMA-2).

    b. Please describe the monitoring frequency for each of these activities and the sample locations as they relate to dissolved copper. Summarizing these in a table would be useful.

    Monitoring occurs at these gages pursuant to the Interim Facility-Wide Groundwater Monitoring Plan and in response to storm events as follows:

Gage	Flow	Metals (including dissolved copper)	General Inorganics	TSS/SSC
E-121 (S-SMA-2) Sandia Right Fork @ Power Plant (above wetland)	Continuous	Quarterly and in response to storm events	Quarterly and in response to storm events	Quarterly and in response to storm events
E-123 Sandia Below Wetlands	Continuous	Quarterly and in response to storm events	Quarterly and in response to storm events	Quarterly and in response to storm events
S-SCS-2 Middle Sandia		Quarterly and in	Quarterly and	Quarterly and in

Canyon @ Terminus of Persistent Base Flow		response to storm events	in response to storm events	response to storm events

c. Surface water monitoring Number 1: This text includes a description of activities that implies ground water is discharging to surface water. If this is the case, then a discussion of the potential impact of ground water discharge on surface water concentrations should be included.

No, this is not the case. The Interim Facility-Wide Groundwater Monitoring Plan fulfills a requirement of the Consent Order. The Laboratory collects and analyzes groundwater and surface water samples at specific locations and for specific constituents to fulfill the requirements of the Consent Order.

i. Is the ground water contaminated with copper and is it a source of contamination for surface water?

Not Applicable

ii. Where does the ground water discharge to surface water?

Not Applicable

iii. Do ground water characteristics (pH, pollutants, hardness, etc) impact surface water and how does that affect copper concentration?

Not Applicable

d. Surface water monitoring Number 4: this states that monitoring under the MSGP will continue. According to Table 4, only one location is sampled. Sampling at all other locations has been discontinued. Please clarify what sampling will be conducted in support of this 4bdemonstration.

No additional sampling above and beyond MSGP permit requirements will be conducted. Activities and monitoring results since the initiation of analytical storm water monitoring at MSGP facilities in April 2009 have satisfied the MSGP conditions for discontinuation of monitoring at all but one site discharging into Sandia Canyon. This is the reason that monitoring is currently being conducted at only one MSGP facility. Upon issuance of the new MSGP (expected in 2014), analytical monitoring at all of the MSGP facilities will resume in accordance with the new permit requirements. This part of the document was intended to provide a summary of the overall sampling conducted of surface water at the Laboratory.

e. Please clarify that the data and 4b effectiveness evaluation will be part of the Environmental Surveillance report and will be submitted annually for agency review.

The annual Environmental Surveillance Report is prepared pursuant to DOE Order 450.1. The report summarizes environmental data that are used to determine compliance with applicable federal, state and local environmental laws and regulations, executive orders, and

departmental policies. Additional data, beyond the minimum required, are also gathered and reported as part of the Laboratory's efforts to ensure public safety and to monitor environmental quality at and near the Laboratory. A summary of 4b measures and effectiveness will be included in the Watershed chapter.

f. The document does not discuss the AU's relationship to downstream water quality and designated uses.

i. What are the downstream water quality criteria?

The AU downstream of the upper Sandia Canyon AU is NM-128.A_11 Sandia Canyon (within LANL below Sigma Canyon). The designated uses are: 1) limited aquatic life, 2) livestock watering, 3) secondary contact, and 4) wildlife habitat. The designated use not supported is limited aquatic life. Dissolved copper is the parameter associated with non-attainment.

ii. Is this evaluation expected to be protective of downstream water quality criteria?

Yes, improvements in water quality criteria in the upper AU are expected to be protective of the lower Sandia Canyon AU. Results of base flow samples at gage S-SCS-2, which is located at the downstream end of the upper AU, show attainment of the acute dissolved copper criteria. Use of this gage was discontinued in 2012 and did not capture storm events for the period. As part of this demonstration, the gage will be activated to capture both baseflow and storm events and used to evaluate potential impacts to the lower AU.

14. General: Please replace the site figures with electronic versions that can be reviewed at high resolution. The site is complex with multiple management units and points of interest that are difficult to identify without clear figures.

Agree. Electronic versions of figures and maps will be provided.

15. General: Because of its complexity, simple site descriptions and a logical flow of historical activities is essential for a reader that is not familiar with the site's history. Moving details and explanations stated in Sections 2.3.1 and 2.3.2 to Sections 1.3.1 and 1.3.2 would assist the reader in understanding this site early in the document.

Agree. These changes will be made in the final document.

16. Section 1.1: It would be helpful to identify and describe E-123, as well as all other gage stations, early in the report.

Agree. Gages E-121, E-123 and SCS-2 will be identified and described in Section 1.

17. Table 4: Table 4 has a column titled 'Gage No.' and lists E121.9, E122.3, E123.4, and E122.35. According to Appendix 1 Figure 4B Demonstration Sandia Canyon Assessment Units, these are MSGP monitoring stations. Please clarify what the 'Gage No.' column represents.

Table 4 is amended to include the outfall and station # for MSGP monitoring sites.

18. Section 2.3.1.1: The average discharge listed here is 300,000 gallons per day. The listed average in Section 1.3.1.1 is 290,000 gallons per day. The averages reported and used in the calculations throughout the report should be consistent and should not vary.

    Calendar year 2012 average flows from outfall 001 will be used throughout the report. This includes flows used for loading calculations.

19. Section 4: Effective dates are inconsistent with previous text discussion of expected expiration dates. Industrial Outfall Permit is explained as being proposed in 2013 and expected to be reissued in 2014 (Section 2.3.1.1); Storm water individual permit expires 2015 (Section 2.3.1.2) and MSGP permit has been issued as draft and is anticipated that the new permit will be issued in 2014 (Section 2.3.1.3).

    Agree. Inconsistencies will be corrected and updated as permits are re-issued.

20. Footnotes 1 and 2 are missing from Table 7.

    Table 7 has been updated to include footnotes.

ENCLOSURE 2

Environmental Protection Agency Memorandum – April 8, 2014

ENV-DO-14-0103

LAUR-13-28670

Date: MAY 1 4 2014

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
WATER QUALITY DIVISION
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

April 8, 2014

MEMORANDUM

SUBJECT: Review of the *Justification for an Integrated Reporting Category 4b Demonstration – Upper Sandia Canyon Assessment Unit – AU NM-9000.A_047-Dissolved Copper Pollutant Pair*

TO: Daniel Reid, Monitoring and Assessment
Water Quality Protection Division

Through: Richard Wooster, Chief
TMDL Section

From: Katrina Higgins-Coltrain, State Coordinator
TMDL Section

On March 5, 2014, the New Mexico Environment Department (NMED) received the *Justification for an Integrated Reporting Category 4b Demonstration – Upper Sandia Canyon Assessment Unit – AU NM-9000.A_047-Dissolved Copper Pollutant Pair*, submitted by Los Alamos National Security, LLC and the Department of Energy. The document was then sent to the U.S. Environmental Protection Agency (USEPA) for review. The purpose of this memorandum is to provide review comments and questions for your consideration.

USEPA regulations recognize that alternative pollution control requirements that are stringent enough, in place, and monitored may make the development of a total maximum daily load (TMDL) unnecessary because both mechanisms would essentially achieve the same surface water quality goal. Specifically, TMDLs are not required if technology-based effluent limitations, more stringent effluent limitations, or other pollution control requirements (*e.g.*, best management practices) required by local, State, or Federal authority are stringent enough to implement an applicable water quality standard (WQS) [see 40 CFR 130.7(b)(1)] within a reasonable period of time. The purpose of the submitted report is to provide justification and documentation that the regulatory controls currently in place and planned are stringent enough to implement applicable water quality standards within a reasonable time period and provide an alternative to the development of a TMDL. The focus of the report is on assessment unit (AU) NM-9000.A_47 Sandia Canyon (Sigma Canyon to outfall 001) where the

designated coldwater aquatic life use is unattained due to dissolved copper-acute aquatic life criterion.

The following list of required elements is taken largely from USEPA's 2008 Integrated Report and Listing Decisions memorandum from Diane Regas.[1] This memorandum states that "the demonstration should describe the basis for concluding that the pollution controls are requirements or why other types of controls already in place may be sufficient." The memorandum provides a structure for submitting all the information needed in order to determine if Category 4b is the correct determination. Alternatively, an AU can be moved from Category 4b to Category 5 if the original Category 4b determination can no longer be supported.[2] All requests for Category 4b determinations must include the following six elements:

1. Identification of assessment unit and statement of problem causing the impairment;
2. Description of pollution controls and how they will achieve water quality standards;
3. An estimate or projection of the time when WQS will be met;
4. Schedule for implementing pollution controls;
5. Monitoring plan to track effectiveness of pollution controls; and
6. Commitment to revise pollution controls, as necessary.

This report is being reviewed with respect to the 6 elements listed above with emphasis on the monitoring and modeling data submitted to support the point source loads, nonpoint source loads and the load reductions estimated to occur from best management practices implemented to achieve applicable water quality standards.[3] It is understood that the 4b demonstration is preferred to a TMDL due to the work being completed under the Resource Conservation and Recovery Act Corrective Action and the work being completed under the requirements of the three permits. However, the report does not clearly explain how these actions will result in attainment of the dissolved copper acute-aquatic water quality standard. The report includes each of the six elements described above; however, questions and comments related to several elements may require that additional clarification and detail be provided.

Under element number 1, the Category 4b demonstration should identify the sources of the pollutant causing the impairment. The demonstration includes a description of the known and likely point, nonpoint, and background (upstream inputs) sources of the pollutant causing the impairment, including the potential magnitude and locations of the sources. The report describes an evaluation completed in 2013 that was specifically

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[1] Information concerning 2008 Clean Water Act sections 303(d), 305(b), and 314 integrated reporting and listing decisions. Memorandum from the Office of Wetlands, Oceans, and Watersheds. October 12, 2006. Washington, D.C.

[2] Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act. Memorandum from the Office of Wetlands, Oceans, and Watersheds. July 29, 2005. Washington, D.C.

[3] Enclosure to memorandum from Mr. Miguel Flores, Director, Water Quality Protection Division, EPA Region 6, to Region 6 State Water Quality Program Managers, "EPA Region 6 Process for Review of Watershed-based Plans in lieu of TMDL's. May 23, 2007. Dallas, TX.

designed to determine background concentrations in undeveloped reference watershed and western locations and determine the baseline/non-point source concentrations of metals in urban/developed areas runoff. The report does not include or discuss the data used in these analyses and does not discuss the process used to develop these concentrations representing potential source magnitude. Additional information regarding the sampling strategy, the results, and the justification for the selected concentrations is necessary in order to determine and accept these values as appropriate comparison criteria and estimates of source magnitude.

Under element 2, the Category 4b demonstration should describe the cause-and-effect relationship between the water quality standard and the identified pollutant sources and, based on this linkage, identify what loadings are acceptable to achieve the water quality standard. This report discusses the loading capacity for the AU for the pollutant of concern in terms of a load duration curve. The report only provides the reader a visual graph and does not include the data used to develop this curve for a more detailed evaluation. In addition, the data presented in the graph appears to be a subset of data actually collected (see Table 6 and Figures 3 through 5). Under Section 2.1.3, the document presents target load allocations for dissolved copper; however, the document does not include the data used to calculate the loads, does not discuss how the point source loads were calculated, does not include a discussion on why point sources are given an allocation of zero, and does not describe how the model was used to calculate the non-point source load allocation.

The report discusses the dissolved copper concentrations in relationship to storm water and total suspended solids/sediment. Based on the load duration curve presented in the report, 0.042 pounds per day (lbs/day) for high flow and 0.014 lbs/day for mid-range flow are the estimated load reductions. The report states that 'to the extent that sediment transport, generated by high flow events, can be further controlled, copper concentrations are likely to improve.' Dissolved copper is the target pollutant, and its concentration has not been correlated with total suspended solids/sediment. Therefore, the conclusion that the control of sediments will directly impact dissolved copper concentrations is not fully supported. As noted in the listed comments, additional data are needed in order to conclude that the dissolved copper concentrations are linked with total suspended solids/sediment, and that control of total suspended solids/sediment will eventually lead to attainment of the dissolved copper acute-aquatic water quality standards. This relationship is crucial as all pollutant control measures described in this report are related to the reduction of flow and the loading of total suspended solids/sediment.

Under element 5, the Category 4b demonstration should include a description of, and schedule for, monitoring milestones to track effectiveness of the pollution controls. The demonstration should describe water quality monitoring that will be performed to determine the combined effectiveness of the pollution controls on ambient water quality. The report indicates that two gaging stations will be sampled and used to determined the effectiveness of the 4b demonstration by evaluating information specific to the pollutants causing the impairment; however, details on how these stations will be sampled, what pollutants and information specific to the pollutants will be sampled, and how data will

be evaluated to determine effectiveness are not presented. In addition, these two gaging stations are downgradient of the wetland and associated site storm water controls. The effectiveness of the site storm water controls and the wetland cannot be assessed without upgradient monitoring locations that provide comparison input data.

The purpose of the Category 4b report is to demonstrate and document that current and future regulatory controls are stringent enough, in place, and monitored such that development of a TMDL is unnecessary because both mechanisms would essentially achieve the same surface water quality goal. The three elements of the 4b Structure discussed above are the primary areas of concern and are essential to the evaluation of the Category 4b demonstration and its acceptance as an alternative to a TMDL. It is expected that LANL can address these issues through a report revision that includes

- explanations of the corrective action and permit required work completed, ongoing, and planned; how these actions are monitored; and how these actions are expected to impact water quality.
- data tables with calculation explanations in support of background, baseline, and load calculations.
- data tables with explanations of the data collected and used to evaluate the correlation of dissolved copper to total suspended solids and how this correlation supports site control measures and impacts water quality.
- a description of the 4b-specific sampling strategy used to evaluate effectiveness.

To assist with responses and revisions to the above mentioned primary areas of concern, detailed section-specific comments and questions are listed below.

1. Section 1.3.1.2:
    a. A brief description of the various corrective actions being taken to address the solid waste management unit (SWMUs) under the consent order would be useful and provides information related to source cleanup.
    b. Paragraph 6: Text is not clear regarding the refined locations where copper is a contaminant of potential concern (COPC) for soil. Text identifies one area of concern [AOC (C-61-002)] and one SWMU 03-13(i) as areas of concern, but then lists a different AOC [03-003(d)] and 3 different SWMUs [03-45(b), 03-45(c), 03-014(c)] as being covered by the individual permit (IP). It is noted that neither of the COPC soil areas are listed in Table 3 as being covered by the IP.
        i. Does storm water from AOC (C-61-002) and SWMU [03-13(i)] discharge to the AU and impact dissolved copper concentrations?
        ii. Is this storm water sampled although these are not part of the IP?
        iii. What measures will be put in place to control runoff from the COPC soil areas in order to eliminate them as a source?
    c. Paragraph 7: This text describes the data collected for the thirteen sites and states that copper was not identified in the site description as a *significant* (emphasis added) industrial material historically used at any of the sites. Table 3 identifies some of the areas as **sources**, and if not sources, areas where the copper target action level (TAL) has been **exceeded**. Copper

may not have been a 'significant industrial material'; however, based on the results listed in Table 3, it is clearly a discharge pollutant.

d. Paragraph 8: This text states that data have been collected from the 13 site monitoring areas (SMAs) since 2011. Please include a Table that provides the sampling results compared with the IP target action levels.

2. Section 1.3.1.3:
   a. The last two paragraphs are not clear. The text states that per the Multi-Sector General Permit (MSGP), copper is identified as a potential pollutant at only one MSGP facility [TA-60 (E122.35)], yet Table 4 shows copper to be a monitoring requirement for all. In addition, Table 4 identifies only one MSGP outfall that is currently being sampled, and it is sampled for PCBs not copper. If TA-60 is a source for copper, how will runoff be managed and monitored in the site monitoring plan (see Section 5).
   b. The last paragraph states that all monitoring results for copper have been below the MSGP sector-specific benchmarks or the LANL specific background value for storm water; therefore, monitoring for copper was discontinued.
      i. Over what time period were samples collected?
      ii. When was monitoring discontinued?
      iii. Please include a Table that provides the sampling results as compared with the MSGP benchmark or LANL specific background.
3. Sections 1.3.2.1 and 1.3.2.2: Reference is made to a report titled "*Background Metals concentrations and Radioactivity in Storm Water on the Pajarito Plateau, Northern New Mexico*". This report appears to be the source for the copper data as well as the documentation on how the LANL site-specific copper background concentration and the LANL urban/developed areas copper baseline were determined. This 4b demonstration should present the details on how the LANL site-specific background concentration and the LANL urban/developed areas baseline were developed. These are critical comparison criteria that are used to estimate loads, make decisions regarding monitoring, and evaluate the effectiveness of implemented storm water controls.
   a. Has the report been reviewed and accepted by the agencies?
   b. Is there agreement that the site-specific background and urban/developed areas baseline values are acceptable and representative?
   c. Generally, copper easily adsorbs to particulate matter, primarily organic matter, and is associated with the matrix of solids in urban fill. The presence of copper in water is dependent on pH, the oxidation-reduction potential of the water, and the presence of competing cations, salts, and anions of insoluble cupric-organic and -inorganic complexing agents. The combined processes of complexation, adsorption, and precipitation control the level of free Cu(II) in water. The chemical conditions in most natural water are such that, even at relatively high copper concentrations, these processes will reduce the free Cu(II) concentration to extremely low

values.[4]

i. The report provides an estimated background range of 3.43 to 5.7 micrograms per liter (µg/l). When compared with the estimated background, the LANL urban/developed areas baseline is 6 times higher (34 µg/l vs 3-6 µg/l). Based on this, what is expected to be the source of the high dissolved copper concentrations found in the urban/developed area storm water?

ii. Is the calculated LANL urban/developed areas baseline reasonable when compared with other urban areas?

d. The Background report uses samples from two onsite SMAs to develop the 'run-on values'. S-SMA-0.25 is described in Table 3 as being a potential source for copper, where S-SMA-2 is not; however, both are described as having data that exceed the dissolved copper TAL.

i. Review of the figures in Appendix 2 shows sample locations to be downgradient of and within urban development. Why and how were these locations selected as representative of 'run-on'?

ii. If the purpose was to gather data related to 'run-on', then the sample locations should be located outside and upgradient of the urban area. If this is not the purpose of the sampling, then that should be made clear in the report.

4. Section 2.1.1:

a. The second paragraph states that a load-duration curve was developed for E-123. The report does not include the data used to develop the load duration curve. The data (flow and concentration) and the process used to develop the flow and load duration curve should be provided. Without this information, it is not possible to evaluate the established curve.

b. Figure 2 presents 9 data points.

i. Are these the only data collected over the span of 2008 to 2013?

ii. What was the sample frequency?

iii. Section 5 states that in accordance with the Laboratory's Surveillance Program, surface water and sediment have been sampled and analyzed since approximately 1970. Why are only 9 sample points used to develop the load duration curve?

iv. Table 6 indicates that 15 samples were collected from E-123 and Figure 4 presents at least 21 samples. Why are only 9 data points used to develop the load duration curve and not all 15 and/or 21?

v. Table 6 indicates that the acute criterion was exceeded 4 times whereas Figure 2 shows only 2 exceedances. Please explain why these are different.

5. Section 2.1.2: Table 6 and Figures 3-5 are not consistent in the number of data points collected and presented. For example, Table 6 indicates that 15 samples were collected from E-121 where Figure 3 presents 13 or 14. Differences between Table 6 and Figures 4 and 5 are greater.

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[4] Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry. *Toxicological Profile for Copper*. September 2004

6. Section 2.1.3:
    a. As referenced in the comments for Section 2.1.1, the target loads presented cannot be evaluated without the data.
    b. The report does not provide information or data on how the target loads for each source presented in Table 7 were calculated.
    c. There are two locations where copper is a CPOC as cited in Section 1.3.1.2. These two locations are not covered by the IP. It is not clear if water from these areas discharge to the AU. Since they are areas of interest (one AOC and one SWMU) then any load associated with them is of interest. Currently, the S-SMA, assuming that these are covered by the IP, is assigned a WLA of zero (0). Information related to these areas needs further discussion to determine whether they are source areas.
    d. As referenced in the comments for 1.3.1.3.a, one MSGP is identified as a source of copper. Currently, the MSGP category is assigned a WLA of zero (0). Information related to the MSGP source area needs further discussion.
    e. As stated in Comment 3.c, copper easily adsorbs to particulate matter, primarily organic matter, and is associated with the matrix of solids in urban fill. Storm events increase runoff and water velocity resulting in increased total suspended solids/sediments in the water column. Because of its association with solids, it is expected that elevated total copper concentrations would be associated with the increase in total suspended solids/sediments during storm events. This relationship does not necessarily translate to dissolved copper. Figure six in this report is provided to demonstrate a link between dissolved copper and total suspended sediments; however, this relationship is influenced by one sample point that appears to be an outlier. More data need to be collected in order to conclude that there is a positive correlation between dissolved copper and total suspended solids/sediments.
    f. This section states that the Technical Release 55 model was used to estimate load allocations from non-point sources.
        i. Please describe how the model was used to calculate the load allocation.
        ii. The text states that the model estimated a 1.32 lbs/day peak load using a 0.5 inch precipitation event. Based on data presented in Figure 2 and stated in the text, this model estimated 1.32 lbs/day load was not reached even during a site-sampled storm event where flow was measured at 1.49 mgd and load was measured at 0.248 lbs/day. The non-point source load estimate far exceeds the target load for the entire site at high flow conditions.
            1. What is the significance of the model estimated load?
            2. How do model results influence estimated load allocations?
    g. The text states that the target loads of 0.248 lbs/day and 0.0499 lbs/day were exceeded by 0.042 lbs/day and 0.014 lbs/day, respectively. Please clarify that these exceedances (0.042 lbs/day and 0.014 lbs/day) are

intended to represent load reductions that would be necessary in order to meet the water quality standards.

7. Section 2.3: The control measures discussed in this section of the report are specifically designed to manage storm water and associated total suspended solids/sediments. The AU impairment is for dissolved copper. As noted in comments 3.c and 6.e, more data are needed to support a correlation between dissolved copper and total suspended solids/sediment.
8. Section 2.3.1.2:
    a. Please include a description of the site-specific control measures implemented by the laboratory to address the non-numeric technology-based effluent limits. In addition, please describe the monitoring program that accompanies these implemented measures.
    b. Please provide a schedule for the completion of corrective action and/or BMP implementation for the remaining 33 sites (21 sites delayed due to decommissioning/demolition actions, 2 under other regulatory programs, 10 extend of contamination investigation).
    c. What are the other regulatory programs that will be addressing the 2 sites? How will the actions of these other regulatory programs result in and/or support improvements to water quality?
9. Section 2.3.1.3:
    a. The text states that since April 2009 monitoring results for copper have been below either the MSGP benchmark or the LANL specific background value for storm water.
        i. How many samples were collected and analyzed for copper? Over what time period were these samples collected? When was copper eliminated from the sampling plan?
        ii. The text states that storm water monitoring results identify the need to modify existing controls or implement new controls. If copper is no longer sampled, then potential future exceedances will go unnoticed and necessary adjustments or modifications to control measure will not be made. Please describe the control measures or checks that are in place to address this.
10. Section 2.3.2.1: Please identify the frequency of the monitoring that will be conducted pursuant to the consent order.
11. Section 2.3.2.3: Please clarify if the site investigation has determined whether landfill leachate is discharging to the AU and whether this may be a source of dissolved copper.
12. Section 3: Based on this section, achievement of water quality standards is expected within two assessment cycles or 4 years. Since the wetland project is complete (2013), and the document describes storm water controls in place presently, then data collected over the next 4 years, ending in 2018, should indicate that the water quality standard for copper has been met. If at the end of this 4 year assessment the water quality standard has not been met, then what corrective actions and/or alternatives will be implemented?

13. Section 5:
    a. This monitoring plan should include E-121. Based on data presented in Section 2.1.2, this location has exceedances of dissolved copper and has data results essentially the same as E-123. This location is upstream of the Sandia Wetland and downstream of LANL TA-03, including the three industrial permitted outfalls. Monitoring E-121 will provide data related to the effectiveness of controls implemented within TA-03 for the purposes of controlling the LANL urban/developed laboratory non-point source. In addition, E-121 will provide data to assess the effectiveness of the wetland area by providing an upstream influent value that can be compared with the downstream effluent data collected at E-123.
    b. Please describe the monitoring frequency for each of these activities and the sample locations as they relate to dissolved copper. Summarizing these in a table would be useful.
    c. Surface water monitoring Number 1: This text includes a description of activities that implies ground water is discharging to surface water. If this is the case, then a discussion of the potential impact of ground water discharge on surface water concentrations should be included.
        i. Is the ground water contaminated with copper and is it a source of contamination for surface water?
        ii. Where does the ground water discharge to surface water?
        iii. Do ground water characteristics (pH, pollutants, hardness, etc) impact surface water and how does that affect copper concentration?
    d. Surface water monitoring Number 4: this states that monitoring under the MSGP will continue. According to Table 4, only one location is sampled. Sampling at all other locations has been discontinued. Please clarify what sampling will be conducted in support of this 4b demonstration.
    e. Please clarify that the data and 4b effectiveness evaluation will be part of the Environmental Surveillance report and will be submitted annually for agency review.
    f. The document does not discuss the AU's relationship to downstream water quality and designated uses.
        i. What are the downstream water quality criteria?
        ii. Is this evaluation expected to be protective of downstream water quality criteria?

General comments and suggested revisions to assist the reader and provide background support for the report.

14. General: Please replace the site figures with electronic versions that can be reviewed at high resolution. The site is complex with multiple management units and points of interest that are difficult to identify without clear figures.
15. General: Because of its complexity, simple site descriptions and a logical flow of historical activities is essential for a reader that is not familiar with the site's history. Moving details and explanations stated in Sections 2.3.1 and 2.3.2 to Sections 1.3.1 and 1.3.2 would assist the reader in understanding this site early in

the document.

16. Section 1.1: It would be helpful to identify and describe E-123, as well as all other gage stations, early in the report.
17. Table 4: Table 4 has a column titled 'Gage No.' and lists E121.9, E122.3, E123.4, and E122.35. According to Appendix 1 Figure 4B Demonstration Sandia Canyon Assessment Units, these are MSGP monitoring stations. Please clarify what the 'Gage No.' column represents.
18. Section 2.3.1.1: The average discharge listed here is 300,000 gallons per day. The listed average in Section 1.3.1.1 is 290,000 gallons per day. The averages reported and used in the calculations throughout the report should be consistent and should not vary.
19. Section 4: Effective dates are inconsistent with previous text discussion of expected expiration dates. Industrial Outfall Permit is explained as being proposed in 2013 and expected to be reissued in 2014 (Section 2.3.1.1); Storm water individual permit expires 2015 (Section 2.3.1.2) and MSGP permit has been issued as draft and is anticipated that the new permit will be issued in 2014 (Section 2.3.1.3).
20. Footnotes 1 and 2 are missing from Table 7.

ENCLOSURE 3

CD

Category 4b Data Set

Map 4b Demonstration

Map S-SMA Permitted Features

Map MSGP Locations in Sandia Canyon

Table 4

ENV-DO-14-0103

LAUR-13-28670

Date: MAY 1 4 2014