The Brake Pad Partnership (BPP) Steering Committee held a Steering Committee teleconference meeting on July 15th. A copy of the agenda is attached. The following people were on the call:

- Sarah Connick (Sustainable Conservation, Project Manager, Facilitator)
- Mark Schlautman (Clemson University, project technical advisor)
- Rodger Dabish (TMD Friction and lead representative of the Brake Manufacturer’s Council Product Environmental Committee [BMC/PEC])
- Tim Merkel (formerly of Federal-Mogul Corporation)
- Mark Phipps (Federal-Mogul Corporation)
- Jim Pendergast (U.S. EPA)
- Michael Endicott (Sierra Club)
- Kelly Moran (TDC Environmental)

Chris Shepley (Dana Corporation) was not able to participate in the call.

The following items were discussed:

- **Wear Debris Generation/Aerodynamic Particle Size Diameter Measurements Update.** Clemson completed the particle collection portion of the aerodynamic particle size diameter measurements last week. Clemson is now working on the data analysis. The remainder of the brake pad wear debris generation has not yet started, but should start any day. The BMC/PEC and Link Testing Laboratories are paying for the dynamometer time and staff time for setting up the wear debris generation system and collecting the representative sample of brake pad wear debris.

- **Extraction Tests on the Representative Sample of Brake Pad Wear Debris.** The Steering Committee discussed input from U.S. EPA and URS regarding extracting tests of brake pad wear debris, agreeing with the contractors that additional testing beyond that in the current plan is likely to be desirable. The goal of the next phase of extraction tests is to find out how the representative sample of brake pad wear debris compares to the sample of brake pad wear debris from one pad.

- **Air Deposition Monitoring.** Dry season monitoring has started. A draft quality assurance project plan (QAPP) was circulated to the Steering Committee for review.

- **Action Plan progress.** Sustainable Conservation indicated that all other items currently in process are proceeding as planned.
Anticipated Next Steps

The Steering Committee continues to focus on implementing its Action Plan. The upcoming Steering Committee meeting schedule is as follows:

- August 20, teleconference meeting
- September 2, teleconference meeting
- September 15, teleconference meeting
- September 27, teleconference meeting
- October 20 and October 21, in-person meeting in San Francisco
BPP STEERING COMMITTEE TELECONFERENCE
Thursday, July 15, 2004 11:00 a.m. to noon PDT
Dial: 866-279-1566
Meeting Number: *4762806*

1) Teleconference agenda review and anything new? (5 min)

2) Update from Mark Schlautman - Accomplishments at Link Test Lab for Aerodynamic - Particle Size Measurements (10 min)

3) Update from Roger Dabish - Generation of the Representative Sample of Brake Wear Debris (5 min) - Sample status

4) Information from Roger Dabish - Purchase Order for Dynamometer time for ADPSD measurements (10 min)

5) Project Updates: (15 min)
   a) Air Deposition Monitoring - QAPP (See attachment)
   b) Contracting for Kirsten Rosselot
   c) Write up on methodology for generating the representative brake wear debris sample
   d) Draft BPP update
   e) Quarterly Report

6) Re-visit intent of proposed leaching tests on representative sample of brake wear debris (see attached email communications for purpose of leaching studies, pH issues ) (10 min)

7) Anything else?
Selected Brake Pad Partnership (BPP) Steering Committee members held a teleconference meeting with modeling contractors on August 5th. The purpose of the meeting was to discuss how the Brake Pad Partnership’s environmental models will handle non-brake sources of copper and to determine what information the modelers need from the Steering Committee about non-brake sources of copper. The following people were on the call:

- Sarah Connick (Sustainable Conservation, Project Manager, Facilitator)
- Mark Schlautman (Clemson University, project technical advisor)
- Tim Merkel (formerly of Federal-Mogul Corporation)
- Jim Pendergast (U.S. EPA)
- Kelly Moran (TDC Environmental)
- Kirsten Rosselot (Process Profiles)
- Terry Cooke (URS)
- Christian Seigneur and Betty Pun (AER)

Jim Carleton (the U.S. EPA watershed modeler) was not able to participate in the call.

The group reviewed how each model would use information about non-brake copper sources and what alternative approaches were possible. The group is relying on the draft Copper Sources report prepared for the Clean Estuary Partnership for initial information about non-brake copper sources.

- **Air deposition model.** The modelers will compare modeled copper deposition to measured copper deposition to determine how well the model works. They anticipate that the measured deposition will be equal to or greater than the brake-only deposition modeled. Unless uncertainties in the estimates of other copper sources are reduced, AER does not believe that modeling them will be useful. The group agreed to scope out the next steps for looking at non-brake copper sources to provide a better basis to evaluate air emissions/deposition from those sources (the sources that may be emitted to and deposited from the air include soil, copper-containing pesticides applied to landscaping, and air emissions sources).

AER suggested that another approach was to check the model with another pollutant that is specific to cars (a “tracer”). This works if other sources of copper provide fairly uniform background and if the tracer is emitted primarily from cars. This would allow the fraction of copper deposition from cars to be estimated.
preliminary recommendation for a tracer is benzene (which would need to be measured via air column concentration measurements, not on our air deposition plates). AER will look further into this recommendation to address questions raised during the teleconference about the tracer technique and the suitability of benzene at the tracer.

- **Watershed model.** U.S. EPA’s modeler will evaluate the sensitivity of copper concentrations in runoff to copper loads from vehicle brake pads. The ability to use information about other copper sources will be discussed at a future meeting.

- **Bay model.** URS will primarily rely on inputs from other models. The need to address in-Bay sources (e.g., marine antifouling paint) should be discussed at a future meeting.

**Anticipated Next Steps**

Future special teleconferences on this topic will be needed. Sustainable Conservation plans to schedule needed meetings.
The Brake Pad Partnership (BPP) Steering Committee held a teleconference meeting on August 20th. A copy of the agenda is attached. The following people were on the call:

- Sarah Connick (Sustainable Conservation, Project Manager, Facilitator)
- Mark Schlautman (Clemson University, project technical advisor)
- Tim Merkel (formerly of Federal-Mogul Corporation)
- Mark Phipps (Federal-Mogul Corporation)
- Kelly Moran (TDC Environmental)

Chris Shepley (Dana Corporation), Jim Pendergast (U.S. EPA), Rodger Dabish (TMD Friction and lead representative of the Brake Manufacturer's Council Product Environmental Committee [BMC/PEC]), and Michael Endicott (Sierra Club) were not able to participate in the call.

The following items were discussed:

- **Generation of the Representative Sample of Brake Wear Debris.** The initial phase of wear debris generation was completed in June; however, the phase to generate the majority of the wear debris (that for chemical characterization) will not start for at least a month. Depending on the amount of dynamometer time required for this phase (still to be determined), the BPP may contribute funding (a few thousand dollars) in addition to that contributed by the BMC/PEC and Link Testing Laboratories.

- **Watershed Modeling Workplan Review.** The peer review process for the watershed modeling workplan has been delayed because it took Sustainable Conservation longer than anticipated to line up reviewers. Two of three planned reviewers have been identified: Professor Wayne Huber (Oregon State University) and Ken Schiff (Southern California Coastal Water Research Project). Sustainable Conservation hopes to receive comments from reviewers by September 21st. Sustainable Conservation will send an e-mail with the updated schedule to the BPP listserver.

- **Upcoming documents to review.** Several reports will be coming out in the coming months (see attached schedule):
  - Report on Characterization of Airborne Brake Wear Debris
  - Report on Chemical Characterization of Brake Pad Wear Debris Representative Sample
Sustainable Conservation is preparing now for these review processes, lining up reviewers and preparing preliminary drafts of charges to reviewers. This should prevent delays in future review processes.

**Anticipated Next Steps**

The Steering Committee continues to focus on implementing its Action Plan. The upcoming Steering Committee meeting schedule is as follows:

- September 2, teleconference meeting
- September 15, teleconference meeting
- September 27, teleconference meeting
- October 20 and October 21, in-person meeting in San Francisco
Agenda Distributed by Sustainable Conservation via e-mail

BPP STEERING COMMITTEE TELECONFERENCE
Friday, August 20, 2004 10:00 a.m. to 11:00 am PDT

Dial: 866-393-8073
Meeting Number: *8893164*

Draft Agenda

1) Teleconference agenda review and anything new? (5 min)

2) Update from Roger Dabish/Mark Phipps - Generation of the Representative Sample of Brake Wear Debris (15 min)
   a) Sample status and time frame for sending the sample to Mark Schlautman to begin his solubility and leaching tests?
   b) Will this impact Mark Schlautman’s schedule?
   c) Overview of sample collection – Do we have weights on fallout and airborne fraction?
   d) How did the mass balance turnout?

3) Watershed Modeling Plan Review Process (5 min)
   - Final charge to reviewers forthcoming

4) Upcoming Document Review Processes (20 min)
   a) Draft Charge - Characterization of Airborne Brake Wear Debris (Clemson)
   b) Draft Charge – Chemical Characterization of Fallout Brake Wear Debris of the Representative Sample (Clemson)
   c) Draft Charge- Water Quality Monitoring Report (ACCWP)
   d) Draft Charge – Copper Source Loading Estimate Work plan (Process Profiles)

   Draft charges forthcoming. A selection of reviewers and questions for reviewers to be included in the draft charge will need to be done.

5) Project Update: (5 min)
   a) Draft BPP August 2004 Newsletter update- All comments and feedback received; in final review process

6) Anything else?
Selected Brake Pad Partnership (BPP) Steering Committee members held a special teleconference meeting with modeling contractors on September 2nd. This was a follow-up to a teleconference meeting of the same group in early August. The purpose of the meeting was to discuss how the Brake Pad Partnership’s environmental models will handle non-brake sources of copper and to determine what information the modelers need from the Steering Committee about non-brake sources of copper. The following people were on the call:

- Sarah Connick (Sustainable Conservation, Project Manager, Facilitator)
- Mark Schlautman (Clemson University, project technical advisor)
- Tim Merkel (formerly of Federal-Mogul Corporation)
- Chris Shepley (Dana Corporation)
- Kelly Moran (TDC Environmental)
- Terry Cooke (URS)
- Christian Seigneur and Betty Pun (AER)

Jim Carleton (the U.S. EPA watershed modeler) was not able to participate in the call.

The discussion focused on air deposition and methods of estimating what fraction of copper in each model is from brake pads. A “tracer” would allow the BPP to estimate what fraction of the copper measured location is due to brake pads.

- AER has concluded that benzene could be a good tracer for air modeling, if sampling logistics can be worked out. Vehicles are the primary emissions sources for benzene. Ground level variability shows differences in communities are meaningful, suggesting that it can reflect differences in different watershed locations. Its high vapor pressure means that it will not be associated with particles, but since brake pad wear debris particles are very fine, transport should be very similar. To be used as a tracer, air concentration measurements would need to be made in parallel with air deposition measurements. The BPP will explore cost and feasibility of co-locating benzene monitoring stations with the air deposition monitoring stations.

- Professor Schlautman and URS believe that soil “background” contributions to deposited copper could be traced with soil indicators like aluminum or silicon. These two elements are not frequently present at meaningful concentrations in brake pads, according to industry representatives. The BPP will explore the feasibility of adding these two elements to the air deposition monitoring study.
Anticipated Next Steps

Future special teleconferences on this topic will be needed. Sustainable Conservation plans to schedule needed meetings.
The Brake Pad Partnership (BPP) Steering Committee held a teleconference meeting on September 2nd. A copy of the agenda is attached. The following people were on the call:

- Sarah Connick (Sustainable Conservation, Project Manager, Facilitator)
- Mark Schlautman (Clemson University, project technical advisor)
- Rodger Dabish (TMD Friction and lead representative of the Brake Manufacturer's Council Product Environmental Committee [BMC/PEC])
- Tim Merkel (formerly of Federal-Mogul Corporation)
- Chris Shepley (Dana Corporation)
- Kelly Moran (TDC Environmental)
- Michael Endicott (Sierra Club)

Mark Phipps (Federal-Mogul Corporation) and Jim Pendergast (U.S. EPA) were not able to participate in the call.

The following items were discussed:

- **Los Angeles River TMDL Project Report.** The L.A. River metals TMDL project report calls for urban runoff agencies to pursue legislation to ban copper in vehicle brake pads. Since this would undermine the activities of the Brake Pad Partnership (which are based on cooperation, not confrontational advocacy), Sustainable Conservation sent a letter to the L.A. Regional Board to request that this measure be redirected into a measure to support the Brake Pad Partnership, similar to the measures in the lower South San Francisco Bay Copper Action Plan.

- **Generation of the Representative Sample of Brake Wear Debris.** There was no update on this much-delayed activity, as the industry representative managing this process did not participate in the teleconference. Sustainable Conservation will follow up.

- **Rationale for Estimating Copper Emissions from Brake Lining Wear—Preliminary Work Plan for Heavy Duty Vehicles.** The Steering Committee discussed technical issues relating to the very preliminary work plan provided by Process Profiles. Sustainable Conservation will be managing follow-up activities, including a more detailed Steering Committee discussion and identification of alternative approaches with the assistance of industry Steering Committee members.
• Document Review Processes. Status updates on each of the five documents that will be up for review this fall are provided on the agenda (attached).

• Draft Report on Methodology for Generating a Representative Sample of Brake Wear Debris. Although the BMC/PEC developed the method for creating the representative brake pad wear debris sample, it did not write this procedure down. Sustainable Conservation has taken on the task of preparing a proper written description of these procedures. The initial draft document had many deficiencies, which Sustainable Conservation will work with the industry representatives to address.

**Anticipated Next Steps**

The Steering Committee continues to focus on implementing its Action Plan. The upcoming Steering Committee meeting schedule is as follows:

- September 15, teleconference meeting
- September 27, teleconference meeting
- October 20 and October 21, in-person meeting in San Francisco

Sustainable Conservation is in the process of scheduling meetings after October 21.
Draft Agenda

1) Teleconference agenda review and anything new? (5 min)

2) Update from Mark Phipps - Generation of the Representative Sample of Brake Wear Debris (15 min)
   a) Amount of wear debris to generate
   b) Timing and cost
   c) Modifying sample collection to get separate fallout and wash down fractions

3) Review and discuss draft write up/partial work plan on Rationale for Estimating Copper Emissions from Brake Lining Wear (Emission Factor) from Kirsten Rosselot. (20 min)
   a) See Kirsten’s questions requiring Steering Committee feedback (see attached email from Kirsten Rosselot "heavy-duty vehicle draft work plan")

4) Document Review Processes (10 min)
   a) Watershed Modeling for Environmental Fate and Transport of Copper from Vehicle Brake Pad Wear Debris (EPA) — in process, reviewer comments due September 24.
   b) Characterization of Airborne Brake Wear Debris (Clemson) — Need update from Mark Schlautman on new due date for draft report
      ▪ Identify reviewers — Would like to have Tom Cahill and Paul Sanders to review draft report. Anyone else?
      ▪ Completed draft charge for Stakeholder review by date tbd; pending confirmation from Mark S. on new draft report (original due date Aug 27, 2004)
   c) Water Quality Monitoring Report (ACCWP)
      ▪ Identify reviewers
      ▪ Completed draft charge for Stakeholder review by Sept 15, 2004
   d) Copper Source Loading Estimate Work Plan (Process Profiles)
      ▪ Identify reviewers
      ▪ Completed draft charge for Stakeholder review by due Sept 14, 2004
   e) Chemical Characterization of Fallout Brake Wear Debris of the Representative Sample (Clemson) — draft report due within three and half months of receiving sample from Link

5) Draft Report on Methodology for Generating a Representative Sample of Brake Wear Debris (10 min)
   a) Revised draft (see attached draft report for “Methodology for Generating a Rep. Sample of Brake Wear Debris”)
b) Discuss additional reporting needs (see attached email from Kelly Moran regarding draft memo for development rep. brake wear sample) and identify next steps

6) Anything else?
MEMO

For BASMAAA Member Agency Internal Use Only

TO: Geoff Brosseau & BPP Representation Work Group   DATE: Sept. 15, 2004
FROM: Kelly D. Moran  PROJECT: 16
SUBJECT: Brake Pad Partnership Conference Call—September 15, 2004

The Brake Pad Partnership (BPP) Steering Committee held a teleconference meeting on September 15th. A copy of the agenda is attached. The following people were on the call:

• Sarah Connick (Sustainable Conservation, Project Manager, Facilitator)
• Mark Schlautman (Clemson University, project technical advisor)
• Tim Merkel (formerly of Federal-Mogul Corporation)
• Chris Shepley (Dana Corporation)
• Kelly Moran (TDC Environmental)
• Jim Pendergast (U.S. EPA)
• Jim Carleton (U.S. EPA)

Rodger Dabish (TMD Friction and lead representative of the Brake Manufacturer's Council Product Environmental Committee [BMC/PEC]), Michael Endicott (Sierra Club), and Mark Phipps (Federal-Mogul Corporation) were not able to participate in the call. Kirsten Rosselot of Process Profiles joined the teleconference for the discussion of the rationale for estimating copper emissions from brake lining wear.

The following items were discussed:

• Rationale for Estimating Copper Emissions from Brake Lining Wear—Preliminary Work Plan. The Steering Committee discussed additional technical issues relating to the preliminary work plan provided by Process Profiles. Process Profiles is doing a good job handling this challenging task, which is moving forward more quickly and more productively than I had anticipated given previous BPP discussions of this topic.

One interesting note from the discussion—manufacturers anticipate an increase in the copper content of heavy duty truck brakes in the next few years. The change is due to a design trend (a shift to air/disc brakes) that relates, in part, to an upcoming braking safety standard for trucks. Although trucks are a relatively small fraction of the vehicle fleet, this potential change is noteworthy because trucks have enormous brakes and they are driven many more miles per year than automobiles.

• Generation of the Representative Sample of Brake Wear Debris. For the second meeting in a row, there was no update on this much-delayed activity, as the industry
representative managing this process did not participate in the teleconference. Sustainable Conservation will follow up again.
• **Planning for In-Person Meeting in October.** The Steering Committee reviewed the agenda topic list proposed by Sustainable Conservation.

**Anticipated Next Steps**

The Steering Committee continues to focus on implementing its Action Plan. The upcoming Steering Committee meeting schedule is as follows:

- September 27, teleconference meeting
- October 20 and October 21, in-person meeting in San Francisco

Sustainable Conservation is in the process of scheduling meetings after October 21.
BPP STEERING COMMITTEE TELECONFERENCE
Wednesday, September 15, 2004 12:00 noon to 1:00 pm PDT

Dial: 866-393-8073
Meeting Number: *8893164*

**Draft Agenda**

1) Teleconference agenda review and anything new? (5 min)

2) Update from Mark Phipps - Generation of the Representative Sample of Brake Wear Debris (10 min)
   a) Amount of wear debris to generate
   b) Timing and cost
   c) Modifying sample collection to get separate fallout and wash down fractions

3) Steering Committee Meeting held Oct 20, 2004 (8:30 am to 5 pm) and Oct 21, 2004 (8:30 am to 4 pm) (15 min)
   a) Proposed list of topics/meeting objectives to be discussed:
      ▪ Review updated Project Schedule
      ▪ Partnership Business
      ▪ Update on Copper Brake Sources (Kirsten Rosselot)
      ▪ Update on Non-Brake Copper Sources
      ▪ Discussion of Copper Use Monitoring Report for Model Year 2003 (BMC)
      ▪ Update on results of Airborne Wear Debris Characterization Study and potential for additional characterization studies (Mark Schlautman)
      ▪ Update on Air Deposition Monitoring (Don Yee)
      ▪ Update on Water Quality Monitoring (Jim Scanlin)
      ▪ Update on Watershed Modeling and Extrapolations (Jim Carelton)

4) Review and discuss key topics from the draft work plan on Rationale for Estimating Copper Emissions from Brake Lining Wear (Emission Factor) from Kirsten Rosselot. (15 min)
   - Discuss key topics that were noted from comments and feedback submitted by Tim Merkel (Chris S., Mark P.), Kelly Moran, Mark Schlautman on Kirsten’s work plan

5) Anything else?
TO: Geoff Brosseau & BPP Representation Work Group  DATE: Sept. 27, 2004
FROM: Kelly D. Moran  PROJECT: 16
SUBJECT: Brake Pad Partnership Conference Call—September 27, 2004

The Brake Pad Partnership (BPP) Steering Committee held a teleconference meeting on September 27th. A copy of the agenda is attached. The following people were on the call:

- Sarah Connick (Sustainable Conservation, Project Manager, Facilitator)
- Mark Schlautman (Clemson University, project technical advisor)
- Tim Merkel (formerly of Federal-Mogul Corporation)
- Chris Shepley (Dana Corporation)
- Mark Phipps (Federal-Mogul Corporation)
- Kelly Moran (TDC Environmental)
- Michael Endicott (Sierra Club)
- Jim Carleton (U.S. EPA)

Rodger Dabish (TMD Friction and lead representative of the Brake Manufacturer's Council Product Environmental Committee [BMC/PEC]), and Jim Pendergast (U.S. EPA) were not able to participate in the call.

The following items were discussed:

- **Generation of the Representative Sample of Brake Wear Debris.** Details of the procedures for collection of the fraction of the material released to the air, falling on the ground, and attached to the equipment are being worked out. The contracts are now in place, so the generation should happen soon.

- **Watershed modeling workplan.** Three scientific peer reviewers have reviewed the draft workplan and have provided interesting comments with implications beyond the watershed modeling portion of the project. As planned, the next step will be to convene a conference call with reviewers to discuss their comments and ask them any questions we have. Any stakeholder can participate in this call, which is tentatively scheduled for Thursday October 7, 8:30 to 9:30 a.m. Sustainable Conservation will be circulating the reviewer comments to all stakeholders on the Partnership’s e-mail list.

- **Copper sources other than vehicle brake pads.** The Steering Committee had a rather technical discussion of the approach to handling the differentiation of brake pads from other copper sources in the modeling exercise. This continues to be problematic, as tracers do not appear to be capable of giving us a lot of information and modeling.
cannot readily differentiate brakes from other copper sources with any reliability. This will be a major topic at the October in-person meeting.

- **Planning for In-Person Meeting in October.** The Steering Committee reviewed and agreed to the meeting goals and the draft agenda proposed by Sustainable Conservation.

**Anticipated Next Steps**

The Steering Committee continues to focus on implementing its Action Plan. The upcoming Steering Committee meeting schedule is as follows:

- October 7, 8:30 a.m., teleconference with scientific advisory team on watershed modeling workplan comments (time and date are tentative)
- October 20 and October 21, in-person meeting in San Francisco

Sustainable Conservation is in the process of scheduling meetings after October 21.
BPP STEERING COMMITTEE TELECONFERENCE
Monday, September 27, 2004 noon to 1:00 p.m. PDT

Dial: 866-393-8073
Meeting Number: * 8893164 *

Draft Agenda

1. Teleconference agenda review and anything new? (5 min)
   a. Please please please send in your calendar if you have not yet done so!

2. Update on Generation of the Representative Sample of Brake Wear Debris (5 min)
   a. Update on method for collecting and weighing the fallout fraction
   b. Timing
   c. Purchase order

   a. Update on comments from reviewers
   b. Process and schedule for reviewing the comments received from reviewers and stakeholders (see attached review schedule)

4. Draft Agenda Review for the October 20-21 Meeting (5 min)
   a. See attached draft agenda

5. Discussion of How to Account for Nonbrake Sources of Copper in the Environmental Modeling with Jim Carleton (40 min)
   a. Adequacy of aluminum and silica/silicon as tracers of soil sources of copper (see attached e-mail from Kelly)
      b. Accounting for nonbrake sources of copper in the watershed model (see attached e-mail with summaries of two previous calls on this topic)

6. Anything else?
The Brake Pad Partnership (BPP) held a teleconference meeting between the Scientific Advisory Team members who peer reviewed the watershed modeling workplan, BPP consultants, Steering Committee members, and stakeholders on October 7th. The purpose of the call was to go through the main comment made by the scientific advisors on the draft watershed modeling workplan. These comments are important to evaluate and prioritize, as the BPP’s funding will not be sufficient to allow it to address all issues. The key comments of the reviewers and the main points of the discussion are summarized briefly below:

- **Need to understand the mass balance for copper in the watershed.** Reviewers feel that looking at other copper sources in the BPP’s modeling work is important, as it will be very difficult to separate brake wear debris copper from other copper in urban runoff. They believe that *Copper Sources in Urban Runoff Report* will be useful in completing the needed mass balance work, but recognize that this report does not contain the level of detail desired. A mass balance for the Bay is included in the Bay modeling scope.

- **Distinguishing brake pad wear debris from other copper sources would be desirable.** Reviewers agreed that it would be desirable to find a way (i.e., a fingerprint or tracer) to differentiate various copper sources from brake pad wear debris at various stages in the modeling. To date, no fingerprint or tracer has been identified that allows such differentiation, despite exploration of many options by the BPP Steering Committee.

- **The potential for washoff from pervious surfaces should be explored.** Reviewers suggested some analysis of the assumption that deposition on pervious surfaces does not wash off. They feel that pervious surface washoff could be meaningful in the Bay watershed.

- **Should land use be considered, in addition to impervious surface areas?** The general consensus was “no.” Copper concentrations in urban runoff are relatively consistent across urban land uses, so land use in itself does not seem to be a factor. In addition, one of the purposes of this project is to try to connect a specific pollutant source to pollutant levels in the receiving water.

- **Is wind erosion accounted for in one of the models?** The BPP’s air deposition modelers will work with the watershed modeler to see if they can include wind erosion in the modeling.
• How much can and should the watershed model address particulate vs. dissolved copper? There is general agreement that a high fraction of copper washing off urban surfaces is in the dissolved form—and that this copper partitions onto solids as it is transported through the watershed to the Bay. The extent of partitioning, the ability to model particles separately, and the potential value of this exercise in the context of the Bay modeling were discussed. This topic will require further exploration.

• Build up and washoff functions. Some of the details of the pollutant build-up and wash-off functions were questioned by reviewers. This is not a strength of the watershed model being used (HSPF).

The following scientific advisory team comment topics were not covered in the discussion, due to lack of time:

- Appropriateness of the selected model (HSPF)
- Approach to calibrating and validating the model
- Spatial and temporal scales and uncertainty
- Input data selections

**Anticipated Next Steps**

Sustainable Conservation plans to hold a second teleconference to continue discussion of these topics. Any stakeholder is welcome to attend. The teleconference is tentatively scheduled for October 25 at 11 a.m. PDT. Sustainable will send an announcement to the BPP stakeholder list confirming the date and time.
The Brake Pad Partnership (BPP) Steering Committee held a Steering Committee in-person meeting on October 20th and 21st in San Francisco. A copy of the agenda for the meeting is attached.

The purposes of the Steering Committee meetings were to:
- review the project schedule;
- review results of aerodynamic diameter measurements;
- determine whether to pursue measurement of a vehicle emissions “tracer” in parallel with air deposition monitoring;
- review scientific advisory team and stakeholder comments on the draft watershed modeling workplan;
- review the draft workplan for estimating brake sources of copper and determine next steps for estimates of brake and non-brake copper sources; and
- receive model year 2003 copper use data from vehicle brake manufacturers and determine next steps for producing the BPP annual copper use report.

The following people participated in the Steering Committee meeting:
- Sarah Connick (Sustainable Conservation, Facilitator)
- Connie Liu (Sustainable Conservation, Project Manager)
- Mark Schlautman (Clemson University, project technical advisor)
- Rodger Dabish (TMD Friction and lead representative of the Brake Manufacturer's Council Product Environmental Committee [BMC/PEC])
- Mark Phipps (Federal-Mogul Corporation)
- Michael Endicott (Sierra Club)
- Jim Carleton (U.S. EPA)
- Jim Pendergast (U.S. EPA)
- Kelly Moran (TDC Environmental)

Steering Committee members Chris Shepley (Dana Corporation) and Tim Merkel (formerly of Federal-Mogul Corporation) were unable to attend. Many others participated in part of the meeting including Arleen Feng from the Alameda Countywide Clean Water Program (ACCWP), Terry Cooke of URS, Betty Pun of AER, Kirsten Rosselot of Process Profiles, and Don Yee of the San Francisco Estuary Institute (SFEI).
Action Plan Implementation

Most of the meeting was spent on managing the implementation of the Brake Pad Partnership’s action plan of brake pad wear debris characterization and environmental fate and transport studies. The highlights of the meeting are summarized below.

- **Air Deposition Monitoring.** The monitoring is in progress. At the recommendation of air deposition modeler, the Steering Committee decided to ask SFEI to collect up to 5 sets of additional dry deposition samples (in dry periods this winter) in parallel with samples of air concentration of benzene at the same locations. This would allow the modelers to use the benzene data (benzene is emitted primarily by vehicles) to check the model. There is some possibility SFEI may not be able to fulfill this request, but Sustainable Conservation promised to pursue this vigorously, as it is the only option available to check the model, other than via copper measurements, which may include copper from other sources.

- **Representative Sample of Brake Pad Wear Debris.** Manufacturers apologized for the extended delay in generating the representative sample of brake pad wear debris. The Steering Committee reminded them of the importance of this sample to the Action Plan and the project schedule.

  Manufacturers continue to work with Sustainable Conservation to draft a detailed written description of the process to collect brake pads for generation of a representative sample of brake pad wear debris. A version of this procedure suitable for stakeholder review should be completed by early 2005. This document will go through the BPP’s scientific advisory team and stakeholder review process.

- **Aerodynamic Diameter Measurements of Brake Pad Wear Debris.** Clemson University reviewed its draft report on the measurements it took of aerodynamic diameter of brake pad wear debris. This report is currently available for review by stakeholders and the Scientific Advisory Team. The measurements found that the average particle size is quite small—the average diameter was 2.7 microns. The work appears to be of good quality, so I do not anticipate problems with the use of this data in the air deposition modeling.

- **Brake Copper Release Estimate.** The Steering Committee reviewed the draft workplan for the estimate of copper from all types of vehicle brake pads (cars, trucks, etc.). This workplan is currently available for review by stakeholders and is about to be reviewed by Scientific Advisory Team members. While there are some minor issues (including issues of coordination between these estimates and the air deposition model and watershed models), the approach appears to be technically sound. Given the sensitivity of these estimates for vehicle brake pad manufacturers, I anticipate close scrutiny and further discussion of this workplan as it is completed and implemented.

- **Other Copper Sources.** The Steering Committee decided to seek a contractor to complete the estimates of non-brake copper sources required to generate inputs for the air deposition and watershed models. This effort will primarily rely on the
soon to be completed Clean Estuary Partnership *Copper Sources in Urban Runoff and Shoreline Activities* report. The funding for this and the brake copper release estimates will be taken from the “chemical characterization” task. The BPP will work with the San Francisco Estuary Project to issue a request for proposals to hire a consultant to conduct both tasks.

- **Watershed Modeling.** The Steering Committee, joined by Arleen Feng and the air deposition and bay modeling consultants, had a lively discussion of the approach to the watershed modeling. While there are many issues to deal with, the U.S. EPA modeler appears to be taking a reasonable approach to the comments received from the Scientific Advisory Team and stakeholders (which are available on the project web site). The scientific advisors have indicated a willingness to provide meaningful technical support for the modeler. It appears that U.S. EPA resource availability and the data gaps in Bay Area watershed monitoring will be the primary limitations on the modeling exercise. In general, the watershed modeling effort looks to be on track.

- **Other Action Plan Elements.** The first set of chemical characterization tests—extraction of the representative sample with environmentally relevant test solutions—is delayed pending generation of the representative sample of brake pad wear debris. Other elements of the Action Plan are proceeding as planned.

- **Schedule.** Sustainable Conservation distributed a revised project timeline. A spreadsheet with graphical and table versions of the schedule is attached (note that the graphical timeline view is best be viewed on screen or printed in color on legal size paper). The schedule can accommodate the delays noted above. Further delays could, however, delay plans for completing the Action Plan studies by the end of 2006.

**Brake Pad Copper Use**

At the meeting, the Brake Manufacturers’ Council (BMC) gave the Steering Committee its annual report of copper use in original equipment passenger vehicle and light truck disc brake pads for model year 2003. The report indicates that copper use in vehicle disc brake pads was essentially unchanged between model years 2002 and 2003. The results are summarized in the table on the next page. The Steering Committee plans to issue a report again this fall similar to last year’s report.

**Other items**

- **Project Budget.** Sustainable Conservation reviewed the overall project budget with the Steering Committee. Funds are still needed to support Sustainable Conservation (for Steering Committee coordination, and stakeholder communication) and the Scientific Advisory team. Sustainable Conservation continues to apply for grants and to seek agency and private funding for the project.

- **Stakeholder Meeting.** The next stakeholder conference will be in the Bay Area in spring 2005.

**Brake Pad Friction Material Copper Content Monitoring Results**
<table>
<thead>
<tr>
<th>Model Year:</th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002*</th>
<th>2003*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data from Top 20 New Vehicles Sample</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total vehicle sales (vehicles)</td>
<td>15,540,765</td>
<td>16,890,536</td>
<td>17,349,932</td>
<td>17,122,368</td>
<td>16,816,368</td>
<td>16,639,053</td>
</tr>
<tr>
<td>Top 20 vehicle sales (vehicles)</td>
<td>6,659,538</td>
<td>6,931,931</td>
<td>6,810,462</td>
<td>6,799,008</td>
<td>6,33,977*</td>
<td>7,011,419*</td>
</tr>
<tr>
<td>Top 20 as a % of total vehicle sales</td>
<td>42.8%</td>
<td>41.0%</td>
<td>39.3%</td>
<td>39.7%</td>
<td>43%</td>
<td>49.6%</td>
</tr>
<tr>
<td>(39.4%*)</td>
<td>(42.1%*)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total friction material in Top 20 (kg)</td>
<td>9,366,940</td>
<td>9,109,322</td>
<td>8,556,864</td>
<td>8,416,727</td>
<td>7,850,371*</td>
<td>8,142,643*</td>
</tr>
<tr>
<td>Friction material per vehicle (kg)</td>
<td>1.406</td>
<td>1.314</td>
<td>1.256</td>
<td>1.238</td>
<td>1.183*</td>
<td>1.161</td>
</tr>
<tr>
<td>Cu in Top 20 (kg)</td>
<td>267,462</td>
<td>358,541</td>
<td>384,145</td>
<td>381,507</td>
<td>507,938*</td>
<td>538,992*</td>
</tr>
<tr>
<td>Cu per vehicle (kg)</td>
<td>0.0402</td>
<td>0.0517</td>
<td>0.0564</td>
<td>0.0561</td>
<td>0.0766*</td>
<td>0.0769*</td>
</tr>
<tr>
<td>Copper: change from 1998 results</td>
<td>--</td>
<td>+29%</td>
<td>+40%</td>
<td>+40%</td>
<td>+91%*</td>
<td>+91%*</td>
</tr>
<tr>
<td>Copper: change from previous year results</td>
<td>--</td>
<td>+29%</td>
<td>+11%</td>
<td>No change</td>
<td>+37%*</td>
<td>No change</td>
</tr>
</tbody>
</table>

*One manufacturer did not report copper use in 2002 and 2003. While all of the top 20 vehicles comprised almost half of all model year 2003 brake pads, the 2003 sample comprised only 42% of brake pads. Data marked with asterisks are for reported brake pads only.

**A list of the Top 20 vehicles for each model year.

**Anticipated Next Steps**

The upcoming Steering Committee meeting schedule is as follows:

- November 4, teleconference meeting
- November 19, teleconference meeting
- December 3, teleconference meeting
- December 15, teleconference meeting
- January 7, teleconference meeting
- January 28, teleconference meeting
- February 9 or 10, teleconference meeting
- February 25, teleconference meeting

The next in-person Steering Committee meeting will be in San Francisco in February 2005 (specific dates to be determined).
BGRAKE PAD PARTNERSHIP

Steering Committee Meeting

Wednesday, October 20, 2004
8:30 a.m. to 5:00 p.m.

Thursday, October 21, 2004
8:30 a.m. to 4:00 p.m.

Sustainable Conservation
121 Second Street, Sixth Floor
San Francisco, CA  94105
Phone: 415-977-0380

AGENDA

MEETING OBJECTIVES

- Fully review the Project Timeline, identify potential risks of project delays, and develop strategies for preventing project delays.
- Review and understand results from comparison of different extraction techniques for the Air Deposition Monitoring samples.
- Understand the results of the Characterization of Airborne Brake Wear Debris and identify next steps if needed.
- Review and understand reviewer and stakeholder comments on the Draft Watershed Modeling Work Plan, including further explanation of accounting for brake and nonbrake sources of copper.
- Review and discuss Draft Work Plan for Estimating Brake Sources of Copper and identify next steps to address any outstanding issues raised.
- Review and discuss (Steering Committee only) the Copper Use Monitoring Report for Model Year 2003 data and understand the results and identify next steps and timing for producing Report.

SCHEDULE

Wednesday, October 20, 2004
8:00 a.m.  Meeting room open, and bagels, coffee, and tea available
  ➢  Complete lunch order forms
8:30 a.m.  Meeting Begins:  Partnership Business -- Steering Committee Only
  ➢  Announcements of any new developments affecting the partnership
  ➢  Report from Sustainable Conservation regarding funding
  ➢  Technical Reference Library stewardship
  ➢  Scheduling next Steering Committee meeting
  ➢  Other items?
**Guests invited:** Terry Cooke (URS), Arleen Feng (ACPWA), Betty Pun (AER), Paula Trigueros (SFEP/ABAG), and Don Yee (SFEI)

9:00 a.m. **Technical Studies Schedule Review**
- Project schedule review
- Identification of key priority actions for staying on schedule
- Contracting update

9:30 a.m. **Air Deposition Monitoring Update with Don Yee**
- Comparison of the different extraction techniques (*i.e.*, Clemson, USEPA, and USEPA followed by Clemson)
  - Report on results of laboratory analyses from Clemson and Clarkson Universities
  - Discussion and decision regarding the method(s) to be used for total copper determination for the air deposition samples
- Update on air deposition sampling conducted to date
- Report on benzene monitoring prospects
  - Opportunities, costs, and tradeoffs
  - Identification of next steps
- Identify and address any potential issues with upcoming shift to wet deposition monitoring

11:30 a.m. **Characterization of Airborne Brake Wear Debris**
- Summary of results from Mark Schlautman
- Technical review process schedule
- Finalize charge to reviewers
- Continued after lunch

12:00 noon Lunch

1:00 p.m. **Characterization of Airborne Brake Wear Debris**
- Discussion of need for additional characterization studies stemming from the results of this work
- Identification of next steps

1:30 p.m. **Watershed Modeling**
- Update from Jim Carleton
- Discussion of reviewer and stakeholder comments and resulting modifications to the Work Plan
- Discussion of the accounting for brake and nonbrake sources of copper
- Identification of next steps

4:30 p.m. **Copper Use Monitoring Report for Model Year 2003 – Steering Committee Only**
- Update from PEC members
- Discussion aimed at thoroughly understanding the results
- Next steps and timing for producing the Copper Use Monitoring Report

5:00 p.m. Adjourn
6:00 p.m.  Steering Committee Dinner at Harbor Village Restaurant

Thursday, October 21, 2004

Guests invited:  Terry Cooke (URS), Betty Pun (AER), and Paula Trigueros (SFEP/AGAG)

8:00 a.m.  Meeting room open, and bagels, coffee, and tea available
  ➢ Complete lunch order forms

8:30 a.m.  Estimating Brake Sources of Copper
  ➢ Review Kirsten’s draft report
  ➢ Go through draft report painstakingly with Kirsten
  ➢ Identify concrete next steps to address any concerns raised
  ➢ Review schedule for technical review process
  ➢ Finalize charge to reviewers

Review Draft RFQ for Estimating Sources of Copper from Brakes and Other Sources
  ➢ Review draft RFQ and identify any changes needed
  ➢ Finalize RFQ

11:30 a.m.  Review Methodology for Generating a Representative Sample of Brake Wear Debris- Steering Committee Only
  ➢ Review and discuss methodology report memo
  ➢ Identify next steps

12:00 noon  Lunch

1:00 p.m.  Revisiting of topics held over from earlier in the meeting
  ➢ Continued discussion of Draft Watershed Modeling Work Plan effort

3:30 p.m.  Review of Meeting Accomplishments and Action Items
  ➢

4:00 p.m.  Adjourn
The Brake Pad Partnership (BPP) Steering Committee held a teleconference meeting on November 4th. A copy of the agenda is attached. The following people were on the call:

- Sarah Connick (Sustainable Conservation, Project Manager, Facilitator)
- Mark Schlautman (Clemson University, project technical advisor)
- Rodger Dabish (TMD Friction and lead representative of the Brake Manufacturer's Council Product Environmental Committee [BMC/PEC])
- Tim Merkel (formerly of Federal-Mogul Corporation)
- Chris Shepley (Dana Corporation)
- Mark Phipps (Federal-Mogul Corporation)
- Kelly Moran (TDC Environmental)
- Jim Carleton (U.S. EPA)

Michael Endicott (Sierra Club) and Jim Pendergast (U.S. EPA) were not able to participate in the call.

The following items were discussed:

- **Generation of the Representative Sample of Brake Wear Debris.** Generation is underway at Link Engineering laboratories. This activity has been substantially delayed. It is now time-critical in the project schedule. Manufacturers promised to coordinate timely delivery of the representative sample to Clemson for the much-anticipated extraction testing.

- **Copper Brake Sources Work Plan.** The Scientific Advisory Team review is underway. Additional relevant data just became available from Professor Jamie Schauer of the University of Wisconsin, who last year gave a presentation to the Air Resources Board on his work.

- **Project Status and Schedule.** The Steering Committee went through the many projects currently underway and reviewed status and next steps. Everything is on track.

**Anticipated Next Steps**

The upcoming Steering Committee meeting schedule is as follows:

- November 19, teleconference meeting
- December 3, teleconference meeting
• December 15, teleconference meeting
• January 7, teleconference meeting
• January 28, teleconference meeting
• February 9 or 10, teleconference meeting
• February 17-18, in-person meeting in San Francisco
• February 25, teleconference meeting
BPP STEERING COMMITTEE TELECONFERENCE
Thursday, November 4, 2004, 11:30 pm to 12:30 pm Pacific Time

Dial:  866-393-8073
Meeting Number: *8893164* (NOTE: You must dial the *s at the beginning and end of the meeting number.)

Draft Agenda

1) Teleconference agenda review and anything new? (5 min)

Reminder: Date confirmed for BPP Steering Committee Meeting to be held February 17 (8:30 am to 5:00 pm) and February 18, 2005 (8:30 am to 5:00 pm)

2) Update from Mark Phipps - Generation of the Representative Sample of Brake Wear Debris (5 min)

   a) Status of sample generation testing at Link. Is it completed? Were there any issues we should be aware of?
   b) Timing of sample to be ready to be sent to Mark Schlautman for chemical characterization? Mark’s report (due date March 16, 2005) for the chemical characterization needs to be finished before Air & Watershed modeling starts (Air Modeling start date May 2005 and Watershed Model start date Oct 2005)

3) Copper Brake Sources Work Plan

   a) Review Kirsten’s response to Kelly comments along with responses from 10/21/04 Steering Committee Call
   b) Reminder- deadline for comments is Nov. 8, 2004
   c) RFQ sent out to contractors to provide technical services for estimating copper loadings to the lower San Francisco Bay

4) Technical Studies Updates

   – Characterization of Airborne Wear Debris draft report (Mark Schlautman) – comments due Nov. 8, 2004
   – Air Deposition Monitoring for benzene update:
     - Don can monitor for benzene
     - Sarah/Connie working on contract amendment

5) Anything else?
The Brake Pad Partnership (BPP) Steering Committee held a teleconference meeting on December 3rd. A copy of the agenda is attached. The following people were on the call:

- Sarah Connick (Sustainable Conservation, Facilitator)
- Connie Liu (Sustainable Conservation, Project Manager)
- Mark Schlautman (Clemson University, project technical advisor)
- Rodger Dabish (TMD Friction and lead representative of the Brake Manufacturer’s Council Product Environmental Committee [BMC/PEC])
- Tim Merkel (formerly of Federal-Mogul Corporation)
- Michael Endicott (Sierra Club)
- Kelly Moran (TDC Environmental)
- Jim Pendergast (U.S. EPA)

Mark Phipps (Federal-Mogul Corporation) and Chris Shepley (Dana Corporation) were not able to participate in the call.

The following items were discussed:

- **Generation of the Representative Sample of Brake Wear Debris.** Generation is complete at Link Engineering laboratories, but the sample still has not arrived at Clemson for testing. It should arrive any day. Sustainable Conservation will work closely to oversee Clemson’s wear debris characterization schedule to avoid having this delay hold back the entire project.

- **Annual Copper Use Report.** The Steering Committee approved revisions to and release of the annual copper use report (Brake Pad Partnership, *Copper Use Monitoring Program, Results for Model Years 1998 – 2003, December 2004*). I will forward the report separately when I receive it.

- **Project Status and Schedule.** The Steering Committee went through the many projects currently underway and reviewed status and next steps. Other than the generation of the representative sample of brake pad wear debris, everything time critical is on track.
Anticipated Next Steps

The upcoming Steering Committee meeting schedule is as follows:

- December 15, teleconference meeting
- January 7, teleconference meeting
- January 28, teleconference meeting
- February 7, teleconference meeting
- February 17-18, in-person meeting in San Francisco
BPP STEERING COMMITTEE TELECONFERENCE
Friday, December 3, 2004 11:30 am to 12:30 pm (Pacific Time)

Dial: 866-393-8073
Meeting Number: *8893164

1) Teleconference agenda review and anything new? (5 min)

2) Update from Mark Phipps and Mark Schlautman - Generation of the Representative Sample of Brake Wear Debris (5 min)
   a) Summary report from Link (i.e., is there information on partitioning of the wear debris that can be provided to Kristen)?
   b) Status of representative sample -- when can Mark start the solubility and leaching tests?

3) BPP Program Update (5 min)
   a) BPP Steering Committee Meeting Calendar 2005
      • Jim P. is now unable to participate in the Feb 9, 2005 (11 am to 12 pm) and Feb 10, 2005 (11 am to 12 pm) call – is there another time that week that would work for everyone?
      • Feb 25, 2005 call is CANCELLED since the Steering Committee Meeting is on the 17th and 18th.
   b) Copper Use Monitoring Report for Model Year 2003 (BMC) (see attached)
      • Only one minor format change (footnote change on pgs 6-7) in this version of the report
      • Review and finalize report

4) BPP Technical Studies Update (10 min)
   a) Status on Generation of the Representative Sample Report – BMC’s procedures write up on the development of the representative sample (Rodger Dabish)
   b) Status on Characterization of Airborne Brake Wear Debris draft Report (Mark Schlautman)
   c) Status on Estimating Copper Loading to the Watershed work plan (Kirsten Rosselot)
   d) QAPP and Water Quality Monitoring Report (Jim Scanlin) – due date TBD? (was set for Nov 15)
   e) Update on contracting for the Copper Source Estimation work (pending information from SFEP/ABAG)

5) Anything else?
The Brake Pad Partnership (BPP) Steering Committee held a teleconference meeting on December 15th. A copy of the agenda is attached. The following people were on the call:

- Sarah Connick (Sustainable Conservation, Facilitator)
- Connie Liu (Sustainable Conservation, Project Manager)
- Mark Schlautman (Clemson University, project technical advisor)
- Rodger Dabish (TMD Friction and lead representative of the Brake Manufacturer's Council Product Environmental Committee [BMC/PEC])
- Mark Phipps (Federal-Mogul Corporation)
- Chris Shepley (Affinia, formerly Dana Corporation)
- Michael Endicott (Sierra Club)
- Kelly Moran (TDC Environmental)
- Jim Pendergast (U.S. EPA)

Tim Merkel (formerly of Federal-Mogul Corporation) was not able to participate in the call.

The following items were discussed:

- **Copper Loading Estimates—Contractor Selection.** On behalf of the BPP, the San Francisco Estuary Project (SFEP) issued a request for qualifications for completing copper load estimates for brake pads and non-brake pad sources (building on the *Copper Sources in Urban Runoff and Shoreline Activities* report). One set of qualifications was received from Process Profiles, the same contractor that successfully prepared the workplan for estimating the copper load from vehicle brake pads. Based on its previous successful experience with Process Profiles, the Steering Committee evaluation of the submitted qualifications, and an interview of Kirsten Rosselot during the teleconference, the Steering Committee agreed to select Process Profiles to conduct this work. Sustainable Conservation and SFEP will set up a contract for the first phase of this project.

- **Castro Valley Creek Monitoring Draft Report Completed.** To provide additional data for the BPP’s watershed modeling, the Alameda Countywide Clean Water Program (ACCWP) conducted enhanced monitoring of copper in stormwater in the Castro Valley watershed in winter 2003/04. Results of this monitoring were presented to the BPP Steering Committee and stakeholders at this annual meeting last summer.
draft report (*Draft Results of the 2003-2004 Castro Valley Creek Water Quality Monitoring Project*) is now available for review. (I will forward this draft report to BASMAA members under separate cover.) Like other BPP technical reports, this report will be peer reviewed by Scientific Advisory Team members and appropriate members of the BPP’s contractor team (Jim Carleton, U.S. EPA and Terry Cook, URS). Sustainable Conservation will arrange for the peer reviewers. Recommended peer reviewers include Val Connor (SWRCB SWAMP program) and USGS surface water monitoring program staff.

- **Project Status and Schedule.** The Steering Committee went through the many projects currently underway and reviewed status and next steps. While there have been some delays in transporting samples between labs, everything time critical remains on track. One piece of good news—the long-delayed representative sample of brake pad wear debris has finally reached Professor Schlautman’s laboratory.

**Anticipated Next Steps**

The upcoming Steering Committee meeting schedule is as follows:

- January 7, teleconference meeting
- January 28, teleconference meeting
- February 7, teleconference meeting
- February 17-18, in-person meeting in San Francisco
AGENDA

1) Teleconference agenda review and anything new? (5 min)

Update- Connie sent out a message to the BPP list serve asking stakeholders if they would like a conference call to discuss the Draft Report on the Characterization of Airborne Brake Wear Debris. Responses are needed by December 8, 2004.

2) Complete Ranking Sheets for the Copper Loading Statement of Qualifications from Kirsten Rosselot (Process Profiles) (30 min)

a) Complete Ranking Sheets
b) Interview Kirsten
c) Make a decision regarding selection of contractor

3) BPP Technical Studies Update (5 min)

a) Update on comparison of digestive techniques between Tom Holsen and Mark Schlautman. Tom’s digested samples are ready but they were not able to be delivered to Mark S. due to unforeseen circumstances.
b) Status of Characterization of Airborne Brake Wear Debris draft Report (Mark Schlautman).
c) Estimating Copper Loading to the Watershed work plan (Kirsten Rosselot) – Need Rodger’s input on the following open item/question from the Oct Steering Committee Meeting:

   Question #2) The mileage between pad changes and fraction of friction material remaining at the time of a pad change. To help with developing these estimates,

   a) Rodger had offered to try to obtain OE warranty data for Alameda County and determine if it can help narrow down uncertainty regarding brake pad replacement rates in Alameda County.

4) Anything else?
MEMO

For BASMAA Member Agency Internal Use Only

TO: Geoff Brosseau & BPP Representation Work Group  DATE: January 7, 2005
FROM: Kelly D. Moran  PROJECT: 16
SUBJECT: Brake Pad Partnership Conference Call—January 7, 2005

The Brake Pad Partnership (BPP) Steering Committee held a teleconference meeting on January 7th. A copy of the agenda is attached. The following people were on the call:

- Sarah Connick (Sustainable Conservation, Facilitator)
- Connie Liu (Sustainable Conservation, Project Manager)
- Mark Schlautman (Clemson University, project technical advisor)
- Mark Phipps (Federal-Mogul Corporation)
- Chris Shepley (Affinia, formerly Dana Corporation)
- Tim Merkel (formerly of Federal-Mogul Corporation)
- Michael Endicott (Sierra Club)
- Kelly Moran (TDC Environmental)
- Jim Pendergast (U.S. EPA)

Rodger Dabish (TMD Friction and lead representative of the Brake Manufacturer’s Council Product Environmental Committee [BMC/PEC]) was not able to participate in the call.

The following items were discussed:

- **Missing brake pad wear debris.** Most of the generated brake pad wear debris is AWOL. BMC members will assist in resolving the problem. If the missing wear debris is not found immediately, this will have serious implications for the schedule.

- **Castro Valley Creek Monitoring Draft Report Review Process.** To provide additional data for the BPP’s watershed modeling, the Alameda Countywide Clean Water Program (ACCWP) conducted enhanced monitoring of copper in stormwater in the Castro Valley watershed in winter 2003/04. The BPP review of the draft report prepared by ACCWP is in progress. Completion of the review may be slightly delayed for logistical reasons, as it is not as time critical as the previous item.

- **Project Status.** Other elements of the project are on track and progressing as planned.

- **Planning for next Steering Committee meeting.** The Steering Committee began planning the agenda for its next in-person meeting in late February. The meeting is likely to focus on the copper load estimates.
Anticipated Next Steps

The upcoming Steering Committee meeting schedule is as follows:

• January 28, teleconference meeting
• February 7, teleconference meeting
• February 17-18, in-person meeting in San Francisco
BPP STEERING COMMITTEE TELECONFERENCE
Wednesday, December 15, 2004, 12 noon to 1 pm (Pacific Time)

Dial: 866-393-8073
Meeting Number: *8893164*

DRAFT AGENDA

1) Teleconference agenda review and anything new? (5 min)

2) BPP Technical Studies Update (20 min)
   a) Chemical Characterization Studies Update (Mark Schlautman)
      - Need to resolve discrepancy between the 18.4 grams of wash down reported by Link Test lab and the 2.7+ grams that was sent to Mark S.
      - Finalize Charge to Reviewers (see attachment)
      - Draft Review Plan for Alameda Countywide Clean Water Program Draft Report on Storm water Quality Monitoring (see attachment)
   c) Final Report on Characterization of Airborne Brake Wear Debris (Mark Schlautman) and Response to Technical Reviewers' and Stakeholders' Comments on Draft Report on Characterization of Airborne Brake Wear Debris
      - Sent out to list serve on Dec 20 for people to take a look and see if the final report reflected adequate response to the reviewers' comments. Questions due before January 7, 2005.
      - Update: Received comment from Glynis Lough (ok with revisions)
   d) Updated BPP Air Deposition QAPP and Updated BPP Air Deposition Work Plan from Don Yee
      - Both documents reflect the addition of benzene sampling/monitoring.
      - Update: Received comment from Jim Pendergast who had no changes
   e) Contract in process for Kirsten Rosselot (Process Profiles) to develop estimates of copper loadings from vehicle brakes work plan

3) DRAFT Agenda for February 17-18, 2005 Steering Committee Meeting, San Francisco (5 min)
   - Review and discuss Copper Loadings Estimates from Vehicle Brake Sources (Kirsten Rosselot)
   - Review Chemical Characterization Studies lab analysis and results (Mark
Schlautman)

- Update on Air Deposition Monitoring Sampling (Don Yee)
- Update on Air Deposition Modeling (Betty Pun)
  - Modeling to begin May-June 2005 (are we on track?)

4) Anything else?
The Brake Pad Partnership (BPP) Steering Committee held a teleconference meeting on January 28th. A copy of the agenda is attached. The following people were on the call:

- Sarah Connick (Sustainable Conservation, Facilitator)
- Connie Liu (Sustainable Conservation, Project Manager)
- Mark Schlautman (Clemson University, project technical advisor)
- Rodger Dabish (TMD Friction and lead representative of the Brake Manufacturer's Council Product Environmental Committee [BMC/PEC])
- Tim Merkel (formerly of Federal-Mogul Corporation)
- Michael Endicott (Sierra Club)
- Kelly Moran (TDC Environmental)
- Jim Pendergast (U.S. EPA)

Mark Phipps (Federal-Mogul Corporation) and Chris Shepley (Affinia, formerly Dana Corporation) were not able to participate in the call.

The following items were discussed:

- **Apparently missing brake pad wear debris.** The case of the missing brake wear debris has been solved—no wear debris was missing. Substantially less wear debris was generated in the “fall on the ground fraction” than anticipated based on previous short-term runs. The mass balance showed that in the long-term wear debris generation runs a much larger percentage of the generated wear debris was fine particulate emitted to the air and collected in the air filter. Only material in the “fall on the ground fraction” can be used in chemical characterization experiments (the material collected on the air filters cannot be readily separated from the filter). The amount generated was initially misrepresented by a serious error at the laboratory that did the mass balance weight measurements (this lab will never be used again by the dynamometer lab or brake pad manufacturers). There is sufficient wear debris to complete the currently planned characterization, but not enough for additional characterization work, if required.

- **Project Status.** Most elements of the project are on track and progressing as planned. The following project activities have management issues:
  - *Copper load estimates (brake pads and other copper sources).* Process Profiles will develop the load estimates to be used as input for the BPP’s air deposition,
watershed, and Bay modeling. Development of these load estimates is a time-critical task for the project schedule. Review periods will be tight and schedules will need to be held. The anticipated release dates for key documents are: draft workplan for estimates of copper loads from non-brake sources—February 18; draft report with estimates of copper load from vehicle brake pads—March 28; draft report with estimates of copper loads from non-brake sources—about April 22.

- Chemical characterization of brake pad wear debris. If additional characterization is required to support modeling activities, the overall project schedule will probably be delayed. The Steering Committee is developing a contingency plan for generation of additional wear debris. The Steering Committee plans to review preliminary characterization results at its February meeting with the hope of making a firm decision about the need for additional characterization at that meeting.

- Planning for next Steering Committee meeting. The Steering Committee began planning the agenda for its next in-person meeting in late February. The committee agreed on the following goals for the in-person meeting:
  - Review the Project Timeline, identify potential risks of project delays, and develop strategies for preventing project delays.
  - Review and discuss the preliminary draft Work Plan for Estimating Copper Releases from Non Brake Sources and identify next steps to address any outstanding issues raised.
  - Provide input to the preliminary draft Report for Estimating Copper Releases from Vehicle Brake Pads and identify next steps to address outstanding issues.
  - Review the latest results on Air Deposition and Benzene Monitoring samples.
  - Understand the preliminary results of the Chemical Characterization Studies, if available, and identify next steps for chemical characterization of brake pad wear debris, if necessary.
  - Review process for archiving literature in BPP technical reference library.
  - Review and discuss the preliminary draft Methodology for Generating Representative Sample of Brake Wear Debris Report.
  - Determine whether additional brake pad wear debris needs to be generated for additional chemical characterization, and if so, establish process for its generation.
  - Review and understand new research linking copper exposure to sublethal effects in salmonids.

Anticipated Next Steps

The upcoming Steering Committee meeting schedule is as follows:

- February 7, teleconference meeting
- February 17-18, in-person meeting in San Francisco

Sustainable Conservation is in the process of scheduling a stakeholder conference in May or June and steering committee meetings from March-June.
BPP STEERING COMMITTEE TELECONFERENCE
Friday, January 28, 2005, 11:00 am to 12 noon (Pacific Time)

Dial: 866-393-8073
Meeting Number: * 8893164 *

DRAFT AGENDA

1) Teleconference agenda review and anything new? (5 min)

2) BPP Technical Studies Update (10 min)
   a) Chemical Characterization Studies – now underway
   b) Reviewer of Draft Report on Castro Valley Creek Water Quality Monitoring
      - Update: Process is behind schedule because we have had difficulty lining up reviewers.
   c) Final Report on Characterization of Airborne Brake Wear Debris (Mark Schlautman) and Response to Technical Reviewers’ and Stakeholders’ Comments on Draft Report on Characterization of Airborne Brake Wear Debris
      - Update: Forwarded Mark’s response to Betty’s comments to Steering Committee. Any more questions? If not, need to finalize Mark’s report.
   d) Updated BPP Air Deposition QAPP and Updated BPP Air Deposition Work Plan — the SWRCB is ready to sign off on this pending one minor change.
   e) Contract ready to be executed with Kirsten Rosselot to develop estimates of copper loadings from vehicle brake and non-brake sources
      - Note: Kirsten’s schedule for completing brake and non brake sources reports will be very tight. (see attached copy of Kirsten’s schedule of deliverables)

3) DRAFT Agenda for February 17-18, 2005 Steering Committee Meeting, San Francisco (20 min)
   (** Note: Full draft agenda to arrive shortly for your review and input!)
   - Review and discuss Copper Loadings Estimates from Vehicle Brake Sources (Kirsten Rosselot)
   - Review Chemical Characterization Studies lab analysis and results, if available (Mark Schlautman) – Mark may join by telephone
   - Update on Air Deposition Monitoring Sampling (Don Yee)
   - Review Process for archiving BPP literature in BPP library (see Kelly Moran’s Steps for Adding Papers to BPP Technical Reference Library attached)
   - Don’t forget – Stakeholder and BPP Steering Committee Face Meeting is anticipated for May or June 2005 in San Francisco. Please send in your calendar if you have not done so already.

4) Anything else?
The Brake Pad Partnership (BPP) Steering Committee held a teleconference meeting on February 7th. A copy of the agenda is attached. The following people were on the call:

- Sarah Connick (Sustainable Conservation, Facilitator)
- Connie Liu (Sustainable Conservation, Project Manager)
- Mark Schlautman (Clemson University, project technical advisor)
- Mark Phipps (Federal-Mogul Corporation)
- Chris Shepley (Affinia, formerly Dana Corporation)
- Michael Endicott (Sierra Club)
- Kelly Moran (TDC Environmental)

Rodger Dabish (TMD Friction and lead representative of the Brake Manufacturer's Council Product Environmental Committee [BMC/PEC]), Tim Merkel (formerly of Federal-Mogul Corporation), and Jim Pendergast (U.S. EPA) were not able to participate in the call.

The following items were discussed:

- **Project Status.** No new problems have arisen. The Steering Committee briefly went over the review plan for 2003-04 Castro Valley water quality monitoring report.

- **Planning for next Steering Committee meeting.** The Steering Committee reviewed and approved the agenda for the in-person meeting in late February.

- **Stakeholder Meeting Dates.** The Steering Committee reviewed possible dates for the Stakeholder and June in-person meetings. Pending resolution of final details, the Stakeholder meeting will be June 29th, June 22nd or June 24th.

- **Non-Brake Copper Sources Load Estimate Workplan.** The Steering Committee reviewed a copper source list from Process Profiles, which was based on the *Copper Sources in Urban Runoff and Shoreline Activities* report. Process Profiles proposes to create load estimates for all the potentially major urban runoff copper sources identified in that report. Additionally, Process Profiles has proposed to tackle a source that could not be quantified in that report—fertilizers. Based on local watershed characteristics, the Steering Committee agreed that a farm animal estimate was not worthwhile. The Steering Committee asked to explore the potential to use an estimate of releases from marine antifouling paint in the Bay model; this will be discussed further with URS, which will be doing the Bay modeling.
Anticipated Next Steps

The upcoming Steering Committee meeting schedule is as follows:

- February 17-18, in-person meeting in San Francisco
- March 10, Thursday, 11:00 a.m. to 12 noon
- March 18, Friday, 11:30 am to 12:30 pm
- April 7, Thursday, 11:00 am to 12 noon
- April 22, Friday, 11:30 am to 12:30 pm
- May 6, Friday, 11:00 a.m. to 12:00 noon
- May 19, Thursday, 11 am to 12 noon
- June 9, Thursday, 11:00 a.m. to 12:00 noon
- June 30, Thursday, 11:00 a.m. to 12:00 noon

Sustainable Conservation is in the process of scheduling a stakeholder conference and the in-person steering committee meeting in June.
BPP STEERING COMMITTEE TELECONFERENCE
Monday, February 7, 2005, 9:00 a.m. to 10 a.m. (Pacific Time)

Dial: 866-393-8073
Meeting Number: *8893164*

AGENDA

1) Teleconference agenda review and anything new? (5 min)

2) BPP Technical Studies Update (5 min)
   a) Reviewers of Draft Report on Castro Valley Creek Water Quality Monitoring
      • Robert Holmes, Central Valley Regional Water Quality Control Board, agreed to serve as a reviewer and provided comments
      • Arthur J. Horowitz, U.S. Geological Survey, Georgia agreed to serve as a reviewer and provided comments
   Review and finalized revised schedule of draft review plan for storm water quality monitoring draft report (see attached)

3) DRAFT Agenda for February 17-18, 2005 Steering Committee Meeting, San Francisco (please see attached updated agenda) (15 min)

4) Review proposed options for Stakeholder and Steering Committee Meeting (June 2005) (5 min)
   • June 21 (BPP), June 22 (Stakeholder), June 23 (BPP ½ day)
   • June 22 (BPP ½ day), June 23 (BPP), June 24 (Stakeholder) – Jim P. N/A
   • June 28 (BPP) – Richard L. N/A; June 29 (Stakeholder), June 30 (BPP ½ day) - Richard L. N/A
   • June 29 (BPP ½ day), June 30 (BPP) – Richard L. N/A; July 1 (Stakeholder) – Jim P. N/A

5) Review and approve Steering Committee Call and Meeting Schedule (March to June 2005) – (attached) (5 min)

6) Discuss Kirsten’s email for defining what types of copper releases (or release categories) to be included in her Non Brake Sources of Copper work plan. (see email below): (10 min)
   Here is the list of release categories that I would propose at this point. Let's see if this list has the group's okay:
      • architectural copper
      • copper in pesticides and fertilizer
      • copper releases from industry (including releases in runoff)
      • copper in soil erosion
      • copper in domestic water discharged to storm drains
      • copper from farm animal facilities
   These categories of releases are taken from "Copper Sources in Urban Runoff and Shoreline Activities" (Kelly's report). Work plans for inventorying sources estimated by Kelly to contribute less than 1000 lb per year of copper in urban runoff (those from fuel combustion, wood burning, and vehicle fluid leaks) will not be developed. Also, I'm adding fertilizers and farm animals.

7) Anything else?
The Brake Pad Partnership (BPP) Steering Committee held an in-person meeting on February 17th and 18th in San Francisco. A copy of the agenda for the meeting is attached.

The purposes of the Steering Committee meeting were to:

- Review the project timeline, identify potential risks of project delays, and develop strategies for preventing project delays.
- Review and discuss the preliminary draft Work Plan for Estimating Copper Releases from Non Brake Sources and identify next steps to address any outstanding issues raised.
- Provide input for the preliminary draft Report for Estimating Copper Releases from Vehicle Brake Pads and identify next steps to address outstanding issues.
- Review the latest results on air deposition and benzene monitoring samples.
- Understand the preliminary results of the chemical characterization studies and identify next steps for chemical characterization of brake pad wear debris.
- Review process for archiving literature in BPP technical reference library.
- Review and discuss the preliminary draft Methodology for Generating Representative Sample of Brake Wear Debris Report.
- Review and understand new research linking copper exposure to sublethal effects in salmonids.

The following people participated in the Steering Committee meeting:

- Sarah Connick (Sustainable Conservation, Facilitator)
- Connie Liu (Sustainable Conservation, Project Manager)
- Mark Schlautman (Clemson University, project technical advisor) (by telephone)
- Rodger Dabish (TMD Friction and lead representative of the Brake Manufacturer's Council Product Environmental Committee [BMC/PEC])
- Mark Phipps (Federal-Mogul Corporation)
- Chris Shepley (Dana Corporation)
- Michael Endicott (Sierra Club) (Friday only)
- Jim Pendergast (U.S. EPA) (by telephone)
- Kelly Moran (TDC Environmental)
Steering Committee member Tim Merkel (formerly of Federal-Mogul Corporation) was unable to attend. Many others participated in part of the meeting including Jim Carleton (U.S. EPA), Richard Looker (Regional Board), Terry Cooke (URS), Betty Pun (AER), Kirsten Rosselot (Process Profiles), and Don Yee (SFEI).

**Brake Pad Wear Debris Copper Extraction Tests**

Professor Schlautman presented the results of extraction test of the representative sample of brake pad wear debris. These long-awaited tests repeat a series of extraction tests conducted by his laboratory on a sample of brake pad wear debris from a single brake pad. The results are summarized in a table on the next page, which includes the previous data. A written report will be available soon.

For the more concentrated test solutions, like the waste extraction test (WET) and Toxicity Characteristic Leaching Procedure (TCLP), most or all of the copper was extracted in the short-term tests (all tests were 18 hour extractions, except the WET test, which is a 48-hour test). In the less concentrated solutions, like synthetic rainwater, substantially less copper was extracted than was extracted from the previous sample. Professor Schlautman believes that the formulation of the pads likely plays a role in the differences, as the final pH of the extraction solutions was higher—and thus less likely to dissolve copper based solely on pH—than the previous solutions.

Professor Schlautman interprets the results of these and previous short-term extraction tests to mean that the copper in brake pad wear debris is available to be dissolved and thus become bioavailable. He interprets the differences among the lower concentration extraction solutions to suggest that the rate of release of copper from a representative sample of brake pad wear debris is likely lower than the rate from the wear debris from the single previously tested pad. He noted that even though only a relatively small amount of copper was extracted in the short-term tests with the more environmentally realistic solutions (like synthetic rainwater), this was sufficient to show that over the long term, in real environmental conditions, copper would certainly be released.

Based on these results, Steering Committee members generally feel that it would be reasonable to assume that copper from brake pad wear debris behaves like any other copper in the environment. The brake pad manufacturer representatives do not feel that they have quite enough information to “sell” this assumption to other brake pad manufacturers, who are not familiar with the subject of environmental fate of materials. To address this need, Sustainable Conservation will work with the scientific advisory team to develop a written recommendation about this assumption. It is possible that the recommendation will suggest additional limited characterization of brake pad wear debris or (more likely) of copper-containing reference materials to strengthen the basis for the assumption. Any decision on additional characterization will need to be made quickly to avoid delaying the project schedule.
Brake Pad Wear Debris Copper Leaching Test Results
(Preliminary Data - 18-Hour Extractions)

<table>
<thead>
<tr>
<th>Extracting Solution</th>
<th>Copper Fraction Leached</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Copper (II) oxide powder</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Federal Hazardous Waste Classification Test (Toxicity Characteristic Leaching Procedure)</td>
<td>0.3%</td>
</tr>
<tr>
<td>California Hazardous Waste Classification Test (Waste Extraction Test*)</td>
<td>5%</td>
</tr>
<tr>
<td>U.S. EPA Synthetic Precipitation Leaching Procedure</td>
<td>--</td>
</tr>
<tr>
<td>Synthetic rainwater (Chemical composition of Los Angeles rain)</td>
<td>--</td>
</tr>
<tr>
<td>Concentrated synthetic rainwater</td>
<td>--</td>
</tr>
<tr>
<td>Water with humic acids** (Standard river humic acids)</td>
<td>--</td>
</tr>
</tbody>
</table>

-- Not tested

*This 48 hour test is used for compliance with the California Soluble Threshold Limit Concentration (STLC).

**Humic acids—natural acids found in soils and plants—are commonly found in urban runoff and creeks.

Source: Reports from Professor Mark Schlautman to the Brake Pad Partnership.

**Action Plan Implementation**

Most of the meeting was spent on managing the implementation of the Brake Pad Partnership’s action plan of brake pad wear debris characterization and environmental fate and transport studies. New information from the meeting is summarized below.

- **Air Deposition Monitoring.** Don Yee presented SFEI’s preliminary air deposition monitoring data. Happily, the weather was accommodating this winter, providing plenty of wet weather sampling opportunities. Preliminary wet weather and benzene data show the expected relationships between location and copper and benzene concentrations. Dry weather data have not been analyzed, awaiting resolution of some questions about analytical procedures that SFEI’s lab (Professor Tom Holsen, Clarkson University) and the lab that developed the BPP’s characterization procedures (Professor Mark Schlautman, Clemson University) still need to work out.

- **Brake Copper Release Estimate.** Process Profiles, the Steering Committee, and the consultant team worked through some questions that need to be answered to complete the estimate of copper from vehicle brake pads. The load estimate report is on track for delivery by the end of March.
• **Load from Other Copper Sources.** Process Profiles went through the draft workplan for estimating copper releases from non-brake copper sources with the Steering Committee and the consulting team. While the workplan relies heavily on the *Copper Sources in Urban Runoff and Shoreline Activities* report, it has some differences, primarily due to the different scope of this load estimate. Many questions were resolved in this detailed discussion, which will continue as the draft workplan goes through review in the coming weeks.

• **Written methodology for generation of the representative brake pad wear debris sample.** Although the representative sample of brake pad wear debris has been generated, the method for creating the sample has not yet been documented in a written report. This task is stalled, due to delays on the brake pad manufacturer end. The Steering Committee again reviewed the scope of the task and manufacturers again promised to prepare the needed documentation.

• **Other Action Plan Elements.** The status of the chemical characterization work was summarized above. Other elements of the Action Plan are proceeding as planned.

• **Schedule.** Sustainable Conservation distributed a revised project timeline. A spreadsheet with graphical and table versions of the schedule is attached (note that the graphical timeline is best be viewed on screen or printed in color on legal size paper). Several reports with review periods this spring are time-critical for the Brake Pad Partnership project schedule. Please note the dates below if you are interested in reviewing these reports:
  
  o **Copper load from non-brake copper sources**
    
    - [Workplan](#) released 2/21/05; comments due 3/11/05
    
    - [Draft report](#) scheduled for release about 4/22/05; comments due 5/13/05
  
  o **Air deposition monitoring**
    
    - [Draft report](#) scheduled for release about 4/4/05; comments due 5/2/05

**Copper Sublethal Toxicity to Salmon**

Urban creeks in California, Oregon, and Washington have been designated as critical habitat for endangered salmonids (e.g., the Central California Coast Steelhead, the Central Valley Steelhead, the Central Valley Spring-Run Chinook Salmon, the Winter-Run Chinook Salmon, the Central California Coast Coho Salmon, and the South Central California Steelhead). Salmonids use smell for several important functions, such as predator avoidance and navigation to home streams for reproduction. Recent research from scientists at the NOAA Northwest Fisheries Science Center in Seattle suggests that there may be a link between the presence of dissolved copper in freshwater and reduction in the olfactory function (ability to smell) in salmonids. This research has been published in several papers, including:
NOAA Fisheries believes that these adverse effects, if they occur in West Coast creeks and rivers, could interfere with behaviors that are important for survival and migration of endangered salmonids.

At the Steering Committee meeting, I reviewed information from these papers and from my conversations with NOAA Fisheries scientists aware of this issue. To help them understand what the effect of copper on olfactory function means in a practical sense, I showed a video that I obtained from NOAA Fisheries. It shows the effect of 3 hour copper exposure on the response of juvenile coho to an alarm pheromone.¹

This research is of interest because it shows that—in a laboratory setting—the threshold for adverse effects on juvenile coho salmon is less than 10 µg/l dissolved copper. This concentration of dissolved copper is not unusual in urban runoff and urban creeks (though it is above the mean or median in most data sets). The laboratory water is not, however, the same as natural creek water, so the laboratory results must be interpreted cautiously.

There are many questions yet to be answered before the meaning of this work can be fully defined, for example:

- The ability of the fish to acclimatize to copper is not known (but is likely to be a topic that the researchers will investigate).
- What effects may occur under real exposure regimes has not been explored. Real exposures involve changing copper concentrations, such as pulses from storm event, followed by exposures to lower “background” copper concentrations.
- The effects of other constituents in natural waters are not yet understood. While the research shows that hardness does not appear to reduce the effect of copper on salmon olfaction (in contrast to other copper-related toxicity in freshwater, which is reduced by increasing hardness), it is not yet known if the presence of copper ligands (e.g., EDTA, humic acids) modify the copper toxicity to salmon olfaction.

Although the Brake Pad Partnership has, to date, focused on San Francisco Bay, this new information about copper in fresh water has the potential to cause stakeholders to consider the implications of brake pad copper releases to urban creeks as well.

¹ This video and more information on this research is available on the Internet
http://www.nwfsc.noaa.gov/research/divisions/ec/ectox/fishneurobiology/displaypicmov.cfm?picmov=coppermovie
Other items

- **Stakeholder Meeting.** The next stakeholder conference will be in the Bay Area on Wednesday, June 22, 2005.

- **Project Budget.** Sustainable Conservation reviewed the overall project budget with the Steering Committee. Funds are still needed to support Sustainable Conservation (for Steering Committee coordination, and stakeholder communication). Sustainable Conservation continues to apply for grants and to seek agency and private funding for the project.

- **Brake Pad Partnership Technical Reference Library.** Sustainable Conservation has agreed to take over the management of the BPP Technical Reference Library that was set up with funds from U.S. EPA, BASMAA, and the San Francisco Estuary Project.\(^2\) The U.S. EPA Region 9 library will continue to host the physical collection. Addition of materials and the web site has been an unfunded activity for the last two years. The web site will not be relocated immediately; a notice will be sent when it is shifted to Sustainable Conservation’s web site.

Anticipated Next Steps

The upcoming Steering Committee meeting schedule is as follows:

- March 10, Thursday, 11:00 a.m. to 12 noon
- March 18, Friday, 11:30 am to 12:30 pm
- April 7, Thursday, 11:00 am to 12 noon
- April 22, Friday, 11:30 am to 12:30 pm
- May 6, Friday, 11:00 a.m. to 12:00 noon
- May 19, Thursday, 11 am to 12 noon
- June 9, Thursday, 11:00 a.m. to 12:00 noon
- June 21 and 23, in-person meeting in San Francisco
- June 22, **Stakeholder Conference**, San Francisco
- June 30, Thursday, 11:00 a.m. to 12:00 noon

\(^2\) The catalog is online at [www.tdcenvironmental.com/brake](http://www.tdcenvironmental.com/brake)
BRAKE PAD PARTNERSHIP

Steering Committee Meeting

Thursday, February 17, 2005  8:30 a.m. to 5:00 p.m.
Friday, February 18, 2005  8:30 a.m. to 11:00 a.m.

Sustainable Conservation
121 Second Street, Sixth Floor
San Francisco, CA  94105
Phone: 415-977-0380

Agenda

MEETING OBJECTIVES

- Review the Project Timeline, identify potential risks of project delays, and develop strategies for preventing project delays.
- Provide input to the Draft Report for Estimating Copper Releases from Vehicle Brake Pads and identify next steps to address any outstanding issues.
- Review and discuss Draft Work Plan for Estimating Copper Releases from Non Brake Sources and identify next steps to address any outstanding issues.
- Review latest results from the Air Deposition and Benzene Monitoring study.
- Understand the results of the Chemical Characterization Studies, if available, and identify next steps.
- Review process for archiving literature in BPP technical reference library.
- Review Methodology for Generating Representative Sample of Brake Wear Debris Report.

SCHEDULE

Thursday, February 17, 2005

8:00 a.m.  Meeting room open, and bagels, coffee, and tea available
  ➢ Complete lunch order forms
8:30 a.m.  Meeting Begins: Partnership Business -- Steering Committee Only: Jim Pendergast & Mark Schlautman (via telephone)
  ➢ Announcements of any new developments affecting the partnership
  ➢ Review Sustainable Conservation’s report regarding funding with Sarah (handouts #1a,1b,1c)
  ➢ Review upcoming BPP Steering calls and meeting schedule with Connie (handout #2)
  ➢ Other items?
Guests invited: Terry Cooke (URS), Richard Looker (SFB-RWQCB), Betty Pun (AER), Kirsten Rosselot (Process Profiles), Paula Trigueros (SFEP/ABAG), and Don Yee (SFEI)

9:00 a.m. Review Technical Studies Schedule -- Steering Committee, Richard Looker, Paula Trigueros
- Review product review schedule (handout #3) and technical studies timeline (handout #4)
- Identification of key priority actions for staying on schedule
- Contracting update
- Review BPP Prop 13 Budget (handout #5)

9:15 a.m. Air Deposition Monitoring Update with Don Yee -- Steering Committee, Richard Looker, Terry Cooke, Betty Pun
- Update on air deposition sampling conducted to date, including Mark Schlautman’s update on Tom Holsen’s digestion results
- Report on benzene monitoring samples
- Identify and address any potential issues

10:00 a.m. Break

10:15 a.m. Estimating Copper Loading to the Watershed from Brake Sources with Kirsten Rosselot -- Steering Committee, Richard Looker, Terry Cooke, Betty Pun
- Draft Report update from Kirsten Rosselot
- Painstakingly review key data inputs and assumptions for Kirsten’s estimates and discuss implications for source estimation results and air deposition modeling
  - Information on wear debris partitioning
  - Additional inputs and assumptions?
- Identify concrete next steps
- Review technical review process schedule

12:00 noon Lunch

12:45 p.m. Estimating Copper Loading to the Watershed from Non Brake Sources with Kirsten Rosselot -- Steering Committee, Richard Looker, Terry Cooke, Betty Pun
- Review Draft Work Plan painstakingly with Kirsten Rosselot
- Identify concrete next steps to address any concerns raised
- Review and finalize charge to reviewers
- Review technical review process schedule

2:45 p.m. Break

3:00 p.m. Review Methodology for Generating a Representative Sample of Brake Wear Debris with Rodger Dabish -- Steering Committee, Richard Looker, Kirsten Rosselot
- Review and finalize methodology report
- Identify next steps, if needed
- Other- Discuss January 20, 2005 BPP Steering Committee Call Summary on issue of generating representative sample of brake wear debris (handout #6)

3:45 p.m. **Copper and Critters Update with Kelly Moran and Chris Shepley -- Steering Committee, Richard Looker**
- Update and video on Copper Effects on Salmon provided by Kelly
- Item on copper concentrating microbe from Chris

4:15 p.m. **Technical Reference Library with Connie and Kelly -- Steering Committee**
- Review process (handout # 7)
- Discuss questions and approve procedure for adding documents to the BPP’s Technical Reference Library

5:00 p.m. Adjourn
6:00 p.m. Steering Committee Dinner at Maya Restaurant – directions/map to be provided

**Friday, February 18, 2005**

- **Guests invited:** Jim Carleton (US EPA) via telephone, Terry Cooke (URS) via telephone, Richard Looker (SFB-RWQCB) via telephone, Betty Pun (AER) via telephone; Jim Pendergast (via telephone), Mark Schlautman (via telephone)

8:00 a.m. Meeting room open, and bagels, coffee, and tea available

8:30 a.m. **Characterization of the Representative Sample of Brake Wear Debris with Mark Schlautman -- Steering Committee, Jim Pendergast (via telephone); Jim Carleton (via telephone), Terry Cooke (via telephone), Richard Looker (via telephone), Betty Pun (via telephone)**
- Summary of preliminary results from Mark Schlautman (via telephone)
- Review draft report (if available) and identify concrete next steps to address any concerns raised
- Discuss potential for additional tests
- Review technical review process schedule
- Review and finalize charge to reviewers

10:00 a.m. **Revisiting of topics held over from earlier in the meeting**

10:30 a.m. **Review of Meeting Accomplishments and Action Items**

11:00 a.m. Adjourn
The Brake Pad Partnership (BPP) Steering Committee held a teleconference meeting on April 7th. A copy of the agenda is attached. The following people were on the call:

- Sarah Connick (Sustainable Conservation, Facilitator)
- Connie Liu (Sustainable Conservation, Project Manager)
- Mark Schlautman (Clemson University, project technical advisor)
- Mark Phipps (Federal-Mogul Corporation)
- Rodger Dabish (TMD Friction and lead representative of the Brake Manufacturer's Council Product Environmental Committee [BMC/PEC])
- Tim Merkel (formerly of Federal-Mogul Corporation)
- Jim Pendergast (U.S. EPA)
- Michael Endicott (Sierra Club)
- Kelly Moran (TDC Environmental)

Bob Peters (Akebono Corporation) and Chris Shepley (Affinia) were not able to participate in the call.

The following items were discussed:

- **New Brake Manufacturer Lead—Bob Peters.** Bob Peters of Akebono Corporation will be assuming the leadership of the BMC/PEC, taking over for Rodger Dabish. He will take Rodger’s place on the Steering Committee. They will both serve on the Steering Committee through the June in-person meeting.

- **Brake Pad Copper Load Estimates.** The draft report on brake pad copper load estimates will soon be released for review. The Steering Committee worked on—but did not finalize—the charge to reviewers and the review plan for this report.

- **Planning for Stakeholder Conference.** The Steering Committee discussed the agenda for the Stakeholder Conference in June. Manufacturers will look for a representative to review their activities regarding brake pad copper content.

- **Project management.** The Steering Committee approved a request for a $5,000 contract amendment for SFEI to pay for additional elemental analysis being conducted on air deposition samples. Steering Committee members indicated a need for close oversight over contractors for potential cost overruns, given the tight project budget.
Anticipated Next Steps

The upcoming Steering Committee meeting schedule is as follows:

- April 22, Friday, 11:30 am to 12:30 pm
- Tentative April 29, Friday, 11:00 a.m. to 12:00 p.m. special teleconference with peer reviewers to discuss brake pad copper load estimate report
- May 6, Friday, 11:00 a.m. to 12:00 noon)
- May 19, Thursday, 11 am to 12 noon
- June 9, Thursday, 11:00 a.m. to 12:00 noon)
- June 21 and 23, in-person meeting in San Francisco
- June 22, Stakeholder Conference, San Francisco
- June 30, Thursday, 11:00 a.m. to 12:00 noon
BPP STEERING COMMITTEE TELECONFERENCE
Thursday, April 7, 2005, 11:00 a.m. to 12 Noon (Pacific Time)
Dial: 866-393-8073
Meeting Number: *8893164*

AGENDA

1) Teleconference agenda review and anything new? (5 min)
   a) Introduce Bob Peters to the Steering Committee (Mark Phipps)

2) BPP Technical Studies Update (20 min)
   a) Estimating Copper Loading from Brake Sources Draft Report (by Kirsten Rosselot)
      ➢ Finalize Charge to Reviewers (see redlined comments attached)
      ➢ Review draft Review Plan (see attached)
   b) Water Quality Monitoring (Jim Scanlin)
      Review action items from technical conference call on (03-14-05) that were raised by Steering Committee:
      ▪ Need to understand experimental error before moving forward with the watershed modeling;
      ▪ After summarizing technical conference call issues, determine what it means to us, what we may have to do, and how it impacts our timeline;
      ▪ What is the load of copper into the Bay? If we have systematic error in water sampling then we need to correct it before going ahead with watershed modeling.
      ➢ Identify how we can address these items further in future Steering Committee calls and meetings.

3) DRAFT Agenda for June 22, 2005 Stakeholder Meeting, San Francisco, (PG&E location) (20 min)
   Topics for Discussion:
      ➢ Communicate and provide feedback on Project Timeline and Schedule.
      ➢ Review and discuss results from the following technical work products:
         ▪ Air Deposition Monitoring Report
         ▪ Water Quality Monitoring Report
         ▪ Review and discuss the Methodology for Generating a Representative Sample of Brake Wear Debris (Rodger Dabish, BMC)
         ▪ Chemical Characterization of the Representative Brake Wear Debris Sample Report
         ▪ Copper Loading Estimates to the Watershed from Brake and Non Brake Sources

   **Obtain feedback and provide input on upcoming modeling work/studies**

   Question for Steering Committee: Would you like to have a manufacturer representative present an update on what their company is doing to address copper in brake pads?

4) Castro Valley Field Trip to Castro Valley Creek & Air Deposition Monitoring sites with Arleen Feng, Jim Scanlin (tentative) & Don Yee – scheduled for Monday, June 20, 2005 (10 min)
   a) Please let me know if you are planning to attend. For out of town people, let me know your travel plans and when you expect to fly in so I can coordinate the field trip logistics. Note: Flying into Oakland Airport is recommended if you plan to attend on Monday since it is the closest airport to the meeting site.
   b) Attendees: Let me know if you have any specific requests for the field trip (what do you want to get out of the visit? What would you like to see & learn more about, etc…) This info will help in generating an orientation for folks.

5) Review and discuss 2005 BPP Prop 13 Budget (10 min)
   a) Discuss issue regarding SFEI’s subcontract invoice (email sent 3/31).
      ➢ Need Steering Committee approval to provide Don/SFEI a $5K contract add on to cover the unexpected lab costs and additional services due to the change in scope.

6) Anything else?
The Brake Pad Partnership (BPP) Steering Committee held a teleconference meeting on April 22nd. A copy of the agenda is attached. The following people were on the call:

- Sarah Connick (Sustainable Conservation, Facilitator)
- Connie Liu (Sustainable Conservation, Project Manager)
- Mark Phipps (Federal-Mogul Corporation)
- Bob Peters (Akebono Corporation and new lead representative of the Brake Manufacturer's Council Product Environmental Committee [BMC/PEC])
- Rodger Dabish (TMD Friction and former lead representative of the BMC/PEC)
- Tim Merkel (formerly of Federal-Mogul Corporation)
- Jim Pendergast (U.S. EPA)
- Kelly Moran (TDC Environmental)

Mark Schlautman (Clemson University, project technical advisor), Michael Endicott (Sierra Club), and Chris Shepley (Affinia) were not able to participate in the call.

The following items were discussed:

- **Technical studies status.** Three reports are currently out for review (brake pad copper load estimates; chemical characterization; air deposition) and a fourth (non-brake copper load estimates) will soon be out for review. The steering committee established review plan and peer reviewer conference schedules for each of the reports. (If you may wish to participate in any of these teleconferences, please see the times on the next page). The Steering Committee also finalized the charge to reviewers and the review plan for the chemical characterization report.

- **Planning for Stakeholder Conference.** The Steering Committee again discussed the agenda for the Stakeholder Conference in June.

- **Castro Valley Tour.** In conjunction with the Steering Committee meeting in June, Sustainable Conservation is coordinating with the Alameda Countywide Clean Water Program to set up a tour of the Brake Pad Partnership’s study watershed, Castro Valley. The tour is primarily aimed at out of towners who are not familiar with the characteristics of the watershed, but it will provide an opportunity for informal discussion of the modeling efforts.
Anticipated Next Steps

The upcoming Steering Committee meeting schedule is as follows:

- April 29, Friday, 11:00 a.m. to 12:00 p.m.—special teleconference with peer reviewers to discuss brake pad copper load estimate report
- May 6, Friday, 11:00 a.m. to 12:00 noon) —special teleconference with peer reviewers to discuss air deposition measurements report
- May 11, Wednesday, 9:00 a.m. to 10:00 a.m.
- May 16, Monday, 9:00 a.m. to 10:00 a.m.
- May 19, Thursday, 11 am to 12 noon—special teleconference with peer reviewers to discuss brake pad wear debris chemical characterization report
- *Date to be determined in late May or early June*—special teleconference with peer reviewers to discuss non-brake pad copper load estimates report
- June 9, Thursday, 11:00 a.m. to 12:00 noon)
- June 21 and 23, in-person meeting in San Francisco
- June 22, *Stakeholder Conference*, San Francisco
- June 30, Thursday, 11:00 a.m. to 12:00 noon
BPP STEERING COMMITTEE TELECONFERENCE
Friday, April 22, 2005, 11:30 a.m. to 12:30 pm (Pacific Time)

Dial: 866-393-8073
Meeting Number: *8893164*

DRAFT AGENDA

1) Teleconference agenda review and anything new? (5 min)

2) BPP Technical Studies Update (20 min)

   a) Estimating Copper Loading to the Watershed from Vehicle Brake Sources draft Report (by Kirsten Rosselot)
      ▪ Comments due Friday, April 22, 2005 -- please submit to Connie asap
      ▪ *Reminder* Teleconference to discuss reviewers’ comments on Friday, April 29, 2005, 11:00 am to 12 Noon (CA time)
        o SAT advisors/co-moderator: Jerry Schubel and Mark Schlautman – confirmed (John Sansalone out of town)
        o Reviewers: Bob Frosch and Eric Stein – confirmed
        o Contractors: Kirsten Rosselot, Betty, Terry and Jim C. (invited)

   b) Air Deposition Monitoring draft Report (by Don Yee)
      ▪ Comments due Friday, April 29, 2005
      ▪ ** Reminder** Teleconference to discuss reviewers’ comments on Friday, May 6, 2005, 9:00 am to 10:00 am (CA time)
        ➢ Need Steering Committee confirmation
          o SAT advisors: Jerry Schubel, Mark Schlautman, John Sansalone – confirmed
          o Reviewers: Ken Schiff, Lynn Hildenmann, Mike Bergin, Peter Kozelka, John Ondov

   c) Chemical Characterization draft Report (by Mark Schlautman)
      ▪ Comments due Friday, May 6, 2005
      ▪ Draft Charge to Reviewers – need to finalize on Friday, April 22 (attached)
      ▪ *Proposed New* Teleconference to discuss reviewers’ comments on Monday, May 16, 2005, 9:00 am to 10:00 am or Noon to 1 pm (CA time)
        ➢ Need to confirm date/time with Steering Committee, SAT advisors, and reviewers

   d) Estimating Copper Loading from Non Brake Sources Final Work Plan (by Kirsten Rosselot)
      ▪ Final Work Plan expected to be submitted on Friday, April 22

   c) Estimating Copper Loading from Non Brake Sources draft Report (by Kirsten Rosselot)
      ▪ Report due Friday, April 22 -- will be delayed (1 to 2 weeks?)
      ▪ Note: Teleconference to discuss reviewers’ comments on Thursday, May 19, 11:00 am to 12 Noon (CA time). This was already scheduled on BPP Steering Committee Call Calendar. This may change due to a delay in report availability.
        ➢ Need input for a new Steering Committee Call date (backup) during week of May 9 to May 13
          o Proposed Call for Wednesday, May 11, 9:00 am to 10:00 am (Pacific Time)
            – need Steering Committee approval
          o Review updated/redlined Steering Committee Call & Meeting Schedule (redlined) at the end of agenda

3) Review DRAFT Agenda for BPP Stakeholder Meeting on Wed. June 22 (9 a.m. to 4 p.m.) at Pacific Gas & Electric Company, San Francisco (20 min) -- attached
Need Steering Committee input on the following questions:

1) Does the agenda cover everything we want to cover?
2) Are the speakers the right people for the topics?
   a. Who should give the Keynote Address – any suggestions?
   b. Who will be presenting on behalf of a brake pad manufacturer?
3) Are the time allotments appropriate for each item?
4) Any other questions?

4) Update on Castro Valley Field Trip on Monday, June 20, 2005 (10 min)

   a) Current list of interested people in attending:
      - Jim Carleton (arrives Mon. at 11 a.m. at SFO)
      - John Sansalone, Arleen Feng, Don Yee, Kelly Moran
      - Bob Peters (depending on travel authorization)
      - Mark Schlautman (depending on travel arrangements)
      - Michael Endicott (depending on work schedule)
         - Any updates to the list?
         - Any specific requests for the field trip (what do you want to get out of the visit? What would you like to see & learn more about, etc…) - your input will help generate an orientation for folks.

5) Anything else?
MEMO

For BASMAA Member Agency Internal Use Only

TO: Geoff Brosseau & BPP Representation Work Group  DATE: May 12, 2005
FROM: Kelly D. Moran  PROJECT: 16
SUBJECT: Brake Pad Partnership Conference Call—May 12, 2005

The Brake Pad Partnership (BPP) Steering Committee held a teleconference meeting on May 12th. A copy of the agenda is attached. The following people were on the call:

- Sarah Connick (Sustainable Conservation, Facilitator)
- Connie Liu (Sustainable Conservation, Project Manager)
- Mark Schlautman (Clemson University, project technical advisor)
- Mark Phipps (Federal-Mogul Corporation)
- Bob Peters (Akebono Corporation and lead representative of the Brake Manufacturer's Council Product Environmental Committee [BMC/PEC])
- Chris Shepley (Affinia)
- Michael Endicott (Sierra Club)
- Jim Pendergast (U.S. EPA)
- Kelly Moran (TDC Environmental)

Rodger Dabish (TMD Friction) and Tim Merkel (formerly of Federal-Mogul Corporation) were not able to participate in the call.

The following items were discussed:

- **Technical studies status.** Technical studies are generally on schedule for completion as planned. The Steering Committee finalized the charge to reviewers and approved the review plan for the report estimating copper releases from non-brake sources. This report is delayed (as expected), but should be completed soon. The steering committee also discussed at length two proposals for additional expenditures to assess project-related data; neither was sufficiently clear in its benefits for the Steering Committee to make a decision on it.

- **Planning for Stakeholder Conference.** Based on input from BASMAA and the Water Board, Sustainable Conservation substantially modified the draft agenda for the June Stakeholder Conference. The Steering Committee discussed the revised agenda, which needs more work.

- **Planning for June In-Person Meeting.** The Steering Committee reviewed a preliminary agenda for the in-person meeting and discussed the logistics for the pre-meeting tour of the Castro Valley watershed (the BPP’s study watershed).
Anticipated Next Steps

The upcoming Steering Committee meeting schedule is as follows:

- May 19, Thursday, 11 a.m. to 12 noon
- May 25, TBD or May 26, 11:00 a.m. to 12 noon—special teleconference with peer reviewers to discuss brake pad wear debris chemical characterization report
- June 2, 9:00 a.m. to 10:00 a.m.—special teleconference with peer reviewers to discuss non-brake pad copper load estimates report
- June 9, Thursday, 11:00 a.m. to 12:00 noon
- June 20, Castro Valley study watershed visit
- June 21 and 23, in-person meeting in San Francisco
- June 22, Stakeholder Conference, San Francisco
DRAFT AGENDA

1) Teleconference agenda review and anything new? (5 min)

2) BPP Technical Studies Update (20 min)

   a) **Air Deposition Monitoring draft Report (by Don Yee)**
      - Don is following up on items from the technical call on 5/6
      - Final report due May 16, 2005
      - Note: we will need additional discussion regarding meaning of results.

   b) **Chemical Characterization draft Report (by Mark Schlautman)**
      - Comments due Friday, May 6, 2005
      - Technical Call scheduled for Thursday, May 19, 11:00 a.m. to 12 Noon (CA time) to discuss reviewers’ comments
      - Need new time to accommodate reviewers’ schedule. Here are two options: 9 a.m. to 10 a.m. or 10 a.m. to 11 a.m. (on May 19.)
      - Need Steering Committee input – Mark raised an interesting approach to better understand airborne brake pad wear debris samples collected last summer at Link by using fluorescence fingerprints for dissolved organic copper. This technique, if successful, could also be applied to Don Yee’s monitoring samples (see attached email from Mark S.)
      - Methodology for generating representative brake pad wear debris sample Note: this report is overdue! Rodger/Chris/Mark P./Bob -- what is the status?

   c) **Estimating Copper Loading to the Watershed from Vehicle Brake Sources draft Report (by Kirsten Rosselot)**
      - Thanks! for participating in the technical call on April 29 with reviewers; Follow-up items from call and responses to reviewers’ comments sent out
      - Need Steering Committee input – should we consider using Monte Carlo simulation (using Excel with add-on application) to understand uncertainties in Kirsten’s report, which is beyond her scope (see attached Monte Carlo email from Terry Cooke).

   d) **Estimating Copper Loading from Non Brake Sources Final Work Plan (by Kirsten Rosselot)**
      - -- Final Work Plan submitted April 27

   e) **Estimating Copper Loading from Non Brake Sources draft Report (by Kirsten Rosselot)**
      - Report delayed due to data availability -- expected May 7th
      - Draft Charge to Reviewers – needs to be finalized (attached)
      - Draft Review Plan (attached)

3) Agenda for BPP Stakeholder Meeting Wednesday, June 22, at PG&E (20 min)

   ➢ Need Steering Committee input on agenda topics raised by Kelly (see attached BPP Stakeholder input email)
   ➢ Identify critical issues/challenging points of uncertainty

4) Update on Castro Valley Field Trip on Monday, June 20, 2005 (5 min)

   a) Current list of interested people in attending:
- Jim Carleton (arrive Mon. at 11 a.m. at SFO)
- John Sansalone, Arleen Feng, Don Yee, Kelly Moran, Bob Peters
- Mark Schlautman (depending on travel arrangements)
- Michael Endicott, Betty Pun, Terry Cooke (depending on work schedule)
  - Any updates to the list?
  - Any specific requests for the field trip (what do you want to get out of the visit? What would you like to see & learn more about, etc...) - your input will help generate an orientation for folks.

5) Draft Agenda for Steering Committee Meeting June 21 & 23, 2005 (15 min)
   -- draft agenda to follow shortly…

6) Steering Committee Scheduling Calendar July to October 2005 (attached) (5 min)

It’s that time again! Please add your dates/times when you are not available, include the time zone, and send back to me within 3 weeks, by June 2. Thank you!

7) Anything else?
MEMO

For BASMAA Member Agency Internal Use Only

TO: Geoff Brosseau & BPP Representation Work Group  DATE: May 19, 2005
FROM: Kelly D. Moran  PROJECT: 16
SUBJECT: Brake Pad Partnership Conference Call—May 19, 2005

The Brake Pad Partnership (BPP) Steering Committee held a teleconference meeting on May 19th. A copy of the agenda is attached. The following people were on the call:

- Sarah Connick (Sustainable Conservation, Facilitator)
- Connie Liu (Sustainable Conservation, Project Manager)
- Mark Schlautman (Clemson University, project technical advisor)
- Bob Peters (Akebono Corporation and lead representative of the Brake Manufacturer's Council Product Environmental Committee [BMC/PEC])
- Tim Merkel (formerly of Federal-Mogul Corporation)
- Chris Shepley (Affinia)
- Jim Pendergast (U.S. EPA)
- Kelly Moran (TDC Environmental)

Michael Endicott (Sierra Club), Rodger Dabish (TMD Friction), and Mark Phipps (Federal-Mogul Corporation) were not able to participate in the call.

The following items were discussed:

- **Technical studies status.** The report estimating copper releases from non-brake sources should be available for review in the next 1-2 weeks. The Steering Committee again discussed the possibility of doing a Monte Carlo analysis on uncertainty in the data inputs to this report. Such an analysis seems unlikely to be useful, as there are no distributions available for most of the input data. Nevertheless, this topic continues to be raised, reflecting the interest among Steering Committee members in trying to get the best possible handle on the range uncertainty in copper load estimates.

- **Planning for Steering Committee in-person meeting and Stakeholder Conference.** The Steering Committee discussed revised agendas for both meetings, which still need more work. Planning for these meetings includes identification of the major issues with each of the technical studies completed so far, so that these issues can be fully covered at the Stakeholder Conference.

BASMAA members should note that the BPP is currently in the busiest period it has ever experienced. The reason for this high level of activity is that all inputs for the air deposition model need to be completed now to keep the overall project plan on schedule. The next phase of work (which starts this summer) will be more complicated.
scientifically (as we get into the modeling details), but is not anticipated to involve such an intense level of activity.

**Anticipated Next Steps**

The upcoming Steering Committee meeting schedule is as follows:

- May 26, Thursday, 11:00 a.m. to 12 noon
- June 2, Thursday, 9:00 a.m. to 10:00 a.m.—special teleconference with peer reviewers to discuss brake pad wear debris chemical characterization report
- June 9, Thursday, 11:15 a.m. to 12:15 noon—special teleconference with peer reviewers to discuss non-brake pad copper load estimates report
- June 16, Thursday, 11 a.m. to 12 noon
- June 20, Monday, Castro Valley study watershed visit
- June 21 and 23, Tuesday and Thursday, in-person meeting in San Francisco
- June 22, Wednesday, *Stakeholder Conference*, San Francisco

Sustainable Conservation is in the process of scheduling Steering Committee meetings after June 30th.
DRAFT AGENDA

1) Teleconference agenda review and anything new? (5 min)

2) BPP Technical Studies Update (15 min)
   a) Chemical Characterization draft Report (by Mark Schlautman)
      - Technical call with reviewers: scheduled for Thursday, June 2, 9:00 am to 10:00 am CA time
      - Update from Mark. -- review and provide additional info on technique to better understand airborne brake pad wear debris samples collected at Link and discuss if this is worthwhile to pursue
      - Methodology for generating representative brake pad wear debris sample -- Mark, P/Rodger/Chris/Bob/Tim -- what is the status?

   b) Estimating Copper Loading to the Watershed from Vehicle Brake Sources draft Report (by Kirsten Rosselot)
      - Review & discuss possibilities for using Monte Carlo simulation (see attached email from Bob Frosch):
        1. Kirsten (flat top distribution) vs. other modelers (assumed distribution):
           a. If one did Monte Carlo analysis with ‘standard set’, then one would find out the results of this analysis in standard distributional form (which gives some credibility & confidence) 
           b. If no easily accessible ‘standard distributions’, then go to plan 2
        2. Use Monte Carlo simulation to test sensitivity of results to distributional assumptions, by assuming several plausible possibilities for each distribution
           i. Determine next steps

   c) Estimating Copper Loading from Non Brake Sources draft Report (by Kirsten Rosselot)
      - Report delayed due to data availability -- expected soon
      - Technical Reviewer call scheduled for Thursday, June 9, 11:15 am to 12:15 pm (note time change to accommodate SAT) – pending reviewer availability too

3) BPP Stakeholder Conference Agenda, Wednesday, June 22, at PG&E (20 min) -- attached
   - Review agenda -- input on agenda topics and speakers for each session
   - Need input on technical sessions – Review current items listed as critical issues/challenging points of uncertainty and identify other ones
   - Are the session times appropriate?

4) Update on Castro Valley Field Trip on Monday, June 20, 2005 (5 min)
   a) Current list of interested people in attending:
      - Jim Carleton (arrive Mon. at 11 a.m. at SFO)
      - John Sansalone, Arleen Feng, Don Yee, Kelly Moran, Bob Peters
      - Mark Schlautman (depending on travel arrangements)
      - Michael Endicott, Betty Pun, Terry Cooke (depending on work schedule)
        - Any updates to the list?
        - Any specific requests for the field trip (what do you want to get out of the visit? What would you like to see & learn more about, etc…) - your input will help generate an orientation for folks.
5) Draft Agenda for Steering Committee Meeting June 21 & 23, 2005 (20 min)

- Review and discuss agenda topics and time allocated for each session
- Goal for June 21 is to prepare for Stakeholder meeting and end the day by 3 pm!
- Need input on technical sessions – Review current items listed as critical issues/challenging points of uncertainty and identify any other ones
- Any other suggestions?

6) Steering Committee Scheduling Calendar July to October 2005 (5 min)

a) Reminder -- Please send me your scheduling calendar by June 2. Thank you!

b) We may need to schedule Steering Committee Call during week of June 13 to June 17 (see redlined scheduling calendar below)
   - Proposed option: Thursday, June 16, 11 am to 12 Noon (CA time)

7) Anything else?
TO: Geoff Brosseau & BPP Representation Work Group     DATE: May 26, 2005
FROM: Kelly D. Moran                          PROJECT: 16
SUBJECT: Brake Pad Partnership Conference Call—May 26, 2005

The Brake Pad Partnership (BPP) Steering Committee held a teleconference meeting on May 26th. A copy of the agenda is attached. The following people were on the call:

- Sarah Connick (Sustainable Conservation, Facilitator)
- Connie Liu (Sustainable Conservation, Project Manager)
- Bob Peters (Akebono Corporation and lead representative of the Brake Manufacturer's Council Product Environmental Committee [BMC/PEC])
- Tim Merkel (formerly of Federal-Mogul Corporation)
- Chris Shepley (Affinia)
- Michael Endicott (Sierra Club)
- Mark Phipps (Federal-Mogul Corporation)
- Jim Carleton (U.S. EPA)
- Kelly Moran (TDC Environmental)

Mark Schlautman (Clemson University, project technical advisor), Rodger Dabish (TMD Friction) and Jim Pendergast (U.S. EPA) were not able to participate in the call.

The following items were discussed:

- **Technical studies status.** Because Professor Schlautman could not participate in the teleconference, planned discussion of a potential reanalysis of wear debris generation data with sophisticated statistical methods had to be postponed.

- **Copper Development Association (CDA) interactions with BPP team members.** The Copper Development Association has expressed a new interest in the Brake Pad Partnership. The CDA has had contractors contact two BPP team members: U.S. EPA’s watershed modeler and Professor Mark Schautman. U.S. EPA watershed modeler Jim Carleton reported that a contractor made several recent calls to him, asking questions about his watershed modeling workplan (I do not know the name of this contractor). A different contractor (Dr. Kevin Reinert) has contacted Professor Schlautman to let him know that he is developing an inventory of San Francisco Bay Area copper sources for CDA. He asked to “collaborate” in the BPP’s soon to be completed analysis of copper sources in the Bay Area. Professor Schlautman has asked Dr. Reinert for additional information about his work; if that information is forthcoming, I will share it with BASMAA.
Sustainable Conservation reminded the Steering Committee that the CDA has been afforded many opportunities to participate in the BPP’s process—the same as other stakeholders. For the copper sources study, formal opportunities have included submitting comments during the stakeholder review of the draft workplan and a teleconference meeting to discuss Scientific Advisory Team comments on the draft workplan (CDA did neither). While providing input on the soon to be released non-brake copper sources report would be completely appropriate, special collaboration on this report with one stakeholder would involve a delay in the project and a revision of the contractor’s scope and budget. No one wanted to delay the schedule for completing this report, as it is time-critical for the entire project. The Steering Committee decided to continue to proceed with its copper sources inventory report to keep it and the remainder of BPP project on the planned timeline.

- Planning for Steering Committee in-person meeting and Stakeholder Conference.
  The Steering Committee approved revised agendas for both meetings.

**Anticipated Next Steps**

The upcoming Steering Committee meeting schedule is as follows:

- June 2, Thursday, 9:00 a.m. to 10:00 a.m.—special teleconference with peer reviewers to discuss brake pad wear debris chemical characterization report
- June 9, Thursday, 11:15 a.m. to 12:15 noon—special teleconference with peer reviewers to discuss non-brake pad copper load estimates report
- June 16, Thursday, 11 a.m. to 12 noon
- June 20, Monday, Castro Valley study watershed visit
- June 21 and 23, Tuesday and Thursday, in-person meeting in San Francisco
- June 22, Wednesday, **Stakeholder Conference**, San Francisco

Sustainable Conservation is in the process of scheduling Steering Committee meetings after June 30th.
BPP STEERING COMMITTEE TELECONFERENCE
Thursday, May 26, 2005, 11:00 a.m. to 12:00 Noon (Pacific Time)

Dial: 866-393-8073
Meeting Number: *8893164*

DRAFT AGENDA

1) Teleconference agenda review and anything new? (5 min)

2) BPP Technical Studies Update (10 min)

a) Chemical Characterization draft Report (by Mark Schlautman)
   - Reminder! Technical call with reviewers: scheduled for Thursday, June 2, 9:00 am to 10:00 am CA time
   - Update from Mark S. on potential new technique for brake pad wear debris:
     i. Review additional analysis provided on “what if” simulations (attached email from Mark Schlautman)
     ii. Discuss results and what it means and review questions posed by Steering Committee members in previous discussion:
        1. Is this worthwhile to pursue using Link data?
        2. How does this analysis play out for us? What does this mean and how will this make a difference?
   - Methodology for generating representative brake pad wear debris sample – Mark P./Rodger/Chris/Bob/Tim -- what is the status?

b) Estimating Copper Loading from Non Brake Sources draft Report (by Kirsten Rosselot)
   - Reminder! Technical Reviewer call scheduled for Thursday, June 9, 11:15 am to 12:15 pm (note time change to accommodate SAT)

3) Potential collaboration with Copper Development Association (CDA) (10 min)

a) Mark S. – provide background info on potential collaboration with Dr. Kevin Reinert who is currently trying to put together a copper source inventory for the SF Bay area for the CDA. Mark S. has requested Dr. Reinert to send an email describing his project and what information he was seeking, and that his request would be forwarded to the Steering Committee for their review and decision.

BPP Stakeholder Conference Agenda, Wednesday, June 22, at PG&E (20 min)

- Review revised draft agenda (attached)
- **Follow up on action item for Steering Committee**

4) Draft Agenda for Steering Committee Meeting June 21 & 23, 2005 (20 min)

- Review revised draft agenda (attached)
- Review topics and time allocated for each session

5) Steering Committee Scheduling Calendar July to October 2005 (5 min)

a) Reminder -- Please send me your scheduling calendar by June 2. Thank you!

6) Anything else?
The Brake Pad Partnership (BPP) Steering Committee held a teleconference meeting on June 9th. A copy of the agenda is attached. The following people were on the call:

- Sarah Connick (Sustainable Conservation, Facilitator)
- Connie Liu (Sustainable Conservation, Project Manager)
- Mark Schlautman (Clemson University, project technical advisor)
- Bob Peters (Akebono Corporation and lead representative of the Brake Manufacturer's Council Product Environmental Committee [BMC/PEC])
- Michael Endicott (Sierra Club)
- Mark Phipps (Federal-Mogul Corporation)
- Jim Carleton (U.S. EPA)
- Kelly Moran (TDC Environmental)

Rodger Dabish (TMD Friction), Tim Merkel (formerly of Federal-Mogul Corporation), Chris Shepley (Affinia), and Jim Pendergast (U.S. EPA) were not able to participate in the call.

The following items were discussed:

- **Technical studies status.** The Steering Committee continued discussion of a potential reanalysis of wear debris generation data with sophisticated statistical methods. Before any decisions can be made on the overall value of this proposal, additional questions need to be posed to air quality modeler AER.

- **Methodology for generation of representative sample of brake pad wear debris.** The manufacturer representative who was going to write up the methodology is unable to do so. The BMC/PEC plans to contract with Link Engineering to complete the write up of the methodology. This will again create a delay in completing the report, which may not be done before the Stakeholder Conference.

- **Copper Development Association (CDA) interactions with Sustainable Conservation.** Connie & Sarah met with Dr. Kevin Reinert, who is completing an inventory of copper sources for the San Francisco Bay Area. He particularly focused on copper roof runoff estimates and treatment methods for removal of copper from roof runoff (e.g., copper removal by running over concrete). The Steering Committee reaffirmed its view that the CDA is welcome to participate in the review of the non-brake copper...
sources draft report (due out this week), but the BPP will not make any special arrangements for “collaboration” with the CDA on the BPP report.

- **Planning for Steering Committee in-person meeting and Castro Valley field trip.** Sustainable Conservation describes the upcoming meeting as a “marathon” for the Steering Committee. The project demands a high level of activity to stay on schedule and to meet stakeholder expectations.

**Anticipated Next Steps**

The upcoming Steering Committee meeting schedule is as follows:

- June 16, Thursday, 11 a.m. to 12 noon
- June 20, Monday, Castro Valley study watershed visit
- June 21, Tuesday, noon to 1:00 p.m.—special teleconference with peer reviewers to discuss non-brake pad copper load estimates report
- June 21 and 23, Tuesday and Thursday, in-person meeting in San Francisco
- June 22, Wednesday, *Stakeholder Conference*, San Francisco

Sustainable Conservation is in the process of scheduling Steering Committee meetings after June 30th.
BPP STEERING COMMITTEE TELECONFERENCE
Thursday, June 9, 2005, 11:00 a.m. to 12:00 Noon (Pacific Time)

Dial: 866-393-8073
Meeting Number: *8893164*

DRAFT AGENDA

1) Teleconference agenda review and anything new? (5 min)

2) BPP Technical Studies Update (10 min)
   a) Chemical Characterization
      - Mark S. – Update on potential new techniques to better understand airborne brake pad wear debris.
        Review previous Steering Committee questions posed for Mark S.:
        o How does this impact the Air Model? What is the maximum potential change?
        o How sensitive are these (background levels) to the Air Model? What data are you looking at for source?
        o Cost?
        o Explain graphs (discrete and cumulative) of summary figures for what-if calculations
        o Need Steering Committee input: Is this worthwhile to pursue using Link data?
        o How does this analysis play out for us? What does this mean and how will this make a difference?
      - Methodology for generating representative brake pad wear debris sample – Mark P./Rodger/Chris/Bob/Tim -- what is the status?

   b) Estimating Copper Loading from Non Brake Sources draft Report (by Kirsten Rosselot)
      - Update! Technical Reviewer call proposed for Tuesday, June 21, Noon to 1:00 pm during Face to Face Steering Committee Meeting (note: time change to accommodate SAT reviewers)

3) Update on potential collaboration with Copper Development Association (CDA) (10 min)
   a) Connie/Sarah -- update on meeting with Dr. Kevin Reinert who is currently trying to put together a copper source inventory for the SF Bay area for the CDA.

4) BPP Stakeholder Conference Wednesday, June 22, at PG&E (5 min)
   - Update on contractor presentations
   - Any questions/updates to agenda?

5) Draft Agenda for Steering Committee Meeting June 21 & 23, 2005 (20 min)
   - Review revised draft agenda (attached)
Review topics and time allocated for each session due to new item on agenda:
Technical call for Copper Loading from Non Brakes

6) Castro Valley Field Trip (5 min)
  ➢ Update on logistics for those attending and draft itinerary coming soon!
  ➢ Any questions/updates?

7) Steering Committee Scheduling Calendar July to October 2005 (5 min)
  a) Reminder -- Please send me your scheduling calendar as soon as possible! Thank you!

8) Anything else?
The Brake Pad Partnership (BPP) Steering Committee held a teleconference meeting on June 13th. A copy of the agenda is attached. The following people were on the call:

- Sarah Connick (Sustainable Conservation, Facilitator)
- Connie Liu (Sustainable Conservation, Project Manager)
- Tim Merkel (formerly of Federal-Mogul Corporation)
- Chris Shepley (Affinia)
- Mark Phipps (Federal-Mogul Corporation)
- Jim Carleton (U.S. EPA)
- Kelly Moran (TDC Environmental)

Bob Peters (Akebono Corporation and lead representative of the Brake Manufacturer's Council Product Environmental Committee [BMC/PEC]), Rodger Dabish (TMD Friction), Michael Endicott (Sierra Club), Mark Schlautman (Clemson University, project technical advisor), and Jim Pendergast (U.S. EPA) were not able to participate in the call.

The following items were discussed:

- **Technical studies status.** The Estimating Copper Loading from Non Brake Sources Draft Report is now available for review. I expressed concern about the extremely abbreviated review period (comments due on Friday). The Steering Committee continued discussion of a potential reanalysis of wear debris generation data with sophisticated statistical methods.

- **Methodology for generation of representative sample of brake pad wear debris.** The manufacturers updated the Steering Committee on the plan for writing up the methodology. A draft may not be available prior to the Stakeholder Conference.

- **Planning for Steering Committee in-person meeting and Castro Valley field trip.** Final details were reviewed.

**Anticipated Next Steps**

The upcoming Steering Committee meeting schedule is as follows:

- June 20, Monday, Castro Valley study watershed visit
- June 21, Tuesday, noon to 1:00 p.m.—special teleconference with peer reviewers to discuss non-brake pad copper load estimates report
• June 21 and 23, Tuesday and Thursday, in-person meeting in San Francisco
• June 22, Wednesday, Stakeholder Conference, San Francisco

Sustainable Conservation is in the process of scheduling Steering Committee meetings after June 30th.
BPP STEERING COMMITTEE TELECONFERENCE
Monday, June 13, 2005, 12:00 Noon to 1:00 p.m. (Pacific Time)

Dial: 866-393-8073
Meeting Number: *8893164*

DRAFT AGENDA

1) Teleconference agenda review and anything new? (5 min)

2) BPP Technical Studies Update (10 min)
   a) Chemical Characterization
      - Update on Mark S.’s potential new technique to better understand airborne brake pad wear debris (fingerprinting):

Questions posed for Betty:
   1. If particle size distribution slips over 1 to 2 micron, how much will it impact model results?
   2. How many times can Betty run the model once it’s built

   - Methodology for generating representative brake pad wear debris sample – Mark P/Rodger/Chris/Bob/Tim -- what is the outcome of the meeting with Link?

   b) Estimating Copper Loading from Non Brake Sources draft Report (by Kirsten Rosselot) (5 min)
      - Report is now available for review! Due to time constraints, please submit comments as soon as possible, by Friday, June 17
      - Reminder! Technical Review Call – scheduled during Steering Committee Face to Face Meeting at Noon.

3) Castro Valley Field Trip (5 min)
   - Updated draft itinerary & logistics (will soon be available)
   - Questions?

4) Anything else?
The Brake Pad Partnership (BPP) Steering Committee held an in-person meeting on June 20th, 21st, and 23rd and a Stakeholder Conference on June 22nd in San Francisco. A copy of the agenda for the Steering Committee meeting is attached. These notes reflect the key outcomes of the Steering Committee meeting. Since Sustainable Conservation will be preparing a summary of the Stakeholder Conference, it is not discussed below.

The purposes of the Steering Committee meeting were to:

- Review the project schedule and status.
- Prepare for the Stakeholder Conference.
- Review the preliminary draft report describing the methodology for generating representative sample of brake pad wear debris.
- Review and discuss modeling efforts (air, bay, and watershed), and identify challenging areas of uncertainty and develop plan for addressing them.
- Hold the technical review call for the non-brake copper sources draft report.

The following people participated in the Steering Committee meeting:

- Sarah Connick (Sustainable Conservation, Facilitator)
- Connie Liao (Sustainable Conservation, Project Manager)
- Mark Schlautman (Clemson University, project technical advisor) (by telephone)
- Rodger Dabish (TMD Friction and lead representative of the Brake Manufacturer's Council Product Environmental Committee [BMC/PEC])
- Mark Phipps (Federal-Mogul Corporation)
- Bob Peters (Akebono)
- Tim Merkel (formerly of Federal-Mogul Corporation) (by telephone Tuesday)
- Michael Endicott (Sierra Club) (by telephone Thursday)
- Jim Pendergast (U.S. EPA)
- Kelly Moran (TDC Environmental)

Steering Committee members Chris Shepley (Dana Corporation) was unable to attend. Many others participated in part of the meeting including Jim Carleton (U.S. EPA), Richard Looker (Regional Board), Terry Cooke (URS), Betty Pun (AER), Kirsten Rosselot (Process Profiles), and Don Yee (SFEI).
**Castro Valley Watershed Tour**

On June 20, the Steering Committee and most of the project consultants toured the project’s study watershed (Castro Valley). Host Arleen Feng of the Alameda Countywide Clean Water Program arranged an excellent tour that included the creek and air deposition monitoring points and views of various watershed characteristics that will help the team (particularly the out-of-town Steering Committee members) better understand the watershed.

**Action Plan Studies Review/Stakeholder Conference Preparation**

Most of the first meeting day was spent in preparation for the Stakeholder Conference. The main preparation activity was to review with contractors each of the Brake Pad Partnership’s technical studies, identifying any issues to be highlighted to stakeholders and follow-up actions for the Steering Committee. The review afforded the opportunity to check the consistency of results of the various studies and to ensure that modelers are receiving data for their modeling efforts that they understand (i.e., strengths, weaknesses) and that meets their needs.

While the Steering Committee review and Stakeholder Conference discussion identified issues that need to be worked out, it appears that the processes are in place to ensure that all issues will be addressed as the modelers proceed with their work. Most of the reports providing inputs to the three models are complete or near completion. The two outstanding reports are:

- **Loads from Other Copper Sources.** During the meeting, the Steering Committee held a technical review teleconference meeting with the Scientific Advisory Team to discuss the draft report on non-brake copper sources. Due to the abbreviated review period, some of the reviewers had not completed their reviews. The Steering Committee determined that only industrial air emissions data are needed from this report for the air model. Since these data are available from another published source (the U.S. EPA Toxics Release Inventory), this report is not time-critical for the BPP project schedule. This allowed the Steering Committee to extend the review period for the draft report until July 22nd.

- **Written methodology for generation of the representative brake pad wear debris sample.** Although the representative sample of brake pad wear debris was generated last winter, the method for creating the sample has not yet been documented in a written report. This task has been stalled, due to delays on the brake pad manufacturer end. The Steering Committee reviewed and commented on a pre-release draft of this report (which will be released once loose ends are filled and the BMC-PEC approves release). This report will be taken through peer review this summer to ensure that all stakeholders understand the strengths and limitations of the representative sample.

**Schedule.** Sustainable Conservation distributed an updated project timeline, which anticipates completion of the BPP action plan studies by December 2006. A spreadsheet with graphical and table versions of the schedule is attached (note that the graphical timeline is best be viewed on screen or printed in color on legal size paper). Please note that this schedule reflects only the completion of the grant-funded technical studies—it
does not include the final phase of the project that involves decision-making by Partnership members.

**Other items**

- **Next Stakeholder Meeting — Air Deposition Modeling Workshop in October.** The next stakeholder event will be a workshop on the air deposition modeling report. The workshop is planned for October (tentatively October 19).

- **Project Budget.** Armed with the project’s recent accomplishments, Sustainable Conservation’s recent fundraising efforts have been quite successful. They are currently making a major drive to secure funding for the remainder of the project. Funds are still needed to support Sustainable Conservation for Steering Committee coordination, and stakeholder communication. Additional funds may also be required to support project-related costs that extend beyond the grant budget.

**Anticipated Next Steps**

Steering Committee activities will return to a more normal activity level in the coming year. There are three in-person meetings planned, along with approximately monthly teleconference meetings and occasional special technical teleconference meetings. Half-day Stakeholder Workshops are planned around each of the three modeling reports that will be generated between fall 2005 and December 2006.

The upcoming Steering Committee meeting schedule is as follows:

- July 7 (Thursday), noon – 1 p.m.—teleconference meeting
- July 21 (Thursday), 11 a.m. – noon—teleconference meeting
- August 1 (Monday), 11 a.m. – noon—Tentative time for technical teleconference with reviewers of methodology for generation of the representative brake pad wear debris sample
- August 17 (Wednesday), 11 a.m. – noon—teleconference meeting
- September 8 (Thursday), 11 a.m. – noon—teleconference meeting
- September 22 (Thursday), 11 a.m. – noon—Tentative time for technical teleconference with reviewers of air deposition modeling report
- October 18-20 (Tuesday-Thursday)—Tentative dates for next in-person meeting
- October 18 or 20 (TBD)—Tentative date for technical teleconference with reviewers of Bay Modeling workplan
- October 19 (Wednesday)—Tentative date for half-day workshop on air deposition modeling report
BRAKE PAD PARTNERSHIP

Steering Committee Meeting

Tuesday, June 21, 2005  8:30 a.m. to 5:00 p.m.
Thursday, June 23, 2005  8:30 a.m. to 11:00 a.m.

Sustainable Conservation
121 Second Street, Sixth Floor
San Francisco, CA  94105
Phone:  415-977-0380

AGENDA

MEETING OBJECTIVES

- Review the Project Timeline, identify potential risks of project delays, and develop strategies for preventing project delays.
- Prepare for the next day’s Stakeholder Conference; review agenda, fully understand key lessons learned with technical studies and discuss game plan for addressing any outstanding issues.
- Review methodology for generating representative sample of brake pad wear debris report.
- Review and discuss modeling efforts (air, Bay, watershed), and identify challenging areas of uncertainty and develop plan for addressing them.
- Conduct technical review call for source loading estimates from nonbrake sources draft report.

SCHEDULE

Monday, June 20, 2005
12:30 – 4:00 p.m.  Steering Committee tour of Castro Valley Watershed

Tuesday, June 21, 2005
8:00 a.m. Meeting room open, and bagels, coffee, and tea available

8:30 a.m. Meeting Begins:  Partnership Business — Steering Committee Only (15 min)
Announcements of any new developments affecting the partnership

Technical Studies Schedule

- Review product review schedule and technical studies timeline
- Identification of key priority actions for staying on schedule
- Review BPP Prop 13 Budget
8:45 a.m. **Castro Valley Field Trip** (15 min)
- Debrief and discuss highlights or key issues raised from field trip to air deposition monitoring and Castro Valley creek water quality monitoring sites

**Guests invited:** Ashley Boren (Sustainable Conservation); Kirsten Rosselot (Process Profiles) by telephone, Don Yee (SFEI) by telephone, Jim Scanlin (ACPWA) by telephone, Terry Cooke (URS) by telephone, Betty Pun (AER) by telephone, Richard Looker (SFB-RWQCB), Paula Trigueros (SFEP/ABAG)

9:00 a.m. **Stakeholder Conference Preparation – Overview of Objectives** (10-15 min)
The following are objectives we want to cover for the remainder of the day in preparation for the Stakeholder Conference:
- Review agenda
- Provide a re-affirmation of commitment to Project outcomes
- Review, identify, and discuss key lessons learned from technical studies
- Identify and discuss critical issues/challenging points of uncertainty, how it impacts the project and how we are addressing them
- Highlight data that is most contentious and be prepared for discussion sessions
- Other?

9:15 a.m. **Methodology for Generating a Representative Sample of Brake Wear Debris** – **Rodger Dabish** (30 min)
- Review and finalize methodology report
- Identify next steps, if needed

9:45 a.m. **Brake Pad Wear Debris Characterization** – **Mark Schlautman** (30 min)
- Review presentation and provide feedback -- identify and discuss key lessons learned or challenging points of uncertainty from Airborne, Non Airborne, Methodology, Chemical Characterization, Solubility and Leaching Studies and how it impacts the project
- Review and discuss the following topics:
  - High background levels from Airborne wear debris & its impact on its uncertainty
  - Differences in wear debris portioning and its impact on copper loading estimates
  - Solubility and leaching results from Chemical Characterization, what does it mean, and how does it impact

10:15 a.m. **Break** (15 min)

10:30 a.m. **Storm Water Quality Monitoring Results** – **Jim Scanlin, Jim Pendergast, Jim Carleton** (30 min)
- Review presentation and provide feedback -- identify and discuss key lessons learned or challenging points of uncertainty and how it impacts the project
- Discuss the following topics:
Uncertainty regarding sampling collection and how it affects the watershed model

- Need to understand experimental error and discuss uncertainty regarding collection of a representative sample vs. measure of chemistry that is representative of the material collected in the ISCO sampler
- What is the load of copper into the Bay? If we have systematic error in water sampling then we need to correct it before going ahead with watershed modeling.
- Need to understand the results and the issues raised, and determine what it means to us, what we may have to do, and how it impacts our timeline.

11:00 a.m. **Source Loading Estimates by Brake Sources** – Kirsten Rosselot (by telephone) (30 min)

- Review presentation and provide feedback -- identify and discuss key lessons learned or challenging points of uncertainty and how it impacts the project
- Review and discuss the following topics:
  - Amount of wear debris partitioning to the air and ground
  - Tunnel studies rationale and justification for relying heavily on results
  - Replacement time to change brake pads
  - Highlight key assumptions and how if they change, it would affect results.

11:30 a.m. Lunch

12 Noon **Source Loading Estimates from Non Brakes** – Kirsten Rosselot (60 min)

- Technical review call with reviewers

1:00 p.m. **Source Loading Estimates from Non Brakes** – Kirsten Rosselot (30 min)

- Review presentation and provide feedback -- identify and discuss key lessons learned or challenging points of uncertainty and how it impacts the project
- Review and discuss the following topics: [TBD]

1:30 p.m. **Air Deposition Monitoring Results** – Don Yee (by telephone) (30 min)

- Review presentation and provide feedback -- identify and discuss key lessons learned or challenging points of uncertainty and how it impacts the project
- Discuss the following topics:
  - Are we seeing higher levels of copper near the roadway sampler? Is the Redwood difference real? How are these data tied into/used in the modeling efforts? How do we compare and use data at the different sites given design constraints on sampler locations and types?
  - Bulk (Madison & Redwood) vs. wet (CVE & CVCC) sampling
  - Differences in sampling site geometry, both sampler relative to roadways, and site relative to watershed topography.
  - Benzene as a tracer of vehicle traffic (with Betty Pun)

2:00 p.m. **Air, Bay, and Watershed Modeling** – Betty Pun & Terry Cooke (by telephone), Jim Carleton (30 min)
- Review presentation and provide feedback -- identify and discuss key lessons learned or challenging points of uncertainty and how it impacts the project
- Discuss technical studies results and its impact on air, Bay, and watershed model
- Discuss how modelers will use information
- Other?

2:30 p.m. **Break (15 min)**
2:45 p.m. **Steering Committee Preparation for Stakeholder Conference**
4:00 p.m. **Review presentations**
5:00 p.m. **Adjourn**
6:00 p.m. **Steering Committee Dinner at Osha Thai, 149 Second Street**

**Wednesday, June 22, 2005**

8:30 a.m. – 4:45 p.m. **Stakeholder Conference, PG&E Building, San Francisco**

**Thursday, June 23, 2005**

*Guests invited:* Ashley Boren (Sustainable Conservation); Richard Looker (SFB-RWQCB) by telephone

8:00 a.m. Meeting room open, and bagels, coffee, and tea available
8:30 a.m. **Debrief of Stakeholder Conference – Steering Committee**
- Review and discuss highlights and key issues raised
- Identify what areas or issues were unresolved and develop an approach to address them
10:15 a.m. Break
10:30 a.m. **Identify Next Steps in Partnership**
- Inform and discuss Steering Committee members involvement in the next few months and its impact on the Partnership
- Next phase will focus on Modeling Efforts which will result in fewer Steering Committee calls
- Identify key issues for resolution in future calls and meetings
10:30 a.m. **Review of Meeting Accomplishments and Action Items**
11:00 a.m. **Adjourn**