

MINUTES OF THE
THE CITY OF SANTA FE & SANTA FE COUNTY
BUCKMAN DIRECT DIVERSION BOARD MEETING

June 6, 2013

This meeting of the Santa Fe County/City Buckman Direct Diversion Board meeting was called to order by Councilor Chris Calvert, Chair, at approximately 4:10 p.m. in the Santa Fe City Council Chambers, 200 Lincoln Avenue, Santa Fe, New Mexico.

Roll was called and the following members were present:

BDD Board Members Present:

Commissioner Kathy Holian, Chair
Councilor Chris Calvert, Vice Chair
Ms. Consuelo Bokum
Commissioner Miguel Chavez [4:20 arrival]

Member(s) Excused:

Councilor Carmichael Dominguez

Others Present:

Nancy Long, BDD Board Consulting Attorney
Erika Schwender, BDD staff
Stephanie Lopez, Staff Liaison
Pego Guerrerortiz, County Utility Director
Teresa Martinez, County Finance Director
Gary Durrant, BDD Operations Chief
Karen Torres, County Hydrologist
Dale Lyons, Outgoing Water Resource Coordinator
Nick Schiavo, Acting City Public Utility Director

[Exhibit 1: Sign-in Sheet]

3. APPROVAL OF AGENDA

[Exhibit 2: Agenda]

CHAIR HOLIAN: I would just like to say that this is fire season and I have a very important fire safety meeting that I have to go to in my district tonight. So I am going to have to leave around 5:15. So I would like to move the action items to after item 6. Matters from Staff. Are there any other changes?

COUNCILOR CALVERT: Move for approval as amended.

CHAIR HOLIAN: Is there a second?

MEMBER BOKUM: Second.

The motion passed by unanimous [3-0] voice vote. [Commissioner Chavez was not present for this action.]

4. APPROVAL OF CONSENT AGENDA

CHAIR HOLIAN: Would anyone like further discussion of the Consent Agenda items. Member Bokum? You would like to pull item 7?

MEMBER BOKUM: I just want to make a brief comment on it. Really brief.

CHAIR HOLIAN: Any other – well, I will go ahead and pull item 8 because I think it's an important report to have. So there's no motion to approve the Consent Agenda.

5. APPROVAL OF MINUTES: May 2, 2013

CHAIR HOLIAN: Are there any changes?

ERIKA SCHWENDER (Acting Director): Madam Chair, we have no changes.

CHAIR HOLIAN: Any changes from the Board? Is there a motion?

COUNCILOR CALVERT: Move to approve.

MEMBER BOKUM: Second.

CHAIR HOLIAN: I have a motion and a second to approve the minutes from the May 2, 2013 meeting.

The motion passed by unanimous [3-0] voice vote. [Commissioner Chavez was not present for this action.]

6. Matters from Staff

MS. SCHWENDER: Madam Chair, members of the Board, I would like to introduce a new member to the team. The City of Santa Fe has appointed an interim Public Utility Director, Nick Schiavo and I would like to give you a brief introduction to his background and let him maybe answer some questions or introduce himself a little bit too.

Nick's background is a bachelor's in biology from Bowling Green State University. He also is in possession of a masters in civil engineering from UNM, and he's a certified PE in New Mexico as well as in Hawaii. He has a very versatile background ranging from environmental health to project engineering, project managing and he has been active in the private sector as well as in the governmental agencies. Most recently, Nick has been employed by the City of Santa Fe as the acting director for Housing and Community Development as well as the energy specialist. Nick has been deeply involved in the City's energy efficiency and renewable energy projects, as well as the solar facilities that have been developed for the wastewater treatment plant and the BDD.

On a more personal note Nick has been married to Ellie Ortiz, a Santa Fe native since 1996. His wife works for the State of New Mexico in finance. Nick and his wife reside in Santa Fe and he volunteers every year during the tax season through the

community group, New Mexico Tax Aid and provides tax consulting and tax preparation services to the community. And I would really like to welcome him.

CHAIR HOLIAN: Welcome, Nick and congratulations.

NICK SCHIAVO (Acting Public Utility Director): I'm really looking forward to working with the Board and I know that the Board knows that Erika will be moving on to greener pastures and I'm very sad. I've only had a few days to work with her. She's been excellent to work with so one of my first tasks will be assigning an interim director in Erika's place and working to get that job position posted and get someone else on board. And I look forward to working with everyone.

CHAIR HOLIAN: Welcome, Nick.

MR. SCHIAVO: One more thing. I just want to embarrass Dale Lyons quickly. Dale, can you stand up? Dale's been working for the City for what? About six years now, Dale, and Dale is also resigning. And I'd like the record to show that both of them resigned before I officially took over.

CHAIR HOLIAN: Would the Board like to make any comments on these two announcements?

COUNCILOR CALVERT: Well, I thanked Dale yesterday at our PUC, so I won't embarrass him again but he has served us well and very professionally. And Erika, I want to thank you very much for your service to the Buckman Direct Diversion. You've filled several positions and done them quite well and we appreciate all of your time and efforts and wish you well in the future.

CHAIR HOLIAN: Member Bokum.

MEMBER BOKUM: Yes, I'm just sorry to see you both go. It's hard.

CHAIR HOLIAN: Erika, I just want to say from my own personal point of view that I'm really, really sorry to see you go and I just have to say that your presentations to the Board have always been so professional and full of information. It really helped me when I came on board in this position. This is a very complex subject and you've helped me greatly in understanding the details of that complexity. I've really appreciated your being there when I've been chair of this Board too, because I feel like we're getting the complete story. I just want to wish you the best in your new position. I know it's a very important position and I hope we'll still be in contact somehow.

MS. SCHWENDER: Thank you, very much. You're very kind and it was not an easy decision although the career opportunity is fantastic, but I've been with this project since just before we actually took over ownership and started operation. I'm not leaving easily and I would like everyone to know that I will be available for more than just the transition period to provide support and I will make sure everyone has my contact information so we will stay in touch. Thank you very much.

CHAIR HOLIAN: And I just also want to say to Dale, good luck in your new position and I know that we will be in contact and I think that what you're doing is very important for our community. Thank you. Are there any further matters from staff?

MS. SCHWENDER: As a matter of fact, I would like to give you a brief update on the hiring process at the BDD. We have a series of positions in the recruitment process and one position that has actually just recently been posted. The BDD operator position closed on May 10th and the candidates were invited to the work keys testing procedure, which closes on June 14th, and we will be moving forward appropriately afterward.

The AWT operator position was internally posted on June 4th and will therefore be open until June 17th. We anticipate several internal candidates to apply for this position and are looking forward to evaluating their qualifications.

The planner-scheduler position was also posted externally and has closed already. Applications are currently under review with the HR Department and we anticipate receiving a list of eligible candidates next week.

The journeyman industrial electrician position was posted internally and closed. We had an internal candidate from within the BDD apply for this position. We evaluated the qualification of this employee and actually decided to offer the position to this employee and promote him from industrial electrician to journeyman industrial electrician. Currently the paperwork is in HR and we hope to close and finalize this recruitment soon.

The finance manager – exciting news. We received 18 applications for this position and 11 of those 18 applicants were invited to participate in the work keys testing. The testing period closes tomorrow, on Friday, June 7th. We hope to receive the test results back during next week and would like HR to fast forward the review of this recruitment and help us to fill this position as soon as possible.

The safety officer position, which has been open for almost a year now, we actually did make an offer to a candidate. He currently resides in Albuquerque, has a great track record. We had five candidates on the interview panel. We were very pleased for this candidate and hope to have him start work for us in June.

And then we have of course the facility manager position, and I'm not going to say anything about that. Thank you very much.

CHAIR HOLIAN: Thank you, Erika.

12. Request for Approval of Contract with American Alternative for BDD Insurance Policies Including Real Property for the Total Amount not to exceed \$127,504.00 Exclusive of NMGRT

CHAIR HOLIAN: I would like the record to show that Commissioner Chavez is here.

MS. SCHWENDER: Madam Chair, members of the Board, I would like to inform you that under requirements we are reviewing our insurance coverage for the BDD on an annual basis. Our current policy is expiring at the beginning of July. We have contracted with Daniels Insurance and Daniels Insurance has in our interest contacted several insurance companies, nationwide insurance companies, to compare available coverage and policy rates and they have done a fantastic job in actually finding us an insurance provider which would offer a policy with better and greater coverage for less than what we're actually currently paying in our policy, and for details, I would like to refer to George Segura with Daniels Insurance. He would like to give you more detailed information on the research and the actual coverage of the insurance policy.

CHAIR HOLIAN: Thank you, Erika. George.

GEORGE SEGURA: Thank you, Madam Chair, members of the Board, as the agent of record we go out to bid on behalf of the Board every year to secure a most comprehensive and competitive coverage that's available. This current year we are with Travelers'. When we went out to market the renewal figures came in at \$247,000,

compared to their current figures of \$151,000. Now, we secured a fantastic bid from Gladfelter American Alternative for \$127,000. Now, Gladfelter American Alternative currently provides coverage for 150 to 200 water utilities throughout New Mexico. They provide those coverages for 3,900 utilities on a national basis. They've been in business for 20 years. We're very comfortable with them. Their financial rating is excellent and it's our recommendation in meeting with Erika that we place the coverages with American Alternative this coming year.

CHAIR HOLIAN: Thank you. Any questions? Commissioner Chavez.

COMMISSIONER CHAVEZ: Yes. Explain the policy period and how that correlates with either the calendar year or our fiscal year. I'm not sure.

MR. SEGURA: Well, it typically – most public entities have it run concurrently with their fiscal year so it goes from July 1 to July 1.

COMMISSIONER CHAVEZ: Okay. Thank you, Madam Chair.

CHAIR HOLIAN: Councilor Calvert.

COUNCILOR CALVERT: I'd move for approval.

CHAIR HOLIAN: Is there a second?

COMMISSIONER CHAVEZ: Second.

CHAIR HOLIAN: I have a motion and a second for approval of the insurance coverage with American Alternative.

The motion passed by unanimous [4-0] voice vote.

MR. SEGURA: Thank you very much. Appreciate your time.

CHAIR HOLIAN: Good work.

13. Request Approval of Amendment #2 to the Legal Services Agreement with Long, Pound & Komer for One (1) Additional Year in the Amount not to Exceed \$100,000 Exclusive of NMGRT

MS. SCHWENDER: Madam Chair, members of the Board, as you have probably learned before, the Board has secured legal representation coverage through Long, Pound, Komer in the past. We have a current contract and agreement with Long, Pound, Komer in place. That agreement was amended one time last year to renew or to extend this agreement and we would like to ask you to renew this coverage for one additional year in the same amount, for \$100,000.

The coverage provided by Long, Pound, Komer would address legal representation during litigation, preparation of written opinions, presentation at Board meetings and other duties as assigned. However, we do need to be cognizant of should any more deeply involving litigation or legal issue arise we would most likely have to return to the Board and potentially ask for additional funding for a more extended litigation related activity.

CHAIR HOLIAN: Thank you, Erika. Any questions? A motion?

COUNCILOR CALVERT: Move for approval.

CHAIR HOLIAN: I'll second that with pleasure.

The motion passed by unanimous [4-0] voice vote.

CHAIR HOLIAN: The amendment #2 to the legal services agreement with Long, Pound & Komer is extended for one year, and thank you very much, Ms. Long, for your service.

NANCY LONG (BDD Contract Attorney): Thank you.

CHAIR HOLIAN: I feel very confident in your advice.

MS. LONG: Thank you. We very much enjoy representing the Board and appreciate being of service for another year.

14. Request for Approval of Amendment #2 to the Professional Services Agreement with Chavez Security for Security Services for One (1) Additional Year in the Amount not to exceed \$159,900 Exclusive of NMGRT

MS. SCHWENDER: Madam Chair, members of the Board, during the first year of operation we secured security service through Chavez Security for the Buckman Direct Diversion project. The majority of the activities are patrolling of the Buckman pipeline corridor and our facilities, especially down at the river area and the booster stations. During the last two years we have been very fortunate to work out a very productive and good working relationship with Chavez. We feel that especially through continued services through Chavez we would provide detailed and specific security services that are needed for our project in a very remote area at the river.

We also, during the past year compared services from similar organizations and we have found that pricing offered by Chavez Security is more than compatible. We could actually not match that pricing. And I'm pleased to state that Chavez Security has assured us to remain at the same price quote and the same level of services for an additional year, should we choose them. Therefore I would like to ask you to approve an additional year of coverage through this agreement.

CHAIR HOLIAN: Thank you, Erika. Any questions? Commissioner Chavez.

COMMISSIONER CHAVEZ: Madam Chair, before the vote I would just like to state for the record that I am not related to Peso Chavez, to that branch of the Chavez family. So I just wanted to point that out. That's my disclaimer. Thank you.

CHAIR HOLIAN: Any further people not related to Chavez? Yes, Councilor Calvert.

COUNCILOR CALVERT: Move for approval.

CHAIR HOLIAN: Is there a second?

MEMBER BOKUM: Second.

CHAIR HOLIAN: We have a motion and a second.

The motion passed by unanimous [4-0] voice vote.

15. Request for Approval of \$15,000 in BDD Funds to Cost-Share a USGS Watershed Wildfire Risk Analysis of Middle Rio Grande Tributary Watersheds, as Part of the Nature Conservancy's Rio and Forest Water Fund Initiative [Exhibit 3: USGS Material]

DALE LYONS (Water Resource Coordinator): Good evening, Madam Chair. Several months ago the Nature Conservancy approached the City through Councilor Calvert and Commissioner Holian with the BDD Board about funding to address a need to look at the potential for watershed debris flows in the Middle Rio Grande, recognizing that there are a number of stakeholders along the Rio Grande that are impacted by water quality following some of these large fires that have happened in the Jemez Mountains in particular and that those entities like the BDD, like the MRGCD, the Middle Rio Grande Conservancy District, and the Albuquerque-Bernalillo joint water utility have had to curtail their diversion of water because of poor water quality as a result of sediment and ash that has flowed into the Rio Grande from these watersheds that have burned in the Jemez Mountains.

The Nature Conservancy is coordinating a large effort to convene these entities that are interested in maintaining and improving water quality in the Rio Grande to marshal their resources to ultimately treat and protect watersheds in the Jemez Mountains and also in the Middle Rio Grande generally as a way to protect the source of supply. That treatment would primarily consist of forest thinning. This is basically modeled off in part by our own municipal watershed program where the City of Santa Fe has partnered with the Forest Service. The City of Santa Fe has had a long-standing cost-share program with the Forest Service to reduce fuel loads in our municipal watershed as a way to protect our municipal water supply.

And so the concept is to expand this water fund to the entire Middle Rio Grande Basin as a way to protect the Middle Rio Grande water supply. And one of the first steps in this process is to actually prioritize watersheds in the Jemez Mountains and other contributing watersheds to the Middle Rio Grande to get a real good handle on which have the highest potential for debris flow and also fire risk. And so the request actually pertains to a \$15,000 amount that would go to fund, along with other entities, other stakeholders, the USGS study – it's a watershed analysis model that would be focused on tributary watersheds to the Rio Grande. And I want to point out that we have with us tonight Mark Gunn, who is the deputy director for the New Mexico Water Science Center, with the USGS in Albuquerque. And if you had any specific questions about the modeling effort that this money would go in part to pay for, along with other funds from other entities like the Albuquerque-Bernalillo Water Utility Authority, the US Forest Service, BLM, BIA, LANL and Los Alamos County. Mark is here to answer any questions about the actual modeling effort.

CHAIR HOLIAN: Thank you, Dale. Any questions? Commissioner Chavez.

COMMISSIONER CHAVEZ: Well, I don't have any questions – thank you, Madam Chair, but on the modeling, if you could just give us a brief scenario or summary of what that modeling will do and what your objectives are.

MR. LYONS: If you could come up, Mark. Just so everybody knows, what was stated in the two-page write up of the overall initiative is that the model has

been developed by the USGS, would be used to evaluate the most vulnerable high severity watersheds and post-fire flooding. So I'll let Mark speak to the details of the modeling.

CHAIR HOLIAN: Mark.

MARK GUNN: Madam Chair, Commissioners, thank you. It's a pleasure to come and speak to you today. The basis of the model that we're discussing is work that has been done in the state for the past two years dealing with the Las Conchas, White Water Baldy, the Little Bear fires that attract fire?? Up in Raton. The premise behind the model itself is to look at after the fire has occurred to look at the burn severity on the ground and then to take that into consideration with geographic features such as the topography, the steepness of the terrain, the ruggedness of the terrain and other parameters such as soil moisture content, soil moisture capability content, and apply an average rainfall event on that to see what happens. So it's a cause and effect type model.

It was developed in Colorado but it's actually specifically for the western United States and we've done four to date. We've done two last year. We're actually publishing the fourth in about two weeks for the Little Bear fire there in Ruidoso. The model that we're proposing to do is there's three phases to the model. The first phase has been fully funded by the Albuquerque-Bernalillo Water Utility Authority and we do a cost-share with them for the East Mountain area of the Sandias. The second model is going to be for the southwest Jemez, partially being burned right now by the Thompson Ridge fire, so we're too little too late there. The third model that Dale's speaking of is for the southwest Sangre de Cristos and in lieu of waiting for after the fire, we want to give management organizations, both state, federal, local and even the private citizen the ability to look at what is your potential hazard based on fuel loads that they'll discuss and based on other criteria that go into the model.

And so instead of putting the cart in front of the horse we're actually going to put the horse in front of the cart to try to come up with a method to give the management agencies themselves the ability to determine what areas have the highest priority to do management activities. Secondary to that is it also gives these same organizations the ability to plan for the worst case scenario to be able to manage infrastructure, loss of roads, bridges, culverts, streams and utilities and so forth and so on.

The products that come out of the report, there are three maps, basically, that show – one is a hazard based specifically on the burn intensity, showing you what is the probability of having a debris flow. And a debris flow isn't a flood but it isn't a mass movement like a landslide. It's a little bit of both. So it shows you your potential hazard. Second it shows what potential volume you could expect that would come off of this flow based on a specific rainfall event. And then third is the probability – what are your chances of it occurring based on where you're located.

And so what we're – the short-term goal is to provide this as a methodology to allow, again, management agencies to look at, I guess pre-treatment prior to a fire because eventually, everything is going to burn at some point in time. Hopefully, it doesn't but odds are that it will. And then second is we would like to take this in the future and incorporate it into an online methodology that you as an organization would use free or charge to be able to look at what is my risk based on any criteria that you set. And we already have the mechanism for that as part of the US Geological Survey's data system. We just haven't incorporated the model into that yet.

CHAIR HOLIAN: Thank you. Any questions?

COMMISSIONER CHAVEZ: Madam Chair, that was helpful. I know that the state legislature has done some – there's been some discussion about this at the state legislature – at the legislative level, and there's been – there's one member of the audience who has approached us with concerns about this but on the other side of that, if there were something to happen to our, let's say Buckman Direct Diversion, what is the funding mechanism to replace or to retrofit that facility in the event that it was damaged to the extent that it was no longer able to produce water for us. We invested so much in these systems, delivery systems, and so I know what's on the other side of the equation.

MR. GUNN: It is, and I can't answer that exactly, but I will say that between the Army Corps of Engineers and FEMA, on the federal side, which is what I'm most familiar with, they have the assets and the capabilities to rapidly deploy to be able to if not mitigate, alleviate some of the damage. And long term, there would be funding, I would assume, that would allow for the rebuilding if necessary. What the model does, and this is the – I don't want to say apocalyptic, but it's the worst-case scenario model is what we're doing. We're going to run the model over several different burn intensities. We're actually modeling it in conjunction with the Bureau of Land Management, the Park Service and the US Forest Service. So we're going to model the burn intensity based on different fuel moisture contents and different climatic conditions. And they are also going to apply different rainfall events.

And one of the issues that we have here is obviously during the issue that we have is the fire season occurs immediately before the monsoon season, which the monsoons are these nice, uniform rains that you get in other parts of the country. You have high intensity, short duration, really sharp events and that's – we're also trying to model that as well. And again, that would be the worst-case scenario type.

COMMISSIONER CHAVEZ: I think that's probably not a bad approach because that's where we're going to see obviously the most damage on all levels and then incur more cost in trying to compensate or adjust for that event, whether it's one or a series of events as we've experienced in the past.

MR. GUNN: Correct.

COMMISSIONER CHAVEZ: So I just wanted to ask those questions and hope that we're assuming – but in the worst-case scenario we better be ready and we better have a plan so that we can take action, because if we don't – we just need to be ready for that I think. Thank you, Madam Chair.

CHAIR HOLIAN: Thank you. Any further questions, comments? I'll just say that I think this is an incredibly important initiative and I think what's positive about it too is that you're making recommendations about how to try to avoid the worst-case scenario. Correct?

MR. GUNN: Yes, ma'am. Yes. Well, and it's not so much a recommendation as it just the potential what-if. And again, we're as USGS, we're a science agency; we don't manage. But we can provide that data to you as a management organization who can then go and implement it. But yes, that's effectively what we're trying to accomplish is to give you information upfront and say this is what you could do instead of well, this is what you should have done.

CHAIR HOLIAN: And we know that the forests have really changed considerably over the last hundred years and they're not in a natural state at this point.

And so if we have a burn in the forest they're explosive, rather than the low-intensity burns that we had in the past.

MR. GUNN: And coupled with drought, that only exacerbates the problem.

CHAIR HOLIAN: Yes, indeed. Is there a motion?

COUNCILOR CALVERT: Yes, I move for approval.

COMMISSIONER CHAVEZ: Second.

CHAIR HOLIAN: Okay. I have a motion and a second.

The motion passed by unanimous [4-0] voice vote.

CONSENT AGENDA

7. Update and Discussion of BDD Operations

GARY DURRANT (Chief Operator): Madam Chair, members of the Board, thanks for this opportunity to be able to update this. In the last month's Board meeting there was a request from the Board to give more specific information, especially concerning the water rights and usages of the water rights of our members at the BDD. What I just handed out is three pages worth of information. [Exhibit 4] The first two came in the packet, and just starting on the monthly divisions under SP-2847, just kind of walk you quickly through what it shows here. It shows on the top, the BDD diversion of San Juan/Chama water and you can see that the total San Juan/Chama water is listed there as 661.33, and that's what arrived at the BDD, and that is what we diverted. That hasn't always been the case; there has been some water go by on occasion. Right now we're able to divert all of that water.

Come down to the next section, the total BDD water diverted from all water rights, the current total you can see is the 750.8 and then you see the 661 from above, which is the SJC. When you subtract the total SJC from the total diversion, then it gives you the number of native water rights and all of those were diverted under the County's native water rights. You can see we've got places there for the County on SJC and in the future for the SJC from Las Campanas, which has been – they're working on that lease from the Jicarilla. So we'll be filling those in as they come out also.

The bottom is just showing the actual metered diversions. The OSE requires us to show the actual totalizers and the total there and you can see that the total diverted 750 down at the bottom matches up and it gives us a cross check on what we're doing that way.

If you go to the next page, the Buckman Direct Diversion monthly SJC and native, please go to the row listed as April and you can see on this page some of the same number carried over on to this page. This gives us a nice table that shows us year-to-date. You can see the 680.73 which was the – actually didn't come from the previous page but the 661.33 did and you can see that carried across. So that was the total SJC in the third column. The fourth column is the total for that water right. Then you see the native in the next column over, the release in Elephant Butte, we've got a zero there, the total surface diversion, which refers back to the 750.8 on the previous page, and then I didn't mention the SJC offset. If we do have water go by that we aren't able to take we're allowed to

take a certain amount of credit for that and credit it back to the wellfield as an offset for the wellfield use.

A couple of quick comments about the first three numbers here. If you look at the third page, which I handed you, with a few numbers on it, the column to the immediate left, it says total SJC release. If you look at it you'll see a different number, the 680.73 – that's what shows up in the total of the first column of that second page also. I've got the box around the numbers for the month specifically of April. So it's the water that was released during April which the OSE wants us to report for them.

Come to the next column over that says One day offset delay, we use that to calculate the conveyance loss. First, if you look at that you'll see the little arrows going down across, and you'll see it goes from a day in advance, like the 31st of March, and then I point the arrow over to the 1st of April over to the next column at the edge. And what happens there is we have the water that we order from Abiqui Reservoir. The transport time to get that water down to the BDD diversion is one day. So what I order and when I make a change it takes one day for that to take effect and that's what you see the arrows pointing to is when that effect actually happens.

And so the 667 total at the bottom, which doesn't show up anywhere else is what we total up which was released for use during the month of April, but it actually includes the first day or the last day of the previous month. And it doesn't include the last day of the current month. And the total losses are calculated, the conveyance losses are calculated based on what was released for the month and then what actually came in during the month is the total that you've seen several times now, the SJC diverted, actually diverted, the 661.

It took me a few minutes to put this together to try to explain this in a really simple as I could manner because it's not very simple some times, but this is what the OSE requires, and these forms, the first two pages that we talked through are actually the forms that are sent in as part of the report to the Office of the State Engineer on a monthly basis.

CHAIR HOLIAN: Thank you, Gary. You did an excellent job of explaining it. And I wanted to thank you for including that more detailed information. Any questions? Member Bokum.

MEMBER BOKUM: I'm going to begin by thanking you and everybody else for providing all the additional information. I think we're all getting a lot of questions about what's going to happen, what's happening and I think it's really important to have information like this. I think this ties in with our wanting a public education person and I think there are – I think over the next year it's going to be really important that we work on getting the information in the form that helps people understand what's going on and what the decisions are, and this is a great first step. But I do want to stress that I think we've a lot more to do.

The City just did a water report which I recommend everybody look at. I think we need to move in that direction and our website needs to be updated. We need to take into account the questions that are being asked of us and all the questions that we need to ask of ourselves in managing water at a time when supplies are dwindling. We're not in a crisis but I think the sooner we start on this road of really getting all the information together and figuring out what it's telling us and asking the questions that we need to ask the better off we'll be. Thank you very much for doing this.

COMMISSIONER MAYFIELD: Thank you. Any other questions, comments?

COUNCILOR CALVERT: Move for approval.

CHAIR HOLIAN: I'll second it.

The motion passed by unanimous [4-0] voice vote.

8. Drought, Monsoon and Water Resource Management Update

RICK CARPENTER (Water Resources & Conservation Group Manager): Good afternoon, Madam Chair, members of the Board. There's a short, two-page memo in your packet and a drought map. I'm happy to summarize that or if you have specific questions I'll be happy to stand for questions, m.

CHAIR HOLIAN: Would the Board members like a summary. Perhaps it would be good to go ahead and put it on the record.

MR. CARPENTER: Thank you, Madam Chair. The memo starts out with sort of a general statement that we're all very well aware of at this point, that we're in the third year of very severe drought, record heat. The memo goes into various basins – Rio Grande, San Juan Basin and our own local basin. They're all pretty much the same. There is very little run off. The snowpack is all but gone and the reservoirs in the upper canyon as well as up and down the Rio Grande are at record lows. One significant difference between this drought and previous years is we don't have any carryover storage going into next year and some of the longer range models are suggesting that not only our monsoon season looking not very good but our winter snowpack for next year may not be very good either. So if you combine that with no carryover storage and next year is looking as bleak or more bleak than this year.

With regard to the Buckman Direct Diversion that will manifest this year, probably beginning in July and through September with extremely low flows, both native and San Juan/Chama in the Rio Grande that could have implications for the Buckman Direct Diversion in terms of low flow curtailments. And with that, Madam Chair, I would stand for questions.

CHAIR HOLIAN: I do have a couple of questions. What is the flow at the Otowi Gauge now?

MR. CARPENTER: I didn't check it today, but I think it's – well, we had a thunderstorm last night so it may have been up today. Over 1,000?

MS. SCHWENDER: Currently, the flow at Otowi is about 1,100, plus/minus, and the majority of that flow is really originating at SJC. The flows at Embudo, which mostly measures the native flow coming out of the northern regions of the Rio Grande are currently around 250.

CHAIR HOLIAN: Does that mean that the native Rio Grande water rights are being curtailed?

COUNCILOR CALVERT: Which one of you wants to take that one?

MR. CARPENTER: No. The native rights are still intact. In fact we've been talking amongst City staff and County staff about using the native rights that are available now before they're curtailed and then switching over the San Juan/Chama water, stretching that out as far as we can.

CHAIR HOLIAN: So is there a change of curtailment this summer?

MR. CARPENTER: Madam Chair, there is a chance. We've had a series of meetings with the federal modelers, hydrologists and climatologists. The latest model that we've seen shows that July through September at the Otowi Gauge flows are right around 350 cubic feet per second. It goes up and down of course, but that's right around where they're projecting, so that is quite low. We start having curtailment issues below 300 cfs. So we'll have to see but it's going to be dicey through those tough months.

COUNCILOR CALVERT: On that point.

CHAIR HOLIAN: Yes, Councilor Calvert.

COUNCILOR CALVERT: And Rick, there's other circumstances that will impact that as well, right? As determined by other San Juan/Chama users, whether they put a call for their water or not as well. Is that right?

MR. CARPENTER: That's correct, Councilor Calvert. The way it's looking now is MRGCD has been releasing water but they're set to run out very soon, perhaps in a couple of weeks. When that happens the carriage losses are so great that Albuquerque-Bernalillo Water Authority will probably cease calling for water as well. They just don't want to incur those losses. They have the option to switch to groundwater at that point. At that point we're pretty much reliant upon whatever native flows are in the river. That could impact the BDD. We may or may not be able to call for water at that point. That said, there is in the works the option that the Bureau of Reclamation is discussing with Albuquerque to lease and then release up to maybe 40,000 acre-feet of their water, and then release that through those tough months, keep the river wet, and then that would help everybody else who might want to call for water and divert it.

COUNCILOR CALVERT: Okay. Thank you.

CHAIR HOLIAN: Thank you, Rick. Member Bokum.

MEMBER BOKUM: I just want to thank you too and I hope we'll continue to get these reports every month because they're so important.

MR. CARPENTER: Member Bokum, we do this for the Public Utility Committee and the Water Conservation Committee and we're happy to bring this to the Board as well every month as well.

MEMBER BOKUM: Thank you.

COMMISSIONER CHAVEZ: Well and Madam Chair, Rick, to Conci, to your comments earlier about public education, I think this needs to be front and center of that public education campaign and I'm sure that this would be also posted on our webpage, right?

MR. CARPENTER: This memo is not posted on the webpage but it certainly can be, but portions of this memo are embedded in a new website that the City's Conservation Office just launched last Sunday that is very aggressive with regard to the drought, the stages of the drought, and the implications that it has for our water supply portfolio.

COMMISSIONER CHAVEZ: Because the map, the visual for me is very telling, with the chart next to it. So I think that visual with the information I think would have – I would hope would have a significant impact to the public that would be interested and concerned on this issue.

2013 JUN 06 09:58 AM

MR. CARPENTER: Commissioner Chavez, I may have misspoken. I don't know, Erika, if you post the packet on line or not. If you do, then, yes, this memo and the map would be on line.

MS. SCHWENDER: Madam Chair and members of the Board, yes we post the complete Board packet on our website and they are currently posted, I would say routinely in Friday prior to the Board meeting and they remain on the website.

CHAIR HOLIAN: Since I pulled this agenda item I will move for approval.

COMMISSIONER CHAVEZ: Second.

The motion passed by unanimous [4-0] voice vote.

INFORMATIONAL ITEMS

9. Update on the BDD Booster Station 2-A Solar Project

COUNCILOR CALVERT: Your swan song?

MR. LYONS: Madam Chair, with the lack of water at least the sun is still shining. So we have completed our procurements. Our contractor is hired – Bradbury Stamm and Positive Energy for the Buckman Direct Diversion solar project, and they are busily working with PNM to get through the interconnection process. We have also – we are almost through contract execution with the construction manager for the project, Smith Engineering, so that should be finalized any day, and the developer, Bradbury Stamm, in partnership with Positive Energy has submitted their interconnection application for the two megawatts, because there are two meters at the site, and we have enough grant funding to actually build two megawatts. So those interconnection applications have been received by PNM and have made it through their initial phase of review. We're just expecting any day now to get confirmation that PNM will send them into the second phase of review which we expected all along.

The developer is responsible for paying the interconnection application fee at that point which will be about \$8,000. But in the meantime – well, that secondary review, supplementary review they call it within PNM where they basically run the traps on the proposed solar system to determine whether their electrical grid can handle the input of an additional power source at that location. We don't expect any problems with that. WE are located just across the street from the substation and even if there were some modest upgrades required for their grid to accommodate the solar system we actually have several hundred thousand dollars in grant funding that we could apply to that if need be.

The supplementary review for the interconnection application will probably take between two and four months before PNM grants their authorization to proceed and in that intervening period between now and when PNM is done the solar developer is working with the Bureau of Land Management to finalize the right of way. There are only basically two things outstanding that the developer is working on providing to the BLM and that is the SWPP Plan, the Stormwater Pollution Prevention Plan as well as some supplementary information to the plan of development.

So that certainly isn't going to be the bottleneck. We expect BLM to issue their authorization to proceed probably within the next month. The holdup – it's not a holdup; it certainly was well anticipated, is PNM's review process, which is required for every

net metered system that is interconnected with PNM. Rick Carpenter is taking over as project manager for this project and so probably within the next few weeks he's going to convene the contractor, the construction manager, the BLM, to make sure he's aware of exactly where things stand and we will be able to provide – or he will be able to provide another project update relatively shortly.

CHAIR HOLIAN: Thank you, Dale. Any questions, comments?

COMMISSIONER CHAVEZ: Let me see. So the dollar amount will not be changing, right? The scope of services is the same so the dollar amount is still what was discussed earlier?

MR. LYONS: That's correct. The developer's scope of work is unchanged.

COMMISSIONER CHAVEZ: That's the only question I had. Thank you, Madam Chair.

CHAIR HOLIAN: Councilor Calvert.

COUNCILOR CALVERT: Thank you. So, Dale, thank you very much for your work on this and what started out as a project for one megawatt turned into a project that now will deliver two megawatts, which will bring the total for the Buckman Direct Diversion to three megawatts. Correct?

MR. LYONS: That's right. And Nick and I within the last few weeks we were talking about how much of the total energy consumption or energy demand for the City will be offset by renewable power. And once this two megawatts is built, if you can attribute this project to a portion of the City's demand, a full quarter of the City's energy demand will be offset by renewable power after this is done. And the other thing I just wanted to mention was that the EPA's drinking water state revolving loan fund program is still – they have a green project to preserve, so they're interested in seeing future projects. They're able to mate energy efficiency and renewable energy with drinking water facilities. And there's a clean water program actually for wastewater too.

But just like this project, which received 50 percent grant money, that program continues their funding. Financing continues. So if the BDD is interested in doing even more solar perhaps even closer to the river at Booster Station 1A, or perhaps even routing some of the power that's being produced at 2A down to 1A, I think the EPA would probably be really interested in seeing a proposal from BDD in the future for financing.

COUNCILOR CALVERT: Good. Thank you very much. Appreciate all your work on this.

CHAIR HOLIAN: I appreciate your work too, Dale. So the BDD could perhaps do more? How much would it be to offset all of the BDD? Have you done a back of the envelope calculation?

MR. LYONS: I haven't, because I don't recall if I knew at one point what the total energy demand – in fact Gary Durrant would probably know if he was still here.

???does gary speak from the audience?

MR. LYONS: Right. The City's water utility's energy budget is about \$1.5, \$1.6 million per year. So it just illustrations how big the BDD is and how much power demand it has.

CHAIR HOLIAN: Well, thank you, Dale. This is really a positive thing on our agenda and hopefully we can go forward and have more positive energy.

10. Update on the Proposed Water Storage Agreement between the City of Santa Fe and the Club at Las Campanas

MR. CARPENTER: Madam Chair, members of the Board, this item came before the City's Public Utility Committee last night in executive session and it will be and it was recommended for approval so it will be moving through the committee and the City Council process. So I can't really discuss the specific details of the terms of it. But in general, Las Campanas has entered into a lease agreement with the Jicarilla Apache Nation for 600 acre-feet of San Juan/Chama water. And subsequent to that they approached the City with a proposed agreement to use, temporarily use some of the City's storage that it has leased in Abiqui Reservoir when the City's not using it. So that agreement was brought forward and as I said it will be moving through the process and we'll report back when it has been approved, assuming it will be. At that time we'll be able to talk in more detail about the terms of the agreement.

CHAIR HOLIAN: Thank you. Any questions?

11. Update on the Proposed Amendment #4 to the Project Management and Fiscal Services Agreement (PFMSA) Increasing the Monetary Authority for Project Manager Approval of Contracts from \$50,000 Plus Gross Receipts Tax To \$60,000 Plus Gross Receipts Tax to be Presented for Approval at a Subsequent Meeting

MS. LONG: Thank you, Madam Chair and members of the Board. We'd originally planned to bring this proposed amendment to you today but have delayed doing so and the reason is we want to be consistent with the City procurement policies. This proposed amendment would increase the project manager for Buckman is the City. The City is currently rewriting some of its purchasing policies and during this recent legislative session there were a number of changes to procurement rules but one of the changes was to increase the small purchase amount from \$50,000 to \$60,000. And our project manager authority has always been consistent with that small purchase amount.

So we are just alerting you that we will bring forward a proposed amendment. This will be our fourth amendment to our project management fiscal services agreement between the Board and the City proposing to increase that project manager authority, really administrative authority from \$50,000 to \$60,000. But we're working concurrently with the City so that the procurement officer for the City doesn't have two sets of rules that they're trying to implement, one for the Board and one for the City. So we expect that to be coming to you within the next month or two.

CHAIR HOLIAN: Thank you. Questions, comments? At this point we are on to Matters from the public. I am going to leave at this time. I have a very important fire safety meeting that I have to attend in my district. The two big issues – fire and water right now. So I will turn this over to Vice Chair Calvert.

COUNCILOR CALVERT: Thank you. Good luck with your meeting.

MATTERS FROM THE PUBLIC

COUNCILOR CALVERT: We're at that point in the agenda for Matters from the Public. Is there anybody in the audience wishing to address the Board? Please come forward.

MICHAEL AUNE: Thank you, Mr. Chair, Board members. I'm Michael Aune. I just want to reiterate a couple things about what was just talked about. I provided the state legislation that passed to the gentleman who presented to you the information relative to the Nature Conservancy and the USGS. I think that is the kind of pro-active, best management practices that we've been talking about for over a year now, especially after the Las Conchas fire. That's when I first came to you I think was in the fall after the Las Conchas fire and those severe floods.

The second leg of the stool that we're sitting on – it's a three-legged stool. One is the fires that could potentially damage our watersheds, including the Santa Fe River Watershed. The second leg is the San Juan/Chama project. The third leg are all the wellfields. That's, I know, an oversimplification. But I very much appreciate Rick Carpenter's comments being very truthful. He spoke the truth to you. And I've been coming to these meetings for a long time and I'm very thankful that it's finally on the public record. You've heard it from me a number of times. We've talked privately several of us. So I appreciate very much that it's on the public record and he's addressing one of the legs of that stool, the risk to the San Juan/Chama project water and the Rio Grande water.

The photographs that I've give you tonight which you have, more recent ones – I've been giving them to you on a regular basis – validate Rick Carpenter's comments to you. It's visual evidence, it's proof that what he's saying is correct. Two things that I wanted to do quickly: March 15, 2013 the New Mexico State Legislature sent a letter to each of our five congressional representatives in Washington, DC. I'm just going to read one sentence out of one of them. This is the March 15th letter. It is the view of the New Mexico Legislature that the loss of vegetation, soil and water due to catastrophic wildfires on federal lands constitutes a menace to the economic welfare of the state of New Mexico.

If the northeast winds came and the Pecos Canyon fire came across into the Santa Fe River Watershed I think you all understand the situation we would have with McClure Reservoir, Nichols Reservoir and possible contamination and how many years it might take to restore water from that particular leg of the three-legged stool.

On April 10th, relative to HJM 24, the other one was on HM 65, a second letter went from the New Mexico State Legislature. This one was approved by everybody in the State Senate and thee State House of Representatives. It went to each of our five members of our US congressional delegation. It is a concern of the New Mexico Legislature that because of recent catastrophic wildfires on public lands that resulted in significant damage to watersheds, including Bandelier, Cochiti Canyon and Santa Clara Canyon the San Juan/Chama project watersheds in southern Colorado are at major risk of similar damage. It is the desire of the New Mexico Legislature that pro-active, best management practices be initiated prior to any potential wildfire and flooding in the headwaters region for the San Juan/Chama project. That's the second leg. That's

consistent with some of the other work that's being done by other people. And this again went to our US congressional delegation.

You have the information that the Rio Grande waters – there's no snowpack. The San Juan/Chama project, the photographs I showed you, the storage and Heron Lake and at El Vado Lake, they're nearly empty and I've been observing also, taking it by myself to start measuring what's going on at the Army Corps of Engineers Reservoir, Abiqui Reservoir, and since early April to the present, that reservoir is also down by five feet and it could be because of the severe winds and the low humidity that's adding to the evapo-transpiration and our water's just disappearing.

So two of our legs are potentially cut off of the stool that we're sitting on, the San Juan/Chama water and a risk of damage from the fires and reduced flows in the Santa Fe River and other watersheds. That leaves us the wellfields, and I would like to see some other information at a future meeting, and I request you and Rick Carpenter and whoever else is involved – the County Hydrologist perhaps, Karen Torres, to provide us information at a public meeting of the exact status of all of our wells, how close we are to being recharged. I know the Buckman wellfield is being "rested". We really need to know. The public needs to know if we're going to be balancing on just one leg on that stool, or if we have some other support mechanisms.

I thank you very much. I want to thank you for the work that you've done and your respectful and cordial manner in which we've interacted. I appreciate that very much and I wish you well in your future endeavors. Thank you all very much.

COUNCILOR CALVERT: Thank you. Anybody else to address the Board?

GAIL GILES: My name is Gail Giles and I'm a citizen here of Santa Fe and I have also witnessed the work that Michael Aune has been doing really over many, many years, over a year now, but strictly seeing it when it was published in the paper in October and when we came to you last fall and her testimony from Michael of what was going on. I did want to read that I notice from the Buckman BDD – from February 25th, where it says our region is still suffering from a severe drought, and I'll skip down to the third paragraph. However, the City of Santa Fe has invested in a robust and diverse portfolio of four distinct water supply sources: Buckman wellfield, City wellfield, Canyon Road water treatment plant on the upper Santa Fe River, and the Buckman Direct Diversion on the Rio Grande. The City also has several years worth of San Juan/Chama project water stored in reservoirs.

We're finding that is not the case, so I'm happy to hear that finally the testimony and all the hard work Michael Aune is coming to bear, that this is the truth and we have to look at it in an adult manner. We need to know what's going on with our water so we can make pro-active choices and move on from there as responsible citizens and responsible legislators. Thank you.

COUNCILOR CALVERT: Thank you. Anybody else wishing to address the Board? Okay. Thank you very much.

MATTERS FROM THE BOARD

None were presented.

NEXT MEETING: Thursday, July 11, 2013 @4:00 P.M.

ADJOURNMENT

Having completed the agenda Vice Chair Calvert declared this meeting adjourned at approximately 5:15 p.m.

Approved by:

Kathy Holian
Kathy Holian, Board Chair

Respectfully submitted:

Karen Farrell
Karen Farrell, Wordswork

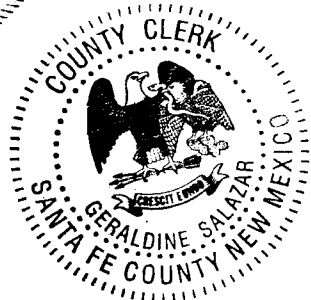
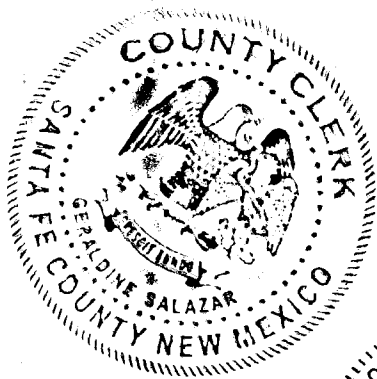
FILED BY:

Geraldine Salazar
GERALDINE SALAZAR
SANTA FE COUNTY CLERK

ATTEST TO:

N/A
YOLANDA VIGIL
SANTA FE CITY CLERK

8/9/2013



COUNTY OF SANTA FE)
STATE OF NEW MEXICO) ss

BUCKMAN DIRECT DIV MIN
PAGES: 31

I Hereby Certify That This Instrument Was Filed for
Record On The 9TH Day Of August, 2013 at 01:13:06 PM
And Was Duly Recorded as Instrument # 1714606
Of The Records Of Santa Fe County

Deputy *Marcello*)
Witness My Hand And Seal Of Office
Geraldine Salazar
County Clerk, Santa Fe, NM

REC'D CLERK RECORDED 8/9/2013 11:22:00 AM



CITY CLERK'S OFFICE

DATE 5/29/13 TIME 2:45pm

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AGENDA

**The City of Santa Fe
And
Santa Fe County**

Buckman Direct Diversion Board Meeting

**THURSDAY, JUNE 6 2013
4:00 PM
CITY HALL
CITY COUNCIL CHAMBERS
200 Lincoln**

1. CALL TO ORDER
2. ROLL CALL
3. APPROVAL OF AGENDA
4. APPROVAL OF CONSENT AGENDA
5. APPROVAL OF MINUTES FROM THE MAY 2, 2013 BUCKMAN DIRECT DIVERSION BOARD MEETING
6. MATTERS FROM STAFF

CONSENT AGENDA

7. Update and discussion of BDD operations. (Gary Durrant)
8. Drought, Monsoon and Water Resource Management Update. (Rick Carpenter)

INFORMATIONAL ITEMS

9. Update on the BDD Booster Station 2A Solar Project. (Dale Lyons)
10. Update on the proposed Water Storage Agreement between the City of Santa Fe and The Club at Las Campanas. (Marcos Martinez and Rick Carpenter)

VERBAL UPDATE

11. Update on proposed Amendment No. 4 to the Project Management and Fiscal Services Agreement (PMFSA) increasing the monetary authority for Project Manager approval of contracts from \$50,000 plus gross receipts tax to \$60,000 plus gross receipts tax to be presented for approval at a subsequent meeting. (Nancy Long) **VERBAL UPDATE**

DISCUSSION AND ACTION ITEMS

12. Request for approval of contract with American Alternative for BDD insurance policies including Real Property for the total amount not to exceed \$127,504.00 exclusive of NMGRT. (Erika Schwender and George Segura)
13. Request for approval of Amendment No. 2 to the Legal Services Agreement with Long Pound Komer for one (1) additional year in the amount not to exceed \$100,000.00 exclusive of NMGRT. (Erika Schwender)
14. Request for approval of Amendment No. 2 to the Professional Services Agreement with Chavez Security for security services for one (1) additional year in the amount not to exceed \$159,900.00 exclusive of NMGRT. (Erika Schwender)
15. Request for approval of \$15,000 in BDD funds to cost-share a USGS watershed wildfire risk analysis of Middle Rio Grande tributary watersheds, as part of the Nature Conservancy's Rio and Forest Water Fund initiative. (Dale Lyons)

MATTERS FROM THE PUBLIC

MATTERS FROM THE BOARD

NEXT MEETING: Thursday, July 11, 2013

ADJOURN

PERSONS WITH DISABILITIES IN NEED OF ACCOMODATIONS, CONTACT THE CITY CLERK'S OFFICE AT 505-955-6520, FIVE (5) WORKING DAYS PRIOR TO THE MEETING DATE.

2013/07/11 09:58:00 AM

BUCKMAN DIRECT DIVERSION BOARD MEETING

SIGN IN SHEET

June 6, 2013

NAME (Please print)

ORGANIZATION

Gary Durrant

BDD

~~Paula Higgins~~
Gloria Hadden~~Paula Higgins~~
Glatfelter Public Practice

JAY HORANY

CHAVEZ SECURITY INC

PAUL KAPAS

CDM SMITH

CLAUDIA CARLSEN

LC Water + Sewer Coop

Shannon Jones

BDD

Danny Carter

BDD

Liz Siskhaug

Club Las Campanas

Charlie Nylund

Club at Las Campanas

PAUL GILES

citizen SF.

Mark Silbert

Club at Las Campanas

Wendell T. Egelhoff

The Club at Las Campanas

Rick Albarri

CANL

CAROL RODRIGUEZ

DOE

Nick Schiavo

Co SF

MARK GUNN

USGS

Dale Lyons

City of Santa Fe

MICHAEL AUNE

RECORDED & INDEXED

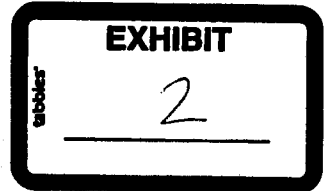


CITY CLERK'S OFFICE

DATE 5/29/13 TIME 2:45

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AGENDA

**The City of Santa Fe
And
Santa Fe County**

Buckman Direct Diversion Board Meeting

**THURSDAY, JUNE 6 2013
4:00 PM
CITY HALL
CITY COUNCIL CHAMBERS
200 Lincoln**

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2013/06/06 09:09:20 AM

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MATTERS FROM THE PUBLIC

MATTERS FROM THE BOARD

NEXT MEETING: Thursday, July 11, 2013

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Prepared in Cooperation with the California Geological Survey

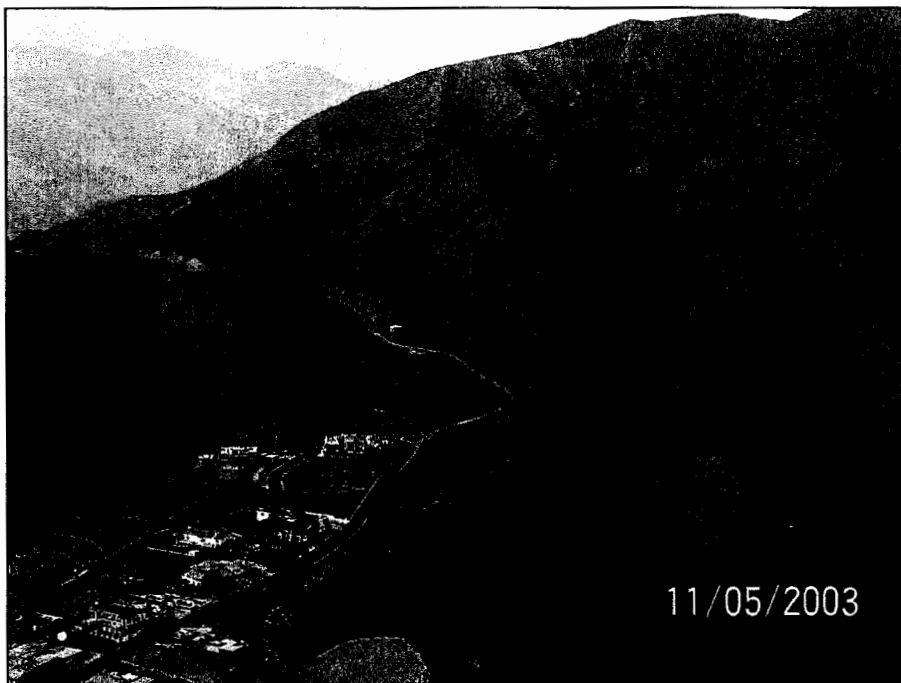
Southern California—Wildfires and Debris Flows

Introduction

Wildland fires are inevitable in the western United States. Expansion of man-made developments into fire-prone wildlands has created situations where wildfires can destroy lives and property, as can the flooding and debris flows that are common in the aftermath of the fires. Fast-moving, highly destructive debris flows triggered by intense rainfall are one of the most dangerous post-fire hazards. Such debris flows are particularly dangerous because they tend to occur with little warning. Their mass and speed make them particularly destructive: debris flows can strip vegetation, block drainages, damage structures, and endanger human life.

The U.S. Geological Survey's Landslide Hazards Program is participating in a multi-agency cooperative effort to investigate debris flows in burned areas of southern California and other parts of the western United States. Participating agencies are the U.S. Department of Agriculture (USDA) Forest Service, the Natural Resources Conservation Service, and the California, Colorado, and Montana Geological Surveys. The objective of this project is to develop methods needed to estimate the locations, probability of occurrence, and size of potentially destructive debris flows. Public officials can use this information to plan and execute emergency response and post-fire rehabilitation.

Analysis of data collected from studies of debris flows following wildfires can answer many of the questions fundamental to post-fire hazard assessments—what and why, where, when, how big, and how often?



Photograph of a typical burned hillslope in southern California. Photograph by Sue Cannon.

What We Know About Post-Fire Debris Flows

What and Why? Post-fire debris flows generally are triggered by one of two processes: surface erosion caused by rainfall runoff, and landsliding caused by infiltration of rainfall into the ground. Runoff-dominated processes are by far the most prevalent because fires commonly reduce the infiltration capacity of soils, which increases runoff and erosion. Infiltration processes are much less common, but prolonged heavy rains may increase soil moisture even after a wildfire. The wetted soil then may fail, producing infiltration-triggered landslides.

Where? Although debris flows can occur in areas underlain by nearly any rock type, the areas most likely to produce debris flows are those underlain by sedimentary or metamorphic rocks that have more than about 65 percent of the area burned at moderate to high severities. In addition, debris flows are most frequently produced from steep ($> 20^\circ$),

tightly confined drainage basins with abundant stored material, and are unlikely to extend beyond the mouths of basins larger than about 25 square kilometers (~10 square miles) in area.

When? Post-fire debris flows are most common in the 2 years after a fire; they are usually triggered by heavy rainfall. Flooding and increased runoff may continue for several years, but it is unusual for post-fire debris flows to be produced beyond the second rainy season. Some of the largest debris-flow events have been triggered by the first intense rain-storm of the storm season. It takes much less rainfall to trigger debris flows from burned basins than from unburned areas. In southern California, as little as 7 millimeters (0.3 inches) of rainfall in 30 minutes has triggered debris flows, and any storm that has intensities greater than about 10 millimeters/hour (0.4 inches/hour) is at risk of producing debris flows.

How big? Documented debris flows from burned areas in southern California and the western United States have ranged in volume from as small as 600 cubic meters to as much as about 300,000 cubic meters. This larger volume is enough material to cover a football field with mud, rocks, and debris to about 65 meters deep.

How often? Basins slopes covered only by a thin layer of soil and loose rock and channels that contain only minimal deposits generally produce debris flows only in response to the first intense rainfall of the season. Basins that contain thick channel-fill deposits and slopes mantled with thick layers of soil and loose rock rubble commonly produce numerous debris flows throughout the rainy season. Once the sediment supply has been depleted, debris-flow activity wanes, but water floods are still possible.

Debris-flow hazard maps: In 2003, large areas in San Bernardino, San Diego, and Ventura Counties burned; debris flows are now a hazard in these burned areas. The U.S. Geological Survey (USGS) has



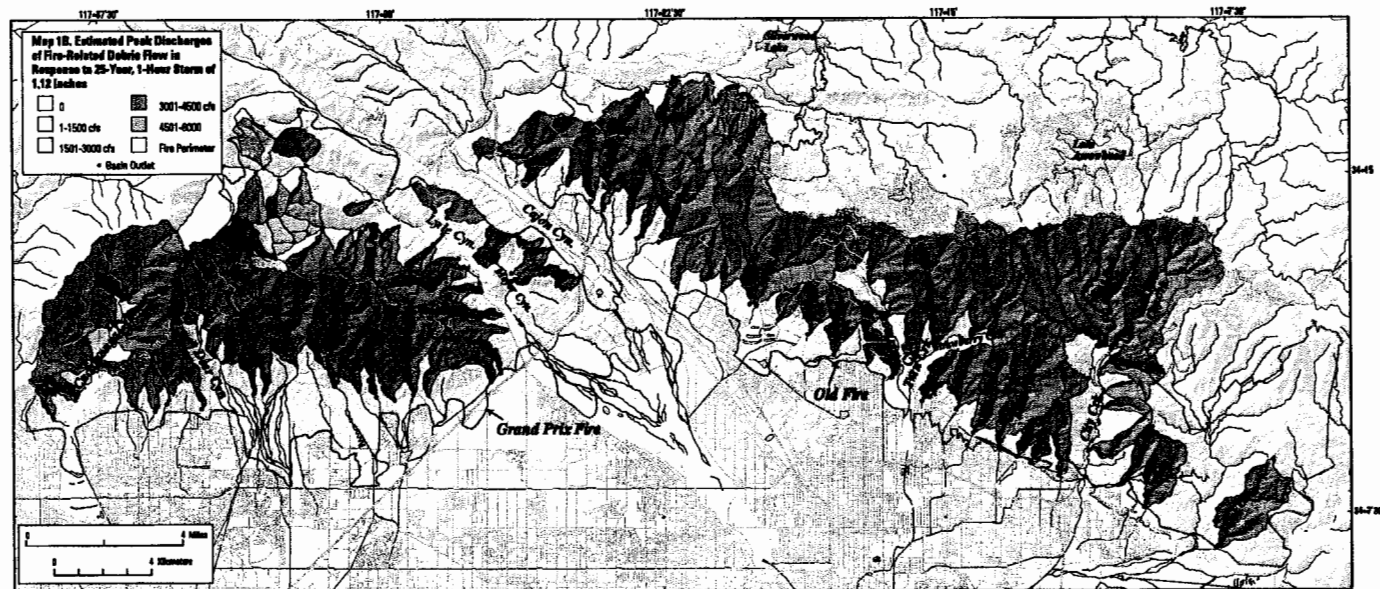
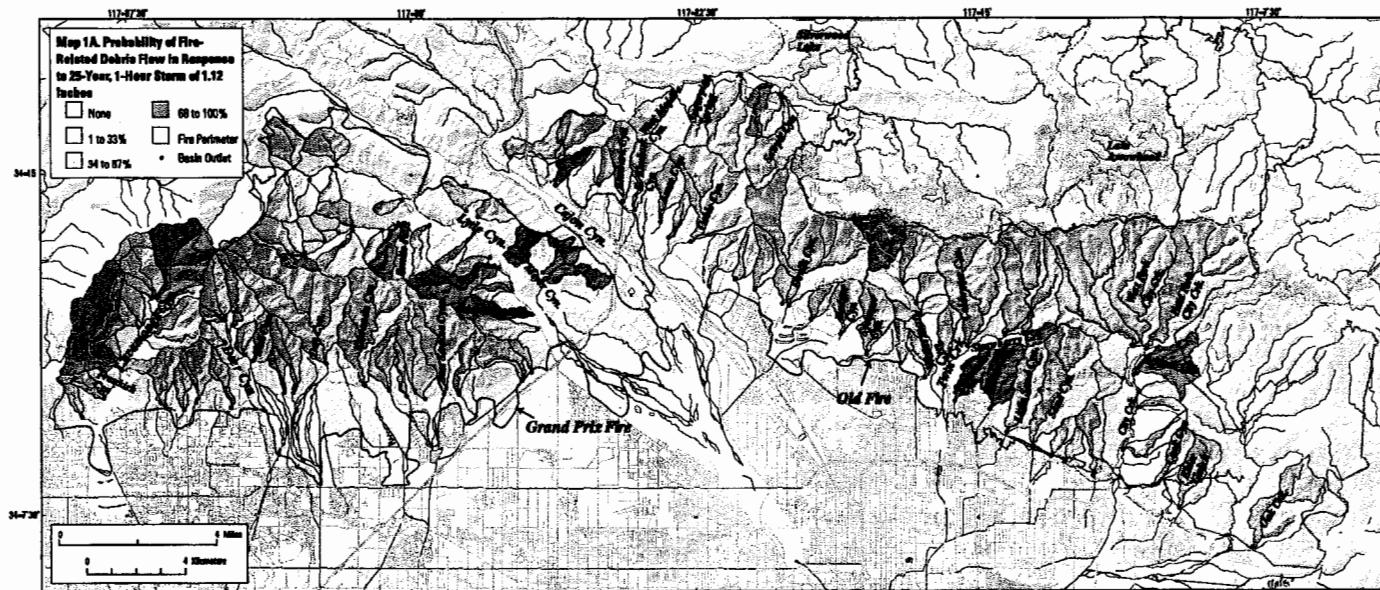
Campground in Cable Canyon, southern California, where a debris flow on December 25, 2003, killed two people. A wildfire during the previous October burned hillslopes in the area, and heavy rains triggered the deadly debris flows. Photograph by Sue Cannon.

published a series of maps of these counties that show the basins most likely to produce the largest debris flows. These maps show the potential for debris flows that might occur in response to 25-year, 10-year, and 2-year rainstorm events; the maps are based on models derived from data collected from recently burned basins throughout the western United States. The models take into account the combined effects of the area of the basin burned, basin gradient, soil properties, and storm rainfall conditions. USGS scientists continue to refine ways to assess the risk of debris flows in recently burned areas, so that more timely information can be provided to emergency response agencies.

Rapid-Deployment Data-Collection Networks (RDNs)

RDN rain gages installed immediately after a wildfire provide valuable data for researchers studying the erosive response of burned basins, and they form the basis for post-fire flood and debris-flow warnings in some areas. Scientists use rainfall data from the RDNs to define rainfall intensity-duration thresholds that identify those conditions most likely to result in post-fire debris-flow activity. Rain gage data are used to develop models for estimating the probability and magnitude of debris-flow activity. Data collected by these RDNs are rapidly becoming an integral element of the Federal government mission of protection of life and property following wildfires.

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Maps of basins burned by the October 2003 Old and Grand Prix wildfires in San Bernardino County, California, showing the probability of debris-flows (Map 1A), and potential peak discharges that can issue from a basin outlet (Map 1B), in response to 25-year-recurrence, 1-hour-duration storms. Source given in reference 5 under "For more information."

What Can You Do If You Live Near A Recently Burned Area?

Before a Storm:

1. Watch the patterns of storm-water drainage near your home, and note the places where runoff water converges, increasing flow in channels. These are areas to avoid during a storm.
2. Contact your local authorities to learn about the emergency-response and evacuation plans for your area. Develop your own emergency plan for your family or business.

During Heavy Rainfall:

1. If you are in an area that is susceptible to flooding or debris flow (or has experienced flooding or debris flow in the past), consider leaving if it is safe to do so. Remember that driving during heavy rainstorms can be hazardous.
2. Stay alert and stay awake! Many debris-flow and flood fatalities occur when people are sleeping. Listen to the radio for warnings of intense rainfall. National Oceanic and Atmospheric Administration (NOAA) Weather Radio All Hazards tone alert will let you know of hazards in your area. Be aware that intense bursts of rain may be particularly dangerous, especially after longer periods of heavy rainfall.
3. If you are near a stream or a channel, listen for any unusual sounds that might indicate moving debris, such as trees cracking or boulders knocking together. A trickle of flowing mud or debris may precede larger flows. Be alert for any sudden increases or decreases in water flow and for a change from clear to muddy water. Such changes may indicate debris-flow activity upstream, so be prepared to move quickly. Don't

delay! Save yourself, not your belongings.

4. Keep in mind that during flash floods and debris flows water may rise much faster and much higher than it would if the watershed were not burned.
5. Be particularly alert when driving. Bridges may be washed out, and culverts overtopped. Do not cross flooding streams!! Embankments along roadsides are particularly susceptible to landsliding. Watch the road for collapsed pavement, mud, fallen rocks, and other indications of debris flow.



Debris-flow deposits produced during a Christmas day 2003 storm in Waterman Canyon, San Bernardino County, California. Photograph by Sue Cannon.

For more information

1. <http://landslides.usgs.gov/research/wildfire/>
2. Gartner, J.E., Bigio, E.R., and Cannon, S.H., 2004, Compilation of post-wildfire runoff-event data from the western United States: U.S. Geological Survey Open-File Report 2004-1085. <http://pubs.usgs.gov/of/2004/1085/>
3. Cannon, S.H., Gartner, J.E., Rupert, M., and Michael, J.A., 2004, Emergency assessment of debris-flow hazards from basins burned by the Piru, Simi, and Verdale fires of 2003, southern California: U.S. Geological Survey Open-File Report 03-481. <http://pubs.usgs.gov/of/2003/ofr-03-481/>
4. Cannon, S.H., Gartner, J.E., Rupert, M.G., and Michael, J.A., 2004, Emergency assessment of debris-flow hazards from basins burned by the Cedar and Paradise fires of 2003, southern California: U.S. Geological Survey Open-File Report 2004-1011. <http://pubs.usgs.gov/of/2004/1011/>

5. Cannon, S.H., Gartner, J.E., Rupert, M.G., Michael, J.A., Djokic, Dean, and Sreedhar, Sreeresh, 2004, Emergency assessment of debris-flow hazards from basins burned by the Grand Prix and Old fires of 2003, southern California: U.S. Geological Survey Open-File Report 03-0475. <http://pubs.usgs.gov/of/2003/ofr-03-475/>

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<http://pubs.usgs.gov/fs/2005/3106>

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**Monthly Diversions under SP-2847-E and SP-4842
April 2013**

BDD Diversion of San Juan Chama Water	af	mg
Total SJC water arrived at the BDD diversion site	661.33	215.49
Total SJC diverted at BDD	661.33	215.49
Total SJC available for offsetting depletions under RG-20516.	0.00	0.00

Total BDD water diverted from all water rights	af	mg
BDD Current Monthly Total	750.80	244.65
<i>Total SJC Diversion (SP-2847-E)</i>	<i>661.33</i>	<i>215.49</i>
<i> City of Santa Fe</i>	<i>661.33</i>	<i>215.49</i>
<i> Santa Fe County</i>	<i>0.00</i>	<i>0.00</i>
<i>SJC Diversion, CLCI (leased from Jicarillo Apache Nation)</i>	<i>0.00</i>	<i>0.00</i>
<i>Rio Grande native water rights (SP-4842- SFCounty)</i>	<i>89.47</i>	<i>29.15</i>

Metered Diversions under Permit SP-2847-E and SP-4842					
Meter Serial Number	OSE Meter Number	Current Month Meter Reading	Previous Month Meter Reading	Diversion by Meter	
				ac-ft	mg
CC004816000-Diversion	14113	1442.0160	1369.5653	222.34	72.45
CC004916000-Diversion	14114	1485.3210	1398.6930	265.85	86.63
CC004A16000-Diversion	14115	1459.6810	1368.7061	279.19	90.97
CC000A16000-Return	14255	120.2149	114.8097	16.59	5.41
Total Metered Diversions				750.80	244.65

SFC Clerk RECORDED 09/09/2013

Buckman Direct Diversion Monthly SJC and Native Diversions

April 2013

Month	Total SJC Release SP-2847-E (AF)	Conveyance Losses (AF)	Total SJC Available at BDD Diversion (AF)	Total SJC Diversion SP-2847-E (AF)	Total Native Rio Grande Diversion SP-4842 (AF)	Release of SJC in Elephant Butte (AF)	Total BDD Surface Diversion (SP-2847-E plus SP-4842, AF)	SJC used to offset Buckman Wells RG-20516 (AF)
JAN	439.04	4.24	441.79	441.79	44.09	0	485.88	0.00
FEB	261.03	2.47	257.94	257.94	10.49	0	268.42	0.00
MAR	353.69	3.30	343.57	343.57	75.66	0	419.23	0.00
APR	680.73	6.34	661.33	661.33	89.47	0	750.80	0.00
MAY								
JUN								
JUL								
AUG								
SEP								
OCT								
NOV								
DEC								
TOTALS	1734.49	16.35	1704.62	1704.62	219.71	0.00	1924.33	0.00

Source of SJC Releases in reporting month. Includes conveyance losses.

Month	Total Release (AF)	HERON		ABIQUIU	
		SFCo	The Club at Las Campanas	CITY	COUNTY
JAN	439.04	0.00	0.00	439.04	0.00
FEB	261.03	0.00	0.00	261.03	0.00
MAR	353.69	0.00	0.00	353.69	0.00
APR	680.73	0.00	0.00	680.73	0.00
MAY					
JUN					
JUL					
AUG					
SEP					
OCT					
NOV					
DEC					
TOTALS	1734.49	0.00	0.00	1734.49	0.00

