-----Original Message-----
From: nagy@lanl.gov [mailto:nagy@lanl.gov]
Sent: Wednesday, November 09, 2005 10:01 AM
To: Owens, Kirk W.
Cc: 'isaacson@lanl.gov'; Folk, Kevin T.; KIRK.W.OWENS@saic.com; Hoffman, Robert; jfm@lanl.gov; rrivera@lanl.gov; hefele@lanl.gov
Subject: RE: Water Use at SCC For FYs 04 and 05

Kirk,

Your numbers are close, but what I reported for 2005 is actual building usage of 5.2 MW. Thus, what is going to the computers in about 3.2 MW and the chillers & remainder of building are using about 2 MW. Calculating today's water usage to be about 19 MGY is fairly accurate.

Full expansion to us means 12 MW dedicated to the computers and about 2.5 to 3 MW for chillers/remainder of building. Thus, in round numbers, we're thinking that our total electrical usage will expand to approx. 15 MW in the future (maybe 5 years?). Water usage would be more like 51 MGY (32 MGY equates to a total electrical load of about 9 MW).

We're fairly confident that these are good estimates of usage in the Metropolis Center. Please don't hesitate to run all of your stuff past us again as it nears completion.

Let us know if we can help.

Nick

"Owens, Kirk W." <KIRK.W.OWENS@saic.com>
Sent by: KIRK.W.OWENS@saic.com

11/08/2005 06:51 PM

To "'nagy@lanl.gov'" <nagy@lanl.gov>
cc "Folk, Kevin T." <KEVIN.T.FOLK@saic.com>, "Hoffman, Robert" <ROBERT.HOFFMAN@saic.com>, "'isaacson@lanl.gov'" <isaacson@lanl.gov>
Subject RE: Water Use at SCC For FYs 04 and 05

Nick,

Thank you for your reply. I was also hoping that we would have the "expansion" numbers, but let me suggest what we propose to use and correct me if we are wrong.

First the easy stuff -

Current Usage

Based on our previous discussion and your email below, we make the following estimate:

Electricity

Computer usage:	5.2 MW	
Chiller/building use:	2.0 MW	(per phone call)

Total current use: 7.2 MW

Water 19 MGY (estimated in the SCC EA and consistent with the numbers below)

Future Usage- this would be to support expansion of computing capabilities at the MetropolisCenterthru 2011. These values are based on earlier emails, your comments on the rough draft SWEIS, and our telephone call.

Electricity

Computer usage: 12.5 MW

Chiller/building use: 2.0 MW

Total use (rounded): 15.0 MW

Water 32 MGY (this was a number that I think you wanted to verify)

Please let me know if we have it right.

Thank you,

Kirk Owens
SAIC
(301) 601-5611 (voice)
(301) 428-0145 (fax)

-----Original Message-----
From: nagy@lanl.gov [mailto:nagy@lanl.gov]
Sent: Tuesday, November 08, 2005 7:26 PM
To: owensk@saic.com
Cc: jfm@lanl.gov; isaacson@lanl.gov; rrivera@lanl.gov; hefele@lanl.gov
Subject: Fw: Water Use at SCC For FYs 04 and 05

Kirk,

No, we haven't forgotten you, but it turns out that this was harder than it should have been!

The electrical usage is straightforward: in FY04, we averaged 5.0 megawatts at the Metropolis center; in FY05, the number increased to 5.2 megawatts. The problem we encountered is with water usage--our meter is broken (and repair is complicated and expensive). The attached message from our Operations Team Leader, Doug Hefele, calculates our water usage. Essentially, in FY04, it was calculated to be 17.2 million gallons per year. Similarly, in FY05, is was 17.9 million gpy. As you will see, Doug goes on to calculate usage based on evaporation, and he gets comparable results.

In any event, our numbers are very similar to what we've discussed in previous SWEIS documents. We also plan to get our water meter fixed during the coming year!

Let me know if you need further information.

Nick

----- Forwarded by Nicholas Nagy/LANL on 11/08/2005 05:12 PM -----

Doug Hefele <hefele@lanl.gov>

11/08/2005 11:15 AM

To nagy@lanl.gov

cc rrivera@lanl.gov, phil_s@lanl.gov

Subject Water Use at SCC For FYs 04 and 05

Nick

Below are water use calculations based on 2.4 COC and 5 MW average continuous power usage for FY04 and 5.2 MW for FY05. These calculations also are assuming that 70 % of the power delivered to the building power manifest itself as heat that must be removed by the cooling plant - this is an assumption based on actual chiller plant load of 1000 Tons in FY04 divided by the building average usage of 5 MW (or 1421.5T). Anyway, it will be close.

FY04

E = (.0192 gpm / Ton) (5 MW) (0.7) (284.3 Ton / MW) = 19.1 gpm
MU = 1.71 E = 32.7 gpm = 17.2 million gpy

FY05

E = (.0192 gpm / Ton) (5.2 MW) (0.7) (284.3 Ton / MW) = 19.9 gpm
MU = 1.71 E = 34.0 gpm = 17.9 million gpy

to cross-check using actual blow-down meter numbers:

FY04

11/10/04 12.428 million gallons
1/9/04 6.425 million gallons

or 6.0 million gallons in 10 months
or 7.2 million gallons per year of blow-down

FY05

9/30/05 20.369 million gallons
10/29/04 12.205 million gallons

or 8.2 million gallons in 11 months
or 8.9 million gallons per year of blow-down

Taking this one step further and assuming 2.4 Cycles of Concentration and using the following equations:

$C = (E + B) / B$
$M = E + B$
$M = 1.4 B + B = 2.4B$ (at 2.4 COC)

where:
C = Cy\cles of Concentration
E = Evaporation
B = Blow-down

we arrive at the following results:

FY04

M = (2.4) (7.2 million gpy) = 17.3 million gpy

FY05

M = (2.4) (8.9 million gpy) = 21.4 million gpy

This is probably more information than you wanted; but, I wanted to include everything that went into the basis of the estimate.

Doug