STATEMENT UNDER OATH

OF

GARY HARTSOG

Taken pursuant to Notice by Miranda D. Elkins, a Court Reporter and Notary Public in and for the State of West Virginia, at the U.S. Bankruptcy Court, 324 West Main Street, Clarksburg, West Virginia, on Tuesday, March 28, 2006, at 9:04 a.m.

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1 P R O C E E D I N G S

2 ----------

3 MR. UROSEK:

4 My name is John Urosek.

5 I'm an accident investigator

6 with the Mine Safety and

7 Health Administration, an

8 agency of the United States

9 Department of Labor. With me

10 is Robert Wilson, with the

11 Solicitor's Office, Mike

12 Rutledge and Dave Stuart, with

13 the West Virginia Office of

14 Miners' Health, Safety &

15 Training. I've been assigned

16 to conduct an investigation

17 into the accident that

18 occurred at the Sago Mine on

19 January 2nd, 2006, in which 12

20 miners died and one was

21 injured. The investigation is

22 being conducted by MSHA and

23 the West Virginia Office of

24 Miners' Health, Safety &

25 Training to gather information

1 to determine the cause of the
2 accident, and these interviews
3 are an important part of the
4 investigation.
5 At this time, the
6 accident investigation team
7 intends to interview a number
8 of people to discuss anything
9 that may be relevant to the
10 cause of the accident. After
11 the investigation is
12 completed, MSHA will issue a
13 written report detailing the
14 nature and causes of the
15 accident. MSHA accident
16 reports are made available to
17 the public in the hope that
18 greater awareness about the
19 causes of accidents can reduce
20 their occurrence in the
21 future. Information obtained
22 through witness interviews is
23 frequently included in these
24 reports. Your statement may
25 also be used in other

1 enforcement proceedings.
2 I would like to thank
3 you in advance for your
4 appearance here. We
5 appreciate your assistance in
6 this investigation. The
7 willingness of individuals to
8 work with us is critical to
9 our goal of making the
10 nation's mines safer. We
11 understand the difficulty for
12 you in discussing the events
13 that took place, and we
14 greatly appreciate your
15 efforts to help us understand
16 what happened.
17 This interview with Mr.
18 Gary Hartsog is being
19 conducted under Section 103(a)
20 of the Federal Mine Safety &
21 Health Act of 1977 as part of
22 an investigation by the Mine
23 Safety & Health Administration
24 and the West Virginia Office
25 of Miners' Health, Safety &

1 Training into the conditions,
2 events and circumstances
3 surrounding the fatalities
4 that occurred at the Sago
5 Mine, owned by International
6 Coal Group in Buckhannon, West
7 Virginia, on January 2nd,
8 2006.
9 This interview is being
10 conducted at the U.S.
11 Bankruptcy Courthouse in
12 Clarksburg, West Virginia, on
13 March the 28th, 2006.
14 Questioning will be conducted
15 by representatives of MSHA and
16 the Office of Miners' Health,
17 Safety & Training.
18 Mr. Hartsog, the
19 interview will begin by me
20 asking you a series of
21 questions. If you do not
22 understand a question, please
23 ask me to rephrase it. Feel
24 free at any time to clarify
25 any statements that you make

in response to the questions. After we have finished asking questions, you will also have an opportunity to make a statement of and provide us with any information that you believe may be important. If at any time after the interview you recall any additional information that you believe may be useful in the investigation, please contact Richard Gates at the phone number and e-mail address provided to you. His contact information is in the letter that was provided to you.

Your statement is completely voluntary. You may refuse to answer any question and you may terminate or end your interview at any time. If you need a break for any reason, please let me know.

1 A court reporter will
2 record your interview and will
3 later produce a written
4 transcript of the interview.
5 Please try and respond to all
6 questions verbally since the
7 court reporter cannot record
8 nonverbal responses. Also,
9 please try and keep your voice
10 up. Copies of the written
11 transcripts will be available
12 at a later time.
13 If any part of your
14 statement is based not on your
15 own firsthand knowledge but on
16 information that you learned
17 from someone else, please let
18 us know. Please answer each
19 question as fully as you can,
20 including any information you
21 have learned from someone
22 else. We may not ask the
23 right question to learn the
24 information you have, so do
25 not feel limited by the

1 precise question that we've
2 asked. If you have any
3 information about the subject
4 area of a question, please
5 provide us with that
6 information.
7 At this time, Mr.
8 Rutledge, do you have anything
9 that you would like to add on
10 behalf of the Office of
11 Miners' Health, Safety &
12 Training?
13 MR. RUTLEDGE:
14 Gary, I have a short
15 statement here, and that's
16 just that the West Virginia
17 Office of Miners' Health,
18 Safety & Training is
19 conducting this interview
20 session jointly with MSHA and
21 we are in agreement with the
22 procedures outlined by Mr.
23 Urosek for the interviews that
24 will be conducted here today.
25 However, the Director of

1 Miners' Health, Safety &
2 Training reserves the right,
3 if necessary, to call or
4 subpoena witnesses or to
5 require the production of any
6 record, document, photograph
7 or other relevant materials
8 necessary to conduct this
9 investigation. We appreciate
10 you being here today, for
11 taking the time to come up
12 here. If you have any
13 questions from the State's
14 side, you can use that contact
15 information there for Brian
16 Mills. Thanks.
17 MR. UROSEK:
18 Mr. Hartsog, are you
19 aware that you may have a
20 personal representative
21 present during the taking of
22 this statement?
23 MR. HARTSOG:
24 Yes, I am.
25 MR. UROSEK:

1 Do you have a
2 representative present here
3 today?
4 MR. HARTSOG:
5 Yes, I do.
6 MR. UROSEK:
7 And could you introduce
8 that person?
9 MR. HARTSOG:
10 I got with me David
11 Hardy.
12 MR. UROSEK:
13 Do you have any
14 questions regarding the manner
15 in which this interview will
16 be conducted?
17 MR. HARTSOG:
18 Not at this time.
19 MR. UROSEK:
20 Will you please swear
21 in Mr. Hartsog?
22 ----------
23 GARY HARTSOG, HAVING FIRST BEEN DULY
24 SWORN, TESTIFIED AS FOLLOWS:
25 ----------

1 BY MR. UROSEK:
2 Q. Please state your full name,
3 and spell your last name.
4 A. Gary McKinley Hartsog,
5 H-A-R-T-S-O-G.
6 Q. And please give us your
7 address and your telephone number.
8 A. Home address is 512 North
9 Highland Drive, Beckley, West
10 Virginia. (304)255-4131.
11 Q. Are you appearing here today
12 voluntarily?
13 A. Yes.
14 Q. Okay. Can I call you Gary?
15 A. Please.
16 Q. And please call me John. How
17 many years of mining experience or
18 engineering experience, Gary, do you
19 have?
20 A. I started working for Eastern
21 Coal in 1976. That will be 30 years
22 this May.
23 Q. And can you give us a brief
24 description of your history?
25 A. I started working for Eastern

1 Coal while I was in college. I
2 worked as a rodman, transitman,
3 draftsman, various other positions in
4 safety, engineering up through 1991
5 with Eastern and then with Peabody.
6 I worked in northern West Virginia
7 and southern West Virginia.
8 In 1991, I resigned from
9 Eastern Coal/Peabody and started
10 working as a consultant with Alpha
11 Engineering, it was a company that I
12 started, and have been with Alpha
13 since.
14 Q. And is that your present
15 position?
16 A. Yes, sir.
17 Q. What would your present title
18 be?
19 A. President of Alpha
20 Engineering.
21 Q. And do you have any mining
22 licenses, certifications, degrees,
23 such as your P.E., or ---?
24 A. I have a B.S. degree in
25 Education. I have a B.S. degree in

1 Mining Engineering. I have a
2 Master's degree in Mining Engineernig
3 and a Master's degree in Business
4 Administration. I have fire boss,
5 foreman papers in West Virginia and
6 various other certifications like
7 instructor and such.
8 Q. Are any of your certifications
9 in any other state other than West
10 Virginia?
11 A. I'm a P.E. and a P.S. in West
12 Virginia, P.E. in Illinois.
13 Q. Okay. And where is your
14 office located?
15 A. Beckley, West Virginia.
16 Q. Can you explain a little bit
17 the relationship between Alpha
18 Engineering and ICG?
19 A. Alpha Engineering became
20 involved with the Sago Mine in 2003,
21 when it was in the process of being
22 re-opened. That was for Anker
23 Energy. Anker was acquired in some
24 manner by ICG in 2005. And we
25 continued with that work for ICG as

they took over the operation and then after they had taken it over. The main thrust of our work has been surveying and mapping. We've done some other engineering work as requested along the way.

Q. Was that your first work with ICG, was at the Sago Mine after they took control of ---?

A. We worked with Anker and then ICG at Sentinel and Sycamore Two, had done some work with them at Spruce for Anker and then ICG, and some other incidental work along the way. We had worked for ICG on some other projects in other places as well.

Q. Is that since 2003 or was that prior?

A. Well, ICG came into being I think in 2004, 2005. So not long after they came into being we've done some projects for them.

Q. Okay. So at the Sago Mine, one of the primary focuses that you do is the engineering, the mapping of

the mine for them?
A. Yes, sir.
Q. How many employees does Alpha Engineering employ?
A. Currently 18.
Q. Can you tell me a little bit about their backgrounds?
A. We have surveyors. We have engineers. There's another P.E. in the office. We have CAD operators. We have what we call engineers-in-training. And then we have some clerical staff.
Q. On a yearly basis, on average, and obviously not starting from this year, but in the previous years, about how much time does Alpha Engineering employees spend at the Sago Mine?
A. On average, we'll have a survey crew there twice a week.
Q. Is that their normal assignment? In other words, every --- twice a week, that they just automatically go to the Sago Mine, or

1 is it more as an as-needed? How does
2 that work?
3 A. It's an as-needed. We
4 schedule day-to-day with mine
5 management, according to their needs
6 and according to the work that we
7 need to get done to satisfy those
8 needs.
9 Q. Can you explain that a little
10 bit for me? I mean, do you call
11 them? Do they call you? Or how does
12 that work out?
13 A. Typically speaking, we get a
14 fax each morning that shows us where
15 the faces are. And we use those
16 faxes to track their advance and to
17 schedule our work so that we can set
18 spads for them as they need them. We
19 try to anticipate their needs, and
20 then we try to schedule other work
21 that needs to be done, for example,
22 check surveys, elevations, so that we
23 can make the most efficient use of
24 our time there while we're there.
25 Q. Just to get into that a little

1 bit further, for example, can you
2 explain a little bit how far --- what
3 criteria do you use to advance the
4 survey? I mean, is it so many feet
5 of advance that you would bring your
6 crew in or ---?
7 A. Typically we like to set
8 spads, that is face spads, every two
9 to three breaks. And that height at
10 that mine that's probably a good
11 distance. If they have a problem,
12 such as a swag or some reason they
13 can't see the spads or maybe the
14 spads have fallen out, then we, of
15 course, have to get there more
16 quickly. But typically, every two to
17 three breaks we try to put in face
18 spads.
19 Q. As far as the elevations ---
20 you mentioned the elevations. What's
21 your typical methods or how often do
22 you do the elevation?
23 A. We like to take care of some
24 of the elevations each time when
25 we're there. In other words, we may

do three or four breaks of elevations while we're on the section doing work. If the elevations get back a little bit, let's say for some reason we're not able to do them with our regular spad work, say the spad work takes longer or something as we're going, then we'll make a special trip, if we need to, to catch up the elevations and keep them reasonably close to the section face.

Q. Do you do an elevation for every spad or is it in a particular entry, or how do you do that?

A. We don't do it on every spad. Typically speaking, we run elevations in the two outside headings and try to tie across on some frequency to check from one side to the other.

Q. Would that be every, approximately, thousand feet, or what would that frequency --- is there a general number?

A. There isn't a general number. Sometimes it may be the entire panel.

1 It's just a check that we do as we
2 watch the advance and we want to make
3 certain where we are with our
4 elevations.
5 Q. Is there a particular entry
6 that you may pay closer attention to,
7 for instance, the belt entry?
8 A. No, sir. Typically, we run
9 the elevations in the two outside
10 headings. Occasionally, we'll run an
11 elevation in the belt heading or the
12 track heading, depending on how wide
13 the section is or some specific need
14 that we have to do that.
15 Q. And your folks that do that,
16 can you describe a typical day with
17 them? In other words, a typical day,
18 when they would arrive at the mine,
19 would they go in with a crew, or how
20 does that work at Sago?
21 A. Typically speaking, they would
22 ride in with the production crew and
23 coordinate with the section foreman
24 where he's going to be working, where
25 they have their production plan, and

1 work around those so that they don't
2 get in the way of the equipment. And
3 they have entries for their own use
4 for short periods of time to do their
5 work so that they're out of the way.
6 Once they get the spads put into the
7 face, then they'll look at their time
8 and decide if they can pick up some
9 elevations. They'll get coal
10 sections, any other information that
11 we want them to get on that
12 particular trip.
13 Q. A typical day, and I know that
14 --- but a typical day, how long would
15 it take them to actually do the
16 survey, the surveying part of the
17 work?
18 A. At Sago, a good day would be
19 four to five hours.
20 Q. Is there a --- I know it's
21 difficult to schedule the folks
22 sometime. Is it typically that
23 they're --- and again, I know you
24 adjust it accordingly, but would it
25 be like Monday and Wednesday were

1 normally at Sago, unless something
2 different happens, or is there a
3 typical schedule for those folks?
4 A. We typically like to do
5 Tuesday and Friday because they have
6 weekend production. So we like to
7 have spads in the face on Friday.
8 But what we do in reality is based on
9 where the faces are and how fast
10 they're advancing.
11 Q. Sure. Prior to the accident
12 or prior to January 2nd, when was the
13 last day that you or your staff were
14 actually in the mine?
15 A. I believe they were there on
16 Thursday before, which would have
17 been the 28th, I believe,
18 thereabouts.
19 Q. And do you know what they did
20 that day?
21 A. They ran a check survey.
22 Q. A check survey. Can you
23 describe that a little bit for me?
24 A. Every so often, we will run a
25 check survey, which is an independent

survey loop that is independent of the daily work that I've been talking about, so that we can check where the mine is, run a higher accuracy closed-loop so that we can do any adjusting that we need to do to the daily work before going on ahead.

Q. Can you describe that a little bit for me, I mean, your normal accuracy versus this higher accuracy?

A. Typically, when we put spads in the face, those are like construction points, like putting a hub on a road job to do a cut or a grade by. They're the grade --- or excuse me, they're the sites that they're using to advance the mining, to keep the mining straight and in the proper direction.

The check survey is a loop where we want to be, depending on the situation, anywhere from a foot and 10,000 up in accuracy, realizing that our daily work isn't looped back. So you don't really know what its

accuracy is other than when you're measuring between entries, your measurements hit the lines from what's been done before and they match up with each other. The loops are more to make certain that we're headed in the right direction and that we've got the proper azimuth.

Q. The prior --- that was a check survey on Thursday.

A. Yes, sir.

Q. When would have been the last time they would have been in and done the normal, the routine survey, do you remember that?

A. I don't recall.

Q. The results of that survey --- first of all, was it conducted in the Two Left section?

A. It was.

Q. How did it work out with your normal survey? Was it pretty much on line with what you had?

A. As I recall, it was very close. It was reasonably close to

1 what we were expecting it to be.
2 Q. If we could step over to the
3 other table, we have a map there.
4 And I'm going to ask you to take a
5 look at that. What we have here is a
6 small map of the Two Left section.
7 And I think we'll call this Exhibit
8 One.
9 (Hartsog Exhibit One
10 marked for
11 identification.)
12 BY MR. UROSEK:
13 Q. And anyways, Gary, if you can,
14 can you tell us approximately on the
15 --- or actually mark on this map, if
16 you would, where the survey check
17 that they conducted on Thursday, what
18 areas they would have surveyed to.
19 A. They would have run a line up
20 into the area around the section
21 loading point. The exact location, I
22 don't know right now.
23 Q. Okay. If you can just give us
24 approximately.
25 A. Somewhere in this general

area.
Q. And what you've circled here is the area between 22 and 24 crosscut in entries Three to Seven?
A. Yes, sir.
Q. Okay. So this is the area where the check survey ---. And what spads --- what is the furthest spads that would have been set prior to January 2nd, if you know?
A. This appears to be a map of the area just prior to January 2nd. If that is the case, then looking at this map, the spads 20 --- excuse me, 4278 ---.
Q. Could you circle those for us?
A. In green?
Q. In green.
WITNESS COMPLIES
A. 4277, 4276, 4275, 4282, 4283 appear to be the most inby spads.
BY MR. UROSEK:
Q. And what day would those spads --- those would have been set?
A. I don't recall the exact date.

1 Probably earlier that week would be a
2 guess.
3 Q. And the spads within the
4 circle that was part of the check
5 survey would have been outby that
6 approximately one to two crosscuts?
7 A. Yes, sir.
8 Q. So just so that I understand
9 the surveying method, the spads
10 located, for example, 4269, 4270,
11 4271, 4279 and 4280, are kind of in
12 the zone that we talked about where
13 the check survey was; is that
14 correct?
15 A. Yes, sir.
16 Q. Would the accuracy be better
17 in those --- at those spad locations
18 than they would be at the spads
19 located up near the face area?
20 A. After the check survey was
21 run, that should be comparable.
22 Q. Okay. Make sure I understand
23 that. But the check survey was done
24 --- were these --- the survey, the
25 spads up near the face, the ones that

you've circled in green, would they have been part of that check survey?

A. I don't know without referring to the field book at the time.

Q. Okay.

A. I am estimating here because I don't recall exactly where those went to.

Q. Okay. That's all I have on this exhibit for right now. Thank you.

Can you describe a little bit, Gary, how the process actually works with the mapping and drawing of the maps and how you get back to the Sago Mine?

A. The cycle would be we send a survey crew to the mine. They would, for example, set up on the most advanced spad, take a back site from the previous spad and align using a transit to give a distance to set the next spad. Measure that distance very accurately, then the transitman, along with the other surveyor, would

1 take what we call side notes, which
2 are measuring left and right, walking
3 up the entry to get the location of
4 the coal rib, the corners of the
5 crosscuts and any other features that
6 they see that they want to make note
7 of. That information is brought back
8 to the office. We have a CAD person
9 who enters that information into
10 AutoCAD, plots that on a map in
11 AutoCAD, connects the dots that are
12 plotted, and then produces a map that
13 has the updated spads on it. Then
14 those --- in the case of Sago, those
15 updated maps are sent to the mine
16 weekly, usually on Friday afternoon,
17 to give them the most up-to-date map
18 to start their week the next week.
19 Q. Would they send that to them
20 electronically?
21 A. Yes.
22 Q. I don't believe I've asked you
23 this. Can you describe what type of
24 equipment that you use in the
25 surveying?

A. Typically, we use what's called a total station, which is an electronic transit. Measures generally --- depending on the instrument, it may measure to five seconds arc. It may measure to 20 seconds, depending on the instrument. And then it has an electronic distance meter built into it that uses an infrared beam to bounce off of a mirror and measure the distance from the transit to the spad. The instrument also has a vertical circle in it that measures the horizontal angle and the vertical angle to give us the position in three dimensions. And it does --- or it can do the trig internally to give you the readout of what the horizontal and vertical are straight off the instrument.

Q. Is there a particular model, number of instrument, that you used at Sago?

A. We use any of a number of instruments at Sago. Usually it's

1 the --- what we call the DT-10. We
2 use Topcon, we use Sokkia
3 manufacturers. There are different
4 instruments that we use for different
5 things.
6 Q. Getting specifically back to
7 the incident on January 2nd and the
8 week prior to that, when would have
9 been the last time that you would
10 have completed the procedure that
11 you've just mentioned and sent the
12 information back to the mine
13 operator?
14 A. Without checking the record
15 exactly, I think it was that week
16 before that Friday. That being a
17 holiday week, they may have varied
18 from that a little bit. But the mine
19 had worked three days that week, I
20 believe, and there should have been a
21 section map sent out electronically.
22 If there wasn't that Friday before,
23 it would have been the Friday before
24 that. But with the holidays, I
25 couldn't tell you exactly without

1 going back to look.
2 Q. Okay. And who would be the
3 person --- do you e-mail that to a
4 certain person or do you drop it onto
5 a hard drive somehow? Who's the
6 person that you deal with that at the
7 mine, with that?
8 A. That particular map we e-mail
9 to Joe Myers, the engineer. We
10 e-mail it to the superintendent, Jeff
11 Toler. And there may be a couple
12 other names on the distribution. But
13 it's a fairly widely-distributed map
14 that everyone takes a look at to see
15 where they are.
16 Q. And if they have questions ---
17 is there like a normal contact person
18 that you work with on this?
19 A. Typically, Joe Myers. But we
20 have conversations with different
21 people at the mine as we need to.
22 Q. And do you know what Joe
23 Myers' title is?
24 A. Chief engineer.
25 Q. Chief engineer. And I know

you've gone over this, but just to get the wording in correctly, the surveying method, is it called a closed-loop method or what would you actually call the method that you use?

A. The check survey is the closed loop. The spads that we put in daily are push-up spads, one of the ways that they're described. And they're pushed straight up.

Q. And you've described it, I believe, already for us, ---?

A. Yes, sir.

Q. Okay. Switching gears just a little bit on you, Gary, have you ever conducted, prior to January 2nd, a ventilation survey at the Sago Mine or conducted any ventilation work for them?

A. No, sir.

Q. How about as far as --- and again, I'm going to switch gears on you back to kind of the surveying. As far as gas wells or boreholes at

the mine, is that something that you would have surveyed for them as part of your work?

A. Yes, sir.

Q. And have you surveyed gas wells and boreholes at the mine?

A. Yes.

Q. Have you ever been called in by them to survey any gas well or borehole that may not have been originally plotted or that they knew about, they may have hit accidentally?

A. I know of none that have been hit accidentally. As far as I know, all the gas wells that we have located have been in advance of mining.

Q. In the area where the seals were located, do you know of any gas wells in that area that they may have encountered that's not on their mine map that we've seen?

A. No, sir.

Q. Focusing now on the ---

1 actually, on the January 2nd day,
2 were you or any of your employees
3 scheduled to work that day?
4 A. No, sir.
5 Q. And of course, the accident
6 did occur. And were you contacted
7 when the accident happened?
8 A. When the accident happened, I
9 was in Atlanta. And I got a cell
10 phone call from one of our employees,
11 telling me that he had heard from
12 some other individual that there had
13 been something at Sago and asking me
14 if I had heard anything.
15 Q. I guess at this time what I'd
16 like to do is just start on the
17 morning of the 2nd and, to the best
18 that you can for us, describe the
19 contact between or how your company
20 found out about this and who from the
21 company contacted you and what all
22 activities occurred between yourself
23 and Sago and between your staff and
24 Sago.
25 A. I got a cell phone call in

1 Atlanta about 10:30, quarter 'til
2 11:00 that morning. The upshot of it
3 was there had been an incident at
4 Sago, had I heard anything. Of
5 course, I said no. And I told this
6 fellow to stand by. And I called Joe
7 Myers' cell phone, didn't get an
8 answer. I got voice mail. So I
9 called Chuck Dunbar's cell phone, who
10 is Joe's immediate superior. Chuck
11 told me that something had happened,
12 I don't recall exactly how he
13 described it at that moment, and they
14 needed maps. So I called Dave
15 Prelaz, the other engineer in our
16 office, found that he was already on
17 his way to the office because he had
18 heard about the incident on CNN. So
19 I talked with him while he was
20 driving to the office, and we began
21 coordinating getting the maps and
22 different things that they needed
23 ready for them. Now, recall that I
24 said that we had run a check survey
25 just the week before into Second

1 Left. My instructions were get that
2 calculated and checked, and make any
3 adjustments that you need to before
4 we release anything, because we want
5 to make sure that it's as accurate as
6 we can give them.
7 Q. And that was done that
8 morning?
9 A. That was done immediately that
10 morning by David. And he was calling
11 other people into the office as he
12 came along.
13 Q. Do you know what time he
14 approximately got to the office?
15 A. Somewhere around 11:00.
16 Somewhere in that general vicinity.
17 David proceeded to get the
18 information together to check the
19 maps and began plotting maps. You
20 may recall that the weather was
21 getting bad at that time. And I
22 didn't want to turn one of our guys
23 loose in a hurry to try to run maps
24 there, so I called the State Police
25 to ask them to act as couriers,

knowing that they could get their safely and more quickly than we could. And they were very amenable to helping us. In fact, they sent a trooper to the office. By that time, Joe Myers had been found, and we began exchanging maps by internet, across what's called the FTP or the file transfer site that we have set up with their group. And Joe began producing maps on site.

About one o'clock, give or take, Joe told us that he needed a survey crew. And as I said, we already had people moving in different directions, coming toward us. I sent the fellow that I had in Sutton, who's one of our employees, who happened to have a mapping grade GPS with him. I sent him immediately to the site with the idea in mind that they could start building road and building site based on the mapping grade GPS while we got the exact spot ready for them to drill.

Q. Interrupt you for one second, Gary. As you're going through this, you're doing a great job, any time you can interject a time, an approximate time that somebody was called, I'd appreciate it if you could put that in for us.

A. Okay. Matt got to the site somewhere in the neighborhood of two o'clock. Somewhere in that vicinity, and I'm not certain when right now, Joe called and gave us a coordinate that he wanted to hit in the mine, which was at the tailpiece of the Second Left belt. We talked about it a little bit. We did our checking to make sure of exactly where it was and that we were all aiming for the same point. They gave the coordinates to the fellow on site with the mapping grade GPS, and he went out to locate it on site.

There was some problem with the mapping grade because of satellite reception. In mapping

1 grade, as in survey grade GPS, you
2 are required by the software to have
3 a certain number of satellites in
4 communication in order to get the
5 work done. There's an internal ratio
6 in the instrument that's displayed
7 called a PDOP. That PDOP has to do
8 with the reception strength of the
9 signal, the number of satellites and
10 the like. The thing that you need to
11 know about the PDOP is that the
12 higher the PDOP, the less reliable
13 the results. Therefore, we like to
14 have a PDOP that's in the five, six,
15 seven range. At that time, they were
16 getting a PDOP somewhere in the 16 to
17 18 range, which was not encouraging.
18 But using that --- and understand
19 that this is the kind of thing that
20 happens. You don't --- it doesn't
21 indicate that there's anything wrong
22 with the equipment. It has to do
23 with satellite strength. It has to
24 do with weather. It has to do with
25 foliage, with trees, with structures.

1 Any number of things can affect this.
2 Q. So you weren't surprised that
3 this PDOP was high that day?
4 A. No, I wasn't surprised. I was
5 disappointed, but I wasn't surprised.
6 Those things happen. So what we did
7 was using the mapping that had the
8 planametrics surface features on it,
9 plus the mapping grade information
10 that we could glean, and using a
11 little bit of judgment, built the
12 road, got the site started somewhere
13 in that afternoon. And that time I
14 don't know.
15 When we had the information
16 gathered together for the
17 conventional survey crew, they left
18 to go to the site. I contacted our
19 GPS folks, and they gathered their
20 equipment together and went to the
21 site. And somewhere in the
22 neighborhood of four to five o'clock
23 they started trying to set iron pins
24 and get ready to do the GPS work.
25 The GPS work actually started

1 somewhere in the neighborhood of
2 seven, eight o'clock. And I'm
3 calling from memory now, somewhere in
4 the neighborhood of seven, eight
5 o'clock. And we were trying to use
6 what's called real-time GPS, which
7 involves radio communication between
8 units. We were unable to establish
9 the radio communication to a
10 satisfactory level, so we went to our
11 fallback position, which was to use
12 observations of GPS receiver units on
13 particular points. So we were using
14 one of the permanent points at Sago
15 and one of the permanent points at
16 Spruce, which was a neighboring mine
17 that we were familiar with, to give
18 us the baseline that we wanted to do
19 the GPS work in the neighborhood of
20 the boreholes.
21 Once those observations are
22 made, it has to be downloaded and
23 what's called post-processed. In
24 other words, it has to be calculated
25 using some high statistics to give us

a coordinate for those two points. That process was done in the field, on laptop computer, and was ready somewhere in the neighborhood of 11:00 p.m.

Once that was completed, the conventional people took those two points and spotted the hole conventionally. They found that they had to do a little more work on the site and they --- our fellows stood by until they got their work completed, re-spotted the hole, helped them set up the rig, helped them plum the rig and got them drilling. So that, in essence, is the scenario for how we got there.

Q. Okay. I'm going to ask you a series of questions and try to recap some of the areas that you just went into with that. What time did --- did you come back to the office, your office, at some point during this day or did you coordinate over the phone? Can you explain that a little bit for

1 us?
2 A. As soon as I heard what was
3 going on and switched on CNN and
4 looked at the internet, I began
5 packing. I got a reservation to come
6 back, fly back into Yeager and come.
7 I called Chuck Dunbar and I said,
8 Chuck, I'm on my way back. I should
9 be there, give him an ETA. He said,
10 no. He said, we need you to stay
11 where you are. Don't be out of
12 communication.
13 Q. In Atlanta?
14 A. In Atlanta. Coordinate from
15 there. It's more important that we
16 do that rather than have you out of
17 communication for two or three hours.
18 So I stayed in Atlanta and stayed by
19 the cell phone and the internet and
20 the television until --- well, just
21 about all night.
22 Q. So you never did come to the
23 mine or come back to your office, you
24 coordinated from your hotel in
25 Atlanta?

A. Yes.
Q. And explain to me a little bit how you would have done that. In other words, who was your lead person at your office?
A. Dave Prelaz.
Q. So you would have been calling him?
A. I was talking with Dave Prelaz at our office, with our survey crew in the field, with Joe Myers, once he was in his office.
Q. You mentioned that Joe Myers had called you about a particular coordinate ---
A. Yes.
Q. --- that he was interested in? Did you have any decisions? Did you talk to him about why that particular coordinate was selected?
A. I asked him why there. He said that's where Sam Kitts told him to put it. And that was good enough for me. I didn't have anything better to offer. I was out of the

loop. I wasn't on site. So that's where we went.

Q. That particular point, was it --- was there any different accuracy if they had picked anything closer to the face versus where that particular was --- that particular point, I understand, is how far back from the furthest point of advance of the face, approximately?

A. That point, without referring to a map, that was two or three breaks from the faces.

Q. There were some spads in those breaks ---?

A. There were spads inby there. What you like to do is aim for a check survey station.

Q. Yes.

A. You can't always do that. What we did here was use our side notes and our other surveying information to aim for the intersection where they wanted to hit and went through a procedure to check

that and make sure that we were okay, and then that's what we aimed for.

Q. I guess what I'm trying to get to, Gary, is there any more accuracy at that particular spad than one of the spads that are further inby?

A. I would have to go back and review the exact locations before I could say that.

Q. Was it a discussion that anyone had? Did you have that type of discussion, I mean, this is the most accurate --- or the best accuracy we can get is if we pick this particular spad? I mean, did you have those discussions at that time?

A. We talked about it a little bit. I don't recall the exact conversation. I recall we pointed out where particular spads were. The bottom line was we felt confident that we could hit the intersection where we wanted to hit it. There wasn't a lot of reason to go

1 elsewhere that I knew of. So we felt
2 like we could hit the target.
3 Q. Do you know why he picked ---
4 I mean, other than you said Sam Kitts
5 told him that, I mean, was there any
6 philosophy as to why that particular
7 spot? Was there any discussion as to
8 that?
9 A. Not at that time.
10 Q. Did he indicate to you or
11 maybe Dave that he had --- did he
12 have a GPS system or GPS survey
13 equipment on site, Joe Myers?
14 A. I believe Joe Myers did have a
15 unit. It was what we refer to as a
16 Wal-Mart unit. It's the kind people
17 use for hunting and fishing and
18 hiking. It's not capable of the
19 accuracy that the units that we
20 typically use are.
21 Q. Did he indicate to you that he
22 was having any difficulty with that
23 unit?
24 A. Yes. He was having the same
25 difficulty with that unit as I

1 understand that we had with the
2 mapping grade unit.
3 Q. The mapping grade unit, where
4 was it located physically on January
5 2nd?
6 A. It was in Sutton.
7 Q. It was in Sutton. Why was it
8 in Sutton?
9 A. One of our employees lives in
10 Sutton. He had used it the Friday
11 before to do some work in the field.
12 And I told him to take it home, put
13 it on charge for the weekend.
14 Q. And the survey grade, that's
15 the best grade?
16 A. Yes.
17 Q. And where was that unit
18 located?
19 A. That's a series of units. It
20 takes three units to do what we were
21 doing. Those units were located in
22 Danville at that time.
23 Q. So you had to have them
24 brought to your office, or did you
25 take those right to the mine from

Danville?
A. They were taken directly to the mine.
Q. You mentioned conventional surveying. And I just want to make sure that I understand that there was conventional surveying being conducted. Is that the same as the GPS with the survey grade or is that something different?
A. Conventional surveying, as I'm using the term, is where one sets an instrument such as a transit or a total station over a point, gets a reference by back-sighting another point to give angle, and then measures an angle to another point on the ground, and then measures the distance and calculates --- then we can calculate a coordinate to the new point. That's what you typically see out here with a transit and a chain and those kinds of things.
The GPS is where one uses the --- a receiver to receive signals

1 from a set of Department of Defense
2 satellites that are in geosynchronous
3 orbit. And by calculating the
4 differences in time that it takes to
5 get certain signals from those
6 satellites, it's able to calculate
7 where it is on the face of the earth.
8 That's GPS.
9 Q. And I guess it's the
10 terminology, just to make sure that
11 we have it clear, when you say
12 conventional, you used the GPS system
13 between the points of the Sago Mine
14 and another mine to locate the
15 borehole. You physically didn't run
16 a transit with a tape between these
17 points?
18 A. That is correct.
19 Q. So I guess when I think of
20 conventional survey, that's what I'm
21 thinking when you mentioned that,
22 that there's a transit at these
23 points and that the tape you actually
24 measured to the borehole. You didn't
25 do that; is that correct?

A. Are you asking from the permanent points at the mine?
Q. Yes.
A. We did not. What we did was transfer the coordinates for two points, using GPS, from the mine points out into the field where the borehole was going. Once we had those two points in the field, then we could set up on them, using conventional work, and actually spot the hole.
Q. Okay. The mapping grade wasn't adequate to do that because of the signal strength; is that correct?
A. Let me answer this way. We have talked here about three different grades of GPS work. Let's talk about it in terms of what we call the Wal-Mart unit, which is what Joe Myers had. That generally will tell you where you are within 40 or 50 meters on the earth's surface.
We talk about the mapping grade unit, which is the unit that

was located in Sutton when this happened, and we got to the site first. That one will get you generally within a meter to a meter and a half of your location on the earth's surface.

Then we talk about survey grade GPS, which will give you sub-centimeter accuracy on the face of the earth, sub-centimeter being pretty close. So we were using, in effect, all three of those grades to accomplish what we needed to do.

Q. The survey grade, when was the decision made to bring it into the picture, to use it that day?

A. When Joe told me that we were going to send survey crews, as I recall, I made the assumption that there was going to be a borehole somewhere and I called for the survey grade equipment at that time.

Q. And approximately what time would that have been?

A. Somewhere around one o'clock.

Q. Somewhere around one o'clock. Did you call for the mapping grade at about the same time?

A. Yes.

Q. And why the time difference in getting it to the mine? The one got there before the other.

A. The mapping grade --- with the mapping grade unit, we had a fellow standing by the telephone ready to move in Sutton, which is only about an hour from the mine. With the survey grade, we had people who were on holiday that we had to find and equipment that we had to mobilize and bring in, check and make sure batteries were charged and things of that nature, gather the information and get it moving. So the mapping grade was basically ready to go. The survey grade, being a holiday, it took a little time to gather the people and the equipment and move it.

Q. Was that the fastest way to locate the actual site that they

1 wanted to put the borehole in? In
2 other words, could you have done it
3 conventionally, the old-fashioned
4 way? And how long would that have
5 taken if you would have tried to do
6 that?
7 A. Had we tried to do it
8 conventionally, it would have taken
9 probably many hours. We could have
10 put multiple crews on it. We could
11 have worked through the night with
12 it. But it would have been many
13 hours before we could have had that
14 there conventionally.
15 Q. I mean, would it have been
16 longer than it would have took ---
17 A. Yes.
18 Q. --- to do it this way?
19 A. Yes.
20 Q. If --- and I'll just ask your
21 opinion in this area. If you were to
22 try to locate the borehole with the
23 Wal-Mart grade unit, what do you
24 think the chances would have been of
25 actually hitting the point that you

1 were trying to hit at the mine, given
2 the signal strength that was
3 available that day?
4 A. Not very good. Rather poor.
5 Q. The mapping grade, with the
6 signal strength that you described,
7 if you were to try and locate that
8 borehole, just using that particular
9 system? And in fact, I think you had
10 a point located with that system, if
11 I'm correct.
12 A. There are different procedures
13 that you can use with that equipment.
14 One of them is a procedure called
15 post-processing, where you can take
16 the signal that's recorded in the
17 unit and then, comparing it to a base
18 station signal somewhere else, get a
19 more accurate location. Had we used
20 post-processing and had we used
21 multiple points and averaging, we
22 could have probably been within a
23 meter, maybe less, of the point that
24 we wanted to hit. So figure a circle
25 that's about seven feet in diameter,

we would have been somewhere in that. I wouldn't want to try to hit a mine intersection with that if I could avoid it. I would probably do that as a last resort if I had to. But there's a lot of error built into that system for the work that we're intending to do.

Q. The signal strength --- even with the signal strength you had that day, would you still have been able to get within that circle?

A. I don't know. Understand that signal strength changes, that it is a dynamic situation and it's constantly changing because the earth is moving around with the satellites changing their constellation at all times.

Q. Did you locate a point or a rough point with the mapping grade, or your staff?

A. Yes.

Q. And approximately how far from the final location of the borehole was that point; do you know?

A. I don't know.
Q. Was it Joe's decision or a joint decision to come up with --- to decide to go have the survey grade brought into place to accurately locate the borehole based on the knowledge of the mapping grade survey? Who made that decision? Can you describe it a little bit for us?
A. I made the decision of what equipment to mobilize and send. I told Joe over the telephone what I was doing and what my plan was. Joe probably discussed that with somebody there, I'm going to guess Chuck, and came back and said, that sounds good.
Q. Have you or your company in the past had to locate boreholes for mine operators for them to drill?
A. Yes.
Q. Has that been a successful operation in the past?
A. We've hit them all so far.
MR. RUTLEDGE:
Can we take a break,

1 John?
2 MR. UROSEK:
3 Yes.
4 SHORT BREAK TAKEN
5 BY MR. UROSEK:
6 Q. Gary, just to go over just a
7 little bit more on the surveying work
8 that you did. You used the phrase
9 planametrics. Can you describe that
10 a little bit for us.
11 A. Planametrics refers to the
12 planar map that's over top of the
13 mine workings. There's a difference
14 between what you would usually call a
15 topo map, which shows contours of
16 elevation and relief. That's a topo
17 map. Just the component of that that
18 shows things like roads, houses,
19 physical features, those are the
20 planametrics, in other words in plan
21 view, that show what's on the surface
22 above the mine.
23 Q. And you indicated that you
24 used that or that they used that at
25 the mine to get a general location of

where they were going to put the borehole?

A. Yes, sir. That's where you look to see where you drive to down the road to get a starting point.

Q. Now, that mine, that map, that particular map, was that something that was in your office or was that map already at the site?

A. We had the planametrics in AutoCAD that we could overlay the map and manipulate it to see what we wanted to see. So we had it in our office. Joe had it on his computer. Our guys in the field had hard copies with them that showed that.

Q. At the beginning, though, I mean, where was that? In other words, did Joe have that at the beginning, on January 2nd, at, say, six o'clock in the morning? That particular map, was it on your computer in your office or was it on Joe's computer in his office? And the hard copies, where would they

have been?
A. We both had it on our computers. It's an integral part of our mine map to show the surface features.
Q. Okay.
A. The hard copies were produced that day from the digital copy to send with the survey crews into the field.
Q. Would they have been produced at your office, at the mine site or at both locations?
A. The ones the survey crews had came from our site. They could have been produced at either one.
Q. You mentioned that you used two points, one at the Sago Mine and another mine. Can you explain a little bit why you couldn't just pick a location along the road or use a state map to come up with the location of where to put the borehole?
A. Every mine, by law, has to

1 have some survey points outside
2 somewhere that are tied in to the
3 underground system, surveying system.
4 Those are called permanent points, as
5 a label more than as a describer
6 sometimes. And it's from those
7 points that one can reference where
8 the mine works are on the surface.
9 We did not have any points that we
10 were comfortable in using outside of
11 those points at the mine site, at
12 Sago, other than what we knew to be
13 in existence at Spruce.
14 Spruce is another mine owned
15 by the same company that we had
16 familiarity with. We had done work
17 there. And we elected to use a point
18 from Sago and a point from Spruce
19 because of their distance apart. In
20 doing the GPS work, we wanted a
21 rather long baseline, long being, in
22 this case, 5,000 or 6,000 feet, that
23 was perpendicular to the direction
24 that we were trying to project. Had
25 we used the points that were just at

1 Sago, we may not have gotten as good
2 a result --- a resolution to the
3 problem. Don't know because we
4 didn't try. We felt more confident
5 using those two points that were some
6 distance apart and oriented
7 perpendicular to where we were going
8 to get the best resolution and the
9 best answer that we could get in the
10 field.
11 Q. Well, these base points, we
12 all know --- our own property is all
13 surveyed. Some surveyor comes in and
14 actually locates the points where our
15 property lines are. And of course,
16 there were properties above the Sago
17 Mine that I'm sure at one point
18 someone would have surveyed those.
19 And of course there's highways there
20 and different things. Why couldn't
21 you use those survey points to locate
22 the borehole?
23 A. Property boundary corners or
24 surveys are a completely different
25 area of practice from mine surveying.

1 In the case of Sago and Spruce, we're
2 working on what's called the state
3 plane system, which is a system set
4 up by the federal government and by
5 the state to reference any and
6 everything within their zone. So we
7 had elected to use those coordinates
8 --- that coordinate system from the
9 beginning to facilitate something
10 like we were doing here.
11 In the case of boundary
12 surveying, those boundaries don't
13 have to be connected to anything.
14 They can be free-floating because one
15 bases property lines more on evidence
16 than you do a given coordinate survey
17 point in general.
18 So locating a tree and a rock
19 and the intersection of a road
20 certainly don't give us the accuracy
21 that we need to go out and put a
22 borehole into a mine where you've got
23 two and a half miles of underground
24 surveying and two and a half miles of
25 surface surveying between the two

1 points.
2 Q. Okay. I think that clears up
3 that particular issue. You've
4 mentioned, and I know you've --- you
5 mentioned different folks coming to
6 the mine from different locations in
7 our discussions. Just to make sure
8 that I have it clear, can you go over
9 again who all was at your office and
10 who would have left either their
11 house or their office and come to the
12 mine for this effort, and approximate
13 times if you can remember those.
14 A. Matt Ashley was the employee
15 of Alpha Engineering that was living
16 in Sutton. And he was the one who
17 had the mapping grade GPS at his home
18 on the weekend. David Prelaz, is a
19 P.E., is the engineer that works for
20 Alpha Engineernig that came to the
21 office. He was on his way to the
22 office when I called him at roughly a
23 little before 11 o'clock. Mike
24 Gosnel is an engineering tech and
25 surveyor that is an Alpha employee.

He was called by David at some point and came to our office to help with the calculations. And then he was the lead or the crew chief in the survey crew that we sent to do the work.

Q. Did Dave --- not to interrupt, but did Dave stay at the office the rest of the day, or did he, at some point, travel to the mine site?

A. No. His assignment was to stay at the office in communication and produce whatever they needed.

Q. And that check calculation, approximately how long did that take, that you did at the office?

A. Well, there are a number of checks and a number of calculations.

Q. The very first one that you just had indicated that he went in and you were going to check the --- go over the check survey that had been conducted on Friday.

A. As I recall, that took something like an hour and a half,

1 two hours, to go through and check
2 everything and make sure that we were
3 all --- we had everything adjusted
4 right.
5 Q. I'm sorry. I'll let you get
6 back. I think you mentioned Mike and
7 what he was doing.
8 A. We had Chris Kelley, who was
9 an Alpha employee, was called in to
10 make up the second man that we were
11 sending from Beckley. Matt made the
12 third man on the survey crew. He
13 was, by that time, already on site.
14 Then I called Marshal Robinson, who
15 is a principal in Allegheny Surveys,
16 a company that we have worked with
17 for 10, 12 years, doing this kind of
18 work and with whom we share this GPS
19 equipment, called him and he pulled
20 out some of his people, their names I
21 don't know, to come and help him.
22 And he also called another gentleman,
23 who was a leading GPS expert, lives
24 in Teays Valley. Called him out to
25 go with us, not because we thought we

1 particularly needed him, but we
2 really wanted somebody else to check
3 us.
4 Q. Do you know what time ---?
5 A. So we wanted a certain level
6 of redundancy.
7 Q. Do you know what time those
8 folks all --- I assume at some point
9 they all came together at the mine to
10 do the final survey. Do you know
11 what time they all would have gotten
12 there?
13 A. It was somewhere in the seven,
14 eight o'clock range. Somewhere in
15 that general vicinity.
16 Q. And I know you indicated this.
17 Their mission was to survey the spot
18 for the borehole as accurately as
19 possible, and so they have to go out
20 in the field to do that and take
21 their equipment out to do that. And
22 then after that, they do a series of
23 calculations. So how long would it
24 take to actually do the work in the
25 field before they started their

1 calculations?
2 A. Generally, you let the
3 receiver sit on the site, on the
4 points for 30 minutes to an hour. It
5 depends on signal strength. It
6 depends on the constellation of the
7 satellites. The longer you let them
8 sit and receive the signal, the
9 higher the degree of accuracy. So we
10 like to let them sit as long as we
11 can. However, in this case, of
12 course, we wanted to sit long enough
13 but not too long. So typically
14 speaking, we're talking about an hour
15 maybe by the time you get --- after
16 you get set up and get receiving.
17 Then the actual calculations may ---
18 you know, realize you got a guy
19 working in the dark on the tailgate
20 of his truck with a laptop computer.
21 We're probably another 30, 40 minutes
22 by the time he had done everything
23 and calculated it and checked it.
24 Q. So you had mentioned typical.
25 So it's about an hour and about 40

1 minutes. That's typical. Is that
2 pretty much what happened here?
3 A. Let's say a couple hours.
4 Q. A couple hours?
5 A. No.
6 Q. And that's for the whole
7 process?
8 A. Now, realize that in this
9 particular case we first tried to use
10 the real-time equipment. But that
11 because of the radios not
12 communicating properly, we couldn't
13 do that. That would have cut the
14 time down significantly. But again,
15 because of the radios not working
16 properly --- and I don't know why at
17 this point, I'd still like to know,
18 but we had problems with all kinds of
19 radio equipment that evening. Now,
20 we've got Joe's GPS equipment, our
21 mapping grade units, the real-time
22 equipment. And I seem to recall
23 there being some other problems with
24 radio transmitting receiving, that
25 evening. Why, I don't know. It was

1 just one of those things that
2 happens.
3 Q. Well, just so I understand
4 then. At say seven o'clock, they
5 would been all there and prepared to
6 start. And they would have tried to
7 do it the first method, but the radio
8 is ---. And how much time would that
9 have taken before they changed to the
10 other method?
11 A. As I recall, as soon as we set
12 the equipment up, we saw that it
13 wouldn't work. I spoke with them and
14 said, quit trying. You know, we've
15 had other radio problems. There's
16 something in the atmosphere. Let's
17 go with what we know is going to work
18 now. Joe Myers was in agreement with
19 that. So we went to the receiver
20 mode and post-processing.
21 Q. So the receiver mode, was
22 there like a half an hour there?
23 A. Maybe.
24 Q. Half an hour. Then the
25 receiver mode, that would have been

1 intact for about an hour?
2 A. Probably.
3 Q. And then the processing would
4 have been another 45 minutes to an
5 hour?
6 A. Probably. And there's some
7 travel time in there, too. So all
8 tolled, you're talking somewhere in
9 the neighborhood of three --- say
10 three hours, three and a half hours,
11 somewhere in that neighborhood.
12 Q. Thank you. After the borehole
13 was completed on that evening --- or
14 that morning, actually, what role did
15 your folks have, if any, for the rest
16 of the rescue operation?
17 A. We were asked to locate two
18 more holes at that time. One of them
19 was at the tailpiece of the One Left
20 section. One of them was at the
21 drive for tailpiece --- right in the
22 area of the mouth of Two Left. The
23 hole that went into One Left was
24 completed. The hole that went into
25 the drive area of Two Left was not

completed. It went down so far and stopped before they actually drilled in, because they had completed the rescue part.

We were asked to locate, from those points, the gas wells, the four gas wells that were in the immediate area. We did that.

Q. Did your folks have any role in the command center, in any of the decisions or any of the actions that were going on throughout the rescue efforts in the command center?

A. No, sir.

Q. I think I'm ready to change to another subject.

MR. UROSEK:

Mike, are there any questions?

BY MR. RUTLEDGE:

Q. You just mentioned that you were asked by the company to locate gas wells --- you said four gas wells that were around that property?

A. Yes, sir.

Q. And your survey of those gas wells, were the initial surveys accurate? Did the surveys that you made at this time coincide with original surveys?

A. Yes, sir. As I recall, they were all within a foot or two, which is pretty good.

Q. You gave a lot of testimony, we appreciate that. If you can, tell me --- when was the first time that you were aware that a borehole was being planned or that the company wanted you to plot a location for a borehole? What's your best estimate of when you first became aware that a borehole was in the works?

A. Somewhere around 1:00 p.m.

Q. About 1:00 p.m., okay. And do you know who from the company asked you that or gave you that information or made you aware of that?

A. Joe Myers.

Q. Joe Myers. And if you can briefly, you mentioned that a

point --- a road was put in and a site was prepared, okay, and a point was picked on that site, okay. And then that had to be moved before the actual --- the whole location had to be moved before the actual drilling began?

A. No, sir. This --- it was my understanding that the site had to be made larger to accommodate the rig.

Q. Okay. So ---.

A. The point wasn't moved from the time it was set conventionally.

Q. I understand now. Thank you. That cleared up a lot for me. Are you aware or do you know what it would have taken on the site preparation or anything in the site area if, for example, someone had said, we want to hit the spot 100 feet in front of this tailpiece? Would that have taken a lot longer to do or was the site conducive to that, or would that have created problems or

--- are you aware of anything at all about that?

A. I'm not familiar enough with that specific area to say.

Q. And in using the GPS equipment, you stated that it's a dynamic process, that the signal strength is always changing and that the position of the satellites is always changing; is that correct?

A. Yes, sir.

Q. So if I set my GPS unit up right here right now, I might have four satellites with a certain signal strength?

A. No, sir. If you set it up right there, you'd have no satellites because you can't use GPS inside a building.

Q. Okay. I apologize then. If we just pick any certain spot outside, anywhere, and at one --- as soon as we set this equipment up there, we might have X number of satellites and X number of --- or X

1 amount of signal from those. Two
2 hours later, four hours later, six
3 hours later, that would all be
4 completely different because of the
5 movement of the earth and the
6 movement of the satellites, the
7 number of satellites and the strength
8 of those things would change, you
9 know, over those period of hours?
10 A. Yes, sir.
11 Q. So what would be an accurate
12 station outside somewhere today may
13 not be tomorrow or what was
14 inaccurate today could be accurate
15 tomorrow?
16 A. Yes, sir.
17 Q. And I'm being very
18 hypothetical here, so --- and let's
19 use the Two Left section of Sago
20 since we're all familiar with that.
21 If the company asked you, okay, we're
22 turning Two Left section and it's
23 been driven in there four or five
24 breaks, okay. If the company asks
25 you to go on the surface and plot me

1 two points, say one in the far left
2 entry and another point in the far
3 right entry, plot me two points there
4 and put me a stake in the ground, how
5 long would that take? You know,
6 would that be a long, drawn-out,
7 expensive process or something that
8 could be done fairly easily?
9 A. Mike, do you mean under normal
10 circumstances?
11 Q. Absolutely. Normal, everyday,
12 everything is normal circumstance,
13 just for whatever reason I decide I
14 want these two points on the surface.
15 A. In the case of Two Left, in
16 that general area, we would most
17 likely use the same methodology we
18 used here. And it would be at least
19 a couple of days.
20 Q. A couple of days.
21 A. At the very least.
22 Q. Three or more people?
23 A. For three people, plus your
24 office support.
25 Q. Okay. So three people in the

field for a couple of days and then office time or whatever to ---

A. To do the calculations.

Q. --- do the data entry and ---

A. Processing.

Q. --- process and stuff and so on. And if that had happened or if that had been done, would those two points be usable three months down the road, when the sections had advanced so far to maybe to be able to plot a borehole location or something like that?

A. Yes.

Q. Those two plots would be usable and would speed that process up?

A. Well, the two points that were installed in this instance are still there and have been used now to spot and drill, I believe, eight boreholes into the mine, in that area. So to answer your question, yes.

Q. Okay. The original survey that you did or your company did,

your crew did, have been used to do eight additional holes?

A. I think there's a total of eight holes now, without stopping to count them, that are in the First Left, Second Left and old Second Left areas.

Q. Okay. Gary, just to try to be a little more specific, and we're trying to make an assumption here, but let's assume that under normal circumstances we've put these two points up there on the surface when we first started driving Two Left section. Okay. Now, three months, six months down the road, whatever it is, an emergency occurs and we have need to accurately drill a hole to a specific spot in the mine. Would those two points be usable to spot a specific point here that we want to hit, like I said, three months, six months later, and would they speed that process up?

A. If they had not been

disturbed, they'd be available to do that. And yes, it would speed the process up if you had points there close by.

Q. How much would it speed the process up?

A. In this particular case, and we're speaking very hypothetically, ---

Q. Of course.

A. --- it would just depend on the terrain and where they actually were. And those kinds of questions I hesitate to answer because we don't know the distances. We don't know the terrain. We don't know the specifics of the site. I don't know the ground that you'd be talking about, so ---.

MR. RUTLEDGE:

That's all I have for the moment.

BY MR. UROSEK:

Q. Gary, in response to a couple of the questions that he had asked,

to make sure so that I understand this correctly, the --- as I understand, when the mapping grade GPS system got there, they were able to locate some spot in the proximity of where the borehole was going to be located to put a pad in. Do I understand that correctly?

A. Yes. There were problems with the PDOP. And there was a certain amount of estimation that had to go into what they were saying and doing.

Q. And did they try to actually locate a spot where the borehole was going to be with the mapping grade or did they just locate a place to begin road construction and pad construction?

A. My instructions to them were to locate enough area to where they could build the road and build a rough site, that we do not spot holes, if we can avoid it, with the mapping grade.

Q. Did they attempt an

1 approximation of where the borehole
2 may be at that point in time?
3 A. They attempted an
4 approximation of about the area
5 involved. To say that you put your
6 foot on the ground and we're going to
7 drill here, I don't think so.
8 Q. Okay. I guess my next
9 question was, compared to that
10 approximation and then the final
11 location, which was many hours later,
12 do you have any idea how close they
13 were with their approximation? And
14 is that part of the reason that the
15 road or the pad had to be made
16 bigger?
17 A. I don't know.
18 Q. I'd like to use Exhibit One
19 that we'd spoken about earlier and
20 ask you a question. If I --- instead
21 of asking you to drill a borehole as
22 you did, near spad --- I believe it's
23 spad 4270, ---
24 A. Yes, sir.
25 Q. --- if I would have --- if the

1 question to you would have been you
2 wanted to locate a borehole in the 26
3 crosscut in the Number Three entry,
4 right where I've just drawn a circle,
5 if that were what were asked of you,
6 and knowing that there's no spad in
7 that location, would that have been
8 possible?
9 A. Yes.
10 Q. And would you have been able
11 to do that accurately or would there
12 have been a less accurate --- would
13 you have been able to do it as
14 accurately as you were able to spot
15 the one that you did, based on the
16 information that you had available to
17 you?
18 A. At that time, to have put a
19 borehole there would have been
20 somewhat more risky than putting the
21 borehole where we did. Now, with
22 20/20 hindsight, yes, I think we
23 could have hit that just fine. At
24 that particular moment, with the
25 information we had at that particular

1 time, had we been told that that's
2 where it needed to go, we would have
3 tried our best. Most likely, it
4 would have hit, based on what we know
5 now. But at the time, I would have
6 resisted somewhat if I could have.
7 Q. You wouldn't have felt s
8 comfortable because the data that you
9 had wasn't as secure --- I'm just
10 trying to put it in some kind of
11 words.
12 A. I would have been more
13 comfortable with the outby point at
14 the tailpiece because going inby,
15 yes, we --- as I said, now, knowing
16 what we know, we could have hit that.
17 Q. Excluding that information?
18 A. But not knowing that, we would
19 have been relying on foreman's maps
20 and assuming that they were driving
21 to places straight ahead.
22 BY ATTORNEY HARDY:
23 Q. What do you know now that you
24 didn't know then that causes you to
25 say now, knowing what I know, I would

1 have been more comfortable?
2 A. Because I've stood at spad
3 4275 and looked at where it is with
4 relation to the mine, and I know that
5 it's in a good location. It's right
6 in the entry. And I know that the
7 place was driven pretty much on
8 centers. And I've walked it.
9 BY MR. UROSEK:
10 Q. Knowing, Gary, --- again, not
11 knowing what you know now, but
12 knowing what you knew at the time and
13 someone had asked you, I want to put
14 a borehole as close to the face as I
15 can and knowing the importance of
16 that particular borehole and you were
17 to do that, what would be the ---
18 knowing the information you had
19 available to you, what would be the
20 closest you'd feel comfortable
21 saying, if we put it here, I feel
22 comfortable about it's going to hit?
23 A. Realize that any time you're
24 going to drill a hole much ---
25 whether it's in this situation or

1 just normal course of work, there's
2 always a certain tightness that goes
3 with that. And it's a matter of
4 degree. In this particular case,
5 knowing that there was an
6 intersection there, intersections
7 make much nicer targets than dead-end
8 places. Knowing that there was an
9 intersection there, had we been asked
10 to hit any of those three
11 intersections in 26 break, we could
12 have --- we would have gone for it
13 and had a reasonable degree ---
14 reasonable to comfortable degree that
15 we would have hit it. We would have
16 been, of course, more comfortable
17 being outby, but it wouldn't have
18 bothered me a whole lot at that point
19 more than I was already bothered to
20 have tried to hit one of those three
21 intersections in crosscut 26.
22 Q. Okay.
23 MR. RUTLEDGE:
24 Can we take a minute?
25 SHORT BREAK TAKEN

BY MR. UROSEK:

Q. Gary, in locating boreholes, in addition to just surveying them in relation to where they're at in the mine, are there other factors, such as topography, that are considered in locating those boreholes?

A. Speaking of boreholes in general?

Q. Well, in general and in specifically at the Sago Mine, this borehole we're speaking about.

A. In general, yes, you do, accept that sometimes you can't pick the place underground. Mother Nature picks it for you by simply where something is underground, and you have to accommodate accordingly.

In this particular case, I was not familiar with the ground personally. I had to leave that to other folks to decide where they wanted the borehole drilled. Other issues enter into it as well, like property control, access to water,

1 drainage. Lots of other things enter
2 into it. And I know from my mining
3 experience and from my knowledge of
4 emergency operations that the
5 decision to put it in a particular
6 place, once made --- I wasn't on site
7 to know the reasons why. Unless I
8 saw some glaring problem with it, I
9 needed to comply with their wishes.
10 Q. And if someone that was making
11 that decision had looked at the site
12 and it was on the side of a cliff or
13 someplace that was very difficult,
14 that there was some reason they
15 couldn't, would they factor that into
16 their decision on where to put the
17 borehole?
18 A. Assuming they could move it,
19 yes.
20 BY MR. RUTLEDGE:
21 Q. Gary, you stated that someone
22 at the company told you where they
23 wanted the hole. And I believe your
24 comment was, you know, they told you,
25 and that was good enough for you.

1 You didn't question their decision to
2 where it was --- where the hole was
3 to be put or anything.
4 A. I think my question to --- Joe
5 Myers is the one who told me. I
6 think my question to him was
7 something along the lines of who
8 wants it there or why there or
9 something of that nature. He said,
10 that's where Sam Kitts wants it. And
11 that was good enough for me.
12 Q. And since that time, have you
13 learned anything that --- as to why
14 that site might have been selected?
15 A. It's my understanding that the
16 goal of the hole was to check the
17 atmosphere and to look around with a
18 video camera to see if one could tell
19 if that was the origin of the
20 explosion. Because at that point I
21 don't think anybody knew for certain
22 where the explosion had come from.
23 So I think, from my understanding, he
24 had two reasons. One was to look
25 around and see if that's where it

1 came from. And the other one was
2 check the atmosphere.
3 Q. And just a general opinion,
4 have you visited that site at that
5 borehole --- the surface site of that
6 borehole since this incident has
7 occurred?
8 A. Yes, sir.
9 Q. And in your general opinion,
10 was that site --- I have no idea of
11 what the site looks like, if it's on
12 a steep hillside or flat place or
13 anything else. In your general
14 opinion, was that an easy site to
15 prepare, a moderately difficult or a
16 very difficult site to prepare?
17 A. I'd have to think about that
18 some because I just don't recall
19 exactly what it all looked like. I
20 was there in the dark.
21 MR. RUTLEDGE:
22 Okay. Thanks.
23 BY MR. UROSEK:
24 Q. Switching gears, Gary, a
25 couple questions on the seals. Are

1 you familiar with the seals that were
2 in the old Two Left mains area?
3 A. Yes.
4 Q. Did you have any input in the
5 construction or the design into those
6 seals at all?
7 A. No.
8 Q. Did you have any input into
9 using Omega block seals versus some
10 other type of seal at that location?
11 A. No.
12 Q. Did you have any input into
13 the location of those seals?
14 A. No.
15 Q. Okay. Can you explain ---
16 changing gears again on you, Gary, to
17 the ventilation plan we're going to
18 talk a little bit about now. Do you
19 have any responsibility in the
20 submittal of the ventilation plan to
21 MSHA?
22 A. Our company prepares the map
23 that goes to MSHA for the ventilation
24 plan and may have, from time to time,
25 prepared other exhibits that go with

1 the plan at one time or another. I
2 don't recall right now whether or not
3 we had for Sago in the immediate
4 past, but we do that from time to
5 time.
6 Q. As part of the ventilation
7 plan for Sago, there was some
8 information provided to use the Omega
9 type seals. Were you involved in
10 that plan process at all?
11 A. No, sir.
12 Q. Your company wasn't involved
13 in submitting that?
14 A. No, sir.
15 Q. You indicated that you are
16 responsible for the mapping portion
17 of that. And who in your company
18 would be responsible for that, to
19 ensure that it's accurate?
20 A. I am.
21 Q. For example, on the location
22 of the seals in Two Left, how would
23 you --- would you survey that or
24 would that information be provided to
25 you or how would you find out about

that?
A. That was information that was provided to us by the mine management people. We would only locate them by survey if we were requested to.
Q. Were you requested to do that in this case?
A. No.
Q. At some point, someone would have told you that those seals were being constructed and there would be an amendment to the plan. The amendment to the plan, were you involved in that at all?
A. No, sir.
Q. And how would you have learned that they were going to be putting seals in and the location of those seals?
A. As I recall, we were sent a map that showed the seal locations as proposed. And when the seals were built, we were told that it was completed, and we updated our maps accordingly.

1 Q. Would any of your staff have
2 seen the seals being constructed or
3 have any part of that?
4 A. Not to my knowledge.
5 Q. Are you familiar with the old
6 Two Left mains area, the area inby
7 the seals?
8 A. Yes, sir.
9 Q. Have you been there prior to
10 January 2nd?
11 A. No, sir.
12 Q. Would your staff have been
13 there prior to January 2nd?
14 A. Yes, sir.
15 Q. Do you recall any of your
16 staff ever, prior to January 2nd,
17 indicating to you any unfamiliar ---
18 or any unusual patterns on the roof
19 in that area?
20 A. Not that I recall.
21 Q. Subsequent to January 2nd,
22 were you involved in mapping an
23 anomaly in the roof in the Two Left
24 area?
25 A. Yes.

Q. That anomaly is what I'm speaking of. Do you recall before of anyone mentioning that anomaly, that they had seen it or noticed something unusual prior to January 2nd?

A. Not that I recall.

Q. As far as the investigation, what services did Alpha Engineering provide to ICG after the accident?

A. Through the rescue phase, we provided surveying and some limited mapping services. During the recovery phase, we provided assistance in the mapping and the preparation of the plans to go underground for the rescue teams and provided technical help through the command center during the recovery process.

Q. The technical help to the command center, would that have --- what would that have been in the form of?

A. Helping them with ventilation, estimating what the ventilation was

1 going to be, which stoppings or which
2 controls were most important to get
3 back into service, in some cases how
4 to do that, the methodology with how
5 to go back into the mine.
6 Q. Okay. Just to make it clear,
7 that's the recovery. That's after
8 the rescue was completed?
9 A. Yes, sir.
10 Q. Are you part of the Sago
11 investigation team for ICG?
12 A. Yes.
13 MR. UROSEK:
14 Do you have any
15 questions, Mike?
16 BY MR. RUTLEDGE:
17 Q. Gary, you said a little while
18 ago that you were familiar with the
19 seals that were in the old Two Left
20 section?
21 A. Only after the fact, yes.
22 Q. So John asked you, and you
23 didn't see them beforehand, you
24 didn't map them or anything
25 beforehand. So your only familiarity

with those seals is after the explosion and during the investigation of that area?

A. I knew that the seals had been installed by the changes to the map. Other than that, had no discussion concerning it until after the fact.

MR. RUTLEDGE:

Okay. Thanks. That's all I have.

BY MR. UROSEK:

Q. Gary, have you been involved in any other investigations in the past where seals have been damaged, compromised, destroyed by an explosion?

A. Would you repeat the question? I'm not sure I understand.

Q. Prior to January 2nd, ---

A. Okay.

Q. --- have you been involved in any investigation at any mine where ventilation explosion-resistant seals have been damaged, compromised, destroyed by any type of explosion?

A. Not directly. In an investigative team, such as is going on now, no. I have had some experience around the old Birchfield Mine when it had an event that was credited to an explosion behind the seals. And I was doing some work at Oak Grove in Alabama. I'm not certain if that was during or just after they had had a similar event.

Q. Did you actually go underground at those two operations and observe the seals?

A. I did not, no. At Birchfield, as I recall, no one got to the seals that blew out, not that I recall. And at Oak Grove, I didn't go to that area specifically.

Q. Do you recall what type of seals were used at those two operations?

A. I don't recall at Birchfield. It seems to me that Oak Grove may have been pumpable seals, but I don't recall exactly.

1 Q. Do you recall the time at
2 Birchfield, approximately? The year?
3 A. '95, '96, '97, somewhere in
4 that time frame.
5 Q. You were able to go back in
6 after the event and observe the seals
7 at the Sago Mine or the remnants of
8 the seals?
9 A. Yes.
10 Q. Is there any information you
11 can provide to the investigation team
12 that would help us understand what
13 happened --- at Sago Mine in
14 particular, what happened to those
15 seals?
16 A. At this time, I'm working
17 under a confidentiality agreement
18 with ICG. And anything that I would
19 know about the area is covered by
20 that agreement, and I'm not at
21 liberty to discuss it.
22 MR. UROSEK:
23 Mike?
24 BY MR. RUTLEDGE:
25 Q. Gary, you said that later on

at Sago you drilled --- or excuse me, you plotted a location for a hole to be drilled in One Left?

A. Our company did, yes, sir.

Q. Your company did, yes. Okay. Can you give me any estimate of how long it took you to plot that hole to establish a location for ---?

A. As I recall, it was sometime Tuesday morning. The exact time I don't recall right now.

Q. Can you give me an estimate of the amount of time that your company or employees spent in plotting that location? Did it take them an hour or two hours, three hours, six hours?

A. As I recall, it was three or four hours.

Q. Was that hole as accurate as the first one?

A. It hit the mine.

Q. And one other thing. You mentioned earlier that your employees had helped plum the drill?

A. Yes.

Q. Can you give me just a brief explanation of what that involves?
A. What you're trying to do is set a point on the surface that is directly above a point in the mine. If the drill doesn't set up vertical and plum, it will drill at an angle. So what we want to do is we want to plum the steel, in other words, make sure that it's vertical, straight up and down, when it starts to drill. Holes have a tendency to drift. It's the nature of drilling. And there's certain things you can do to minimize that drift. But there's one thing that you can do before you start drilling that will help you in that, and that is to make sure that the drill steel and the mast is plum straight up and down, aimed for the point underground. That's what we call plumming the rig.
Q. And is that done with equipment or a tool or by measurements or ---? Very briefly,

you know, is there --- what's the procedure for doing that?

A. The best way to do it, that I'm familiar with, is to set up two transits at 50 or 60 feet, 100 feet away from the rig, that are 90 degrees apart, so that you can set the transit up, level it, and then take your scope and look up and down the rig with your crosshair and align it to the crosshair.

MR. RUTLEDGE:

Okay. Thanks. That's all.

BY MR. UROSEK:

Q. Gary, just something I just thought of. When we talked about elevations and getting --- determining elevations, that's something that you said you go back and do. How close do you determine the elevations? Approximately how many feet in the mine do you do an elevation determination?

A. I'm not sure I understand your

1 question, but I'll tell you what we
2 do. Typically speaking, we get an
3 elevation on the bottom in about
4 every intersection in the two outside
5 entries of the panel.
6 Q. So approximately every 100
7 feet?
8 A. It would be every 70 feet,
9 every 100 feet, maybe 105 feet.
10 That's typically what we do.
11 Q. So everywhere there's a spad
12 that's in the intersection in the
13 outside entries, you would determine
14 an elevation there?
15 A. We don't use the spads to
16 determine the elevations, other than
17 we use them as benchmarks, in other
18 words, an elevation keeper, elevation
19 reference in the roof. We survey the
20 floor to get the floor elevation.
21 Q. Okay. One other question. If
22 you were going to locate a --- trying
23 to drill a borehole into the mine and
24 you wanted to do it without
25 conducting a survey, just using the

maps that were available of the mine and the maps that you have on the surface, what do you think, as a surveyor, the success rate may be of just using maps to try and locate a borehole that would enter the mine?

A. Depending on the surveyor and depending on the relative accuracy of the maps, you probably have about the same chances there as in Las Vegas. It's a crap shoot. By nature, if you're over the works --- about 40 percent of the area is mined. So you can randomly --- if you know about where a panel is, you can go out over top of it --- you got a 40-percent chance of hitting an opening probably just randomly going out. I don't know that I'd give it much better odds than that.

Q. That's all I needed. I just was interested in your opinion on how to do that.

MR. UROSEK:

On behalf of MSHA, I

1 want to thank you for
2 appearing and answering your
3 questions here today. Your
4 cooperation has been very
5 important to the investigation
6 as we work to determine the
7 cause of the accident. We ask
8 that you not discuss your
9 testimony with any person who
10 may have already been
11 interviewed or may be
12 interviewed in the future.
13 This will ensure that we
14 obtain everyone's independent
15 recollection of events
16 surrounding the accident.
17 After questioning other
18 witnesses, we may call you if
19 we need to have any follow-up
20 questions that we feel we need
21 to ask you. If at any time
22 you have any additional
23 information regarding the
24 accident that you would like
25 to provide to us, please

contact us at the contact information that was previously provided to you.

If you wish, you may now go back over any answer that you have given during the interview or make any statement that you would like to make at this time, any information you think that would help us in our cause to determine the causes of this accident.

A. There was one question asked at break that may help explain the system that we use. I used the term geosynchronous. Understand that GPS is using satellites that are in orbit above the earth, put there by the Department of Defense. Those satellites are placed in geosynchronous orbit, which means that they stay in the same position around the center of the earth all the time. They're high enough to

where they stay in the same position. That's why they're --- geo, meaning earth; synchronous, meaning synchronized with the earth. And the earth, in effect, rotates under the satellites. So you're constantly getting different constellations of satellites that ebb and flow with the level of information that you can receive with your receivers.

MR. UROSEK:

Thank you very much. Again, I want to thank you for your cooperation in this matter.

* * * * * * * *

SWORN STATEMENT CONCLUDED

AT 11:22 A.M.

* * * * * * * *

Scale: 1" = 50'

106)