

**Ana M. Marquez**

**From:** Richard Burtell  
**Sent:** Wednesday, July 01, 2009 7:47 AM  
**To:** 'champson@sonosky.com'  
**Cc:** Janet L. Ronald; Glenda S. Winters; Ana M. Marquez  
**Subject:** RE: Hopi Tribe Comments on Preliminary Hopi HSR

Hi Colin,

I received both of your emails yesterday (6/30/09) and was able to print out the attachments.

We'll let you know when the Federal Express packet arrives.

Thanks!

Rich

P.S. Scott's been out of the office since Monday.

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**From:** Colin C. Hampson [mailto:champson@sonosky.com]  
**Sent:** Tuesday, June 30, 2009 4:21 PM  
**To:** Scott M. Deeny  
**Cc:** Richard Burtell  
**Subject:** RE: Hopi Tribe Comments on Preliminary Hopi HSR

Scott,

If you could confirm receipt of my two e-mails from a few minutes ago sending the comments and exhibits, I'd appreciate it.

Thanks.

Colin Cloud Hampson  
Sonosky, Chambers, Sachse, Endreson & Perry, LLP  
Symphony Towers  
750 B Street, Suite 3130  
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7/1/2009

-----Original Message-----

**From:** Colin C. Hampson [mailto:champson@sonosky.com]

**Sent:** Tuesday, June 30, 2009 4:11 PM

**To:** 'Scott M. Deeny'

**Cc:** 'Richard Burtell'; 'Harry R. Sachse'; 'SCanty0856@aol.com'; 'Vanessa.Willard@usdoj.gov'; 'Guarino, Guss (ENRD)'; 'Joelynn Roberson'

**Subject:** Hopi Tribe Comments on Preliminary Hopi HSR

Scott,

Attached please find the Hopi Tribe's comments on the Preliminary Hopi Hydrographic Survey Report. The exhibits will be sent by separate e-mail. The original comments and exhibits will be sent by Federal Express.

Regards,

Colin Cloud Hampson  
Sonosky, Chambers, Sachse, Endreson & Perry, LLP  
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**Kathleen A. Donoghue**

**From:** Colin C. Hampson [champson@sonosky.com]  
**Sent:** Tuesday, June 30, 2009 4:11 PM  
**To:** Scott M. Deeny  
**Cc:** Richard Burtell; 'Harry R. Sachse'; SCanty0856@aol.com; Vanessa.Willard@usdoj.gov; 'Guarino, Guss (ENRD)'; 'Joelynn Roberson'  
**Subject:** Hopi Tribe Comments on Preliminary Hopi HSR  
**Attachments:** 65pld-Hopi Tribe's comments on Preliminary HSR 6.30.09.pdf

Scott,

Attached please find the Hopi Tribe's comments on the Preliminary Hopi Hydrographic Survey Report. The exhibits will be sent by separate e-mail. The original comments and exhibits will be sent by Federal Express.

Regards,

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°NOT ADMITTED IN CA

June 30, 2009

Arizona Department of Water Resources  
Attn: Adjudications  
3550 N. Central Avenue, Fourth Floor  
Phoenix, Arizona 85012

Re: Comments of the Hopi Tribe on the Preliminary Hopi Hydrographic Survey  
Report

Dear Sir or Madam:

In accordance with the Court's Pretrial Order No. 6 regarding Notice of Hydrographic Survey Reports of July 26, 2000 and Order of March 9, 2009, the Hopi Tribe respectfully submits its comments on the Preliminary Hopi Hydrographic Survey Report dated December 2008 (hereinafter "Preliminary HSR" or "Preliminary Report").

### Comments on the Preliminary Report

The Hopi Tribe respectfully offers the following specific comments on the Preliminary Report. The comments are provided on a section-by-section and page-by-page basis.

#### Chapter 1: Introduction and Scope

Figure 1-2 should be revised to distinguish between allotments and the 21 "TR" or "Murphy" tracts that are still tribal trust land that are interspersed among the allotments, comprising approximately five acres each, totaling approximately 105 acres. While the Tribe is not aware of the complete history of these tracts, it believes that the federal government surveyed these tracts but never allotted them. *See* Preliminary HSR footnote at 2-24 and text at 2-25.

#### Chapter 2: Summary of Adjudication Claims Related to the Hopi Indian Reservation

The Hopi Tribe intends to file a Second Amended Statement of Claimant which will set out the Tribe's revised claims for water rights.

### 2.3.2 Water Sources

Footnote 3 on page 2-4 states that the Tribe holds two contract entitlements for Colorado River water for a total of 6,000 AF. The footnote also indicates the Hopi leases one of the entitlements, and that the Hopi claims do not include plans to use the water entitlement on the Reservation. The Hopi Tribe claims the right to import this water to the 1882 Reservation and Moenkopi to satisfy water demands in those locations. The Hopi Tribe's amended claims will address this water.

### 2.3.3 Priority Date

On page 2-5 the Preliminary HSR discusses the Hopi Tribe's claim to senior priority. The sentence should be revised to read: *"The Tribe's claim of immemorial priority, senior to all claimants, Indian or non-Indian, extends to waters located on and underneath Hopi lands, as well as waters located outside the boundaries of its lands necessary to meet on-reservation demands consistent with the homeland purpose."*

### 2.3.4 Past and Present Irrigation Use

On Page 2-5 the Preliminary HSR discusses the Tribe's past and present irrigation use claim. The maximum amount of water available is claimed in order to provide any available water to lands that have been irrigated in the past and present. The Tribe recommends that the sentence beginning with the word "However, . . ." be revised to read: *"However, the Hopi claim a maximum quantity for irrigation of the past and presently irrigated acreage in order to provide water in years when water is available."*

### 2.3.8 Stockponds, Springs and Wells

Footnote 5 on page 2-8 states that no capacities are claimed for the recreational lakes identified in Footnote 2 to Table 1 in Appendix 2. However, as noted in Section 2.3.7, the Tribe does identify capacities of the recreational lakes claimed.

### 2.3.12 Hopi Ranches

The Preliminary HSR states on page 2-10 that the Tribe claims "water for five ranches based on state law," pursuant to the Navajo-Hopi Land Dispute Settlement Act of 1996. On December 11, 2008, the Bureau of Indian Affairs took into trust four of the five ranches referred to in this section. As stated in the Tribe's 2004 Amended Statement of Claimant, the Tribe claims water rights provided for under the 1996 statute, as well as the rights pursuant to state law. The following should be added at the end of the first sentence: *"and the provisions of the Act."*

#### 2.8.2 Past and Present Domestic, Commercial, Municipal and Light Industrial

Table 2-1 does not compare the Hopi and United States claims accurately. The Hopi and United States' domestic, commercial, municipal and industrial ("DCMI") claims include past, present and future as one 11,211 AF claim. ADWR's breakdown of the springs, wells and stockponds does not accurately reflect past and present DCMI quantities as claimed. Table 2-1 should be revised to delete the DCMI entry and simply note that the United States and Hopi Tribe claim a DCMI amount that includes past, present and future.

#### 2.8.4 Past and Present Livestock

ADWR's breakdown in Table 2-1 of the springs, wells and stockponds does not accurately reflect past and present livestock quantities as claimed. The Preliminary HSR should note that the Tribe claims multiple and continuous fillings of impoundments as unregulated structures. *See* comments regarding Section 7.2.3 below regarding entitlements for stockponds.

#### 2.11 Peabody Western Coal Company Claims

On page 2-25 the Preliminary HSR discusses claims filed by Peabody Western Coal Company (PWCC) for groundwater used on Hopi and Navajo lands. These state law claims on Hopi lands leased by PWCC appear to be for water reserved by the Hopi Tribe under federal law governing Indian reserve rights and are leased to Peabody. Accordingly, they are not subject to appropriation under state law.

#### 2.12 Other Water Uses

On page 2-26 the Preliminary HSR discusses a claim made in 1892 by Mr. Freeman Stewart, presumably a non-Indian, for water for mining and milling purposes from springs located in Blue Canyon on the Hopi Reservation. The Preliminary Report should state whether the claimed use was verified and, if so, has since continued. There is no possible legal basis for a claim for such use on Indian lands, and none apparently has been made in the *Adjudication*.

### **Chapter 3: Hopi Reservation Lands**

The Hopi Tribe is concerned about the accuracy of certain information presented in Chapter 3 and the difficulty of accurately conveying the details necessary to understand many complex circumstances, relationships and events discussed there. The Hopi Tribe understands that the Preliminary HSR is not a scholarly paper but is intended to provide the Court and the parties back background information about the Hopi people and their lands. Nevertheless, the Preliminary HSR is produced by the State of Arizona and will be available to the general public who may rely on the information presented in it. It is important to the Hopi people that the information presented about Hopi history, culture and traditions is accurate. There is a vast

literature, both scholarly and general, on Hopi history, culture and tradition, a portion of which is cited in the References.

The Tribe requests that ADWR carefully review Chapter 3, the Tribe's comments (including the Tribe's comments on the Anderson report below) and the relevant literature to ensure that this Chapter is accurate and that every passage in the discussion is necessary for accomplishing the purposes of the HSR.

### 3.1.1 History to 1540

On page 3-1 the Preliminary HSR states, "[t]he Hopi are a Pueblo people." The Hopi refer to themselves as *Hopisenom*. The Hopi have been described as a "Pueblo people" but have a history that is substantially distinct from the Pueblo peoples of New Mexico. Also, other clans migrated to Hopi from southern Arizona and Mexico, so the Hopi culture has much more extensive historical connections over a wider geographical area. Accordingly, we suggest that the first sentence of the second paragraph be rewritten to state the following: "*The Hopi have been described as a 'Pueblo people' similar in some ways to the Zuni . . .*"

On page 3-2 the Preliminary Report states, "[w]hether the occupants of these earliest sites can be considered ancestors of the Hopi is unclear . . ." In fact, the relationship between modern Hopi and the occupants of the sites described in the Preliminary HSR is clear. The Hopi consider those populations their ancestors. There are Hopi shrines in these areas dating back to this era which the Hopi continue to visit.

The interactions referred to on page 3-2 as "warfare" should more properly be described as "conflict" because they involved small raids and minor attacks, not large scale battles. The phrase "or to other developments, such as warfare or social breakdown" should be deleted.

On page 3-3 the Preliminary Report states that Hopi sites supporting Ancestral Puebloan Settlements "were abandoned." However, the Hopi continue to maintain ceremonial ties to those sites and visit them regularly in the course of their religious duties. Accordingly, those sites have not been abandoned. The HSR should be revised to state that the settlements were "*depopulated*."

On page 3-3 the Preliminary Report describes *Hopitutskwa* in the past tense ("*Hopitutskwa's* boundary ran"). This is inaccurate because *Hopitutskwa* continues to exist and hold substantial meaning for the Hopi people. "*Hopitutskwa* is markedly a sacred landscape, sung of and to in Hopi ceremonial songs, traversed frequently in religious pilgrimages, and re-charged in every season of the calendrical cycle of Hopi ceremonies. Hopis continue to regard their aboriginal lands as under Hopi religious stewardship and cultural sovereignty." Peter M. Whiteley, *The Importance of the Little Colorado River Drainage and its Water Resources to the Hopi* 15-16, 46-58 (2009). Also, the text's use of the term "boundary" does not capture the full meaning to the Hopis of these areas. It is a pilgrimage route which describes the area within the

sacred sites in the LCR Basin regularly visited by Hopis as a part of ceremonies that date back to the Hopi clans' migrations to *Hopitutskwa*. The term "boundary" suggests a terminus of Hopi culture and historic interest, but in some circumstances such interest and relationship extends beyond the pilgrimage route. The Hopi continue to visit, revere and use these lands in accordance with their culture and traditions.

On page 3-3 the Preliminary HSR describes the Hopi claim to *Hopitutskwa* as "based not on current occupancy so much as it was on periodic use and past occupancy (or use) by ancestors of the Hopi," based apparently on a statement found on page 6 of the Anderson report. This statement is inaccurate and involves numerous complex legal issues and should be deleted. For example, the suggestion in the statement that "periodic use" can never amount to occupancy is not consistent with the law. For example, in *Masayeva v. Zah*, 65 F.3d 1445, 1454-1455 (9th Cir. 1995), the Ninth Circuit held that annual religious use by (even a small number of) the Hopi of Hopi shrines outside the 1882 Reservation could be sufficient to establish that the Hopi were "located" on the site within the meaning of the 1934 Act.

Page 3-3 purports to describe the limits of *Hopitutskwa* and refers to Figure 3-1. Figure 3-1 does not coincide with the description provided in the text. For example, the text includes Bill Williams Mountain as a point along the outer edge of *Hopitutskwa*, while it is not included in Figure 3-1. Also, the text states that a "significant part of Grand Canyon" is included in *Hopitutskwa*. It should read "*all of the Grand Canyon, encompassing the entire landscape. . .*"

### 3.1.3 Mexican Period

On page 3-4 the Preliminary Report refers to "intertribal conflict with the Navajo, Utes, Paiutes, and to a lesser extent, the Apaches" in the Mexican Period between 1821 and 1848. Initial conflicts involved the Utes at the Mesa villages. The Navajo conflicts came later, and conflicts with Apaches were limited. The Anderson report (page 20) finds that "there does not appear to have been any significant conflict between" Hopi and the Southern Paiutes, noting one instance of a conflict reported by Vizcarra. Accordingly, the phrase at the end of the sentence should be revised to read: "*intertribal conflict with the Navajo, Utes, and to a lesser extent, the Apaches and Paiutes.*"

On page 3-4 the Preliminary Report states that Navajo settlements could be found on Black Mesa, the Kaibito Plateau, the Painted Desert and other land surrounding the Hopi Mesas "[b]y early 1800s." Navajo settlements did not appear in these areas until the mid-1800s and remained ephemeral and seasonal into the first third of the 20th century. Peter M. Whiteley, *The Historical Evolution of Navajo Occupancy Areas in the Southwest, with Particular Reference to Black Mesa and the Hopi Washes* 1, 2 (2009). The text should be revised accordingly.

#### 3.1.4 Early Contacts with Americans (1848-1882)

On pages 3-5 and 3-6 the Preliminary HSR discusses the initial Mormon visits in 1858 to Hopi and settlement in Moenkopi Wash near the area now known as Tuba City. The first Mormon settlement was not until 1875. Peter M. Whiteley, *Historic Hopi Use and Occupancy of the Little Colorado Watershed, 1540-1900* 68-69 (2009).

#### 3.1.5 Hopi Agency (1850-1882)

On page 3-6 the Preliminary Report states that Indian Agent John Ward provided the Hopis corn and farming implements in 1865. With centuries of experience farming corn, the Hopi certainly had corn and farming tools by 1865. When Jacob Hamblin and his first party of Mormon explorers in 1858 tried to appeal to Hopis by offering them iron farming tools, they were rebuffed because the Hopis had just received tools from the soldiers at Fort Defiance; even in the 1770's, regular visits were made by Spanish traders to Hopi with tools. Accordingly, the word "*additional*" should be inserted before "corn and farming implements." In addition to the centuries of experience the Hopi had varieties of maize developed over a millennium with an elongated mesocotyl and a single large radicle that were adapted to the arid Hopi environment. New varieties of seed corn which the government attempted to introduce were inferior to the native varieties. T.J. Ferguson, *Hopi Agriculture and Water Use* 30 (2009).

The Preliminary HSR quotes a letter from an Indian agent, A.D. Palmer who reported that on a trip in the spring of 1870 he showed the Hopi how to "clean out and curb their springs and wells" and "the best manner of using their tools and cultivating their cornfields and vegetable patches, and in irrigating where there was sufficient water." While it seems likely that the tools provided by the agent were likely new to the Hopi at the time, and thus instruction on their use was useful to the Hopi, it is unlikely that, after centuries of farming in the area and using its water resources, the Hopis required instruction on cleaning springs and wells and cultivation. In the traditional system, there are specific Katsinas who come around in the springtime to call men to go clean the springs.

The reference in the first sentence on page 3-7 to the Hopi Reservation should be modified to read "*the Hopi Reservation in 1882.*"

#### 3.2 1882 Executive Order Reservation Lands

On page 3-8 it states that the provision of the 1882 Executive Order setting aside the Hopi Reservation for the Hopi for "such other Indians as the Secretary of the Interior may see fit to settle thereon" included the Navajo. This is an incorrect interpretation of the Executive Order. The court in *Healing v. Jones*, 210 F.Supp. 125, 134, 138-139, (D.Ariz. 1962), held that while the Hopi Tribe acquired immediate rights to the 1882 Reservation under the Executive Order, the Navajos (or any other Indians) had no right to the Reservation until "the act of the Secretary on some date subsequent to December 16, 1882" settled them on the Reservation, that is by the

fulfillment of the “future contingency.” There was no immediate grant of rights to the Navajo. *Id.* at 139 (“Indians whose rights in the reservation are dependent upon future official acts of discretion can hardly be said to have gained immediate rights by virtue of an executive order which authorizes the exercise of such discretion”). The *Healing* court ruled that settlement occurred in the 1930s. *Id.* at 158. The historical record also supports the contrary conclusion, *e.g.* that, “[f]rom events in the late 1880s involving direct action by the Secretary of the Interior, it is incontrovertible that the ‘such other Indians’ clause did not refer to Navajos.” Whiteley, *Reply Report III* at 8.

On page 3-8 it states that Navajos “settled on the Hopi Mesas” by 1882. This description suggests a greater degree of settlement on the Hopi Mesas than actually occurred. The court in *Healing v. Jones* ruled that Navajos were not settled on the 1882 Reservation until the 1930s. The sentence should be deleted.

### 3.2.1 District 6 Lands

On page 3-10 it states at the top, “The Hopi and Navajo continued to be unable to resolve their differences.” This sentence should be deleted as it doesn’t relate to the discussion in the paragraph regarding the establishment of District 6.

### 3.2.2 Hopi Partitioned Lands

On page 3-13 the Preliminary HSR states that relocation “was slow due to lack of adequate funding and available land.” Considering that the Navajo Nation inhabits the largest Indian reservation in the United States comprising 17.2 million acres the conclusion that availability of land seems difficult to support. The Navajo Nation’s opposition to relocation was also a significant, likely greater, factor. *See Anderson report* at 84.

On page 3-14 the Preliminary HSR notes that the Hopi-Navajo Land Dispute Settlement Act of 1996 authorizes extensions of the 75-year leases to Navajos residing on Hopi lands pursuant to accommodation agreements. Such extensions, while authorized in the Accommodation Agreement approved by the Act, are not unilateral options to extend but are instead subject to the Hopi Tribe’s approval at the time of any such extensions. *See Pub. L. 104-301 §§ 2(3), 4; Accommodation Agreement § E(2) (set out in S. Rep. 104-363, 104th Cong., 2d Sess. 52 (1996)).*

### 3.3 1934 Act Reservation Lands (including Moenkopi)

On page 3-17 the Preliminary HSR discusses the decision in the 1934 Act case, stating, “The court also attempted to partition water sources equitably so that every grazing area would have access to water.” The court awarded the Hopi Tribe a license and/or easement to maintain the ditches running across the Navajo farms in the northern part of Pasture Canyon. *Masayeva v. Zah*, 816 F. Supp. 1387, 1420 n.48, 1424 (D. Ariz. 1992), *aff’d in part, rev’d in part*, 65 F.3d

1445 (9th Cir. 1995). The court granted certain Navajos a license and/or easement to water their livestock in watering troughs if constructed by the Hopi Tribe. *Id.* The court did not address groundwater resources. Indeed, Moenkopi suffers from lack of adequate groundwater resources.

#### **Chapter 4: Physical Setting**

##### 4.1 Location

BIA Route 2 should be included in the list on page 4-1 of “[m]ajor routes leading to the Reservation” and included in Figure 6-9.

##### 4.2 Topography

Wepo Wash should be included among the “important Hopi washes” listed on page 4-2.

##### 4.3 Climate

On page 4-4 and on Table 4-2 the Preliminary Report indicates that annual surface water evaporation rates on the Hopi Reservation vary from a lower bound estimate of 63.5 inches at Keams Canyon to an upper bound estimate of 80.2 inches at Tuba City. ADWR should confirm whether the rates are for gross or net lake evaporation.

#### **Chapter 5: Culture**

The Hopi Tribe is very concerned about a number of inaccurate statements in Chapter 5. The Hopi Tribe understands that the Preliminary HSR is not a scholarly paper but is intended to provide the Court and the parties back background information about the Hopi people and their lands. Nevertheless, the Preliminary HSR is produced by the State of Arizona and will be available to the general public who may rely on the information presented in it. It is important to the Hopi people that the information presented about Hopi history, culture and traditions is accurate. There is a vast literature, both scholarly and general, on Hopi history, culture and tradition, a portion of which is cited in the References.

The Tribe requests that ADWR carefully review the Tribe’s comments and the relevant literature and make changes to ensure accuracy and that the discussion is necessary in light of the purpose of the HSR.

##### 5.1 Social Organization

On page 5-1 the Preliminary HSR refers to the Village of Tewa, which is also known as Hano. The Tewa-speaking people of First Mesa are of the village of Hano located next to Sichomovi and Walpi. Hano was established by Tano people who came from the Galisteo Basin around 1700 after the Second Pueblo Revolt of 1696. Though they are not recorded historically,

Hopis sometimes distinguish between Tewas who migrated to Sitsom'ovi before the Tano at Hano.

On page 5-2 the Preliminary HSR states that the Oraibi Split resulted in the establishment of two new villages, Hotevilla and Bacavi. It also resulted in the substantial growth of Kykotsmovi which included only a few houses in the 1890s.

On page 5-3 the Preliminary Report discusses the *kikmongwi* of Oraibi who went to Washington D.C. in 1890. The *kikmongwi*'s name was Loololma. It also states that troops were sent to Oraibi in summer of 1891. They were buffalo soldiers from Fort Wingate.

On page 5-4 the Preliminary Report discusses a *kikmongwi* leader of the Friendlies who was sent to Sherman Institute for three years and who, upon his return, sought to push out the Hostiles. That leader was Tawaquaptewa. It also states that the Shungopavi Hostiles were forced out of Oraibi to Bacavi, but, in fact they were forced to return to Shungopavi.

On page 5-5 the Preliminary HSR cites Mischa Titiev's conclusion that the Oraibi Split can be attributed to a social structure that favors small villages and prevents "unity beyond the village level." There is disagreement about the principal forces leading to the Oraibi Split. See Anderson at 40-41; Whiteley (1988) and Clemmer (1995). Also, while there have been different views between villages about certain issues over time, such differences have not prevented unity between those villages. In religious and social matters there remains an overarching sense of Hopi unity. See Anderson at 39 (describing "cultural solidarity of the Hopi") 40 (quoting another who stated "[p]ractically everyone is related both by kinship and religious ties"). Also, as discussed below, while villages are constituents of the present-day tribal government and retain independence, the government is Reservation-wide. Accordingly, the phrase "no unity beyond the village level" should be deleted.

The last paragraph of Section 5.1 on page 5-5 refers to the "tribal Hopi Council." It should state "*Hopi Tribal Council*."

## 5.2 Governance

On page 5-5 the Preliminary Report states in the first paragraph that upon visiting Hopi Mesas the Spaniards reported that Hopi villages were governed by a cacique, one or two captains and a council of elders. In the third sentence the Preliminary HSR surmises that the cacique was the *kikmongwi* and the two captains were likely the war chief and assistant. This statement ventures into a complex area of Hopi culture, tradition and history. Village leadership structures have varied from time to time and village to village. Accordingly, the last part of the sentence following "*kikmongwi*, or village chief . . ." should be deleted.

On page 5-5 the Preliminary HSR states that American observers “were uncertain about whether the villages cooperated with each other or not.” There was certainly village cooperation albeit not on all issues at all times.

On page 5-6 the Preliminary HSR states that Oliver LaFarge’s constitution gave “the *kikmongwi* power to appoint the representatives to the Tribal Council.” In fact, the Constitution did not require appointment of Tribal Council representatives by the *kikmongwi* but allowed each village to choose its means for selecting its representatives. See Hopi Constitution of 1936, art. IV, § 4 (“Each village shall decide for itself how it shall choose its representatives” provided that each selection was certified by the *kikmongwi*). The statement should be revised to read: “*LaFarge decided this by reserving powers to the villages and religious leaders to select Council members and address internal village matters.*”

On page 5-7 the Preliminary HSR states that representatives to the Council, under the 1936 Constitution, would be selected “either by appointment by the *kikmongwi* or by election by its residents.” For the reasons described in the paragraph above this phrase should be deleted.

On page 5-7 the Preliminary Report also discusses issues related to the level of participation in the 1936 referendum election on the Hopi Constitution. As noted, the proposed Constitution and the election on its approval vote was controversial at the time and is not a necessary or proper topic for the Preliminary HSR.

On page 5-8 the Preliminary HSR states that the Hopi tribal government is comprised of an executive, legislative and judicial branch. In fact, under the Hopi Constitution the Tribal Council holds all legislative, executive and judicial authority. The Council is authorized to delegate the exercise of these powers as it sees fit in the best interest of the Tribe. For example, the Tribal Council can delegate authority to the Council’s Chairman to carry out a broad range of day-to-day executive responsibilities. In addition, the Constitution empowers the Council to establish courts for the resolution of disputes. For example, by Ordinance No. 21 the Tribal Council established the Tribal Court. Finally, the Council can delegate authority for administrative matters to the various departments and programs that comprise the Hopi governmental organization established by the Council. Attached as Exhibit 7 is a copy of the Hopi Constitution.

### 5.3 Customs

On page 5-9 the Preliminary Report states that Hopi people use wild plants for “personal use” such as for hair washing for ceremony and for basketry. The description should be changed from “personal” to “*ceremonial, religious and medicinal,*” and it should emphasize that Hopis use many wild plants for many purposes—personal, social, subsistence, and manufactures as well as ceremonial etc.

On page 5-9 it also states that rabbit hunting was carried out for sport. Hunting has a broader cultural significance than as described as it is tied to the ceremonial cycle and is for subsistence. *Importance of Little Colorado River Watershed* at 108-110. Accordingly, the words “as a sport” should be deleted.

On page 5-9 the Preliminary HSR states that the Hopi “traditional subsistence economy was first supplemented with and then replaced by a cash economy.” This is incorrect. A large measure of the subsistence economy remains. Most crops are grown for consumption, not sale.

On page 5-9 the Preliminary HSR refers to the use of burros in the present tense. This discussion needs to be in the past tense, as Hopis do not use burros any more (the last working burro on Third Mesa died in 1981). Today Hopis use cars and pick-up trucks, which has facilitated farming fields further removed from the villages though Hopis were farming a long distance from the villages way before they had motor vehicles.

On page 5-10 the Preliminary HSR concludes that the stock reduction did not adversely affect Hopi income because of efforts to improve and control breeding by fencing pastures. This is incorrect. Stock reduction had devastating impact on Hopi economy. *Importance of Little Colorado River Watershed* at 93; Clemmer, R.O., 1978, *Continuities of Hopi Culture Change*, pp 61-62 *Hopi Hearings*, 1955, pp 10-17, Whiteley, 1988, 142-43.

Page 5-12 contains a description in the first two full paragraphs of Hopi ceremony that contains substantial inaccuracies and relies on an internet source (Sweat, 2008) that is not authoritative. These two paragraphs should be deleted.

## **Chapter 6: Economic Base**

### **6.1.2 Rangeland**

The HSR indicates the ADWR does not have an estimate of useable rangeland in the Moenkopi area. The Hopi Tribe has recently received funding for a range inventory for about 64,000 acres in Moenkopi and plans to complete the study in October 2009. The study results may result in a revised claim for livestock uses.

### **6.1.3 Minerals and Energy Resources**

On page 6-5 the Preliminary HSR indicates the preferred alternative in the November 2008 EIS for the PWCC coal operation in the Black Mesa complex would assume the now shut down coal slurry pipeline would not resume and the Mohave Generating Station (MGS) would not reopen. It should also be noted that the EIS also included a non-preferred Alternative A that did include resumption of the coal slurry pipeline (using C aquifer water piped from near Leupp) and reopening of the MGS. The EIS on page ES-2 notes that, while implementing Alternative A is unlikely, such actions could still occur under certain circumstances.

The Preliminary HSR describes the resources of the Reservation. Renewable energy and wind and solar power should be included in the list of resources. The Hopi Tribe plans to appoint four individuals to an Interim Hopi Regulatory Energy Board to continue the efforts of creating a renewable energy program for its natural resources program.

The Hopi Tribe intends to evaluate possible future development of a Renewable Energy Office (to change the name of current program Hopi Clean Air Partnership Project). The Hopi Tribe will be completing the Feasibility for a Utility-Scale Wind Farm by constructing two 50-meter towers for collecting data on wind resources in the Clear Creek Ranch area. The Hopi Tribe is working with The State of Arizona Energy in development of a Tribal Rural Electrification Program (for those residents who are not able to get on the local electrical grid). The Hopi Tribe plans to install a 30 meter tower close to the villages to assess the wind resource in that area.

All references to “JUA” should be changed to “former JUA.”

The Hopi Tribe believes that Morale Uranium Mine near Hopi Buttes mentioned on page 6-7 is outside the HPL and located east of Seba Dalkai, Arizona.

#### 6.1.4 Timber Resources

Page 6-10 of the HSR indicates wood products available from woodlands include railroad ties, but the Tribe does not believe that there is wood that makes good wood ties.

Mistletoe should be included in the list on page 6-11 of the threats to juniper.

#### 6.1.5 Tourism

On page 6-11 the Preliminary HSR states that “some Hopi . . . have a cautious, if not negative, attitude towards tourism today.” In fact most Hopis support tourism. In 2005 and 2006 the Tribe conducted a survey on the Reservation which provides evidence that many Hopi do in fact support tourist development on the reservation itself. The survey asked respondents “Do you support development that might bring more tourists to your village?” Out of 724 respondents, 65% said “yes,” 18% said “no,” and 16% said “not sure/neutral.” There was a similar response to the statement that “the Tribal government should promote tourism on the reservation.” 67% of the respondents agreed with the statement, 16% disagreed, and 17% were unsure/neutral. Finally, when asked if they would support the building of a new modern museum for the return and display of Hopi cultural arts and crafts on the reservation, 81% said “yes,” 10% said “no,” and 9% were not sure/neutral. Accordingly, the statement should be revised to read: *“The behavior of early visitors to the Reservation caused concern among some Hopi about tourism, but today a majority of Hopi support development, including a museum, that would bring more tourism to the Reservation.”*

#### 6.2.2 Utilities

The HSR refers to the Hopi Tribal Utility Regulatory Authority and a program for renewable electric systems. This can be referred to as the Interim Hopi Regulatory Energy Board.

#### 6.4.1 Demographics

The Tribe will submit revised population projections in its upcoming amended claim. On page 6-24 the Preliminary Report states that the average number of people in a Hopi household has dropped from 4 in 1990 to 2 in 2007. The Tribe conducted a survey on the Reservation in 2005 and 2006 which reached a different conclusion, estimating a current average of 3.6 people per household.

#### 6.4.2 Labor Force

On page 6-25 the Preliminary HSR states, “[m]edian family income is as much as \$41,250 in 2007.” ADWR should clarify what “as much as” refers to in a median value and the source of data for this figure. It seems unlikely to be accurate. A survey conducted by the Tribe on the Reservation in 2005 and 2006 found a median family income of \$22,500. In the SWCA report it indicates for the Hopi Reservation the median family income was \$15,875 with a per capita income of \$8,637 from the 2000 census data.

### **Chapter 7: Water Resources**

#### 7.1.1 Hopi Washes

The Preliminary HSR should include a note in the text and footnote on Table 7-1 and Figure 7-1 that USGS gage 09401265 Pasture Canyon Springs is not listed in the table because ADWR does not consider this gage to be a stream flow gage but rather a spring flow gage which is discussed in the springs section on pages 7-12 and 7-13.

The Preliminary HSR does not identify which PWCC gages were utilized in their analysis. Page 7-3 of the Preliminary HSR indicates USGS and PWCC data were utilized in a regional flow analysis. The Tribe requests that ADWR include a list and location map of the PWCC gages in the final HSR.

On Page 7-5 of the Preliminary HSR ADWR presents a hypothetical scenario for sediment filling on of a reservoir on a Hopi wash. Sediment loads are highly variable, and therefore, the hypothetical scenario is not illustrative at all locations. The analysis should be based on a range of sediment loads based on real data.

The ADWR internal report on surface water quality indicates the sediment load estimates in Table 7-5 and Figure 7-8 were derived from the 1981 USDA report and a 1993 Gebhard-Sarma Group report. USGS has measured some suspended sediment data at their streamflow gages on Dennibito, Oraibi, Polacca, and Jeddito Washes at various times starting in late 1993. It appears that this data may not have been included in the sediment load estimates. This data is available on the USGS website. Furthermore, Table 7-5 and Figure 7-8 should include an additional sediment load site at Moenkopi Wash gage 09401260. This gage and nearby gage 09401250 have several years of sediment load data in the 1970's. The Tribe's water resource experts' preliminary calculations indicate an average of about 450 AF/year of sediment load at/near gage 09401260 assuming a sediment density of about 97 lb/cubic ft. This data would result in significant changes to the estimates in ADWR's scenario for sediment filling of a hypothetical reservoir on Lower Moenkopi Wash.

## 7.2 Impoundments

The Tribe's Second Amended Statement of Claimant will contain a revised impoundment inventory which will address a number of issues discussed in this section.

### 7.2.1 Condition

There are also at least five current or historic reservoirs that are or were primarily used for irrigation. Pasture Canyon Reservoir and Lower Lagoon Reservoir (previously unclaimed reservoirs identified by ADWR in Pasture Canyon near Moenkopi) are active reservoirs primarily used for irrigation (Pasture Canyon Reservoir also has incidental recreation use). There was a Middle Reservoir located between Pasture Canyon Reservoir and Lower Lagoon Reservoir that was used for irrigation. Use of Middle Reservoir was discontinued. DW10 Reservoir on Dinnebito Wash and DW11 Reservoir on Many Sheep Valley Wash (tributary to Dinnebito Wash) are two historic reservoirs currently breached that were used to store water for historic irrigation further downstream of the dams. DW10 Reservoir was not claimed by either the Tribe or identified by ADWR, while DW11 Reservoir appears to be ADWR unclaimed pond UNC-D-01 but is erroneously labeled in Table C-2 in Appendix C as Big Mountain Dam (which is claimed pond Hopi ID I-7-112). See comments in Chapter 8 and 9 for further information on irrigation reservoirs.

### 7.2.2 Capacity

On page 7-9 the Preliminary HSR states that ADWR did not include the capacity of claimed impoundments that had breached berms because "[i]t was assumed that impoundments with breached berms store relatively little or no water and, therefore, may not be part of the available water resources in the vicinity of the Reservation." This approach is inconsistent with the reserved water rights doctrine which holds that Indian water rights are not lost through non-use. *In re the General Adjudication of All Rights to Use Water in the Gila River System and Source*, 35 P.3d 68, 72 (Ariz. 2001) ("*Gila V*") (a reserved right "retains priority despite non-

use”). The Hopi Tribe has the right to repair breached facilities and to the water necessary to fill them. Accordingly, their original capacity should be included in the Tribe’s water rights. This is consistent with ADWR’s inclusion of the full capacity of partially silted in impoundments. *See* page 7-9.

The Preliminary HSR capacity of Pasture Canyon Reservoir is listed on page 7-9 and in the Appendix C tables as 202 acre-feet. Based on a past study of this dam, the Tribe’s experts calculated the capacity to be 212 acre-feet based on planimetry contour areas on a design drawing and using the conic method commonly used by the U.S. Corp of Engineers. *See* Exhibit 1.

The Preliminary HSR capacity for the Lower Lagoon Reservoir is listed on page 7-9 and in the Appendix C tables as about 51 acre-feet. The Tribe’s experts calculated the capacity to be about 121 acre-feet based on planimetry contour areas on design drawings and using the conic method. *See* Exhibit 2.

The Tribe provides comments on the method ADWR used to determine capacity of impoundments in the comments below related to Appendix C. Comments on the capacity of other irrigation reservoirs are set out in the comments on Chapter 8.

### 7.2.3 Surface Water Depletion

For depletion, on Page 7-10 the Preliminary Report states that 50% of the volume captured by the ponds was depleted, assuming that ponds with surface area of less than one acre fill twice a year and ponds with surface area one acre or larger fill once a year. Depletion is not a proper basis for calculating water right attributes. As explained in ADWR’s *Water Entitlements Report* 14-15 (Sept. 1988) prepared for this *Adjudication*, stockponds are considered unregulated structures that are permitted to fill until the water level reaches the spillway, and there is outflow. The entitlement is calculated based on the maximum controlled storage capacity within the associated maximum surface area. Though it should, ADWR does not appear to include depletion (or diversion) in its recommendations for water right attributes in Chapter 9. Furthermore, the proposed calculation of depletion, if it were used, is not appropriate, as it is not consistent with the concept of unregulated flow allowed for stock ponds.

### 7.3 Springs

The Tribe’s amended claims will include a revised inventory of springs.

On page 7-12 the Preliminary HSR notes that 21 springs (18 claimed and 3 unclaimed) are just outside the Reservation boundary along Pasture Canyon. The Tribe has a right to the

flow from these springs as a result of historic use as found by the court in *Masayesva, supra*, at 1420, 1424.<sup>1</sup>

The ADWR total flow of all springs was based only on springs for which discharge measurements were available, and flow was assumed zero if spring was dry, and no value (no flow) if the spring had no measurement data (*see* Table 7-9). This unfairly denies the Hopi Tribe a right to water which there is no question that is available and that Hopis have historically used. Also, such springs should be assumed to have a flow based on reasonable estimates. This comment also applies to Section 8.7.

Some of the springs, though documented as existing, may have been dry when observed by ADWR in 2006 (*see* Appendix D) because 2006 was a drier than average year (as indicated by precipitation data at Keams Canyon and Tuba City) and/or because the spring flow had not yet recovered after PWCC reduced their pumping after shutting the coal slurry pipeline to the Mohave Generating Station at the end of 2005. These springs may flow again in wetter years or may flow as the N-Aquifer levels rise due to the reduced PWCC pumping. The Tribe should be entitled to a right to the flow of those springs should it resume. This comment also applies to Section 8.7.

Some places in the text on pages 7-10 to 7-12 indicate there are 41 unclaimed springs while other places in the text and Table 7-9 indicate the number is 42. On Page 7-11 the Preliminary HSR identifies 5 springs from the D-Aquifer and 103 springs from the T-Aquifer. This may underestimate the number of springs tied to the D-Aquifer. ADWR should review the location of springs in correlation with a geologic map to determine whether the springs tied to the T-Aquifer actually come from the D-Aquifer.

On Page 7-13 in the top paragraph the Preliminary HSR discusses the USGS Pasture Canyon gage. The Tribe notes that this gage does not measure the combined discharge of all upstream springs. There are seeps and springs downstream of the gage, there is likely flow in the subsurface beneath the gage, and there are losses above the gage due to evapotranspiration. The higher historical measurements of spring flow made by the USGS were at a different location.

#### 7.4 Aquifers

Page 7-14 states that ADWR was unable to verify 14 of the claimed wells. In its amended claim, the Tribe will provide verification data for many of these claimed wells. The Tribe will also provide a revised inventory of wells claimed.

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<sup>1</sup> The court awarded the Hopi Tribe a license/easement to maintain the ditches in the northern part of Pasture Canyon.

Page 7-14 of the Preliminary Report references Figures 7-15 and 7-16. Figure 7-15 is not consistent with Figure 7-16. For example, T-Aquifer wells and springs appear near the eastern corner of District 6 on Figures 7-14 and 7-15, but the extent of the T-Aquifer is not shown there on Figure 7-16.

#### 7.4.1 Overview

Page 7-14 of the Preliminary HSR references Figure 7-16 showing the extent and dominant flows of the groundwater aquifers on the Reservation. The flow direction arrow in Figure 7-16 for the N-Aquifer in the southeast corner of the Reservation is inaccurate. It is also inconsistent with the flow directions indicated in Figure 7-23. The dominant flow direction in the vicinity of the villages of First, Second, and Third Mesa is from the north. Any flow from the southeast (as reflected in Figure 7-16) would be weak.

Page 7-15 of the Preliminary Report references Figure 7-17 which appears inaccurate. For example, the depth to water in the N-Aquifer along the northern and western side of Moenkopi District is less than 300 feet, not 1000 to 2000 feet as indicated. If the map reflects the C-Aquifer, it may be correct. Furthermore, Figures 7-17 and 7-18 rely on a report from 1974 based on estimates. Substantial relevant data has been collected since 1974. ADWR's analysis should reflect more recent data.

Page 7-15 of the Preliminary Report references Figure 7-19 showing a conceptual hydrologic model of the region. ADWR should explain why the T-Aquifer is not included.

#### 7.4.5 D Aquifer

Page 7-20 of the Preliminary HSR cites Cooley, 1969 in its discussion of the D-Aquifer. Truini and Longworth, 2003, is a more comprehensive and recent report regarding the D-Aquifer and should be cited rather than Cooley where the two reports address the same topic. Also, the text should address the underlying confining layer.

On Page 7-22 the Preliminary HSR states that the primary drinking water standard for arsenic was also exceeded at two Hopi public water supply wells (Polacca #5 and #6) which were completed in the D-Aquifer. They draw predominantly from the N-Aquifer. *See Exhibit 6.*

The Preliminary Report discusses the estimated storage volume of the D-Aquifer. Such a discussion should also consider and explain that retrievable groundwater is substantially less than the total volume in storage, and the volume of water in storage has little to do in many cases with the potential detrimental effects of pumping.

#### 7.4.6 N Aquifer

On page 7-22 the Preliminary Report states that water can be obtained from the Kayenta Formation. ADWR should note that the Navajo Sandstone is clearly the most important aquifer unit at most locations. The Kayenta Formation generally does not yield significant quantities of water to wells, and at many locations the Wingate Sandstone does not yield appreciable quantities of water or is not present.

The phrase "... at or below the top of the aquifer" on page 7-23 in second paragraph under "Flow Direction" should be modified to read: "... *at or below the top of the Navajo Sandstone.*"

Page 7-23 of the Preliminary Report states that the age of water in the N-Aquifer is estimated to be older than 10,000 years where the aquifer is confined and about 35,000 years where it is unconfined. This statement is incorrect and does not accurately reflect the information in Lopes and Hoffman, 1997. The groundwater ages of 10,000 years to 35,000 years relate to confined portions of the N-Aquifer only.

Pages 7-23 through 7-24 of the Preliminary Hopi HSR discuss recharge. The first sentence states that the N-Aquifer has a median recharge of 13,000 acre-feet per year. The range of recharge listed includes estimates based on different N-Aquifer model areas and differences over time. The "median" of these estimates is not informative and could be misleading. The Tribe proposes deleting the reference to a median and revising the first sentence in the first paragraph of the Natural Recharge and Discharge Section as follows: "*Recharge to the N Aquifer overall is estimated to range from 2,600 and 20,248 acre-feet per year. The recharge in the Shonto area, the main recharge area to the confined portion of the N-Aquifer, is estimated by Lopes and Hoffman to be 2,500 to 3,500 acre-feet per year.*"

Page 7-24 of the Preliminary HSR references Figures 7-24 and 7-25. ADWR should make clear to the reader that those figures show values assigned to grid cells in a model, and while they are based on some empirical data, they do not necessarily represent actual conditions.

On pages 7-25 and 7-26 the Preliminary Report discusses the estimated storage volume of the N-Aquifer. As noted above with respect to the D-Aquifer, such a discussion should also consider and explain that retrievable groundwater is substantially less than the total volume in storage, and the volume of water in storage has little to do in many cases with the potential detrimental effects of pumping.

The Western-Navajo Hopi N-Aquifer (WNHN) study and model are used throughout this section. This violates the Protective Order dated January 3, 2002, which states:

IT IS ORDERED that the Hopi/Western Navajo Water Supply Study shall not be used in any judicial proceeding in this Adjudication by any party to this Adjudication or by any representative of a party to this Adjudication.

All references to the model and study, including Figure 7-21 the third bullet and last paragraph on page 7-25 under the “Water in Storage” should be deleted.

On page 7-27 the Preliminary Report discusses measured hydrologic impacts from development. ADWR should point out that the wells that exhibit drawdown in Figure 7-27 are far outside the mining area, while the wells that have exhibited the rising water levels in Figure 7-28 are within the lease area, much closer to the center of pumping. It also would be useful for appropriate context to provide the drawdown portion of observed water levels for wells NAVOBS3 and NAVOBS6, rather than only the recovery portion of the curve. This information would give some indication of the drawdown effects near large pumping centers in the confined portion of the N-Aquifer.

Page 7-27 refers to Figure 7-29 which refers to “Betoothkin, Arizona.” The correct spelling of that location is Betatakin, Arizona. Also, the statement that “Pasture Canyon Springs appear to have declined by about . . . 10 gpm respectively,” should be clarified that the decline is based on values from the current USGS gage which, as discussed above regarding Page 7-13, does not capture the entire flow of all springs in Pasture Canyon.

On page 7-28 the Preliminary HSR makes a recommendation regarding the “best suited” model. This should be deleted. This conclusion is not needed and is inconsistent. For example, the PWCC model does a poorer job than the USGS model simulating observed water levels in the vicinity of the Hopi villages.

## **Chapter 8: Water Demands**

### **8.1 Agriculture**

#### **8.1.1 Quantification**

The annual irrigated acreage values shown in the Preliminary HSR Figure 8-1 appear to include crop or cultivated land but not irrigated pasture land, and therefore underestimate the quantity of acreage that is irrigated. The source of data for all years of the data in Figure 8-1 except 2005 is Table 9 of the Anderson report. Many of the annual acreage values in this Table 9 come from the 2004 Ferguson report. No mention is made of irrigated pasture. However, the report does mention an additional 5,750 acres of pasture were cultivated to improve forage. Based on the 2004 Hopi and U.S. claims, the range pasture category of irrigation makes up about 20% of the total historic irrigated acreage claim. Accordingly, there appears to be a significant

amount of current or historic irrigated pasture that is not included in the annual acreage values shown in Figure 8-1 of the Preliminary HSR.

The Preliminary HSR on page 8-3 indicates that the ADWR net irrigation requirement (NIR) figures for traditional farming are comparable to the “irrigation depletion” claimed by the United States and Hopi Tribe. It states that the average and maximum depletion claimed (derived from total claimed depletions and total claimed irrigated acres) of 0.61 and 0.99 acre-feet per acre respectively are within the range of the ADWR traditional farming NIR values of 0.35 to 0.86 acre-feet per acre. Depletions, however, are typically more than NIR, and include a portion of conveyance and on-farm losses which do not make it back to the stream as return flow. In the case of traditional farming, there would probably not be much conveyance losses because of the lack of conveyance facilities like canals, but there would be on farm or field irrecoverable losses such as seepage to groundwater which would be depletions. Hence, for traditional farming, depletions should be slightly more than NIR. Although the 0.61 to 0.99 acre-feet per “depletion rate” derived from the United States claim is slightly higher than the ADWR traditional farming NIR, historic irrigation on the Hopi Reservation has included both traditional farming as well as irrigation projects which have higher NIR values and depletions. Therefore, it is not correct to compare the United States reservation wide depletion rates to just traditional farming NIR and ignore historical project NIR.

Depletions and diversions should be determined as a part of the water right attributes.

The Preliminary HSR on page 8-3 indicates the Pasture Canyon service area has a claimed depletion rate of 1.81 acre-feet per acre, which is within the range of the ADWR modern farming NIR values. As pointed out above, depletion rate cannot be compared to NIR. Depletion not only includes NIR but also the portion of conveyance and on-farm irrecoverable losses which are not return flows. In addition, some of the Pasture Canyon service area along Moenkopi Wash also receives supplemental water by pumping from Moenkopi Wash when water is available. This impacts depletions in the Pasture Canyon service area.

The preliminary HSR on page 8-3 indicates that more modern methods of irrigation are being used near Moenkopi, and states that 179 acres are being served by Pasture Canyon Reservoir. This acreage figure is low (*see* comments on Section 8.1.3). In addition, the Hopi also farm part of the Upper Kerley Valley Irrigation Project (downstream of the Pasture Canyon project) which is a modern system of a diversion dam and canals. There are two major siphons which serve two distinct service areas. The second most downstream siphon can be repaired, and irrigation deliveries can resume.

#### 8.1.2 Agriculture, Historic (Pre-1985)

On page 8-5 the Preliminary Report discusses areas previously farmed by Hopi. Hopis farmed in Red Lake to the north (“Red Lake Plateau”). It also states that Hopis previously traveled as much as 45 miles to farm. Such long-distance farming also included fields in Sand

Spring, Burro Spring, Coyote Spring and Talahogan. Hopis continue to travel long distances to farm.

On page 8-5 the Preliminary HSR concludes that the traditional farming acreage per person has dropped from 2.5 acres prior to 1930 to 1.75 acres after 1930 to less than 1 acre in 2005. While this may be true in a general sense, the end of this paragraph speculates as to what the ratio of acres per person may be. Such speculation is unnecessary and misleading. The Tribe proposes deletion of the final two sentences which currently read as follows: "If it were assumed that 8,000 Hopi were living on the Reservation in 2005 and they successfully cropped 5,000 acres that year, the ratio now would be less than 1. The ratio would be even lower if the entire population of the Reservation at the time (about 12,000) were assumed."

Table 8-3 lists past and present irrigation projects on the Hopi Reservation. The Tribe makes the following comments on the Table:

a. The location of some of the irrigation projects is not clear. The HSR should include a map showing the location of the projects. Also, it appears that there are errors. For example, the table indicates the Lower Dinnebito Project lies 18 miles southwest of Hotevilla, but this places it at the Sand Springs project. The Lower Dinnebito project is described in *Arizona v. California* exhibits (and the facilities are still shown on USGS quad maps) as being located where Dinnebito Wash re-enters the Hopi Reservation about 8.5 miles northeast of Hotevilla.

b. While the table shows annual cropped acreage for each project, it does not reflect the maximum historical acreage served by each project.

c. The list of historical irrigation projects is incomplete and fails to note that some projects lie both on Hopi and Navajo land. Historic reports and interpretation of 1934 and 1954 aerial photos document several other historic irrigation projects and a much larger historic project irrigated acreage. Projects omitted from the Preliminary HSR list include: Begashibito 2, Upper Kerley Valley (joint Hopi/Navajo), Oraibi Delta (joint Hopi/Navajo), Polacca Wash (PW) 1, Polacca Wash 35, and Polacca Delta (joint Hopi/Navajo). A comprehensive list and map locating the historic projects will be supplied in the Tribe's Second Amended Statement of Claimant. ADWR should evaluate this information along with aerial photography from the 1930's through the 1950's (shortly after many of the projects were built) to determine the acreage cultivated when these projects were active, with special attention to above-average water years.

On page 8-6 the Preliminary Report discusses dams built by Mormons in Pasture Canyon and states that Navajos were using the irrigation when the government took ownership of Moenkopi. When Mormons built the irrigation system, there were no Navajos living in the area. Later the BIA came in and began farming in the area but didn't use the Pasture Canyon system.

Hopis were farming lands that are now on the Navajo Reservation, including east of Kerley Valley. No Navajos were using lands served by Pasture Canyon irrigation system.

Page 8-6 of the Preliminary HSR refers to a return in 1875 and afterward by Hopi “to fields [in Moenkopi] they had previously farmed before Navajo encroachment” suggesting that Hopi use of land in Moenkopi was not constant. The Anderson report does not support this inference. While it states on page 25 that one scholar concluded that Hopi could not remain there on a full-time basis because of the Navajo, he found that they continued to use the fields during farming seasons.

On page 8-6 the Preliminary HSR refers to the Chambers & Campbell, 1962 report as stating that Pasture Canyon irrigation system was serving an area of approximately 300 acres, but only 40% of this area (120 acres) was being cropped at that time. This did not include acreage farmed above Pasture Canyon Reservoir.

### 8.1.3 Recent

On page 8-9 it states that 74 fields surveyed were found to obtain their water from springs, and 5 fields were supplied by wells. During dry years, many farmers haul well water to fields, so the number of fields supplied by wells would be much more than 5.

On page 8-9 it states that “reclaimed water [from wastewater treatment plant] from the plant is planned to be used to irrigate Hopi and adjoining Navajo lands.” The wastewater treatment plant is now releasing water for irrigation use.

Page 8-9 of the HSR states that flows into Pasture Canyon Reservoir are presumably gauged by the BIA. Inflow into the Reservoir is not gaged. There is no gage measuring inflow to the Reservoir. The structure described in the Preliminary HSR is actually a diversion structure for conveying water to drinkers. As noted above regarding page 7-13, there is a USGS gage further upstream about 1.5 miles above the upper end of the Reservoir, but there are at least four springs between the gage and the Reservoir. The measured flow is also subject to losses from evaporation and transpiration before reaching the reservoir. Measurements by Chambers and Campbell in 1962 and the Tribe’s experts in 1992 just above the Reservoir indicate that inflow to the reservoir is larger than the flow at the USGS gage. These data indicate an inflow of 400 acre-feet per year. The inflow could be increased with watershed improvement measures.

Page 8-9 and Figure 8-3 of the preliminary HSR indicates that the Pasture Canyon Reservoir Irrigation Project serves 179 acres. There are some minor differences between Figure 8-3 and the GIS inspected field coverage. For example, Figure 8-3 shows some tracts between Highway 160 and Pasture Canyon Reservoir, while the GIS coverage does not. It is not clear whether Figure 8-3 and the 179-acre value are derived from the GIS coverage for the inspected field study, and if so, why there are differences in some of the tracts. These discrepancies should be explained in the final HSR.

The GIS coverage for the inspected field study provided by ADWR to the Tribe's experts has an outdated and erroneous column for tract (polygon) acres. While the acres column shows a total of 651 acres as on HSR Table 8-4, the true total area of polygons in square meters is shown as 2,467,206.3, which converts to 609.7 acres. It may be that some of the GIS polygons were modified but the acreage of the polygons was not recalculated. This would impact some of the values on Table 8-4. The Tribe's experts recalculated the polygon acreage and found a total of 609.7 acres which matched the square meters total. Using the recalculated polygon acres, the Tribe's experts obtained for the Pasture Canyon Reservoir Irrigation Project about 144 acres irrigated, 25 acres fallow, and 11 acres not irrigated for a total of 180 acres, which is slightly different from the 179 acres listed in the Preliminary HSR. The ADWR 2005 agriculture and riparian study GIS coverage shows a total of about 219 acres (202 acres active agriculture, 15 acres active ag or fallow, and 2 acres active fallow). Preliminary Tribal estimates of this acreage including both active and idle irrigation exceed 240 acres, a figure that will be finalized in the Tribe's amended claim.

The Preliminary HSR on page 8-9 and on Figure 8-3 indicates that there are 55 acres of recent irrigation of traditional farming in the Moenkopi area not served from Pasture Canyon. The Tribe's experts have preliminarily found much more than the 55 acres of non-Pasture Canyon system irrigation. Some of this acreage is on the Hopi south side of Moenkopi Wash within the Upper Kerley Valley Irrigation Project downstream of the Pasture Canyon project. This area was not included in the ADWR 2005 field inspected study, but the upper part of it does show up in the ADWR 2005 agriculture and riparian study. The upper part on the south side is still mostly active and is served by an active flume carrying water across Moenkopi Wash, but most of the lower south side is idle because the flume serving it washed away many years ago and has not been replaced. Another part of this acreage is in isolated tracts which are either served by pumping from Moenkopi Wash or are "traditional farm tracts" served from springs and small side tributaries of Moenkopi Wash upstream of the Pasture Canyon project area. In addition, some of the Pasture Canyon service area adjacent to Moenkopi Wash receives supplemental water pumped from Moenkopi Wash. Therefore not all this farming is traditional, and it exceeds 55 acres. The ADWR 2005 agriculture and riparian study showed about 142 acres of non-project agricultural land along Moenkopi Wash in the Moenkopi area. The exact amount of acreage has not yet finalized by the Tribe but will be reflected in the upcoming amended claim.

On page 8-11, while the Preliminary HSR correctly indicates that the January to April precipitation in 2005 was higher than normal, the primary growing season months of April to October precipitation was lower than normal. For Keams Canyon, the 2005 April to October precipitation was about 5.0 inches while period of record normal is about 6.2 inches. At Tuba City, the 2005 April to October precipitation was at least 4.0 inches compared to period of record normal of about 4.1 inches. At both stations, the May and June precipitation was well below normal with hardly any precipitation. Therefore, while there was good precipitation to plant crops in 2005, the crops may not have developed in May and June unless there was local

irrigation water available. Furthermore, a decade-long draught has likely temporarily reduced the total area farmed.

Four current or historic irrigation reservoirs have been preliminarily identified:

- 1) Pasture Canyon Reservoir—212 acre-feet capacity
- 2) Lower Lagoon Reservoir—121 acre-feet capacity
- 3) DW10 Reservoir (historic)—592 acre-feet capacity
- 4) DW11 Reservoir (historic)—481 acre-feet capacity

Evaporation loss is not yet calculated, but will be in the Tribe's amended claims. Exhibits 1 through 4 describe the calculations of the capacities of these reservoirs.

## 8.2 Domestic, Commercial, Municipal and Light Industrial

### 8.2.2 Historic (Pre-1985)

On page 8-14 the Preliminary HSR estimates historic DCMI use of 300 AFA based on population estimates and 10-20 gpcpd, confirmed by estimates of usage by persons who must haul water. ADWR should confirm that this estimate applies to the time period before the construction of municipal water systems described in initial paragraphs of this Section. If so, then the title should be changed to "Pre-1950." If not, then the estimate is too low because water use by persons using water from municipal water systems would consume greater amounts than those who must haul water.

### 8.2.3 Recent

For DCMI use, ADWR determined the recent use rate is between 10-43 gpcpd, based on 10-40 gpcpd rates published in some Hopi references (*see* page 8-13), and 32-43 gpcpd rates based on public water system use (292-501 AFA on Table 6-3) and reservation populations on Table 6-7 (*see* page 8-14). The Preliminary HSR compares this 292-501 AFA use to a claimed current use of 716 to 742 gpm (1154 to 1196 AFA) for domestic and municipal wells plus an additional amount for domestic springs (*see* page 8-15). The Tribe makes the following comments:

a. The 32-43 gpcpd rates for public water systems listed on page 8-14 are too low because they are apparently based on total population but do not include non-public water sources such as private domestic wells and springs, as acknowledged in the Preliminary HSR on page 8-15. Also, Table 6-3 indicates the amount of use from the spring serving Lower Moenkopi is unknown and hence is not included in the 292-501 AFA public use totals. These low rates of usage are the result of poor infrastructure and overcrowding of housing. It should also be noted

that if the 2004 water demand from Table 6-3 (445.3 AF) is divided by the 2004 on-Reservation population from Taylor in Table 6-7 (8000 people), the result is 49.7 gpcd.

b. ADWR apparently arrived at the 1154 to 1196 AF claimed amounts by summing the entire United States claimed amounts for those wells and springs that included domestic and municipal use. The Preliminary HSR notes that most of these wells and springs are also claimed for stock use, and the claims did not separate amounts for each use of multiple use wells and springs. This will be addressed in the Tribe's amended claims.

#### 8.2.4 Future

On page 8-16 the Preliminary Report states, "The future per capita use assumed in the [Hopi, United States] claims is within the range recently reported for large communities in the region. In 2000, the cities of Williams and Page had an estimated per capita use of 198 and 351 gpcd, respectively. For Flagstaff, per capita water usage was estimated at 120 gpcd in 2005 and 132 gpcd in 2002." First, the assumed future per capita use of 160 gpcd occurs not just in large communities, but in small communities as well (and Page is not a large community with population less than 7,000). Second, this 160 gpcd is conservative in the sense that it is constant over the planning period, i.e., does not increase over time. The Flagstaff figure may be depressed by the significant population of students at NAU. In addition to the data cited by ADWR, it is worth noting that water use in Tuba City is now 146 gpcd, not far below the 160 gpcd benchmark. While Tuba City has better infrastructure and housing conditions than Moenkopi and Kykotsmovi, it still suffers from the infrastructure deficiencies of most American Indian Reservations. Improved water supply, better housing, and economic development will certainly lead to higher levels of water use at Tuba City as well as at Moenkopi, Kykotsmovi, and other parts of the Hopi Reservation.

#### 8.4 Livestock

On page 8-19 the Preliminary HSR states that BIA has authority over Navajo still grazing the HPL. The Tribe enforces grazing regulations pursuant to contract with the Department of Interior.

#### 8.4.3 Recent

The lower quantification limit discussed on page 8-22 of the Preliminary HSR is based on livestock data from the recent drought period which depressed the number of cattle grazed.

In calculating recent livestock use ADWR states on page 8-22 that the capacities of breached stockpounds were not counted. *See* footnotes in Table 8-7. As discussed above, this is inconsistent with the reserved rights doctrine which holds that tribal rights are not lost through non-use. *See Gila V, supra*. The Tribe has the right to rebuild the breached impoundments.

It is unclear if ADWR used all verified wells which included stock use, or if ADWR used verified wells whose only claimed use was stock.

## 8.5 Recreation

### 8.5.1 Historic

On Preliminary HSR page 8-24 the reference for USDA should be 1981, not 1980.

Table 8-8 indicates the ADWR recreational lake capacities are smaller than both those in the Hopi claim and those published in the 1981 USDA study. This raises the question whether the ADWR capacities of the lakes are calculated based on their existing partially silted-in conditions or are they based on the original unsilted conditions. The capacities should be based on the unsilted condition. Also, Table 8-8 erroneously attributes to the USDA report a finding that Keams Lake is completely silted in. This finding related to "Upper Keams Lake," also known as Lake Maho. The USDA report states with respect to Keams Lake: "Lower Keams Pond is stocked each year with catchable rainbow trout and occasionally with catchable channel catfish. Substantial demand for recreational fishing exists in the area . . ." This facility continues to be stocked for fishing (as recently as March 2009) and used for recreational purposes.

### 8.5.2 Recent

As noted above in the comments on Chapter 4, ADWR should confirm whether its evaporation rates are gross or net lake evaporation rates.

## 8.7 Cultural/Ceremonial

On page 8-27 ADWR argues that the irrigated family gardens would only need 0.35-0.86 acre-feet per acre. These are the crop water duties that ADWR estimated for traditional Hopi agriculture, including dryland farms. The proposed plan for irrigated family garden plots calls for much more intensive irrigation than this using modern irrigation methods. The crop water duties the Tribe will be using in the upcoming amended claim will be much closer to project acreage values. ADWR should correct this mistake.

The comments in Section 7.3 regarding springs with unmeasured flow and springs which have been documented but are currently dry apply to this Section.

## 8.8 Riparian Evapotranspiration

### 8.8.1 Historic

Page 8-28 of the Preliminary HSR discusses the introduction of saltcedar to the riparian environments on the Hopi Reservation. Russian olive was also introduced from outside the Reservation.

### 8.8.2 Recent

Page 8-29 mentions species in riparian environments, including cottonwood, willow, Russian olive and saltcedar. Alkali sacaton and camelthor should also be included in this list. Also, ADWR's estimates for annual water demand of the riparian vegetation are based on a study from New Mexico. However, New Mexico is under a different climate regime than the Colorado Plateau. A composite of riparian water use values in the Four Corners states would be more appropriate, with strong consideration for evapotranspiration rates on the Hopi Reservation.

## **Chapter 9: ADWR's Analysis of Hopi Water Rights and Proposed Water Right Attributes for Past and Present Water Uses**

Chapter 9 is based on information presented in prior chapters (and appendices) in the Preliminary HSR. Accordingly, the Tribe's comments on previous chapters (and appendices) are incorporated into Chapter 9 and should be applied to its conclusions, proposed water right attributes and supporting discussion. In addition, the Tribe makes comments specific to Chapter 9 below. Furthermore, as noted above, the Tribe intends to file revised claims in the near future.

### 9.1.1 Agriculture

As discussed above, ADWR's estimates and water rights recommendations on page 9-2 and Table 9-1 of past/present agricultural use (350 to 7921 AFA) for traditional farming and (0 to 1582 AFA) for irrigation projects undercount actual uses principally for the following reasons: (a) some historic irrigation projects are omitted, and (b) irrigated pasture land is omitted. Also, the water rights attributes should include diversion and depletion amounts.

### 9.1.2 DCMI

The Tribe's DCMI claim includes past, present and future use as a single claim. It did not present a past and present use portion of the claim. Therefore, the Tribe notes that such an approach is inconsistent with the Tribe's claims as filed in the Adjudication.

#### 9.1.4 Livestock

As discussed above, ADWR's estimates and water rights recommendations on pages 9-3 and 9-4 and Table 9-1 underestimate Hopi livestock use for the following principal reasons: (a) stockponds with breached dams or berms were omitted, and (b) depletion was not included in the calculation.

There appears to be a conflict between Table 9-1 which indicates 159 claimed and 18 unclaimed wells for stock purposes, and Table 7-10 which identifies 170 claimed and 18 unclaimed wells for stock use. This conflict may be due to ADWR's allocation of wells claimed for multiple purposes between stock and domestic purposes.

#### 9.1.5 Recreation

As discussed above, ADWR's estimates and water rights recommendations on page 9-4 and Table 9-1 underestimate present Hopi recreational uses principally because ADWR's measurements of capacities of the recreational lakes are less than those claimed and less than those identified in the 1981 USDA study on the LCR basin (*see* Table 8-8).

#### 9.1.6 Ceremonial/Cultural

As discussed above, ADWR's estimates and water rights recommendations on page 9-4 and Table 9-1 underestimate present Hopi ceremonial and cultural uses because ADWR assumes no flow for documented springs with no measured flow. Hopi rights to spring flow should be estimated for documented springs even where there is no measured flow.

### 9.3 ADWR's Recommended Water Right Attributes

On page 9-12 the Preliminary Report states "Because the Court has not yet determined whether the Hopi are entitled to use surface water sources that do not cross the Reservation, and because the Court has not yet analyzed or quantified proposed future uses, ADWR cannot make a recommendation regarding whether the Hopi federal reserved water right extends to groundwater." This statement is unnecessary and should be deleted.

For the reasons explained above, the Tribe comments that ADWR underestimates the quantity of water used for past and present purposes by the Hopi Tribe.

## **Tables and Figures**

Most comments for tables and figures are already included in the comments on the various chapters. Additional comments are set out below.

In Figure 8-3 showing the Pasture Canyon irrigation system, the Hopi Reservation boundary is incorrect, as it seems to exclude the allotment area. In addition, there is additional irrigation not shown in the Hopi portion of the Upper Kerley Irrigation Project, as well as additional current or historic irrigation upstream of the Pasture Canyon area along Moenkopi Wash.

## **Appendix A-2: USA Adjudication Claims**

The first 50-60 pages of this appendix appear to be an unorganized mix of 1985, 1994 and 1995 claim material. These pages are followed by the 1985 claim (starting with the cover sheet 39-91441 (US) 11-29-85), the 1994 claim (cover sheet 39-91441 (US) 11-22-94), and then the 2004 claim.

The second and third sheets of Appendix A-2 are Statement of Claimant form 39-91442 filed by the Navajo Nation. It is not clear why they are included here.

The United States 1985 claim is missing part of Table 11, plus all of the tables following Table 11 of the 1985 Stetson Report.

## **Appendix A-4: Allotted and Other Lands**

This appendix contains allotment information submitted by the United States in August of 2002, and includes the size, location map, and irrigated acreage of each allotment (and other tracts) located along Moenkopi Wash served from Pasture Canyon. The Appendix omits a later letter submitted in September 5, 2002 by the United States (described in a footnote in the main Preliminary HSR Preliminary Report page 2-24) which clarifies the August 2002 submittal noting that only the "AR" tracts are allotments created by the allotment act while "TR" tracts are not allotments but are tracts still in Tribal trust that were assigned to individuals or families. This appendix should contain a copy of that September 5, 2002 letter.

## **Appendix A-5: Other Water Uses**

The first page of this appendix is a map that shows the allotments and Murphy tracts described in the June 3, 2008 letter at the end of Appendix A-4. It appears this map is a part of this letter and should be moved to Appendix A-4 following the above mentioned letter. This map is also not one of the two items described in the Preliminary HSR table of contents for Appendix A-5.

## **Appendix B: USGS Stream Gages on or near the Hopi Reservation**

USGS gage 09401265 Pasture Canyon Springs is not included in this Appendix because ADWR apparently does not consider this to be a stream gage but rather a gage measuring spring flow. The gage is discussed in the main Preliminary HSR Preliminary Report in section 7.3.2 spring discharge on pages 7-12 and 7-13.

## **Appendix C: Impoundments**

Pages C-6 and C-7 describe the ADWR method used to calculate pond capacity. For the ponds with field data, pond capacity was calculated as  $\text{capacity} = (\text{surface area}) \times (\text{berm height}) \times 0.4$ , where capacity is assumed to be ...“the maximum volume of water that could be stored by the impoundment when there is no discharge of water and regardless of the potential loss in storage due to siltation,” surface area is the field measured area in acres, berm height is the outside spillway crest or embankment height in feet, and 0.4 is the assumed pond shape factor. For capacity of ponds measured from photo analysis without field measurements, ADWR performed a regression analysis of the field data from 51 measured impoundments to arrive at an equation relating pond capacity to pond area, from which capacity of ponds identified from photos could be estimated from the pond area measured on the photos. Ponds with breached berms were assumed to have no capacity. The Tribe has the following comments on the capacity methodology:

- a. ADWR should not have assumed that there is no capacity for ponds with breached berms. Most breached berms or dams can be rebuilt, and the capacity should have been based on the potential rebuilt berm and pond. This would be consistent with the nature of reserved rights.
- b. It is not clear what surface area ADWR measured in the field, the existing surface area, or the potential maximum surface area at the top elevation contour of the spillway crest or embankment if there was no spillway. To meet the definition of capacity as the maximum stored volume, the area should have been the maximum pool area at the spillway crest or top of embankment if it had no spillway.
- c. Similarly, it is not clear what surface area was measured on the photos, the area at the existing pool level or the maximum pool level at spillway crest or top of embankment. If the pond surface area was measured at maximum pool, how was this done without analyzing the ponds in three dimensions using stereo photo analysis?
- d. Based on analysis of ponds visited in the field by both ADWR and the Tribe’s retained water resources experts, it appears that the ADWR capacity is generally lower than that of the capacity developed by tribal experts. This appears to be because ADWR’s measurements of pond depths were less than those of the Tribe’s experts and likely did not account for the usual construction practice of excavating the material for the berm from the pond water storage area.

This common practice was observed by the Tribe's experts in the field on the Hopi Reservation and other reservations in the southwest United States, as well as previous discussions with a stock pond contractor. If there was water and/or silt in the pond so that the original excavation in the pond storage could not be seen, the original pond depth could be easily underestimated without knowledge of common construction practices. It appears that ADWR estimated the depth for capacity calculations as the depth between the spillway and the bottom of the natural drainage. If embankment soil was excavated from the reservoir bottom and not the hillside (as it was in almost all Hopi ponds), then the depth should have been increased to account for the extra excavated depth. Based on field experience, this extra depth is commonly roughly equivalent to the spillway depth, and hence an estimate of the true depth can be estimated by taking the depth from the berm top to the downstream toe of the berm. This would have typically added roughly five feet to the ADWR depth estimate. NRCS criteria shows typical minimum depths should be 12 to 14 feet for the precipitation range on the Hopi Reservation. *See Exhibit 5.* Most ADWR field measured depths are markedly lower than this.

ADWR's regression equation used to estimate pond capacity is inaccurate. The ADWR internal report on the regression analysis indicates the coefficient of correlation  $r$  is 0.79, which is below the 0.80 to 1.00 normally used to describe strong correlation. In addition, the regression equation understates such estimates because it relies on data which, as described above, understates capacities of ponds which ADWR measured. The Tribe's experts did not rely on an artificial regression equation to determine capacity, but used stereo aerial photo analysis to estimate the area and depth of each claimed impoundment. The stereo estimated depths and areas were calibrated by actual field visits to many of the ponds.

Appendix C indicates that ADWR used a shape factor of 0.4 to calculate capacity. A shape factor of 0.4 is consistent with NRCS standards. However, the ADWR field sheets show factors of 0.25 to 0.33. ADWR should review its calculations to ensure that it applies a shape factor of 0.4.

The ADWR capacity of the 4 claimed recreational ponds are lower than both the claimed amounts and those listed in the USDA 1981 study and therefore should be re-evaluated. Similarly, the capacities of Pasture Canyon Reservoir and Lower Lagoon Reservoir are lower than those calculated by the tribal experts. *See previous comments on Chapters 7 and 8.*

#### **Appendix D: Springs**

Tables D-1 and D-2 include a column stating if water quality data are available for a spring. Following that column there are three columns for exceedences of various water quality standards. While this information may be useful, the quality of the water is not a factor in determining if the Hopi Tribe has a reserved right for the water.

The two columns under spring use in Table D-1 are confusing. In almost all instances, the use identified in the "Other Documented" column are already identified in the "Claimed" column. How are they "other" uses?

Table D-2 identifies several potentially unclaimed springs. These springs will be reviewed and may be included in the upcoming amended claim to be submitted. However, it is noted that for one facility only the general location is now known. If this spring is included in the amended claim and final HSR, would it be classified as "unverified"?

#### **Appendix E: Wells**

The same comments regarding water quality provided for springs also apply to the tables of wells.

The same comments regarding potentially unclaimed springs also apply to potentially unclaimed wells. In addition, some of the unclaimed wells listed in Table E-2 are included in Table E-1.

#### **Appendix F: ADWR Report on Consumptive Use of Crops**

Why does Figure 2.9 of Appendix F show both a higher and lower curve of GDD for each site if for GDD the only variable in its calculation is mean temperature?

There is some question whether Appendix F Figures 2.12 and 2.13 match the data in Appendix F Tables 2.6 to 2.9.

Is the reference for FAO24 Table 21 the correct table reference for the Kc curve for the DRY scenario?

The Appendix F Table 2-24 compares the ADWR NIR values to those claim values derived by taking average and maximum claimed depletion divided by total claimed acreage. As previously noted in comments on Chapter 8, this is not valid because NIR is not equal to depletions.

It is not clear whether ADWR's methodology accounts for the Hopi practice of planting corn in clumps when the calculating the NIR values for DRY condition.

It appears that ADWR did not develop NIR for irrigated pasture land which is irrigated by water spreading. The Tribe claims 7,522 acres of historic range pasture type irrigation.

### **Appendix G-3: 2005 Agriculture & Riparian Lands**

Although the accuracy assessment of the 2005 agriculture study involved 40% of the 514 fields mapped in the field, Table 2 of Appendix G-3 indicates this 40% involved only about 228 acres out of the total 5613 identified agricultural acres (or about 3.9%). ADWR should explain why only 40% of the field mapped irrigation was used in the accuracy assessment, and on what basis the 40% of the fields were selected. It would also help to know generally where this 228 acres was located (was most of it in the Moenkopi area or was it randomly spread across the reservation) and what proportion of the 228 acres is traditional farming versus project irrigation.

The difference between the different categories of active agriculture, active agriculture or fallow, and active fallow should be explained. ADWR should also explain assumptions about crop rotations in defining the category and analyzing the data and whether Hopi crop rotation methods were taken account.

It appears that ADWR did not include irrigated pasture land in the 2005 study. Such lands should have included.

### **Appendix G-4: Drainages Derived by ADWR**

In Appendix G-1 and Appendix G-3, the reduced quad map for Moenkopi shows a large blue area in the southeast portion of the quad. What does this area represent, or is this some type of error in generating the stream segments from the Digital Elevation Model (DEM) described in Appendix G-4?

### **ADWR Hydrographic Survey Groundwater Report Nelson (2008)**

The comment made above in Chapter 7 that the Western-Navajo Hopi N-Aquifer (WNHN) study and model may not be used in the Preliminary HSR because of the Protective Order dated January 3, 2002 applies to this report where they are cited throughout, including Chapter 6, Figures 3 through 5 and 25 through 28, and the storage estimate at the bottom of the first paragraph on page 8-1. The references to the WHHN study and model and all estimates, analyses or conclusions based on them should be removed from the report.

#### **2.4 D Aquifer Geologic Units**

On page 2-3 the report states that the thickness of D-Aquifer ranges from 100 feet in the northwest to 700 in the southeast to 1,300 feet near the center. These measurements appear to be of the thickness of all geologic units that may comprise a portion of the D-Aquifer. The sandstone units that produce water or potentially produce water have significantly less thickness as indicated, for example, by information provided in Truini and Longworth (2003).

## 2.5 N Aquifer Geologic Units

On page 2-4 the report describes the thickness of the N-Aquifer as measuring more than 1,200 feet northwest of Black Mesa. These measurements appear to be of the thickness of all geologic units. The units that produce water or potentially produce water have less thickness.

## 3.5 D Aquifer

The report discusses withdrawals from the D-Aquifer on pages 3-3 and 3-4 but omits withdrawals from Peabody wells. Some PWCC wells are screened across the D-Aquifer and obtain water from both the D- and N-Aquifer when pumped, as detailed in the PWCC modeling reports.

## 3.6 N Aquifer

On page 3-4 (and elsewhere) the report refers to the geologic unit (e.g. Navajo Sandstone) and is used interchangeably with the term aquifer (e.g. N-Aquifer). The top of the Navajo Sandstone (or other geologic unit) is not the same as the top of the aquifer. Where a water table occurs, the top of the aquifer is the water table, and unsaturated portions of the geologic formation should not be included in thickness computations or referred to as the aquifer. This point, which also has bearing on use of the terms "water table" and "potentiometric surface," should be clarified throughout the text to avoid potential confusion. For example, on page 3-4 in the second paragraph the report states "where the water table was higher than the top of the aquifer." This should be changed to read: "*where the potentiometric surface was higher than the top of the Navajo Sandstone.*"

On page 3-5 in the bottom paragraph the report states that the storage coefficient of a confined aquifer is the ratio of the specific storage and saturated thickness. The storage coefficient of a confined aquifer is the *product*, not the ratio, of the specific storage and saturated thickness.

## 3.7 C Aquifer

On page 3-6 of the report, ADWR should note the poor quality of C-Aquifer water under the Hopi Reservation. It is not potable.

## 3.8 Paleo-Hydrology

On page 3-7 report discussed recharge. The recharge values in the Shonto area from Lopes and Hoffmann (1996) should be specifically mentioned. They estimated current Shonto area recharge to be about 2,500 to 3,500 ac-ft/yr. This is the main recharge area to the confined portion of the N-Aquifer.

#### 4 Water Use Trends

On page 4-2 the report discusses withdrawals in the periods 1965-1972, 1973-1974, 1985, 1986-2004, 2005. ADWR should explain why these periods were selected.

The top paragraph on page 4-2 states that the PWCC production wells draw from the N-Aquifer. Some of the PWCC production wells are also screened in the D-Aquifer, and obtain a portion of their water from this aquifer. *See also* comment regarding Section 3.5.

#### 6 Groundwater Flow Models

The purpose of the discussion on page 6-1 and subsequent pages that recount the previous simulation results is not clear. The model simulations are outdated and do not appear to be applicable to this Adjudication and were not based on projected demands at issue in this Adjudication. This discussion should be removed.

#### 7 Estimate of Groundwater in Storage.

Chapter 7 estimates storage of the N-Aquifer. The report does not explain the value of such estimates. Such discussion should also consider how much of the estimated storage can actually be efficiently and economically recovered from beneath the Hopi Reservation.

#### 8 Summary and Conclusions

On page 8-1 the report states that mining operations at Peabody ceased and discusses water levels after the cessation. Although use of the slurry has ceased, mining operations have not ceased, and significant quantities of water are still used for mining operations.

On page 8-2 the report recommends that the PWCC model be used for future studies. This recommendation should be removed. The PWCC model is not as accurate as the USGS model in the vicinity of the Hopi Villages. On page 6-7 (bottom of second paragraph) the report quotes one of the model authors as making the recommendation that the model be improved prior to application in the vicinity of the Hopi villages. The observation that the PWCC model extends further southeast than the USGS model is a primary reason not to use it, and it is one of the reasons that the model does a poor job simulating water levels in the vicinity of the Hopi villages. The N-Aquifer southeast of the Hopi Villages is non-existent at many locations. The PWCC model assumes that some pumping from the Polacca area occurs in the D-Aquifer (in part) rather than from the N-Aquifer. Hopi's hydrologists have considered this issue in detail and believe that Polacca pumping is predominately from the N-Aquifer, although there may be some casing leakage at the production well. *See Exhibit 6.*

The summary of simulation results that begins at the bottom of page 8-2 and continues through page 8-5 should be removed. None of these simulations include Hopi or Navajo claims,

nor do they include updated predictive scenarios given current events on the ground. The referenced simulations were all conducted for purpose other than the present adjudication, and therefore there is no basis for reference as to what they do, or do not, imply.

On page 8-4 in Paragraph 5 the report concludes that the USGS and PWCC models overestimate water level declines in the Tuba City area and therefore overstate predicted declines in streamflow and spring discharge. The conclusion may be incorrect and at a minimum should be verified. An overestimation of groundwater declines will not necessarily overestimate reductions in stream flow and spring discharge because: (a) overestimation of water level declines may lead to dry cells during the predictive simulations, at which point the effects of continued pumping on surface water are artificially reduced (i.e. pumping associated with the dry cell location is effectively removed from the simulation), (b) If the overestimation of drawdown is due to a hydraulic conductivity that is too low, then the extent of the simulated cone of depression will also be artificially constrained. This condition may lead to the result that springs and portions of Moenkopi Wash that should experience depletion due to pumping may not, because the extent of the cone of depression is underestimated.

**Fred Anderson Consulting, Historical Research for a Hydrographic Survey Report of the Hopi Reservation (2008)**

The Hopi Tribe has served expert reports on topics addressed in this report in *In re Hopi Priority*. Those reports are: (1) Peter M. Whiteley, *The Importance of the Little Colorado River Drainage and its Water Resources to the Hopi* (2009); (2) Peter M. Whiteley, *Historic Hopi Use and Occupancy of the Little Colorado Watershed, 1540-1900* (2009); (3) Peter M. Whiteley, *The Historical Evolution of Navajo Occupancy Areas in the Southwest, with Particular Reference to Black Mesa and the Hopi Washes* (2009); (4) David J. Weber, *Hopi Land and Water Rights Under Spain and Mexico* (2009); (5) T.J. Ferguson, *Hopi Agriculture and Water Use* (2009); (6) E. Charles Adams, *Hopi Use and Development of Water Resources in the Little Colorado River Drainage Basin of Arizona: an Archaeological Perspective to 1700* (2009); (7) Whiteley, Peter M., Ph.D., *Reply Report I: re: The Myth of Late Arrival of the Navajo in the Southwest, by Alan S. Downer, Ph.D., and Diné Presence in the Little Colorado River Watershed: Pre-Columbian Times to c AD 1800, by Klara Kelley, Ph.D.* (June 2009); (8) Peter M. Whiteley, *Reply Report II: re: Federal Indian Policy and the Diné/Navajos, 1846 to the Present, by Jennifer Nez Denetdale, Ph.D.* (June 2009); (9) Peter M. Whiteley, *Reply Report III: re: two Reports by Historical Research Associates, Inc.: Report I: Water Use and Boundary Disputes in the Little Colorado River Basin, 1860s–1940s; Report II: A Brief Summary of Legislative and Judicial Attempts to Resolve the Hopi-Navajo Land Dispute, 1950s-1990s* (June 2009); and (10) T.J. Ferguson, *Tree Ring Dates and Navajo Settlement in the Little Colorado River Basin of Arizona* (June 2009).

### 1.1 Prehistoric Period

Anderson states that “some scholars have suggested that the[] early residents were the Hopi’s ancestors.” Adams states that “the Western Pueblo people of the upper Little Colorado River area, and the Anasazi of the plateau are all believed to be ancestral Pueblo groups and all probably contributed to the ancestry of the Hopi.” E. Charles Adams, *Hopi Use and Development of Water Resources in the Little Colorado River Drainage Basin of Arizona: an Archaeological Perspective to 1700* at 20. This is consistent with Hopi oral tradition which firmly establishes the relationship between modern Hopi and the *Hisatsinom* the Hopi ancestors who lived throughout northern Arizona.

#### 1.2.5 Standoff with Spain (1700-1821)

On page 15 the report states that at the time of the Escalante and Garces expedition in 1776 Navajos “were moving onto land surrounding the Hopi mesas.” While there is evidence that Navajos were to the east of Hopi at that time (at some distance) there is “no indication of any Navajo presence to the west or north of Hopi country.” Whiteley, *The Historical Evolution of Navajo Occupancy Areas in the Southwest, with Particular Reference to Black Mesa and the Hopi Washes* at 23.

#### 1.3.2 Relations with Other Tribes

On page 21 the report states “[b]y the early 1800s, Navajo settlements could be found on Black Mesa, the Kaibito Plateau, the Painted Desert and other lands surrounding the Hopi mesas.” Whiteley concludes that it is unlikely that in the early 1800s Navajos were in Black Mesa, noting that Navajos needed to conduct raids from a distance in order to retreat, as far as the Lukachukai Mountains. Whiteley, *The Historical Evolution of Navajo Occupancy Areas in the Southwest, with Particular Reference to Black Mesa and the Hopi Washes* at 45, 55. Tree-ring data suggest a mid-nineteenth century date for Navajo settlement on Black Mesa. Ferguson explains: “tree-ring dates indicate that a few Navajos first occupied Black Mesa in the early 1840s, and this was followed by a movement to areas northwest and southeast of the Hopi Mesas during the early 1860s, when Navajos fled from military campaigns waged by the U.S. Army. More extensive Navajo occupation began on Black Mesa, at the head of the Moenkopi Wash, and along the upper Little Colorado River after the release of Navajos from Fort Sumner in 1868, as the Navajo people began to slowly resettle the areas they had first occupied during the 1860s when they sought to evade capture by the U.S. Army.” Ferguson, *Tree Ring Dates and Navajo Settlement in the Little Colorado River Basin of Arizona* at 1-2.

#### 2.1.3 Creation of the Reservation

On page 32 the report discusses the purpose of the establishment of the 1882 Reservation, noting that the language permitting settlement of “other Indians” was boilerplate. Whiteley demonstrates that the original intent of the 1882 Hopi Reservation was, *inter alia*, to protect the

Hopi from Navajo encroachment, and to prevent the latter from trespassing on the rights and resources of the former. Whiteley, *Reply Report III* at 4. Also, its boilerplate language authorizing the settlement of “other Indians” was included as a part of policies then favored by the government to permit deliberate Secretarial removal of Indians to a reservation. *Id.* at 8. However, “[f]rom events in the late 1880s involving direct action by the Secretary of the Interior, it is incontrovertible that the ‘such other Indians’ clause did not refer to Navajos.” *Id.*

### 2.6.2 Indian Claims Commission

This section discusses the Indian Claims Commission decisions. The Tribe notes that the final judgment of the Claims Commission on Hopi’s claims did not rest on the findings and conclusions in that decision discussed in the report. The Hopi Tribe and the United States settled the case while the Tribe’s petition for review of the decision cited above was pending before the United States Supreme Court. *See* 429 U.S. 1030 (1976) (order dismissing petition under then Supreme Court Rule 60). The parties expressly stipulated that the judgment would have no preclusive effect, and the Claims Commission entered judgment in accordance with the stipulation. 39 Ind. Cl. Comm. 204, 222 (Dec. 2, 1976) (Findings 7 and 9). The 1970 decision never became final.

### 3.1.1 Navajo Migrations

On page 58 the report concludes that “[b]y the time the Navajo Reservation was established in 1868, there is no doubt that the Navajo settlement area had expanded to the point where it completely surrounded the Hopi mesas.” Whiteley reaches a different result. In his exhaustive review of the contemporaneous accounts of the location of Navajos, Whiteley shows that the westernmost boundary of regular Navajo settlement prior to the establishment of the 1868 Navajo reservation was the Pueblo Colorado wash and the Wide Ruins area to the south, with some stockgrazing northwest of Canyon de Chelly at the Calabasa and Vaca Mountains. Whiteley, *The Historical Evolution of Navajo Occupancy Areas in the Southwest, with Particular Reference to Black Mesa and the Hopi Washes* 71, map accompanying 71. To be sure, during the military campaign against the Navajo during the late 1850s and early 1860s some Navajos moved somewhat further north west, to Skeleton Mesa, the Klethla Valley and Navajo Mountain, as well as onto Black Mesa, and even as far as the Grand Canyon and the San Francisco Mountains, *id.* at 70, 76, but, with the apparent exception of Skeleton mesa and the Klethla Valley, expeditions to these areas showed little signs of Navajo habitation. *Id.* at 760-78. During the final push of the military campaign to subdue the Navajos in 1864, many Navajos did flee to the Hopi washes and mesas, where they resided temporarily while the U.S. military sought to capture them, *id.* at 85-89, but the short term residence of very few small groups of Navajos does not indicate that the Navajo settlement area surrounded the Hopi mesas. To the contrary, the established line of Navajo settlement consistently along the Chinle wash and the Pueblo Colorado wash. *Id.* at map accompanying p. 6, map accompanying p. 71, which were

well east of Black Mesa. And there appears to have been no Navajo settlements to the west of the mesas, which would be necessary for the Hopi mesas to have been completely surrounded.

#### 3.1.4 Hopi-Navajo Relations after the Navajo War

On page 65 the report states “[m]uch of the reservation was, at the time of its creation, occupied not by Hopis but by Navajos.” This is incorrect. To be sure, after the creation of the 1868 Navajo reservation, a significant number of Navajos refused to remain within its boundaries and moved westward, encroaching on historically Hopi areas. Whiteley, *Historic Use and Occupancy of the Little Colorado Watershed, 1540-1900* at 81. See also Whiteley, *Historical Evolution of Navajo Occupancy Areas* at 92. But as late as 1876, the Navajo population remained mainly to the east of the Hopi people. Whiteley, *Historic Use and Occupancy of the Little Colorado Watershed, 1540-1900* at 79. And the Navajos that did move into Hopi areas, such as Black Mesa, did so on a largely seasonal basis. Whiteley, *Historical Evolution of Navajo Occupancy Areas* at 90-91. Moreover, Navajo movement onto the southern parts of the Hopi Reservation of 1882 did not occur until the 1890s, see Whiteley, *Historical Evolution of Navajo Occupancy Areas* at 92.

#### 4.5 Federal Irrigation and Agricultural Projects

##### 4.5.1 Early Projects

On page 127 the report states, “[i]n the 1930s several irrigation projects were built on the Hopi washes. The Hardrocks, or Lower Oraibi Wash, project was built as a Navajo farm unit in the 1930s but never used. In 1942 it was turned over to the Hopi. It included a masonry dam, gates, and ditches to serve up to three hundred irrigable acres. Neither Ferguson nor Whiteley indicated that this land was ever actually irrigated by Hopis (IIS 1943; IIS 1944:4).” In fact, Laura Thompson reported that Hardrock was farmed by Hopis. Ferguson explains: “In 1946, in a report prepared for Indian Service administrators, Laura Thompson reported there were 7,130 acres under cultivation. A total of 6,967 acres were cultivated using floodwater and dry farming techniques, while 163 acres were irrigated, including 11 acres of irrigated village gardens, 5 acres of irrigated school gardens, and 147 acres in Irrigation Division Projects at Hardrock, Jeddito, and Phillips Farms.” Ferguson, *Hopi Agriculture and Water Use* at 172.

On page 129 the report states: “Moenkopi was farmed by Hopis in the past, but not permanently occupied.” Moenkopi was seasonally occupied during the growing season in the 19<sup>th</sup> century, and probably earlier. By the late 19<sup>th</sup> century, the Hopis established a permanent settlement at Moenkopi. See Ferguson, *Hopi Agriculture and Water Use* at 133.

**Conclusion**

The Hopi Tribe will provide ADWR new information regarding its claims and the matters addressed in the Preliminary HSR as it becomes available. The Tribe reserves the right to supplement information provided to date prior to issuance of the final HSR.

The Hopi Tribe looks forward to working with ADWR as the Adjudication proceeds. Please do not hesitate to contact us with any questions regarding these comments.

Sincerely,

A handwritten signature in black ink that reads "Colin Cloud Hampson" with a long horizontal line extending to the right.

Harry R. Sachse  
Colin Cloud Hampson  
A. Scott Canty

**Kathleen A. Donoghue**

**From:** Colin C. Hampson [champson@sonosky.com]  
**Sent:** Tuesday, June 30, 2009 4:14 PM  
**To:** Scott M. Deeny  
**Cc:** Richard Burtell; 'Harry R. Sachse'; SCanty0856@aol.com; Vanessa.Willard@usdoj.gov; 'Guarino, Guss (ENRD)'; 'Joelynn Roberson'  
**Subject:** RE: Hopi Tribe Comments on Preliminary Hopi HSR - Exhibits  
**Attachments:** Hopi Comments on Prelim Hopi HSR - Exhs 1-7 (complete set).pdf

Scott,

Attached are the exhibits to the Hopi Tribe's comments on the Preliminary HSR.

Regards,

Colin Cloud Hampson  
Sonosky, Chambers, Sachse, Endreson & Perry, LLP  
Symphony Towers  
750 B Street, Suite 3130  
San Diego, CA 92101  
(619) 546-5585  
(619) 546-5603 (direct)  
(619) 546-5584 (fax)  
(619) 855-7050 (cell)

# **EXHIBIT 1**

ELEVATION-AREA-CAPACITY DATA FOR THE UPPER FASTURE CANYON RESERVOIR NO. 1014 CITY

ELEV. (FEET)	AREA (AC)	CAPACITY (AF)	TOTAL DEPTH (FEET)	CONC. DEPTH (FEET)
4872.0	1.71	0.7	0.0	1.6
4873.0	3.82	1.7	0.0	5.5
4873.5	5.71	2.3	0.0	8.4
4874.0	5.60	5.6	0.0	14.7
4874.5	5.79	8.2	0.0	0.0
4875.0	6.05	11.0	0.0	0.0
4875.5	7.55	14.8	0.0	0.0
4876.0	8.53	18.0	0.0	0.0
4876.5	9.55	23.4	0.0	0.0
4877.0	10.55	28.7	0.0	0.0
4877.5	11.79	34.0	0.0	0.0
4878.0	13.03	40.2	0.0	0.0
4878.5	14.26	47.1	0.0	0.0
4879.0	16.70	54.5	0.0	0.0
4879.5	18.09	63.0	0.0	0.0
4880.0	19.77	73.0	0.0	0.0
4880.5	21.55	83.4	0.0	0.0
4881.0	24.01	94.9	0.0	0.0
4881.5	26.18	107.8	0.0	0.0
4882.0	28.42	121.3	0.0	0.0
4882.5	29.07	135.3	0.0	0.0
4883.0	29.71	150.0	0.0	0.0
4883.5	30.57	165.2	0.0	0.0
4884.0	31.03	180.5	0.0	0.0
4884.5	31.70	195.2	0.0	0.0
4885.0	32.57	212.3	0.0	0.0

Notes:

- \* Area shown on P75 "Phase 2 Part 3 Improvements to Pasture Canyon Reservoir" drawings by L.H. Bell & Assoc. Areas approx. verified OK by HKH measurements from contour map shown in the above drawings.
- \*\* Areas determined by estimating contours below el. 4882 on contour map referenced above and then planimetry these estimated contours.
- NWS el. = 4885 = spillway crest el.

ELEVATION-AREA-CAPACITY DATA FOR THE UPPER FASTURE CANYON RESERVOIR NO. 1014 CITY

ELEV. (FEET)	AREA (AC)	CAPACITY (AF)
4872.0	1.71	0.7
4873.0	3.82	1.7
4873.5	5.71	2.3
4874.0	5.60	5.6
4874.5	5.79	8.2
4875.0	6.05	11.0
4875.5	7.55	14.8
4876.0	8.53	18.0
4876.5	9.55	23.4
4877.0	10.55	28.7
4877.5	11.79	34.0
4878.0	13.03	40.2
4878.5	14.26	47.1
4879.0	16.70	54.5
4879.5	18.09	63.0
4880.0	19.77	73.0
4880.5	21.55	83.4
4881.0	24.01	94.9
4881.5	26.18	107.8
4882.0	28.42	121.3
4882.5	29.07	135.3
4883.0	29.71	150.0
4883.5	30.57	165.2
4884.0	31.03	180.5
4884.5	31.70	195.2
4885.0	32.57	212.3

PLANIMETER SHEET--HKM ASSOCIATES

Job No. 34137.169 BY DRS Date 6/30/70

Job Name Hopi - Pasture Canyon - 1

Description of Areas Upper Pasture Canyon Res

Scale of map/drawing 1" = 100' baseline 1" = 50' on BY (not say)

Planimeter Type

Conversion Constant/Factor  $(\frac{100 \text{ ft}}{1 \text{ in}})^2 \times \frac{94.2}{1571} \times \frac{1}{43888} = .00315$

Description	Cumulative Planimeter Readings	Called out Area			
1x around	2x around	3x around	average	Area	
100 ft Blue line Drive	1571	3142	4713	1571	
CA Gull House 3150	2067	4134	6201	2067	
Red Area EL 4882	2861	5722	8583	2861	28.43
EL 4885	3241	6482	9723	3241	23.7
Notes: 4884 & 4886 Contour not entirely shown on drawing					
200 ft Drive					
CA Gull House 3150	8218	16436	24654	8218	
EL 4882	2861	5722	8583	2861	28.43
This is essentially the same as above					
House associated in interpolated contours	198	396	594	198	
4872	454	908	1362	454	1.38
4874	908	1816	2724	908	2.87
4876	1362	2724	4086	1362	4.29
4878	1816	3632	5448	1816	5.71
4880	2270	4544	6818	2270	7.14
Conclusion: Use areas called out on drawing for EL 4882 & 4885					
Use in interpolated areas for contours below 4882 w.e.					
4872	454	908	1362	454	1.38
4874	908	1816	2724	908	2.87
4876	1362	2724	4086	1362	4.29
4878	1816	3632	5448	1816	5.71
4880	2270	4544	6818	2270	7.14



## **EXHIBIT 2**

SECTION-AREA-CAPACITY USING THE COEFF. METHOD

SITE: LAGOON RESERVOIR USING MEASURED AREAS FROM DESIGN DWGS

FELEV. (FEET)	AREA (SQ)	DEPTH (FEET)	CAPACITY (MG)	CALC. AREA (SQ)	CALC. CAPACITY (MG)
4791.5	0.0	0.0	0.0	0.0	0.0
4792.0	11.2	0.5	50.8	11.2	1.5
4792.5	11.4	1.0	70.1	11.4	7.5
4793.0	11.6	1.5	57.9	11.6	13.3
4793.5	11.9	2.0	49.1	11.9	19.2
4794.0	12.1	2.5	41.2	12.1	25.2
4794.5	12.3	3.0	34.2	12.3	31.3
4795.0	12.4	3.5	31.8	12.4	37.0
4795.5	12.6	4.0	28.8	12.6	43.7
4796.0	12.8	4.5	25.8	12.8	50.1
4796.5	13.0	5.0	22.8	13.0	56.9
4797.0	13.2	5.5	20.1	13.2	63.1
4797.5	13.5	6.0	17.5	13.5	69.8
4798.0	13.7	6.5	15.1	13.7	76.6
4798.5	14.0	7.0	12.8	14.0	83.5
4799.0	14.4	7.5	10.6	14.4	90.6
4799.5	14.7	8.0	8.5	14.7	97.9
4800.0	15.1	8.5	6.5	15.1	105.3
4800.5	15.5	9.0	4.5	15.5	113.0
4801.0	15.9	9.5	2.5	15.9	120.8
4801.5	16.2	10.0	0.5	16.2	128.8
4802.0	16.6	10.5	0.0	16.6	137.0
4802.5	17.1	11.0	0.0	17.1	145.5
4803.0	17.7	11.5	0.0	17.7	154.2
4803.5	18.2	12.0	0.0	18.2	163.1
4804.0	18.8	12.5	0.0	18.8	172.4
4804.5	19.4	13.0	0.0	19.4	182.0
4805.0	20.0	13.5	0.0	20.0	191.8

NWS elev. ?  
Overflow Pps. Invert

SECTION-AREA-CAPACITY USING THE COEFF. METHOD

SITE: LAGOON RESERVOIR USING MEASURED AREAS FROM DESIGN DWGS

FELEV. (FEET)	AREA (SQ)	DEPTH (FEET)	CAPACITY (MG)	CALC. AREA (SQ)	CALC. CAPACITY (MG)
4791.0	0.0	0.0	0.0	0.0	0.0
4791.5	11.2	0.5	50.8	11.2	1.5
4792.0	11.4	1.0	70.1	11.4	7.5
4792.5	11.6	1.5	57.9	11.6	13.3
4793.0	11.9	2.0	49.1	11.9	19.2
4793.5	12.1	2.5	41.2	12.1	25.2
4794.0	12.3	3.0	34.2	12.3	31.3
4794.5	12.4	3.5	31.8	12.4	37.0
4795.0	12.6	4.0	28.8	12.6	43.7
4795.5	12.8	4.5	25.8	12.8	50.1
4796.0	13.0	5.0	22.8	13.0	56.9
4796.5	13.2	5.5	20.1	13.2	63.1
4797.0	13.5	6.0	17.5	13.5	69.8
4797.5	13.7	6.5	15.1	13.7	76.6
4798.0	14.0	7.0	12.8	14.0	83.5
4798.5	14.4	7.5	10.6	14.4	90.6
4799.0	14.7	8.0	8.5	14.7	97.9
4799.5	15.1	8.5	6.5	15.1	105.3
4800.0	15.5	9.0	4.5	15.5	113.0
4800.5	15.9	9.5	2.5	15.9	120.8
4801.0	16.2	10.0	0.5	16.2	128.8
4801.5	16.6	10.5	0.0	16.6	137.0
4802.0	17.1	11.0	0.0	17.1	145.5
4802.5	17.7	11.5	0.0	17.7	154.2
4803.0	18.2	12.0	0.0	18.2	163.1
4803.5	18.8	12.5	0.0	18.8	172.4
4804.0	19.4	13.0	0.0	19.4	182.0
4804.5	20.0	13.5	0.0	20.0	191.8

2

PLANIMETER SHEET--HKM ASSOCIATES

Job No. BM157.164 By \_\_\_\_\_ Date \_\_\_\_\_

Job Name Hopi Irr. Sta. Reservoir nr. Ploenkopi

Description of Areas Areas for elev. area - corp

Scale of map/drawing See below

Planimeter Type basice

Conversion Constant/Factor  $\frac{1}{100} \text{ Cont.} = \frac{10000}{10000} \text{ Cont.} = 1.00133 \text{ (read)}$   
 $\frac{1}{100} \text{ Cont.} = \frac{10000}{10000} \text{ Cont.} = 1.00133 \text{ (read)}$

Description	Planimeter Readings			average	Design Area	IHS Drop
	1x	2x	3x			
Calibration	1575	3146	4718	1575		
Lagoon Reservoir	Scale 1" = 100' - Design Drawg					
4792	111	2237	3355	1118	0	
94	120	2415	3624	1208	162	
66	1279	2559	3838	1279	178	
4800	1370	2741	4112	1371	146	
02	1508	3047	4625	1508	151	155
01	1664	3347	4970	1663	166	167
1205 Top Lim	1825	3736	5653	1824	188	
	2002	4003	6005	2003	200	
Lagoon Reservoir	Scale 1/4" = 100' (Sheeted) - IHS Drawg					
4798	1325	2770	4157	1325	1525	
4800	1462	3125	4387	1462	1462	
1802	1548	3093	4640	1547	1547	
	1668	3335	5002	1668	1668	



From HHS Drwg  
of Upper Moentop  
Water Sewer  
As built



10/14/1956



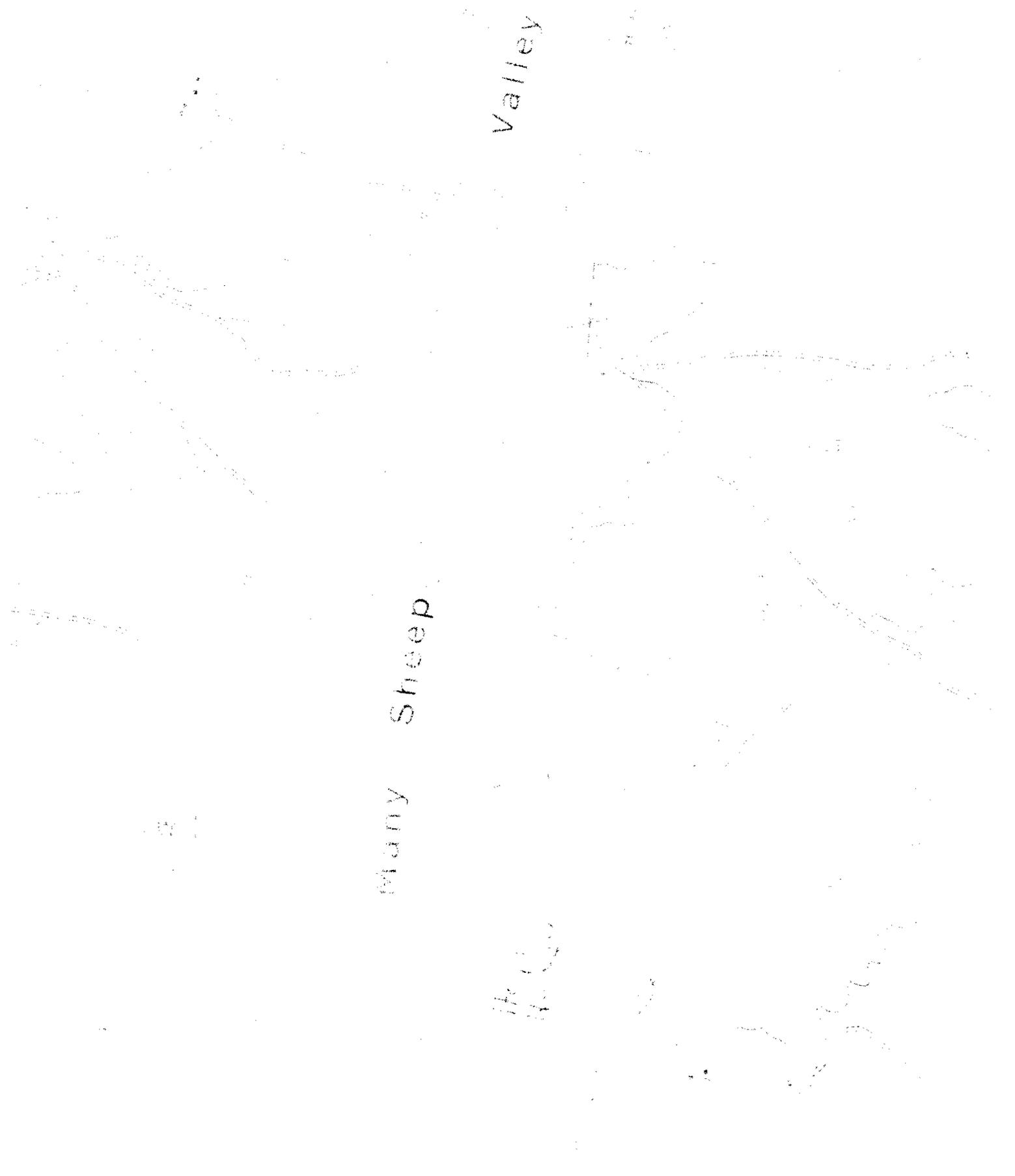
## **EXHIBIT 3**



Valley

Many Sheep

the





## **EXHIBIT 4**

ELEVATION-AREA-CAPACITY USING THE CONIC METHOD

SITE: Historic Dam on Dinnebio Wash at HIA Site DW10

INPUT ELEV. (FEET)	INPUT AREA (AC)	TOTAL DEPTH (FEET)	CONE DEPTH (FEET)	INC HT TO NEXT ELEV	INC HT + DEPTH	-ELEV + DEPTH	AREA * DEPTH	NEXT AREA
6125	0	0.0	0.0	15.0	-6125.0	15.0	0.0	8.4
6140	6.4	15.0	13.2	20.0	-6126.8	33.2	111.1	53.0
6160	53	35.0	16.0	10.0	-6144.0	26.0	847.6	140.0
6170	140	45.0	0.0	0.0	-6170.0	0.0	0.0	0.0

Note: Countour 6170 estimated between contours 6160 & 6180

5/5/2009

ELEVATION-AREA-CAPACITY USING THE CONIC METHOD

SITE: Historic Dam on Dinnebio Wash at HIA Site DW10

ELEV. (FEET)	CALC. AREA (AC)	CALC. CAPACITY (AF)
6125.0	0.0	0.0
6126.0	0.0	0.0
6127.0	0.1	0.1
6128.0	0.3	0.3
6129.0	0.6	0.8
6130.0	0.9	1.6
6131.0	1.3	2.7
6132.0	1.8	4.3
6133.0	2.4	6.4
6134.0	3.0	9.1
6135.0	3.7	12.4
6136.0	4.5	16.6
6137.0	5.4	21.5
6138.0	6.3	27.3
6139.0	7.3	34.1
6140.0	8.4	42.0
6141.0	9.7	51.1
6142.0	11.1	61.5
6143.0	12.6	73.3
6144.0	14.2	86.8
6145.0	15.9	101.9
6146.0	17.7	118.7
6147.0	19.6	137.4
6148.0	21.6	158.0
6149.0	23.7	180.7
6150.0	25.9	205.5
6151.0	28.2	232.5
6152.0	30.6	261.9
6153.0	33.0	293.7
6154.0	35.6	328.0
6155.0	38.2	364.9
6156.0	41.0	404.5
6157.0	43.9	446.9
6158.0	46.8	492.3
6159.0	49.9	540.6
6160.0	53.0	592.0
6161.0	56.8	648.4
6162.0	67.1	711.8
6163.0	74.7	782.7
6164.0	82.8	861.4
6165.0	91.3	948.5
6166.0	100.2	1,044.2
6167.0	109.5	1,149.1
6168.0	119.3	1,263.5
6169.0	129.4	1,387.8
6170.0	140.0	1,522.5



## **EXHIBIT 5**

SCS ENGINEERING FIELD MANUAL

CHAPTER 11. PONDS AND RESERVOIRS

Compiled by: George M. Renfro, Agricultural Engineer, SCS, Fort Worth, Tex.

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A check should be made to insure that no buried pipelines or cables exist in the construction area. These might be broken or punctured by the excavating equipment, resulting not only in damage to the utility but in injury to the operator of the equipment as well. Where such a site must be used, the utility owners should be contacted prior to foundation investigation or construction.

## 5. PRELIMINARY SITE STUDIES

In addition to the considerations mentioned for the selection of a pond location, there are other physical characteristics of the drainage area and the pond site which should be investigated before the final selection is made.

### ADEQUACY OF THE DRAINAGE AREA

Where surface runoff is the main source of water supply, the contributing drainage area should be large enough to yield sufficient runoff to maintain the water supply in the pond during all periods of intended use. The drainage area should not be so large, however, as to require large and expensive overflow structures to bypass runoff safely.

The amount of runoff that can be expected annually from a watershed of a given area depends on so many factors that no set rule can be given for its determination. The physical characteristics of the watershed that have a direct effect on the yield of water are land slopes, soil infiltration, vegetal cover and surface storage. Storm characteristics such as the amount, intensity and duration of rainfall also affect water yield. All of these characteristics vary widely throughout the United States.

Exhibit 11-1 can be used as a general guide for estimating the size of a watershed required for each acre-foot of capacity in a pond or reservoir to maintain normal pool level, if more precise local data is not available. The map does not apply when ponds are used for irrigation.

### MINIMUM POND DEPTH

For a permanent water supply, it is necessary to provide sufficient water depth to meet the intended use and to offset seepage and evaporation losses. These losses vary in different sections of the country and also from year to year in any section. Table 11-3 shows recommended minimum depths of water for farm ponds, assuming normal seepage and evaporation losses. Greater depths are desirable where a year-round water supply is essential or where seepage losses may exceed three inches per month. See State Standards and Specifications for local minimum depths.

Table 11-3. Recommended minimum depths of ponds and reservoirs

Climate	Annual Rainfall (inches)	Minimum Water Depth Over 25 percent of the Area (feet)
Superhumid	Over 60	6
Humid	40 - 60	8
Subhumid - Moist	30 - 40	9
Subhumid - Dry	20 - 30	10
Semiarid	10 - 20	12
Arid	Under 10	14

#### DRAINAGE AREA PROTECTION

To maintain the required depth and capacity of a farm pond, it is necessary that the inflow be reasonably free from sediment. The best protection is adequate erosion control on the contributing drainage area. Land under a cover of permanent vegetation, such as trees or grasses, makes the most desirable drainage area. If such an area is not available, cultivated areas that are protected by necessary conservation practices, such as terracing, contour tillage, strip-cropping, conservation cropping systems, vegetated desilting areas, and other soil-improvement practices, may be utilized as a last resort. Allowance should be made for the expected sedimentation during the effective life of the structure.

#### ADEQUACY OF POND CAPACITY

To insure that the water stored in a farm pond will be adequate to satisfy the intended uses, a reasonable estimate of the pond capacity should be made. The following is a simple method of estimating capacity.

The pond-full water elevation is established and the waterline is staked at this elevation. The widths of the valley at this elevation are measured at regular intervals and these measurements are used to compute the pond-full surface area in acres. The surface area is multiplied by 0.40 times the maximum water depth at the dam. For example, a pond with a surface area of 3.2 acres and a depth of 12.5 feet at the dam would have an approximate capacity of  $0.4 \times 12.5 \times 3.2 = 16.0$  ac.ft. (1 acre-foot = 325,857 gallons). If a more accurate answer is required, the surface area at successive intervals of elevation may be determined and the average end-area method may be used to compute the volume.

### 6. ENGINEERING SURVEYS

Once the location of the pond or reservoir has been determined, sufficient engineering surveys should be made so that the dam, spillway and other features of the pond can be planned.

Surveys for embankment-type ponds normally will consist of a profile of the centerline of the dam, a profile of the centerline of the earth

## **EXHIBIT 6**



Daniel B. Stephens & Associates, Inc.

## MEMORANDUM

TO: Paul Clark, OSM

FROM: Neil Blandford and Chris Wolf

DATE: June 20, 2006

SUBJECT: Summary of Well Completion Data for Polacca Wells No. 5 and 6

Water supply wells for the Village of Polacca were investigated by Daniel B. Stephens & Associates, Inc (DBS&A) to determine the source of elevated total dissolved solids (TDS) and the lithology of water producing zones. DBS&A reviewed existing records and conducted a borehole geophysics analysis (DBS&A, 1998b). The primary issues investigated were the quality of well completion and sources of water in the well. The primary aquifer at Polacca is the Navajo Sandstone aquifer system (N-aquifer). The Dakota Sandstone aquifer system (D-aquifer) is stratigraphically higher and is shallower than the N-aquifer. The N-aquifer produces high-quality (low-TDS) water, but the D-aquifer contains poorer quality groundwater and is typically "cased off" to prevent mixing of water between the aquifers.

### Well Completion

Polacca wells No. 5 and 6 were installed in 1986 within 500 feet of each other. The wells are telescoped from a 10-inch casing to an 8-inch casing. The 10-inch casing is grouted in the annular space. The 8-inch casing has no annular seal, so it is essentially hanging in an open borehole. Completion details presented herein (Table 1 and the attached well completion diagram) are primarily based upon a video log run in 1997. Some of the entries in Table 1 are queried because suspended materials in the water column obscured the view of the well casing in the video log.

**Table 1. Polacca Supply Wells Nos. 5 and 6 Completion Details  
Hopi Tribe, Arizona**

Detail	Polacca No. 5	Polacca No. 6
Total depth (ft bgs)	910	915
Casing diameter (inches)	10	10
Casing reduction (ft bgs)	636	626
Screen diameter (inches)	8	8
Screen interval (ft bgs)	825(?)–910	715–717, 760–915

ft bgs = Feet below ground surface



## Lithologic Interpretation

The U.S. Geological Survey (USGS) originally had designated the Polacca wells as D-aquifer wells (USGS, 1997a), but subsequently reinterpreted the stratigraphy and decided that the Polacca wells were N-aquifer wells based on a geophysical log from the Mishongovi Well west of Polacca (USGS, 1997b). The USGS also provided a lithologic profile to the Hopi Tribe indicating that the Navajo Sandstone was 215 feet thick and exposed in Polacca No. 4 (USGS, 1997c). DBS&A confirmed the N-aquifer status of nearby Polacca wells No. 5 and 6 during a water quality and geophysical investigation (DBS&A, 1998b).

**Table 2. Lithology of Polacca Wells Nos. 5 and 6  
Hopi Tribe, Arizona**

Formation	Top of Formation (ft bgs)	Bottom of Formation (ft bgs)	Thickness (feet)
Valley Fill	0	30	30
Mancos Shale	30	?	?
Dakota Sandstone	?	338	?
Cow Springs Sandstone	338	542	204
Entrada Sandstone	542	692	150
Carmel Formation	692	771	79
Navajo Sandstone	771	910+	139+

ft bgs = Feet below ground surface

## Water Quality Issues

Based on our geophysical investigation of Polacca wells No. 5 and 6, DBS&A concluded that both wells predominantly produce water from the N-aquifer (DBS&A, 1998b). After these wells were completed, it was noticed that water obtained from well No. 6 was poorer quality (higher TDS) than that obtained from well No. 5. Because the differences in water quality are not related to geologic structures such as faults (as determined from the good correlation of gamma-neutron logs run in each well), it was suspected that the marked differences in water quality might be attributable to poor well completion that could allow for vertical mixing of poor water quality from the D-aquifer to mix with the better quality water of the N-aquifer. Because the 10-inch casing and associated annular seal was intended to seal off the D-aquifer, the grout competency of this zone was investigated using a cement bond log for each well.

Polacca well No. 6 appears to have a poor cement seal based upon the cement bond log. The cement bond log indicated a poor seal from about 400 feet below ground surface (ft bgs) to the reduction point at 626 ft bgs, thereby indicating the strong potential for the downward leakage of water along the annulus. The cement bond log for Polacca well No. 5 indicated a better seal, and downward leakage from above the reduction point at 636 ft bgs was not suspected.

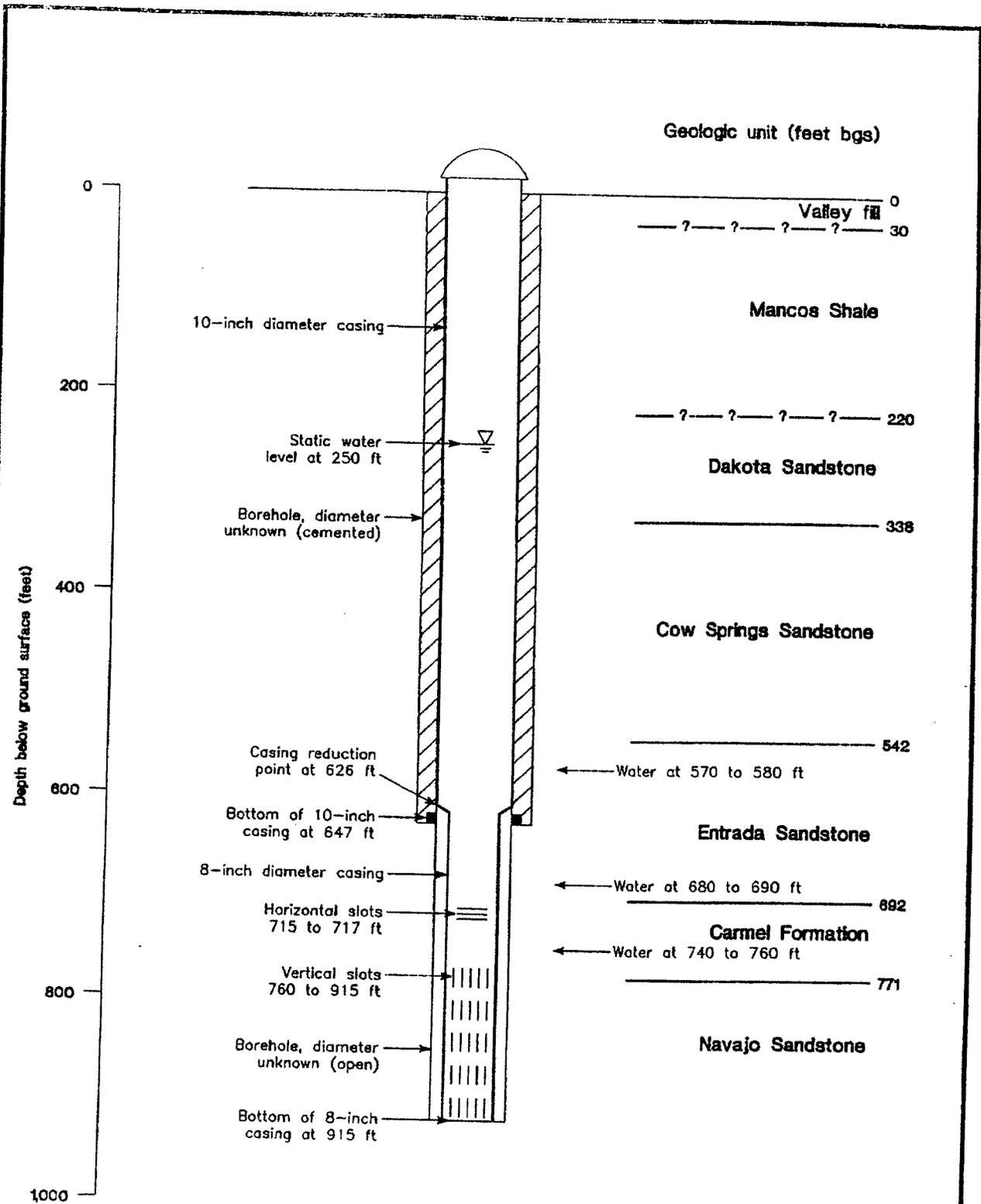


DBS&A concluded that two mechanisms are allowing the mixing of D-aquifer and N-aquifer water in Polacca well No. 6. The first mechanism is downward seepage from the Entrada Sandstone exposed below the reduction point at top of the 8-inch casing. Below the reduction point there is no annular seal, so any water from the D-aquifer from a leaking cement seal or that exposed in the adjacent open borehole will be able to reach the perforated section of the casing deeper in the borehole. The second mechanism is vertical seepage along the annular space from zones of D-aquifer above the casing reduction point.

While working at the Hopi High School, DBS&A observed that water quality became better (TDS decreased) as pumping progressed. This same trend is probably true at Polacca wells No. 5 and 6 because the High School well is completed in a similar manner. The majority of water pumped from each well is believed to be from the N-aquifer, although a minor volume of the flow would be expected to travel through the annular space behind the casing and contribute to the produced water.

#### References

- Daniel B. Stephens & Associates, Inc. (DBS&A). 1998a. *Geophysical evaluation of Civic Center and Keams Canyon #2 wells*. Prepared for the First Mesa Consolidated Villages Water Program, Polacca, Arizona. January 14, 1998.
- DBS&A. 1998b. *Geophysical evaluation of Polacca Wells #5 and #6*. Prepared for the Hopi Water Resources Department, Kykotsmovi, Arizona. April 24, 1998.
- U.S. Geological Survey (USGS). 1997a. Letter from G. Litton to Nat Nutongla, Hopi Water Resources Department, regarding Proposed site for the Hopi hospital, Polacca, Arizona. Water Resources Division, Flagstaff, Arizona. January 2, 1997.
- USGS. 1997b. Letter from G. Litton to Nat Nutongla, Hopi Water Resources Department, regarding Proposed site for the Hopi hospital, Polacca, Arizona. Water Resources Division, Flagstaff, Arizona. February 5, 1997
- USGS. 1997c. Letter from G. Litton to Nat Nutongla, Hopi Water Resources Department, regarding Lithologic profile along Hwy 264 from Hotevilla to Keams Canyon, Arizona. Water Resources Division, Flagstaff, Arizona. August 20, 1997



bgs = below ground surface

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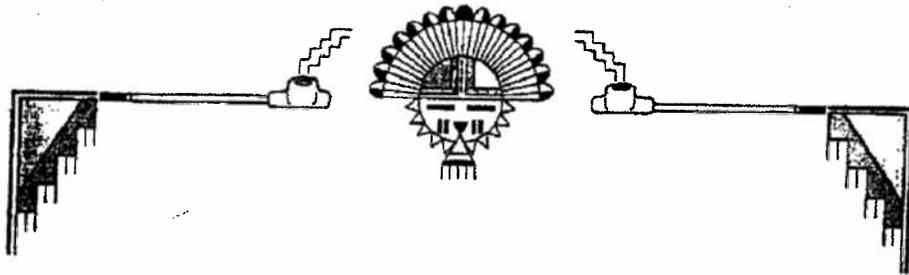


DANIEL B. STEPHENS & ASSOCIATES, INC.  
1-14-98  
JN 7081

HOPI TRIBE  
**Polacca Well #6 Construction Details**

## **EXHIBIT 7**

# Office of General Counsel



## Constitution and By-laws of the Hopi Tribe

Approved December 19, 1936  
and as Amended on  
August 1, 1969  
February 14, 1980  
December 7, 1993

RECEIVED  
BY GENERAL COUNSEL



United States  
Department of the Interior  
Office of Indian Affairs

MAR 21 1994  
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**PREAMBLE**

This Constitution, to be known as the Constitution and By-Laws of the Hopi Tribe, is adopted by the self-governing Hopi and Tewa Villages of Arizona to provide a way of working together for peace and agreement between the villages, and of preserving the good things of Hopi life, and to provide a way of organizing to deal with modern problems, with the United States Government and with the outside world generally.

**ARTICLE I - JURISDICTION**

The authority of the Tribe under this Constitution shall cover the Hopi villages and such land as shall be determined by the Hopi Tribal Council in agreement with the United States Government and the Navajo Tribe, and such lands as may be added thereto in future. The Hopi Tribal Council is hereby authorized to negotiate with the proper officials to reach such agreement, and to accept it by a majority vote.

**ARTICLE II - MEMBERSHIP**

**SECTION 1.** The following persons shall be enrolled members of the Hopi Tribe:

All persons whose names appear on the Census Roll of the Hopi Tribe as of December 31, 1937, as corrected and adopted by the Hopi Tribal Council; PROVIDED, That subsequent corrections may be made to said roll by the Hopi Tribal Council at any time with the approval of the Secretary of Interior.

**SECTION 2.** After the effective date of this Constitution, the following persons shall be eligible for enrolled membership in the Hopi Tribe.

(a) All persons of a one-fourth (1/4) degree Hopi Indian blood or more, or one-fourth (1/4) degree Tewa Indian blood or more, or one-fourth (1/4) degree Hopi-Tewa Indian blood or more combined, born after December 31, 1937, who are not enrolled with any other Indian Tribe.

(b) For the purpose of determining enrolled membership, Hopi Indian blood, Tewa Indian blood, and Hopi - Tewa Indian blood shall mean biological lineal descent from any Hopi or Tewa Indian person whose name appears on the Corrected Membership Roll of the Hopi Tribe as defined in Section 1.

**SECTION 3. Persons Already Enrolled.** All persons properly enrolled as members of the Hopi Tribe as of the effective date of this Constitution shall continue to be members.

SECTION 4. Village Membership. Village membership shall be determined by the individual Hopi Villages.

SECTION 5. Hopi Enrollment Ordinance. The Hopi Tribal Council shall adopt, and from time to time may amend, an enrollment ordinance not inconsistent with this Article, setting forth the manner in which this Article shall be implemented and administered.

### ARTICLE III - ORGANIZATION

SECTION 1. The Hopi Tribe is a union of self-governing villages sharing common interests and working for the common welfare of all. It consists of the following recognized villages:

First Mesa (consolidated villages of Walpi, Shitchumovi, and Tewa).

Mishongnovi.

Sipaulavi.

Shungopavi.

Oraibi.

Kyakotsmovi.

Bakabi.

Hotevilla.

Moenkopi.

SECTION 2. The following powers which the Tribe now has under existing law or which have been given by the Act of June 18, 1934, (48 Stat. 984), and acts amendatory thereof or supplemental thereto, are reserved to the individual villages:

- (a) To appoint guardians for orphan children and incompetent members.
- (b) To adjust family disputes and regulate family relations of members of the villages.
- (c) To regulate the inheritance of property of the members of the villages.
- (d) To assign farming land, subject to the provisions of Article VII.

SECTION 3. Each village shall decide for itself how it shall be organized. Until a village shall decide to organize in another manner, it shall be considered as being under the traditional Hopi organization, and the Kikmongwi of such village shall be recognized as its leader.

SECTION 4. Any village which does not possess the traditional Hopi self-government, or which wishes to make a change in that government or add something to it, may adopt a Village Constitution in the following manner: A Constitution, consistent with this Constitution and

By-Laws, shall be drawn up, and made known to all the voting members of such village, and a copy shall be given to the Superintendent of the Hopi jurisdiction. Upon the request of the Kikmongwi of such village, or of 25% of the voting members thereof, for an election on such Constitution, the Superintendent shall make sure that all members have had ample opportunity to study the proposed Constitution. He shall then call a special meeting of the voting members of such village, for the purpose of voting on the adoption of the proposed Constitution, and shall see that there is a fair vote. If at such referendum, not less than half of the voting members of the village cast their votes, and if a majority of those voting accepts the proposed Constitution, it shall then become the Constitution of that village, and only officials chosen according to its provisions shall be recognized.

The village Constitution shall clearly say how the Council representatives and other village officials shall be chosen, as well as the official who shall perform the duties placed upon the Kikmongwi in this Constitution. Such village Constitution may be amended or abolished in the same manner as provided for its adoption.

**ARTICLE IV - THE TRIBAL COUNCIL**

SECTION 1. The Hopi Tribal Council shall consist of a Chairman, Vice Chairman, and representatives from the various villages. The number of representatives from each village shall be determined accordingly to its population, as follows: villages of 50 to 250 population, one (1) representative; villages of 251 to 500 population, two (2) representatives; villages of 501 to 750 population, three (3) representatives; villages of over 750 population, four (4) representatives.

The representation in the first Tribal Council shall be as follows:

First Mesa .....	4
Mishongnovi.....	2
Sipaulavi.....	1
Shungopavi .....	2
Oraibi.....	1
Kyakotsmovi.....	2
Bakabi.....	1
Hotevilla.....	2
Moenkopi.....	2

SECTION 2. The term of office of the representatives shall be two (2) years, except that at the first election or choosing of representatives following the adoption of this section, approximately one-half of the representatives shall serve for a term of one (1) year. The determination as to which representatives shall serve for one (1) year shall be made by the Tribal Council and announced to each village Kikmongwi or Governor on or before the first day of October 1969. Representatives may serve any number of terms in succession or otherwise.

SECTION 3. Each representative must be a member of the village which he represents. He must be twenty-five (25) years or more of age, and must have lived in the Hopi jurisdiction for not less than two (2) years before taking office, and must be able to speak the Hopi language fluently.

SECTION 4. Each village shall decide for itself how it shall choose its representatives, subject to the provisions of Section 5. Representatives shall be recognized by the Council only if they are certified by the Kikmongwi of their respective villages. Certifications may be made in writing or in person.

SECTION 5. One (1) representative of the Village of Moenkopi shall be selected from the Lower District, and certified by the Kikimongwi of Moenkopi, and one (1) representative shall be selected by the Upper district, and certified by the Official whom that District may appoint, or who may be specified in a village Constitution adopted under the provisions of Article III, Section 4. This section may be repealed, with the consent of the Tribal Council, by vote of a two-thirds majority at a meeting of the voting members of Moenkopi Village called and held subject to the provisions of Article III, Section 4.

SECTION 6. No business shall be done unless at least a majority of the members are present.

SECTION 7. The Chairman and Vice-Chairman shall be elected by secret ballot by all members of the Hopi Tribe. The Tribal Council shall choose from its own members or from other members of the Tribe, a secretary, treasurer, sergeant-at-arms and interpreters and such other officers and committees as it may determine necessary, subject to the provisions of the By-Laws, Article I.

SECTION 8. All members of the Hopi Tribe eighteen (18) years of age or over shall be qualified to vote in any election or referendum other than village elections and referendums under such rules and regulations as may be prescribed by the Hopi Tribal Council.

SECTION 9. The Chairman and Vice Chairman shall serve for a term of four (4) years. Candidates for the offices of Chairman and Vice Chairman shall be members of the Hopi Tribe, twenty-five (25) years of age or older and must be able to speak the Hopi language fluently. Each candidate for either of said offices must also have lived on the Hopi Reservation for not less than two years immediately preceding his announcement of such candidacy.

SECTION 10. Candidates for the offices of Chairman and Vice Chairman may declare their candidacy by filing with the tribal Secretary or tribal Chairman or Vice Chairman a petition signed by at least ten (10) adult members of the tribe at least 15 days before the date set for the election. It shall be the duty of the Secretary to post the names of the qualified candidates for both the primary and final elections in a public place in each village at least ten (10) days prior to the election.

SECTION 11. A primary election shall be held on the first Wednesday in November in 1969 and on the first Wednesday in November in every fourth year thereafter, PROVIDED. That, no primary election shall be held in the years when there shall be no more than two (2) candidates for either of the offices of Chairman and Vice Chairman. The two (2) candidates in a primary election receiving the highest number of votes for each of said offices of Chairman and Vice Chairman shall have their names entered in the final election. In the event there are not more than two (2) candidates for either of such offices those candidates with no more than one (1) competing candidate shall have their names entered in the final election without the necessity of a primary election.

SECTION 12. The general election shall be held on the third Wednesday in November 1969 and on the third Wednesday in every fourth year thereafter.

SECTION 13. Inauguration of the Chairman and Vice Chairman shall take place at the first regular Tribal Council meeting following their election.

#### ARTICLE V - VACANCIES AND REMOVAL FROM OFFICE

SECTION 1. Any Chairman, Vice Chairman, representative or other officer found guilty in a tribal or other court of a misdemeanor involving dishonesty, of a felony, or of drunkenness, shall be automatically removed from office and the Council shall refuse to recognize him.

SECTION 2. Any officer or representative may be removed from office for serious neglect of duty, by a vote of not less than two-thirds of the Council, after the officer to be so removed has been given full opportunity to hear the charges against him and to defend himself before the Council.

SECTION 3. Vacancies occurring for any reason among the representatives shall be filled for the rest of the term by the village concerned, in the same manner as a representative from that village is ordinarily chosen.

Vacancies occurring for any reason among the officers appointed by the Council shall be filled by the Council.

Vacancies occurring for any reason in the offices of Chairman and Vice Chairman or in the office of any other officer shall be filled for the rest of the term in the same manner as those officers are ordinarily chosen.

#### ARTICLE VI - POWERS OF THE TRIBAL COUNCIL

SECTION 1. The Hopi Tribal Council shall have the following powers which the Tribe now has under existing law or which have been given to the Tribe by the Act of June 18, 1934. The Tribal Council shall exercise these powers subject to the terms of this Constitution and to the Constitution and Statutes of the United States.

(a) To represent and speak for the Hopi Tribe in all matters for the welfare of the Tribe, and to negotiate with the Federal, State, and local governments, and with the councils or governments of other tribes.

(b) To employ lawyers, the choice of lawyers and fixing of fees to be subject to the approval of the Secretary of the Interior so long as required by Federal law.

(c) To prevent the sale, disposition, lease or encumbrance of tribal lands, or other tribal property.

(d) To advise with the Secretary of the Interior and other governmental agencies upon all appropriation estimates or Federal projects for the benefit of the Tribe, before the submission of such estimates to the Office of Management and Budget or to Congress.

(e) To raise and take care of a tribal council fund by accepting grants or gifts from any person, State, or the United States Government, or by charging persons doing business within the Reservation reasonable license fees.

(f) To use such Tribal Council fund for the welfare of the Tribe, and for salaries or authorized expenses of tribal officers. All payments from the Tribal Council fund shall be a matter of public record at all times.

(g) To make ordinances to protect the peace and welfare of the Tribe, and to set up courts for the settlement of claims and disputes, and for the trial and punishment of Indians within the jurisdiction charged with offenses against such ordinances.

(h) To act as a court to hear and settle claims or disputes between villages in the manner provided in Article VIII.

(i) To provide by ordinance for removal or exclusion from the jurisdiction of any non-members whose presence may be harmful to the members of the Tribe.

(j) To regulate the activities of voluntary cooperative associations of members of the Tribe for business purposes.

(k) To protect the arts, crafts, traditions, and ceremonies of the Hopi Indians.

(l) To delegate any of the powers of the Council to committees or officers, keeping the right to review any action taken.

(m) To request a charter of incorporation to be issued as provided in the Act of June 18, 1934.

(n) To adopt resolutions providing the way in which the Tribal Council itself shall do its business.

SECTION 2. Any resolution or ordinance which, by the terms of this Constitution, is subject to review by the Secretary of the Interior, shall be given to the Superintendent of the jurisdiction, who shall, within ten (10) days thereafter, approve or disapprove the same.

If the Superintendent shall approve any ordinance or resolution, it shall thereupon become effective, but the Superintendent shall send a copy of the same, bearing his endorsement, to the Secretary of the Interior, who may, within ninety (90) days from the date of enactment, veto said ordinance or resolution for any reason by notifying the Tribal Council of his decision.

If the Superintendent shall refuse to approve any ordinance or resolution submitted to him, within ten (10) days after enactment, he shall report his reasons to the Tribal Council. If the Tribal Council thinks these reasons are not sufficient, it may, by a majority vote, refer the ordinance or resolution to the Secretary of the Interior, who may, within ninety (90) days from the date of its enactment, approve the same in writing, whereupon the said ordinance or resolution shall become effective.

SECTION 3. The Hopi Tribal Council may exercise such further powers as may in the future be delegated to it by the members of the Tribe or by the Secretary of the Interior, or any other duly authorized official or agency of the State or Federal Government.

SECTION 4. Any rights and powers which the Hopi Tribe of Indians now has, but which are not expressly mentioned in this Constitution, shall not be lost or limited by this Article, but may be exercised by the members of the Hopi Tribe of Indians through the adoption of appropriate by-laws and constitutional amendments.

#### ARTICLE VII - LAND

SECTION 1. Assignment of use of farming land within the traditional clan holdings of the Villages of First Mesa, Mishongnovi, Sipaulavi, and Shungopavi, and within the established village holdings of the Villages of Kyakotsmovi, Bakabi, Oraibi, Hotevilla, and Moenkopi, as in effect at the time of approval of this Constitution, shall be made by each village according to its established custom, or such rules as it may lay down under a village Constitution adopted according to the provisions of Article III, Section 4. Unoccupied land beyond the clan and village holdings mentioned shall be open to the use of any member of the Tribe, under the supervision

of the Tribal Council. Nothing in this Article shall permit depriving a member of the Tribe of farming land actually occupied and beneficially used by him at the time of approval of this Constitution, but where an individual is occupying or using land which belongs to another by agreement with the owner, that land shall continue to belong to that owner.

SECTION 2. In order to improve and preserve the range, range land shall be supervised by the Tribal Council in cooperation with the various United States Government agencies.

SECTION 3. All springs shall be considered the property of the Tribe, and no individual or group of individuals shall be allowed to prevent the reasonable use of any spring by members of the Tribe generally, but the individual who develops a spring, or on whose land it is, shall have the first use of it.

SECTION 4. The administration of this Article shall be subject to the provisions of Section 6 of the Act of June 18, 1934.

#### ARTICLE VIII - DISPUTES BETWEEN VILLAGES

SECTION 1. When a dispute arises between villages over any matter, the Kikmongwi of any village party to the dispute may inform the Chairman of the Tribal Council of the nature of the dispute, and ask him to call a special meeting of the Council to settle the matter.

The Chairman shall thereupon call a special meeting of the Council, to be held on the eighth day from the day of such request, at which meeting he, and the Council representatives or other persons chosen by each village party to the dispute to speak for it before the Council, may summon all witnesses having evidence to give in the matter, and may examine them.

When the Council has heard all the evidence and examined the witnesses to its satisfaction, it shall hold a secret meeting which shall not be attended by the representatives of the villages party to the dispute, and after full and careful consideration and discussion, shall vote on a decision. Such decision shall become effective when it is carried by a majority of the Council members present. The Council shall keep a record of the evidence and the reasons for its decision.

SECTION 2. If both the Chairman and the Vice Chairman are representatives of villages party to the dispute, the Council shall elect a temporary Chairman to serve for the duration of the trial.

SECTION 3. If any village party to the dispute feels that the decision of the Council in such case is unjust, the Kikmongwi of that village may notify the Superintendent within ten (10) days and the decision of the Council shall then be subject to review by the Secretary of the Interior, within ninety (90) days thereafter, in the manner provided in Article VI, Section 2.

#### ARTICLE IX - BILL OF RIGHTS

SECTION 1. All resident members of the Tribe shall be given equal opportunities to share in the economic resources and activities of the jurisdiction.

SECTION 2. All members of the Tribe shall be free to worship in their own way, to speak and write their opinion, and to meet together.

#### ARTICLE X - AMENDMENT

Any representative may propose an amendment to this Constitution and By-Laws at any meeting of the Council. Such proposed amendment may be discussed at that meeting, but no vote shall be taken on it until the next following meeting of the Council. If the Council shall then approve such proposed amendment by a majority vote, it shall request the Secretary of the Interior to call a referendum for accepting or rejecting such amendment. It shall then be the duty of the Secretary of the Interior to call such referendum, at which the proposed amendment may be adopted subject to the Secretary's approval, in the same manner as provided for the adoption and approval of this Constitution and By-Laws.

#### ARTICLE XI - TAXATION

SECTION 1. The Hopi Tribal Council shall, subject to the express limitations contained in this Constitution and the laws of the United States, have the power to impose duties, fees, taxes, and assessments on any person, corporation or association residing or doing business within the Hopi Reservation, PROVIDED, That the Tribal Council shall not have the power to impose a personal income tax.

SECTION 2. No tax imposed by the Tribal Council under Section 1 of this Article shall become effective unless approved by a majority vote of the eligible voters of the Hopi Tribe voting in a referendum called for that purpose pursuant to Section 8 of Article IV of this Constitution.

**BY-LAWS OF THE HOPI TRIBE**

**ARTICLE I - DUTIES AND QUALIFICATIONS OF OFFICERS**

SECTION 1. The Chairman shall preside over all meetings of the Tribal Council. He shall perform all duties of a Chairman fairly and impartially, and exercise any authority delegated to him by the Council.

He shall vote only in case of a tie.

SECTION 2. The Vice Chairman shall help the Chairman in his duties when called upon to do so, and in the absence of the Chairman shall act as Chairman with all the attendant powers and duties.

SECTION 3. The representatives shall perform the duties of the Council, set forth in this Constitution and By-Laws. They shall inform the people of their villages of the matters discussed and the actions taken, and they shall fairly and truly represent the people of their villages.

SECTION 4. The Secretary shall write all tribal correspondence, as authorized by the Council, and shall keep an accurate record of all action of regular and special meetings of the Council. He shall keep a copy of such records in good order and available to the general public and shall send another copy of them, following each meeting of the Council, to the Superintendent of the jurisdiction. He shall have a vote in the Council only if he is a regular representative.

The Secretary must be a resident member of the Hopi Tribe, and must be able to speak the Hopi language fluently, and to read and write English well.

SECTION 5. The Treasurer shall receive, receipt for, and take care of all funds in the custody of the Council, and deposit them in a bank or elsewhere as directed by the Council. He shall make payments therefrom only when authorized by a resolution of the Council, and in the manner authorized. He shall keep a faithful record of such funds, and shall report fully on receipts, payments, and amounts in hand at all regular meetings of the Council and whenever requested to do so by the Council. His accounts shall be open to public inspection.

He shall have a vote in the Council only if he is a regular representative.

The Treasurer may be required by the Council to give a bond satisfactory to the Council and to the Commissioner of Indian Affairs.

The Treasurer must be a resident member of the Hopi Tribe, and must be able to speak the Hopi language fluently and to read and write English well.

SECTION 6. The interpreter or interpreters shall be resident members of the Hopi Tribe, and shall be able to interpret fluently and accurately in the Hopi, English, and Navajo languages, and shall do so whenever requested by the Council. Interpreters shall have a vote in the Council only when they are regular representatives.

SECTION 7. The Sergeant-at-Arms, at the orders of the Chairman, shall enforce order in the Council, and shall summon all persons required to appear before the Council, and deliver notices of special meetings, and perform such other duties as may be required of him by the Council. The Sergeant-at-Arms shall be a resident member of the Hopi Tribe, and must be able to speak Hopi fluently, and to speak English.

SECTION 8. The qualifications and duties of all committees and officers appointed by the Council shall be clearly defined by resolution of the Tribal Council at the time the positions are created. Such committees or officers shall report to the Council whenever required.

#### ARTICLE II - MEETINGS OF THE COUNCIL

SECTION 1. Regular meetings of the Tribal Council shall be held on the first day of December, March, June, and September, at such places as shall be determined by the Council.

SECTION 2. Within sixteen (16) days after this Constitution goes into effect, the villages shall choose their representatives for the first term of one (1) year, and on the sixteenth day the first meeting of the Council shall be held at Oralbi Day School.

SECTION 3. Special meetings of the Council shall be called by the Chairman in his discretion or at the request of four (4) representatives, or in the case of a dispute between villages, as provided in Article VIII of the Constitution. Notice of special meetings shall be delivered to each representative not less than eight (8) days before such meeting, together with a statement of the business to be discussed thereat.

SECTION 4. All members of the Hopi Tribe may attend any meeting of the Council, but they may not speak, except by invitation of the Council. Non-members may be invited by the Council to attend any meeting and to address it.

SECTION 5. The Council may employ, or may request the Superintendent of the jurisdiction to furnish, a clerk trained in shorthand, to take down verbatim minutes of any meeting.

SECTION 6. When the Council desires advise of, or consultation with, any officer of the Federal Government, it may invite him to attend any meeting and may give him the privilege of the floor.

**ARTICLE III - ORDINANCES AND RESOLUTIONS**

All ordinances and resolutions shall be recorded and available at all times for the information and education of the Tribe. Copies of all ordinances shall be posted from time to time in a public place in each village.

**ARTICLE IV - EAGLE HUNTING TERRITORIES AND SHRINES**

The Tribal Council shall negotiate with the United States Government agencies concerned, and with other tribes and other persons concerned, in order to secure protection of the right of the Hopi Tribe to hunt for eagles in its traditional territories, and to secure adequate protection for its outlying, established shrines.

**ARTICLE V - ALL-PUEBLO COUNCIL**

The Tribal Council may appoint delegates to speak for the Tribe at the All-Pueblo Council, and to report to the Council and the Tribe on all proceedings thereof.

**ARTICLE VI - ADOPTION OF CONSTITUTION AND BY-LAWS**

This Constitution and By-Laws, when ratified by a majority vote of the adult members of the Hopi Tribe voting at a referendum called for that purpose by the Secretary of the Interior, PROVIDED, That at least thirty percent (30%) of those entitled to vote shall vote at such referendum, shall be submitted to the Secretary of the Interior, and if approved, shall take effect from the date of approval.

### CERTIFICATION OF ADOPTION

Pursuant to an order, approved September 30, 1936, by the Secretary of the Interior, the attached Constitution and By-laws was submitted for ratification to the Hopi Tribe residing on the Hopi Reservation, and was on October 24, 1936, duly adopted by a vote of 651 for, and 104 against, in an election in which over 30 percent of those entitled to vote cast their ballots, in accordance with section 16 of the Indiana Reorganization Act of June 18, 1934, (48 Stat. 984), as amended by the Act of June 15, 1935 (49 Stat. 378).

George Coochise, *Chairman of Election Board.*

Albert Yava, *Secretary of Election Board.*

A. G. Hutton, *Superintendent.*

I, Harold L. Ickes, the Secretary of the Interior of the United States of America, by virtue of the authority granted me by the act of June 18, 1934 (48 Stat. 984), as amended, do hereby approve the attached Constitution and By-laws of the Hopi Tribe.

All rules and regulations heretofore promulgated by the Interior Department or by the Office of Indian Affairs, so far as they may be incompatible with any of the provisions of the said Constitution and By-laws are hereby declared inapplicable to these Indians.

All officers and employees of the Interior Department are ordered to abide by the provisions of the said Constitution and By-laws.

Approval recommended December 14, 1936.

John Collier, *Commissioner of Indian Affairs.*

Harold L. Ickes, *Secretary of the Interior.* [Seal]

Washington, D.C., December 19, 1936

AMENDMENT  
CONSTITUTION AND BYLAWS  
of the  
HOPI TRIBE  
ARIZONA

AUG - 1 1968

AMENDMENT I

Section 3 of Article II, Membership, shall be deleted in its entirety.

The first sentence of Article IV, The Tribal Council, shall be amended to read:

Section 1. The Hopi Tribal Council shall consist of a chairman, vice chairman and representatives from the various villages.

Section 2 of Article IV, The Tribal Council, shall be amended in its entirety to read as follows:

Sec. 2. The term of office of the representatives shall be two years, except that at the first election or choosing of representatives following the adoption of this section, approximately one-half of the representatives shall serve for a term of one year. The determination as to which representatives shall serve for one year shall be made by the tribal council and announced to each village Kichmongwi or Governor on or before the first day of October 1968. Representatives may serve any number of terms in succession or otherwise.

Section 7 of Article IV, The Tribal Council, shall be amended to read as follows:

Sec. 7. The chairman and vice chairman shall be elected by secret ballot by all members of the Hopi Tribe. The tribal council shall choose from its own members or from other members of the tribe, a secretary, treasurer, sergeant-at-arms and interpreters and such other officers and committees as it may determine necessary, subject to the provisions of the Bylaws, Article I.

Article IV, The Tribal Council, shall be amended by adding to it Sections 8, 9, 10, 11, 12 and 13 as follows:

Sec. 8. All members of the Hopi Tribe twenty-one years of age or over shall be qualified to vote in any election or referendum, other than village elections and referendums under such rules and regulations as may be prescribed by the Hopi Tribal Council and approved by the Secretary of the Interior.

Sec. 9. The chairman and vice chairman shall each serve for a term of four years. Candidates for the offices of chairman and vice chairman shall be members of the Hopi Tribe, twenty-five years of age or older and must be able to speak the Hopi language fluently. Each candidate for either of said offices must also have lived on the Hopi Reservation for not less than two years immediately preceding his announcement of such candidacy.

Sec. 10. Candidates for the offices of chairman and vice chairman may declare their candidacy by filing with the tribal secretary or tribal chairman or vice chairman a petition signed by at least ten adult members of the tribe at least 15 days before the date set for the election. It shall be the duty of the secretary to post the names of the qualified candidates for both the primary and final elections in a public place in each village at least ten days prior to the election.

Sec. 11. A primary election shall be held on the first Wednesday in November in 1969 and on the first Wednesday in November in every fourth year thereafter, provided that, no primary election shall be held in the years when there shall be no more than two candidates for either of the offices of chairman and vice chairman.

The two candidates in a primary election receiving the highest number of votes for each of said offices of chairman and vice chairman shall have their names entered in the final election. In the event there are not more than two candidates for either of such offices those candidates with no more than one competing candidate shall have their names entered in the final election without the necessity of a primary election.

Sec. 12. The general election shall be held on the third Wednesday in November 1969 and on the third Wednesday in November in every fourth year thereafter.

Sec. 13. Inauguration of the chairman and vice chairman shall take place at the first regular tribal council meeting following their election.

AMENDMENT  
CONSTITUTION AND BYLAWS  
of the  
HOPI TRIBE  
ARIZONA

AMENDMENT II

Article V, Vacancies and Removal from Office, shall be amended as follows:

Section 1. Any chairman, vice chairman, representative or other officer found guilty in a tribal or other court of a misdemeanor involving dishonesty, of a felony, or of drunkenness, shall be automatically removed from office, and the council shall refuse to recognize him.

Section 3, paragraph 3 shall be added as follows:

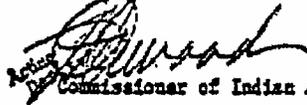
Vacancies occurring for any reason in the offices of chairman and vice chairman or in the office of any other officer shall be filled for the rest of the term in the same manner as those officers are ordinarily chosen.

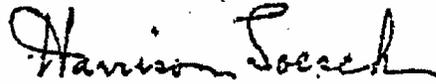
APPROVAL

I, Harrison Loesch, Assistant Secretary of the

Interior of the United States of America, by virtue of the authority granted to me by the Act of June 18, 1934 (48 Stat. 984), as amended, do hereby approve the attached Amendments I and II to the Constitution and Bylaws of the Hopi Tribe of Arizona.

Approval Recommended:

  
Commissioner of Indian Affairs



Assistant Secretary of the Interior

Washington, D. C.

Date: AUG - 1 1968

AMENDMENT  
CONSTITUTION AND BYLAWS  
OF THE  
HOPI TRIBE OF ARIZONA

Amendment III

Article II, Membership, Section 1, subsections 1(a), 1(b) and 1(c) shall be amended as follows:

Section 1. Membership in the Hopi Tribe shall be as follows:

- (a) All persons whose names appear on the census roll of the Hopi Tribe as of December 31, 1937, provided that corrections may be made at any time to said roll by the Tribal Council, subject to the approval of the Secretary of the Interior.
- (b) All children born after December 31, 1937, whose father and mother are both members of the Hopi Tribe.
- (c) All children born after December 31, 1937, whose mother is a member of the Hopi Tribe, and whose father is a member of some other tribe.

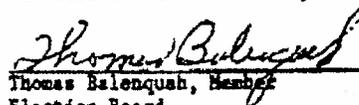
Article II, Section 1, subsection 1(d) is not being amended.

CERTIFICATES OF RESULTS OF ELECTION

Pursuant to an election authorized by the Phoenix Area Office on June 26, 1979, the attached Amendment III to the Constitution and By-laws of the Hopi Tribe, was submitted to the qualified voters of the Hopi Tribe of Arizona and was on January 30, 1980, duly adopted by a vote of 607 for and 74 against, in an election in which at least 30 per cent of the 977 entitled to vote cast their ballots in accordance with Section 16 of the Indian Reorganization Act of June 13, 1934, (48 Stat. 984) as amended by the Act of June 15, 1934, (49 Stat. 378).

  
 Alph H. Secakuku, Chairman  
 Election Board

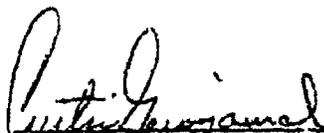
  
 Samuel P. Shing, Member  
 Election Board

  
 Thomas Balenquah, Member  
 Election Board

APPROVAL

Amendment No. III

I, Curtis Gelegomah, Deputy Phoenix Area Director, Bureau of Indian Affairs, by virtue of the authority delegated to the Commissioner of Indian Affairs by the Act of June 18, 1934 (48 Stat. 984), as amended, and redelegated to me, do hereby approve the foregoing Amendment No. III to the Constitution and Bylaws of the Hopi Tribe of Arizona; provided that nothing in this approval shall be construed as authorizing any action under the Constitution and Bylaws that would be contrary to Federal Law.

  
Deputy Phoenix Area Director  
Bureau of Indian Affairs

Phoenix, Arizona

Date: FEB 14 1950

AMENDMENT  
CONSTITUTION AND BYLAWS  
OF THE  
HOPI TRIBE OF ARIZONA

AMENDMENT NO. A

ARTICLE II - MEMBERSHIP shall be amended in its entirety to read as follows:

ARTICLE II - MEMBERSHIP

Section 1. The following persons shall be enrolled members of the Hopi Tribe.

All persons whose names appear on the Census Roll of the Hopi Tribe as of December 31, 1937, as corrected and adopted by the Hopi Tribal Council; PROVIDED, That subsequent corrections may be made to said roll by the Hopi Tribal Council at any time with the approval of the Secretary of the Interior.

Section 2. After the effective date of this amendment, the following persons shall be eligible for enrolled membership in the Hopi Tribe.

- (a) All persons of one-fourth (1/4) degree Hopi Indian blood or more, or one-fourth (1/4) degree Tewa Indian blood or more, or one-fourth (1/4) degree Hopi-Tewa Indian blood or more combined, born after December 31, 1937, who are not enrolled with any other Indian Tribe.
- (b) For the purpose of determining enrolled membership, Hopi Indian blood, Tewa Indian blood, and Hopi-Tewa Indian blood shall mean biological lineal descent from any Hopi or Tewa Indian person whose name appears on the Corrected Membership Roll of the Hopi Tribe as defined in Section 1.

Section 3. Persons Already Enrolled. All persons properly enrolled as members of the Hopi Tribe as of the effective date of this amendment shall continue to be members.

Section 4. Village Membership. Village membership shall be determined by the individual Hopi Villages.

Section 5. Hopi Enrollment Ordinance. The Hopi Tribal Council shall adopt, and from time to time may amend, an enrollment ordinance not inconsistent with this Article, setting forth the manner in which this Article shall be implemented and administered.

Having been duly adopted and approved, Proposed Amendment A is hereby designated as Amendment No. IV to the Constitution and Bylaws of the Hopi Tribe of Arizona.

CERTIFICATE OF RESULTS OF ELECTION

Pursuant to a Secretarial election authorized by the Assistant Secretary - Indian Affairs on September 8, 1993, Amendment No. A to the Constitution and Bylaws of the Hopi Tribe of Arizona was submitted to the qualified voters of the Hopi Tribe, and was on Dec. 7, 1993, duly adopted/rejected by a vote of 364 for, and 134 against, and 9 cast ballots found spoiled or mutilated, in an election in which at least thirty percent (30%) of the 776 members entitled to vote, cast their ballots in accordance with Section 16 of the Indian Reorganization Act of June 18, 1934 (48 Stat. 984), as amended.

Dennis F. Peusa  
Chairman, Election Board

Gloria Salaymptun  
Election Board Member

Bernard J. Thomas  
Election Board Member

Bob Thunders Hawk  
Election Board Member

Robert C. Sakindson Jr  
Election Board Member

Date: 12/07/93

APPROVAL

I, Ada E. Deer, Assistant Secretary - Indian Affairs, by virtue of the authority granted to the Secretary of the Interior by the Act of June 18, 1934 (48 Stat. 984), as amended, and delegated to me by 230 D. M. 2.4, do hereby approve Amendment A, hereinafter known as Amendment No. IV, to the Constitution and Bylaws of the Hopi Tribe of Arizona. This Amendment is effective as of this date; PROVIDED, That nothing in this approval shall be construed as authorizing any action under this document that would be contrary to Federal law.

*Ada E. Deer*

Ada E. Deer  
Assistant Secretary - Indian Affairs

Washington, D. C.

Date: Jul 8 1960

AMENDMENT  
CONSTITUTION AND BYLAWS  
OF THE  
HOPI TRIBE OF ARIZONA

AMENDMENT B

Section 8 of ARTICLE IV - THE TRIBAL COUNCIL shall be amended to read as follows:

Section 8. All members of the Hopi Tribe eighteen (18) years of age or over shall be qualified to vote in any election or referendum other than village elections and referendums under such rules and regulations as may be prescribed by the Hopi Tribal Council.

Having been duly adopted and approved, Proposed Amendment B is hereby designated as Amendment No. V to the Constitution and Bylaws of the Hopi Tribe of Arizona.

CERTIFICATE OF RESULTS OF ELECTION

Pursuant to a Secretarial election authorized by the Assistant Secretary - Indian Affairs on September 8, 1993, Amendment B to the Constitution and Bylaws of the Hopi Tribe of Arizona was submitted to the qualified voters of the Hopi Tribe, and was on Dec. 7, 1993, duly adopted/rejected by a vote of 343 for, and 154 against, and 0 cast ballots found spoiled or mutilated, in an election in which at least thirty percent (30%) of the 776 members entitled to vote, cast their ballots in accordance with Section 16 of the Indian Reorganization Act of June 18, 1934 (48 Stat. 984), as amended.

Davis F. Pecos  
Chairman, Election Board

Herrie Shoyimtaewa  
Election Board Member

Beneke D. Thomas  
Election Board Member

Boa Thunder Hawk  
Election Board Member

Robert C. Schuster Jr  
Election Board Member

Date: 12/07/93

APPROVAL

I, Ada E. Deer, Assistant Secretary - Indian Affairs, by virtue of the authority granted to the Secretary of the Interior by the Act of June 18, 1934 (48 Stat. 984), as amended, and delegated to me by 230 D.M. 2.4, do hereby approve Amendment B, hereinafter known as Amendment No. V, to the Constitution and Bylaws of the Hopi Tribe of Arizona. This Amendment is effective as of this date; PROVIDED, That nothing in this approval shall be construed as authorizing any action under this document that would be contrary to Federal law.



Ada E. Deer  
Assistant Secretary - Indian Affairs

Washington, D. C.

Date

AMENDMENT  
CONSTITUTION AND BYLAWS  
OF THE  
HOPI TRIBE OF ARIZONA

AMENDMENT C

Section 1(e) of ARTICLE VI - POWERS OF THE TRIBAL COUNCIL shall be amended to eliminate Secretarial approval to read as follows:

- (e) To raise and take care of a tribal council fund by accepting grants or gifts from any person, State, or the United States Government, or by charging persons doing business within the Reservation reasonable license fees.

Having been duly adopted and approved, Proposed Amendment C is hereby designated as Amendment No. VI to the Constitution and Bylaws of the Hopi Tribe of Arizona.

CERTIFICATE OF RESULTS OF ELECTION

Pursuant to a Secretarial election authorized by the Assistant Secretary - Indian Affairs on September 8, 1993, Amendment C to the Constitution and Bylaws of the Hopi Tribe of Arizona was submitted to the qualified voters of the Hopi Tribe, and was on Dec. 7, 1993, duly adopted/rejected by a vote of 325 for, and 169 against, and 0 cast ballots found spoiled or mutilated, in an election in which at least thirty percent (30%) of the 776 members entitled to vote, cast their ballots in accordance with Section 16 of the Indian Reorganization Act of June 18, 1934 (48 Stat. 984), as amended.

Doris F. Peuss  
Chairman, Election Board

Hanni Selayungtwa  
Election Board Member

Bernice J. Shoman  
Election Board Member

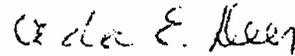
Betty Thunder Hawk  
Election Board Member

Robert C. Sakiestewa Jr  
Election Board Member

Date: 12/07/93

APPROVAL

I, Ada E. Deer, Assistant Secretary - Indian Affairs, by virtue of the authority granted to the Secretary of the Interior by the Act of June 18, 1934 (48 Stat. 984), as amended, and delegated to me by 230 D.M. 2.4, do hereby approve Amendment C, hereinafter known as Amendment No. VI, to the Constitution and Bylaws of the Hopi Tribe of Arizona. This Amendment is effective as of this date; PROVIDED, That nothing in this approval shall be construed as authorizing any action under this document that would be contrary to Federal law.



Ada E. Deer  
Assistant Secretary - Indian Affairs

Washington, D. C.

Date: DEC 10 1933

AMENDMENT  
CONSTITUTION AND BYLAWS  
OF THE  
HOPI TRIBE OF ARIZONA

AMENDMENT D

Section 1(g) of ARTICLE VI - POWERS OF THE TRIBAL COUNCIL shall be amended to eliminate Secretarial approval to read as follows:

- (g) To make ordinances to protect the peace and welfare of the Tribe, and to set up courts for the settlement of claims and disputes, and for the trial and punishment of Indians within the jurisdiction charged with offenses against such ordinances.

Having been duly adopted and approved, Proposed Amendment D is hereby designated as Amendment No. VII to the Constitution and Bylaws of the Hopi Tribe of Arizona.

CERTIFICATE OF RESULTS OF ELECTION

Pursuant to a Secretarial election authorized by the Assistant Secretary - Indian Affairs on September 8, 1993, Amendment D to the Constitution and Bylaws of the Hopi Tribe of Arizona was submitted to the qualified voters of the Hopi Tribe, and was on Dec. 7, 1993, duly adopted/rejected by a vote of 311 for, and 178 against, and 0 cast ballots found spoiled or mutilated, in an election in which at least thirty percent (30%) of the 776 members entitled to vote, cast their ballots in accordance with Section 16 of the Indian Reorganization Act of June 18, 1934 (48 Stat. 984), as amended.

Dennis F. Pecusq  
Chairman, Election Board

Heidi Layman  
Election Board Member

Barry J. Shuman  
Election Board Member

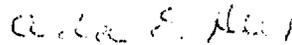
Betty Thunder Hawk  
Election Board Member

Robert C. Salientino Jr  
Election Board Member

Date: 12/07/93

APPROVAL

I, Ada E. Deer, Assistant Secretary - Indian Affairs, by virtue of the authority granted to the Secretary of the Interior by the Act of June 18, 1934 (48 Stat. 984), as amended, and delegated to me by 230 D. M. 2.4, do hereby approve Amendment D, hereinafter known as Amendment No. VII, to the Constitution and Bylaws of the Hopi Tribe of Arizona. This Amendment is effective as of this date; PROVIDED, That nothing in this approval shall be construed as authorizing any action under this document that would be contrary to Federal law.



Ada E. Deer  
Assistant Secretary - Indian Affairs

Washington, D. C.

Date: DEC 30 1993

AMENDMENT  
CONSTITUTION AND BYLAWS  
OF THE  
HOPI TRIBE OF ARIZONA

AMENDMENT E

Section 1 (j) of ARTICLE VI - POWERS OF THE TRIBAL COUNCIL shall be amended to eliminate Secretarial approval to read as follows:

- (j) To provide by ordinance for removal or exclusion from the jurisdiction of any non-members whose presence may be harmful to the members of the Tribe.

Having been duly adopted and approved, Proposed Amendment E is hereby designated as Amendment No. VIII to the Constitution and Bylaws of the Hopi Tribe of Arizona.

CERTIFICATE OF RESULTS OF ELECTION

Pursuant to a Secretarial election authorized by the Assistant Secretary - Indian Affairs on September 8, 1993, Amendment E to the Constitution and Bylaws of the Hopi Tribe of Arizona was submitted to the qualified voters of the Hopi Tribe, and was on Dec. 7, 1993, duly adopted/rejected by a vote of 329 for, and 162 against, and 0 cast ballots found spoiled or mutilated, in an election in which at least thirty percent (30%) of the 776 members entitled to vote, cast their ballots in accordance with Section 16 of the Indian Reorganization Act of June 18, 1934 (48 Stat. 984), as amended.

Dennis F. Pocusa  
Chairman, Election Board

Glenn A. Layman  
Election Board Member

Donald J. Simon  
Election Board Member

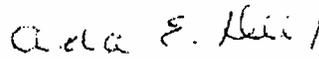
Betty Thunder Hawk  
Election Board Member

Robert C. Sakiatawa Jr  
Election Board Member

Date: 12/07/93

APPROVAL

I, Ada E. Deer, Assistant Secretary - Indian Affairs, by virtue of the authority granted to the Secretary of the Interior by the Act of June 18, 1934 (48 Stat. 984), as amended, and delegated to me by 230 D.M. 2.4, do hereby approve Amendment E, hereinafter known as Amendment No. VIII, to the Constitution and Bylaws of the Hopi Tribe of Arizona. This Amendment is effective as of this date; PROVIDED, That nothing in this approval shall be construed as authorizing any action under this document that would be contrary to Federal law.



Ada E. Deer  
Assistant Secretary - Indian Affairs

Washington, D. C.

Date: DEC 30 1993

AMENDMENT  
CONSTITUTION AND BYLAWS  
OF THE  
HOPI TRIBE OF ARIZONA

AMENDMENT F

Section 1(b) of ARTICLE VI - POWERS OF THE TRIBAL COUNCIL shall be amended to read as follows:

- (b) To employ lawyers, the choice of lawyers and fixing of fees to be subject to the approval of the Secretary of the Interior so long as required by Federal law.

Having been duly adopted and approved, Proposed Amendment F is hereby designated as Amendment No. IX to the Constitution and Bylaws of the Hopi Tribe of Arizona.

CERTIFICATE OF RESULTS OF ELECTION

Pursuant to a Secretarial election authorized by the Assistant Secretary - Indian Affairs on September 8, 1993, Amendment F to the Constitution and Bylaws of the Hopi Tribe of Arizona was submitted to the qualified voters of the Hopi Tribe, and was on Dec. 7, 1993, duly adopted/rejected by a vote of 344 for, and 144 against, and 0 cast ballots found spoiled or mutilated, in an election in which at least thirty percent (30%) of the 776 members entitled to vote, cast their ballots in accordance with Section 16 of the Indian Reorganization Act of June 18, 1934 (48 Stat. 984), as amended.

Davis F. Peusa  
Chairman, Election Board

Herri Ahumpton  
Election Board Member

Bruce D. Thomas  
Election Board Member

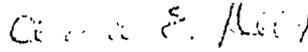
Betty Shunder Hawk  
Election Board Member

Robert C. Sakiestewa, Jr  
Election Board Member

Date: 12/07/93

APPROVAL

I, Ada E. Deer, Assistant Secretary - Indian Affairs, by virtue of the authority granted to the Secretary of the Interior by the Act of June 18, 1934 (48 Stat. 984), as amended, and delegated to me by 230 D.M. 2.4, do hereby approve Amendment F, hereinafter known as Amendment No. IX, to the Constitution and Bylaws of the Hopi Tribe of Arizona. This Amendment is effective as of this date; PROVIDED, That nothing in this approval shall be construed as authorizing any action under this document that would be contrary to Federal law.



Ada E. Deer  
Assistant Secretary - Indian Affairs

Washington, D. C.

Date: DEC 30 1993

AMENDMENT  
CONSTITUTION AND BYLAWS  
OF THE  
HOPI TRIBE OF ARIZONA

AMENDMENT G

The Constitution and Bylaws of the Hopi Tribe shall be amended by adding a new article entitled ARTICLE XI - TAXATION to read as follows:

ARTICLE XI - TAXATION

Section 1. The Hopi Tribal Council shall, subject to the express limitations contained in this Constitution and the laws of the United States, have the power to impose duties, fees, taxes, and assessments on any person, corporation or association residing or doing business within the Hopi Reservation, PROVIDED, That the Tribal Council shall not have the power to impose a personal income tax.

Section 2. No tax imposed by the Tribal Council under Section 1 of this Article shall become effective unless approved by a majority vote of the eligible voters of the Hopi Tribe voting in a referendum called for that purpose pursuant to Section 8 of Article IV of this Constitution.

Having been duly adopted and approved, Proposed Amendment G is hereby designated as Amendment No. X to the Constitution and Bylaws of the Hopi Tribe of Arizona.

CERTIFICATE OF RESULTS OF ELECTION

Pursuant to a Secretarial election authorized by the Assistant Secretary - Indian Affairs on September 8, 1993, Amendment G to the Constitution and Bylaws of the Hopi Tribe of Arizona was submitted to the qualified voters of the Hopi Tribe, and was on Dec. 7, 1993, duly adopted/rejected by a vote of 278 for, and 213 against, and 0 cast ballots found spoiled or mutilated, in an election in which at least thirty percent (30%) of the 776 members entitled to vote, cast their ballots in accordance with Section 16 of the Indian Reorganization Act of June 18, 1934 (48 Stat. 984), as amended.

Thomas F. Pearson  
Chairman, Election Board

Herri Selayngtewa  
Election Board Member

Benny J. Thomas  
Election Board Member

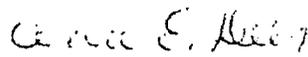
Betty Thunder Hawk  
Election Board Member

Robert C. Sakiestewa  
Election Board Member

Date: 12/07/93

APPROVAL

I, Ada E. Deer, Assistant Secretary - Indian Affairs, by virtue of the authority granted to the Secretary of the Interior by the Act of June 18, 1934 (48 Stat. 984), as amended, and delegated to me by 230 D. M. 2.4, do hereby approve Amendment G, hereinafter known as Amendment No. X, to the Constitution and Bylaws of the Hopi Tribe of Arizona. This Amendment is effective as of this date; PROVIDED, That nothing in this approval shall be construed as authorizing any action under this document that would be contrary to Federal law.



Ada E. Deer  
Assistant Secretary - Indian Affairs

Washington, D. C.

Date: DEC 30 1903