



Smart Contract Audit

FOR
zkPepe

DATED : 8 May 23'



AUDIT SUMMARY

Project name – zkPepe

Date: 8 May, 2023

Scope of Audit- Audit Ace was consulted to conduct the smart contract audit of the solidity source codes.

Audit Status: Passed

Issues Found

Status	Critical	High	Medium	Low	Suggestion
Open	0	0	0	0	1
Acknowledged	0	0	0	0	0
Resolved	0	1	0	0	0

USED TOOLS

Tools:

1- Manual Review:

A line by line code review has been performed by audit ace team.

2- BSC Test Network: All tests were conducted on the BSC Test network, and each test has a corresponding transaction attached to it. These tests can be found in the "Functional Tests" section of the report.

3- Slither :

The code has undergone static analysis using Slither.

Testnet version:

The tests were performed using the contract deployed on the BSC Testnet, which can be found at the following address:

<https://testnet.bscscan.com/token/0xf0cddc483f04b18f6e0ad1a7fabb342c8cad6a43>



Token Information

Token Name : zkPepe

Token Symbol: zkPepe

Decimals: 18

Token Supply: 420,690,000,000,000

Token Address:

0x3d160ddedf093c4E77342eB25a1B12570c0aA2b4

Checksum:

80b4b14b6f2ec91de8765d5ba8fe52cf73411863

Owner:

0xe03d0bdee20e6f275e48f2adccebe2c3f72dc250

(at time of writing the audit)

Deployer:

0xe03d0bdee20e6f275e48f2adccebe2c3f72dc250



TOKEN OVERVIEW

Fees:

Buy Fees: up to 8%

Sell Fees: up to 8%

Transfer Fees: up to 8%

Fees Privilege: Owner

Ownership: Owned

Minting: No mint function

Max Tx Amount/ Max Wallet Amount: No

Blacklist: No

Other Privileges: changing swap threshold - changing fees - enabling trades



AUDIT METHODOLOGY

The auditing process will follow a routine as special considerations by Auditace:

- Review of the specifications, sources, and instructions provided to Auditace to make sure the contract logic meets the intentions of the client without exposing the user's funds to risk.
 - Manual review of the entire codebase by our experts, which is the process of reading source code line-by-line in an attempt to identify potential vulnerabilities.
 - Specification comparison is the process of checking whether the code does what the specifications, sources, and instructions provided to Auditace describe.
 - Test coverage analysis determines whether the test cases are covering the code and how much code is exercised when we run the test cases.
 - Symbolic execution is analysing a program to determine what inputs cause each part of a program to execute.
 - Reviewing the codebase to improve maintainability, security, and control based on the established industry and academic practices.
-

VULNERABILITY CHECKLIST

- | | |
|------------------------------------|-------------------------------|
| ✓ Return values of low-level calls | ✓ Gasless Send |
| ✓ Private modifier | ✓ Using block.timestamp |
| ✓ Multiple Sends | ✓ Re-entrancy |
| ✓ Using Suicide | ✓ Tautology or contradiction |
| ✓ Gas Limitand Loops | ✓ Timestamp Dependence |
| ✓ Address hardcoded | ✓ Revert/require functions |
| ✓ Exception Disorder | ✓ Use of tx.origin |
| ✓ Using inline assembly | ✓ Integer overflow/underflow |
| ✓ Divide before multiply | ✓ Dangerous strict equalities |
| ✓ Missing Zero Address Validation | ✓ Using SHA3 |
| ✓ Compiler version not fixed | ✓ Using throw |
-



CLASSIFICATION OF RISK

Severity

Description

◆ Critical	These vulnerabilities could be exploited easily and can lead to asset loss, data loss, asset, or data manipulation. They should be fixed right away.
◆ High-Risk	A vulnerability that affects the desired outcome when using a contract, or provides the opportunity to use a contract in an unintended way.
◆ Medium-Risk	A vulnerability that could affect the desired outcome of executing the contract in a specific scenario.
◆ Low-Risk	A vulnerability that does not have a significant impact on possible scenarios for the use of the contract and is probably subjective.
◆ Gas Optimization /Suggestion	A vulnerability that has an informational character but is not affecting any of the code.

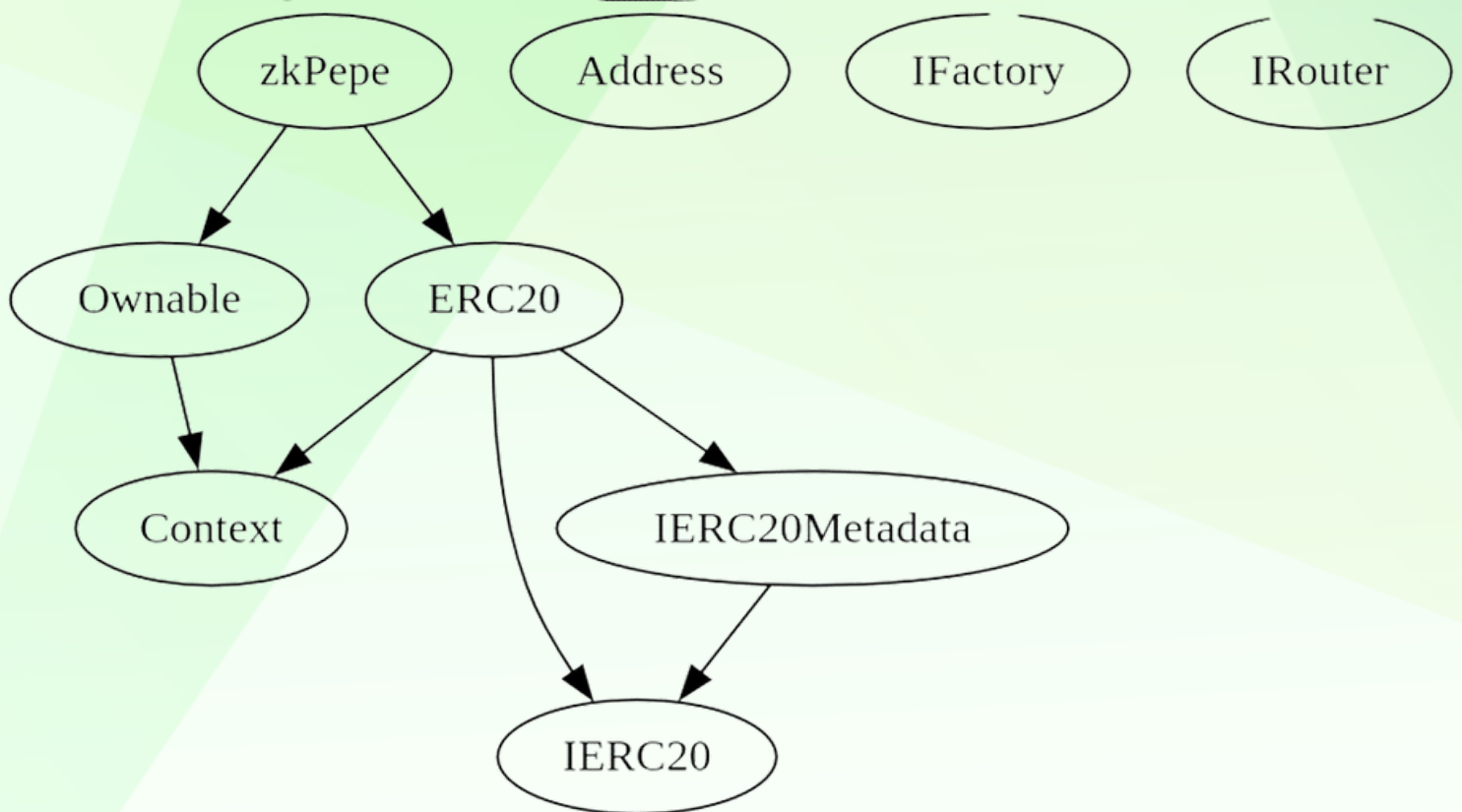
Findings

Severity

Found

◆ Critical	0
◆ High-Risk	1
◆ Medium-Risk	0
◆ Low-Risk	0
◆ Gas Optimization / Suggestions	1

INHERITANCE TREE



POINTS TO NOTE

- Owner is not able to set set buy/sell/transfer tax more than 8% each
 - Owner is not able to set a max buy/transfer/wallet/sell amount
 - Owner is not able to blacklist an arbitrary wallet
 - Owner is not able to disable trades
 - Owner is not able to mint new tokens
 - Owner must enable trades for holders to be able to trade
-



CONTRACT ASSESMENT

Contract	Type	Bases			
:-----: :-----: :-----: :-----: :-----:					
└	**Function Name**	**Visibility**	**Mutability**	**Modifiers**	
Mutability **Modifiers**					
Context Implementation					
└	_msgSender	Internal	🔒		
└	_msgData	Internal	🔒		
IERC20 Interface					
└	totalSupply	External	!		NO !
└	balanceOf	External	!		NO !
└	transfer	External	!		NO !
└	allowance	External	!		NO !
└	approve	External	!		NO !
└	transferFrom	External	!		NO !
IERC20Metadata Interface IERC20					
└	name	External	!		NO !
└	symbol	External	!		NO !
└	decimals	External	!		NO !
ERC20 Implementation Context, IERC20, IERC20Metadata					
└	<Constructor>	Public	!		NO !
└	name	Public	!		NO !
└	symbol	Public	!		NO !
└	decimals	Public	!		NO !
└	totalSupply	Public	!		NO !
└	balanceOf	Public	!		NO !
└	transfer	Public	!		NO !
└	allowance	Public	!		NO !
└	approve	Public	!		NO !
└	transferFrom	Public	!		NO !
└	increaseAllowance	Public	!		NO !
└	decreaseAllowance	Public	!		NO !
└	_transfer	Internal	🔒		
└	_tokengeneration	Internal	🔒		
└	_approve	Internal	🔒		
Address Library					
└	sendValue	Internal	🔒		
Ownable Implementation Context					
└	<Constructor>	Public	!		NO !



CONTRACT ASSESMENT

```
| L | owner | Public ! | | NO ! |
| L | renounceOwnership | Public ! | ● | onlyOwner |
| L | transferOwnership | Public ! | ● | onlyOwner |
| L | _setOwner | Private 🔒 | ● | |
|||||
| **IFactory** | Interface | |||
| L | createPair | External ! | ● | NO ! |
|||||
| **IRouter** | Interface | |||
| L | factory | External ! | | NO ! |
| L | WETH | External ! | | NO ! |
| L | addLiquidityETH | External ! | 💰 | NO ! |
| L | swapExactTokensForETHSupportingFeeOnTransferTokens | External ! | ● | NO ! |
|||||
| **zkPepe** | Implementation | ERC20, Ownable |||
| L | <Constructor> | Public ! | ● | ERC20 |
| L | approve | Public ! | ● | NO ! |
| L | transferFrom | Public ! | ● | NO ! |
| L | increaseAllowance | Public ! | ● | NO ! |
| L | decreaseAllowance | Public ! | ● | NO ! |
| L | transfer | Public ! | ● | NO ! |
| L | _transfer | Internal 🔒 | ● | |
| L | Liquify | Private 🔒 | ● | lockTheSwap |
| L | swapTokensForETH | Private 🔒 | ● | |
| L | addLiquidity | Private 🔒 | ● | |
| L | updateLiquidityProvide | External ! | ● | onlyOwner |
| L | updateLiquidityTreshhold | External ! | ● | onlyOwner |
| L | EnableTrading | External ! | ● | onlyOwner |
| L | UpdateZeroBuyTax | External ! | ● | onlyOwner |
| L | UpdateZeroSellTax | External ! | ● | onlyOwner |
| L | SetBuyTax | External ! | ● | onlyOwner |
| L | SetSellTax | External ! | ● | onlyOwner |
| L | UpdateTxTax | External ! | ● | onlyOwner |
| L | updatedeadline | External ! | ● | onlyOwner |
| L | updateMarketingWallet | External ! | ● | onlyOwner |
| L | updateDevWallet | External ! | ● | onlyOwner |
| L | updateExemptFee | External ! | ● | onlyOwner |
| L | bulkExemptFee | External ! | ● | onlyOwner |
| L | rescueBNB | External ! | ● | onlyOwner |
| L | rescueBEP20 | External ! | ● | onlyOwner |
| L | <Receive Ether> | External ! | 💰 | NO ! |
```



CONTRACT ASSESMENT

Legend

Symbol	Meaning
:	:
●	Function can modify state
💰	Function is payable



STATIC ANALYSIS

```
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#reentrancy-vulnerabilities-3

Context.msgData() (contracts/Token.sol#22-25) is never used and should be removed
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#dead-code

Pragma version^0.8.17 (contracts/Token.sol#15) necessitates a version too recent to be trusted. Consider deploying with 0.6.12/0.7.6/0.8.16
solc-0.8.19 is not recommended for deployment
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#incorrect-versions-of-solidity

Low level call in Address.sendValue(address,uint256) (contracts/Token.sol#346-357):
- (success) = recipient.call{value: amount}() (contracts/Token.sol#352)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#low-level-calls

Variable ERC20_balances (contracts/Token.sol#78) is not in mixedCase
Variable ERC20_allowances (contracts/Token.sol#88) is not in mixedCase
Function IRouter.WETH() (contracts/Token.sol#410) is not in mixedCase
Contract zkPepe (contracts/Token.sol#433-775) is not in CapWords
Function zkPepe.Liquify(uint256,zkPepe.Taxes) (contracts/Token.sol#609-653) is not in mixedCase
Parameter zkPepe.updateLiquidityTreshhold(uint256).new_amount (contracts/Token.sol#692) is not in mixedCase
Function zkPepe.EnableTrading() (contracts/Token.sol#704-709) is not in mixedCase
Function zkPepe.UpdateZeroBuyTax() (contracts/Token.sol#711-713) is not in mixedCase
Function zkPepe.UpdateZeroSellTax() (contracts/Token.sol#715-717) is not in mixedCase
Function zkPepe.SetBuyTax() (contracts/Token.sol#719-721) is not in mixedCase
Function zkPepe.SetSellTax() (contracts/Token.sol#723-725) is not in mixedCase
Function zkPepe.UpdateTxTax() (contracts/Token.sol#727-730) is not in mixedCase
Parameter zkPepe.updatedeadline(uint256).deadline (contracts/Token.sol#732) is not in mixedCase
Parameter zkPepe.updateExemptFee(address,bool)._address (contracts/Token.sol#748) is not in mixedCase
Variable zkPepe.genesis_block (contracts/Token.sol#445) is not in mixedCase
Constant zkPepe.deadWallet (contracts/Token.sol#451-452) is not in UPPER CASE WITH UNDERSCORES
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#conformance-to-solidity-naming-conventions

Redundant expression "this (contracts/Token.sol#23)" inContext (contracts/Token.sol#17-26)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#redundant-statements

zkPepe.constructor() (contracts/Token.sol#473-492) uses literals with too many digits:
- tokengeneration(msg.sender,4206900000000000 * 10 ** decimals()) (contracts/Token.sol#474)
zkPepe.updateLiquidityTreshhold(uint256) (contracts/Token.sol#692-702) uses literals with too many digits:
- require(bool,string)(new_amount >= 420690000000,Swap threshold amount should be lower or equal to 0.01% of tokens) (contracts/Token.sol#693-696)
zkPepe.updateLiquidityTreshhold(uint256) (contracts/Token.sol#692-702) uses literals with too many digits:
- require(bool,string)(new_amount <= 420690000000000,Swap threshold amount should be lower or equal to 1% of tokens) (contracts/Token.sol#697-700)
zkPepe.slitherConstructorVariables() (contracts/Token.sol#433-775) uses literals with too many digits:
- tokenLiquidityThreshold = 4206900000000 * 10 ** 18 (contracts/Token.sol#443)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#too-many-digits

zkPepe.launchtax (contracts/Token.sol#447) should be constant
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#state-variables-that-could-be-declared-constant

zkPepe.pair (contracts/Token.sol#437) should be immutable
zkPepe.router (contracts/Token.sol#436) should be immutable
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#state-variables-that-could-be-declared-immutable
```

Result => A static analysis of contract's source code has been performed using slither,

No major issues were found in the output



FUNCTIONAL TESTING

Router (PCS V2):

0xD99D1c33F9fC3444f8101754aBC46c52416550D1

All the functionalities have been tested, no issues were found

1- Adding liquidity (passed):

<https://testnet.bscscan.com/tx/0xfd380e0944a236341b86ab506ccbc918c4080d185819633e4cf37188e4fed72>

2- Buying when excluded (0% tax) (passed):

<https://testnet.bscscan.com/tx/0x219248b3bce0128df8d4ba95a1006b7be6098d8d925106c993fc9ba4610e6e8e>

3- Selling when excluded (0% tax) (passed):

<https://testnet.bscscan.com/tx/0x2abeeddc5da5463fc969e026a427002aacbbe1b5e7c56f399301c298202cb131>

4- Transferring when excluded from fees (0% tax) (passed):

<https://testnet.bscscan.com/tx/0xdf35585bca54e40641979a40898f03fc3fcb145f0783d65101852dbc1c192765>

5- Buying when not excluded from fees (upto 8% tax) (passed):

<https://testnet.bscscan.com/tx/0x24bcd482e84c1619eb175e5acccf1c483051c0ae6b440e19da814cd2f04826d1>

6- Selling when not excluded from fees (upto 8% tax) (passed):

<https://testnet.bscscan.com/tx/0x4f0eb5b3ecfd7d43ec9648b1ce2efd9b313cb1289df7ca642121f96c77fc9c7c>



FUNCTIONAL TESTING

7- Transferring when not excluded from fees (upto 8% tax)(passed):

<https://testnet.bscscan.com/tx/0x81e26ed066166788902b4cf71aad9eaf598dd93f630f3827eefef82135b80d1a>

7- Internal swap (fee wallets received BNB)(passed):

<https://testnet.bscscan.com/address/0xe590f86e972b4b27ad832d699b7dd641d9481dbf#internaltx>

MANUAL TESTING

Centralization – Trades must be enabled

Severity: **High**

function: EnableTrading

Status: **Resolved (Contract is owned by Pinksale safu developer)**

Overview:

The smart contract owner must enable trades for holders. If trading remain disabled, no one would be able to buy/sell/transfer tokens.

```
function EnableTrading() external onlyOwner {
    require(!tradingEnabled, "Cannot re-enable trading");
    tradingEnabled = true;
    providingLiquidity = true;
    genesis_block = block.number;
}
```

Suggestion

To mitigate this centralization issue, we propose the following options:

1. Renounce Ownership: Consider relinquishing control of the smart contract by renouncing ownership. This would remove the ability for a single entity to manipulate the router, reducing centralization risks.
2. Multi-signature Wallet: Transfer ownership to a multi-signature wallet. This would require multiple approvals for any changes to the mainRouter, adding an additional layer of security and reducing the centralization risk.
3. Transfer ownership to a trusted and valid 3rd party in order to guarantee enabling of the trades (**applied**)



MANUAL TESTING

Informational – Redundant code

Status: Not Resolved

Overview:

Auto-liquidity feature of the contract is never used (0% liquidity tax) hence its suggested to remove auto-liquidity code.



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