

DAY 16

JANUARY 10, 1996

WESTRAY MINE

PUBLIC INQUIRY

HEARD BEFORE: The Honourable Justice K. Peter Richard,
Commissioner

PLACE: Stellarton, Nova Scotia

COUNSEL:

Solicitor for the Commission: Mr. J. Merrick, Q.C., and
Ms. Ena MacDonald, document coordinator

Solicitor for the Department of Justice Canada: Ms. Lynn
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Solicitors for the Department of Justice Nova Scotia:
Messrs. R. Endres, Q.C., J. Traves, and Wm. Wilson, Q.C.

**Solicitor for the United Steelworkers of America and the
Nova Scotia Federation of Labour:** Mr. David Roberts

Solicitor for the Westray Families Group: Mr. B. Hebert

Representing the United Mine Workers: Mr. Hugh McArthur

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1 January 10, 1996 - 9:32 a.m.

2 COMMISSIONER Good morning.

3 ALL Good morning.

4 COMMISSIONER Mr. Merrick.

5 MR. MERRICK Thank you, Mr. Commissioner. The first
6 witness today will be Mr. Mitchell.

7 **MR. DONALD MITCHELL**, sworn, testified:

8 EXAMINATION BY MR. MERRICK

9 THE CLERK Please state your name for the record and spell
10 it, please?

11 A. Donald William Mitchell, M-I-T-C-H-E-L-L.

12 MR. MERRICK Just before we begin, Mr. Commissioner,
13 and just for the record, with the completion of Dr.
14 Salamon's evidence yesterday, that is the evidence from
15 the consultants hired by the Commission, at least at this
16 stage in the proceeding.

17 We have two other expert witnesses, if you will, Mr.
18 Mitchell today and Mr. Liney coming next week. A word of
19 explanation, these are not consultants that were retained
20 by the Commission themselves, but we felt would be useful
21 to have their evidence and their perspective in order to
22 see if there were other perspectives that the evidence
23 can be looked at.

24 I will take Mr. Mitchell through on direct
25 examination but because of the -- he and I had had an

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1 opportunity to meet, but not in the same detail that I've
2 had with the other consultants so that at times perhaps
3 he and I may not be going in the same direction, but we
4 will have an interesting discussion. Having said that,
5 we're prepared to proceed.

6 Q. Mr. Mitchell, you have done a series of letters or
7 reports in relation to Westray. They've been put
8 together -- some of them have been put together in
9 Exhibit 48, which you should have up there in front of
10 you, and tab 1 of that exhibit book is your resume. Can
11 you take me through, very briefly, your training,
12 qualifications and experience so that we can keep that in
13 context when we hear your evidence?

14 A. Yes, sir. I started in the coal mining industry in
15 1940 and as a labourer in the Cobendale Mine at the -- of
16 the Hudson Coal Company. That fall I started mining
17 engineering school at Pennsylvania State -- at that time
18 it was Penn. State College, Pennsylvania State College.

19 I worked summers and vacations in the mines of the
20 Hudson Coal Company and also the H.C. Frick Coke Company.
21 I went into the Army Air Corps in 1943 and following the
22 end of the war I returned to the Pennsylvania State
23 College and completed my Bachelor in Mining Engineering.

24 I went back to the Hudson Coal Company and
25 eventually became foreman of a -- Baltimore colliery. I

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1 was also captain of the mine rescue team.

2 And in 19 -- the fall of 1949, however, we had a
3 polio epidemic and our team -- we did ambulance service
4 and we all came down with the stuff.

5 And so during rehabilitation in New York I attended
6 Columbia University where I took my Master's degree in
7 Mining Engineering.

8 On completion of my Master's degree, I -- and my
9 area of study in the Master's degree was what they then
10 called "barodynamics" which subsequently became what is
11 known as rock mechanics, the area that Dr. Salamon
12 testified to.

13 I joined the United States Bureau of Mines on
14 completion of my Master's degree. And during the years
15 from 1951 to 1978 -- well, actually, I left the Bureau of
16 Mines in 1974. We will take that period; I went from --
17 we were in that period developing the place for the
18 President to go in the event of atomic warfare at Mount
19 Weather.

20 And then when we completed our phase of that work, I
21 went and started the New York/New England Interagency
22 Office for the Bureau of Mines. Our job was investigate
23 the mineral resources in the New York/New England area to
24 militate against their destruction by the Corps of
25 Engineers in mines dams and the like.

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1 1954 I was sent to the experimental coal mine in
2 Bruceton, Pennsylvania. I became chief mining engineer
3 at the experimental mine. This is the area that was --
4 the place at which all the research at that time and the
5 Bureau of Mines on mine fires, mine explosions, mine
6 ventilation, and roof control were being conducted.

7 I was sent by the Bureau of Mines to Indonesia to
8 assist the Government of Indonesia in the development of
9 their coal mines in 1957.

10 On my return from that in 19 -- the end of 1959 I
11 was made chief of the experimental coal mine and after
12 awhile I was made assistant chief of the Branch of Dust
13 Explosions which covers the experimental coal mine in
14 addition to gas and other fire research that was being
15 conducted by the Bureau of Mines. That was all put under
16 my aegis.

17 In 1967 I was made research coordinator of the group
18 called Engineering Applications which took responsibility
19 for all fire and dust control and ventilation and roof
20 control, ergonomics, and transportation research by the
21 Bureau of Mines.

22 In 1969 I was, in addition to that job, I was
23 assigned to the staff of the Congress which were at that
24 time writing what subsequently became the Federal Coal
25 Mine Health and Safety Act of 1969. On the passage of

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1 that Act, right after Thanksgiving of '69, I was made
2 assistant chairman of the task force that wrote the
3 regulations implementing the Act. These are the
4 regulations that you find in 30 C.F.R., Part 75. I was
5 responsible particularly for the regulations pertaining
6 to ventilation, dust control, rock dust, coal dust, mine
7 -- fire protection, hoisting, blasting and a
8 miscellaneous portion which covers things such as self-
9 contained self-rescuers, escapeways and the like.

10 On the completion of that activity, I returned to my
11 job which I was doing at the same time, responsible for
12 the Engineering Applications Group.

13 Our group was then transferred to -- another man
14 took over as our research director and broke up my group
15 which was getting awfully large at the time.

16 And I was then doing a lot of work fighting mine
17 fires. I was also on the Bureau of Mines' mine rescue
18 team. Well, actually, I had been on the Bureau of Mines'
19 mine rescue team since 1954, in which job we would attend
20 fires, fight fires at various mines, investigate
21 explosions and we were having quite a few of those by the
22 passage of the Federal Coal Mine Health and Safety Act of
23 1969.

24 Let's see, we're up into 1974. I went to the what
25 then was MESA, Mine Enforcement Safety Administration as

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1 principal mining engineer and technical support in which
2 job I was responsible for Mine Emergency Operations and
3 for the Approval and Certification Centre. The Center is
4 responsible for approving and certifying equipment used
5 in underground coal mines in the United States.

6 In 19 -- at the same time I was responsible for the
7 technical defence of the United States Government as a
8 result of the explosion at the Hyden Mine and then for
9 the fire at the Sunshine Mine. At the same time we were
10 fighting a fire, a major fire, at Bethlehem 33 Mine. I
11 was home in the years '77 and -- '76 through '78, my wife
12 told me, for three weekends.

13 I retired from the Mine Safety and Health
14 Administration in the end of June, 1978, after I
15 completed my testimony with respect to the Sunshine Mine
16 fire which they found that the United States Government
17 was not negligent in its actions that resulted in that
18 fire.

19 Q. I take it you were retained by the U.S. Government?

20 A. Pardon?

21 Q. You were retained by the U.S. Government?

22 A. Well, I was an employee of the U.S. Government in
23 that -- at that time. I then retired from the
24 government. I became chief engineer for Gates
25 Engineering, a consulting firm. I started an office up

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1 for a company called Foster-Miller Associates.

2 And then I -- in 1982 I became a self-employed
3 consultant specializing in the area of mine fires, mine
4 explosions, and ventilation.

5 Q. And does that remain your areas of primary interest?

6 A. Yes, sir.

7 Q. And are you still fully active in investigating or
8 are you tending to cut back on your workloads these days?

9 A. I've been wanting to cut back, but I've been very
10 active. We've had, right now, I've been involved this
11 past year in five explosions and four fires. In fact,
12 right now I have just completed fighting a fire at the
13 Jim Walters No. 5 Mine and we're recovering the equipment
14 now so I'm no longer needed there. They've got the area
15 sealed and -- but we fought that since Thanksgiving.

16 COMMISSIONER Is that outside Birmingham?

17 A. Yes, sir. Right there between Tuscaloosa and
18 Birmingham. Their No. 5 Mine, they have a unique problem
19 in spontaneous heating in their gobs in the floor. When
20 the floor heaves, the epigenetic pyrites have a tendency
21 to self-heat, and this was a fire like they've never had
22 before. It's quite interesting.

23 MR. MERRICK In any of the other mine incidents, fires,
24 explosions, whatever, that you have investigated, are
25 there any that you would draw an analogy to the present

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1 situation at Westray or from which you would take
2 specific similarities or lessons that would be applicable
3 to Westray?

4 A. I walk away from every fire and explosion amazed at
5 how much I've learned that I -- for example, in 1989 I
6 published a book called Mine Fires, and the third edition
7 is coming in the pre -- in the thing that begins -- the
8 introduction says there have been 19 fires and explosions
9 I have been involved in since writing this, and I've
10 learned an awful lot I think we better put in the third
11 edition.

12 Everyone is different. However, as different as
13 each one is, there is a basic pattern of the same things
14 happening, the failures of miners to do what they have to
15 do to maintain a safe environment. We can pass the
16 United States -- as I said, I've been -- I'm responsible
17 for all these regulations, and we still have explosions,
18 we still have fires. We still have people working in
19 mines making mistakes.

20 Q. Are you able to elaborate on that at all
21 particularly in the context of Westray? Is it always
22 just the fault of miners or have you learned that it goes
23 beyond that?

24 A. A coal mine is a hostile environment. You go down
25 into a mine. You've got a roof -- ground control

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1 conditions such as described by Dr. Salamon so well, an
2 erratic ground that very few of us truly understand. And
3 I said that I started the study in ground control back in
4 1949 when the subject was in its infancy. We called it,
5 as I said, "barodynamics" using the Greek term rather
6 than the present day term. It's a field that is -- it's
7 a study that no matter what we do, we're constantly
8 learning and correcting ourselves.

9 In addition, in a coal mine, we have -- there are
10 three basic things to a fire or an explosion. There's
11 really no difference. The only difference between a fire
12 and an explosion is an explosion is a fire that is
13 confined and in its being confined is capable of
14 developing pressure, pressures that are capable of
15 causing destruction. This follows the universal gas law,
16 as your know, or Boyle's Law, that pressure, volume are
17 related to temperature. As the temperature rises, the
18 pressure or the volume will increase. If the volume is
19 constrained, then the pressure will rise linearly with
20 temperature. And this is an explosion, nothing more than
21 a fire that -- where you confine pressure.

22 There are three basic things to a fire: fuel,
23 oxygen, and heat. Now in a coal mine, we have all the
24 fuel you need. It's not the coal that's the fuel, but
25 the gases and the tars and the other things associated,

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1 the volatiles associated with the coal that are liberated
2 by heat. This creates the fuel for fire and for an
3 explosion.

4 In addition we have the methane that's normally
5 associated with most carbonaceous strata. So we have all
6 the fuel you need for the -- one of the key legs of the
7 triangle that forms the fire triangle. You can think of
8 it in terms of a triangle, one leg being fuel.

9 Now we have one leg that's oxygen. And we put air
10 into a mine so that we humans can work there. Without
11 this air, unless we -- somebody comes up with scuba-type
12 equipment that we can wear as a practical mode and, by
13 the way, this has been attempted, there's all the air you
14 need so we have the second leg of the triangle that
15 exists. We have fuel and we have oxygen.

16 So there's the critical third leg, the heat. And
17 this third leg, this heat comes from the failure to
18 maintain equipment in a permissible manner, the use of an
19 open flame incorrectly, improperly. We have many sources
20 of heat. And these sources of heat are all associated
21 with people because there is no normal source of this
22 abnormal heat. We can go to some mines where you will
23 have geothermal temperatures, perhaps 120, 180 degrees;
24 go down to South Africa and you can go into mines where
25 temperatures are as high as 180 degrees. They're

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1 horribly hot. But this is -- that's Fahrenheit, not
2 Celsius. Don't mind me, I'm an -- from the States where
3 you still talk in the old language.

4 But to ignite methane, to ignite these tars and
5 stuff, you're talking about temperatures close to 1,000
6 degrees Fahrenheit which would be about, what, 500-and-
7 some-odd degrees Celsius. I can take the quick
8 calculation; you will have to excuse me for that.

9 So one thing about this heat is that this is what
10 we, as people, misuse. We take this heat into a mine.
11 I've gone into a mine following an explosion, I've found
12 men sitting in a shuttle car because they finished their
13 shift early and they didn't want to leave because that
14 would get them in trouble and you go there after this
15 mine has exploded and you find a pack of cigarettes, you
16 find a butane lighter there. It's a very sad thing.

17 We had an explosion like this just two years ago in
18 Kentucky. Then we had another one in Virginia just about
19 18 months ago. And it makes you cry. And that we have
20 people today who do things like that. We have people who
21 misuse welding, who misuse cutting torches.

22 We have all of this electricity in a mine and we
23 have people operating shuttle cars or other equipment
24 where they overstretch the cable so that they get arcing
25 right there at the machine typically. If we're lucky,

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1 the cable will get a breakdown below in the body -- in
2 the main length where it is not quite likely to ignite
3 methane. But when you pull your cables right there where
4 they go into the mining machine and then you will get the
5 spark, the arc, that's hot enough to ignite methane. So
6 that's what we have; that's an explosion. That's what we
7 have learned.

8 Q. Can I ask you this, and I'm assuming that perhaps
9 your answer is in the negative, but was there anything
10 about any of the prior explosions or fires factually that
11 was similar to Westray? Was Westray similar -- I know in
12 a lot of the smaller ways. I'm just wondering if you had
13 anything that you would say that was Westray 1 and this
14 Westray 2?

15 A. Well, that's what I was saying, we had fuel, we had
16 oxygen at Westray 1, Westray 2 and every other mine in
17 which we have ever had a fire or an explosion, and then
18 we had the misuse of something that generated the heat
19 that gave us the third leg of the triangle. And when you
20 put these three legs of the triangle together, you get a
21 fire. And an explosion starts off as a fire. If you
22 ever watch methane when it starts burning, it starts
23 burning and you just see it burning and if it's a body of
24 methane, not a layer of methane, but a body of methane,
25 if we filled this room say with a seven or eight percent

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1 methane concentration and we ignited it, we would observe
2 a -- like a balloon getting larger and larger and larger
3 and larger and reaching a critical volume at which time
4 when it reaches a critical volume, we now develop
5 pressure and this wave of flame and pressure start moving
6 out and propagating through this room, out into the
7 hallway, out into the roads. So this is common. There
8 is nothing different from this explosion that we don't
9 find at almost any other.

10 Q. All right.

11 A. We find someone having too much fuel in the wrong
12 place with the -- with a heat, the igniting source.

13 Q. And I will come to that in a minute as to exactly
14 the mechanics in this particular situation. Just before
15 I do, is there anything else about your resume that you
16 would want to bring to our attention that may be of
17 particular relevancy to the present situation?

18 A. I don't -- let's see, you did ask me and you -- I
19 don't mean to sound egotistical, but I'm -- they tell me
20 they call me "the last of the breed." I'm one of the
21 last of the fire and explosion men left in the States.
22 I've written quite a bit on the subject. I've got about
23 100 papers on the subject of -- well, on fires and
24 explosions, I would say maybe 60 of my papers. These are
25 all given in the resume. I've been involved in talking

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1 to people like you all too many times, heartbreaking
2 times; this is not a happy time. It just shocks me that
3 we don't seem to learn. And that's about all I can say
4 about my resume.

5 Q. All right. I will keep that last comment of yours
6 as to what we should learn because toward the end of my
7 questions I'm going to ask you what lessons should we
8 have learned from Westray. But just before we get to
9 that question, let me go through some more mundane
10 matters first. When did you first become involved in
11 this particular explosion?

12 A. Shortly after the explosion the Department of
13 Labour, Nova Scotia Department of Labour, I believe it
14 was -- I don't recall whether it was Mr. White or Mr.
15 Noonan at that time, called me asked me to come up here
16 and assist them in the activities associated with the --
17 at that time, which was -- the main activity at that time
18 was determining -- there were being plans presented by
19 Westray for re-entry into the mine and --

20 Q. Was this part of the rescue efforts or following the
21 rescue efforts?

22 A. This followed the -- I wouldn't call those rescue
23 efforts, the recovery of the bodies out of the Southwest
24 and the -- what they did down in the North Mains, yes.
25 The Westray people had some people from -- like, John

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1 Bacharach, a gentleman I know from British Mining
2 Consultants. They had a group of people that were
3 advising them what to do to re-enter the mine at that
4 time.

5 Q. All right.

6 COMMISSIONER Could you put an actual time on when you
7 became involved? Like, the explosion was May 9th.

8 A. I was -- I wish I had brought my files on that. I
9 was looking -- one of my papers here gives reference to
10 some instructions I was given on the 24th of May on
11 getting dust samples or, actually, so it was prior to the
12 24th of May. I would say --

13 COMMISSIONER Would it be safe to say that it would be
14 after they called off any rescue attempts?

15 A. Yes, sir.

16 COMMISSIONER Okay, thank you.

17 A. The teams had -- this was during the -- out when the
18 Westray people wanted to re-enter the mine. I would say,
19 like, the middle of May, sir.

20 COMMISSIONER Okay, thank you.

21 MR. MERRICK Had you been -- and this was -- you were
22 employed by the Province. Had you been employed by the
23 Province previously to assist them on advising on mining
24 matters?

25 A. No, sir.

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1 Q. And what were your instructions and sort of scope of
2 your retainer at that time? You told me that it was to
3 help them, give them advice as to re-entry, et cetera.
4 Can you be any more specific than that?

5 A. Well, I was -- they were hoping that I would try to
6 do whatever necessary to investigate, determine the cause
7 of the explosion and to determine mine recovery. We had
8 been involved in, ever since then -- well, in 1993, for
9 example, I worked with the Department in evaluating the
10 plans for subsequent mining of the property, but
11 particularly to provide assistance in determining what
12 action should be taken in recovery of the mine and
13 investigation of the causes of the explosion.

14 Q. Now this was in your capacity as -- in your own
15 consulting role, the company that you set up, your
16 consulting company. Do you have others involved in your
17 consulting services that were involved in this at all?

18 A. Not here on site. I had other people who did some
19 ventilation -- did the basic work on ventilation
20 analyses, putting the -- making the mine schematics for
21 the ventilation analyses of the computer models, putting
22 the data into the computer and that type of thing.

23 Q. I'm just looking here for -- and I've lost it for a
24 second, but do you as a regular -- does your consulting
25 firm have other full-time employees?

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1 A. No, sir. We call on people on an as-needed basis
2 because the types of jobs we do differ so greatly, and
3 you must call on certain expertise for that specific
4 function and this can vary quite greatly.

5 I did have the assistance in this, the backstopping
6 on this, from a gentleman by the name of Bill Parisi;
7 unfortunately, Bill is deceased. He was the greatest
8 mine rescue man that we ever -- that we've had in the
9 post-'60s and '70s and '80s in the United States. He was
10 in charge of safety for the Consolidated Coal Company,
11 later called "Consol" and he was the president of the
12 National Mine Rescue Association of Smoke Eaters and my
13 dearest friend. And he provided me a great deal of
14 backstopping in my analysis of the causes of this
15 explosion.

16 Q. Did you have an opportunity to go into the mine?

17 A. Yes, I did.

18 Q. Can you -- on how many occasions and where?

19 A. At least twice. I was trying to recall this just
20 the other day. On two occasions I went underground; we
21 went -- we walked in the -- we walked down the belt
22 entry, the North -- the return, because I wanted to
23 observe that very closely, and then we walked up the --
24 down to the shore line and then we walked -- the shore
25 line being the level -- the location just inbye Crosscut

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1 10 where we had flooded the mine. In that area of the
2 mine, I -- by the way, I'm the person responsible -- I
3 had read some of the people complaining about not be able
4 to go in the mine or roadblocks being put in their way.
5 And if you want to blame anybody for that, blame me; it
6 was my advice and my insistence, for the safety of
7 anybody going into that mine, that was a thing, in my
8 judgment, that had to be done. And --

9 Q. Are you --

10 A. -- then we walked out the slope. I located areas
11 where I wanted dust samples taken, and we examined the
12 condition of the damage conduct -- the damaged produced
13 by the forces. I collected some samples of rock dust
14 bags that were overlying the arches in the No. 1 entry
15 inbye No. 10 Crosscut, and we gave those to Tom Smales.
16 And I believe I saw their analyses, finally, in a report
17 by Mr. Brookes.

18 Q. I take that your inspection into the mine then,
19 occurred after it had been flooded up to 10 Crosscut?

20 A. Yes, sir.

21 Q. And just a minor point: are you saying that it was
22 your recommendation that the flooding take place?

23 A. Yes, sir.

24 Q. All right.

25 A. I want to take the responsibility. If you want to

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1 put the blame on anybody, it's mine.

2 Q. Now we know that you have rendered some written
3 opinions to the Department that are contained in Exhibit
4 48. What's the exhibit with everything?

5 MS. MACDONALD In 122, tab 1.

6 MR. MERRICK Exhibit 122, tab 1 repeats those same
7 documents but includes now, for the first time, a lot of
8 the attachments to one of your letters. But I'll stick,
9 just for the moment, to Exhibit 48. It has a series of
10 letters dated July the 2nd, September the -- one dated
11 July the 2nd, two dated September the 12th, two dated
12 September the 21st. In addition, you have filed a more
13 recent letter dated November the 14th, 1995, which is in
14 Exhibit 122 at tab 1. Have you given any other written
15 opinions other than those? If you want --

16 A. Other than those, the only important -- as you can
17 see there -- a lot of written stuff here. They -- in
18 these books to my left. The only important opinion, you
19 might call it, if you wish to dignify it by that word,
20 are my comments regarding the reports of other
21 consultants, RCMP and Commission consultants, where I did
22 read and make comments regarding their reports.

23 Q. All right. And we'll cover most of those comments
24 today, I think. But what I'm looking for are any
25 opinions that you yourself would have formed as to the

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1 cause of the explosion or the way that the mine was
2 operated? Are there any other opinions on those topics
3 that you have formed other than the letters that I
4 referred to a moment ago?

5 A. No, sir.

6 Q. All right, thank you. Let me go through those for a
7 few minutes with you because I think that will assist us.
8 If we can look at Exhibit 48 first, and I'll work off of
9 that one rather than the more recent edition -- it has
10 more attachments to it.

11 And let me take you first to the July the 2nd, 1992
12 letter. This is addressed to Mr. White. You've told me
13 already about your general retainer by the Province and
14 your broad mandate that you were given. Why was this
15 particular letter generated?

16 A. Fire origin, as we said initially, the only
17 difference between a fire and an explosion, if you'll
18 bear -- I hope you'll bear with the repetition, is
19 confinement. Fires -- therefore, I looked at all
20 explosions from the concept of fires. We have that fire
21 triangle that I gave you; fires have fuel, oxygen and
22 heat. And there's one thing we say about fires and that
23 is: fires are fuel and ventilation controlled. And
24 because we have all the fuel we need in a coal mine for a
25 fire, then I teach my people when I teach them fire

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1 fighting, I say if you don't control the fire, the fire
2 will. I mean, if you don't -- excuse me. If you don't
3 control the ventilation, the fire will.

4 So one of the key things that one must do in
5 analyzing, at least in my opinion, in analyzing a fire or
6 an explosion, because I keep the two in the same context,
7 is one must analyze the ventilation. Because, as I said,
8 if you don't control the ventilation, the fire will. And
9 we have -- explosions typically are the result of a
10 failure in ventilation. I have never known an explosion
11 not to have been associated with some failure in
12 ventilation; that's a given.

13 And I hate to say it, I've -- as I've said I've been
14 involved in --I didn't say it, but I would say I've been
15 involved in more than 200 actual underground mine
16 explosions. In addition, I've been involved in the
17 research and the analysis of over a thousand experimental
18 mine explosions. So on that basis I can say that as far
19 as I'm concerned, study the ventilation if you want to
20 study an explosion.

21 Q. All right. That's a useful guide for us. I take it
22 then that this letter was generated as part of your
23 general mandate or retainer by the Province and not
24 necessarily a specific request as such?

25 A. That is correct.

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1 Q. All right.

2 A. You will find nothing in here, unless I say directly
3 in the beginning; this is in response to your request.

4 Q. All right.

5 A. I believe I do that with respect to diesels.

6 Q. So your opinion on this, ventilation, which -- and
7 this letter does deal with your opinion on ventilation,
8 was to have been generated as a result of your original
9 retainer and the fact that it was generated on July 2nd
10 was because that was when you were ready to render it?

11 A. This is -- I rendered this initial opinion, yes.

12 Q. Yeah. Let me take a look at it. I notice that you
13 base it on the ventilation survey that was actually
14 conducted by Westray on May the 8th?

15 A. Yes, sir.

16 Q. You then modify that information to take account for
17 the fact that there would be things or obstructions in
18 the various headings or roadways, such as miners,
19 bolters, equipment, that sort of thing?

20 A. With the exception of the belt conveyors. Because
21 at that time I was trying, but I had not at that time
22 defined exactly what I needed to learn about the belt
23 conveyors and also the arches. Those were two things
24 that were not incorporated in this; they are incorporated
25 in the subsequent study.

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1 Q. So you were satisfied that with those two exceptions
2 you were taking account of any other equipment that might
3 have been in the roadways in doing your analysis?

4 A. Yes, sir. Assuming that the equipment and people
5 were stationary.

6 Q. Yes. And I take it that the way that you accounted
7 for it was to -- what did you do? Did you subtract from
8 the typical cross-section areas?

9 A. Based on our experience in mine ventilation, and we
10 do quite a bit of mine ventilation work in the United
11 States from -- and based on our experience, we do this by
12 not only adjusting the cross-sectional area but adjusting
13 the frictional factor. All of these studies are based on
14 the basic concept of ventilation of which friction factor
15 of the airway is a critical component.

16 Q. Did you do that for your July 2nd letter? Did you
17 adjust by reducing the cross-sectional area and by
18 increasing the frictional factors?

19 A. Adjusting while increasing in some places;
20 increasing -- in some cases, well in all cases,
21 increasing, but the amount of increase was consistent
22 with the friction factor that we found in typical
23 situations -- similar situations in the coal mines in the
24 United States.

25 Let me say there is one problem that we had and we -

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1 - that would raise questions in my mind as to the
2 credibility of this work. The cross-sectional areas in
3 the Westray Mine exceed by a factor of 2 the typical
4 cross-sectional areas in coal mines in the United States,
5 and therefore the friction factors that I used might be
6 greater for Westray than they actually were. I don't
7 know; we just had no idea of what the factor would be.
8 But if anything, the friction factor I would have used,
9 that we did use, would be a higher factor and therefore a
10 more worse case scenario than might have existed at
11 Westray.

12 Q. In any event, the factor that you used you derived
13 from your experience in US mines that had the smaller
14 headings?

15 A. Smaller cross-sectional area.

16 Q. Yes.

17 COMMISSIONER I just want to clarify. What do you mean
18 referring to a "cross-section"?

19 A. The cross -- what I mean by -- what we mean by
20 cross-section, sir, is what we -- and I should use the
21 word, if you'll please -- phrase, if you'll excuse me,
22 "effective cross-section." Typically, the cross-section
23 area, cross-sectional area, is the height, the average
24 height multiplied by the average width. To that, one
25 must -- now when you put in a mining machine, you take

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1 the cross-sectional area of that mining machine --

2 COMMISSIONER A slice of the drive then?

3 A. That is correct, sir.

4 COMMISSIONER Okay.

5 A. And you must consider, however, is there sloughing
6 of the ribs where there is coal that is off, lying on the
7 floor on the rib line. You have to look at things such
8 as posts. You have to look at things such as the
9 location of arches and their effect on the cross-
10 section --

11 COMMISSIONER And these are measured into resistance,
12 aren't they?

13 A. Yes, sir.

14 COMMISSIONER Okay, okay, I'm following you.

15 A. Thank you.

16 MR. MERRICK In any event, as I understood you, and I
17 just want to make sure I've understood you correctly.
18 The increase in the resistance factor that you used was
19 based on your experience with the U.S. headings that were
20 smaller than the Westray headings?

21 A. Yes, smaller in cross-sectional area.

22 Q. But -- and I take it from your evidence that the
23 adjustments that you referred to here in arriving at your
24 analysis for this letter, you adjusted by both reducing
25 the cross-sectional area and by increasing the frictional

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1 factors, is that correct? Or resistance factors.

2 A. Well, the frictional factor -- and friction is one
3 of the components that define resistance, yes, sir.

4 Q. So -- All right, so you did both?

5 A. Yes, sir

6 Q. You adjusted by doing two things?

7 A. Yes, sir.

8 Q. All right. Are you able to give me how much your
9 reductions were in cross-section?

10 A. I would have to go -- if you'll bear with me, I
11 don't remember; I'd have to go to the data which are
12 given in the -- I believe you said another exhibit.

13 Q. Exhibit --

14 A. Well, I have it here in my own book; let me just
15 pull it out here, it's faster.

16 Q. Well, it would assist us if you could turn to
17 Exhibit 122, tab 5 and tell us where it is and then
18 everybody else can follow it. Cynthia, does he have -- I
19 believe that's it.

20 COMMISSIONER Your books are going back with you, but
21 our exhibits are staying, so we'll have a point of
22 reference. Okay?

23 A. Aye-aye, sir.

24 MR. MERRICK Tab 5 is again, in a sense, a repeat of
25 Exhibit 48, but this time including all of the

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1 attachments to your July 2nd letter. And it's those
2 attachments, I assume, that you want to look at?

3 A. Yes. For example, if you will look on what you have
4 or someone has noted as page 24 --

5 Q. Yes.

6 A. -- in the upper right-hand corner?

7 Q. Yes.

8 A. If you will look at the -- across there, you will
9 see "'K' Branch from 2 air flow pressure loss length area
10 resistance K."

11 Q. Yeah.

12 A. You see that letter -- the letter "K"?

13 Q. This is on page 24.

14 A. That should be a page --

15 Q. Yes, I've got it; down toward the bottom. Two-
16 thirds of the way down?

17 A. Yes, sir.

18 Q. Got it.

19 A. All right. "K" is the friction factor.

20 Q. Yes.

21 A. And you will see -- now there I used a friction
22 factor for the roadway of 45. Typical roadway in the
23 United States like that, but of a smaller cross-sectional
24 area, but does not have arches but is supported solely by
25 roof bolts and did not have a -- floor conditions, as I

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1 observed in this mine, a typical K factor would be in the
2 neighbourhood of 30 to 35.

3 Q. So you were adjusting from the typical US K factor
4 in arriving at the specific K factor used here?

5 A. That's correct. And if you continue, you will see
6 that numbers like 145 for a K factor, 210. Here's one,
7 229, 234, 175. All different numbers. As we go along,
8 77. These were our best judgments of the probable
9 maximum K factor, friction factor: "K" being friction
10 factor one might likely have in the Westray Mine.

11 When we don't have numbers that we can state with
12 engineering certainty are correct, we, in my
13 organization, will always do what we call a "worst case
14 analysis." We believe that to be always on the side of
15 safety and best judgment.

16 Q. So you were doing what? Giving it the maximum K
17 factor?

18 A. That would give you the highest resistance as a
19 result.

20 Q. Okay.

21 A. And would tend to --

22 Q. So you --

23 A. -- result in -- would result in less air flowing
24 through the mine at higher pressures than might actually
25 have existed.

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1 Q. All right.

2 A. That's not higher pressures, but pressure losses
3 would be greater than might have actually existed. This
4 is, indeed, in my opinion, being on the safe side of an
5 analysis.

6 Q. Let me take you to the --

7 COMMISSIONER Just a second. You used the term
8 "resistance" there which is a component of the K factor,
9 is that correct?

10 A. The K factor is the component of the resistance,
11 Your Honour.

12 COMMISSIONER Okay.

13 A. Resistance is equal to the friction factor, K, times
14 the length of the segment that you're examining, times
15 the perimeter of that segment, divided by 5.2, so that
16 you can put this in terms of pounds per square inch, and
17 times the area cross -- the effective cross-sectional
18 area to the third power. Would you like me to write that
19 down?

20 COMMISSIONER It's okay. No, that's fine. I'll follow
21 it as we go along, yeah.

22 A. Okay. And one other thing, Your Honour. Resistance
23 -- the -- when we study air flows in a mine we -- there
24 are three critical parameters: pressure. Think in terms
25 of your heart. Your heart does -- is like a pump. The

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1 fan in a mine is a pump, nothing more. And as your heart
2 -- what does your heart do? Your heart beats and
3 generates pressure. That's why your doctor measures your
4 blood pressure. It's a very critical parameter to tell
5 him how healthy your heart is.

6 Well, we do the same thing with mine ventilation: we
7 measure the pressure of the air flow in the mine just
8 like the doctor measures the pressure of the blood flow
9 in your body.

10 And then the doctor measures your pulse rate. And
11 this is something we also do because the pulse rate is a
12 function of the resistance of the arteries and vein and
13 capillary network within your body and also of the
14 adequacy of that pump, your heart.

15 So we measure pressure and resistance. And when we
16 know pressure and resistance, we know the air flow; just
17 like the doctor after he measures your pulse rate and
18 your blood pressure knows whether you are getting
19 adequate proper flow of blood through your body. They're
20 one and the same; there's no difference.

21 And it's the same with electricity and water. These
22 are all basic hydraulic principles and well established
23 over the centuries.

24 COMMISSIONER Okay.

25 MR. MERRICK Let me ask --

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1 A. Nothing magical.

2 Q. I just have one other question so that we can
3 understand the background to your report. Looking --
4 what reduction in cross-sectional areas did you make for
5 the equipment? Where do we find that on your analysis?

6 A. All right, let's start again on page 24; it's a nice
7 place to start. If you will look in -- where I have "A.
8 Area."

9 Q. Yeah.

10 A. All right. Let us go to page 25, towards the top.

11 Q. Yes.

12 A. Here we have "Southwest 2-A face. No known mining.
13 There was no evidence of equipment in Southwest 2-A
14 face." We have a 20 horsepower auxiliary fan and that
15 fan is in Branch 6381. And if look at the areas there,
16 we see the cross-sectional areas, that's column one, two,
17 three, four, five, six, seven, would be that column.
18 One, two, three, four, five, six, seven. You see the
19 area, for example, of the auxiliary fan is 1.8 square
20 feet.

21 Q. Yes.

22 A. This is taken directly off of the fan manufacturer's
23 information. We obtained -- we have com -- we have all
24 the data for all these fans and that is right off the fan
25 manufacturer's data. Now let's drop down to the

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1 Southwest 2 --

2 Q. Just let me stay there for a second. Go up one line
3 to your, whatever you called it, "Branch 6463," you've
4 got 270 there.

5 A. Yes, sir.

6 Q. Is that representing the cross-sectional area in
7 that particular location?

8 A. That is the cross-sectional, average cross-sectional
9 area -- of course, we didn't go in there --

10 Q. No.

11 A. -- but based on information from Trevor Eagles'
12 ventilation surveys, if you'll excuse the use of that
13 phrase; that's what they show on the map. But if you
14 look at the base data that he used for reporting the
15 quantities of air shown on the bi-weekly reports of
16 ventilation for the Westray Mine, you will find the
17 cross-sectional areas that he measured and those are the
18 ones we used as our base.

19 Q. And as I understand it, you were -- you accepted his
20 cross-sectional areas as measured on the ventilation
21 surveys except where you have reduced them because of
22 equipment in the passageways?

23 A. That is correct, sir.

24 Q. But when we look at the line that we've got here,
25 the only thing that's puzzling me is that at Branch 6463

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1 we're showing a cross-sectional area of 270. At Branch
2 6381, if it's to show the equivalent, it looks like it's
3 only showing a cross-sectional area of 1.8.

4 A. Yes, sir.

5 Q. I thought 1.8 was merely to be subtracted from 270?

6 A. No. The air flowing out of the Southwest 2-A face
7 has to go through the duct, and only through the duct.
8 The air flows into the Southwest 2-A face through the
9 entire cross-sectional area less the duct.

10 Q. So that --

11 A. It comes out through a 30-inch duct to a fan. The
12 controlling mechanism for that flow is the fan, and one
13 must use the cross-sectional area of that fan since it
14 controls the flow.

15 Q. So that in the area of the fan, all you are
16 measuring is the cross-sectional area of the fan
17 itself --

18 A. That is correct.

19 Q. -- not of the passageway which surrounds it?

20 A. That is right. We are just following the flow of
21 the air. Just like we flowed the -- followed the flow of
22 your blood, one would look at the cross-sectional area of
23 that artery or vein. And if you have cholesterol in
24 there or other things blocking it, then we have to
25 subtract that from the cross-sectional area, and if you

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1 get too much you don't get any air flow.

2 Q. Let me just test --

3 A. Or blood flow.

4 Q. -- my understanding of what you've just told me by
5 taking you down to the last section on that page that's
6 entitled "Assumed methane outflow from Southwest 1 into
7 Southwest 2 faces." And again, dealing just with the
8 cross-sectional area column, we're seeing numbers like 15
9 and 36. In Branch 7656 you're showing a cross-sectional
10 area 15. What is that representing?

11 A. Let me locate that branch, if you will, sir?

12 Q. Yes.

13 A. And you can locate those branches -- the from and
14 to. You will see that you have a diagram, what I call a
15 "ventilation schematic." This is a typical one, this is
16 this -- and here I have one for Southwest 1.

17 Q. What page number?

18 A. This is page 21. Excuse me, I forgot to think of
19 turning the pages. And you will see numbers on there,
20 and those are the junction numbers that you will find as
21 the from -- under the columns "from and to." And that's
22 as the air goes from junction -- for example, the one
23 you're giving reference to, junctions -- was that --

24 Q. 7 6 --

25 A. -- 7656?

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- 1 Q. 5 6, yes.
- 2 A. All right. Junction --
- 3 Q. The first line.
- 4 A. -- 665 to junction 765.
- 5 Q. I follow you.
- 6 A. And if you will look on page 21 and find 665. And
- 7 you will find 665 in the -- if you look at the letter "S"
- 8 in the word "Southwest 1" --
- 9 Q. Yes.
- 10 A. -- the first "S".
- 11 Q. Yeah.
- 12 A. And look right below "S" --
- 13 Q. Yes.
- 14 A. -- you will see "665."
- 15 Q. Yes.
- 16 A. And if you follow that line straight, up you will --
- 17 this is my simulated layer. This whole area here
- 18 represents that if a layer was formed in the Southwest 1
- 19 -- one has -- I am asking the question: if a layer could
- 20 form, what happens? So to ask the question if a layer
- 21 could form, what I am modelling here and what you're
- 22 looking at is the beginning stage of the model of a
- 23 layer. And you are taking the leg up from junction 665
- 24 which is in the general body atmosphere --
- 25 Q. So what you're --

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1 A. -- and it is going up to the roof to a junction that
2 I'm calling 765. And I am saying that that has -- that
3 is like a pipe that has a cross-sectional area that I
4 selected. And the reason we selected that number is
5 after many trials trying to form a layer, since I
6 insisted on forming a layer, Your Honour; that was the
7 whole intent. If a layer could form -- therefore, to ask
8 the question what happens if a layer could form, I had to
9 form a layer. And to form a layer required that cross-
10 sectional area.

11 Q. So --

12 A. If you had a smaller cross-sectional area, you would
13 not have formed a layer initiating at that junction. And
14 that was critical to the question.

15 Q. Am I correct in assuming then that your cross-
16 sectional area of 15 is the area that you presumed would
17 be occupied by the layer?

18 A. No, not be occupied by the layer; this is a column
19 of gas or -- atmosphere, excuse me. This is a column of
20 atmosphere connecting junction 665, which is in the
21 general body, with a point at the roof, which is called
22 765. It's like a post. It's like a leg on your chair.
23 To support that layer, I had to have something to support
24 that layer for the model to -- otherwise, it wouldn't
25 hold on the model.

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1 Q. All right, as long as I understand what those
2 numbers refer to, I can do my analysis later.

3 A. That is based strictly on a trial and error -- we
4 started with a cross-sectional area of one, which is a
5 very common area that we use when we don't know what
6 we're talking about. And when we run through there, we
7 could not form a layer, so then we multiplied one, and we
8 said "Let's try a cross-sectional area of five." This is
9 actually what we did, and we couldn't form a layer. So we
10 then went to ten. Again, we couldn't form a layer. I
11 like to work in even numbers, Your Honour. And then we
12 went to fifteen. And lo and behold, at fifteen, we
13 formed a layer and said aha, now we can continue with the
14 study.

15 Q. Who did the analysis for you?

16 A. Well, we all worked together. I told -- now a young
17 lady by the name of Margie Sarkis put the stuff into the
18 computer.

19 Q. Was this in-house staff that you were using?

20 A. My staff, yes, sir, people I called in for the job.

21 Q. This is the people that you call in on as "as need"
22 basis?

23 A. Yes, sir.

24 Q. All right, I follow you.

25 COMMISSIONER I don't. The chart on page 21 shows --

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1 I've got the 665, but then there's a straight line goes
2 up the paper?

3 A. Yes, sir.

4 COMMISSIONER And then turns to the left?

5 A. Yes, sir.

6 COMMISSIONER And that goes over to 765?

7 A. Yes, sir, that's at the roof.

8 COMMISSIONER The roof of what?

9 A. The roof above -- assume your point 665 --

10 COMMISSIONER Put it on the chart, would you, please?

11 A. My pleasure, sir. We'll assume that this is the
12 cross-sectional area. This is a point in the Southwest A
13 Road, immediately inbye. Let us do it three dimensional
14 then.

15 MR. MERRICK Actually, Mr. Mitchell, we have a chart of
16 the blow-up of the Southwest district that's a
17 ventilation one. If you can identify on there, if you're
18 able to, exactly what location this was taken at.

19 A. Yes, sir. 665 is immediately --

20 Q. The upper one, I think, is your Southwest district.

21 A. Yeah, I couldn't find it there -- is immediately
22 inbye this chocks plywood covered. The thing that says
23 "Chocks plywood covered." If you take Road 2 N-A and
24 take what they call C-1 Road, you have a blue arrow and
25 you have what they call "chocks plywood covered."

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1 Q. Yeah.

2 A. And let me draw that. It would be easier for me, if
3 you don't mind.

4 Q. Okay.

5 COMMISSIONER Perhaps too you could mark the plan with
6 the location so we'll know. Don't talk with your mouth
7 full either.

8 A. All right, this would be Southwest -- I always
9 called it A Road.

10 MR. MERRICK Well, let's call it what it's called on
11 the chart.

12 A. Yes, that's what I'm going to do, C-1 Road, okay?

13 COMMISSIONER Would you put a circle around that on the
14 plan?

15 A. On this plan here, sir?

16 COMMISSIONER Yeah. Just mark it with a black circle,
17 yeah, okay, fine, thank you. Watch your step there now.

18 A. Thank you. Okay, here is that -- what they call
19 "chocks plywood covered." Let me write that -- "chocks
20 plywood covered."

21 COMMISSIONER At the stoppping?

22 A. And here is 765 right at the roof and we should have
23 gone back farther. Let's put 665 back here. In other
24 words, it's behind that area because I have to assume
25 that if a layer is going to form, it is going to form in

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1 the area called Southwest 1 behind the ventilated --
2 inbye the point where ventilation is disrupted because
3 the velocities flowing in Southwest C-1 Road and in the
4 No. 3 Crosscut and out are too high to -- and will
5 militate against layering. Therefore, the only place
6 within this zone that layering might occur would be in
7 the area inbye these two plywood covered things.

8 MR. MERRICK "Things." All right, we'll come back to
9 that choice of words in a few minutes because I'd be
10 interested to have your views on those. And I'm going to
11 come back later, if we need to, to talk in more detail on
12 your actual ventilation analysis, but I'm not sure that
13 it's particularly critical to the essence of what we want
14 to talk about today. But thank you for that explanation,
15 and we may come back to visit it.

16 Let me just take you on with your report if I can
17 for a few moments. What did I do with it? I'm back on
18 that letter of July 2, 1992, and I just want to touch on
19 some of the opinions that you formed and expressed in
20 that letter.

21 Down toward the bottom of the first page, you say
22 that "Methane liberation rates of 200 cubic feet per
23 minute were assumed in the far extents of the six upper
24 entries in Southwest 1." Am I correct in assuming from
25 that statement that that is your presumed amount of make

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1 of methane in the abandoned Southwest 1 workings?

2 A. As I say on the next page, if you'll allow me, sir,
3 I assume that without basis. There is no basis, in fact,
4 for this mine for that assumption. However, in my
5 judgment, 200 cubic feet per minute at each of those
6 locations is not unrealistic for similar conditions in
7 mines in the United States.

8 Q. All right, and --

9 A. Not only similar conditions -- in mines having the
10 same typical gas content. Just not all mines, but I
11 chose particularly mines such as in the Pittsburgh coal
12 seam which has a gas content comparable to that at the
13 Westray Mine.

14 Q. Let me ask you this, was that 200 cubic feet per
15 minute being generated in the whole of the old workings,
16 as I look on that ventilation scheme, or are you saying
17 that that was the amount being generated in each of the
18 working headings?

19 A. That was being the -- if you'll excuse me, I'd like
20 to -- '92, it's been three years since I looked at that,
21 and I'll give you an answer exactly in a second.

22 Q. Okay.

23 A. I'll go to the raw data. Sorry to take that time.
24 Here we are. Here we are right here, Southwest 1, I have
25 that in one, two, three, four, five, six. I have 200 cfm

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1 in each of those six points.

2 Q. And when we say "each of the six points," I assume
3 as we look on that ventilation chart which is 45, tab 11,
4 it's the one of the Southwest district. You're talking
5 about each of the ends of what we've been calling the
6 finger pillars?

7 A. Yes, sir. In the upper reaches. This area is like
8 a bottle. The opening in the bottle, the bottom of the
9 bottle is down here where these chocks, plywood covered,
10 are located. And this area rises to your left. As you
11 go to your left, you go uphill, and methane rises and
12 therefore the methane would collect -- begin to collect
13 in the upper reaches of the Southwest 1 area. And that
14 would be specifically --

15 COMMISSIONER Up here?

16 A. All of these openings for A-3 Road would be the
17 first road to get filled with methane. Then A-2 Road,
18 and it would work its way down.

19 COMMISSIONER Is that because A-1 was the highest?

20 A. A-3 is the highest, Your Honour.

21 COMMISSIONER Okay, I'm sorry, so the one at the far
22 left is the highest, so therefore the methane would
23 accumulate there first?

24 A. Yes, sir.

25 COMMISSIONER Okay, thank you.

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1 A. And so I have six points up here where I put methane
2 at 200 cubic feet per minute, so I had a total emission
3 of methane of 1200 cubic feet per minute in the Southwest
4 1.

5 MR. MERRICK And that would be the amount of emission
6 of methane just from the old workings as they stood?

7 A. That's correct, sir.

8 Q. Now let me ask you this, because you say in your
9 letter "Methane liberation rates of 200 cubic feet per
10 minute were assumed in the far extents of the six upper
11 entries." Would that deal with methane that might have
12 been made in the outbye sections of the old workings as
13 well?

14 A. Yes, sir, that would rise to those areas. It would
15 want to go up there, and so I put it up there.

16 Q. I realize that that's where it may go. What I'm
17 trying to figure out is if you're saying that that's
18 where it would have been made through the whole of each
19 of those entries?

20 A. Oh, no, sir. You have to look at the total surface
21 area of Southwest 1 and you will have a relatively
22 uniform -- because the stresses within Southwest 1, even
23 though they're variable throughout that Southwest 1, one
24 has to assume a relatively uniform stress field, and
25 therefore you have the same pressures on the coal, the

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1 same fracturing of the coal, and therefore the same rates
2 of methane liberation per square foot of surface -- of
3 exposed coal surface.

4 Q. All right, let me ask my question this way. If we
5 total up your 200 cubic feet per minute for each of the
6 six headings, if you will, you've said that that comes to
7 1200 cubic feet per minute in total. Are you telling us
8 that in your premise then that the whole of that
9 Southwest district would have been making 1200 cubic feet
10 per minute of methane?

11 A. If you will go, sir, to the Loveridge Mine in
12 northwestern West Virginia, I happen to have an area not
13 too unlike this. And it happens to be an area where we
14 know the methane liberation rate per square foot of
15 exposed coal surface. That's the rate I used here. And
16 I just took -- we took the -- I didn't do it -- Steve
17 Harrison did it. We took the total surface area of the
18 ribs in this area.

19 Q. Now did you take the total surface area of the ribs
20 in only those six headings or did you take the total
21 surface of the ribs in all of the old workings?

22 A. In all of Southwest 1. And that came to 1200 --
23 actually it came to -- if I remember correctly, it came
24 to eleven forty something, and as I said before, I like
25 even numbers, so we went to 1200, the next highest number

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1 up. And we put that 1200 in six discreet points because
2 it's easier to do it that way. It turns out to be the
3 same whether you do it per square foot -- that's a more
4 complicated mathematical approach. This is a much easier
5 one. You'll get the same results.

6 Q. And this would be the cubic feet per minute make of
7 gas in there without taking into account barometric
8 pressure drops or anything of that nature?

9 A. Yes, the barometric pressure drop -- the changes in
10 barometric pressure will not have a major effect on
11 methane emission rates from the strata. The effects of
12 barometric pressure on movement of gases is of the free
13 gas, not of the gas occluded within the pores and
14 structure of the coal.

15 COMMISSIONER I was under the impression that a drop in
16 the barometric pressure would cause less pressure on the
17 ribs and therefore with less pressure the gas would
18 release more freely. That's not right?

19 A. It's not wrong, sir, but the effect is minuscule.
20 We know that. It's basically minuscule compared to the
21 effect of the drop or change in barometric pressure on
22 the movement of the gas that is already liberated coming
23 out. It's a drop of water in the ocean.

24 COMMISSIONER Okay, okay.

25 MR. MERRICK Let me move on to the next point in your

MR. MITCHELL, EXAM. BY MR. MERRICK

1 letter that I'm interested in. This is over on page 2
2 now under the heading "General Mine Ventilation." You
3 compared, as I understand what you've said here, and tell
4 me if I've got it wrong or right. You compared then the
5 results of your computer network analysis of ventilation
6 with the actual air flow measurements that were conducted
7 by Westray in that May 8 ventilation survey and you found
8 a close enough correlation that you commented on it and
9 said that it reflected well on the actual ventilation
10 survey measurements that were made. Have I got that
11 right?

12 A. Yes, sir.

13 Q. All right, so that this high degree of correlation
14 gave you confidence that the May 8 ventilation survey
15 that was conducted was -- appeared to have been done
16 accurately?

17 A. I wouldn't say "accurately." Let us use, if you'll
18 excuse me, sir, I don't mean to correct you. I would
19 rather say "adequately."

20 Q. Well --

21 A. It is difficult to get good quantity readings. You
22 don't get quantity readings. Mr. Eagles or whoever did
23 the work would measure the velocity and he would
24 determine the cross-sectional area, and from that he
25 would report the quantity, which is nothing more than the

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1 cross-sectional area times the velocity that he measured.
2 These numbers -- and this is difficult to do in a place
3 having the height that we had in the entries that they
4 had in Westray. I was rather impressed. I don't find as
5 good a correlation -- now you might question how good one
6 -- for example, we calculate 163,000 where he reports
7 190,000. I consider for him to have gotten that quantity
8 was quite good where he took it.

9 Q. In short, your analysis of the ventilation survey
10 conducted on May 8 was a commendable one. I'm using your
11 word here. "The survey should be commended."

12 A. Yes.

13 Q. All right, now --

14 A. I would say, excuse -- I don't mean to interrupt,
15 but I would say on the basis of that, I would have
16 reasonable reliance on data from his prior reports. That
17 is what is intended by that statement.

18 Q. Thank you, and that was basically, I think, the
19 point I was interested in. Let me take you now over to
20 the next page. You're referring now to your network
21 analysis. You refer to the fact that for that analysis
22 there was an assumed methane layer issuing from the
23 brattices across the junctions of Southwest 1. And what
24 we're talking about there is that your analysis assumed
25 that there was the escape of a methane layer from the old

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1 Southwest 1 workings into the ventilation flow of the
2 mine?

3 A. Yes, sir, I believe we discussed that in rather long
4 detail before, explaining why we used an area of 15
5 square feet, because we were saying we've got to form a
6 layer for this analysis. The idea -- what we're asking
7 is if a layer existed, could it persist and what would
8 happen with it. That's all we were trying to do.

9 Q. And I take it from your analysis that if a layer did
10 exist, your analysis has indicated that it would persist.

11 A. Yes, sir.

12 Q. And by persisting, we're meaning that it would have
13 come out of the old Southwest workings and then gone up
14 the Southwest 2-B Road into the headings that they were
15 working at the time of the explosion?

16 A. That is correct. That is what this shows.

17 Q. Let me take you on as well. I understand from the
18 set 2 paragraph that's in the middle of that third page
19 that you also calculated the difference that might have
20 been made in the methane flow by a barometric pressure
21 drop, is that correct?

22 A. That is correct, a drop of one-half inch mercury
23 which is the same drop as occurred between noon time,
24 approximately noon time on the 8th of May and five
25 something in the morning of the 9th of May.

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1 Q. All right, I was going to ask you whether that was
2 in fact representing the pressure drop that in fact
3 occurred. And it is.

4 A. As it was reported at Caribou Point.

5 Q. Yes, all right, thank you. Now let me go down and
6 take a look, I guess, at your conclusions at the bottom
7 of page 3. You say "The chance for an ignitable
8 concentration to form was greater -- " and then you put
9 three scenarios "-- in A than in any other Southwest 2
10 face." What are you referring to by "A"?

11 A. If you will look at the Southwest 2 area, A is the
12 entry to the farthest left. A is the extension.

13 Q. You're in the north now. Go up.

14 A. Oh, excuse me, here we are here. I'll try to use
15 this laser, if I can figure out how to --

16 Q. I'll ask this, is it an extension of what is known
17 as the Southwest 2-A Road where my laser is pointing
18 right there?

19 A. Yes, sir, that is A Road.

20 Q. I follow you. So you say that that is the area
21 where there would have been the most likely chance for an
22 ignitable concentration with these flows that you've
23 analyzed?

24 A. Yes, sir.

25 Q. But you also say -- sorry, you go on to say in No. 2

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1 that the chance for an ignitable concentration to form
2 was greater if it had flowed as a layer rather than
3 general leakage, and I understand that. And you also go
4 on to say that the chance for an ignitable concentration
5 to form was greater following a major depression in
6 barometric pressure. The major depression that you're
7 talking about, is that the one that you calculated?

8 A. That is correct, sir, a half inch -- we also did
9 work at a quarter inch because the drop in barometric
10 pressure is not precipitous. It did not drop a half inch
11 immediately. So we look at one-eighth inch, quarter
12 inch, three-eighths inch and then half inch.

13 Q. If I can change your wording around a little bit, am
14 I correct in stating it this way that the depression in
15 barometric pressure that actually occurred, which is what
16 you've used, increase the chances for an ignitable
17 concentration up in that area of the mine?

18 A. That is correct, sir; that's what this says.

19 Q. I follow you. Now let's go over to page 4 and you
20 go on with more of your conclusions and these are ones
21 that I am quite interested in.

22 COMMISSIONER Just one point of clarification before we
23 go on, Mr. Mitchell. When you say, I think, "an
24 ignitable layer of methane," now does that presuppose
25 that in the layering there's going to be non-combustible

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1 concentrations also?

2 A. The layers, sir, is defined as having its top close
3 to 100 percent methane immediately adjacent to the roof
4 and decreasing as you go down the depth of the layer to
5 the general body atmosphere at the bottom of the layer.

6 COMMISSIONER And that would be -- presumably part of
7 that would be non-inflammable, and you'd go up a little
8 bit further and you'd be in the flammable mixture and up
9 to, again, into the higher concentrations?

10 A. That is -- you're correct, sir.

11 COMMISSIONER Okay, that's consistent with the other. I
12 just wanted to get that out, thank you.

13 A. The critical question there is how thick is the
14 ignitable portion of that layer.

15 COMMISSIONER Okay, yeah.

16 MR. MERRICK Let me take you to page 4, your conclusion
17 under letter "b" at the top of the page. You say "The
18 flow of intake air into Southwest 2 entries and faces did
19 not travel free from Southwest 1, a place likely to
20 contaminate the air, a violation of Rule 70(6)." And
21 when you say "did not travel free from Southwest 1,
22 you're talking about the ventilation circuit that was set
23 up subsequent to the abandonment of old Southwest 1,
24 which is shown on our ventilation survey where it comes
25 in the C-1 road, comes across by the stoppings and then

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1 goes up into the Southwest 2 area. And your point there
2 is that intake air was allowed to travel past the
3 entrances to the old workings, is that correct?

4 A. That is correct, sir.

5 Q. And that is a violation of our legislation?

6 A. As I understand it. And that's only as I understand
7 it, in my opinion, how I understand the regulation.

8 Q. But you also have considerable experience and I take
9 it that that would be a violation of good practice?

10 A. Yes, it would be.

11 Q. And it would be a violation of just straight common
12 sense?

13 A. That I can't agree with because I never really knew
14 what common sense was. I've seen it too often and --

15 Q. All right, let me put it to you this way, as a lay
16 person, I picked up on that fairly quickly, not more than
17 four or five weeks into this hearing. It's something
18 that's pretty obvious.

19 A. It should be. If you'll excuse me, I shouldn't
20 editorialize, but I will. It's typically a result of
21 expediency, expediency. That's why I don't like to
22 correlate it with common or uncommon or any other kind of
23 sense.

24 Q. I want you to elaborate on that because we've heard
25 a lot of evidence about the situation that management was

MR. MITCHELL, EXAM. BY MR. MERRICK

1 facing in those particular days and whether expediency
2 became a major factor here. Can you elaborate as to
3 whether -- on that for me?

4 A. The only alternative to doing what they did was to
5 build an overcast in No. 9, across No. 1 North Main and
6 No. 9 crosscut, and make what is shown on this map as B
7 Road into the intake and take air up Southwest 2-A Road
8 and make that an intake, whereas right now it's a return.

9 Q. In effect, reverse their circuit?

10 A. Reverse the air, and then remove the overcast at the
11 junction of No. 1 entry and No. 10 crosscut.

12 Q. So that in effect you would have taken the intake
13 air against the arrows up into the Southwest district and
14 then out the C-1 Road in an overcast across the No. 10
15 crosscut and then out the main return?

16 A. That is the --

17 COMMISSIONER It would pass the offensive area in
18 reverse, drawing the methane accumulation out rather than
19 putting it in?

20 A. If there were an accumulation. That is the problem,
21 sir.

22 MR. MERRICK Well, would that not have been the proper
23 way to do it any time that you are running your air past
24 old workings?

25 A. That is the way I would want to see it done.

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1 Q. How difficult a job would it have been to have done
2 it right?

3 A. It is a major job. The construction of the overcast
4 alone, you're talking in terms of not less -- I would say
5 we're talking in terms of not less than a week of down
6 time and perhaps -- and this is just a wild guess, not
7 knowing your costs here, but I'm looking at costs in the
8 neighbourhood of \$60,000 to \$80,000.

9 Q. \$60,000 to \$80,000 compared to the risk that you'd
10 run otherwise?

11 A. Well, that's the question -- is there a risk? You
12 must remember I kept saying that my analysis is based on
13 demanding of the program that we form a layer. There is
14 no evidence to support belief that a layer did flow from
15 Southwest 1 and there is the evidence supports belief
16 that the outflow of methane from Southwest 1 was not
17 great enough to contaminate the air. In other words, the
18 general body atmosphere in the intake air flowing into
19 Southwest 2 was -- contained less a quarter percent
20 methane.

21 Q. And we'll come in a minute to your final opinion
22 that you have rendered in writing that no layer did form
23 coming out of Southwest 1, but that doesn't change the
24 fact that Southwest 1 was producing methane, does it?

25 A. I feel certain Southwest 1 produced methane.

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1 Q. And that that methane was, in fact, going into the
2 circulation system of the mine?

3 A. A portion of that methane would enter -- would enter
4 the ventilating current flowing through the Southwest
5 area of the mine.

6 Q. The only question that we want to elaborate on later
7 today is whether or not it was entering it as a layer or
8 in the general body, was being mixed into the general
9 body?

10 A. That is correct. That is what I subsequently
11 studied.

12 Q. And the rate of emission of methane into the air-
13 circulation system of the mine would also depend, I take
14 it, on variances caused by barometric pressure drops or
15 rises, is that right?

16 A. That is correct, sir.

17 Q. And it would also depend on whether or not there was
18 a possibility of a pulse of methane coming out of that
19 district because of a fall or some other event occurring
20 in there?

21 A. That is correct, sir.

22 Q. So that we may well get occasions when the amount of
23 methane coming out of the Southwest 1 district would be
24 increased?

25 A. Yes.

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1 Q. Yeah, I follow that. Let me ask you quickly about
2 the stoppings that you've seen described. And you've
3 read the descriptions of those stoppings? Your facial
4 expression leads me to connect it with your reference a
5 few minutes ago to them as things. What is your comment
6 as to the adequacy of the things that were put in there?

7 A. Well, one must ask the question which I did ask,
8 what was their purpose? I would not dignify them with
9 the name "stopping." They are definitely not seals. So
10 if they're not stoppings and they're not seals, I didn't
11 know anything else to call them but "things."

12 In my discussions with Westray people my impression
13 was that they're sole intent was to be a barricade. Now
14 I -- to me a barricade is a couple of pieces of board on
15 which one hangs a danger sign which basically says "thou
16 shalt not enter." And the area, in turn, is ventilated.
17 Given the methane concentrations that I put in my
18 program, I could well visualize that it would not be
19 desirable to put a couple of pieces of board across the
20 opening with a -- hang a danger sign on and say -- that
21 tells us not to enter. I would say that they figured
22 that this might militate against major outflows of
23 methane. And if you follow the shift reports, they were
24 observing these closely.

25 Q. How effective would these things be in preventing

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1 the outflow of methane from the old workings into the
2 main body of air? You may have answered that already,
3 I'm just making sure.

4 COMMISSIONER They're not stoppings and they're not
5 seals.

6 MR. MERRICK Do I take it it's -- they were about -- as
7 far as stopping the outflow of gas, they were about as
8 equivalent as putting a couple of boards across with a
9 sign?

10 A. No, they would reduce the outflow. That's what they
11 would do.

12 Q. But how effectively, for the purposes of safe
13 mining?

14 A. Well, the name of the game, as I read your
15 regulations, is what is the methane concentration in the
16 general body atmosphere.

17 And as long as, and I hate to say it, this same
18 concept, the same mental concept applies in every country
19 in the world with the exception of Great Britain. Even
20 though they tend to keep talking about general body
21 atmospheres, they've gone a little beyond that. But we
22 in the United States, I do quite a bit of work in
23 Australia, I've done a lot of work in Alberta, Columbia,
24 China, I've been in mines throughout Europe, and as long
25 as the air in the general body atmosphere, the intake

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1 air, contains less than a quarter percent methane, nobody
2 fusses.

3 Q. You don't adhere to that view, I take it?

4 A. No, sir. But I am a minority and so I could very
5 well be wrong. Let's say -- it's not that I don't adhere
6 to it; very few people agree with me.

7 Q. All right. Break point.

8 COMMISSIONER We will break for 15 minutes, thank you.

9 INQUIRY RECESSED (TIME: 11:06 a.m.)

10 INQUIRY RESUMED (TIME: 11:24 a.m.)

11 COMMISSIONER Mr. Merrick?

12 MR. MERRICK Thank you. Mr. Mitchell, just before I
13 pick up where we left off, let me go back just for a
14 second and make sure we've got the source of some of your
15 data. You referred to the barometric pressure drop that
16 you took into account in your analysis and the effect
17 that it might have on the potential for ignition. Can
18 you tell me where in your analysis that data -- the
19 amount of the pressure drop is found?

20 A. Yes, sir. In the original data base which you don't
21 have -- I do have it, should you wish to have it, in the
22 -- one of the commands to the computer program is the
23 density of the air and the barometric pressure. What
24 this does is it examines what the fan, the pump, the
25 heart is capable of doing. And it adjusts the fan

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1 characteristic curve for that -- the curve for the --
2 showing the fan -- the characteristics for the fan, the
3 pump for this mine. So the only place I can show you
4 where that is is in the original base.

5 However, what you can do, should you wish, is on the
6 printout look where -- at the -- towards the end of the
7 data where we show the -- what the fan produces and you
8 will see something that says -- let's go to a page and be
9 specific for once. Why don't we try page --

10 Q. This is Exhibit 122, tab 5?

11 A. Yes, sir.

12 Q. All right.

13 A. 122 - 5. And if you will go to page 28.

14 Q. Yeah.

15 A. Now you will see there, towards the bottom, fans and
16 you see two fans. One -- the only fan you're really
17 interested in is 9923, and you will see air flow and a
18 fan pressure.

19 Q. Yeah.

20 A. And beneath this you will see these characteristics
21 were stored for Fan 9923. And it describes these
22 characteristics. These characteristics are directly from
23 the Joy Manufacturing data. And these are specific to a
24 fan at standard conditions. The program will then modify
25 the fan characteristics for the density and barometric

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1 pressure that you assign. Let us see if this is shown in
2 another printout. Let's see, that would be Number 2,
3 wouldn't it.

4 Q. Well, let me be specific in my question. Can you
5 show me -- can you give me the barometric pressure drop
6 data that you were operating from based on the Caribou
7 Point readings, or if you don't have it readily available
8 to you --

9 A. Oh, I --

10 Q. -- this morning --

11 A. I do, sir.

12 Q. All right. If you can just give me that, that's all
13 I'm looking for.

14 A. All right. Westray 5, here it is here. Blow fan,
15 there I used a barometric pressure, a barometric pressure
16 at standard which would be 29.92 inches of mercury, as
17 based on the information from Caribou Point except that's
18 given in another -- you have to change it. And for that
19 I get a density of the air of .075 as my base density.

20 Now what I do for the next run which is Westray 6
21 and if you will look at page 44, you will see the effects
22 of that. The program has been modified since we ran this
23 in '92 and if we had the -- ran this again, it would
24 print out the fan characteristics on page 44. But you
25 will see that the fan pressure here is 2.337, whereas on

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1 the previous one the fan pressure was 2.339. You will
2 see a difference in air flow, not very much but it has an
3 effect. And if you go through all of the data, you will
4 see that effect, particularly in the Southwest 1 area.

5 Q. All right. What I'm after though I think is more --
6 is simpler than that. What was the barometric pressure
7 readings from Caribou Point on which you based your
8 changes?

9 A. Excuse me, sir, I have that right here. Barometric
10 pressure data, tab 21 in my book.

11 Q. Yeah.

12 A. And I have here a chart, sea level pressure at
13 Caribou Point, 3 May to 16 May, 1992, times in local
14 daylight saving; units, millibars. And it gives it by
15 hour of the day.

16 Q. All right. And you took the time period from when
17 to when?

18 A. Well, for the base model, I took the period May 8th
19 when things were basically -- we had a very -- relatively
20 constant barometric pressure in the morning hours of May
21 8th.

22 Q. All right. What morning, just so that I can pick
23 the point on your chart?

24 A. If I look at this chart here, it tells me the data I
25 would use for May 8th was 1,032 millibars.

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1 Q. All right. Would it be possible for you to leave
2 those charts with the Commission, at least copies of
3 them? We don't --

4 A. It would be my pleasure, sir.

5 Q. All right. But we will do that at the noon break.
6 I just want to be able to make sure I've got the right
7 data base.

8 COMMISSIONER That's 1,032 millibars, that would be at
9 noon on the 8th, would it?

10 A. That was basically from the period of 3:00 in the
11 morning of the 8th through 10:00 o'clock on the morning
12 of the 8th. After that, that barometric pressure started
13 to drop.

14 COMMISSIONER Okay. So what was the -- okay, as a
15 comparison, what would it have been roughly at 5:00 -- at
16 5 a.m. on the 9th?

17 A. At 5 a.m. on the 9th of May, sir, it was 1,023
18 millibars.

19 MR. MERRICK Is that the comparison you used for the
20 drop that you used?

21 A. Yes, sir.

22 Q. Thank you. Now let me pick up where we left off on
23 your letter of July the 2nd. We were talking about the
24 old Southwest workings and the stoppings that were in
25 there. I'm not sure if you were present for all of Dr.

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1 Salamon's evidence but he described a report that he had
2 been involved in for the South African Government that
3 would have put -- that recommended putting more
4 responsibility on the owners of a mine for the safe
5 operation of a mine. And he described it to me, I don't
6 believe in evidence, but I will repeat it for you,
7 whereas a result of those initiatives some companies are
8 setting up safety advisory boards to advise their boards,
9 boards of directors, on safety issues in the mine. And
10 one of the functions of these committees would to be
11 actually inspect the mine, take a look at it and advise
12 the board of directors on matters that they should be
13 alerted on to safety, seeing as responsibility was being
14 put on their shoulders. Had you been on such a safety
15 committee, reporting to the Board of Directors of
16 Westray, and had you had an opportunity to inspect this
17 mine subsequent to the closure of the old Southwest
18 workings and the creation of those stoppings, sorry, the
19 plywood barriers, what would you have reported to the
20 Board of Directors?

21 A. I would have reported that, in fact, immediately
22 following my observation -- but you've got to realize,
23 sir, that my observation and my attitude are based on 50
24 years of experience in this area, sir. And seeing this
25 as a problem so many times and being intimately involved

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1 in writing regulations to prohibit just this. So I'm
2 only stating this because my objectivity, therefore, is
3 suspect. I'm not looking at this -- I'm looking at this
4 from a point of view that -- of experience and knowledge
5 that would not be likely to be held by the person,
6 assuming that I was the person hired to do this job for
7 the company.

8 Q. I'm just asking what you would do?

9 A. I just wanted to caveat that. What I would do is,
10 immediately on observing this, I would state to the mine
11 manager that we have an imminent danger and all persons
12 must be withdrawn until the situation is corrected.

13 Q. You would have pulled people out of the mine,
14 looking at those barriers?

15 A. I would have -- not -- I don't have the authority to
16 pull people out of the mine, but I would, as a safety man
17 and working for that company, I would tell the mine
18 manager he had an imminent danger, he was required to
19 withdraw people. I would then notify, if the mine
20 operation was such that my superior was not the mine
21 manager, but rather my superior was a level beyond the
22 mine manger, and this is very critical. This is an area
23 we in the United States are having quite a bit of effort
24 on, where we are removing safety directors from
25 responsibility to the local management. We have

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1 succeeded in that. We have achieved these things. You
2 report to upper management and they, in turn, do their
3 thing.

4 Q. All right.

5 A. They fire me or they tell the guy to withdraw.

6 Q. Assuming now that you are a reasonably typical mine
7 manager and putting yourself in the position of somebody
8 who would have had the experience, training, and who
9 should have had the safety frame of mind that a
10 reasonably prudent mine manager would have, what would
11 you do if you were a mine manager and saw that condition?

12 A. I can't really answer that since my whole working
13 career since 1951 has been devoted to safety rather than
14 production. So I'm safety oriented, not production
15 oriented. I have no -- I mean, I have no interest in the
16 financial aspects of mining whatsoever, so I'm not -- I
17 don't believe I'm capable of answering that question
18 objectively. Mine would strictly be a biased opinion
19 and, of course, that biased opinion would be the same --
20 to do the same action that I said this so-called safety
21 man should do, but, in all likelihood, would not.

22 COMMISSIONER Mr. Mitchell, all of your evidence here is
23 predicated upon the fact that you are an expert in the
24 field of coal mining. You have lengthy experience in
25 that field and your opinions are based upon that

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1 experience. If they are biased because of that
2 experience, I don't think it's necessary to say this. I
3 mean that's part of your expertise, isn't it?

4 A. Thank you, sir.

5 COMMISSIONER Yeah.

6 A. I -- it scares me a little to try to wear the other
7 man's moccasins when they don't fit too good.

8 MR. MERRICK You've seen a lot of mines, you've seen a
9 lot of things done in mines, you've seen a lot of how
10 management runs mines. You are able, from those
11 observations, to sort of draw your assessment as to what
12 is the typical standard of safety in a mine, whether or
13 not that's something you would do, but you've seen, I
14 guess, what would be a criteria for a reasonably safe
15 mine operation just from your observations of what's
16 done. Based on all of that experience, would you say
17 that what you saw in those stoppages in the old Southwest
18 workings was what you would typically expect to see of a
19 reasonably-run mine or would it be a breach of the proper
20 -- of what a reasonably-run mine should do?

21 A. Without question, in my mind, it's a breach.

22 Q. Okay. Let me go back to your letter on page 4 and
23 go to the (c) paragraph at the top of that page where you
24 say, "Intake air into the Southwest 2-A face was returned
25 from the Southwest 2-B and 1 faces, a violation of Rule

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1 70(6)." Can you just, so that I make sure I have
2 understood that, show me on the plan that we've got what
3 you're talking about?

4 A. I know how to use this now, I believe.

5 Q. Be careful. It's a radiation weapon.

6 A. All right. Southwest 2-1 Road and its left-hand
7 connection are taking intake air from the entrance of
8 that road and pulling this intake air properly up into
9 the Southwest 2-1 Road and exhausting it through the duct
10 which is this black line to a fan that is shown as a 40-
11 horsepower fan. At the same time, intake air is flowing
12 up Southwest 2-B Road extension into Southwest 2-3 Road
13 and also to this point where there's a roof bolter and
14 that is properly done. And this is fresh intake air and
15 it is being removed from these roads through these black
16 ducts which represent -- black lines which represent
17 ventilation duct and that is coming to a fan marked as a
18 20-horsepower auxiliary fan. The outflow of air entering
19 Southwest 2-A Road extension, that is the point on this
20 draw -- exhibit -- I don't see an exhibit number -- oh,
21 there it is.

22 Q. It's 45, tab 11.

23 A. Whatever it be, this is the intersection inbye the
24 intersection of what is shown as Southwest 2, No. 2
25 Crosscut. They show a dozer. And there the return air

MR. MITCHELL, EXAM. BY MR. MERRICK

1 from those two prior roads, the 1 Road and I assume that
2 -- I call this the "B" Road with the 3 Road extension,
3 the return air from those roads are entering into the
4 Southwest 2-A Road which is a contaminated inflow of air
5 and this, in turn, is being exhausted from that road
6 through another duct to another 20-horsepower fan.

7 Q. And that is what is not to be done under Nova Scotia
8 legislation, as you read it?

9 A. As I understand -- as I read the Nova Scotia
10 regulations, yes.

11 Q. And leaving aside the regulations, that is not a
12 safe ventilation practice?

13 A. It's not a safe ventilation practice, given the
14 conditions in Southwest 2.

15 Q. And -- all right.

16 A. In my opinion.

17 Q. In your opinion. And, again, that's something that
18 once you -- I see where the -- once an observer sees
19 where the fans are located and recognizes that they are
20 exhausting fans, it's something that's readily apparent?

21 A. They're readily apparent, but contrary to what other
22 people testify to, in my judgement the ones in No. 1 Road
23 and B Road and 3 Road are correct and the preferred
24 method of ventilation. It is only the one in A Road that
25 I find a problem with.

MR. MITCHELL, EXAM. BY MR. MERRICK

1 Q. And that's one you just described?

2 A. Yes, sir.

3 Q. But, again, that's obvious? The problem is obvious?

4 A. When one does a study such as I did, it's obvious.
5 Whether it would be obvious to an observer, I think you
6 used the word -- I believe you used the word "observer,"
7 I'm not quite sure it would be so obvious. As I caveated
8 my statement, for the conditions as they existed in
9 Southwest 2, and those are conditions only -- that we
10 only can define after the explosion. They were not
11 defined by anyone prior to the explosion.

12 Q. Well, Mr. Mitchell, is it not true that anybody with
13 any rudimentary idea of mine ventilation would realize
14 that the air being pulled up into the extension of
15 Southwest 2-A Road face would be air that has already
16 been vented from the previous working faces?

17 A. Yes, sir. But the only time that this constitutes a
18 serious hazard is if we have major bodies of methane in
19 either Southwest 2-1 Road or Southwest 2-B Road
20 extension. That is where it constituted a problem. It
21 is a situation that would not represent, in my judgment,
22 a hazard to the safety -- health and safety of the
23 miners, had it not been for what I believe to be
24 extensive, thick layers of methane in the Southwest 2-1
25 and B Road extension.

MR. MITCHELL, EXAM. BY MR. MERRICK

1 Q. Leaving aside the existence of layers in those areas
2 that you believe existed, it still would not be proper
3 ventilation?

4 A. No, I disagree with you, sir. In the absence of
5 layers of the thickness that I believe existed and with
6 the absence of the recirculation problem that they had
7 with this continuous miner operation, had those
8 inadequacies not existed, then this method of ventilation
9 as shown on this drawing would meet the -- would be
10 considered to be acceptable by most people engaged in
11 mine inspection and ventilation analysis.

12 Q. All right, I'll come back to that in a minute. Let
13 me finish off some of the questions raised by your
14 comments. You've said that you have -- do have concerns
15 about the ventilation of the Southwest 2-A Road in these
16 conditions. Your letter says that you do not have those
17 concerns about the recirculation aspect, I guess, of the
18 ventilation in the Southwest 2-1 Road and the heading
19 where the bolter was.

20 A. At the time, in July of 1992 when we did this work,
21 we were not -- we did not know that the dust scrubber on
22 the continuous miner was a 7,500 CFM scrubber.

23 Q. All right.

24 A. That scrubber created a new and different hazard
25 than was considered in this letter report of July 1992.

MR. MITCHELL, EXAM. BY MR. MERRICK

1 Q. Let me -- and I'll come to that in just a minute. I
2 just want to finish off the wording that you had in
3 clause (d) of your letter on page 4. You said "The
4 Southwest 2 faces could not be deemed dangerous in
5 accordance with Rule 71 provided the methane monitor on
6 the continuous miner was operating." If that methane
7 monitor on the continuous miner was not operating or was
8 not operating accurately --

9 A. Yeah, I did use the word "properly."

10 Q. Yes. Then I take it your opinion might well change
11 as to the appropriateness of that ventilation?

12 A. And when you add the dust scrubber to it, it changes
13 the story and picture totally.

14 Q. All right. Just leaving the dust scrubber out of it
15 for a moment because when you wrote this letter on July
16 2nd, you didn't know about the dust scrubber.

17 A. That's correct.

18 Q. If somebody had suggested to you that the methane
19 monitor on the continuous miner in that heading was not
20 working properly, then your opinion may well have been
21 different?

22 A. That's what -- why I state what I did, yes.

23 Q. All right.

24 A. My opinion would be different.

25 Q. Okay.

MR. MITCHELL, EXAM. BY MR. MERRICK

1 A. By the way, I did make an investigation into that
2 methane monitor and it was confusing, what I learned, and
3 that's why I phrased this the way did.

4 Q. You had made it at the time you wrote this letter?

5 A. Prior to writing this letter I did make a, what I
6 thought a best effort to know what the condition of that
7 methane monitor was and how it operated, because, in my
8 judgment and experience, this is the miners' first
9 defence against ignition of methane at the working face.

10 Q. In your view then this is a very critical piece of
11 machinery? Equipment?

12 A. It is critical to the safe operation of a continuous
13 min -- safe, continuous mining operation.

14 Q. Your emphasis on that as being a critical piece of
15 equipment, is that something that should be shared by any
16 reasonably prudent miner with some years of experience?

17 A. I would hope so.

18 Q. That's nothing that would be unique to you purely
19 because of your own specialty and expertise; this is
20 something a reasonably prudent miner should be sensitive
21 to?

22 A. I would say in the United States coal mines, I
23 wouldn't even require reasonably prudent; it is something
24 for every person in that mine to respect and be concerned
25 with. And they, as a general rule, are.

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1 Q. Okay.

2 A. They've learned to be. Initially, in the '70s, it
3 was questionable, and we are now -- our miners are
4 getting rather smart about these methane monitors.

5 Q. And it goes without saying that those responsible
6 for the equipment, as you go up through the ranks of
7 management, would certainly also be expected to have that
8 sensitivity and knowledge of the importance of that
9 equipment?

10 A. They'd better.

11 Q. Yeah. I've made a note to come back and ask you
12 about your investigations of the monitor and also to get
13 your elaboration on your views on the scrubber.

14 Just before I do, I want to go back and deal with
15 your comment about your opinion that there were layers in
16 that particular heading. I'm talking now about Southwest
17 2-1 Road going up to the continuous miner. Tell me about
18 your opinion and how you formed that opinion.

19 A. My -- I -- my opinion that we had a thick,
20 relatively thick, whatever that thickness is, I -- don't
21 ask me, but I'm -- it's not a thin layer of no
22 consequence, but a relatively thick layer -- I -- let me
23 go -- I hope I don't bore you with this one.

24 I have been intimately involved in methane layer
25 studies since 1963 when, in Great Britain I had the

MR. MITCHELL, EXAM. BY MR. MERRICK

1 honour to meet Dr. Leach and Dr. Bakke and also Dr.
2 Phillips, who were at that time doing the basic research
3 into methane layering. It is something we always knew
4 about but no one really understood until we saw their
5 work. Dieter Fisher in Germany, Dr. Fisher at the
6 Versuchsteke in Germany was doing parallel work and
7 Dieter is a close friend of mine. And as I said I've
8 been following this work ever since 1963 because we had
9 suspected a number of explosions were associated with
10 what we believed were layers, and we did not understand
11 them or much about them, and Leech and Bakke and Fisher
12 were starting to -- and Phillips, those four gentlemen,
13 were starting to give us some insights.

14 Well, on that basis I'm -- I have found in my
15 studies, mine explosions, that we have definitely traced
16 to layers, that to have the reactions of the six
17 gentlemen who lost their lives in Southwest 2-1 Road,
18 their actions, and I spoke with the coroner, I looked at
19 the photographs, I read his reports. He and I spent many
20 long hours together because, if you'll excuse the
21 expression, in mine explosion investigations dead men do
22 tell tales, and we learn more from them than from
23 anything else, in my judgment. And these gentlemen told
24 us a lot. And they told us of slow developing flame that
25 they observed, and we observed radiation burns on their

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1 bodies rather than direct burns. So we -- and we know
2 that their deaths were the result of carbon monoxide
3 poisoning.

4 Therefore, this is like -- I hope it doesn't make
5 anybody angry, this is like laying on a beach too long,
6 too hot a sun, you get a devil of a sunburn; that's what
7 these gentlemen got. They all had very severe sunburns.
8 This would come from extremely slow moving flame and the
9 body of methane would have to be relatively thick; it
10 would not be something in the neighbourhood of one, two
11 or three inches. We're looking at something that might
12 have been a foot or more in thickness. This would
13 explain the slowness of the flame propagation through
14 this layer, because the speed of flame propagation is a
15 function of what the Judge was talking about. We have a
16 zone in there that's combustible, and we have a zone
17 beneath that zone that is too lean in methane to ignite
18 and above it, too rich in methane to burn.

19 But as you develop heat you create a turbulence, a
20 mixture -- mixing, within this layer where you suck air
21 in from underneath that it mixes with this too rich zone
22 above this. So you create, as you propagate, a thicker,
23 wider, combustible band. It is, please excuse me, it's
24 the difference between -- I've never been in one, but
25 I've -- you go to these places where you get suntans and

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1 they have these quartz rods in there and -- think in
2 terms of here you have one quartz rod, now you put in --
3 go to one with two quartz rods, three quartz rods, and
4 you keep adding these rods of -- these heat sources,
5 these burning sources, and that's what we see in
6 Southwest 1 Road for a period of time that might have
7 lasted -- we -- I believe lasted at least 20 seconds and
8 could have lasted longer. The only way you could do that
9 is with a layer, as I described it. I hope I --

10 COMMISSIONER And this is the road that -- at which the
11 -- at the working face, was this continuous miner, is it?

12 A. And the bolter, sir. The two of them.

13 COMMISSIONER Okay, the bolter was off --

14 A. And the shuttle car.

15 COMMISSIONER The bolter was off on the left-hander
16 though?

17 A. Yes, sir.

18 COMMISSIONER Okay. Fine. Okay, thank you. There were
19 -- I think there were six bodies on that roadway?

20 A. Yes, sir.

21 COMMISSIONER Yeah, okay. Thank you.

22 MR. MERRICK Mr. Mitchell, on what do you base your
23 estimate that the amount of time that the flame would
24 have burned. I take it burned before it propagated into
25 an explosion is what you mean?

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1 A. Well, burning -- yes. Yes, sir.

2 Q. On what do you base the fact that there may have
3 been this 20 second lead-up before the explosion itself
4 took place?

5 A. I base this on the actions -- may I go to my files
6 so I can --

7 Q. Yes.

8 A. -- get the names of the gentlemen --

9 Q. Yes.

10 A. -- who were specific to that. See where that report
11 is. Index 13. Oh dear.

12 COMMISSIONER What is he looking for, the coroner's
13 report?

14 MR. MERRICK No, he's looking for -- I'm not sure.
15 What are you looking for, Mr. Mitchell? We may have
16 copies of it as well.

17 A. It's my report -- here it is. I took it out. I
18 have it right here. I'll give you the name of it. It's
19 my report to -- a letter report, it's not really a
20 report. All right, dated 21 September, 1992.

21 Q. Yes, we should have that --

22 A. Reference -- Westray Mine ignition source re:
23 analysis.

24 Q. Yes. That's in the Exhibit 48 and it would be the -
25 - there are two letters dated September 21st in that

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1 exhibit and it would be the second of them; in fact, the
2 last letter that's in that exhibit booklet.

3 A. Yes, the one that says "Re: Westray Mine ignition
4 source, a re-analysis."

5 Q. All right. Now what I'm going to put up just below
6 the Southwest District blow-up is a map that is in
7 exhibit -- that shows the location of the bodies in both
8 the Southwest District and in the North Mains. That is
9 exhibit number --

10 MS. MACDONALD 72.

11 MR. MERRICK -- 72. Is that of assistance to you as
12 well?

13 A. Yes, that's the same as the map that I used in my
14 analysis except mine just concentrates on that area. I
15 have a blown up map if the Court would like -- Inquiry
16 would like, showing the position of the bodies, whether
17 they're -- which way they're lying on the ground and that
18 type of thing which is quite critical to analysis.

19 Q. You take us through your data that is the basis of
20 your conclusion of a layer having formed in that heading
21 because I think that's an important opinion. And if we
22 differ at all from our data, we'll ask for a copy of
23 yours. Take us through your data.

24 A. All right. On page 1 --

25 Q. This is of your report of September 21st?

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1 A. Yes, the one -- ignition source re-analysis.

2 Q. Yes, got it.

3 A. On the bottom, if you will bear with me, I have the
4 subheading "Fuel."

5 Q. Yes.

6 A. And on the -- this starts "The fact that the
7 probable fuel --" I tried to, in that paragraph, give
8 reason to believe that methane was involved. As you
9 recall, we defined a fire, one of the legs of a fire
10 being fuel.

11 Q. Yeah. You can --

12 A. So to have an explosion or have a fire, we have to
13 have a fuel.

14 Q. You can speed up a little bit; I think I can follow
15 you.

16 A. Okay, good. I didn't really know how well your
17 memory is. So I looked and I defined yes, there is a
18 reason to believe methane existed. Now on the top of
19 page 2, I asked the question: could coal dust have been a
20 fuel? And a very short paragraph, and I can spend hours
21 on why, and I can -- in that paragraph, basically just go
22 along with me if you will, I say: "Coal dust is an
23 improbable fuel at least to start the ignition." And
24 we're only talking about the ignition --

25 Q. Yes.

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1 A. -- not the explosion. All right. This -- and I say
2 in the last sentence, "Flame growth was relatively slow
3 as evidenced by the facts that: (a) Eugene Johnson and
4 Trevor Jahn, while at their machines, attempted to don
5 filter self-rescuers." Now this takes not less -- to do
6 what they did, observing where they threw portions of
7 their filter self-rescuer, based on RCMP photographs, and
8 based on my discussions with the mine rescue teams that
9 went in that area, and observing what they showed on the
10 coroner's report, that took no fewer than 10 seconds.
11 That is the least time it takes to do what Trevor Jahn
12 and Eugene Johnson tried to do while at the shuttle car
13 and continuous mining machine.

14 Now Robert Fraser -- (b) says, "Robert Fraser
15 succeeded in donning his filter self-rescuer." This, I
16 say, takes an experie -- takes me, and I'm experienced,
17 and I've used it in actual fires, and this takes at least
18 30 seconds to don. And other people, I would think a
19 person not experienced, it might take more. But, again,
20 as you know, I always look on the conservative side, and
21 I knocked the 10 seconds off and I said this is 20
22 seconds at the -- here we are again within our 20-second
23 period.

24 Adonis Dollimont, who was the roof bolter in the
25 left -- I say right-hand face, it's the left-hand face;

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1 it depends which way I'm facing, and Myles Gillis, who
2 was the mechanic or electrician that came into the
3 section just a few minutes before the explosion, both
4 attempted to don their filter self-rescuers. So again,
5 we have people who are taking -- removing -- I hope the
6 Court under -- knows what a filter self-rescuer is;
7 please, if they don't --

8 Q. No, we've had a demonstration in fact, Mr. Mitchell,
9 so you can --

10 A. Okay, good then I don't have to demonstrate that.
11 What we're talking about takes time and what we're
12 looking at is just these actions alone, it's going to
13 take 10 to 30 seconds and I'd like to say, to be
14 conservative, at least 20 seconds.

15 Additionally, they travel almost 300 feet, some of
16 them, from where they began their escape. Now we know
17 this to be a fact based on the RCMP photographs showing,
18 for example, Eugene Johnson's location at the shuttle
19 car, seeing the portion of the self-rescuer that he had
20 to remove there to activate the self-rescuer. And we
21 locate his body -- and we've got people who have moved as
22 far as 300 feet. Well, this takes time. And so we're
23 looking at relatively long time in an explosion scenario.

24 When you think, if I have a body, a homogeneous
25 mixture of methane and air within the ignitable

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1 concentration of methane, that the time from ignition to
2 the development of a propagating pressure, not the flame,
3 the flame is well advanced, but to the pressure itself,
4 that you're talking in terms of maybe microseconds to
5 milliseconds, depending on the strength of igniting
6 source. We're not talking milliseconds or microseconds
7 here; we're not talking nanoseconds, which it could well
8 be. So, therefore, this had to be a layer. It is the
9 only thing.

10 And I have written -- I did some research back in
11 '67, and I have in my files here a paper I presented at
12 Sheffield, at the Safety and Mines Research Establishment
13 about the ignition of layers and the time it takes for
14 their propagation and such. We have a good strong handle
15 on this, so we know that the initial incident was a slow
16 burning flame.

17 Q. And that must have been a layer?

18 A. That can only be a layer.

19 COMMISSIONER Now that was referred to by one of the
20 other witnesses, and I don't recall which one, Mr.
21 Merrick, but as the propagation of a rolling flame, does
22 that --

23 A. It depends. You might call it a rolling flame; it
24 depends on the thickness of the body of methane.

25 COMMISSIONER I assumed that "rolling" in that context

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1 meant that the flame drew out methane from the thicker
2 layer, caused the ignition and sort of caused a, sort of
3 an atmospheric change in pressure which would have caused
4 that sort of a reaction.

5 A. If you'll excuse me -- my contradiction, sir: it's
6 not the pulling out of the methane, it's the pulling in
7 of air --

8 COMMISSIONER Air, okay. Yeah, yeah.

9 A. -- from beneath and mixing with the methane. And
10 what people will observe in the slow motion films of this
11 phenomenon they will see what looks like a rolling action
12 and the amount of rolling is strictly a function of the
13 thickness of the layer. Because as you can see, the
14 thinner the layer, the less rolling you need to pull this
15 methane up into the upper region.

16 COMMISSIONER Okay.

17 MR. MERRICK So that -- just to bring it to a sharp
18 point, I take it then that your estimation as to how long
19 this flame would have been burning before it propagated
20 into an explosion is based on your assessment of the time
21 it would take for these miners to have gone through the
22 actions which they apparently went through?

23 A. That is correct because we know they died from
24 carbon monoxide poisoning and not from the trauma
25 associated with explosion-induced pressures. And,

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1 therefore, their deaths occurred, in all likelihood,
2 before this explosion developed major forces.

3 Q. Were you able to observe any indications that the
4 bodies found in that particular roadway or any of the
5 equipment found in that roadway had been subject to the
6 major forces of an explosion?

7 A. My observation of the RCMP photographs and from my
8 discussions with the mine rescue teams that went up into
9 that area, and I spoke with about six team members, I
10 believe, was that there was no evidence of important
11 forces exerted on equipment or people within that area.

12 Q. So that would it be more accurate to say that your
13 estimation of time period is how long it took these
14 miners to die rather than how long it may have taken the
15 flame to burn to the point where it propagated to an
16 explosion?

17 A. Yes, in my belief, the explosion occurred subsequent
18 to death.

19 Q. And what -- on what --

20 A. Or subsequent to their collapse, let's rephrase
21 that.

22 Q. And on what do you base that?

23 A. Mainly on the fact that where some of them were
24 located, there should have been pressure effects. One
25 gentleman, in fact the most-forward gentleman, was in a

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1 crouch position and he was -- had to be in that position
2 before the pressures developed otherwise he -- I would
3 expect to have seen more flash burns on him.

4 Q. Except that we have no evidence of heavy -- of
5 pressure going back up into that heading?

6 A. Pressures are exerted -- the pressures would tend to
7 go up into that heading, but that heading being a dead-
8 end, they would only go in a certain distance. It's like
9 trying to put water into a pipe that's capped on one end
10 and you can just push the water so far and then you have
11 a resistance of the air inbye that point. This is what
12 you're seeing there.

13 But the heat effects -- I said if we didn't see
14 flash burns on him, heat will be extended in all
15 directions. And if he had been standing at the time when
16 coal dust got involved in this explosion, we would have
17 found the body -- we would have seen signs of being
18 peppered by the coal dust, and we would have seen signs
19 of flash burns rather than radiation burns, based on
20 observing bodies in other explosions.

21 Q. You have said on several occasions that, in your
22 opinion, the layer of methane in this heading was several
23 feet thick. Do you base that solely on the fact that
24 there must have been a time -- the time lapse that must
25 have occurred or do you have any other information on

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1 which you base that?

2 A. Just on the time lapse that I believe occurred in
3 conjunction, particularly with the work of Phillips and
4 Dieter Fisher which have looked at this question of
5 thickness of methane layer.

6 Q. If your opinion is correct and there was a thick
7 methane layer, one as thick as you assume, several feet
8 thick, does that allow you to draw any conclusions as to
9 how long that layer may have been in existence?

10 A. It allows me to speculate with reasonable -- a
11 little better than speculate, I wouldn't be saying it's -
12 - I wouldn't categorize it even as an assumption,
13 somewhere between a speculation and an assumption.
14 Because one of the critical questions that we don't have
15 and know nothing about, is did the bulk of the methane
16 come from fissures or did it come from liberation from
17 the coal strata which would be a relatively uniform --

18 Fissure liberation then depends -- typically, we
19 will get thicker layers from fissure type liberation than
20 we do from strata liberation, uniform strata liberation,
21 and then the thickness of the layer, how long it takes to
22 develop, will be a function of how many fissures we have.

23 Q. Would it be fair to conclude, from what you're
24 telling me, if I understand it correctly, is that the
25 thickness of the layer can be explained by either the

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1 quantity being released, and that depends on whether it's
2 fissures or strata, have I got it right so far?

3 A. So far.

4 Q. Would it be to also say that the thickness of that
5 layer might also be as a result of build-up over a period
6 of time?

7 A. Yes, sir, it is a function of build-up. I believe
8 your question was how long and what I was trying to say
9 is I can't tell you how long but I can speculate. It
10 would be somewhere speculating and assumption and I'm
11 saying --

12 Q. A "spessumption."

13 A. Thank you. If you will accept a presumption, we're
14 talking several days maybe.

15 Q. Several days?

16 A. Or longer.

17 Q. Maybe even longer? All right, thank you.

18 A. Excuse me, let me add on to caveat that. For the
19 reported methane content of this coal which has been
20 reported as -- at maximizing somewhere above 6, 6 1/2
21 centimeters per square -- grams per centimeters square,
22 which is the same as cubic meters per tonne.

23 Q. All right.

24 A. And that is not unlike the coals we find in north --
25 Pittsburg No. 8 coal seam in northern West Virginia.

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1 COMMISSIONER I'm just trying to reconcile the time, the
2 20 seconds that you're postulating as the length of time
3 for this --

4 A. For the minimum, sir.

5 COMMISSIONER The minimum of 20 seconds, what if the --
6 what if the miners had notice of the fire immediately and
7 started their escape manoeuvre while trying to put on
8 their rescuer? Would that have decreased the time, in
9 your estimation?

10 A. Yes, sir, I believe I -- I may not have said it
11 clearly. On page 2 of my letter I say, "Eugene Johnson
12 and Trevor Jahn stood there and attempted to put on their
13 filter self-rescuers. We do have, however, Adonis
14 Dollimont and Myles Gillis who might have been doing what
15 you're suggesting, trying to put on their self-rescuers
16 while travelling, while moving. In fact, I feel certain
17 Mr. -- the probabilities are Mr. Dollimont was attempting
18 to put his rescuer on as he was leaving the left-hand
19 bolter split.

20 COMMISSIONER When you say "stood there," stood where?

21 A. Mr. Johnson, for example, was standing to the right
22 of the continuous miner. If you will look at -- excuse
23 me, at the shuttle car, if you will look at the seat that
24 -- in the shuttle car where -- which would be Mr.
25 Johnson's normal --

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1 COMMISSIONER Position, okay.

2 A. -- work position, you will find on the ground
3 immediately to the right of that seat portions of his
4 filter self-rescuer.

5 COMMISSIONER Okay, fine.

6 A. The portions that we must remove prior to donning --

7 COMMISSIONER That would be the clips and the cap?

8 A. The clip and the case, that's correct, sir.

9 COMMISSIONER Okay. Yeah, okay. Fair enough, thank you
10 very much. The reason I'm pursuing this, I think, Mr.
11 Merrick, you can correct me if my impression is wrong,
12 but Mr. Brookes, in his -- and I asked him the same
13 question. He postulated at that time that the -- that
14 the total time lapse from the start of the fire,
15 including the propagation into the coal dust explosion
16 and including the final emission out the portal would
17 have been about 20 seconds. Do you think that's a little
18 bit low in time estimate?

19 A. Once the explosion developed --

20 COMMISSIONER There would be no time, would there?

21 A. -- then we're talking in terms of milliseconds --

22 COMMISSIONER Okay.

23 A. -- for -- because you have a pressure wave --

24 COMMISSIONER Yeah.

25 A. -- and I may talk about the speed of this pressure

MR. MITCHELL, EXAM. BY MR. MERRICK

1 wave, but the least this pressure wave is travelling is
2 at the shock wave and this shock wave will form 100 or
3 200 feet from the point where the coal dust is raised
4 into suspension.

5 COMMISSIONER Okay. Yeah.

6 A. And then it will travel at a speed of not less than
7 the speed of sound. I have reason to believe that this
8 explosion, when it entered the North Mains, was
9 reinforced by reflection waves and travelled at a speed
10 greater than the speed of sound, so we're talking about
11 perhaps several thousand feet per second. So once we get
12 over this initial hurtle of the original ignition,
13 everything from there on is phew! [witness making sound]

14 COMMISSIONER So that estimate is not unreasonable then?

15 A. Not unreasonable.

16 COMMISSIONER Okay, thank you.

17 A. You can argue 20 seconds, 30 seconds, maybe a
18 minute --

19 COMMISSIONER Yeah. No, no.

20 A. -- but we're all talking the same ballpark.

21 COMMISSIONER Yeah, okay. Thank you.

22 MR. MERRICK In your opinion, Mr. Mitchell, this
23 methane layer that would have existed in the Southwest 2-
24 1 Road, and you say in your letter or letters that it
25 would have existed in each of the faces, I guess, in the

MR. MITCHELL, EXAM. BY MR. MERRICK

1 Southwest district, would that have included the end of
2 Southwest 2-A Road?

3 A. Yes, sir.

4 Q. And, again, several feet thick in each of those
5 locations?

6 A. Yes, sir. In fact, that correlates with my computer
7 model which indicates that the thickest layer would be in
8 A Road in the Southwest area.

9 Q. And based on your review, what is your opinion as to
10 how far back out the Southwest district that layer may
11 have existed? If we can look at the ventilation blow-up
12 of the Southwest district, if we have a methane layer
13 that's several feet thick in each of the four headings or
14 working faces, where else might that layer have existed?
15 How far would its perimeters be?

16 A. When I incorporated the belt conveyors and the
17 critical -- and the arches into this analysis, I would
18 say that we can state with reasonable certainty that the
19 layers persisted the length of the 1 Road and the B Road
20 extension and A Road extension. It might have extended
21 into Southwest 2 as far outbye into the intake as the
22 Stamler and it could very readily have extended a short
23 distance into the Southwest 2-A Road return.

24 Q. So that if we look at the blow-up of the ventilation
25 diagram, if we look at going out the Southwest 2-B Road,

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1 you're saying the gas layer may have come down to where
2 the Stamler was?

3 A. Yes, sir.

4 Q. And that is just outbye the -- what's marked on that
5 diagram as a "feeder breaker?"

6 A. Well, that's what a Stamler is.

7 Q. All right, sorry.

8 A. I'm sorry.

9 Q. You're right. I was thinking of electrical
10 equipment. And approximately an equivalent position on
11 the Southwest 2-A Road out?

12 A. I would say I would not have been astonished to find
13 a layer around the electrical switchgear.

14 Q. All right. And the layer -- if the layer did exist
15 down Southwest 2-B Road and Southwest 2-A Road for
16 whatever distance it did, what would have been the source
17 of that layer?

18 A. The source of the layer would be a combination of
19 the normal liberation, the normal expected liberation of
20 methane from the pores and fractures within the coal
21 strata as they are exposed to -- on the surface -- as
22 their surface area is exposed. And based on post-
23 explosion interview information, we learn that they did
24 experience, and this is not to be unexpected, they did
25 experience feeders, gas feeders, in the Southwest

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1 district. And I would tend to believe the types of
2 layers that were formed at least in 1 Road were more
3 representative of feeders than they would of -- that
4 feeders would be the primary source for the layer rather
5 than surface emission.

6 Q. And if there was, in fact, layering occurring outbye
7 of Southwest 2-1 Road and going down Southwest 2-B Road,
8 the gas that would be layering in Southwest 2-B Road,
9 might it be going up into Southwest 2-1 Road?

10 A. Not likely.

11 Q. Well, if we had one contiguous layer coming out and
12 around that intersection, would it not be flowing up-
13 slope?

14 A. It would but you're reaching a zone that No. 2
15 Crosscut -- or is it No. 3 Crosscut? Excuse me.

16 Q. You're looking at 2 Crosscut, I think.

17 COMMISSIONER Southwest 2, 2 Crosscut.

18 A. Yes, Southwest 2, 2 Crosscut, excuse me. At No. 2
19 Crosscut you're reaching a zone of high turbulence, and
20 that is why I said I do not -- and also the entrance to
21 Southwest 2-1 Road you have arches. And, for that
22 reason, I had, when I reconsidered everything, I had
23 difficulty extending a layer from Southwest 2-B Road up
24 into 1 Road as a preferential flow path. I would say
25 that would be a secondary flow path, not the primary flow

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1 path. There would be some flow of methane into that
2 zone, but the probabilities are the great bulk of that
3 layer, had it existed, would have been to blow into the
4 No. 2 Crosscut and then into Southwest 2-A Road.

5 MR. MERRICK So have I got you correctly that any layer
6 coming up Southwest 2-B Road from wherever it was
7 forming, the bulk of it would come around to the right on
8 2 Crosscut, although some of it may well have gone up
9 into Southwest 1 -- Southwest 2-1 Road?

10 A. That is correct. But, basically, the bottom -- the
11 synopsis of this is whatever layering existed, assuming
12 there was layering in Southwest 2-1 Road, the probable
13 source of most of that methane was Southwest 2 Road --
14 Southwest 2-1 Road itself, not other sources.

15 B. But your hypothesis does account for the fact that
16 some may have been coming, not the majority of it, but
17 some of it, from Southwest 2-B Road?

18 A. Yes, that potential exists.

19 Q. All right.

20 COMMISSIONER Now the arch that you mention at the cross
21 -- at the Southwest 2, 2 Crosscut, as a deterrent, that
22 would sort of act as a dam to stop the flow of the heavy
23 layer?

24 A. Because the arches, how they're locate --

25 COMMISSIONER They intrude --

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1 A. -- the configuration --

2 COMMISSIONER They intrude into the crosscut?

3 A. That is correct, sir.

4 COMMISSIONER Yeah.

5 A. And the way we militate against layering, the most
6 effective way to militate against layering where you have
7 inadequate velocity, is to hang some things -- tin cans,
8 pieces of belting, the arch. Those types of things
9 militate -- create a turbulence because the air, as it
10 strikes that, tends to roll and that generates a
11 turbulence and turbulence is the enemy of methane layers.

12 COMMISSIONER Okay, yeah. I see. Okay, thank you.

13 MR. MERRICK Now let's add the other component to what
14 you consider was happening up in that Southwest 2-1 Road
15 and that's the scrubber -- not -- yes, the scrubber on
16 the continuous miner. What impact do you believe that
17 had on the gas situation in there?

18 A. Its impact on layering was to militate against
19 layering at that point. However, we had a mismatch
20 between the scrubber capacity and the air quantity
21 delivered by the auxiliary ventilation once they
22 developed that left-hand split. Prior to developing that
23 left-hand split, they had in excess of 10,000 cubic feet
24 of air per minute in the Southwest 2-1 Road. The
25 scrubber had a volume capacity of 7500 cubic feet per

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1 minutes. This scrubber design demands that it take into
2 its guts 7500 cubic feet of air of atmosphere per minute.
3 If you deliver less atmosphere or less air to the intake
4 of this scrubber than the scrubber demands, then what
5 happens is you get recirculation, and you are now
6 recirculating the atmosphere being developed at the
7 working face. And depending on how well they clean their
8 filters, and we'll leave that subject unspoken to, there
9 is a chance not only to increase the methane
10 concentration -- well, no -- the methane concentration in
11 the working face will increase and the dust concentration
12 might also increase.

13 Q. Let me make sure I've got it because we've had
14 evidence on this already and I think I understood it.

15 A. Oh, I'm sorry.

16 Q. At the face of the exhaust tube, if it's only
17 pulling in from the end of the heading 5,000 cubic feet
18 per minute, and the scrubber is circulating 7500 cubic
19 feet per minute, then the difference between the two, the
20 scrubber will be taking from that general atmosphere and
21 preventing it from going back out the tube. It will
22 recirculate it?

23 A. That is correct.

24 Q. And the scrubber was to scrub dust, not methane, so
25 that whatever methane is in that air that is being

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1 recirculated goes back into the air again?

2 A. Yes, sir.

3 Q. All right.

4 A. Which causes an increase in the methane
5 concentration in the immediate face area.

6 Q. Should a reasonably prudent mine foreman or mine
7 manager be able to know that they've got that problem?

8 A. Yes. I don't know if you need to put in the concept
9 of reasonably prudent.

10 Q. All right. Because it seems apparent to a lawyer
11 and if it's apparent to a lawyer, it's got to be pretty
12 apparent. Is that a break point?

13 COMMISSIONER It's an appropriate time to be self-
14 deprecating, I suppose. Thank you. We will recess until
15 1:30.

16 A. Thank you, sir.

17 INQUIRY RECESSED (TIME: 12:31 p.m.)

18 INQUIRY RESUMED (TIME: 1:32 p.m.)

19 COMMISSIONER Mr. Merrick?

20 MR. MERRICK Thank you. Mr. Mitchell, before the break
21 we were talking about the layer of methane that you have
22 opinioned was in the heading that we are concerned with.
23 Just give me a second while I get this out. And that it
24 was several feet thick and that, as well, it was your
25 opinion that it may have been in existence for several

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1 days. This would be a layer that would be detectable, I
2 assume, if somebody were to check for gas in that area of
3 the ceiling -- or roof?

4 A. Depending on the thickness. If the layer was thick
5 -- as thick as I opined, one would have found the methane
6 concentration in the upper regions of that No. 1 Road to
7 be higher, much higher, than the methane concentrations
8 in the general body. There are some -- unfortunately,
9 some problems with the detection of layers and those
10 problems increase with decrease in thickness of layer.

11 Q. Yes, but talking about the layer that, in your
12 opinion, may have existed there. One several feet thick,
13 between whatever the highest concentration would be down
14 to the general body air concentration. I'm assuming that
15 that would -- that higher level of methane, higher than
16 the general body of air, if it was -- if that zone of
17 concentration or methane was several feet thick, that
18 should have been detectable?

19 A. Yes, sir.

20 Q. And if anybody had been using the detection
21 equipment that was available at Westray, such as hand
22 held methanometers, with or without probes, as long as
23 they had held it in that vicinity, they would have had
24 their reading?

25 A. They would have read a concentration higher than

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1 they would have read in their general -- typical, general
2 body ready.

3 Q. And I would assume that depending on where in that
4 layer several feet thick they took their reading, they
5 might get a very high concentration?

6 A. They might indeed.

7 Q. All right. Assuming for the moment there was such a
8 layer in existence for a matter of days in a working
9 heading, was that not something that should have been
10 detected?

11 A. It is something that we have agreed could have been
12 detected. I am not familiar with the practises of your
13 foremen and where they take their general body atmosphere
14 reading. In the States, typically, they will take them
15 12 or -- between 12 to 15 inches beneath the roof to
16 constitute what we call a "legal sample."

17 I have seen people in Alberta and in Australia where
18 they take the general body reading around face level. Or
19 eye level, I should say. I was not able, I attempted,
20 but I did not get a consensus of where the people at
21 Westray took that reading. I did not want to rely on the
22 information I was given.

23 Q. But the potential for layering occurring in this
24 mine, and, in particular, in this particular area of the
25 mine, would be an obvious one?

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1 A. Obvious to someone who did an analysis for layering.
2 This, unfortunately, is an uncommon practice the world
3 over.

4 Q. But for someone with reasonable knowledge of mining,
5 and I'm not talking here about a mining consultant, but
6 perhaps in the mining industry, knowing that you're
7 bringing your intake air past the old workings, up a belt
8 line, into a working face, would it not be a fair
9 assumption that they should have been aware that there
10 was a potential of layering?

11 A. In my opinion the people at Westray had no
12 understanding of layering.

13 Q. That's a separate issue. My question is: Should you
14 have had a reason -- a reasonable mining person, should
15 they have had an awareness that layering was potential in
16 these circumstances?

17 A. In the United States, it's the only place I can talk
18 to otherwise, my answer is reason -- people you would
19 think reasonably competent have no appreciation for
20 layering until we've had an ignition, an explosion or a
21 burning layer. We've had layers burn for distances of
22 3,400 feet, and all of a sudden they get educated. It's
23 a sad -- sad commentary, I'm sorry.

24 Q. I'm not sure that it has answered my question
25 whether they --

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1 A. Oh I'm sorry.

2 Q. I appreciate your saying that a lot of people don't,
3 all I'm asking you -- and you may have answered it: would
4 a reasonably competent mining person involved in mining,
5 in the operation of a mine, should they have been aware
6 of the potential that layering could be occurring under
7 these circumstances?

8 A. Well, I'm sorry, I thought I answered that question
9 by giving the analogy of the United States where we have
10 certified people and we have a lot of courses given to
11 these people by the Mine Safety and Health Administration
12 and they don't teach layering. And as I said before,
13 they only seem to learn after we've had our problem. And
14 it's amazing, I can have learning at one place and the
15 mine right next door, they remain ignorant.

16 We have a good example of a layering ignition at the
17 Amonate No. 31 Mine in southern West Virginia back in
18 December of '92, and two weeks later a mine 12 miles away
19 has the same thing. We talked to the guys 12 miles away,
20 Maple Meadow Mine, and you're talking a foreign language
21 to them when you said well, do you do this, do you do
22 that, with respect to layering.

23 I'm sorry, it's -- the use of the words "reasonable
24 and competent," we have failed -- we have failed in our
25 industry to get the concept of layering across. I can't

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1 even get the regulations changed in the United States to
2 take care of this problem. In fact, we have regulations
3 that exacerbate layering rather than militate against
4 them.

5 Q. All right. In any event, I take it that if a layer
6 existed of the dimensions that you have postulated, that
7 if somebody is taking general body measurements and gets
8 anywhere near the vicinity of the roof, they should have
9 detected it?

10 A. That, they should have done; I thought we answered
11 that one.

12 Q. Yes. Well, we did. Bear with me, I tend to repeat
13 sometimes.

14 A. Sorry.

15 COMMISSIONER Mr. Mitchell, if layering is -- and I
16 accept the fact that it is a problem, isn't it rather
17 strange that the MSHA wouldn't -- MSHA people wouldn't
18 teach that in their training schools?

19 A. You and I agree completely. And while I was in
20 still in a position within MSHA to do something about it,
21 and we had a history of ignitions and four explosions
22 that we could trace directly to beginning with layer --
23 ignition of layers, we were not able to get the
24 regulations changed.

25 For example, we have one regulation with respect to

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1 air flow and belt conveyor entries, and that regulation
2 exacerbates layering. We have regulations with respect
3 to bleeder entries. Those regulations exacerbate
4 layering. There is -- there are a lot of reasons; I
5 don't believe any of them are good, but that's my own
6 opinion.

7 COMMISSIONER Okay, thank you.

8 MR. MERRICK Now just talking for a moment about the --
9 your first letter of July the 2nd that we were looking at
10 a few minutes ago; this is in 1992. You were operating
11 on the premise at that time that there was a layer of
12 methane that would be being formed from the old Southwest
13 1 workings. You built that into your analysis.

14 A. Yes, if you recall my testimony was that we
15 deliberately forced the analysis to develop a layer.

16 Q. Yes.

17 A. Because the question we were asking is: if a layer -
18 - if the source of the layer was Southwest 1, what would
19 that effect be in Southwest 2?

20 Q. Yes. And based on your analysis which assumed the
21 formation of a layer from Southwest 1, you -- your
22 analysis led you to the conclusion that it would have
23 increased the likelihood of a gas layer up in the heading
24 that we were talking about?

25 A. That is correct.

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1 Q. Why was the assumption made at that time that there
2 was in fact a layer coming out of Southwest 1?

3 A. I apologize if I give the concept that it was an
4 assumption that a layer came from that area. We knew --
5 I knew, let's rephrase that; I don't want to use the
6 universal concept. I knew that there was a body of
7 methane in all likelihood in the Southwest 1 area, and I
8 also knew that the ventilation pressures in the Southwest
9 area were such that they could cause the outflow of
10 atmosphere from Southwest 1 into the Southwest B Road,
11 in which case, this would be atmosphere that could flow
12 into South -- that would flow into Southwest 2. So I
13 look at the worst case scenario and I say okay, I have
14 this body of methane in Southwest 1, what -- if a layer
15 came from Southwest 1, if a layer was able to flow from
16 Southwest 1, what would happen for the assumptions that I
17 made? And the rest of that memorandum describes what
18 would happen.

19 Q. Now you've changed your view on whether or not a
20 layer could form from Southwest 1 and that's contained in
21 your most recent letter of November the 14th, 1995, which
22 is in Exhibit 122 at tab 1. When did you change your
23 opinion that a layer could form coming out of Southwest
24 1?

25 A. I never changed my opinion; my opinion as expressed

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1 in the November '95 was for the conditions specified in
2 that letter. That had a layer come from Southwest 1, it
3 would not persist within Southwest. And, therefore,
4 since it would not persist within the Southwest, that
5 layer could therefore not flow into Southwest 2. That's
6 all that says.

7 Q. Well, let me make sure I've got this. If we were to
8 have read your letter of July the 2nd, we would have come
9 away, would we not, with the assumption that you were
10 satisfied to operate on the premise that a layer of
11 methane could be formed from Southwest 1 and that layer
12 could well be going up and going into the face that we're
13 talking about? That's the whole basis of the letter.

14 A. That is correct.

15 Q. And your November 14th letter says that no, there is
16 no such layer that can form and persist up Southwest 2-B
17 Road?

18 A. I pray that I did not use the word "form." I trust
19 that the concept is that it could not persist.

20 Q. "Persist." All right. In any event, that's a
21 changed position being put forward by you?

22 A. That is subject I -- from listening to
23 interpretation, I don't believe so. I assume to you,
24 sir, and perhaps to others that might seem to be a change
25 in position. In my letter of 1992 on page 4, in -- on

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1 item (g) I said "for the conditions assumed."

2 Q. Yes.

3 A. That has been said, but I'm -- that's an editorial
4 addition for the conditions assumed. Now I'll quote.

5 "Thinner layers likely extended from Southwest 1 through
6 the Southwest 2 mains." And these -- this is -- and it
7 was this -- this says there is a potential for thin
8 layers for the assumptions given.

9 COMMISSIONER Are you reading from your July 2nd letter
10 now?

11 A. Yes, sir.

12 COMMISSIONER On --

13 A. On page 4, item (g). The -- one, two, three, four,
14 five, six, seventh line down, sir.

15 COMMISSIONER Thinner layers likely. Okay, thank you.

16 MR. MERRICK Well, just -- and I'm not trying --

17 A. In other words -- I'm sorry, I didn't mean to
18 interrupt.

19 Q. I'm not trying to pin you or cause you any
20 difficulty, Mr. Mitchell. All I want to do is establish
21 what you said then and what you are saying now. And if I
22 look at what you said then, on page 3, at the bottom of
23 that page, after setting out various background data, you
24 make the statement just below the table: "These data
25 indicate," and then you have your (a) paragraph that

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1 we've talked about. And then you come over to page 4,
2 your (g) paragraph. And you say, "These data indicate --
3 to militate against methane layering in Southwest 2
4 requires velocities exceeding 280 feet per minute." You
5 make some intervening statements and you say, "Thinner
6 layers likely extended from Southwest 1 through Southwest
7 2 Mains and into and through B and C Roads." That is
8 your statement in July of '92?

9 A. That's correct, sir.

10 Q. You no longer make that statement?

11 A. Because at the beginning of that (g) I have the
12 basis for that conclusion and that is that to militate
13 against methane layering in Southwest 2 requires
14 velocities exceeding 280 feet per minute. For the
15 conditions used in the models that were the basis for the
16 2 July '92 letter, which conditions are detailed on the
17 first page and within the individual runs, for those
18 assumptions and conditions, the velocities that I
19 attained in the Southwest 2 Mains range from 160 to 225
20 feet per minute. These are below the velocity I said
21 would be the key velocity, which is 280 feet per minute.

22 In July and November of '95, in that report, I add
23 additional factors: (1) the belt conveyors. And the most
24 critical factors -- factor regarding the belt conveyor,
25 which is something I did not know, I tried to learn, but

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1 I did not learn and therefore I did not consider it in
2 July of '92, and that is the belt conveyor from the mouth
3 of the Southwest 2-B Road for some distance into
4 Southwest 2-B Road was suspended from the roof. This
5 places a new velocity source into the entry as well as a
6 shock loss and when you put -- have this belt running,
7 which I then subsequently found was somewhere between 500
8 and 600 feet per minute, this is generating a velocity
9 close to the roof in excess of that needed to militate
10 against methane layering. So as long as that belt was
11 running, any methane that would accumulate and tend to
12 form a layer near the roof would be mixed into the air,
13 induced by this running belt. And once methane mixes
14 with air, it does not separate from air; it is not like
15 oil and water, but rather, it becomes a homogeneous
16 mixture. And -- so this methane, as long as the belt was
17 running, mixes with the air.

18 Now there are certain things we do know, and that is
19 for sometime -- most of that morning of May 9th, for a
20 short while prior to the explosion, coal was being
21 produced in the Southwest section. This is based on data
22 from the preparation plant. And, therefore, we know in
23 the morning of May 9th, sometime during the morning of
24 May 9th, the belt was running and therefore this would
25 militate against the -- a layer being sustained in

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1 Southwest 2.

2 Now, of course, if that information about the belt
3 running is incorrect, then I am wrong. This was based
4 on, as I said before, information given to me by -- and I
5 can check my report, by people working in the preparation
6 plant who are able to differentiate between coals from
7 the Southwest and coals from the Southeast and coals from
8 the North Mains.

9 Q. All right. My only point was this, Mr. Mitchell, at
10 this point, and I'll discuss with you later why you --
11 when I say "changed your position," and the different
12 factors, but all I'm getting at now is that in July of
13 '92, based on the factors that you had in front of you,
14 that was your opinion that we see on page 4?

15 A. That is correct.

16 Q. In November of '95, because you took into account
17 some additional things and entered additional input into
18 your computer program, you have come a different
19 position. My only question to you is this: when did you
20 change your position? Was it just in November of '95?

21 A. No, sir.

22 Q. When did you come to a changed position?

23 A. I actually changed my thinking, but I had not done
24 the calculations. But it seemed the probable -- back in
25 -- sometime in '93. I believe it was '93. Let me check

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1 when the diesel -- when people were asking me about
2 diesels. No, this would be late '92. Excuse me. I
3 learned in late '92 about the belt configurations.

4 Q. And did you at any time in the intervening two
5 years, three years, indicate to anybody that you might
6 change your position on this?

7 A. You mean outside of my own group?

8 Q. Out -- that's right.

9 A. No, sir, I don't believe so. I don't -- I may have,
10 but there's -- I have no recollection of telling -- if I
11 told anybody, it would be Mr. White, so you might ask
12 him. I don't recollect telling him.

13 Q. All right. In any event, I assume that the changed
14 position set out in your letter of November the 15th --
15 if I've got the date right -- doesn't change your opinion
16 at all as to the amount of methane that would be produced
17 in the old Southwest 1?

18 A. No, sir.

19 Q. Nor does it change your opinion at all as to the
20 amount of methane that might escape from -- although,
21 "escape" may be a wrong word -- come out of the old
22 Southwest 1 into the general body air of the mine?

23 A. No, sir.

24 Q. The only change in position you've got is whether it
25 may be -- whether a layer may persist coming out of

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1 there?

2 A. You are correct, sir.

3 Q. All right.

4 COMMISSIONER So if I just follow that through a little
5 further. What I deduce from this, Mr. Mitchell, is that
6 the same amount of methane could be there, but it would
7 be mixed with the air rather than layered?

8 A. That is correct, sir.

9 COMMISSIONER Okay. Thank you.

10 MR. MERRICK And I'm not sure -- as you know, Malcolm
11 McPherson has given evidence that in his opinion there is
12 a possibility that there was a layer that came out of
13 Southwest 1, went up Southwest 2-B Road and possibly,
14 although he isn't prepared to postulate with any
15 certainty, that it might have been a factor going up into
16 Southwest 2-1 Road. You differ in that opinion?

17 A. Now based on my analysis in November of '95, the
18 only difference being that the persistences were well
19 defined between the No. 3 Crosscut in Southwest area to
20 the mouth of -- or the entrance of Southwest 2.

21 Q. Let me ask you this: I don't see any particular
22 significance between the two of you in the sense that it
23 doesn't appear to me to be particularly relevant whether
24 there was a layer coming out of Southwest 1 and up the
25 heading or not. It seems to me that the real key items

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1 of relevance for our inquiry are that there was methane
2 being produced in Southwest 1, that the intake air was
3 being allowed to pass by those old workings, as we've
4 talked about, the adequacy of the barriers that were
5 there. Is that a fair assumption?

6 A. Yes, sir.

7 Q. So that on the essentials key to this Inquiry, you
8 two are in agreement?

9 A. Yes, sir.

10 Q. Okay. Let me just press you a little bit though
11 because that's my tendency as a lawyer. If, indeed,
12 there were a layer persisting out of Southwest 1 -- we
13 may have covered this before the lunch break, that may
14 have been at least a partial source of the layer in the
15 Southwest 2-1 Road?

16 A. Yes, we discussed that prior to the lunch --

17 Q. Yes.

18 A. -- break at length.

19 Q. And if in fact you can't account for a layer several
20 -- of methane several feet thick in Southwest 2-1 Road
21 merely from the make of gas in that vicinity itself,
22 whatever the source is: the face, the fissures, the
23 strata, whatever, then a layer coming up Southwest 2-B
24 Road would be the likely explanation?

25 A. Could be an explanation is as far as I would try to

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1 take that statement.

2 Q. All right. And one last point. And even Dr.
3 McPherson did not postulate with any degree of certainty
4 that the layer in Southwest 2-1 Road that he agrees was
5 there came from the old Southwest 1. I take it though
6 that even if there was no layer persisting, if your
7 calculations are correct, all that means is that the gas
8 from Southwest 1 would not have necessarily been involved
9 in the initial ignition but may well have been a factor
10 in the subsequent explosion?

11 A. One would expect as much, yes.

12 Q. All right. In fact -- I just want to make sure I've
13 understood the way you phrase that last answer: "One
14 would expect that." I take it that if the explosion did
15 occur in Southwest 2-1 Road, initiated by burning of a
16 methane layer and then came out the mine as you've
17 postulated in your letters, it's probable, if not almost
18 certain that gas from Southwest 1 was involved in the
19 explosion.

20 A. That would be an added fuel, and this would be
21 typical of most explosions we've experienced in the
22 United States prior to the requirement that all abandoned
23 areas be ventilated or sealed, and if sealed, sealed with
24 explosion-proof bulkheads.

25 Q. And would it be fair to say then that that

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1 illustrates in a tragic fashion in Westray why the old
2 Southwest 1 workings should have been more properly taken
3 care of than they were?

4 A. Yes.

5 Q. Now let me take you back to a point that you raised.
6 I just want to get your evidence on it while you're here.
7 You said you made inquiries about the methane detector or
8 monitor on the continuous miner in the Southwest 2-1
9 Road. I'd like to know what you found out about that.

10 A. Well, they were having trouble with it. They also -
11 - and don't forget, you're talking to an old man three
12 years later. Things you forget. They were moving it --
13 removed it.

14 COMMISSIONER I don't buy that at all.

15 A. Excuse me, sensitivity does set in. They moved it
16 from one location to another. In fact, I recall either
17 on that subject or remarking on that subject that
18 actually the place that they moved the sensor head to was
19 a better place than where they had the sensor head
20 originally.

21 Then there was the question that I never got that
22 satisfactorily -- I never got an answer to as to the
23 quality of calibration because the methane monitor's
24 adequacies are a direct function of the quality of its
25 calibration. I am -- to be blunt, I am not satisfied

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1 that this methane monitor was giving accurate cut-off
2 readings. In other words, that I am not satisfied that
3 this methane monitor would de-energize the continuous
4 miner should it encounter methane concentration in excess
5 of whatever it was set for. We, in the United States,
6 set it at two percent de-energization typically. I
7 believe, in Nova Scotia, they are supposed to set it at a
8 lower level, something like perhaps one and a half, but
9 don't quote me on that.

10 Q. Why do you think it was not accurate?

11 A. Well, I didn't say it was not accurate. I hope I
12 said that I am not satisfied that I can state with
13 certainty that it was accurate, that it would cause DNI
14 energization of two percent, but that's academic, because
15 the evidence is that the machine was not operating at the
16 instant of the explosion and for a few minutes prior to
17 the explosion.

18 Q. Just give me the evidence now that you have on which
19 you base your -- I forget your phraseology, but your
20 suspicions or belief that it was not cutting off accurate
21 or would not cut off at the level.

22 A. My study of the calibration practices led me to
23 raise questions in my mind as to the adequacy of those
24 practices. I don't know -- I cannot state that they
25 properly calibrated the methanometers. I have reason to

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1 believe that this was less than proper or less than
2 adequate.

3 Q. Can you be any more explicit with me? What is it
4 that you think was wrong?

5 A. I checked the calibration gases. I remember asking
6 to see the calibration gases.

7 Q. This would be the gases maintained by Westray?

8 A. Yes.

9 Q. For some reason I never could get my hands on a
10 calibration canister. I would like to have seen the --
11 what the canister stated on it as to be its -- the
12 percent methane in the canister, and I could not find in
13 any of the section books any record of calibration, at
14 least in the books that I looked at.

15 Q. So you're saying you were never able to get a sample
16 of the calibration gas, the gas used to calibrate the
17 machine, the methanometer, and you could not see any
18 record of it being calibrated?

19 A. That is correct. By definition -- the word "sample"
20 means the calibration canister itself. It's a little
21 cylinder of gas.

22 Q. Yes. So you never had an opportunity to get one of
23 those to check it, and you didn't see any records of it
24 being calibrated. Was there any other evidence that you
25 have got for the basis of that belief?

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1 A. Well, just talking to people.

2 Q. What kind of evidence?

3 A. Well, I didn't get the feeling people knew what I
4 was asking and I thought I was asking rather clear-cut
5 simple questions.

6 Q. So nobody seemed to know -- nobody seemed to know
7 about how to accurately calibrate it, is that what you're
8 saying?

9 A. No, they just didn't give me an answer that I was
10 happy with.

11 Q. Who were you talking to?

12 A. Oh, I don't know, I talked to a lot of people on the
13 property. I -- when I go on a property like that, I talk
14 to everybody I can get my hands on or get my mouth to.

15 Q. Any other evidence?

16 A. Well, I did have that record of, I believe it was
17 the previous shift, and I may be wrong about that.
18 Somewhere in my files I could find that. Previous shift
19 or sometime just shortly -- within a reasonable period
20 prior to the explosion, it was not operating.

21 Q. Yeah.

22 A. And they called a mechanic to repair it, that type
23 of thing.

24 Q. Okay.

25 A. And you couldn't -- you couldn't say it ever got

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1 repaired. I could never say it got repaired. And then
2 the thing that bothered me was moving the head. I never
3 could find out why they did it though I do feel that the
4 place they located -- where they put it when they changed
5 it was the better of the two places. That I remember.

6 Q. All right. Let me go back to your letter of July
7 the 2nd and just give me a second while I try to find
8 where this is in that letter.

9 Oh, yes. On page 4, Clause (f), you're stating
10 again, based on the data you had then, the four faces --
11 sorry, "The four places from the last open crosscut to
12 the faces were ventilated solely by accelerated fan
13 induced air." The last sentence you say, "These fans
14 were exhausting, therefore had the tubing been 15 feet
15 from the face, there was little, if any, forced
16 ventilation in the face." I'm taking it from your
17 comment that what you're saying is that if that -- the
18 intake end of the tube was more than 15 feet from the
19 working face, it probably was generating very little air
20 circulation at the face itself.

21 A. In the absence of the dust scrubbers, I said
22 earlier, at that time I had no information. In fact, I
23 was not aware they had dust scrubbers.

24 Q. Yeah. And that would be an inadequate way to
25 ventilate a working face, I assume, in the absence of a

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1 dust scrubber?

2 A. Yes, sir.

3 Q. And that would -- that comment then would be true in
4 any working face where we're dealing with that kind of
5 exhausting system or that kind of volume?

6 A. That is correct.

7 Q. All right. Under those circumstances where the end
8 of your tubing is going to be more than 15 feet from the
9 working face, would it not be a preferable system to use
10 a forcing air system under those circumstances?

11 A. For conditions in the Westray Mine I would prefer an
12 exhausting auxiliary system. And, therefore, I -- or I
13 would use a line curtain system. A blowing system or
14 forcing system, I believe you called it, would have not
15 been appropriate, in my opinion, for the Westray Mine.

16 Q. All right. And I want to come to that in a few
17 minutes because that's a fairly important point that I
18 would like to discuss with you, but let me finish off
19 this so that we've got it clear. Wherever we have an
20 exhausting system with tubing that is more than 15 feet
21 from the face, that's inadequate, in your opinion?

22 A. Not only in my opinion. That opinion is buttressed
23 by some very good research, major research by the U.S.
24 Bureau of Mines and by the Mine Safety and Health
25 Administration, the Bureau of Mines and Laboratories, and

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1 the Mine Safety and Health Administration in actual
2 mines. And, for that reason, we require such systems to
3 be within 10 feet of the face unless scrubbers are used
4 and then we make modifications.

5 Q. In your experience, is that kind of a use of an
6 exhausting system, by that I mean having the tube more
7 than 15 feet from the face, are the problems associated
8 with that something that should be apparent to reasonable
9 mine management?

10 A. Yes, sir.

11 Q. Just give me a second while I make a note of that.

12 A. All right. And may I add to that, sir?

13 Q. Yes.

14 A. To people working on roof-bolting equipment and
15 other face equipment with the exception of a continuous
16 miner when the miner is operating with the dust scrubber
17 and its water sprays.

18 Q. So that should be apparent to the miners themselves?

19 A. With the exception of the continuous miner operator,
20 assuming he had the dust scrubber on and its water spray
21 is operating.

22 Q. All right. So, again, this isn't rocket science;
23 this is something that your average miner should know?

24 A. They will -- they should well perceive this without
25 difficulty.

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1 Q. Okay. Let me take you to the rest of that letter of
2 July the 2nd. On page 4 we have talked about your Clause
3 (g). We have talked about the rest of it up there. You
4 then go on to talk about the North section. And as I
5 understand your comments that follow on the rest of that
6 page and page 5, your -- you express concerns about the
7 fact that there was recirculation taking place in the
8 North?

9 A. Yes, sir. If was going to choose a place, if
10 someone asked me where you would have an explosion in
11 this mine, I would put it down in the Southeast as number
12 one and then the faces to the right, at the bottom of the
13 North Mains is my number two.

14 Q. All right. We have up on the board a blow-up of
15 Exhibit 45, tab 11, the North Mains blow-up. It's the
16 bottom one. Can you quickly take me through your report
17 or comments in that letter referring them to that map so
18 that I can understand your concerns?

19 A. The most northern extent of the mine, and this is
20 the most northern extent of the mine workings, had five
21 faces: the A Road, B Road, D Road -- and I put question
22 marks here because I never could find out the names, here
23 you call this one -- you don't call it anything, but it's
24 the extent of 2 North Mains and over here you have North
25 6 Crosscut. One, two, three, four, five faces. Now in A

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1 face I tell us, and there you can see it on your map,
2 that we have a Dosco and that this face was ventilated by
3 a 5,200 cubic foot per minute exhaust auxiliary fan. I
4 then say A Road was the only intake entry into the North
5 Mains.

6 Okay, B face, in B face I have a roof bolter and you
7 show a roof bolter. And this was ventilated by air from
8 A face. And this assume air flow into the face, but
9 there is no evidence that there was any means to bring
10 air into B face. There is no auxiliary ventilation.
11 There is no evidence of line cut. As far as we know, B
12 face is an unventilated face. Now B Road was the primary
13 return from the North section, therefore, air that
14 entered A Road, as I've said before, A Road was the
15 intake --

16 Q. Yes.

17 A. -- would flow through this crosscut. And does that
18 have a name? It doesn't, but in that crosscut there is a
19 box with 20 horsepower, that's the auxiliary fan
20 providing air into the face of A Road. And the air would
21 then come and you would like it to go down here to D Road
22 and to these two faces, but there was nothing in this
23 mine, at least shown on these drawings or any other
24 information, to say that if I'm a molecule of air, why
25 would I want to go down there when it's easier for me to

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1 come right back through this B Road and out my return?

2 And that is how air is going to want to flow.

3 Okay, now we have D Road down here. And in D Road -
4 - let me read my own writing. Okay, we have three
5 tractors which occupy some of the cross-sectional area
6 and we have a 1,000 KBA transformer. And what I'm saying
7 here is if any air decided to come down here, which it
8 didn't want to do anyhow, but let's assume some air did
9 want to get down there, how is it going to get down here
10 to D Road when there's no way to bring air to D Road.

11 So I now have an unventilated B road, basically, and
12 I have an unventilated D Road. And I have a roof bolter
13 in both places. We do know men were working in D Road
14 bolting the roof in there, and I question if they any
15 ventilation air to help them do their work.

16 And so we keep going, and then I come to these two
17 faces here and those two faces we were never able to
18 recover. They were the extensive caves so we -- they --
19 we don't really know much about what's going in those
20 faces, but we do have a record from the shift report and
21 the work plan that they were to be doing some mining in
22 there.

23 So and you do indeed -- I do indeed see you have
24 continuous miner, assumed location, and I agree with
25 that. So I suspect we had a miner operating in there,

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1 and that miner, they had an auxiliary fan pulling air out
2 of that. But how do you pull air out of a place when
3 you're not putting air into a place? It's a very
4 interesting thing. So, really, what all you're doing is
5 you're recirculating. So whatever they were doing down
6 there, they were just breathing their own air over and
7 over again, just getting it richer in dust and richer in
8 methane and having fun. Okay.

9 And I don't know what was going on in North 6
10 Crosscut. There wasn't anything shown, but that's not
11 being ventilated anyhow. So, basically, what we have
12 down here in the bottom of the North Main is one
13 ventilated face in which nothing is going on. But
14 wherever work was going on, we had no evidence that they
15 had air flow. That's not very good mining practice.
16 Okay.

17 Then to make matters worse and what you have here is
18 a great proclivity -- if you're going to have methane
19 layering anywhere in this mine, the probabilities for
20 nice, good, thick, heavy layers of methane are going to
21 be in D Road and down in these two places, the extension
22 of 2 North Main and North 6 Crosscut. That area is a
23 mess.

24 Then to make matters worse, you come up here to the
25 Southeast and now we have -- let us -- now, there's one

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1 thing we have going for us that makes all this bad stuff
2 not so bad. There is no evidence, even though we have a
3 continuous miner down there, the shuttle car was back
4 here at the Stamler. Now it was all empty and the belt
5 was empty of coal down there and so, with a little bit of
6 luck in the hour or so before the explosion, we may not
7 have been mining coal down there. And this may also
8 explain maybe why one of the mechanics or electricians --
9 I don't remember, I could check my files and get his
10 name, went in the mine at the same time or about the same
11 time Mr. Gillis went in the mine, and he went down there
12 somewhere.

13 Okay, let's get up here to the Southeast section
14 which is a producing section. And here it is being
15 served by a blowing fan, your forcing fan, and this
16 forcing fan is blowing return air into the Southeast
17 section. Not fresh air. No intake air. It's taking the
18 air that is going through A Road, B Road, if it went down
19 here to D Road, into the recirculated outflow from those
20 two places and that's what coming into the Southeast.

21 And you blow here and here's your nice blower fan,
22 and you're getting it to blow. And what you're doing is
23 now -- now they have it -- they showed the end of the
24 duct as just beyond this crosscut that you show on this
25 exhibit -- you show a 40-horsepower -- the shortcut --

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1 the crosscut, excuse me, in which you have a 40-
2 horsepower fan. Now this 40-horsepower is a C-70.
3 That's one of the two C-70 fans in this mine. And this
4 is exhausting air from the face of this -- the two faces
5 in the Southeast.

6 But if you -- you've heard -- I believe people told
7 you about blowing, well, if you look at the distance of
8 the jet effect of this blowing fan, it doesn't get there.
9 So all your exhausting is recirculation, so here we're
10 not only blowing in return air, we now at the faces are
11 recirculating the air and the atmosphere and the dust and
12 the methane that you're making at the faces.

13 Q. Just on that one point, we've had one of the
14 consultants talk about that, blowing fan overlapping with
15 the exhausting fan saying he couldn't figure out what
16 they were trying to do with that.

17 A. Well, I wouldn't call that overlapping. It's like
18 me trying to throw a football from here to Halifax. I
19 don't think that football will get there. And that's
20 like -- the air from -- coming out of that blowing -- the
21 end of that duct there trying to get up to the face, no
22 way. It's not going to get there. This air is just
23 going to come right back into this crosscut. And the air
24 at the Southeast face, if it sees any of this air that is
25 being blown in, well, that will be -- the probabilities

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1 of that you can -- I wouldn't want to go betting on that.
2 And anyhow the air that is blowing in is return air, and
3 if you're producing any methane and dust down here, and I
4 believe I'm producing methane and dust down here because
5 I'm -- I think this is going to be one of the gasiest
6 spots of the mine down there, if I was a betting man. So
7 we're putting a pretty horrible atmosphere into the
8 Southeast.

9 Q. Just a minor point first, this combination of the
10 blowing fan and the exhausting fan, let me use the words
11 here, doesn't make sense from a ventilation perspective?

12 A. Oh, yes. This is a common good practice in
13 tunnelling.

14 Q. No, I'm talking about this particular setup in these
15 circumstances?

16 A. Oh, the way this is set up, it's not that it doesn't
17 make sense, it doesn't do a -- it's an exercise in
18 futility.

19 Q. All right. You describe the ventilation in the
20 North Mains and the Southeast as a mess. I think that
21 was your word.

22 A. Well, if that was my word then I was being very
23 gracious.

24 Q. That's a point that I, as a lay person, want to make
25 sure I assimilate. Listening to you and others who have

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1 described the ventilation, not just in the North Mains, I
2 guess, but moreso in the North Mains than the Southwest,
3 it sounds to me like it is an -- from any kind of a
4 ventilation perspective, it is obviously just wrong.

5 Let me ask this question, how does that reflect, in
6 your opinion, on the competency of the people who set it
7 up that way?

8 A. I, interestingly, this was set up like this, I
9 believe, around the 6th of May is when this started like
10 this. Prior to the 6th of May -- or actually, let's say
11 prior to May, this wasn't badly ventilated. So something
12 -- somebody, somebody -- perhaps somebody new or somebody
13 -- I don't know what happened, but something happened in
14 that first week in May that changed the -- made a major
15 change in the ventilation practices throughout the mine.

16 Q. Let me come back to my question. Having seen the
17 changes that were made and the way that it was operating
18 at the time of the explosion, what do you say as to the
19 competency of the people that did it?

20 A. Well, maybe I stated -- what I was trying to say is
21 the competency of the people in May who caused this is
22 incompetent. I don't see that in April, the same level.
23 I don't see such weird thinking prior to May.

24 Q. Tell me about the -- tell me about the -- let me ask
25 you this, back in April when you say you don't see "such

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1 weird thinking" or I forget your exact word, was the
2 ventilation circuit, as set up back in April, proper, or
3 was it also subject to criticism?

4 A. Well, all ventilation circuits are subject to
5 criticism, but in April they had good strong --
6 reasonably strong flows of air into all the active
7 working faces.

8 Q. And you based this on what?

9 A. On the ventilation -- what they called ventilation
10 survey reports that were submitted biweekly and showed
11 the author or responsible person to be a fellow by the
12 name of Trevor Eagles, I believe.

13 Q. If you will look at Exhibit 37-A, if you have it
14 there. It should be a black ring binder. No, it would
15 be a slightly thicker one than that. Just a moment and
16 we will get it for you. It's on its way.

17 COMMISSIONER What number, Mr. Merrick?

18 MR. MERRICK I'm going to refer him to the ventilation
19 surveys that start back early in the book at about page
20 30-something.

21 COMMISSIONER Okay.

22 MR. MERRICK 37-A is the exhibit.

23 A. Thank you.

24 Q. Now the first -- from approximately page 30-
25 something on, there are a series of ventilation surveys.

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1 Are these what you're talking about?

2 A. Yes, sir.

3 Q. And as we go up into pages 75 and following, we see
4 ventilation surveys for April. What was your
5 understanding as to the ventilation system that was
6 existing prior to May when you say changes were made to
7 bring it to this level of disrepute?

8 A. Okay. I would like to direct your attention, sir,
9 not only to these that you handed me which are quite good
10 and if you read them you could understand them well, I
11 also direct your attention -- they had -- they produced
12 drawings showing the mine and showing the quantities of
13 air at the various locations within the mine at which
14 these points -- for example, on page 75 you see
15 "location." And when you look at this item -- when you
16 look at the submitted map in conjunction with this, you
17 get a fuller appreciation for it, and you see air going
18 to each working face.

19 Here, on May 8th, we do not have air going to each
20 working face. Additionally, we have an adequate flow of
21 air. I make a mistake. In April we did have return air
22 going to the Southeast, except it was not return air
23 because we only had one continuous mining machine in the
24 North Mains at that time and that was the mining machine
25 in the Southeast. So it was basically and legally on

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1 intake air, though I wouldn't have liked to see the way
2 it was done.

3 Q. Would you turn to Exhibit 45 which is in front of
4 you, I think. The booklet with all the tabs. And tab 1.

5 A. Thank you.

6 Q. Are they the plans that you were referring to a
7 moment ago?

8 A. Yes. I'd like you to consider these in conjunction
9 with these. You have to look at the totality.

10 Q. Yes.

11 A. At least it's easier to look at it from -- at least
12 it's easier for me to look at it that way.

13 Q. Perhaps if we could take -- and I'll let you pick a
14 date in April, perhaps as late in April as possible in
15 order to get us to the transition point. And with your
16 help, referring to the ventilation surveys and the plans,
17 show us how this system operated differently than it does
18 on the map that we looked at a moment ago.

19 A. Well, the last report in April was April 29, and I
20 don't see that in this exhibit.

21 Q. How about we try --

22 A. And I'm sorry, I have April 29 back in my office; I
23 never thought of -- that I needed to bring that.

24 Q. Well, how about April the 15th?

25 A. Okay --

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1 Q. Are you able to use that?

2 A. -- let's take April 15.

3 Q. If we can get the ventilation survey. Yeah, here we
4 go. Let me try this: we have a map, it's the second last
5 one under tab 1 of Exhibit 45.

6 COMMISSIONER There's an April 29th here, but -- in my
7 book. Ventilation Survey, April 29th, 1992.

8 A. Yes, sir.

9 MR. WILSON Page 88.

10 MR. MERRICK Okay.

11 COMMISSIONER I have it page 74.

12 MS. MACDONALD No, there's two different types of
13 reports.

14 COMMISSIONER Oh I see, okay.

15 MR. WILSON I have page 88, and there are maps on 92
16 and 93.

17 MR. MERRICK Let's try that. This is all in Exhibit
18 37-A and we are looking at, as I understand it, page 88,
19 which is the ventilation survey, April 30th. And then
20 attached to it, about four or five pages further on, are
21 photocopies of what appear to be the mine layout. Is
22 that adequate to do the job?

23 A. Yes, sir.

24 Q. All right, let's do it. Let's use those documents
25 and you tell us how the system was operating differently.

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1 A. All right. Let us look at page 92 --

2 Q. Yeah.

3 A. -- which shows the North Mains and we see in
4 A Road --

5 Q. The same thing, don't we?

6 A. No, we don't see the same thing. We see the fan --
7 that's interesting. We see the fan supplying air to A
8 face.

9 Q. Yes, and exhausting --

10 A. We see the exhaust, because there is no equipment in
11 A face, they are using the exhaust from A face as the
12 intake to B face and to the extension.

13 Q. Yes.

14 A. And they have a duct going into B face, but they
15 don't show it going in very far, but I don't know -- I
16 imagine that's as far as it went. But they show no
17 equipment in B face, and they show this intake air going
18 down the straight. So if one says that you can take this
19 intake air from A face and use it to ventilate B and the
20 straight, which can be done provided we do not have
21 methane being liberated in important quantities in A
22 face, which is hard to believe they weren't liberating,
23 then this is -- this meets the requirements of the
24 regulations.

25 Q. Well, just a minute --

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1 A. We don't have any equipment shown operating in this
2 area, and all they're doing is showing ventilating idle
3 faces. And we, in the United States, would say you can
4 ventilate idle faces as long as you provide not less than
5 3,000 cubic feet of air per minute to the -- into the
6 face area. I would say A face should meet that
7 requirement. They -- I would have to look at -- this is
8 -- at the data to see what kind of flow I have down
9 there.

10 Q. Well --

11 A. And he shows having about 10,000 cubic feet of air
12 per minute being delivered by that fan. So that should
13 meet the 3,000 -- if he is correct, they should be
14 getting close to 3,000 at the faces.

15 Q. But your opinion as to how satisfactory this is is
16 dependent on them not being active in A face? Or A Road.

17 A. A, B and the straight. That there is no mine -- no
18 mining machine there. And according to the section
19 books, there were only two mining machines in the mine in
20 April. And at this date there was one in the Southeast
21 and one in Southwest 2.

22 Q. To the extent though that those were faces that they
23 were cutting from, and we see even on that ventilation
24 drawing, where in A Road it says "4-foot cuts," that
25 doesn't mean they were cutting at the time?

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1 A. They were not cutting at the time.

2 Q. But to the extent that they would operate in any of
3 those four faces with the ventilation system still set up
4 like it was, then that would not be appropriate?

5 A. It is acceptable. You can have bolting operations
6 downstream of your mining operation, provided that the
7 methane concentration flowing into the bolter section
8 does not exceed -- I don't know what you have in this
9 country, in our country, the United States, we require
10 not in excess of .25 per cent.

11 Q. Well, we know that you alternate bolters and miners?

12 A. That's correct.

13 Q. Bolters only come in after miners are done?

14 A. That's correct.

15 Q. So that if you're going to have bolters in there,
16 you will have had miners in there?

17 A. Not at the same time.

18 Q. Not at the same time but prior to the bolter going
19 in?

20 A. Yes.

21 Q. And if you put miners in any of those headings, this
22 is not the proper way to ventilate them?

23 A. This form of ventilation is considered acceptable.
24 My biggest complaint with it is that the -- their faces
25 are too far apart, and I really don't believe the

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1 straight -- I believe A and B are adequately ventilated;
2 I question whether the straight is ventilated adequately.

3 Q. Assuming cutting going on in each of those three
4 headings?

5 A. [No audible response]

6 Q. If you have cutting going on in A Road, you've got a
7 continuous miner put in there?

8 A. Yes.

9 Q. That is not the way you should ventilate?

10 A. That is the way people do ventilate.

11 Q. That wasn't my question. That's not the way you
12 should be ventilating?

13 A. [No audible response]

14 Q. You're now using return air from an active face to
15 ventilate other active faces.

16 A. You -- as long as the other active faces -- as long
17 as you are not producing coal in the other active faces,
18 this is an acceptable method.

19 Q. Yes, I know. But my question is premised on the
20 fact that they were indeed putting miners into each of
21 those headings, either a miner or a Dosco roadheader --
22 same thing, I assume --

23 A. Yes.

24 Q. -- for ventilation purposes, perhaps sequentially --
25 but if you were going to have a roadheader or a miner in

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1 any one of those three -- in each of those three
2 headings --

3 A. Oh, in each?

4 Q. In turn.

5 A. Oh. You cannot -- there -- nowhere can you allow
6 two mining machines cutting coal, or cutting rock, or
7 mining -- producing material in the same split of air.

8 Q. Yeah, all right. And that was my point. All right,
9 thank you.

10 A. But there's no evidence that that was the case.

11 Q. Well, we going --

12 A. In April.

13 Q. Your premise is they were not cutting down there in
14 April? That's your premise?

15 A. Based on the section books and -- yes. Because the
16 section books showed where they had -- purportedly showed
17 where equipment was operating.

18 Q. All right, thank you.

19 COMMISSIONER Just -- I just want to look at that plan
20 you're looking at there because I'm not sure I have the
21 right one. No, that's okay; stay where you are.

22 [Commissioner goes to witness stand to see diagram] Now
23 the headings we're talking about are here?

24 A. A, B and the straight.

25 COMMISSIONER Okay, fair enough. Now I've got it.

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1 Thank you.

2 MR. MERRICK -- Mr. Mitchell, if you'll look at Exhibit
3 45 which is the book with the tabs, with the various maps
4 in it, turn to tab 9. It's a colour-coded layout of the
5 map -- of the mine that shows where they were working in
6 various months. And if you'll look on the key colour-
7 code, you'll see that April they use a dark blue. Follow
8 me?

9 A. Yes, sir.

10 Q. And if we look down in the North Mains, we'll see
11 that, in fact, they were cutting down there in April?

12 A. Yes, sir.

13 Q. Let me just pick up where I left off in my notes.
14 Yes, back at the letter of July the 2nd, over on page 6,
15 and I guess this just follows up on the point that we
16 were making a few minutes ago. You say in your summary,
17 "Analysis of the Westray Mine ventilation raised
18 questions as to whether anyone at this mine either
19 understood or appreciated the basic rules governing air
20 flows. Other than in the main intake and return and in a
21 few isolated segments of roadway, nothing supports belief
22 in meaningful efforts to provide sufficient air for
23 minimally safe..." et cetera, et cetera. That was your
24 opinion at the time?

25 A. Yes, sir.

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1 Q. Do you stick to it today?

2 A. Yes, sir.

3 Q. Thank you. Now let me take you to the next letter
4 that you did. Still in the same exhibit book. If we can
5 turn over to the first of the two letters dated September
6 the 12th, '92. It's entitled "Re Westray Mine Ignition
7 Source." That letter was, I take it, written to set out
8 your views at that time as to what the possible ignition
9 source may have been?

10 A. Yes, sir.

11 Q. And do I take it from that letter that at that point
12 you were of the view that the ignition source probably
13 con -- occurred in or on -- or I'll even broaden it a
14 bit, around the continuous miner in the -- I need that
15 plan to be able to follow -- in the Southwest 2-1 Road --

16 A. Yes, sir.

17 Q. -- heading? And that you discounted the
18 possibility, or you discounted the likelihood of it being
19 at the bolter in that left-hand heading?

20 A. With a caveat on page 2.

21 Q. Yes. And the caveat on page 2 is where?

22 A. The paragraph beginning with "Phillips told us."

23 Q. Yeah.

24 A. And I say, "Phillips told us the vent tube in
25 Southwest 2 face was not burned, whereas that in the

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1 left-hand face was. Should this be true, I have no basis
2 for believing the igniting source was on or in the
3 continuous miner. It supports believing the source was
4 roof bolting operations."

5 Q. All right. So subject to learning the condition of
6 the vent tubing in the 1 Road heading, you formed the
7 view, subject to that, that it was at or on the
8 continuous miner and not at the bolter?

9 A. That is correct.

10 Q. And on page 1 of that letter where you're
11 discounting -- where you're saying why you didn't think
12 it was the bolter, you make the comment in the second
13 paragraph:

14 "I discounted the possibility the igniting source
15 was frictional sparks generated by roof bolting
16 operations in the left-hand face. I did not believe
17 sparks or heat from steel against steel would be
18 sufficiently incentive to ignite..." et cetera, et
19 cetera.

20 And you go on to give your reasons why the bolter
21 was not the potential candidate?

22 A. Yes, sir.

23 Q. You have subsequently, I take it, found out that Mr.
24 Phillips' description to you was correct, that there was
25 a segment of tubing that came back out of the area of the

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1 continuous miner unburned?

2 A. Yes, sir.

3 Q. As a result of learning that that was so, what is
4 your opinion today as to where the ignition source was?

5 A. My opinion is the more probable, it doesn't mean it
6 was, but the most probable location in the mine was
7 Southwest 2-1 Road. And within Southwest 2-1 Road, the
8 most probable location would be somewhere around the
9 bolter.

10 And the next most probable would be somewhere around
11 either the continuous miner or shuttle car.

12 But in light of the burning of the tube and all, I
13 would have liked very much to have seen a permissibility
14 examination made of the bolter.

15 Q. What do you mean by that?

16 A. The photographs that I observed from the RCMP
17 investigation showed that it seemed that at the time of
18 the ignition they have -- the photographs show one
19 ATRS up holding the mesh against the roof. They show the
20 other ATRS down with mesh on it. Now the question I
21 would like to -- one question I would like to have had an
22 answer to, which would have been determined by the
23 hydraulic part of the study which would have taken about
24 five minutes in there, would be to determine if there was
25 oil pressure in that hydraulic system for the second

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1 ATRS. I found it rather impressive that after all that
2 time the inbye ATRS was still in place. Typically, one
3 installs the outbye ATRS first.

4 So it appears that at that time they were getting
5 ready to bolt; they were putting up the mesh which would
6 be preliminary to bolting. Part of this discounting the
7 possibility was that the information I had obtained from
8 the mine rescue teams, they didn't tell me about the
9 ATRS's and the mesh, but they did tell me that there was
10 no bolting steel nor -- there was no drill steel nor bolt
11 in the socket on the roof bolter; therefore, they were
12 not in the process of bolting.

13 And I didn't know about the ATRSs and when I saw
14 that, it tells me that these men were indeed working.
15 And you had to have power on the -- to put up the ATRS,
16 we had to have power on the bolting machine. So there I
17 have one place in which I have electrical power --
18 likely, to have had electrical power at the time of the
19 ignition.

20 We do know, and this was corroborated by the RCMP
21 investigation, that the continuous miner was about three
22 feet back from the face and was not in the clean-up mode.
23 Therefore -- and also the dust scrubber was not
24 operating. And that is the information I believe I had.
25 But it doesn't matter about the dust scrubber. The

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1 machine was three feet back and was not in the clean-up
2 mode. Therefore, the probabilities are that machine was
3 not being operated.

4 Now if the dust scrubber was operating, then that
5 machine was electrically powered. If the dust scrubber
6 wasn't operating, then it was not electrically powered.
7 However, no one examined the substation in A Road and
8 opened it up to see if the breakers were thrown. At
9 least I -- in my inquiries I found that was not done.
10 And had the methane monitor de-energized the mining
11 machine, we would have seen that back at the KVA unit
12 there in A Road, but we didn't see it there. We don't
13 know anything about it. But -- so we don't know whether
14 it was electrically powered.

15 The operator of the shuttle car apparently was in or
16 about his seat. So there may have been power to the
17 shuttle car. The shuttle car was about two-thirds full.
18 One of the things we miners don't do, I mean, you'd have
19 -- you have to have a darn good reason not to completely
20 fill the shuttle car and let it get down and dump, so it
21 appears that something happened, mechanically or
22 electrically or somehow, that prevented them from
23 continuing loading of the shuttle car.

24 Q. This is based on the premise -- on information that
25 has been given to you that the miner was not, in fact,

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1 actually up and cutting into the coal?

2 A. That is based on that premise. Yes, sir.

3 Q. And that premise is based on what you were told by
4 some members of the team that went in as part of the RCMP
5 investigation?

6 A. And it also was told to me, I believe, by either a
7 gentleman by the name of "James" or "George Muise." I
8 don't remember which one of those two men who were on
9 mine rescue teams that went into that area. And I believe
10 a Mr. Dooley gave me that information.

11 Q. All right. If, indeed, the miner was right up at
12 the face, was not pulled back but was right up at the
13 face, then that may well change your opinion?

14 A. If the miner was in the process of mining, then the
15 miner might have been the source of ignition.

16 Q. That would also explain why the shuttle car would
17 not yet be full?

18 A. That is correct.

19 Q. All right. And do I take it that that may be the
20 most significant piece of evidence, in your opinion, as
21 to whether the miner is to be considered the primary
22 suspect or is to be discounted? Whether it was actually
23 in the process of mining at the time.

24 A. I would say yes, but I would like to see the
25 evidence of what the breakers at the substation -- I

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1 don't know what you call it in Nova Scotia, we have
2 different names -- "Power box" is what we generally call
3 them -- in A Road that --

4 Q. All right.

5 A. -- was providing electrical power to the equipment.

6 Q. Let me have your opinion on the unburnt tubing for a
7 moment, because you initially formed the opinion that if
8 there was unburnt tubing right up at the miner that that
9 would be a factor that would discount the miner or its
10 immediate vicinity as being the source of the ignition.

11 If you'll take a look at the photographs that are on
12 the wall, the post-explosion conditions underground --
13 David, what's the one with the tubing?

14 MR. ROBERTS It's 25.

15 MR. MERRICK Photograph 25 shows the unburnt tubing and
16 you'll see it there?

17 A. Yes, sir.

18 Q. You've seen it -- I assume you've looked at this
19 photograph?

20 A. [No audible response]

21 Q. You'll see the miner and you'll see that the roof
22 slopes upward because we know that was the dip on the
23 seam?

24 A. Yes, sir.

25 Q. And the concept has been put forward that there may

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1 well have been a layer of methane in there that right up
2 at the face would have been pooled, if you will, on the
3 high side of that roof, may have burned there, and only
4 as you come outbye would it have been spreading across
5 the roof and thus burn the tubing further out. Is that
6 possible?

7 A. That is possible. When I made this statement, it
8 never occurred to me that someone would put the tubing on
9 the down dip side.

10 Q. That's true. I take it that putting the tubing on
11 the down dip side is not a prudent thing to do? Not the
12 proper way to do it?

13 A. It's not the way I would do it.

14 Q. Yeah. Because obviously you were not exhausting
15 where you're most likely to be getting methane?

16 A. Well, not only that, you're making -- you're putting
17 that tubing in a location where it's more likely to be
18 damaged.

19 Q. All right. Thank you. I take it that to the
20 extent, based on the information that you were given,
21 being the location of the miner, you then looked for an
22 alternative and you looked at the bolter. Now I know in
23 your letter of September the 12th you said that you
24 discounted the boulder because you -- the bolter because
25 you didn't think the sparks that would be generated in a

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1 bolting operation would be sufficient to ignite. What do
2 you believe the bolter was doing that would have ignited?
3 Would it have been just a short in its electrical system
4 or a rupture of the cable?

5 A. A rupture of the cable should have been observed by
6 the RCMP investigators. Such are typi -- normally quite
7 easily seen -- the evidence. These give off arcs of
8 around 10,000 degrees kelvin and they leave a nice scar
9 when you get a proper rupture that's capable of igniting
10 methane.

11 I would anticipate, and I believe I said earlier
12 today, if they over-extended the bolter, the length of
13 cable, I would have wanted to look at the point at which
14 the cable enters the control box on the bolter to see if
15 I had -- whether we had some pulling away there. This is
16 not an uncommon thing to happen, and it gives you a nice
17 spark. And if I have say, a floor feeder, for example --
18 and we know we had floor feeders in this mine -- and this
19 has happened quite a number of times in other mines --
20 and you get this electrical short where you -- in the
21 vicinity of a floor feeder, where the gases from the
22 floor feeder are collecting in the underneath portions of
23 this machine, then you're going to ignite it. You ignite
24 this feeder and this ignition will rise up -- the flame
25 will rise up to the point -- you'll see this lazy flame

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1 just coming up, like along the rib, along the side of the
2 machine, and it will reach the top to where the layer is
3 and now start burning in the layer.

4 Q. What if -- to the extent that you hypothesize the
5 possibility that it occurred at the bolter, what is the
6 most probable mechanism that you are hypothesizing caused
7 it at the bolter? Is it this one that you've just
8 described?

9 A. Either this or a -- or being that the bolter, and
10 this is -- we have no knowledge about -- was not
11 maintained permissibly. That is, for example, the
12 explosion-proof boxes, the -- that methane had gotten --
13 gets into these boxes and the gap, they didn't have the
14 bolts tightened down, so you had a 4,000th inch gap
15 around -- or not more than 4,000th of an inch gap around
16 the box. And this you can see by missing bolts or loose
17 bolts. And it's a very simple thing: 10 or 15 minutes
18 around that machine by an electrical mi -- any miner with
19 electrical papers would have defined whether or not this
20 was the igniting source.

21 Q. You have no evidence on that one way or the other?

22 A. No, we are in the dark.

23 Q. Just while we talk about being in the dark. Well,
24 let me back up; one question before that. Would you not
25 be of the opinion that from the location of the bodies

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1 that it would suggest that those that were up in the
2 vicinity of the continuous miner travelled the greatest
3 distance in trying to escape and that, therefore, they
4 might have had the earliest warning of this flame and,
5 therefore, that -- the location of the bodies is more
6 consistent with it having occurred in or about the
7 vicinity of the miner?

8 A. I considered that, Mr. Merrick, and there is one
9 reason why I won't agree totally. And that is it would
10 have been more difficult for Mr. Dollimont, assuming he
11 was installing the -- putting the mesh in and getting
12 ready to bolt, which would be what I would suspect if --
13 once you start putting the mesh up the next step is to
14 get the drill steel and get ready to start drilling your
15 bolt holes. He would -- his means of escape from the --
16 his working place, was the most difficult of all people.
17 It would take him more time and more effort to get from
18 his workplace -- and if you look at the photographs of
19 the bolter, the tight side was the operator's side. That
20 had me a little confused. The wide side in there was the
21 other. So he would have to cross over the machine --
22 assuming he was at the bolter's control place, he would
23 have to cross over the machine to escape it. It would be
24 a little bit more work for him than it would be for Mr.
25 Jahns, for example.

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1 Q. Just a last question on this point. Do you agree
2 with the position that in an investigation such as this,
3 a public inquiry such as this, that it is not unusual to
4 never be able to absolutely and with 100 per cent
5 certainty be able to establish the exact mechanism of the
6 ignition and that that's not really what's the most
7 important.

8 What the most important thing to do is to identify
9 the most probable method by which it occurred, what
10 possibilities there were and then to examine why there
11 were such possibilities. Do you agree with that?

12 A. I agree with that but I would like to add, if you
13 will excuse me, the credibility of the Inquiry's findings
14 are enhanced by having -- by being based on a -- on an
15 as-thorough investigation of conditions as possible.

16 Q. All right, that's fair. Break point, Mr.
17 Commissioner?

18 COMMISSIONER Yeah. I will just follow up a bit on Mr.
19 Merrick's point there. When Mr. Brookes was on the
20 stand, he made the observation that doesn't appear to be
21 very arguable, but he said the actual -- this pretty well
22 the same as what Mr. Merrick has said, the actual source
23 of ignition is -- would be nice to know, but the main
24 concern is that why all of the elements were present at
25 that time to cause the explosion. I mean, the -- I think

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1 that's -- that's what we're here for, really.

2 A. Yes, sir.

3 COMMISSIONER Yeah.

4 A. I agree with Mr. Brookes in that, but my experience,
5 and, unfortunately, I've been involved in too many
6 similar exercises, the credibility of the findings which
7 often lead to changes in practices if not changes in
8 regulations, changes in philosophy, the acceptance by the
9 public is enhanced if the inquirer or the finder the
10 facts, has more than supposition and assumptions on which
11 he bases his findings.

12 COMMISSIONER That's the gap I've been trying to bridge
13 over for the last eight weeks or so. Thank you for your
14 assistance in that. We will recess for 15 minutes.

15 INQUIRY RECESSED (TIME: 3:02 p.m.)

16 INQUIRY RESUMED (TIME: 3:18 p.m.)

17 COMMISSIONER Mr. Merrick.

18 MR. MERRICK Thank you. Mr. Mitchell, just one
19 question that follows off from what we were talking about
20 just prior to the break. You've been involved in a large
21 number of investigations of mine incidents and disasters.
22 How many times in investigating a mine incident are you
23 unable to determine with real precision the exact
24 mechanism of the event?

25 A. If I put a number to it I would say 99.999 percent

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1 of the time might be reasonably conservative.

2 Q. All right. So that that's not an unusual
3 circumstance to face in a mine investigation?

4 A. That is correct?

5 Q. All right, thank you. Now let me move on as quickly
6 as I can with your letters that you filed. Let me take
7 you to the second letter dated September the 12th, '92
8 which is found in that exhibit. And this one is entitled
9 -- in Exhibit 48. This one is entitled, "Westray Mine
10 Incombustible." Have you got it?

11 A. Yes, sir.

12 Q. Okay. Your first paragraph, halfway down you say,
13 "It must be noted, however, that many employees said they
14 had been asked to apply dust between shifts." How
15 adequate -- satisfactory is it to do your rock dusting by
16 asking for volunteers between shifts?

17 A. That, in my opinion, would not constitute an
18 appropriate program for maintaining the rock dust in the
19 mine.

20 Q. I take it that there should be a formal routine for
21 applying rock dust?

22 A. There should be and, in most mining countries there
23 is a -- the mine operator does have a plan that is
24 followed religiously for maintaining rock dust.

25 Q. So that is something that should be able to be

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1 determined by anybody coming to the mine and asking or
2 inquiring?

3 A. That is correct.

4 Q. Just, as you go down that letter, a couple minor
5 questions. Two-thirds of the way down, paragraph (b),
6 you're referring to your discussion with Mr. Phillips.
7 You make the statement, "prior to May 9th..." this is
8 what Phillips is telling you, "Prior to May 9th, Westray
9 had applied almost four pounds of rock dust per tonne of
10 coal mined." What do you say as to the adequacy of that?

11 A. Were that true, then that would constitute a program
12 of application that would represent, I would say, among
13 the best of mines.

14 Q. It would also represent, I assume, one heck of a
15 quantity of rock dust that must have gone into that mine?

16 A. That is what one would conclude from that if it's
17 true.

18 Q. Based on everything that you have seen and that
19 includes not only your observations of the mine post-
20 explosion, but comments, inquiries that you have made,
21 evidence of testing, evidence as to the extent that rock
22 dust was actually existing in the mine, and I say the
23 bags of it, the supplies, of it and the amount that --
24 any evidence that you know that you've come across as to
25 what was in fact being done to apply dust, do you believe

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1 him?

2 A. No, sir.

3 Q. Apparently he told you that he had a two-inch binder
4 of data supporting this. Did you ever see that?

5 A. He showed us the binder. It's a blue-covered loose
6 leaf. We were not privy to the contents, though we did
7 ask.

8 Q. To see it? To the --

9 A. To look at it. But the subject was changed. I
10 remember that conversation.

11 Q. Indeed? All right. I take it, looking at Clause
12 (b), that Mr. Phillips told you that there was so much
13 rock dust on the floor of pitching roadways that it made
14 traction difficult?

15 A. That is correct, and I would agree with him.

16 Q. That, if there, it makes it difficult?

17 A. Yes, sir.

18 Q. Yeah. Do you believe it was there to the quantity
19 that it made traction difficult in Westray?

20 A. No, sir.

21 Q. Give me a second, I'm going to skip over some things
22 here because of time commitments.

23 COMMISSIONER May I interject something on that, Mr.

24 Merrick, if you don't mind? I refer you just to

25 Photograph 25, if you --

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1 A. You're right, Your Honour, it's very obvious.

2 Q. Well, it seems to me from the minuscule experience
3 I've had at this, that that wall on the left-hand side
4 should be grey or almost white?

5 A. You are correct, sir. I was -- that is the most
6 definite proof --

7 COMMISSIONER Yeah.

8 A. -- of the inadequacy of rock dusting. Because as we
9 discussed before, we see no evidence of important
10 pressures going into the depth of Southwest 2-1 Road and,
11 therefore, there's no reason to believe that the black we
12 see is post-explosion.

13 COMMISSIONER And I think, for the record, rock dust is
14 not black?

15 A. That's correct. And a more even and a more elegant
16 photograph, sir, is the one in the prior -- Photograph 24
17 is.

18 COMMISSIONER Okay, yeah. That's raw coal?

19 A. That is raw coal, without question.

20 COMMISSIONER Yeah, thank you.

21 MR. MERRICK And this is from Exhibit 59, if you're
22 looking at the photographs?

23 A. That's correct, Mr. Merrick.

24 Q. Thank you. Just give a second here. I'm not going
25 to ask you any detailed questions about the rest of your

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1 letter. It speaks for itself, I think. Other parties
2 may want to ask you some questions about it.

3 That brings us to the first letter dated September
4 the 21st, '92, that's entitled, "Re: Violations Based on
5 Westray Mine Ventilation Analysis." And, again, you
6 basically are repeating many of the views that you had
7 previously set out, is that fair?

8 A. That's fair.

9 Q. And you pointed out where you consider that
10 violations of the legislative requirements are and where
11 there are violations of safe practices. Is that fair?

12 A. Yes, sir.

13 Q. And, again, the letter speaks for itself and I'm not
14 going to go through it with you other than a couple of
15 points. On page 3 you talk about non-permissible
16 equipment was inbye the last open crosscut. As I read
17 your paragraph, I understand you to be saying that that
18 boom truck was probably in violation, am I right?

19 A. That paragraph states that, but as we find from the
20 RCMP investigation, the boom truck is not where Mr. Muise
21 and MacNeil told me it was. So I am in error with
22 respect to that No. 1.

23 Q. Have you seen the photographs of where that boom
24 truck actually is?

25 A. Yes, sir.

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1 Q. And what is your opinion then?

2 A. The boom truck is at the entrance, just outbye the
3 entrance to the No. 1 Road and the B Road extension.
4 And, therefore, is in intake air. It is not 300 feet,
5 however, from that last open crosscut.

6 Q. So it is in violation?

7 A. It's in violation of the letter that the Department
8 of Labour -- I believe the -- I don't know if it's a
9 letter or criteria that the Department of Labour
10 established for the use of diesel equipment. However,
11 it's not in violation, for example, of -- it was would an
12 acceptable location in the United States. For that boom
13 truck, nothing else.

14 Q. Let me ask you this and -- no, I will leave that.
15 Just give me a second. On page 4 of that letter you talk
16 about the fact that there was no water gauge for the main
17 fan. I take it that you consider that significant?
18 That's a violation of the rule, to begin with.

19 A. Yes, it's a -- but the reason it's in the regulation
20 is that it is, in my judgement, I believe the judgement
21 of most mine ventilation people, an important means of
22 evaluating air flows in the mine. In fact, let me
23 rephrase that. It is a critical means for evaluating air
24 flows in the mine.

25 Q. Is it something that reasonably prudent mine

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1 management would be expected to have?

2 A. Yes, sir.

3 Q. How frequently have you come across situations where
4 that hasn't existed? Is it a rare thing that you don't
5 find one?

6 A. It is the basis in the United States for withdrawing
7 all persons from the mine.

8 Q. Its absence?

9 A. Its absence.

10 Q. And, again, I take it that the existence or absence
11 of a water gauge is something that would be readily
12 apparent to anybody who wanted to check.

13 A. Unfortunately, with this fan, that isn't the case.

14 Q. Well, I suppose somebody could ask if they had one?

15 A. Of course.

16 Q. And if they were told that they didn't, that should
17 alert any reasonable mine -- any person reasonably
18 experienced in mining that that's a safety problem?

19 A. Yes, sir.

20 Q. And they should have done something about it?

21 A. Yes, sir. But the problem -- I have looked at this
22 very carefully because it's astonished me, if you will
23 excuse the expression, because it was just something that
24 any and all of us just expect would be there. It would
25 not be something we would -- I would never think of

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1 asking unless I wanted to look at the -- and the reason I
2 asked about it is because you look on the chart -- what
3 the water gauge does, sir, is it produces a pressure and
4 this is recorded on a chart. And you can get the exact
5 time of the explosion and also the question I wanted to
6 know, was there more than one explosion. And you would
7 see that in the -- on the chart of the water gauge. And,
8 I mean, I would never have ever thought of asking about
9 the water gauge, had it not been that I wanted to see the
10 chart. It's just not something you would consider is not
11 there.

12 COMMISSIONER Is this chart something that's done
13 automatically by the gauge itself or is it a handwritten
14 chart?

15 A. No, it's an automatic chart. It's a pen-recorded
16 chart.

17 COMMISSIONER Oh, something like --

18 A. Yes.

19 COMMISSIONER Okay, thank you.

20 A. That's the most common type, pen-recorded. Nowadays
21 you can get, you know, these fancy digital type that come
22 out printed.

23 COMMISSIONER Computerized, things --

24 A. Yeah.

25 COMMISSIONER -- like that, yeah. Okay, thank you.

MR. MITCHELL, EXAM. BY MR. MERRICK

1 MR. MERRICK Does its absence in this case tell you
2 anything or allow you to draw any conclusions in your own
3 mind as to the safety attitude of management?

4 A. It just supports my opinions regarding that.

5 Q. Which are?

6 A. I believe I expressed it in my letter of July that
7 we read before when we talked about --

8 Q. Ventilating?

9 A. -- the --

10 Q. You were talking there about ventilation.

11 A. Yes. Well, this is like the blood pressure unit
12 that the doctor puts on you when he takes your blood
13 pressure, except we like to know what the blood pressure
14 is all the time.

15 Q. But does it allow you to draw any conclusions in
16 your own mind as to their general approach to safety --

17 A. Yes.

18 Q. -- or is it -- all right. I take it -- and what are
19 your views as to their general approach to safety?

20 A. There was none. Or if there was any, it wasn't --
21 you couldn't add up to a hill of beans.

22 Q. Mr. Mitchell, let me ask you this and this is
23 requiring a hypothesis on -- it's a hypothetical
24 question, and if you don't want to answer it, fine.

25 Having drawn the conclusions that you have as to the

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1 mentality of management as to how they handled
2 ventilation, we will talk in a little while as to how
3 they handled planning and everything else, and your views
4 you've just told me as to their attitude toward safety,
5 had you had an opportunity to visit that mine back in
6 April of '92, how long do you think it would have been
7 before you realized that you were dealing with a
8 problematic management, a management that had these
9 problems?

10 A. I will be honest with you, I know a little more
11 about some of the people involved and they could have
12 snowed me too. A lot of what I'm saying is Monday
13 morning quarterbacking, having done the studies I did,
14 talked to the people I did. These people didn't tell us
15 these things prior to the event, unfortunately. This is
16 all retrospect that we can make this judgment. I'm not
17 going to mention names, but some of these people have
18 been -- maybe one or two of these people have been
19 categorized in our business as like con men.

20 Q. You say that you would have been snowed too; who got
21 snowed?

22 A. Oh, I don't know -- anybody. I just assume that
23 whoever -- you were using this as a universal term. So I
24 would --

25 Q. Do you think --

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1 A. They could have snowed me.

2 Q. Do you think that they snowed anybody else?

3 A. Well, now that sounds egotistical because, you know,
4 the response would be if they could snow me, they could
5 snow you. But I don't want to go that far, so it's hard
6 to answer that. But I kind of feel that would be the
7 case, that you and I, if we went in there, would be
8 mightily impressed.

9 Q. Do you think they snowed any of the inspectors that
10 visited?

11 A. To be honest with you, my opinion, having talked
12 this over with the inspectors at length, is yes.

13 Q. So the inspectors got snowed?

14 A. Just like I would have been.

15 Q. Do you think any other department officials, I'm
16 thinking now of Department of Mines or Natural Resources,
17 the people that were looking after all of the
18 applications and changes and approvals for changes, do
19 you think they got snowed?

20 A. Well, when you have somebody come in and say I've
21 got this guy, that guy, I mean all these people they had
22 working for them, extremely competent, tough, known
23 people in our industry, giving them advice, and I come to
24 you and I say, well, all these people have been telling
25 me to do this, you have every reason to believe me.

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1 Q. I'm going to use your terminology, do you think the
2 Department of Natural Resources got snowed?

3 A. I don't know; I never asked -- I never really
4 searched that question out with them. I did search it
5 out with the Department of Labour people.

6 Q. All right. I suppose that raises the next question;
7 how easily should we expect our inspectorate to get
8 snowed? Got any comments to that rather general
9 question?

10 A. Oh, boy. I hate to say it, this is not an uncommon
11 thing, and eventually it gets cured. But, unfortunately,
12 it gets cured after something bad happens, and then we
13 learn that the person that who is giving out this
14 information is not giving us -- is not doing what he
15 claims to be doing. And, for that reason, in the United
16 States we have very severe penalties for this type of
17 action now. We have mine operators who are being fined
18 as much as \$100,000 for relatively minor violations of
19 the regulations. This the way -- and also the
20 superintendent, the foreman, any certified person is
21 subject and is being fined enough big bucks to militate
22 or mitigate the problem.

23 Q. Let me ask you this, if you've come to the view that
24 the Department of Labour got snowed, tell me how they got
25 snowed?

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1 A. Well, we were talking about rock dusting before.
2 The Department of Labour is not allowed, authorized, to
3 take rock dust samples in the manner that you have to
4 take them. They just don't have the personnel. To do a
5 proper rock dust analysis, which is the only basis for a
6 legal action, would require, in a mine such as Westray --
7 I would say that we require no fewer than six people.
8 And I'm looking at maybe three days' effort by those six
9 people to take the survey. Then you could do something
10 about it.

11 And I did look into this and I understood that what
12 they were saying, and this is common, you go into a mine,
13 you always say there's not enough rock dust here. I
14 always do that, even with my own clients. I say, let's
15 get some rock dust. Well, I remember telling one guy,
16 gee, you've got the best rock dusted mine I've seen in
17 ages. And it was, amazingly well.

18 They were asking for the mine operator to provide
19 them with a rock dusting plan. And this plan would
20 specify the frequency of a sampling program and where
21 samples would be taken. And this was the problem in what
22 I've been hearing about with respect to rock dusting, in
23 my opinion.

24 Q. Let me back up just for a second. Yesterday, we had
25 evidence from Dr. Salamon, yesterday or the day before,

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1 when he was asked questions about whether on key safety
2 issues the inspectorate should grant leniency. And he
3 said that on key safety issues, there can be no leniency.
4 Do you agree with that view?

5 A. Oh, yes.

6 Q. And I take it that what he meant by that is that on
7 key safety issues, the inspectorate must see that the
8 thing is done properly. Is that fair?

9 A. The word "properly" creates a problem. That's where
10 we have all our arguments.

11 Q. That it must be done in accordance with either the
12 dictates of the law or with the dictates of safety.

13 A. And there is where the law is not specific is where
14 we run into trouble, sir.

15 Q. Well, let me come back to the stone dusting point;
16 this mine was not properly stone dusted, was it?

17 A. It was not properly stone dusted, in my opinion.

18 Q. Nor, right up to the time of the explosion, is there
19 any evidence that they had a proper stone dusting plan or
20 program?

21 A. That is correct.

22 Q. It was the topic of conversation on a number of
23 occasions between the mine and the inspectorate. In fact
24 you refer to them in one of your letters. You've seen
25 the inspection reports. And we see there entries that on

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1 occasion stone dusting appear to be appropriate, but then
2 on other occasions the inspectorate were concerned that
3 it wasn't appropriate. More particularly, we see
4 notations where they were consistently pressing mine
5 management to come up with a stone dusting program.
6 Deadlines were being given and not met by management. Do
7 you recall all of that?

8 A. I do.

9 Q. Is that where the Department got snowed? Is that
10 one of the examples?

11 A. Yes, sir.

12 Q. They were stalled off by management when the
13 management shouldn't have stalled them off?

14 A. There was always [manyana?] attitude, I believe.
15 And I truly believe the inspectors were of the opinion
16 that they were going to achieve their goal of getting
17 this plan and program.

18 Q. But stone dusting is a key safety issue, isn't it?

19 A. Yes, it is.

20 Q. And the inspectors should not have granted leniency
21 on that, should they?

22 A. I'm not in the position in Nova Scotia to make a
23 judgment in that.

24 Q. I'm asking Don Mitchell, based on all of his years
25 of experience?

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1 A. I wish you hadn't. You are right that there is no
2 basis for leniency if you leave it to Don Mitchell, but
3 you didn't leave it to Don Mitchell.

4 Q. Well, we're leaving it to the people that were
5 charged legislatively with the safety of that mine. They
6 shouldn't have adopted an [manyana?] attitude either,
7 should they?

8 A. I hate to say it, if I was -- I might have done it
9 too were I in their position. Based on what I believe I
10 learned and I believe I understand.

11 Q. What is that?

12 A. [No audible response]

13 Q. What excused it?

14 A. These things were going to get done.

15 Q. Month after month after month?

16 A. Month after month after month. And --

17 Q. Tell me what excused that?

18 A. The climate. I have seen this same type of climate
19 before and I -- and I will not throw brickbats at any of
20 the people involved; the climate was such that the
21 ramifications from actions might not have been to the
22 best advantage of all concerned.

23 Q. Tell me what that climate was. What were these
24 ramifications? Because I want to hear the justification
25 for what you say and I bel -- I agree with was something

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1 that should not have been delayed.

2 A. I don't agree, I'm just sad about. But I can
3 understand it. I don't like it, but I can understand it.
4 It is a case where gee whiz, we want to do our best to
5 keep these men employed and keep this mine -- get this
6 mine going in a positive direction. And it just was --
7 they figured it was -- I believe they figured, I don't
8 know that this is what they figured, I just believe they
9 figured that they would achieve this goal with a little
10 patience, a little perseverance -- a lot of perseverance,
11 and a little bit of patience. They were dealing with
12 people that they were trusting.

13 Q. And they shouldn't have trusted them, should they?

14 A. They did not have the misfortune of knowing more
15 about the people with whom they were dealing.

16 Q. But more importantly, regardless of who you're
17 dealing with, when you're dealing with a key safety
18 issue, they shouldn't have trusted them? No matter who
19 you were dealing with.

20 A. I know we shouldn't but we do. All of us in our
21 everyday life, we all go and give some people the benefit
22 of the doubt.

23 Q. Now, Mr. Mitchell, you've given me your answers
24 based on very close involvement with the Department --
25 much closer than I've had an opportunity to have, for

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1 example, discussions with a number of people, including
2 the inspectors. And you have advanced as an explanation
3 for them having done something which they should not have
4 done: the atmosphere, as you describe it. You've
5 described it as their view they wanted very much to make
6 this mine work and thus keep these men employed.

7 I want you to be completely candid with me, and
8 based on your experience and years, I trust that you
9 will. Will you not agree with me that part of that
10 environment was that these inspectors were operating in a
11 small province where the government had supported this
12 mine. It was in a constituency of important politicians,
13 and there was a concern about political ramifications as
14 well?

15 A. I would not disagree with you.

16 Q. And that stands as a condemnation not just to the
17 inspectors, does it? It stands as a condemnation of all
18 us.

19 A. If I thought so I would say it does stand as a
20 condemnation, yes.

21 Q. Because we allow a system like that to operate?

22 A. I hope not.

23 Q. But we did in this case, didn't we?

24 A. We all have at one time; this is how we grow.

25 Q. In other cases, similar industrial operations have

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1 come into this province and closed within a very short
2 time, having cost us a lot of tax dollars. The one
3 unique thing about this is it also cost us lives. How
4 much pressure do you think the inspectors, this is the
5 front line inspectors now, were under because of this
6 atmosphere?

7 A. I -- if I were them -- had I been one of them, I
8 would believe there was a great deal of pressure on me.

9 Q. Have you seen examples of this pressure?

10 A. In Nova Scotia?

11 Q. In this case.

12 A. I wouldn't say I've seen examples; I've sensed
13 examples, but I could sense incorrectly.

14 Q. Tell me what you've sensed.

15 A. I sensed the belief that they could achieve their
16 goals, which was to obtain a safe mine, through patience,
17 a little bit of patience, and a lot of perseverance.
18 That I truly believe, sir.

19 Q. Yes, but I'm now also talking about the atmosphere
20 or the pressure that comes from not wanting to bring
21 trouble down on one's head from one's superiors. Did you
22 see any -- have -- you've told me that that was part of
23 the atmosphere. Did you --

24 A. Just an atmosphere I sensed; I didn't say it was
25 part of it. That is my belief. And I've believed things

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1 incorrectly before.

2 Q. Did you see any evidence that justified that belief
3 or from which you formed that belief?

4 A. Well, that's the feeling I obtained in my short time
5 here.

6 Q. This would be from talking to the inspectors and
7 talking to people in the Department?

8 A. And elsewhere.

9 Q. And elsewhere. See, this is very critical to us
10 because to the extent that this atmosphere existed, it
11 may well have existed at other times in this mine's life
12 as well. It may have been behind some of the conditions
13 developing as they developed.

14 In your own assessment of the Westray disaster, do
15 you put this down as one of the factors?

16 A. Yes, sir.

17 Q. This atmosphere of not wanting to rock the boat, not
18 wanting to upset this mine, and not wanting to cause
19 trouble with one's political superiors, in your view is a
20 factor in the explosion?

21 A. With the strong belief that I -- if I were they,
22 that I would succeed in my goals to have safety. I truly
23 believe, and this is without equivocation -- and I've
24 been in this game long enough; I know inspectors. I've
25 known thousands of inspectors. And I felt -- and I am

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1 strongly of the opinion that these were competent men of
2 good will who were trying to do the best job that they
3 were being allowed to do.

4 Q. That they were being allowed to do?

5 A. Yes, sir.

6 Q. Elaborate on that for me for a moment.

7 A. Well, I should say and what they believed they were
8 allowed to do. That I believe -- had I come into this
9 mine as an inspector and found something less than
10 imminent danger, that I would do a lot of talking and
11 hopefully get it corrected rather than require a
12 withdrawal of all persons inbye. Because if I required
13 the withdrawal of all persons inbye, I might be on the
14 unemployment line tomorrow.

15 Q. And you got that distinct feeling that that's what
16 these fellows were facing in this case?

17 A. I could be wrong, but that's the feeling I got.

18 Q. That, in effect, they were not allowed to confront
19 and roust this company?

20 A. I wouldn't use the word "allowed." The climate was
21 such that that would be not the right thing for them to
22 do if they wanted to feed their families.

23 Q. Let me broaden, just a little bit, from that for a
24 moment. Have you seen that kind of atmosphere in other
25 jurisdictions?

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1 A. Yes, sir.

2 Q. In what kind of jurisdictions do you find that
3 atmosphere?

4 A. We found that, and we still find it -- an ex-
5 Governor of West Virginia was just sent to -- not just, a
6 couple -- about a year ago, was sent to jail for a couple
7 of years for this type of thing. Where he was applying
8 pressure not only on his State inspectors but on the MSHA
9 inspectors with respect to things relative to mine
10 safety. We had a Commissioner of Mines in Pennsylvania
11 some years ago who did this thing.

12 I remember when I started in the mines, and I'll
13 never forget it, our company, Hudson Coal Company, was
14 trying to make us -- in those days we had to buy our own
15 clothing, and we still do -- buy our hard hats and steel-
16 toed shoes. And the mine -- the State mine inspectors,
17 we didn't have federal mine inspectors in those days, the
18 State mine inspectors would insist on coming in the mine
19 with their cloth cap and their tennis shoes. And this --
20 I was a foreman at that time, and if you think of how you
21 -- when you're trying to force men to wear hard hats and
22 go out and buy hard hats and buy steel-toed shoes and
23 wear them, and here come the inspectors doing this, it's
24 a hard thing to get your point across.

25 Q. Let me come back to my broad question in a minute.

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1 Let me ask a more specific one. Were you ever made
2 aware, or did you ever suspect from what evidence you
3 were gathering, that there were in fact -- were you ever
4 aware of specific times when perhaps superiors did, in
5 fact, influence how the inspectors did their job? In
6 other words, I'm being very specific: are you aware of
7 any evidence that establishes that any political figure
8 interfered in how the inspectorate was carrying out their
9 job?

10 A. No, I'm not aware of anything specific. It's -- as
11 I kept using the word; this was purely sensing.

12 Q. Did any of the inspectors tell you about specific
13 things that might have happened that would have supported
14 that belief?

15 A. No, sir.

16 Q. But I take it that based on the information they did
17 give you, this was the distinct feeling you got from
18 them?

19 A. And, basically, when I -- the way I talk to them and
20 get them to start giving me feelings and all -- this is
21 the -- that's, I believe, where the sensitivity comes.
22 Of course, I could have misunderstood them too.

23 Q. Now did you detect this from anybody other than the
24 inspectors? This would be the Department of Labour
25 inspectors that would have been in the mine itself.

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1 There are only a couple of them.

2 A. You mean outside the Department of Labour?

3 Q. Outside the couple of Department of Labour
4 inspectors that would have been involved with this mine.
5 Did you --

6 A. With whom I was working? I can't really answer
7 that. I'm -- because I -- I don't want to say -- there
8 were so many discussions, so many things. Sense like
9 this grows from more than -- so I -- I'm not able to say
10 with specificity -- whatever the word is.

11 Q. All right. Mr. Mitchell, I'm pressing this a little
12 bit -- as hard as I can, because I consider it very
13 important, in this sense, that there's much that can be
14 learned from the Westray disaster, but unlike some mine
15 disasters, it may not teach us that there is a new way
16 that you can ignite methane or that there's a new way
17 that coal dust can be involved in an explosion. It seems
18 to me on what everybody has said that the mechanism of
19 this explosion is pretty well already established and
20 there's not much new about it. But why the mine was
21 allowed to get into the condition that it was. Why the
22 mine was reacting the way that it was. And when I say
23 "the mine" I mean management, men, and inspectors. We
24 maybe can learn from that.

25 And most particularly in this province if this

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1 atmosphere that we've talked about may have influenced
2 how the inspectors did their job, that's the thing that
3 we perhaps most can learn about in this province and what
4 we can most gain from this Inquiry.

5 And so let's just discuss that a little further.
6 When you have run into this kind of atmosphere in other
7 jurisdictions where the inspectorate, the front line
8 inspectorate, feels that they cannot rock the boat, what
9 conditions usually exist to permit that atmosphere to
10 exist? Are you able to answer that? Is it small
11 jurisdictions, big jurisdictions? Is it politicized
12 jurisdictions? Is it --

13 A. I gave the example of Governor Arch Moore and when I
14 gave the example of the mine inspectors that was coming,
15 at that time, direct orders from the Commissioner of
16 Mines and Deep Mine Safety in Pennsylvania. A man by the
17 name of Richard Maize. They were following in West
18 Virginia -- and we have problems in Kentucky. We just
19 sent a couple of federal mine inspectors to jail in
20 Kentucky. And when you look at it, you always see that
21 their actions are coming from sometimes undefinable
22 pressures, but at the very highest of levels in their
23 hierarchy. And that's why in the United States we now
24 have a group of people involved in this work we call
25 "special investigators," who are free of all influence,

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1 as much as we can keep them, so that their actions and
2 studies into these things can be objective and
3 independent.

4 Q. One of the things that appears troubling on the
5 evidence, and evidence that we have yet to hear, but we
6 know we will hear it, for example, we understand that the
7 first time that the Department of Natural Resources
8 became aware that Westray was actually mining the
9 Southwest district as it was mining it in an unapproved
10 fashion was the day of the explosion. And that when they
11 learned that, officials of the Department were very, very
12 upset with the fact that Westray had gone ahead and mined
13 that in the way that they had without seeking approval.
14 And that would be understandable.

15 But when asked what they did about it, they said
16 nothing. And to the best of our information, they never
17 have said anything. There's been no letter of protest;
18 there's been no picking up the phone and blasting
19 anybody; there's been no formal reprimand, albeit all
20 after the explosion. But something that would be
21 consistent with the venting of legitimate leg --
22 regulatory anger when an operator would do something like
23 that. Nothing was done. Is that what you've detected in
24 this province?

25 A. I heard a lot about that business, and to be honest

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1 with you, candid with you, I don't quite understand the
2 function, as I've been hearing it, of the Department of
3 Natural Resources. Among the things I've done is
4 represent land owners. That's the people who own the coal
5 that is leased to a mining company, and I was under the
6 impression that what I used to do is the same function
7 that this department has to do. And that is, once a year
8 I'd go down into the mine, look at what they've done,
9 decide if they left coal that they -- in my opinion,
10 shouldn't have been left and they should have paid a
11 royalty on that coal. And I will then write a report
12 saying well, this area of the mine they're mining in a
13 manner I don't consider safe and as a result, might
14 result in the loss of coal. And I estimate the potential
15 loss of coal to be so many million tonnes.

16 Then I will say, at this place their method of
17 mining left, we'll say, 100,000 tonnes of coal that could
18 have been mined and, therefore, they owe you -- whatever
19 the royalty figure is -- so many dollars for that amount
20 of coal. The places where I claim is unsafe -- this is
21 for future, should that coal be lost, that we have a
22 legal basis to go after our royalty.

23 And to be blunt, until sitting in this court and
24 listening to some of the evidence the past couple of
25 days, I was always under the opinion -- or the impression

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1 that this was the function the Department of Mineral
2 Resources to -- Natural Resources, to assure that the
3 safe and efficient mining was in terms of that same
4 concept, optimizing the recovery for the Province or the
5 owner of the coal.

6 So, after that long speech, what I'm really trying
7 to say is I can't answer the question as you posed it
8 because I'm not capable of answering it. And I truly
9 suspect, sir, that my belief of what the function of the
10 Department is is closer to what they do than what people
11 were claiming they should do.

12 Q. Let me ask this: You are probably aware, if you've
13 been following these proceedings, of the evidence that we
14 have about the mine plan that was submitted by Westray
15 for approval in October of 1991 and that it was rejected.
16 It was what I've been referring to as the "feather plan."

17 There was a memo prepared internally within the
18 Department of Natural Resources by Dr. Jones, being very
19 critical of the company and pointing out that they were
20 subject to, or potentially could have their licence
21 lifted. And Mr. Phelan writes to the company and advises
22 them of that. Notice is given to the company's bankers
23 that they may be in potential violation. Are you aware
24 of that incident?

25 A. Yes, I am.

MR. MITCHELL, EXAM. BY MR. MERRICK

1 Q. And ultimately a mine plan is approved at the middle
2 end of December for Westray, but a letter is also written
3 by Mr. Phelan to Westray setting out the rules of
4 engagement from this point on. And you're aware of that?

5 A. Peripherally aware of that, yes.

6 Q. Yet we know from the colour-coded diagram, as to
7 what was being done each month, that within a matter of
8 days of having that meeting or that -- those instructions
9 issued, Westray was off mining somewhere else. Not the
10 plan that had been approved. And without making any
11 attempt to get clearance from the Department or even
12 advise the Department that they were mining somewhere
13 else. And that continues up to the time of the
14 explosion.

15 Would you not have expected the Department of
16 Natural Resources to have monitored this operator a
17 little more closely in light of their run-in in December?

18 A. Well, I don't mean to repeat myself. We have a
19 bunch of guys who are real good snowballs and as I use my
20 analogy, I'd go to the mine once a year to look things
21 over. You just don't anticipate -- it's not reasonable
22 to expect people to do what we've -- you've just
23 described doing. It is just so unreasonable. There's no
24 basis for monitoring it. You just don't expect it.

25 Q. Does it -- does this particular incident trouble you

MR. MITCHELL, EXAM. BY MR. MERRICK

1 at all, as you look it? The fact that Westray, just
2 after they get the -- I'm going to call it the Wongawilli
3 room-and-pillar method, whatever we describe it as. It
4 was the method that was being talked about yesterday.
5 Just after they get that approved, they don't do it.
6 They go off and do something else. Add it to the fact
7 that they were just told by Mr. Phelan now, look, from
8 here on in, any changes in your mining plan you file with
9 us. We'll decide if they're important and then we'll
10 decide what we need to do. They ignore that. Does that
11 trouble you?

12 A. Yes, but this is what I've been saying. This is the
13 whole thing. The "holier than thou." The "I'm the king
14 of the mountain" and just keep out of my way, and I'll
15 sweet talk you into believing that I'm going to do
16 everything you tell me to do. Eventually.

17 Q. But shouldn't the Department have been just a little
18 more less susceptible to being sweet-talked by that
19 point?

20 A. Well, it's desirable that they had -- would have
21 been more -- but I don't -- I can well understand why
22 they weren't, I'm sorry to say. Like I told you, we were
23 shown -- we sat down with a certain gentleman who talks
24 about applying four pounds of rock dust per tonne of coal
25 mined and has a two-inch thick blue binder with all the

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1 proof positive. And the only reason I disbelieved him is
2 I knew we had an explosion, and I also had some rock dust
3 sampling at my instigation and I was a little more
4 cognizant of conditions than -- but if I had never had
5 that information and he tells me gee, I got -- I'm
6 applying four pounds per tonne, and here are all the
7 purchase orders, here's all the stuff; I have every
8 reason to believe him.

9 Q. If there was somebody from the Department of Natural
10 Resources who actually went into the mine and actually
11 travelled throughout the Southwest District, would you
12 have expected -- if they were exercising their duties in
13 a reasonably competent fashion, would you have expected
14 that they would have been aware that they were in an
15 unapproved area of the mine?

16 A. You know, when you go into a mine, Mr. Merrick, if
17 you don't know that mine really well and -- let's say we
18 go into Westray, we ride down the -- down to 10 Crosscut
19 in this buggy and then we turn up that A Road -- or C-1
20 Road and the guy who's driving the buggy says okay, let's
21 get out here and we then start walking, you won't know
22 where the devil you are in the mine. And you'll go and
23 look at the place and, gee, you look at the roof, you
24 look at the rib, you see the coal and it all looks good.
25 That's all you see.

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1 Now -- and I've been in the mines now for almost 50
2 years, take away the time I'm in school and the time I'm
3 sitting in court or going in the army, and I go into a
4 mine I've never been in before, I carry a map with me and
5 I keep saying "where am I? Where am I? Show me on this
6 map" and I hope the guy tells me the truth. And I --
7 what I do is I look at the span.

8 Now in your mine here, Westray Mine, there was no
9 way I could get up and look at the span number and check
10 that span number against my map.

11 Q. But you at least ask "where am I." Nobody's
12 suggesting that when the inspectors or the Department of
13 Natural Resources were walking through the Southwest
14 district on tours that anybody was telling them that they
15 were somewhere else. Don't you at least ask "where am I?
16 Show me on a map -- where am I?"

17 A. Well, this is what I do and as I've said, you just
18 hope the guy tells you.

19 Q. And anybody exercising reasonable prudence, if
20 you're a mining engineer and you've got regulatory
21 authority, either as a Department of Labour inspector or
22 Department of Natural Resources for the sake of knowing
23 how the resource is being mined, you should ask "where am
24 I"? Fair?A. Yeah, if you don't know where you are.

25 Q. And if you're told and come to believe that you are

MR. MITCHELL, EXAM. BY MR. MERRICK

1 in something like the Southwest district, would you not
2 expect that you would at least put two and two together,
3 is this where they're supposed to be or am I in an area
4 of the mine that was never approved?

5 A. I see your point. I'm going to digress. I
6 apologize for this. We just finished a case in the
7 States on this very question about deviation from
8 projections. And where MSHA went after a mine operator
9 following an explosion, as usual, because the mine
10 operator deviated from the projections and the
11 ventilation plans and roof control plans submitted to
12 MSHA and for which MSHA approved.

13 They didn't deviate from the quantities and the
14 types of flows of methane -- of air -- and they didn't
15 deviate from the method of roof control. What they
16 deviated from was that they pillared the left-hand side
17 before mining straight to the back of the panel, whereas
18 the projections indicated they'd mine to the back of the
19 panel. And the courts held that the mine operator could,
20 in his judgment, deviate from those projections if it was
21 appropriate and safe and efficient. So you have that
22 argument here.

23 Q. No, Mr. Mitchell, I'm going to argue with you a
24 little bit. What we've got here is a mine plan, and I'm
25 looking at the coloured section now that's tab 9 of

MR. MITCHELL, EXAM. BY MR. MERRICK

1 Exhibit 45. And we have an approval --

2 COMMISSIONER This one that you're looking at?

3 MR. MERRICK Yes. And we don't have a deviation as to
4 which side of the rib you're pillaring from. We've got a
5 mine plan approved up somewhere to the north of the
6 Southwest district.

7 A. I'm familiar with that, yes.

8 Q. And instead what we have is Southwest district 1.
9 Now that's considerably different than which side of the
10 heading you're depillaring. And here's my question: if
11 we are told in evidence by a Department of Natural
12 Resources mining engineer that on a tour of the mine --
13 he was through the Southwest district -- what I need help
14 from you on, because I'm a lay person, should that person
15 have been aware where they were by asking, seeing a plan?
16 I mean, you just don't go through dark tunnels. Should
17 you be asking where you are? And if you are, indeed,
18 told that you are in something like this, should we have
19 expected that person to say to themselves, "What is this?
20 It's not this that was approved."

21 A. I follow you here. Excuse me then for my deviation
22 before. It is a different area, and, indeed, a different
23 method of mining.

24 Q. Indeed, it is. A bloody dangerous one, apparently,
25 from the descriptions. So come back to my question to

MR. MITCHELL, EXAM. BY MR. MERRICK

1 you, how am I to assess those answers? Should I look at
2 that person and say "That's not acceptable? That's not
3 what we should have reasonably expected from you in your
4 position?" Can't I do that?

5 A. I would say you're correct, that that would be an
6 appropriate response.

7 Q. So that they would have to answer for that. Let me
8 ask you this: what about a Department of Labour mine
9 inspector who goes into the Southwest district in an
10 unapproved area? Now grant you this, the Department of
11 Labour is not the department that approves these things.
12 That's another department, but should we not reasonably
13 expect of a mining inspector that he at least determines
14 what's the approved mining plan?

15 A. In my opinion, the duty of an inspector working for
16 the Department of Labour is to make every effort to
17 assure the safe -- not the efficient -- but the safety
18 and health of the men in the mine. Where they're mining
19 is of no consequence to that question. How they're mining
20 is of consequence if how they are mining induces --
21 results in roof or rib conditions that could endanger the
22 miners or if how they're mining creates excessive
23 concentrations of methane or respirable dust or how their
24 mining creates slipping and falling accidents which are
25 one of the big problems we have in a mine such as

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1 Westray.

2 Q. Would you include in that list or whether they're
3 mining narrow finger pillars that go down to six meters
4 in width in places?

5 A. Because I, as this mine inspector, have heard of all
6 these great companies, well-known companies, who came in
7 here and advising this company of how to do things, I
8 would be -- me with just high school, if I'm lucky to
9 have that much, education, I'm not going to go up against
10 all these guys with a doctorate and big companies behind
11 me who have been doing this kind of stuff for a long time
12 and all over, and they know all this stuff. And if they
13 have told the Westray officials that you mine this six
14 meters wide, well, who am I to disagree until the roof
15 comes in? Then I might say, gee whiz, this is kind of
16 stupid, isn't it? But the roof has to come in first or
17 the miners have to tell me about all the problems they're
18 having because I'm not there when they did this.

19 Q. Let me come back to the question though that I
20 started with. Should we not be able to expect of our
21 inspectors, Department of Labour inspectors, that when
22 they do the tour of the mine that they would at least
23 have checked to determine if the method of mining and the
24 layout of mining has been approved? In other words, show
25 me the plan, I want to make sure that's an approved plan?

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1 A. I thought I -- I am sorry if I failed to answer it.
2 I believe I said or I should have said the function to
3 me, the duty of the Department of Labour inspectors, as I
4 read your OHS and mine regulation Acts, its sole duty is
5 the health and safety of the people in that -- in and
6 around that mine. How that mine is -- how that coal is
7 mined, the layout of that mining, he is not competent --
8 and I can assure you your inspectors are not competent to
9 judge the rock-mechanic principles on which these
10 decisions purportedly were based.

11 Q. Just using your terminology and accepting your
12 point, should we not, however, expect them to be
13 competent enough to know that they are inspecting an area
14 of the mine that's here when all that was ever asked for
15 or approved or laid out or planned was somewhere else?

16 A. That's right. I keep failing to -- I guess I keep
17 failing to answer. I don't believe that these inspectors
18 -- that's within their rightful purview.

19 Q. All right.

20 A. In fact, I will be -- go farther. I believe if they
21 try to step into that area, they're asking for trouble.

22 Q. Who then should have the responsibility to police
23 where Westray is mining and how they're mining?

24 A. Whoever owns the coal property because the owner of
25 the coal wants to optimize the recovery of that coal

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1 because that's his money.

2 Q. Well, in this case it's the Province, but I guess
3 what you're saying to me --

4 A. Well, that's what I mean.

5 Q. -- is the Department charged with that, the
6 Department of Natural Resources?

7 A. If the Province owns that coal, then the Province
8 wants to maximize the return on its -- not investment,
9 but its asset.

10 Q. Let me ask you this. And again talking about a
11 Department of Labour inspector, should we be entitled to
12 expect from those inspectors that they would be aware of
13 diesel equipment in the mine and whether that diesel
14 equipment was operating under an exemption or not?

15 A. Oh, yes. That is something which would affect the
16 health and safety of the miners and, therefore, that
17 would seriously be a part of their responsibilities and
18 duties, yes.

19 Q. And if we were to ask one of those inspectors,
20 please explain to me, knowing as you do what the
21 exemptions were that were issued, please explain to me
22 where in the mine the boom truck was allowed to go, or
23 where in the mine any of the tractors were allowed to go,
24 should we reasonably be -- reasonably expect that they
25 should be able to tell us?

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1 A. Yes, sir.

2 Q. And if they weren't able to tell us, what would you
3 say?

4 A. We need to improve our education and training of
5 these inspectors.

6 Q. In fact, based on all of your information that
7 you've gathered to date, bearing in mind that you have
8 been retained by that Department, do you agree that if we
9 are to continue to monitor our mines, we desperately need
10 to upgrade that?

11 A. Yes, sir. And following this, myself and Bob Elam
12 who is the Number 2 man in MSHA made arrangements for
13 your people to go to the Academy at Beckley where we
14 train inspectors and they -- I can assure you, they look
15 forward and hope that the Province will make this -- and
16 we in the United States have offered to make this
17 education and training available to them, as we do to all
18 of our inspectors. Every inspector who is part of the
19 Mine Safety and Health administration must attend -- well,
20 before they start inspecting, attend three months of
21 education and training at the Academy.

22 Every year this is followed up by, I believe, six
23 weeks of training in various specialties as we develop
24 specialists among these inspectors. This continues, at
25 the minimum, this is not the max, this is the minimum for

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1 each inspector for as long as he remains an inspector.

2 Companies send their safety people to the Academy.
3 The unions send their Safety Committee people to the
4 Academy. And this -- in fact, we have had people from
5 Ontario, people from Alberta as well as from Devco come
6 down. And this is something you don't want to copy
7 unless you've got a couple of billion dollars you want to
8 throw around, but this facility is available to the
9 Province of Nova Scotia, and I trust that you will make
10 use of it. And I know your people in the Department
11 would look forward to getting this opportunity.

12 Q. Mr. Mitchell, my next question to you -- I'm going
13 to again ask for your candor because I think if we are to
14 learn anything of value to this Province, we have to
15 start to getting very candid with each other. And when I
16 say that, I mean everybody participating in the
17 procedure.

18 You have now had an opportunity to review in detail
19 the Department of Labour aspect, at least, of our
20 inspectorate. And I'm going to put to you a proposition
21 to see if you agree with it. Do you agree that prior to
22 the May 9th explosion at Westray, we, as a province, I'm
23 not picking out any individuals; we, as a province, were
24 not providing a level of competence in our inspection of
25 the coal mine, the Westray Coal Mine, that we should have

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1 been?

2 A. If you will restate that without the "should have
3 been" because, you know, life is full of "should have
4 beens."

5 Q. We were --

6 A. I would agree with you, if we modify that "should
7 have been."

8 Q. Let me try it this way, we were not providing the
9 level -- well, you state it as you feel comfortable with
10 it?

11 A. Uh huh, just without the "should have been."

12 Q. It was not competent?

13 A. That we could have provided a greater level of
14 support, education, and training, a greater number of
15 people, a mine such as Westray with the problems
16 associated with that. We don't have, in Nova Scotia,
17 ventilation specialists. We don't have, in Nova Scotia,
18 roof control specialists within the Department of Labour.

19 We don't have -- we did have an electrical man, a
20 very competent one who, I believe, is retired. And I
21 wonder if he has been -- his job has been filled by a
22 person of equal competence. I have a reason to believe
23 it hasn't.

24 We have inspectors, these same inspectors who go to
25 a coal mine are inspected -- are expected to do the same

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1 job at a gold mine, at a quarry, at this, that and the
2 other thing. I understand you're going to put them in
3 forests and buildings and all over the world. You're
4 going to make generalists out of them which is going to
5 be to go in the direction opposite from the one you and I
6 have been discussing. And I hope you will apologize -- I
7 -- you take my apology for that lecture.

8 Q. One last question on this point of interference and
9 atmosphere under which people may have been operating.
10 The incident in December of '91 raises a lot of questions
11 in one's mind, at least in my mind.

12 We had Mr. Phelan -- we have a very strong reaction
13 in the Department being taken to what Westray had been
14 doing. We have Mr. Phelan writing the letter that he
15 wrote. We have the subsequent approval of an amended
16 mine plan. And then we have no apparent, maybe
17 explainable, follow-up by the Department on this mine.

18 Have you detected in any of your travels through
19 this scenario any suggestion that there may have been
20 pressure exerted in December on the Department of Natural
21 Resources?

22 A. No, if you recall, I believe I said earlier I did
23 not get the opportunity, deliberately did not get the
24 opportunity to satisfy or dissatisfy myself with respect
25 to actions by the Department of Natural Resources.

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1 Q. It's interesting the way you phrase that, "satisfy
2 or dissatisfy." I take it you also have questions in
3 your mind?

4 A. That have no answers because I deliberately made no
5 effort to get an answer.

6 Q. What are your questions?

7 A. I've wondered if there was reasons to function in
8 the manner things were functioned.

9 Q. So that somebody coming in from outside -- I find
10 this interesting; somebody coming in from outside,
11 looking at the evidence that we have, would also form
12 those questions in their mind?

13 A. Well, it's basically because I found what's amazing
14 -- or was pleasurable, not "amazing." I know a lot of
15 people in this business. I found people in the
16 Department of Labour that I dealt with and I found the
17 people, not all, but most of the people in the Department
18 of Labour with whom I dealt, and Mr. Jones, Mr. Phelan,
19 are the two men I dealt with very closely in the
20 Department of Natural Resources when we were starting the
21 plans for recovery of the mine. And I found these were
22 extremely knowledgable, competent people who had a real
23 purpose to achieve what had to be achieved.

24 We had extreme difficulty with Westray. They wanted
25 to do things that I just could not countenance, and I was

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1 so honoured and pleased at the support and the
2 understanding, the technical understanding, and the
3 support I got from those gentlemen.

4 Q. And that's a valid comment. And tomorrow morning
5 perhaps I will explore with you a little bit more about
6 that. But I take it that you're still left, in your
7 mind, with questions about that incident?

8 A. Oh, yes.

9 MR. MERRICK Break point?

10 COMMISSIONER Okay. We will adjourn until 9:30. Mr.
11 Mitchell, thank you.

12 A. Thank you, sir.

13 INQUIRY ADJOURNED (TIME: 4:29 p.m.)

14

REPORTER'S CERTIFICATE

I, Margaret E. Graham, Court Reporter, certify that the foregoing is a true and accurate transcript of the evidence taken by way of recording and reduced to typewritten copy.

Margaret E. Graham

DATED this 10th day of January, 1996, at Stellarton, Nova Scotia.