RAS 3241

NUCLEAR REGULATORY COMMISSION

DOCKETED
USNRC

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

'01 JUL 24 A9:48

In the Matter of:	)	Docket No. 72-22-ISFSI
PRIVATE FUEL STORAGE, LLC (Independent Spent Fuel Storage Installation)	)	ASLBP No. 97-732-02-ISFSI
	)	July, 19, 2001

OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

STATE OF UTAH'S OPPOSITION TO APPLICANT'S MOTION FOR SUMMARY DISPOSITION OF UTAH CONTENTION DD - ECOLOGY AND SPECIES

The State of Utah opposes the Applicant's June 29, 2001 Motion for Summary Disposition of Utah Contention DD - Ecology and Species ("Applicant's Motion") on the grounds that there are genuine disputes regarding material facts and therefore that the Applicant is not entitled to summary disposition. The State's opposition is supported by a Statement of Material Facts in Dispute ("Utah Facts") and by the Declaration of Dr. Frank P. Howe (July 19, 2001) ("Howe Dec.," attached hereto as Exhibit 1).

PROCEDURAL BACKGROUND

At the time PFS filed its license application in 1997, the only environmental document supporting the PFS license application was the Applicant's Environmental Report ("ER"). The State challenged the adequacy of the ER's discussion of the impacts on ecology and species. As admitted by the Board, the contention states:

> The Applicant has failed to adequately assess the potential impacts and effects from the construction, operation and decommissioning of the ISFSI and the transportation of spent fuel on the ecology and species in the region as required by 10 C.F.R. §§ 72.100(b) and 72.108 and NEPA in that:
> 1. The License Application fails to address all possible impacts on federally endangered or threatened species, specifically peregrine falcons nesting on the Timpie Springs Waterfowl

Template = SECY-041

SECY-02

Management Area.

2. The License Application fails to include information on pocket gopher mounds which may be impacted by the proposal.
3. The License Application has not adequately identified plant species that are adversely impacted or adequately assessed the impact on those identified, specifically the impact on two "high interest" plants, Pohl's milkvetch and small spring parsley.
4. The License Application does not identify, nor assess the adverse impacts on, the private domestic animal (livestock) or the domestic plant (farm produce) species in the area.

LBP-98-7, 47 NRC 142, 204-205, *aff'd on other grounds*, CLI-98-13, 48 NRC 26 (1998), and LBP-98-10, 47 NRC 288, 296 (1998).

The State has reviewed the pleadings, motion, and supporting evidence for issues relative to the impacts on Skull Valley Pocket Gophers, Pohl's milkvetch, Small Spring Parsley, livestock and produce (Applicant's Motion, parts III B through D, at pp. 12 through 15), and will not be filing responses to those portions of Applicant's Motion.

ARGUMENT

I. THE APPLICANT HAS FAILED TO SHOW THAT IT IS ENTITLED TO SUMMARY DISPOSITION OF CONTENTION UTAH DD AS A MATTER OF LAW.

A. Standard of Review

Pursuant to 10 CFR § 2.749(d), a party is entitled to summary disposition if "there is no genuine issue as to any material fact" and the party "is entitled to a decision as a matter of law." The burden of proving entitlement to summary disposition is on the movant.[1]

---

[1] Advanced Medical Systems, Inc. (One Factory Row, Geneva, Ohio 44041), CLI-93-22, 38 NRC 98, 102 (1993). *See also* Cleveland Electric Illuminating Co (Perry Nuclear Power Plant, Units 1 and 2) ALAB-443, 6 NRC 741, 755 (1977): "[S]ummary disposition is a harsh remedy. It deprives the opposing litigant of the right to cross-examine the witness,

Because the burden of proof is on the proponent, "the evidence submitted must be construed in favor of the party in opposition thereto, who receives the benefit of any favorable inferences that can be drawn."[2] Furthermore, if there is any possibility that a litigable issue of fact exists or any doubt as to whether the parties should be permitted or required to proceed further, the motion must be denied.[3]

B. There Are Genuine Material Facts in Dispute Relative to the Applicant's Analysis of the Impacts of PFS Activities on the Peregrine Falcon

The State acknowledges that the Applicant's Motion does improve the record by providing important new information about the impacts of the Applicant's activities on the peregrine falcons at the Timpie Springs Wildlife Management Area. However there are some areas relative to those impacts that must still be addressed for an adequate assessment.

The Applicant's expert witness, Dr. Clayton White, has concluded that the Timpie Springs peregrine falcons will be unaffected by increased traffic or habitat loss related to PFS's construction or operation activities, largely because they forage primarily in the Timpie Springs Wildlife Management area itself. This analysis fails to take into consideration the

---

which is perhaps at the very essence of an adjudicatory hearing. In such circumstances -- even in administrative proceedings where the rules of evidence may be relaxed -- it is important that a movant for summary disposition be required to hew strictly to the line set out by our Rules of Practice."

[2] Sequoyah Fuels Corp. and General Atomics Corp. (Gore, Oklahoma Site Decontamination and Decommissioning Funding), LBP-94-17, 39 NRC 359, 361, *aff'd* CLI-94-11, 40 NRC 55 (1994).

[3] General Electric Co. (GE Morris Operation Spent Fuel Storage Facility), LBP-82-14, 15 NRC 530, 532 (1982).

changing conditions at Timpie Springs.

Fluctuations in the levels of the Great Salt Lake are common. *See* Deposition Transcript of State Witness Solomon, Utah Contention W – NEPA: Flooding at Rowley Junction at 38-39, attached hereto as Exhibit 2; *see also* Deposition Transcript of State Witness Cole, Utah Contention W – NEPA: Flooding at Rowley Junction at 5- 10, and 29-30, attached hereto as Exhibit 3. Falling Lake levels and rising Lake levels both result in the loss of wetlands habitat around the Lake. When habitat is lost, populations of shorebirds and ducks in wetlands areas around the Lake decrease or are displaced. New wetlands further inland – closer to the freeway – can also be created by rising Lake levels, with populations of shorebirds displaced by the rising levels utilizing the new habitat.[4] *See* Utah Facts ¶¶ 1 and 5, and Declaration of Frank P. Howe, Exhibit 1 ("Howe Dec.), ¶¶ 9, 12.

The impact of this change in conditions should change Applicant's analyses. When Great Salt Lake levels change again, the Timpie Springs peregrine falcons will adjust their foraging patterns, with increasing reliance on either their normal shorebird and duck prey species, now located further inland at existing or newly created wetlands, or upon upland prey species such as mourning doves, Western meadowlarks and, to a lesser extent, horned larks, sage thrashers, and lark sparrows. Dr. White's assumption that the peregrine falcons will seldom forage anywhere but the Timpie Springs Wildlife Management Area ("WMA") would no longer apply. *See* Utah Facts ¶¶ 2 and 5, and Howe Dec. ¶ 10.

---

[4] Exhibit 5 to Dr. White's Declaration clearly shows wetland habitat on both sides of the freeway under present conditions. These wetlands would become an increasingly important foraging area for the peregrine falcon with the loss of habitat in the Timpie Springs WMA. *See* Howe Dec. ¶ 12.

Because they will be foraging further inland under these conditions, peregrine falcons will be foraging closer to the freeway than assumed in the Applicant's analysis. They will therefore have an increased risk of vehicle collision that has not been analyzed in the DEIS or by the Applicant. *See* Utah Facts ¶¶ 4, 6, and 11, and Howe Dec. ¶¶ 10, 11, 13, 14, and 16.

Changing conditions of the Great Salt Lake would also make the Timpie Springs peregrine falcons increasingly vulnerable to loss of habitat due to wildfire. In the event Applicant's activities, including increased rail traffic in the area, cause wildfires, shrub-steppe habitat in the vicinity of the Timpie Springs WMA would be vulnerable. If Lake conditions had resulted in increased reliance by the peregrine falcons on upland or inland prey, that loss of habitat could be a threat to the falcons. Again, this impact is not discussed in the DEIS or by the Applicant. *See* Utah Facts ¶¶ 7 and 12, and Howe Dec. ¶ 17.

Finally, the State believes the Applicant is too optimistic in its analysis of the impacts on the peregrine falcon of disturbance related to its activities. The peregrine falcons at Timpie Springs have not had as much breeding success as other birds in similar breeding towers around the Great Salt Lake. It is reasonable to infer that the disturbance from the nearby salt processing plant may be hindering that success. If that is the case, additional nearby disturbances from Applicant's activities could have a significant impact, another impact that has not been evaluated by the DEIS or the Applicant. *See* Utah Facts ¶¶ 8, 9, 10, and Howe Dec. ¶¶ 18-19.

CONCLUSION

For the reasons stated above, PFS is not entitled to Summary Disposition and the State requests the Board to set this matter for hearing.

DATED this 19th day of July, 2001.

Respectfully submitted,

Denise Chancellor, Assistant Attorney General
Fred G Nelson, Assistant Attorney General
Connie Nakahara, Special Assistant Attorney General
Diane Curran, Special Assistant Attorney General
Laura Lockhart, Assistant Attorney General
Attorneys for State of Utah
Utah Attorney General's Office
160 East 300 South, 5th Floor, P.O. Box 140873
Salt Lake City, UT 84114-0873
Telephone: (801) 366-0286, Fax: (801) 366-0292

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:	)	Docket No. 72-22-ISFSI
PRIVATE FUEL STORAGE, LLC (Independent Spent Fuel Storage Installation)	)	ASLBP No. 97-732-02-ISFSI
	)	July 19, 2001

STATE OF UTAH'S STATEMENT OF DISPUTED AND RELEVANT MATERIAL FACTS

In support of its Response to PFS's Motion for Summary Disposition of Utah Contention DD, the State submits this Statement of Disputed and Relevant Material Facts.

1. Fluctuations in the levels of the Great Salt Lake are common and can result in decreased suitability of habitat within the Timpie Springs WMA and a corresponding decrease in the shorebird and duck populations. Howe Dec. ¶ 9; *see* Deposition Transcript of State Witness Solomon, Utah Contention W – NEPA: Flooding at Rowley Junction at 38-39, included as Exhibit 2; *see also* Deposition of State Witness Cole, Utah Contention W – NEPA: Flooding at Rowley Junction at 5- 10, and 29-30, included as Exhibit 3.

2. The Timpie Springs WMA peregrine falcons' preference for foraging on Timpie Springs WMA shorebirds and ducks would decrease or be eliminated if there is a significant decrease in the shorebird and duck populations as a result of lake level fluctuations. Peregrines would then have an increased reliance on upland prey species such as the mourning dove, Western meadowlark and, to a lesser extent, horned lark, sage thrasher, and lark sparrow. Howe Dec. ¶10.

3. An increased reliance on upland prey species would in turn mean that loss of upland prey habitat within 8-10 miles of the Timpie Springs WMA peregrine nest would be detrimental to the foraging success of those birds. Even loss of habitat within 18-20 miles could have an impact. Howe Dec. ¶ 10.

4. Vehicle impacts can be a significant source of mortality for peregrine falcons. Howe Dec. ¶ 11.

5. Changing levels of the Great Salt Lake would result in peregrine prey species moving to wetlands further inland. Howe Dec. ¶ 12.

6. Increased reliance on upland and inland prey would also increase the likelihood that peregrines would be foraging in the vicinity of the freeway. Howe Dec. ¶ 13.

7. In the event Applicant's activities, including increased rail traffic in the area, cause increased wildfires, shrub-steppe habitat in the vicinity of the Timpie Springs WMA would be vulnerable. If other conditions have resulted in increased reliance by the peregrine falcon on upland prey, that loss of habitat could be a threat to the Timpie Springs peregrine falcons. Howe Dec. ¶ 17.

8. Recovery of peregrine falcon populations around GSL is much slower than in other parts of Utah; the GSL birds belong to a population that has not recovered at a rate similar to other western populations.

9. Breeding failure by the peregrine falcon at the Timpie Springs WMA breeding tower may indicate a susceptibility to disturbances, such as those from the salt processing plant. It is reasonable to infer that additional nearby disturbances would be likely to make this already vulnerable site less attractive as a breeding site.

10. The State disputes PFS Material Fact ¶ 11, which indicates that the Timpie Springs WMA peregrine falcons have acclimatized to the vehicular and human foot traffic. The breeding success rate for the peregrine falcons is lower than that for other pairs similarly situated. Howe Dec. ¶ 19.

11. The State disputes PFS Material Facts ¶¶ 12, 13, 15, 16, 18, 21, 23, and 24, which discuss potential threats to the peregrine falcons related to increases in traffic. The Applicant has not analyzed the potential impact of changes in the Great Salt Lake levels, which would tend to encourage increased foraging by peregrine falcons upland and inland. Howe Dec. ¶¶ 8 through 16.

12. The State disputes PFS Material Fact ¶ 30, which discusses potential threats to the peregrine falcons related to wildfire. The Applicant has not analyzed the potential impact of changes in the Great Salt Lake levels, which would tend to encourage increased foraging by peregrine falcons upland and inland. Howe Dec. ¶ 17.

CERTIFICATE OF SERVICE

I hereby certify that a copy of STATE OF UTAH'S RESPONSE TO APPLICANT'S MOTION FOR SUMMARY DISPOSITION OF UTAH CONTENTION DD - ECOLOGY AND SPECIES was served on the persons listed below by electronic mail (unless otherwise noted) with conforming copies by United States mail first class, this July 19, 2001:

Rulemaking & Adjudication Staff
Secretary of the Commission
U. S. Nuclear Regulatory Commission
Washington D.C. 20555
E-mail: hearingdocket@nrc.gov
(*original and two copies*)

G. Paul Bollwerk, III, Chairman
Administrative Judge
Atomic Safety and Licensing Board
U. S. Nuclear Regulatory Commission
Washington, DC 20555
E-Mail: gpb@nrc.gov

Dr. Jerry R. Kline
Administrative Judge
Atomic Safety and Licensing Board
U. S. Nuclear Regulatory Commission
Washington, DC 20555
E-Mail: jrk2@nrc.gov
E-Mail: kjerry@erols.com

Dr. Peter S. Lam
Administrative Judge
Atomic Safety and Licensing Board
U. S. Nuclear Regulatory Commission
Washington, DC 20555
E-Mail: psl@nrc.gov

Sherwin E. Turk, Esq.
Catherine L. Marco, Esq.
Office of the General Counsel
Mail Stop - 0-15 B18
U.S. Nuclear Regulatory Commission
Washington, DC 20555
E-Mail: set@nrc.gov
E-Mail: clm@nrc.gov
E-Mail: pfscase@nrc.gov

Jay E. Silberg, Esq.
Ernest L. Blake, Jr., Esq.
Paul A. Gaukler, Esq.
Shaw Pittman
2300 N Street, N. W.
Washington, DC 20037-8007
E-Mail: Jay_Silberg@shawpittman.com
E-Mail: ernest_blake@shawpittman.com
E-Mail: paul_gaukler@shawpittman.com

John Paul Kennedy, Sr., Esq.
1385 Yale Avenue
Salt Lake City, Utah 84105
E-Mail: john@kennedys.org

Joro Walker, Esq.
Land and Water Fund of the Rockies
1473 South 1100 East, Suite F
Salt Lake City, Utah 84105
E-Mail: joro61@inconnect.com

Danny Quintana, Esq.
Danny Quintana & Associates, P.C.
68 South Main Street, Suite 600
Salt Lake City, Utah 84101
E-Mail: quintana@xmission.com

James M. Cutchin
Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001
E-Mail: jmc3@nrc.gov
(electronic copy only)

Samuel E. Shepley, Esq.
Steadman & Shepley, LC
550 South 300 West
Payson, Utah 84651-2808
E-Mail: Steadman&Shepley@usa.com
slawfirm@hotmail.com
DuncanSteadman@mail.com

Office of the Commission Appellate Adjudication
Mail Stop: O14-G-15
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Denise Chancellor
Assistant Attorney General
State of Utah

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:	)	Docket No. 72-22-ISFSI
PRIVATE FUEL STORAGE, LLC (Independent Spent Fuel Storage Installation)	)	ASLBP No. 97-732-02-ISFSI
	)	July 19, 2001

DECLARATION OF FRANK P. HOWE, PHD, IN SUPPORT OF UTAH'S RESPONSE TO SUMMARY DISPOSITION OF CONTENTION UTAH DD

I, Frank P. Howe, hereby declare under penalty of perjury and pursuant to 28 USC § 1746, as follows:

1. I am the Nongame Avian Program Coordinator for the Utah Division of Wildlife Resources, Department of Natural Resources, and have held that position for eight years. My responsibilities include the development and implementation of a statewide program to manage and conserve native, nongame bird species and their habitats, and habitat monitoring programs for rare and endangered species, neotropical migrants, and resident birds. I am the primary state contact for all issues dealing with federally listed bird species. I also conduct federal certification workshops for endangered species surveyors, and am a member of the Mexican Spotted Owl recovery team. Additional responsibilities include representing the state in creation of interagency Northern Goshawk Conservation Strategy; compiling the State Sensitive Species List; formulating and administering contracts for research on sensitive bird species; creating and teaching professional workshops on avian population monitoring, bird identification, songbird management, raptor management, and endangered species management; conducting guest lectures at Utah State University, University of Utah, and Southern Utah University on avian community and habitat management, and public outreach workshops on bird conservation, identification, and feeding; as well as many other duties.

2. I am also an Associate Biology Professor at Westminster College of Salt Lake City, Utah, from 1999 to the present. In this position, I conduct classroom and field/laboratory instruction in undergraduate biology for a course which emphasizes general biology and ecology research and application in the context of environmental science.

3. I earned my Ph.D. from Colorado State University in Wildlife Biology in 1993, my MS from South Dakota State University in Wildlife Science in 1986, and my BA from St. Cloud State University in Biology and Anthropology in 1982.

4. I have authored or co-authored a number of technical ornithological publications and reports. *See* my attached resume and publications list for more information.

5. On March 19, 2001, I was named the State of Utah's expert witness on Contention Utah DD, and was deposed by the Applicant on April 24, 2001.

6. I am familiar with applicable portions of Private Fuel Storage, L.L.C.'s ("PFS's") Environmental Report in this proceeding, and updates thereto; the applicable PFS responses to NRC's Requests for Additional Information; relevant documents produced by PFS during discovery; the NRC Staff's *Safety Evaluation Report* dated September 29, 2000; and the *Draft Environmental Impact Statement for the Construction and Operation of an Independent Spent Fuel Storage Installation on the Reservation of the Skull Valley Band of Goshute Indians and the Related Transportation Facility in Tooele County, Utah*, NUREG-1714 dated June 2000.

7. I have reviewed the Applicant's June 29, 2001 Motion for Summary Disposition of Utah Contention DD – Ecology and Species, as well the Applicant's Statement of Material Facts on Which No Genuine Dispute Exists and all attachments thereto. I provide this declaration in support of the State of Utah's Response the PFS's Motion for Summary Disposition. The following statements in this declaration are based on my experience, training, and best professional judgment.

8. Shrub-steppe habitats support a number of important peregrine falcon prey species, including mourning doves, Western meadowlarks, and, to a lesser extent, horned lark, sage thrashers, lark sparrows. *See* Applicant's Motion, White Dec. (Exh. B) ¶ 16.

9. Fluctuations in the levels of the Great Salt Lake ("GSL") are common. Increases in GSL levels can result in decreased suitability of habitat within the Timpie Springs Wildlife Management Area ("WMA") as a result of increased water salinity. Decreased suitability of habitat will result in a decrease in the shorebird and duck populations.

10. Although the Timpie Springs WMA peregrine falcons are likely to prefer foraging on Timpie Springs WMA shorebirds and ducks under current conditions, that preference would decrease or be eliminated if there is a significant decrease in the shorebird and duck populations as a result of lake level fluctuations. Peregrines would then have an increased reliance on upland prey species such as the mourning

dove, horned lark, sage thrasher, lark sparrow, and Western meadowlark. An increased reliance on upland prey species would in turn mean that loss of upland prey habitat within 8-10 miles of the Timpie Springs WMA peregrine nest would be detrimental to the foraging success of those birds. Even loss of habitat within 18-20 miles could have an impact.

11. Vehicle impacts can be a significant source of mortality for peregrine falcons. *See* White Dec. ¶¶ 21 and 22.

12. Exhibit 5 to White's Declaration clearly shows wetland habitat on both sides of the freeway. Further, as discussed above, fluctuations in the GSL level are common and can make habitat within Timpie Springs WMA much less suitable for shorebirds and ducks. Low lake levels reduce the amount of wetland habitat and thus shorebird and duck populations in the Timpie Springs area. High lake levels also reduce wetland habitats in the Timpie Springs area but create wetland habitats farther inland, closer to the freeway and proposed rail corridor. Thus, shorebirds and ducks which now congregate in the Timpie Springs area would congregate in areas farther from the current nest site.

13. Increased reliance on upland prey, as described in paragraph 10 above, would also increase the likelihood that peregrines would be foraging in the vicinity of the freeway.

14. Information about mortality to peregrine falcons from vehicle strikes in urban areas (White Dec. ¶ 22) is not directly applicable to the situation facing the Timpie Springs WMA peregrine falcons. Vehicles in urban areas travel much more slowly than vehicles on the freeway near Timpie Springs, where the speed limit is 75 miles per hour.

15. I have seen dead shorebirds along freeways in many locations, although I have not quantified road-kill in the immediate vicinity of the PFS project.

16. For these reasons, I conclude that increases in traffic, including traffic related to the construction and operation of the PFS facility, would result in increased risks of mortality from vehicle strikes, both for the peregrine falcon and its prey species.

17. In the event Applicant's activities, including increased rail traffic in the area, cause increased wildfires, shrub-steppe habitat in the vicinity of the Timpie Springs WMA would be vulnerable. If other conditions have resulted in increased reliance by the peregrine falcon on upland prey, as described in paragraph 10 above, that loss of habitat could be a threat to the Timpie Springs peregrine falcons.

18. Recovery of peregrine falcon populations around GSL is much slower than in other

parts of Utah; the GSL birds belong to a population that has not recovered at a rate similar to other western populations.

19. As indicated by Dr. White, peregrines have not bred at the facility for four of the 13 years, which corresponds to over 30% of the breeding seasons. This is a significantly higher rate of failure for this nesting tower than for similar towers around the Great Salt Lake and indicates that this site is more vulnerable than other GSL sites; many of those other towers have a success rate of 100% during the same period. This may be related to the nearby disturbances, such as those from the salt processing plant. It is reasonable to infer that additional nearby disturbances would be likely to make this already vulnerable site less attractive as a breeding site.

I declare under penalty of perjury that the foregoing is true and correct.

Dated this 19th day of July, 2001.

By: _____
Frank P. Howe, PhD
Non-Game Avian Program Coordinator
Utah Division of Wildlife Resources
Utah Department of Natural Resources

I declare under penalty of perjury that the foregoing is true and correct.

Dated this 19th day of July, 2001.

By: 

Frank P. Howe, PhD
Non-Game Avian Program Coordinator
Utah Division of Wildlife Resources
Utah Department of Natural Resources

Resumé

FRANK PENCE HOWE

588 Cortez Street
Salt Lake City, Utah 84103
home: 801-322-4067 office: 801-538-4764
e-mail: fhowe@state.ut.us

EDUCATION

B.A.	St. Cloud State University, Biology and Anthropology, 1982
M.S.	South Dakota State University, Wildlife Science, 1986 *Thesis: An ecological study of Mourning Doves in a cold desert ecosystem on the Idaho National Engineering Laboratory*
Ph.D.	Colorado State University, Wildlife Biology, 1993 *Dissertation: Effects of an experimental food reduction on nesting shrubsteppe passerines*

PROFESSIONAL EXPERIENCE

Current Position

Nongame Avian Program Coordinator - Utah Division of Wildlife Resources

Develop and implement statewide program to manage and conserve native, nongame bird species and their habitats. Design and implement statewide population and habitat monitoring programs for rare and endangered species, neotropical migrants, and resident birds. Conduct federal certification workshops for endangered species surveyors. Member of Mexican Spotted Owl Recovery Team; Chair of interdisciplinary team to implement recovery plans for Mexican Spotted Owls in 4 states on the Colorado Plateau. Represent state in creation of interagency Northern Goshawk Conservation Strategy. Compile State Sensitive Species List. Formulate and administer contracts for research on sensitive bird species. Develop funding proposals; administer interagency cooperative agreements, university contracts, and foundation grants. Conduct and direct statistical analyses of statewide avian databases. Develop work plans for, edit and approve reports from 5 Division of Wildlife Resources regional offices. Design Professional Development program for Division of Wildlife Resources. Create and teach professional workshops on avian population monitoring, bird identification, songbird management, raptor management, and endangered species management. Conduct guest lectures at Utah State University, University of Utah, and Southern Utah University on avian community and habitat management. Teach Project WILD and Outdoor's Woman workshops. Develop and coordinate annual statewide public outreach events. Conduct public outreach workshops on bird conservation, identification, and feeding. Founder (1992), Chair (1992-1996), and Steering Committee member (1997-present) of Utah Partners in Flight.. Write professional reports and present findings at professional and public meetings. 1991-1994 & Jan 1996 - present.

Current Position

Associate Biology Professor - Westminster College of Salt Lake City

Conduct classroom and field/laboratory instruction in undergraduate biology. Prepare and administer course syllabus, lectures, field trips, tests, quizzes, and additional teaching materials for Environmental Biology. Grade all materials including papers, field, and Internet-oriented projects. Course emphasizes general biology and ecology research and application in the context of environmental science. Field trips require journal keeping and enforce classroom activities; trips range from identification of life zones, biomes, habitats,

and life forms to treatment and disposal of solid waste, sewage, aerial effluents, and toxic wastes. Course delivers historical perspective and emphasizes current issues. 1999-present.

Previous Positions

Utah Partners in Flight Coordinator - Utah Division of Wildlife Resources

Directed and coordinated development and implementation of statewide bird population monitoring, research, and management among several federal agencies, state agencies, regional universities, and private organizations. Developed and established guidelines for bird species and habitat management, monitoring ,and recovery programs. Conducted professional workshops on avian management and field techniques. Utah representative to Western and International Partners in Flight. Conducted analyses, wrote, reviewed, edited, and approved technical reports and professional manuscripts. Presented results of studies at professional and public meetings. 1995-1996.

Utah Mexican Spotted Owl Coordinator - Contract, Utah Division of Wildlife Resources

Represented State of Utah as consulting member of the Mexican Spotted Owl Recovery Team. Coauthored national Recovery Plan for Mexican Spotted Owls. Developed statewide Mexican Spotted Owl locational (GIS) database. Chaired interagency team to develop management plans for Mexican Spotted Owls in Utah. 1995.

Research Associate/Graduate Research Assistant - Colorado State University

Conducted field and laboratory research to determine effects of insecticides on breeding birds. Designed research project, directed field and laboratory personnel, entered and analyzed data, prepared annual reports. Presented findings at professional meetings and published results. Graduate student representative to faculty; acted on two faculty search committees. 1988-1991.

Wildlife Biologist - U.S. Fish and Wildlife Service

Conducted surveys on population status of endangered and threatened bird species and availability of suitable habitat for those species. Conducted research involving instream flow requirements for plains river fishes. Directed field survey crews and data entry. Prepared technical reports and public awareness materials; presented findings at public meetings. 1986-1988.

Graduate Research/Teaching Assistant - South Dakota State University

Conducted research on the Idaho National Engineering Laboratory to determine the potential for transport of radionuclides by birds; also supervised research on the nesting ecology of a migratory bird species. Was responsible for research design, data collection, data entry, and statistical analysis. Prepared professional publications and technical reports. Presented findings at professional meetings. Taught undergraduate laboratory in ornithology. 1983-1986.

Wildlife Research Technician - University of Minnesota - Cloquet State Forest

Collected, compiled, and entered data on biology and behavior of ruffed grouse in Minnesota. 1982.

Assistant Archaeologist - St. Cloud State University

Collected, compiled, and catalogued archaeological artifacts from sites in Minnesota. 1980-1982.

SPECIAL SKILLS

Extensive use of personal computers and PC software including spreadsheet, data base management, word processing, and statistical packages. Also, use of land survey equipment, GPS and GIS methods

and applications. Broad experience designing and conducting large-scale research and monitoring projects.

Communication skills include experience forming and directing partnerships with state, federal, and non-governmental organizations. Extensive experience publishing and presenting results and concepts to professional and nonprofessional audiences (see attached). Experience teaching college level biology courses, coordinating symposia, developing and conducting professional and public workshops.

PROFESSIONAL AFFILIATIONS

The Wildlife Society
American Ornithologists' Union
Cooper Ornithological Society
Ecological Society of America
Society for Conservation Biology
Utah Partners in Flight (Founder, Chair, Steering Committee)
North American Bird Banding Association
American Birding Association
Utah Ornithological Society

HONORS AND CERTIFICATION

Conservation Service Award (Mexican Spotted Owl Recovery Team) - 1999 - presented by President William J. Clinton, Secy. (DOI) Bruce Babbitt, and Director (USFWS) Jamie R. Clark.
President Utah Chapter of The Wildlife Society (TWS) - 1997
Certified Wildlife Biologist (TWS) - 1996
Graduated Magna Cum Laude (3.9 GPA) Colorado State University - 1993
Graduated Summa Cum Laude (4.0 GPA) South Dakota State University - 1986
Graduated Magna Cum Laude (3.7 GPA) St. Cloud State University - 1982
Associate Wildlife Biologist (TWS) - 1986
Outstanding Graduate Student SDSU (TWS) - 1986
Phi Kappa Phi (Honor Society) - 1985
Gamma Sigma Delta (Honor Society) - 1985
National Honor Society - 1978

REFERENCES -additional references available upon request

Dr. Ty Harrison **School of Arts and Sciences** **1840 South 1300 East** **Westminster College** **Salt Lake City, UT 84105** **(801)832-2349** **t-harris@wcslc.edu**	**Dr. Bonnie Baxter** **School of Arts and Sciences** **1840 South 1300 East** **Westminster College** **Salt Lake City, UT 84105** **(801)832-2345** **b-baxter@wcslc.edu**	**Dr. Richard L. Knight, Professor** **Dept. Fishery & Wildlife Biology** **Colorado State University** **Ft. Collins, CO 80523** **(970)491-6714** **knight@cnr.colostate.edu**
Dr. Kate Grandison **Biology Dept.** **Southern Utah University** **Cedar City, UT 84720** **(435)865-8345** **grandison@suu.edu**	**Alan G. Clark, Wildlife Chief** **Utah Div. of Wildlife Resources** **1594 W. North Temple** **Salt Lake City, UT 84114-6301** **(801)538-4881** **nrdwr.aclark@state.ut.us**	**Dr. Lester D. Flake, Professor** **Dept. Wildlife & Fisheries Sci.** **South Dakota State University** **Brookings, SD 57007** **(605)688-6121** **flakel@mg.sdstate.edu**

Frank P. Howe, Ph.D.

PUBLICATIONS AND PRESENTATIONS

Refereed

Howe, F. P., R. L. Knight, L. C. McEwen, and T. L. George. 2000. Diet switching and food delivery by shrubsteppe passerines in response to an experimental reduction of food availability. *Western North American Naturalist* 60:139-154.

White, G. C., W. M. Block, J. P. Ward Jr., J. L. Ganey, A. B. Franklin, S. L. Spangle, J. R. Vahle, S. R. Rinkevich, W. H. Moir, F. P. Howe, and J. L. Dick Jr. 1999. Science Versus Political Reality in Delisting Criteria for a Threatened Species: The Mexican Spotted Owl Experience. *Transactions of the 64th North American Wildlife and Natural Resources Conference* 64:292-306.

Howe, F. P., R. L. Knight, L. C. McEwen, and T. L. George. 1996. Direct and indirect effects of insecticide applications on growth and survival of nestling passerines. *Ecological Applications* 6:1314-1324.

Block, W.M., F. Clemente, J.F. Cully, J.L. Dick, A.B. Franklin, J.L. Ganey, F.P. Howe, W.H. Moir, S.L. Spangle, S.E. Rinkevich, D.L.Urban, R. Vahle, J.P. Ward, and G.C. White. 1996. Recovery Plan for the Mexican spotted owl. Albuquerque, New Mexico. 172pp.

Howe, F. P. 1993. A western state perspective on monitoring and managing neotropical migratory birds. Pp. 269-271 *in* D.M. Finch and P. W. Stangel, eds. *Status and management of neotropical migratory birds*, USDA-Forest Service General Technical Report RM-229, Rocky Mountain Forest and Range Experiment Station, Ft. Collins, CO.

Howe, F. P. 1992. Effects of *Protocalliphora braueri* (Diptera: Calliphoridae) parasitism on nestling sage thrashers. *Journal of Wildlife Diseases* 28:141-143.

Howe, F. P. 1991. Two new host species for the parasitic blow fly *Protocalliphora braueri*. *Wilson Bulletin* 103:520-521.

Howe, F. P. and L. D. Flake. 1989. Mourning dove use of man-made ponds in a cold-desert ecosystem. *Great Basin Naturalist* 49:627-631.

Howe, F. P. and L. D. Flake. 1989. Nesting ecology of mourning doves in a cold desert ecosystem. *Wilson Bulletin* 101:467-472.

Howe, F. P. and L. D. Flake. 1988. Mourning dove movements during the reproductive season in southeastern Idaho. *Journal of Wildlife Management* 52:477-480.

Technical Reports

Howe, F.P. 2000. Southwestern Willow Flycatcher and Yellow-billed Cuckoo Surveys on the Green River in Utah. *Utah Division of Wildlife Resources Report.*

Howe, F. P. 1999. Colorado Breeding Bird Atlas (Book Review). *The Auk.*

Parrish, J. R., F. P. Howe, and R. Norvell. 1999. Utah Avian Conservation Strategy. *Utah Partners in Flight and Utah Division of Wildlife Resources Report.*

P. A. Gardner, R. Stevens and F. P. Howe. 1999. Handbook of Riparian Management for the Conservation of Land Birds in Utah. *Utah Division of Wildlife Resources Report*

Howe, F.P. 1999. Southwestern Willow Flycatcher Surveys on U.S. Forest Service Lands in Utah. *Utah Division of Wildlife Resources Report*

Howe, F.P., J. R. Parrish, and R. Norvell. 1999. Utah Partners in Flight Progress Report. *Utah Division of Wildlife Resources Report*

Messmer, T. A., F.P. Howe, R. Drake, L. Lentsch, B. Blackwell, M.A. Zablan, and A. Menses. 1998. Endangered and Threatened Animals of Utah. Berryman Institute Publication No. 17, Utah State University, Logan. 60pp.

Howe, F.P. 1998. Southwestern Willow Flycatcher Surveys on U.S. Forest Service Lands in Utah. *Utah Division of Wildlife Resources Report.*

Howe, F.P., J.R. Parrish, and R. Norvell. *In Prep.* Riparian Landbird Population Trends and Monitoring in Utah: 1992-1999. *Utah Division of Wildlife Resources Report.*

Howe, F.P. and J.R. Parrish. 1997. Densities and Trends of Breeding Birds in Utah's Riparian Habitats. Proceedings of the Fourth Biennial Conference on Research on the Colorado Plateau, USGS-BRD Colorado Plateau Field Station, Flagstaff, AZ.

Breeding Status of Utah Neotropical Migratory Bird Species. *Utah Division of Wildlife Resources Reports.* 1992 and 1996.

Population Monitoring of Utah Neotropical Migratory Birds in Riparian Habitats: Annual Reports. *Utah Division of Wildlife Resources Reports.* 1992-1995.

Suggestions for Management of Mexican Spotted Owls in Utah. *Utah Division of Wildlife Resources Report.* 1994.

Indirect Effects on Birds of Insect Food Base Reduction. *USDA-APHIS, Cooperative Grasshopper Integrated Pest Management Project Annual Reports.* 1988-1990.

Avian Rookery and Foraging Area Survey of the James River in South Dakota. *USDOI-USFWS.* 1987.

James River Waterfowl Breeding Pair and Brood Survey in South Dakota. *USDOI-USFWS.* 1987.

Location of Habitat Important to Federally Listed Bird Species on the Missouri National Recreational River. *USDOI-USFWS.* 1986.

Professional Presentations

The Bird Behind the Waterfall: Finding the Enigmatic Black Swift in Utah. Utah Chapter. The Wildlife Society. 2001.

The Yellow-billed Cuckoo: Crazy for Being So Lonely. Utah Chapter. The Wildlife Society. 2001.

Community Composition and Conservation of Shrubsteppe Habitats and Avifaunas. Utah Chapter. The Wildlife Society. 2000.

Conservation of Land Birds in Utah: The Utah Partners in Flight Conservation Strategy (J. Parrish, F. Howe, R. Norvell). Utah Chapter. The Wildlife Society. 2000.

Science vs. Political Reality: Monitoring Mexican Spotted Owls on Federal Lands (G. White, B. Block, F. Howe, et al.). North American Wildlife Conference. 1999.

Monitoring Utah riparian bird density trends with point counts (F. Howe, R. Norvell, J. Parrish). Cooper Ornithological Society. 1999.

Trends in density, richness, and diversity of Utah's riparian birds. (F. Howe, R. Norvell, J. Parrish). Utah Chapter. The Wildlife Society. 1999.

Developing a Conservation Strategy for Utah's Nongame Birds (J. Parrish, F. Howe, R. Norvell). Utah Chapter. The Wildlife Society. 1999.

Mexican Spotted Owl Symposium (Symposium Coordinator and Summary Speaker). Raptor Research Foundation. 1998.

Inventory, monitoring, and management of nongame birds in forested habitats. U.S. Forest Service Workshop-Utah State University. 1998 and 1999.

Five years of monitoring of birds in Utah's riparian habitats (F. Howe, J. Parrish, R. Norvell). Utah Chapter: The Wildlife Society. 1998.

The State of Utah's Wildlife (Symposium Coordinator). Utah Chapter: The Wildlife Society. 1997.

High Tech Wildlife Management Workshop (Moderator). Utah Chapter: The Wildlife Society. 1997.

The Utah Partners in Flight Program (F. Howe, J. Parrish). Utah Chapter: The Wildlife Society. 1997.

Escalante-Grand Staircase National Monument: wildlife, people and the land (Panel Moderator). Utah Chapter: The Wildlife Society. 1997.

Changes in avian density, diversity, and richness in Utah's riparian areas. Utah Chapter: The Wildlife Society. 1997.

Utah's avian resources: research and management beyond boundaries (Moderator). Utah Chapter: The

Wildlife Society. 1996.

Constant-effort mist netting as a monitoring tool in Utah riparian habitats (F. Howe, J. Parrish). Utah Chapter: The Wildlife Society. 1996.

Monitoring and management of riparian habitats for breeding birds. Utah Chapter: The Wildlife Society. 1996.

Managing riparian systems for land birds. Colorado Riparian Association. 1996.

Managing native birds in forested systems. U.S. Forest Service Managers Workshop. 1994.

Population Monitoring of Utah neotropical migratory birds in riparian habitats (Best Paper). Utah Chapter: The Wildlife Society. 1993.

Using birds to monitor riparian health. EPA workshop on western wetlands and riparian areas. 1993.

Indirect effects of an experimental insecticide application on nesting passerines. Utah Chapter: The Wildlife Society. 1992.

Effects of malathion on nesting passerines in southern Idaho. Central Mountains & Plains Section: The Wildlife Society. 1991.

Malathion's effects on nesting passerines. Grasshopper Integrated Pest Management Symposium. 1989.

Mourning Dove nesting ecology in a cold desert ecosystem. South Dakota Chapter : The Wildlife Society. 1986.

Popular Articles and Presentations

Howe, F. P. 1997. Habitat: Utah's Critical Link in the Chain of Bird Migration. *The Web-Utah Society for Environmental Education and Utah Wildlife Review.*

Howe, F. P. 1995. Challenges of migration: Utah's songbirds head south. *Utah Wildlife Review.* Fall 1995

Howe, F. P. 1995. Harbingers of Spring: Utah's migratory songbirds. *Utah Wildlife Review.* Spring 1995

Howe, F. P. 1988. Heads up, Herons! *South Dakota Conservation Digest* 55(3):2-5.

Howe, F. P. 1987. Terns and plovers on the Rec. River. *South Dakota Conservation Digest* 54(3):18.

Rivers of Life: Why riparian zones are the most important habitat type for Utah's birds. Great Salt Lake Audubon. Spring 1999.

The Endangered Birds of Utah's Canyons. Bridgerland Audubon. Spring 1999.

Forested wetlands: riparian zones as habitat for Utah's wildlife. Utah River's Council Forum. 1998.

Breeding bird trends in riparian habitats of Utah. Great Salt Lake Audubon. 1998.

The decline of Utah's shrub-dependent birds. Cache Valley Audubon. 1998.

Bird communities of Antelope Island. Antelope Island Workshop-Friends of Great Salt Lake. 1994-1998.

Conservation of avian communities in southern Utah. Red Cliffs Audubon. 1997.

Great Basin Desert bird communities. Great Basin Workshop-Great Salt Lake Audubon. 1996.

The crane community. Cache Valley Crane Festival. 1996.

Monitoring and management of breeding birds in Utah's riparian areas. Utah County Birders. 1996.

Managing breeding birds in Utah's riparian habitats. Bridgerland Audubon. 1995.

Monitoring populations of neotropical migratory birds in Utah. Great Salt Lake Audubon. 1994.

Birding: hobby into science. Salt Lake Birders. 1994.

Utah's spotted owl: a threatened canyon species. Eco-issues Wildlife Forum-University of Utah. 1993.

A conservation strategy for shorebirds on the Great Salt Lake. Great Salt Lake Audubon. 1993.

Monitoring neotropical migrant birds in Utah's riparian areas. Bridgerland Audubon. 1993.

(Brochure) Utah's Wetlands: treasures worth caring about. *Utah Partners in Flight/Utah Division of Wildlife Resources.* 1995.

(Poster) Utah's neotropical migratory birds. *Utah Partners in Flight/Utah Division of Wildlife Resources.* 1995.

(Pamphlet) Join Utah's Stream Team. *Utah Division of Wildlife Resources.* 1995.

PAGE 37

37

generating the earthquake."
A. Correct.
Q. Do you agree with that statement?
A. Yes.
Q. And it's much rarer in comparison to earthquakes causing ground shaking events. Is that what that means?
A. Correct. Ground shaking can be felt in earthquakes all the way down to two or three, although it certainly doesn't cause any damage. In fact, surface rupturing requires earthquake magnitudes of up around five and a half to six. So anything below a surface rupturing event by definition will not result in any tectonic subsidence.
Q. Now, in the same paper we're talking about -- same paper that we're in right now, you look on page 490 and there it talks about potential for damage associated with future rises of the Great Salt Lake.
A. Right.
Q. The second paragraph there states, "Several critical facilities constructed all or in part on the bed of Great Salt Lake are exposed to inundation by lake flooding. These include the Salt Lake City International Airport, Interstate State Highways I-80 and I-15, the mainlines of the Union Pacific and

PAGE 38

38

Southern Pacific Railroads, several sewage treatment plants, petroleum refining and storage facilities, landfills, and electrical transmission lines." Do you agree with that statement?
A. I do, but it introduces the concept of recurrence interval. And whenever you're talking about exposure to inundation as they do in this article, you're referring to a certain lake level that occurs periodically every few years or centuries or whatever. And in this case what they're referring to is the historically high lake level of 4212 feet. If you go back further in time, there have been considerably higher lake levels than that. And considering the sensitivity of the nature of the type of project we're looking at, I would think that you would have to look at a longer time period than just the historical record. And in that case you're looking at higher elevations of the lake.
Q. I didn't quite understand your answer completely. You say this raises the issue of recurrence. In what sense? In the sense that this paragraph here is based upon recurrence level I just read?
A. It's implied in that paragraph. When you're talking about an elevation, a lake level of 4212, that

PAGE 39

39

occurred in the 1980's and then again in the late 19th century. So based upon that, it has occurred twice in the last 120 or so odd years -- 120, 130 years. If you want to go up to a lake level of 4717, that hasn't occurred in historic time, but it has occurred 400 years ago. If you want to go up to the lake level of 4221, that hasn't occurred within the last 400 years but it's occurred 2,000 years ago. So the longer time span that you're referring to, the greater the potential rise in the elevation of the lake.
And the time span is intimately involved with the type of development that you're considering. You would consider a different time span for a nuclear facility than you would for a storage shed or for a single family home. You would have a different time span for a school or a hospital than you would for a 7-Eleven store.
Q. Are you aware of any other studies that have studied the subsidence levels of large earthquakes?
A. Not specifically. I'm sure there must be some other areas of the country, but I'm not -- I am not familiar with them.
Q. All of these articles that we've talked about so far, they relate to the Lake Hebgen earthquake?
A. Yes.

PAGE 40

40

Q. And has there been subsidence studies done on other earthquakes?
A. Again, I'm sure there has been, but I'm not familiar with them.
Q. Are you aware what subsidence has been on other earthquakes of similar magnitude as Lake Hebgen?
A. I could estimate. The amount of subsidence, the upper limit on the amount of subsidence is going to be the amount of displacement on the fault, so that's a rough estimate of what the amount of tectonic subsidence would be.
Q. But that includes both the uplift of the -- what wall is that again?
A. Yeah. That would be a conservative estimate, yeah. The true amount of subsidence would be somewhat less than the amount of displacement. But that's a conservative estimate.
MR. GAUKLER: Let's take a break.
(Recess from 2:44 to 2:58 p.m.)
Q. (BY MR. GAUKLER) Let's go back on the record. Before we were talking about the frequency of occurrence when we broke, and you were talking about the frequency of occurrence of fluctuation of lake levels.
A. Right.
Q. And you would also say that there's a

PAGE 5

(Exhibit W-6 marked.)
And what's been marked as Utah W Exhibit 6, is that a copy of your resume?
A. Yes, it is.
Q. And is the resume up to date?
A. Yes.
Q. And is it accurate?
A. Yes.
Q. It shows that you're a senior engineer with Utah Division of Water Resources. And how long have you been employed by the Utah Division of Water Resources?
A. I started there in November of '71.
Q. And you've been employed by them since that time?
A. Yes.
Q. And what has been your function as an engineer for the Utah Division of Water Resources?
A. I've been an engineer since 1976. I was going to school. So an early part. I work in the hydrology section, hydrology and computer applications.
Q. And what duties do you perform in the hydrology computer section of the Division of Water --
A. I write water resource models of river systems. I've also worked with my boss and whatnot as far as the Great Salt Lake as they prepared reports over

PAGE 6

the years.
Q. What type of reports have you prepared for the Great Salt Lake?
A. There was -- I didn't personally author these, but there have been reports back in the early -- back in the 70's.
Q. And what were the subject of those reports?
A. How to manage the Great Salt Lake, what could you do to manage the flooding as it rises or whether it will rise or not.
Q. Okay. Do you do flooding analysis as part of your job?
A. Yes, I do.
Q. And what type of situation do you normally evaluate with respect to flooding? Is it a river situation or a --
A. Generally it's a stream or a -- we don't have too many rivers, actually.
Q. And how many stream flooding evaluations, approximately, have you done in your approximately 25 years?
A. Probably a couple of dozen.
Q. Have you done flooding evaluations with respect to lakes or bays or other bodies of water of that nature?

PAGE 7

A. No, not specifically, other than the work we did for these reports on the lake.
Q. And these reports you did on the lake, you're referring back to the reports in the 1970's?
A. Yeah.
Q. Would you tell me something about the nature of those reports and what issues you worked on with respect to them?
A. They were essentially data gathering.
Q. And what type of data did you gather with respect to those reports?
A. Well, everything from -- they had me go up and research all the reports that had ever been written on the lake and write an abstract. And then we collected data from the USGS for my boss for the model of the lake, how the different inflows impacted its hydrologic models, how the different inflows to the Great Salt Lake and the changing area of the lake and salinity affect the elevation of the lake. So he actually wrote that model.
Q. Did you do any analysis of projections for future rise or flooding of the Great Salt Lake with respect to those models?
A. Yeah, we did.
Q. And what are they reflected in?

PAGE 8

A. There is a couple of reports that are back in our office that would have that. I'm not exactly sure what the titles of them right now are. We call one of them the Easter egg report.
Q. You call them what?
A. It's called the Easter egg report because of the picture on the front of it.
Q. I'd like to see that report. And when were these reports dated?
A. These were dated in the 70's. This was prior to the rise of the lake in the 80's.
Q. Do these reports have any relevance to the issues that you're conceding here with respect to Utah W?
A. Other than my experience in knowing that the lake can do more than we estimated.
Q. So you didn't estimate the rise in the lake in these reports in the 1970's?
A. Well, we underestimated what it would do.
Q. Have you been involved in any more recent estimates in terms of the Great Salt Lake, what it's projected to do in terms of future rises or decreases in elevation?
A. No, just the work we did. And as we watched it rise and looked at the -- I mean, we looked at the

SHEET 2 PAGE 9

topography and where the lake would expand to as it rises.
Q. What's the current level of the Great Salt Lake?
A. It's between 4201 and 4202.
Q. When you say 4201 and 4202, is that for a particular month, particular year?
A. That was -- the recent number on the board when I walked out of the office was 4201.6. I didn't look to see whether that was the 15th or the 1st of April.
Q. What's usually the peak season for the -- in terms of the calendar year, what is usually the peak season?
A. It generally peaks in June. Occasionally it'll peak earlier, depending on the weather, or it could peak later. On years that it's made big rises, the weather and things have made it towards the end of June.
Q. And so what was the peak for the last season, the last year, approximately?
A. I don't know the exact number. It was over 4203.
Q. Less than 4204 but more than 4203?
A. Yeah, somewhere in that range. I don't have

PAGE 10

that number on the top of my head.
Q. That's good enough.
Let me have marked as Exhibit No. 7 a map of the Great Salt Lake area, the southern part.
(Exhibit W-7 marked.)
Do you recognize this map?
A. It's certainly part of the country that I recognize.
Q. It's a map of the Great Salt Lake area, the southern shore area, the eastern and western shore. About how far up the lake does it go, approximately?
A. Well, it goes beyond Promontory Point, so it's probably got two thirds of the lake.
Q. So it's two thirds of the lake. Does this appear to be within the scale of a map an accurate depiction of the Great Salt Lake and the surrounding area?
MS. CHANCELLOR: Objection. He doesn't have any idea how this map was generated or where it was from.
MR. GAUKLER: I'm asking if it appears to be accurate in terms of his knowledge of the area and work he's done with respect to the Great Salt Lake.
MS. CHANCELLOR: You may answer.
A. Well, it's reasonably. I mean, I don't know

PAGE 11

what the elevation of the lake is at this time or --
Q. (BY MR. GAUKLER) It's a reasonable approximate?
A. So it's reasonably approximate, yeah.
Q. What's your understanding of Utah Contention W?
A. Well, my understanding is that they're looking at the transfer point where you transfer from rail to truck.
Q. And that's the transfer point for -- one alternative for the transfer point of spent nuclear fuel being shipped to the Private Fuel Storage facility?
A. Yes.
Q. What's your understanding of the purpose or function that would occur at the transfer point?
A. Well, the main function being to transfer your casks from the train to the truck, which would then move it to your storage facility farther south.
Q. And where do you understand the location of the fullest transfer point to be in relationship to this map?
A. Well, just west of that Timpie mark.
Q. You understand it to be approximately 1.8 miles west of that mark?
A. That's what your report's saying. I don't

PAGE 12

have any reason to discount it.
MR. GAUKLER: I'd like to have marked as Exhibit No. 8 a two-page excerpt from the state's contention. It's identified at the top "W. Other Impacts not Considered."
(Exhibit W-8 marked.)
This is Contention Utah W as filed by the state in the fall of 1997. And we're here with respect to subpart 3 of Utah W, which discusses flooding. And do you recognize this contention?
A. Yes, I've seen it before.
Q. Did you have any role in writing the contention, that is, as it relates to flooding subpart 3 on page 163?
MS. CHANCELLOR: Objection. This also refers to Utah N, and you need to see the document to be complete.
MR. GAUKLER: Let me mark as an exhibit Utah Exhibit N, then. Let's mark that as Exhibit No. 9.
(Exhibit W-9 marked.)
Q. If you look at Exhibit 8 -- if you look at Utah Exhibit No. 8, which is Contention W, on subpart 3, flooding, it states in its entirety, "The Applicant has not considered the impact of flooding on its facility or the Intermodal Transfer Point. See Contention N

PAGE 29

29

A. Do I have any concerns?
Q. Do you have any concerns or information? Do you have any information concerning the final design elevation?
A. I don't have any information other than what's in here.
Q. And in there, you're referring to Utah W Exhibit 2?
A. Well, in your materials that you provided.
Q. That's page 4.3-5 of the environmental report?
A. Yes.
Q. And do you have any concerns concerning the final elevation of the ITP, final design elevation of the ITP?
A. No, not concerning that.
Q. How far from the shore of the Great Salt Lake is the location of the proposed ITP?
A. That would depend on what elevation the lake's at. The lake shoreline moves considerably. Where it was originally proposed if the lake hits 4212, the lake would come up to the 4212 elevation, which would be considerably closer. I'm not sure just what the elevation is off the knoll right there, but it would -- the shoreline would move right up to that

PAGE 30

30

elevation, 4212.
Q. Now you said the original location. What were you referring to? The original location of the ITP?
A. I think originally there was a location that was over by Timpie Junction --
Q. Right.
A. -- and I looked at that and realized that it's not that much higher than the high level of the lake.
Q. Do you know how far the ITP would be assuming an elevation between 4220 and 4225 from the historic high level point of the lake of 4211.85 feet, what that distance would be?
A. No, I don't.
Q. What evaluation have you done concerning the potential flooding for the ITP beyond just looking at the elevation and doing a wave, looking at the wave heights and seiche? What have you done, in your words?
A. That was primarily it.
Q. What conclusions did you reach from that evaluation? Strike that. What factors did you look at in making the evaluation that you did with respect to the potential flooding of the ITP, hydrological reasons?
A. The hydrological reasons was the elevation

PAGE 31

31

of the lake and the potential total depth of the lake.
Q. When you say the potential total depth of the lake, what do you mean?
A. Meaning the lake plus whatever the runup and the seiche was from a storm.
Q. What is runup from a storm? Can you define that term for me?
A. Well, when one of these events occurs where the wind moves the water, the water actually of course raises to a higher elevation than the average pool surface out in the lake. So seiche can move it up a couple of feet higher than normal.
Q. And what do you understand seiche to be? Is seiche similar to wave runup, as you understand?
A. Well, it's actually a large movement of water in a slower period of time, other than the waves that are coming in one after the other.
Q. What's your definition or understanding of seiche?
A. Well, we're talking about a wind generated seiche.
Q. Correct, as opposed to --
A. So the wind is actually moving the mass of water at a slower rate. So it piles it up against a shore, whatever shore it's blowing towards.

PAGE 32

32

Q. Did you look at the -- to what extent do you take into account the location of the ITP in evaluating flooding, potential of flooding at the ITP?
A. Well, the main thing I was concerned with is the elevation and also its proximity to the lake.
Q. What did you determine was its proximity to the lake with respect to the new location of the ITP?
A. Well, elevation wise it's higher than the original site, so...
Q. You actually looked at the potential for flooding with respect to the site?
A. What I was doing was looking to see what the total elevation of the water surface that you would be concerned with, so...
Q. When you say the total elevation of the water surface that you'd be concerned with, you're talking about --
A. How high the water would be, or possible water.
Q. From the Great Salt Lake?
A. From the Great Salt Lake.
Q. And you arrived at this elevation of water by taking the historic level of the lake?
A. Yes.
Q. And then what did you do?