UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

April 22, 1982

Before the Atomic Safety and Licensing Board

In the Matter of	)	
	)	
CLEVELAND ELECTRIC ILLUMINATING COMPANY, Et Al.	)	Docket Nos. 50-440 50-441
	)	(Operating License)
(Perry Nuclear Power Plant, Units 1 and 2)	)	

OHIO CITIZENS FOR RESPONSIBLE ENERGY
MOTION FOR LEAVE TO FILE ITS CONTENTIONS 17, 18, AND 19

Ohio Citizens for Responsible Energy ("OCRE") hereby moves the Licensing Board to grant OCRE leave to supplement further its Petition to Intervene by filing its Contentions 17, 18, and 19 in the above-captioned proceeding. They are entitled respectively, "Substratum Placement of Water Intake Structure", "Use of Commercial Spent Fuel for Nuclear Weapons", and "Polymer Degradation from Radiation Exposure."

This Intervenor will first provide general explanations for each contention; OCRE will then address the filing requirements of 10 CFR 2.714.

Contention 17: Substratum Placement of Water Intake Structure

OCRE contends that the latest water intake system proposed by the Applicant in its design for PNPP (ER-OL, Section 3.4.4) will inflict unacceptable damage to the aquatic ecology of the site and the Central Basin of Lake Erie. The intake system planned for the Grand Gulf station (of which this Intervenor has recently learned) could well be a superior and environmentally preferable method of extracting the necessary water for PNPP.

At the Construction Permit stage the AEC ASLB, the NRC Staff, and various commenters on the DES-CP all expressed concern that the Applicant's intake system designs would cause excessive impingement/entrainment of fish, fish eggs, and larvae. In the recently issued DES-OL (NUREG-0884), the Staff, on the basis of data collected at other power plants on Lake Erie, concludes that impingement/entrainment impacts at PNPP will be insignificant in comparision to the losses caused by other plants (DES-OL at 5-11). Impingement/entrainment losses at PNPP are predicted to be comparable to those observed at Davis-Besse (see Table 5.2, DES-OL).

OCRE notes, however, that although these losses are indeed less than those occurring at other plants, they are not negligible. These losses need not be accepted, as the Grand Gulf design is far superior in this regard. As the FES-OL for the Grand Gulf Nuclear Station (NUREG-0777) at Section 5.6.1 succinctly points out, "because water is not removed directly from the river, no impingement or entrainment of organisms will occur." OCRE inquires as to why a similar system could not be incorporated at Perry.

The Grand Gulf design incorporates five radial wells (see Attachment 1). Collectively they will withdraw 41,900 gallons/minute. The water requirement at PNPP is somewhat higher: 69,400 gpm (ER-OL at Section 3.6.2). This Intervenor surmises that it may be possible for a well system to be successfully employed at Perry, given the construction of additional wells.

OCRE further suspects that the stratigraphy at the site

may be quite suitable for collection wells. According to the PNPP FES-CP, Section 2.4.2, the strata located between the surface and the shale bedrock some 55-61 feet below is comprised of "two tills and then lacustrine deposits." The depth and composition of this strata could lend itself well to the "induced infiltration" the Grand Gulf plant will employ.

The benefits are most notably the infliction of zero impingement and entrainment losses upon Lake Erie. The costs to achieve such benefits must be examined. The Applicant has apparently not done this.

Contention 18: Use of Commercial Spent Fuel for Nuclear Weapons

In October 1981 President Reagan lifted the ban on commercial reprocessing of spent fuel imposed by the previous administration. Subsequently, there has been much speculation that as a result of this policy, plutonium from civilian reactor spent fuel will be used to make nuclear weapons. This speculation has been fueled by the development of laser isotope separation technology, which makes such utilization more feasible by removing the undesirable plutonium isotopes (Pu-238, 240, 241), leaving highly pure (93.5%) Pu-239, which is the preferred isotope for use in weapons. This speculation has also been fueled by various statements supportive of this plan made by high-level officials in the Department of Energy, including DOE Secretary James Edwards.

The Applicants apparently share Secretary Edwards' enthusiasm for this plan, as is evidenced by an article (Attachment 2) appearing in "The Motor," a monthly magazine for CEI employees.

OCRE thus suspects that plutonium produced in the operation of PNPP may be used to produce nuclear weapons.

If, in addition to generating electricity, Perry will operate as a production facility for nuclear weaponry, OCRE contends that the effects of this must be considered under the National Environmental Policy Act (NEPA). Since the scope of NEPA is broad, an analysis of such action should not be limited to the radiological health effects of reprocessing, plutonium extraction and refinement, and weapons fabrication, but should examine societal consequences as well. E.g., an analysis under NEPA should examine whether this action would increase or decrease national security. Similarly, in accordance with the recent court decision in the TMI-1 restart case requiring the NRC to consider psychological stress under NEPA, the psychological effects on the Applicants' customers should be examined; e.g., some ratepayers may have moral objections to financing nuclear weapons production through their usage of electricity.

OCRE recognizes that such matters have been traditionally left to the Defense Department. However, since ours is a government of, by, and for the people, and, as is evident from even a cursory glance at the news media, many American citizens are questioning defense policies relating to nuclear weapons, it is possible that this tradition may be changing. OCRE therefore believes that the inclusion of this issue in this proceeding is appropriate.

OCRE of course realizes that the use of commercial spent fuel to make nuclear armaments is not current policy. However,

PNPP will be licensed to operate for 40 years (indeed, the Pu-239 produced therein has a half-life of 24,000 years); it is difficult to predict events 40 years hence (let alone 24,000 years). From the indications given above, OCRE believes that this plan may be enacted within the operating lifetime of PNPP, possibly even in the near future. Licensure of Perry is under consideration now. The NRC Staff has already performed its preliminary evaluation under NEPA of the impacts of PNPP operation, the DES-OL, NUREG-0884, which did not address this issue. A final statement is due within the next two months. OCRE contends that the effects of using spent fuel from Perry for the production of nuclear weapons must be considered under NEPA in the current NRC evaluation of PNPP, and a cost-benefit analysis be prepared pursuant to such action.

If this cost-benefit analysis indicates that such action is undesirable, the Commission should impose a licensing condition specifically prohibiting such use of spent fuel produced at Perry. If such a licensing condition cannot, for some reason, be imposed, then said use of spent fuel should be assumed to occur, and the NEPA evaluation should be incorporated into the cost-benefit analysis used for determining the desirability of plant operation. The Commission's decision on the licensing of PNPP should thus be based accordingly.

Contention 19: Polymer Degradation from Radiation Exposure

OCRE has learned of recent experiments conducted by Sandia National Laboratories which indicate that polymers degrade more rapidly when exposed to lower levels of radiation

for long periods of time than when exposed to high levels for shorter periods. Since the latter conditions are used for age testing materials used in nuclear power plants, it is possible that the useful life of such materials in a radiation environment has been greatly overestimated. Science News, March 27, 1982 at 215 (Attachment 3).

OCRE has not found in the FSAR a comprehensive listing of all polymers used at PNPP which will be exposed to radiation and the methods used for age testing same, so this Intervenor cannot now determine the degree to which this concern is applicable to the Perry facility. However, such matters are clearly appropriate subjects for discovery.

OCRE is concerned that the radiation-induced embrittlement of polymers, especially those used as electrical insulation, may compromise plant safety. OCRE therefore contends that all polymer materials used in a radiation environment at PNPP should be tested under realistic conditions and inspected for degradation at increased intervals throughout the plant's lifetime.

Section 2.714 Filing Requirements for Contentions 17, 18, and 19

OCRE offers as "good cause" for its non-timely filings the novelty of the information upon which the contentions are based. The Grand Gulf design for water intake structures proposed in Contention 17 was described in the FES-OL for Grand Gulf, which was issued in October 1981, and was not received by this Intervenor until recently. Likewise Contention 18 is based on changes in government policy occurring in

recent months. Both of these issues should have been considered in the DES-OL for Perry; the lack of assessment therein also constitutes good cause. Contention 19 is based on an article appearing in the March 27 issue of Science News.

The above-captioned proceeding represents, as has been mentioned previously, the only forum in which OCRE can conveniently and expediently deal with these matters. No other parties to this proceeding have voiced any concern about these significant matters; OCRE's participation will surely aid in the development of a sound record. Although the inclusion of these contentions may broaden the issues, the extent of delay resulting thereby is highly speculative. Since the evidentiary hearing is not scheduled until November of this year, and this Intervenor expects slippage at that, there should be no delay or resulting prejudice to the other parties by the inclusion of these matters in the proceeding. These factors thus favor the admission of these three contentions into this proceeding.

Respectfully submitted,

Susan L. Hiatt

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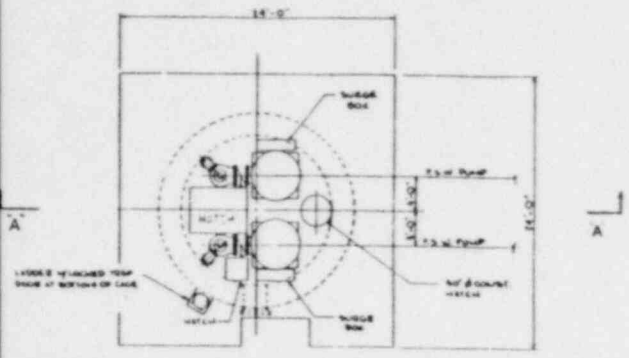
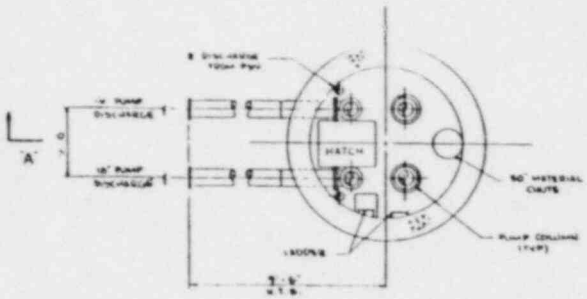
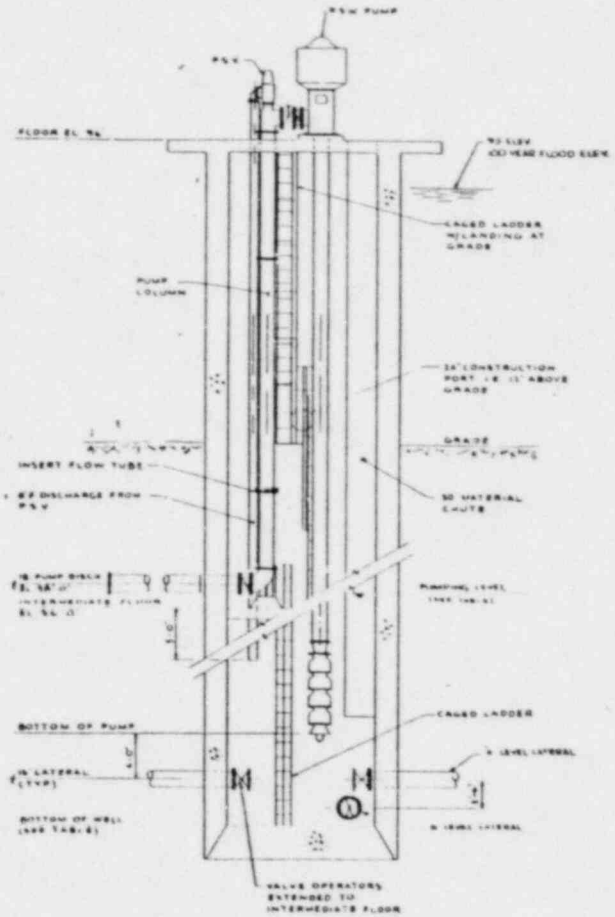
ATTACHMENT 1



PLAN AT EL 96



PLAN AT INTERMEDIATE FLOOR
EL 56'-0"



SECTION "A"-A

SCALE: 1/4" = 1'-0"

RADIAL COLLECTOR WELL DATA

	WELL 1	WELL 3	WELL 5
Elevation of pumping level in caisson, ft. msl.	-25	-21	-25
Total length of laterals, linear ft.	2300	2300	2300
Diameter of laterals, in.	16	16	16
Number of laterals	12	12	11
Elevation of centerline of laterals, ft. msl.	-45	-39	-45
Dimensions of caisson I.D. X O.D., ft	13 X 17	13 X 17	13 X 17
Elevation of bottom of caisson, ft. msl.	-49	-43	-49
Elevation at top of aquifer, ft. msl.	+21	+55	+67

MISSISSIPPI POWER & LIGHT COMPANY
GRAND GULF NUCLEAR STATION
UNITS 1 & 2
ENVIRONMENTAL REPORT

PLANT SERVICE WATER
RADIAL COLLECTOR WELL

FIGURE 3.4-5

ATTACHMENT 2

NUCLEAR POWER
SIXTH IN A SERIES

WASTE MANAGEMENT

It wasn't too long ago that the term wastes, to the average American, meant the rubbish, garbage and other trash you stuffed into a plastic bag and left outside for the sanitation department to pick up.

The only controversy once generated by wastes was the typical family argument over whose turn it was to take it out.

Today, greater public awareness of modern technology coupled with concern for the environment have given new meaning to the term wastes.

The public is justifiably concerned about the gaseous, liquid and solid wastes from industry that can present a health hazard. New laws and regulations now govern the storage, shipment and disposal of such wastes.

Wastes from nuclear power plants are similarly an area of public concern. In fact, recent polls have shown that support for nuclear power is closely tied to public confidence in the nuclear industry's ability to deal with its wastes.

Anti-nuclear groups, meanwhile, have been using the waste management issue in their arguments against nuclear power plants. Unfortunately many of their arguments are based on misconceptions and exaggerations.

Radiation levels

Two types of radioactive wastes are produced by nuclear power plants – low-level and high-level.

In the category of low-level wastes are protective garments worn by workers, sludges, filters, retired equipment, clean-up liquids, and other industrial trash that *may* contain very small amounts of radioactivity. Such material can be easily packed in drums and shipped to designated burial sites. The radiation levels in this material are so low, and their decay is so rapid, that it is not considered hazardous.

The real issue of public concern is high-level radioactive wastes that come from one source – the fuel in a nuclear reactor, whether it's used for commercial power generation or for the production of national defense materials.

There are some facts about these high-level wastes we should all know from the onset:

Basic facts

- Nuclear power plants are not the major source of high-level radioactive wastes. In terms of volume, more than 90 per cent of such wastes in our country today come from the national defense program.
- The technology to reprocess and ultimately isolate such wastes from the environment already exists and is in use in other major industrial nations. America's reprocessing program has been delayed by political considerations, not through any lack of technology.
- Reprocessing nuclear wastes does not add to the radioactivity on our planet. In fact, it ultimately reduces the radioactivity that nature would otherwise be producing from the natural disintegration of the uranium in the earth.
- The waste issue should not be viewed as a disadvantage of nuclear power. It is one of the benefits. Nuclear power produces a far smaller volume of wastes than that produced by coal-fired generation. And the toxicity of nuclear wastes decreases with time. Chemical waste toxicity remains forever.

A 1000-megawatt nuclear

plant, for example, produces only enough high-level wastes a year to fill two telephone booths.

By contrast, each year the nation's other industries produce a volume of toxic wastes some 10,000 times greater than the entire nuclear industry has produced since its beginning.

The source

As noted earlier, high-level radioactive wastes are contained in the spent fuel from nuclear reactors.

To maintain efficient reactor operations, the fuel must be periodically replaced. Each of the two reactors at our Perry Nuclear Power Plant, for example, will have some 46,000 fuel rods containing the uranium pellets that undergo a fissioning process to create heat.

Once every 12 to 18 months, one-third of these rods will be replaced with fresh fuel. The spent fuel will be kept in a storage pool for several months until it becomes considerably less radioactive.

Plans derailed

Originally, the plan for Perry and for other nuclear power plants was to then ship the spent fuel to a reprocessing center.

Here, unused uranium and the plutonium that is produced during the fissioning process would be recovered. Both could be recycled into new reactor fuel.

But in 1977, the Carter Administration froze reprocessing plans for an indefinite period. The reason cited was that the separated plutonium – a raw material for atomic weapons – could result in nuclear arms proliferation.

Other nations with nuclear power plants – France, Great Britain, Canada, West Germany and Japan – are continuing with their reprocessing programs. Uranium and plutonium will continue to be recycled worldwide with or without American participation.

Decision is due

A go-ahead on reprocessing facilities by our federal government must come sooner or later. The nation's breeder reactor program must have a reprocessing facility and the defense program is running short on plutonium. Meanwhile, spent fuel continues to be stored at the nation's nuclear power plants that could be used to fill these needs and also add recycled fuel to the nation's conventional nuclear reactors.

Once a political decision has been made, the waste management programs of the nation's nuclear power industry can move ahead. Congress is now making substantial progress in developing legislative guidelines.

Safe shipment

Spent fuel assemblies will then be shipped to reprocessing plants in lead and steel casks specially designed and tested to withstand 30-foot falls, 80 mile-an-hour traffic accidents, exposure to fire, and immersion in water without any leakage.

(To date, more than 4,000 spent fuel assemblies have been transported in this country with no one ever being injured by radiation exposure. By contrast, there have been injuries, even fatalities, from the hundreds of shipments each day involving flammables, explosives, and poisons from other industries.)

At reprocessing centers, the spent fuel would be chemically dissolved to separate valuable unused uranium and plutonium.

The residual radioactive wastes would then be solidified and blended into stable, non-dissolvable ceramic or glass materials.

In this form, the waste would be sealed into ceramic or metal cannisters and buried in dry, geologically stable areas such as thick salt beds thousands of feet beneath the earth's surface.

After burial

Within 300 to 700 years, the radioactivity level of this waste would decay to the level at which it stood when the original uranium was first mined from the earth. It would continue to decay below the radioactivity level of natural uranium, thus cleansing the earth of some of its natural radioactivity.

Salt beds and other geologically stable formations are ideal repositories for high level nuclear wastes.

Geologists estimate that even if ground water were diverted into such areas, it would take 50,000 years to dissolve the surrounding salt or rock formations and another 10,000 years to erode the waste containers. By then the radioactivity in the wastes would have long since decayed into harmless levels.

Die-hard critics of nuclear power plants like to claim that this industry is burdening future generations with our nuclear wastes. The fact is that these wastes already exist, not only from the nuclear power industry, but from the defense program.

The unfair burden

An unfair burden will fall on the shoulders of future generations only if we fail to reprocess these wastes, recycle usable uranium and plutonium, and establish federal burial sites for the residual nuclear wastes.

The utility industry's position on waste management was put forth by the Edison Electric Institute in 1981. The statement said, in part:

"It is imperative that a federal policy and legislation be set forth which would initiate a program and establish repositories for the disposal of nuclear waste...

"Completed reports by both the National Academy of Sciences and the International Nuclear Fuel Cycle Evaluation have concluded that radioactive waste disposal can be carried out without undue risk to man or the environment. But until a waste management facility is permitted to operate, even on a demonstration scale, the public will continue to perceive that no solution exists to the waste management problem." ■

of what can be accomplished by a steady and consistent commitment to important scientific goals." The "steady and consistent" part, many U.S. space scientists feel, has been a sorely lacking aspect of the U.S. planetary program, whose progress is sometimes perceived as a succession of individual battles for separate funding needs. Calling attention to the declining role of the U.S. in planetary research, he said, "I know that we all look forward to the advances in human knowledge that soon will be appearing in Soviet scientific journals. . . ." The Venera accomplishment, he said, suggesting a strong reference to concerns about the potential losses if the U.S. loses its position of space leadership, "has surely aroused the admiration of people all over the world." His words were spoken to Barsukov and Surkov. His message was for Washington.

Other planetologists feel, however, that individual contacts rather than formal agreements still provide the bulk of their scientific exchange, and such one-to-one links are likely to continue. "I could not see a situation," says the State Department source, "where the U.S. government would try to restrict personal contacts."

—J. Eberhart

Rad damage of polymers

At the bottom of a water-filled, stainless-steel-lined pit, various construction materials used in nuclear power plant buildings recently were exposed to a cobalt-60 radiation source. The experiments — conducted by Ken Gillen and Roger Clough of Sandia National Laboratories in Albuquerque, N.M.—indicate that long-term, low-level doses of gamma radiation degrade the materials faster than do equal doses doled out at a higher rate over a shorter period of time.

The findings have implications for determining the lifetime of certain polymers used in nuclear reactor structures. Traditionally, age testing of these materials has emphasized total radiation dose—not dose rate. A typical age test, for example, involves exposing polymers to 40 Megarads—a radiation dose about equal to that expected during a plant's 40-year design life—over a period of several days.

The Sandia tests, on the other hand, involved administering lower doses over a longer period of time to more closely simulate the nuclear power plant environment. In one test, polyvinylchloride—which is used for cable jacketing — was shown to degrade three to four times faster at the lower-level, longer-term dose rate. Similar results were observed using polyethylene, a cable insulation material.

The Sandia tests show that polymer damage, mostly embrittlement, occurs when radiation exposure causes chemical bonds to break, which in turn leads to oxidation — the combination of a substance with oxygen. □

Hypothalamic hormones and cancer

The hypothalamus was found during the late 1960s and early 1970s to be the brain and body's executive hormonal switchboard; Roger C.L. Guillemin of the Salk Institute in LaJolla, Calif., and Andrew V. Schally of the Veterans Administration Hospital in New Orleans shared a Nobel Prize for the discovery (SN: 10/22/77, p. 260). Since then the isolation, sequencing and synthesis of hypothalamic hormones and the design of analogues of, and antagonists to, them has opened a radically new approach to birth control, with one analogue ultimately reaching clinical trials (SN: 5/24/80, p. 331). And now hypothalamic hormone analogues look as if they can counter some hormone-sensitive cancers — notably hormone-sensitive prostate cancer — Schally and his colleagues report in the March PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES.

Luteinizing hormone-releasing hormone (LHRH) is a hypothalamic hormone that controls sex hormones in both men and women (SN: 8/12/72, p. 108). Superactive LHRH analogues (compounds similar in structure to LHRH) increase levels of the male hormone testosterone, stimulate the testes, stimulate libido and influence other sex-hormone related functions. Paradoxically, however, large doses of these analogues do just the opposite. So Schally and his co-workers tried to learn whether such doses might make testosterone-dependent prostate cancer regress in animals. They found that it does.

Then they attempted to see whether such doses can do the same for testosterone-dependent prostate cancer in humans, which constitutes about a half of all cases of human prostate cancer. Over periods of six weeks to a year they gave large doses of superactive LHRH analogues to six patients with localized prostate cancer and to four patients whose prostate cancer had already metastasized. The patients agreed to this experimental treatment since estrogen, a treatment for local prostate cancer that cannot be surgically treated and for metastasized prostate cancer, had not helped one of them and was contraindicated for the rest of them because of their medical histories. (Castration is another treatment for metastasized prostate cancer.)

The treatments brought about tumor regression and clinical improvement — such as better urinary flow and a decrease in bone pain due to cancer metastasis—in nine out of 10 patients. (The tenth patient's cancer was found to be hormone-insensitive.) Schally and his colleagues conclude, ". . . Long-term administration of LHRH analogues could become an alternative to surgical castration and estrogen therapy for the treatment of hormone-dependent prostate carcinoma."

However, the analogues were not without some undesirable side effects of their own, notably a decrease in libido and erectile potency. And as Avery Sanberg, a prostate cancer scientist at Roswell Park Memorial Institute in Buffalo, told SCIENCE NEWS, what Schally and his group are doing, essentially, "is changing the hormonal milieu. But it remains to be seen whether that effect is any better than what therapy in the past has given. . . . Nobody has ever cured prostate cancer with hormonal therapy." William Scott of the Johns Hopkins Medical Institutions agrees: "I think we have gone about as far as one can go with hormonal therapy. I think any other hormonal manipulation is just a variation on the theme."

—J.A. Treichel

Measles eradication as world-wide goal

Although still regarded in some countries as just part of growing up, measles infections take a heavy world toll. Each year 1.5 million children die of the disease and its complications, which include pneumonia and brain inflammation. The incidence of complications and death is highest in developing countries where there is malnutrition and high risk of concurrent infections.

At a meeting in Washington, physicians from 21 countries concluded that worldwide eradication of measles is possible, probably within 20 years. An effective vaccine is available, but major challenges are expected in financing immunization programs in developing countries and in motivating some of the developed countries, such as France and the United Kingdom, to participate.

The United States is cited as the best example of a measles eradication program. Currently, more than 96 percent of children entering school have proof of immunity. The annual incidence of measles here has dropped from 336.3 cases per 100,000 population in the 1950s (before the vaccine came into use in 1963) to 1.3 cases per 100,000 population in 1981. So far in 1982, a record low of only 130 cases has been reported, says Alan R. Hinman of the U.S. Centers for Disease Control. He and colleagues predict in the March 19 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION that by October 1982 indigenous measles will have been eliminated in the United States, although approximately 500 cases per year will occur due to importation of measles with occasional, limited transmission. Other countries making progress toward extensive immunization of children include Canada, China, Czechoslovakia, Costa Rica, Cuba and Chile. □

CERTIFICATE OF SERVICE

This is to certify that copies of the foregoing OHIO CITIZENS FOR RESPONSIBLE ENERGY MOTION FOR LEAVE TO FILE ITS CONTENTIONS 17, 18, AND 19 were served by deposit in the U.S. Mail, first class, postage prepaid, this 22nd day of April, 1982 to those on the Service List below.

Susan L. Hiatt

Susan L. Hiatt

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