A.3. Description of Proposed Activities: This collaborative research project is sponsored by the National Science Foundation (NSF) program in Chemical Oceanography and will be conducted by academic scientists from three participating institutions:

1) University of California Santa Barbara (David Valentine, Chief Scientist)
2) Woods Hole Oceanographic Institution (WHOI; Chris Reddy, Principal Investigator)
3) University of Mary Washington (Charles Sharpless, Principal Investigator)

Three NSF assets will be used for the research:

1) R/V Atlantis (owned by the US Navy and operated by WHOI)
2) HOV Alvin (owned by the US Navy and operated by WHOI)
3) AUV Sentry (owned by WHOI and operated by the National Deep Submergence Facility)

The goals of the proposed research pertain to the chemical transformations of hydrocarbons discharged to the environment. The investigators plan to analyze the pattern of hydrocarbon oxygenation from the sea floor to fresh oil slicks at the sea surface, to weathered slicks, to weathered hydrocarbons re-deposited to the ocean floor. Additional work will be conducted in the seep areas for site characterization, including collection of sediment, rock and biota (e.g., chemosynthetic muscles), and water samples.

All three assets will be used for the proposed studies. The Atlantis will be used to identify locations of natural seepage or anthropogenic deposition, using the hull mounted Konsburg EM-122 MBES. The AUV Sentry will be deployed in these target areas to generate high-resolution multibeam maps of the target areas to further pinpoint sampling locations for the HOV Alvin. Lastly, the HOV will be deployed to these sites for sample collection as outlined above. This nested approach requires a large number of initial targets (Table 1), with only a small fraction of these locations ultimately seeing asset deployment.

The scientists involved and HOV pilots are experienced with research in seep environments, and will minimize benthic disturbance during their sampling activities.

The RV Atlantis will mobilize and demobilize in Saint Petersburg, FL. The proposed target areas are provided in Table 1, and displayed in the attached Plat (Figure 1).

Expanded Responses to Section D

Description of proposed coring, drilling or sampling method. Include heat flow measurements and depth of penetration.

Sampling will be conducted for oil, gas, sediment, water and biota as described below.

- Oil samples will be collected using the HOV Alvin at the sea floor. Seeping oil will be captured using an inverted funnel type of device, and samples returned to RV Atlantis. Oil will be collected at the sea surface using a Teflon net for sampling.

- Gas will be collected from seeps using an inverted funnel sort of sampling design.
- Sediment will be collected using push cores on the HOV Alvin. Push cores are approximately 2.75 inches in diameter and 12 inches in length.
- Water samples will be collected using Niskin bottles mounted to the HOV Alvin.
- Grab samples of benthic biota (e.g., chemosynthetic mussels) will be collected with the manipulator arm of the HOV Alvin and placed in a sample box.

Description of coring, drilling or sampling equipment to be used:

Coring will use traditional push cores as described above. The oil and gas collection devices are best described as inverted funnels that allow for sample collection at depth and maintenance during transit to the surface. Water samples will be collected in Niskin bottles.

Method of sample storage, and handling:

Samples will be mounted to the front basket of the HOV Alvin and returned to the R/V Atlantis. Samples will be frozen or refrigerated once aboard the R/V Atlantis, and shipped to the home laboratories following the expedition.

Table 1. Proposed sampling areas for the SEEPS 15 expedition.

Lease Block	Lat (N)	Lon	Radial Distance
GC958	27.009386°	-90.275162°	Radius: 5nm
GC822	27.144326°	-90.451812°	Radius: 4nm
GC951	27.004210°	-90.602553°	Radius: 4nm
GC991	26.992397°	-90.822100°	Radius: 5nm
GC944	27.023304°	-90.940158°	Radius: 3nm
GC986	26.970182°	-91.039149°	Radius: 4nm
WR273	26.679684°	-91.510783°	Radius: 5nm
WR95	26.859215°	-91.611556°	Radius: 5nm
WR52	26.917890°	-91.522428°	Radius: 5nm
WR48	26.914746°	-91.699695°	Radius: 5nm
WR222	26.740312°	-91.828190°	Radius: 5nm
KC128	26.864871°	-91.961302°	Radius: 5nm
KC343	26.646326°	-92.222850°	Radius: 5nm
KC471	26.535304°	-92.442955°	Radius: 5nm
KC557	26.414460°	-92.495819°	Radius: 5nm
KC642	26.362788°	-92.678696°	Radius: 5nm
KC818	26.153260°	-92.649897°	Radius: 5nm
KC691	26.309744°	-92.423213°	Radius: 5nm
KC831	26.174296°	-92.029157°	Radius: 5nm
KC919	26.080123°	-92.030506°	Radius: 5nm
KC524	26.466518°	-91.966886°	Radius: 5nm
KC157	26.841614°	-92.712767°	Radius: 3nm
KC291	26.707727°	-92.626818°	Radius: 5nm

GB962	27.023198°	-92.082348°	Radius: 4nm
GC711	27.235593°	-91.611302°	Radius: 5nm
GC574	27.378989°	-91.824383°	Radius: 5nm
GC665	27.279455°	-91.666212°	Radius: 4nm
GC847	27.123158°	-91.393684°	Radius: 2nm
GC848	27.135985°	-91.341719°	Radius: 5nm (North)
GC766	27.212014°	-91.029338°	Radius: 1.5nm
GC590	27.360873°	-91.051085°	Radius: 2nm
GC504	27.457218°	-90.929525°	Radius: 2nm
GC539	27.407128°	-91.373304°	Radius: 5nm
GC451	27.528799°	-91.397524°	Radius: 4nm
AT47	27.887236°	-89.796907°	Radius: 5nm
MC293	28.683627°	-88.534073°	Radius: 2.5nm
MC758	28.216586°	-89.445340°	Radius: 2nm
GC469	27.502835°	-90.491778°	Radius: 1nm
GC287	27.665670°	-90.817267°	Radius: 0.75nm
Backup Stations			
AC218	26.785647°	-93.878538°	Radius: 2nm
GC600	27.369917°	-90.571033°	Radius: 4nm
EB900	27.051983°	-94.935033°	Radius: 2.5nm
AC157	26.795567°	-94.681350°	Radius: 2nm
AC205	26.784867°	-94.53045	Radius: 1nm
AC818	26.180267°	-94.622933°	Radius: 2nm
AC601	26.392167°	-94.514167°	Radius: 3nm
EB245	27.733333°	-94.733333°	Radius: 3nm
WR56	26.893284°	-91.330524°	Radius: 5nm
AT340	27.644830°	-88.364851°	Radius: 1nm
GB697	27.320264°	-92.110541°	Radius: 1nm