

1 IN THE CIRCUIT COURT OF JACKSON COUNTY,
2 SIXTEENTH JUDICIAL CIRCUIT, DIVISION 16
3 Honorable Marco Roldan, Judge
4 Leonard Ryan, et al.,)
5)
6 Plaintiffs,)
7)
8 vs.) Case No. 04CV-223271
9)
10 BP Corporation, et al.,)
11)
12 Defendants.)

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15 TRANSCRIPT
16 EXAMINATION OF JOHN SPENCER
17
18 SEPTEMBER 9, 2005
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25 Kathy J. Foley, Certified Court Reporter #446
 Official Court Reporter, Division 16
 Sixteenth Judicial Circuit at Independence

1 September 9, 2005

2 JOHN SPENCER

3 called as a witness herein, having been first duly
4 sworn by the Court, was examined and testified as
5 follows upon,

6 DIRECT EXAMINATION

7 By MR. McELDOWNEY:

8 A. Excuse me while I catch my breath.

9 Q. Thought you decided you weren't going to wait
10 any longer. Would you please introduce
11 yourself to the Court and to the jury?

12 A. My name is John Spencer. I'm out of Baltimore,
13 Maryland.

14 Q. And could you spell your last name for the
15 court reporter?

16 A. S-P-E-N-C-E-R.

17 Q. Mr. Spencer, what do you do for a living?

18 A. I'm what is called an industrial hygienist. I
19 evaluate exposures to people. I evaluate
20 exposures in the environment to determine the
21 significance of those exposures and whether
22 it's likely to harm human health or the health
23 of our environment.

24 Q. And what is industrial hygiene, briefly?

25 A. It's a profession that is dedicated to

1 recognizing, evaluating, and then developing
2 controlled strategies or management strategies
3 for managing occupational exposures to
4 chemicals, to physical agents like noise or
5 radiation or to biological agents like bacteria
6 and mold, fungi. Those things they're
7 facing in New Orleans right now.

8 Q. Why is industrial hygiene important?

9 A. It's important because it is a science. It's a
10 profession that deals with evaluating
11 exposures. We're all exposed to some level of
12 a chemical or the physical agents in our
13 environment or to biological agents. But my
14 profession, what I do is determine the
15 significance of that exposure, what the level
16 of that exposure is, and whether or not based
17 on other medical, toxicological data whether
18 it's likely to cause harm. And, if it is, to
19 develop strategies to manage those exposures.

20 Q. As an industrial hygienist do you look at
21 exposures to workers in the work place?

22 A. Sure. I mean, that's what I have done for
23 about 28 years with various private and
24 government agencies.

25 Q. Have you also had an opportunity to look at

1 exposures, not only to workers, but other types
2 of people?

3 A. Sure. I mean, communities. I've been involved
4 in a number of projects where I've evaluated
5 community exposures to kids in school and
6 everything from asbestos to solvent exposures
7 that somehow wound up in a school setting.
8 Hospitals. I have actually been in courtrooms.
9 I have been in -- evaluating exposures there.
10 And in towers at airports, looking at exposures
11 to air traffic controllers.

12 Q. Mr. Spencer, are you a certified industrial
13 hygienist?

14 A. Yes. I have been certified since 1987.

15 Q. And how did you become board certified in
16 industrial hygiene?

17 A. It is a -- the certification process for
18 industrial hygiene is similar to that of a
19 professional engineer. Requires so many years
20 of experience, minimum of five years experience
21 working in the area of industrial hygiene. I
22 then have to be accepted by other certified
23 industrial hygienists, qualified by them in a
24 letter. Then I have to pass, at that time, it
25 was a two day examination.

1 Q. Have you prepared, Mr. Spencer, a resume of
2 your educational background and work
3 background?
4 A. Yes, I have.
5 Q. I'm going to hand you what we have marked as
6 Exhibit 691 and ask you to identify that
7 document.
8 A. Yes. That's my C.V. It's an older one, but
9 it's mine.
10 MS. McELDOWNNEY: We would offer
11 Exhibit No. 691.
12 MR. WALTERS: No objection.
13 THE COURT: Exhibit 691 is admitted.
14 Q. (By Ms. McEldowney) Mr. Spencer, where do you
15 currently work?
16 A. All over the country. My office is in
17 Baltimore, Maryland though.
18 Q. Do you have your own company?
19 A. Yes.
20 Q. What is that company called?
21 A. It is Environmental Profiles.
22 Q. What does Environmental Profiles do? What
23 types of services do they provide?
24 A. Again, we do health hazard assessments. We
25 write product warnings. We do environmental

1 investigations in the properties. We do
2 various government work, doing abatement
3 planning for removal of asbestos or lead in
4 buildings, government buildings, schools. I am
5 involved in the litigation. And in terms of
6 testifying, I'm the only one in my firm that
7 does that aspect out of 17 people in the
8 company. We have been involved in everything
9 from helping sink ships for artificial reefing
10 projects by identifying potential health
11 hazards prior to sinking those ships, to
12 evaluating hospitals for their health and
13 safety programs.

14 Q. And you mentioned earlier that you provide
15 expert consulting services?

16 A. Yes.

17 Q. And you have obviously provided expert
18 consulting services before this case; right?

19 A. Yes.

20 Q. What kinds of cases have you provided that
21 expert consulting work on?

22 A. I mean, I have been involved in a number of
23 many different cases over the last ten years or
24 so that I have been doing this litigation
25 related work. A lot of asbestos work, there

1 are hundreds of thousands of asbestos claims
2 out there for a variety of asbestos containing
3 products. I have been involved in a number of
4 asbestos related cases only for encapsulated
5 products like gaskets and packing and other
6 material where the asbestos is locked up in a
7 rubber matrix or plastic matrix. I don't do
8 the dusty stuff exposures because usually
9 people don't want to hear what I have to say
10 about that.

11 I have been involved in other solvent
12 exposure cases including benzene exposure
13 cases. Most of the time that I work in that
14 area it has been on behalf of the defendant.
15 That is who I have been called by and I can
16 support through science their side of the case.
17 Although I have worked on plaintiff cases as
18 well in solvent exposure cases and I'm
19 currently doing so.

20 Q. I see also from your resume that you have
21 worked for NIOSH. Could you tell me what NIOSH
22 is?

23 A. That stands for the National Institute for
24 Occupational Safety and Health. It was
25 Established basically the same time that OSHA,

1 the Occupational, Safety and Health
2 Administration was established. It's basically
3 the research arm of OSHA for health and safety
4 professionals. They conduct the research for
5 them. It's part of the Centers for Disease
6 Control Public Health Service.

7 Q. What did you do while you were working at
8 NIOSH?

9 A. I was part of what was called the National
10 Occupational Exposure survey. We went around
11 the country. I was one of the team leaders
12 that went around the country and we went into
13 different types of businesses around the
14 country and evaluated exposures within those
15 different facilities. Looked at the safety and
16 health programs. Looked at the product
17 warnings. And looked at the programs and
18 policies and procedures that were in place to
19 protect those workers. In fact, I was here in
20 Kansas City for an entire month. So I got to
21 know Kansas City at that time. That was in the
22 early 1980s.

23 Q. I see too that you've also done work for the
24 United States Coast Guard?

25 A. Yes, I was an industrial hygienist for the U.S.

1 Coast Guard from about 1982 to 1987 and I
2 managed -- first I started in the Coast Guard
3 ship yard outside of Baltimore and then I
4 managed it out of Virginia, the Fifth District
5 of the Coast Guard, which was most of the east
6 coast. We had aircraft repair and supply
7 centers. We had many ships and we had the ship
8 yards and various other repair facilities and I
9 was responsible there for the industrial
10 hygiene program and the medical monitoring
11 program for about 4400 people.

12 Q. Can you tell us a little bit about what you did
13 at the Coast Guard in terms of industrial
14 hygiene and medical monitoring?

15 A. Sure. I guess one of the relevant things is we
16 had what we call marine inspectors. They would
17 board barges or ships that contained -- carried
18 various cargos, including benzene cargos or
19 benzene containing cargos. I followed them
20 along and I monitored what they were exposed
21 to.

22 I put equipment on them to sample the air
23 as they were doing their work to determine what
24 their level of exposure was for purposes of
25 determining whether we put them into an

1 on-going medical monitoring program or not. If
2 it was low levels of exposure, no. If it was
3 higher levels, exceeded health standards then
4 we put them on a program and we would evaluate
5 their blood on a routine basis. And I did that
6 for many other products including asbestos,
7 including noise and paints and various other
8 solvents.

9 Q. Can you explain, very briefly, how it is that
10 somebody goes about measuring benzene on an
11 individual?

12 A. Sure. The current way that we do it today
13 is -- it's called a personal sample and the
14 OSHA regulations require that if you're going
15 to evaluate an exposure that it be done by a
16 personal sample. There's a little portable
17 pump with a plastic tubing. It goes up to a
18 little charcoal tube and you clip it on their
19 collar so it's in what's called the breathing
20 zone of the individual. You pump a known
21 volume of air across that charcoal tube and
22 then that tube is taken off and sent to a
23 laboratory and they use -- they do what's
24 called desorbing the many solvents that are in
25 the air, including benzene, off of there.

1 And they run it through a gas
2 chromatograph or a mass spectrometer or any
3 number of instruments that will quantify how
4 many milligrams of benzene is on that tube and
5 then, based on the amount of air that you have
6 sampled, you can get milligrams per cubic liter
7 of air, convert that to parts per million so
8 you can compare your results to occupational
9 health standards.

10 Q. I see, Mr. Spencer, too that you are a member
11 of many different professional societies; one
12 of them being the American Industrial Hygiene
13 Association; is that correct?

14 A. Yes. In fact, I just got my certificate for
15 being 25 years longer with the AIHA, yes.

16 Q. What other professional societies are you a
17 member of?

18 A. It's many. The American Conference of
19 Governmental Industrial Hygienists, the Society
20 for Chemical Hazard Communication, the New York
21 Academy of Sciences, the Academy for
22 Advancement of Sciences. Many others.

23 Q. In fact, you were part of -- at least for your
24 section -- of the American Industrial Hygiene
25 Association; is that correct?

1 A. Yes, I was.

2 Q. You were also a member of the Emergency
3 Response Planning Committee; is that right?

4 A. Yes.

5 Q. Would you explain a little bit about what you
6 did and what that committee does?

7 A. Yes. That was a -- it's part of the American
8 Industrial Hygiene Association. It's
9 actually -- that's a world-wide organization
10 for industrial hygienists and they have various
11 committees. The one I sat on for many years
12 was Emergency Response Planning. We developed
13 guidelines, numbers, for things like benzene,
14 toluene, xylene, many other chemicals.

15 If there was a spill or if there is a
16 release of a chemical from a tank or a tank car
17 we -- you want to know, should I be concerned,
18 number one. Number two, based on the level,
19 the modeled level of exposure should we keep
20 the people in place, keep them in their homes
21 and protected from this vapor cloud or do we
22 need to evacuate the community? Because there
23 is hazard, there is danger in evacuating a
24 large number of people just as there are
25 exposing them to a chemical.

1 We developed those guidelines and I was on
2 the committee that would finalize these and
3 then ultimately they're produced and they're
4 used by the Emergency Response Planning
5 personnel around the country. So your state or
6 local fire departments and other personnel,
7 emergency personnel, use these guidelines to
8 determine when to evacuate a community and plan
9 for that in the event of a tank failure, an
10 accident on a rail system or something like
11 that.

12 Q. Could you describe a little bit more about what
13 these guidelines are in the event of an
14 emergency or a release?

15 A. Again, they're designed to -- you take the data
16 about the size of the tank that you have and
17 what is in it and then you plug in
18 meteorological information, wind direction,
19 speed, distance to various receptors, receptors
20 are people, either where they work or where
21 they live and you plug this into generally
22 what's called -- it's an EPA model, a
23 standardized model called a Gaussian plume
24 model. There's several versions of it. The
25 more popular one is a Screen Three Model that

1 is used now.

2 And so you plan by running several
3 different scenarios of what could happen and
4 then you determine, based on if this is the
5 source here, you've got a community here, what
6 is the likely level of exposure going to be in
7 a worse case scenario and will it reach these
8 emergency response planning guidelines? So it
9 allows you to plan ahead in the event of a
10 catastrophic event and to know immediately
11 whether you need to get the community out or
12 tell them to kind of hunker down in place.

13 Q. This model, in fact, is an EPA model?

14 A. The model that is used to do that analysis,
15 yes, it is one that is sanctioned by the EPA
16 and, in fact, it is in the EPA regulations.

17 Q. Mr. Spencer, how does one become a member of
18 the emergency response planning committee?

19 A. This particular committee is -- there are many
20 people who try to get to this committee and you
21 have to go through a review process within the
22 committee members. It's also one of the few
23 committees in the AIHA that allows you to stay
24 on more than two years. I was on it for many
25 more years than that. It's because it's a

1 special expertise that it is necessary to be
2 able to develop these guidelines and understand
3 the significance of these guidelines.

4 Q. So it's a committee that you have to be
5 actually selected and reviewed. It's not a
6 committee that you can simply join?

7 A. Correct.

8 Q. And to this day, they are still asking you to
9 come back and participate in that committee?

10 A. They have. They were a good group of people
11 that I enjoyed working with, yes.

12 Q. Would you briefly give us a bit of your
13 educational background?

14 A. My background is general. My undergraduate is
15 in biological sciences. That was my major
16 through college. It was primarily focused on
17 environmental sciences. Frankly, I didn't know
18 about industrial hygiene in 1972. Following
19 college, I ended up working with an
20 organization that had industrial hygienists and
21 toxicologists. I took graduate courses in
22 industrial hygiene. I did not finish my
23 masters thesis or degree. But I took many
24 courses. In fact, participated in the OSHA
25 Training Institute in Chicago for several weeks

1 as part of my training program with NIOSH.

2 Q. In not only your education and your training
3 but throughout your work career have you had an
4 opportunity to work with exposures to gasoline
5 and to benzene?

6 A. Sure, many times.

7 Q. And can you just give us generally some
8 examples of those instances where you had to
9 deal with gasoline and benzene exposures?

10 A. Well, it's a very common substance. When I was
11 with NIOSH, part of the surveys I did, I went
12 through various refineries. I audited various
13 refineries and looked at the exposures that
14 occurred in the refineries, looked at their
15 health and safety programs, looked at the air
16 monitoring data.

17 With the Coast Guard, as I mentioned
18 before, I was involved in evaluating marine
19 inspectors exposures to benzene and benzene
20 containing solvents as they boarded ships or in
21 the proximity of loading or off-loading cargo.
22 I have been involved, over the years, in a
23 number of assessments that have involved
24 underground storage tanks where there were
25 significant leaks.

1 I have been involved in projects on Long
2 Island where there's very rocky substraat up
3 there and gasoline, hundreds of thousands of
4 gallons of gasoline, had leaked from
5 underground storage tanks over an extended
6 period of time and started showing up in
7 resident's basements and I was asked to
8 evaluate those exposures. I have been involved
9 in a number of projects where there were
10 leaking underground storage tanks. But -- it
11 was more doing some community work, but more
12 looking at the workers who were doing the
13 clean-up activities.

14 Q. I think you said that you have actually been
15 involved in some refinery sites and looking at
16 exposures at refineries; is that right?

17 A. Sure.

18 Q. So are you very familiar then with how
19 refineries operate and the types of exposures
20 that would occur at refineries?

21 A. Yes. I have been through a number of different
22 refineries, small and large, around the
23 country, both when I worked for the government
24 and as a private consultant. So I'm fairly
25 familiar with refineries.

1 Q. Mr. Spencer, could you tell us what you were
2 asked to do in this case?

3 A. Yes. One, I was asked to evaluate the
4 plaintiff's industrial hygiene expert's process
5 and method for evaluating Mrs. Ryan's potential
6 exposures to benzene at her two different
7 residences. I was asked to evaluate whether or
8 not I could specifically evaluate her specific
9 exposures using different methodologies or, I
10 should say more accepted methodologies. And
11 then finally to do some analysis of using
12 standard and accepted EPA methodologies for
13 determining what the community exposures would
14 be under varying circumstances of releases of
15 gasoline from the Sugar Creek site to
16 Mrs. Ryan's residence at Evans Street and
17 Huttig Street.

18 Q. So what the -- really the primary focus of what
19 you have been asked to do is to really look at
20 the calculations that Mr. Petty has made with
21 respect to potential exposures to benzene from
22 gasoline from the refinery; is that right?

23 A. Yes.

24 Q. And then we also asked you whether you, in
25 fact, could just do an independent exposure

1 assessment using well-accepted EPA sanctioned
2 models in order to come up with your own
3 calculation?

4 A. Well, I looked at it also using more standard
5 and accepted industrial hygiene techniques for
6 evaluating exposures. I looked at that and the
7 EPA method, which the EPA is really more for
8 community or environmental types of levels of
9 exposures versus a distinct individual. So
10 I'll separate out those two.

11 Q. And just to give the jury a little bit of a
12 perspective, you've been obviously involved in
13 occupational exposures at refineries?

14 A. Yes.

15 Q. And at some of these refineries were there
16 neighboring communities surrounding them?

17 A. Sure. I mean, that's fairly typical.

18 Q. Could you tell us, what are the general, say,
19 benzene exposures that occur at different
20 refineries that you have had experience with
21 inside the fence line?

22 A. Well, that's a good description, fence line.
23 That's a typical thing that is measured, again,
24 more for environmental and community purposes.
25 They're called fence line concentrations.

1 There's personal industrial hygiene data,
2 personal monitoring that is going on in the
3 workers inside the plant, look at the
4 individual exposures.

5 And there is literature by a number of
6 people that generally inside a plant -- it
7 depends on the point in history, I mean,
8 historically, levels of exposure were higher
9 inside the plant than they are today. We have,
10 in general, a couple of parts per million. It
11 varies based on the activities and the time of
12 day and what they're doing and what kind of
13 process they're doing it on. But the general
14 background levels that I have seen in the
15 literature are generally less than parts per
16 million. They're in the parts per billion
17 range.

18 And that's also true for what are the
19 properties -- boundary concentrations where
20 there's continuous monitoring going on. Again,
21 they're in the parts per billion range.
22 They're background levels.

23 Q. And a part per billion is what, 1/1,000th of a
24 part per million; is that right?

25 A. Yes.

1 Q. And I think we have mentioned to the jury
2 during opening statement it's comparable to a
3 teaspoon of water in two Olympic size swimming
4 pools?

5 A. A part per billion sounds about right. It's
6 one penny in a billion dollars. It's not much.

7 Q. So you were asked to evaluate what Mr. Petty
8 did. And we also asked you whether you could,
9 in fact, do your own independent exposure
10 assessment calculation. Were you, in fact,
11 able to do that based on the data that was
12 available?

13 A. No. Using conventional and standard and
14 accepted industrial hygiene techniques there
15 wasn't enough information for me to be
16 comfortable with any level that I would derive.
17 I would have to use modeling. There was no
18 data specifically stating what a resident's
19 exposure or Mrs. Ryan's exposure at the Evans
20 property or the Huttig property was. So there
21 was no specific data for me that allowed me to
22 do a calculation specifically for Mrs. Ryan.

23 Q. And is that because it's important to know
24 various point sources of where the emissions
25 may be coming from, whatever chemical or

1 substance that you're looking at in order to
2 then try to calculate back in time as to what
3 the total exposure would have been?

4 A. Sure. Absolutely. You need some understanding
5 of how much material there is being released
6 into the environment, over what period of time
7 it's being released so that you can calculate
8 or determine what that exposure was with some
9 reasonable degree of accuracy.

10 Q. So what we did then is to try to give you
11 certain assumptions and then from those
12 assumptions you did do an independent
13 calculation; is that right?

14 A. Well, I did a calculation but, again, not using
15 what I call conventional industrial hygiene
16 techniques. I used more of an environmental
17 assessment technique using the EPA
18 methodologies that are used in evaluating
19 community exposure and evaluating community
20 risk to chemicals in the environment.

21 Q. And we're going to talk about that a little bit
22 more later. But could you tell us the types of
23 documents you have reviewed and what things you
24 have done in connection with your work in this
25 case?

1 A. Sure. I have reviewed the testimony of
2 Mr. Ryan. I reviewed the testimony of
3 Mrs. Ryan's daughter to understand their
4 perspective on it and where they were and when
5 and what conditions were like at that time. I
6 have reviewed many documents from the facility
7 at Sugar Creek to understand what activities
8 were going on there, reviewing the storage
9 tanks, what kind of tanks were in place, what
10 kind of venting was occurring, what kind of
11 losses were occurring. And then I reviewed
12 additional data, outside data in understanding
13 the environment historically, such as from the
14 National Weather Service, wind directions and
15 speeds and that sort of thing since the early
16 1960s.

17 Q. You have also reviewed the RCRA file reports
18 too, various documents within those RCRA
19 reports have been prepared and submitted to the
20 EPA?

21 A. I have many of those reports and also the
22 Agency for Toxic Substances and Disease
23 Registry, I have reviewed their reports. The
24 Missouri Public Health related reports on
25 discussing risk and the evaluation of the site.

1 Yes, I reviewed those as well.

2 Q. And you've actually been to the site; haven't

3 you?

4 A. Yes, I have.

5 Q. And you actually got a little bit more out of

6 that site visit than you wanted?

7 A. I did. I had my first case of chiggers since I

8 was a kid. These guys didn't warn me about

9 Missouri chiggers and ticks and I found them.

10 Q. Could you tell me a little bit about your site

11 visit, what you looked at, where you went on

12 the site, what you observed while you were

13 there?

14 A. Well, we drove through most of the site,

15 fortunately. I did walk through the areas

16 where many of the storage tanks were, where

17 they were closest to Mrs. Ryan's residence on

18 Evans Street. I also went into the

19 neighborhood and actually introduced myself to

20 the current owner of the Evans property and he

21 let me look around the property, look

22 underneath the house and around the house.

23 Then went down to the Huttig property as well.

24 And just got a sense of distance and topography

25 and relationship to the site, to the tanks, and

1 to the homes.

2 Q. Did you find anything significant about when
3 you went to the Evans Street home and you
4 looked to where the tanks were on Willow? I
5 mean was there something about the topography
6 there that struck you when you actually went
7 and walked the site?

8 A. Sure. There was a rise. Topographically there
9 was a rise separating the property on Evans
10 Street from the tanks themselves. They
11 actually sat down in a heavily bermed area. So
12 they were, from what I could see there, they
13 were topographically separated from the
14 properties, from the community.

15 Q. So, in other words, the tanks would be here.
16 You would have to go over a hill in order to
17 see the Evans home?

18 A. Correct.

19 THE COURT: Ms. McEldowney, if you're
20 at a good breaking point.

21 MS. McELDOWNEY: That would be fine.

22 THE COURT: Ladies and gentlemen of
23 the jury, we're at a good breaking point,
24 right on schedule for our afternoon break.
25 We'll take our normal break time, come

1 back and finish out the day.

2 (The Court reads the instruction.)

3 (Recess.)

4 (Proceedings return to open court.)

5 THE COURT: Ladies and gentlemen of

6 the jury, this Court is once again in

7 session. Please make sure that all

8 cellular phones and digital pagers are

9 turned off. Ladies and gentlemen of the

10 jury, at this time we'll continue with the

11 direct examination of Mr. Spencer.

12 Ms. McEldowney, you may proceed.

13 MS. McELDOWNEY: Thank you, Your

14 Honor.

15 Q. Mr. Spencer, would you briefly explain to us

16 what an exposure assessment is?

17 A. Yes. In industrial hygiene terms there's a

18 standardized process that one follows and there

19 is a couple of standard textbooks that describe

20 this. But it is, first, you start with

21 understanding the product itself. In this case

22 we're talking about, say gasoline, what is it

23 made out of, what is vapor pressure, how does

24 it move within the environment, how does

25 someone become exposed either through the air

1 or through the ground or through water.

2 Then we look at the environment itself.

3 Are we talking about indoors? Are we talking
4 about outdoors? What is going on in the
5 environment? What is wind direction? Wind
6 speed? What factors effect the environment in
7 which the exposure is occurring?

8 We look at the activities. We look at the
9 tasks, the frequency and duration of the
10 activities. If there's a release, when did it
11 occur, how often does it occur? If someone
12 is -- for that person being exposed, you want
13 to understand how often they're in proximity to
14 being exposed.

15 There's more to it but those three
16 elements generally go into doing an exposure
17 assessment. We follow up by either doing air
18 monitoring or personal sampling pumps and other
19 devices, direct reading instruments, or we can
20 model the data as well if we have sufficient
21 data to input into the model.

22 Q. When you model, when you model it when you
23 don't have actual personal measurements of
24 exposure, is that typically what you would do
25 then to obtain data is look at point sources of

1 emissions?

2 A. Yes. Sure. That's where we start is if we're
3 going to model something, we want to
4 understand, well, how much material are we
5 starting with? How much is released to the air
6 versus the ground or the water? And then how
7 does someone become exposed to that and how
8 does it get to that person?

9 Q. What are the ways that people can be exposed to
10 a given substance?

11 A. Well, that's basically through a -- what's
12 called a route of exposure. And that's either
13 airborne, that is through the skin, through
14 dermal uptake or through ingestion, eating it
15 or drinking it.

16 Q. What is your understanding of what the exposure
17 route was in this case for Mrs. Ryan?

18 A. From what I saw, what I have learned, it was --
19 if there was an exposure pathway, it was an
20 airborne pathway. They were not using -- they
21 did not have groundwater wells for drinking
22 water, drinking water even the ATSDR and the
23 Missouri Public Health documents address that
24 fact as well, that that was not considered a
25 route of exposure. So if product was released

1 in the air in substantial quantities, then that
2 was something that I would look at as a route
3 of exposure.

4 Q. And, Mr. Spencer, have you prepared a slide
5 presentation that will assist us in
6 understanding how you went about analyzing what
7 Mr. Petty did and then ultimately the
8 calculations that you made?

9 A. Yes.

10 Q. I'm going to hand you what we have marked as
11 Exhibit 799. Is this the presentation that you
12 have prepared?

13 A. It appears to be.

14 MS. McELDOWNEY: We have provided
15 this to Mr. Walters. Your Honor, we offer
16 Exhibit 799 at this time.

17 MR. WALTERS: No objection.

18 THE COURT: Exhibit 799 is admitted.

19 Q. (By Ms. McEldowney) Brian, would you? What
20 are we looking at right here?

21 A. This is an aerial photograph of the Sugar Creek
22 refinery. The date I'm not entirely certain
23 of. I have looked at several aerial
24 photographs. This appears to be perhaps in the
25 1950s, 1960s, based on my review of other

1 aerials.

2 Q. And can you just generally explain what
3 Mr. Petty did in order to calculate what
4 Mrs. Ryan's potential exposure to gasoline and
5 specifically benzene in the gasoline was?

6 A. Well, he used a unique process, one that I have
7 never seen done before in 28 years of
8 practicing as an industrial hygienist either
9 for the government or in private practice. I
10 mean, I have met Mr. Petty and have been
11 involved in other projects with him. He's a
12 very nice fellow. But I don't mean to degrade
13 him but I have never seen this technique ever
14 used before. That is where he used primarily
15 odor as a means of quantifying an exposure to
16 an individual. It was a unique process.

17 Q. In your entire training and career as a
18 certified industrial hygienist, have you ever
19 known anyone to do that that has been endorsed
20 by either a recognized association or a
21 governmental agency that has used odor as a
22 basis upon which to then build an exposure
23 assessment?

24 A. Never. I will say, as an industrial hygienist,
25 for certain chemicals and if you're trained and

1 you understand the odor thresholds of a
2 particular chemical constituent, you can use
3 odor kind of as a screening tool to determine
4 whether it was present or not but you cannot
5 quantify what that exposure is.

6 Q. In fact, as an industrial hygienist when you go
7 on site for a particular area do you use odor
8 in any way when you start to begin to identify
9 whether there may or may not, in fact, be a
10 health concern?

11 A. Sure. In fact, gasoline is a very good example
12 because the odor threshold for gasoline is so
13 low, that is it's below a level, the odor
14 threshold the point at which you can smell it
15 is at a level that is so low that it's below
16 the occupational health standard for gasoline.
17 So it's still safe when you smell it. It has
18 what's called good warning properties. Many
19 chemicals, not all, have that what are called
20 good warning properties, but gasoline does.

21 Q. Could you tell us, briefly, what are the flawed
22 assumptions that you have determined Mr. Petty
23 has made with respect to the -- with the
24 calculations he had made?

25 A. And, again, I want to be clear on this, I'm not

1 agreeing with this process that he created
2 himself. But if you're going to do it, at
3 least choose the right data in making your
4 assumptions. And he starts off right from the
5 get-go in choosing the wrong set of data when
6 it comes to odor and defining odor as it
7 relates to gasoline.

8 Q. And then that is covered under factor number
9 one; is that right?

10 A. Correct.

11 Q. So not only did he start with the basis that,
12 yes, I'm going to perform this exposure
13 assessment, using odor what people smell, but
14 then he also is using on your slide the wrong
15 odor threshold, meaning the wrong threshold at
16 which you can begin to start smelling gasoline?

17 A. Absolutely.

18 Q. And then factor number two?

19 A. Well, he didn't account for wind. And there's
20 data from the National Weather Service, from
21 Kansas City at the International Airport, has
22 data that we were able to get from 1961 through
23 1988. EPA says if you have five years of data
24 that is generally a statistical reliable data
25 set. We had '61 through '88, so that is even

1 more reliable and the data was extraordinarily
2 consistent over that period of time. We'll
3 talk more about that. But wind direction is
4 important. If it's blowing away from you then
5 you're not going to be exposed to vapors being
6 released into the environment.

7 Q. And factor number three?

8 A. There's a -- he used and I think later
9 corrected for this in a second supplemental
10 report. He's changed his report I think after
11 he recognized an error that he had made in this
12 item number three. Gasoline -- benzene is
13 present in gasoline. It is varied and changed
14 over time. But, yes, there's benzene present.
15 There's what's called a liquid phase. There's
16 gasoline in the liquid and then there's a vapor
17 phase what evaporates off there. The vapor
18 phase, what is in the air, is different than
19 the concentrations that are in the liquid. In
20 fact, the benzene content in the air in the
21 vapor phase is what is less than in the liquid
22 phase and he didn't recognize that when he did
23 his second report.

24 Q. But his first calculation?

25 A. His first calculation. And then later he --

1 recently, he modified that and he did recognize
2 that there is a difference in that.

3 Q. And what you mean by that, just so I'm clear,
4 is in there -- is the benzene content in liquid
5 gasoline would be different than the benzene
6 content in vapor gasoline?

7 A. Yes. If you have one percent benzene in liquid
8 phase you don't have -- the benzene is not
9 one percent of the vapor phase, it's about 100
10 to 300 times less than in the airborne phase of
11 the material.

12 Q. And then the last factor?

13 A. He, in his report, used data from Canada, from
14 other -- I think he had some material safety
15 data sheets from Amoco and from Shell. And
16 used those materials, safety data sheets, as if
17 they were technical spec sheets on the
18 gasoline product. And I presume he just wasn't
19 aware of a particular document from the
20 mid-1960s from Sugar Creek that identified the
21 actual benzene content of gasoline. So he used
22 data that was far above what was actually
23 present at the Sugar Creek gasoline and benzene
24 concentration.

25 Q. All right. Let's talk about the first

1 assumption that he made.

2 MS. McELDOWNEY: And, Your Honor, may
3 I approach the witness?

4 THE COURT: You may.

5 Q. He started with odor, what people smell, as a
6 basis upon which to build his exposure
7 assessment; is that right?

8 A. Well, sort of. He used a study from Drinker,
9 who was the author, 1943. It was really a
10 study to evaluate toxicological effects, what
11 would happen if you exposed people to vapor in
12 the air, gasoline vapor. It really wasn't an
13 odor threshold study. It's what happens when
14 you expose people to varying levels of gasoline
15 in the air.

16 Q. And what did Mr. Petty use for purposes of
17 determining what people were smelling? You
18 understand he never had an opportunity
19 obviously to interview Mrs. Ryan about what she
20 in fact smelled. Do you have an understanding
21 as to what other sources of information then he
22 assumed for purposes of his calculation?

23 A. In my review of Mr. Petty's deposition
24 testimony, he relied on accounts from Mr. Ryan,
25 and from Mrs. Ryan's daughter, I guess, who was

1 born in 1955 and I like I said lived at the
2 Evans property from 1955 to 1960. I'm not sure
3 her accounts of the Evans property apply. But
4 he relied on those two individuals for
5 description of odor.

6 Q. And do you have an understanding of what
7 Mr. Ryan and his daughter, Nancy Jane Eberle,
8 told him about what they smelled during the
9 time period they lived on Evans and on Huttig?

10 A. I don't know what they told him. Again, it's
11 from testimony of Mr. Ryan, from his daughter,
12 where they indicated that at the Evans property
13 that, yes, occasionally there were some parts
14 of the testimony there was occasional smells on
15 one or two occasions, Mrs. Ryan had smelled it
16 to the extent where it made her nauseous. But
17 it varied.

18 And, in my view, he also described the
19 odors not only of gasoline on occasion but
20 sulfur based compounds which are common with
21 petroleum products. You have sulfur in
22 petroleum products so you can smell those in
23 the part per billion levels. Like driving into
24 a town that has a paper mill, that's what you
25 smell, the same sort of thing. Doesn't cause a

1 health hazard, but it's not a very pleasant
2 smell.

3 Q. So, as far as you understand, at least for
4 purposes of his initial calculation that he
5 made, he relied at least upon, in part, his
6 interviews with Mr. Ryan and his daughter; is
7 that correct?

8 A. Yes.

9 Q. Did he come then to the conclusion that they
10 were smelling strong odors of gasoline for
11 that 24 year time period?

12 A. Yes. Based on his calculation and his tables,
13 he listed it as strong odors every day, all
14 day, seven days a week, except for a two week
15 vacation period.

16 Q. You're not aware of this, but we have heard
17 testimony in this trial of neighbors and former
18 refinery workers about what they, in fact,
19 would smell in the residential community,
20 outside of the refinery. And I believe we have
21 heard from four neighbors. And, generally
22 speaking, they said, yeah, it was strong some
23 days. It wasn't as strong at other times. The
24 wind may or may not have effected what they
25 were smelling. Sometimes it was stronger in

1 the winter. Some other witnesses said it might
2 be stronger in the summertime. And others said
3 they didn't really smell it all, only once in a
4 while.

5 Could you tell me where in Mr. Petty's
6 report he accounted for what other neighbors
7 were smelling during this 24 year time period?

8 A. Well, he did not. In fact, you have the same
9 problem in the exact study that he is relying
10 on, the Drinker study. If you read that study
11 carefully they exposed laboratory technicians,
12 they exposed I think there was a series of -- I
13 think they were women from 17 to 30 plus years
14 of age. And within each of those groups, even
15 the experienced laboratory people, some smelled
16 it at high levels and some smelled it at low
17 levels. There was incredible variation among
18 the different groups. That's a big reason why
19 odor is not used. It is not a reliable source
20 of evaluating exposures. It cannot be used.

21 Q. We have also heard during this trial from
22 refinery workers, guys that worked at the
23 refinery, went there every day, worked there
24 eight hours a day, five days a week, and they
25 have said that they don't recall smelling

1 gasoline in the Sugar Creek community. So can
2 you tell me where in Mr. Petty's calculations
3 he accounted for their recollection of what the
4 odors were during that 24 year time period?
5 A. He did not.
6 Q. Let's talk a little bit -- you mentioned the
7 Drinker paper. Is this the paper upon which
8 Mr. Petty then determined what the odor
9 threshold of gasoline would be?
10 A. That was his basis of saying that based on the
11 descriptions by family members, the two family
12 members, that the odors, that the concentration
13 in the air 24 hours a day, seven days a week,
14 fell within this range of values, a 150 to 600
15 parts per million, day in and day out, hour
16 after hour, based on this 1943 paper. A paper
17 which the analytical techniques of the time
18 didn't even really allow them to accurately
19 measure those types of levels.
20 Q. And we have heard about this Drinker study
21 before. Is this where he would put women and
22 men in enclosed chambers and expose them to
23 liquid vaporized gasoline?
24 A. That's right.
25 Q. And then what was the purpose of that study?

1 A. It was to evaluate the toxicological properties
2 of gasoline. Basically at what point will
3 someone's eyes begin to tear or when will they
4 start getting a scratchy throat or narcotic
5 effects, you know, feeling dizzy or out of
6 sorts. And he was evaluating this among
7 various men and women in a test chamber.

8 Q. And what, in fact, did Mr. Petty decide was the
9 odor threshold of gasoline based upon this
10 paper?

11 A. I don't know if he ever really defined odor
12 threshold. He used this to determine exposure
13 and he said it was a 150 to 600 parts per
14 million, again day in and day out. It varied.
15 His numbers varied depending on the household
16 they were living.

17 For example, Evans he reported 375 parts
18 per million, 24 hour a day, seven days a week,
19 based on using that paper and the Ryans'
20 testimony about smelling, what he believed
21 their testimony to be.

22 At the Huttig property it was 225 to 150
23 parts per million. Pretty incredible numbers
24 given the distance away. I mean incredible to
25 believe.

1 Q. So based upon what Mr. Petty did, he's
2 assigning a value of 150 ppm, that's the level
3 at which somebody would begin to smell
4 gasoline; right?

5 A. That's what he was stating, yes.

6 Q. And what, in fact, is the accepted odor
7 threshold for gasoline from various
8 governmental agencies?

9 A. Well, there are various reports and other
10 studies that have been done. The most recent
11 one I know is 1994. And those values range
12 from about 0.08 parts per million to 1 parts
13 per million as the level at which one can smell
14 gasoline. That's called the odor threshold
15 level. That's the concentration, this
16 threshold level, at which now that -- more than
17 50 percent of the subjects who are exposed to
18 it can smell it. That's kind of the criteria,
19 more than 50 percent of the subjects.

20 There's a variety of studies that have
21 demonstrated this. ATSDR, the American
22 Conference of Governmental Industrial Hygienist
23 and the Coast Guard all use a data point of
24 0.25 parts per million. There's others that
25 have done work, Amore in 1983, 0.08. Actually

1 there were some numbers even lower than that.
2 And then the API document in 1994 of 0.5 to 1
3 part per million.

4 Of course this is done in a more current
5 time where we had analytical methods that can
6 accurately measure the levels of gasoline in
7 the air. Vastly different than from 57 years
8 ago that this work was done where they were
9 using color metric methods to determine what
10 concentrations were. So it's we're using GCs
11 and mass specs today, slightly more sensitive
12 than what we were using in 1943.

13 Q. So is it fair to say then that Mr. Petty
14 assumed for odor threshold 150 ppm and can you
15 agree with me that it's generally accepted in
16 the industry that 0.25 ppm is the level at
17 which somebody can begin to detect the odor of
18 gasoline?

19 A. Yes. The Coast Guard is a good example.
20 They're the -- when I was with the Coast Guard
21 part of my role was with the emergency response
22 personnel. We were the first ones on the
23 scene. So if a tank car overturned, we were
24 there measuring and evaluating the exposures.
25 That's in their emergency response documents,

1 that 0.25 parts per million. It's widely used
2 and widely accepted by people who are in the
3 field every day dealing with products like
4 gasoline. It's a very common commodity in our
5 living and working environment.

6 Q. And is this one factor alone, in other words,
7 the fact that he assumed people don't begin to
8 smell gasoline until it's 150 ppm
9 concentration, is that one factor alone if you
10 adjust that to use what is generally accepted
11 by the federal and governmental agencies as
12 0.25 ppm, that will ultimately change his final
13 calculation by orders of magnitude?

14 A. Yes, 100, 200 times, absolutely.

15 Q. And has the federal government, and
16 specifically the Agency for Toxic Substances
17 and Disease Registry, commented on the
18 limitations of this Drinker study?

19 A. They have. And the most recent version of the
20 toxicological profile for gasoline they did
21 comment on that. And basically what they
22 said -- it's not a reliable document for
23 evaluating human exposure to gasoline. The
24 reason is because it wasn't gasoline vapor that
25 was used in the study. They sprayed heated

1 gasoline into ventilation ducts and then spread
2 that out into a room where the people were.

3 So as I mentioned before, that the liquid
4 phase of gasoline is different from the vapor
5 phase, you can let a bucket of gasoline
6 evaporate because the vapor -- the chemical
7 composition is going to be different in that
8 vapor phase than it is from the liquid phase.
9 They basically atomized liquid and heated it
10 up. They applied steam with it at the same
11 time because they didn't want it to be
12 explosive at the nozzle when they were spraying
13 it into the duct work so they added water
14 vapor, heated, steam, along with that and
15 sprayed that into this room.

16 So that's why ATSDR says this is not a
17 reliable document for evaluating effects on
18 humans and, in particular, odor thresholds.

19 Q. And that statement is actually found in the
20 ATSDR toxicological profile for gasoline that
21 we have received into evidence as Exhibit 582?

22 A. That's correct.

23 Q. So for purposes at least for his starting point
24 in calculating what her exposures would be,
25 what is your opinion as to whether or not,

1 using odor and then odor thresholds based upon
2 the Drinker study was a really good starting
3 place to calculate what her exposures might be?

4 A. Well, as I said, you don't use -- industrial
5 hygienists don't use odor to model or otherwise
6 evaluate quantitatively exposure. There's not
7 a single article in the peer reviewed
8 literature. I have never seen anybody use it
9 in 28-plus years of doing exposure assessments
10 and I have done many and have worked with many
11 doing assessments. It's not done.

12 If you're going to try to make up a new
13 approach or a new method, at least use reliable
14 data. Don't use data from 1943 that's not even
15 accepted by federal agencies. There's other
16 data that is out there. Use that data.

17 Q. Let's talk about his remaining three
18 assumptions. What happens if you adjust
19 Mr. Petty's calculations putting in actually
20 accurate assumption data? So the first one is
21 wind. Would you explain to the jury what he
22 assumed and then what you did to correct that
23 assumption?

24 A. Mr. Petty assumed that the odor was present
25 90 percent of the time. So 90 percent of the

1 time that she was there at the house, I believe
2 16 hours a day, when she was not working for
3 five days a week and then perhaps 24 hours a
4 day for the weekend. Fairly consistent ongoing
5 exposure. And at the Evans property he was
6 saying she was exposed to 375 parts per
7 million.

8 Now, the health standards for gasoline are
9 300 parts per million. So if somebody is
10 exposed, even for a short time to 300 parts per
11 million or 375 parts per million, you're going
12 to start having severe eye irritation, upper
13 respiratory tract irritation let alone 16 hours
14 a day. Personally, I do not believe that would
15 be bearable. And we corrected that assumption
16 by going to the National Weather Service,
17 getting data from the closest point, which was
18 the Kansas City International Airport, and data
19 from 1961 through 1988.

20 Q. And what did that data show?

21 A. That 44 percent of the time that the wind, it
22 was blowing away from the Evans property. So
23 for that -- nearly half time the wind was
24 blowing away. Not 90 percent of the time
25 blowing towards her. It was 44 percent of the

1 time blowing away. From the Huttig property,
2 which was much further away it's 78 percent,
3 almost 80 percent of the time it would be
4 blowing away from her residence. So it would
5 not have had an exposure from anything coming
6 from the refinery.

7 Q. So as I understand the wind data and the data
8 that you have used to correct Mr. Petty's
9 assumption, is this the type of data that
10 industrial hygienists would use in order to
11 determine what the predominant wind direction
12 would be?

13 A. Sure. I have used this before. Environmental
14 scientists use it in doing community exposure
15 assessments. It's a critical component of
16 their approach.

17 Q. So what I can understand then, what you did is
18 at the Evans Street property then if she
19 smelled anything she only had the possibility
20 of smelling gasoline 56 percent of the time
21 that she was there?

22 A. Right, not 90 percent.

23 Q. And then at the Huttig property she would have
24 had the potential to smell gasoline only
25 22 percent of the time?

1 A. Correct.

2 Q. The next factor that you considered was his
3 gasoline concentration and if you could briefly
4 explain what you did here?

5 A. In Mr. Petty's -- both of his two follow-up
6 reports where he made corrections the third
7 time, he used this 100 to 600 parts per million
8 and he got that number from this 1943 Drinker
9 article where they exposed all these people in
10 the chamber to atomized gasoline. He used an
11 average depending on the property and depending
12 on how close it was to the -- the Evans
13 property he used a higher number. He used an
14 average. He used 375.

15 For the Huttig property he used 225 and
16 then later on in time because there was
17 something -- he adjusted for some environmental
18 controls that may have gone in place he dropped
19 it down to 150 parts per million. So he varied
20 that number between 100 and 600 and he used 375
21 to 150 parts per million as the day in and day
22 out exposure level to Mrs. Ryan.

23 Q. And how did you correct that assumption?

24 A. I used -- we saw the odor thresholds range from
25 0.08 to 1 part per million based on acceptable

1 odor threshold data. I used 10 parts per
2 million based on my own experience in
3 monitoring for gasoline, doing underground
4 storage tank removals, and what was taken from
5 other data. And 10 parts per million is about
6 40 times or more than this number of 10 parts
7 per million. I used a higher number to kind of
8 account for a strong odor. If there were 10
9 parts per million in your house, it would smell
10 pretty strong. Even a few parts per million
11 would smell pretty strong in your house.

12 Q. And even at 10 ppm of gasoline would you start
13 to exhibit maybe even any physical effects from
14 being around that for a long period of time?

15 A. That's possible. I have not seen data where
16 humans were exposed for 16 hours a day. I
17 can't honestly answer that. But it's quite
18 possible because the longer you're in there,
19 the greater the potential for an adverse
20 effect. Honestly I have not seen any data that
21 looked at exposures for that long.

22 Q. Let's look at the last factor that you
23 corrected. That was the benzene content of the
24 Sugar Creek gasoline. If you could explain
25 what Mr. Petty assumed and how you corrected

1 it.

2 A. He's saying the benzene content of the gasoline
3 at Sugar Creek contained 2.75 percent. All the
4 records for the relevant time period in which
5 Mrs. Ryan -- there is a claimed exposure to
6 benzene from the Sugar Creek gasoline actually
7 show it was in the mid-1960s, a document that
8 shows 0.7 percent for both premium and regular
9 gasoline. So gasoline benzene content can vary
10 depending on where you are in the country or
11 what part of the world you're in. The benzene
12 in crude is different. It depends on where it
13 comes up out of the ground. So it's different.

14 It's also different based on your point in
15 time and your point in history. But during
16 this time, it was generally less than
17 one percent and there's a lot of literature
18 explaining that as well.

19 Q. I know you don't agree with his initial premise
20 that you can use what people smell to do an
21 initial exposure assessment but just assume
22 that to be true and a reliable way to do it.
23 Then adjusting for the three factors that we
24 just went over, you in fact did that
25 calculation; is that right?

1 A. Yes. I mean, I followed Mr. Petty's process
2 and just inserted what I believe were more
3 accurate, reliable, and believable numbers.

4 Q. And when you inputted the correct assumptions
5 and, again, not saying that you endorsed how he
6 created this model or exposure assessment in
7 the first place, what did you in fact calculate
8 was her exposure or potential exposure to
9 benzene from gasoline during the 24 year period
10 that she lived on Evans and on Huttig?

11 A. I came up with 0.6 parts per million. That's
12 in contrast to 400 parts per million years in
13 Mr. Petty's second report and 163 parts per
14 million years in his third report.

15 Q. And if I could just --

16 MS. McELDOWNEY: Is Exhibit 752, Your
17 Honor, received in evidence?

18 Q. (By Ms. McEldowney) Is this in fact the table
19 from Mr. Petty's first calculation of how much
20 he attempted to determine what the potential
21 exposure to benzene from gasoline would be?

22 A. Yes.

23 Q. And what was his ultimate finding as to her
24 potential exposure?

25 A. I believe that's 412 ppm years.

1 Q. And your calculation, adjusting and correcting
2 his assumptions came to?
3 A. 0.6.
4 Q. And then he performed yet another calculation
5 in July and what did he calculate her potential
6 exposure to be?
7 A. That's 164.7, again, versus 0.6.
8 Q. What caused the 60 percent reduction in his own
9 calculations from 412 to 164?
10 A. I think not long after my deposition in this
11 matter he had recognized an error that was made
12 in one of his assumptions and that was this
13 ratio of benzene in the liquid phase versus the
14 vapor phase or the air phase. So he realized
15 that based on using one of his own papers he
16 made a mistake, he made the adjustment from 412
17 to 165.
18 Q. So what happens then if you actually believed
19 Mr. Petty's calculations, have you done some
20 calculations to determine that if everything he
21 did was accurate and reliable what would happen
22 in concentrations of gasoline around her home
23 on Evans if you took that back to actually the
24 source of the gasoline to the refinery fence
25 what, in fact, did your calculation show?

1 A. Well, this was using 600 parts per million.
2 You can use 375 parts per million and reduce
3 that number but what actually happened --
4 common sense applies in industrial hygiene just
5 like it does in any other part of life. So if
6 you're assuming that there's 600 parts per
7 million in somebody's house on some occasion
8 and it's coming from a source that is some
9 distance away, then logically the source has a
10 higher concentration than it does at the place
11 where you're measuring that exposure.

12 So I actually ran an EPA model to
13 determine what the concentration would be at
14 the source. And found out that it was deadly
15 to people, acutely dangerous if any of us
16 walked through that plume of material we would
17 be dead if we didn't blow up first.

18 Q. So, in other words, if the gasoline
19 concentrations at Mrs. Ryan's home on Evans
20 Street were even between 375 to 600 if you go
21 back to the source of the odors there, to the
22 refinery fence, to, say, the nearest gasoline
23 tank it would have been at explosive limits?

24 A. That's right. For example, if this was a
25 container of benzene and I have a reading

1 instrument and I come over and I measure right
2 here, I'm going to get the needle to peg on
3 that instrument. If I move it right here, I'll
4 probably get no detectable levels. If I get
5 closer, I might get a little bit. If I get
6 closer, I'm going to get more. If I get here,
7 I'll get a lot. And that's what this is
8 telling us. It's common sense. As you get to
9 the source it's got to be a higher level of
10 exposure. In this case, it's a catastrophic
11 level, if you believe the assumptions that were
12 made by Mr. Petty in this case.

13 Q. Now, we talked a little bit earlier, you said
14 you tried or you attempted to do your own
15 exposure assessment but there just wasn't
16 enough data available to do that and I know
17 that you have reviewed Mr. Petty's reports and
18 all of the documents that Mr. Petty apparently
19 relies on evidencing leaks and spills at this
20 refinery; is that right?

21 A. Yes.

22 Q. Can you tell us a little bit about -- from all
23 of the documents that Mr. Petty reviewed
24 showing all the leaks and spills at this
25 refinery, out of all of those documents which

1 one would provide you at least some data upon
2 which to do an exposure assessment?

3 A. There was one in particular where there was a
4 report of somebody calculating a loss of
5 gasoline vapors from tanks. And they reported
6 7664 barrels of gasoline vapor, I think the
7 light end, escaping from tanks. These are more
8 the domed type tanks. So I used that data
9 since that had some objective information there
10 about the amounts of material and plugged that
11 in with other data into this EPA Screen Three
12 model.

13 Q. And why did you choose that particular document
14 as opposed to any of the other leak and spill
15 documents that Mr. Petty reviewed?

16 A. It was the only document that had some
17 objective data in it, had actual information in
18 it about amounts of material that I could use
19 to plug into this model, it was necessary to
20 plug in this model.

21 Q. And did that, in fact, provide a point source
22 of potential emissions into the atmosphere?

23 A. Correct.

24 Q. And the other documents that Mr. Petty reviewed
25 talked about leak and spills into the ground;

1 right?

2 A. Into the ground or perhaps there were also some
3 instances into the creek or on railroad tracks
4 or, you know, other areas but, you know, more
5 confined areas that generally wouldn't lead to
6 an exposure at any distance immediately away
7 from those confined locations.

8 Q. So because her only exposure route was her
9 breathing in potential gasoline odors, you
10 found it not important or relevant to look at
11 documents evidencing leaks and spills under the
12 ground?

13 A. I wouldn't say it wasn't important or relevant.
14 I mean I looked at all the documents and tried
15 to consider everything. I used this one
16 document in particular because, again, there
17 was some form of objective data there. At
18 least it gave me a beginning point to make this
19 assessment. The others did not.

20 Q. This is the last page of what we have marked as
21 Exhibit 30. Is this the document upon which
22 you tried to determine what her potential
23 exposures would have been from an actual point
24 source?

25 A. Yes. It looks like the page. I'm trying to

1 see where it said 7000.

2 Q. I think it's the last paragraph.

3 A. Yes. Okay. Thanks for the highlight.

4 Q. Actually, we have heard from testimony from

5 witnesses that, in fact, this document, the

6 loss of 7664 barrels, if you assume that that

7 calculation was accurate was happening

8 somewhere in the Norguard Tank Area, I believe

9 somewhere up here. But we have asked you to

10 assume -- this is a better picture -- which is

11 this area here.

12 But we asked you to assume for purposes of

13 this calculation that the point source

14 emissions was coming from the closest gasoline

15 tanks to her home on Evans and on Huttig; is

16 that right?

17 A. Yes. In fact, those tanks had what are called

18 floating roofs. You wouldn't have

19 volatilization of vapors from those tanks. But

20 I, for purposes of this exercise, I wanted to

21 get -- try to look at the what the highest

22 number could be at Mrs. Ryan's home. I assumed

23 that these tanks were the domed type tanks and,

24 in fact, that the 7600 barrels of material came

25 from a tank located there. It couldn't have

1 been those tanks because they were floating
2 roofs, meaning there is no vapor -- there's no
3 space in there for vapor to expand. The roof
4 sits right down on the liquid itself so there's
5 no vapor phase in there.

6 Q. So if you could take us through quickly how you
7 performed this calculation and what model you
8 in fact used to do so?

9 A. Again, it was an EPA Screen Three model.
10 That's the name of it. It's identified in the
11 federal code of -- Code of Federal Regulations
12 40 CFR. And it's a standard model used by
13 environmental people, by risk assessment
14 people, EPA, ATSDR, use this same model to
15 evaluate community exposures. The model
16 overstates exposure. It has uncertainty built
17 into the model and it overstates exposure.

18 Q. Tell us what calculations you made in order --
19 that you inputted into this EPA model.

20 A. Basically it was distance, the height of the
21 tanks themselves, and the amount of material,
22 the number of grams of gasoline and ultimately
23 benzene that were coming out of those tanks on
24 a daily basis for a month long period.

25 Q. So you were assuming that from the nearest tank

1 to each of those residences, each of those
2 tanks even though we know that they were
3 floating roofs and would not be emitting any
4 gasoline into the air, but you assumed the
5 highest possible reading could be 7664 barrel
6 losses of gasoline?

7 A. That was based on the memo, the calculation
8 done by someone within Amoco.

9 Q. You did the same then for the Huttig Street
10 residence, you took that and assumed that loss
11 from the nearest gasoline tank?

12 A. That's correct.

13 Q. When you inputted that data what were your
14 ultimate findings?

15 A. Well, based on the amount of benzene and the
16 gasoline and the proximity of these tanks and
17 the amount of material coming out of these
18 tanks and this hypothetical situation that at
19 the closest residence it was just over 11 parts
20 per billion -- parts per billion not million --
21 of benzene that would have been at her house,
22 not inside her house, but just outside of her
23 house. At the Huttig property it was 2.6 --
24 well, 2.65 parts per billion based on the
25 standardized approach.

1 Q. And can you give us some context as to what
2 that means? What does 2 to 11 parts per
3 billion of benzene in the air mean?

4 A. It's general background. It's basically
5 ambient. I could probably go into most of your
6 homes -- and I'm not saying there's anything
7 wrong that's in any of your homes. I could go
8 in my house and I can measure those kinds of
9 levels and higher in homes. EPA has done
10 studies over the years. Wallace et al. has
11 done a study measuring inside homes around the
12 country and found levels similar to this and
13 even slightly higher.

14 Q. And, in fact, has the EPA issued a report that
15 talks about background levels of benzene in the
16 air that we breathe?

17 A. Yes, they did. It's called the total exposure
18 assessment methodology study. It's like they
19 came up with an acronym and they had to come up
20 with the words for it, the team study. And in
21 that study is where they went into homes around
22 the country and measured inside and outside
23 homes and looked for benzene and toluene and
24 other hydrocarbons.

25 Q. I'm going to hand you a document that we have

1 marked as Exhibit 639 and ask you if this is
2 the team study that you're referring to?

3 A. Yes.

4 MS. McELDOWNNEY: Your Honor, I would
5 offer Exhibit 639.

6 MR. WALTERS: No objection.

7 THE COURT: Exhibit 639 is admitted.

8 Q. (By Ms. McEldowney) What did the team study
9 show in terms of background benzene levels in
10 the air that we all breathe?

11 A. That it's part of our environment. Benzene
12 comes from many sources, from various products.
13 It comes from smoke, whether you're burning
14 wood in the fireplace or whether you're smoking
15 cigarettes. It's there. It's present. It's
16 in our body. We have benzene in our body that
17 makes up D.N.A. It's part of the world around
18 us. This shows that there's a background level
19 in the modeling that we did, even at this
20 scenario that we created to get the levels as
21 high as we could get them, still shows only at
22 the closest residence of 11 1/2 parts per
23 billion. And that's outside the house. It's
24 less inside.

25 Q. And did you reach certain conclusions then

1 after you did all these calculations and
2 analyzed what Mr. Petty did with respect to
3 whether or not his exposure assessment is
4 reliable?

5 A. Sure.

6 Q. And what were your conclusions?

7 A. Well, I have said it a couple of times now.
8 I'll say it again. The use of odor is totally
9 unacceptable. It's not done by any other
10 industrial hygienist or environmental scientist
11 to evaluate exposure. There's too many
12 variables. Each of us here would have a
13 different sense of what a particular odor means
14 and it doesn't quantify what the level of
15 exposure is. The sense of odor comes and goes
16 depending on the level of exposure. So it is
17 not used. It is not a scientific reliable
18 method to evaluate exposures to individuals.

19 Q. And, in fact, what I have been writing here on
20 this easel, I mean, doesn't this sort of say it
21 all? If you use odor or what people are
22 smelling to determine what past exposures would
23 have been, you get numbers like Mr. Petty
24 calculated of 412 ppm years, and with one
25 adjustment it went down 60 percent to 164 ppm

1 years?

2 A. That's right. If he had kept adjusting and
3 corrected the other values in the study he
4 would have gotten down to the 0.6 number that I
5 did. But, again, the numbers don't mean much
6 of anything because it's not a tested method.
7 It's not reliable. There's no way to evaluate
8 it or compare it against anything out there to
9 tell you whether it's true or not.

10 Q. And, in fact, what the EPA endorses or
11 sanctions when you're trying to do this kind of
12 assessment is at least what you attempted to
13 do, one model was an EPA model using a point
14 source; right?

15 A. It's called a point source and a volume source
16 and we used both. And I ran both. The volume
17 source is even less than the numbers that we
18 just looked at there. But that is how you
19 evaluate community exposures. It's a tested
20 model. It's published. It's in the federal
21 regulations. It's in the published literature.
22 And it's an accepted technique for evaluating
23 exposure. It overstates the exposure. But
24 it's an accepted technique for evaluating
25 exposures. Odor is not.

1 Q. In fact, the EPA model calculation that you
2 performed was showing background levels of
3 benzene and that was assuming sort of the
4 highest concentrations of gasoline that could
5 have been or that Mrs. Ryan could have been
6 exposed to?

7 A. Right. We took that document where there was a
8 calculated release of almost 8,000 barrels of
9 gasoline. I don't know why Mr. Petty didn't
10 use it because it was objective data, not odor
11 data that's not objective. We used that data
12 to try to create the highest possible level
13 that we could and that's what we came up with.

14 Q. So as a certified industrial hygienist, if you
15 had two alternatives to do an exposure
16 assessment, would you use smell or would you
17 use an EPA well-accepted model?

18 A. I mean, obviously, clearly I would use the EPA
19 model. The odor method doesn't pass the smell
20 test.

21 Q. And, Mr. Spencer, have all your opinions today
22 been to a reasonable degree of scientific
23 certainty?

24 A. Yes, they have.

25 MS. McELDOWNNEY: Thank you.

1 THE COURT: You may cross-examine.

2 CROSS-EXAMINATION

3 BY MR. WALTERS:

4 Q. Mr. Spencer, we met in Baltimore for your
5 deposition; right?

6 A. Yes, we did.

7 Q. Now, I want to see if I understand this, are
8 you telling this jury that someone who lives
9 within 500 feet of a gasoline storage tank that
10 holds over 3 million gallons of gasoline, that
11 if that gasoline tank is leaking 8,000 barrels
12 and someone lives within 500 feet of that, that
13 that is going to be no different that what you
14 can find at my house in Smithville?

15 A. No, that's not what I'm saying. That data was
16 based on a monthly loss. I computed that over
17 the course of a month. If that happened all at
18 once, yes, that's a sudden and a catastrophic
19 release of material. That clearly didn't
20 happen. There would have been explosions and
21 fires and death as a result of that. This was
22 over a month-long period and based on that
23 month-long period those are the levels that you
24 get.

25 Q. Now, I want to talk with you a little bit and

1 pull up -- first off, let me ask you about
2 something. You know Mr. Petty did not use odor
3 threshold; right?

4 A. I'm not quite sure what he used. He used data
5 from the Drinker study that was really based on
6 toxicological responses.

7 Q. Right. It's based on odor recognition, would
8 that be a better term?

9 A. No.

10 Q. Odor from the Drinker study is different than
11 odor threshold; right?

12 A. No.

13 Q. All right.

14 A. In odor threshold there is odor detection and
15 there is odor recognition. But that study that
16 he relied on was determining how severely
17 someone's eyes would tear or whether their
18 throat would constrict or whether they would
19 get nauseous.

20 Q. Let me ask you something about the ATSDR odor
21 threshold. That's based, as I think you
22 testified, on current data; right?

23 A. Yes.

24 Q. And it's true, is it not, that over time
25 substances have been added to gasoline to raise

1 the octane? Is that true?

2 A. Yes, in the late 1970s and early 1980s, they

3 started taking the lead out of gasoline so they

4 increased the aromatic content of gasoline.

5 Q. And there's a chemical called MTBE that has

6 been added to gasoline?

7 A. Yes, which has an even lower odor threshold.

8 Q. And those would change the odor threshold

9 though; wouldn't it?

10 A. It would. I'm not sure -- MTBE wasn't added

11 until later. I'm not aware that it was in this

12 particular product at the Sugar Creek facility.

13 Q. Now, I want to ask you about -- and I'm going

14 to put up here on the board -- I'm looking for

15 exhibits, Exhibit 322. Let's look at

16 Mr. Petty's calculations here. And let me

17 point out something, you're an industrial

18 hygienist and he's an industrial hygienist;

19 right?

20 A. Correct.

21 Q. And he's something that you're not and that is

22 a chemical engineer?

23 A. Yes, he is.

24 Q. He has a chemical engineering degree that you

25 don't hold?

1 A. That's correct.

2 Q. He has more education and training dealing with
3 chemicals, that's what chemical engineering is;
4 right?

5 A. Well, he's a chemical engineer, I'll give him
6 that. I have been -- I don't know that he's
7 been in a single refinery, at least what I
8 recall from his deposition testimony. I have
9 been in many refineries. I worked with the
10 federal government investigating refineries.
11 So I also -- I know chemicals pretty well
12 having worked at the National Institutes of
13 Health in the laboratory in chemistry while I
14 was in college.

15 Q. Let me start first with you talked about 600
16 parts per million years or 600 parts per
17 million concentration of gasoline; right?

18 A. I talked about and 375, 225 these were the
19 average values he used. This was the range
20 that he used from the Drinker study.

21 Q. He never in making his calculations of her
22 ultimate exposure used a range of 600, did he?

23 A. That's not a range. That was the end of the
24 range. He used 375.

25 Q. And 375 was the most he ever used?

1 A. That's correct.

2 Q. If we go to our chart here from the Drinker
3 study --

4 A. -- I'm sorry. I need to back up on that. If
5 you look at his report, he gives a range of ppm
6 years based on 150 to 600 ppm. So in his
7 report he did use 600 ppm to compute a range of
8 ppm years. It doesn't show on this chart but
9 it's in his report.

10 Q. Sure. The ultimate calculation, the ultimate
11 number here, never used 600; did it?

12 A. He's not showing it in here. In his report, it
13 did.

14 Q. Now, I want to ask you some questions about the
15 Drinker study. You're not suggesting to this
16 jury that those folks were sprayed with liquid
17 gasoline; are you?

18 A. Well, maybe that's a way to put it. They
19 were -- through duct work was sprayed -- you
20 can see it on the schematic in the paper.
21 There are heated lines, steam jacketed lines
22 that come out into duct work that are spraying
23 aerosolized gasoline that was from under
24 pressure from nitrogen coming out of these
25 nozzles. And with that was also steam so it

1 wouldn't explode inside these duct works and
2 then that material was being sprayed into the
3 room.

4 Q. You know from reading that study that they --
5 that the gasoline was completely vaporized;
6 right?

7 A. That is what they did. They heated it up in
8 order to get the material from the liquid phase
9 aersolized and spread out into the room.

10 Q. The Drinker study is the only study of its time
11 and even to this day that looked at levels on
12 real human beings?

13 A. Incorrect. The Amore study that did and the
14 API study did that.

15 Q. And you didn't look at those studies; did you?

16 A. Oh, sure, I did. In fact, they were up on the
17 slides there.

18 Q. Well, didn't you testify in your deposition
19 that you didn't know whether or not the odor
20 thresholds used by ATSDR were done on
21 individuals?

22 A. I did not. At that time I hadn't reviewed for
23 that. But after the deposition, I certainly
24 went and looked. I looked at the basis for
25 some of that data and they were done on human

1 test subjects, both the Amore data and then
2 later the API data.

3 Q. In your deposition, in fact, you didn't even
4 look to see if they were done on individuals?

5 A. For the ATSDR data?

6 Q. Correct.

7 A. I did not at that time, no. It was standard
8 threshold used by emergency response personnel
9 and I felt it was reliable.

10 Q. Now, I want to follow a little bit with your
11 thought, even though Mr. Petty in his
12 calculation didn't use 600, you as we just saw
13 on the slide did a calculation and determined
14 that it would be explosive back at the tanks;
15 right?

16 A. Yes.

17 Q. All right. I want to show you what's been
18 marked as Exhibit 10 and ask you if you have
19 ever seen this document before? Have you seen
20 this memorandum from 1964?

21 A. I don't specifically recall this document, no.

22 MR. WALTERS: Your Honor, I'll offer
23 Exhibit 10.

24 MS. McELDOWNNEY: No objection, Your
25 Honor.

1 THE COURT: Exhibit 10 is admitted.

2 Q. (By Mr. Walters) Now, you're aware, aren't

3 you, that the tanks along Willow were about

4 500 feet from the Evans house?

5 A. It was 500, 600 feet. Yes, I believe that's

6 correct.

7 Q. You're aware from your review of the documents

8 that over time those tanks were found to be

9 leaking?

10 A. Yes, through the some of the bottoms of the

11 tanks. Yes, that's true.

12 Q. You would agree that if in fact there were

13 complaints of odors of gasoline on Evans Street

14 those leaking tanks would certainly be one

15 possible source?

16 A. If it was going into the ground and then

17 perhaps coming out somewhere else, yes. If it

18 was going to the ground and it had not come the

19 surface again then, no, there may have been

20 other sources for gasoline odors. Certainly

21 would refute that.

22 Q. Did I ask you -- I'm looking at page 57,

23 beginning on line 9. Did I ask you this

24 question and did you give this answer? Just

25 take a look at it and then we'll take a look at

1 it together on the board. Page 57, beginning
2 on line 9.
3 A. Okay.
4 Q. And you were under oath when you gave your
5 deposition; right?
6 A. Yes.
7 Q. Raised your hand just like you did in here and
8 swore to tell the truth?
9 A. Yes, same way, same hand.
10 Q. You told the truth that day?
11 A. Yes.
12 Q. Let's see what you said that day. Right here.
13 "QUESTION: And if in fact there
14 were complaints of odors of
15 gasoline in the area of Evans
16 Street, those leaking tanks
17 would certainly be one
18 explanation as to the source
19 of those odors?"
20 And your answer was;
21 "ANSWER: It could be a source,
22 yes."
23 Did I read that correctly?
24 A. Sure.
25 Q. And you gave that answer?

1 A. I did. And I believe I gave a similar answer
2 when I said in terms of it could be, depends on
3 if it went into the ground or if it was on the
4 surface. On the surface then, yes, you might
5 smell a spill of gasoline. If it goes in the
6 ground, no.

7 Q. Let's look at Exhibit 10. Is Exhibit 10 that I
8 just showed you -- this is an internal Amoco
9 memo from 1964; right?

10 A. I'm really not familiar with that document.

11 Q. From the manufacturing department it says.

12 A. Okay.

13 Q. And if we flip back over to the last page they
14 talk, do they not, about leaks; Tanks 176, 177.
15 Those are the tanks along Willow; right?

16 A. Yes.

17 Q. And when they went out to check those leaks,
18 they found vapors in the fire wall holes were
19 found to be explosive; isn't that what they
20 found on that occasion?

21 A. I'm sorry. What holes are they talking about
22 there?

23 Q. Well, they're talking about the fire wall holes
24 that they drilled into these tank areas and
25 they found vapors in those holes that were

1 explosive.

2 A. Absolutely. If you're in a confined area and
3 there's even a small amount of gasoline that
4 could be explosive. I mean, that is clearly
5 possible. But that's in an enclosed or
6 confined area.

7 Q. Now, I want to talk to you a little bit about
8 the wind. You used wind data from Kansas City
9 International Airport; right?

10 A. Correct.

11 Q. And you're aware that's 20 to 30 miles away
12 from Sugar Creek?

13 A. That was my estimate. Is that correct? Is
14 that about right?

15 Q. That was your estimate?

16 A. Yes.

17 Q. And you would agree that wind direction at a
18 given location is going to depend on
19 topography; right?

20 A. No. Not wind direction, no.

21 Q. The wind direction will remain the same but
22 whether or not a given location because of
23 topography experiences a breeze, topography
24 would effect it; would it not?

25 A. Certainly it can. If it's something that is

1 protected from the wind it certainly doesn't
2 experience the immediate effect of that wind
3 but whatever -- if there's vapors being
4 released it certainly can't come up and go
5 against that wind.

6 Q. But topography, in other words, hills, can
7 effect -- you could have a swirling effect, for
8 example?

9 A. Well, you don't necessarily have a swirling
10 effect. You have what's called a vortices,
11 it's like buildings. It's something that is
12 studied in ventilation systems. It's why you
13 put your stack up a little higher on the
14 building to get away from the effect of the
15 building because it creates a swirling effect.
16 Whatever is coming out will remain right there,
17 it won't move from that spot.

18 Q. Didn't you testify in your deposition that you
19 would have to look at a particular topography
20 to make any determination of what effect wind
21 would have?

22 A. Which is what I did, yes.

23 Q. You didn't look at the topography to determine
24 what wind direction would effect?

25 A. No, no, no. Not wind direction but the effect

1 of wind.

2 Q. Now, I think you answered this earlier but you
3 didn't put together a model yourself that you
4 believe to be more reliable; correct?

5 A. Well, no, not entirely correct. I did put
6 together the model that we used, the EPA
7 environmental model, the Screen Three model.

8 Q. I'm talking about to determine Mrs. Ryan's
9 exposure. You didn't put together a model
10 yourself that you believe would be more
11 reliable?

12 A. Not that would address her specific exposure.
13 The EPA screen model that I use I believe
14 overstated what her exposure would have been.

15 Q. Now, I want to talk to you about Mr. Petty's
16 report here. Now, he used a benzene
17 concentration in gasoline of 2.75; correct?

18 A. Yes.

19 Q. And you relied upon one document from one month
20 in 1963 of 0.7 correct?

21 A. Well, there was a specific Amoco document, yes.
22 Although I believe there was one other that --
23 there was another document, I can't recall the
24 date on it, but it said less than 1 percent to
25 1.5 percent. I also relied on literature from

1 Runyan, from McDermott et. al, from Wittsom and
2 there are others in the literature that
3 described the benzene content in United States
4 gasoline during this period.

5 Q. But you made the assumption that during the
6 entire operation of the refinery the benzene
7 concentrations in gasoline was 1 percent;
8 right?

9 A. I used 1 percent, I used the best data that was
10 available; not data from Canada, not data from
11 Europe or not from a material safety data
12 sheet.

13 Q. All right. And you had never heard -- when I
14 took your deposition you had never heard of
15 gasoline with a 5 to 15 percent benzene
16 concentration; right?

17 A. Not gasoline. I mean, Europe approached,
18 historically approached, 5 percent. They had
19 higher benzene content in their crude and their
20 manufacturing process was different than here
21 in the United States.

22 Q. But didn't you tell me that you'd never heard
23 of gasoline with 5 to 15 percent?

24 A. Yeah. That's what I just said, yes.

25 Q. And the information that you reviewed in

1 formulating your opinions in this case, you got
2 those from defendant's attorneys; right?

3 A. Well, actually I found the Sugar Creek document
4 from the mid-1960s. I had it in my file from,
5 I don't know, something else. The other
6 literature that I had on benzene content comes
7 from the IARC, the International Research
8 Agency on carcinogens and it comes from other
9 literature that I already had in my possession.

10 Q. But you relied on information provided you from
11 the defendants?

12 A. I really didn't on the issue of the benzene
13 content.

14 Q. Well, one thing that you didn't receive was
15 Exhibit 75; correct?

16 A. Correct.

17 Q. I'll show you that and then we'll put it up on
18 the board.

19 A. Yes, I did see that.

20 THE COURT: It's already admitted.

21 A. I'm sorry, Mr. Walters, what was the date on
22 that, again?

23 Q. (By Mr. Walters) August 12, 1981.

24 A. Okay. Thank you.

25 Q. And you hadn't ever heard of gasoline with

1 benzene at 5 percent. But as it turns out on a
2 sampling occasion in August of 1981 results as
3 high as 5.4 volume percent benzene as
4 determined by the Whitting Laboratory for Sugar
5 Creek Amoco regular sample July was found;
6 right?

7 A. That's what it says. But you need to
8 understand, one data point does not make an
9 average level. Also, importantly here this is
10 in 1981. They were taking lead -- the EPA was
11 requiring lead be taken out of gasoline. In
12 order to get the octane boost that lead was
13 providing, they added aromatics, including
14 benzene. So actually the benzene content went
15 up in this period of time than what it was
16 historically.

17 Q. But you never heard, at the time I took your
18 deposition, of gasoline with five percent or
19 more benzene; right?

20 Now, what they did, isn't it true, that
21 they took multiple samples because they weren't
22 supposed to have any more than -- wasn't
23 supposed to exceed five percent?

24 A. That's what that memo appears to say. I don't
25 know everything behind or how many samples were

1 collected.

2 Q. And doesn't this memo talk about that they
3 could sample different I'm looking for -- here
4 it is. They had sampled the top, middle, and
5 bottom of the storage tank strata.

6 A. Yes.

7 Q. And, so, depending on where you sample it, that
8 can change the percent of benzene; right?
9 Because when they resampled it at another --
10 the same product sample later analyzed yielded
11 a result of 3.2 to 3.3 percent benzene?

12 A. That may have been error within the analytical
13 method as well. It's difficult to measure
14 benzene in a mixed hydrocarbon solution. Even
15 in 1981 the technique was -- had variability in
16 the analytical results. But again this is
17 1980s where they were adding more aromatics at
18 this time because they had taken the lead out,
19 not the types of aromatic levels that were
20 present in the '50s, '60s, and even the '70s.

21 Q. But you assumed the same value for the entire
22 time period that they operated the refinery;
23 didn't you?

24 A. Yes, it was -- and the evidence actually shows
25 that it was lower.

1 Q. Now, I want to talk to you again about some of
2 the things that Mr. Petty accounted for. He
3 did not assume that Mrs. Ryan was exposed 24
4 hours, seven days a week, he reduced that?
5 A. I think I mentioned that. He was saying 16
6 hours a day because she had worked. So she was
7 at work for eight hours a day. And then I
8 think he made some accounting, maybe saying
9 only 90 percent of that time. We talked about
10 that.
11 Q. Now, ultimately in this column here, we have
12 his -- based on his calculations, his estimate
13 of, in ppm, the amount of benzene that
14 Mrs. Ryan was exposed to. Is that how you
15 understand this column?
16 A. Yes, that's his calculated number, yes.
17 Q. And one of the things if you have the data, if
18 someone had gone out and taken actual
19 measurements at her house those could be
20 plugged into this part of chart; correct?
21 A. If someone had gone to her house and taken
22 measurements? You wouldn't even need this
23 chart.
24 Q. That's what I'm saying. The whole reason that
25 Mr. Petty created an estimate is because at no

1 point in time did anyone -- during the time
2 period that Mrs. Ryan lived on Evans Street or
3 on Huttig -- do any air monitoring at her
4 house?

5 A. Sure. And that's true probably almost anywhere
6 in this country. And that's why if you're
7 going to do a retrospective assessment you
8 choose the right methodology to do that
9 assessment that has some reliability and
10 meaningfulness to it. He's got benzene
11 concentration of 4.3 parts per million up
12 there. If you look at -- with that comes the
13 total hydrocarbons from gasoline. He's got
14 them exposed to over 860 parts per million of
15 total hydrocarbons. People would be
16 unconscious in that house after a few hours.

17 Q. Well, isn't it true, Mr. Spencer, that you have
18 reviewed some industrial hygiene reports from
19 actually on the refinery; right?

20 A. I did look at them, yes. It wasn't part of my
21 task here but, yes, I looked at them.

22 Q. Were you aware that on-site they found benzene
23 at 73.4 parts per million?

24 A. Sure. That's what the data says. What was the
25 length of time that sample occurred? What was

1 the time weighted average? And it was one data
2 point that was high among many.

3 Q. And that's far less than what Mr. Petty
4 calculated at Mrs. Ryan's house; right?

5 A. But if it's 73 at the facility --

6 Q. -- Mr. Spencer, was that less than what
7 Mr. Petty calculated?

8 A. Yes, it was.

9 Q. And, listen, I don't want to be rude but you'll
10 have plenty of time to explain your position to
11 Ms. McEldowney. I just would like you to
12 answer my question.

13 A. Of course 73 is higher than 4. Yes. They're
14 just not relevant comparisons.

15 Q. Now, by the way, this isn't the first case that
16 you have consulted with this defense team; is
17 it?

18 A. Well, that I have worked for most of these
19 people; yes, it is.

20 Q. You, in fact -- this isn't it only case that
21 you're working on where BP is involved?

22 A. It is the only one I'm aware of.

23 Q. Didn't you tell me about Hazleton,
24 Pennsylvania?

25 A. I wasn't sure whether that was BP, to tell you

1 the truth. My mother's hometown, yes.

2 Q. And in Hazleton, Pennsylvania you're working

3 with these same people, same defendant; BP?

4 A. Yes, it was a gas station that had leaking

5 underground storage tanks, yes.

6 Q. And there's a gasoline plume like in Sugar

7 Creek?

8 A. I don't know that it's -- no, I don't know that

9 it's the same. It's a different environment up

10 there, different issues.

11 Q. People with leukemia, just like Sugar Creek?

12 A. I'm not aware of any leukemia cases. I mean,

13 leukemia is in our environment. A friend of

14 mine's son has leukemia.

15 Q. Do you know why there is a case then in

16 Hazleton?

17 A. There are several, because products have been

18 released into the environment and sometimes

19 people sue over that. I can't give you the

20 basis for it.

21 Q. And you're working with Ms. McElDowney's firm

22 on that case; right?

23 A. I am, yes.

24 Q. And they're back east where you are, in

25 Delaware?

1 A. I'm in Baltimore, yes.

2 Q. Now, I know you weren't tasked to look at this,
3 but there are some other actual measurements of
4 benzene taken at the refinery; were you aware
5 of that?

6 A. Yes.

7 Q. There's some measurements of benzene that they
8 found on site of 24.5, 14.5, 10.2, and 10.6.
9 And my question to you is; Mr. Petty didn't
10 include benzene in those ranges, did he?

11 A. And why?

12 Q. It's an actual measurement.

13 A. It is in the refinery. You couldn't even
14 detect it at Mrs. Ryan's residence using those
15 numbers and that's why he didn't use it.

16 Q. Not only, Mr. Spencer, have you worked for BP
17 in benzene cases but you have also consulted
18 with Shell Oil Company; haven't you?

19 A. Yes, I have.

20 Q. And you have consulted with Chevron?

21 A. Yes.

22 Q. And you have been on the side of Texaco in
23 cases?

24 A. I believe so. I just can't recall whether it
25 was benzene or an asbestos issue. But, yes, I

1 believe so.

2 Q. And you have been with Phillips/Conoco, you
3 have consulted with them on cases?

4 A. Yes.

5 Q. Virtually every oil company, all the major oil
6 companies you've consulted?

7 A. I'll also provided training to Unical another
8 oil company on how to audit their health and
9 safety programs, yes.

10 Q. You testified earlier that obviously this isn't
11 the first time you've been in the courtroom;
12 correct?

13 A. Correct.

14 Q. And the truth of the matter is, Mr. Spencer,
15 that in at least one case a judge excluded your
16 opinions because they weren't reliable?

17 A. That's incorrect. He did not let me talk about
18 cumulative dose. I was able to testify in the
19 case on industrial hygiene and exposure issues
20 but not on cumulative dose.

21 Q. Your opinions were excluded?

22 A. On that specific issues. I was not excluded
23 from the case.

24 Q. Now, Mr. Spencer, are you aware that there are
25 other individuals who have testified in this

1 case that there were odors of gasoline in the
2 Sugar Creek area?

3 A. I'm only aware of Mr. Ryan and his daughter
4 testifying to that. I don't even believe his
5 son testified to there being any extensive
6 odors there. Those are the only two that I'm
7 aware of.

8 Q. Now, you talked about a point source and you
9 understand that out at the Sugar Creek refinery
10 there's a plume of benzene; right?

11 A. Underground plume, yes.

12 Q. And you understand from reviewing the documents
13 that there were multiple tanks that were
14 leaking?

15 A. Yes.

16 Q. And you understand from the documents that
17 there were lines all through the refinery that
18 were leaking?

19 A. Yes.

20 Q. So when we talk about a point source there are
21 multiple point sources at this site; correct?

22 A. Well, I'm talking about a point source that
23 would lead to an airborne release of material
24 and exposure to the community. If it's
25 underground pipes or tanks leaking into the

1 ground then, no, that's not what I'm talking
2 about.

3 Q. All right. Because you're not a soil gas vapor
4 expert; right?

5 A. I have done quite a bit of it but I have not
6 testified in court regarding it. I have done a
7 lot of soil vapor analysis.

8 Q. Now, have you testified -- you mentioned that
9 you have testified for plaintiff before; right?

10 A. Yes.

11 Q. Did you testify in a fingernail polish case?

12 A. Gosh, I don't remember that one. I did a study
13 of people using, mostly women, using fingernail
14 polish and the toluene exposure that results
15 from that. But I don't think I testified.
16 That was just a study we did.

17 Q. Did you determine that -- was your opinion in
18 that study that there needed to be a warning
19 not to drink fingernail polish?

20 A. I have a vague recollection. I can't imagine I
21 made that -- that I would make that suggestion.

22 MR. WALTERS: I think that's all I
23 have. Thanks.

24 THE COURT: May I see Counsel?
25 (Out of the hearing of the jury.)

1 THE COURT: It's 5:00.

2 MS. McELDOWNNEY: I'll finish in five

3 minutes. I'd like to get him out.

4 MR. TAFF: Otherwise he has to go

5 home for the weekend, Judge.

6 MS. McELDOWNNEY: He's unavailable

7 next week to testify. Can I just have

8 five minutes, Judge?

9 THE COURT: Keep it to about three or

10 four minutes.

11 MS. McELDOWNNEY: Okay.

12 (In the hearing of the jury.)

13 REDIRECT EXAMINATION

14 BY MS. McELDOWNNEY:

15 Q. Mr. Spencer, the Drinker study is what

16 Mr. Petty relied on solely, correct, for

17 purposes of --

18 A. -- to develop the concentration level that he

19 believed that Mrs. Ryan was exposed to.

20 Q. So he must have believed the Drinker study was

21 a reliable source of that information?

22 A. Yes.

23 Q. Now, what if he used Drinker to establish what

24 strong odors would have been in the range of

25 900 to 2600 ppm; if he in fact used those range

1 of numbers that Drinker identified as strong
2 odors of gasoline, what would that do to his
3 ultimate calculation from Mrs. Ryan's exposure?

4 A. Well, it would drive it up many fold times to
5 an incredibly high number.

6 Q. Mr. Walters asked you about different point
7 sources and leaks and spills at this refinery
8 and why you didn't consider those for purposes
9 of your calculations. Can you tell us why you
10 considered it but rejected it for purposes of
11 doing your model?

12 A. I did look at that data. As we talked about
13 before, I looked for pathways that someone can
14 be exposed, how they get exposed to vapors.
15 And it's through airborne losses, the venting
16 losses, the 7644 barrels that was attributed
17 through venting losses. If it goes into the
18 ground -- I have done a lot of monitoring --
19 right over the top of leaking underground
20 storage tanks, leaking pipes you don't get
21 detectable levels.

22 Q. The last point I have for you, Mr. Spencer,
23 Mr. Walters showed you benzene monitoring
24 results from the Sugar Creek refinery and some
25 of the samples showed numbers 73, 24, 14, 10

1 ppm; correct?

2 A. Yes.

3 Q. Why do we have monitoring at refineries? What
4 is the purpose of it?

5 A. It is to evaluate the exposures because those
6 chemicals are used there and it's the right
7 thing to do to ultimately protect the health
8 and safety of those workers. Those samples are
9 also only for several minutes, some of them 10
10 minutes, some 15 minutes. They weren't
11 weighted samples, meaning time weighted to
12 compare to occupational health standards. They
13 could have been in locations where workers were
14 wearing respiratory protection. It didn't say
15 there. I didn't see that. And it's
16 certainly -- it doesn't show that there was
17 13,000 parts per million or 35,000 parts per
18 million at that location, which would be
19 necessary to have any kind of exposure at the
20 Ryan home.

21 Q. More importantly, when they're monitoring
22 employees, what happens when they get an
23 exceedence of benzene exposure, for instance,
24 in this case? What do they do with the
25 employee?

1 A. They take corrective actions to ensure that
2 he's properly protected and they would also
3 enroll him in a medical monitoring program.
4 But, most importantly, they would take
5 measures, corrective measures, to eliminate or
6 reduce those exposures either through
7 engineering controls or through respiratory
8 protection.

9 Q. So they take these workers out of the potential
10 exposure to benzene; correct?

11 A. They want to limit that exposure. And the
12 problem with benzene and gasoline is not only
13 the toxicity issue we're dealing with here, but
14 there's fire and explosion hazards. So it
15 generally has been a fairly well controlled
16 exposure in the work place because of safety
17 reasons.

18 Q. So when you got a hit or exceedence of benzene
19 with respect to a worker, that worker is
20 removed from that environment and then further
21 investigation is done to eliminate those
22 exposures; correct?

23 A. They may not ultimately remove them as in the
24 exact sense of the word. They may provide
25 protective measures so in that sense they have

1 removed the worker from any harmful exposure.

2 Q. So those exceedences of, say, 74 ppm, that
3 would not mean that they would continue to keep
4 the worker exposed to 74 ppm of benzene for 24
5 years, for example?

6 A. No. And that may have been a one time incident
7 that they may go back and resample and not find
8 anything close to that again.

9 MS. McELDOWNNEY: Thank you,
10 Mr. Spencer.

11 THE COURT: Any recross?

12 MR. WALTERS: Nothing.

13 THE COURT: All right. Mr. Spencer,
14 thank you very much. You may step down,
15 sir. Ladies and gentlemen, we're going to
16 finish up just a little bit past the hour.
17 I did want to tell you that I was happy to
18 see most of you in your Chief's outfits.
19 And I want to tell you, Ms. Foley, said,
20 Judge, don't wear your red robe.

21 Ladies and gentlemen, I told you
22 that I would touch bases with you on how
23 we're doing, we're doing very well. Okay?
24 I feel very comfortable that we can finish
25 the case at the end of next week, which

1 would be the fifth week and that puts us
2 on schedule with what we said. So that's
3 what I'm approximating with the attorneys,
4 looking towards the end of next week to
5 finish up the case.

6 We will follow our same schedule
7 Monday morning. Ladies and gentlemen, I'd
8 ask you to please be here at 8:45 in the
9 morning and we'll get started at 9:00.

10 (The Court reads the instruction.)

11 (Court adjourned.)

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