Comments on Proposed Natural Gas Development Regulations for the Delaware River Basin

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Introduction

This document provides comments on the proposed natural gas development regulations of the Delaware River Basin Commission (DRBC). These comments are prepared as a public service, not on behalf of any client. They reflect the decades of practical experience in all aspects of the regulatory process by Schmid & Company staff working for development interests, for conservation groups, and for regulatory agencies for the protection of environmental resources throughout the Delaware River basin. That experience includes providing extended comments on many proposed environmental regulations at the federal, state, regional, and local level, as well as preparing the paperwork to comply with such regulations.

As recognized by the DRBC, natural gas development represents a major economic enterprise that will affect large areas of the basin for many decades. Unless carefully controlled, such development will bring one more tidal wave of severe devastation to the waters and other natural resources of the region. The environmental effects of that devastation will persist long after any hoped-for economic stimulus has ceased. Thus it is essential that DRBC exercise its full powers to protect those resources for the benefit of current and future residents of the basin, as well as to protect those project sponsors that elect to comply with the regulations from competitors who prefer to cut corners. Were there a strong regulatory presence at the state or local level within the basin, there might be less need for DRBC efforts. But for the foreseeable future, DRBC must exert every effort and available authority to fill the current regulatory void, if there is to be any pittance of environmental protection from gas development in the Delaware River basin.

Schmid & Company strongly supports the efforts of DRBC to construct and promulgate the proposed regulations as Article 7 of its Part III-Basin Regulations. If fully implemented and enforced, they will represent a significant step forward. The following comments are intended to aid DRBC in clarifying and expanding the regulations in order more fully to achieve the stated purpose and objectives of the requirements. We hope that the regulations, upon adoption, will be fully and effectively utilized by DRBC and its associated agencies as the minimum level of environmental protection expected of all participants in natural gas development activities throughout the basin.

The following comments are organized to correspond with numbered sections of the proposed regulations as published by DRBC at http://www.state.nj.us/drbc/naturalgas.htm. We commend the DRBC for including many important provisions. We direct attention to sections whose provisions, as drafted, are not clear. And we recommend that DRBC fill several noticeable regulatory gaps.

Section 7.1 Purpose, Authority, Scope, Relationship to Other Requirements

Schmid & Company strongly supports the stated purposes of preventing damage to surface water and groundwater resources, of facilitating optimum planning for present and future human needs, of public disclosure of proposed industrial activity, and for promoting sound principles of watershed management. We urge DRBC to seize every opportunity to "link water quality and water quantity with the management of other resources" [7.1(e)(2)(i)] and to "avoid shifting of pollution from one medium to another or adversely impacting other locations; and push the boundaries of technological possibility while balancing economic constraints" [7.1(e)(2)(iv)]. May these be effective guiding principles, not mere pious rhetoric, as real projects come before the DRBC. DRBC should work on adding protection for air resources and human health, both of which are threatened by gas development, but neither of which get significant attention in the regulations as drafted. DRBC also should seek to expand its control over other potentially disastrous industrial operations, such as gasoline and fuel distribution, as well as other aggregations of toxic chemicals that pose similar threats to basin water quality.

In the interest of avoiding duplication, it may be reasonable to specify that compliance with state law is sufficient to comply with DRBC requirements, but only in those instances---if any exist---where the actual implementation of state law has been carefully scrutinized and found to be no less stringent than DRBC requirements. The proposed reliance solely upon Section 7.5 requirements to go beyond state requirements [7.1(i)] is likely to undermine the success of DRBC efforts. It is critically important that Section 7.5 specify broadly and precisely the requirements in 7.5 aimed at going beyond existing state requirements to achieve the purposes of 7.1. In Pennsylvania sections of the basin there are hardly any requirements for environmental protection from the known effects of natural gas development.

DRBC must be vigilant during its review of every project, because state "requirements" all too often sound protective on paper but actually achieve nothing because of agency neglect, lack of resources for implementation, intentional non-enforcement, or political intervention. At present it would not be possible for DRBC to reach its essential water quality objectives by relying upon state or local agencies in the basin. State and local controls on natural gas development do not exist.

Section 7.2 Definitions

Forested site. The definition as proposed is appropriate except for its last clause: "which will require the removal of 3 or more acres of tree canopy". We recommend removal of the arbitrary and unwarranted 3-acre threshold. The cumulative impact

of developing 2-acre or 1-acre or smaller tracts, interconnected by the necessary infrastructure, is no less than that of developing 3-acre and larger tracts. Small well pads are likely to attract less scruntiny than large pads, but pose no less potential for environmental damage.

Natural diversity inventory assessment. As proposed, this requirement is to be satisfied for Pennsylvania projects by a scan of the Pennsylvania Natural Diversity Inventory (PNDI) database. This definition is not clear and it is not protective of basin resources in Pennsylvania. The PNDI database contains scattered records of rare plants and animals that have accumulated by historic accident. Every project site at minimum must request a scan of that database for resources within 1 mile of all proposed site disturbances (well pads, access roads, pipelines, etc.). That is easily accomplished via the Internet. DRBC must specify that all original followup site investigations by qualified professionals deemed appropriate by the relevant resource agencies be completed, in addition to the mere database consultation records, as part of the sponsor's minimum assessment for inclusion with every application.

Natural gas development project. This definition is comprehensive and appropriate as proposed. DRBC is to be commended for it. Given the tendency for state regulations to be segmented among agencies and for permits to be administered under very narrow perspectives, it will be essential for DRBC to be sure that all proposed project activities in fact are evaluated comprehensively, as this definition and Section 7.1 of the regulations imply. This may prove difficult to achieve, at least at the outset, given the long-established practice among Pennsylvania state agencies of evaluating small parts of development projects in isolation from each other, exacerbated of course by precipitate haste to approval.

Special Protection Waters. The definition should be expanded specifically to include any Clean Water Act Tier 3 resources. In Pennsylvania these include EV or HQ Waters as determined by the PADEP per 25 *Pa. Code* Chapter 93.

Substantial funds. As proposed this definition is not clear. We suggest deleting the vague term "completion" and substituting "commercial gas production" instead.

Wastewater. In the third line "discharges" should be "discharged".

Wetlands. It would be prudent to cite in full the long-established federal definition of wetlands *verbatim*, rather than attempt to paraphrase it in this definition, which leaves out significant verbiage.

In Pennsylvania and New York, delineated wetlands typically are confirmed by formal, site-specific Jurisdictional Determination from the Army Corps of Engineers after field inspection. It is not clear that this agency is a "signatory party." The definition should be revised as appropriate to recognize the role of the Corps of Engineers in wetland delineation for regulatory purposes. Every

application for DRBC approval should be required to include a copy of the Corps JD for the project site including all disturbed areas, along with the underlying technical documentation on which the JD is based. Corps JD methodology relies upon updated scientific knowledge as applied to field conditions, rather than the inaccurate, not field-checked, and outdated wetland maps available for some areas from state agencies or from the US Department of the Interior.

If DRBC, like other agencies in the basin at present, merely lists wetlands as a resource to be protected, without requiring field delineation and JD review at every proposed site of land disturbance, the present non-protection of wetlands will continue. Better to remove any pretense of wetland protection from the regulations than to claim protection of these water resources without any means to identify them during review of proposed land disturbance.

Section 7.3 Administration

(a) Types of Natural Gas Development Projects. In the third line "require" should be "requires".

(g) Name Changes and Transfers. This section mentions a procedure for recording changes of ownership of water resources. It should be expanded to make clear that it applies equally to changes of ownership of natural gas resources in all projects that require any type of DRBC approval.

(k)(4) This section should make crystal clear that crude oil, natural gas, condensates, drilling mud, produced return water, and many hydrofracturing fluid chemical additives, among other items, are explicitly included as "hazardous substances, pollutants, or contaminants". Only "pollutants" are defined in 7.2, and its definition does not specifically enumerate these materials. The regulations should be revised as appropriate to clarify that hazardous substances and contaminants are regulated.

(k)(5) This section concerning financial assurances is not clear. If DRBC expects to need to aggregate funds from a project sponsor's wells from throughout the basin to pay for its necessary remedial activities, that implies that the project-specific assurances required from a sponsor are planned in advance by DRBC to be insufficient to finance well closure or response actions following accidents at any single well site. This is extraordinarily unwise public policy. Recent disasters at various wells have demonstrated that sufficient financial assurances must be instituted to form some incentive for sponsors to minimize damages and to avoid cost-cutting actions that pose unnecessary environmental risks. DRBC should not confine itself to such a feeble ability to secure compliance when dealing with among the largest and best funded of domestic and foreign corporations.

(k)(9) This section is not clear. It appears to conflict with the provisions of (k)(7)(iv) above. DRBC should clarify the interrelationship of these two sections.

(k)(12(vii) This section is unduly narrow and insufficiently protective in its scope. The section should be expanded to read "at least 60 days before the project sponsor commences any clearing or other site preparation activities at the well site or for any associated roads, pipelines, or other utilities that support a well site." At present there is no definition of site preparation specifically including site clearing. Natural gas project activities and resource damages are not confined to well sites and well pads.

(k)(13)(viii) This section is unduly narrow and insufficiently protective in its draft scope. The section should be expanded to read "at least 60 days before the project sponsor commences any clearing or other site preparation activities at the gas well site or for any associated roads, pipelines, or other utilities that support a well site." At present there is no definition of site preparation specifically including site clearing. Natural gas project activities and resource damages are not confined to gas well sites and well pads.

(k)(15)(ii) This section is unclear. At minimum, a threshold time frame should be supplied after "planned". Just because work has stopped for 1 year and is not planned to resume for another year, that is not sufficient reason to rescind 75% of the financial surety posted against future damages from a drilled well. If the sponsor is truly planning to keep the well shut-in for 10 years, then a procedure to reduce financial assurance might be considered upon demonstration of actual financial hardship by a sponsor. Yet the environmental threat from the fractured well remains indefinitely, and it is hard to imagine that any partial reduction in financial assurance would ever appear to be warranted unless the risk of damage were actually reduced. DRBC should consider this matter carefully.

(k)(17)(ii) Release of financial assurance is proposed after observations during two growing seasons indicate no significant hydrologic impact and no outstanding compliance issues remain after successful restoration of well sites and access roads. This regulation should specify that such determinations are to be made only by DRBC staff following site inspection, upon request and after presentation of site documentation by a project sponsor. Two growing seasons typically are not long enough monitoring for some hydrologic restoration activities, such as wetland restoration, which normally entail 5 years minimum of post-restoration monitoring and reporting. DRBC should consider carefully whether financial release is warranted after only two growing seasons.

More important than protecting against soil erosion, however, is what DRBC should do to protect against long-term damage from the "hazardous substances, pollutants, and contaminants" that may be buried in "restored" well pads. The sites of buried drilling mud, return water residue, and other substances pose long-term hazards. These are numerous, small, hazardous-waste landfills that

typically are ignored by state and local regulations. Yet they may contain radioactive or other toxic wastes that in time may leach into soils and water supplies. At minimum, DRBC should require disclosure of all "hazardous substances, pollutants, and/or contaminants" buried in any well pad and maintain permanent records of all such substances.

(l)(6) The last clause in this section is not warranted and should be excised. There is no reason whatever that DRBC "may condition the approval on the payment of fees." This implies that DRBC expects payment of application filing fees only upon issuance of an approval and need not be paid at all if it denies an application. Instead, DRBC should not expend any public funds or undertake any project review prior to the receipt of all applicable fees for that project, as well as all outstanding fees from any other project of the same sponsor, if such exist within the basin. Natural gas development project sponsors are among the largest and wealthiest of domestic and foreign corporations. If a sponsor cannot afford to pay its application fees timely, how can DRBC expect it to be able to provide the necessary financial resources to remediate damages when disaster strikes? This defies common sense and unnecessarily endangers the environment and the public throughout the basin.

(l)(8) and (9) These sections are not clear. If additional well pads or wells are added to an existing approved project, additional financial surety must be required. These sections should specify clearly that additional development must be accompanied by appropriate additional surety.

Table 7.3.1 Natural Gas Development Project Fees and Charges
Several provisions of the proposed fee schedule appear unwarranted and require change or further justification. (a) and (h): The standard fee "box" should make clear that the minimum fee of $500 for public projects or $1,000 for private projects is triggered only when the normal by-formula review fee for such projects falls below the stated minimum. (e): The review cost of $10 per acre up to 5,000 acres and reduced acreage fee above 7,500 acres appears to be low. Is it expected to cover the DRBC staff expenses, or does it represent yet another subsidy to the oil and gas industry at the public's expense? (n): The DRBC consumptive use charge for fresh water proposed (8¢ per 1,000 gallons; $80 per million gallons) appears very low. Not only does it suggest a subsidy to the oil and gas industry at the public's expense, but it offers no incentive to minimize consumptive use of fresh water. The proposed charges should be reviewed with the objective of raising them on behalf of the public and providing a strong incentive to project sponsors for reduced consumptive use of fresh water. To that end, it would be appropriate to apply a much reduced consumptive use charge for any "produced" or otherwise polluted water actually reused in gas wells. Industrial reuse of degraded water potentially can help reduce both withdrawal of fresh water from surface and in-ground sources and the volume of wastewater requiring treatment. DRBC should offer a significant financial incentive for project sponsors to do this.

Section 7.4 Water Sources

(b)(2) The determination that existing DRBC environmental regulations "do not adequately protect the water resources of the basin from the effects of natural gas development" is an understated but welcome recognition of conditions in the real world. It applies, of course, equally to the at-best minimal existing environmental regulations and their widespread non-enforcement at the state and local level throughout the basin. The decision to set new thresholds requiring approval for all water used for natural gas development projects is warranted and commendable. DRBC is to be congratulated for this acknowledgment. Now it needs to implement diligently its proposed review.

(d)(1)(vi) The required demonstration "that removal of one hundred percent of the water proposed for uses related to natural gas development will not adversely affect streamflow..." is appropriate and commendable. DRBC is to be congratulated for this acknowledgment. Now it needs to implement diligently its proposed review and to specify precisely the methodology to be utilized.

(d)(1)(vii)(B) The end of this section needs to be expanded as follows: "of a gas well pad site or sites and any associated road, pipeline, or other utilities."

(d)(1)(viii) The provision that water withdrawn for natural gas development must be conveyed directly to storage tanks prior to being transferred to vehicles or pipelines is reasonable and appropriate. If diligently enforced, it should help reduce the current practice whereby trucks pull up at streams and dewater them willy-nilly with no oversight or resource protection.

It is not clear why water records are to be kept for 10 years <u>at the withdrawal site</u>. This provision would seem to serve no public purpose but could impose a burdensome requirement on project sponsors. Instead, records should be kept by the project sponsor. The full set of all water withdrawal and transfer tracking records should be supplied in electronic format to DRBC. These records should be supplied routinely in every case, not merely for some projects upon the specific request of the Executive Director.

In the third line from the end of this section "provides" should be "provide".

(d)(1)(ix) This section should be combined with the preceding section (viii). The limitation of reporting to monthly totals is inconsistent with (e)(2)(iv) below.

(d)(2)(v) This text appears to be incorrectly copied from (1)(vii) on page 38 of the draft regulations without the appropriate revisions for (2)(v). This section refers to "discharges", but there are references to bulk water sale agreements and to purchasers of water. The language should be revised as warranted.

(d)(2)(vi) Similar confusion continues to apply to "water sold". Are there many instances of natural gas wastewater being sold to treatment plants in the basin? I would have thought a project sponsor typically would be paying for wastewater treatment. As in (d)(1)(viii), the full set of all water withdrawal and transfer tracking records should be supplied in electronic format to DRBC. These records should be supplied routinely in every case, not merely for some projects at the specific request of the Executive Director.

(e)(1)(i) In line 1, "water" should be moved from the end of the line to a location between "surface" and "or".

(e)(2)(ii) As proposed, this requirement apparently is to be satisfied for Pennsylvania projects by the database scan of the Pennsylvania Natural Diversity Inventory (PNDI) database. This is not protective of basin resources in Pennsylvania. The PNDI database contains scattered records of rare plants and animals that have accumulated by historic accident.

Every project site at minimum must request a scan of the database for resources within 1 mile of all proposed site disturbances (well pads, access roads, pipelines, etc.). That is easily accomplished via the Internet. DRBC must specify that any and all original followup site investigations by qualified professionals deemed appropriate by the relevant resource agencies be completed, in addition to the database records, as part of the sponsor's minimum assessment for inclusion with every application.

The provision for DRBC to prepare a separate assessment at the expense of the project sponsor is appropriate, but may entail considerable delay during the review of an application. Many rare species of plants and animals can be located and identified only during precise field seasons. It would be much more effective to require project sponsors routinely to have qualified professionals inspect their areas of proposed disturbance for rare species as part of every project's planning and permit's preparation, before any paperwork reaches DRBC. Additional site investigation by DRBC for rare species may occasionally be warranted, but should not be normal procedure. It would not benefit either resource protection or efficient project planning by sponsors to delay site inventory until after an application has been completed and filed.

(e)(2)(iii) The provision that water withdrawn for natural gas development must be conveyed directly to storage tanks prior to being transferred to vehicles or pipelines is reasonable and appropriate. If diligently enforced, it should help eliminate the current practice whereby trucks pull up at streams and dewater them willy-nilly with no oversight or resource protection.

It is not clear why water records are to be kept for 10 years <u>at the withdrawal site</u>. This provision would seem to serve no public purpose but could impose a burdensome requirement on project sponsors. The full set of all water

withdrawal and transfer tracking records should be supplied in electronic format to DRBC. These records should be supplied routinely in every case, not merely for some projects at the specific request of the Executive Director.

(e)(2)(ix) This section must be expanded by adding to the end: "fluid, or road or pipeline or other utility construction."

(e)(4(i) This section requires clarification. "The Final Hydrogeologic Report must include ... nearby perennial streams, wetlands and other sensitive hydrologic features." The term "nearby" is not defined. DRBC should specify a minimum radius for inventory of sensitive hydrologic features, so that both the affected public and the project sponsor can understand what is being required.

(e)(4)(i)(G) The term "if available" should be deleted. If DRBC thinks it must adopt an escape, then it should be worded "to the maximum extent practicable". To the list of required map information should be added "contours of existing near-surface cones of depression within 0.5 mile." "Near-surface" in this context means 10 feet or shallower. Existing cones of depression are particularly likely to experience contamination by gas development and may already threaten the survival of wetlands.

(e)(4)(ii) In the last line on p. 48 of the draft regulations "user" should be "use". It is not likely that DRBC wants adversely affected water users replaced by project sponsors, but if so, the circumstances should be explained fully. We hope that DRBC is not seeking to have affected water users "liquidated".

Section 7.5 Well Pads

(b) The end of the first sentence should be expanded to read: "well pad site or associated road, pipeline, or other utility."

(b)(3)(i) 25 *Pennsylvania Code* Chapter 105 regulations define minimum floodways along all streams <u>not</u> delineated by the Federal Emergency Management Agency or other regulatory bodies as extending outward 50 feet from the stream channel. New York State has similar regulations. It is not clear whether DRBC recognizes such areas as floodplains. It should do so explicitly.

(b)(4)(i) The 500-foot setback for ordinary waterbodies (as defined in 7.2) is appropriate and commendable. The proposed regulations, however, make no provision for enforcing this requirement. Every applicant should be required to delineate and secure a Corps Jurisdictional Determination for every waterbody potentially affected by a well pad, gas well, or associated road, pipeline, or other utility. DRBC also should make clear that all additional waterbodies regulated by signatory states (such as "isolated" wetlands) also are to be protected by this setback. Corps Jurisdictional Determinations typically identify all potentially

regulated waters; to confirm lack of federal jurisdiction requires additional investigation. At present Pennsylvania claims to have buffer requirements around some water resources, but an automatic "waiver" from the requirement is available for the asking. DRBC must be careful to avoid such cosmetic but worthless provisions in its regulations, working instead to close such regulatory gaps.

The proposed 500-foot setback from ordinary wetlands and water bodies, however, may not prove sufficient for all wetlands and water bodies. For those wetlands or other water bodies that are Clean Water Act Tier 3 resources (designated in Pennsylvania as Special Protection waters, either EV or HQ per 25 *Pa. Code* Chapter 93), or if the wetlands are exceptional value wetlands (per 25 *Pa. Code* Chapter 105), then the setbacks should be much larger to provide the necessary protection. We suggest the setbacks be 1,500 feet for such waters. Similarly, the setbacks for "Surface water supply intakes" and for "water supply reservoirs" should be 1,500 feet (not 500 feet as currently proposed). If some provision is needed for reducing these setbacks, then a specific procedure should be created with specific standards that must be met in order to receive a variance after special scrutiny by DRBC staff, accompanied by increased monitoring throughout the course of natural gas development. Even so, the drilling of natural gas wells will pose a permanent threat to these resources. Wells should be kept away from them except under extraordinary circumstances.

(b)(4)(ii) This section is unnecessary, inasmuch as wetlands already are included in (i) above by the definition in 7.2, but its redundancy is consistent with (vi) and (vii) below. Sections ii, vi, and vii appear to be harmless as written.

(b)(4)(9)(i) The same concerns about undelineated floodways and floodplains apply here as in (b)(3)(i) above. The final regulations should address these issues, putting project sponsors on notice that undelineated floodways and floodplains are protected just like Federal Emergency Management Agency-mapped features (or else notifying the public that DRBC plans to ignore undelineated floodways).

(b)(4)(9)(iii) Notice of requested variances also should be given routinely to adjacent surface property owners, or at least to adjacent downslope and downstream property owners who are the most likely to be impacted adversely.

(c)(1) In the paragraph beginning "Entire basin leaseholds", "includes" should be "include". In line 5 of the paragraph beginning "A project sponsor may also make" the word "gas" should be inserted between "natural" and "pad".

(c)(3)(ii)(D) As specified by the proposed regulations, the required Hydrology Map will not protect water resources in the basin. USGS 7.5-minute topographic quadrangles omit many permanent and most intermittent streams in headwaters throughout the basin. DRBC must mandate that onsite stream delineation be completed wherever site disturbance is proposed for well pads, gas wells, roads,

pipelines, or other utilities that support the gas development. Such work should begin with computer processing of the most recent LiDAR orthophotos available online to determine candidate streams. Then in-field delineation should flag the actual banks of watercourses and water bodies suggested by Digital Elevation Models, including all adjacent and isolated wetlands, and JD confirmation of their location from the Army Corps of Engineers should be obtained. This section should be rewritten to include such requirements for every application. Water resources can be protected only if they have been identified in advance of planning for natural gas development on any land proposed for disturbance.

National Wetland Inventory (NWI) maps of wetlands were never designed for regulatory purposes and have no relevance to the DRBC project review process. NWI maps are inaccurate, not field-checked, and outdated. They should under no circumstances be accepted by DRBC as sufficient for development project site mapping, although DRBC staff always should check to see that any wetlands shown by NWI mapping have been addressed on each project site. Likewise, state wetland maps may be outdated, incomplete, and inaccurate. Onsite stream and wetland delineation mapping should routinely be done at every project site where land disturbance is proposed, and should routinely be subject to an Army Corps of Engineers Jurisdictional Determination. Both the JD letter and all supporting documentation should be included with each application to DRBC. This section should be rewritten to include such requirements. Nothing less will provide any protection to basin wetlands.

(c)(3)(ii)(F) This section should be rewritten to require that all hydric soil map units and known hydric-inclusion map units within 0.5 mile of any planned disturbance should be highlighted on the required map. While not definitive, hydric soil and inclusions map units on county soil surveys often are the best available clues to nearby wetlands that may be affected by gas development. Preparation of such maps is now simple, given the availability of electronic mapping online, and should routinely constitute preparation for onsite field investigation and delineation wherever land disturbance is proposed.

(d) As proposed, the requirement in the second paragraph apparently can be satisfied for Pennsylvania projects by an electronic scan of the Pennsylvania Natural Diversity Inventory (PNDI) database. This is not sufficiently protective of basin resources in Pennsylvania. The PNDI database contains scattered records of rare plants and animals that have accumulated by historic accident. It is not even systematically updated as a byproduct of the PADEP permit process, alas.

For every project site at minimum the sponsor must request a scan of the state database for rare biological resources within 1 mile of all proposed site disturbances (well pads, access roads, pipelines, etc.). That is easily accomplished via the Internet. DRBC must specify that all original followup site investigations by qualified professionals deemed appropriate by the relevant resource agencies be completed, in addition and supplemental to the database

record search, as part of the sponsor's minimum assessment for inclusion with every application.

The provision for DRBC to prepare a separate assessment at the expense of the project sponsor is appropriate, but may entail considerable delay during the review of an application. It would be much more effective to require project sponsors routinely to have qualified professionals inspect their areas of proposed disturbance for rare species as part of every project's planning and every permit application's preparation. Additional site investigation directed by DRBC for rare species may occasionally be warranted, but should not be normal procedure. It would not benefit either resource protection or efficient project planning by sponsors to wait until DRBC review is underway to begin site investigation for rare species.

(e)(5) We note that watersheds draining to New York City reservoirs are not eligible for Approvals by Rule. The watersheds draining merely to the water supply of Philadelphia and other cities do not receive such protection. That is unfortunate and suggests that DRBC views only New York City water supplies as warranting first-class protection. DRBC should inform the public why approvals by rule are allowed for the Philadelphia watershed but not for New York watersheds. It is not clear wly approval by rule could be deemed sufficient protection of water resources for citizens of other municipalities but not for New Yorkers?

(h)(1)(iii)(C) The full set of all water withdrawal and transfer tracking records should be supplied in electronic format to DRBC. These records should be supplied routinely in every case, not merely for some projects at the specific request of the Executive Director.

(h)(1)(iii)(E) This section proposes to exempt exploratory and low-volume hydraulically fractured wells entirely from the minimal consumptive use charges for water used for other natural gas development in Table 7.3.1. This is an unwarranted and environmentally damaging subsidy to the oil and gas industry at the expense of the public. This exemption should be eliminated, and the DRBC charge for water use should be raised sufficiently to discourage fresh water use for gas well development.

(h)(1)(iii)(F) This section proposes to exempt exploratory and low-volume hydraulically fractured wells entirely from the continuous water conservation program required of other gas wells. This is an unwarranted and environmentally damaging subsidy to the oil and gas industry at the expense of the public. The exemption in the last sentence should be deleted entirely.

(h)(1)(iv)(A)(4) The prohibition on applying production water and brine to roads or other surfaces with the basin is appropriate and commendable. This prohibition also should be extended to drilling muds and cuttings, which typically contain radioactive isotopes, salts, and other contaminants.

(h)(1)(iv)(B) The full set of all water withdrawal and transfer tracking records for development of every gas well should be supplied in electronic format to DRBC. These records should be supplied routinely in every case, not merely for some projects at the specific request of the Executive Director.

(h)(1)(iv)(C)(2) This section says that the results of water samples are to be reported. Are any such samples required? If so, what is to be sampled, how, and how often? To what standards are the results to be compared? This should be clarified. DRBC may want to reserve the right to adjust sampling to fit conditions at a specific project site; but it should at least provide an example of the kind of sampling it would anticipate requesting on a routine basis. Otherwise, both the public and project sponsors are left wondering what is being required.

(h)(1)(vi)(A) There is no definition of a "threatened release to the environment of any substance". Yet these must be reported immediately to DRBC. As written this makes no sense and seems to be unenforceable. What does DRBC want each project sponsor to do? Absent some specific guidance, such provisions appear to be meaningless filler.

(h)(1)(vi)(C) In line 4 "user" presumably should be "use". It is not likely that DRBC wants adversely affected water users replaced by project sponsors, but if so, the circumstances should be explained fully. We hope that DRBC is not seeking to have affected water users "liquidated".

(h)(2)(i)(A)(2) The last sentence says that monitoring will be required by DRBC. It would be helpful to the public, as well as to any project sponsor, to have some idea of what DRBC may want to see in routine monitoring data---at least a typical sample of parameters, methods, frequencies, and pollutant limitations---even though the precise details may be adjusted for particular sites. From the general language here it is impossible to tell what DRBC might deem appropriate, whether it is superficial or exhaustive, cosmetic or environmentally protective.

(h)(2)(i)(B) DRBC should advise the public and project sponsors what frequency of surface water monitoring it expects to require after all wells at a pad site have been plugged and sealed. Apparently this monitoring is to be performed less often than annually. Past experience suggests that seals will continue to fail in the future, perhaps unpredictably, especially at deep gas wells tapping the Marcellus and other Devonian shale formations. It seems very prudent to require ongoing monitoring for many years. DRBC should divulge what level of monitoring it expects to impose after well closure, so that adequate financial provision can be made to insure that the monitoring is done and reported timely, whatever happens over time to the project sponsor. Absent some specific guidance, such provisions appear to be meaningless filler.

(h)(2)(ii)(D) At approximately this location in the regulations DRBC must add a new section requiring that each project sponsor preserve one or more representative samples of return water from each gas well. Splits of each sample must be provided to, cataloged by, and permanently preserved by DRBC and by each project sponsor. DRBC with the assistance of USEPA and other agencies should oversee development of analytical protocols specifically targeted for evaluating drinking water potentially affected by fracking fluids. Then when the inevitable instances of contamination arise, the samples will provide a rational basis for linking the pollution source to or dissociating the hydrofracking fluid from specific domestic wells. Fracking fluids are complex mixtures of organic and inorganic compounds. Both university and commercial analytical chemistry laboratories are capable of detailed analyses of suites of chemical contaminants in extremely low concentrations at relatively low cost. Those analyses can provide distinctive "fingerprints" of contaminants. But nothing can be done if samples are not collected and preserved properly for every well.

(h)(2)(ii)(F) This section says that monitoring will be required by DRBC. It would be helpful to the public, as well as to any project sponsor, to have some idea of what DRBC may want to see in monitoring data---at least a typical sample of parameters, methods, frequencies, and pollutant limitations---even though the precise details may be adjusted for particular sites. From the general language here it is impossible to tell what DRBC might deem appropriate, whether it is superficial or exhaustive, cosmetic or environmentally protective. Is this sampling expected to be essentially the same for all wells, or are significant differences expected in the requirements for different wells?

(h)(2)(ii)(G) The required storage of all flowback water in watertight tanks for temporary storage is appropriate and commendable. Some gas companies already advertise that they put all of their flowback water in tanks, so this is hardly a burdensome requirement.

This section should be expanded expressly to prohibit the storage of flowback water in open pits for evaporation and to prohibit evaporative sprayers associated with such pits, which can spread contaminants widely. Lacking such explicit prohibition, such features may be introduced into the basin, because they are used elsewhere by cost-cutting project sponsors.

(h)(2)(iv)(A) This section should be expanded expressly to prohibit the storage of flowback water in open pits for evaporation and to prohibit evaporative sprayers associated with such pits. Lacking such explicit prohibition, such features may be introduced into the basin, because they are used elsewhere by cost-cutting project sponsors.

(h)(2)(iv)(B)(4) This section should be expanded expressly to prohibit the storage of flowback water in open pits for evaporation and to prohibit evaporative sprayers associated with such pits. Lacking such explicit prohibition, such

features may be introduced into the basin, because they are used elsewhere by cost-cutting project sponsors.

Section 7.6 Wastewater

(e)(1)(ii)(B) The first line of this section is not clear. The word "a" seems unlikely. Should it be "any" instead? Or should this phrase read "any threatened or endangered species"? DRBC needs to rewrite the first sentence of this section to express clearly what it intends.

(e)(1)(iii) This section is not clear. Apparently it provides an overall toxicity limit for pollutants in the mixing zones addressed in (e)(1)(ii)(A), but DRBC should say explicitly to what this section applies.

(g) The first sentence of this section is unclear. What are "conservative substances" that basin waters have limited capacity to accept and assimilate? "Conservative" should be defined here and/or in 7.2.

(h) This section appears to authorize the unrestricted underground injection of domestic sewage wastes. Is that the intent of DRBC, or is additional language needed to clarify what this section allows?

Additional Comments

Several general comments are needed in addition to the above comments on specific sections of the draft regulations.

Provided that it continues its current moratorium on natural gas development in the basin, DRBC should not be in a rush to implement its draft regulations. The US Environmental Protection Agency currently is engaged in a major analysis of impacts from natural gas development. DRBC might learn from the EPA findings and need to revise its regulations accordingly.

There is no mention of enforcement in these draft regulations. Given the general lack of enforcement of the minimal existing regulations that apply to natural gas development in Pennsylvania, enforcement should receive major attention in the DRBC regulations. Otherwise, the damages now ongoing at a rapid rate in the other sections of Pennsylvania will be extended into the Delaware River basin. Energy producers pay Pennsylvania politicians well to minimize environmental regulation and enforcement. Perhaps DRBC can begin to shift the balance within the basin to favor resource protection benefiting current and future generations and public resources when natural gas development occurs.

Careful consideration must be given to fines for violations of DRBC natural gas development regulations. If typical minimal fines are assessed as at present by states such as Pennsylvania, these will continue to be incorporated as normal costs of doing business, much cheaper than actual compliance with requirements. Conscientious project sponsors willing to comply with and fund environmentally protective measures will continue to suffer from the economic benefits enjoyed by cost-cutting competitors who know that state environmental enforcement is unlikely, and even if undertaken, has negligible costs.

The draft DRBC regulations say virtually nothing about protecting air quality. Air pollutants from natural gas development and transport seriously compromise human health as well as contribute to global warming. DRBC should incorporate appropriate protective measures for air quality protection prior to completing its natural gas regulations.

DRBC should consider how it might extend its regulation of domestic water supply wells throughout the basin. In Pennsylvania there is no regulation of such wells, which all too often are contaminated by improper siting and inadequate casing. Gas development is generating a major quantity of new monitoring data on domestic well water quality and quantity. DRBC has not established a process for collecting all such data into a comprehensive database. The opportunity now exists for supporting a database through cooperating institutions. At minimum, DRBC participation in making monitoring data widely available will aid the better understanding of water quality throughout the basin.

Finally, the public and the environment are going to be significantly damaged by natural gas development, even if DRBC does its best to promulgate, implement, and enforce strong regulations. In return for the privilege of damaging the human environment, project sponsors should be required to install renewable energy sources on each well pad that they carve from basin forests. DRBC should establish a minimum quantity of solar panels that must be installed at each well pad. Likewise, large wind collectors must be installed at every well pad where their installation makes sense in the context of wind resources and surrounding land uses. These renewable energy sources must be tied into the electric grid. They not only will provide energy to run natural gas production equipment but also will provide a source of income to project sponsors long after the natural gas itself is exhausted. Project sponsors expect immense financial returns immediately from their natural gas wells, with both production and financial returns tapering off over time. Sponsors should be directed to invest a minor part of that income in constructing renewable energy facilities, benefiting both their stockholders and the public at large over the longer term.

Conclusion

In sum, DRBC has done a praiseworthy job of drafting regulations, but should not rush them into place prior to making necessary improvements to the draft requirements and all requisite preparations for implementing them fully. Adoption of these regulations, particularly after revision to incorporate the changes recommended above and others that become apparent as a result of current USEPA research and via the public review process will make DRBC regulations the state-of-the-art for natural gas development in the United States. Diligent and consistent implementation and enforcement of these regulations will go far toward protecting basin resources from the inevitable severe damages that otherwise will occur. Only then will some of the environmental resources of the basin be preserved for future generations.