

**IN UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF LOUISIANA**

**In re: Oil Spill by the Oil Rig
“Deepwater Horizon” in the Gulf
of Mexico, on April 20, 2010**

This Document Relates to:

Actions in Pleading Bundle B3,

and

**No. 12-cv-968, *Plaisance et al. v. BP Exploration
& Production Inc., et al.***

MDL No. 2179

SECTION: J

JUDGE BARBIER

**MAGISTRATE JUDGE
SHUSHAN**

DECLARATION OF MICHAEL R. HARBUT, M.D., M.P.H., F.C.C.P.

MICHAEL R. HARBUT, under penalty of perjury, declares as follows:

I. BACKGROUND AND QUALIFICATIONS

1. My name is Michael Raymond Harbut. I have been licensed as a physician and surgeon in the State of Michigan since 1984. Although a researcher and teacher, I have also been an active clinician, diagnosing and treating diseases of the environment and workplace. I have seen thousands of patients who suffer from one or more of the illnesses associated with toxic exposures, including the chemicals at issue in this litigation.

2. Presently, I am the Director of the Environmental Cancer Program at Karmanos Cancer Institute, which is affiliated with Wayne State University in Detroit, Michigan. Karmanos is one of the National Cancer Institute's approximately 40 Centers of Excellence nationally. I am also the Director of the National Center for Vermiculite and Asbestos Related Cancers. I am also Chief of the Section of Occupational and Environmental Medicine in the Department of Internal Medicine at Providence Hospital in Southfield, Michigan. Providence Hospital is one of the major teaching institutions in the United States affiliated with the University of Michigan, Michigan State University and Wayne State University, among several other institutions.

3. I am a diplomate in Occupational Medicine of the American Board of Preventive Medicine. I am a fellow of the American College of Chest Physicians and past chair of its Occupational and Environmental Disease section. I am a member of the American College of Occupational and Environmental Medicine and the American Medical Association.

4. I am a full Clinical Professor of Internal Medicine at Detroit's Wayne State University School of Medicine. I was named Teacher of the Year in occupational medicine in 1995.

5. I have authored and/or co-authored scholarly works in my medical specialty, and they have been presented in venues such as the White House and appeared in journals such as the New England Journal of Medicine. Research teams of which I have been a part have discovered tumor markers for certain cancers, illustrated neuropsychological compromise caused by organic solvents, reported the likely cause of intractable pleuritic pain in patients with pleural disease caused by asbestos exposure, and summarized the harmful effects of arsenic exposure. I am co-author of the American Thoracic Society's most recent guidelines for the diagnosis and treatment of asbestos related disease. A full description of my background and publications is attached to this declaration.

6. I am certified in Occupational Medicine by the American Board of Preventive Medicine. This certification attests to clinical competency in occupational and environmental medicine. I am a fellow of the American College of Chest Physicians.

7. I was specialty trained in occupational and environmental medicine at the University of Michigan Medical Center, graduating from the training program in 1987. I had completed a categorical general internal medicine residency year at Southfield, Michigan's Providence Hospital, graduating in 1985.

8. I hold a Masters of Public Health in environmental and industrial health from the University of Michigan School of Public Health, awarded in 1987. I also hold a Dyplom,

awarded in 1980, from the Jagiellonian University in Kraków, Poland's Polonia Research Institute.

9. I hold a Doctor of Medicine from the American University of the Caribbean in Plymouth, Montserrat, British West Indies, which was awarded in 1984. I had begun medical school at the University of Breslau in Poland, but I was advised to leave the country owing to its then social and political instability. I completed my undergraduate medical clinical training at Wayne State University and University of Michigan-affiliated teaching hospitals.

10. I was awarded a Bachelor of Arts degree from Madonna University, Livonia, Michigan, in 1978. I started at Michigan State University in 1968 and through a combination of night school courses, working, loans and scholarships, I completed degree requirements 10 years later.

II. EXPERIENCES

11. A number of past professional experiences make me uniquely qualified to render opinions in this matter. Foremost, I know how to recognize diseases caused by exposure to chemicals based on my years of clinical practice. Indeed, through my practice and other associations, I have first-hand knowledge and experience of the disease processes evoked by exposure to the agents stated to have been found at the Deepwater Horizon well site.

12. I have seen, diagnosed and treated hundreds to thousands of persons who have been exposed to petroleum, petroleum products, petroleum distillate, organic solvents, naphtha, volatile organic compounds, benzene, n-hexane and the other hydrocarbons which have been reported in multiple, reliable sources to have found their origin at the Deepwater Horizon well. Some of these individuals have become ill as a result of the exposure and others have not.

13. The chemicals at issue in this matter are ubiquitous in an industrial environment, and for the preponderance of my years in medical practice in Detroit, Michigan, many of my patients work or have worked directly or indirectly with these toxins.

14. I also know how to save lives in conditions where there is a public health urgency, and where conflict related to accurate diagnosis and treatment may exist. During the genocide of Rwanda in 1994, I was Medical Coordinator of the United States Sector of the Kibumba Refugee Camp in Goma, Zaire. Among the epidemic diseases which attacked the population en route to the refugee camp, and while settled there, were cholera, dysentery, meningococcal meningitis, measles, HIV and malaria. Although the camp operated under the direction of the United Nations High Commissioner for Refugees, the individual nations that sent relief workers such as myself were given considerable discretion to make diagnostic and treatment decisions under harsh and difficult circumstances. I was responsible for making such decisions in the sector of the camp at which I was assigned. Because the United States Agency for International Development funded much of the relief effort, there were representatives of the Centers for Disease Control monitoring morbidity and mortality rates. In immediate proximity to the American effort, and in some cases in cooperation with the American effort, were the French, the Dutch, the Israelis, the Germans, the Irish and multiple other less organized volunteers. The Centers for Disease Control found that the death rate in the part of the camp under my supervision and coordination was less than one-third that of any other sector in the camp.

15. I understand barriers which may be social, organizational or political in nature which can prevent the preservation of human life and how to navigate those barriers with the greatest possibility of success. For example, although I left Poland as a medical student, I was invited to perform the functions of the Chief United States Medical Advisor to the Solidarity

underground movement for democracy by the Executive Director of the United States National Endowment for Democracy, a federally funded, bipartisan congressional corporation. Traveling and working on a "diplomatic letter," from 1988 to 1992, I worked and met regularly with Solidarity President and later Poland's President, Lech Walesa, and his immediate staff. I received a medal from the International Rescue Committee for the performance of this work, which resulted in the establishment of a number of medical "centers of excellence" prior to the fall of communism. Further, these "centers of excellence" existed in a legal twilight owing to the presence of the communist state system. A children's leukemia center and a center for industrial-toxin induced cancers were among those facilities established as a result of my work.

III. SUMMARY OF STATE OF SCIENCE ON ISSUES INVOLVED

16. I am familiar with the terms of the Medical Benefits Class Action Settlement Agreement ("Settlement Agreement"). I have thoroughly reviewed the acute and chronic health conditions and symptoms enumerated in the Specified Physical Condition ("SPC") matrix and the medical evaluation set forth in the Periodic Medical Consultation Program ("PMCP"). Indeed, I worked with the Plaintiffs' Steering Committee during its negotiation of the SPC matrix and the PMCP. I also have familiarized myself with the Zone maps and the definition of Clean-Up Workers contained in the Settlement Agreement.

17. I find the conditions in the SPC matrix to reflect the state of the science and conform with the world's medical literature in regard to the health effects of exposure to petroleum and/or petroleum-based dispersants.

18. Two issues which required significant attention while developing the matrix were routes of exposure and time frames. Given the circumstances of the chemical release, the most

likely transit routes of oil and distillates from their source to organs capable of being harmed by the exposure would be as a result of direct dermal contact or the inhalation of airborne chemicals. Petroleum products are capable of crossing directly over the skin to the internal organs as are they capable of being inhaled when airborne and transmitted to internal organs via the lung. As a practical matter, once inside the nasopharynx, it is possible that there could be ingestion to the gastrointestinal tract as well, but in the normal course of activity, petroleum and/or petroleum-based products are not anticipated to be ingested on purpose any more than they would be expected to be administered intravenously.

19. The issue of time frames is more complex. The time frames included in the matrix reflect the predominant guides to identifying the most likely sequelae of petroleum and petroleum-based product exposure in these circumstances and when those sequelae could be expected to clinically manifest in most persons. I based my opinion in regard to these intervals on my experience, education and training, and on a consensus of the findings in the medical literature based on clinical, laboratory, medical and epidemiological evidence as reflected in the citations found in Appendix A.

20. It is important to note that petroleum discharged from the Macondo well consists of scores of separate but related chemicals in the hydrocarbon family. Furthermore, petroleum distillates as found in Corexit® 9500 and Corexit® EC9527A, the dispersants predominantly used to remediate the spill, are actually derived from petroleum, such as the crude oil. For purposes of health discussions, the health effects of petroleum and petroleum distillates, petroleum-based dispersants and crude oil are often quite similar if not identical, because the chemicals causing insult to the living organism are substantially the same.

21. For example, benzene is found in crude oil, but it can be isolated from the crude oil. Benzene is a chemical with multiple health effects ranging from causing certain cancers after the relevant latency period to causing skin irritation. Similarly, xylene, toluene and hexane are found regularly and frequently throughout the product range beginning with the crude oil, but find endpoints as individual chemicals used in petroleum-based dispersants and related compounds.

22. The science and medicine related to the health effects of exposure to petroleum and petroleum-based products is one of the more “mature” areas of scientific inquiry. Disease processes, acute injuries, chronic insult and other medical conditions related to exposure to petroleum and the components of petroleum have been studied globally for over 100 years. In fact, benzene, one of the most harmful components of petroleum, is also one of the earliest-identified human carcinogens. Although new findings related to petroleum exposures are reported in the medical literature with some regularity, a number of fairly specific conditions have been identified which may appear acutely or chronically or with latency.

23. An article by Dr. James H. Diaz, of the Louisiana State University Health Sciences Center, authored in the wake of the Deepwater Horizon oil spill, comprehensively summarizes health effects of petroleum exposure in the Gulf based on generally accepted medical and epidemiological tenets. A citation to the article can be found in Appendix A, attached to this declaration. Dr. Diaz provides a substantial collection of scientific, epidemiological, medical and government sources which also provided the academic framework for the article.

24. Simply put, petroleum and petroleum-based products have been studied extensively for over 100 years. Multiple health effects are known and acute health outcomes from exposure to them are reflected in the SPC matrix.

IV. SPECIFIED PHYSICAL CONDITIONS MATRIX

25. Table 1 of Exhibit 8 to the Settlement Agreement discusses acute specified physical conditions associated with exposure to oil, other hydrocarbons, or other substances released from the MC252 Well and/or the Deepwater Horizon and its appurtenances, and/or dispersants used in connection with the spill response. On review of the contemporary world literature regarding the epidemiology and manifestation of disease caused by petroleum and petroleum-based dispersants within the context of symptoms, signs and latency, and based on my own education, experience and training, I find that the proposed settlement is consistent with the best science available.

26. A person who is exposed to oil and/or petroleum-based dispersant via either airborne or direct contact is at risk of contracting conjunctivitis, corneal ulcer or keratitis, and/or experiencing eye irritation or eye burn because of the insult caused at a cellular level. The clinical manifestation of this "chemical attack" is well documented in the materials cited in Appendix A. I have also witnessed this phenomenon in my clinical practice. One or more of these conditions or symptoms could manifest, and if manifested would be expected to occur in the general population of Zone A and B residents and Clean-Up Workers, under the exposure conditions as I understand them, within 24 hours of exposure to oil and/or petroleum-based dispersant.

27. A person who is exposed to oil and/or petroleum-based dispersant via inhalation is at risk of contracting acute rhinosinusitis, acute tracheobronchitis and/or acute bronchitis and/or experiencing at least two or more of the following conditions: (i) nasal congestion, discharge or post-nasal drip; (ii) headache, facial pain/pressure or sinus pain; (iii) decreased sense of smell; (iv) cough; (v) sputum production; (vi) wheezing; and (vii) shortness of breath. This is because of the insult which occurs at a cellular level. Two or more of these conditions or symptoms could manifest, and if manifested would be expected to occur in the general population of Zone A and B residents and Clean-Up Workers under the exposure conditions as I understand them, within 72 hours of exposure to oil and/or petroleum-based dispersant. Such conditions could occur because the cellular insult translates to a clinical toxic response which is either toxic irritant, chemically or immunologically mediated. I base this opinion on both my experience treating patients who have been exposed to the same or similar chemicals and the medical literature cited in Appendix A.

28. A person who is exposed to oil and/or petroleum-based dispersant via inhalation is at risk of experiencing acute exacerbation of pre-existing asthma, acute exacerbation of Chronic Obstructive Pulmonary Disease and/or epistaxis because of the insult which occurs at a cellular level. One or more of these conditions could manifest, and if manifested would be expected to occur in the general population of Zone A and B residents and Clean-Up Workers under the exposure conditions as I understand them, within 48 hours of exposure to oil and/or petroleum-based dispersant. I base this opinion on both my experience treating patients who have been exposed to the same or similar chemicals and the medical literature regarding similar exposures.

29. A person who is exposed to oil and/or petroleum-based dispersant via inhalation is at risk of contracting acute pharyngitis because of the insult which occurs at a cellular level. This condition could manifest, and if manifested would be expected to occur in the general population of Zone A and B residents and Clean-Up Workers, under the exposure conditions as I understand them, within 48 hours of exposure to oil and/or petroleum-based dispersant. I base this opinion on both my experience treating patients who have been exposed to the same or similar chemicals and the medical literature cited in Appendix A.

30. A person who is exposed to oil and/or petroleum-based dispersant via direct skin contact is at risk of contracting acute contact dermatitis, atopic dermatitis, eczematous reaction, folliculitis, irritant contact dermatitis and/or urticaria, and/or experiencing two or more of the following conditions: (i) redness; (ii) inflammation or pain; (iii) blistering; (iv) crusting; (v) swelling; (vi) itching; (vii) lesion; (viii) dryness or flaking; (ix) peeling; (x) scaly skin; (xi) welts; or (xii) pimples. This is because of the insult that occurs at the cellular level. I base this opinion on my personal experience in treating patients with the same or similar exposures and the medical literature cited in Appendix A. One or more of these conditions and/or symptoms could manifest, and if manifested would be expected to occur in the general population of Zone A and B residents and Clean-Up Workers, under the exposure conditions as I understand them, within 72 hours of exposure to oil and/or petroleum-based dispersant.

31. A person who is exposed to oil and/or petroleum-based dispersant via direct skin contact is at risk of contracting acne vulgaris or oil acne because of the insult which occurs at a cellular level. This condition could manifest, and if manifested would be expected to occur in the general population of Zone A and B residents and Clean-Up Workers, under the exposure conditions as I understand them, within 72 hours of exposure to oil and/or petroleum-based

dispersant. I base this opinion on both my experience treating patients who have been exposed to the same or similar chemicals and the medical literature regarding these chemicals and their epidemiology.

32. A person who is exposed to oil and/or petroleum-based dispersant via inhalation is at risk of experiencing headache, dizziness, fainting and/or seizure because of the insult which occurs at a cellular level. One or more of these conditions could manifest, and if manifested would be expected to occur in the general population of Zone A and B residents and Clean-Up Workers, under the exposure conditions as I understand them, within 24 hours of exposure to oil and/or petroleum-based dispersant. I base this opinion on both my experience treating patients who have been exposed to the same or similar chemicals and the medical literature regarding their clinical and epidemiological mechanisms.

33. A person who is exposed to oil and/or petroleum-based dispersant via inhalation is at risk of contracting gastrointestinal distress and/or experiencing nausea, diarrhea, vomiting, abdominal cramps and/or abdominal pain because of responses which occur at a cellular level. One or more of these conditions and/or symptoms could manifest, and if manifested would be expected to occur in the general population of Zone A and B residents and Clean-Up Workers, under the exposure conditions as I understand them, within 24 hours of exposure to oil and/or petroleum-based dispersant. I base this opinion on both my experience treating patients who have been exposed to the same or similar chemicals and the medical literature as cited in Appendix A.

34. Zone A and Zone B residents and Clean-Up Workers are also at risk of contracting certain chronic conditions. For purposes of this settlement, I understand a chronic

condition to be one in which an acute symptom or condition manifested within the time frame set forth in Table 3 of the SPC matrix but which still remains present as of April 16, 2012.

35. A person who is exposed to oil and/or petroleum-based dispersant via direct contact is at risk of incurring chronic ocular sequela from direct chemical eye splash. The first symptom of this chronic condition would have manifested itself in the general population of Zone A and B residents and Clean-Up Workers, under the exposure conditions as I understand them, within 24 hours of exposure to oil and/or petroleum-based dispersant. I base this opinion on both my experience treating patients who have been exposed to the same or similar chemicals and the medical literature regarding them.

36. A person who is exposed to oil and/or petroleum-based dispersant via inhalation is at risk of contracting chronic rhinosinusitis (defined in the SPC matrix as an inflammatory condition involving the paranasal sinuses and linings of the nasal passages that lasts 12 weeks or longer, despite attempts at medical management) as a result of cellular insult and interaction. The first symptom of this chronic condition would have manifested itself in the general population of Zone A and B residents and Clean-Up Workers, under the exposure conditions as I understand them, within 72 hours of exposure to oil and/or petroleum-based dispersant. I base this conclusion on my personal experience with the same or similar exposures in the epidemiology and the findings of the medical literature found in Appendix A.

37. A person who is exposed to oil and/or petroleum-based dispersant via inhalation is at risk of contracting reactive airways dysfunction syndrome, also referred to as a type of irritant-induced asthma, based on my personal experience in treating patients with the same or similar exposures as well as the medical literature cited in Appendix A. The first symptom of

this chronic condition would have manifested itself in the general population of Zone A and B residents and Clean-Up Workers, under the exposure conditions as I understand them, within 24 hours of exposure to oil and/or petroleum-based dispersant. Such conditions would occur because of activity at the cellular level, within the context of the evolving understanding of the natural history of reactive airways dysfunction syndrome.

38. A person who is exposed to oil and/or petroleum-based dispersant via direct skin contact is at risk of contracting either chronic contact dermatitis or chronic eczematous reaction because of the chemical insult which occurs at the cellular level. The first symptom of this chronic condition would have manifested itself in the general population of Zone A and B residents and Clean-Up Workers, under the exposure conditions as I understand them, within 72 hours of exposure to oil and/or petroleum-based dispersant. I base this conclusion on both my experience treating patients who have been exposed to the same or similar chemicals and the medical literature cited in Appendix A.

39. I also believe that Zone A adequately covers the coastal residential population that could have had sufficient exposure to the oil and/or petroleum-based dispersant merely by virtue of their residency to manifest one or more of the conditions or symptoms listed on the SPC matrix. While it would be possible for someone who lives greater than one-half mile from the coastline to manifest one of these conditions, this would not be expected among the general population based solely on residency under the exposure conditions as I understand them. This is because one would expect concentrations of toxins to diminish as distance from point source exposure increases.

40. I believe that Zone B adequately covers the residential population living within marshland areas that could have had sufficient exposure to the oil and/or petroleum-based dispersant merely by virtue of their residency to manifest one or more of the conditions or symptoms listed on the SPC matrix. While it would be possible for someone who lives in the marshland and greater than an approximate one mile range from the coastline to manifest one of these conditions, this would not be expected among the general population based solely on residency under these exposure conditions.

41. I believe that Clean-Up Workers would have had sufficient exposure to the oil and/or petroleum-based dispersant by virtue of their work status to manifest one or more of the conditions or symptoms on the SPC matrix. This is because, by definition, oil cleanup workers are involved in the cleanup of oil. This puts them in closer and more prolonged contact with the petroleum and/or petroleum products. While accurate measurements of airborne and/or other concentrations of petroleum and petroleum products remain elusive in some situations, as a practical matter it would be unusual for a worker involved in petroleum cleanup operations to not have petroleum exposures.

42. I also believe that the circumstances of exposure of residents of Zone B and Clean-Up Workers may be associated with an elevated incidence of petroleum-associated disease compared to lesser or non-exposed populations. Based on information provided to me about the oil spill cleanup, the oil in Zone B could not be removed, as it was from beaches, and it would, therefore, largely have to dissipate through natural attenuation. As to Clean-Up Workers, I am informed that much of their work was involved in oil spill remediation, removing oil from wildlife, laying and picking up boom, and other such oil-related activities.

43. Although the settlement is designed to address medical conditions that are likely to affect a majority of Zone A and B residents and Clean-Up Workers, under the circumstances of exposure as I understand them, there may be some Zone A and B residents and/or Clean-Up Workers who developed more serious conditions as a result of exposure to oil and/or petroleum-based dispersants. It is my understanding that such individuals need not participate in the class settlement and that there is an alternate avenue of relief outside the settlement.

44. Zones A and B are appropriately designed to include the majority of Zone A and B residents who experience the medical conditions most likely to occur under the exposure conditions as I understand them. It is possible that a person residing outside Zones A and B could also experience one of the medical conditions set forth in the SPC matrix. It is my understanding that there is an avenue of relief outside the settlement that is available to such individuals.

45. Based upon my experience and the best available medical literature, it is also possible that Zone A and B residents and Clean-Up Workers could develop certain later-manifesting conditions as a result of their exposure to the oil and/or petroleum-based dispersants. Having read the Settlement Agreement, I understand that if a class member develops a later-manifesting medical condition, he or she may seek compensation from BP through a back-end litigation option.

V. PERIODIC MEDICAL CONSULTATION PROGRAM

46. A medical consultation program is also included in the proposed settlement. It includes the performance of a comprehensive medical, occupational and environmental history and physical examination vision screening, plus a complete blood count, a comprehensive

metabolic panel including lupus, calcium, albumin, total protein, sodium, potassium, carbon dioxide, chloride, blood urea nitrogen, creatinine, alkaline phosphatase, alanine aminotransferase, aspartate aminotransferase, Billirubin, a urinary beta-2 microblog one, gamma glutamyl transferase, urinalysis with microscopy, C-reactive protein, hemoglobin A-1 C, lipid panel, fecal occult blood, prostate specific antigen, a 12 lead electrocardiogram resting, spirometry and if indicated, the violator, pulse oximetry, chest x-ray, and 6 minute hall walk. These laboratory and clinical tests may help detect disease processes associated with petroleum and related product exposure, which sometimes take years to develop. That is one of the reasons it is important for both Zone B residents and Clean-Up Workers to receive periodic medical consultation because, as explained in paragraph 42 above, their exposure to the petroleum may be prolonged and concentrations elevated.

47. This medical consultation program offers advantages over medical surveillance programs which are solely epidemiologically directed or are comprised of simple "data-gathering." The medical consultation program includes tests that could identify diseases caused by petroleum and/or petroleum distillates.

48. The PMCP offers further advantages because, rather than characterizing them as "research subjects," persons presenting to the medical consultation program are deemed to be "patients" and a physician-patient relationship is established. This offers significant protection and the benefits of medical attention as opposed to detached observation. In addition, to facilitate class members' participation in the consultation program, the Claims Administrator is required to provide regular reminders to each member when it is time for a periodic consult. This is yet another benefit beyond that which would be provided under a typical surveillance or data-gathering protocol. In my experience, participants in these surveillance or data-gathering

regimens often discontinue participation simply because, over time, they forget to affirmatively participate.

49. The PMCP is not experimental or investigational, and it finds its basis in generally accepted medical practice, as well as the medical literature as contained at least in part in Appendix A.

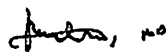
50. In my opinion, this consultation program provides a critically important benefit to class members.

VI. CONCLUSION

51. It is my opinion as a physician-scientist, researcher and clinician with training in epidemiology, occupational and environmental medicine, and the other disciplines required to develop such an opinion, that the above-described disease matrix and medical consultation program offer the greatest opportunity to do the most good for the most people. These aspects of the settlement help to bridge the gap between speculation and science on a basis of generally accepted medical knowledge and provide persons who may be at an elevated risk of contracting disease with a mechanism to obtain medical attention, regardless of whether such risk is due to petroleum and/or petroleum product exposure or due to some other source.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

August 11, 2012



Michael R. Harbut, M.D., M.P.H., F.C.C.P.

**APPENDIX A TO THE DECLARATION OF
MICHAEL R. HARBUT, M.D., M.P.H., F.C.C.P.**