ATTACHMENT A-1
Background Survey

Assessing the Research Environment

Contextual Data From Middle Managers And Selection of Projects

Model for Pacific Northwest National Laboratory

Creating an Environment That Fosters Excellent Research

Name of Manager _____

Department/Center name _____

Org unit name _____

Interview Objective

You may be aware of the Research Environment Survey which is part of a study funded by DOE/BES (Gretchen Jordan, Sandia, PI). The PNNL Division of Environment and Health Sciences was part of that BES survey several years ago. We have also received a grant from the NSF to help build a science of science and innovation policy. In this interview we would like to learn about the context of the research environment in your [Center]. Because we want to study specific selected projects as well as provide you with an assessment of your [Center] as a whole, we also want to guide you through selection of projects that fit the requirements of that study.

Selection of Research Projects for the Survey

As part of this study, we are focusing on two departments and two centers in each of three large national laboratories (yours, Brookhaven and Sandia and one each in three smaller laboratories (Ames Lab, National Renewable Energy Laboratory, and National Oceanic and Atmospheric Administration). In your **department of microbial and cellular biology,** we would like to select four research projects to study in depth, as we administer the survey in your department [center] to gauge employee attitudes on their research environment. The four projects are to be each one in a different research strategy defined as follows:

1. incremental scientific innovation in a small project of 6 people or less in which each of them spends at least five percent of their time
2. radical innovation or scientific breakthrough in a small project of 6 people or less defined similarly
3. incremental scientific innovation in a large project of at least 7 people or more in which each of them spends at least five percent of their time
4. radical innovation or scientific breakthrough in a large project of 7 people or more defined similarly

Radical innovation or scientific breakthrough can be defined as a project that is likely to be nominated for a R&D 100 award or that you think is likely to win some other form of recognition or make a considerable advance in the science involved. Still another way of thinking about breakthrough science is the

development of a significant new scientific research tool or measurement instrument.

Let's Begin.

We define "researchers" to include scientists, engineers, technologists, post docs, graduate students and visiting researchers.

1. First the small projects

a. If small projects are defined as six researchers or less (each spending at least 5 percent of their time), how many small projects are in your Department/Center's portfolio? _____

b. What percentage of these projects would you identify as making scientific breakthroughs or developing significant new scientific tools or instruments? _____

c. Please list three small projects that have had radical innovations during the past five years:

_____

_____

_____

d. What are the criteria of innovation and which two should be selected (circle the manager's choices)?

e. Please list three small projects that have had incremental innovations during the past five years.

_____

_____

_____

f. What are the criteria of innovation and which two should be selected (circle the manager's choices)?

2. Now the large projects:

a. How large are your largest projects in the Center?

b. If large projects are defined as seven researchers or more (even if only 5 percent of their time), how many large projects are in your Department/Center's portfolio [we understand some of these include staff from other Departments/Centers]? _____

c. What percentage of these large projects would you identify as making scientific breakthroughs or developing significant new scientific tools or instruments? _____

d. Please list three large projects that have had radical innovations during the past five years:

_____

_____

_____

e. What are the criteria of innovation and which two should be selected (circle the manager's choices)?

f. Please list three large projects that have had incremental innovations during the past five years.

_____

_____

_____

g. What are the criteria of innovation and which two projects should be selected (circle the manager's choices)?

The Survey Process:

Each of the members of the small research projects that you have nominated will receive a survey that allows them to assess their research environment and recommend changes if they so desire. In the large projects that have less than twenty-five members all of them will receive a survey as well. For projects larger than this, we will select a maximum of 25 members in a stratified random sample.

In addition because we recognize that the boundaries of projects are not necessarily well defined, we will also select 50 percent of the members of the department [Center] at random to receive the survey. The survey takes about 30 minutes to complete and will be web-based for all except the selected projects which will complete a paper survey as a group. If you wish, we can survey everyone. The advantage of this is that it provides better data on the pattern of communication and internal networks that are so crucial to good science.

3. Background on Specialties

As you are well aware, the specialty and/or disciplinary context of research departments varies a great deal. For your department of *microbial and cellular biology*, what specialties in biology do you consider to be critical to monitor for new ideas, theories, tools and techniques?

(1)_____ (2)_____
(3)_____

Are there specialties or disciplines outside of biology that are important for the effectiveness of the research projects in your department, i.e. critical to monitor (but not have on project staff) for new ideas, theories, tools, and techniques?

(1)_____ (2)_____
(3)_____

To help in this process, show list prepared by the Department of Energy of the various specialties that are funded, recognizing that the list may be a bit out of date. (see last page).

4. Collaboration and Communication

As you may know, combining quite different specialties or areas of research in the same projects can create communication difficulties.

(a) Do you have any policies that are designed to overcome this difficulty? If so, what are they?

(b) How would you assess each of them for their relative effectiveness?

Contextual Background Questions

Part 1. Putting the Current Research Environment of *Microbial and Cellular Biology* in Context

A. Strategies and Programs

1. Has *microbial and cellular* biology at Pacific Northwest added any research programs during the past five years?

If yes, which ones?

2. Has *microbial and cellular* biology at Pacific Northwest eliminated any research programs during the past five years?

If yes, which ones?

B. FTE, Visitors, and Funding History

1. The number of full time equivalent staff in *microbial and cellular* biology over the past 5 years has been…

O Declining O Relatively Stable O Increasing O Department Is New O NA

2. Projections are that the staffing in this department/Center in the next 5 years will…

O Decline O Stay Relatively Stable O Increase O NA

3. Is this department associated with any of the user facilities at Pacific Northwest? If yes, ask which ones.

4. Do any of the research projects in your department have either visiting researchers or post-docs? If yes, how many of each type of these visitors were there in your department this past year?

4a. The number of visiting researchers and/or post-docs to your department over the past 5 years has been…

O Declining O Relatively Stable O Increasing O Department Is New
O NA

4b. In your projections for the number of visiting researchers and/or post-docs in this department/Center in the next 5 years, will they …

O Decline O Stay Relatively Stable O Increase O NA

5. Please identify approximately what percentage of your department/Center's funding comes from each of the following sources.

_____% Public funds (government, direct funding)
___% Office of Science
___% Energy Efficiency & Renewable Energy
___% other DOE non-NNSA
___% NNSA
___% Non DOE public funds

_____% Private Sector sources
_____% Non governmental organizations, non-profits
_____% From your own organization
_____% Other (Please Specify) _____

C. Department Management

Stability

1. How many years have you been in this position? _____ years

2 How many years has this department been one? _____ years

3. How many years was your predecessor in this position? _____ years

[If less than five
years, then ask for how many directors in the past five years.]

Decision-Making

1. How many managers within the Laboratory do you consult with when making strategic or policy decisions related to science or technology for your department?

2. How many managers within the Laboratory do you consult with when making programmatic decisions?

C. Characteristics of the External Environment

1. Technical Environment/ State of Knowledge

Aspects of the technical environment that can positively or negatively affect the course and progress of your Center's research include:

- Nature of the discipline or field (e.g., emerging or mature)
- Presence or absence of necessary research tools (e.g., supercomputers, electron microscopes, lasers)
- Existence or lack of complementary and supporting research or technologies
- Stage or maturity of the research or technology
- Degree and speed of widespread technical change.

A. Relative to the specialties in biology and the various disciplines that you indicated above, would you describe the state of knowledge as stable or dynamics for your Center's research projects …

O Very stable, changing slowly
O
O Moderate rate of change
O
O Very dynamic, changing rapidly

O NA

Follow-up, why do you say that?

B. During the past ten years, would you say that the rate of knowledge growth has itself changed?

O Very stable, changing slowly
O
O Moderate rate of change
O
O Very dynamic, changing rapidly

O NA

Follow-up, why do you say that?

C. Knowledge growth is always to a certain extent dynamic, but given this how predictable is the direction of change?

O Very predictable, easy to anticipate the nature or direction of change
O
O Moderately predictable
O
O Very unpredictable, hard to anticipate the nature or direction of change

O NA

Follow-up, why do you say that?

D. Progress in the research projects in your department is …

O Greatly hampered by need for supporting tools and research
O
O Not affected strongly by presence or lack of supporting tools and research
O
O Greatly accelerated by recent innovations in supporting tools and research

O NA

E. Overall, what is the effect of the technical environment on your Center's research?

O Very favorable
O

O Neutral
O
O Very unfavorable

O NA

F. For the selected projects, is the technical environment different from the department/Center norm? If so, how?

O Small projects, incremental innovation
O Small projects, radical innovation
O Large projects, incremental innovation
O Large projects, radical innovation

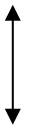
O NA

2. Social and Demographic Environment

Changes taking place in the culture and in the structure of society can influence the course and progress of your Center's research. Examples include:

- Society's values and preferences (human cloning, commercial nuclear reactors, cancer research)
- Shifts in age distribution (research about aging, demographic concerns about availability of scientists)

A. Are your Center's fields of research …



O Attracting many new scientists and engineers
O
O Moderately attracting new scientists and engineers
O
O Attracting few new scientists and engineers

O NA

B. Overall, what is the effect of the social and demographic environment on your Center's research?

O Very favorable
O
O Neutral

O
O Very unfavorable

O NA

C. For the selected projects, is the social/cultural environment different from the department/Center norm? If so, how?

O Small projects, incremental innovation
O Small projects, radical innovation
O Large projects, incremental innovation
O Large projects, radical innovation

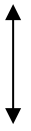
O NA

3. Legal, Regulatory, and Political Environment

Laws and regulations can be simple or complex, strict or flexible, reasonable or unreasonable. These often affect the ability to pursue or progress in research in a particular field. For example,

- State and Federal government laws, regulations, or policies and political pressures for changes
- Air emission regulations have precluded development of some hazardous waste incineration techniques
- Policies against underground weapons tests rule out and certain types of research on nuclear weapon performance

A. Overall, what is the effect of the legal, regulatory, political environment on your Center's research?



O Very favorable
O
O Neutral
O
O Very unfavorable

O NA

B. For the selected projects, is the legal, regulatory, and political environment different from the department/Center norm? If so, how?

O Small projects, incremental innovation
O Small projects, radical innovation
O Large projects, incremental innovation
O Large projects, radical innovation

O NA

4. Economic Environment

Economic trends other aspects of the "market" can affect your Center's progress and performance. These include:

- overall national prosperity, levels of Federal funding for R&D, availability of funding for research in your Center's fields
- Level of competition for funds
- Cost of the research infrastructure

A. Competition for funds and recognition in your Center's fields of research is characterized by …

O Few competitors
O
O Moderate number of competitors
O
O Many competitors

O NA

B. Overall, what is the effect of the economic environment on your Center's research?

O Very favorable
O
O Neutral

o

O Very unfavorable

O NA

C. For the selected projects, is the economic environment different from the department/Center norm? If so, how?

O Small projects, incremental innovation
O Small projects, radical innovation
O Large projects, incremental innovation
O Large projects, radical innovation

O NA

Thank You!