LAS CAPAS, AZ AA:12:111 (ASM), CANAL PROFILE DATA AND DESCRIPTIONS

Fred L. Nials
Geomorphological Consultant

CANAL PROFILE DATA AND DESCRIPTIONS

1. The following descriptive information is derived directly from F. Nials' field notes. Much of these data were transcribed directly from the notes, and no significant editorial effort was made to polish grammar and verbiage. The information is presented in this format as an open record for future research on Early Agricultural period canals.

2. Exception specific references to Locus C, the letter "C" in combination with a number indicates a specific canal (for example, C3 = Canal 3, C145 = Canal 145, etc.).

3. Any map reference that contains the word "Fields" (for example, Map B - Fields 5, 6, and 7, p. 1) refers to site maps generated 18 May 2011, unless otherwise stated. Some maps have more than a single page; these will be indicated by a page number. A reference to a map followed by "(corrected version)" refers to the same map issue with my corrections shown in red ink. Corrected version maps were submitted for correction, and kept in Nials' files to ensure documentation of changes.

4. Descriptive pages with a canal or profile number highlighted in green (for example, Canal 92) relate to canals that were not profiled. Much of the data normally generated by examination of stratigraphic profiles is missing for these canals. Additional elevation data not currently available will be gleaned from site map electronic records for further analysis.

Canal 3, Locus G
Profile No.: 3.01

Map Reference: G2
Date Profiled: February 18, 2009
Trench, Unit: 240
Canal Type: Main
Cross-section Shape(s): 4
Parent Canal: None?
Daughter Canal(s): Undocumented
Stratigraphic Origin: 505/506
Profile Datum (mbsd): -13.071
Profile Datum (masl): 668.288
Mapped Canal Length: Not mapped for this project, see Mabry (2008)
Banks Visible: Yes, 4(?) generations
Digouts Visible: Yes
~Max. Visible Width (m): 1.75
~Max. Visible Depth (m): 0.55-0.60
~Ground Elevation at Inception (masl): 668.08
Number of Iterations Detected: 4+
Canal Bottom Elevation-Earliest Use (masl): 667.99
Canal Bottom Elevation-2nd Iteration (masl): 668.02
Canal Bottom Elevation-3rd Iteration (masl): 668.14
Canal Bottom Elevation-4th Iteration (masl): 668.22
Fe/Mg Stains Present: Y
Relation To Canal Fill (In, Below): B
Amount (Slight, Moderate, Heavy): S
Samples Taken: 8 ostracode samples
Field Notes X-refs: 137-138

Comments: The canal itself is less than 2 m wide, but the drawn profile is 8 m in length to ensure that banks and digouts would be included. The backhoe trench is approximately 1.5 m in depth. This canal course is not shown on current site maps, but is depicted on numerous other maps and profiles available from Mabry's work.

Description of Stratigraphic Units in C3, Trench 240, Stripping Unit G2.

Depositional Unit (DU) 1: Stratum 505. Fine and medium sand forms a bed approximately 4-5 cm thick; nearing meter .6, it begins to incorporate finely disseminated charcoal as well as some charcoal pieces derived from DU 4.

DUs 2 and 3: Water-lain, primarily fine sand, with small amounts of medium sand and smaller amounts of silt and silty clay. Sediments deposited within the same depression in which DU 1 was deposited.

DUs 2 and 3: Water-lain, primarily fine sand, with small amounts of medium sand and smaller amounts of silt and silty clay. Sediments deposited within the same depression in which DU 1 was deposited.

DU 4: Between the burned stump and C3, DU 4 probably coincides with what is called DU 1 in the earlier part of this description and is part of Stratum 505.

DU 5: Fine and medium sand with silt and silty clay near the top. Generally massive except for finer grained sediments which are bedded and locally cross-bedded. DUs 5 and 6 gradually grade into the course sands of DU 9 at about meter 4.1.

DU 6: Naturally-deposited very fine sand and silt bed near meter 3.4. Near meter 3.7 there are lenses of silt and clay interbedded with the sands. The sediments are probably part of the terminal deposition of Stratum 505, although it is conceivable that DUs 1, 2, 3, 4, and 5 are actually part of Stratum 504.04.

DU 8: Naturally deposited thin-bedded and laminated very fine sand, with some silt. Deposited by water flowing in the remnant depression of C3, but do not appear to be canal use-sediments. Present for only a short distance between meters 3.1 and 3.8.

DU 9: Thick massive sand, slightly finer grained toward the top in many places, but not universally so. Varies primarily from medium to coarse sand; micaceous, some mica flakes up to 2-3 mm in diameter; some ashy sediment of unknown origin. Very occasional small discrete blocks of silty clay contained within this deposit may have been brought from below by bioturbation processes. Lower boundary is very irregular, with 10 cm+ of topography; constitutes the boundary between the culturally modified surface and post-canal-use sediments. In many places there are 2-4 cm diameter blocks of clay and/or silt situated on the boundary. These blocks of finer-grained sediments are relatively angular and discrete, and were clearly deposited close to their source, primarily by human activity. This stratum lies topographically and stratigraphically above the man-made banks of C3 between meters 2 and 3 of the profile.

DU 10: Fine sand, also part of Stratum 505; pinches out at approximately meter .5-.6.

DU 11: Part of stratum 505. Lower boundary between DU 11 and DU 9 is not clearly visible in most places and is shown as a dashed line. This DU also pinches out at approximately meter .4 in the profile.

DU 12: Thin-bedded very fine sand, grades into deposits of DU 9 near meter 4.2 - 4.3. Contains an ashy lens with small flecks of charcoal, and occasional larger pieces of charcoal near the upper boundary stretch that. I believe this to be the first post-canal-use deposits, although it conceivably could be terminal canal-use sediments.

DU 13: Very thin bed of silt and silty clay, in most places no more than about 2 cm maximum thickness. Some sand locally present. Canal-use deposits.

DU 14: Medium and coarse sand; grades into DUs 17 and 18, and probably a part of that depositional event.

DUs 15 and 16: Appear to be eroded into the top of DU 17. I do not know whether 15 and 16 are contemporaneous or not, but they do appear to be erosional features that were subsequently filled with sediments. They may be remnants of earlier canal use-sediments that somehow managed to survive a clean-out episode.

DU 17: Bedded, primarily medium and coarse sand, although there are patches of fine sand and small blocks of silty clay and clayey silt contained within. Thought to be canal-use deposits, although conceivably initial post-canal.

DU 19: Overlies DU 18, and appears to continue with DU 17 near the southern margin of the canal. Clay-rich, containing numerous disaggregated blocks of silt and clayey silt with random orientations and patches of sand intermixed. Clean-out deposit, separated from DU 20 because there is a bedding and slight texture change, although texturally similar to deposits of DU 20. These deposits rise on top of the southern canal bank.

DU 20: Culturally deposited clean-out materials deposited on the banks of the canal during its use-life. The deposits are clay-rich, consisting of numerous disaggregated blocks of clay-rich sediments, but also patches of sand and other sediments are mixed within. Extends from approximately meter 1.2 to approximately meter 3, and lie directly atop Stratum 506 sediments.

DU 21: Very fine sand with silt, some irregular blocks of finer grained sediments, primarily silty clay; distinguished from DU 20 primarily by texture. Although these sediments are naturally deposited, the upper surface has clearly been modified by human activity, probably because of proximity to the canal and the activities conducted there. Gradually disappears at near meter 2.0 on the profile.

DU 22: Naturally deposited laminated silty very fine sand and very fine sandy silt flood sediments. The sediments fine upward and become more clay-rich toward the top. In places the laminae have been disrupted but, for the most part, the sediments are relatively intact, although DU 9 cuts into DU 22 in places.

DU 23: Thin-bedded and laminated very fine sand and silt; DUs 22 and 23 were truncated by the original excavation of C3; this truncation allows definition of primary excavation dimensions.

DU 24: Culturally deposited layer that lies atop DU 22. Contains numerous blocks of clean-out materials. Near meter 2.6-2.7 in the profile, the upper part of stratum 22 (separated by DU 24) is also clean-out materials that I believe are part of the original proto-berm of the canal construction episode.

DU 25: Thin and relatively discontinuous deposit. Found in the area of meter 4.5. It is separated from deposits of DU 26 by a distinct bedding line, but it may be continuous with parts of DU 19 and/or 26. It is clay-rich, has blocks in it, and is virtually identical to parts of DUs 19, 20, and 26.

DU 26: Clean-out deposits; numerous disaggregated blocks of silt and clay, extends from about meter 4.5 to 5.2. Appears to have been deposited while still wet, indicating a wet clean-out, and locally the bedding conforms to the slope and bedding contacts. Wet clean-out speculative at this point in time.

DU 27: Culturally modified, may be some mixed flood deposits in the lower part, but it still contains Clean-out materials that were either manually deposited or washed/rolled for as short distance off the canal bank; locally contains some ash and charcoal within. In the lower part it is a fine and medium sand, while in the upper part it is a primarily a fine to medium sand with more numerous clay blocks, although there are clay blocks throughout. The sands fine upward, and are very micaceous. In at least one place it can be divided into two episodes of clean-out. These two episodes are separated by a bedding plane that is not visible in all locations.

DU 28: Very thin-bedded, appears to be naturally deposited. Bedding conforms to the upper and lower boundary, and appears to be a flood deposit, possibly of local origin, that lapped onto the southern bank prior to the deposition of DU 27.

DU 29: Clay-rich, contains some charcoal; individual clean-out deposit; these deposits lap onto the side of the proto-bank.

DU 30: Clay-rich; individual clean-out deposit.

DU 31: Individual clean-out deposit; primarily a silty clay and very fine sand, slightly more sand than DU 30.

DU 32: Clean-out deposit; rests on what appears to be a truncated proto-bank of DU 33.

DU 33: Proto-bank of initial canal excavation. Silt and very fine sand that is virtually identical in character to DU 34 beneath (on the northern side of canal was labeled as DU 22, 23, or both).

DUs 34, 35: Natural flood deposits. Continuations of DUs 22 and 23 on the other side of C3.

DU 36: Relatively localized deposit, visible for only about ¾ meter. Consists of very fine sand; natural deposits.

DU 37: Soil associated with Stratum 506. Fine sandy loam to loam. I have only shown in the lower boundary of this DU in the first meter of the profile, because it is very gradational and difficult to precisely identify.

DU 38: Very fine sandy loam, in places approaching loam. Abundant charcoal in the top 15 cm of Stratum 506 on both sides of canal.

DU 39: Boundary between 38 and 39 is very diffuse and difficult to recognize. I believe that this DU probably represents Stratum 506.02. Sandy, compact, some coarser grains, oxidation makes the sediments redder some eluviation of clay from the DU above. Appears to be

pedogenically modified. From the viewpoint of deposition, the sediments probably represent the last-deposited part of Stratum 507, but from a pedogenic standpoint have been modified by soil formation during the Stratum 506 interval.

DU 40:Discontinuous very fine sand, thin-bedded in most places, pinches out at about meter 6.3 on the stratigraphic profile.

DU 41: Stratum 505 deposits, massive medium- and coarse sand, but does contain "patches" of silty and clay- rich sediments. Although there is relatively abundant charcoal in deposits of this DU, appears to be completely natural. It probably represents not more than one or two floods, and I would not be surprised if it were a single flood deposit. Lower contact with DU 40 is irregular.

DU 42: Clay-rich, especially near the bottom; represents post-canal deposition and these sediments are some of the latest deposits at this exposure. Continuation of DU 4, probably some of the uppermost deposits of Stratum 505. It is possible that these deposits could represent the earliest phase of the Stratum 504 deposition.

DU 43: Clay-rich clean-out materials, contains blocks of clay-rich sediments mixed with sand. Near meter 6 it appears to have a lot of cultural materials (disaggregated blocks), but as you get further to the south (meter 7 to m 8) it becomes cleaner, although it still has some blocks. These clean-out events occurred prior to the flood deposits previously described.

DU 44: Single, discontinuous, more clay-rich natural DU between M7 and M8.

DU 45: Thin, cross-bedded and very thin-bedded fine sand. Lower contact gradually disappears about meter 7.

DU 46: A prominent stump that clearly burned in place is located at approximately meter 2 on the profile. I believe that the tree was probably a mesquite because of the single vertical taproot approximately 10 to 15 cm in diameter in most places. Lateral roots extend from the taproot in some areas near the surface. Deposits above the burned stump and within the root cavity have been called DU 46. Although the stump burned, the root apparently did not. Charcoal mixed with other sediments is present in the upper 30 cm of the root cavity. The central part of the remainder of the cavity is relatively fine-grained sediments, but around the perimeter is a very coarse sand, which I believe is the coarse sand of Stratum 504.03. If the tree burned close in time to the cessation of deposition of Stratum 505, it suggests that very little time elapsed between the burning of the stump and the deposition of Stratum 504.03. From a stratigraphic perspective this stump occurs in roughly the same stratigraphic position as several other extensive floodplain fires in the Las Capas area.

Trench 240 (G2). History of use of C3 in T240

The canal banks are unusually well-preserved, as is the stratigraphy within the banks and below. The history of the canal at this location and its immediate area are as follows:

(1) Deposition of Stratum 506; weathering with little or no overbank sediment accumulation for an unknown period of time (perhaps 50-100 years???).

(2) There was a fire of unknown origin on the floodplain surface. The surface at that time was stable, and fairly smooth at this location. The surface appears to have been well-vegetated, including shrubs and trees, and a very weak cumulative "soil" had developed on the surface.

(3) A shallow-water flood deposited ~10 cm of laminated and thin-bedded fine sand's and silt on the floodplain surface. This flood occurred relatively shortly before the canal was dug. The flood sediments retain their delicate bedding and there is very little bioturbation of the upper surface of the flood deposits.

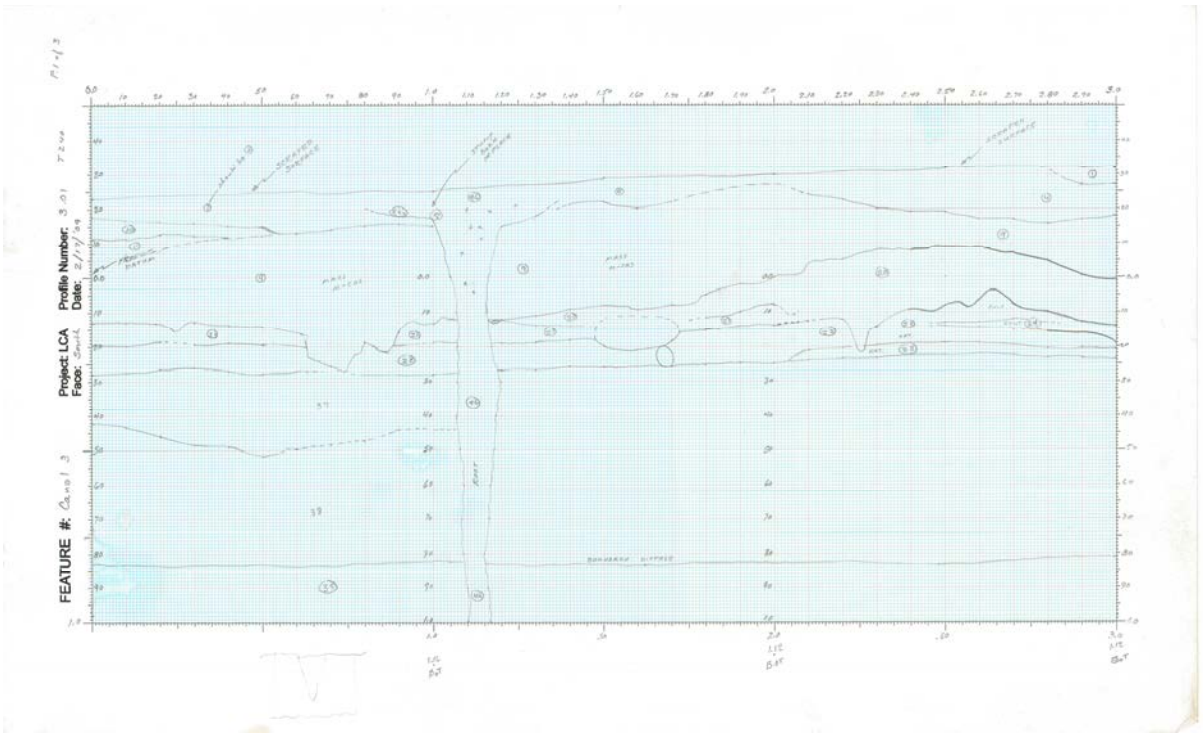
(4) Original excavation of the canal occurred. The excavation was very shallow, with maximum excavated depth below the top of the flood sediments only about 15 cm, and excavation with was only 1.0 m. Sediments removed during canal excavation more primarily Event #2 flood sediments and ~5 cm of the underlying 506 soil. The excavated sediments were placed on either side of the canal, forming a distinct "proto-bank" ~20 cm maximum preserved height. Total bank-to-bank width of the canal at this place and time was till the 1.90 m, and the total depth from bank rest to bank rest was no more than ~30 cm deep. With this with-depth ratio, it was hardly an efficient canal. There had to have been problems with weed control and loss of water through infiltration.

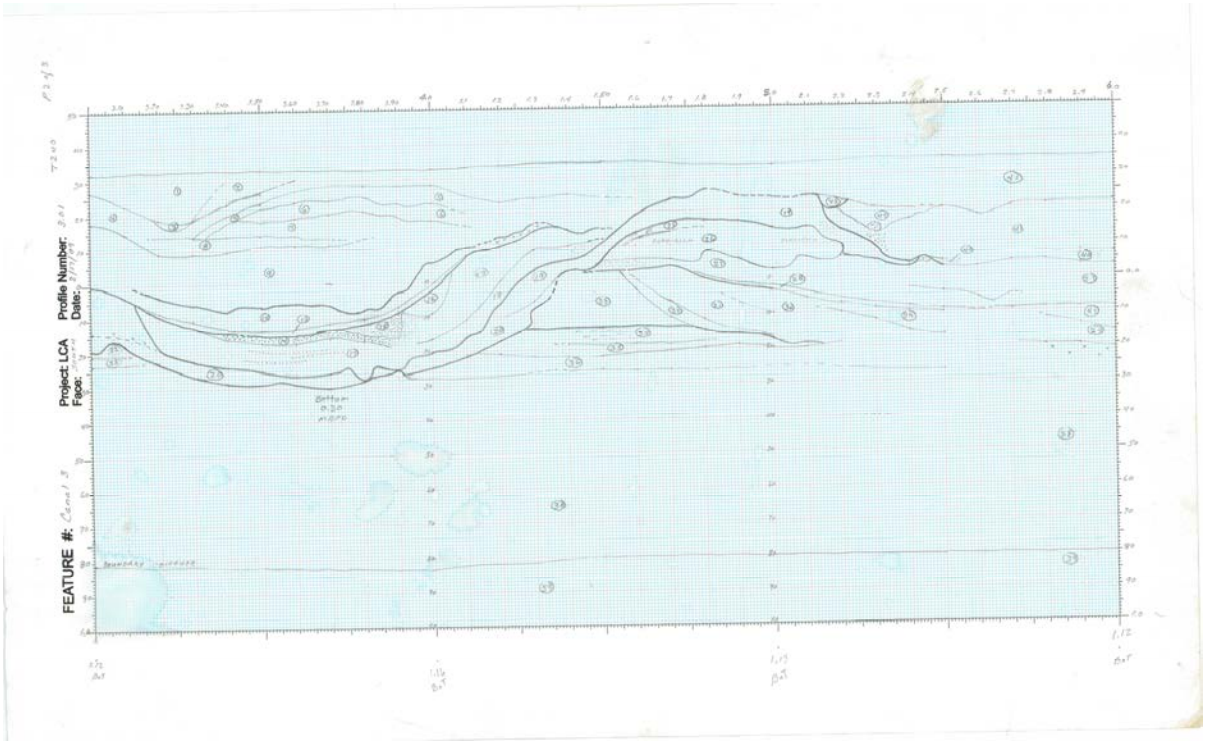
(5) Part of the southern (upslope) bank was removed. The smooth curved line of removal suggests that it was done by running water, but it could also have been done by human action.

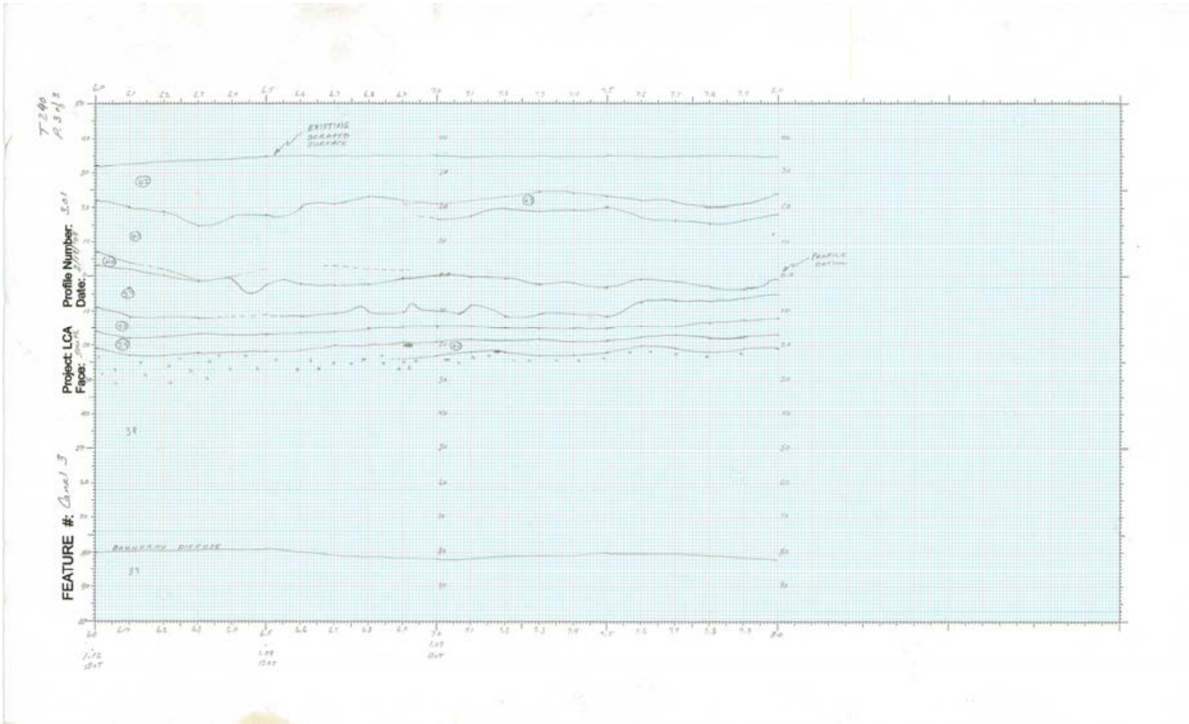
(6) The canal was cleaned – probably twice, but certainly at least once. This clean-out episode is most obvious on the southern side of the profile (canal-right), where it was placed outside the proto-bank, and did not raise the height of the bank. Removal sediments include some relatively pure clay (at the bottom), silty fine sand, and clayey sand.

(7) A minor flood occurred, forming a thin (1-4 cm) had a very fine sand and silt that laps onto #5 sediments on the south side of the canal bank. This "flood" may have been localized runoff, I cannot determine for sure. Although floodwaters rose well-onto the southern bank, they do not appear to have overtopped the bank.

(8) Clean-out of the canal occurred. These clean-out deposits are relatively thick, and added ~10-15 cm to the height of the bank. The lower of the clean-out sediments are relatively more sandy, while the top has many disaggregated angular blocks of relatively pure clay. I am almost certain that these deposits represent two different episodes of clean-out, but cannot say so conclusively. These deposits were placed atop and to the outside of existing bank crests. Crest-to-crest width at this time was ~2.30 m and depth was approximately 40 to 45 cm.


FEATURE #:
Project: LCA
Face:
Profile Number:
Date:


FEATURE #:
Project: LCA
Face:
Profile Number:
Date:


FEATURE #:
Project: LCA
Face:
Profile Number:
Date:

Canal 11, Locus B
Profile No.: 11.01

Map Reference: B1
Date Profiled: April 20-28, 2009
Trench, Unit: 1956
Canal Type: Sub-main
Cross-section Shape(s): 4
Parent Canal: 7?
Daughter Canal(s): 52?, 56, 79?
Stratigraphic Origin: 504.01/.02
Profile Datum (mbsd): -12.40
Profile Datum (masl): 668.96
Canal Length (m): 34 m
Banks Visible: Yes
Digouts Visible: Yes?
~Max. Visible Width (m): 2.00
~Max. Visible Depth (m): 0.35
Number of Iterations Detected:
~Ground Elevation at Inception (masl): 668.86+
Canal Bottom Elevation-Earliest Use (masl): 668.67
Fe/Mn Present (Y/N): None present
Samples Taken: None from this profile
Field Notes X-refs: 194

Comments: The profile is only 4 m long, and is not very informative. The profile top was truncated by construction prior to stripping, so not much can be said about stratigraphic origination from this profile, although it appears to have originated at the bottom of Stratum 504.02 or top of 504.01. These relationships can be seen much more clearly in Profile 11.02. The figure given for ground surface at inception is approximate, because the profile was not long enough to see adjacent undisturbed areas. It could be as much as 5 to 10 cm higher.

Bank/clean-out deposits are visible on canal-right; these generally consist of sandy loam, silty fine sand, or fine sandy loam with small included exotic blocks. It appears that these deposits are entirely from clean-outs during the use history, but I cannot be absolutely sure of this. A low depression is present on canal-right below the clean-out/bank deposits (see meter 3 on profile). The depression may simply be a natural undulation on the floodplain surface, but it's position in relation to the canal is suggestive of a digout.

My early conception of this canal was that it may have been a parent canal for C21; C11 appears to be smaller than expected, however, which makes me wonder if this idea has any merit.

Canal 11, Locus B
Profile No.: 11.02
Map Reference: B1
Date Profiled: April 27, 2009
Trench, Unit: 3125
Canal Type: Sub-main
Cross-section Shape(s): 3
Parent Canal: 7?, unobserved Main?
Daughter Canal(s): 52?, 56, 79?
Stratigraphic Origin: 504.01/.02 (see discussion below and previous interpretations by other investigators)
Profile Datum (mbsd): -12.38
Profile Datum (masl): 668.98
Mapped Canal Length (m): 34
Banks Visible: Yes
Digouts Visible: No
~Max. Visible Width (m): 2.30
~Max. Visible Depth (m): 0.5
Number of Iterations Detected: Minimally 2, possibly as many as 4
~Ground Elevation at Inception (masl): 668.95
Canal Bottom Elevation-Earliest Use (masl): 668.38
Fe/Mg Stains: None visible
Features Intruded by Canal: 7019
Features Intruding Canal:
Samples Taken: 4 ostracode samples
Field Notes X-refs: 194

Comments: This is an exceptional profile that will be a topic in the discussion of canal evolution and history. The uppermost iteration of this canal is one of only three 502 canals that were identified in the original project area.

There appear to be at least 4 iterations, although the last is very small. The trench is not long enough to determine the presence of digouts and to see bank characteristics in their entirety, so I cannot definitively say that digouts are not present. Unlike Profile 11.01, this profile is more nearly the expected size of a sub-main. What appears to be the initial canal is approximately 2.3 m wide and about 50-60 cm deep. These dimensions may have been modified by subsequent use and maintenance of the canal, however.

A variety of different canal-use sediments are present within and adjacent to the canal depression. A very large bell-shaped pit (F7019) containing charcoal, stone tray, and other artifacts, lies immediately beneath the canal.

Terminal 504.01 flood silts dip into the canal, indicating that it was still in use at the end of the 504.01. At the time of this flood a canal depression approximately 20-25 cm deep still remained in this portion of the canal course. What appear to be clean-out sediments having a similar texture to the flood deposits lie immediately above the terminal 504.01 flood silts, indicating that the canal was repaired or modified after flooding, but prior to the Stratum 503

flood, whose flood sands in other areas of this profile rest directly on the terminal 504.01 flood silts. Note the similarity of stratigraphic sequence with C30 in Locus D.

Stratum 503 sediments also dip into the canal, and suggest that after partial cleaning the canal-fill deposits were approximately 50 cm thick. At the time of the 503 flood, however, the canal depression was still approximately 2 m wide and 15-20 cm deep. Clean-out deposits clearly lie directly atop the 503 flood sands on profile-right. After the (503) clean-out, deposition of 502 silt and fine sand sediments occurred, which were also manually removed from the canal channel to some extent. The initial 502 clean-out was followed by deposition of laminated and thin-bedded (primarily thin-bedded) find sands and some silts in the remaining canal depression. At least 1 other clean-out episode occurred subsequent to what appears to be some use of the canal. Scraping related to the current project removed the uppermost part of the 502 canal, along with any evidence of banks that may have existed. The earliest deposits in the post-503 canal are a thin wedge of rather trashy, but well-sorted, fine-, medium-, and coarse sands. Contacts are not clear and it is possible that the upper contact of this surface is drawn incorrectly. This is one of the few (3) known instances of a post-503 canal, and the degree of its functionality, ultimate origin of canal waters, and canal capacity is not known at present. There appear to be canal-use sediments within the canal channel and the canal depression truncates other natural and clean-out deposits. I cannot say with absolute certainty whether the deposits in the post-503 canal result from canal-use *per se*, or are the product of incidental flooding that may have occurred, but the canal depression itself was clearly of cultural origin.

This exposure demonstrates the serendipitous nature of locating diagnostic canal features. Because of modern truncation(?), none of the other exposures of C11 show any evidence of a post-503 canal within the C11 channel. Because exposures are so limited, I do not know whether the smaller (502) canal is coincidentally located inside the C11 channel at this exact location, or whether it follows C11 for its entire length. Had only a few more centimeters been removed from the surface at this location, it would have been impossible to recognize the 502 and 503 and it would not have been possible to interpret the significance of these sediments within the canal depression.

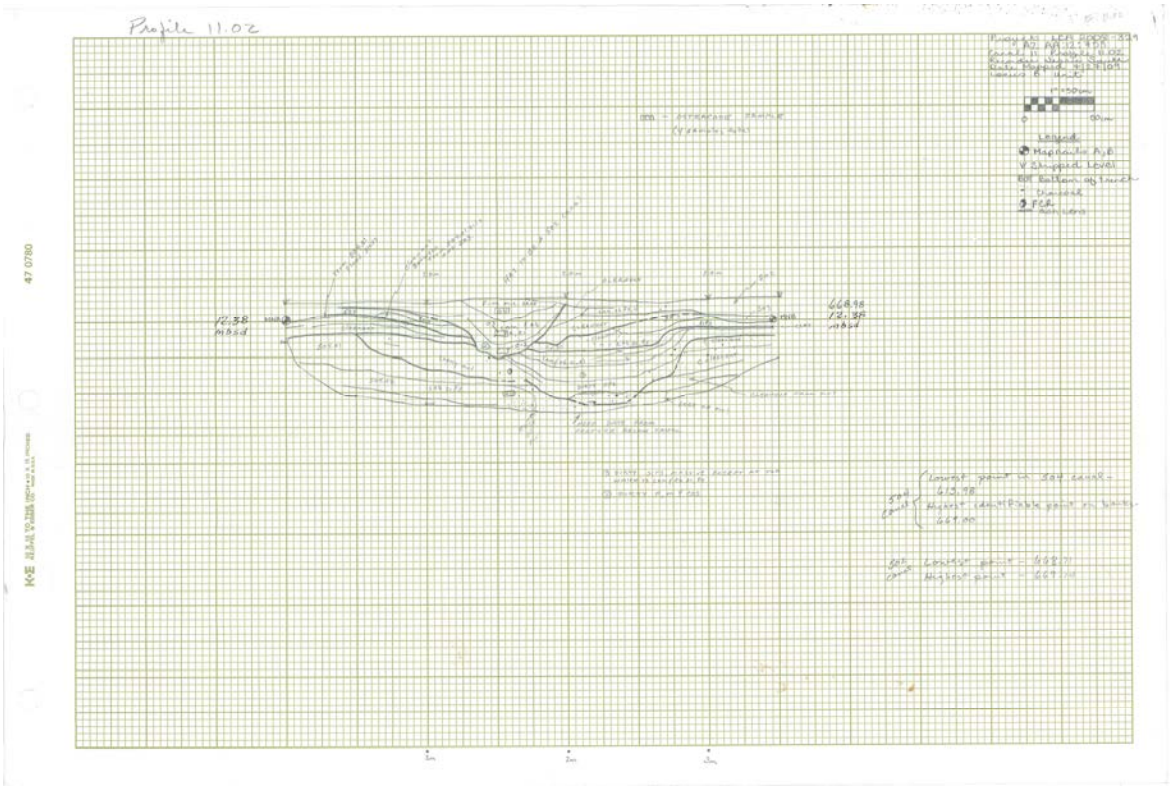
This profile also demonstrates one of the problems in interpreting the date of origin of canal features. Based on stratigraphic relationships that can be seen in this profile it appears that the canal originated in Stratum 504.02/504.01. In the SWCA profile (Figure 18.2:410), however, (assuming their stratigraphic interpretations are correct) the canal clearly starts much earlier in Stratum 504, probably 504.04. (Note that although they say the canal was dug <u>through</u> SWCA Stratum 5 (DAI stratum 505), it was only dug a short distance <u>into</u> Stratum 5 in this profile.) A portion of C11 was exposed by SWCA, and SWCA tentatively extended C11 to C16. (See SWCA map 18.1, page 408)

"... C11, identified at the Treatment Plant locality, may have dated to the late San Pedro or early cienega phase. Mabry, Holmlund, et al. (2007:267) suggested that this canal might be a branch of C7, but this seems unlikely in terms of alignment and topography as well as the dating (see Figure 18.1). Mabry, Holmlund, et al. (2007: Table 10.1) gave the minimum length of C11 as 1,010 m and its potential length as 1515 m. They also identified four separate subchannels of C11. Using historically documented ratios of canal discharged irrigated

acreage is comparative data, Mabry, Holmlund, et al. (2007:273) estimated that C11 initially irrigated an area of 26-34 acres (10-14 ha)." [Quoted from the SWCA report]

Ostracode Samples:

Sample O-1 is not located within the canal. It is in the edge of a bell-shaped pit.
Samples O-2 through 4 were recovered from the 502 canal.



Canal 16 (SWCA Feature 350, SA 4, Treatment Plant locus)
Profile No.: SWCA Figure 18.3

Date Profiled: Unknown
Trench, Unit: SWCA BHT 1
Canal Type: Unknown
Parent Canal: 11
Daughter Canal(s): Not stated
Stratigraphic Origin: If the correlation with Canal at 11 is correct, the canal would have started in SWCA Stratum 504 C. As shown in profile in Figure 18.4, the canal probably originated in Stratum IV (their designation).
Profile Datum (mbsd): Not given
Profile Datum (masl): Not given
Mapped Canal Length (m): Not mapped for this project
Banks Visible: No
~Max. Visible Width (m): 1.1
~Max. Visible Depth (m): 0.40
~Ground Elevation at Inception (masl): Cannot determine
Samples Taken: SWCA took ostracode samples (see report)

Comments: This canal profile was originally presented in the SWCA report (Figure 18.4). We were unable to re-open their excavation or make a new exposure of the canal, so all of my interpretations regarding this canal are made on the basis of examination of the SWCA profile shown in their report. I have included it because I want to point out in the discussion of profile interpretations several aspects of this particular profile that appear to have been misinterpreted, and how to avoid such problems in the future. In the SWCA report on the Warehouse Locus, they suggest that C16 was fed by the possible well they had in that area. I need to write up a detailed explanation of 1) why that feature could not have been a well, and 2) why the hydrologic conditions that could produce artesian flow do not exist in this area.

SWCA interprets two iterations of this particular canal, which they tentatively correlated with C11. (I have some problems with their interpretation, which will be discussed in more detail at a later point in time)

Canal 19, Locus D
Profile No.: 19.01

Map Reference: D1
Date Profiled: December 4, 2008
Trench, Unit: 103
Canal Type: Distribution
Cross-section Shape(s): 5
Parent Canal: 21
Daughter Canal(s): 124, 123, 122, 49, 50, 51, and there were probably others beyond the excavated and mapped extent of Locus D.
Stratigraphic Origin: 504.02 (at beginning of interval?)
Profile Datum (mbsd): -12.998
Profile Datum (masl): 668.360
Mapped Canal Length (m): 108
Banks Visible: No?
Digouts Visible: No
~Max. Visible Width (m): 1.40
~Max. Visible Depth (m): 0.50
Number of Iterations Detected: 2
~Ground Elevation at Inception (masl):?
Canal Bottom Elevation-Earliest Use (masl): 667.82
Canal Bottom Elevation-2nd Iteration (masl): 668.04
Fe/Mg Stains: Y, B, S. There is a faint oxidation halo present beneath the canal.
Samples Taken: 10 ostracode samples (need to get his diagram showing distribution of samples)
Field Notes X-refs: Pages 111-113

Comments Regarding C19 in General: While working in Locus D, I realized that several small canal exposures had been previously mis-identified as natural floodplain depressions. As a result, I got copies of SWCA's report which showed a very problematic profile of the feature they called Canal 19. The approximate location of the canal was located and its previously mapped orientation traced directly into trenches 104 and 103. To my dismay, I found the canal/channel depression in both trenches had been previously missed. After cleaning the trench walls, the one in Trench 104 does look like a small canal. The exposure of this canal in Trench 103 is not a very impressive, and if I had only this one exposure, I would still conclude that it is a natural feature. Gven the location on the projected trend and the Trench 104 exposure, however, I am convinced that C19 does exist. The trend of the canal was later traced into Trench 116, where yet another canal-like C19 depression was found.

All of the exposures of C19 have several characteristics in common (these are preliminary and subject to later change):

(1) They are relatively small (dimensions to be given later),

(2) Most have little or no coarse-sand concentration at the base of the canal fill,

(3) Canal-use sediments are primarily fine-sand, silt, and clay,

(4) All display some variety of catenary cross-section profile,

(5) The lower sidewalls are difficult to distinguish from natural sediments into which they were dug,

(6) All have at least one lens of relatively pure silt,

(7) All exposures appear to be contemporaneous, starting at, or very near, the top of Stratum 504,

(8) Banks could not be readily discerned on any of the exposures , apparently having been clipped by the modern plow zone.

Comments Specific to Profile 19.01: This small canal was only observed in Locus D and a small portion of Locus E. The canal was originally identified during the SWCA investigations, and we merely extended the known distribution of the canal. The canal has a directional trend similar to C21, 30, 33, and 31, and appears to be intermediate in size between C21 (sub-main canal) and C30 (at the smallest end of distribution canals). See additional discussion comments for Profile 19.02. This canal is clearly a distribution canal, and appears to originate from, and b coeval with, C21. There are a number of daughter canals listed above.

Our initial profile of this canal (19.01) is in Trench 103, and the profile is very short. No clear banks were visible in the profile, nor were digouts visible. As with most of the canals in Locus D, the canal had rather pronounced cicada disturbance, and some aspects of the stratigraphy were not clear.

Piping features observed just west of this canal in Locus D suggests that these features may be related to the operation of C19

Canal 19, Locus D
(NO OSTRACODE SAMPLES COLLECTED FROM THIS PROFILE)
Profile No.: 19.02

Map Reference: D1
Date Profiled: December 4, 2008
Trench, Unit: 104
Canal Type: Distribution
Cross-section Shape(s): 5
Parent Canal: 21
Daughter Canal(s): 124, 123, 122, 49, 50, 51
Stratigraphic Origin: 504.04
Profile Datum (mbsd): -12.846
Profile Datum (masl): 668.513
Mapped Canal Length (m): 108
Banks Visible: No?
Digouts Visible: no
~Max. Visible Width (m): 1.25
~Max. Visible Depth (m): 0.48
Number of Iterations Detected: 2, possibly 3
~Ground Elevation at Inception (masl): 668.24
Canal Bottom Elevation-Earliest Use (masl): 667.73
Canal Bottom Elevation-2nd Iteration (masl): 667.97
Fe/Mg Stains Present (Y/N, In canal fill, Below, Slight, Heavy): Y, B, S. Very slight oxidation halo .
Samples Collected: None
Field Notes X-refs: Page 111, 112

Comments: December 1, 2008: Copies of SWCA's report showed a very problematic profile of the feature they called C19. I found the approximate location of the canal and traced its postulated orientation directly into trenches 104 and 103, where canal/channel depressions were found in both the trenches. After cleaning, the exposure in Trench 104 is a small canal (approximately half the size of C21?). The exposure in Trench 103 is damaged at the top and is not a very impressive canal, and if I had only this one exposure, I would conclude that it is a natural feature. Given the location on the projected trend and the Trench 104 exposure, however, I am convinced that C19 does exist. I later traced the trend of the canal into Trench 116, where I found yet another canal-like depression for C19.

Very preliminary examination of all the exposures of C19 shows several characteristics in common: 1) they are small, 2) most have little or no coarse sand concentration at the bottom of the canal fill, 3) canal-use sediments are primarily fine sand, silt, and clay, 4) all display some variety of catenary profile, 5) the lower sidewalls are often difficult, if not impossible, to distinguish from the natural sediments into which they were dug (badly disturbed by cicadas), 6) all have at least one lens of relatively pure silt, 7) all appear to be contemporaneous, starting in Stratum 504.02/504.01, 8) banks could not be readily discerned on any of the exposures, and all profiles appeared to have been truncated by the modern plow zone. (Note that these are preliminary observations and some may be invalidated after detailed profiles have been drawn.)

I decided that I should take another look at several small "natural depressions" that had been previously brought to my attention by Carrie and Steve. This resulted in the identification of another very small canal in Trench 116, 106 and 103. Exposures of this feature are more ambiguous than C19, but it is at the same stratigraphic level (or higher) and it parallels the trend of that canal. I numbered this C30, and will profile all available exposures. I could not find any continuations of C19 or C30 north of Trench 116.

Several observations: 1) as far as can be determined right now, the trends of C30, C19, and C21 are all approximately parallel. 2) the spacing between these canals seems to be rather regular. This leads to speculation that their spacing may reflect the area that could be easily watered from a single distribution canal, i.e., field width. *(This comment was made prior to discovery of individual fields and the widths of canal "belts".*)

As excavations proceeded to greater and greater depths in Locus D, I began to realize that the course of C19 was determined by pre-existing topography (see discussion of natural channels). A broad, shallow floodwater channel existing on the floodplain surface at the end of deposition of Stratum 505 extends across Locus D; the course of C19 approximately parallels the western edge of this channel. The canal is excavated into a low, slightly elevated "natural levee-like" mound of sandy sediments that parallel the channel margin for much of its course. The daughter canals listed above carried water into fields that were located *in* the broad channel depression. It appears that some of the earliest irrigation in the central part of Locus D occurred in this channel, although C31 (at the eastern end of Locus D) appears at this time to be older (504.04?). Irrigation appears to have continued in fields related to C19 through the end of 504.01, and there are indications that an attempt was made to rehabilitate portions of the area following the occurrence of the Stratum 503 floods (see discussion of Canals 30, 35).

Canal 19, Locus D
Profile No.: 19.03

Map Reference: D1
Date Profiled: December 17, 2008
Trench, Unit: 116
Canal Type: Distribution
Cross-section Shape(s): 3, 5 (irregular)
Parent Canal: 21
Daughter Canal(s):
Stratigraphic Origin: 504.02/.01 (note differences with profiles 19.01 and 19.02)
Profile Datum (mbsd): -13.281
Profile Datum (masl): 668.078
Mapped Canal Length (m): 108
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): 1.55
~Max. Visible Depth (m): 0.47
~Ground Elevation at Inception (masl): 667.95?
Number of Iterations Detected: 2, possibly three
Canal Bottom Elevation-Earliest Use (masl): 667.56
Canal Bottom Elevation-2nd Iteration (masl): 667.84
Fe/Mg Stains: None observed
Fe/Mn Present (N):

Comments: This is the most downstream profile of any on C19, and in fact, on any canal except C21. The profile was drawn from an exposure in Trench 116 and displays an irregular shape. A small irregular depression in the bottom of the canal is filled with disturbance material, and it is not known whether this reflects the original excavation debris or a possible clean-out of a pre-existing canal.

If my stratigraphic interpretation is correct, in this exposure the canal was definitely present during the 504.04 interval. The canal is somewhat smaller in cross-section in this particular exposure, perhaps it was carrying less water because of infiltration and use-losses of water in upstream portions of the canal. Two iterations of the canal were noted in this particular location, and it is significant that the latter of the two occurs near the end of 504.04 deposition. Sediments that overlie the canal are primarily silty fine sands and fine sandy silts, and most closely resemble Stratum 502 sediments in this portion of the site.

Canal 20, Locus G

Map Reference: Locus G, not shown on maps
Date Profiled: not profiled
Trench, Unit: 220
Canal Type: ?
Cross-section Shape(s): 3
Parent canal: Canal 3?
Stratigraphic Origin: 506.01
Banks Visible: No
Digouts Visible: No

Comments: This small field-lateral type canal was exposed in Locus G very early in the project. The feature was assigned a canal number by the crew, but was never profiled, and never definitely identified as a canal.

Canal 21, Locus D
Profile No.: 21.02

Map Reference: D2
Date Profiled: December 17, 2008
Trench, Unit: 104
Canal type: Main
Cross-section Shape(s): 2
Parent canal: 42?
Daughter canal(s):
Stratigraphic Origin: 504.02/.01
Profile Datum (mbsd): -12.92
Profile Datum (masl): 668.44
Mapped Canal Length (m): 103 (Locus D segment only, figure does not include that portion in Locus E)
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): 1.45
~Max. Visible Depth (m): 0.55
~Ground Elevation at Inception (masl): Cannot determine
Number of Iterations Detected: 1
Canal Bottom Elevation-Earliest Use (masl): 667.52
Fe/Mn Present (Y/N): Y, B, moderate to heavy
Samples Taken: 12 ostracode samples

Comments: There will be a much more extensive discussion of C21 in other profiles, the following is a summary of preliminary observations. The top of the canal was truncated by the modern plow zone in this exposure, so it is not possible to thoroughly evaluate the presence of banks and/or digout depressions, although there is possibly a small digout on profile-left. Modern truncation has also made it impossible to confidently determine the number of iterations of this canal although I am sure that multiple generations of the canal are present. See other profiles of C21 for examples of variety in iterations on this canal.

This particular profile was described before I had realized that Stratum 504 could be consistently divided into substrata. There has been an unusual amount of clay enrichment in the sediments alongside the canal, and all exposures of this canal have been seriously turbated by cicada burrowing, but I am now sure that the canal began during the early (?) 504.02 interval.

The lowermost canal-use sediments are primarily coarse to medium sands, indicating relatively rapidly flowing water, and probably a more substantial volume of water than is seen in any of the other canals in the site. Modern truncation prohibits precise determination of exact dimensions of the canal in this exposure, but reliable estimates can be obtained from other exposures. Twelve ostracode samples were collected from this profile, one of the more heavily iron/manganese-stained canal exposures observed in the site. With few exceptions heavy staining was observed only and exposures of canal 21 and several other larger canals, in addition to some of the distribution canals. Iron/manganese oxide staining was not

observed in relation to any of the field laterals exposed in this investigation. One slightly unusual aspect of this particular profile is that iron/manganese deposits not only extend into and across sediments beneath the canal, but also are present (primarily in the form of oxidation stains) in the coarser sediments in the lowermost canal-fill sediments.

The sequence of C21 profiles starts with Profile 21.02. What would have been Profile 21.01 was exposed in Trench 103, but was not drawn because of severe cicada disturbance. Virtually all exposures of larger canals (main and distribution) showed at least some evidence of cicada burrowing. In contrast, field laterals almost never showed evidence of cicada disturbance. The presence of both abundant cicada burrows and manganese accumulation are interpreted as indications of the fact that these canals carried water more regularly and for more prolonged periods than the field laterals, and as a result, the areas around the canals were damp for much more longer periods of time.

Ostracode Samples:

The lowermost ostracode sample (O-1) is from sediments beneath the canal. Samples O-11 and O-12 are from post-canal sediments. Samples O-2 through O-4 are from the 1st canal iteration, while samples O-5 through O-9 are from a 2nd iteration. Sample O-10 appear to be from natural post-canal flood deposits, although I cannot conclusively determine this because the top of the canal is truncated).

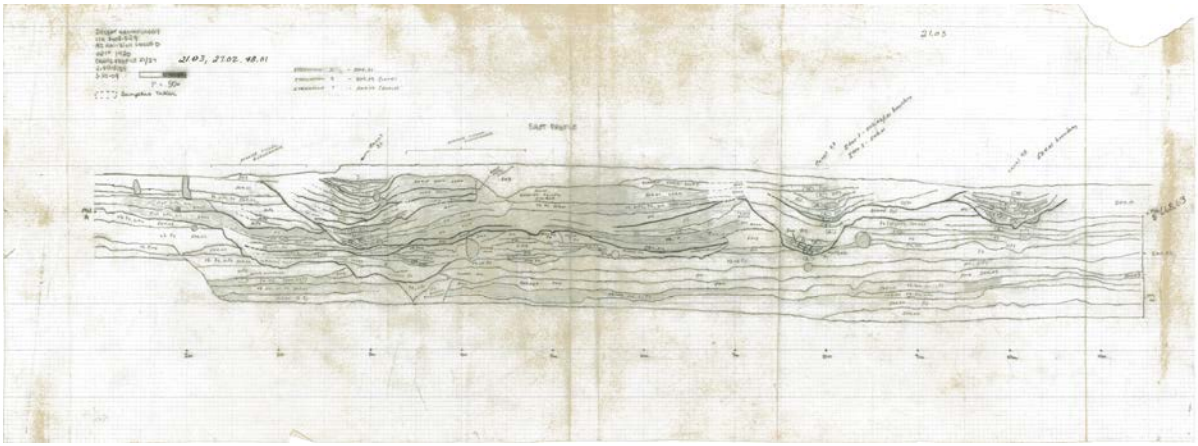
Canal 21, Locus D
Profile No.: 21.03 (also shows Profiles 27.02 and 48.01)
Map Reference: D2
Date Profiled: March 20, 2009
Trench, Unit: 1420
Canal Type: Sub-main
Cross-section Shape(s): 4, 5
Parent Canal: 42?
Daughter Canal(s):
Stratigraphic Origin: 504.02
Profile Datum (mbsd): -12.72
Profile Datum (masl): 668.63
Mapped Canal Length (m): 103 (Locus D segment only, figure does not include that portion in Locus E)
Banks Visible: Yes
Digouts Visible:?
~Max. Visible Width (m): 5.20
~Max. Visible Depth (m): 1.13
~Ground Elevation at Inception (masl): 668.67
Number of Iterations Detected: 4+
Canal Bottom Elevation-Earliest Use (masl): 667.40
Canal Bottom Elevation-2nd Iteration (masl): 668.13
Canal Bottom Elevation-3rd Iteration (masl): 668.39
Canal Bottom Elevation-4th Iteration (masl): 668.23
Fe/Mn Stains: Y, B, H

Comments: Fifth iteration canal bottom = 668.43. This is an absolutely amazing profile that shows the consequences of not understanding erosion control, and the causes of that selfsame erosion. The total exposure of C21 in this particular location is more than 7 m wide (although it was never that wide during any given iteration), and there may have been as many as seven or eight different iterations. C21 makes a ~30° deviation in course within a few meters up- and down-canal from Unit 1420. Shortly downstream, it deviates even further and makes several sharp bends including one that is almost a right-angle turn. Subsequent to the initial description of profile 21.03, I recognized the presence of several natural channels and piping vents just west and north of the location of this profile. The deviations in course are apparently an attempt to avoid these natural disruptions to the topography of the floodplain. The combination, however, of relatively soft easily eroded sandy soils, a relatively large canal, and a sharp turn in that canal created a situation of inevitable erosion on the bank outside the bend of C21 (profile-right). As the canal "got away", its course widened to the point that it was eventually more than 6 m wide. It appears that for the first 4 (?) or so iterations of the canal the channel was allowed to remain in this unnaturally widened configuration, and C27 appears to have been diverted from the outside of the eroding bend at some point (3rd iteration?). At about the fifth iteration of the canal, material was artificially a added to build up the outside of the bend and narrow the channel.

An important aspect of this profile is that it appears to demonstrate something of the state of technological knowledge during the Early Agricultural period. Canal erosion along this

slight bend could have been relatively easily controlled simply by placement of stones or wood on the outside of the bend. While it is possible that the canal was allowed to remain in this artificially expanded condition simply because it didn't cause any particular problem, it seems more likely that the prehistoric irrigators did not understand some of the basic principles of erosion control found so commonly in later prehistoric canals. It should also be noted that stones or indications of bank reinforcement were not found in any canal exposures.

Another interesting aspect of this canal is the presence of irregularly oriented silty clay blocks in a relatively narrow area directly beneath the earliest iteration of the canal. This is reminiscent of C145, where a filled piping tunnel was present immediately below that particular canal. I cannot prove, but rather would suggest, that these randomly oriented blocks may represent natural collapsed into a small piping opening beneath the canal. In this particular profile the exposure could not be deepened because of OSHA restrictions, so we could not see sediments beneath the canal.



Canal 21, Locus E
Profile No.: 21.04

Map Reference: Not shown on standard maps
Date Profiled: April 8, 2009
Trench, Unit: 1552?
Canal type: Main
Cross-section Shape(s): 3
Parent canal: 42?
Daughter canal(s):
Stratigraphic Origin: 504.02/.01
Profile Datum (mbsd): -13.64
Profile Datum (masl): 667.72
Mapped Canal Length (m): 103 (Locus D segment only, figure does not include that portion in Locus E)
Banks Visible: Yes
Digouts Visible: Yes
~Max. Visible Width (m): 2.90
~Max. Visible Depth (m): 0.91
~Ground Elevation at Inception (masl): ?
Number of Iterations Detected: 1
Canal Bottom Elevation-Earliest Use (masl): 668.81
Fe/Mn Present (Y/N): Y, B, S
Field Notes X-refs: Page 183

Comments: This particular profile, located in Locus E, is an excellent profile, despite the fact that there is rather pronounced cicada disturbance on both canal-left and canal-right. Perhaps because of this disturbance, I can only confidently identify one iteration of the canal, although I am virtually certain that there are three or more. A small depression exists on profile-left that has been interpreted as a digout for one of the early stages of the canal, and a similar depression may be starting at the end of the profile on profile-right.

Sediments in the bottom of this canal are muddy silty clays that display no obvious signs of stratification. The area beneath the canal is unusually well oxidized, and is locally slightly cemented. Cementation in sediments around the canals in the site is rather unusual, despite the fact that it is common in other areas. Although the canal bottom is slightly a regular it displays a rather nice catenary curve cross-section (type 3).

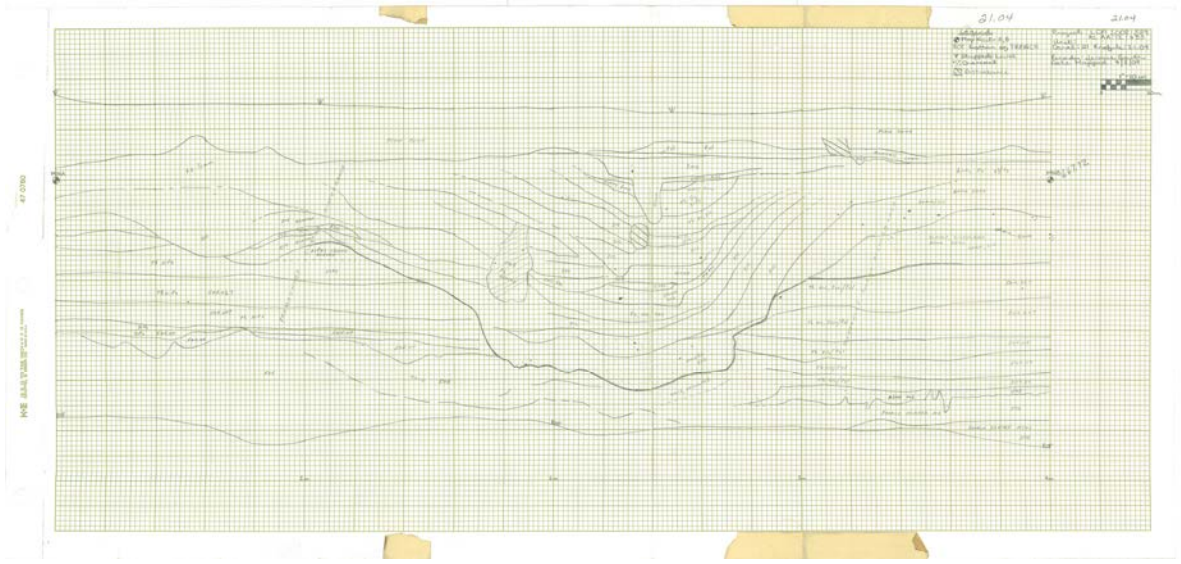
One interesting aspect of this profile is that the canal appears to start during the lower 504.02 interval, or at best near the top of Stratum 504.04 (see discussion of stratigraphic relationships for profile 21.02).

Cleaned profile 21.04 in new trench on April 7, 2009.
Because of cicada disturbance, I had anticipated this would not be a good profile. To my surprise, it turned out to be one of the best profiles yet in terms stratigraphic differentiation. Banks can be discerned to some extent, although internal bank stratigraphy cannot. The canal in this trench proved to be located in almost the exact place where it was predicted to be. Interestingly, the canal position exactly coincides with the line of vegetation on the modern

surface. Perhaps this is mere coincidence, but I suspect the water-retention capabilities of the canal sediments played a part.

I took a series of photos, about 12 to 15 total. I did several panoramas for splicing, as well as several close-ups of manganese/iron oxides at the canal bottom.

This canal profile is unique for several reasons: first, most exposures show 2 canal iterations. These vary from two partially overlapping channels (Trench 116, Trench 104), a major inset canal inside the canal meander (excavation unit 1420?), to possibly two separate channel separated by several meters in the Trench 115 area. Second, this profile shows relatively abundant manganese/iron oxide staining and accumulation of the canal base. As has been previously discussed, such oxides are the exception in the Tucson basin canals. Several other exposures of Canal 21 also show oxides, but none as plentiful as this.



Canal 21, Locus E
Profile No.: 21.05

Map Reference: Not shown on standard maps
Date Profiled: April 13, 2009
Trench, Unit: 1552
Canal type: Letter Main
Cross-section Shape(s): 2, 3
Parent canal: 42?
Daughter canal(s):
Stratigraphic Origin: 504.02/.01
Profile Datum (mbsd): -13.61
Profile Datum (masl): 667.75
Mapped Canal (m): 103 (Locus D segment only, figure does not include that portion in Locus E)
Banks Visible: Yes
Digouts Visible: Yes
~Max. Visible Width (m): 1.70
~Max. Visible Depth (m): 0.85
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): ?
Canal Bottom Elevation-Earliest Use (masl): 666.90
Fe/Mn Present (Y/N): Y, B, M
Field Notes X-refs: Page 184

Comments: Profile 21.05 is the most northerly (downstream) of the C21 exposures. The canal is slightly smaller in this exposure, again probably because of infiltration and use-losses of water in the more heavily agricultural area upstream from this location. The canal displays a steep catenary curve profile (type 3) and has good exposures of both banks and digout areas. The canal appears to be located at the side of a natural channel, which can be seen in the profile-right side, where beds dip rather steeply (approximately 20-25°) toward the channel.

I can only confidently recognize one iteration of the canal in this particular location, although I'm relatively sure that there are at least three. The banks and appear to be composed primarily of clean-out materials although on profile-left the lowest identifiable bank materials may represent original excavation. This particular exposure was in a rather unusual location at the confluence of several trenches (Trenches 114 and 115), and displayed significant variability from one trench to the other even though the trenches are only separated by a few meters. Near the eastern end of Trench 115 (see profile for 21.05) and on the opposite side, there was a natural channel somewhat larger than the canal itself. In a slightly more upstream position in Trench 114 there seemed to be two separate C21 channels, one of which seemed to be largely filled with flood deposits as opposed to canal-use sediments. Because of limited space and time I was not able to unravel this puzzle, but it appears that the original location of C21 may have been impacted by flood deposits, at which time a new version of the canal was excavated, slightly westward from the original position. If this is a correct interpretation, it may also explain why I cannot see as many iterations of C21 in Profile 21.05.

In the most upstream position of C21 (southernmost, Profile 21.02) the elevation of the canal bottom is 667.52 masl, whereas in the most downstream position (this profile), the elevation of the canal bottom is 666.90 indicating a total drop of approximately 0.62 m over the length of the canal. I have not calculated the distance between the two points as of yet.

Canal 21, Locus D
Profile No.: 21.06

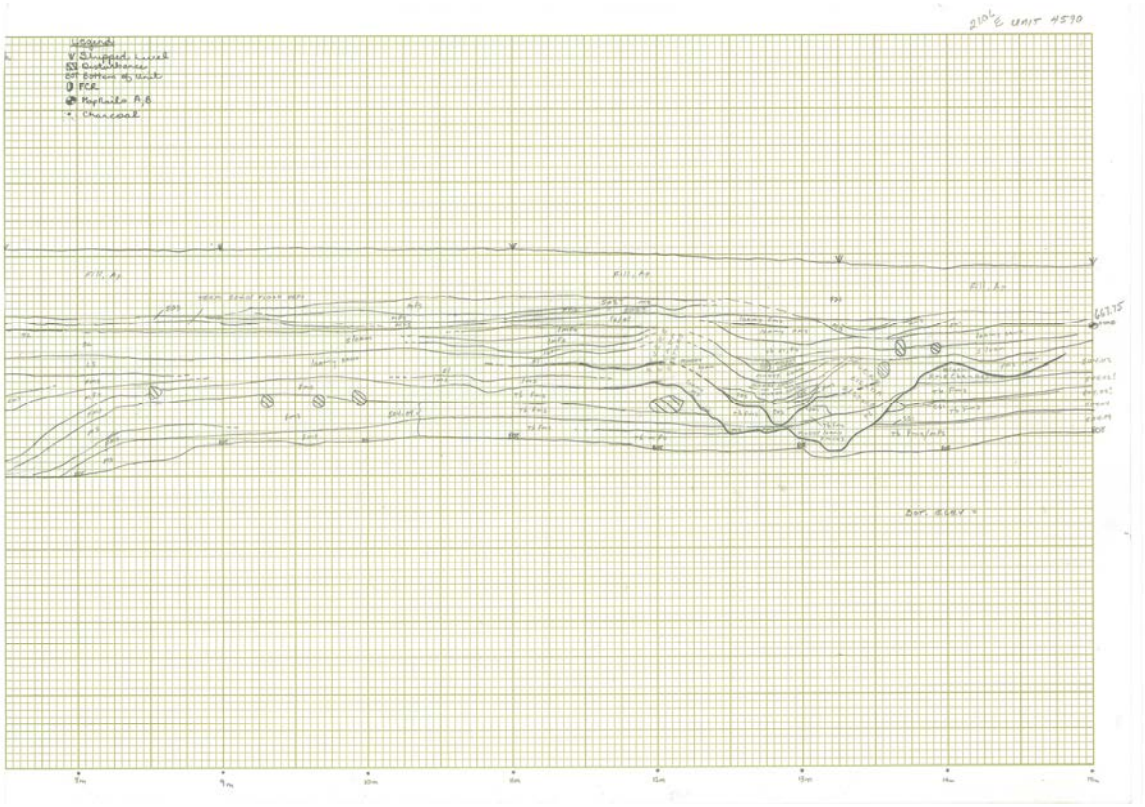
Map Reference: D2
Date Profiled: May 19, 2009
Trench, Unit: 4590
Canal type: Main
Cross-section Shape(s): 2, 3
Parent canal: 42?
Daughter canal(s):
Stratigraphic Origin: 504.02/.01
Profile Datum (mbsd): -13.61
Profile Datum (masl): 667.75
Mapped Canal Length (m): 103 (Locus D segment only, figure does not include that portion in Locus E)
Banks Visible: Yes
Digouts Visible: No
~Max. Visible Width (m): 1.95
~Max. Visible Depth (m): 0.60
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): ?
Canal Bottom Elevation-Earliest Use (masl): 666.90
Fe/Mn Present (Y/N): Y, B, M
Field Notes X-refs: 202, 203

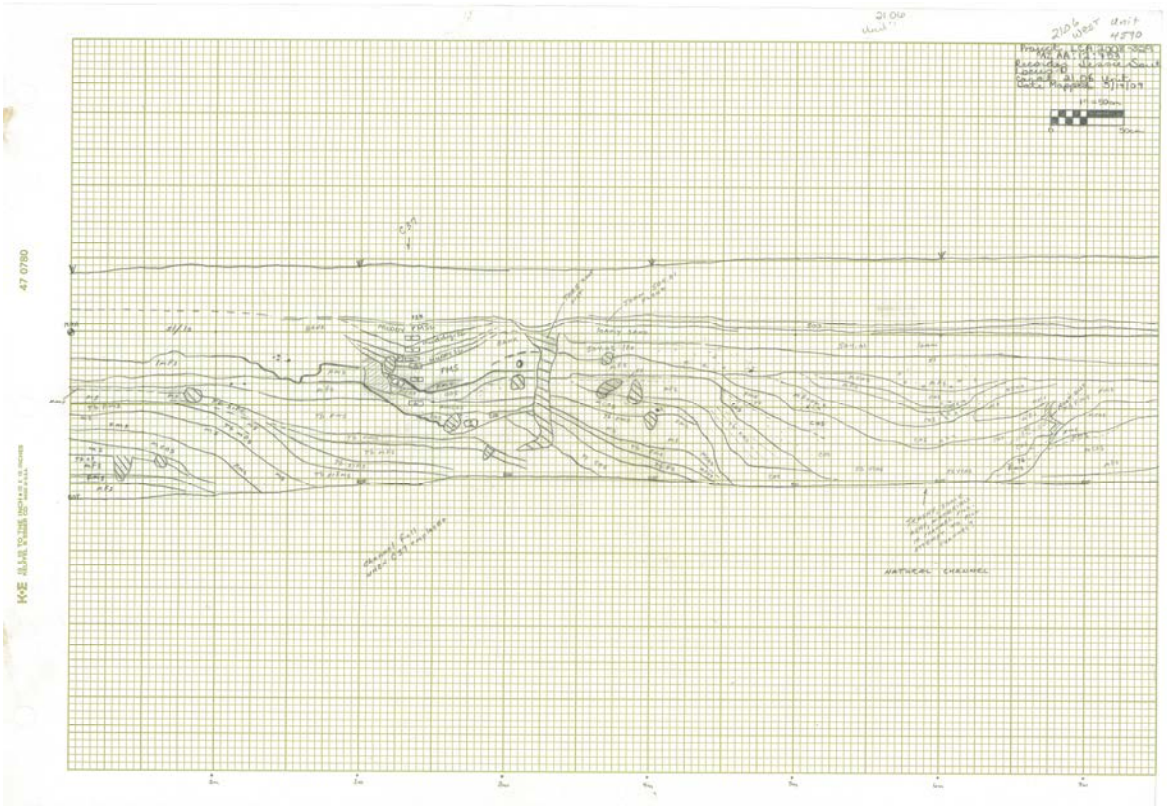
Comments: This profile is extremely long (15 m) and was drawn in this fashion to illustrate a stratigraphic relationships between a natural channel which lies a few meters to the west of C21. 21 has a maximum width of almost 2 m at this particular point and has a maximum depth of approximately 0.6 m. a minimum of two iterations can be recognized in this particular profile, although there are probably more.

The profile clearly shows that the natural channel (Stratum 504.04 and 505) predated the canal. The natural channel had already begun filling at the time of the first-recognize iteration of C21 (which still appears to be 504.02 at this particular location), with the bottom of the natural channel lying probably not much below the bottom of the canal. Deposits having the morphological shape of banks lie at the western edge of the canal (canal-left), although cicada disturbance is so pronounced that I cannot interpret depositional structures very well. In general, these "banks" consists of muddy sediments having loamy textures. By the end of canal use (Stratum 504.01) the natural channel had filled and Stratum 504.01 and 503 sediments extend straight across the natural channel rather than dipping into it. It appears that the primary use of the canal ended near the end of 504.01, although there is a slight depression filled with Stratum 50 to sediments near the top of canal-right. I cannot say conclusively whether sediments within the canal depression represent canal use or natural flood deposition.

Just to throw a little bit more confusion into the picture, while the larger natural channel appears to have filled before the end of the 504.01 interval, Feature is 37 is located near the western side of the natural channel. This feature was originally identified as a small canal in

excavation unit 1421, but as more exposures were opened it was noted that the fill of the feature was consistently trashy, with large amounts of charcoal and artifactual content. In order to interpret the origin of this feature better, a long trench was excavated perpendicular to the feature just north of Trench 105. In this location it became clear that the feature was no longer a canal but rather a canal that had enlarged into a natural channel that apparently interfered with the functioning of the irrigation system, because people were throwing trash into the channel to minimize erosion and cause filling. There is a much more extensive discussion of this in other portions of the report, but it is important to recognize that natural channels of various sizes did exist on the floodplain during the time that the canals were operational, and that people were making attempts not only to avoid the position of these channels (e.g., the strange curves in C21), but were also making efforts to minimize erosion and presumably enlargement of the natural erosional features.





Canal 21, Locus E
Profile No.: 21.07

Date Profiled: November 24, 2008
Trench, Unit: 116
Canal type: Main
Cross-section Shape(s): 2, 5
Parent canal: 42?
Daughter canal(s):
Stratigraphic Origin: 504.02/.01
Profile Datum (mbsd): -13.28
Profile Datum (masl): 668.08
Mapped Canal Length (m): 103 (Locus D segment only, figure does not include that portion in Locus E)
Banks Visible: Yes?
Digouts Visible: Yes
~Max. Visible Width (m): 1.85
~Max. Visible Depth (m): 0.89
Number of Iterations Detected: 2+
~Ground Elevation at Inception (masl): 667.63
Canal Bottom Elevation-Earliest Use (masl): 667.16
Canal Bottom Elevation-2nd Iteration (masl): 667.04
Fe/Mn Present (Y/N): Y, B, M-H
Field Notes X-refs: 108, 109

Comments: Profile 21.07 is located in Trench 116, and displays a relatively typical cross-section profile, although perhaps slightly deeper and narrower than usual. This profile displays a minimum of two canal iterations, but there also appears to have been a change in thalweg position that may have been naturally or culturally induced. As is characteristic of this canal, some parts of the canal stratigraphy can be mapped in minute detail, while other deposits (particularly clays) are highly disrupted by repeated wetting and drying, cicada burrowing, and perhaps by cultural dislocation. Cicada disturbance is especially pronounced on the profile-left side of the canal. Although I could not recognize distinct depositional features that conclusively identified the presence of banks, there are morphological features suggestive of banks in the position of banks on both sides of the canal. These banks would appear to have been very low and without remarkable stratigraphy. There is a small pit on either side of the canal. In addition, there is a very distinctive digout area on profile-left. Canal fill includes coarse sand and "chocolate clay", along with distinctively-bedded and laminated silt. In the lower part of the canal fill relatively coarse sandy deposits alternate with fine sandy silts and silty clays, indicating (at the least) multiple episodes of flow within the canal and these may represent, in part, different iterations. Manganese deposition is pronounced on bedding planes in the area immediately below the canal and an oxidized and manganese-stained halo follows the canal bottom.

The canal originates from near the top of Stratum 504. What are interpreted as Stratum 503 sediments (that here appear to be mixed with contemporaneous Santa Cruz River sediments) dip into the canal immediately above what I interpret as the top of the canal-use deposits. Stratum 502 sediments overlie the canal; although these deposits dip slightly into a

depression remaining after deposition of Stratum 503, it appears that they are the product of natural flooding rather than canal use. A schematic diagram of this profile is shown on p. 109 of field notes.

Canal 22, Locus D
Profile No.: 22.01

Map Reference: D2
Date Profiled: December 15, 2008
Trench, Unit: 103
Canal type: Historic lateral
Cross-section Shape(s): 5
Parent canal: Unknown
Daughter canal(s): None
Stratigraphic Origin: Historic
Profile Datum (mbsd): -12.950
Profile Datum (masl): 668.436
Mapped Canal Length (m): This canal was not mapped for this project. The course of the canal shown on the map is a projection only.
Banks Visible: Yes
Digouts Visible: No
~Max. Visible Width (m): 0.95
~Max. Visible Depth (m): 0.28
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 668.39
Canal Bottom Elevation-Earliest Use (masl): 668.06
Fe/Mn Present (Y/N): None present
Samples Taken: 7 ostracode samples

Comments: This is one of three parallel historic canals in the Southwest corner of Locus D (Canals 22, 23, 24). We need to look on historic maps and photographs to see how these canals relate to historic fields, wells, and other canals. Profiles 22.01 and 23.01 are on the same drawing.

Canal 23, Locus D
Profile No.: 23.01

Map Reference: D2
Date Profiled: December 15, 2008
Trench, Unit: 103
Canal type: Historic lateral
Cross-section Shape(s): 3
Parent canal: Unknown
Daughter canal(s): None
Stratigraphic Origin: Historic
Profile Datum (mbsd): -12.950
Profile Datum (masl): 668.436
Mapped Canal Length (m): This canal was not mapped for this project. The canal course shown on map is a projection only.
Banks Visible: Yes
Digouts Visible: No
~Max. Visible Width (m): 1.30
~Max. Visible Depth (m): 0.30
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 668.39
Canal Bottom Elevation-Earliest Use (masl): 668.09
Fe/Mn Present (Y/N): N
Samples Taken: 6 ostracode samples

Comments: See comments for Profile 22.01; Profiles 22.01 and 23.01 are on the same drawing.

Canal 24, Locus D

Profile No.: No profile of this feature was drawn

Map Reference: D2 (canal course not shown on maps, only the location where the canal was exposed is in the westward extension of Trench 103)

Date Profiled: No profile drawn

Trench, Unit: Trench 103

Canal Type: Historic lateral (?)

Stratigraphic Origin: Historic

Comments: Exactly parallels C22 and C23.

Canal 25, Locus C

Map Reference: C1
Trench, Unit: N/A
Canal Type: Unknown
Cross-section Shape(s):
Parent canal: Unknown
Daughter canal(s): None observed
Stratigraphic Origin: Historic
Mapped Canal Length (m): This concrete-lined historic canal was not mapped for this project
Samples Taken: None

Comments: The location of this historic canal is shown near the southern boundary of Map C - Field 1, p. 1.

Canal 26, Locus C

Profile No.: 26.01 the canal was observed in a backhoe trench, but is not shown on maps

Map Reference: C
Date Profiled: December 19, 2008
Trench, Unit: This canal was exposed in Trench 222
Canal Type: Field lateral equivalent
Parent canal: Unknown
Daughter canal(s): Unknown, if any
Stratigraphic Origin: Historic
Profile Datum (mbsd): -13.89
Profile Datum (masl): 667.47
Mapped Canal Length: None
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): ~1.25 m
~Max. Visible Depth (m): ~0.20 m
Number of Iterations Detected: 1

Canal 27, Locus D
Profile No.: 27.01

Map Reference: D2
Date Profiled: November 25, 2008
Trench, Unit: 105
Canal type: Distribution
Cross-section Shape(s): 2, 3
Parent canal: 21
Daughter canal(s): Unknown
Stratigraphic Origin: 504.02
Profile Datum (mbsd): -13.26
Profile Datum (masl): 668.10
Mapped Canal Length (m): 34
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): 1.60
~Max. Visible Depth (m): 0.35-0.40
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 668.05
Canal Bottom Elevation-Earliest Use (masl): 667.70
Fe/Mn Present (Y/N): Y, B, S
Description: Weak oxidation halo beneath canal
Features Intruded by Canal: None in the vicinity of this profile
Features Intruding Canal: None in the vicinity of this profile

Comments: When first discovered, the canal in this exposure was thought to be a continuation of C21. After more trenches were dug and more exposures of C21 were available it was recognized that this is separate from C21, and has been given the number C27. In this exposure, maximum width is approximately 1.5 m and maximum identifiable depth is just less than 0.45 m. The profile is exposed at an angle, but width is not significantly distorted. The uppermost part of Profile 27.01 had been removed by modern construction prior to this description. As a consequence, I cannot say anything very definitive about the presence/absence of banks, or numbers of iterations. A deposit of randomly oriented, blocky sediments near the bottom of the canal on profile-left was interpreted as original canal excavation debris – there is a possibility that this could represent a clean-out of the canal, but if this is the case, the newer iteration of the canal is as large or larger than the original canal. The profile was not long enough to establish the presence/absence of digouts adjacent to the canal.

The canal originates at or near the top of Stratum 504, which is quite thin at this particular place. Soil formation has modified upper canal-fill sediments to the extent that bedding planes in canal margins are obscure. A strong zone of carbonate filament accumulation ~20 cm thick also is present. Blocky, dry-disturbance sediments on the northeastern side of the profile are interpreted as canal-excavation deposits. The bottom of the canal was cut into silty fine sand and fine sandy silts (504.04?) for a depth of about 20 cm , and through pedogenically-modified clay-rich overbank deposits for a depth of approximately 30 cm.

Canal-fill sediments indicate very sluggishly moving water at this point. See also comments for Profile 21.03, Unit 1420.

Canal 27, Locus D
Profile No.: 27.02 (also shows Profiles 21.03 and 48.01)
Map Reference: D2
Date Profiled: March 20, 2009
Trench, Unit: 1420
Canal type: Distribution
Cross-section Shape(s): 2
Parent canal: 21
Daughter canal(s): None known
Stratigraphic Origin: 504.02
Profile Datum (mbsd): -12.72
Profile Datum (masl): 668.63
Mapped Canal Length (m): 34
Banks Visible: Yes
Digouts Visible: No
~Max. Visible Width (m): 1.50
~Max. Visible Depth (m): 0.60-0.65
Number of Iterations Detected: 2+
~Ground Elevation at Inception (masl): 668.60
Canal Bottom Elevation-Earliest Use (masl): 668.15
Canal Bottom Elevation-2nd Iteration (masl): 668.57
Fe/Mn Present: Y, B, S
Samples Taken: Ostracode samples– 12 collected

Comments: C27 in this profile shows two iterations – the first appears to originate near the end of the 502.02/.01 depositional interval, while the second iteration clearly begins during the 504.01 interval. At this particular location the canal roughly parallels C21, the location of which posed many problems for prehistoric farmers in this immediate area. Stratigraphic evidence in the canal-left area of C27 (canal-right of C21) suggests that the earliest use of C27 may be coeval with the third iteration of C21 in this location. Similar stratigraphic evidence on canal-right of C27 suggests that the second iteration of C27 in this profile appears to be coeval with the first (and apparently only) generation of C48. (See further discussion in next paragraph) Second iteration ground-level for C27 is approximately 668.90.

Canal maps show that C27 branches from C21 within a few meters up-canal from Unit 5008. C27 then flows westward, passing beneath C48 to its intersection with Trench 105, where profile 27.01 was drawn. If this interpretation is correct, and C48 indeed passes over C27, then C48 has to be younger than C27, despite the apparent stratigraphic correlation in Unit 1420. An alternative explanation would be that the downstream end of C27 (and Profile 27.01) is actually the downstream extension of C48. The sizes of the canal are different, however and this does not seem to be a probability. Part of Trench 105 collapsed while it was being dug; unfortunately the collapsed area was where C48 would have been exposed in the trench, so that canal could not be observed. In addition, we were unable to recognize C48 in Trench 247.

Ostracode Samples:

A total of 12 ostracode samples were collected from this profile. Sample 1 is from natural Stratum 502 flood sediments; Samples 2 through 7 are from the 1st iteration of C27; Samples 8 through 11 appear to represent a 2nd iteration, and Sample 12 is from natural post-canal flood deposits.

Canal 28, Locus A
Profile No.: 28.01 (Profile has two pages)

Map Reference: A1, A2
Date Profiled: January 26-27, 2009
Trench, Unit: South wall of Locus A
Canal type: Field lateral
Cross-section Shape(s): 4
Parent canal: 7? (Connection inferred)
Daughter canal(s): None observed
Stratigraphic Origin: 504.02-.01
Profile Datum (mbsd): Not available (check with Tyler)
Profile Datum (masl): Not available (check with Tyler)
Mapped Canal Length (m): 28
Banks Visible: Yes, but not distinctive
Digouts Visible: Yes
~Max. Visible Width (m): 1.8 m (cut at oblique angle, actual width closer to 1.0 m)
~Max. Visible Depth (m): 0.30-0.35
Number of Iterations Detected: 1
Samples Taken: 9

Comments: This canal was erroneously double-numbered along with a historic canal at the end of Trench 222 in Locus C. The historic canal in Locus C has been assigned a new Feature Number, C217, and C28 will be retained for this canal in Locus A. The correct location for C28 is on Map A - Fields 1, page 1 between C29 and 39.

C28 (Locus A) is one of the first canals that was recognized during excavation. The canal appears to be a field lateral, and the slightly unusual depth of this canal may reflect the fact that the fields to which it delivered irrigation water are 4-6 times the normal size of fields observed in the general site area. This canal is a particularly good one for evaluation of canal-field relationships, as some turnouts into individual fields can be seen, along with what appears to be a dirt tapon "reservoir" for opening and closing the field entry diversion.

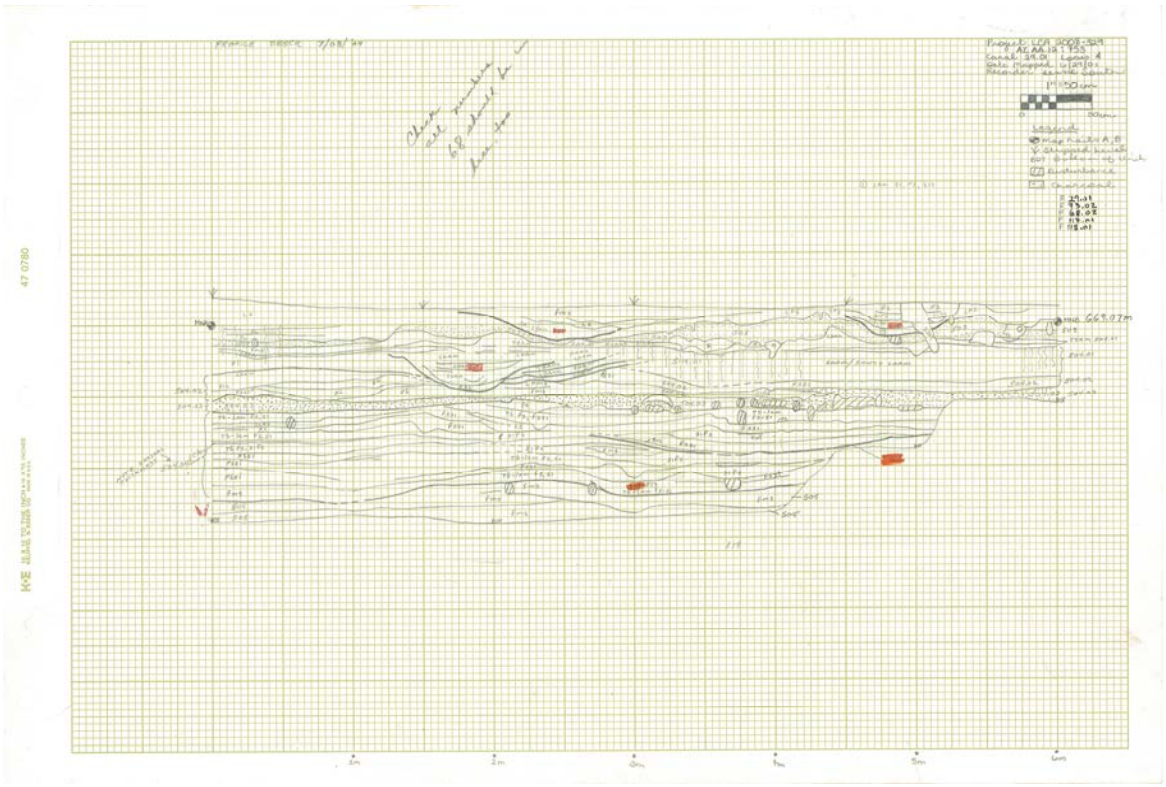
Ostracode Samples:

The following comments are based on depths from datum shown on Manuel Palacios-Fest's Figure 1. Samples 1, 2 are natural 504.04 sediments below the canal. Sample 3 is natural 504.02 sediments below the canal; Samples 4, 5, 6 are in canal-use sediments. 7 and 8 are in a single-episode post-canal flood deposit above the canal; Samples 9 and 10 are in natural 504.01 post-canal flood deposits.

Canal 29, Locus A
Profile No.: 29.01 (also contains Profiles 68.02, 73.02, 117.01, and 118.01)
Map Reference: A1
Date Profiled: June 29, 2009
Trench, Unit: Northwest wall, Locus A
Canal type: Field lateral
Cross-section Shape(s): 3
Parent canal: 7?
Daughter canal(s): Unknown
Stratigraphic Origin: 504.01
Profile Datum (mbsd): -12.288
Profile Datum (masl): 669.071
Mapped Canal Length (m): 33
Banks Visible: Yes
Digouts Visible: No
~Max. Visible Width (m): 1.65
~Max. Visible Depth (m): 0.27
Number of Iterations Detected: 1+
~Ground Elevation at Inception (masl): 668.72
Canal Bottom Elevation-Earliest Use (masl): 668.60

Comments: This canal is shown on Map A - Fields 1, page 2. There appear to be several iterations of this canal, shown not so much by sediments within the canal channel itself as by multiple sets of bank deposits resulting from clean-outs, especially on canal-right. Over time the canal seems to have deepened and narrowed from its original configuration.

This canal is adjacent to, and contemporaneous with, Canals 28, 39, and 40 in Locus A. The same comments regarding canal dimensions and future analysis for C28 apply to this canal and its other contemporaries.



Canal 30, Locus D
Profile No.: 30.01

Map Reference: D2
Date Profiled: December 15, 2008
Trench, Unit: 103
Canal type: Distribution?
Cross-section Shape(s): 3
Parent canal: 21? [speculative]
Daughter canal(s): 35
Stratigraphic Origin: U504.01
Profile Datum (mbsd): -13.069
Profile Datum (masl): 668.290
Mapped Canal Length (m): 12
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): 1.20
~Max. Visible Depth (m): 0.41
Number of Iterations Detected: 2
~Ground Elevation at Inception (masl): 667.89
~Ground Elevation 2nd Iteration (masl): 667.94
Canal Bottom Elevation-Earliest Use (masl): 667.51
Canal Bottom Elevation-2nd Iteration (masl): 667.77
Fe/Mn Present (Y/N): None detected
Samples Taken: 10 ostracode samples

Comments: C30 is approximately perpendicular to Trench 106. In that trench, the canal is very small, and but for Stratum 503 sediments dipping into the canal depression, would have been missed entirely. No banks were visible, and 503 and 502 sediments overlie and dip into the canal depression. The maximum recognized dimensions were approximately 80 cm wide, and 30 cm deep in this exposure. Pre-Stratum 503 canal-fill (use?) deposits are almost identical in texture to Stratum 504 deposits (fill deposits are very slightly more clay-rich) in Trench 106, but seem to lack some of the soil structure. Internal canal stratigraphy and canal sides are extremely difficult to differentiate. Flow within this feature was obviously very sluggish, and primary depositional structures (laminations, bedding planes, etc.) have been obscured by subsequent pedogenesis and bioturbation. The canal obviously very slightly postdates the U504 canal system. As stated before, I would have called this feature a natural drainage were it not for trend and location.

A series of laminated silt and clay beds is often present between the 504.01 soil and 503 flood deposits. Usually the deposits are very thin (1cm-4cm), and it was originally postulated (in Locus F) that they might represent individual irrigation episodes. Since that time these deposits have been recognized in many areas of the site (A, B, D, F), and it has become obvious that they represent one or more floods.

In Unit 1373 (on the southern side of Locus D) the deposits are unusually thick, about 8cm-10cm. These beds have been truncated by the excavation of Canal 30, which was subsequently partially filled with 503 Aorange sand@ flood deposits. This places the

excavation of the canal squarely between the time of depositions of the silt and clay beds and Stratum 503, and means that the clay and silt deposits form a Amarker horizon@ that separates the “Younger” generation of canals represented by Canal 30 and “Older”, earlier generations of canals represented by most of the features in the site. In addition, the complete absence of bioturbation and/or weathering implies the passage of minimal time (a few months to no more than a few years?) between deposition of the silts and the occurrence of the 503 flood.

Ostracode Samples:

Sample 1 is from beneath the canal; Samples 2 through 4 are from canal-use deposits; Samples 5 through 7 are questionable, but probably do not represent canal use; Samples 8 through 10 are definitely post-canal-use natural flood sediments.

Canal 30, Locus D
Profile No.: 30.02

Map Reference: D2
Date Profiled: December 5, 2008
Trench, Unit: 104
Canal type: Distribution?
Cross-section Shape(s): 2, 3
Parent canal: 19?, 33? (No connection was observed)
Daughter canal(s): 35
Stratigraphic Origin: U504.01
Profile Datum (mbsd): -12.824
Profile Datum (masl): 668.27
Mapped Canal Length (m): 12
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): 0.80
~Max. Visible Depth (m): 0.35
Number of Iterations Detected: 2
~Ground Elevation at Inception (masl): 668.02
~Ground Elevation 2nd Iteration (masl): 668.07
Canal Bottom Elevation-Earliest Use (masl): 667.70
Canal Bottom Elevation-2nd Iteration (masl): 667.94
Fe/Mn Present (Y/N): None detected

Comments: This small canal began in the U504.01 interval, and was remodeled shortly prior to and following deposition of Stratum 503. Whether this canal ever functioned during the 502 interval is not known with certainty, but it does indicate an attempt to refurbish the system subsequent to the 503 flood event. Although the canal is tentatively associated with either C19 or 33, no connection with either of those canals can be demonstrated, nor can it be demonstrated that they were even functioning after the 503 flood event. This profile is very short, and the fact that neither banks nor digouts were observed may be a function of profile length rather than actual absence.

Canal 31, Locus D
Profile No.: 31.01

Map Reference: D1
Date Profiled: March 30-31, 2009
Trench, Unit: 1358 (south wall)
Canal type: Distribution
Cross-section Shape(s): 3
Parent canal: 11/16? (No connection was observed, association is inferred from map distribution)
Daughter canal(s): 135, 181, 136
Stratigraphic Origin: 504.04
Profile Datum (mbsd):
Profile Datum (masl):
Mapped Canal Length (m): 50
Banks Visible:
Digouts Visible:
~Max. Visible Width (m): 1.6
~Max. Visible Depth (m):
Number of Iterations Detected:
~Ground Elevation at Inception (masl):
Canal Bottom Elevation-Earliest Use (masl):
Fe/Mn Present (Y/N): Y, B, H
Samples Taken: 8 ostracode samples

Comments: This canal is one of the largest, and possibly the earliest, of the canals in Locus D, and is possibly a continuation of C11 or C16. C31 shows signs of extensive use, and sediments adjacent to the canal (on both sides) appear to be significantly clay-enriched. The canal bottom is dug into Stratum 505; it appears to originate in the very top of Stratum 505 or bottom of Stratum 504.04. Sediments beneath and adjacent to the canal show some of the strongest oxidation seen in the site. Despite the strong oxidation, however, there is a surprisingly small amount of manganese oxides, although there is localized manganese staining along bedding planes and in some of the sandier deposits beneath the canals. The staining is seldom more than approximately 1-2 cm thick. The oxidation suggests long-term use of the canal or prolonged presence of water during the annual cycle.

Profile 31.02 is on the northern side of the same trench only a few meters away.

Ostracode Samples:

A total of eight samples were collected for ostracode analysis from Profile 31.01. Sample 1 represents natural Stratum 505 overbank deposits, Samples 2-6 are from canal-use deposits, Sample 7 appears to have been collected from post-canal natural sediments, while Sample 8 is almost certainly in post-canal sediments near the latest of post-use canal-fill deposition.

Canal 31, Locus D
Profile No.: 31.02

Map Reference: D1
Date Profiled: March 30-31, 2009
Trench, Unit: 1358
Canal type: Distribution
Cross-section Shape(s): 3
Parent canal: 11/16? (No connection was observed, inferred from map distribution)
Daughter canal(s): 135, 181, 136
Stratigraphic Origin: 504.04
Profile Datum (mbsd): -13.86
Profile Datum (masl): 667.50
Mapped Canal Length (m): 50
Banks Visible: Yes
Digouts Visible: Yes?
~Max. Visible Width (m): 1.8
~Max. Visible Depth (m): 0.3
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 666.34
Canal Bottom Elevation-Earliest Use (masl): 666.54 (check this)
Fe/Mn Present: Y, B, H. Strong, but highly variable oxidation beneath the canal and in some of the lowermost sandy canal deposits. Accumulation appears to be primarily iron oxides but some manganese is also present. In places approaches 7.5YR 5/8 or redder colors.

Comments: C31 is a relatively large and very important canal in the history of Locus D. I believe this to be probably the oldest of the larger canals in Locus D. Although I have called it a distribution canal, there is some reason to believe that it may be a continuation of the C16 trend, which I believe is a main or secondary main canal. The degree of oxidation in the sediments in and beneath the canal strongly suggest prolonged presence of water. Most of the non-canal strata in the general area of the canal are quite clay-rich as a result of irrigation, and argillization obscures much of the natural bedding so that it is often difficult to determine a very precise stratigraphic origination of cultural features.

This canal originated early in the 504.04 depositional interval, although stratigraphic relationships in this location are not as clear as I would like. Nearby smaller canals originate at or very near the 505 surface, and incorporate 505 sediments in their bank deposits. Houses just north of this excavation unit are in clay rich sediments that date to the 504.04 interval, and it appears that the canal was contemporary with the early houses. Both profiles in Unit 1358 show a coarse, dull-red, oxidized sand that appears to have been cleaned from the canal that I have correlated with Stratum 504.03 flood sediments. Similar sediments outside the canal are clearly part of the Stratum 504.03 flood deposits, and I believe that the 504.03 flood impacted an existing canal in this location. The canal clearly continued to be in use after the 504.03 floods, and well into the 504.02 depositional interval.

Profile Description: This profile is located approximately 2.5 m north of profile 31.01. This exposure was profiled because the banks show more clearly and it shows the changes that

can occur in the nature of sedimentation and profile characteristics within a very short distance.

The same reasoning applies to the description of profile 31.03, which is only a few meters further to the south (upcanal). As one can see from the drawn profiles and from the profile descriptions, there is a significant degree of difference between these two profiles, particularly in the nature of the banks and in the type of sedimentation within the canal.

Profile 31.02 was chosen because the banks show particularly well in this profile. I'm not sure that we have all of the bank, as the top appears to have been partially truncated by stripping, but the lower part of the bank and the initial bank construction show quite clearly. As I stated, bank-to-bank width is approximately 1.6 m. The maximum visible depth is somewhat misleading because of the aforementioned truncation of the bank, but the visible depth is roughly 60 cm. From this point northward, the canal trends into an area of houses and cannot be traced further, but has to extend into Locus E. Given its size, the canal cannot terminate within the area of houses, and stratigraphy shows that the houses are contemporary with the canal.

The following are generalizations: DUs (DUs) 1-5 represent site Stratum 505. Several DUs (profile left), 41, 42, 43, 44, and 47, appear to be naturally-deposited continuations of Stratum 505 that have been disturbed slightly by human activity. DUs 8-13 and 19-35 are canal deposits (although these may include some deposits that may be post-canal use). Bank deposits or disturbed natural deposits include DUs 14-18, and possibly 36 and 37, and 38-54. DUs 6 and 7 were omitted from the profile after closer examination. I cannot see any evidence of the terminal 504.01 silt flood deposits, nor can I see any clear evidence of Stratum 503. These deposits should occur approximately 10-15 cm higher than the stripped surface, and are thought to have been removed by stripping prior to this description.

DU 1: Fine and medium sands; very slightly cemented. Oxidized; this is a natural stratum, member of Stratum 505.

DU 2: Silt and fine sand lens; slightly laminated. Member of Stratum 505.

DU 3: Fine and medium sand, cross-bedded with numerous lenses bordering on coarse sand. Natural flood deposits, member of Stratum 505.

DU 4: Only present on profile-left; these deposits may have been modified after their original deposition by either natural or cultural means; somewhat coarser than below, more oxidized, contained numerous irregular blocks and very short lenses of discontinuous, irregular chunks of clay mixed within.

DU 5: Also contains blocks and irregular pieces of clay. Matrix is fine- and medium-sand; cross-bedded, locally contorted very thin beds. These deposits contain a few very dark lenses and stains along rootlet channels that appear to be manganese. These deposits are most oxidized directly beneath the deeper part of the canal channel.

DU 6 and 7: Upon further inspection, these two DUs were found to be part of DU 5 and were removed from the profile and discussion.

DU 8: Very compact; primarily fine and medium sand, but contains significant amounts of clay as well. Water-lain, these are the lowest canal-use deposits within the canal itself. This unit grades into DU 10 toward profile-left.

DU 9: In the deepest part of the canal, DU 9 is separated from DU 8 by a thin discontinuous silt lens; very clay rich, appears to have been broken somewhat after deposition, locally contains irregular patches of medium sand. Grades laterally into DUs 10, 11, 12, and 13, which are:

DU 10: Several distinct clay beds with interbedded medium sand; these deposits are Water-lain, deposited near the margins of the canal. They appear to have been disturbed somewhat by human activity.

DU 11: Clay-rich, with silt lenses.

DU 12 and 13: Clay-rich, but have more abundant silt and fine sand; locally laminated. These deposits appear to have been disturbed to some extent by root activity.

DU 16: Lies beneath unit 22. This is a silt deposit that thins toward the canal and thickens away from the canal. These could be natural 504.04/.02 flood deposits.

DU 19: Silt and fine sand; bedding locally present, including minor lamination, but for the most part thin-bedded. This unit is truncated on profile-right, as is DU 8, and it appears that these deposits may represent an earlier episode of canal use (I am not absolutely sure of that supposition).

DU 21 and 22: Mixture of sand and clay; bedding is not obvious. These units extend slightly over what may have been the canal banks at one time. These two units gradually grade into other bank deposits or what appear to be Stratum 504 deposits on profile-right.

DU 23 and 24: These two units are lateral gradations of DU 25. Both are relatively massive, clay-rich deposits that contain very small pieces of relatively pure clay that appear to have been dredged from the bottom of the canal. While these two units are canal deposits, they appear to be remnants of canal-cleaning contained within the canal-fill sequence. At their most lateral extent on profile-left there are very obvious clay chunks and blocks within this unit, and these are very obvious clean-outs sediments.

DU 25: This unit is a silt-rich continuation of DU's 23 and 24 that begins at what would have been a bank area on profile-left. The lower part is locally laminated and thin-bedded. On profile-right is a distinctly thin-bedded and laminated fine and medium sand with very fine sand and/or silt thin beds and/or laminae. These deposits grade toward the side of the canal into bank deposits.

DU 26: Clay-rich; locally thin-bedded and laminated; bedding grades to more silt-rich and massive toward profile-left and distinct bedding disappears at about M 1.6. At that point in the profile a series of very distinct, flat (some are curved downward) tabular clay bodies 2-4 cm in length appear. Beginning at M1.6-1.5 on the profile the deposits are clearly mixed with blocks of exotic materials contained within a fine sandy and silty matrix These tabular clay blocks appear to be clay curls that have been dredged up from the bottom of the canal during a light cleaning episode at some time after the canal had dried. These deposits gradually fade out and merge into bank deposits of DU 33.

DU 27: Clayey silt or silty clay; bedding is not distinct; these deposits appear to have been deposited by relatively slow-moving water within a canal, grade into bank deposits at approximately M1.6-1.7 on the profile.

DU 28: Very thin silt-rich unit; and laminated silt and fine sand. This stratum should probably be omitted and included as part of DU 29.

DU 29: Silt rich; hints of lamination and thin bedding, but bedding is not distinct; there are some exotic blocks with in this unit. The unit tapers away and disappears at about M1.8.

DU 30: This unit appears to be post-canal-use. It is a relatively flat body of sediment; bedding is not particularly apparent. This unit disappears at approximately meter 1.6 , where it merges with and becomes indistinguishable from other units. After spending more time examining the tabular clay bodies that I mentioned before, I now believe that these are in situ development related to termite burrows. There are at least 10-12 of these features, and each is distinctly clay-rich on the top and relatively silty on the bottom in every instance. The most likely suspect is that this is an ant (or termite) colony that became flooded. At any rate, meter 1.6 does appear to be basically the edge of the canal in all periods of use.

DU 30: DU 30 extends both above and below Dus 31 and 32. The part that extends above it is sandy (silty fine sand). It also contains some of these tabular clay bodies, which I can see now extend all the way to the surface. I believe that this unit represents termination of use of the canal even though there is some canal depression still remaining.

DUs 31 and 32: Relatively massive. Both contain some of the tabular clay bodies that I previously described in DU 30. Both strata appear to be disturbed, and both contain numerous exotic blocks of clay, silt, and other sediments that are clearly manually deposited. I believe that these DUs represent continuing canal clean-out.

DUs 36 and 37: On profile-right, should be deleted. These appear to be part of post-canal-use deposits of DU 34. In this area the sediments contain large amount of coarse material, and are mixed and weathered. Bedding is visible, but it does not conform to the canal shape. If they are related to the canal at all, I believe that they are bank deposits, and they occur at approximately meter 2.6 and 2.7 in the profile.

DU 38: Appears to possibly continue with DU 43. DU 43 is disturbed by a small pit containing much charcoal, ash and numerous exotic blocks. These are slightly modified sediments from DU 5.

DUs 39, and 40: These profile-left deposits appear to be slightly disturbed portions of DU 5.

DUs 41 and 42: Somewhat puzzling in regards to their origin; they may represent inflow of runoff water. 41 is sandy, but contains blocks of clay within. 42 is very clay-rich, is bedded, but is truncated on both ends. This either represents water flowing in a tiny depression or has been modified to a significant extent by later activity.

DU 43: Clean silt, laminated, thin-bedded silt and fine sand. It is very distinctive, it is obviously relatively intact and in situ, but is out of context for 505 deposits or for "normal" bank deposits. Everything above DU 43 appears to been disturbed to one extent or another, and in some cases extensively disturbed.

DU 45: Tiny area of clay-rich deposits; contains numerous disaggregated clay blocks at random orientations.

DU 46: Sand, appears to continue with DU 15, which is properly a part of DU 13. DU 15 in this sandy, appears to be part of the bank. The matrix is medium sand, but contains numerous disaggregated blocks that are unquestionably bank deposits.

DU 50: Clearly bank deposits with a sandy matrix, but containing numerous exotic blocks of silt, clay, and charcoal. The shape is very irregular and these sediments are clearly not in place.

DU 51: Somewhat less obvious bank deposits, in that there are not as many exotic blocks as in DU 50. Predominately fine sand and silt, hint of bedding, but also some disaggregated blocks of clay and what appear to have been sandy sediment as well.

DU 52: Fine sand; contains blocks of exotic materials.

DU 53: Sandier than 52; contain some blocks of exotic materials although not as many.

DU 54: Except for its rather abrupt termination with a root disturbance, this unit is clearly cultural; contains abundant charcoal; matrix primarily medium sand with some coarse sand. Drops downward on profile-left over what appears to be a bank deposit. Above that is a micaceous sand which I have labeled as DU 60 on the profile. This deposit appears to be natural, bedded, micaceous; relatively uniform in texture; grades laterally into more clay-rich sediments.

In general the canal, during its use-life, appears to have had a bank at approximately M1.6 (profile-left) and M2.6 to 2.7 (profile-right). The profile-right bank is not as clearly defined as that on the left, perhaps because of the nature of the exposure. The crest-to-crest width in profiles 31.01 and 31.02 is approximately 1.6 m.

Canal 31, Locus D
Profile No.: 31.03

Map Reference: D1
Date Profiled: March 23, 2009
Trench, Unit: 1376
Canal type: Distribution
Cross-section Shape(s): 3
Parent canal: Unknown
Daughter canal(s):
Stratigraphic Origin: 504.04-.02
Profile Datum (mbsd): -13.28 (check this)
Profile Datum (masl): 668.08 (check this)
Mapped Canal Length (m): 50
Banks Visible: Yes?
Digouts Visible: Yes?
~Max. Visible Width (m): 1.80-2.0
~Max. Visible Depth (m): 0.55
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 667.73
Canal Bottom Elevation-Earliest Use (masl): 667.12
Fe/Mn Present (Y/N): Y, B, S

Comments: Profiles 31.02 and 31.03 are only a few meters apart and yet the profiles are markedly different.

Canal 32, Locus D
Profile No.: No profile of this canal was drawn
Map Reference: D1
Trench, Unit: 32.01, 1360
Canal Type: Field lateral?
Cross-section Shape(s): 3
Parent canal: 132?
Daughter canal(s): None observed
Stratigraphic Origin: 504.04
Mapped Canal Length (m): 19

Comments: This small canal parallels C34, and both appear to have originated from C132. Although a profile was cleaned (32.01), strata and stratigraphic relationships were extremely difficult to see, and no profile was ultimately drawn. The canal is in an area of poorly defined fields and appears to be a field lateral canal. Although stratigraphic relationships could not be determined from the profile itself, other canals and fields in the immediate area relate to the 504.04 interval.

Canal 33, Locus D
Profile No.: 33.01

Map Reference: D1
Date Profiled: March 30, 2009
Trench, Unit: 1362
Canal type: Distribution
Cross-section Shape(s): 2
Parent canal: Unknown
Daughter canal(s): 128, 129, 133, 137?
Stratigraphic Origin: 504.02-.01 (Note: the earliest origin that could be determined from existing canal profiles indicate a 504.02/.01 origin. Suggestive relationships with possible daughter canals, however, (e.g. 128, 129, and 133) suggests that the canal could be older, and that earlier generations of the canal have been masked by remodeling of the canal during the 504.02/.01 interval. It should also be noted that it was difficult to distinguish between Strata 504.02 and 504.04 in the location of Profile 33.01.
Profile Datum (mbsd): 13.41
Profile Datum (masl): 667.95
Mapped Canal Length:
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): 1.40
~Max. Visible Depth (m): 0.53
Number of Iterations Detected: 3
~Ground Elevation at Inception (masl): 667.85?
Canal Bottom Elevation-Earliest Use (masl): 667.42
Canal Bottom Elevation-2nd Iteration (masl): 667.57
Canal Bottom Elevation-3rd(?) Iteration (masl): 667.77
Fe/Mn Present (Y/N): Y, B, S
Samples Taken: 5 ostracode samples

Comments: This is a very good canal profile, although the faced area was cut too short to pick up potential canal banks and digout areas. This profile would be a good one to use in illustrations of how distribution canals differ in the form and remodeling history from field laterals and main canals.

This profile is the furthest upcanal of any of the profiles we have on C33. There appear to be at least three iterations of this canal. The earliest iteration is represented by DUs 5 through 12, while the second iteration is DUs 13 through 16. DUs 17-21 may entirely represent post-use natural sediments, although I believe that DU 17 is probably a canal-use deposit.

There are basically only two site strata exposed in this profile, Stratum 504 and Stratum 505. Stratum 504 is not as well-differentiated here as it is in some other places. Substratum 504.01 is present, along with 504.02/.04. Substratum 504.03 is missing in this particular exposure, although it is present in others nearby. Approximately the lower third of the profile consists of relatively clean fine-, medium-, and occasionally coarse-sands characteristic of Stratum 505.

In the following description, individual DU numbers correspond to the numbers shown on the profile drawing. This canal is like many others in Locus D in that there is disturbance on one or both sides of the profile. In this particular exposure the disturbance is on the canal-right side, and one or more pits were dug immediately adjacent to the canal. Pit-fill contains abundant charcoal.

Canal DUs:

DU 1: Stratum 505. Fine-sand with minor medium-sand that presents a relatively massive appearance. In places there is minor vertical fracturing and slight cementation that I believe is primarily the product of "bleed-down" from canal sediments above.

DU 2: Lower part of Stratum 504.02/.04. Consists of thin-bedded (primarily) sand, but with minor silt; localized clay enrichment. Some root disturbance but for the most part is relatively clean and unaffected by bioturbation.

DU 3: Relatively fine sand; truncated at top on profile-left, on right is a slightly finer-grained unit near the top of the DU. I believe that this could be the equivalent of Substratum 504.04. As previously mentioned, however, Substratum 504.03 is not present in this exposure and therefore I have tentatively lumped this DU with 504.02.

DU 4: Unit not seen on profile-left because of disturbance, but on profile-right it is primarily fine sand. Texture becomes slightly siltier at top, where individual silt and very fine sand laminae and thin beds are present. Contacts on these beds are very "ghosty" and have obviously been modified to slight extent by pedogenesis and bioturbation.

Early Iteration of Canal:

DU 5: This is the earliest of canal sediments. Some medium sand in lower part, although it is primarily fine sand. The uppermost part consists of relatively clean, very dark, silty clay. Sediments deposited in an obvious channel with relatively sharp sides on both sides of the canal.

DU 6: Fine sandy silt and/or silty fine sand. Bedding clearly displayed within deposit; upper contact appears to be eroded. Deposited by relatively slow-moving waters.

DU 7: Thin-bedded and laminated, alternating fine sand, silt, and clay. Relatively clean clay is locally present within, and upper contact of DU7 is erose.

DU 8: Only seen on profile-left. This DU consists of 1-2cm-thick, silty-fine sandy clay at bottom; upper part primarily very fine sand with minor silt.

DU 9: Silty fine sand. Massive, no bedding in most places, but very faint bedding near canal margins.

DU 10: Silty fine sand. Distinguished primarily because of a single bedding plane that could be discerned, otherwise it is very similar to DU 9 below. Cannot be traced to the sides of the canal with any certainty.

DU 11: This DU appears to be continuous with DU 7 on profile-left, although it is more disturbed. I believe that the two are simply different facies of the same unit. Within the main part of the canal channel, it consists of alternating fine sandy silt and clay, becoming significantly more clay-rich and disturbed near the sides. Appear to be clean-out materials related to the time when DU 7 was being deposited.

DU 12: Rounded, occasionally elongated-appearing, broken blocks of fine sand and silt held in a clay-rich matrix. These sediments may have been deposited while wet. They form a slight mound on the edge of the canal, and appear to be clean-out deposits.

Second Iteration of Canal:

DU 13: Thin-bedded and laminated silt and clay that grades into a silt and very fine sand toward the edges of the canal. Contains occasional blocks of disturbed materials near left edge of profile.

DU 14: Lens of medium and coarse sand with a very fine sand/silt interbed in the middle part. The lens extends all the way across the profile and is relatively consistent in character. On profile-right these sediments gradually become more clay-rich, (I think) because clean-out materials have been mixed with them.

DU 15: Primarily very fine sand and silt that grades into sandier deposits on the left and pinches out on profile-right.

DU 16: Relatively dark, very fine sand with clay, especially in lower part. Suggests very sluggish water movement.

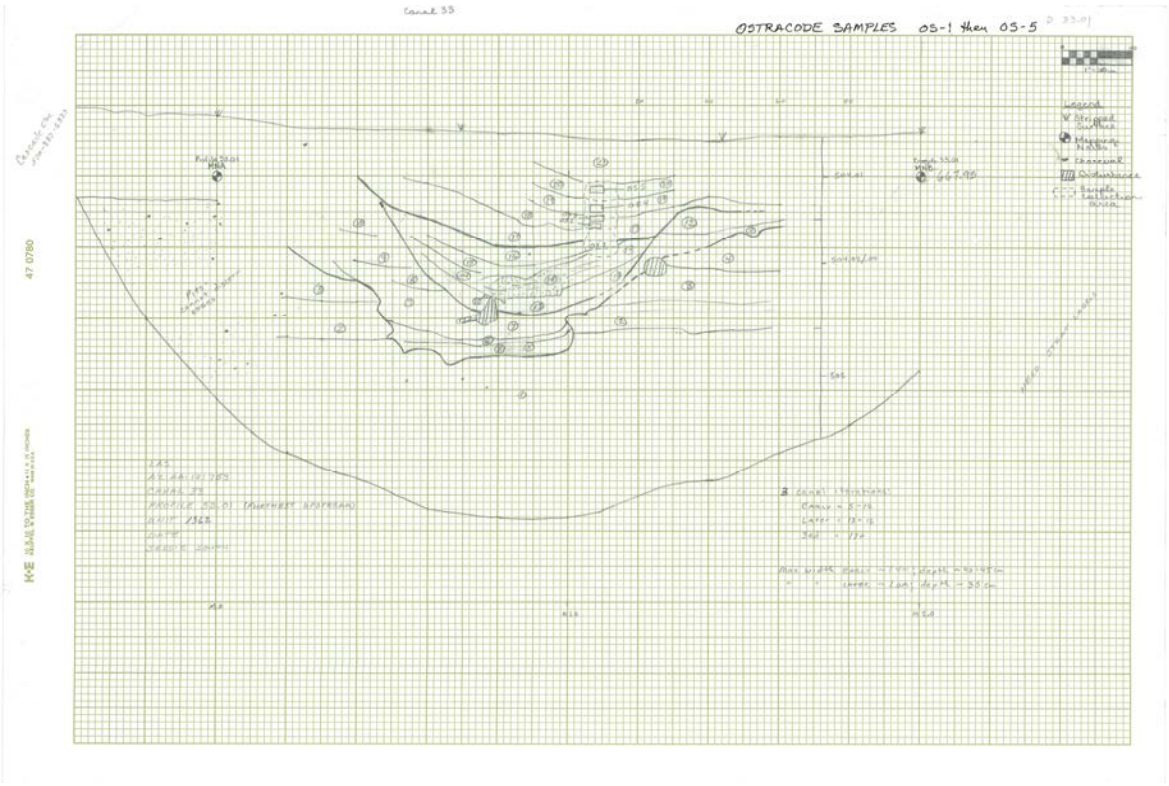
Third Iteration and/or Post-Canal-Use Deposits:

DU 17: Thin-bedded and occasionally laminated very fine sandy silt and clay near the center of the channel, but toward the edges grades into a more massive and somewhat sandier deposit. This DU may represent the last canal-use deposits, although that cannot be said with certainty.

DUs 18-21: thought to represent post-canal-use deposits. All have been modified to some extent by pedogenesis. Internal bedding is present, but relatively obscure. Deposits are very clay-rich and display pronounced vertical fracturing. The deposits eventually merge into the 504.01 soil on either side of the canal.

Ostracode Samples:

Samples 2, 3, 4, and 5 appear to come from DUs 18-21 and are thought to represent natural flood deposits. Sample 1 represents the uppermost canal-use deposits of the 2nd iteration of the canal.



Canal 33, Locus D
Profile No.: 33.02

Map Reference: D1
Date Profiled: April 2, 2009
Trench, Unit: 1359
Canal type: Distribution
Cross-section Shape(s): 2, 5
Parent canal: Unknown
Daughter canal(s): 128?, 129?, 133?
Stratigraphic Origin: 504.02-.01
Profile Datum (mbsd): -13.38
Profile Datum (masl): 667.98
Mapped Canal Length:
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): 1.40
~Max. Visible Depth (m): 0.25
Number of Iterations Detected: 1 +?
~Ground Elevation at Inception (masl): 667.78?
Canal Bottom Elevation-Earliest Use (masl): 667.42
Fe/Mn Present (Y/N): Yes
Relation To Canal Fill (In, Below): B
Amount (Slight, Moderate, Heavy): VS
Description: Very slight staining forms a barely-visible halo beneath the canal that is only 2-5 cm thick. Note that there is also slight clay enrichment near the top of DU 7 that appears to be "bleed-down" from the surface between DUs 8 and 7.
Features Intruded by Canal: Feature 14284, described as a large borrow pit by Denoyer, lies stratigraphically below C33, and the canal intrudes in the western side of this feature.
Features Intruding Canal: None
Samples Taken: No charcoal samples were collected from feature 14284, but flotation and pollen samples were collected. There was a great deal of charcoal in this feature, and we should be able to get and of charcoal from the float samples to run a date. This date would provide a maximum age for the canal. It appears that DU 10 was probably deposited between the time the pit feature was used and the time of emplacement of C33.

Comments: This canal appears to be 504.02/.01 in age, but I'm pretty sure that the apparent age is a product of remodeling rather than primary age of the canal. I can't conclusively demonstrate more than one iteration in this particular exposure, but there may be at least two.

A secondary datum (shown on profile) was added in order to include several cultural features at the canal-right side on the profile. These charcoal-rich pits appear to be stratigraphically below the canal or roughly contemporaneous with the initial canal construction. These features will be discussed in more detail below.

C33 is one of the larger canals in Locus D, and is roughly similar in size to distribution Canals 19, 31, and 27. The maximum observable depth of the canal in this profile is approximately 40-45 cm, and the maximum observable width is approximately 60 cm. The top of the canal, however, has been truncated by a the modern Ap, so it is impossible to accurately determine actual width and depth. There are no identifiable banks, partly because of the aforementioned truncation and parts of this profile, particularly along the margins of the canals and within the canal sediments themselves, have been extensively disturbed by cicada burrowing. Cicada burrows extend into Stratum 505 deposits below and adjacent to the canal.

The natural strata seen in this profile are 505, 504.04, 504.02, and 504.01. C33 in this location is at the margins of a natural channel which formed in the 505, similar to the natural channel observed in Trench 222, Locus C, and is probably a continuation of that same channel. A bed of sandy silt, shown as DU 2 in the profile drawing, may be contemporaneous with a similarly-textured bed observed in approximately the same stratigraphic position in Trench 222. At this location, I have called it a part of Stratum 505, but one should be aware that this placement is subject to minor revision.

Twenty-one DUs were identified in this profile, including naturally deposited strata below the canal. Of these, 1-7 are natural channel margin and floodplain deposits that represent the uppermost part of Stratum 505. DU 8 represents Stratum 504.04, although there is some question. DU 10 is 504.01. DU's 11 through 19 are canal-use deposits. Strata 20 and 21 are post-canal-use. It is difficult to determine the exact stratigraphic origin of the pits located at the side of the canal, although they appear to have originated near the top of the 504.02 deposits. The canal, which originates in 504.01, truncates pit-fill deposits. Pit-fill deposits are extremely rich with charcoal and a sample should be collected to provide maximum dates for the origin of the canal.

DU Descriptions:

DU 1: Clean, massive, medium sand; slightly cemented, especially immediately beneath the canal; some bioturbation features in the upper part from unit 504 above.

DU 2: Conceivably could be 504.02, although I have included it in 505 in this location because of the amount of sand above it. Fine sand, with some medium sand and silt; clearly bedded, generally can be divided into three poorly defined beds: the lower part consists of thin-bedded, slightly coarser fine sands, a poorly-defined central zone consists of massive fine and medium sand, and an upper part consisting of fine sand and silt that is locally laminated and/or thin-bedded.

DU 3: On canal-right, this DU is a portion of the uppermost fine sand and silt of DU 2 that is well defined in this area.

DU 4: Primarily medium sand, with slightly more fine sand than DU 1. Cicada burrows appeared to consist of finer sand and silt, this DU becomes more vague as one progresses into the channel on canal-left.

Canal 33, Locus D
Profile No.: 33.03

Map Reference: D1
Date Profiled:
Trench, Unit: 1423
Canal type: Distribution
Cross-section Shape(s): 3, 4
Parent canal: Unknown
Daughter canal(s): 128, 129, 133
Stratigraphic Origin: 504.02/.01
Profile Datum (mbsd): -13.64
Profile Datum (masl): 667.72
Mapped Canal Length:
Banks Visible: Yes
Digouts Visible: Yes?
~Max. Visible Width (m): 0.90
~Max. Visible Depth (m): 0.18
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): Not available
Canal Bottom Elevation-Earliest Use (masl): Not available
Fe/Mn Present (Y/N): N

Comments: The profile in Unit 1423 was prepared for a profile drawing, but was too damaged by rains before recording to profile or recover. The data recorded above are from a series of brief observations made during the profile preparation work. The most significant aspect of this particular profile is the fact that C35 is also recorded in the same unit, and lies stratigraphically above C33.

Canal 34, Locus D
Profile No.: 34.01

Map Reference: D1
Date Profiled: June 18, 2009
Trench, Unit: 1375
Canal type: Field lateral
Cross-section Shape(s): 4
Parent canal: 132
Daughter canal(s):
Stratigraphic Origin: 505-504.04
Profile Datum (mbsd): No datum available
Profile Datum (masl): No datum available
Mapped Canal Length (m): 23
Banks Visible: Yes
Digouts Visible: Yes?
~Max. Visible Width (m): 0.80
~Max. Visible Depth (m): 0.12
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): Not available
Canal Bottom Elevation-Earliest Use (masl): Not available
Fe/Mn Present (Y/N): N

Comments: C34 is located between and parallels C127 and C32. Despite this orientation, C34 appears to be a field lateral. The canal was almost entirely removed by scraping prior to description. There is a suggestion of a low bank (approximately 10 cm high) on profile-right, with possible digout areas on both sides of the canal. The digouts are inconclusive, however, and there is no indication of disturbed sediments *per se.* Likewise, the possible bank contains no sediments that I can conclusively recognize as disturbance sediments. This is not a very good profile.

Canal 35, Locus D

Profile No.: No profile was drawn for this canal

Map Reference: D1
Trench, Unit: need to get this (north side of D1)
Canal Type: Field lateral
Cross-section Shape(s): 4
Parent canal: 30
Daughter canal(s): None
Stratigraphic Origin: Very latest 504.01, earliest 502
Mapped Canal Length (m): 13

Comments: This small canal branches from C30 near the center of Locus D and trends northward from that point. This canal, along with C30 is the youngest canal in Locus D. See notes for C30 regarding details of the the stratigraphic origin. A profile cross-section was exposed in the same unit as 33.03 on the northern side of Locus D, but was damaged by weather prior to its being drawn. Although the profile could not be drawn in that exposure, examination prior to rainfall damage showed that C35 was clearly younger than C33.

Canal 36, Locus D
Profile No.: 36.01

Map Reference:
Date Profiled: March 20, 2009 (Corrected by J.S. June 1, 2009)
Trench, Unit: 103
Canal Type: Distribution
Cross-section Shape(s): 4
Parent canal: 21
Daughter canal(s): 187
Stratigraphic Origin: 504.02/.01
Profile Datum (mbsd): -13.35
Profile Datum (masl): 668.01
Mapped Canal Length (m): 89
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): 1.40
~Max. Visible Depth (m): 0.30
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 668.00
Canal Bottom Elevation-Earliest Use (masl): 667.77
Fe/Mg Stains Present: No
Samples Taken: 5 ostracode samples

Comments: This canal is also exposed in Unit 1358.

Canal 36, Locus D
Profile No.: 36.02

Map Reference: D2
Date Profiled: March 20, 2009 (corrected by J. South, June 1, 2009)
Trench, Unit: Trench 103
Canal type: Distribution? (but very small!)
Cross-section Shape(s): 4
Parent canal: 21
Daughter canal(s): 187
Stratigraphic Origin: 504.02-.01
Profile Datum (mbsd): -13.35
Profile Datum (masl): 668.01
Mapped Canal Length (m): 89
Banks Visible: Possible bank of clean-out origin on profile-left. Sediments within the possible bank displayed no obvious disturbance characteristics, so this identification is tentative.
Digouts Visible: If the aforementioned bank is real, there is a slight depression to the right of the bank in the profile that could be a small digout.
~Max. Visible Width (m): 1.40
~Max. Visible Depth (m): 0.30
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 668.00
Canal Bottom Elevation-Earliest Use (masl): 667.77
Fe/Mn Present (Y/N): No
Samples Taken: 5 ostracode samples

Comments: This canal is also exposed in Unit 4591. As mentioned above, there is a possible bank of clean-out origin on the profile-right side of the diagram. This bank and associated clean-out(?), however, lie *within* the larger depression of the canal. Either the canal was placed in a pre-existing depression, or the original canal was dug to a somewhat greater width and was subsequently cleaned. If this is the case, there are at least two iterations of the canal. C36 overlies (and thus is younger than) C153 on the north side of Locus D.

Note: The initial course of C36 was misinterpreted on the ground by field crew during initial scraping, and as a consequence, C157 (D22) was initially mis-numbered as C36. The two canals are in close proximity and have similar trends. C157, however, originates in Stratum 504.04, whereas C36 is a 504.02 Canal.

Ostracode Samples:

Sample 1 (lowest) is in natural sediments below canal. Samples 2, 3 are from in the canal; 4 and 5 are from natural sediments above the canal.

Canal 36, Locus D
Profile No.: 36.03

Map Reference: D2
Date Profiled: May 18, 2009
Trench, Unit: 4591
Canal type: Distribution
Cross-section Shape(s): 4
Parent canal: 21
Daughter canal(s):
Stratigraphic Origin: 504.02-.01
Profile Datum (mbsd): -13.21
Profile Datum (masl): 668.15
Mapped Canal Length (m): 89
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): 1.40-1.60
~Max. Visible Depth (m): 0.25
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 668.03
Canal Bottom Elevation-Earliest Use (masl): 667.76
Fe/Mn Present (Y/N): None observed
Samples Taken: 7 ostracode samples
Field Notes X-refs: 201, 215

Comments: The top part of this profile was compromised by the modern plow zone. The lower part of the canal fill is well-bedded. Some beds within the canal appear to be flood deposits, but individual beds cannot be traced to outside bank area; banks are largely destroyed, but the canal appears to originate in 504.02/.01. Canal dimensions given above are minimal because of truncation.

This distribution canal roughly parallels C19 and trends northward across entire area of Locus D. Two profiles were drawn on the canal, with 36.03 being the northernmost. If mapped correctly, C36 is younger than C153 (note relationship on maps). Only one daughter canal was recognized, C187. C187 is a very small, short canal that could be traced for approximately 10 m and then disappeared. There may be multiple iterations of C36 shown in this profile, but stratigraphic relationships were not clear enough to determine with certainty. If there is more than one, each appears to have been dug to approximately the same depth. The surface from which this canal originates is the stratigraphic boundary between 504.02 and 504.01. Uppermost 504.02 sediments on profile-left may be a bank-sediments seem to be somewhat disturbed, but there is not a typical bank morphology. No digouts were observed, although stratigraphy on profile-right near edge of the canal has been completely disrupted by what appears to have been a large tree growing on the surface between 504.02 and 504.01. Sediments immediately beneath the canal edges on both profile-left and profile-right appear to be disturbed and contain small, randomly-oriented silty blocks contained in a fine sandy matrix.

Ostracode Samples:

A total of seven samples were collected from this profile. Sample 1 (lowest) is from natural 504.02(?) flood deposits; 2 through 5 are from canal-use deposits; 6 is questionable, but probably post-canal deposits; 7 is post-canal flood sediments.

Canal 37, Locus D
Profile No.: 37.02

Map Reference: D2
Date Profiled: nd
Trench, Unit: See Profile 21.06
Canal Type: See discussion below
Cross-section Shape(s): 2-3
Parent canal: Unknown
Daughter canal(s): None known
Stratigraphic Origin: 504.02
Profile Datum (mbsd): Not available
Profile Datum (masl): Not available
Mapped Canal Length (m): Cannot measure because eroded by natural channel
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): ~1.50
~Max. Visible Depth (m): ~0.50
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): NA
Canal Bottom Elevation-Earliest Use (masl): NA
Samples Taken: 8 ostracode samples
Field Notes X-refs: 203, 204

Comments: Compare profiles 37.01, 247.05 and 21.06. When first observed in Excavation Unit 1421, this feature was identified as a small canal with an unusual amount of trash in the canal-fill sediments. As additional units were opened (Units 4626, 4609, 4576, 4590, GeoProfile 247.05), however, it became clear that this feature was a canal that had been enlarged by uncontrolled erosion and drainage into a natural channel. The depression created by this feature was relatively small where first observed (Profile 37.01 - 1.5m X 0.5m) but enlarged and deepened rapidly and markedly near the central portion of its exposure (Trench 247.05), and was again shallower where exposed in the western end of Profile 21.06. Because this configuration is not possible in a canal or gully without some means of erosion that includes a base level at least as low as the bottom of the channel in Profile 247.05, it is presumed that Profiles 37.01 and C37 in Profile 21.06 represent to the ends of a canal that was breached, probably by piping, and eroded after its construction or origin. At the point of breach, either an arroyo flowing to the west or a deep piping vent in the vicinity of Trench 247.05 would have provided an outflow escape. A similar modern analog may be seen several hundred meters south of Irvington Rd. on the eastern side of the Santa Cruz River. In that area, a series of piping tunnels have collapsed to form a digit tape system of short arroyos that now flow into the adjacent river.

Every profile of this feature, whether identified as a canal (Profiles 37.01, 37.03) or clearly a natural arroyo (Trench 247.05) contains unusual amounts of trash and artificially deposited cultural debris. It is thought that the trash and debris documents human attempts to stop erosion by filling the eroding c him anal with trash. The stratigraphic origin cannot be determined in Profile 37.01, and I can only say that the feature appears to be very late 504.04 or 504.02 in Profile 21.06.

Ostracode Samples:

Ostracode samples were collected to see if additional insight might be gained into the origin and history of the feature. 8 samples are all from within the feature.

Canal 38, Locus D
Profile No.: **NUMBER ABANDONED, NOT A CANAL.**

Comments: This canal exposure was discovered prior to description of C48 in EU 1420. At the time of discovery, C38 was thought to be an independent canal, but after additional scraping and excavations, it was realized that C38 and C48 are the same canal. For that reason, this canal number was abandoned and can be used for other canal features.

Canal 39, Locus A
Profile No.: 39.01

Map Reference: A1
Date Profiled: April 15, 2009
Trench, Unit: 1987
Canal type: Field lateral
Cross-section Shape(s): 2, 3
Parent canal: 7?
Daughter canal(s): None observed
Stratigraphic Origin: 504.02-.01
Profile Datum (mbsd): -12.64
Profile Datum (masl): 668.72
Mapped Canal Length (m): 21
Banks Visible: Yes
Digouts Visible: No
~Max. Visible Width (m): 0.90
~Max. Visible Depth (m): 0.28
Number of Iterations Detected: 2 +
~Ground Elevation at Inception (masl): 668.66
Canal Bottom Elevation-Earliest Use (masl): 668.54 (This may be the bottom of the original excavating depth, rather than the lowermost functioning canal depth)
Canal Bottom Elevation-2nd Iteration (masl): 668.60 (This may actually be the original functioning canal bottom)
Fe/Mg Stains Present: N
Samples Taken: None

Comments: This canal is shown on Map A - Fields 1, between C28 and C40. It should be noted that the lowermost ~8 cm of the canal-fill sediments may actually be original excavation debris, containing small blocks of fine sand the sediment, etc. These sediments do not show distinct bedding are lamination. What has been listed as the second iteration canal bottom (above) may actually be the original functioning canal bottom. This comment is based on the fact that DU 4 on the profile contains numerous sandy blocks, and is not appear to have been Water-lain.

Although this canal is one of a set of field lateral-sized canals, the morphology of the canal is more typical of a distribution canal in terms of its width-depth ratio. Note that this was also true of canals 28, 29, and 40, all of which are also in Locus A. My supposition is that these canals are deeper than normal because of the unusually large field sizes at this particular stratigraphic level in this Locus. As discussed elsewhere, 504.01 fields in Locus A are roughly 6-8 times (or larger) the average size of fields in all other areas and all other stratigraphic levels. At the present time I do not know why Locus A fields are larger, but it may have something to do with the fact that C7, the presumed parent canal, is so close. A possible alternative is that these canals, which are relatively late in the canal sequence, may be actually designed for delivery of larger quantities of water to larger fields. If this is true, it might imply a that they farmers at this time had learned that deeper canals are more efficient in the delivery of water than the shallow field laterals which had been used previously. An

argument against this, however, is that later C117 and C118, which directly overlie C29 seem to possess a shape more characteristic of earlier field laterals in other Loci of the site.

What appears to be the original prehistoric excavation profile is visible, and at least two generations of banks (and possibly 3 or more) are present. As with many of the canals in this site, 39 appears to of originated on the stratigraphic boundary between 504.02 and 504.01. The canal clearly overlies the coarse oxidized sands of 504.03, and in fact, the canal is excavated most of the way through that particular stratum. That fact could have posed problems for the prehistoric farmers, for what are losses would have been extremely large because of infiltration into this extremely porous and permeable bed. A potential benefit of this particular stratigraphic association with 504.03, however, is that water infiltrated into 504.03 would flow beneath and adjacent field areas and provide subirrigation to those fields.

Although I identified several generations of bank deposits in this profile, the trenched area was too short to determine if digouts were present.

Canal 40, Locus A
Profile No.: 40.01

Map Reference: A1
Date Profiled: April 17, 2009
Trench, Unit: 2064
Canal type: Field lateral
Cross-section Shape(s): 4, 5
Parent canal: 7?
Daughter canal(s): None observed
Stratigraphic Origin: 504.02-.01
Profile Datum (mbsd): -11.81
Profile Datum (masl): 669.55
Mapped Canal Length (m): 15
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): 1.10
~Max. Visible Depth (m): 0.20-0.25
Number of Iterations Detected: 1 + (?)
~Ground Elevation at Inception (masl): 668.87
Canal Bottom Elevation-Earliest Use (masl): 668.66
Fe/Mn Present (Y/N): None observed

Comments: This canal is shown on Map A - Fields 1, page 1, and is the first canal east of C39. The canal parallels the general trend of Canals 28, 29, and 39, and it is assumed that this feature is also a field lateral that fed larger than normal fields in Locus A. As with the other canals exposed in the stripping level in Locus A, this canal originated on the boundary between 504.02 and 504.01, but aside from that many of the similarities disappear. The canal is slightly deeper than more typical field laterals seen elsewhere, but I could not recognize good bank deposits, or features that I could clearly identify as digouts.

This exposure was on the access ramp into Locus A, was exposed only during construction of the ramp, was open for only a very brief period of time (literally hours), and for that reason and informative profile description was not made. It is possible that there may be an earlier iteration of the canal 10-12 cm below the identified channel bottom of C40, where there is a feature that morphologically resembles banks on profile-right; this feature does contain material that resembles disturbed bank deposits. All in all, however, this is a very poor profile, and is not very informative because of the short length of the profile exposure and ongoing excavation disturbance. Sediment contacts and strata were very “fuzzy”.

Canal 41, Locus B
Profile No.: 41.01

Map Reference: B1
Date Profiled:
Trench, Unit: 3124
Canal type: Distribution
Cross-section Shape(s): 3
Parent canal: 42?, 76? (see discussion below)
Daughter canal(s): 63? 64?
Stratigraphic Origin: 504.02/.04 (check this)
Profile Datum (mbsd): -12.28
Profile Datum (masl): 669.08
Mapped Canal Length (m): 29
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): 1.80-1.90
~Max. Visible Depth (m): 0.55-0.60
Number of Iterations Detected: 3
~Ground Elevation at Inception (masl): 668.56
Canal Bottom Elevation-Earliest Use (masl): 668.44
Canal Bottom Elevation-2nd Iteration (masl): 668.61
Canal Bottom Elevation-3rd Iteration (masl): 668.69
Samples Taken: Ostracode samples 38-48
Field Notes X-refs: 213

Comments: This profile was originally mis-labeled on the site map as one of two profiles having the number 41.02. The correct Profile 41.01 is in Excavation Unit 3124 (closest to C42), and maps have been corrected.

C41 remains a puzzle to me. It has all of the basic characteristics of a distribution canal, but trends at an odd angle in relation to the numerous field laterals seen in this stripping level of Locus B. In addition, based on the map view, C41 would appear to be a daughter of C42, yet the actual connection with that canal cannot be seen and there must necessarily be some question as to whether the two represent the same canal generation or not. In profile 41.01, C41 appears to originate in 504.01 deposits, while in profile 41.02 C41 appears to originate at the 504.02/504.04 boundary. Furthermore, C41 trends at right angles to C42, but is not mapped as connecting with that portion identified as C41 where profile 41.02 is drawn (which trends at an approximately 60° angle with C42. I think that the feature(s) identified as C41 actually represents two separate canals.

The mapped distribution of the downstream (more north-easterly) portion of C41 would appear to cross the path of C11 and continue with C52 (see additional discussion about this relationship in Profile 41.02). See additional discussion in C52.01 profile description. The stratigraphic origin of this canal cannot be accurately determined in this profile, but in Profile 41.02 it appears to originate on the boundary between site strata 504.02 and 504.04.

We may be able to resolve the problems of relationships between canals 41,42, 63, 62, 61 and 60 by comparing bottom elevations (and originating surfaces) from those canals to see what, if any, patterns show up. One potential problem is that C42 is a much larger canal the others and consequently was dug to a greater depth than most of the other canals. Also, we need to compare stratigraphic profiles drawn in a number of areas in Locus B and match ground level at time of canal origin with those canal profiles to see if perhaps I've mis-identified the stratigraphic origin. Between these two procedures, we should be able to resolve most of the questions I've outlined above, although since there is no profile drawn of C76, this could pose an additional problem. However, the parent/daughter relationships between canals 42, 76, 41, 62, 61, and 60,should theoretically be resolvable.

Ostracode Samples:

Sample 38 is from natural sediments below the canal; 39 and 40 from 1st iteration of canal-use; 40 and 41 from 2nd iteration; samples 42 through 45 are from 3rd iteration; samples 46 through 48 appear to be from post-canal flood deposits.

Canal 41, Locus B
Profile No.: 41.02

Map Reference: B1
Date Profiled: April 28, 2009
Trench, Unit: 2005
Canal type: Distribution
Cross-section Shape(s): 3
Parent canal: 42
Daughter canal(s): 63
Stratigraphic Origin: 504.02(?)/.04(?)
Profile Datum (mbsd): -12.30
Profile Datum (masl): 669.06
Mapped Canal Length (m): 29
Banks Visible: Yes
Digouts Visible: Yes
~Max. Visible Width (m): 1.50
~Max. Visible Depth (m): 0.35-0.40
Number of Iterations Detected: 2+
~Ground Elevation at Inception (masl): 668.96
Canal Bottom Elevation-Earliest Use (masl): 668.84
Canal Bottom Elevation-2nd Iteration (masl): 668.94
Samples Taken: None
Field Notes X-refs: 191, 194

Comments: Unit 2005 exposes three purported canals: 41, 60, and 64. Canals 60 and 64 are not canals at the point of this profile, but rather appear to be scraping depressions (digouts) for the banks of C41. First iteration width is 1.0 m, second 1.4, third 1.1, and fourth 1.8-1.9 m. C41 displays excellent banks and digouts in this profile. Canal origin is in the late Stratum 504.04 or early 504.02 interval. Stratum 504.03 is missing in this profile and in nearby trench exposures.

Canal 42, Locus B
Profile No.: 42.01

Map Reference: B1
Date Profiled: April 3, 2009
Trench, Unit:
Canal type: Sub-main
Cross-section Shape(s): 3
Parent canal: 7?
Daughter canal(s): 41, 59, 60, 61, 62, 63, 64, 84
Stratigraphic Origin: 504.02/.01
Profile Datum (mbsd): -12.34
Profile Datum (masl): 669.02
Mapped Canal Length (m): 15
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): 1.70
~Max. Visible Depth (m): 0.60
Number of Iterations Detected: 2?
~Ground Elevation at Inception (masl): 668.82
Canal Bottom Elevation-Earliest Use (masl): 668.53
Canal Bottom Elevation-2nd Iteration (masl): 668.62 (speculative) (not on spreadsheet)
Fe/Mn Present (Y/N): Y, B, S
Relation To Canal Fill (In, Below): B
Amount (Slight, Moderate, Heavy): S
Description: Patchy halo beneath the lowermost part of canal
Samples Taken: None taken
Field Notes X-refs: Page 182

Comments: There are two location shown for C42 on map B-1; one is mapped as being in the "upper field" and one in the "lower field". This distinction was not recognized in the field, and as a consequence the "lower field" canal was not profiled, and its stratigraphic origin remains unresolved. The "lower field" canal was renumbered as C76.

C42 is a large canal recognized only in Locus B. In this area the canal trends approximately north 80° west. As mentioned, the canal is large, with a maximum observable width of approximately 1.8 m in profile 42.01. The profile has been truncated at the top by scraping and modern construction. Banks are not well preserved, and an unknown amount of bank height has been removed. There may be two iterations of C42 in Profile 42.01, but the evidence is not clear-cut because of an absence of identifiable multiple bank deposits.

The ultimate destination of C42 is not known, but this is one possible candidate for a source for C21 in Locus D. In addition, the trend of the canal is toward canals in the northeastern end of Locus C, although no corresponding canal was recognized in that area. Existing modern infrastructure prohibits making a definitive connection with either of these locations.

Canal 42, Locus B
Profile No.: 42.02

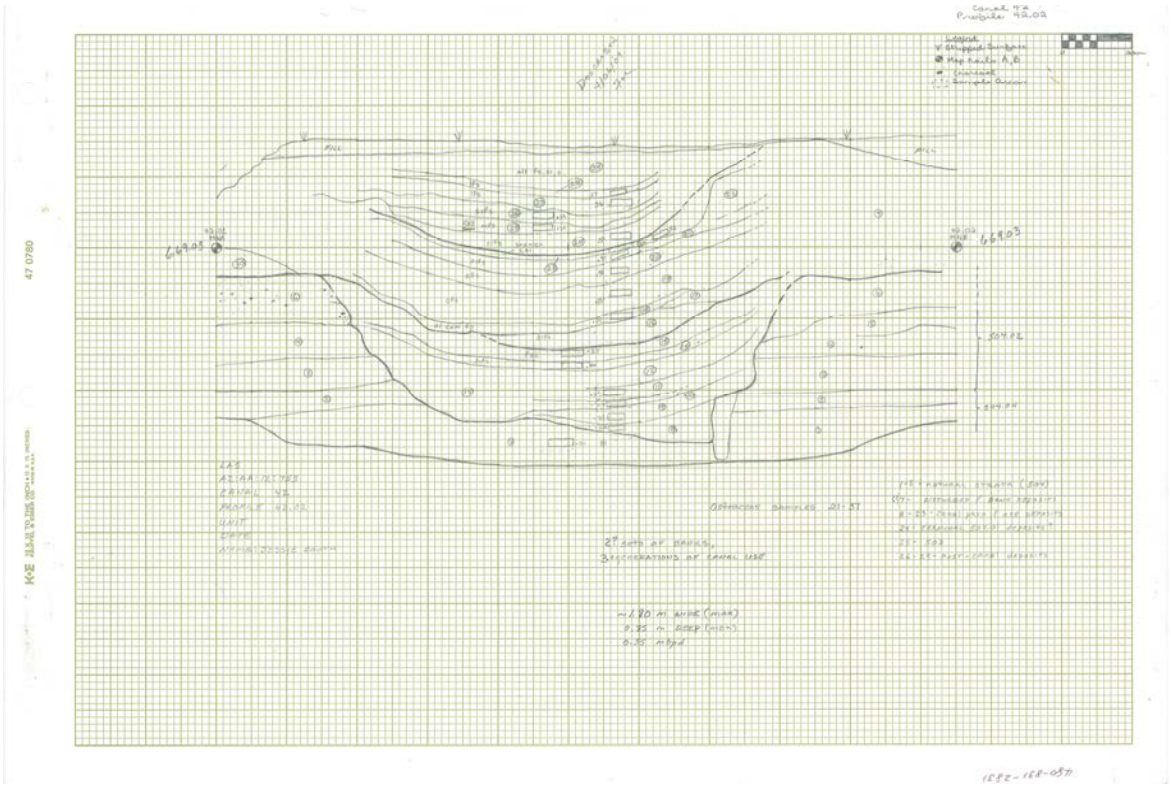
Map Reference: B1
Date Profiled: April 6, 2009
Trench, Unit:
Canal type: Sub-main
Cross-section Shape(s): 3, 5
Parent canal: 7?
Daughter canal(s): 41?, 63?, 62?, 61?, 60?, 59?, 84?
Stratigraphic Origin: 504.02/.01
Profile Datum (mbsd): -12.33
Profile Datum (masl): 669.03
Mapped Canal Length (m): 15
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): 1.60-1.80
~Max. Visible Depth (m): 0.85
Number of Iterations Detected: 3
~Ground Elevation at Inception (masl): 668.95?
Canal Bottom Elevation-1st Use (masl): 668.48
Canal Bottom Elevation-2nd Iteration (masl): 668.75
Canal Bottom Elevation-3rd Iteration (masl): 669.01
Fe/Mg Stains Present: Y, B, S
Samples Taken: Ostracode samples 21-37 (17)

Comments: This is an excellent profile, with multiple generations of canal use. The canal is approximately 1.8 m wide, and approximately 95 cm deep in Profile 42.02. There appear to be three rather clearly defined iterations of C42 in this profile. There is a clear rise present where the banks should be, and bank deposits are present. Unfortunately boundaries between subsequent bank deposits cannot be delineated very clearly.

There are questions about the relationships between this canal (C42), C76, C41, C63, and other listed daughter canals). See discussions of those canals.

Ostracode Samples:

A total of 16 samples were collected from this profile. All but 1 (#21) appear to be from various iterations of canal-use. Sample 21 is from natural deposits below the canal; 22-27 from 1st iteration; 28-32 from 2nd iteration canal-use deposits; and 33-37 from 3rd iteration canal-use deposits.



Canal 43, Locus C
Profile No.: 43.01

Map Reference: Map C - Field 1, p. 1
Date Profiled: March 13, 2009
Trench, Unit: 3131
Canal type: Historic unknown (may not be a canal)
Cross-section Shape(s): 2, 3
Parent canal: Unknown
Daughter canal(s): 46?
Stratigraphic Origin: Historic
Profile Datum (mbsd): -12.66
Profile Datum (masl): 668.70
Mapped Canal Length (m): Did not measure because of uncertainty about the validity of canal designation (if it is a canal).
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m):
~Max. Visible Depth (m):
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): Cannot determine
Canal Bottom Elevation-Earliest Use (masl): 668.51
Fe/Mg Stains: None present

Comments: The age of this canal (?) is very uncertain. This is a badly drawn profile that I did not see until after the profile exposure had been altered. I cannot tell anything about the feature from the profile, and I am not even sure that it is a canal. A number of other features were present in the area that superficially resembled canals, but upon closer inspection were found to be closed depressions. Although this feature was drawn in on the ground as a canal, I think this is probably another closed depression, but cannot be sure. I re-examined large expanses of vertical exposures in this area while doing monitoring for construction in the vicinity of the feature numbered C43 (early 2011) and could not find anything resembling a canal in the area. Because of uncertainties, I have not discarded this feature as a canal, but I simply cannot be sure. The mapped distribution of this feature is shown on the northwestern edge of Map C - Field 1, p. 1.

Canal 44, Locus C
Profile No.: No profile of this feature was drawn.
Map Reference: C1
Trench, Unit:
Canal Type: Unknown
Cross-section Shape(s): 4
Parent canal: Unknown
Daughter canal(s): None observed
Stratigraphic Origin: Cannot determine

Comments: As mapped, this feature is linear for a short distance and has the general dimensions of a canal, with a northeast-southwest trend between C43 and C45 near the western corner of Map C - Field 1, p. 1. The area where this feature located is extremely disturbed, and no informative profiles could be found. This canal is in the area of numerous historic closed depressions (possibly construction features), and my feeling is that this is probably not a canal, but rather another depression that has been mis-identified as a canal.

Canal 45, Locus C
Profile No.: No profile of this canal was drawn.
Map Reference: C1
Trench, Unit:
Canal Type: Unknown
Cross-section Shape(s):
Parent canal: Unknown
Daughter canal(s): Unknown
Stratigraphic Origin: Historic

Comments: The course of this historic canal is shown in the southwestern quadrant of Map C - Field 1, p. 1. C45 and C25 are unquestionably real, but there are many canal-like linear depressions in the same general area that are discontinuous and that are clearly not canals.

Canal 46, Locus C- NOT A CANAL

This feature was originally called a canal, C46, by the field crew. Closer inspection, however, showed that it is actually a filled piping vent that was given Feature #3133.

Canal 47, Locus D

No profile was drawn of this feature

Map Reference: D1

Stratigraphic Origin: 504.02/.01

Samples Taken: None

Canal 48, Locus D
Profile No.: 48.01 (on same profile as 21.03, 27.02)
Map Reference: D2
Date Profiled: March 20, 2009
Trench, Unit: 1420
Canal type: Distribution
Cross-section Shape(s): 3
Parent canal: 21
Daughter canal(s): Unknown
Stratigraphic Origin: U504.01
Profile Datum (mbsd): -12.72
Profile Datum (masl): 668.63
Mapped Canal Length (m): 52
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): 1.15
~Max. Visible Depth (m): 0.40
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 668.88
Canal Bottom Elevation-Earliest Use (masl): 668.45
Fe/Mg Stains: None observed
Samples: 9 ostracode samples

Comments: This profile is shown on the same profile drawing with C21.03 and C27.02. Along with C27, C48 is a daughter canal of C21. C48 appears to have been constructed after the first iteration of C27, but before the second iteration. I cannot clearly distinguish more than one iteration of C48. Note that in excavation unit 1387 this canal was mistakenly numbered C38 by the field crew. This has since been corrected. Also see additional comments on Profile 27.02.

Ostracode Samples:

A total of nine ostracode samples were collected from C48. Sample 1 is in natural 504.02(?) flood sediments; I cannot distinguish the top of canal-use sediments in this profile with any certainty, but Samples 6 through 9 are probably from post-canal flood deposits; Samples 2 through 5 are definitely from canal-use deposits.

Canal 49, Locus D
Profile No.: 49.01

Map Reference: D1
Date Profiled: March 27, 2009
Trench, Unit: 1457
Canal type: Field lateral
Cross-section Shape(s): 6
Parent canal: 19
Daughter canal(s): None
Stratigraphic Origin: 504.02/.01
Profile Datum (mbsd): -13.379
Profile Datum (masl): 667.98
Mapped Canal Length (m): 16
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): 1.10
~Max. Visible Depth (m): 0.30
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 667.98
Canal Bottom Elevation-Earliest Use (masl): 667.61
Fe/Mg Stains: None observed
Samples Taken: Sampled for ostracodes – 8 samples collected

Comments: Not a very good profile. This small field lateral originates from C19 along with a series of parallel field laterals in Locus D. Although the profile is shown to be approximately 30 cm deep, the bottom of the canal was not clearly delineated, and the bottom elevation is somewhat uncertain. The bottom as shown on the profile seems unusually deep, and I am not sure that it is correct. A further problem is that most strata within the canal are extremely difficult to see. This being said, however, the canal may have possibly been modified (?) just prior to deposition of the terminal 504.01 flood silts and Stratum 503.

The parallel field laterals that I mentioned are good to use for illustration of field layout patterns. The canals that should be considered for an illustration are C19, the distribution canal, and C49, 50, 51, 122, 123, and 124 (all of which originate with C19). The fields associated with these canals shows several variations on the “two field-one canal system”, and in this area especially in relation to C1 22, 123, and 124, there are a series of secondary distributions that branch off of the primary field laterals. This is also the first place that we realized that the field laterals were not directed toward the river as we had originally thought they would be, but rather away from the river and toward another distribution canal, in this case C33. All of the primary field laterals parallel one another, all are of very similar size, and all have a length between 30 m and 40 m. The canals extend essentially to the field on the downslope side of C33.

Ostracode Samples:

8 samples collected in total. Sample 1 (lowest) is from natural (504.02) sediments below the canal. Samples 2-6 appear to be from canal-use deposits; Samples 7 and 8 are from post-canal-use deposits.

Canal 50, Locus D
Profile No.: No profile was drawn of this canal
Map Reference: D1
Canal Type: field lateral
Cross-section Shape(s): Not observed
Parent canal: 19
Daughter canal(s): None observed
Stratigraphic Origin: 504.01

Comments: This small field lateral is one of a series that appeared to originate with C19. The field laterals that emanate from C19 include C49, 50, 51, 122, 123, and 124 (all of which originate with C19). The fields that are associated with these canals shows several variations on the "two field-one canal system", and in this area especially in relation to C122, 123, and 124, there are a series of secondary distributions that branch off of the primary field laterals. This is also the first place that we realized that the field laterals were not directed toward the river as we had originally thought they would be, but rather away from the river and toward another distribution canal, in this case C33. All of the primary field laterals parallel one another, all are of very similar size, and all have a length between 30 m and 40 m. The canals extend essentially to the field on the downslope side of C33.

Canal 51, Locus D
Profile No.: No profile was drawn of this feature.
Map Reference: D1
Trench, Unit:
Canal Type: Field lateral
Cross-section Shape(s): Not observed
Parent canal: 19
Daughter canal(s): None observed
Stratigraphic Origin: 504.02/.01

Comments: This small field lateral is one of a series that appeared to originate with C19. The field laterals that emanate from C19 include C49, 50, 51, 122, 123, and 124 (all of which originate with C19). The fields that are associated with these canals shows several variations on the "two field-one canal system", and in this area especially in relation to C122, 123, and 124, there are a series of secondary distributions that branch off of the primary field laterals. This is also the first place that we realized that the field laterals were not directed toward the river as we had originally thought they would be, but rather away from the river and toward another distribution canal, in this case C33. All of the primary field laterals parallel one another, all are of very similar size, and all have a length between 30 m and 40 m. The canals extend essentially to the field on the downslope side of C33.

Canal 52, Locus B
Profile No.: 52.01

Map Reference: B-1A
Date Profiled: March 23, 2009
Trench, Unit:
Canal type: Distribution?
Cross-section Shape(s): 3, 4
Parent canal: 11?
Daughter canal(s): None observed
Stratigraphic Origin: 504.02-.01
Profile Datum (mbsd): -12.84
Profile Datum (masl): 668.52
Mapped Canal Length (m): 23
Banks Visible: Yes
Digouts Visible: No
~Max. Visible Width (m): 1.00-1.10
~Max. Visible Depth (m): 0.15-0.20
Number of Iterations Detected: 2 (not well-expressed)
~Ground Elevation at Inception (masl): 668.65
Canal Bottom Elevation-Earliest Use (masl): 668.48
Canal Bottom Elevation-2nd Iteration (masl): 668.56
Fe/Mg Stains: None present
Samples Taken: 1 ostracode sample

Comments: Profile 52.01 is not a particularly good profile, although there may be at least two iterations and a bank is visible on profile-right. The second iteration is not clear. The bank is clearly demarcated, although sediments within the apparent bank do not show the ideal condition of exotic blocks, randomly oriented sediment blocks, etc. The path of C52 is roughly perpendicular to that of C11, and the trend of the canal suggests that C41 and C52 may be the same canal. Additional excavations in the vicinity of Trench 242 did not seem to support the idea of C52 and 41 being the same canal, but no connection with either canal and C11 could be determined. In fact, it could not be physically determined whether C52 (or C41) pass above, below, or connect with C11. Canal-bottom elevations and comparison of profiles, however, shows that the bottoms of 41 and 11 are almost identical and the two canals are similar in size. Canal 52 is a significantly smaller canal, although the bottom elevation is similar to the other two canals.

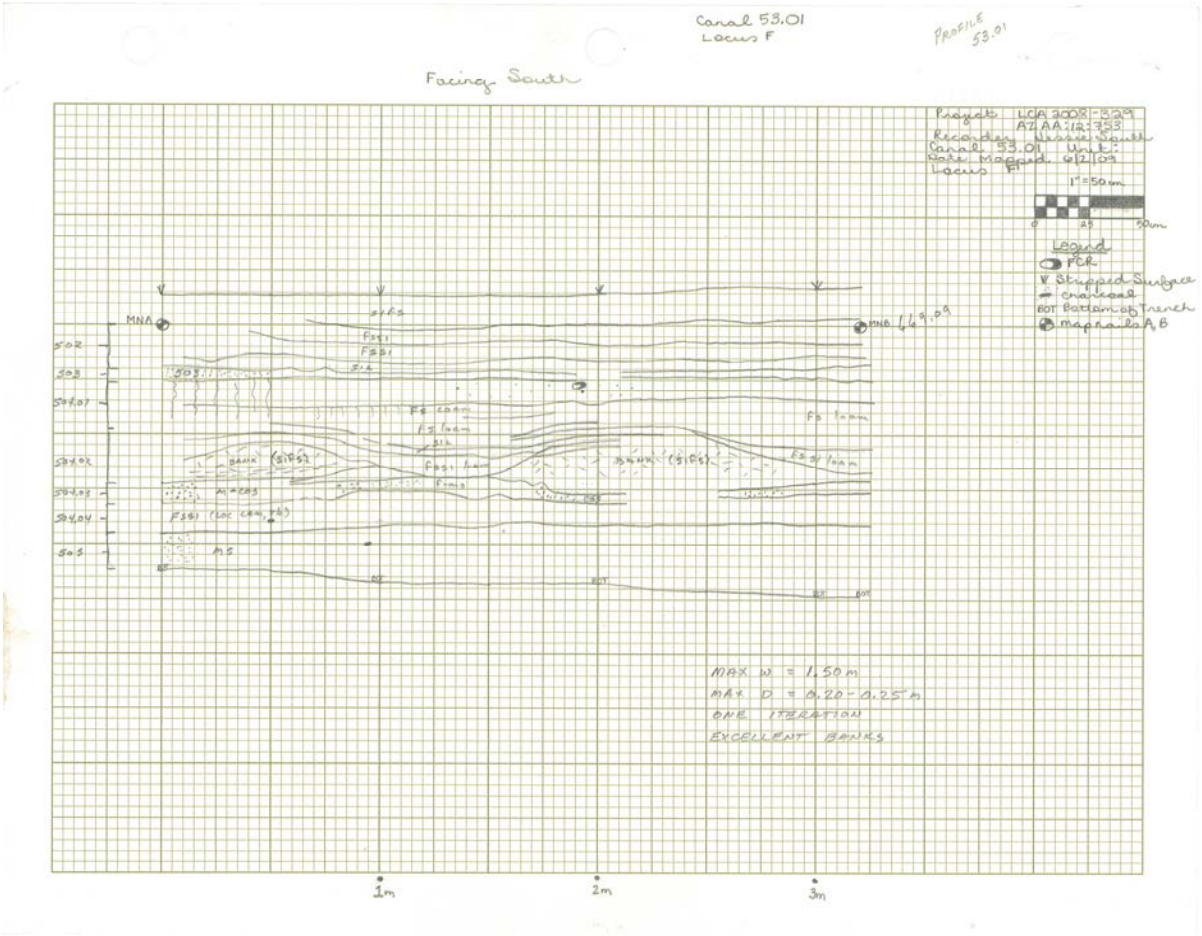
Ostracode Samples:

Only 1 sample was collected from this exposure, from within canal-use deposits.

Canal 53, Locus F
Profile No.: 53.01

Map Reference: F1
Date Profiled: June 2, 2009
Trench, Unit: 235
Canal type: Field lateral?
Cross-section Shape(s): 3, 4
Parent canal: 7?, 87?
Daughter canal(s): Unknown, if any
Stratigraphic Origin: 504.02
Profile Datum (mbsd): -12.27
Profile Datum (masl): 669.09
Mapped Canal Length (m): 7
Banks Visible: Yes
Digouts Visible: Yes
~Max. Visible Width (m): 1.50
~Max. Visible Depth (m): 0.20-0.25
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 668.47
Canal Bottom Elevation-Earliest Use (masl): 668.39
Fe/Mg Stains: None observed
Samples Taken: None

Comments: This small canal shows some of the best banks and digout area in Locus F. This is an exceptional profile. Adjacent digout areas could have been shown better had the profile been drawn somewhat longer. As with many of the small field lateral type canals, several episodes of flooding are recorded that appear to have overrun both banks and the canal channel. In this particular profile there is no clear evidence that the canal was cleaned out or modified to improve the efficiency or capacity of the canal after flood deposition occurred.


Canal 53.01
Locus F
PROFILE 53.01
Facing South
Project: LCA 2008-529
AZ AA:12:353
Recorder: Jessie Smith
Canal: 53.01 Unit:
Date: Mapped, 6/2/09
Locus F
1"=50cm
0 25 50cm
Legend
FCR
V Stripped Surface
charcoal
BOT Bottom of Trench
Mapping A, B
MNA
MNA 1/4 9.05
5'02
5'03
5'04.07
5'04.02
5'04.03
5'04.04
5'05
MAX W = 1.50m
MAX D = 0.20-0.25m
ONE ITERATION
EXCELLENT BANKS
1m
2m
3m

Canal 53, Locus F
Profile No.: 53.02 (See Profile 96.01)

Comments: This canal profile was originally mis-identified as part of C53 in the field. Later inspection showed this to be in error, and the profile was re-numbered as Profile 96.01

Canal 54, Locus F
Profile No.: 54.02

Map Reference: Map F - Fields 1
Date Profiled: June 2, 2009
Trench, Unit: 3213
Canal type: Field lateral
Cross-section Shape(s): 3, 4
Parent canal: 87?
Daughter canal(s):
Stratigraphic Origin: 504.02-.01
Profile Datum (mbsd): No profile datum was recorded
Profile Datum (masl): No profile datum was recorded
Mapped Canal Length (m): 10
Banks Visible: Yes
Digouts Visible: Yes
~Max. Visible Width (m): 1.00
~Max. Visible Depth (m): 0.25
Number of Iterations Detected:
~Ground Elevation at Inception (masl): Cannot determine
Canal Bottom Elevation-Earliest Use (masl): Cannot determine
Fe/Mg Stains: None observed
Samples Taken: None
Field Notes X-refs: Page 215

Comments: C54 is shown near the northwestern edge of Map F - Fields 1. Unit 3213 appears to have been dug so that the canal-left bank and digout are more-or-less centered in the profile drawing. Only one side of the canal is profiled, but it still shows an excellent bank and digout area worthy of illustration. There may be 2 iterations represented, but stratigraphic relationships are not clear, therefore only one iteration was recorded.

This feature was originally identified as pit Feature 3190, but was later determined to be a small canal. The canal appears to start late in the 504.02 interval, was still operational during part of 504.01, but was out of use by the occurrence of the Stratum 503 flood. In contrast, nearby C53 also originated late in the 504.02 interval, but appears to have been abandoned before the onset of the 504.01 interval. In the original exposure of this feature in the preliminary dimensions were approximately 1.10 m by approximately 30 cm deep.

Canal 55, Locus E
Profile No.: 55.01

Map Reference: This canal is located in Locus E, and is not shown on the maps.
Date Profiled: March 19, 2009 (Re-drawn April 9, 2009)
Trench, Unit: No excavation unit
Canal type: Field lateral
Cross-section Shape(s): 4
Parent canal: Unknown
Daughter canal(s): None
Stratigraphic Origin: 504.02-.01
Profile Datum (mbsd): -13.83
Profile Datum (masl): 667.53
Mapped Canal Length: Canal was exposed only in the walls of a backhoe trench, no measurements were made.
Banks Visible: Yes
Digouts Visible: Yes?
~Max. Visible Width (m): 1.10
~Max. Visible Depth (m): 0.23
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 667.40
Canal Bottom Elevation-Earliest Use (masl): 667.29
Fe/Mg Stains: None present
Samples Taken: None
Field Notes X-refs: Page 184

Comments: This small field lateral is of interest for several reasons: first, it is located less than 2 m from a house in Locus E, and although scraping has removed much of the stratigraphic record, it suggests that the house and canal were roughly contemporaneous. The house is Fea. 3430, and was assigned to the 504.02. As with many of the small canals, 55 shows no record of extensive use prior to being overrun by floodwaters. It has what appears to be low banks on either side, but no canal-use deposits are identifiable. What appears to be terminal 504.01 flood deposits lie below part of the banks, and the lowest deposits within the depression are the "orange sands" of Stratum 503. A depression on the eastern side of this feature may be a digout for bank fill, and this also is partially filled with Stratum 503 sands that extend over the low banks. Denoyer had previously profiled the feature, but I modified the profile considerably. This appears to be a field lateral but cannot be connected with any other canals. In this particular case the floodwaters appear to be related to Stratum 504.01, and these deposits appear to have been partially truncated, in turn, by Stratum 503 floodwaters. I cannot say conclusively whether the post-504.01 deposits within the canal channel represent canal use or natural flood deposition.

Canal 56, Locus B
Profile No.: 56.01

Map Reference: B1
Date Profiled: April 22, 2009
Trench, Unit: 2006
Canal type: Distribution?
Cross-section Shape(s): 4
Parent canal: 11?
Daughter canal(s): 57, 58
Stratigraphic Origin: 504.02-.01
Profile Datum (mbsd): -12.62
Profile Datum (masl): 668.74
Mapped Canal Length (m): 12
Banks Visible: Yes (poorly)
Digouts Visible: No
~Max. Visible Width (m): 1.22
~Max. Visible Depth (m): 0.18
Number of Iterations Detected: 2?
~Ground Elevation at Inception (masl): 668.53
Canal Bottom Elevation-Earliest Use (masl): 668.50
Canal Bottom Elevation-2nd Iteration (masl): 668.64
Fe/Mg Stains: None observed
Samples Taken: None
Field Notes X-refs: 194

Comments: Strata were extremely difficult to see in this profile, and as a result interpretations are questionable. For example, the presence of a "first iteration" as shown on the spreadsheet and in the data above is questionable. In general, unless there is some very good reason to do so, I would rather not use information from this profile.

Canal 57, Locus B

Profile No.: No profile was drawn of this feature.

Map Reference: B1
Canal Type: Field lateral
Parent canal: 56
Daughter canal(s): None observed
Stratigraphic Origin: 504.02-.01

Canal 58, Locus B

Profile No.: No profile of this feature was drawn.

Map Reference: B1
Trench, Unit: 2004
Canal Type: Field lateral
Stratigraphic Origin: 504.02-.01
Profile Datum (mbsd): Not available
Profile Datum (masl): Not available
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): 0.70-0.80 (Measured on stripped surface)
~Max. Visible Depth (m): 0.15
Parent canal: 56
Daughter canal(s): None observed
Field Notes X-refs: 194

Canal 59, Locus B
Profile No.: 59.01

Map Reference: B1
Date Profiled: April 24, 2009
Trench, Unit: 2007
Canal type: Field lateral
Cross-section Shape(s): 4
Parent canal: 42?, 173?
Daughter canal(s): None
Stratigraphic Origin: 504.02-.01
Profile Datum (mbsd): -12.49
Profile Datum (masl): 668.87
Mapped Canal Length (m): 23
Banks Visible: Yes
Digouts Visible: Yes (questionable)
~Max. Visible Width (m): 1.00
~Max. Visible Depth (m): 0.13
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 668.85
Canal Bottom Elevation-Earliest Use (masl): 668.84
Samples Taken: None
Field Notes X-refs: 194, 213

Comments: This small field lateral is one of a series that originate from C42. Most of these smaller canals are similar in size, shape, presence of banks, etc. In this particular case, I cannot confidently say that digouts are present. See discussions of C42 and 76 regarding parent canal.

Canal 60, Locus B
Profile No.: 60.01

Map Reference: B1
Date Profiled: April 24, 2009
Trench, Unit: 2008
Canal type: Field lateral
Cross-section Shape(s): 4
Parent canal: 42
Daughter canal(s): None
Stratigraphic Origin: 504.02-.01
Profile Datum (mbsd): -12.51
Profile Datum (masl): 668.85
Mapped Canal Length (m): 30
Banks Visible: Possibly?
Digouts Visible:
~Max. Visible Width (m): 0.90
~Max. Visible Depth (m): 0.13
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 668.92
Canal Bottom Elevation-Earliest Use (masl): 668.82
Fe/Mg Stains: None present
Samples Taken: No
Field Notes X-refs: 194, 213

Comments: This is not a very good profile. Individual beds were extremely difficult to differentiate. Site maps show C60 extending between unit 2008 and 2005. Where this feature is exposed in Unit 2005, however, it is not a canal, but rather a digout adjacent to another canal.

Canal 61, Locus B
Profile No.: 61.01

Map Reference: B1
Date Profiled: May 7, 2009
Trench, Unit: 2010
Canal type: Field Lateral
Cross-section Shape(s): 4
Parent canal: 42
Daughter canal(s): None
Stratigraphic Origin: 504.02-.01
Profile Datum (mbsd): -12.55
Profile Datum (masl): 668.81
Mapped Canal Length (m): 18
Banks Visible: Very poorly, except on scraped surface
Digouts Visible: No
~Max. Visible Width (m): 1.20
~Max. Visible Depth (m): 0.08
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 668.52
Canal Bottom Elevation-Earliest Use (masl): 668.54
Canal Bottom Elevation-2nd Iteration (masl):
Fe/Mg Stains: None observed
Samples Taken: None
Field Notes X-refs: 195, 213

Comments: This is a very poor and inconclusive profile. There may be two iterations but sediment distinctions are so inconclusive that I cannot determine that with any certainty. Were it not for its visibility on the scraped surface I can rather confidently say that I would not have recognized this as a canal. I would rather not use any data from this canal, if possible.

Canal 62, Locus B
Profile No.: 62.01

Map Reference: B1
Date Profiled: May 7, 2009
Trench, Unit: 2009
Canal type: Field lateral
Cross-section Shape(s): 4
Parent canal: 42
Daughter canal(s): None
Stratigraphic Origin: 504.01
Profile Datum (mbsd): -12.55
Profile Datum (masl): 668.81
Mapped Canal Length (m): 10
Banks Visible: No (Canal-left has bank morphology, but the sediments are not distinguishable at all)
Digouts Visible: No
~Max. Visible Width (m): 0.85
~Max. Visible Depth (m): 0.16
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 668.96
Canal Bottom Elevation-Earliest Use (masl): 668.84
Fe/Mg Stains: None observed
Samples Taken: None
Field Notes X-refs: 195, 213

Comments: This is one of a series of very small field laterals originating from C42. All show very similar sizes and depths, stratigraphy is generally poorly defined, and all appear to have been used for a very short period of time only. Much of the original ground surface was removed by scraping prior to description of this canal.

Feature 7208 lies directly beneath the canal, and is separated from it by approximately 10-15 cm of flood deposits. The feature is quite ashy and appears to be a broad shallow pit. Although a radiocarbon dates could probably be obtained from this feature, its main value would be in establishing a maximum date for the canal. The canal does not intrude the feature.

Canal 63, Locus B
Profile No.: 63.01

Map Reference: B1
Date Profiled: May 14, 2009
Trench, Unit: 2089
Canal type: Field lateral?
Cross-section Shape(s): 4
Parent canal: 41
Daughter canal(s): None
Stratigraphic Origin: 504.01
Profile Datum (mbsd): -12.68
Profile Datum (masl): 668.68
Mapped Canal Length (m): 3
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): 1.30
~Max. Visible Depth (m): 0.07
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 668.75
Canal Bottom Elevation-Earliest Use (masl): 668.73 (Only one iteration was recognized)
Fe/Mg Stains: None observed
Samples Taken: None
Field Notes X-refs: 213

Comments: As with most others in this general area, this is not a particularly informative profile. Most of the top (and any possibility of banks) was removed by stripping prior to field recognition. Underlying natural (?) sediments undulate more significantly than in most other areas, and several places vaguely resemble canals, but I could not recognize any indications of human modifications of the sediments. This canal was not extensively examined in the field.

In one of the undulations beneath the identified C63 there is another feature that conceivably could be a canal, although I doubt it. This “feature” is a canal-like depression with ashy deposits in the canal-right position that resemble a canal bank. It is conceivable that it is actually a canal with bank, but, again, I doubt it.

Canal 64, Locus B
Profile No.: No profile of this feature was drawn.
Map Reference: B1
Trench, Unit: 2005
Canal Type: Distribution
Cross-section Shape(s):
Parent canal: 41?
Daughter canal(s):
Stratigraphic Origin: U504.04
Field Notes X-refs: 213

Comments: One unnamed canal branches from this one.

Canal 65, Locus A
Profile No.: No profile of this feature was drawn.
Map Reference: A2
Canal Type: Field lateral
Cross-section Shape(s):
Parent canal: 66
Daughter canal(s): None observed
Stratigraphic Origin: U504.04
Samples Taken: None
Field Notes X-refs: 212

Comments: C65 appears to be a field lateral branching from C66; the canal is shown on Map A - Fields 2, page 2.

Canal 66, Locus A
Profile No.: 66.01 (See also Profile 72.01)
Map Reference: A2
Date Profiled: May 8, 2009
Trench, Unit: 2055
Canal type: Distribution
Cross-section Shape(s): 2,3
Parent canal: 7?
Daughter canal(s): 65, 67, 69?
Stratigraphic Origin: U504.04
Profile Datum (mbsd): -12.87
Profile Datum (masl): 668.49
Mapped Canal Length (m): 16
Banks Visible: Yes
Digouts Visible: Yes?
~Max. Visible Width (m): 1.25-1.30
~Max. Visible Depth (m): 0.30
Number of Iterations Detected: 2
~Ground Elevation at Inception (masl): 668.46?
Canal Bottom Elevation-Earliest Use (masl): 668.26
Canal Bottom Elevation-2nd Iteration (masl): 668.42
Fe/Mg Stains: None observed
Samples Taken: None
Field Notes X-refs: 193 a (sketch, page 199), 212

Comments: This distribution canal trends east-west, and is located near the southern side of Map A - Fields 2, p. 2. This canal appears to feed C65, 67, and 69. There is a slight depression adjacent to the canal, but the depression does not constitute an obvious digout area. There appear to be two iterations of this canal; the lower has a rather deeper aspect than is normal, and there appear to be banks on both sides of the canal. The canal-right bank is more prominently developed of the two. The second iteration is broader than the first.

Two canals having similar orientations and locations are exposed in the sidewalls of the Unit 2055. The upper canal is C66, which is about 1.25-1.30 cm wide by approximately 30 cm maximum visible depth. C66 starts in the upper part of 504.04, and unlike C71, the canal was full of use-sediments prior to deposition of the 504.03, which extends across the canal with little change in elevation. [See profile sketch, page 199 in field notebook]

As I have interpreted it in this unit, Stratum 505 has a smooth, flat upper surface and is slightly coarser and darker in color than the overlying 504.04. Initial 504.04 deposits are a clean, fine to medium, cross-bedded, micaceous sand approximately 12-15 cm thick. The top of this bed is a very fine sand/silty fine sand/silty clay bed approximately 1-2 cm thick that is thin-bedded to laminated. Canal 72 truncates the latter bed and was excavated into the lower 504.04 bed to a depth of approximately 7-8 cm. The 504.04 in this profile is about 80 cm thick and the Canal 72 origination surface is approximately 15 cm above the 504.0 4/505 contact.

Canal 67, Locus A
Profile No.: No profile of this feature was drawn.
Map Reference: A2
Canal Type: Field lateral
Parent canal: 66
Stratigraphic Origin: U504.04
Mapped Canal Length (m): 17
Samples Taken: None

Comments: C67 is a northerly-trending canal that appears to be a distribution canal branching from C66 between C69 and C65 on Map A - Fields 2, page 2. Note the distribution of fields in relation to canals 65, 67 and 69.

Canal 68, Locus A
Profile No.: 68.01 (on profile with 73.01)
Map Reference: A2
Date Profiled: May 8, 2009
Trench, Unit: North Wall, Excavation Locus A
Canal type: Distribution?
Cross-section Shape(s): 3,4
Parent canal: 7?
Daughter canal(s): 70, 163
Stratigraphic Origin: U504.04
Profile Datum (mbsd): -13.142
Profile Datum (masl): 668.216
Mapped Canal Length (m): 26
Banks Visible: Yes
Digouts Visible: Yes
~Max. Visible Width (m): 1.15
~Max. Visible Depth (m): 0.15-0.20
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 668.59
Canal Bottom Elevation-Earliest Use (masl): 668.15
Fe/Mg Stains: None observed
Samples Taken: None
Field Notes X-refs: 212

Comments: C68 is an east-west-trending canal near the western end of Map A - Fields 2, page 1. C70 and C163 branch from this canal. This small canal displays excellent banks. This profile is also worthy of illustration of small-canal features, particularly in combination with C73 which lies beneath 68 in this profile. Although not as clear in the case of C68, the capping flood deposits consist primarily of silty fine sands and fine sandy silts, and are deposited in relatively thin beds, most of which are 2 to 7 cm thick. As is the normal case, I can't tell exactly how rapidly the overlying flood deposits were deposited. I cannot recognize more than a single iteration of use.

This particular canal system is one of the best developed in Locus A. There is pronounced regularity in the distribution of distribution canals and field laterals, and this is one of the better examples of the "two field-one canal" organization that characterizes much of the larger system.

Canal 68, Locus A
Profile No.: 68.02 (on Profile 29.01, with 73.02, 117.01, and 118.01)
Map Reference: A2
Date Profiled: June 29, 2009
Trench, Unit: Locus A west wall
Canal type: Distribution
Cross-section Shape(s): 4
Parent canal: 7?
Daughter canal(s): 70, 163
Stratigraphic Origin: U504.04
Profile Datum (mbsd): -12.290
Profile Datum (masl): 669.070
Mapped Canal Length (m): 26
Banks Visible: No
Digouts Visible: N
~Max. Visible Width (m): 2.40 (excessive width caused by oblique angle of canal transect)
~Max. Visible Depth (m): 0.15
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 668.22
Canal Bottom Elevation-Earliest Use (masl): 668.20
Fe/Mg Stains: None observed
Samples Taken: None
Field Notes X-refs: 212

Comments: The datum for this profile is the 29.01 datum, and the profile of C68 is shown on the 29.01 profile drawing. This profile is unusually shaped because of the extremely oblique angle between the canal and the north wall of Locus A. The profile is rather poor, and is recognized simply as a very broad, shallow depression. I can't tell if there's more than one iteration of this canal in this particular profile, and in Profile 68.01 there appeared to be only one iteration (see Profile 73.01).

Canal 69, Locus A
Profile No.: 69.01

Map Reference: A2
Date Profiled: May 18, 2009
Trench, Unit: 2063
Canal type: Field lateral
Cross-section Shape(s): 4
Parent canal: 66
Daughter canal(s): None observed
Stratigraphic Origin: U504.04
Profile Datum (mbsd): -12.43
Profile Datum (masl): 668.93
Mapped Canal Length (m): 10
Banks Visible: Yes
Digouts Visible: No
~Max. Visible Width (m): 1.00
~Max. Visible Depth (m): 0.13
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 668.53
Canal Bottom Elevation-Earliest Use (masl): 668.46
Fe/Mg Stains: None observed
Samples Taken: None
Field Notes X-refs: 201, 212

Comments: C69 is a northward-trending canal near the eastern edge of Map A - Fields 2, page 2. This canal is extremely difficult to see in profile, so I can't tell anything about its use history. The spatial relationships are clear, however, and it is clearly a field lateral related to C66. Width and depth relationships are similar to virtually all of the field laterals observed in the site.

Canal 70, Locus A
Profile No.: No profile of this feature was drawn.
Map Reference: A2
Trench, Unit:
Canal Type: Field lateral
Cross-section Shape(s):
Parent canal: 68
Daughter canal(s): None observed
Stratigraphic Origin: U504.04
Mapped Canal Length (m): 11
Samples Taken: None
Field Notes X-refs: page 201, 212

Comments: This canal is shown near the center of Map A - Fields 2, page 1. The trend is northerly and it branches from C68.

Canal 71, Locus A
Profile No.: 71.01

Map Reference: A2
Date Profiled: May 18, 2009
Trench, Unit: 2064
Canal type: Distribution?
Cross-section Shape(s):4
Parent canal: Unknown
Daughter canal(s): 161
Stratigraphic Origin: U504.04
Profile Datum (mbsd): -12.73
Profile Datum (masl): 668.62
Mapped Canal Length (m): 7
Banks Visible: Yes
Digouts Visible: No
~Max. Visible Width (m): 1.10
~Max. Visible Depth (m): 0.25
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 668.42
Canal Bottom Elevation-Earliest Use (masl): 668.27
Fe/Mg Stains: None observed
Samples Taken: None
Field Notes X-refs: Page 200 (includes sketch), 201, 212, 215

Comments: This small, rather enigmatic canal is only exposed for a very short distance (2-3 m) in the northeast corner of Locus A, shown on Map A - Fields 2, page 1. C71 and C161 branch in the location where it is exposed, and I cannot tell which is the parent canal. C161 appears to extend for a slightly greater distance, but this is a function of scraping. The branching relationships suggest that this could be a distribution canal, but the dimensions are relatively characteristic of a field lateral, although perhaps slightly deeper than normal. In the exposure in Unit 2064 there are good banks exposed composed of fine sandy silt, into which the canal was excavated. Overlying deposits are relatively thin (as is the case with all of the canals of this age in Locus A), and consist primarily of loamy silts (canal-left), and silty fine sands.

C71 starts in the U504.04. Banks are well-defined, but canal-use sediments are not. The canal was overtopped by at least one 504.04 flood that deposited thin-bedded and laminated fine sand, silty fine sand and minor clay as a blanket over banks and channel. The last sediments deposits in the canal depression are 504.03 coarse sands; these sediments filled the channel completely. Near M1 on the profile just above the datum is a small bank-like mound above the 504.03 sediments that contains mixed fine sand and 504.03 sand. There is no corresponding bank on the other side. This mound conceivably could be a continuation of canal use after the 504.03 flood, although I am not inclined to accept this hypothesis.

Canal 72, Locus A
Profile No.: 72.01 (on profile with C66.01)
Map Reference: A2
Date Profiled: May 8, 2009
Trench, Unit: 2055
Canal type: Field lateral
Cross-section Shape(s): 4
Parent canal: Unknown
Daughter canal(s): None apparent
Stratigraphic Origin: L504.04
Profile Datum (mbsd): -12.87
Profile Datum (masl): 668.49
Mapped Canal Length (m): 13
Banks Visible: Yes
Digouts Visible: Yes?
~Max. Visible Width (m): 1.37
~Max. Visible Depth (m): 0.20
Number of Iterations Detected: 2
~Ground Elevation at Inception (masl): 667.87
Canal Bottom Elevation-Earliest Use (masl): 668.18
Canal Bottom Elevation-2nd Iteration (masl): 667.87
Fe/Mg Stains: None observed
Samples Taken: None
Field Notes X-refs: 199, (sketch, page 199), 212

Comments: C72 is a textbook example of a small field lateral trending approximately east-west on the southwestern corner of Map A - Fields 3, p. 2. The canal parallels C166; note, however, the unusual three-field pattern between the two lateral canals rather than the usual two.

Profile 72.01 is shown on the Profile 66.01 drawing, and, while located in almost the same position as C66 is stratigraphically lower. Both canals are exposed in unit 2055 at the west end of Locus A. The profile displays excellent banks. Overlying flood deposits are relatively fine-grained, and are deposited as thin beds 2-10 cm thick. The flood deposits clearly overlie the banks and extend beyond the canal proper, but I cannot recognize any clear indication of canal remodeling, although it should be pointed out that there is a depression about 30 cm higher than the identified C72, with a rise and corresponding thickening of beds in the position where banks would be located. There is no obvious connection between C72 and the latter-mentioned feature, and it is possible that this is simply a “blanketing” reflection of C72. No evidence of canal maintenance is shown in this profile. The patterning of fields in the area of C72 is very regular, but differs slightly from the “normal” two-field pattern between field laterals.

Bank-to-bank width is approximately 1.35-1.40 m, and maximum observable depth is approximately 15-20 cm. Based solely on canal dimensions, the exact classification of this canal is somewhat questionable, for it has the basic dimensions of a small distribution canal and a very prominently visible, straight orientation on the scraped surface. If this is a

distribution canal, however, the orientation of the canals in this field system is switched 90° from the system above. Previous observations have shown that the basic dimensions of distribution and field lateral canals are not significantly different in many instances, and although the orientation is perpendicular to the 504.01/.02 system, I believe that it is probably a field lateral canal.

Canal 73, Locus A
Profile No.: 73.01 (on Profile 68.01)
Map Reference: A2 (Course of canal not shown on map)
Date Profiled: May 8, 2009
Trench, Unit: Wall
Canal type: Field lateral
Cross-section Shape(s):
Parent canal: Unknown
Daughter canal(s): None observed
Stratigraphic Origin: L504.04
Profile Datum (mbsd): -13.14
Profile Datum (masl): 668.21
Mapped Canal Length: (Course of canal not shown on map)
Banks Visible: Yes
Digouts Visible: No
~Max. Visible Width (m): 0.85
~Max. Visible Depth (m): 0.17
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 667.87
Canal Bottom Elevation-Earliest Use (masl): 667.84
Fe/Mg Stains:
Samples Taken: None
Field Notes X-refs: 212

Comments: There does not appear to be more than one iteration of this canal in this particular profile. This is a classic example of a cross section of a field lateral-size canal (although banks are slightly higher than normal, perhaps), but otherwise this is a perfect example of many of the features that we want to illustrate for canals. I've called it a field lateral, but there is a distinct possibility that it may be a prior-generation precursor of the C68 distribution canal. Profile is shown on profile 68.01. The path of C73 is not shown on site maps, but it appears to parallel C68.

Canal 73, Locus A
Profile No.: 73.02 (on Profile 29.01, with profiles 68.02 117.01 and 118.01)
Map Reference: A2 (Canal course not shown on map)
Date Profiled: June 29, 2009
Trench, Unit: West wall of Locus A
Canal type: Field lateral
Cross-section Shape(s): 4
Parent canal: Unknown
Daughter canal(s): None observed
Stratigraphic Origin: L504.04
Profile Datum (mbsd): -12.29
Profile Datum (masl): 669.07
Mapped Canal Length: Course of canal not shown on map.
Banks Visible: Yes
Digouts Visible: Yes?
~Max. Visible Width (m): 2.00 (cut at very oblique angle)
~Max. Visible Depth (m): 0.15
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 667.87
Canal Bottom Elevation-Earliest Use (masl): 667.87
Fe/Mg Stains: None observed
Samples Taken: None
Field Notes X-refs: 196-197 (sketch, page 197), 212

Comments: I can only confidently recognize one iteration of C73 in this profile. Although there are morphological banks composed of Stratum 505 deposits, the banks do not display the classic characteristics of bank deposits, i.e., exotic blocks, variable texture, etc. (perhaps because of the original texture of Stratum 505 sediments).

Canal 76, Locus B (Formerly C173, B1)
Profile No.: No profile was drawn of this feature.
Map Reference: B-1B
Canal Type: Distribution
Parent canal: Unknown, see discussion
Daughter canal(s): 41?, 84?, 59?, 60?, 61?, 62?, 141? (Note questions about origin of C41)
Stratigraphic Origin: 504.04?
Mapped Canal Length (m): 21
Profile Datum (mbsd): None available
Profile Datum (masl): None available
Field Notes X-refs: 212

Comments: Unfortunately, this canal was not recognized in the field, and the first realization that it was a discrete canal came from map observations. Because it closely parallels C42, it was originally thought to be that canal during initial mapping. Examination of maps showed that it was actually a separate canal, and at that time the canal was given the number C173 in error. Because of a double-numbering mistake, the C173 number was subsequently changed to C76. See also comments section for C42.

C76 closely parallels C42, and appears to pre-date that canal. Sediments are extremely jumbled near Profile 42.02 where they could be seen on the ground and stratigraphic relationships are not clear at all. Based on the limited observations that I have, this canal appears to have a 504.04 origin. The parent canal for 76 is unknown. In comparing canal bottom elevations of C42 and the daughter canals listed above, this could conceivably be may be the parent canal of all the daughter canals formerly attributed to C42, with C42 actually postdating the daughters listed above.

Canal 77, Locus B
(Initially assigned as C169 in double-numbering error, Map B1. The extra C169 was re-assigned as C77)
Profile No.: No profile was drawn
Map Reference: B1
Canal Type: Field lateral
Stratigraphic Origin: 504.02/.01
Mapped Canal Length (m): 3
Number of Iterations Detected: 1
Samples Taken: None
Field Notes X-refs: 212

Comments: Possible canal feature in Locus A was originally assigned the number C77. This feature was later determined not to be a canal. The vacated #77 was re-assigned to one of a double-numbered set of canals C169 (Map B1). Canal numbers 77 and 169 now shown on maps are correct as shown.

Canal 78, Locus B
Profile No.: No profile drawn
Map Reference: Map B - Fields 5, 6 and 7, page 1 (corrected version)
Date Profiled: N/A
Trench, Unit: 2087
Canal Type: Field lateral?
Cross-section Shape(s): Exposed portion of the canal was too shallow to profile
Parent canal: 80?
Daughter canal(s): None observed
Stratigraphic Origin: 504.02/.01
Mapped Canal Length (m): 6
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): ~0.60
~Max. Visible Depth (m): ~0.06
Field Notes X-refs: 213

Comments: I'm not absolutely sure that this small field lateral-type feature is actually a prepared canal. Although I delineated a "channel" the sediments were very near the surface and badly broken up by construction and scraping, so I do not feel totally comfortable with my delineation. I cannot definitely determine the stratigraphic origin, but it appears to be in 504.02 or 504.01. Canal 78 was mis-numbered as C171, and the label 171 was erroneously placed on the eastern end of C106 on Map B - Fields 5, 6 and 7, p. 1. The number and label placement have been corrected.

Canal 79, Locus B
Profile No.: 79.01

Map Reference: B1
Date Profiled: May 14, 2009
Trench, Unit: 2084
Canal type: Distribution
Cross-section Shape(s): 3,4
Parent canal: 11?, 82?
Daughter canal(s): 80, 102, 104, 170, 171
Stratigraphic Origin: 504.02
Profile Datum (mbsd): -12.87
Profile Datum (masl): 668.49
Mapped Canal Length (m): 14
Banks Visible: Yes
Digouts Visible: Yes?
~Max. Visible Width (m): 0.90
~Max. Visible Depth (m): 0.14
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 667.92
Canal Bottom Elevation-Earliest Use (masl): 668.16
Fe/Mg Stains: None observed
Samples Taken: None
Field Notes X-refs: 213, 215

Comments: This is an interesting profile. There appear to be multiple iterations in this profile, but stratigraphic relationships are not clear enough to say conclusively just how many.

Profile 79.01 shows a canal originating near the bottom of Stratum 504.02. It appears to have continued in use through the 504.01 interval. The lowermost bank deposits are composed of 504.03 sands, while higher banks are variable, and of fair quality. The constructed dimensions are approximately 1.10 m by 15-20 cm, and it appears that depth increases slightly through time.

Canal 79, Locus B
Profile No.: 79.02

Map Reference: B1
Date Profiled: May 14, 2009
Trench, Unit: 2086
Canal type: Distribution
Cross-section Shape(s): 4
Parent canal: 11?, 82?
Daughter canal(s): 80, 102, 104, 170, 171
Stratigraphic Origin: 504.02
Profile Datum (mbsd): -12.86
Profile Datum (masl): 668.50
Mapped Canal Length (m): 14
Banks Visible: Yes
Digouts Visible: Yes?
~Max. Visible Width (m): 1.00
~Max. Visible Depth (m): 0.32
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 667.92
Canal Bottom Elevation-Earliest Use (masl): 668.30
Samples Taken: None
Field Notes X-refs: 213

Comments: Clean-out/bank deposits are clear, but overall not a very good profile. Profile is very short and metrics cannot be determined accurately.

Canal 80, Locus B
Profile No.: No profile drawn
Map Reference: Map B - Fields 5, 6 and 7, p. 1 (corrected version)
Date Profiled: N/A
Trench, Unit: 2085
Canal Type: Field lateral?
Cross-section Shape(s): 3?
Parent canal: 79?
Daughter canal(s): Unknown
Stratigraphic Origin: 504.02/.01? Cannot accurately determine from the available exposure
Fe/Mg Stains: None
Samples Taken: None
Field Notes X-refs: Page 213

Comments: Can see narrow "stripe" on surface, but it is too shallow to profile. This feature was almost entirely scraped away before discovery. This canal was originally mislabeled as C170 on the 8/23/2010 map. After the mistake was recognized, the canal was given abandoned number C80.

Canal 81, Locus A
Profile No.: No profile of this feature was drawn.
Map Reference: A4
Trench, Unit: N/A
Canal Type: Distribution
Cross-section Shape(s): Not observed
Parent canal: 3?
Daughter canal(s): None observed (see notes)
Stratigraphic Origin: L505
Mapped Canal Length (m): 19
Samples Taken: None
Field Notes X-refs: Page 221

Comments: C81 is a possible distribution canal shown primarily at the eastern end of Map A - Fields 4, p. 2. There are a number of unresolved issues regarding C81. The canal parallels C92 and C93 on Map A - Fields 4, p. 2. The exact stratigraphic and contextual relationships with those canals, however, is not clear because the canals were mostly scraped away prior to their recognition. The trend of C92 makes it appear to derive from C81, but C81 appears to be slightly higher stratigraphically. Similarly, the relation of C81 to C93 and C92 to C93 could not be determined.

This feature trends approximately north-south for a distance of about 10-12 m, and seems to show up slightly higher in Stratum 505 than Canals 88-92 as a single dark stripe with no recognizable banks (note contrasts with canals 88-91). I believe that this feature may be a distribution canal rather than a field lateral. No profile was drawn of this feature because it was so deeply scraped.

The scraped surface from which canals and fields were defined is in Stratum 505, just a few centimeters above the 505/506 contact. The agricultural features originate on the 506 surface, however, and would have projected above that surface. The first identifiable 505 flood in this location appears to have been a relatively large one, that initially flowed in the canals and then overtopped both fields and canals, and deposited medium and coarse sands in and over both. Both fields and canals are +/-5 cm above Stratum 506, which is in this location a dirty, heavily modified surface with numerous pit features and abundant charcoal. The western end of Locus A, which at the present time has numerous pits exposed, has been scraped to a level approximately 15 cm below the fields and canals, and it appears that scraping went through and removed the fields in that area. On the eastern side of Locus A the fields appear to have acted as shallow reservoirs that “ponded” initial 505 flood deposits.

Canal 82, Locus B
Profile No.: 82.01

Map Reference: B2
Date Profiled: May 14, 2009
Trench, Unit: 2083
Canal type: Distribution
Cross-section Shape(s): 3,4
Parent canal: Unknown
Daughter canal(s): 102, 104, 105, 167?, 168?
Stratigraphic Origin: L504.04
Profile Datum (mbsd): -12.89
Profile Datum (masl): 668.50
Mapped Canal Length (m): 27
Banks Visible: Yes
Digouts Visible: Yes?
~Max. Visible Width (m): 1.25
~Max. Visible Depth (m): 0.30-0.35
Number of Iterations Detected: 3
~Ground Elevation at Inception (masl): 667.85
Canal Bottom Elevation-Earliest Use (masl): 667.82
Canal Bottom Elevation-2nd Iteration (masl): 668.04
Canal Bottom Elevation-3rd Iteration (masl): 668.28
Fe/Mg Stains: None observed
Samples Taken: None
Field Notes X-refs: 213, 215, 219

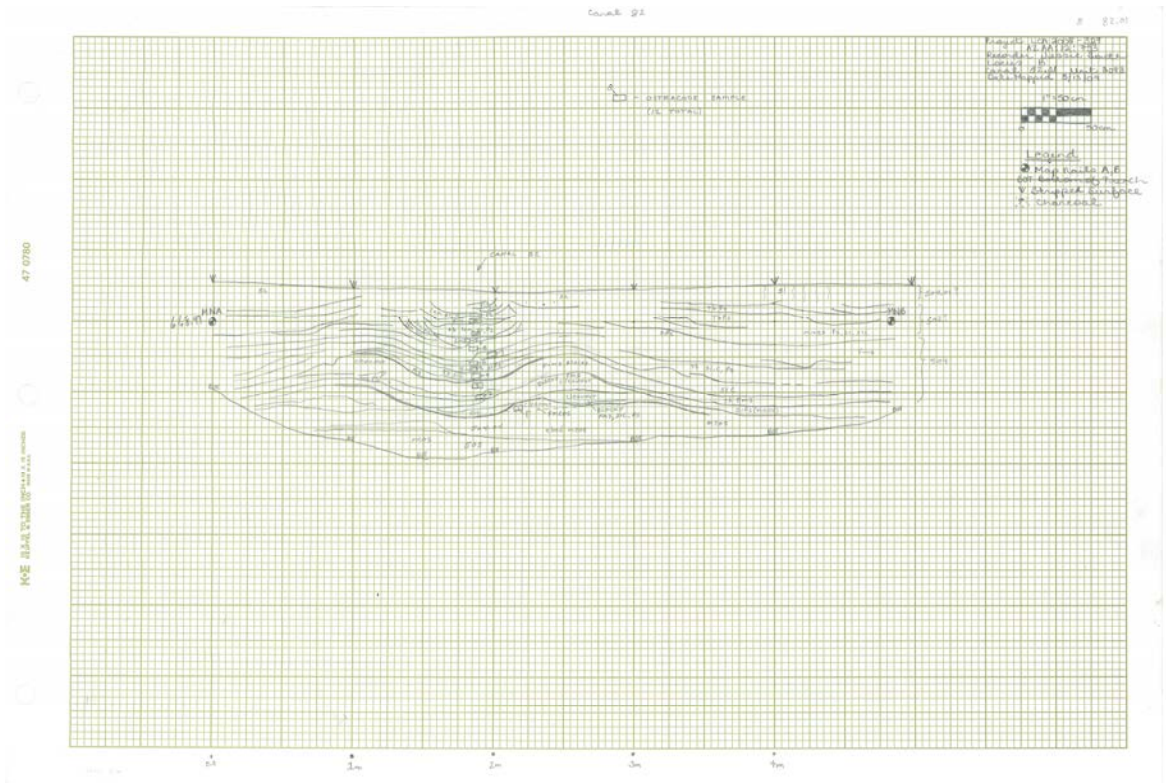
Comments: I originally thought this canal to have an unusually long use-history, starting in the L504.04, with continued use into at least part of the 504.02. After seeing more profiles and re-examining this one numerous times, I think that the canal was actually used last in the U504.04, and that sediments above that are natural flood sediments. The small channel at the top of the profile is either a newly constructed canal in the 504.02/504.01 interval, or possibly C52. This idea is supported by the fact that C52 has a very similar course, and in fact overlies, C82 in many areas. C52 originates in either the late 504.02 or 504.01. In addition, U504.04 sediments overlie digout(?), banks, and canal channel. The canal is stratigraphically older than C11, and appears to pass beneath that canal.

Profile 82.01 is an excellent profile. The canal starts in the L504.04, and a canal (see above) continues to be visible until the 504.01 interval. The L504.04 canal is approximately 1.7 m by approximately 35-40 cm; the U504.04 canal is approximately 1.30-1.40 m by approximately 20-25 cm; the 504.02 canal is approximately 1.20 m by approximately 25-30 cm (these are all maximum visible figures). There are several reconstruction episodes.

Ostracode Samples:

A total of 12 samples were collected from this profile. Sample 1 is from natural deposits below the canal; 2-4(?) are from the earliest canal (504.04); 5-8 appear to be in natural flood

deposits that overrode the canal and deposited blanketing sediments; 9-12 are from the latest canal (possibly C52?).



Canal 82, Locus B
Profile No.: 82.02

Map Reference: B2
Date Profiled: June 4, 2009
Trench, Unit: 2179
Canal type: Distribution
Cross-section Shape(s): 3,4
Parent canal: Unknown
Daughter canal(s): 102, 104, 105, 167?, 168?
Stratigraphic Origin: L504.04
Profile Datum (mbsd): -12.93
Profile Datum (masl): 668.43
Mapped Canal Length (m): 27
Banks Visible: Yes
Digouts Visible: Yes?
~Max. Visible Width (m): 1.15
~Max. Visible Depth (m): 0.37
Number of Iterations Detected: 4+
~Ground Elevation at Inception (masl): 668.06
Canal Bottom Elevation-Earliest Use (masl): 667.86
Canal Bottom Elevation-2nd Iteration (masl): 667.95
Canal Bottom Elevation-3rd Iteration (masl): 668.12
Canal Bottom Elevation-4th Iteration (masl): 668.25
Fe/Mg Stains: None observed
Samples Taken: None
Field Notes X-refs: 219

Comments: As with Profile 82.01, this canal has an extremely long use-history, and appears to have been flooded by 503 floods. This is a very important profile.

Canal 83, Locus B
Profile No.: No profile was drawn of this feature
Map Reference: Map B - Fields 5, 6 and 7, p. 1 (corrected version)
Date Profiled: N/A
Trench, Unit: 2088
Canal Type: Field lateral?
Cross-section Shape(s): Unknown
Parent canal: Unknown
Daughter canal(s): None observed
Stratigraphic Origin: 504.04
Field Notes X-refs: 213

Comments: The feature originally designated as C83 was not a canal, and that number (C83) was subsequently given to a double-numbered feature originally called C172 that was shown (in error) in the eastern corner of Map B - Fields 5, 6 and 7, p. 1. This is now the location for C83 and the correct location of C172 is shown on the northwestern side of Map B - Fields 1 and 2, p. 1.

Canal 84, Locus B
Profile No.: 84.01

Map Reference: B1
Date Profiled: May 20, June 9, 2009
Trench, Unit: 2253
Canal type: Field lateral
Cross-section Shape(s): 3
Parent canal: 11?, 42?
Daughter canal(s): None observed
Stratigraphic Origin: 505
Profile Datum (mbsd): -12.83
Profile Datum (masl): 668.53
Mapped Canal Length (m): 7
Banks Visible: Yes
Digouts Visible: No
~Max. Visible Width (m): 1.15-.20
~Max. Visible Depth (m): 0.37
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 668.58
Canal Bottom Elevation-Earliest Use (masl): 668.51
Fe/Mg Stains: None observed
Samples Taken: None
Field Notes X-refs: Page 220, 267, 268

Comments: This canal is exposed in the WOK (Wall of Knowledge) profile. Although the WOK profile is large, only one small canal (C84) originates near the top at approximately the 504.01/.02 boundary. The larger profile was drawn to illustrate stratigraphic relationships (e.g., note 504.03 sand characteristics), and to show and contrast nearby canal-like features that are believed to be of natural origin.

9/01/'09- The C84 exposure was deepened an additional +/- 1-1.25m on the west end, providing excellent exposures of Stratum 506 and a small portion of the top of 507. Textures and strata characteristics have changed significantly from exposures in Loci A and F. An additional 4 meters was added to the west end of the existing profile. A new canal cross-section is exposed in the newly-dug part of the profile (top of Stratum 506), along with a pit that was bisected. In comparison with previously profiled 504 and 505 strata, contacts are, in general, surprisingly "blurry". Edges and strata within the canal were unusually difficult to discern, as was the pit. In the process of cleaning the canal feature, I noticed what I first took to be dispersed small-pebble-sized gravel clasts within the fine sands of the lower 506. Upon closer observation, I realized that the "pebbles" were actually nodules of gypsum. In addition to the nodules, there are also gypsum-filled root casts. I believe that the gypsum may indicate submersion below the watertable [recall the carbonate "bed" in Huckleberry's description of Stratum 506 in Locus A (Huckleberry Profile A2). If this is the case, it may also explain the relatively poor preservation of stratigraphic contacts and feature boundaries. I will write more on this subject as I learn more. An additional factor in the apparent absence (or difficulty in seeing) canals may be the lack of beds that are markedly different in

texture/color in the 506 substrata below the uppermost weathering surface. Because beds are quite similar, digouts, banks [exotic clasts] and field boundaries do not show up well.

Canal 85, Locus F
Profile No.: 85.01

Map Reference: Map F - Fields 1
Date Profiled: June 9, 2000
Trench, Unit: 3222
Canal type:
Cross-section Shape(s): 3
Parent canal: Unknown
Daughter canal(s):
Stratigraphic Origin: 504.02-.01
Profile Datum (mbsd): -12.74
Profile Datum (masl): 668.62
Mapped Canal Length (m): 13
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): 1.50
~Max. Visible Depth (m): 0.35
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 668.50
Canal Bottom Elevation-Earliest Use (masl): 668.32
Fe/Mg Stains: None observed
Samples Taken: None

Comments: The canal appears to originate exactly on the stratigraphic boundary between 504.02/.01.

Canal 86, Locus F
Profile No.: 86.01

Map Reference: Map F - Fields 1
Date Profiled: June 3, 2009
Trench, Unit: 3218
Canal type: Distribution?
Cross-section Shape(s): 3
Parent canal: 3?
Daughter canal(s): None observed
Stratigraphic Origin: 505-504.04
Profile Datum (mbsd): -12.82
Profile Datum (masl): 668.54
Mapped Canal Length (m): 6
Banks Visible: Yes
Digouts Visible: Yes
~Max. Visible Width (m): 1.75
~Max. Visible Depth (m): 0.20
Number of Iterations Detected: 2
~Ground Elevation at Inception (masl): 668.27
Canal Bottom Elevation-Earliest Use (masl): 667.92
Canal Bottom Elevation-2nd Iteration (masl): 668.10
Fe/Mg Stains: None observed
Samples Taken: None

Comments: The canal appears to start exactly on the stratigraphic boundary between Strata 505 and 504.04, and is shown in the southeastern corner of Map F - Fields 1. The canal is oriented perpendicular to C7 and 87, but underlies those canals, with C3 as the probable parent canal.

Canal 87
Profile No.: 87.01

Map Reference: F1
Date Profiled: June 4, 2009
Trench, Unit: Wall
Canal type: Distribution
Cross-section Shape(s): 3
Parent canal: 7
Daughter canal(s): 53, 54, and ?
Stratigraphic Origin: L504.04
Profile Datum (mbsd): -12.43
Profile Datum (masl): 668.93
Mapped Canal Length (m): 20
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): 0.75
~Max. Visible Depth (m): 0.15
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): Does not apply
Canal Bottom Elevation-Earliest Use (masl): 668.78
Fe/Mg Stains: None observed
Samples Taken: None
Field Notes X-refs: 224, of 227

Comments: This canal is important for interpretation of how this part of the system works. The canal was functional when the Stratum 503 floods hit, and 503 deposits overlie this canal.

C87 is an interesting small canal located adjacent to C7 in locus A. The canal parallels C7, and is actually located on the margins of the bank of that canal. The bottom of C87 is actually higher than the bottom of C7 although it derived its water from C7. I believe that C87 functioned as a distribution canal diverging from and running parallel to C7. There are several reasons why this is a plausible explanation: 1) One could divert part of the flow from C7 into C87 without stopping flow in the main canal simply by cutting a hole in the bank of the master canal. As long as the bottom of C87 is higher than that of C7, a portion of the master canal's water will flow into C87, but can only erode as low as the bottom of C87. This eliminates the necessity of a tapon and interruption of flow in C7. 2) Reduced flow in C87 would allow slower and more uniform, deeper watering in field areas without wild flow problems.

C87 appears to have originated in the 504.04, and the two canals may have existed simultaneously from 504.04 times until 504.02. (This still remains to be verified). This simultaneous existence almost certainly is the case during later 504.04 and for some unknown period of time.

Canal 88
Profile No.: No profile of this feature was drawn.
Map Reference: A4
Trench, Unit: N/A
Canal Type: Field lateral?
Cross-section Shape(s): Not observed
Parent canal: These features ultimately derived water from C3, but no immediate parent was observed
Daughter canal(s): 94?
Stratigraphic Origin: L505
Mapped Canal Length (m): 4
Samples Taken: None
Field Notes X-refs: Page 223

Comments: C88 was only exposed for a distance of 3-4 m, shown on the northern corner of Map A - Fields 4, p. 1. No fields were observed in relation to this canal, so little can be said about the canal type. Based on size and the relatively parallel course with C89, however, my guess is that this is probably a field lateral.

The following comments pertain to Locus A Canals 88, 89, 90, and 91. These 4 canals all appear to be field lateral-type features. Although each shows quite clearly on the scraped surface, they cannot be seen in profile in shovel trenches. This is because during the scraping process all but the lowermost 2 cm was removed of both channel and banks. What remains of the channel fill is exceptionally micaceous, slightly coarser than adjacent non-canal flood sediments, and cross-bedded in all of these canals. Banks show as significantly darker and finer-textured than adjacent channel or field sediments. Because of the limited exposure, no profiles were drawn of any of these canals. Each of the canals trends approximately east-west.

The scraped surface from which the canals and fields were defined is in Stratum 505, just a few cm above the 505/506 contact. The agricultural features originate on the 506 surface and would have projected above that surface. The first identifiable 505 flood appears to have been a relatively large one that initially flowed in the canals and then overtopped both canals and fields and deposited medium- and coarse-sand in and over both. Both fields and canals are immediately above (+/- 5 cm) a dirty, heavily modified surface with numerous pit features and abundant charcoal. The western end of Locus A, which at the present time has numerous pits exposed, has been scraped into Stratum 506 to a level ~15cm below the fields and canals. It appears that scraping went through the fields in that area. In the east side, the fields acted as shallow reservoirs that ponded initial 505 flood deposits.

Canal 89
Profile No.: No profile of this feature was drawn.
Map Reference: A4
Trench, Unit:
Canal Type: Field lateral?
Cross-section Shape(s):
Parent canal: These features ultimately derived water from C3
Daughter canal(s): None recognized
Stratigraphic Origin: L505
Mapped Canal Length (m): 10
Samples Taken: None
Field Notes X-refs: 223

Comments: The following comments pertain to Locus A Canals 88, 89, 90, and 91. These 4 canals all appear to be field lateral-type features. Although each shows quite clearly on the scraped surface, they cannot be seen in profile in shovel trenches. This is because during the scraping process all but the lowermost 2 cm was removed of both channel and banks. What remains of the channel fill is exceptionally micaceous, slightly coarser than adjacent non-canal flood sediments, and cross-bedded in all of these canals. Banks show as significantly darker and finer-textured than adjacent channel or field sediments. Because of the limited exposure, no profiles were drawn of any of these canals. Each of the canals trends approximately east-west.

The scraped surface from which the canals and fields were defined is in Stratum 505, just a few cm above the 505/506 contact. The agricultural features originate on the 506 surface and would have projected above that surface. The first identifiable 505 flood appears to have been a relatively large one that initially flowed in the canals and then overtopped both canals and fields and deposited medium- and coarse-sand in and over both. Both fields and canals are immediately above (+/- 5 cm) a dirty, heavily modified surface with numerous pit features and abundant charcoal. The western end of Locus A, which at the present time has numerous pits exposed, has been scraped into Stratum 506 to a level ~15cm below the fields and canals. It appears that scraping went through the fields in that area. In the east side, the fields acted as shallow reservoirs that ponded initial 505 flood deposits.

Canal 90
Profile No.: No profile of this feature was drawn.
Map Reference: A4
Trench, Unit: N/A
Canal Type: Field lateral?
Cross-section Shape(s): not observed
Parent canal: These features ultimately derived water from C3
Daughter canal(s): None recognized
Stratigraphic Origin: L505
Mapped Canal Length (m): 19
Samples Taken: None
Field Notes X-refs: 223

Comments: C90 is a slightly unusual canal in that it is not particularly straight, but otherwise appears to be a typical field lateral. The canal is located on Map A - Fields 4, p. 1, between C89 and C91.

The following comments pertain to Locus A Canals 88, 89, 90, and 91. These 4 canals all appear to be field lateral-type features. Although each shows quite clearly on the scraped surface, they cannot be seen in profile in shovel trenches. This is because during the scraping process all but the lowermost 2 cm was removed of both channel and banks. What remains of the channel fill is exceptionally micaceous, slightly coarser than adjacent non-canal flood sediments, and cross-bedded in all of these canals. Banks show as significantly darker and finer-textured than adjacent channel or field sediments. Because of the limited exposure, no profiles were drawn of any of these canals. Each of the canals trends approximately east-west.

The scraped surface from which the canals and fields were defined is in Stratum 505, just a few cm above the 505/506 contact. The agricultural features originate on the 506 surface and would have projected above that surface. The first identifiable 505 flood appears to have been a relatively large one that initially flowed in the canals and then overtopped both canals and fields and deposited medium- and coarse-sand in and over both. Both fields and canals are immediately above (+/- 5 cm) a dirty, heavily modified surface with numerous pit features and abundant charcoal. The western end of Locus A, which at the present time has numerous pits exposed, has been scraped into Stratum 506 to a level ~15cm below the fields and canals. It appears that scraping went through the fields in that area. In the east side, the fields acted as shallow reservoirs that ponded initial 505 flood deposits.

Canal 91
Profile No.: No profile of this feature was drawn.
Map Reference: A4
Trench, Unit:
Canal Type: Field lateral?
Cross-section Shape(s):
Parent canal: These features ultimately derived water from C3
Daughter canal(s): None recognized
Stratigraphic Origin: L505
Mapped Canal Length (m): 16
Samples Taken: None
Field Notes X-refs: 223

Comments: C91 appears to be a typical field lateral that may (?) have derived its water from either C92 or C81. The canal is shown in the southwestern corner of Map A - Fields 4, p. 1. The canal parallels (roughly) the trend of C90.

The following comments pertain to Locus A Canals 88, 89, 90, and 91. These 4 canals all appear to be field lateral-type features. Although each shows quite clearly on the scraped surface, they cannot be seen in profile in shovel trenches. This is because during the scraping process all but the lowermost 2 cm was removed of both channel and banks. What remains of the channel fill is exceptionally micaceous, slightly coarser than adjacent non-canal flood sediments, and cross-bedded in all of these canals. Banks show as significantly darker and finer-textured than adjacent channel or field sediments. Because of the limited exposure, no profiles were drawn of any of these canals. Each of the canals trends approximately east-west.

The scraped surface from which the canals and fields were defined is in Stratum 505, just a few cm above the 505/506 contact. The agricultural features originate on the 506 surface and would have projected above that surface. The first identifiable 505 flood appears to have been a relatively large one that initially flowed in the canals and then overtopped both canals and fields and deposited medium- and coarse-sand in and over both. Both fields and canals are immediately above (+/- 5 cm) a dirty, heavily modified surface with numerous pit features and abundant charcoal. The western end of Locus A, which at the present time has numerous pits exposed, has been scraped into Stratum 506 to a level ~15cm below the fields and canals. It appears that scraping went through the fields in that area. In the east side, the fields acted as shallow reservoirs that ponded initial 505 flood deposits.

Canal 92
Profile No.: No profile of this feature was drawn.
Map Reference: A4
Trench, Unit: N/A
Canal Type: Possibly a secondary distribution canal
Cross-section Shape(s): Not observed
Parent canal: Unknown
Daughter canal(s): 90?, 91?
Stratigraphic Origin: L505/506
Mapped Canal Length (m): 11
Samples Taken: None

Comments: Also see comments for C81 and C93. This canal is exposed for only a very short distance in the northeastern corner of Map A - Fields 4, p. 2, and northwestern corner of Map A - Fields 4, p. 1. The canals had been mostly removed by scraping prior to their discovery, and as a consequence, relationships with other canals are speculative. C92 appears to branch from C81, but this is thought to be unlikely because C81 seems to be slightly higher stratigraphically. I think it more likely that C92 and C93 represent one canal, and the curve in C92 that appears to join C81 is actually a mis-mapped continuation of C91. These questions will remain unresolved because only a few centimeters were left of each of the canals, and no profiles could be drawn.

Canal 93
Profile No.: No profile of this feature was drawn.
Map Reference: A4
Trench, Unit: N/A
Canal Type: Distribution(?)
Cross-section Shape(s): Not observed
Parent canal: 3?
Daughter canal(s): Unknown
Stratigraphic Origin: Lower 505/506
Mapped Canal Length (m): 5
Samples Taken: No samples collected
Field Notes X-refs: 220, 221, 223

Comments: See notes for C81 and C92 also. This canal is exposed for a distance of approximately 5 m in the eastern end of Map A - Fields 4, p. 2. I believe it most likely that C93 is a continuation of C92 and that part of the latter canal was simply mis-mapped because so little remained of the canals to examine.

Canal 94
Profile No.: No profile of this feature was drawn.
Map Reference: A4
Trench, Unit: N/A
Canal Type: Field lateral?
Cross-section Shape(s): Unknown
Parent canal: 88?
Daughter canal(s): None observed
Stratigraphic Origin:
Mapped Canal Length (m): 3
Samples Taken: None

Comments: This very small canal is located near the northern corner of Map A - Fields 4, p. 1. The canal appears to branch from C88, but is only exposed for a distance of 2-3 m, so not much could be said about this canal.

Canal 95
Profile No.: 95.01

Map Reference: B2
Date Profiled: June 8, 2009
Trench, Unit: 2202
Canal type: Distribution
Cross-section Shape(s): 5
Parent canal: Unknown
Daughter canal(s): --
Stratigraphic Origin: L504.04
Profile Datum (mbsd): -13.20
Profile Datum (masl): 668.16
Mapped Canal Length (m): 22
Banks Visible: Yes
Digouts Visible:
~Max. Visible Width (m): 1.45
~Max. Visible Depth (m): 0.32
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 668.13
Canal Bottom Elevation-Earliest Use (masl): 667.91
Samples Taken: None

Comments: This profile was originally thought to be a part of Canal 53 and the excavation unit was dug as Profile 53.02. This was soon shown to be incorrect and has been corrected. The unusual width is due to the high oblique angle of the cut on the canal.

A feature originally identified as a possible canal was exposed in Unit 3240, and given the designation of Canal 95. The profile was cleaned and sprayed but a canal could not be identified. I waited several days for something to pop out, but could never identify a canal in this unit, therefore no profile was drawn for Unit 3240.

Canal 96
Profile No.: 96.01

Map Reference: Map F - Fields 2
Date Profiled: June 2, 2009
Trench, Unit: 3214
Canal type: Field lateral
Cross-section Shape(s): 4
Parent canal: Unknown
Daughter canal(s): None observed
Stratigraphic Origin: L504.02
Profile Datum (mbsd): -12.72
Profile Datum (masl): 668.64
Mapped Canal Length (m): 12
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): 2.00
~Max. Visible Depth (m): 0.25
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 668.42
Canal Bottom Elevation-Earliest Use (masl): 668.27
Fe/Mg Stains: None observed
Samples Taken: None

Comments: This canal is shown near the western margin of Map F - Fields 2. The canal parallels C97 and the association with fields shows that it is a field lateral. This profile was originally numbered (in error) as C53, profile 53.02. This has since been corrected. Canal appears unusually wide in the profile because of the angle at which it was profiled.

Canal 97
Profile No.: No profile of this feature was drawn.
Map Reference: Map F - Fields 1
Trench, Unit: None
Canal Type: Field lateral?
Cross-section Shape(s): 4? (Too shallow to accurately determine)
Parent canal: Unknown
Daughter canal(s): None observed
Stratigraphic Origin: L504.02
Samples Taken: None

Comments: This canal parallels the northeastern edge of Map F - Fields 1, where it has a northeast-southwest trend. Primary width is unknown, and remaining depth was less than 2cm, too shallow to profile. The canal should be shown on Map F - Fields 2, where it is paired with C96. These two field lateral canals have the typical fields and pattern in association.

Canal 98 (NOT A CANAL – NUMBER ABANDONED)

Comments: This canal was originally defined on maps, but field examination showed it not to be a canal.

Canal 99
Profile No.: No profile of this feature was drawn
Map Reference: Map F - Fields 3
Trench, Unit: None
Canal Type: Field lateral?
Cross-section Shape(s): 4?
Parent canal: Unknown
Daughter canal(s): 100?
Stratigraphic Origin: L505
Mapped Canal Length (m): 25
Samples Taken: None

Comments: This east-west-trending canal was identified on a scraped surface, but not enough remained of the canal to profile. Maximum visible width was approximately 0.5m, but it had been heavily scraped. The trend of the canal is exposed for a distance of about 30 m, and the canal is shown on Map F - Fields 3. No connection with a parent canal was observed, but the parent is probably C3.

Canal 100
Profile No.: 100.01

Map Reference: Map F - Fields 3
Trench, Unit: 3242
Canal type: Field lateral (?)
Cross-section Shape(s): 4
Parent canal: 3?
Daughter canal(s): Possible unnumbered canal in southeastern corner of Map F - Fields 3, unnumbered canal in northeastern corner of Map F - Fields 3.
Stratigraphic Origin: Lowermost 505, on top of 506 surface. Stratigraphically equivalent to C3.
Profile Datum (mbsd): 13.60
Profile Datum (masl): 667.76
Mapped Canal Length (m): 21
Banks Visible: Yes
Digouts Visible: No
~Max. Visible Width (m): 1.05
~Max. Visible Depth (m): 0.12
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 667.79
Canal Bottom Elevation-Earliest Use (masl): 667.78
Fe/Mg Stains: None observed
Samples Collected: None

Comments: This small field lateral (?) canal clearly originates in the lowermost part of Stratum 505, but cats into the top of Stratum 506. Bank deposits appear to be present on both sides, and a possible digout area is present on profile right. Canal-use deposits are poorly defined, and the canal appears to have been hit by a flood shortly after construction? The classification of this canal and its association with C99 are uncertain. The length of the canal suggests a possible distribution function, but the apparent association with adjacent fields strongly suggests a field lateral function. Furthermore, C100 may be a single canal that crosscuts C99, or it may be two separate canals that happened to branch from C99 at approximately the same place. Too little remained of the canals C99 and 100 to determine the correct associations.

Canal 101
Profile No.: No profile was drawn
Map Reference: B (Not shown on maps)
Trench, Unit: 2203
Canal type: Field lateral?
Cross-section Shape(s): 4?
Parent canal: Unknown
Daughter canal(s):
Stratigraphic Origin: L504.04
Profile Datum (mbsd): -13.60
Profile Datum (masl): 667.76
Mapped Canal Length (m): Not shown on maps
Banks Visible: Only on scraped surface
Digouts Visible: No
~Max. Visible Width (m): 0.70
~Max. Visible Depth (m): 0.036
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): ~667.75-667.80
Fe/Mg Stains: None observed
Field Notes X-refs: Page 230, June 8, 2009

Comments: The exposure of this small field lateral-type canal is in Unit 2203, a small shovel trench cut across the canal. The canal appears to originate in the L504.04. The profile was cleaned, but ended up being too shallow to profile. What remains of the canal is filled with cross-bedded fine sand and the canal trace is clearly visible on the surface with adjacent banks. The maximum visible depth, however, is only 2-5 cm and the maximum visible width is only about 70 cm. Photos were taken of the surface and shovel trench.

Canal 102
Profile No.: 102.01

Map Reference: B2
Date Profiled: June 15, 2009
Trench, Unit: 2228
Canal type: Field lateral
Cross-section Shape(s): 3
Parent canal: 82
Daughter canal(s): none observed
Stratigraphic Origin: L504.04-505
Profile Datum (mbsd): -13.55
Profile Datum (masl): 667.81
Mapped Canal Length (m): 7
Banks Visible: Yes
Digouts Visible: Yes
~Max. Visible Width (m): 0.90
~Max. Visible Depth (m): 0.15
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 667.82
Canal Bottom Elevation-Earliest Use (masl): 667.80
Fe/Mg Stains: None observed
Samples Taken: No samples were collected
Field Notes X-refs: Page 237

Comments: This small, field-lateral-size canal and what appears to be an adjacent digout on one side is shown in the northeastern corner of map B2. Only the very bottom of the canal and part of one bank remain. A stratigraphic profile for Stratum 505 from 3.0m south of south end of canal is also shown on the canal profile. Stratum 506 was tentatively identified at the base of the profile. Note that this canal overlies C169.

Canal 103
Profile No.: 103.01 (See sketch on page 246 of field notes)
Map Reference: B4
Date Profiled: June 22, 2009
Trench, Unit: 2224
Canal type: Distribution?
Cross-section Shape(s): 3,4
Parent canal: Unknown
Daughter canal(s): None observed
Stratigraphic Origin: 504.02-.01
Profile Datum (mbsd): -14.90
Profile Datum (masl): 668.46
Mapped Canal Length (m): 29
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): 0.90
~Max. Visible Depth (m): 0.25
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): Cannot determine
Canal Bottom Elevation-Earliest Use (masl): 668.34
Fe/Mg Stains: None observed
Samples Taken: No samples were collected
Field Notes X-refs: Page 246

Comments: Other than origin (boundary 504.01/504.02), the stratigraphic relationships are not clear in this profile. From the sketch it appears that the banks may have been truncated by 504.01 floods(?). Coarse sands in lower part of stratigraphic profile (but not canal) may represent Substratum 504.03. This canal trends toward and crosses over the path of C159 (C159 not shown on maps) in the location of Unit 7735 (but was not recognized in that unit). The path of C103 is shown in the northern quadrant of Map B - Fields 5, 6, and 7, p. 2)

Canal 104
Profile No.: 104.01

Map Reference: B2
Date Profiled: June 19, 2009
Trench, Unit: 2269
Canal type: Distribution?
Cross-section Shape(s): 3,4
Parent canal: 82
Daughter canal(s): None observed
Stratigraphic Origin: 504.04
Profile Datum (mbsd): -13.58
Profile Datum (masl): 667.78
Mapped Canal Length (m): 3
Banks Visible: Yes
Digouts Visible: Yes (poorly)
~Max. Visible Width (m): 0.7
~Max. Visible Depth (m): 0.25
Number of Iterations Detected: 4+
~Ground Elevation at Inception (masl): 667.83?
~Ground Elevation at 2nd Iteration (masl): 668.20
Canal Bottom Elevation-Earliest Use (masl): 667.18
Canal Bottom Elevation-2nd Iteration (masl): 667.95
Canal Bottom Elevation-3rd Iteration (masl): 668.55
Canal Bottom Elevation-4th Iteration (masl): 668.66
Fe/Mg Stains: None observed
Samples Taken: No samples were collected
Field Notes X-refs: Pages 236, 241

Comments: Much of this profile was destroyed by modern construction. As a result, the width figure is minimal (50-60%?), and some elevations on this otherwise incredible profile are speculative. Along with its parent canal, this one has an extremely long use-life.

I originally thought this canal was a field lateral but the profile shows that it is almost the magnitude of Canal 82, from which it branches. As with Canal 82, Canal 104 originates early in Stratum 504.04, and continues at least into Stratum 504.02. The top has been removed, so the termination cannot be determined. Only the canal-right side of the profile is preserved, so exact dimensions cannot be determined. There appear to be 4 (maybe 5) iterations of the canal, and banks are clear. This canal is clearly much larger than adjacent field laterals and is on a par with e.g., Canal 33 in Locus D. As of the present, it appears that Canals 82 and 104 were the "master" canals in Locus B during 504.04 times, and may have been supplanted by Canals 11 and 42 (?) during 504.02/01 times. The source canal must of been Canal 7, but the nature of their association cannot be demonstrated.

Canal 105
Profile No.: 105.01

Map Reference: B2
Date Profiled: June 16, 2009
Trench, Unit: 2243
Canal type: Field lateral
Cross-section Shape(s): 4
Parent canal: 82
Daughter canal(s): None observed
Stratigraphic Origin: 504.04
Profile Datum (mbsd): -13.43
Profile Datum (masl): 667.93
Mapped Canal Length (m): 6
Banks Visible: Yes
Digouts Visible: Yes?
~Max. Visible Width (m): 0.92
~Max. Visible Depth (m): 0.08
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 667.95
Canal Bottom Elevation-Earliest Use (masl): 667.94
Fe/Mg Stains: None observed
Samples Taken: None

Comments: The identified parent canal, C82, is one of the longest-lived canals in Locus B. Despite the unusually long use-history of the parent canal, C105 appears to be short-lived, with very little in the way of use-deposits within the canal.

Canal 106
Profile No.: 106.01

Map Reference: B4
Date Profiled: June 16, 2009
Trench, Unit: 2253
Canal type: Field lateral
Cross-section Shape(s): 4
Parent canal: 110?, 116?
Daughter canal(s): None observed
Stratigraphic Origin: 504.04/505
Profile Datum (mbsd): -14.43
Profile Datum (masl): 666.93
Mapped Canal Length (m): 12
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): 0.90
~Max. Visible Depth (m): 0.17
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 666.99
Canal Bottom Elevation-Earliest Use (masl): 666.94
Fe/Mg Stains: None observed
Samples Taken: No samples were collected
Field Notes X-refs: Page 237, 238

Comments: Canals 106 and 107 are small field laterals, and are associated with adjacent field cells. The canals appear to originate just above the top of Stratum 506 in Stratum 505. (The top of 506 is not as clear here as in some other places.) The relationships between C106 and C108 appear strange. Could these be the same canal? Although they are of the same age, the appear to be two separate field laterals that terminate in adjacent fields. If this is correct this pattern was not observed in any of the other fields in this or any other area.

Unit 2253 is a reopened portion of Trench 226. The profile of C106 is unsatisfactory, having been truncated on both ends by scraping and/or small bank collapse. Banks are not really recognizable. The profile was about 2.2 m long. C106 appears to have been recorded as a small pit (Feature 3145) during Phase 1 of this project. That feature number was later changed by the field crew to Feature 7002. Also recorded in this trench, about 4 m southward, is a deep vertical-sided cultural pit (originally recorded as Feature 3144) that I profiled. That Feature number was also later changed to Feature 7001.

The profiles of C106 and 107 start at slightly different levels within Stratum 505. There is some difficulty in stratigraphic assignment in this location, in that the 506 is less distinctive than normal in this part of the site. Stratum 506 is somewhat redder than most of the rapidly-deposited overlying flood sediments, but not as clayey as in Loci A, G and F. Both C106 and C107 seemed to start in the lower part of 505, with C107 or originating approximately 10 to 15 cm higher than C106. This has some rather interesting implications, mainly that there appear to be two irrigation episodes that began in Stratum 505, in addition to at least one earlier one in Stratum 506.

A small field border profile drawn near these two canals (see p. 242 of field notes) is very important for a number of reasons:

(1) It is an excellent profile showing the border and digout on either side
(2) It shows the method of construction and the subsequent accumulation of water in the digouts
(3) This feature clearly demonstrates the existence of fields in the lower part of Stratum 505. After the establishment of the 506 surface (with associated fields and canals), at least two large floods deposited 505 sediments. The field border in question was dug into these sediments.

These conclusions have other important implications for both canals and fields. C106 and 107, as mapped, are associated with the lower 505/506 boundary. The apparent continuations of these canals onto the bench where the profiled bank is located actually represent different canals (or reestablishment of the former canals – See Canal Profiles 106.01 and 107.01). Both these profiles, especially 106.0, have elements associated with the later 505 fields. In addition, soil sample SS B-SS-F-25 and bank sample B-SS-B-15 are associated with the younger 505 fields rather than those at the L505/506 level. The latter sample is less than 50cm from the bank profile.

Canal 107
Profile No.: 107.01

Map Reference: B4
Date Profiled: June 17, 2009
Trench, Unit: 2252
Canal type: Field lateral
Cross-section Shape(s): 4
Parent canal: 110?, 116?
Daughter canal(s): None observed
Stratigraphic Origin: 505-504.04
Profile Datum (mbsd): -14.29
Profile Datum (masl): 667.07
Mapped Canal Length (m): 13
Banks Visible: Yes
Digouts Visible: Yes?
~Max. Visible Width (m): 1.00
~Max. Visible Depth (m): 0.17
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 667.96
Canal Bottom Elevation-Earliest Use (masl): 667.94
Fe/Mg Stains: None observed
Samples Taken: no samples collected
Field Notes X-refs: Pages 234, 238

Comments: The profile is approximately 2.20 m long and 40 cm deep. The canal shows clearly, although there is significant tree(?)-root disturbance on the profile-left bank. There is just a small skiff of what appears to be canal use-sediments in the bottom. Maximum visible width is approximately 1.25 m and maximum visible depth is about 15-18 cm. Banks are composed of what appears to be Stratum 505 medium and coarse sand. The profile-right bank has some small, irregular fine sandy blocks, but banks are otherwise composed of relatively massive medium-coarse sand.

The profiles of C106 and 107 start at different levels within Stratum 505. There is some difficulty in identifying stratigraphic boundaries and feature edges in this location, in that the 506 is less distinctive than normal in this part of the site. The 506 is somewhat redder than most overlying sediments, but not as clayey as in Loci A, G and F. Both C106 and C107 seem to start in the lower part of 505, with C107 originating approximately 10 to 15 cm higher. This has some rather interesting implications, mainly that there are two irrigation episodes that began in the 505, presumably in addition to at least one in the 506. [Also see notes for C106].

Canal 108

Profile No.: No profile of this feature was drawn, (see sketch in field notes, p. 242)

Map Reference: B4
Trench, Unit: 2249, 2259, also exposed in Trench 242
Canal Type: Field lateral?
Cross-section Shape(s): 4
Mapped Canal Length (m): 7
Banks visible?: Not readily apparent
~Maximum visible width: 1.0m
~Maximum visible depth: 10cm
Parent canal: 158?
Daughter canal(s): None observed
Stratigraphic Origin: L505-506
Field Notes X-refs: Page 238, 242

Comments: This possible canal in Locus B was first exposed in a shovel trench (Unit 2249). The feature had been dashed in on the ground (rather than a solid line) on the Stratum 506 surface. The unit was dug perpendicular to the feature and was about 20 cm deep. I repeatedly sprayed and cleaned both walls of 2249, but could not see anything suggestive of a canal. This feature is in almost exact alignment with Canal 106, but does not appear to be related, except in age. The sketched profile is in a cleaned-out portion of T225. Stratum 506 at this location is very red-brown (moist) loamy medium-fine sand/medium fine sandy loam.

The canal is about 1 m wide and about 10 cm deep in the uncleaned profile. Banks are not readily apparent, but may or may not be present. The profile and unit are in a cleaned-out portion of Trench 225 (?) [10 m west of Trench 226]. See sketch in field notes on page 242. The canal is shown on Map B - Fields 5, 6 and 7, p. 1, and was exposed for a distance of about 10 m.

Canal 109
Profile No.: No profile of this feature was drawn.
Map Reference: F2
Trench, Unit:
Canal Type: Field lateral?
Cross-section Shape(s): Cannot determine
Parent canal: Unknown
Daughter canal(s): None observed
Stratigraphic Origin: 505/506
Mapped Canal Length (m): 11

Comments: Canal was observed on maps and ground, but was too shallow to profile

Canal 110
Profile No.: 110.01

Map Reference: B3 (course of canal is not shown on map, only location of profile)
Date Profiled: June 26, 2009
Trench, Unit: Wall
Canal type: Field lateral?
Cross-section Shape(s): 3,4
Parent canal: 3?
Daughter canal(s): Unknown
Stratigraphic Origin: 504.04
Profile Datum mbsd: -12.97
Profile Datum MASL: 668.39
Mapped Canal Length (m): Unknown. The course of this canal was not shown on the maps.
Banks Visible: Yes
Digouts Visible: Yes
~Max. Visible Width: >1.0 m
~Max. Visible Depth: > 0.20 m
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 668.00
Canal Bottom Elevation-Earliest Use (masl): 667.98
Fe/Mg Stains: None observed
Samples Taken: None

Comments: Although truncated, with probably more than half of the canal missing, this is an excellent example of a small canal (probably a field lateral). The canal profile shows the original digout area on canal-right, which is excavated to a depth approximately equal to the canal channel itself. One of the original banks is preserved and appears to have been constructed to a height approximately 10 to 15 cm above the canal bottom and adjacent digout area. The path of this canal is not shown on any of the maps, although the profile location and/or canal number is shown on all maps of Locus B.

Canal 111
Profile No.: 111.01

Map Reference: B4
Date Profiled: July 22, 2009
Trench, Unit: 7100
Canal type: Field lateral
Cross-section Shape(s): 4
Parent canal: 110?, 116?
Daughter canal(s): None observed
Stratigraphic Origin: 505
Profile Datum (mbsd): -14.43
Profile Datum (masl): 666.93
Mapped Canal Length (m): 27
Banks Visible: Yes
Digouts Visible: ?
~Max. Visible Width (m): 1.00
~Max. Visible Depth (m): 0.28
Number of Iterations Detected: 3?
~Ground Elevation at Inception (masl): ~666.90
~Ground Elevation at 2nd Iteration (masl): 666.88
Canal Bottom Elevation-Earliest Use (masl): 666.71
Canal Bottom Elevation-2nd Iteration (masl): 666.80
Fe/Mg Stains: None observed
Samples Taken: No samples were collected
Field Notes X-refs: p. 247

Comments: Canal 111 is a small field lateral that parallels Canals 106, 107, and 112. The stratigraphy appeared to match that of Profile 110.01. No banks were identified, nor was a clear digout area, but the channel is composed of thin-bedded fine sand, silty fine sand and medium sand, while materials to the side of the canal were massive medium sand. A second, smaller, channel-like feature was higher and slightly to the right, but again no banks could be recognized. That feature is filled with massive medium sand. This canal intrudes a bell-shaped pit (Feature 7771). The canal was originally identified as being much shallower.

Canal 112

Profile No.: No profile of this feature was drawn.

Map Reference: B4
Trench, Unit: 6010
Canal Type: Originally believed to possibly be a distribution canal because of the slightly unusual depth, but the relationship with adjacent fields suggests that it is more likely a field lateral.
Cross-section Shape(s): 3
Parent canal: 116?
Daughter canal(s): 113
Stratigraphic Origin: 505
Mapped Canal Length (m): 39
~Max. Visible Width (m): 1.0
~Max. Visible Depth (m): 0.25
Samples Taken: None

Comments: See comments for 111.02.

Canal 113
Profile No.: No profile of this feature was drawn.
Map Reference: B4
Trench, Unit:
Canal Type: Field lateral
Cross-section Shape(s): –
Parent canal: 112
Daughter canal(s): None observed
Stratigraphic Origin: L505/506
Mapped Canal Length (m): 5

Comments: This short segment of a very small canal is a daughter canal of C112. The canal was not profiled, and except for location, type, parent, and approximate stratigraphic origin, nothing is known of this canal. The location of the canal is shown in the southwestern corner of map B feels 56 and seven, p. 1, and the canal was exposed for a distance of only 3-4 m.

Canal 114
Profile No.: No profile of this feature was drawn.
Map Reference: B4
Trench, Unit: N/A
Canal Type: Field lateral
Cross-section Shape(s): Unknown
Parent canal: 121? (Very speculative)
Daughter canal(s): None observed
Stratigraphic Origin: L505
Mapped Canal Length (m): 8
Samples Taken: None

Comments: The location of C114 is shown near the southern margin of Map B - Fields 5, 6 and 7, p. 1, and the canal was exposed for a distance of about 7-8 m. No profile of this feature was drawn.

Canal 115
Profile No.: No profile of this feature was drawn.
Map Reference: B4
Trench, Unit: 2311
Canal Type: Field lateral
Cross-section Shape(s):
Parent canal: 116?
Daughter canal(s): None observed
Stratigraphic Origin: L505
Profile Datum (mbsd): –
Profile Datum (masl): –
Mapped Canal Length (m): 4
~Max. Visible Width (m): 0.60-0.65
~Max. Visible Depth (m): 0.05-0.07
Samples Taken: None
Field Notes X-refs: 246

Comments: Canal 115 is a tiny, field lateral-type canal. Maximum visible width is approximately 60-65 cm; maximum visible depth is approximately 5-7 cm. The canal originates in lower Stratum 505. Canal-fill sediments are fine sand, cannot see good bedding. The canal was not profiled because it was so shallow. The location of the canal is shown in Map B - Fields 5, 6 and 7, p. 1.

Canal 116
Profile No.: No profile of this feature was drawn.
Map Reference: B4
Trench, Unit: 2312
Canal Type: Field lateral?, Distribution?
Cross-section Shape(s): 3?
Parent canal: 3?
Daughter canal(s): 106?, 107?, 111?, 112?, 115?, 120?
Stratigraphic Origin: L(?)505
Mapped Canal Length (m): 6
~Max. Visible Width (m): ~1.0
~Max. Visible Depth (m): ~0.10
Samples Taken: None
Field Notes X-refs: Page 246

Comments: This canal was not profiled because it was too shallow and contacts were not clear. It originates in Stratum 505, and is a field lateral-type canal. The channel fill is discrete, thin-bedded fine sand/with some medium sand. See sketch, page 246. Maximum visible width is approximately 1.0 m; maximum visible depth is approximately 10 cm. The location of C116 is shown near the northern corner of Map B - Fields 5, 6 and 7, p. 1, where it approximately parallels C174 and is roughly perpendicular to C107.

Canal 117

Profile No.: 117.01 (on Profile 29.01, with profiles 68.02, 73.02 and 118.01)

Map Reference: A1 (canal course not shown on maps)
Date Profiled: June 29, 2001
Trench, Unit: Northwest wall of Locus A
Canal type: Field lateral?
Cross-section Shape(s): 4
Parent canal: 7?
Daughter canal(s): Unknown
Stratigraphic Origin: 502
Profile Datum (mbsd): -12.290
Profile Datum (masl): 669.07
Mapped Canal Length (m): Canal course not shown on map, as it was exposed only in wall profile.
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): 2.00 (this seems unusually wide, but we do not know the angle at which the canal was cut.)
~Max. Visible Depth (m): 0.20
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): ~669.07
Canal Bottom Elevation-Earliest Use (masl): 668.95
Fe/Mg Stains: None observed
Samples Taken: No samples were collected
Field Notes X-refs: Page 246

Comments: The path of C117 is not shown on site maps, and Canals 117 and 118 were not seen during the original scraping efforts. The profile for this canal also contains Canals 29, 68, 73, and 118.

Canals 117 and 118 have important implications. Post-Stratum 503 planting holes had been previously observed Loci A and B, but no canals above the 504.01 surface had been found. Later, what appeared to be Stratum 502 canal deposits within the Canal 11 channel were found, reinforcing the idea that part of the C7 system remained active after the 503 flood. There remained, however, the nagging possibility that the C11 502 deposits represented natural flood deposits rather than canal-use sediments. C117 and 118, however, clearly represent previously unobserved post-503 canals, and indicate that at least part of the C7 system was not only continued, but also involved reconstruction of field areas. Further, these canals provide reassurance that the C11 502 deposits represent canal use.

The thickness of the 504.04 deposits shown on these profiles in Locus A is also very important. Compare with Locus G2, where it is almost absent in some places, or Locus F where it is only 10-20 cm thick (e.g., Trench 235).

Canal 118
Profile No.: 118.01

Map Reference: A1 (Canal course not shown on maps)
Date Profiled: June 29, 2009
Trench, Unit: Northern wall of Locus A
Canal type: Field lateral?
Cross-section Shape(s): 3,4
Parent canal: 7?
Daughter canal(s):
Stratigraphic Origin: 502
Profile Datum (mbsd): -12.29
Profile Datum (masl): 669.07
Mapped Canal Length (m): Canal course not shown on maps, as it was exposed only in wall profile.
Banks Visible: Yes (poorly)
Digouts Visible: Yes (poorly)
~Max. Visible Width (m): 1.00
~Max. Visible Depth (m): 0.20
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 669.05
Canal Bottom Elevation-Earliest Use (masl): 668.99
Samples Taken: No samples were collected
Field Notes X-refs: Page 246

Comments: The path of C117 is not shown on site maps, and Canals 117 and 118 were not seen during the original scraping efforts. The profile for this canal also contains Canals 29, 68, 73, and 118.

Canals 117 and 118 have important implications. Post-Stratum 503 planting holes had been previously observed Loci A and B, but no canals above the 504.01 surface had been found. Later, what appeared to be Stratum 502 canal deposits within the Canal 11 channel were found, reinforcing the idea that part of the C7 system remained active after the 503 flood. There remained, however, the nagging possibility that the C11 502 deposits represented natural flood deposits rather than canal-use sediments. C117 and 118, however, clearly represent previously unobserved post-503 canals, and indicate that at least part of the C7 system was not only continued, but also involved reconstruction of field areas. Further, these canals provide reassurance that the C11 502 deposits represent canal use.

The thickness of the 504.04 deposits shown on these profiles in Locus A is also very important. Compare with Locus G2, where it is almost absent in some places, or Locus F where it is only 10-20 cm thick (e.g., Trench 235).

Canal 119
Profile No.: 119.01 (On profile with C111.01)
Map Reference: B4 (Canal course not shown on maps)
Date Profiled: July 22, 2009
Trench, Unit: 7100
Canal type: Field Lateral?
Cross-section Shape(s): 4
Parent Canal: Unknown
Daughter Canal(s): None observed
Stratigraphic Origin: 505
Profile Datum (mbsd): -14.43
Profile Datum (masl): 666.93
Mapped Canal Length (m): Unknown, canal course not shown on maps
Banks Visible: Cannot determine
Digouts Visible: Cannot determine
~Max. Visible Width (m): 1.00
~Max. Visible Depth (m): 0.15
Number of Iterations Detected: 2
~Ground Elevation at Inception (masl): 666.98
Canal Bottom Elevation-Earliest Use (masl): 666.94
Canal Bottom Elevation-2nd Iteration (masl): 666.93
Samples Taken: None

Comments: Canal is truncated both on upper surface and laterally. The proximity of C119 to C111 suggests the possibility that it is a digout, but C111 cuts C119 a few meters away, so C119 cannot be a digout. Both canals were dug into a very trashy surface, making identification of earlier banks difficult. The course of C119 is not shown on site maps.

Canal 120

Profile No.: No profile of this feature was drawn.

Map Reference: Map B - Fields 5, 6 and 7, p. 1
Trench, Unit: N/A
Canal Type: Field lateral
Cross-section Shape(s): Not observed
Parent canal: Unknown
Daughter canal(s): None observed
Stratigraphic Origin: 505
Mapped Canal Length (m): 12
Samples Taken: None

Comments: Very small canal, appears to be a field lateral. No cross-section was ever exposed for profiling except by trowel scrape. The canal remnant appeared to be very shallow, and no profile was ever drawn.

Canal 121
Profile No.: No profile of this feature was drawn.
Map Reference: B4
Trench, Unit: N/A
Canal Type: Field lateral?
Cross-section Shape(s): Not observed
Parent canal: Unknown
Daughter canal(s): 114?
Stratigraphic Origin: 506
Mapped Canal Length (m): 12 to 15
Samples Taken: None
Field Notes X-refs: Page 277

Comments: The canal trends toward the WOK, but could not be identified in the eastern end of that profile. The location of C121 is shown near the center of Map B - Fields 5, 6 and 7, p. 1.

Canal 122

Profile No.: No profile of this feature was drawn.

Map Reference: D1
Trench, Unit: None
Canal Type: Field lateral
Cross-section Shape(s): Not observed
Parent canal: C19
Daughter canal(s): 149, 150
Stratigraphic Origin: 504.02/.01
Mapped Canal Length (m): 15
Samples Taken: None

Comments: This small field lateral is one of a series that appeared to originate with C19. The field laterals that emanate from C19 include C49, 50, 51, 122, 123, and 124. The fields that are associated with these canals shows several variations on the "two field-one canal system", and in this area especially in relation to C122, 123, and 124, there are a series of secondary distributions that branch off of the primary field laterals. This is one of the few areas where "secondary distribution" canals were recognized. In this area the distance between "primary" field laterals is somewhat wider than in other areas and as a consequence the "two fields-one canal" system is modified by the addition of the secondary distributions. The secondary distributions include 149 and 150 (C122), 151 (C123), and 125 and 126 (C124). This is also the first place that we realized that the field laterals were not directed toward the river as we had originally thought they would be, but rather away from the river and toward another distribution canal, in this case C33. All of the primary field laterals parallel one another, all are of very similar size, and all have a length between 30 m and 40 m. The canals extend essentially to the field on the downslope side of C33.

Canal 123
Profile No.: No profile of this feature was drawn.
Map Reference: D1
Trench, Unit: None
Canal Type: Primary field lateral
Cross-section Shape(s): Not observed
Parent canal: C19
Daughter canal(s): 151
Stratigraphic Origin: 504.02/.01
Mapped Canal Length (m): 17

Comments: This small field lateral is one of a series that appeared to originate with C19. The field laterals that originates with C19 include C49, 50, 51, 122, 123, and 124. The fields that are associated with these canals shows several variations on the "two field-one canal system", and in this area especially in relation to C122, 123, and 124, there are a series of secondary distributions that branch off of the primary field laterals. This is one of the few areas where "secondary distribution" canals were recognized. In this area the distance between "primary" field laterals is somewhat wider than in other areas and as a consequence the "two fields-one canal" system is modified by the addition of the secondary distributions. Secondary distributions include 149 and 150 (C122), 151 (C123), and 125 and 126 (C124). This is also the first place that we realize that the field laterals were not directed toward the river as we had originally thought they would be, but rather away from the river and toward another distribution canal, in this case C33. All of the primary field laterals parallel one another, all are of very similar size, and all have a length between 30 m and 40 m. The canals extend essentially to the field on the downslope side of C33.

Canal 124 (D3)
Profile No.: 124.01

Map Reference: D1
Date Profiled:
Trench, Unit: D3
Canal type: Primary field lateral
Cross-section Shape(s): 4
Parent canal: 19
Daughter canal(s): 125, 126
Stratigraphic Origin: 504.02-.01
Profile Datum (mbsd): -13.91
Profile Datum (masl): 667.45
Mapped Canal Length (m): 24
Banks Visible: Yes
Digouts Visible: ?
~Max. Visible Width (m): 0.90
~Max. Visible Depth (m): 0.10
Number of Iterations Detected: 1
Samples Taken: None

Comments: This very small canal was originally given the temporary field designation of D3. The "profile" is only a sketch, so absolute elevation figures are not applicable. This small field lateral is one of a series that appeared to originate with C19. The field laterals that originate with C19 include C49, 50, 51, 122, 123, and 124. The fields that are associated with these canals shows several variations on the "two field-one canal system", and in this area especially in relation to C122, 123, and 124, there are a series of secondary distributions that branch off of the primary field laterals. This is one of the few areas where "secondary distribution" canals were recognized. In this area the distance between "primary" field laterals is somewhat wider than in other areas and as a consequence the "two fields-one canal" system is modified by the addition of the secondary distributions. The secondary distributions include 149 and 150 (C122), 151 (C123), and 125 and 126 (C124). This is also the first place that we realized that the field laterals were not directed toward the river as we had originally thought they would be, but rather away from the river and toward another distribution canal, in this case C33. All of the primary field laterals parallel one another, all are of very similar size, and all have a length between 30 m and 40 m. The canals extend essentially to the field on the downslope side of C33.

Canal 125
Profile No.: No profile of this feature was drawn.
Map Reference: D1
Trench, Unit: None
Canal Type: Secondary distribution
Cross-section Shape(s): Not observed
Parent canal: 124
Daughter canal(s): None
Stratigraphic Origin: 504.02/.01
Mapped Canal Length (m): 17

Comments: See comments for C49, 122. No profile was drawn of this small canal.

Canal 126
Profile No.: No profile of this feature was drawn.
Map Reference: D1
Trench, Unit: None
Canal Type: Secondary distribution
Cross-section Shape(s): Not observed
Parent canal: 124
Daughter canal(s): None
Stratigraphic Origin: 504.02/.01
Mapped Canal Length (m): 20

Comments: See comments for C49, 122.

Canal 127
Profile No.: No profile of this feature was drawn.
Map Reference: D1
Trench, Unit: None
Canal Type: Distribution?
Cross-section Shape(s): Not observed
Parent canal: Unknown
Daughter canal(s): None
Stratigraphic Origin: 505/504.04
Mapped Canal Length (m): ~50

Comments: This canal was not profiled, so its exact dimensions are not known. It was classed as a distribution canal primarily on the basis of its orientation and relatively great length 5050. The canal parallels C34, and is possibly related to C131 (suggested by its similar orientation), although I believe that C131 is actually a field lateral derived from C128.

Canal 128
Profile No.: No profile of this feature was drawn.
Map Reference: D1
Trench, Unit:
Canal Type: Secondary distribution
Cross-section Shape(s): Not observed
Parent canal: Unknown
Daughter canal(s): None observed
Stratigraphic Origin: 505/504.04?
Mapped Canal Length (m): 12

Comments: The distribution of several canals in the eastern part of Locus D (e.g., 128, 129, 133) suggests that they derive their water from the C33. When profiles of C33 were dug, however, it appears that canal has a stratigraphic origin in the 504.02/.01 interval, whereas 128, 129, and 133 are clearly associated with a 505/504.04 surface. This implies one of several things: 1) the age of C33 was misinterpreted [it is often difficult to distinguish between 504.02 and 504.04 in this particular area], 2) the actual originating stratum of C33 has been masked by later reconstruction/remodeling of that canal [I favor this one], or 3) there is a 505/504.04 canal system that underlies the C19 system which is so prominently displayed in Map D1. Although only a small part of the area beneath the C19 canal system was excavated we did find canals and fields related to a 504.04 surface. No distribution canals of a size that might have fed C128, 129, and 133 were observed, but it is entirely possible that portion of area D was simply not scraped. If an earlier distribution canal does lie within that area it would necessarily have been roughly paralleling C33 on the western side of that canal.

Canal 129

Profile No.: No profile of this feature was drawn.

Map Reference: D1
Trench, Unit: None
Canal Type: Field lateral?
Cross-section Shape(s): Not observed
Parent canal: Unknown (see comments below)
Daughter canal(s): None observed
Stratigraphic Origin: 505/504.04
Mapped Canal Length (m): 11

Comments: Several canals in the eastern part of Locus D (e.g., 128, 129, 133) have relationships with canal 33 that suggests that they derive their water from the canal. When profiles of C33 were dug, however, it appears that that canal has a stratigraphic origin in the 504.02/.01 interval, whereas 128, 129, and 133 are clearly associated with a 505/504.04 surface this implies one of several things: 1) the age of C33 was misinterpreted [it is difficult to distinguish between 504.02 and 504.04 in this particular area], 2) the actual originating stratum of C33 has been masked by later reconstruction/remodeling of that canal, or 3) there is a 505/504.04 canal system that underlies the 19 system which is so prominently displayed in Map D1. Although only a portion of the area beneath the C19 canal system was excavated we did find canals and fields related to a 504.04 surface. No distribution canals of a size that might have fed C128, 129, and 133 were observed, but it is entirely possible that that portion of area D was simply not scraped. If an earlier distribution canal does lie within that area it would have to have been roughly paralleling C33 on the western side of that canal.

Canal 130
Profile No.: No profile of this feature was drawn.
Map Reference: D1
Trench, Unit: None
Canal Type: Field lateral
Cross-section Shape(s): Not observed
Parent canal: C128?
Daughter canal(s): None observed
Stratigraphic Origin: 505/504.04
Mapped Canal Length (m): 10

Comments: No stratigraphic cross section of this canal was exposed. This canal appears to terminate in a field. No direct connection with C128 was observed in the field. The presumed parent/daughter relationship of C130 and 131 is based on relative lengths and orientation.

Canal 131
Profile No.: No profile of this feature was drawn.
Map Reference: D1
Trench, Unit: None
Canal Type: Field lateral
Cross-section Shape(s): Not observed
Parent canal: 128?
Daughter canal(s): None observed
Stratigraphic Origin: 505/504.04
Mapped Canal Length (m): 9

Comments: No direct connection with C128 was observed in the field. The presumed parent/daughter relationship of C130 and 131 is based on relative lengths and orientation.

Canal 132
Profile No.: 132.01

Map Reference: D1
Date Profiled: June 18, 2009
Trench, Unit: 1378
Canal type: Distribution
Cross-section Shape(s): 4
Parent canal: Unknown
Daughter canal(s): Unknown
Stratigraphic Origin: 505-504.04
Profile Datum (mbsd): No datum available
Profile Datum (masl): No datum available
Mapped Canal Length (m): 22
Banks Visible: Yes
Digouts Visible: Yes
~Max. Visible Width (m): 0.95
~Max. Visible Depth (m): 0.15
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): No datum available
Canal Bottom Elevation-Earliest Use (masl): No datum available
Fe/Mg Stains: None observed
Samples Taken: None

Comments: Scraping has removed virtually all of the canal, so there is little left to see, plus the stratigraphy is not obvious, so, all in all, this is not a good profile. The canal may start in Stratum 505, but I cannot be sure if this canal is profiled correctly, the digout on profile-right is deeper than the canal itself.

Canal 133
Profile No.: No profile of this feature was drawn.
Map Reference: D1
Trench, Unit: None
Canal Type: Distribution?
Cross-section Shape(s): Not observed
Parent canal: Unknown
Daughter canal(s): 134?
Stratigraphic Origin: 505/504.04
Mapped Canal Length (m): 19

Comments: Canal 133 appears to diverge from C33 (see below). The general orientation would suggest that this is a field lateral, however, its unusual length implies a larger canal, probably a distribution canal. The canal was not profiled, however, so no conclusive determination can be made as to the type of canal.

Several canals in the eastern part of Locus D (e.g., 128, 129, 133) have relationships with C33 that suggests that they derive their water from C33. When profiles of C33 were dug, however, it appears that that canal has a stratigraphic origin in the 504.02/.01 interval, whereas 128, 129, and 133 are clearly associated with a 505/504.04 surface this implies one of several things: 1) the age of C33 was misinterpreted [it is difficult to distinguish between 504.02 and 504.04 in this particular area], 2) the actual originating stratum of C33 has been masked by later reconstruction/remodeling of that canal, or 3) there is a 505/504.04 canal system that underlies the C19 system which is so prominently displayed in Map D1. Although only a portion of the area beneath the C19 canal system was excavated we did find canals and fields related to a 504.04 surface. No distribution canals of a size that might have fed C128, 129, and 133 were observed, but it is entirely possible that that portion of area D was simply not scraped. If an earlier distribution canal does lie within that area it would have to have been roughly paralleling C33 on the western side of that canal.

Canal 134
Profile No.: No profile of this feature was drawn.
Map Reference: D1
Trench, Unit: None
Canal Type: Secondary distribution?, field lateral
Cross-section Shape(s): Not observed
Parent canal: 133
Daughter canal(s): None
Stratigraphic Origin: 505/504.04
Mapped Canal Length (m): 6

Comments: See comments for C133.

Canal 135
Profile No.: No profile of this feature was drawn.
Map Reference: D1
Trench, Unit: 1312, 3438
Canal Type: Field lateral
Cross-section Shape(s): 3
Parent canal: 31
Daughter canal(s): None observed
Stratigraphic Origin: 505/504.04
Mapped Canal Length (m): 12

Comments: C135 parallels C136, and its distribution is shown at the northeastern edge of Map D - Fields 1 and 2, p. 1. The canal appears to originate with C36, although the actual connection was not clear. It is exposed on a scraped surface for total distance of about 12-15 m. Sediments in this portion of the site contain an unusual amount of clay throughout Stratum 504. This appears to be a product of irrigation in the area. In addition, there are a number of houses immediately to the north of this canal.

Canal 136
Profile No.: 136.01

Map Reference: D1
Date Profiled: July 17, 2009
Trench, Unit: 3437
Canal type: Field lateral?
Cross-section Shape(s): 3,4
Parent canal: 31
Daughter canal(s): None observed
Stratigraphic Origin: 504.04
Profile Datum (mbsd): -14.09
Profile Datum (masl): 667.27
Mapped Canal Length (m): 13
Banks Visible: No clear banks observed
Digouts Visible: No clear digouts observed
~Max. Visible Width (m): 1.15
~Max. Visible Depth (m): 0.20
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 667.25
Canal Bottom Elevation-Earliest Use (masl): 667.22
Fe/Mg Stains: None observed
Samples Taken: No

Comments: This canal was originally field-numbered D5; there may be Stratum 504.03 sediments in the profile. C136 parallels C135, and its distribution is shown at the northeastern edge of Map D - Fields 1 and 2, p. 1. The canal is exposed on a scraped surface for total distance of about 12-15 m.

Canal 137

Profile No.: No profile of this feature was drawn.

Map Reference: D1
Trench, Unit: 1422, 3439
Canal Type: Distribution?
Cross-section Shape(s): Not observed
Parent canal: 31?
Daughter canal(s): 138, 139
Stratigraphic Origin: 505/504.04
Mapped Canal Length (m): 29

Canal 138
Profile No.: No profile of this feature was drawn.
Map Reference: D1
Trench, Unit:
Canal Type:
Cross-section Shape(s):
Parent canal: Unknown
Daughter canal(s):
Stratigraphic Origin:
Mapped Canal Length (m): 16

Canal 139

Profile No.: No profile of this feature was drawn.

Map Reference: D1
Trench, Unit:
Canal Type:
Cross-section Shape(s):
Parent canal: Unknown
Daughter canal(s):
Stratigraphic Origin:
Mapped Canal Length (m): 7

Canal 140
Profile No.: 140.01

Map Reference: D1
Date Profiled: August 19, 2009
Trench, Unit: 5034
Canal Type: Field lateral?
Cross-section Shape(s): 4
Parent canal: Unknown
Daughter canal(s):
Stratigraphic Origin: 504.04
Profile Datum (mbsd): -14.03
Profile Datum (masl): 667.33
Mapped Canal Length (m): 16
Banks Visible: Yes
Digouts Visible: ?
~Max. Visible Width (m): 1.05
~Max. Visible Depth (m): 0.20-0.25
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 667.29
Canal Bottom Elevation-Earliest Use (masl): 667.18
Fe/Mg Stains: Y, B, S
Samples Taken: None
Field Notes X-refs: Page 267, 278

Comments: This profile was originally given the temporary field designation D26; the area of the profile is severely disturbed by root activity. (Page 278) The canal cuts a house (Feature 14373) in the northernmost stripping area in Locus D.

Canal 141 (NOT A CANAL – NUMBER ABANDONED)

Comments: This canal was erroneously identified on a scraping surface, but upon further observation was shown not to be a canal.

Canal 142
Profile No.: 142.01

Map Reference: D2
Date Profiled: August 10, 2009
Trench, Unit: 3305
Canal Type: ?
Cross-section Shape(s): 3,4
Parent canal: Unknown
Daughter canal(s): None observed
Stratigraphic Origin: 504.04
Profile Datum (mbsd): -13.43
Profile Datum (masl): 667.93
Mapped Canal Length (m): 13
Banks Visible: Yes
Digouts Visible: Very poorly visible, but not enough to characterize.
~Max. Visible Width (m): 1.00-1.10
~Max. Visible Depth (m): 0.16
Number of Iterations Detected: 2?
~Ground Elevation at Inception (masl): 667.76
Canal Bottom Elevation-Earliest Use (masl): 667.72
Canal Bottom Elevation-2nd Iteration (masl): 667.78
Fe/Mg Stains: None observed
Samples Taken: None
Field Notes X-refs: Page 265

Comments: This profile was originally given the temporary field designation D20. C142 is exposed in two units, 3305 (142.01) and 3308. In Unit 3308 only the very bottom of the canal is present, where it is ~40cm wide and ~8-10cm deep. No profile was drawn in 3308.

Canal 143
Profile #: 143.01

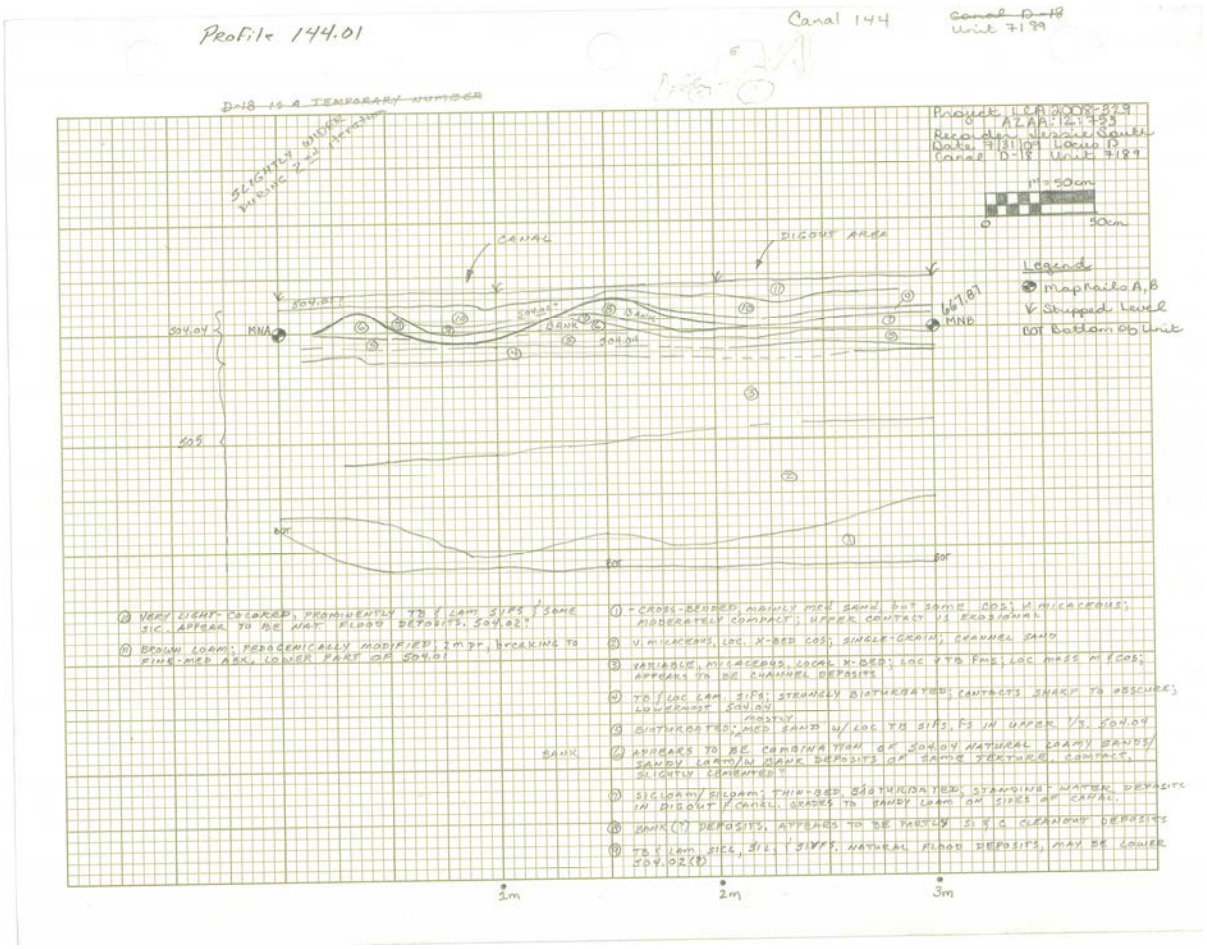
Map Reference: D2
Date Profiled: August 10, 2009
Trench, Unit: 33.06
Canal Type: Field lateral
Cross-section Shape(s): 3
Parent canal: Unknown
Daughter canal(s): None observed
Stratigraphic Origin: 504.04
Profile Datum (mbsd): -13.67
Profile Datum (masl): 667.69
Mapped Canal Length (m): 10
Banks Visible: Yes
Digouts Visible: No
~Max. Visible Width (m): 0.90
~Max. Visible Depth (m): 0.15
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 667.69
Canal Bottom Elevation-Earliest Use (masl): 667.67

Comments: This profile was originally given a temporary field designation D21; there appeared to be two clean-out events, but they show rather poorly on the profile.

Profile No.: 144.01

Map Reference: D2
Date Profiled: July 31, 2009
Trench, Unit: 7189
Cross-section Shape(s): 3,4
Canal Type: D?
Parent canal: Unknown
Daughter canal(s): None observed
Stratigraphic Origin: U504.04-.02
Profile Datum (mbsd): -13.49
Profile Datum (masl): 667.87
Mapped Canal Length (m): 18
Banks Visible: Yes
Digouts Visible: Yes?
~Max. Visible Width (m): 1.15
~Max. Visible Depth (m): 0.20
Number of Iterations Detected: 2+
~Ground Elevation at Inception (masl): 667.85
Canal Bottom Elevation-Earliest Use (masl): 667.80
Canal Bottom Elevation-2nd Iteration (masl): 667.80
Fe/Mg Stains: None observed
Samples Taken: None

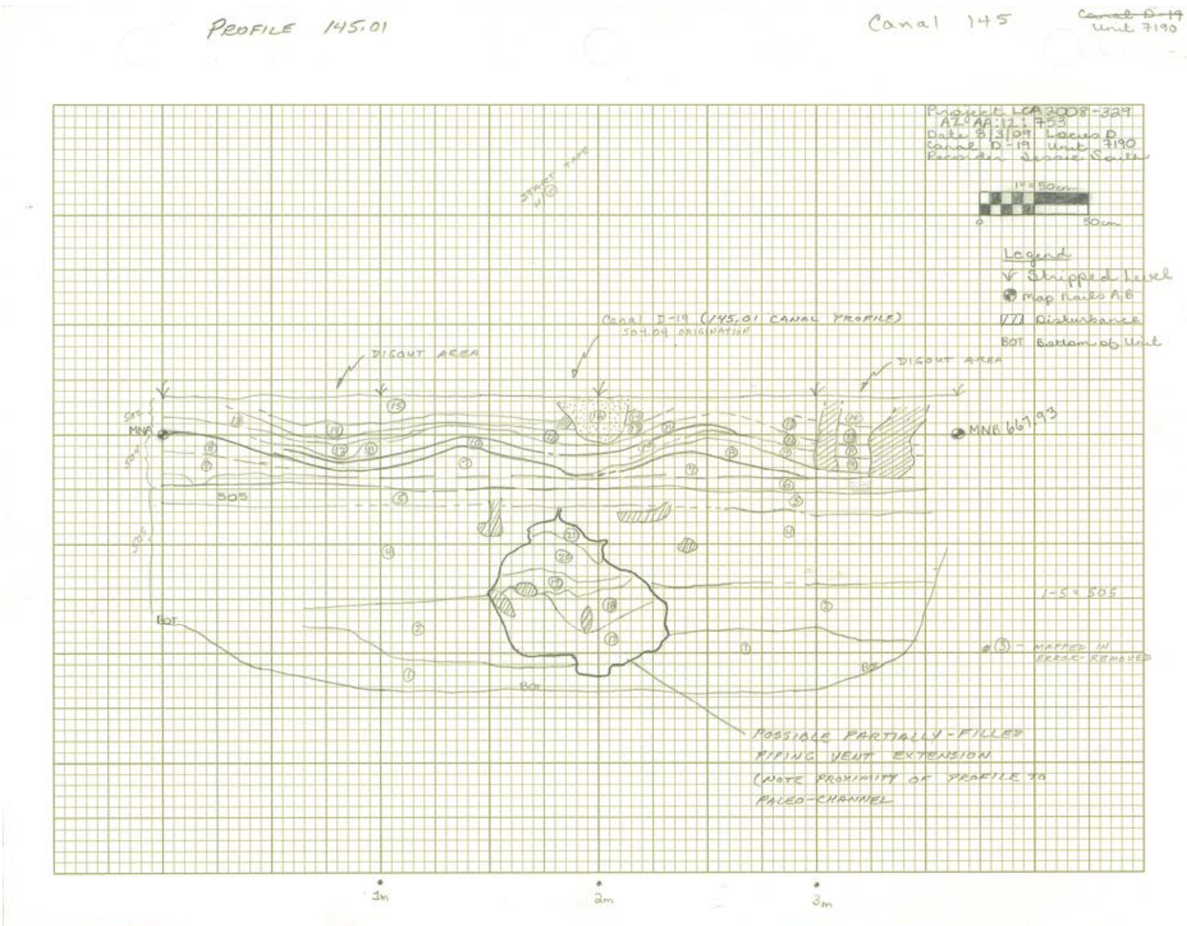
Comments: Good profile, good banks and digout areas, suitable for illustration. Canal during 2nd iteration was slightly wider than in 1st. Originally given temporary field designation D18.


Profile 144.01
Canal 144
Unit 7199
D-18 IS A TEMPORARY NUMBER
SLIGHTLY WAVY PROFILE
Project: LCA 2005-879
AZAA:12:111
Recorded by: Wilcox/Soulé
Date: 7/31/07 Locus 19
Canal D-18 Unit 7189
1m=50cm
0
50cm
CANAL
DIGOUT AREA
Legend
Mapnarks A, B
V Stripped Level
EOT Bottom of Unit
504.87
504.84
BANK
66787
MNA
504.04
505
EOT
1m
2m
3m
② VERY LIGHT-COLORED; PROMINENTLY TO F LAM SI/FS † SOME SIC. APPEAR TO BE WAT. FLOOD DEPOSITS, 504.02†
⑩ BROWN LOAM; PEDOGENICALLY MODIFIED; 2M DP, BRCKING TO FINE-MED ABK, LOWER PART OF 504.01
① - CROSS-BEDDED, MAINLY MCF SAND, BUT SOME COS; V MICACEOUS; MODERATELY COMPACT; UPPER CONTACT IS EROSIONAL
② V MICACEOUS, LOC. X-BED COS; SINGLE-GRAIN; CHANNEL SAND
③ VARIABLE, MICACEOUS, LOCAL X-BED; LOC VFS TO FMS; LOC MASS MFGOS; APPEARS TO BE CHANNEL DEPOSITS
④ TO F LOC LAM. SI/FS; STRONGLY BIOTURBATED; CONTACTS SHARP TO OBSCURE; LOWERMOST 504.04
⑤ BIOTURBATED; MCD SAND W/ LOC VFS SI/FS, FS IN UPPER 1/2, 504.04 MOSTLY
⑥ APPEARS TO BE REMAINS OF 504.04 NATURAL LEVEE SANDS/ SANDY LOAM IN BANK DEPOSITS OF SAME TEXTURE, CONTACTS SLIGHTLY CEMENTED
BANK
⑦ SICLOAM/SICLAM; THIN-BED BIOTURBATED; STANDING-WATER DEPOSITS IN DIGOUT F CANAL; GRADES TO SANDY LOAM ON SIDES OF CANAL
⑧ BANK (?) DEPOSITS; APPEARS TO BE MAINLY S I & C CLEANOUT DEPOSITS
⑨ TO F LOM. SICL, SI/L; † SI/FS, NATURAL FLOOD DEPOSITS, MAY BE COLDER 504.02(?)

Canal 145
Profile No.: 145.01

Map Reference: D1
Date Profiled:
Trench, Unit: 7190
Canal Type: Distribution?
Cross-section Shape(s): 3,4
Parent canal: Unknown
Daughter canal(s): None recognized
Stratigraphic Origin: 504.04?
Profile Datum (mbsd): -13.43
Profile Datum (masl): 667.93
Mapped Canal Length (m):
Banks Visible: Yes
Digouts Visible: Yes (excellent)
~Max. Visible Width (m): 1.00-1.15
~Max. Visible Depth (m): 0.15
Number of Iterations Detected: 2
~Ground Elevation at Inception (masl): 667.81
Canal Bottom Elevation-Earliest Use (masl): 667.76
Canal Bottom Elevation-2nd Iteration (masl): 667.86
Fe/Mg Stains Present: None
Samples Taken: None

Comments: This small canal was originally given a temporary field designation of D19. Based on its dimensions and directional trend, this canal was probably a field lateral. It appears to have originated relatively early in the 504 Stratum, probably in the U504.04. There may be two or more iterations of use, although I cannot be sure. This is an excellent profile of a small canal that shows a number of features worth remarking on. In the digout area on profile-right is an area of disturbance that probably reflects tree growth during or shortly after the time of use. The profile displays clear canal banks that appear to have been overtopped by one or more floods. Although there appear to be several iterations of use, I cannot conclusively identify clean-out deposits in the bank areas. One of the most remarkable aspects of this profile is the presence of what I have interpreted as a filled piping lateral channel directly beneath C145. It should be noted that there are conclusive large piping vents nearby whose origin may be related to prehistoric irrigation of fields in this area.


PROFILE 145.01
Canal 145
Canal D-19
Unit 7190
Legend
Stripped Level
Map Nails A, B
Disturbance
BOT Bottom of Unit
Canal D-19 (145.01 CANAL PROFILE)
DIGOUT AREA
DIGOUT AREA
MNB 667.93
505
BOT
POSSIBLE PARTIALLY-FILLED
PIPING VENT EXTENSION
(NOTE PROXIMITY OF PROFILE TO
PALEO-CHANNEL
1m
2m
3m

Canal 146 (NOT A CANAL – NUMBER ABANDONED)
Profile No.: No profile drawn
Map Reference: Originally defined in Locus F
Field Notes X-refs: Page 267

Comments: This canal was originally defined on the scraped surface, but upon further investigation was shown not to be canal.

Canal 147
Profile No.: No profile of this feature was drawn.
Map Reference: Map F - Fields 4
Trench, Unit: Trench 235
Canal Type: Field lateral
Cross-section Shape(s): Not observed
Parent canal: Unknown
Daughter canal(s): None observed
Stratigraphic Origin: L505
Mapped Canal Length (m): 18
Samples Taken: None
Field Notes X-refs: Page 267

Comments: An exposure was cleaned along the alignment of the original T235 to show C147 in Locus F. Based on the association with adjacent fields this very small canal was classed as a field lateral. The "canal" showed up faintly on the scraped lower 505 surface, but despite multiple attempts, I could not see enough to profile. A stratigraphic profile was drawn instead to document the relatively thin Stratum 505 in this location. Rather than assigning a new unit number, I called the new stratigraphic profile 235.07. This will be a rather short profile because the original T235 sidewall has partially collapsed in this location.

Canal 148
Profile No.: No profile of this feature was drawn.
Map Reference: Map F - Fields 4
Trench, Unit: None
Canal Type: Field lateral?
Cross-section Shape(s): Not observed
Parent canal: Unknown
Daughter canal(s): None observed
Stratigraphic Origin: L505

Comments: C148 is shown in the western corner of Map F - Fields 4. The canal has an east-west trend and parallels C155 and 154.

Canal 149
Profile No.: No profile of this feature was drawn.
Map Reference: D1
Trench, Unit: None
Canal Type: Secondary distribution
Cross-section Shape(s): Not observed
Parent canal: 122
Daughter canal(s): None
Stratigraphic Origin: 504.02/.01
Mapped Canal Length (m): 11 (check this)

Comments: See comments for C49.

Canal 150
Profile No.: No profile of this feature was drawn.
Map Reference: D1
Trench, Unit: None
Canal Type: Secondary distribution
Cross-section Shape(s): Not observed
Parent canal: 122
Daughter canal(s): None
Stratigraphic Origin: 504.02/.01
Mapped Canal Length (m): 9

Comments: See comments for C49.

Canal 151
Profile No.: No profile of this feature was drawn.
Map Reference: D1
Trench, Unit: None
Canal Type: Secondary distribution
Cross-section Shape(s): Not observed
Parent canal: 123
Daughter canal(s): None
Stratigraphic Origin: 504.02/.01
Mapped Canal Length (m): 8

Comments: See comments for C49.

Canal 152
Profile No.: No profile of this feature was drawn.
Map Reference: D1
Date Profiled:
Trench, Unit:
Canal Type:
Cross-section Shape(s):
Parent canal: Unknown
Daughter canal(s):
Stratigraphic Origin:
Mapped Canal Length (m): 8

Comments: Canal is a 504.02/.01 feature in Locus D. See notes for C153, which appears to underlie C152.

Canal 152

Profile No.: 152.01 (this canal was originally thought to be part of 36, but with additional work was shown to be a separate entity. The canal profile 36.02 was subsequently renumbered as profile 152.01. This correction is shown on the profile drawing.

Map Reference: D2
Date Profiled: March 20, 2009
Trench, Unit: 1382
Canal Type: Distribution?
Cross-section Shape(s): 4
Parent canal: 21
Daughter canal(s): None observed
Stratigraphic Origin: 504.02-.01
Profile Datum (mbsd): -13.17
Profile Datum (masl): 668.19
Mapped Canal Length (m): 8
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): 1.40
~Max. Visible Depth (m): 0.30-0.35
Number of Iterations Detected:
~Ground Elevation at Inception (masl): 668.29?
Canal Bottom Elevation-Earliest Use (masl): 667.96
Fe/Mn Present (Y/N): None observed
    Relation To Canal Fill (In, Below): –
    Amount (Slight, Moderate, Heavy): --
    Description: --
Features Intruded by Canal: None
Features Intruding Canal: None
Samples Taken: None

Comments: C152 is discontinuously exposed in the west central portion of Locus D. The source for the canal is unknown. Note that C152 appears to pass beneath C153. No daughter canals were observed in this area.

Canal 153

Profile No.: 153.01
Map Reference: D1
Date Profiled: July 20, 2009
Trench, Unit: 3433
Canal Type: Distribution?
Cross-section Shape(s): 4
Parent canal: 21
Daughter canal(s):
Stratigraphic Origin: 504.04/.02
Profile Datum (mbsd): -13.74
Profile Datum (masl): 667.62
Mapped Canal Length (m): 47?
Banks Visible: Yes (poorly)
Digouts Visible: ?
~Max. Visible Width (m): 0.80
~Max. Visible Depth (m): 0.10
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 667.67
Canal Bottom Elevation-Earliest Use (masl): 667.67
Fe/Mg Stains: None observed
Samples Taken: None

Comments: This profile was originally recorded as D1. A significant portion of the canal has been removed by scraping. The orientation of the canal and its relationship to C21 would suggest that it might be a field lateral; its length, however, suggests that it is more likely a (rather unusual) distribution canal. Note cross-cutting relationships with several other canals that pre- and post-date C153.

Canal 153
Profile No.: 153.02

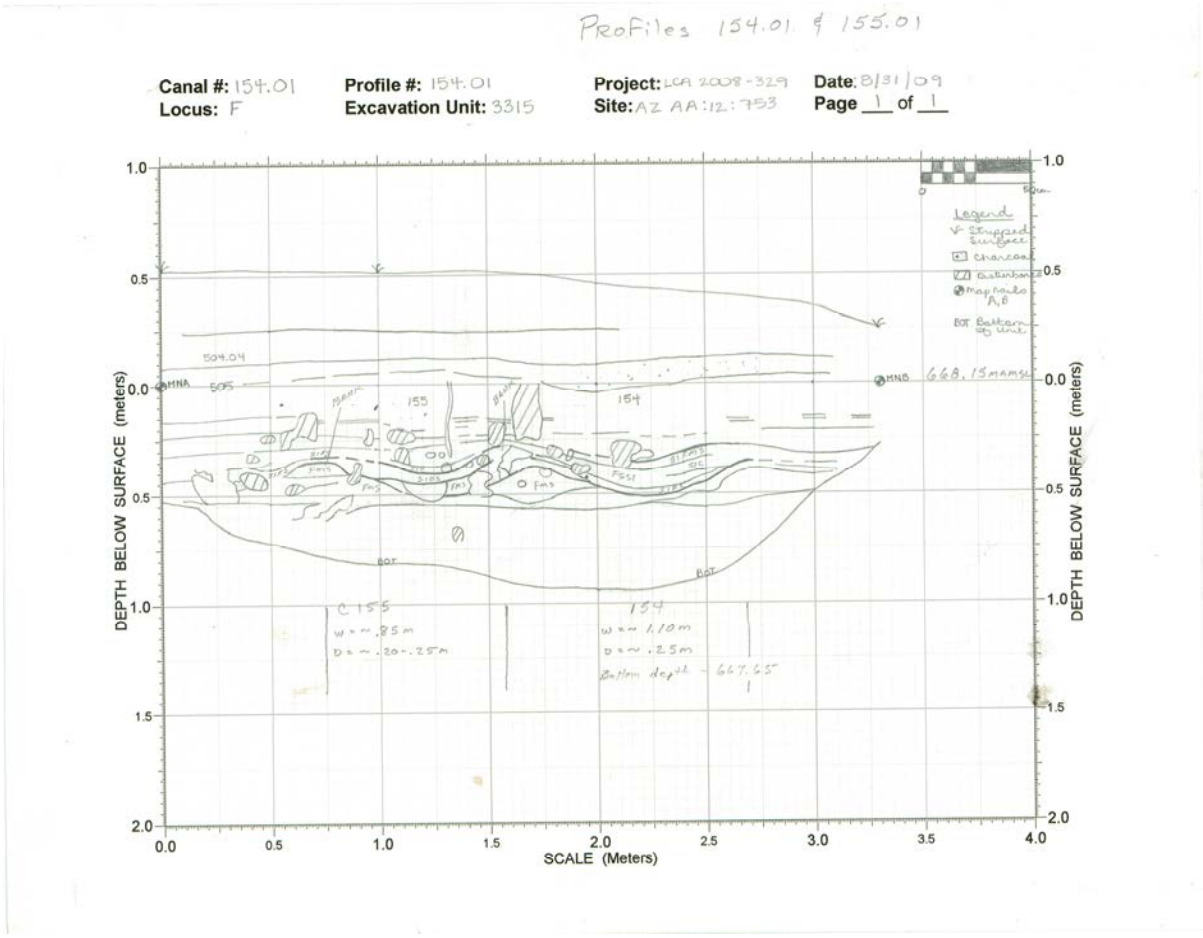
Map Reference: D1
Date Profiled: July 20, 2009
Trench, Unit: 3434
Canal Type: Distribution?
Cross-section Shape(s):
Parent Canal: 21
Daughter Canal(s):
Stratigraphic Origin: 504.04/.02
Profile Datum (mbsd): -13.65
Profile Datum (masl): 667.71
Mapped Canal Length (m): 47?
Banks Visible: No
Digouts Visible: No
~Max. Visible Width (m): 0.50
~Max. Visible Depth (m): 0.70-0.10
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 667.71
Canal Bottom Elevation-Earliest Use (masl): 667.61
Fe/Mg Stains: None observed
Samples Taken: None taken

Comments: Originally recorded as D2. This is not a good profile. A significant portion of the canal has been removed by scraping; see maps for crosscutting relationships between C36, 152, and 153. Map F - Fields 4

Canal 154
Profile No.: 154.01

Map Reference: Map F - Fields 4
Date Profiled: August 31, 2009
Trench, Unit: 3315
Canal Type: Field lateral
Cross-section Shape(s): 4
Parent canal: Unknown
Daughter canal(s): None observed
Stratigraphic Origin: L505
Profile Datum (mbsd): -13.21
Profile Datum (masl): 668.15
Mapped Canal Length: 4
Banks Visible: Yes
Digouts Visible: No
~Max. Visible Width (m): 1.00
~Max. Visible Depth (m): 0.10
Number of Iterations Detected: 2?
~Ground Elevation at Inception (masl): 667.77
Canal Bottom Elevation-Earliest Use (masl): 667.64
Canal Bottom Elevation-2nd Iteration (masl): 667.80 (Second iteration is open to question)
Fe/Mg Stains Present: None observed
Samples Taken: None
Field Notes X-refs: Page 266, 267

Comments: Profile 154.01 is drawn on the same profile as 155.01, and both canals are shown in the northernmost corner of Map F - Fields 4. The two canals have a trend perpendicular to C156 (immediately south of C154 and C147. The canals parallel the trend of C148. These two small field-lateral size canals are side-by-side in this profile, suggesting that one could be a digout. C154 and 155 appear to converge within 5-10m upcanal (east) of the profile, however, and diverge a short distance away in the opposite direction. In addition, they seem to have a slightly different use-history. C154 and 155 both have good banks and appear to have been cleaned at least once. Both originate in the lower Stratum 505 deposits. C154 may slightly pre-date C155. These are excellent profiles, possibly use for illustrations.


Profiles 154.01 & 155.01
Canal #: 154.01
Locus: F
Profile #: 154.01
Excavation Unit: 3315
Project: LCA 2008-329
Site: AZ AA:12:753
Date: 8/31/09
Page 1 of 1
DEPTH BELOW SURFACE (meters)
SCALE (Meters)
Legend
MNA
MNB
668.15 mamsl
155
154
C155
w = ~.85m
D = ~.20-.25m
154
w = ~1.10m
D = ~.25m
Bottom depth - 667.65

Canal 155
Profile No.: 155.01 (on same profile with Profile 154.01)
Map Reference: Map F - Fields 4
Date Profiled: August 31, 2009
Trench, Unit: 3315
Canal Type: Field lateral
Cross-section Shape(s): 4
Parent canal: Unknown
Daughter canal(s):
Stratigraphic Origin: L505
Profile Datum (mbsd): -13.21
Profile Datum (masl): 668.15
Mapped Canal Length (m): 2
Banks Visible: Yes
Digouts Visible: No
~Max. Visible Width (m): 0.70-0.80
~Max. Visible Depth (m): 0.15
Number of Iterations Detected: 2?
~Ground Elevation at Inception (masl): 667.77
Canal Bottom Elevation-Earliest Use (masl): 667.65
Canal Bottom Elevation-2nd Iteration (masl): 667.75
Fe/Mg Stains: None observed
Samples Taken: None
Field Notes X-refs: Page 266, 267

Comments: Profile 155.01 is drawn on the same profile as 154.01, and both canals are shown in the northernmost corner of Map F - Fields 4. The two canals have a trend perpendicular to C156 (immediately south of C154 and C147. The canals parallel the trend of C148. These two small field-lateral size canals are side-by-side in this profile, suggesting that one could be a digout. C154 and 155 appear to converge within 5-10m upcanal (east) of the profile, however, and diverge a short distance away in the opposite direction. In addition, they seem to have a slightly different use-history. C154 and 155 both have good banks and appear to have been cleaned at least once. Both originate in the lower Stratum 505 deposits. C154 may slightly pre-date C155. (See sketch Page 266) These are excellent profiles.

Canal 156
Profile No.: No profile of this feature was drawn.
Map Reference: Map F - Fields 4
Trench, Unit: None
Canal Type: Field lateral
Cross-section Shape(s): Not observed
Parent canal: Unknown Unknown
Daughter canal(s): None observed
Stratigraphic Origin: L505
Mapped Canal Length (m): 6
Field Notes X-refs: Page 266, 267

Comments: C156 is shown near the northern corner of Map F - Fields 4, less than 5 m south of C154 and C155. The trend of the canal is almost due north-south, and it is discontinuously exposed for a distance of about 15-20 m. Based on the pattern of associated fields, this canal is classed as a field lateral. I cannot physically determine the stratigraphic relationships of C156 with any other canals. It appears to be widening just south of C154, and I think that it probably originates from another canal further south rather than from C154, but I cannot say for sure.

Canal 157
Profile No.: 157.01

Map Reference: D2
Date Profiled: ND
Trench, Unit: 3307
Canal Type: Field lateral
Cross-section Shape(s): 3,4
Parent canal: Unknown
Daughter canal(s):
Stratigraphic Origin: 504.04
Profile Datum (mbsd): 13.83
Profile Datum (masl): 667.53
Mapped Canal Length:
Banks Visible: Yes
Digouts Visible: Yes
~Max. Visible Width (m): 1.20
~Max. Visible Depth (m): 0.20-0.25
Number of Iterations Detected: 2
~Ground Elevation at Inception (masl): 667.23 (ground surface for second iteration approximately 667.50?
Canal Bottom Elevation-Earliest Use (masl): 667.23
Canal Bottom Elevation-2nd Iteration (masl): 667.26
Fe/Mg Stains: None observed
Samples Taken: None

Comments: There are two canals numbered 36 were originally shown on Map D2; the easternmost of these should be numbered C157. Map numbers have been corrected. The two canals are in very close proximity and have approximately the same trend. C157 appears to be a small distribution or field lateral canal that originates in the lower part of Stratum 504.04. The profile is exceptional and should be used in discussions of canal characteristics. This canal was originally given a temporary field designation of D22. When mapped, the field crew erroneously correlated D22 with C36; this has been corrected to C157. The originating canal is unknown.

Profile 157.01: The canal was exposed in Units 3307 and 1385. This profile was originally given a temporary field designation of D22. The canal is relatively small, with a maximum width of about 1.20m, a depth of about 0.20-0.25m, and a bottom elevation of 666.60masl. The canal is somewhat deeper than most field laterals, hence the possibility that it may be a secondary distribution canal. Regardless of function, this is an excellent profile that clearly shows banks. There is a possibility that the profile represents two discrete iterations, although the lowermost banks(?) are not as clearly distinguishable as I would like.

Canal 158

Profile No.: 158.01 (Profile 158.01 is shown on Profile 84.01)

Map Reference: B4 (Course of canal is not shown on maps, only the locations of profiles)
Date Profiled: May 20, 2009
Trench, Unit: 2253
Canal Type: Field lateral
Cross-section Shape(s): 3
Parent canal: Unknown
Daughter canal(s): 108?
Stratigraphic Origin: 506.01
Profile Datum (mbsd): -12.83
Profile Datum (masl): 668.53
Mapped Canal Length (m): Unknown, course of canal not shown on maps.
Banks Visible: Yes
Digouts Visible: ?
~Max. Visible Width (m): 1.10
~Max. Visible Depth (m): 0.31
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 666.91
Canal Bottom Elevation-Earliest Use (masl): 666.60
Fe/Mg Stains: None observed
Samples Taken: None

Comments: Although C158 extends across the width of Locus B, the canal path is not shown on the maps for some reason. Two profiles were drawn, one on either side of Locus B. The canal originates in Stratum 506.01. The canal is intruded by a pit that appears to have been dug relatively soon after canal abandonment (get feature number and see if carbon samples were collected). Charcoal from the pit should be collected and dated to provide a minimum date for the canal. This canal appears to be contemporaneous with nearby C159.

Canal Profile 158.01is exposed low in the WOK, and is shown with profile 84.01. Dimensions are similar to those seen in 158.02, although the canal is truncated by a pit on profile right. Maximum visible width is ~1.10m, although the canal was slightly wider. Maximum visible depth is about 0.31m, and the canal bottom lies at 666.60masl.

I did not recognize clear evidence of multiple discrete episodes of use at this particular location, e.g., multiple banks, clean-outs, etc.

Canal 158
Profile No.: 158.02

Map Reference: B4 (course of canal is not shown on maps, only locations of profiles)
Date Profiled: September 25, 2009
Trench, Unit: Wall
Canal Type: Field lateral
Cross-section Shape(s): 3
Parent canal: Unknown
Daughter canal(s): 108?
Stratigraphic Origin: 506.01
Profile Datum (mbsd): -12.84
Profile Datum (masl): 666.88
Mapped Canal Length: Unknown, course of canal not shown on maps.
Banks Visible: Yes?
Digouts Visible: No
~Max. Visible Width (m): 1.10
~Max. Visible Depth (m): 0.30
Number of Iterations Detected: 2
~Ground Elevation at Inception (masl): 666.76
Canal Bottom Elevation-Earliest Use (masl): 666.47
Canal Bottom Elevation-2nd Iteration (masl): 666.59?
Fe/Mg Stains: None observed
Samples Taken: 2 radiocarbon samples
Field Notes X-refs: Page 275, 277

Comments: Profile 158.02 is exposed on the northwestern wall of Locus B, and was drawn on 9/25/'09 (page 277). The profile shows a rather small canal having a maximum visible width of perhaps 1.10m, and the maximum depth at any given time was probably no more than about 0.20m, although the total visible depth is ~30 cm. There appear to be 2 discrete episodes of use, although the evidence is less than conclusive. Thickening of deposits was observed in areas where banks should be, but bank deposits *per se* could not be distinguished. My intention is to collect two 14C samples, one from the lower banks and one from late in the canal use history. Pit 9298 slightly predates the lower carbon-14 sample (see samples from pit). (Pit 9298 elevations- top: -14.71mbd, bottom: -15.15mbd.) The canal is a 506.01 canal, and appears to be contemporaneous with C159.

Canal 159
Profile No.: 159.01

Map Reference: B4 (Course of canal is not shown on maps, only location of profile)
Date Profiled: September 18, 2009
Trench, Unit: 7735
Canal Type: Distribution? (This assertion is based on the apparent depth of the canal and the coarse sand sediments in the base of canal-use deposits)
Cross-section Shape(s): 3,4
Parent Canal: 3?
Daughter Canal(s): 176?
Stratigraphic Origin: 506.01
Profile Datum (mbsd): -14.31
Profile Datum (masl): 667.05
Mapped Canal Length: Unknown, course of canal not shown on maps. Exposed only in wall profile.
Banks Visible: Yes
Digouts Visible: Yes?
~Max. Visible Width (m): 1.75
~Max. Visible Depth (m): 0.35
Number of Iterations Detected: 1?
~Ground Elevation at Inception (masl): ~666.47
Canal Bottom Elevation-Earliest Use (masl): 666.32
Fe/Mg Stains: None observed
Samples Taken: None
Field Notes X-refs: Page 274, 275

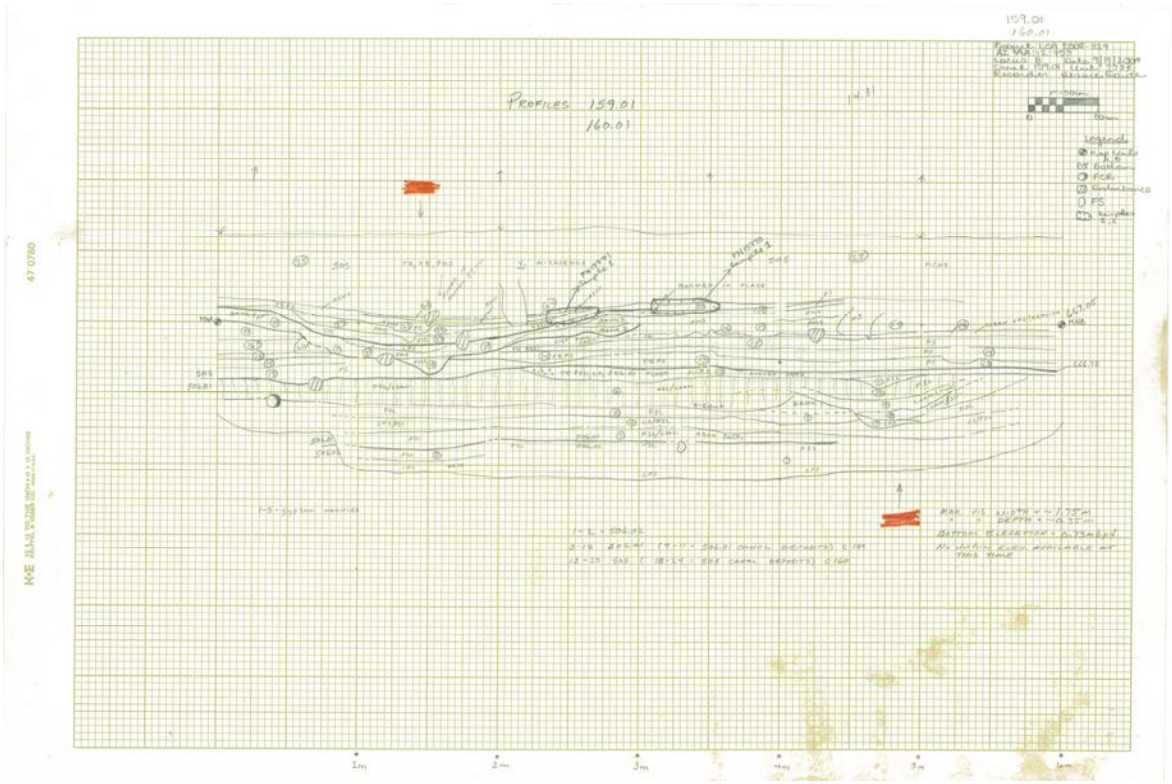
Comments: The path of C159 is not shown on site maps; this is an excellent profile (what is excavation unit 2224?)

C159 is exposed in Units 7735 and 7736. Profile 159.01 was exposed in Unit 7735 and drawn on 9/18/09.

Canal profiles 159 and 160 are on the same profile on the northwestern wall of Locus B. C159 clearly originates in Stratum 506.01, and the boundary with Stratum 505 above is quite clear. The upper part of 506 has been slightly modified by pedogenesis(?), and this has also slightly modified the upper part of the canal fill. The course of C159 is not shown on the maps. C159 starts near the top of 506.01, and, as such, is the oldest yet discovered at Las Capas. Sediments in the canal are dark and loamy with the exception of a lens of very coarse sand at the very bottom of the canal. Where the sands are not present, canal edges are difficult to define. Sediments adjacent to and below the canal contain relatively abundant gypsum nodules and root fillings. As mentioned elsewhere, I think that this may indicate that the watertable was above the sediments at some time after their deposition. This supposition may be supported by the fact that most features in the lower 506.01 and 506.02 tend to have indistinct edges and are hard to define.

The exposure in unit 7735 reveals a relatively small canal approximately 1.75m wide, 0.35 m deep, and the canal bottom is 0.73m below profile datum. No profile datum elevation was

available at the time of this writing. A bank is visible on profile left, along with a shallow depression that may be a digout feature. The bank is characterized by variable texture, occasional blocks of different texture, and a lack of internal bedding. The earliest canal-use sediments are coarse sand, but most other sediments in the canal are relatively fine-grained. Unit 9, a loamy mud, may represent the last use of the canal, although a depression still remained after its deposition. I did not recognize clear evidence of multiple discrete episodes of use, multiple banks, clean-outs, etc.



Canal 159
Profile No.: 159.02

Map Reference: B4 (Course of canal is not shown on maps, only location of profile)
Date Profiled: September 21, 2009
Trench, Unit: 7736
Canal Type: Field lateral?
Cross-section Shape(s): 3
Parent canal: 3?
Daughter canal(s): 176?
Stratigraphic Origin: 506.01
Profile Datum (mbsd): -14.90
Profile Datum (masl): 666.46
Mapped Canal Length (m): Unknown, course of canal not shown on maps. Exposed only in wall profile.
Banks Visible: Yes
Digouts Visible: No
~Max. Visible Width (m): >1.00
~Max. Visible Depth (m): 0.25-0.30
Number of Iterations Detected: 1
~Ground Elevation at Inception (masl): 666.56
Canal Bottom Elevation-Earliest Use (masl): 666.30
Canal Bottom Elevation-2nd Iteration (masl):
Canal Bottom Elevation-3rd Iteration (masl):
Canal Bottom Elevation-4th Iteration (masl):
Fe/Mg Stains Present: None observed
Samples Taken: None
Field Notes X-refs: September 21, 2009, page 275

Comments: Profile 159.02 shows a small feature that appears to be of field lateral-size (note different interpretation in Profile 159.01). Although two profiles were drawn for C159, for some reason the path of this canal is not shown on site maps. Profile (159.02) is not a very good one. The canal edges are indistinct, and canal-use sediments are difficult to distinguish except for a lens of coarse sand at the bottom. The lowest canal-use sediments are coarse sand, and sediments above consist primarily of poorly-bedded fine- medium-sands and silty sands. I did not recognize clear evidence of multiple discrete episodes of use, multiple banks, clean-outs, etc. in this profile. The profile was partially truncated on profile-right by excavation prior to description, but has a maximum width >1.0m, maximum depth of ~0.25-0.30m. The canal was cut at an oblique angle in this excavation unit, so width measurements are inaccurate. The profile was drawn mainly to get a bottom elevation in the canal, which lies at an elevation of 666.30m masl.

Canal 160
Profile No.: 160.01 (See profile 159.01)

Map Reference: B4 (course of canal is not shown on maps)
Date Profiled: September 18, 2009
Trench, Unit: 7735
Canal Type: ?
Cross-section Shape(s): 4
Parent Canal: Unknown
Daughter Canal(s): None observed
Stratigraphic Origin: L505
Profile Datum (mbsd): -14.31
Profile Datum (masl): 667.05
Mapped Canal Length (m): Unknown, course of canal not shown on maps. Exposed only in wall profile.
Banks Visible: Yes
Digouts Visible: No
~Max. Visible Width (m): 2.50
~Max. Visible Depth (m): 0.44
Number of Iterations Detected: 4?
~Ground Elevation at Inception (masl): 666.82
Canal Bottom Elevation-Earliest Use (masl): 666.68
Canal Bottom Elevation-2nd Iteration (masl): 666.90
Fe/Mg Stains: None observed
Samples Taken: ^{14}C samples collected (2), FN 13770 and FN 13771
Field Notes X-refs: Page 274

Comments: The path of C160 is not shown on site maps. This is one of the best examples of canal maintenance by burning that I have yet seen at Las Capas. C160 is exposed on the same profile as 159.01 but is stratigraphically higher, originating in the lower 505. The profile is drawn on the same profile as Profile 159.01. I believe that this canal was probably fed by C3, although that canal appears to have started somewhat earlier. C160 is well-defined, appears to have very low banks, and contains a charcoal-rich bed that was burned in place. The canal in this profile is cut at a very oblique angle and appears much wider than it actually is.

At the point of Profile 160.01, the canal has a somewhat broader width than most canals of its size, ~2.5m (note above). Maximum visible functional depth is approximately 0.44m, and the canal bottom lies 0.37m below profile datum.

This is an exceptional profile for several reasons. There appear to be at least 4 discrete episodes of clean-out and use, represented by clearly distinguishable generations of banks. Bank 4 (see profile) appears to be related to the maximum canal depth. Original construction depth appears to have been ~0.30m (bank top to canal bottom). In addition, there is clear evidence of burning within the canal that may be related to canal maintenance. Two 14C samples were collected from one such deposit, FN #s 13770 and 13771.

Canal 161
Profile No.: No profile of this feature was drawn.
Map Reference: A2
Trench, Unit:
Canal Type: Field lateral
Cross-section Shape(s):
Parent canal: 71
Daughter canal(s): None observed
Stratigraphic Origin: 504.04
Mapped Canal Length (m): 7
Samples Taken: None

Comments: A short exposure of this canal (approximately 6 m) is shown on Map A - Fields 2, page 1. The canal branches from C71, which was arbitrarily designated as the parent canal.

Canal 162 (THIS IS NOT A CANAL – THIS NUMBER IS AVAILABLE FOR OTHER FEATURES)
Profile No.: No profile was drawn

Comments: This feature was tentatively identified as a canal on a scraped surface. Further investigation showed this not be the case.

Canal 163
Profile No.: No profile of this feature was drawn.
Map Reference: A2
Trench, Unit:
Canal Type: Field lateral
Cross-section Shape(s):
Parent Canal: 68
Daughter Canal(s): None observed
Stratigraphic Origin: U504.04
Mapped Canal Length (m): 6

Comments: C1 63 is a northward-trending canal that branches from C68 near the western edge of Map A - Fields 2, page 1.

Canal 164
Profile No.: No profile of this feature was drawn.
Map Reference: A3
Trench, Unit: None
Canal Type: Field lateral
Cross-section Shape(s):
Parent canal: Unknown
Daughter canal(s): None
Stratigraphic Origin: L504.04
Mapped Canal Length (m): 9

Comments: This east-west trending canal appears to be a field lateral derived from an unknown parent canal. The canal is exposed for a distance of only 8-10 m. The pattern of canal termination in a field cell is widely observed in the canals and fields of the site, and is perhaps worthy of illustration.

Canal 165 (Originally designated as C74, then reassigned as C165)
Profile No.: No profile of this feature was drawn.
Map Reference: A3
Trench, Unit: N/A
Canal Type: Distribution? Field lateral?
Cross-section Shape(s):
Parent canal: Unknown
Daughter canal(s): Unknown
Stratigraphic Origin: L504.04
Mapped Canal Length (m): 14
Field Notes X-refs: Diagram, p. 205

Comments: This canal was originally numbered as Canal 74. In a double-numbering mix-up that involved a number of canals, this feature was re-assigned the number Canal 165. The canal trends northwestward and is shown near the western end of Map A - Fields 3, p. 1. This canal has a very unusual relationship to adjacent fields which are rather large and are oriented at an unusual angle to the canal. For this reason, I decided that the canal was probably a distribution canal, but it must be noted that the canal appears to terminate in a field near the northwestern margin of the map, which elsewhere has been deemed a characteristic of field lateral canals.

Canal 166
Profile No.: No profile of this feature was drawn.
Map Reference: A3
Trench, Unit:
Canal Type:
Cross-section Shape(s):
Parent canal: Unknown
Daughter canal(s):
Stratigraphic Origin:
Mapped Canal Length (m): 22

Comments: Too shallow to profile

Canal 167
Profile No.: No profile of this feature was drawn.
Map Reference: B2
Trench, Unit: None
Canal Type: Field lateral
Cross-section Shape(s): Not observed
Parent canal: 82?
Daughter canal(s): None observed
Stratigraphic Origin: 505
Mapped Canal Length (m): 13

Comments: C82 is listed as the tentative parent canal for C167 and 168. It should be noted, however, that both possible daughter canals originate in Stratum 505 whereas the origin for C82 appears to be L504.04.

Canal 168
Profile No.: No profile of this feature was drawn.
Map Reference: B2
Trench, Unit: None
Canal Type: Field lateral
Cross-section Shape(s): Not observed
Parent canal: 82?
Daughter canal(s): None observed
Stratigraphic Origin: U505/L504.04
Mapped Canal Length (m): 6

Comments: Too shallow to profile.

Canal 169

Profile No.: No profile of this feature was drawn.

Map Reference: This short canal segment lies in Locus B, shown on map Fields 3 and 4
Canal Type: Field lateral
Cross-section Shape(s): Unknown
Parent canal: Unknown
Daughter canal(s): None observed
Stratigraphic Origin: L504.04?
Mapped Canal Length: 9 m
Samples Taken: None

Comments: C169 is located on the northeastern margin of Map B-2A (05.18.2011), between C102 and C168. As it was mapped in the field, C169 appears to underlie and is cut by C102. C168 is similarly younger than C169.

Canal 170

No profile of this feature was drawn.

Comments: This canal was not profiled. This canal number was erroneously used twice. The C170 was also applied to C80 (map B-1A) in error. That error has been corrected and the other feature is now re-numbered C80. C170 is correctly shown on the southeastern margin of Map B-3A, where it closely parallels C111.

Canal 171

No profile of this feature was drawn.

Map Reference: Fields B-1A
Date Profiled: N/A
Trench, Unit: None
Canal Type: Field lateral?
Cross-section Shape(s): Not observed
Parent canal: 79?
Daughter canal(s): None observed
Stratigraphic Origin: 504.02

Canal 172
No profile of this feature was drawn.
Map Reference: B1
Canal Type: Field lateral
Parent canal: 64
Stratigraphic Origin: U504.04
Mapped Canal Length (m): 16
Number of Iterations Detected: 1
Samples Taken: None

Comments: Not observed on ground; identified from map. Canal was not seen in profile view.

Canal 173

Profile No.: No profile of this feature was drawn.

Map Reference: B3, Map B - Fields 5, 6 and 7, p. 1
Date Profiled: N/A
Trench, Unit: None
Canal Type: Field lateral?
Cross-section Shape(s): Unknown
Parent canal: Unknown
Daughter canal(s): None observed. The southern end of C116 is deceptive in that it appears to originate at C173, but the two canals are definitely of different ages.
Stratigraphic Origin: 504.04?
Mapped Canal Length (m): Need to check this

Comments: C173 is shown in the northern and northeastern part of Map B-3A. The canal is approximately parallel to C107 and C106 (but are of different ages). On some earlier versions of the site maps, C76 was erroneously mislabeled as C173.

Canal 174
Profile No.: No profile was drawn of this feature.
Map Reference: B3
Trench, Unit: N/A
Canal Type: Field lateral?
Cross-section Shape(s): Unknown
Parent canal: 173
Daughter canal(s): None observed
Stratigraphic Origin: 504.04?
Mapped Canal Length (m): 3

Comments: This small (?) Canal was almost entirely scraped away prior to being observed; as a consequence no profile was drawn. The canal may be a field lateral that originates with C173, but this is speculative. The canal is exposed for only a few meters, and its location is shown in the northern corner of Map B - Fields 5, 6 and 7, p. 1.

Canal 175
Profile No.: No profile of this feature was drawn.
Map Reference: B4
Trench, Unit: N/A
Canal Type: Field lateral?
Cross-section Shape(s):
Parent canal: Unknown
Daughter canal(s): None observed
Stratigraphic Origin: 505
Mapped Canal Length (m): 2

Comments: A 2-meter-long scraping exposure of this trench is shown in the northern corner of Map B - Fields 5, 6 and 7, p. 2

Canal 176
Profile No.: No profile of this feature was drawn.
Map Reference: B4
Trench, Unit: N/A
Canal Type: Field lateral
Cross-section Shape(s): 3
Parent canal: 159? (Course of C159 not shown on maps)
Daughter canal(s): None observed
Stratigraphic Origin: 505
Mapped Canal Length (m): 5

Comments: The location of C176 is shown on the western side of Map B - Fields 5, 6, and 7, p. 2(southern). The canal was exposed on the scraped surface for a distance of only approximately 3 m.

Canal 177
Profile No.: No profile drawn
Map Reference: F1
Trench, Unit: None
Canal Type: Unknown
Cross-section Shape(s): None observed
Parent canal: 53?
Daughter canal(s): 54?
Stratigraphic Origin:

Comments: The entire canal mini-system (C177, 178, 179, and 180), shown on Map C -Field 1, p. 1, is a figment of someone's imagination. I am not sure why they were included on the map, as there is no ground evidence of any feature in any of these locations. In addition, the direction of branches shown on the map indicate that C177 would have to be flowing upslope in an upstream direction. As a consequence, the originally-assigned numbers 177, 178, 179, and 184 were abandoned. Canal 177 was subsequently applied to this feature, shown between Canals 53 and 54 in Locus F.

Canal 178
Profile No.: No profile was drawn
Map Reference: C1
Trench, Unit: N/A
Canal Type: N/A
Cross-section Shape(s): N/A
Parent canal: N/A
Daughter canal(s): N/A
Stratigraphic Origin: N/A

Comments: The entire canal mini-system (C177, 178, 179, and 180), shown on Map C -Field 1, p. 1, is a figment of someone's imagination. I am not sure why they were included on the map, as there is no ground evidence of any feature in any of these locations. In addition, the direction of branches shown on the map indicate that C177 would have to be flowing upslope in an upstream direction. As a consequence, the originally-assigned numbers 177, 178, 179, and 184 were abandoned. Canal 178 was subsequently applied to this feature, shown near canals, 53 and 85 near the southern margin of Locus F.

Canal 179

Profile No.: This is not a canal; the number is available for reassignment.

Map Reference: C1
Trench, Unit: N/A
Canal Type: N/A
Cross-section Shape(s): N/A
Parent canal: N/A
Daughter canal(s): N/A
Stratigraphic Origin: N/A

Comments: This entire canal mini-system (C177, 178, 179, and 180), shown on Map C -Field 1, p. 1, is a figment of someone's imagination. I am not sure why they were included on the map, as there is no ground evidence of any feature in any of these locations. In addition, the direction of branches shown on the map indicate that C177 would have to be flowing upslope and in an upstream direction. As a consequence, the originally-assigned numbers 177, 178, 179, and 184 were abandoned.

Canal 180

Profile No.: This is not a canal; number is available for reassignment.

Map Reference: C1
Trench, Unit: N/A
Canal Type: N/A
Cross-section Shape(s): N/A
Parent canal: N/A
Daughter canal(s): N/A
Stratigraphic Origin: N/A

Comments: This entire canal mini-system (C177, 178, 179, and 180), shown on Map C -Field 1, p. 1, is a figment of someone's imagination. I am not sure why they were included on the map, as there is no ground evidence of any feature in any of these locations. In addition, the direction of branches shown on the map indicate that C177 would have to be flowing upslope and in an upstream direction. As a consequence, the originally-assigned numbers 177, 178, 179, and 184 were abandoned.

Canal 181
Profile No.: No profile of this feature was drawn.
Map Reference: D1
Trench, Unit: None
Canal Type: Field lateral
Cross-section Shape(s): Not observed
Parent canal: 31
Daughter canal(s): None observed
Stratigraphic Origin: 504.04
Mapped Canal Length (m): 7

Comments: This small canal is only exposed for a short distance (8-10 m), and no profile was drawn. The canal appears to originate in stratum 504.04 and roughly parallels C135 and 136. There are several houses in the immediate vicinity of this canal, and soils in the immediate area had unusually high clay contents, set perhaps because of irrigation.

Canal 182
Profile No.: No profile of this feature was drawn.
Map Reference: D-3
Trench, Unit: None
Canal Type: Field lateral?
Cross-section Shape(s): Not observed
Parent canal: Unknown
Daughter canal(s): None observed
Stratigraphic Origin: 504.04/.02

Comments: C182 is exposed for a very short distance near the northern margin of Locus D. Because of the very short distance exposed in lack of profile that is not possible to say with certainty what the type of canal was, but it appears to be a small field lateral. The canal passes beneath C153, and appears to originate in the upper part of Stratum 504.04, but could originate as late as 504.02. The orientation of the canal suggests that it could have come from C19, but that canal appears to be younger than C182. Note the stratigraphic relationships between C36 (the youngest canal), C153 (next youngest), C152 (older than C153), and C102 (the oldest of these four canals).

Canal 183
Profile No.: No profile of this feature was drawn.
Map Reference: D1
Trench, Unit: None
Canal Type: Field lateral?
Cross-section Shape(s): None observed
Parent canal: Unknown
Daughter canal(s): None observed
Stratigraphic Origin: 505/504.04
Mapped Canal Length (m): 14

Comments: C183 was exposed for a short distance near the southern margin of Locus D, between C19, C33, and south of C124. Most of the canal scraped away before it was recognized, and it was too shallow to profile but was clearly associated with 504.04 fields in the area.

Canal 184
Profile No.: No profile of this feature was drawn.
Map Reference: D2
Trench, Unit: 7189, see Profile 144.01
Canal Type: Field lateral, possibly secondary distribution
Cross-section Shape(s): None observed
Parent canal: 144
Daughter canal(s): None observed
Stratigraphic Origin: 504.04
Mapped Canal Length (m): 8

Comments: This canal was too poorly preserved to profile, but is clearly associated with 504.04 fields. Although the actual connection with C144 was not observed it is derived from that canal. The apparent branch from C144 is directly down canal (north) of Profile 144.01. Profile 144.01 was originally given a temporary field designation as Profile D-18; the number has been corrected on the master canal spreadsheet.

Canal 185
Profile No.: No profile of this feature was drawn.
Map Reference: D2
Trench, Unit: None
Canal Type: Field lateral?
Cross-section Shape(s): Not observed
Parent canal: Unknown
Daughter canal(s): None observed
Stratigraphic Origin: 504.04
Mapped Canal Length (m): 3

Comments: C185 was exposed for a distance of only a few meters, and is located between C144 and C157 near the southern edge of Locus D.

Canal 186
Profile No.: No profile of this feature was drawn.
Map Reference: D2
Trench, Unit: 3305
Canal Type: Distribution?
Cross-section Shape(s): Not observed
Parent canal: Unknown
Daughter canal(s): None
Stratigraphic Origin: 504.02 (possibly U504.04?)
Mapped Canal Length (m): 18

Comments: This canal has a strange orientation trending toward C19, and is located between C36 and C19 near the southern boundary of Locus D. It could not be accurately determined on the ground whether the stratigraphic origin is in the upper part of 504.04 or 504.02. The trend of the canal suggests that it might be a continuation of C144, but it definitely was not visible in the scraped area between the two canals, and it would have to cross C143 for this connection to exist. In addition, the canal is clearly associated with 504.02 fields.

Canal 187

Profile No.: No profile of this feature was drawn.

Map Reference: D2
Trench, Unit:
Canal Type:
Cross-section Shape(s):
Parent canal: Unknown
Daughter canal(s):
Stratigraphic Origin:
Mapped Canal Length (m): 12

Canal 188

Map Reference: B, Fields 5, 6, and 7
Canal Type: FL
Parent canal: Unknown
Daughter canal(s):
Stratigraphic Origin: 505?
Profile Datum (mbsd):
Profile Datum (masl):
Mapped Canal Length:
Banks Visible:
Digouts Visible:
~Max. Visible Width (m):
~Max. Visible Depth (m):
Number of Iterations Detected:
~Ground Elevation at Inception (masl):
Canal Bottom Elevation-Earliest Use (masl):
Canal Bottom Elevation-2nd Iteration (masl):
Fe/Mg Stains:
Samples Taken: None
Field Notes X-refs:

Comments: Field lateral canal on border between the north and south halves of map Fields 5, 6, and 7, Locus B

Canal 189

Map Reference: B, Fields 3 and 4 (South map)
Canal Type: Unknown
Parent canal: Unknown
Stratigraphic Origin: 505
~Max. Visible Width (m):
Samples Taken: None
Field Notes X-refs:

Comments: This is a tiny remnant of an unknown canal type in the northwestern quadrant of Locus B, Fields 3 and 4 (South map). C189 is part of C112/111/106/107/115 system.

Canal 190

Map Reference: D, Fields 1, 2, and 3, Map 3.
Canal Type: FL
Parent canal: 153
Stratigraphic Origin: 504.04/.02
~Max. Visible Width (m):
Samples Taken: None

Comments: This canal was identified from maps, and was not observed in the field.

Canal 191
Profile No.:
Map Reference: E (WH)
Date Profiled:
Trench, Unit:
Canal Type: D?
Cross-section Shape(s):
Parent canal:
Daughter canal(s): 213?
Stratigraphic Origin:
Profile Datum (mbsd):
Profile Datum (masl):
Mapped Canal Length:
Banks Visible:
Digouts Visible:
~Max. Visible Width (m):
~Max. Visible Depth (m):
Number of Iterations Detected:
~Ground Elevation at Inception (masl):
Canal Bottom Elevation-Earliest Use (masl):
Canal Bottom Elevation-2nd Iteration (masl):
Fe/Mg Stains:
Samples Taken: None
Field Notes X-refs:

Comments: North-northeast-trending possible distribution canal (so-called black canal). There are many uncertainties about this canal – the trend of the canal is lost in an area of modern disturbance in the eastern quadrant of the footprint area. I think that probably C191 and C192 are part of the same canal system with C191 actually being the parent to C192 (this is speculation, however, and cannot be demonstrated).

Canal 192
Profile No.:
Map Reference: E (WH)
Date Profiled:
Trench, Unit:
Canal Type: D
Cross-section Shape(s):
Parent canal:
Daughter canal(s): 194, 195, 196, 197
Stratigraphic Origin:
Profile Datum (mbsd):
Profile Datum (masl):
Mapped Canal Length:
Banks Visible:
Digouts Visible:
~Max. Visible Width (m):
~Max. Visible Depth (m):
Number of Iterations Detected:
~Ground Elevation at Inception (masl):
Canal Bottom Elevation-Earliest Use (masl):
Canal Bottom Elevation-2nd Iteration (masl):
Fe/Mg Stains:
Samples Taken: None
Field Notes X-refs:

Comments: North-trending distribution canal shown in eastern quadrant of warehouse map. Direct connection with supposed daughter canals was not seen.

Canal 193
Profile No.:
Map Reference: E (WH), eastern quadrant
Date Profiled:
Trench, Unit:
Canal Type: D
Cross-section Shape(s):
Parent canal:
Daughter canal(s):
Stratigraphic Origin:
Profile Datum (mbsd):
Profile Datum (masl):
Mapped Canal Length:
Banks Visible:
Digouts Visible:
~Max. Visible Width (m):
~Max. Visible Depth (m):
Number of Iterations Detected:
~Ground Elevation at Inception (masl):
Canal Bottom Elevation-Earliest Use (masl):
Canal Bottom Elevation-2nd Iteration (masl):
Fe/Mg Stains:
Samples Taken: None
Field Notes X-refs:

Comments: North-trending probable distribution canal, very closely parallels C192, but relationship is unclear. It is possible that C193 is a later iteration of C192 (possible daughter canals to C192 may actually connect with C193, but a direct connection could not be established).

Canal 194

Map Reference: E (WH), southern margin of warehouse map
Canal Type: FL
Parent canal: 192/193
Stratigraphic Origin:
~Max. Visible Width (m):
Samples Taken: None

Comments: Small field lateral.

Canal 195

Map Reference: E (WH), near southern margin of warehouse map
Canal Type: FL
Parent canal: 192/193
Stratigraphic Origin:
~Max. Visible Width (m):
Samples Taken: None

Comments: Northeast-trending field lateral.

Canal 196

Map Reference: E (WH), extends to near center of warehouse map
Canal Type: FL
Parent canal: 192/193
Stratigraphic Origin:
~Max. Visible Width (m):
Samples Taken: None

Comments: Northeast-trending field lateral.

Canal 197

Map Reference: E (WH), west-central part of warehouse map
Canal Type: FL
Parent canal: 192/193
Stratigraphic Origin:
~Max. Visible Width (m):
Samples Taken: None

Comments: Northeast-trending field lateral.

Canal 198

Map Reference: E (WH), southeastern edge of warehouse map
Canal Type: FL
Parent canal: 205
Stratigraphic Origin:
~Max. Visible Width (m):
Samples Taken: None

Comments: Northeast-trending field lateral.

Canal 199

Map Reference: E (WH), near southern edge of warehouse map
Canal Type: FL
Parent canal: 205
~Max. Visible Width (m):
Samples Taken: None

Comments: Northeast-trending field lateral.

Canal 200
Profile #:
Map Reference: E (WH)
Canal Type: FL
Parent canal: 205
Stratigraphic Origin:
~Max. Visible Width (m):
Samples Taken: None

Comments: Northeast-trending field lateral.

Canal 201

Map Reference: E (WH), near center of warehouse map
Canal Type: FL
Parent canal: 205
Stratigraphic Origin:
~Max. Visible Width (m):
Samples Taken: None

Comments: Northeast-trending field lateral.

Canal 202

Map Reference: E (WH), center of warehouse map
Canal Type: FL
Parent canal: 205
Stratigraphic Origin:
~Max. Visible Width (m):
Samples Taken: None

Comments: Northeast-trending field lateral.

Canal 203

Map Reference: E (WH), north central portion of warehouse map
Canal Type: FL
Parent canal: 205
Stratigraphic Origin:
~Max. Visible Width (m):
Samples Taken: None
Field Notes X-refs:

Comments: Northeast-trending field lateral.

Canal 204

Map Reference: E (WH), north-central portion of warehouse map
Canal Type: FL
Parent canal: 205
Stratigraphic Origin:
~Max. Visible Width (m):
Samples Taken: None
Field Notes X-refs:

Comments: Northeast-trending field lateral.

Canal 205

Map Reference: E (WH), near center of warehouse map
Date Profiled:
Trench, Unit:
Canal Type: D
Cross-section Shape(s):
Parent canal:
Daughter canal(s): 198, 199, 200, 201, 202, 203, and 204
Stratigraphic Origin:
Profile Datum (mbsd):
Profile Datum (masl):
Mapped Canal Length:
Banks Visible:
Digouts Visible:
~Max. Visible Width (m):
~Max. Visible Depth (m):
Number of Iterations Detected:
~Ground Elevation at Inception (masl):
Canal Bottom Elevation-Earliest Use (masl):
Canal Bottom Elevation-2nd Iteration (masl):
Fe/Mg Stains:
Samples Taken: None
Field Notes X-refs:

Canal 206
Profile No.:
Map Reference: E (WH), east-central part of warehouse map
Date Profiled:
Trench, Unit:
Canal Type: D
Cross-section Shape(s):
Parent canal:
Daughter canal(s): 207, 208, 209, 216
Stratigraphic Origin:
Profile Datum (mbsd):
Profile Datum (masl):
Mapped Canal Length:
Banks Visible:
Digouts Visible:
~Max. Visible Width (m):
~Max. Visible Depth (m):
Number of Iterations Detected:
~Ground Elevation at Inception (masl):
Canal Bottom Elevation-Earliest Use (masl):
Canal Bottom Elevation-2nd Iteration (masl):
Fe/Mg Stains:
Samples Taken: None
Field Notes X-refs:

Comments: Northwestern-trending distribution canal shown in east-central portion of warehouse map.

Canal 207

Map Reference: E (WH), near eastern edge of warehouse map
Canal Type: FL
Parent canal: 206
Stratigraphic Origin:
~Max. Visible Width (m):
Samples Taken: None
Field Notes X-refs:

Comments: Northeast-trending field lateral.

Canal 208

Map Reference: E (WH), eastern quadrant of warehouse map
Canal Type: Field lateral
Parent canal: 206
Stratigraphic Origin:
~Max. Visible Width (m):
Samples Taken: None

Comments: Northeast-trending field lateral.

Canal 209

Map Reference: E (WH), eastern quadrant of warehouse map
Canal Type: Field Lateral
Cross-section Shape(s):
Parent canal: 206
Daughter canal(s):
Stratigraphic Origin:
~Max. Visible Width (m):
Samples Taken: None

Canal 210

Map Reference: E (WH), Northeastern corner of warehouse map
Date Profiled:
Trench, Unit:
Canal Type: Distribution
Cross-section Shape(s):
Parent canal:
Daughter canal(s): 211, 212
Stratigraphic Origin:
Profile Datum (mbsd):
Profile Datum (masl):
Mapped Canal Length:
Banks Visible:
Digouts Visible:
~Max. Visible Width (m):
~Max. Visible Depth (m):
Number of Iterations Detected:
~Ground Elevation at Inception (masl):
Canal Bottom Elevation-Earliest Use (masl):
Canal Bottom Elevation-2nd Iteration (masl):
Fe/Mg Stains:
Samples Taken: None
Field Notes X-refs:

Comments: Northwest-trending distribution canal.

Canal 211

Map Reference: E (WH), shown in northeastern corner of warehouse map
Canal Type: FL
Parent canal: 210
Stratigraphic Origin:
~Max. Visible Width (m):
Samples Taken: None

Comments: Northeast-trending field lateral.

Canal 212

Map Reference: E (WH), northeastern corner of warehouse map
Canal Type: FL
Parent canal: 210
Stratigraphic Origin:
~Max. Visible Width (m):
Samples Taken: None

Comments: Northeast-trending field lateral.

Canal 213
Profile No.:
Map Reference: E (WH), Northwestern corner of warehouse map
Date Profiled:
Trench, Unit:
Canal Type: Distribution?
Cross-section Shape(s):
Parent canal: 191
Daughter canal(s): Unknown
Stratigraphic Origin:
Profile Datum (mbsd):
Profile Datum (masl):
Mapped Canal Length:
Banks Visible:
Digouts Visible:
~Max. Visible Width (m):
~Max. Visible Depth (m):
Number of Iterations Detected:
~Ground Elevation at Inception (masl):
Canal Bottom Elevation-Earliest Use (masl):
Canal Bottom Elevation-2nd Iteration (masl):
Fe/Mg Stains:
Samples Taken: None
Field Notes X-refs:

Comments: Unusually large canal – has the size of the distribution canal, but the orientation of a bastards field lateral, appears to branch from C191; canal fill sediments are unusually dark.

Canal 214

Map Reference: E (WH), near western edge of warehouse map
Canal Type: FL?
Parent canal: Unknown
Stratigraphic Origin:
~Max. Visible Width (m):
Samples Taken: None

Comments: North-trending field lateral?

Canal 215

Map Reference: E (WH), southwestern corner of warehouse map
Canal Type: FL?
Parent canal: Unknown
Stratigraphic Origin:
~Max. Visible Width (m):
Samples Taken: None

Comments: This small north-trending canal appears to be of field lateral of unknown parentage, but I am not absolutely sure that it is even a canal. The feature parallels Canal 214 in the southwestern corner of the warehouse map.

Canal 216

Map Reference: E (WH), near northern border of warehouse map
Canal Type: FL
Parent canal: 206
Stratigraphic Origin:
~Max. Visible Width (m):
Samples Taken: None

Comments: Northeast-trending field lateral.

Canal 217, Locus C
Profile No.: 217.01
Map Reference:
Date Profiled: 12/19/'08
Trench, Unit: 222
Canal Type: Field lateral?
Cross-section Shape(s):
Parent canal: Unknown
Stratigraphic Origin: Historic
Profile Datum (mbsd): None
Profile Datum (masl): None
~Max. Visible Width (m): 1.21
~Max. Visible Depth (m): 0.20
Samples Taken: None

Comments: Originally double-numbered as C28 with a prehistoric canal in Locus A. This canal, a small historic canal, was re-numbered to Canal 217. No further analysis was done on this canal.