ISSUE PAPER

Effective Flood Plain Encroachment Compensation

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One of the most common yet complex issues dealt with in an Environmental Resource Permit (ERP) application involves flood plains. Not only are questions frequently raised when the pre-development flood plain limits are first delineated, but also when the associated compensation for development impacts is proposed. **This article will briefly consider some of the more common ways flood plain encroachment compensation is proposed in the Southwest Florida Water Management District.** Importantly, recent decisions by Administrative Law Courts have linked ineffective flood plain compensation to the issue of ERP cumulative impacts. Discussion with representatives of professional organizations, private sector development interests, and public sector interests indicates a practical approach is needed that will not only meet regulatory requirements, but also avoid the potential entanglements associated with cumulative impacts.

Current Florida Law does not prohibit construction within delineated flood plain areas. However, regulatory criteria does require "no net encroachment" to occur as a result of the proposed activity. Specifically, at the Southwest Florida Water Management District, Sections 40D-4.301 and 40D-4.302, F.A.C., Conditions for Issuance of ERP Permits, require that in order to obtain a permit, an applicant must provide reasonable assurance that the surface water management system:

" . . . (a) will not cause adverse water quantity impacts to receiving waters and adjacent lands;

(b) will not cause adverse flooding to on-site or off-site property;

(c) will not cause adverse impacts to existing surface water storage and conveyance capabilities;

(d) will not adversely impact the value of functions provided to fish and wildlife, . . .;

(e) will not adversely affect the quality of receiving waters . . . ;

(f) will not cause adverse secondary impacts to the water resources . . . ;

(g) will not cause unacceptable cumulative impacts upon wetlands and other surface waters . . . ; and

(h) the standards and criteria contained in the BOR *[i.e, the District's ERP "Basis of Review" (BOR)]* shall determine whether reasonable assurances have been provided. . . ."

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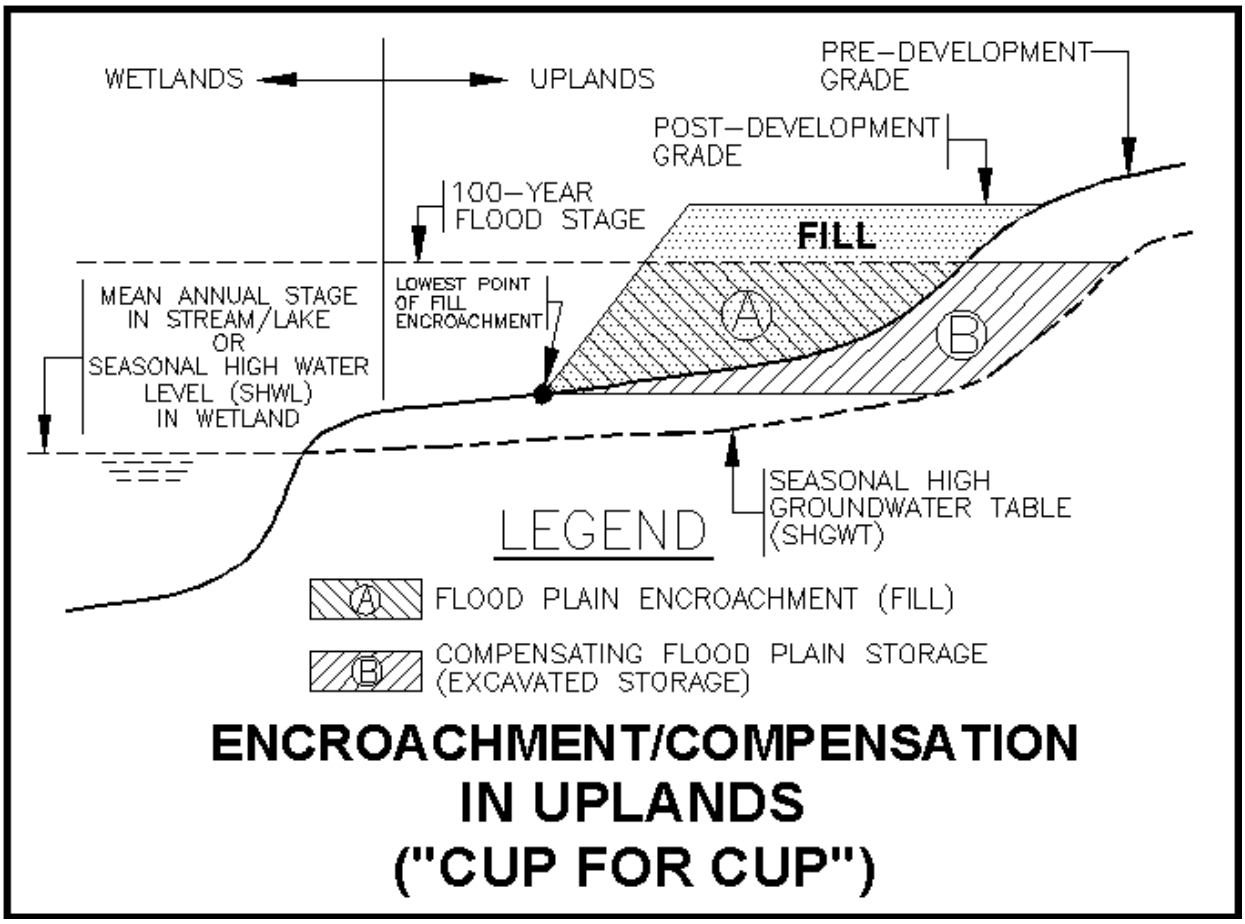
Section 4.4 of the District's BOR provides the following guidance regarding "flood plain encroachment":

" . . . No net encroachment into the flood plain, up to that encompassed by the 100-year event, which will adversely effect either conveyance, storage, water quality or adjacent lands will be allowed. Any required compensating storage shall be equivalently provided between the seasonal high water level and the 100 year flood level to allow storage function during all lesser flood events. . . "



<u>"Cup for CUP" Flood Plain Compensation</u>

The attached sketch, labeled "Encroachment/Compensation in Uplands," depicts some of the concepts involved when flood plain encroachment by construction and development activities occurs. When needed, ERP permit applicants may propose "flood plain

compensation" to offset or mitigate the adverse effects of their encroachment to conveyance, storage, water quality or adjacent lands, and to satisfy the "Conditions for Issuance of ERP Permits." The method of flood plain compensation envisioned by Section 4.4 of the BOR, and most commonly used when activities must occur within a flood plain, involves "equivalent excavation" that is provided "cup for cup" to offset the filling/blockage caused by project flood plain encroachment. Due to the economic incentives of high land values and the technical convenience of computer analytical modeling, some applicants attempt to demonstrate that an alternative means other than "cup for cup" compensation will provide equivalent flood plain compensation and avoid resource impacts. Following is a brief discussion of some of the common alternative compensation methodologies.

Flood Plain Compensation in Detention Ponds

Some applicants propose flood plain compensation in detention ponds that are built below flood plain levels (stages), by showing that the timing differential between stages in the pond and the receiving water body can cause the pond to be empty when flood levels occur in the receiving stream or water body. In this case, the applicant will perform a computer modeling analysis to show that due to the project location in a downstream area of the larger watershed, the pond(s) in the flood plain can fill up and drain down during any storm event without being affected by tail water in the flood plain. If the pond volume becomes theoretically empty, then the pond capacity above the interconnection level may be available for flood plain storage during a design flood event. Critical components to this scenario are both the timing of stages in the pond and in the receiving waters and adequate sizing of the pond/stream interconnection. Few applicants are able to spend the time and expense to provide sufficient and accurate stage/time analysis and supporting information. Actual data is usually lacking, and the modeling results are commonly based on relatively simple hydrologic assumptions. For example, the applicant may assume that a design storm will produce uniform rainfall depth over the project area and entire watershed. Most storm events that cause flooding produce uneven rainfall, occur at random and do not happen according to the modeling assumptions. Generally, ponds located within the flood plain of receiving waters are more likely to cause flood plain impacts rather than to provide compensation.

Minimal Impacts by Single Projects vs. Cumulative Impacts

A method that has been used, by highway bridge crossings and others in an effort to justify the flood plain encroachment impacts, involves computer modeling analysis of the pre- and post- developed cross-sections of a creek/river, to show the local rise in flood plain levels due only to the subject project's encroachment. Then the argument is made that the increased level of the hydraulic grade line due to the individual project should only cause minimal resource and flooding impacts, thereby negating the need to provide specific "cup for cup" flood plain compensation. This individual project analysis does not account for the more significant *cumulative effects* due to loss of flood plain storage/conveyance caused by other similar projects in the area. Although stage changes in the receiving waters due to encroachment by a single project may be individually minimal, the cumulative effects of

flood plain encroachment caused by several projects are often not recognized until after they occur.

Conclusions and Recommendations

When flood plain encroachment is proposed, “cup for cup” equivalent excavation is the method most commonly used and preferred to offset the storage or conveyance affects of project activities and comply with the District’s BOR. Another suitable measure could be for the applicant to show evidence of land flooding rights through ownership or other perpetual control of the affected area (i.e., drainage/flooding easements, etc.). If other less reliable methods are proposed, the applicant should be expected to give a higher degree of reasonable assurance to comply with District ERP Rules. For example, if the “minimal impacts” method is proposed, the applicant could be asked to demonstrate that if all other persons who could affect the surface water by encroachment of the subject flood plain, floodway, stream, lake, other water body or water course, or closed basin were to do so in a similar manner and to the same degree proposed by the applicant, the singular or cumulative impacts of such encroachments would NOT cause violation of the Conditions for Permit Issuance in Rules 40D-4.301 and -.302, F.A.C.

Of these three common methods of flood plain compensation, “cup for cup” compensation is the method that is most clearly supported in Section 4.4 of the District’s BOR.

RECOMMENDATION: It is recommended that the preferred, uniform approach for flood plain encroachment compensation should be the “cup for cup” method. Any other method proposed by an applicant must be thoroughly evaluated on a “case by case” basis, and demonstrated convincingly by the applicant, at a higher level of assurance, to be in compliance with District Rules and also avoid cumulative impact issues.

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