# Interim Meeting of the Sedimentary and Geochemical Processes Panel

Lamont-Doherty Geological Observatory, Palisades, New York
July 19-20, 1989

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## Executive summary

1. The major goal of this meeting was the production of a new white paper which was needed after the new panels SGPP and OHP were formed; a working draft of the white paper is attached. Revision and finalization are expected at the next scheduled meeting.
**Action:** Suess and all panel members

2. Ten new proposals received from the JOIDES office were reviewed; the evaluations are part of these minutes; evaluation forms should be prepared.
**Action:** Suess

3. The SGPP panel review process was restructured to cope with the increased flow of proposals; those ranked with little or no thematic interest to SGPP will not be discussed; those ranked of high interest will be grouped by themes and evaluated in comparison to each other.
**Action:** Suess

4. New panel members requested to improve SGPP expertise in seismic stratigraphy are John Damuth or Steve Lewis and in sedimentary mass balance Bill Hay.
**Action:** PCOM

5. Shipboard radioactive and stable isotope measurements for microbial turn-over rates and fluid flow rates from packer tests are of significant interest to SGPP; a sub-committee will prepare a document for discussion at the next scheduled meeting.
**Action:** Boulegue, Dreiss, Elderfield

6. Thematic publications may adequately and appropriately be published as special journal issues.

7. Sand recovery is of such a high priority that SGPP requests attendance of a TAMU engineer at the next scheduled meeting.
**Action:** McKenzie, Normark, Suess, PCOM, TAMU

8. SGPP members are much concerned over the nature of the process which apparently led to the demise of the geochemical reference hole; crustal material balances rank among the highest priorities of this panel and deserve due process.

9. In order to clearly communicate this panel's thematic priorities for 1991, the proposed drilling of ***Sedimented Ridge Crest*** and ***Cascadia Accretionary Prism*** are ranked as the two top proposals far ahead of all others selected by PCOM.

10. Pore water and gas sampling procedures are in need of a major overhaul; a sub-committee will prepare for such a process and convey eventual SGPP recommendations to SMP.
**Action:** Froelich, Prahl
In the interim SGPP recommends:
**Titanium squeezers should be constructed to allow pore water studies involving metallic elements.**
**Routine squeezing of half round (50 $cm^3$) samples for interstitial water be discontinued.**

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## Minutes

In attendance were:
Erwin Suess (chairman)
Jacques Boulegue
Nicholas Christie-Blick
Shirley Dreiss
Henry Elderfield
Phillip Froelich
Martin Goldhaber
Makato Ito
Judith McKenzie
Juergen Mienert
William Normark
Frederick Prahl
Dorrik Stow

Members absent from the meeting were:
Noel James
Larry Mayer

Liaison members absent from the meeting were:
Lawrence Cathles, Lithosphere Panel
Graham Westbrook, Tectonics Panel

ODP Science Operator (Texas A&M University) was represented by:
Marta von Breymann

Bore Hole Group by:
Mitchell Lyle

Ocean History Panel by:
André Droxler

JOIDES Planning Committee by:
Miriam Kastner

The **minutes of the previous meeting** were approved, and the **agenda** discussed.

**PCOM Report:** Miriam Kastner summarized the results of the Oslo PCOM meeting. She discussed the status of engineering initiatives involving the wireline packer, down hole coring system, and the nature of engineering legs. She next presented the drilling schedule for 1990 and a list of programs from which the 1991 drilling will be selected. By August 15, drilling proposals for post-1991 should be submitted. The thematic panels will then have two meetings prior to the 1990 PCOM meeting at which a thematic program through 1994 will need to be constructed. It was made clear that SGPP input on the 1991 schedule would be important and that in the interest of best science to be obtained by drilling the stipulation "in any ocean" will be taken to mean exactly that.
A report on the question of radioactive and stable isotope policy followed with the recommendation that SGPP should discuss the scientific issues involved and pass these results on to the SMP.
Publications issues, consisting of a summary of the Volume A/B policy and a request that SGPP discuss the form of potential thematic publications, were aired.
Finally, the PCOM deliberations leading to the demise of the Geochemical Reference Hole were

presented. SGPP members expressed concern over the nature of the process by which this occurred; further discussion of this issue and others were tabled till later in the meeting.

**TAMU Report:** Marta von Breymann summarized progress on the APC heat-flow tool (some possibility that it can be constructed by Leg 131), and the Geoprops tool (questionable that it will be ready for Leg 131). She also conveyed her discussions with TAMU engineers on the issue of sand recovery. The technology employed by industry is relatively straight forward to implement but requires a drill pipe trip for each core. The issue of sand drilling will be taken up by the panel later in the meeting.

**SGPP White Paper:** The focus of the entire meeting at LDGO was the production of a white paper summarizing the panel's thematic goals and objectives. A preliminary discussion was presented by Erwin Suess outlining the purpose of the white paper; a condensed version of which should serve as the introduction. This was followed by a lengthy exchange on the form that the document should take. It was decided that there would be five chapters with the headings:

- Changes in sea level
- Fluid circulation and geochemical balances
- Metallogenesis
- Paleocean chemistry
- Depositional architecture and sedimentary processes

These chapters should highlight the most significant and innovative issues to be addressed by ocean drilling. The panel members then adjourned in individual working groups to produce a draft of such a document. A slightly **edited version of this document is attached to these minutes.** The chairman urges to send him comments, criticism and additions prior to 18 September 1989 for incorporation into the final document, particularly welcome is a sound suggestion for the best sequence of the chapters.

**Proposal Reviews:** Ten new proposals received from the Planning Office were reviewed.

Proposal 320A
**High northern Latitude Paleoceanography and Paleoclimate.**
Judith McKenzie presented the details of the proposal to drill in Nordic Seas. The only major area of overlap with the mandate of this panel is the objective to establish sediment budgets; these, however, are a secondary focus of the proposal.
The panel concludes that there is **some interest within SGPP** but the emphasis of this proposal falls squarely within the mandate of OHP.

Proposal 328
**East Greenland**
Erwin Suess presented the details of the proposal emphasizing the origin of seaward dipping reflectors. The panel felt that the major emphasis of the proposal is tectonic. Hereby the merits of drilling the conjugate margin of the Vøring Plateau would need to be more convincingly argued. It was noted that the area of proposed drilling coincides to some degree with that of the previous proposal (320A). Unconformities related to contourites caused by the East Greenland Current are present and are of interest to SGPP.
The panel concludes that the **proposal falls outside the SGPP mandate but we might be more interested if the contourite aspect were more fully developed.**

Proposal 321/E
**East Pacific Rise Ridge Crest Near 9°40'N**
Henry Elderfield presented the details of the proposal to drill on a fast-spreading mid-ocean ridge segment. In the discussion that followed, it was decided to defer on this proposal in favor of a simultaneous evaluation of all proposals for bare rock East Pacific Rise drilling at the next scheduled SGPP meeting in Kiel, FRG.

Proposal 322/E

**Ontong Java Plateau-Pipelike Structures**

Bill Normark presented the details of a proposal presented the details of a proposal to test the interpretation of pipe-like structures based on seismic reflection profiles. The panel felt that there are no critical objectives in this proposal related to the sedimentary sections.The panel concludes that this **proposal is outside our mandate,** and appears improbable at this time to fit into the imminent drilling plans for the OJ Plateau.

Proposal 323/A

**Gibraltar Arc**

Dorrik Stow presented details of a proposal to study the evolution of the Mediterranean-Atlantic gateway. In the discussion that followed it was concluded that the primary objectives, which are to unravel the African-European collision are outside the mandate of this panel. Secondary objectives related to the oceanographic gateway including water exchange with the Atlantic and resulting geostrophic bottom currents are of some interest to us but present drilling mainly targets non-drift sediments.

The panel concludes the **proposal generally falls outside our mandate but that there are some secondary topics of thematic interest to SGPP.**

Proposal 324/A

**Tectonic Evolution of Western and Eastern Mediterranean since Mesozoic**

Makato Ito presented details of a proposal to drill in the Eastern Mediterranean. Because there are neither sedimentological nor geochemical studies called for in the proposal, (although such studies are alluded to in the introduction).

The panel concludes that it **falls clearly outside our mandate.**

Proposal 325/P

**High Temperature Hydrothermal Site N Juan de Fuca**

Jacques Boulegue presented details of a proposal to drill into the Endeavor Segment of the Juan de Fuca Ridge. The panel felt that this proposal has some aspects of clear panel interest, including extensive background studies of the site and an interesting approach to initiate a new vent by drilling and follow its development. The panel was concerned, however, about the lack of consideration given to the hydrology of the system; lack of time series data on vent fluids and temperature, and with the overall narrow focus of the proposal.

It was concluded that the proposal clearly falls within our mandate, but has strong deficiencies. It was decided to retain the proposal for further evaluation at the next meeting.

Proposal 326/A

**Continental Margin of NW Morocco**

Juergen Mienert presented details of a proposal to study the early evolution of a passive continental margin. The panel felt that the study has mainly tectonic objectives. In particular, sea-level issues which would have been of interest, were not addressed.

The **proposal falls outside our mandate.**

Proposal 203/E

**Guyots in the Central Pacific**

Nicholas Christie-Blick presented details of a proposal to drill 8 holes in 5 submerged Guyots in the NW Pacific. Following discussions on sea-level priorities (Mesozoic vs. Tertiary), questions on the available dating resolution, and how sea-level amplitudes are to be established.

It was decided to consider this proposal together with another one which will be submitted shortly at the next SGPP meeting.

Proposal 327

**Argentine Rise**

Fred Prahl presented details of a proposal to drill sediments of the Argentine Rise. Of the three main objectives, two; Mesozoic black shales, and the origin of drift sediments/contourites are of thematic interest to SGPP. The black shale discussion centered on two issues. The first was the significant drilling depths required to core to the pertinent part of the section. Secondly, questions were raised regarding the significance of establishing the presence of black shales at the proposed drilling sites to the overall genesis of this black shale facies. Considerable interest was expressed on the question of understanding the origin of the drift sediments/contourites. By relocating one hole near the top of the drift sequence, their origin could be better evaluated without exacting a penalty on the black shale study.
The panel concluded that the **proposal falls within our mandate,** but that it has **some deficiencies.**

**SGPP Proposal Review Process**

A discussion on the effectiveness of the SGPP proposal review process was initiated by the chairman based on a concern that the increasing number of proposals and the quick turn-around requested of the panel had caused an unfocused and haphazard review process. It was decided that **the chairman would exercise greater oversight in the distribution and preparation-for-review of proposals.** Proposals ranked 1, 2, or 2A (little or no thematic interest) would not be discussed at the meetings but kept on file and be send to panel members upon request. All those ranked 3 or 4 (significant thematic interest) would be send to all panel members instead of the watch-dog team only to facilitate extended plenum discussion. It was further decided that grouping of proposals would aid in a better comparison and hence evaluation of the related topics, even though it might delay the panel's response time by having to wait until all proposals of a group are in. The chairman emphasized the need for thorough "home-work" by the panel members to better cope with the increased flow of proposals. It was decided to finalize the required "evaluation forms" of the ten proposals for the JOIDES Planning Office during the next scheduled meeting at Kiel, FRG.

**Additional panel members**

The panel needs additional expertise in three key areas. SGPP recommends to PCOM that in the area of seismic stratigraphy, **John Damuth or Steve Lewis** be added. We also look forward to the expertise by the Tectonics Panel liaison Graham Westbrook in this particular area. For crustal alteration expertise it was concluded that the Lithosphere Panel representative, Larry Cathles could help significantly. In the area of sedimentary mass balances, the panel recommends that PCOM nominate **Bill Hay** for SGPP membership either as an additional member or eventual rotational replacement of Bill Normark in 1990. In any case, an overlap of veteran and new members during the 1990 SGPP meetings would be desirable.

**Shipboard Radioactive and Stable Isotope Measurements**

The utility of shipboard based radioactive tracer experiments were discussed. Determination of **microbial turnover rates and use of radioactive tracers in packer tests for fluid flow** are of significant interest. A sub-committee was formed consisting of Shirley Dreiss, Jacques Boulegue and Henry Elderfield to prepare a document on the specifics of what topical studies would require the use of radioactivity on board ship. This report is to be presented at the next meeting.

**Publication Policy**

The panel discussed the need for thematic volumes and concluded that **special journal issues are an adequate and appropriate means for thematic publications** and that the panel structure need not push for an organized "Volume C".

**Meetings in 1990**

The September meeting is already set and approved. It was decided to hold the "Spring" meeting on **January 14, 15, and 16 in Santa Cruz,** CA, to be hosted by Shirley Dreiss. SGPP requests approval of this date by PCOM. The timing would allow panel members to coordinate

their travel with the ODP Geochemistry Workshop to be held on January 9-12 in Lake Arrowhead, CA.

### Sand Drilling

The importance of successfully drilling and recovering adequate core material in sandy sediments was stressed repeatedly during the meeting. The success of the Cascadia Accretionary Prism and Sedimented Ridge programs, both of the highest thematic priority to SGPP demand improvements in this area of technology. The panel stresses that the time penalty of one round-trip per core in order to recover sand (see TAMU Report above) is tolerable under certain circumstances. **Sand recovery is such a high priority that a TAMU engineer should be invited to the next meeting to discuss the issues directly with SGPP.** Erwin Suess should write directly to PCOM on the importance of sand drilling and request the attendance of an engineer. It was further decided to ask the Sedimented Ridge Crest DPG to write a letter on the importance of this technology to the success of their thematic objectives. Finally, a sub-committee consisting of Judith McKenzie, Bill Normark, and Erwin Suess was established to prepare for discussions with the TAMU engineering staff.

### Geochemical Reference Hole

The panel discussed the scientific and political implications of dropping a scheduled drilling leg, the Geochemical Reference Hole, from the 1990 schedule. SGPP wishes to express concern over the process through which it was removed, apparently without scheduled debate. From a thematic point of view, this panel is deeply concerned with the issue of crustal material balances. In this context the geochemical reference hole in the western Pacific represents only one site within a global framework. However, lacking a specific proposal with which to evaluate the science, we are not in a position of comment directly on the quality of the science which was lost; however, **geochemical reference holes as a concept must rank among the highest priorities of SGPP.**

### 1991 Drilling Schedule

In order to **clearly communicate this panel's thematic priorities for 1991-drilling,** a vote was taken after lengthy discussions on the programs from which PCOM will formulate the 1991 drilling schedule. The voting resulted in the following ranking:

1) Sedimented Ridge Crests
2) Cascadia Accretionary Prism
3) East Pacific Rise Bare Rock Drilling
4) Eastern Equatorial Pacific Neogene Transect
5) Lower Crust at Site 504B
6) Chile Triple Junction

The SGPP panel wishes to make clear that the **two top rated programs** (Sedimented Ridge Crest and Cascadia Accretionary Prism) were **far ahead of the remaining four.** All first and second place votes were cast for the two top rated programs and the numerical difference between these two was small.

### Pore Water Sampling

The SGPP panel, after discussing several requests related to pore water and gas chemistries, concluded that significant new scientific developments had taken place since first establishing the current sampling procedures that they are in need of revamping. This needed overhaul is not currently being addressed by the Shipboard Measurements Panel. SGPP will defer major discussion on this issue until the scheduled January meeting in 1990, which will benefit from the immediately preceding ODP Geochemistry Workshop. In the interim, we make the following recommendations:

**(1) Titanium squeezers should be constructed in order to allow pore water studies involving metallic elements.**

**(2) Routine squeezing of half round (50 $cm^3$) samples for interstitial water should be discontinued.**
A move on this latter procedure was requested by the ODP Science Operator at TAMU. Other issues such as centrifuging, using inert atmospheres during extraction, and teflon squeezers will be dealt with during the overhaul of the entire pore water procedure. It is clear, however, at this point that **no single** extraction process would satisfy all special needs.
A sub-committee on pore water extraction (including gases) was established with Phillip Froelich and Fred Prahl as members.

## Close of meeting

The chairman thanked members and liaisons for their contributions; in particular **Flip Froelich** for hosting this meeting and arranging an **effective word-processing capability** without which the white paper would not have advanced as much as it did. The chairman also thanked the Lamont Borehole Group for a tour of the facility and a **sumptuous lunch** provided during this visit. The meeting closed Thursday, 20 July, at 6 p.m.

Kiel, 2 August 1989
Erwin Suess