Developing Land Use Projections and Alternative Scenarios for the Phase V Model:
Briefing Paper for the Water Quality Steering Committee Meeting on December 19, 2006

PURPOSE:

This briefing paper is to inform the Water Quality Steering Committee on the overall draft timeline proposed by LGSS for the developing land use projections and alternative scenarios for the Phase V Model. Specifically this paper identifies the timeline elements pertaining to the:

- Roles/responsibilities of, and points of coordination among, the various Subcommittees involved;
- Decisions required from the respective Subcommittees/workgroups
- How alternative future scenarios would be developed and approved.

BACKGROUND:

At the September 2005 Reevaluation Workshop, Ted Graham, Land, Growth and Stewardship Subcommittee chair, gave a presentation regarding the implications of continued population growth and development on meeting and maintaining nutrient load limits.

The Reevaluation Workshop partners agreed on the need for projecting future land uses, animal populations and point source loads beyond 2010 out to 2030, including intermediate projections between base year and 2030. LGSS was assigned the lead responsibility for carrying out this work, working closely with the Nutrient and Modeling Subcommittees as well as the Local Government Advisory Committee.

To kick off this effort, LGSS will host a worksession on February 7, 2006 with the following objectives:

- Provide background on tools to develop land use, ag animal units and point source flow projections and alternative future scenarios (Urban growth models and Phase V model) and set the stage for the STAC Review of the urban growth models in March 2006;
- Discuss the input to the urban growth models (such as impervious cover, population and employment forecasts);
- Begin discussion on the alternative future scenarios to be analyzed; and,
- Agree to roles and responsibilities to develop projections of urban, agricultural and forest land uses, point source flows and agriculture animal units, and alternative future scenarios as outlined in the draft timeline.

ROLES AND RESPONSIBILITIES OF VARIOUS SUBCOMMITTEES:

Although the LGSS was assigned as the Lead Subcommittee, this effort will require a high degree of partnership among subcommittees, workgroups, and advisory committees. LGSS intends to recommend this draft timeline to all partners involved at the February 7, 2006 worksession. Carin Bisland (EPA CBPO Associate Director for Ecosystem Cluster) and Ted Graham (LGSS chair) coordinator) will oversee this whole effort. In addition, Menchu Martinez (LGSS coordinator) will handle the day-to-day coordination and management.

The attached draft timeline indicates four major activities/milestones in this effort to understand when land use changes due to continuing growth could undermine the progress we are making in restoring the Bay's water quality. The major milestones include:

- Development of projections to 2030 in five year increments for land (urban, agriculture, forest) use, agricultural animal unit populations, and point source flows;
- Integration of the projections to ensure that projections dovetail with each other;
- Development of alternative future scenarios for urban lands, point sources, forest lands, agricultural lands and agricultural animal populations;
- Phase V Model Runs using projections and alternative scenarios.

Below would be the roles and responsibilities of various Subcommittees and points of coordination under each major milestone.

I. Development of projections to 2030 in five-year increments for land (urban, agriculture, forest) use, agricultural animal unit populations, and point source flows.

To keep to the draft timeline, the following activities would need to occur simultaneously and be completed by June 30, 2006 by the respective responsible subcommittees (see below).

Nutrient Subcommittee:

The Nutrient Subcommittee would be responsible for developing forecasts for agriculture animal units and agricultural land acreages on which to apply manure, forecasts for forest lands, and forecasts for point source outflows.

Activities	Technical CBPO Staff lead	Decision Required	Responsible SC or WG (or SC/WG Review required)	By When
• Generate animal unit population projections through 2030 • Generate assumptions for alternative futures • Generate agricultural land projections through 2030 • Generate assumptions for alternative futures	Rob Burgholzer	• Approval of animal unit projections & assumptions • Approval of ag land projections & assumptions	Tributary Strategy WG	June 30, 2006
• Generate forest land projections through 2030 • Generate assumptions for alternative futures	Sally Claggett	• Approval of forest projections & assumptions	Forestry WG	June 30, 2006
• Generate point source outflow projections through 2030 and generate assumptions for alternative futures • Reconcile the point source projections with urban growth projections developed by LGSS	Ning Zhou	• Approval of point source flow & assumptions	Point Source WG	June 30, 2006

Land Growth and Stewardship Subcommittee (LGSS):

The LGSS would be responsible for developing urban growth projections using two new growth simulation tools developed and peer reviewed for the Chesapeake Bay watershed by early next year. These models are GAMe and SLEUTH.

Activities	Technical CBPO Staff lead	Decision Required	Responsible SC or WG (or SC/WG Review required)	By When
• Obtain STAC Peer Review of GAMe and SLEUTH urban growth models	Peter Claggett/Menchu Martinez	• Address results of the STAC Peer Review	LGSS	March, 2006
• GAMe trend projections finalized for Phase 5 model area; • SLEUTH trend projections finalized for CB watershed only • Assess utility and cost of loosely coupling GAMe and SLEUTH • Generate urban land projections through 2030 and generate assumptions for alternative future scenarios • Reconcile point source outflow projections through 2030 with urban growth projections and generate assumptions for alternative futures	Peter Claggett/Menchu Martinez	• Approval of urban trend projections & assumptions • Decide whether to couple SLEUTH & GAMe projections	LGSS	June 30, 2006

II. Integration of projections to ensure that projections dovetail with each other.

This is the beginning of major points of coordination between LGSS and NSC. All the projections which were developed separately and simultaneously, would now need to be reconciled to ensure that we are not overestimating or underestimating projections in any particular county. The integration of the projections would start in July 2006, with forecasts approved by September 2006.

Activities	Technical CBPO Staff lead	Decision Required	Responsible SC or WG (or SC/WG Review required)	By When
• Generate maps showing all projections to determine counties where growth is underestimated or overestimated	Peter Claggett		N/A	July 14, 2006
• Work session to review coupling of projections (ag, forest, urban, etc.)			NSC (TSWG, FWG, AWG); LGSS (LATT)	July 17, 2006
• Review, revise and approval of initial forecasts of agriculture, urban and forest land use trends.		• Approval of initial forecasts of ag, urban & forest land use trends	LGSS and NSC	Sept 18, 2006

III. Development of alternative future scenarios for urban lands, point sources, forest lands, agricultural lands and agricultural animal populations.

Once initial forecasts of agriculture, forest and urban trends are developed, alternative future scenarios would need to be developed with LGSS and NSC working closely together. For example, the alternative future scenarios could be developed based on:

- Trends (essentially the initial forecasts);
- Accomplishment of current Tributary Strategy objectives; and,
- Additional policies beyond those outlined in the current Tributary Strategies ("what if" scenario if new policies are put in place).

The state partners would play a critical role in determining what assumptions or policies (that would affect distribution of ag, forest and urban lands, and ag animal populations) should comprise the "what if" scenarios.

After the alternative future scenarios have been approved by the state partners and reviewed by STAC and LGAC, the corresponding nutrient source inputs of the alternative future scenarios would need to be developed for the Phase V Model.

Activities	Technical CBPO Staff lead	Decision Required	Responsible SC or WG (or SC/WG Review required)	By When
• Generate alternative future scenarios for each following sector based on various policies: urban lands, point sources, animal units, agricultural lands, and forest lands	Menchu Martinez & Peter Claggett; Rob Burgholzer; Sally Claggett	Approval of scenarios for each sector	LGSS, NSC (TSWG, FWG)	Oct 31, 2006
• Combine scenarios for all sectors and distill to 3-5 overall alternative futures scenarios			LGSS, NSC (TSWG, FWG)	Dec. 15, 2006
• STAC Peer Review of 3-5 alternative future scenarios			STAC	March 2007
• Seek LGAC review of assumptions used in scenarios			LGSS, NSC	June 2007
• Review, revise and approval of 3-5 alternative futures scenarios		Approval of 3-5 alternative scenarios	LGSS and NSC	September 2007
• Finalize nutrient source inputs for Phase 5 model runs of alternative future scenarios -- water diversions, point source outflows, crop types, manure loads, agricultural fertilizer use, biosolid loads, urban fertilizer use, impervious cover, pervious cover, population on septic, population on sewer, etc.	Peter Claggett, Rob Burgholzer, Ning Zhou	Approval of nutrient source inputs	LGSS, NSC	December 2007

IV. Phase V model runs of revised 2010 projections and 2030 alternative future scenarios.

The Phase V model would be run for the revised 2010 projections and for the alternative scenarios to 2030, beginning January 2008. The key player in this step is the Modeling Subcommittee.

V. Role of STAC and LGAC:

STAC: The Science and Technical Advisory Committee will provide a peer review role for this project. Specifically STAC review would be sought for the following:

- Review of the urban growth models by June 2006;
- Review of preferred alternative future scenarios by June 2007.

LGAC : The Local Government Advisory Committee will be instrumental in:

- Reviewing the urban growth projections;
- Reviewing the various assumptions in the development of the alternative future scenarios.

See attached draft timeline.

Lead contacts: Carin Bisland, EPA Associate Director
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